

Appendix B. Fluid Mineral Lease Notices; Lease Stipulations; and the Process for Exceptions, Modifications, and Waivers

B.1. Lease Notices

A lease notice provides more detailed information concerning limitations that already exist in law, lease terms, regulations, or operational orders. A Lease Notice also addresses special items the lessee should consider when planning operations, but does not impose new or additional restrictions (Uniform Format for Oil and Gas Lease Stipulations, March 1989. Rocky Mountain Regional Coordinating Committee). “An information [lease] notice has no legal consequences, except to give notice of existing requirements, and may be attached to a lease by the authorized officer at the time of lease issuance to convey certain operational, procedural or administrative requirements relative to lease management within the terms and conditions of the standard lease form. Information [lease] notices shall not be a basis for denial of lease operations.” (43 Code of Federal Regulations [CFR] 3101.1-3). There are four standard lease notices that are attached to every lease issued by the Bureau of Land Management (BLM) within Wyoming (three numbered, and one unnumbered lease notice).

LEASE NOTICE NO. 1

Under Regulation 43 CFR 3101.1-2 and terms of the lease (BLM Form 3100-11), the authorized officer may require reasonable measures to minimize adverse impacts to other resource values, land uses, and users not addressed in lease stipulations at the time operations are proposed. Such reasonable measures may include, but are not limited to, modification of siting or design of facilities, timing of operations, and specification of interim and final reclamation measures, which may require relocating proposed operations up to 200 meters, but not off the leasehold, and prohibiting surface disturbance activities for up to 60 days.

The lands within this lease may include areas not specifically addressed by lease stipulations that may contain special values, may be needed for special purposes, or may require special attention to prevent damage to surface and/or other resources. Possible special areas are identified below. Any surface use or occupancy within such special areas will be strictly controlled or, if absolutely necessary, prohibited. Appropriate modifications to imposed restrictions will be made for the maintenance and operation of producing wells.

1. Slopes in excess of 25 percent.
2. Within 500 feet of surface water and/or riparian areas.
3. Construction with frozen material or during periods when the soil material is saturated or when watershed damage is likely to occur.
4. Within 500 feet of Interstate highways and 200 feet of other existing rights-of-way (i.e., U.S. and State highways, roads, railroads, pipelines, powerlines).
5. Within 0.25 mile of occupied dwellings.
6. Material sites.

GUIDANCE:

The intent of this notice is to inform interested parties (potential lessees, permittees, operators) that when one or more of the above conditions exist, surface-disturbing activities will be prohibited

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unless or until the permittee or the designated representative and the surface management agency (SMA) arrive at an acceptable plan for mitigation of anticipated impacts. This negotiation will occur prior to development and become a condition for approval when authorizing the action.

Specific threshold criteria (e.g., 500 feet from water) have been established based upon the best information available. However, geographical areas and time periods of concern must be delineated at the field level (i.e., "surface water and/or riparian areas" may include both intermittent and ephemeral water sources or may be limited to perennial surface water).

The referenced oil and gas leases on these lands are hereby made subject to the stipulation that the exploration or drilling activities will not interfere materially with the use of the area as a materials site/free use permit. At the time operations on the above lands are commenced, notification will be made to the appropriate agency. The name of the appropriate agency may be obtained from the proper BLM Field Office.

THIS NOTICE APPLIES TO ALL PARCELS.

LEASE NOTICE NO. 2

BACKGROUND:

The BLM, by including National Historic Trails within its National Landscape Conservation System, has recognized these trails as national treasures. Our responsibility is to review our strategy for management, protection, and preservation of these trails. The National Historic Trails in Wyoming, which include the Oregon, California, Mormon Pioneer, and Pony Express Trails, as well as the Nez Perce Trail, were designated by Congress through the National Trails System Act (P.L. 90-543; 16 United States Code [U.S.C.] 1241-1251) as amended through P.L. 106-509 dated November 13, 2000. Protection of the National Historic Trails is normally considered under the National Historic Preservation Act (NHPA) (P.L. 89-665; 16 U.S.C. 470 et seq.) as amended through 1992 and the National Trails System Act. Additionally, Executive Order 13195, "Trails for America in the 21st Century," signed January 18, 2001, states in Section 1: "Federal agencies will...protect, connect, promote, and assist trails of all types throughout the United States. This will be accomplished by: (b) Protecting the trail corridors associated with national scenic trails and the high priority potential sites and segments of national historic trails to the degrees necessary to ensure that the values for which each trail was established remain intact." Therefore, the BLM will be considering all impacts and intrusions to the National Historic Trails, their associated historic landscapes, and all associated features, such as trail traces, grave sites, historic encampments, inscriptions, natural features frequently commented on by emigrants in journals, letters and diaries, or any other feature contributing to the historic significance of the trails. Additional National Historic Trails will likely be designated amending the National Trails System Act. When these amendments occur, this notice will apply to those newly designated National Historic Trails as well.

STRATEGY:

The BLM will proceed in this objective by conducting a viewshed analysis on either side of the designated centerline of the National Historic Trails in Wyoming, except, at this time, for the Nez Perce Trail, for the purpose of identifying and evaluating potential impacts to the trails, their associated historic landscapes, and their associated historic features. Subject to the viewshed analysis and archeological inventory, reasonable mitigation measures may be applied. These may include, but are not limited to, modification of siting or design of facilities to camouflage or otherwise hide the proposed operations within the viewshed. Additionally, specification of interim and final reclamation measures may require relocating the proposed operations within

the leasehold. Surface-disturbing activities will be analyzed in accordance with the National Environmental Policy Act (NEPA) of 1969 (P.L. 91190; 42 U.S.C. 4321-4347) as amended through P.L. 94-52, July 3, 1975 and P.L. 94-83, August 9, 1975, and the NHPA, supra, to determine if any design, siting, timing, or reclamation requirements are necessary. This strategy is necessary until the BLM determines that, based on the results of the completed viewshed analysis and archeological inventory, the existing land use plans (Resource Management Plans [RMPs]) have to be amended.

The use of this lease notice is a predecisional action, necessary until final decisions regarding surface-disturbing restrictions are made. Final decisions regarding surface-disturbing restrictions will take place with full public disclosure and public involvement over the next several years if BLM determines that it is necessary to amend existing land use plans.

GUIDANCE:

The intent of this notice is to inform interested parties (potential lessees, permittees, operators) that when any oil and gas lease contains remnants of National Historic Trails, or is located within the viewshed of a National Historic Trails' designated centerline, surface-disturbing activities will require the lessee, permittee, operator or, their designated representative, and the SMA to arrive at an acceptable plan for mitigation of anticipated impacts. This negotiation will occur prior to development and become a condition for approval when authorizing the action.

THIS NOTICE APPLIES TO ALL PARCELS.

LEASE NOTICE NO. 3

Greater Sage-Grouse Habitat: The lease may in part, or in total, contain important Greater Sage-Grouse habitats as identified by the BLM, either currently or prospectively. The operator may be required to implement specific measures to reduce impacts of oil and gas operations on the Greater Sage-Grouse populations and habitat quality. Such measures shall be developed during the Application for Permit to Drill (APD) onsite and environmental review process and will be consistent with the lease rights granted.

THIS NOTICE APPLIES TO ALL PARCELS.

UNNUMBERED LEASE NOTICE

ATTACHMENT TO EACH LEASE

Provisions of the Mineral Leasing Act (MLA) of 1920, as amended by the Federal Coal Leasing Amendments Act of 1976, affect an entity's qualifications to obtain an oil and gas lease. Section 2(a)(2)(A) of the MLA, 30 U.S.C. 201 (a)(2)(A), requires that any entity that holds and has held a Federal coal lease for 10 years beginning on or after August 4, 1976, and who is not producing coal in commercial quantities from each such lease, cannot qualify for the issuance of any other lease granted under the MLA. Compliance by coal lessees with Section 2(a)(2)(A) is explained in 43 CFR 3472.

In accordance with the terms of this oil and gas lease, with respect to compliance by the initial lessee with qualifications concerning federal coal lease holdings, all assignees and transferees are hereby notified that this oil and gas lease is subject to cancellation if: (1) the initial lessee as assignor or as transferor has falsely certified compliance with Section 2(a)(2)(A), or (2) because of a denial or disapproval by a State Office of a pending coal action, i.e., arms-length assignment, relinquishment, or logical mining unit, the initial lessee as assignor or as transferor is no longer in

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compliance with Section 2(a)(2)(A). The assignee, sublessee or transferee does not qualify as a bona fide purchaser and, thus, has no rights to bona fide purchaser protection in the event of cancellation of this lease due to noncompliance with Section 2(a)(2)(A).

Information regarding assignor, sublessor or transferor compliance with Section 2(a)(2)(A) is contained in the lease case file as well as in other BLM records available through the State Office issuing this lease.

B.2. Lease Stipulations

The RMP determines which areas of the planning area are open to fluid mineral leasing, including the constraints or conditions open areas are subject to, and which areas are closed to fluid mineral leasing. The Approved RMP closes the following areas to mineral leasing: Wilderness Study Areas, recommended Wild and Scenic Rivers, and certain Special Recreation Management Areas (Burnt Hollow, Dry Creek Petrified Tree, Middle Fork Powder River, Mosier Gulch, and Hole-in-the-Wall).

In areas open to leasing the BLM may impose lease stipulations. A lease stipulation is a condition of lease issuance that provides a level of protection for other resource values or land uses by restricting lease operations during certain times or locations or to avoid unacceptable impacts, to an extent greater than standard lease terms or regulations. These resource values and land uses generally include wildlife, soil, water, recreation, visual, and cultural resources. A stipulation is an enforceable term of the lease contract, supersedes any inconsistent provisions of the standard lease form, and is attached to and made a part of the lease. Lease stipulations further implement the BLM's regulatory authority to protect resources or resource values. Lease stipulations are developed through the land use planning process. "The authorized officer may require stipulations as conditions of lease issuance. Stipulations shall become part of the lease and shall supersede inconsistent provisions of the standard lease form. Any party submitting a bid... shall be deemed to have agreed to stipulations applicable to the specific parcel..." (43 CFR 3101.1-3).

Exceptions, waivers, and modifications provide an effective means of applying "Adaptive Management" techniques to oil and gas leases and associated permitting activities to meet changing circumstances. The criteria for approval of exceptions, waivers, and modifications should be supported by NEPA analysis, either through the land use planning process or site-specific environmental review.

This appendix identifies fluid mineral lease stipulations and addresses the procedure for providing exceptions, modifications, and waivers of lease stipulations. Procedures for changing Conditions of Approval (COAs) placed on surface disturbance and disruptive activity authorizations to protect resource values are the same.

Definitions

The three types of surface stipulations the BLM applies are: (1) no surface occupancy (NSO), (2) timing limitation stipulation (TLS), and (3) controlled surface use (CSU).

- **NSO:** Use or occupancy of the land surface for fluid mineral exploration or development is prohibited in order to protect identified resource values. The minerals under NSO lands may potentially be developed by directionally or horizontally drilling from nearby lands that do not have the NSO limitation.

- **TLS:** Prohibits surface use during a specified time period to protect identified resource values. (Seasonal Restriction).
- **CSU:** Use and occupancy is allowed (unless restricted by another stipulation), but identified resource values require special operational constraints that may modify lease rights.

Surface use rights are described in more detail at 43 CFR 3101.1-2.

An applicant may request an exception, modification, or waiver of a stipulation or restriction included in a lease or applied as a COA.

- **Exception:** A one-time exemption to a lease stipulation or COA determined on a case-by-case basis.
- **Modification:** A change to the provisions of a lease stipulation, either temporarily or for the term of the lease.
- **Waiver:** A permanent exemption to a lease stipulation.

Standard Stipulations

The following three stipulations are applied to all BLM-administered fluid mineral leases within Wyoming.

LEASE STIPULATION NO. 1: CULTURAL RESOURCES

This lease may be found to contain historic properties and/or resources protected under the NHPA, American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order 13007, or other statutes and executive orders. The BLM will not approve any ground-disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., State Historic Preservation Officer [SHPO]) and tribal consultation) under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

LEASE STIPULATION NO. 2: ENDANGERED SPECIES ACT SECTION 7 CONSULTATION

The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. The BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. § 1531 *et seq.*, including completion of any required procedure for conference or consultation.

LEASE STIPULATION NO. 3: MULTIPLE MINERAL DEVELOPMENT

Operations will not be approved which, in the opinion of the authorized officer, would unreasonably interfere with the orderly development and/or production from a valid existing mineral lease issued prior to this one for the same lands.

Buffalo Planning Area Stipulations

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The following table lists the fluid mineral lease stipulations and exception, modification, and waiver criteria for those stipulations included under the BLM's Approved RMP. Table B.1, "Lease Stipulations and Exception, Modification, and Waiver Criteria" (p. 229) describes the stipulation (NSO, TLS, and CSU), identifies the applicable management action to which the stipulation applies, discloses the approximate acreage to which the stipulation applies, and the criteria for considering exceptions, modifications, and waivers.

Table B.1. Lease Stipulations and Exception, Modification, and Waiver Criteria

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|-----------------------------|------------------|--|
| Soil-1004 | CSU | Soil: severe erosion hazard | 669,739 | <p>Surface disturbance is restricted on soils with a severe erosion hazard rating.</p> <p>Controlled Surface Use (CSU) (1): (a) Prior to surface disturbance on soils with a severe erosion hazard rating a site-specific construction, stabilization, and reclamation plan (Plan) must be submitted to the Bureau of Land Management (BLM) by the applicant as a component of the Application for Permit to Drill (APD) (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate). (b) The Plan must demonstrate to the BLM authorized officer’s satisfaction how the operator will meet the following performance standards:</p> <ul style="list-style-type: none"> • The disturbed area will be stabilized with no evidence of accelerated erosion features. • The disturbed area shall be managed to ensure soil characteristics approximate an appropriate reference site with regard to erosional features to maintain soil productivity and sustainability. • Sufficient viable topsoil is maintained for ensuring successful final reclamation. At locations where interim reclamation will be completed, this will be accomplished by respreading all salvaged topsoil over the areas of interim reclamation. • The original landform and site productivity will be partially restored during interim reclamation and fully restored as a result of final reclamation. <p>On the lands described below: CSU (2) as mapped by the Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) Order 3 soil survey and/or as determined by a BLM evaluation of the area. For the purpose of: CSU (3) ensuring successful reclamation and erosion control on soils with a severe erosion hazard rating in order to meet the standards outlined in, Chapter 6 the BLM’s Oil and Gas Gold Book, as revised, and the 2015 Buffalo Field Office (BFO) Resource Management Plan (RMP) Record of Decision (ROD).</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above or a BLM evaluation determines that the affected soils do not meet the severe erosion hazard rating criteria.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based upon a NRCS soil survey or BLM evaluation. The stipulation and performance standards identified above may be modified based on monitoring results.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---|------------------|--|
| | | | | <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area does not include soils with severe erosion hazard. This determination shall be based upon NRCS mapping and/or BLM evaluation of the area.</p> |
| Soil-1006 | CSU | Soil: slopes greater than 25% and less than 50% | 170,590 | <p>Surface disturbance is restricted on slopes greater than 25% and less than 50%.</p> <p>CSU (1): (a) Prior to surface disturbance on slopes greater than 25% and less than 50% a site-specific construction, stabilization, and reclamation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The Plan must include designs approved and stamped by a licensed engineer. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate). (b) The Plan must demonstrate to the BLM authorized officer’s satisfaction how the operator will meet the following performance standards:</p> <ul style="list-style-type: none"> ● Slope stability is maintained preventing slope failure or mass wasting. ● The disturbed area will be stabilized with no evidence of accelerated erosion features. ● The disturbed area shall be managed to ensure soil characteristics approximate an appropriate reference site with regard to erosional features to maintain soil productivity and sustainability. ● Sufficient viable topsoil is maintained for ensuring successful final reclamation. At locations where interim reclamation will be completed, this will be accomplished by respreading all salvaged topsoil over the areas of interim reclamation. ● The original landform and site productivity will be partially restored during interim reclamation and fully restored as a result of final reclamation. <p>On the lands described below: CSU (2) as mapped by the U.S. Geological Survey (USGS) 1:24,000 scale topographic maps, USGS Digital Elevation Models, and/or as determined by a BLM evaluation of the area. For the purpose of: CSU (3) ensuring successful reclamation and erosion control on slopes greater than 25% and less than 50% in order to meet the standards outlined in Chapter 6 of the BLM’s Oil and Gas Gold Book, as revised, and the 2015 BFO RMP ROD.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above, or a BLM evaluation determines that the disturbed area is not located on slopes greater than 25% but less than 50%.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based upon a BLM evaluation of the area. The stipulation and performance standards identified above may be modified based on monitoring results.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|-------------------------------|------------------|--|
| | | | | <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area does not include slopes greater than 25% but less than 50%. This determination shall be based upon USGS mapping and/or BLM evaluation of the area.</p> |
| Soil-1006 | NSO | Soil: slopes greater than 50% | 45,570 | <p>No surface occupancy (NSO) or use is allowed on slopes greater than 50%.</p> <p>On the lands described below: NSO (1) as mapped by the USGS 1:24,000 scale topographic maps, USGS Digital Elevation Models, and/or as determined by a BLM evaluation of the area.</p> <p>For the purpose of: NSO (2) preventing mass slope failure and accelerated erosion.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action will not result in a mass slope failure or accelerated erosion, or if the action is located entirely within an existing surface disturbance.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based upon a BLM evaluation of the area. The stipulation may be modified based on monitoring results.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area does not include slopes greater than 50%. This determination shall be based upon USGS mapping and/or BLM evaluation of the area.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---|------------------|---|
| Soil-1010 | CSU | Soil: limited reclamation potential areas | 685,950 | <p>Surface disturbance is prohibited or restricted on limited reclamation potential areas such as areas possessing sensitive geologic formations, extremely limiting soil conditions, biological soil crusts, badlands, rock outcrops, and slopes susceptible to mass failure.</p> <p>CSU (1): (a) CSU (1): (a) Prior to surface disturbance on limited reclamation potential areas a site-specific construction, stabilization, and reclamation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The Plan must include designs approved and stamped by a licensed engineer. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate).</p> <p>(b) The Plan must demonstrate to the BLM authorized officer’s satisfaction how the operator will meet the following performance standards:</p> <ul style="list-style-type: none"> ● The disturbed area will be stabilized with no evidence of accelerated erosion features. ● The disturbed area shall be managed to ensure soil characteristics approximate an appropriate reference site with regard to erosional features to maintain soil productivity and sustainability. ● Slope stability is maintained preventing slope failure and erosion. ● Sufficient viable topsoil is maintained for ensuring successful final reclamation. At locations where interim reclamation will be completed, this will be accomplished by respreading all salvaged topsoil over the areas of interim reclamation. ● The original landform and site productivity will be partially restored during interim reclamation and fully restored as a result of final reclamation. <p>On the lands described below: CSU (2) as mapped by the NRCS SSURGO Order 3 soil survey and as determined by a BLM evaluation of the area. For the purpose of: CSU (3) ensuring successful reclamation and erosion control on limited reclamation potential areas in order to meet the standards outlined in, Chapter 6 of the BLM’s Oil and Gas Gold Book, as revised, and the 2015 BFO RMP ROD.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above or a BLM evaluation determines that the area does not meet the limited reclamation criteria.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based upon a NRCS soil survey and BLM evaluation. The stipulation and performance standards identified above may be modified based on monitoring results.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|--------------------|------------------|--|
| | | | | <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon NRCS mapping and BLM evaluation.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|-----------------------|------------------|--|
| Water-1014 | CSU | Water: surface waters | 95,172 | <p>Surface disturbance is restricted within 500 feet of springs, non-Coalbed Natural Gas (CBNG) reservoirs, water wells, and perennial streams.</p> <p>CSU (1): (a) CSU (1): (a) Prior to surface disturbance within 500 feet of springs, non-CBNG reservoirs, water wells, and perennial streams a site-specific construction, stabilization, and reclamation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate).</p> <p>(b) The Plan must demonstrate to the BLM authorized officer’s satisfaction how the operator will meet the following performance standards:</p> <ul style="list-style-type: none"> • Storm water and surface runoff will be controlled to minimize erosion (rilling, gullyng, piping, mass wasting) and offsite siltation during construction, use/operations, and reclamation. • Offsite areas will be protected from accelerated soil erosion. • The original landform and site productivity will be partially restored during interim reclamation and fully restored as a result of final reclamation. <p>CSU (2) as mapped by the USGS National Hydrologic Inventory and/or as determined by a BLM evaluation of the area.</p> <p>For the purpose of:</p> <p>CSU (3) ensuring protection of surface waters and associated riparian habitats by meeting the standards outlined in, Chapter 6 of the BLM’s Oil and Gas Gold Book, as revised, and the 2015 BFO RMP ROD.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based upon a USGS National Hydrologic Inventory and/or BLM evaluation, in coordination with the Wyoming Department of Environmental Quality (DEQ) and/or Wyoming State Engineer’s Office (WSEO). The stipulation and performance standards identified above may be modified based on monitoring results.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within 500 feet of springs, non-CBNG reservoirs, water wells, and perennial streams. This determination shall be based upon USGS National Hydrologic Inventory and/or BLM evaluation, in coordination with the Wyoming DEQ and/or BFO.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|-----------------------------------|------------------|---|
| Cave-1004 | CSU | Cave and Karst: significant caves | 212,626 | <p>Surface disturbance is restricted near the entrances to significant caves.</p> <p>CSU (1): (a) Prior to surface disturbance or disruptive activities near an entrance to a significant cave a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate). (b) The Plan must demonstrate to the BLM authorized officer’s satisfaction that the action will not destroy, disturb, deface, mar, alter, remove, or harm any significant cave or alter the free movement of any animal or plant life into or out of any significant cave. On the lands described below: CSU (2) as mapped by the BLM. For the purpose of: CSU (3) protecting significant cave resources (any material or substance occurring naturally in caves, such as animal life, plant life, paleontological deposits, sediments, minerals, speleogens, and speleothems).</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the significant cave resource(s) will be protected.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based upon on local evaluation. The stipulation and standards identified above may be modified based on monitoring results. The determination shall be based upon field studies of the area by a qualified representative of the operator subject to confirmation from BLM.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area does not contain significant caves. This determination shall be based upon USGS or BLM data and field evaluation of the area.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-----------------------|------------------|--|------------------|--|
| Coal-2002 O&G-2007 | CSU | Coal: areas identified as highly likely to be considered in a Coal (LBA) | 304,967 | <p>Surface use or occupancy is restricted within areas identified as highly likely to be considered in a Coal Lease by Application (LBA).</p> <p>CSU (1): Surface use or occupancy shall not be allowed by oil and gas lessee(s), operating rights holder(s), and/or oil and gas operator(s) on this federal oil and gas lease to conduct any oil and gas operation, including drilling for, removing, or disposing of oil and/or gas contained in federal coal lease(s) unless a plan for mitigation of anticipated impacts is developed between the oil and gas and the coal lessees, and the Plan is approved by the BLM authorized officer; On the lands described below:</p> <p>CSU (2) areas identified as highly likely to be considered in a Coal LBA as mapped by the U.S. Office of Surface Mining, Wyoming DEQ, USGS, and/or BLM. For the purpose of:</p> <p>CSU (3) protecting the first in time valid existing rights of the coal lessee, the BLM authorized officer reserves the right to alter or modify any oil and gas operations on the lands described in this lease ensuring: a.) the orderly development of the coal resource by surface and/or underground mining methods; b.) coal mine worker safety; and/or c.) coal production rates or recovery of the coal resource. The oil and gas lessee(s), operating rights holder(s), and/or oil and gas operator(s) of this federal oil and gas lease shall not hold the United States as lessor, coal lessee(s), sub-lessee(s), and/or coal operator(s) liable for any damage or loss of the oil and gas resource, including the venting of CBNG, caused by coal exploration or mining operations conducted on federal coal lease.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action will not interfere with coal operations.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based upon a BLM evaluation. The stipulation may be modified based on monitoring results.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area does not contain areas identified as highly likely to be considered in a coal LBA. This determination shall be based upon U.S. Office of Surface Mining, Wyoming DEQ, USGS, and/or BLM data.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|-----------------------|------------------|---|
| Riparian-4009 | CSU | Riparian and Wetlands | 144,045 | <p>Surface disturbance is restricted within 500 feet of riparian systems, wetlands, and aquatic habitats.</p> <p>CSU (1): (a) Prior to surface disturbance within 500 feet of riparian systems, wetlands, and aquatic habitats a site-specific construction, stabilization, and reclamation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate). (b) The Plan must demonstrate to the BLM authorized officer’s satisfaction how the operator will meet the following performance standards:</p> <ul style="list-style-type: none"> • Storm water and surface runoff will be controlled to minimize erosion (rilling, gullyng, piping, mass wasting) and offsite siltation during construction, use/operations, and reclamation. • Offsite areas will be protected from accelerated soil erosion. • The original landform and site productivity will be partially restored during interim reclamation and fully restored as a result of final reclamation. <p>CSU (2) as mapped by the USGS National Hydrologic Inventory and/or as determined by a BLM evaluation of the area. For the purpose of: CSU (3) ensuring protection of surface waters and associated riparian habitats by meeting the standards outlined in, Chapter 6 of the BLM’s Oil and Gas Gold Book, as revised, and the 2015 BFO RMP ROD. CSU (3) On the lands described below:</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based upon a USGS National Hydrologic Inventory and/or BLM evaluation. The stipulation and performance standards identified above may be modified based on monitoring results.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within 500 feet of riparian systems, wetlands, and aquatic habitats. This determination shall be based upon USGS National Hydrologic Inventory and/or BLM field evaluation.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|------------------------|------------------|--|
| Fish-4013 | CSU | Fish: occupied habitat | 261,870 | <p>Surface disturbance is restricted within 0.25 mile of naturally occurring water bodies containing native or desirable non-native fish species.</p> <p>CSU (1): (a) Prior to surface disturbance within 0.25 mile of naturally occurring water bodies containing native or desirable non-native fish species a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate).</p> <p>(b) The Plan must demonstrate to the authorized officer’s satisfaction that there will not be a local decline in fish abundance or range as a result of the lease operations. Examples of a few of the items to consider are as follows:</p> <ul style="list-style-type: none"> • Spill prevention measures to ensure hydrocarbons and other potentially toxic substances used for lease activities are prevented from entering the watercourse. • Sediment control measures to ensure increased sediment contributions are avoided. <p>On the lands described below: CSU (2) as mapped by the Wyoming Game and Fish Department (WGFD) and/or BLM. For the purpose of: CSU (3) protecting native and desirable non-native fish populations and habitat.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action will not result in a local decline in native or desirable non-native fish abundance or range.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based upon a WGFD or BLM evaluation, in coordination with the WGFD. The stipulation may be modified based on monitoring results.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within 0.25 mile of naturally occurring water bodies containing native and desirable non-native fish species. This determination shall be based upon WGFD mapping and BLM onsite evaluation of the area.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---|------------------|---|
| WL-4015 | NSO | Wildlife: Big game habitat management areas | 14,216 | <p>NSO or use is allowed within WGFD Big Game Habitat Management Areas (Ed O. Taylor, Kerns, Bud Love, and Amsden Creek).</p> <p>On the lands described below: NSO (1) as mapped by the WGFD.</p> <p>For the purpose of: NSO (2) ensuring the function and suitability of WGFD Big Game Habitat Management Areas.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so that the action will not impair the function or suitability of WGFD Big Game Habitat Management Areas.</p> <p>Modification: The BLM-authorized officer may modify the area subject to the stipulation based upon a WGFD and BLM evaluation, in coordination with the WGFD. The stipulation may be modified based on monitoring results.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within a WGFD big game habitat management area. This determination shall be based upon a BLM evaluation, in coordination with the WGFD.</p> |
| WL-4017 | TLS | Wildlife: big game crucial winter range | 81,437 | <p>Surface-disturbing and disruptive activities are prohibited or restricted from (1) November 15 to April 30 within big-game crucial winter range, or from May 1 to June 15 within elk calving areas (WGFD 2009).</p> <p>On the lands described below: TLS (2) as mapped by the WGFD and evaluated by the BLM.</p> <p>For the purpose of: TLS (3) ensuring the function and suitability of crucial big game winter ranges.</p> <p>Exception: The BLM authorized officer may grant an exception if the operator demonstrates that the crucial habitat is not occupied during the period of concern, subject to confirmation by the WGFD and BLM; or it is determined that the action will not impair the function or suitability of the crucial habitat.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based upon a BLM evaluation, in coordination with the WGFD, to determine that the big game crucial winter range is not present or boundaries of the subject winter range areas have been refined. The stipulation may be modified based on monitoring results.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within big game crucial winter range or an elk calving area. This determination shall be based upon a BLM evaluation of the area, in coordination with the WGFD.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|-----------------------------|------------------|--|
| WL-4017 | TLS | Wildlife: elk calving areas | 37,549 | <p>Surface-disturbing and disruptive activities are prohibited or restricted from (1) May 1 to June 15 within elk calving areas (WGFD 2009). On the lands described below: TLS (2) as mapped by the WGFD and evaluated by the BLM. For the purpose of: TLS (3) ensuring the function and suitability of elk calving areas.</p> <p>Exception: The BLM authorized officer may grant an exception if the operator demonstrates that the crucial elk calving habitat is not occupied during the period of concern, subject to confirmation by the WGFD and BLM; or it is determined that the action will not impair the function or suitability of the crucial habitat.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based upon a BLM evaluation, in coordination with the WGFD, to determine that the elk calving habitat is not present or boundaries of the subject calving areas have been refined. The stipulation may be modified based on monitoring results.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within an elk calving area. This determination shall be based upon a BLM evaluation of the area, in coordination with the WGFD.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|--|------------------|--|
| WL-4017 | CSU | Wildlife: big game crucial winter ranges | 81,437 | <p>Surface disturbance is prohibited or restricted within WGFD designated big game crucial winter range.</p> <p>CSU (1): (a) Prior to surface disturbance within WGFD designated big game crucial winter range, a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate). (b) The Plan must demonstrate to the authorized officer’s satisfaction that the function and suitability of crucial big game winter ranges will not be impaired</p> <p>On the lands described below: CSU (2) as mapped by the WGFD. For the purpose of: CSU (3) ensuring the function and suitability of crucial big game winter range.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so that the action will not impair the function or suitability of the crucial habitat.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based upon a BLM evaluation, in coordination with the WGFD. The stipulation may be modified based on monitoring results.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within big game crucial winter range. This determination shall be based upon a BLM evaluation of the area, in coordination with the WGFD.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|-----------------------------|------------------|---|
| WL-4017 | CSU | Wildlife: elk calving areas | 37,549 | <p>Surface disturbance is prohibited or restricted within WGFD designated elk calving areas.</p> <p>CSU (1): (a) Prior to surface disturbance within WGFD designated elk calving areas a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate). (b) The Plan must demonstrate to the authorized officer’s satisfaction that the function and suitability of elk calving area will not be impaired.</p> <p>On the lands described below: CSU (2) as mapped by the WGFD. For the purpose of: CSU (3) ensuring the function and suitability of elk calving areas.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so that the action will not impair the function or suitability of the elk calving area.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based upon a BLM evaluation, in coordination with the WGFD. The stipulation may be modified based on monitoring results.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within an elk calving area. This determination shall be based upon a BLM evaluation of the area, in coordination with the WGFD.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|--------------------|------------------|------------------------------------|------------------|---|
| WL-4018 WL-4021 | CSU | Wildlife: crucial elk ranges | 173,512 | <p>Surface disturbance is prohibited or restricted within WGFD designated elk crucial winter range and calving areas.</p> <p>CSU (1): (a) Fluid mineral production and byproducts shall be piped out of and (b) permanent above ground facilities will be located outside of WGFD designated elk crucial winter range and calving areas unless a mitigation plan (Plan) submitted by the applicant and approved by the BLM as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate).</p> <p>(c) The Plan must demonstrate to the authorized officer’s satisfaction that the function and suitability of elk crucial winter range and elk calving areas will not be impaired.</p> <p>On the lands described below: CSU (2) as mapped by the WGFD. For the purpose of: CSU (3) ensuring the function and suitability of elk crucial winter range and elk calving areas.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so that the action will not impair the function or suitability of the crucial habitat.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based upon a BLM evaluation, in coordination with the WGFD. The stipulation may be modified based on monitoring results.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within elk crucial winter range or a calving area. This determination shall be based upon a BLM evaluation, in coordination with the WGFD.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|--|------------------|---|
| WL-4023 | CSU | Wildlife: Fortification Creek Planning Area | 79,362 | <p>Surface occupancy or use is subject to the following special operating constraints.</p> <p>CSU (1) Surface-disturbing and disruptive activities shall only be approved with adequate mitigation to ensure compliance with the Fortification Creek RMP Amendment (BLM 2011) performance standards. Prior to surface disturbance within the Fortification Creek Planning Area a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate). On the lands described below: CSU (2) within the Fortification Creek Planning Area (Map 3-36) For the purpose of: CSU (3) protecting the viability of the Fortification elk herd and facilitating ecosystem reconstruction in the stabilization of disturbed areas.</p> <p>Exception: The authorized officer may grant an exception if an environmental record of review determines that the action, as proposed or conditioned, is sited in a location, or otherwise designed, such that the Fortification Creek Resource Management Planning Area objectives (performance standards) are not applicable (i.e., outside the elk yearlong range).</p> <p>Modification: The authorized officer may modify the area subject to the stipulation or the CSU criteria if an environmental record of review finds that a portion of the CSU area is nonessential, it is identified through scientific research or monitoring that the existing criteria are inadequate or overly protective for maintaining the function or utility of the site, or the modification will meet the goals identified in the Fortification Creek Resource Management Planning Area.</p> <p>Waiver: This stipulation may be waived over the entire lease if the authorized officer determines that the described lands are not within the Fortification elk herd yearlong range or do not contain areas of limited reclamation potential (including slopes greater than 25%) and therefore the Fortification Creek Resource Management Planning Area objectives (performance standards) are not applicable. This determination shall be based upon BLM evaluation of the area. The determination may be coordinated with other agencies such as the WGFD or NRCS.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|------------------------------------|------------------|---|
| WL-4026 | CSU | Wildlife: sharp-tailed grouse leks | 3,601 | <p>Surface disturbance is prohibited or restricted within 0.25 mile of the perimeter of occupied sharp-tailed grouse leks.</p> <p>CSU (1): (a) Prior to surface disturbance within 0.25 mile of the perimeter of occupied sharp-tailed grouse leks a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate).</p> <p>(b) The Plan must demonstrate to the authorized officer’s satisfaction that the function and suitability of sharp-tailed grouse breeding habitat will not be impaired (result in physical injury; a decrease in productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or lek abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior).</p> <p>On the lands described below: CSU (2) as mapped by the WGFD. For the purpose of: CSU (3) ensuring the function and suitability of sharp-tailed grouse breeding habitat.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so that the action will not impair the function and suitability of sharp-tailed grouse breeding habitat. The determination may include consultation with the WGFD.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based upon a BLM evaluation, in coordination with the WGFD. The stipulation may be modified based on monitoring results.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within 0.25 mile of an occupied sharp-tailed grouse lek. This determination shall be based upon a BLM evaluation, in coordination with the WGFD.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---------------------------------------|------------------|---|
| WL-4026 | TLS | Wildlife: sharp-tailed grouse nesting | 191,257 | <p>Surface-disturbing and disruptive activities are prohibited or restricted from April 1 to July 15 (WGFD 2009) within 2 miles of the perimeter of occupied sharp-tailed grouse leks. On the lands described below: TLS (2) as mapped by the WGFD and evaluated by the BLM. For the purpose of: TLS (3) ensuring the function and suitability of sharp-tailed grouse nesting habitat.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action will not affect reproductive displays, nest attendance, egg or chick survival, or early brood-rearing success. Actions designed to enhance the long-term utility or availability of suitable sharp-tailed grouse habitat may be exempted from this timing limitation. The determination may include coordination with the WGFD, so that granting an exception would not adversely impact the population being protected.</p> <p>Modification: The BLM authorized officer may modify the size and shape of the TLS area or the TLS criteria if it is determined that the actual habitat suitability for seasonal sharp-tailed grouse activities is greater or less than the stipulated area, or it is identified through scientific research or monitoring that the existing criteria are inadequate or overly protective for maintaining the function or utility of the site for the seasonal habitat, life-history, or behavioral needs of the sharp-tailed grouse, including (but not limited to) reproductive display, daytime loafing/staging activities, and nesting.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined, in coordination with the WGFD, that the described lands are incapable of serving the long-term requirements of sharp-tailed grouse breeding, nesting, and early brood-rearing habitat.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---|------------------|--|
| WL-4028 | CSU | Wildlife: non-special status species raptor nests | 1,195,815 | <p>Surface disturbance is restricted within U.S. Fish and Wildlife Service (USFWS) Wyoming Ecological Service's recommended spatial biological buffers (Appendix Q (p. 633)) or http://www.fws.gov/wyominges/Pages/Species/Species_SpeciesConcern/Raptors.html) of active non-special status species raptor nests.</p> <p>CSU (1) (a) Prior to surface disturbance within USFWS recommended spatial buffers of raptor nests a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate).</p> <p>(b) The Plan must demonstrate to the authorized officer's satisfaction that nesting raptors will not be disturbed. Nesting raptors will not be agitated or bothered to a degree that causes or is likely to cause:</p> <ul style="list-style-type: none"> • Physical injury, • A decrease in productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or • Nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. <p>On the lands described below: CSU (2) as mapped on the BFO Geographic Information System (GIS) database or determined by the BLM from field evaluation, in coordination with the WGFD and/or USFWS. For the purpose of: CSU (3) ensuring raptor productivity.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so that the action will not result in a failure to meet the performance standards above. The determination may include coordination with the WGFD or USFWS.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation. Spatial buffers may be modified based on auditory and visual impacts, as well as the topography and other ecological characteristics surrounding the nest site. The stipulation and performance standards identified above may be modified based on monitoring results. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM. Confirmation may include consultation with the WGFD or USFWS.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area does not include spatial buffer zones for nesting raptors. This determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM. Confirmation may include consultation with the WGFD or USFWS.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---|------------------|---|
| WL-4030 | TLS | Wildlife: non-special status species raptor nesting | | <p>Surface-disturbing and disruptive activities are prohibited or restricted within (1) the USFWS Wyoming Ecological Service's recommended spatial buffers and dates of active non-special status species raptor nests. (Appendix Q (p. 633) or http://www.fws.gov/wyominges/Pages/Species/Species_SpeciesConcern/Raptors.html).</p> <p>On the lands described below: TLS (2) as mapped on the BFO GIS database or determined by, BLM from field evaluation, in coordination with the WGFD and/or USFWS. For the purpose of: TLS (3) ensuring raptor nest productivity.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action will not disturb (likely to cause physical injury; a decrease in productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior) nesting raptors. The determination may include consultation with the WGFD or USFWS.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation. Spatial buffers may be modified based on auditory and visual impacts, as well as the topography and other ecological characteristics surrounding the nest site. The stipulation may be modified based on monitoring results. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM. The confirmation may include consultation with the WGFD or USFWS.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area does not include spatial buffers for raptor nests. This determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|------------------------|------------------|---|
| SS Plant-4008 | NSO | SS Plants: populations | | <p>NSO or use is allowed within special status species plant populations.</p> <p>On the lands described below: NSO (1) as mapped on the BFO GIS database, or determined by BLM from field evaluation, in coordination with the Wyoming Natural Diversity Database and/or USFWS. For the purpose of: NSO (2) protecting special status species plant populations.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so that the action will not adversely affect special status species plant populations.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based upon a BLM evaluation, in coordination with the USFWS. The stipulation may be modified based on monitoring results.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area does not contain a special status species plant population. This determination shall be based upon a BLM evaluation, in coordination with the USFWS.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|--------------------|------------------|---|
| SS Plant-4008 | CSU | SS Plants: habitat | 243,929 | <p>Surface disturbance is prohibited or restricted within special status plant species habitat.</p> <p>CSU (1) (a) Prior to surface disturbance within special status plant species habitat flowering season survey(s) must be conducted and a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate).</p> <p>(b) The Plan must demonstrate to the authorized officer’s satisfaction that special status plant species will not be harmed and that the habitat on which they depend will be conserved.</p> <p>On the lands described below:</p> <p>CSU (2) as mapped or determined by the USFWS, Wyoming Natural Diversity Database, the BFO GIS database, or from field evaluation.</p> <p>For the purpose of:</p> <p>CSU (3) conserving special status plant species and the habitat on which they depend.</p> <p>Exception: The BLM authorized officer may grant an exception if flowering season survey(s) determine that a special status species plant population is not present or it is determined that the action is sited in a location so that the action will not harm special status plant species.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation. The stipulation and performance standards identified above may be modified based on monitoring results. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if flowering season survey(s) determine that the entire lease area does not include populations or habitat of special status species plants. This determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---|------------------|---|
| SS Plant-4008 | CSU | SS Plants: Ute ladies'-tresses orchid populations | 0 | <p>Surface disturbance is prohibited or restricted within 0.25 mile of Ute ladies'-tresses orchid populations.</p> <p>CSU (1) (a) Prior to surface disturbance within Ute ladies'-tresses orchid habitat flowering season survey(s) must be conducted and a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate).</p> <p>(b) The Plan must demonstrate to the authorized officer's satisfaction that Ute ladies'-tresses orchids will not be harmed and that the habitat on which they depend will be conserved.</p> <p>On the lands described below:</p> <p>CSU (2) as mapped or determined by the USFWS, Wyoming Natural Diversity Database, the BFO GIS database, or from field evaluation.</p> <p>For the purpose of:</p> <p>CSU (3) conserving Ute ladies'-tresses orchids and the habitat on which they depend.</p> <p>Exception: The BLM authorized officer may grant an exception if flowering season survey(s) determine that a Ute ladies'-tresses orchid population is not present or it is determined that the action is sited in a location so that the action will not harm special status plant species.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation. The stipulation and performance standards identified above may be modified based on monitoring results. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if flowering season survey(s) determine that the entire lease area does not include populations or habitat of Ute ladies'-tresses orchid. This determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
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| SS Fish-4008 | NSO | SS Fish: occupied habitat | 4,846 | <p>NSO or use is allowed within 0.25 mile of any waters containing special status fish species.</p> <p>On the lands described below; NSO (1) as mapped on the BFO GIS database or from field evaluation, in consultation with the WGFD.</p> <p>For the purpose of: NSO (2) protecting special status fish populations and habitat.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so that the action will not result in a local decline in special status species fish abundance or range.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based upon a BLM evaluation, in consultation with the WGFD. The stipulation may be modified based on monitoring results.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within 0.25 mile of any waters containing special status fish species. This determination shall be based upon WGFD mapping and field evaluation of the area.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|--|------------------|---|
| SS WL-4007 | CSU | SS Wildlife: special status wildlife habitat | 2,325,854 | <p>Surface disturbance is restricted within special status species wildlife habitat.</p> <p>CSU (1) (a) Prior to surface disturbance within special status species wildlife habitat an occupancy survey must be conducted and a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate).</p> <p>(b) The Plan must demonstrate to the authorized officer’s satisfaction that special status wildlife species will not be harmed (any act which actually kills or injures wildlife including habitat modification or degradation that substantially impairs essential behavioral patterns) and that the habitat on which they depend will be conserved.</p> <p>On the lands described below: CSU (2) as mapped or determined by the USFWS, WGFD, Wyoming Natural Diversity Database, or BLM from field evaluation. For the purpose of: CSU (3) conserving special status species wildlife and the habitat on which they depend (BLM 2008 - 6840 manual).</p> <p>Exception: The BLM authorized officer may grant an exception if an occupancy survey determines that special status wildlife species are not present or it is determined that the action is sited in a location so that the action will not harm special status wildlife species. Confirmation may include coordination with the WGFD and/or USFWS.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation. The stipulation and performance standards identified above may be modified based on monitoring results. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM. Confirmation may include coordination with the WGFD and/or USFWS.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area does not include special status species wildlife habitat. This determination shall be based upon field studies of the area by a qualified representative subject to confirmation from BLM. Confirmation may include coordination with the WGFD and/or USFWS.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---|------------------|---|
| SS WL-4009 | CSU | SS Wildlife: prairie dog colonies and dependent species | 58,902 | <p>Surface disturbance is prohibited or restricted within active prairie dog colonies on BLM-administered surface.</p> <p>CSU (1) (a) Prior to surface disturbance within active prairie dog colonies on BLM-administered surface a special status species occupancy survey must be conducted and a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate).</p> <p>(b) The Plan must demonstrate to the authorized officer’s satisfaction that activities with active prairie dog colonies on BLM surface would not adversely impact suitable habitat for special status species dependent upon prairie dog colonies. On the lands described below:</p> <p>CSU (2) as mapped or determined on the BFO GIS database or from field evaluation, in coordination with the USFWS and WGFD.</p> <p>For the purpose of:</p> <p>CSU (3) conserving special status species wildlife and the prairie dog colonies on which they depend.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that special status wildlife species are not present or it is determined that the action is sited in a location so that the action will not harm special status wildlife species. This determination shall be based upon evaluation by a qualified representative, subject to confirmation from BLM. Confirmation may include coordination with the WGFD and/or USFWS.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation. The stipulation and performance standards identified above may be modified based on monitoring results. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM. Confirmation may include coordination with the WGFD and/or USFWS.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not occupied by prairie dog dependent special status wildlife species. This determination shall be based upon field studies of the area by a qualified representative subject to confirmation from BLM. Confirmation may include coordination with the WGFD and/or USFWS.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---|--|--|
| SS WL-4024 | NSO | SS Wildlife: Greater Sage-Grouse Core Population Areas and Connectivity Corridors | Core Population Areas: 30,754 Connectivity Corridors: 7,359 | <p>Stipulation: Occupied Greater Sage-Grouse leks inside designated Priority Habitat Management Area (PHMA) (Core and Connectivity). This area encompasses occupied Greater Sage-Grouse leks inside designated PHMA (Core and Connectivity). NSO or use is allowed within a six-tenths (0.6) mile radius of the perimeter of occupied Greater Sage-Grouse leks inside designated Core Population Areas and Connectivity Corridors, as mapped on the BFO GIS database.</p> <p>Purpose: To protect occupied Greater Sage-Grouse leks and associated seasonal habitat, life-history, or behavioral needs of Greater Sage-Grouse in proximity to leks, from habitat fragmentation and loss and Greater Sage-Grouse populations from disturbance inside designated Core Population Areas and Connectivity Corridors.</p> <p>Exception: The authorized officer may grant an exception if an environmental record of review determines that the action, as proposed or conditioned, would not impair the function or utility of the site for the current or subsequent seasonal habitat, life-history, or behavioral needs of Greater Sage-Grouse. The BLM can and does grant exceptions if the BLM, in coordination with the WGFD, determines that granting an exception would not adversely impact the population being protected. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> <p>Modification: The authorized officer may modify the area subject to the stipulation or the NSO criteria if an environmental record of review finds that a portion of the NSO area is nonessential, or it is identified through scientific research or monitoring that the existing criteria are inadequate or overly protective for maintaining the function or utility of the site for the seasonal habitat, life-history, or behavioral needs of the Greater Sage-Grouse, including (but not limited to) reproductive display, daytime loafing/staging activities, and nesting. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> <p>Waiver: This stipulation may be waived over the entire lease if, in coordination with the State wildlife agency, it is determined that the Greater Sage-Grouse lek has been classified as unoccupied as determined by the State wildlife agency. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|--|--|---|
| SS WL-4024 | CSU | SS Wildlife: Greater Sage-Grouse Core Population Areas and Connectivity Corridors | Core Population Areas: 30,754 Connectivity Corridors: 7,359 | <p>Stipulation: Greater Sage-Grouse Core Population Areas and Connectivity Corridors (Priority Habitat). This area encompasses BLM-administered surface within Greater Sage-Grouse Core Population Areas and Connectivity Corridors (Priority Habitat). All applicable surface disturbances (existing or future, and not limited to fluid mineral disturbances) must be restored, as described in the BFO RMP, to the approval of the BLM authorized officer.</p> <p>Purpose: To restore functional Greater Sage-Grouse habitat to support core Greater Sage-Grouse populations.</p> <p>Exception: The authorized officer may grant an exception if an environmental record of review determines that the action, as proposed or conditioned, would not impair the function or utility of the site for the current or subsequent needs of Greater Sage-Grouse. The BLM can and does grant exceptions if the BLM, in coordination with the WGFD, determines that granting an exception would not adversely impact the population being protected. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> <p>Modification: The authorized officer may modify the area subject to the stipulation or surface occupancy criteria if an environmental record of review finds that a portion of the CSU area is nonessential, or it is identified through scientific research or monitoring that the existing criteria are inadequate or overly protective for maintaining the function or utility of the site for the needs of the Greater Sage-Grouse. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---|------------------|---|
| SS WL-4024 | TLS | SS Wildlife: Greater Sage-Grouse winter concentration areas that support nesting in Core Population Areas (Priority Habitat Area and general habitat) | Not mapped | <p>Stipulation: Greater Sage-Grouse winter concentration areas. This area encompasses designated Greater Sage-Grouse winter concentration areas. No surface use is allowed during December 1 – March 14, within mapped Greater Sage-Grouse Winter concentration areas in designated PHMA (Core and Connectivity), and outside designated PHMA (Core and Connectivity) when supporting wintering Greater Sage-Grouse that attend leks within designated PHMA (Core only).</p> <p>Purpose: To seasonally protect Greater Sage-Grouse winter concentration areas from disruptive activities.</p> <p>Exception: The authorized officer may grant an exception if an environmental record of review determines that the action, as proposed or conditioned, will not impair the function and suitability of the winter concentration area, or it is determined that the winter concentration area is not occupied by concentrated populations of Greater Sage-Grouse during the period of concern. Actions designed to enhance the long-term utility or availability of suitable Greater Sage-Grouse habitat may be exempted from this timing limitation. The BLM can and does grant exceptions to seasonal restrictions if the BLM, in coordination with the WGFD, determines that granting an exception would not adversely impact the population being protected. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> <p>Modification: The authorized officer may modify the size and shape of the TLS area or the TLS criteria if an environmental record of review indicates the actual habitat suitability for seasonal Greater Sage-Grouse activities is greater or less than the stipulated area, or it is identified through scientific research or monitoring that the existing criteria are inadequate or overly protective for maintaining the function or utility of the site for the seasonal habitat, life-history, or behavioral needs of the Greater Sage-Grouse. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|--|------------------|--|
| SS WL-4024 | CSU | SS Wildlife: Greater Sage-Grouse Core Population Areas | 519,444 | <p>Stipulation: Greater Sage-Grouse designated Core Population Areas. This area encompasses Greater Sage-Grouse designated PHMA (Core only). Surface occupancy or use will be restricted to no more than an average of one disturbance location per 640 acres using the Density and Disturbance Calculation Tool (DDCT), and the cumulative value of all applicable surface disturbances, existing or future, must not exceed 5 percent of the DDCT area.</p> <p>This lease does not guarantee the lessee the right to occupy the surface of the lease for the purpose of producing oil and natural gas within Greater Sage-Grouse designated PHMA (Core only). The surface occupancy restriction criteria identified in this stipulation may preclude surface occupancy and may be beyond the ability of the lessee to meet due to existing surface disturbance on federal, state, or private lands within designated PHMA (Core only) or surface disturbance created by other land users. The BLM may require the lessee or operator to enter into a unit agreement or drilling easement to facilitate the equitable development of this and surrounding leases.</p> <p>Purpose: To protect Greater Sage-Grouse designated Core Population Areas from habitat fragmentation and loss.</p> <p>Exception: The authorized officer may grant an exception if an environmental record of review determines that the action, as proposed or conditioned, would not impair the function or utility of the site for the current or subsequent seasonal habitat, life-history, or behavioral needs of Greater Sage-Grouse. The BLM can and does grant exceptions if the BLM, in coordination with the WGFD, determines that granting an exception would not adversely impact the population being protected. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> <p>Modification: The authorized officer may modify the area subject to the stipulation or surface occupancy criteria if an environmental record of review finds that a portion of the CSU area is nonessential, or it is identified through scientific research or monitoring that the existing criteria are inadequate or overly protective for maintaining the function or utility of the site for the seasonal habitat, life-history, or behavioral needs of the Greater Sage-Grouse, including (but not limited to) reproductive display, daytime loafing/staging activities, and nesting. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---|------------------|---|
| SS WL-4024 | TLS | SS Wildlife: Greater Sage-Grouse Core Population Area nesting habitat | 440,114 | <p>Stipulation: Greater Sage-Grouse breeding, nesting, and early brood-rearing habitats inside designated PHMA (Core only). This area encompasses Greater Sage-Grouse breeding, nesting, and early brood-rearing habitats inside designated PHMA (Core only). No surface use is allowed during March 15 – June 30, inside designated PHMA (Core only).</p> <p>Where credible data support different timeframes for this restriction, dates may be expanded by 14 days prior or subsequent to the above dates.</p> <p>Purpose: To seasonally protect Greater Sage-Grouse breeding, nesting, and early brood-rearing habitats from disruptive activities inside designated Core Population Areas.</p> <p>Exception: The authorized officer may grant an exception if an environmental record of review determines that the action, as proposed or conditioned, will not affect reproductive displays, nest attendance, egg or chick survival, or early brood-rearing success. Actions designed to enhance the long-term utility or availability of suitable Greater Sage-Grouse habitat may be exempted from this timing limitation. The BLM can and does grant exceptions to seasonal restrictions if the BLM, in coordination with the WGFD, determines that granting an exception would not adversely impact the population being protected. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> <p>Modification: The authorized officer may modify the size and shape of the TLS area or the TLS criteria if an environmental record of review indicates the actual habitat suitability for seasonal Greater Sage-Grouse activities is greater or less than the stipulated area, or it is identified through scientific research or monitoring that the existing criteria are inadequate or overly protective for maintaining the function or utility of the site for the seasonal habitat, life-history, or behavioral needs of the Greater Sage-Grouse, including (but not limited to) reproductive display, daytime loafing/staging activities, and nesting. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---|------------------|---|
| SS WL-4024 | CSU | SS Wildlife: Greater Sage-Grouse Connectivity Corridors | 150,006 | <p>Stipulation: Greater Sage-Grouse Connectivity Corridors. This area encompasses Greater Sage-Grouse PHMA (Connectivity Only). The cumulative value of all applicable surface disturbances (existing or future, and not limited to fluid mineral disturbances) must not exceed an average of 5 percent of the sagebrush habitat mapped on the BFO GIS database per 640 acres, using the DDCT.</p> <p>This lease does not guarantee the lessee the right to occupy the surface of the lease for the purpose of producing oil and natural gas within Greater Sage-Grouse designated PHMA (Connectivity Only). The surface occupancy restriction criteria identified in this stipulation may preclude surface occupancy and may be beyond the ability of the lessee to meet due to existing surface disturbance on federal, state, or private lands within designated Connectivity Corridors or surface disturbance created by other land users. The BLM may require the lessee or operator to enter into a unit agreement or drilling easement to facilitate the equitable development of this and surrounding leases.</p> <p>Purpose: To protect Greater Sage-Grouse Connectivity Corridors from habitat fragmentation and loss.</p> <p>Exception: The authorized officer may grant an exception if an environmental record of review determines that the action, as proposed or conditioned, would not impair the function or utility of the site for the current or subsequent seasonal habitat, life-history, or behavioral needs of Greater Sage-Grouse. An exception to the stated limits may be granted when compensatory mitigation is determined to provide an overall beneficial effect to Greater Sage-Grouse habitat and populations. The BLM can and does grant exceptions if the BLM, in coordination with the WGFD, determines that granting an exception would not adversely impact the population being protected. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> <p>Modification: The authorized officer may modify the area subject to the stipulation or surface occupancy criteria if an environmental record of review finds that a portion of the CSU area is nonessential, or it is identified through scientific research or monitoring that the existing criteria are inadequate or overly protective for maintaining the function or utility of the site for the seasonal habitat, life-history, or behavioral needs of the Greater Sage-Grouse, including (but not limited to) reproductive display, daytime loafing/staging activities, and nesting. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|--|------------------|--|
| SS WL-4024 | TLS | SS Wildlife: Greater Sage-Grouse Connectivity Corridor nesting habitat | 131,849 | <p>Stipulation: Greater Sage-Grouse breeding, nesting, and early brood-rearing habitat within PHMA (Connectivity only). This area encompasses Greater Sage-Grouse breeding, nesting, and early brood-rearing habitat within PHMA (Connectivity only). No surface use is allowed during March 15 – June 30, inside PHMA (Connectivity only), within four miles of an occupied lek (independent of habitat suitability).</p> <p>Purpose: To seasonally protect Greater Sage-Grouse breeding, nesting, and early brood-rearing habitats inside Connectivity Corridors from disruptive activities, within four miles of an occupied lek.</p> <p>Exception: The authorized officer may grant an exception if an environmental record of review determines that the action, as proposed or conditioned, will not affect reproductive displays, nest attendance, egg or chick survival, or early brood-rearing success. Actions designed to enhance the long-term utility or availability of suitable Greater Sage-Grouse habitat may be exempted from this timing limitation. The BLM can and does grant exceptions to seasonal restrictions if the BLM, in coordination with the WGFD, determines that granting an exception would not adversely impact the population being protected. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> <p>Modification: The authorized officer may modify the size and shape of the TLS area or the TLS criteria if an environmental record of review indicates the actual habitat suitability for seasonal Greater Sage-Grouse activities is greater or less than the stipulated area, or it is identified through scientific research or monitoring that the existing criteria are inadequate or overly protective for maintaining the function or utility of the site for the seasonal habitat, life-history, or behavioral needs of the Greater Sage-Grouse, including (but not limited to) reproductive display, daytime loafing/staging activities, and nesting. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> <p>Waiver: This stipulation may be waived over the entire lease if, in coordination with the State wildlife agency, it is determined that the Greater Sage-Grouse lek has been classified as unoccupied as determined by the State wildlife agency. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---|------------------|---|
| SS WL-4024 | NSO | SS Wildlife: general Greater Sage-Grouse breeding habitat | 16,103 | <p>Stipulation: Occupied Greater Sage-Grouse leks outside designated PHMA (Core and Connectivity). This area encompasses occupied Greater Sage-Grouse leks outside designated Core Population Areas and Connectivity Corridors. NSO or use is allowed within a one-quarter (0.25) mile radius of the perimeter of occupied Greater Sage-Grouse leks outside designated PHMA (Core and Connectivity), as mapped on the BFO GIS database.</p> <p>Purpose: To protect occupied Greater Sage-Grouse leks and associated seasonal habitat, life-history, or behavioral needs of Greater Sage-Grouse in proximity to leks, from habitat fragmentation and loss and Greater Sage-Grouse populations from disturbance outside designated Core Population Areas and Connectivity Corridors.</p> <p>Exception: The authorized officer may grant an exception if an environmental record of review determines that the action, as proposed or conditioned, would not impair the function or utility of the site for the current or subsequent seasonal habitat, life-history, or behavioral needs of Greater Sage-Grouse. The BLM can and does grant exceptions if the BLM, in coordination with the WGFD, determines that granting an exception would not adversely impact the population being protected. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> <p>Modification: The authorized officer may modify the area subject to the stipulation or the NSO criteria if an environmental record of review finds that a portion of the NSO area is nonessential, or it is identified through scientific research or monitoring that the existing criteria are inadequate or overly protective for maintaining the function or utility of the site for the seasonal habitat, life-history, or behavioral needs of the Greater Sage-Grouse, including (but not limited to) reproductive display, daytime loafing/staging activities, and nesting. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> <p>Waiver: This stipulation may be waived over the entire lease if, in coordination with the State wildlife agency, it is determined that the Greater Sage-Grouse lek has been classified as unoccupied as determined by the State wildlife agency. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|--|------------------|---|
| SS WL-4024 | TLS | SS Wildlife: general Greater Sage-Grouse nesting and early brood-rearing habitat | 779,834 | <p>Stipulation: Greater Sage-Grouse breeding, nesting and early brood-rearing habitat outside designated PHMA (Core and Connectivity). This area encompasses Greater Sage-Grouse breeding, nesting and early brood-rearing habitat outside designated PHMA (Core and Connectivity). No surface use is allowed during March 15 – June 30, in Greater Sage-Grouse breeding, nesting and early brood-rearing habitats outside designated PHMA (Core and Connectivity), within two miles of an occupied lek.</p> <p>Where credible data support different timeframes for this restriction, dates may be expanded by 14 days prior or subsequent to the above dates.</p> <p>Purpose: To seasonally protect Greater Sage-Grouse nesting and early brood-rearing habitats from disruptive activities outside designated Core Population Areas and Connectivity Corridors, within two miles of an occupied lek.</p> <p>Exception: The authorized officer may grant an exception if an environmental record of review determines that the action, as proposed or conditioned, will not affect reproductive displays, nest attendance, egg or chick survival, or early brood-rearing success. Actions designed to enhance the long-term utility or availability of suitable Greater Sage-Grouse habitat may be exempted from this timing limitation. The BLM can and does grant exceptions to seasonal restrictions if the BLM, in coordination with the WGFD, determines that granting an exception would not adversely impact the population being protected. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> <p>Modification: The authorized officer may modify the size and shape of the TLS area or the TLS criteria if an environmental record of review indicates the actual habitat suitability for seasonal Greater Sage-Grouse activities is greater or less than the stipulated area, or it is identified through scientific research or monitoring that the existing criteria are inadequate or overly protective for maintaining the function or utility of the site for the seasonal habitat, life-history, or behavioral needs of the Greater Sage-Grouse, including (but not limited to) reproductive display, daytime loafing/staging activities, and nesting. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|--|------------------|---|
| | | | | <p>Waiver: This stipulation may be waived over the entire lease if, in coordination with the State wildlife agency, it is determined that the Greater Sage-Grouse lek has been classified as unoccupied as determined by the State wildlife agency. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manuals 1624 and 3101.)</p> |
| SS WL-4026 | NSO | SS Wildlife: bald eagle nesting habitat | 7,710 | <p>NSO or use is allowed within 0.5 mile of bald eagle nests.</p> <p>On the lands described below: NSO (1) as mapped on the BFO GIS database or determined by field evaluation, in coordination with the WGFD and/or USFWS.</p> <p>For the purpose of: NSO (2) ensuring productivity of bald eagles.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so that the action will not disturb (as defined by the Bald and Golden Eagle Protection Act) nesting bald eagles. Bald eagles will not be agitated or bothered to a degree that causes or is likely to cause:</p> <ul style="list-style-type: none"> ● Physical injury, or ● A decrease in productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or ● Nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation including topography, visibility, disturbance and human activity levels, and other factors. The stipulation may be modified based on monitoring results. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM. Confirmation may include coordination with the WGFD or USFWS.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within 0.5 mile of a bald eagle nest. Confirmation may include coordination with the WGFD or USFWS.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---------------------------------------|------------------|---|
| SS WL-4026 | TLS | SS Wildlife: bald eagle nesting | 36,597 | <p>Surface-disturbing and disruptive activities are prohibited or restricted from February 1 to August 15 within 1.0 mile of active bald eagle nests.</p> <p>On the lands described below: TLS (2) as mapped on the BFO GIS database or determined by field evaluation, in coordination with the WGFD and/or USFWS.</p> <p>For the purpose of: TLS (3) ensuring productivity of bald eagles.</p> <p>Exception: The BLM authorized officer may grant an exception if a staff review determines that the action will not disturb nesting bald eagles. This determination shall be based upon field study by a qualified representative, subject to confirmation from BLM. Confirmation may include coordination with the WGFD or USFWS.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation including topography, visibility, disturbance and human activity levels, and other factors. The stipulation may be modified based on monitoring results. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM. Confirmation may include coordination with the WGFD or USFWS.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within 1.0 mile of a bald eagle nest. Confirmation may include coordination with the WGFD or USFWS.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|--|------------------|---|
| SS WL-4028 | NSO | SS Wildlife: bald and golden eagle winter roosts | 58,902 | <p>NSO or use is allowed within 0.5 miles from the edge of consistently used bald or golden eagle winter roosts and the following consistently used riparian corridors: Clear Creek, Crazy Woman Creek, Piney Creek, Powder River, and Tongue River.</p> <p>On the lands described below: NSO (2) as mapped on the BFO GIS database or determined by field evaluation, in coordination with the WGFD and/or USFWS. For the purpose of: NSO (3) protecting wintering bald and golden eagles.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so that the action will not harm roosting eagles.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation including topography, visibility, disturbance and human activity levels, and other factors. The stipulation may be modified based on monitoring results. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM. Confirmation may include coordination with the WGFD or USFWS.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within 0.5 mile of a consistently used eagle roost or riparian corridor.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|--|------------------|--|
| SS WL-4028 | CSU | SS Wildlife: bald and golden eagle winter roosting habitat | 58,902 | <p>Surface disturbance is restricted within 1.0 mile from the edge of consistently used bald or golden eagle winter roosts and the following consistently used riparian corridors: Clear Creek, Crazy Woman Creek, Piney Creek, Powder River, and Tongue River.</p> <p>CSU (1): (a) Prior to surface disturbance within 1.0 mile of consistently used bald and golden eagle winter roosts and riparian corridors a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate). (b) The Plan must demonstrate to the authorized officer’s satisfaction that wintering eagles will not be disturbed (as defined by the Bald and Golden Eagle Protection Act). Bald or golden eagles will not be agitated or bothered to a degree that causes or is likely to cause:</p> <ul style="list-style-type: none"> ● Physical injury, or ● A decrease in productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior. <p>On the lands described below: CSU (2) as mapped on the BFO GIS database or determined by field evaluation, in coordination with the WGFD and/or USFWS. For the purpose of: CSU (3) protecting bald and golden eagle winter roosting habitat.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so that the action will not result in a failure to meet the performance standards above.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation including topography, visibility, disturbance and human activity levels, and other factors. The stipulation and performance standards identified above may be modified based on monitoring results. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM. Confirmation may include coordination with the WGFD or USFWS.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within 1.0 mile of a consistently used eagle winter roost or riparian corridor.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|--|------------------|--|
| SS WL-4028 | TLS | SS Wildlife: bald and golden eagle winter roosting habitat | 58,902 | <p>Surface-disturbing and disruptive activities are prohibited or restricted from (1) November 1 to April 1 within 1.0 mile from the edge of consistently used eagle winter roosts and the following consistently used riparian corridors: Clear Creek, Crazy Woman Creek, Piney Creek, Powder River, and Tongue River. On the lands described below:</p> <p>TLS (2) as mapped on the BFO GIS database or determined by field evaluation, in coordination with the WGFD and/or USFWS.</p> <p>For the purpose of:</p> <p>TLS (3) protecting roosting eagles.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designated so that the action will not harm roosting eagles.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation including topography, visibility, disturbance and human activity levels, and other factors. The stipulation may be modified based on monitoring results. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM. Confirmation may include coordination with the WGFD or USFWS.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within 1.0 mile of a consistently used bald or golden eagle winter roost or riparian corridor.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|--|------------------|---|
| SS WL-4031 | TLS | SS Wildlife: special status raptor nesting | 701,847 | <p>Surface-disturbing and disruptive activities are prohibited or restricted (1) within USFWS recommended spatial buffers and dates (Appendix Q (p. 633) or http://www.fws.gov/wyominges/Pages/Species/Species_SpeciesConcern/Raptors.html) of active raptor nests of special status species. On the lands described below:</p> <p>TLS (2) as mapped on the BFO GIS database or determined by field evaluation, in coordination with the WGFD and/or USFWS.</p> <p>For the purpose of:</p> <p>TLS (3) ensuring productivity of nesting special status raptors.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action will not disturb nesting special status raptors.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation including topography, visibility, disturbance and human activity levels, and other factors. The stipulation may be modified based on monitoring results. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM. Confirmation may include coordination with the WGFD or USFWS.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within the USFWS recommended spatial buffer of a sensitive species raptor nest. This determination shall be based upon field studies of the area by a qualified representative and reviewed by BLM. The determination may include coordination with the WGFD or USFWS.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|--|------------------|--|
| SS WL-4032 | NSO | SS Wildlife: special status raptor nests | 701,847 | <p>NSO or use is allowed within a species specific spatial buffer of special status species raptor nests using USFWS Wyoming Ecological Service's recommendations (Appendix Q (p. 633) or http://www.fws.gov/wyominges/Pages/Species/Species_SpeciesConcern/Raptors.html).</p> <p>On the lands described below: NSO (1) as mapped on the BFO GIS database or determined by field evaluation, in coordination with the WGFD and/or USFWS.</p> <p>For the purpose of: NSO (2) protecting nest sites of special status raptors.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, or sited in a location, or a site-specific evaluation determines that nesting special status raptors will not be disturbed (agitated or bothered to a degree that causes or is likely to cause: physical injury; or a decrease in productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.) The determination may include coordination with the WGFD or USFWS.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation including topography, visibility, disturbance and human activity levels, and other factors. The stipulation may be modified based on monitoring results. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM. Confirmation may include coordination with the WGFD or USFWS.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within the USFWS recommended spatial buffer of a sensitive species raptor nest. This determination shall be based upon field studies of the area by a qualified representative and reviewed by BLM. The determination may include coordination with the WGFD or USFWS.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|--------------------------------|------------------|---|
| SS WL-4034 | CSU | SS Wildlife: amphibian habitat | 1,217,959 | <p>Surface disturbance is restricted within 1,640 feet (500 meters) of perennial water, vernal pools, playas, and wetlands.</p> <p>CSU (1) (a) Prior to surface disturbance within 1,640 feet (500 meters) of perennial water, vernal pools, playas, and wetlands appropriate surveys must be conducted and a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator may not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan or approved it with conditions.</p> <p>(b) The Plan must demonstrate to the authorized officer’s satisfaction that special status amphibian species will not be disturbed to a degree that causes or is likely to cause:</p> <ul style="list-style-type: none"> ● Physical injury, ● A decrease in productivity, by substantially interfering with normal breeding, sheltering, or hibernation behavior, or ● Site abandonment, by substantially interfering with normal breeding, sheltering, or hibernation behavior. <p>On the lands described below: CSU (2) as mapped on the BFO GIS database or determined by field evaluation, in coordination with the WGFD and/or USFWS. For the purpose of: CSU (3) ensuring production of special status amphibian species breeding, sheltering, and hibernation habitat.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the proposed action is of a scale, sited in a location, or otherwise designed so that the action will not result in a failure to meet the performance standards above. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM. Confirmation may include coordination with the WGFD or USFWS.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation. The stipulation and performance standards identified above may be modified based on monitoring results. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM. Confirmation may include coordination with the WGFD or USFWS.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area does not include special status species amphibian habitat. This determination shall be based upon field studies of the area by a qualified representative and reviewed by BLM. The determination may include coordination with the WGFD or USFWS.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|------------------------------|---|---|
| SS WL-4034 | CSU | SS Wildlife: reptile habitat | 1,217,959 acres outcrops not mapped | <p>Surface disturbance is restricted within 1,640 feet (500 meters) of south facing rock outcrops, perennial water, vernal pools, playas, and wetlands.</p> <p>CSU (1) (a) Prior to surface disturbance within 1,640 feet (500 meters) of south facing rock outcrops, perennial water, vernal pools, playas, and wetlands appropriate surveys must be conducted and a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator may not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan or approved it with conditions.</p> <p>(b) The Plan must demonstrate to the authorized officer’s satisfaction that special status reptile species will not be disturbed to a degree that causes or is likely to cause:</p> <ul style="list-style-type: none"> ● Physical injury, ● A decrease in productivity, by substantially interfering with normal breeding, basking, sheltering, or hibernation behavior, or ● Site abandonment, by substantially interfering with normal breeding, basking, sheltering, or hibernation behavior. <p>On the lands described below: CSU (2) as mapped on the BFO GIS data-base or determined by field evaluation, in coordination with the WGFD and/or USFWS. For the purpose of: CSU (3) ensuring production of special status reptile species breeding, basking, sheltering, and hibernation habitat.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the proposed action is of a scale, sited in a location, or otherwise designed so that the action will not result in a failure to meet the performance standards above. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM. Confirmation may include coordination with the WGFD or USFWS.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation. The stipulation and performance standards identified above may be modified based on monitoring results. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM. Confirmation may include coordination with the WGFD or USFWS.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area does not include special status species reptile habitat. This determination shall be based upon field studies of the area by a qualified representative and reviewed by BLM. The determination may include coordination with the WGFD or USFWS.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|-----------------------------|------------------|--|
| SS WL-4034 | CSU | SS Wildlife: bat habitat | 115,196 | <p>Surface disturbance is restricted within 1,640 feet (500 meters) of cave entrances, mature forest, and rock outcrops. CSU (1) (a) Prior to surface disturbance within 1,640 feet (500 meters) of cave entrances, mature forest, and rock outcrops appropriate surveys must be conducted and a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator may not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan or approved it with conditions. (b) The Plan must demonstrate to the authorized officer’s satisfaction that special status bat species will not be disturbed to a degree that causes or is likely to cause:</p> <ul style="list-style-type: none"> ● Physical injury, ● A decrease in productivity, by substantially interfering with normal breeding, nursery, roosting, or hibernation behavior, or ● Site abandonment, by substantially interfering with normal breeding, nursery, roosting, or hibernation behavior. <p>On the lands described below: CSU (2) as mapped on the BFO GIS database or determined by field evaluation, in coordination with the WGFD and/or USFWS. For the purpose of: CSU (3) ensuring production of special status bat species breeding, nursery, roosting, and hibernation habitat.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the proposed action is of a scale, sited in a location, or otherwise designed so that the action will not result in a failure to meet the performance standards above. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM. Confirmation may include coordination with the WGFD or USFWS.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation. The stipulation and performance standards identified above may be modified based on monitoring results. The determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM. Confirmation may include coordination with the WGFD or USFWS.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area does not include special status species bat habitat. This determination shall be based upon field studies of the area by a qualified representative and reviewed by BLM. The determination may include coordination with the WGFD or USFWS.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|-------------------------------|------------------|--|
| Cultural-5006 | NSO | Cultural: historic properties | 15,382 | <p>NSO or use (NSO) (1) is allowed within the following historic properties: Pumpkin Buttes, Cantonment Reno, Dull Knife Battle, Crazy Woman Battle, contributing and unevaluated segments of the Bozeman Trail, all rock art sites, all rock shelter sites, all Native American burials.</p> <p>On the lands described below: NSO (2) as mapped on the BFO GIS database.</p> <p>For the purpose of: NSO (3) protecting historic properties.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so it will not be placed within the actual boundaries of or will not disturb the site within the defined NSO area.</p> <p>Modification: The BLM authorized officer may modify the stipulation in consultation with State Historic Preservation Office (SHPO), applicable tribes, and other interested parties, if the site is no longer considered eligible under National Register of Historic Places (NRHP) or if, in consultation with SHPO, applicable Indian tribes, and other interested parties it is determined that the identified property's sacred, spiritual, and/or traditional values have been downgraded and/or the tribes have reduced the previous avoidance distance around the site.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined in consultation with SHPO, applicable Indian tribes, and other interested parties, that the identified site is no longer considered sacred, spiritual, and/or traditional.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|-------------------------------------|------------------|---|
| Cultural-5006 | CSU | Cultural: historic property setting | 613,601 | <p>Surface disturbance is restricted within three miles of the following historic properties: Pumpkin Buttes, Cantonment Reno, Dull Knife Battle, Crazy Woman Battle, contributing and unevaluated segments of the Bozeman Trail, all rock art sites, all rock shelter sites, all Native American burials. CSU (1) (a) Prior to surface disturbance within three miles of the identified historic properties a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator may not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan or approved it with conditions after consultation with SHPO, applicable Indian tribes, and other interested parties. (b) The Plan must demonstrate to the authorized officer’s satisfaction that there will be no adverse effects to NRHP eligible or listed historic properties (i.e., the infrastructure will either not be visible or will result in a weak contrast rating). On the lands described below: CSU (2) as mapped on the BFO GIS database. CSU (3) ensuring the setting of historic properties.</p> <p>Exception: The BLM authorized officer may grant an exception if , after consultation SHPO, applicable Indian tribes, and other interested parties, it is determined that the proposed action will result in a no adverse effect determination to the sacred, spiritual, and/or traditional nature of the property(s) (i.e., will not result in a more than a weak contrast rating).</p> <p>Modification: The BLM authorized officer if, in consultation with SHPO, applicable Indian tribes, and other interested parties, the site is no longer considered eligible under NRHP or if, in consultation with Indian tribes and/or SHPO, it is determined that the identified property’s sacred, spiritual, and/or traditional values have been downgraded and/or the tribes have reduced the previous avoidance distance around the site.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined, in consultation with SHPO, applicable Indian tribes, and other interested parties, that the identified site is no longer considered sacred, spiritual, and/or traditional.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---|------------------|---|
| Cultural-5011 | NSO | Cultural: traditional cultural properties | 15,382 | <p>NSO or use is allowed on lands containing traditional cultural properties.</p> <p>NSO (1) On the lands described below: NSO (2) as mapped on the BFO GIS database.</p> <p>For the purpose of: NSO (3) protecting traditional cultural properties.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so it will not be placed within the actual boundaries of or will not disturb the site within the defined NSO area.</p> <p>Modification: The BLM authorized officer if, in consultation with SHPO, applicable tribes, and other interested parties, the site is no longer considered eligible under NRHP or if, in consultation with SHPO, applicable Indian tribes, and other interested parties it is determined that the identified property's sacred, spiritual, and/or traditional values have been downgraded and/or the tribes have reduced the previous avoidance distance around the site.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined, in consultation with SHPO, applicable Indian tribes, and other interested parties, that the identified site is no longer considered sacred, spiritual, and/or traditional.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---|------------------|---|
| Cultural-5011 | CSU | Cultural: traditional cultural property setting | 613,601 | <p>Surface disturbance is restricted within three miles of traditional cultural properties.</p> <p>CSU (1) (a) Prior to surface disturbance within three miles of traditional cultural properties a mitigation plan (Plan) must be submitted by the applicant. The Plan must be approved or approved with conditions by the BLM authorized officer prior to surface-disturbing activities after consultation with SHPO, applicable Indian tribes, and other interested parties.</p> <p>(b) The Plan must demonstrate there will be no adverse effects to NRHP eligible or listed historic properties (i.e., proposed infrastructure is either not visible or will result in a weak contrast rating) On the lands described below: CSU (2) as mapped on the BFO GIS database. For the purpose of: CSU (3) ensuring the setting of traditional cultural properties.</p> <p>Exception: The BLM authorized officer may grant an exception, after consultation SHPO, applicable Indian tribes, and other interested parties, it is determined that the proposed action will result in a no adverse effect determination to the sacred, spiritual, and/or traditional nature of the property(s).</p> <p>Modification: The BLM authorized officer may modify the stipulation, if in consultation with SHPO, applicable Indian tribes, and other interested parties, the site is no longer considered eligible under NRHP or if, in consultation with Indian tribes and/or SHPO, it is determined that the identified property’s sacred, spiritual, and/or traditional values have been downgraded and/or the tribes have reduced the previous avoidance distance around the site.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined, in consultation with SHPO, applicable Indian tribes, and other interested parties, that the identified site is no longer considered sacred, spiritual, and/or traditional.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---|------------------|---|
| Paleo-5007 | NSO | Paleontology: high quality or important resources | 860 | <p>NSO or use is allowed on lands containing paleontological resources of high quality or importance.</p> <p>On the lands described below: NSO (1) as mapped on the BFO GIS database.</p> <p>For the purpose of: NSO (2) protecting paleontological resources of high quality or importance.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so that the action will protect paleontological resources of high quality or importance.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation. The stipulation may be modified based on monitoring results.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area does not contain paleontological resources of high quality or importance.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---|------------------|---|
| VRM-5005 | CSU | Visual: Class II and Special Emphasis Areas | 112,329 | <p>Surface disturbance is restricted within Visual Resource Management (VRM) Class II areas.</p> <p>CSU (1) Prior to surface disturbance within VRM Class II areas, a site-specific plan must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the plan (with conditions, as appropriate). The plan must demonstrate to the BLM authorized officer’s satisfaction how the operator will meet the following performance standards:</p> <ul style="list-style-type: none"> • A visual contrast rating must demonstrate that VRM Class II objectives will be met. • Where required by the BLM authorized officer, a visual simulation must be prepared and must demonstrate that VRM Class II objectives will be met through practices such as siting of permanent facilities. • Where present and feasible, existing surface disturbances shall be utilized; new surface disturbances shall be minimized to the extent practicable. • All permanent above-ground facilities (such as production tanks or other production facilities) not having specific coloration requirements for safety must be painted or designed using a BLM-approved color. <p>On the lands described below: CSU (2) as mapped on the BFO GIS database. For the purpose of: CSU (3) protecting Class II VRM Areas.</p> <p>Exception: The BLM authorized officer may grant an exception if it is demonstrated through a BLM-approved visual simulation and contrast rating worksheet that the project or identified mitigation will meet or exceed VRM Class II objectives. This restriction does not apply to temporary structures such as drilling rigs.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation if it is demonstrated that VRM Class II objectives have been modified through appropriate RMP planning procedures, or if a portion of the lease is not located within a VRM Class II area.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire leasehold is no longer managed for VRM Class II objectives based on planning, or if the entire leasehold is not located within a Class II area.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|---|------------------|--|
| Rec-6019 | CSU | Recreation: Special Recreation Management Areas | 9,504 | <p>Surface disturbance is restricted within the Special Recreation Management Areas (SRMA) available for leasing (Weston Hills).</p> <p>CSU (1) (a) Prior to surface disturbance within SRMAs available for leasing a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM authorized officer has approved the Plan (with conditions, as appropriate).</p> <p>(b) The Plan must demonstrate to the authorized officer's satisfaction that the proposed action is consistent with the prescribed management for the SRMA.</p> <p>On the lands described below: CSU (2) as mapped or determined by BLM. For the purpose of: CSU (3) ensuring the recreational opportunities and setting of the SRMA.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so that the action will meet the management objectives, the recreational opportunities, and setting of the SRMA.</p> <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation. The stipulation may be modified based on monitoring results, or if a portion of the area is no longer located within a SRMA.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area is not within a SRMA.</p> |
| ACEC-7003 | NSO | ACEC: Pumpkin Buttes | 1,731 | <p>NSO or use is allowed within the Pumpkin Buttes Area of Critical Environmental Concern.</p> <p>On the lands described below: NSO (2) as mapped or determined by BLM. For the purpose of: NSO (3) protecting the relevant and important values.</p> <p>Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so that the action will not result in a failure to protect the relevant and important values. The Plan may be subject to consultation with Wyoming SHPO, applicable tribes, and other interested parties.</p> |

| Management Action | Stipulation Type | Protected Resource | Acreage Affected | Stipulation Description |
|-------------------|------------------|--------------------|------------------|--|
| | | | | <p>Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation. The stipulation may be modified based on monitoring results, or if a portion of the lease is no longer located in the Pumpkin Buttes ACEC.</p> <p>Waiver: The BLM authorized officer may waive this stipulation if it is determined that the entire lease area does not contain relevant and important Area of Critical Environmental Concern (ACEC) values, subject to consultation with Wyoming SHPO, applicable tribes, and other interested parties.</p> |

B.3. Processing Exceptions, Modifications, and Waivers

An exception, waiver, or modification must be based on one of two criteria. According to 43 CFR 3101.1-4, “A stipulation included in an oil and gas lease shall be subject to modification or waiver only if the authorized officer determines that the factors leading to its inclusion in the lease have changed sufficiently to make the protection provided by the stipulation no longer justified or if the proposed operations would not cause unacceptable impacts.” Waiver, exceptions, or modifications must be supported by appropriate environmental analysis and documentation.

The person requesting the exception, modification, or waiver is responsible to submit a written request including information that might assist the authorized official in making a decision. The authorized officer will review the information submitted in support of the request along with other pertinent information. Requests must be submitted to the BLM field office (Buffalo) in which the lease is located. Modification and waiver requests will be forwarded to the BLM-Wyoming Deputy State Director for Minerals and Lands along with the Buffalo Field Office (BFO)’s recommendation. Requests shall be subject to at least a 30 day public review if the authorized officer determines that a stipulation involves an issue of major concern to the public (43 CFR 3101.1-4).

The request is considered a unique action and is analyzed and documented individually for RMP and NEPA compliance. Processing may include coordination or consultation with the Wyoming Game and Fish Department (WGFD), U.S. Fish and Wildlife Service (USFWS), SHPO, or other agencies. For example, requests will not be granted for stipulations designed to protect Threatened and Endangered species, unless the BLM consults with the USFWS and reinitiates consultation, if necessary. Consultation with other agencies require additional time and resources to process.

The request must include the lease number and effective date, the stipulation(s) the request is for, the change in circumstances that lead the lessee or operator to believe the request is appropriate, and the name and/or number of any applicable authorization(s) (i.e., APD, sundry, right-of-way). A map is strongly recommended. The following information must be addressed, when applicable, in the written request:

1. **WHY** the public land user wants the request. For example with a timing limitation exception request, include the reason(s) why an action could not be completed within the original stipulation period, any evidence of why the action would not adversely affect the resource or species being protected, or any other information (additional mitigation measures or alternatives) that would help the BLM (and WGFD or USFWS) in reviewing the request.

Appendix B Fluid Mineral Lease Notices; Lease Stipulations; and the Process for Exceptions, Modifications, and Waivers

2. **WHO** is filing the request. This must include the company name, the name of the contact person, and the address, telephone number, e-mail address (if available), and fax number of the contact person.
3. **WHAT** is being requested. For example with a timing limitation request, include a detailed description of the activity including types of equipment or vehicles required and the number of trips expected.
4. **WHERE** the activity would take place. This must include the legal description of the activity and a map clearly depicting these areas. Proponent prepared Geographic Information System layers meeting BLM requirements can expedite the processing.
5. **WHEN** the activity would occur and it's duration. This must include the start date, end date, and time of day/night when activities would occur.

Requests must be made in writing and hard copy delivered to the Buffalo Field Manager at the physical address of the office. When time is of the essence, the process may be initiated by fax or electronic delivery of a scanned copy but the original must be received by the BFO within three working days. No exception, waiver, or modification will be issued until the hard copy request is received.

An exception request must be initiated near the time of the proposed activity. As a general rule, the request should be made within two weeks of conducting the proposed activity. The unpredictability of weather, animal movement and condition, and so on precludes analysis of requests related to wildlife far in advance of the time periods in question. The BLM uses a set of criteria when considering an exception request. Professional judgment plays a key part in the BLM's decisions on whether to grant exceptions. There is no clear-cut formula.

The following example describes some of the factors considered by the BLM when determining whether a request for a big game winter range timing limitation exception should be granted.

Factors Considered

1. Resource Concern
 - Animal presence or absence
 - Additional or new resource concerns
 - Potential for increased wildlife accidents or poaching
2. Animal Conditions
 - Physical condition of individual animals (e.g., fat reserves)
 - Local animal population condition (animal density)
 - Potential for additive mortality
 - Likelihood of introduction or increased incidence of disease
 - Likelihood of decreased recruitment/natality
3. Climate/Weather
 - Snow conditions (depth, crusting, longevity)
 - Current and historic local precipitation patterns
 - Current and historical seasonal weather patterns
 - Recent and current wind-chill factors (indication of animals energy use)
 - Duration of condition
 - Short- and long-range forecasts

4. Habitat Condition and Availability
 - Water and forage condition (availability, quality, and quantity)
 - Competition (interspecific, intraspecific)
 - Animal use of available forage
 - Suitable and ample forage immediately available and accessible
5. Spatial Considerations
 - Migration/travel corridors
 - Winter range, foraging, calving or breeding
 - Topography (plains vs. mountains)
 - Topographic/geographic limitations (barriers)
 - Presence of thermal cover (e.g., protection from wind)
 - Proportion of range impacted
 - Juxtaposition and density of other activities/disturbances in the vicinity
 - Cumulative impacts
6. Timing
 - When proposed activity would occur in the stipulation period
 - Kind and duration of potentially disruptive activity
 - Likelihood of animals habituating to the proposed activity

A determination will be fully documented in the case file with an appropriate level of environmental review after asking not one, but a series of questions, such as:

- Would the BLM remain in compliance with laws and regulations?
- Is the proposal in conformance with the objectives of the RMP?
- What would be the level of harm to the protected resource, both locally and regionally?
- What would be the economic or public safety concerns if an active operation near completion was shut in to comply with a seasonal closure? (For example: economic, multi-stage fracturing not completed; safety, casing and cementing of fresh water zones not completed.)
- Are the impacts temporary, rather than long term?
- Is the resource being protected rare, or is it relatively common? Is it a special status species?
- Based on existing knowledge of a species and its use of an area, would impacts be confined to single or a small number of individuals, or would there be impacts on local or regional populations?
- Would impacts be allowed under existing law and policy?
- Is offsite mitigation an appropriate option? (For example, where individual or cumulative impacts cannot be effectively mitigated on site?)
- Can the impacts be reduced to an acceptable level through intensive use of environmental Best Management Practices?

Bibliography

BLM (Bureau of Land Management). 2008. BLM Manual 6840, Special Status Species Management. U.S. Department of the Interior, Bureau of Land Management.

BLM. 2011. Fortification Creek Area Resource Management Plan Amendment/Environmental Assessment. WY-070-EA08-135. U.S. Department of the Interior, Bureau of Land Management.

Appendix B Fluid Mineral Lease Notices; Lease Stipulations; and the Process for Exceptions, Modifications, and Waivers Processing Exceptions, Modifications, and Waivers

WGFD (Wyoming Game and Fish Department). 2009. Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats. Version 2.0. Wyoming Game and Fish Department.

Appendix C. Best Management Practices and Required Design Features

Best management practices (BMPs) are environmental protection measures developed by governmental bodies, industry, and scientific or other working groups. BMPs are state-of-the-art mitigation measures applied on a site-specific basis to reduce, prevent, or avoid adverse environmental or social impacts. These practices are applied to help ensure that development is conducted in an environmentally responsible manner. Some BMPs are as simple as choosing a paint color that helps oil and natural gas equipment blend with the natural surroundings, turning development almost invisible. Other BMPs may reduce the amount of vegetation lost to development, may speed the re-growth of vegetation, or may reduce the amount of wildlife disturbance in important habitats. Public land users are encouraged to review these practices, incorporate them where appropriate, or develop better methods for achieving the same goal.

The purpose of this section is not to select certain practices or designs and require that only those be used. It is not possible to evaluate all the known practices and make determinations as to which are best. BMPs should be matched and adapted to meet the site-specific requirements of the management action, project and local environment. No one management practice is best suited to every site or situation. BMPs must be adaptive and monitored regularly to evaluate effectiveness.

The following sources contain information regarding the development and implementation of BMPs. These references are not to be considered as exclusive sources of information; rather, they should be used as a starting point when evaluating specific BMPs during project design and implementation.

C.1. Bureau of Land Management (BLM) BMP Resources

BLM BMPs: This website provides an introduction to BLM BMPs with links to BLM contacts, specific resources, and other BMP links, and other resources related to BLM BMPs.
<http://www.blm.gov/bmp/>

General Information for Oil and Gas BMPs: This resource provides general information regarding BLM BMPs for oil and gas development. A sample of BMPs are provided with a brief description of types of BMPs and terminology.
http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices/general_information.html

BMP Frequently Asked Questions: The link below provides responses to frequently asked questions regarding BLM BMPs.
http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices/frequently_asked_questions.html

BMP Technical Information: The slide shows at the link below provide a detailed look at a menu of possible oil and natural gas development BMPs. These slide shows are only a starting point and are not intended to serve as a comprehensive list of BMPs.
<http://www.blm.gov/nhp/efoia/wo/fy05/im2005-069.htm>

Oil and Gas Exploration – The Gold Book: The publication Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (commonly referred to as The Gold

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Book) was developed to assist operators by providing information on the requirements for obtaining permit approval and conducting environmentally responsible oil and gas operations on federal lands and on private surface over federal minerals (split estate). split estate surface owners will also find the Gold Book to be a useful reference guide. In 2007, the Gold Book was updated to incorporate changes resulting from the new Onshore Oil and Gas Order No. 1 regulations. http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices/gold_book.html

Visual Resources: There are numerous design techniques that can be used to reduce the visual impacts from surface-disturbing projects. The techniques described here should be used in conjunction with BLM's visual resource contrast rating process wherein both the existing landscape and the proposed development or activity are analyzed for their basic elements of form, line, color, and texture. http://www.blm.gov/wo/st/en/prog/Recreation/recreation_national/RMS/2.html

While written for renewable energy development, Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands (BLM 2013a) provides visual BMPs applicable to many land use activities. http://www.blm.gov/wo/st/en/prog/energy/renewable_energy.html

Renewable Energy Development BMPs: The following resources provide information on BMPs related to renewable energy development.

- Wind Energy Development Programmatic Environmental Impact Statement [EIS]: The scope of the Wind Energy Programmatic EIS analysis includes an assessment of the positive and negative environmental, social, and economic impacts; discussion of relevant mitigation measures to address these impacts; and identification of appropriate, programmatic policies and BMPs to be included in the proposed Wind Energy Development Program. <http://www.windeis.anl.gov/eis/index.cfm>
- BLM Instruction Memorandum [IM] 2009-043, Rights-of-Way [ROW], Wind Energy: This IM further clarifies the BLM Wind Energy Development policies and BMPs provided in the Wind Energy Development Programmatic EIS. http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2009/IM_2009-043.html
- Record of Decision for the Geothermal Resource Leasing Programmatic EIS: This Record of Decision (ROD) provides a list of sample BMPs that have been collected from various BLM and United States Forest Service documents addressing geothermal and fluid mineral leasing and development, including resource management plans (RMPs), forest plans, and environmental reports for geothermal leasing and development. The document provides guidance on incorporating BMPs, as appropriate, into the geothermal permit application or as Conditions of Approval (COAs). http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS_REALTY_AND_RESOURCE_PROTECTION/_energy/geothermal_eis/final_programmatic.Par.90935.File.dat/ROD_Geothermal_12-17-08.pdf
- Record of Decision for the Solar Energy Development Programmatic EIS: This ROD (published October 2012) includes policies and mitigation measures adopted as part of the proposed solar energy deployment program. The Solar Energy Development Programmatic EIS identifies for the Department of Energy, industry, and stakeholders

the best practices for deploying solar energy and ensuring minimal impact to natural and cultural resources on BLM-administered lands or other federal, state, tribal, or private lands.
<http://www.solareis.anl.gov/>

General Information for Management of Land Boundaries BMPs: The Departmental Manual 600 Chapter 5, Standards for Federal Lands Boundary Evidence and BLM H-9600-1, Cadastral Survey Handbook, provides general information regarding BLM BMPs for management of public land boundaries. Samples of BMPs are available with a brief description of types of BMPs and terminology. http://www.blm.gov/wo/st/en/prog/more/cadastralsurvey/cadastral_review_of.html.

C.2. Other Agency BMP Resources

U.S. Environmental Protection Agency (EPA) BMP Resources

Healthy Watersheds: This resource provides conservation approaches and tools designed to ensure healthy watersheds remain intact. The website provides example approaches that are generally site-specific, and watershed managers are encouraged to use the examples as guidance in developing local conservation strategies. The website also supplies outreach strategies to encourage stakeholder engagement in conservation and protection of healthy watersheds.
<http://www.epa.gov/owow/nps/>

Storm Water BMPs: This online menu provides BMPs designed to meet the minimum requirements for six control measures specified by the EPA's Phase II Stormwater Program. The control measures include public education, public involvement, illicit discharge detection and elimination, construction, post-construction, and pollution prevention/good housekeeping. The menu also provides case studies assessing the performance of various storm water BMPs.
<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm>

Pasture, Rangeland, and Grazing Operations BMPs: The link below provides BMPs compiled by the EPA to prevent or reduce pollution associated with livestock grazing. Topics include practices to reduce methane production, managing nonpoint source pollution, controlled grazing, reducing animal feeding operation pollution, and manure management.
<http://www.epa.gov/oecaagct/anprgbmp.html>

U.S. Department of Agriculture – Natural Resources Conservation Service (NRCS) BMP Resources

National Conservation Practice Standards: This website provides links for national conservation practices developed by the NRCS on topics such as herbaceous wind barriers, feed management, forest stand improvement, and irrigation management. The conservation practice standard contains information on why and where the practice is applied, and sets forth the minimum quality criteria that must be met during the application of that practice in order for it to achieve its intended purpose.
<http://www.nrcs.usda.gov/Technical/Standards/nhcp.html>

National Range and Pasture Handbook: Developed by NRCS grazing land specialists, this handbook provides a source of expertise to guide cooperators in solving resource problems and in sustaining or improving their grazing lands resources and operations.
<http://www.glti.nrcs.usda.gov/technical/publications/nrph.html>

Wyoming Game and Fish Department BMP Resources

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Aquatic Invasive Species: This resource provides information about how to recognize aquatic invasive species and how to avoid introducing them or spreading them through Wyoming's waters. The website contains links to external resources including a link to waterbodies in the United States currently known to be impacted by zebra and quagga mussels. The website also contains information about how to decontaminate equipment and watercraft suspected of harboring aquatic invasive species. <http://gf.state.wy.us/fish/AIS/index.asp>

C.3. Greater Sage-Grouse: Required Design Features and Best Management Practices

C.3.1. Required Design Features

Required Design Features (RDFs) are required for certain activities in Greater Sage-Grouse habitat. RDFs apply to locatable minerals to the extent permitted by applicable law and subject to valid existing rights. RDFs establish the minimum specifications for certain activities to help mitigate adverse impacts. However, the applicability and overall effectiveness of each RDF cannot be fully assessed until the project level when the project location and design are known. Because of site-specific circumstances, some RDFs may not apply to some projects (e.g., a resource is not present on a given site) and/or may require slight variations (e.g., a larger or smaller protective area). All variations in RDFs would require that at least one of the following be demonstrated in the National Environmental Policy Act (NEPA) analysis associated with the project/activity:

- A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g., due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
- An alternative RDF, a state-implemented conservation measure, or plan-level protection is determined to provide equal or better protection for Greater Sage-Grouse or its habitat.
- A specific RDF will provide no additional protection to Greater Sage-Grouse or its habitat.

The practices listed in this section are from the BLM National Technical Team (NTT) report (BLM 2012) and are treated in the RMP as RDFs to ensure regulatory certainty for the conservation of Greater Sage-Grouse. The BLM will adopt them as operational requirements, through issuance of the RMP ROD. The RDFs are primarily written for priority Greater Sage-Grouse habitat (Core Populations Areas and Connectivity Corridors). Within general habitat, the RDFs applied are determined on a project specific basis. The BLM may add additional RDFs as deemed necessary by further environmental analysis and as developed through coordination with other federal, state, and local regulatory and resource agencies. Because practices change, based on new information, the RDFs will be updated periodically.

The EIS for the RMP may not decide or dictate the exact wording or inclusion of the RDFs. Rather, they are used in the RMP process as a tool to help develop the RMP alternatives and to provide a baseline for comparative impact analysis in arriving at RMP decisions. They will be used in the same manner in analyzing activity plans and other site-specific proposals. Design features and management practices and their wording can be a matter of policy. As such, specific wording is subject to change primarily through administrative review, not through the RMP and EIS process. Any further changes that may be made in the continuing refinement of these RDFs

and any development of program-specific standard stipulations will be handled in another forum, including appropriate public involvement and input.

BLM reserves the right to modify the operations of surface-disturbing or disruptive activities as part of the statutory requirements for environmental protection. Those measures selected for implementation will be identified in the site-specific ROD or decision record for those activities and will inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM-administered public lands and minerals. These measures have been written in a format that will allow for either their direct use as stipulations or operating standards or in addition to specific or specialized mitigation following the submission of a detailed development plan or other project proposal and an environmental analysis. These operating standards are given as acceptable methods for mitigating anticipated effects and achieving the desired plan outcomes but are not prescribed as the only method for achieving the outcomes.

Because of site-specific circumstances, some RDFs may not apply to all activities (e.g., a resource or conflict is not present on a given site) and/or may require slight variations. Proposed variations will be analyzed and may be applied in the site specific permitting process. All variations will require appropriate analysis and disclosure as part of activity authorization. It is anticipated that variations will be approved in very limited circumstances and only in coordination with the Wyoming Game and Fish Department (WGFD) and/or U.S. Fish and Wildlife Department (USFWS).

Project proponents are encouraged to include all appropriate RDFs in their proposals. The BLM will require application of all appropriate measures, warranted by site-specific analysis, in order to avoid, minimize, rectify, reduce, or compensate for impacts. RDFs not included in project proposals and determined appropriate from the site-specific analysis will be required as COAs. Additional COAs developed through consultation with other federal, state, and local regulatory and resource agencies may be applied when supported by site-specific analysis.

The proponent must implement all identified measures because they are commitments made as part of the BLM decision. Because the decision document creates a clear obligation for the BLM to ensure any proposed mitigation adopted in the environmental analysis is performed, there is the expectation that applied mitigation will lead to a reduction of environmental impacts in the implementation stage and include binding mechanisms for enforcement (CEQ 2011). The determination of adequate application of the mitigation measures and conservation actions for specific projects will remain with the BLM's authorized officer.

Those resource activities or programs currently without a standardized set of permit or operation stipulations can use the RDFs for Greater Sage-Grouse as stipulations or as COAs or as a baseline for developing specific stipulations for a given activity or program.

At the project level, to prioritize certain general habitat areas over marginal or substandard habitat, consideration should be given to:

- The capability of the habitat to provide connectivity among Greater Sage-Grouse Core Population Areas;
- Habitats occupied by Greater Sage-Grouse where enhancing habitat can offset losses to habitat or populations elsewhere; and
- The potential to replace lost priority habitat or needed changes in priority habitat resulting from perturbations or disturbances to support Greater Sage-Grouse objectives.

Lands and Realty

- Where existing leases or ROWs have had some level of development (road, fence, well, etc.) and are no longer in use, reclaim the site by removing these features and restoring the habitat. Within designated priority habitat, reclaim by removing these features and restoring the habitat of these ROW that are no longer in use.

West Nile Virus

- Increase the size of ponds to accommodate a greater volume of water than is discharged. This will result in un-vegetated and muddy shorelines that breeding *Cx. tarsalis* avoid (De Szalay and Resh 2000). This modification may reduce *Cx. tarsalis* habitat but could create larval habitat for *Culicoides sonorensis*, a vector of blue tongue disease, and should be used sparingly (Schmidtman et al. 2000). Steep shorelines should be used in combination with this technique whenever possible (Knight et al. 2003).
- Build steep shorelines to reduce shallow water (greater than 60 centimeters) and aquatic vegetation around the perimeter of impoundments (Knight et al. 2003). Construction of steep shorelines also will create more permanent ponds that are a deterrent to colonizing mosquito species like *Cx. tarsalis* which prefer newly flooded sites with high primary productivity (Knight et al. 2003).
- Maintain the water level below that of rooted vegetation for a muddy shoreline that is unfavorable habitat for mosquito larvae. Rooted vegetation includes both aquatic and upland vegetative types. Avoid flooding terrestrial vegetation in flat terrain or low lying areas. Aquatic habitats with a vegetated inflow and outflow separated by open water produce 5-10 fold fewer *Culex* mosquitoes than completely vegetated wetlands (Walton and Workman 1998). Wetlands with open water also had significantly fewer stage III and IV instars which may be attributed to increased predator abundances in open water habitats (Walton and Workman 1998).
- Construct dams or impoundments that restrict down slope seepage or overflow by digging ponds in flat areas rather than damming natural draws for effluent water storage, or lining constructed ponds in areas where seepage is anticipated (Knight et al. 2003).
- Line the channel where discharge water flows into the pond with crushed rock, or use a horizontal pipe to discharge inflow directly into existing open water, thus precluding shallow surface inflow and accumulation of sediment that promotes aquatic vegetation.
- Line the overflow spillway with crushed rock, and construct the spillway with steep sides to preclude the accumulation of shallow water and vegetation.
- Fence pond site to restrict access by livestock and other wild ungulates that trample and disturb shorelines, enrich sediments with manure and create hoof print pockets of water that are attractive to breeding mosquitoes.

Fluid Minerals

- Use only closed-loop systems for drilling operations, with no reserve pits.
- Require noise shields when drilling during the lek, nesting, brood-rearing, and wintering seasons.
- Design new transmission towers with anti-perching devices and retrofit existing towers to discourage use by raptors.
- Locate new compressor stations outside priority habitats and design them to reduce noise that may be directed towards priority habitat.
- Locate man camps outside priority Greater Sage-Grouse habitats.
- Roads (Priority Habitat Area)
 - Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
 - Locate roads to avoid important areas and habitats.

- Coordinate road construction and use among ROW holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish slow speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Establish trip restrictions (Lyon and Anderson 2003) or minimization through use of telemetry and remote well control (e.g., Supervisory Control and Data Acquisition).
- Do not issue ROWs to counties on newly constructed energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (use signing, gates, etc.).
- Apply dust abatement practices on roads and pads.
- Close and rehabilitate duplicate roads.
- Roads (General Habitat)
 - Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
 - Do not issue ROWs to counties on energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
 - Establish speed limits to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
 - Coordinate road construction and use among ROW holders.
 - Construct road crossing at right angles to ephemeral drainages and stream crossings.
 - Apply dust abatement practices on roads and pads.
 - Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.
- Operations (Priority Habitat)
 - Clean up refuse to avoid attracting predators (Bui et al. 2010).
 - Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.
 - Use directional and horizontal drilling to reduce surface disturbance.
 - Place infrastructure in already disturbed locations where the habitat has not been restored.
 - Consider using oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.
 - Apply a phased development approach with concurrent reclamation.
 - Place liquid gathering facilities outside of priority areas. Have no tanks at well locations within priority areas (minimizes perching and nesting opportunities for ravens and raptors and truck traffic). Pipelines must be under or immediately adjacent to the road (Bui et al. 2010).
 - Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use (Lyon and Anderson 2003).
 - Restrict the construction of tall facilities and fences to the minimum number and amount needed.
 - Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.
 - Collocate new utility developments (powerlines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
 - Bury new distribution powerlines except when an existing line is already in place.
 - Collocate powerlines, flow lines, and small pipelines under or immediately adjacent to existing roads (Bui et al. 2010).
 - Design or site permanent structures which create movement (e.g., a pump jack) to minimize impacts to Greater Sage-Grouse.

- Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce Greater Sage-Grouse mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (Evangelista et al. 2011) (e.g., by washing vehicles and equipment).
- Operations (General Habitat)
 - Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.
 - Use directional and horizontal drilling to reduce surface disturbance.
 - Clean up refuse (Bui et al. 2010).
 - Restrict the construction of tall facilities and fences to the minimum number and amount needed.
 - Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce Greater Sage-Grouse mortality.
 - Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
 - Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use.
 - Control the spread and effects from non-native plant species. (e.g., by washing vehicles and equipment.)
 - Apply West Nile Virus (WNV) BMPs (Doherty 2007).
- Reclamation
 - Include objectives for ensuring habitat restoration to meet sage-grouse habitat needs in reclamation practices/sites (Pyke 2011). Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve Greater Sage-Grouse habitat needs.
 - Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
 - Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.
 - Implement irrigation during interim or final reclamation for sites where establishment of seedlings has been shown or is expected to be difficult due to dry conditions.
 - Use mulching, soil amendments, and/or erosion blankets to expedite reclamation and to protect soils.

Locatable Minerals

RDFs apply to locatable minerals to the extent permitted by applicable law and subject to valid existing rights.

- Locate new compressor stations outside priority habitats and design them to reduce noise that may be directed towards priority habitat.
- Locate man camps outside priority sage-grouse habitats.
- Roads
 - Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
 - Locate roads to avoid important areas and habitats.
 - Coordinate road construction and use among ROW holders.
 - Construct road crossing at right angles to ephemeral drainages and stream crossings.
 - Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.

- Do not issue ROWs to counties on mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (e.g., use signing, gates, etc.).
- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.
- **Operations**
 - Cluster disturbances associated with operations and facilities as close as possible.
 - Place infrastructure in already disturbed locations where the habitat has not been restored.
 - Restrict the construction of tall facilities and fences to the minimum number and amount needed.
 - Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.
 - Place new utility developments (powerlines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
 - Bury powerlines.
 - Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.
 - Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
 - Control the spread and effects of non-native plant species (Gelbard and Belnap 2003; Bergquist et al. 2007).
 - Apply WNV BMPs (Doherty 2007).
 - Require Greater Sage-Grouse-safe fences around sumps.
 - Clean up refuse (Bui et al. 2010).
 - Locate man camps outside of priority Greater Sage-Grouse habitats.
- **Reclamation**
 - Include restoration objectives to meet Greater Sage-Grouse habitat needs in reclamation practices/sites.
 - Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.
 - Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
 - Restore disturbed areas at final reclamation to pre-disturbance landform and desired plant community.
 - Irrigate interim reclamation as necessary during dry periods.

Solid Minerals – Coal

- For coal mining operations on existing leases: in priority sage-grouse habitat areas, place any new appurtenant facilities outside of priority areas. Where new appurtenant facilities associated with the existing lease cannot be located outside the priority sage-grouse habitat area, co-locate new facilities within existing disturbed areas. If this is not possible, then build any new appurtenant facilities to the absolute minimum standard necessary.

Fuels Management (Original source BLM IM 2011-138)

- Design fuels treatment objective to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patterns which most benefit sage-grouse habitat.

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- Provide training to fuels treatment personnel on sage-grouse biology, habitat requirements, and identification of areas utilized locally.
- Use fire prescriptions that minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of hydrophobicity).
- Ensure proposed sagebrush treatments are planned with interdisciplinary input from BLM and/or state wildlife agency biologist and that treatment acreage is conservative in the context of surrounding Greater Sage-Grouse seasonal habitats and landscape.
- Ensure that treatments are configured in a manner (e.g., strips) that promotes use by sage-grouse (Connelly et al. 2000).
- Incorporate roads and natural fuel breaks into fuel break design.
- Power-wash all vehicles and equipment involved in fuels management activities prior to entering the area to minimize the introduction of undesirable and/or invasive plant species.
- Design vegetation treatment in areas of high frequency to facilitate firefighting safety, reduce the risk of extreme fire behavior; and to reduce the risk and rate of fire spread to sage-grouse priority habitats.
- Give priority for implementing specific sage-grouse habitat restoration projects in annual grasslands first to sites which are adjacent to or surrounded by sage-grouse priority habitat. Annual grasslands are second priority for restoration when the sites not adjacent to priority habitat, but within two miles of priority habitat. The third priority for annual grasslands habitat restoration projects are sites beyond two miles of priority habitat. The intent is to focus restoration outward from existing, intact habitat.
- As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs.
- Emphasize the use of native plant species, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.
- Remove standing and encroaching trees within at least 100 meters of occupied sage-grouse leks and other habitats (e.g., nesting, wintering, and brood-rearing) to reduce the availability of perch sites for avian predators, as appropriate, and resources permit.
- Reduce the risk of vehicle or human-caused wildfires and the spread of invasive species by planting perennial vegetation (e.g., green-strips) paralleling road ROW.
- Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, and strictly managed grazed strips) to aid in controlling wildfire should wildfire occur near key habitats or important restoration areas (such as where investments in restoration have already been made).
- In priority habitat, design and implement fuels treatments with an emphasis on protecting existing sagebrush ecosystems.
 - Do not reduce sagebrush canopy cover to less than 15 percent (Connelly et al. 2000; Hagen et al. 2007) unless a fuels management objective requires additional reduction in sagebrush cover to meet strategic protection of priority sage-grouse habitat and conserve habitat quality for the species. Closely evaluate the benefits of fuel break against the additional loss of sagebrush cover in the Environmental Assessment process.
 - Apply appropriate seasonal restrictions for implementing fuels management treatments according to the type of seasonal habitats present in a priority area.
 - Allow no fuels treatments in known winter range unless the treatments are designed to strategically reduce wildfire risk around or in the winter range and will maintain winter range habitat quality.
 - Do not use fire to treat sagebrush in less than 12-inch precipitation zones (e.g., Wyoming big sagebrush or other xeric sagebrush species; Connelly et al. 2000; Hagen et al. 2007; Beck et al. 2009). However, if as a last resort and after all other treatment opportunities have

been explored and site specific variables allow, the use of prescribed fire for fuel breaks that would disrupt the fuel continuity across the landscape would be considered, in stands where cheatgrass is a very minor component in the understory (BLM 2012).

- If prescribed fire is to be used for vegetation treatments, the burn plan will clearly indicate how the Conservation Objective Team objectives will be met by its use, and why alternative techniques were not selected.
- A risk assessment will be completed for implementation of prescribed fire in relation to the Greater Sage-Grouse goals and objectives.
- Monitor and control invasive vegetation post treatment.
- Rest treated areas from grazing for two full growing seasons unless vegetation recovery dictates otherwise (WGFD 2011).
- Require use of native seeds for fuels management treatment based on availability, adaptation (site potential), and probability of success (Richards et al. 1998). Where probability of success or native seed availability is low, non-native seeds may be used as long as they meet sage-grouse habitat objectives (Pyke 2011).
- Design post fuels management projects to ensure long term persistence of seeded or pretreatment native plants. This may require temporary or long-term changes in livestock grazing management, or other activities to achieve and maintain the desired condition of the fuels management project (Eiswerth and Shonkwiler 2006).
- Design fuels management projects in sage-grouse habitat to strategically and effectively reduce wildfire threats in the greatest area. This may require fuels treatments implemented in a more linear versus block design (Launchbaugh et al. 2007).
- During fuels management project design, consider the utility of using livestock to strategically reduce fine fuels (Diamond et al. 2009), and implement grazing management that will accomplish this objective (Davies et al. 2011; Launchbaugh et al. 2007). Consult with ecologists to minimize impacts to native perennial grasses.
- Restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs.
- Reduce the risk of vehicle or human-caused wildfires and the spread of invasive species by planting perennial vegetation (e.g., green-strips) paralleling road ROWs.
- Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, and strictly managed grazed strips) to aid in controlling wildfire should wildfire occur near habitats or important restoration areas (such as where investments in restoration have already been made).

Fire Management (Original source BLM IM 2011-138)

- Develop state-specific sage-grouse toolboxes containing maps, a list of Resource Advisors (READs), contact information, local guidance, and other relevant information.
- Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics.
- Assign a sage-grouse READ to all extended attack fires in or near priority Greater Sage-Grouse habitat. Prior to the fire season, provide training to sage-grouse READs on wildfire suppression organization, objectives, tactics, and procedures to develop a cadre of qualified individuals.
- On critical fire weather days, pre-position additional fire suppression resources to optimize a quick and efficient response in sage-grouse habitat areas.
- During periods of multiple fires, ensure line officers are involved in setting priorities.
- Locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, heli-bases) in areas where physical disturbance to sage-grouse habitat can be minimized. These

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include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover.

- Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and All-Terrain Vehicles prior to deploying in or near sage-grouse habitat areas to minimize noxious weed spread.
- Minimize unnecessary cross-country vehicle travel during fire operations in sage-grouse habitat.
- Minimize burnout operations in a sage-grouse habitat areas by constructing direct fireline whenever safe and practical to do so.
- Utilize retardant and mechanized equipment to minimize burned acreage during initial attack.
- As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.
- Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.
- Design post Emergency Stabilization and Rehabilitation (ES&R) management to ensure long term persistence of seeded or pre-burn native plants. This may require temporary or long-term changes in livestock grazing and travel management, etc., to achieve and maintain the desired condition of ES&R projects to benefit sage-grouse (Eiswerth and Shonkwiler 2006).
- Post fire recovery must include establishing adequately sized exclosures (free of livestock grazing) that can be used to assess recovery.
- Where burned sage-grouse habitat cannot be fenced from other unburned habitat, the entire area (e.g., allotment/pasture) should be closed to grazing until recovered.
- Mowing of grass will be used in any fuelbreak fuels reduction project (roadsides or other areas).
- Any fuels treatments will focus on interfaces with human habitation or significant existing disturbances.
- In priority sage-grouse habitat areas, prioritize suppression immediately after firefighter and public safety to conserve the habitat.
- Prioritize native seed allocation for use in sage-grouse habitat in years when preferred native seed is in short supply.
- Use native plant seeds for vegetation seedings based on availability, adaptation (site potential), and probability of success (Richards et al. 1998). Where probability of success or native seed availability is low, non-native seeds may be used as long as they meet sage-grouse habitat conservation objectives (Pyke 2011).
- In fire prone areas where sagebrush seed is required for sage-grouse habitat restoration, consider establishing seed harvest areas that are managed for seed production (Armstrong 2007) and are a priority for protection from outside disturbances.
- Consider potential changes in climate (Miller et al. 2011) when proposing post-fire seedings using native plants. Consider seed collections from the warmer component within a species' current range for selection of native seed (Kramer and Havens 2009).

Habitat Restoration/Vegetation Management

- Include sage-grouse habitat parameters as defined by Connelly et al. (2000), Hagen et al. (2007) or if available, State Sage-Grouse Conservation plans and appropriate local information in habitat restoration objectives. Make meeting these objectives within priority sage-grouse habitat areas the highest restoration priority.

Recreation

- Only allow Special Recreation Permits in priority habitat that have neutral or beneficial effects to priority habitat areas.

- Do not construct new recreation facilities (e.g., campgrounds, trails, trailheads, staging areas) within Core/Connectivity Areas unless the development would have a neutral effect or be beneficial to Greater Sage-Grouse habitat (such as concentrating recreation, diverting use away from critical areas, etc.), or unless the development is required for visitor safety or resource protection.

Travel and Transportation Management

- Use existing roads, or realignments as described above to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, then build any new road constructed to the absolute minimum standard necessary, and add the surface disturbance to the total disturbance in the priority area. If that disturbance exceeds 3 percent for that area, then make additional, effective mitigation necessary to offset the resulting loss of sage-grouse habitat.
- Allow no upgrading of existing routes that would change route category (road, primitive road, or trail) or capacity unless the upgrading would have minimal impact on sage-grouse habitat, is necessary for motorist safety, or eliminates the need to construct a new road.
- Limit route construction to realignments of existing designated routes if that realignment has a minimal impact on sage-grouse habitat, eliminates the need to construct a new road, or is necessary for motorist safety.
- Among other designation criteria from 43 Code of Federal Regulations (CFR) 8342.1(b), “areas and trails shall be located to minimize harassment of wildlife or significant disruption of wildlife habitats. Special attention will be given to protect endangered or threatened species and their habitats.”
- Conduct restoration of roads, primitive roads and trails not designated in travel management plans. This also includes primitive route/roads that were not designated in Wilderness Study Areas and within lands with wilderness characteristics that have been selected for protection.
- In priority habitat, limit motorized travel to existing roads, primitive roads, and trails at a minimum, until such time as travel management planning is complete and routes are either designated or closed.
- Where off-road vehicles are causing or will cause considerable adverse effects upon soil, vegetation, wildlife, wildlife habitat, cultural resources, historical resources, threatened or endangered species, wilderness suitability, other authorized uses, or other resources, the affected areas shall be immediately closed to the type(s) of vehicle causing the adverse effect until the adverse effects are eliminated and measures implemented to prevent recurrence. This may include closure of routes or areas. (43 CFR 8341.2).
- When reseeding roads, primitive roads, and trails in priority habitat, use appropriate seed mixes and consider the use of transplanted sagebrush.

Rights-of-Ways and Corridors

- Evaluate and take advantage of opportunities to remove or modify existing powerlines within priority sage-grouse habitat areas. When possible, require perch deterrents on existing or new overhead facilities.
- Where existing leases or ROWs have had some level of development (road, fence, well, etc.) and are no longer in use, reclaim the site by removing these features and restoring the habitat. Within designated priority habitat reclaim by removing these features and restoring the habitat of these ROW that are no longer in use.
- Where new ROWs are necessary, co-locate new ROWs within existing ROWs where possible.

Additional RDFs Identified During the National Greater Sage-Grouse Planning Strategy

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Fire and Fuels Management

- Work cooperatively with permittees, lessees and other landowners to develop grazing management strategies that integrate both public and private lands into single management units.
- Avoid using prescribed fire in Greater Sage-Grouse habitat unless evaluation of site-specific conditions demonstrate that there would be a net benefit for Greater Sage-Grouse. If prescribed fire is used in Greater Sage-Grouse habitat, include an analysis in the NEPA document that indicates how Greater Sage-Grouse goals and objectives will be addressed and met by its use, why alternative techniques were not selected, and a risk assessment to address how potential threats to Greater Sage-Grouse habitat would be minimized.
- If prescribed fire is to be used at the implementation level, at a minimum, the burn plan will indicate how Conservation Objective Team/land use plan objectives would be addressed and met and why alternative techniques were not selected.
- Avoid prescribed fire as a vegetation or fuels treatment in Wyoming big sagebrush or other xeric sagebrush species, or in areas with a potential for post-fire exotic annual dominance. However, after other treatment opportunities have been explored and as site-specific variables allow, prescribed fire could be used in these areas to meet specific fuels objectives that would maintain, improve, or restore Greater Sage-Grouse priority habitat (e.g., creation of fuel breaks that would disrupt the fuel continuity across the landscape in stands where annual invasive grasses are a minor component in the understory, burning slash piles from conifer reduction treatments, used as a component with other treatment methods to combat annual grasses and restore native plant communities).
- Allow no treatments in known winter range unless the treatments are designed to strategically reduce wildfire risk around and/or in the winter range and would protect, maintain, increase, or enhance winter range habitat quality.

Conifer Removal

- Remove conifers encroaching into sagebrush habitats, in a manner that considers tribal cultural values. Prioritize treatments closest to occupied Greater Sage-Grouse habitats and near occupied leks, and where juniper encroachment is phase 1 or phase 2. Use of site-specific analysis and principles like those included in the FIAT report and other ongoing modeling efforts to address conifer encroachment will help refine the location for specific priority areas to be treated.

Livestock Grazing Management

- Work cooperatively with permittees, lessees and other landowners to develop grazing management strategies that integrate both public and private lands into single management units.

C.3.2. Best Management Practices

The management practices in this section are additional practices available for consideration at the project level; BMPs are discretionary. Proponents are encouraged to apply appropriate measures to project proposals to minimize adverse impacts to Greater Sage-Grouse.

Recommendations from Scoping for BLM's National Greater Sage-Grouse Land Use Planning Strategy

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Fluid Minerals

- Any oil, gas, geothermal activity will be conducted to maximize avoidance of impacts, based on evolving scientific knowledge of impacts.
- Prohibit the surface disposal of coalbed methane wastewater, as well as the construction of evaporation or infiltration reservoirs to hold wastewater. Inject coalbed methane wastewater underground into a formation of equal or lower water quality.
- Any oil, gas, or geothermal activity will be conducted to maximize avoidance of impacts, based on evolving scientific knowledge of impacts.

Fuels and Fire Management

- Monitor and control invasive vegetation in treated, burned, or restored sagebrush steppe. Rapidly restore burned or disturbed sagebrush steppe to prevent incursion of invasive plants.
- Vehicles will be washed following projects in known invasive species infestation areas.
- Design and implement fuels treatments with an emphasis on protecting existing sagebrush ecosystems.
 - Retain sagebrush canopy cover at what is expected for that ecological site, consistent with sage-grouse habitat objectives (Connelly et al. 2000; Hagen et al. 2007) unless a fuels management objective requires additional reduction in sagebrush cover to meet strategic protection of sage-grouse habitat and conserve habitat quality for the species.
 - Closely evaluate the benefits of the fuel break against the additional loss of sagebrush cover in future NEPA documents.
 - Apply appropriate seasonal restrictions for implementing fuels management treatments according to the type of seasonal habitats present.
 - Allow no fuels treatments in known winter range unless the treatments are designed to strategically reduce wildfire risk around or in the winter range and will maintain winter range habitat quality.
 - Do not use fire to treat sagebrush in less than 12-inch precipitation zones (e.g., Wyoming big sagebrush or other xeric sagebrush species; Connelly et al. 2000; Hagen et al. 2007; Beck et al. 2009). However, if as a last resort and after all other treatment opportunities have been explored and site specific variables allow, the use of prescribed fire for fuel breaks that would disrupt the fuel continuity across the landscape could be considered, in stands where cheatgrass is a very minor component in the understory (BLM 2012).
 - Design post fuels management projects to ensure long term persistence of seeded or pre-treatment native plants, including sagebrush. This may require temporary or long-term changes in livestock grazing management, travel management, or other activities to achieve and maintain the desired condition of the fuels management project (Eiswerth and Shonkwiler 2006).
- Adjust grazing management in advance of predicted drought so that, to the degree possible, sagebrush habitat continues to meet sage-grouse habitat objectives. During drought periods, prioritize evaluating effects of the drought in sage-grouse habitat areas relative to their biological needs, as well as drought effects on ungrazed reference areas. Since there is a lag in vegetation recovery following drought (Thurow and Taylor 1999; Cagney et al. 2010), ensure that post-drought management allows for vegetation recovery that meets sage-grouse needs in sage-grouse habitat areas based on sage-grouse habitat objectives.
- Ensure that vegetation treatments create landscape patterns which most benefit sage-grouse. Only allow treatments that are demonstrated to benefit sage-grouse and retain sagebrush height and cover consistent with sage-grouse habitat objectives (this includes treatments that benefit livestock as part of an Allotment Management Plan [AMP]/Conservation Plan to improve sage-grouse habitat).

- Evaluate existing structural range developments and location of supplements (salt or protein blocks) to document that they conserve, enhance or restore sage-grouse habitat.
- Include sage-grouse habitat objectives in habitat restoration projects. Make meeting these objectives within occupied sage-grouse habitat the highest restoration priority.
- Design post restoration management to ensure long term Greater Sage-Grouse persistence. This could include changes in livestock grazing management and travel management, etc., to achieve and maintain the desired condition of the restoration effort that benefits sage-grouse (Eiswerth and Shonkwiler 2006).
- Avoid sagebrush reduction/treatments to increase livestock or big game forage in occupied habitat and include plans to restore high-quality habitat in areas with invasive species.
- In sage-grouse habitat, ensure that soil cover and native herbaceous plants are at their Ecological Site Description (ESD) potential to help protect against invasive plants.
- Consider potential changes in climate (Miller et al. 2011) when proposing post-fire seedings using native plants. Consider seed collections from the warmer component within a species' current range for selection of native seed (Kramer and Havens 2009).
- Establish and strengthen networks with seed growers to assure availability of native seed for restoration projects.
- Post fire recovery will include establishing adequately sized exclosures (free of livestock grazing) that can be used to assess recovery.
- Where burned sage-grouse habitat cannot be fenced from other unburned habitat, the entire area (e.g., allotment/pasture) should be closed to grazing until recovered.
- Mowing of grass will be used in any fuelbreak fuels reduction project (roadsides or other areas).

Vegetation Management

- Composition, function, and structure of native vegetation communities will meet ESD and will provide for healthy, resilient, and recovering sage-grouse habitat components.
- Avoid sagebrush reduction/treatments to increase livestock or big game forage in occupied habitat and include plans to restore high-quality habitat in areas with invasive species.
- Include sage-grouse habitat parameters as defined by Connelly et al. (2000), Hagen et al. (2007), or if available State Sage-Grouse Conservation Plans and appropriate local information in habitat restoration objectives. Make meeting these objectives within priority sage-grouse habitat areas the highest restoration preference.
- Design post restoration management to ensure long term persistence. This could include changes to livestock grazing management and travel management, etc., to achieve and maintain the desired condition of the restoration effort that benefits sage-grouse (Eiswerth and Shonkwiler 2006).
- Consider potential changes in climate (Miller et al. 2011) when proposing restoration seedings using native plants. Consider collection from warmer component of the species current range when selecting native species (Kramer and Havens 2009).

Invasive Species and Pest Management

- In sage-grouse habitat, ensure that soil cover and native herbaceous plants are at their ESD potential to help protect against invasive plants.

Travel and Transportation Management

- Limit route construction to realignments of existing designated routes if that realignment has a minimal impact on sage-grouse habitat, eliminates the need to construct a new road, or is necessary for motorist safety. Mitigate any impacts with methods that have been demonstrated to be effective to offset the loss of sage-grouse habitat.

- Use existing roads, or realignments to access valid existing rights. If valid existing rights cannot be accessed via existing roads, then, following the lek prohibitions, build any new road constructed to the absolute minimum standard necessary, and add the surface disturbance to the total disturbance. If the disturbance cap is exceeded, then make additional, mitigation that has been demonstrated to be effective to offset the resulting loss of sage-grouse habitat.
- During subsequent travel management planning, all routes within Priority Habitat would undergo a route evaluation to determine its purpose and need and the potential resource and/or user conflicts from motorized travel. Where resource and/or user conflicts outweigh the purpose and need for the route, the route would be considered for closure or considered for relocation outside of sensitive Greater Sage-Grouse habitat.
- During implementation-level travel planning, threats to Greater Sage-Grouse and their habitat would be considered when evaluating route designations and/or closures.
- During subsequent travel management planning, routes within Priority Habitat that do not have a purpose or need would be considered for closure.
- During subsequent travel management planning, routes within Priority Habitat that are duplicative, parallel, or redundant would be considered for closure.
- During subsequent travel management planning, off-highway vehicle (OHV) timing limitations would be considered in important seasonal habitats where OHV use is a threat.
- During subsequent travel management planning, consider limiting snow machine travel to designated routes or consider seasonal closures in Greater Sage-Grouse wintering areas.
- During subsequent travel management planning, routes in Priority Habitat not required for public access or recreation with a current administrative/agency purpose or need would be evaluated for administrative access only.
- During subsequent travel management planning, prioritize restoration of routes not designated in a Travel Management Plan within Priority Habitat.
- During subsequent travel management planning, consider using seed mixes or transplant techniques that will maintain or enhance Greater Sage-Grouse habitat when rehabilitating linear disturbances.
- During subsequent travel management planning, consider scheduling road maintenance to avoid disturbance during sensitive periods and times to the extent practicable. Use time of day limits to reduce impacts on Greater Sage-Grouse during breeding and nesting periods.

Livestock Grazing Management

- Reduce grazing in advance of predicted drought so that, to the degree possible, sagebrush habitat continues to meet sage-grouse habitat objectives. During drought periods, prioritize evaluating effects of the drought in sage-grouse habitat areas relative to their biological needs, as well as drought effects on ungrazed reference areas. Since there is a lag in vegetation recovery following drought (Thurow and Taylor 1999), ensure that post-drought management allows for vegetation recovery that meets sage-grouse needs in sage-grouse habitat areas based on sage-grouse habitat objectives.
- Avoid grazing and trailing within lekking, nesting, brood-rearing, and winter habitats during periods of the year when these habitats are utilized by sage-grouse.
- Any vegetation treatment plan must include pretreatment data on wildlife and habitat condition, establish non-grazing exclosures, and include long-term monitoring where treated areas are monitored for at least three years before grazing returns. Continue monitoring for five years after livestock are returned to the area, and compare to treated, ungrazed exclosures, as well as untreated areas.

- Implement management actions (grazing decisions, AMP/Conservation Plan development, or other agreements) to modify grazing management to meet seasonal sage-grouse habitat requirements (Connelly et al. 2011). Consider singly, or in combination, changes in:
 1. Season or timing of use;
 2. Number of livestock (includes temporary non-use or livestock removal);
 3. Distribution of livestock use;
 4. Intensity of use; and
 5. Type of livestock (e.g., cattle, sheep, horses, llamas, yaks, alpacas and goats) (Briske et al. 2011).
- During drought periods, prioritize evaluating effects of the drought in priority sage-grouse habitat areas relative to their needs for food and cover. Since there is a lag in vegetation recovery following drought (Thurrow and Taylor 1999; Cagney et al. 2010), ensure that post-drought management allows for vegetation recovery that meets sage-grouse needs in priority sage-grouse habitats.
- Reduce hot season grazing on riparian and meadow complexes to promote recovery or maintenance of appropriate vegetation and water quality. Utilize fencing/herding techniques or seasonal use or livestock distribution changes to reduce pressure on riparian or wet meadow vegetation used by sage-grouse in the hot season (summer) (Aldridge and Brigham 2002; Crawford et al. 2004; Hagen et al. 2007).
- In priority habitat, only allow treatments that conserve, enhance or restore sage-grouse habitat (this includes treatments that benefit livestock as part of an AMP/Conservation Plan to improve sage-grouse habitat).
- Prioritize completion of land health assessments and evaluations and processing grazing permits within priority sage-grouse habitat areas. Focus this process on allotments that have the best opportunities for conserving, enhancing or restoring habitat for sage-grouse. Utilize sage-grouse habitat objectives to conduct land health assessments to determine if standards of rangeland health are being met.
- Design any new structural range improvements to conserve, enhance, or restore sage-grouse habitat through an improved grazing management system relative to sage-grouse objectives. Structural range improvements, in this context, include but are not limited to: cattleguards, fences, enclosures, corrals or other livestock handling structures; pipelines, troughs, storage tanks (including moveable tanks used in livestock water hauling), windmills, ponds/reservoirs, solar panels and spring developments.
- Evaluate the role of existing seedings that are currently composed of primarily introduced perennial grasses in and adjacent to sage-grouse habitat to determine if they should be restored to sagebrush or habitat of higher quality for sage-grouse. If these seedings provide value in conserving or enhancing sage-grouse habitats, then no restoration would be necessary. Assess the compatibility of these seedings for sage-grouse habitat during the land health assessments.
- Evaluate existing structural range improvements and location of supplements (salt or protein blocks) to make sure they conserve, enhance or restore sage-grouse habitat.
- Design all range projects in a manner that minimizes potential for invasive species establishment. Monitor for, and treat invasive species associated with existing range developments (Gelbard and Belnap 2003; Bergquist et al. 2007).
- When developing or modifying water developments, use applicable BMPs to mitigate potential impacts from WNV (Clark et al. 2006; Doherty 2007; Walker et al. 2007; Walker and Naugle 2011).
- Restore seedings of introduced perennial grass to sagebrush habitat where feasible, unless the seedings offer a specific purpose related to achievement of sage-grouse habitat objective.

An example of a related purpose would be a seeded pasture that supports a grazing strategy beneficial to sagebrush habitat in associated pastures.

Sage-Grouse in Fire Operations and Fuels Management (BLM IM 2013-128) (BLM 2013b)

Washington Office (WO) IM 2013-128 supersedes WO IM 2011-138 (June 13, 2011) and Fire and Aviation IM 2012-017 (May 14, 2012).

Fire Operations

1. Compile district-level information into statewide sage-grouse tool boxes. Tool boxes will contain maps, listing of READs, contact information, local guidance, and other relevant information for each district, which will be aggregated into a statewide document.
2. Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics.
3. Assign a READ with sage-grouse expertise, or who has access to sage-grouse expertise, to all extended attack fires in or near sage-grouse habitat areas. Prior to the fire season, provide training to sage-grouse READs on wildfire suppression organization, objectives, tactics, and procedures to develop a cadre of qualified individuals.
4. On critical fire weather days, pre-position additional fire suppression resources to optimize a quick and efficient response in sage-grouse habitat areas.
5. As appropriate, utilize existing fuel breaks, such as roads or discrete changes in fuel type, as control lines in order to minimize fire spread.
6. During periods of multiple fires, ensure line officers are involved in setting priorities.
7. To the extent possible, locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, heli-bases, etc.) in areas where physical disturbance to sage-grouse habitat can be minimized. These include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover.
8. Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and all-terrain vehicles prior to deploying in or near sage-grouse habitat areas to minimize noxious weed spread.
9. Minimize unnecessary cross-country vehicle travel during fire operations in sage-grouse habitat.
10. Minimize burnout operations in key sage-grouse habitat areas by constructing direct fireline whenever safe and practical to do so.
11. Utilize retardant, mechanized equipment, and other available resources to minimize burned acreage during initial attack.
12. As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.
13. Adequately document fire operation activities in sage-grouse habitat for potential follow-up coordination activities.

Fuels Management

1. Where applicable, design fuels treatment objectives to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patterns which most benefit sage-grouse habitat.
2. Provide training to fuels treatment personnel on sage-grouse biology, habitat requirements, and identification of areas utilized locally.

3. Use burning prescriptions which minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of annual grass invasion).
4. Ensure proposed sagebrush treatments are planned with full interdisciplinary input pursuant to NEPA and coordination with state fish and wildlife agencies, and that treatment acreage is conservative in the context of surrounding sage-grouse seasonal habitats and landscape.
5. Where appropriate, ensure that treatments are configured in a manner that promotes use by sage-grouse.
6. Where applicable, incorporate roads and natural fuel breaks into fuel break design.
7. Power-wash all vehicles and equipment involved in fuels management activities, prior to entering the area, to minimize the introduction of undesirable and/or invasive plant species.
8. Design vegetation treatments in areas of high fire frequency which facilitate firefighter safety, reduce the potential acres burned, and reduce the fire risk to sage-grouse habitat. Additionally, develop maps for sage-grouse habitat which spatially display current fuels treatment opportunities for suppression resources.
9. Give priority for implementing specific sage-grouse habitat restoration projects in annual grasslands, first to sites which are adjacent to or surrounded by preliminary priority habitat or that reestablish continuity between priority habitats. Annual grasslands are a second priority for restoration when the sites are not adjacent to preliminary priority habitat, but within two miles of preliminary priority habitat. The third priority for annual grassland habitat restoration projects are sites beyond two miles of preliminary priority habitat. The intent is to focus restoration outward from existing, intact habitat.
10. As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs or one of that referenced in land use planning documentation.
11. Emphasize the use of native plant species, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.
12. Remove standing and encroaching trees within at least 100 meters of occupied sage-grouse leks and other habitats (e.g., nesting, wintering and brood-rearing) to reduce the availability of perch sites for avian predators, as resources permit.
13. Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.
14. Reduce the risk of vehicle- or human-caused wildfires and the spread of invasive species by planting perennial vegetation (e.g., green-strips) paralleling road ROWs.
15. Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, etc.) to aid in controlling wildfire, should wildfire occur near preliminary priority habitat or important restoration areas (such as where investments in restoration have already been made).

Local Unit Fire Program

Many local units with sage-grouse habitats have established protocols that address sage-grouse and fire suppression activities. Examples of these protocols are:

Preseason:

- Ensuring that land use plans, RMPs, and fire management plans are current and include guidance for management of sage-grouse and sage-grouse habitat.

- Conducting informational meetings and workshops with federal, state, and local cooperators to share sage-grouse information such as location of habitats, BMPs for suppression activities in habitat areas, rehabilitation priorities in habitat areas, etc.
- Ensure BLM Multi-Area Coordination representatives at all levels (local, geographic, and national) understand sage-grouse issues and that it is a high agency priority.

Initial Attack:

- Ensuring that interagency fire managers update pre-planned responses within the dispatch zone to align the initial attack response with protection priorities and resource values.
- Encouraging dispatch centers to utilize Geographic Information System (GIS) maps in Wildland Fire Computer Aided Dispatch System to determine if new starts are within sage-grouse habitat or in close proximity to other identified values or assets, and relay that information to responders.
- Briefing all local initial attack crews on awareness of sage-grouse habitat during response and suppression, and ensuring they review and are familiar with BMPs.
- Ensuring out-of-area resources (severity crews, overhead, etc.) receive a full briefing, which includes (among other things) awareness of sage-grouse habitat during response and suppression, and ensuring they review and are familiar with the sage-grouse suppression BMPs.

Extended Attack:

- Ensuring field or district officers and READs are present to brief incoming incident management teams, which may be unfamiliar with sage-grouse issues.
- Ensuring READs are assigned to fires in the zone whenever fire suppression activities may affect resource values, including sage-grouse habitat.
- Ensuring READs are assigned to incidents as early as possible.
- Ensuring READs participate in annual READ workshops which address (among other things) sage-grouse concerns and BMPs.
- Ensuring READs have access to pre-built kits which include: hard copy and electronic resource information, GIS sage-grouse habitat data, fire suppression BMPs for sage-grouse, and rehabilitation guidelines.
- Ensuring sage-grouse issues are addressed throughout the Wildland Fire Decision Support System process (particularly in decision documents), and specified in delegations of authority to Incident Management Teams and Incident Commanders.
- Ensuring READs are assigned to large incidents managed by an incident management team for the duration of the incident. Ensure that, per delegations of authority, READs are included in planning meetings, firefighter briefings, and provide input to the Incident Action Plan.

Post Incident:

- Ensuring READs complete a READ Report upon demobilization of an incident. This report should summarize suppression actions, suppression damage, and damage caused by the fire itself. The READ Report should provide preliminary recommendations for stabilization, rehabilitation, and restoration and vetted by the Emergency Stabilization Rehabilitation Interdisciplinary Team prior to preparation of the Emergency Stabilization Rehabilitation Plan. This preliminary assessment (READ Report) and subsequent Emergency Stabilization Rehabilitation Plan should include impacts to sage-grouse habitat and recommendations for mitigation.

BLM National Sage-Grouse Habitat Conservation Strategy (BLM 2004)

- Develop cooperative agreements with other land owners to maintain sagebrush patches within developed lands (housing developments, croplands, business developments etc.). Avoid the impact of construction and operations by not placing mines, oil and gas and geothermal drilling sites and facilities, roads, and mineral material disposal sites in or next to sensitive habitats such as Greater Sage-Grouse leks, nesting, early brood-rearing, breeding, and wintering habitat. When habitat loss cannot be avoided, stipulations, COAs, or mitigating measures should be developed to reduce impacts on Greater Sage-Grouse habitats.
- Whenever feasible and environmentally preferred, avoid surface occupancy by roads, livestock management facilities, well pads, powerlines, fences, or other structures adjacent to occupied leks. Signage, including OHV designations, identifying and/or protecting sensitive areas should be considered. Dust abatement measures should be employed.
- Locate or construct facilities such as oil and gas compressor stations so that the noise from the station does not disturb grouse activities at the lek. Installing mufflers and baffle panels, berm the station (where invasive weeds are not an issue), or placing restrictions on how close these facilities can be located to leks, nesting and early brood-rearing habitat should be considered. New recreational facilities such as campgrounds should also be located so that the noise does not disturb grouse activities at the lek. Construction and/or maintenance should be scheduled to minimize conflicts with any known leks. Greater Sage-Grouse are sensitive to noise levels from all activities during early evening and morning hours when strutting occurs during March and April, so actions to reduce noise levels during these periods should be taken.
- Reduce habitat loss associated with mineral exploration and development by consolidating facilities as much as possible. The possibility of burying utility and flow lines beneath or along roads, centralizing tank batteries, and drilling multiple wells from a single location should be considered.
- Design and construct mineral exploration and development operations so as to disturb the smallest footprint practical on the landscape while meeting all safety requirements. Where feasible, consider mowing of parking and storage areas on portions of oil and gas well drilling locations rather than stripping the topsoil and vegetation from the entire location, and the use of two-track trails to conduct exploration activities. Minimize traffic by limiting public vehicular access in new development areas, use remote monitoring of production facilities, encourage car-pooling and the use of buses, and encourage operator-enforced speed limits to reduce dust, noise, and potential collisions with Greater Sage-Grouse so as to reduce habitat impacts. Consider using stakeless geophysical exploration activities to reduce vehicle traffic in sagebrush habitat.
- Plan and construct mining and mineral development activities, to the degree possible given State water rights, to minimize disturbances that would result in alterations to springs and riparian habitat. Greater Sage-Grouse can be impacted by the loss of surface water. Alternative water sources should be developed to replace natural sources that have been negatively affected or destroyed during these development activities. Water storage impoundments should be designed to avoid or minimize loss or degradation of Greater Sage-Grouse habitat. Water storage impoundments should be monitored and treated to prevent mosquito breeding (and the associated spread of WNV). Evaporation, reserve, work over, and production pits should also be designed with adequate fencing/netting or other protective features to reduce mortality of Greater Sage-Grouse due to drowning or entrapment.
- Carefully consider impacts to Greater Sage-Grouse and their habitats when reviewing requests for exceptions, waivers, or modifications to lease stipulations or evaluating requests for waivers of COAs.

- Evaluate land exchanges, acquisitions and disposals to determine if important Greater Sage-Grouse habitat would be impacted or whether the BLM would be acquiring important Greater Sage-Grouse habitat.
- Evaluate proposed agricultural leases, range improvements, special recreation or land use permits, and habitat improvement projects to determine if Greater Sage-Grouse and their habitats would be impacted.
- Conduct fire management activities to minimize overall wildfire size and frequency in sagebrush plant communities where Greater Sage-Grouse habitat objectives will not be met if a fire occurs. Wildfire suppression in sagebrush habitat with an understory of invasive, annual species is crucial. Prioritization of suppression actions should take into account the value and rarity of sagebrush habitat and Greater Sage-Grouse. Retain unburned areas, including interior islands and patches, of sagebrush unless there are compelling safety, private property, resource protection, or control objectives at risk. Burnout operations in areas where there are no threats to human life, private property or other important resources identified in land management plans should be minimized in crucial Greater Sage-Grouse habitats as identified in land and fire management plans.
- Annually update Fire Management Plans to incorporate new sagebrush habitat information as well as fire suppression priorities in sagebrush habitats. Objectives for the management of sagebrush ecosystems should be incorporated into Fire Management Plans and provided to initial attack personnel at the beginning of each fire season.
- Provide Fire Management Plans to the Incident Management Team. The Field Office should provide READs to assist the Incident Commander or Incident Management Teams in developing timely fire suppression priorities in crucial Greater Sage-Grouse habitat.
- Evaluate impacts on Greater Sage-Grouse habitat in areas where wildland fire use for resource benefits may be implemented. Also consider the interval since last fire, fire size and past plant community response to burning during this process.
- Establish fuels treatment projects at strategic locations to minimize size of wildfires and limit further loss of sagebrush. Fuels treatment may include the use of green-strips (strips of fire resistant vegetation) to help reduce the spread of wildfires into sagebrush communities.
- Use prescriptive livestock grazing, where appropriate, to reduce annual grass production and the spread of wildfire into sagebrush communities. Timing of grazing and effects on residual native plants need to be carefully evaluated.
- Consider removal of conifers (e.g., cutting, burning, chaining, etc.) where they have encroached upon Greater Sage-Grouse habitat. Areas of dense conifers (pinyon pine, juniper, ponderosa pine, Douglas-fir) may require cutting or chaining to reestablish sagebrush plant communities (prescribed fire may not be feasible given the lack of understory and high woody fuel loads). Sites selected for cutting or chaining should have conifers that have established after the early to mid-1800s. Sites should also have evidence of past sagebrush plant communities as evidenced by residual native plants or soils that support a rangeland not a woodland ecological site. Cutting and chaining may occur as a single treatment or a preparatory treatment for prescribed burning. Post-treatment seeding will probably be required in areas where residual, herbaceous vegetation is inadequate to recover once the conifer competition is removed.
- Steps such as recontouring, respreading topsoil, revegetating all disturbed areas not needed for well or mine production, including cuts, fills, borrow ditches, and well pads up to the production facilities are suggested. Additionally, allowing room for the setup of work over rigs, and allowing future setup and parking on the top of new vegetation will minimize the need for future disturbances. The use of native species of shrubs, forbs, and grasses in seed mixes appropriate for each ecological site will also enhance habitat value or Greater Sage-Grouse.

- Evaluate (e.g., monitor) burned areas for up to three years post-fire and continue management restrictions until the recovering or seeded plant community reflects the desired condition.
- Reclaim unnecessary or redundant roads and facilities by removing surfacing material, reestablishing the original contour, spreading topsoil, and seeding to restore habitat.
- Utilize the ES&R program to apply appropriate post-wildfire treatments (livestock and/or recreation exclusion, reseeding, erosion control structures, etc.) within Greater Sage-Grouse habitat. Use of native species is encouraged dependent on cost, availability and chance for success. Seed mixtures should be designed to reestablish important seasonal habitat components for Greater Sage-Grouse.
- Install anti-perching devices on existing or new powerlines in occupied Greater Sage-Grouse habitat, or habitat identified for restoration, to minimize raptor use of these poles.
- Encourage placement of new utility developments (powerlines, pipelines, etc.) and transportation routes in existing utility or transportation corridors to minimize fragmentation of Greater Sage-Grouse habitat. If corridors do not exist, consider consolidating utility lines, pipelines, and other structures along the same new route (e.g., at one location) that least impacts sagebrush habitat.
- Place new roads where construction activity and use is concentrated and does not impact critical areas such as leks, nesting, early brood-rearing, winter habitat, riparian areas, springs and wetlands.
- Manage existing road use to decrease the level of disturbance during critical periods such as breeding (lek use) by implementing seasonal or daily use schedules, by limiting traffic volume, and/or by posting speed limits.
- Locate new structures associated with recreation (picnic areas, campgrounds, wildlife viewing sites, dispersed recreation sites, kiosks and parking lots) and livestock management facilities (corrals, water pipelines and tanks/troughs, exclosures, etc.) away from crucial breeding, brood-rearing and winter areas; or manage disturbance with seasonal or daily timing restrictions. Construction of recreational-related facilities (kiosks, toilets, signs, etc.) that provide avian perches should be avoided unless they include mitigating features such as perch guards. Manage use at established structures/developments to reduce impacts to Greater Sage-Grouse during critical periods of their life cycle.
- Design and locate the placement of fences for livestock, wildlife, recreation and developed site protection so as not to disturb important Greater Sage-Grouse habitat areas. Impacts of livestock congregation against fences and its effect on Greater Sage-Grouse habitat near leks, nesting, and wintering areas should be considered.
- Design wind energy facilities to reduce habitat fragmentation and mortality to Greater Sage-Grouse. Tubular tower designs to reduce raptor perches and noise reduction to minimize disturbance to nesting birds are encouraged. Design criteria for these projects should include minimizing the facility footprint (including the road network required to service the generators) in Greater Sage-Grouse habitat. BMPs for wind energy are currently being developed in the Wind Energy Programmatic EIS. The BMPs that address the conservation of Greater Sage-Grouse and their habitat are adopted by reference.
- Manage dispersed recreation activities like hiking, mountain biking, and horseback riding to minimize impacts to vegetation and Greater Sage-Grouse in sensitive Greater Sage-Grouse habitat areas. Keeping these users on established trails will minimize impacts to Greater Sage-Grouse habitat and activities.
- Consider seasonal closures to protect priority Greater Sage-Grouse habitat if other alternatives will not achieve desired objectives.
- Reclaim unused roads and facilities by reseeding sagebrush, shrubs, and native grasses and forbs to help improve Greater Sage-Grouse habitat and reduce weed invasion.

- Encourage vegetative restoration along roads, ROWs, on well pads, and at existing facilities where habitat needs for Greater Sage-Grouse are not currently met.
- Require successful seeding of appropriate vegetation on any new disturbance associated with mineral and energy facility developments, livestock management facilities, and recreation facilities.
- Restore small areas dominated by invasive species with desirable vegetation to minimize fragmentation of habitat.
- Where good habitat quality exists, maintain current management practices considering plant composition and soil type.
- Use grazing practices that promote the growth and persistence of native shrubs, grasses and forbs needed by Greater Sage-Grouse for seasonal food and concealment. Vegetation structure (height) should be managed so as to provide adequate cover for Greater Sage-Grouse during the nesting period.
- Change mineral supplement and/or watering locations to move domestic livestock to desired areas. However, any change in location of supplement or watering location should consider potential effects to Greater Sage-Grouse habitat.
- Coordinate with state wildlife agencies where wildlife use detrimentally affects Greater Sage-Grouse habitat quality.
- Construct and maintain water developments at key locations in Greater Sage-Grouse habitat. Install or retrofit water developments with wildlife escape ramps.
- Maintain seeps, springs, wet meadows, and riparian vegetation in a functional and diverse condition for young Greater Sage-Grouse and other species that depend on forbs and insects associated with these areas. Consider fencing if vegetation associated with these wet areas cannot be maintained with current livestock or wildlife use and the impacts of the fence are outweighed by the improved habitat quality.
- Maintain sagebrush and understory diversity (relative to site potential) adjacent to crucial seasonal Greater Sage-Grouse habitats unless such removal is necessary to achieve Greater Sage-Grouse habitat management objectives.
- Encourage the use of insecticide baits and natural pathogens instead of broad-spectrum insecticides where insect control is required. Improper use of pesticides to control insect outbreaks can result in a reduction of food resources for Greater Sage-Grouse, particularly nesting females and chicks. While the Animal and Plant Inspection Service is responsible for controlling these insects on public lands, the BLM should recommend avoidance areas as well as the type of treatment. Target pest control toward key problem areas, and schedule applications to be effective in minimum doses. Broadcast spraying should generally be avoided in favor of ground applications to minimize drift into non-target areas. Avoid applying pesticides to Greater Sage-Grouse breeding habitat during the brood-rearing season (mid-May through mid-July) to reduce the loss of food supply to chicks and avoid the chance of secondary poisoning.
- Grazing use should be adjusted during extended drought periods. Consider transitioning back to pre-drought use when drought conditions have ended.
- Reduce the density of conifers that have encroached into but do not yet dominate sagebrush plant communities. Site selection should be based on proximity to occupied habitat, site potential, herbaceous invasive species, or other factors that affect the potential for sagebrush plant communities to be reestablished.
- Where other grazing management options are not achieving, or cannot achieve, the desired objectives, a short-term option may be livestock exclusion.
- Restore lost riparian and wetland plant species diversity and structure by replanting appropriate species near crucial Greater Sage-Grouse habitat.

- Treatments should be designed to improve a deficient condition within the community (e.g., poor cover of herbaceous understory).
- Reintroduction of appropriate fire regimes will help to limit conifer encroachment into the sagebrush plant communities. Prioritization of areas to be burned or mechanically treated should take into account invasive herbaceous species, fire regime, and condition class (measure of departure from historic fire regime). A balance should be achieved between treating areas that have significantly departed from historic fire regime (condition class 3) and areas that are functioning within an appropriate fire regime (condition class 1).
- Seeding may be required in areas where residual perennial vegetation is insufficient to respond following prescribed burning. Minimize seeding with non-native species that may create a continuous perennial grass cover and restrict reestablishment of native vegetation. However, non-native seed may be appropriate on severely degraded sites if native species would not be successful or are not available.
- Evaluate all wildfires in known Greater Sage-Grouse habitat to ensure that the appropriate plant species are reseeded relative to site potential and seasonal Greater Sage-Grouse habitat requirements. Emphasize the use of native species in these seed mixtures and minimize the use of introduced grasses. Make burned Greater Sage-Grouse habitats a high priority for restoration if funds are limited in the ES&R Program. If native plant seed is scarce, assign a priority that this seed be reallocated to ES&R projects in critical Greater Sage-Grouse habitat areas. Seeding of non-native species may be necessary in areas where invasive plants dominate or have the potential to dominate the post-fire plant community.
- BMPs for this species identified in *Grazing Influence, Objective Development, and Management in Wyoming's Greater Sage-Grouse Habitat as Grazing Management Recommendations* include the following:
 - Avoid any new sources of disturbance such as range improvements on leks sites. Identify the location of leks through consultation with local biologists to provide appropriate emphasis.
 - Maintain the Sagebrush/Bunchgrass Plant Community wherever currently present. Manage for high vigor in all plant communities. Avoid repeatedly using cool-season bunchgrass in the critical growing season and limit utilization to moderate levels to assure that the previous year's standing crop is available for hiding cover.
 - Avoid repeatedly grazing riparian areas in seasons when temperatures are high.
 - Avoid levels of browsing on sagebrush that would limit Greater Sage-Grouse access to their food supply and cover. Additionally, avoid heavy use of herbaceous standing crop as this will adversely affect hiding cover the following spring.
 - Carefully consider changes in management that would increase utilization or change the timing of grazing on bunchgrass community sites.
 - Avoid confining animals on inadequate pasture or supplemental feeding to compensate for a lack of natural forage.
 - Restrict grazing in conjunction with restoration efforts until the site is ready to sustain grazing.

Northeast Wyoming Sage-Grouse Conservation Plan (NWSGLWG 2006)

- **Road Building Maintenance and Usage**
 1. Work cooperatively with all involved permittees, lease holders or field operators, and affected landowners, develop a road use and travel plan for areas within 3 miles (5 kilometers) of sage-grouse leks (Connelly et al. 2000).
 2. Coordinate planning among all companies operating in the same field and strongly encourage everyone involved to follow the same road use plan.

3. Map all existing and proposed roads for areas to be developed, and consolidate activities using existing roads and other facilities where possible.
 4. Minimize the number of vehicles per visit, and the number of roads used within the area.
 5. Encourage remote monitoring of production sites to minimize road use and reduce harassment of birds during critical seasons (breeding, nesting, brood-rearing, and winter).
 6. Allow traffic at most, only every other day, less frequently if possible.
 7. Limit traffic on all roads to three, one-hour travel periods per day spaced at least two hours apart.
 8. Establish acceptable stopping points and “drive through only” areas.
 9. Sign roads as appropriate to prevent off-road travel and to inform all users of the roads of acceptable use times and approved stopping areas.
 10. As appropriate, gate and close all newly constructed (project related) roads to public travel.
 11. Consider using pipelines to bring product to a central facility to reduce needed number of roads and traffic.
 12. Minimize visual/auditory impacts where practicable (e.g., place roads below ridgelines or along topographic features).
 13. Place roads outside of riparian areas where possible.
 14. If avoidance is not possible, minimize impacts to riparian, wetland, or wet meadow habitats to limit impacts to brood-rearing areas. (exploration, drilling, production and operations).
 15. Avoid placement of well pads, roads and other well field facilities on mapped winter habitats, or within a 1/8-mile (200 meter) buffer surrounding winter habitat.
 16. Encourage road rehabilitation or realignment to minimize impacts to sage-grouse.
 17. Select sites for construction that will not disturb suitable nest cover or brood-rearing habitats within 3 miles (5 kilometer) of occupied leks, or within identified nesting and brood-rearing habitats outside the 3-mile (5 kilometer) perimeter (Connelly et al. 2000).
 18. Utilize minimum construction and maintenance standards appropriate for the operation.
 19. Establish acceptable times for road construction and maintenance that will minimize disturbance during critical seasonal use periods.
 20. Reclaim roads that are only needed periodically, and allow operators to drive over reclaimed roads when needed.
- **Powerline Construction and Maintenance**
 1. Working cooperatively with all involved permittees, lease holders or field operators to develop a master powerline plan for all areas within 3 miles (5 kilometer) (Connelly et al. 2000) of sage-grouse leks and on other identified sage-grouse habitats.
 2. Where feasible, bury new powerlines.
 3. Map all existing and proposed powerlines for the area, consolidating new powerlines into existing disturbance corridors.
 4. Coordinate planning and powerline needs among companies operating in the same field.
 5. Include powerline access roads in the road use and travel plan to include power companies in appropriate use times.
 6. Select sites for construction that will not disturb suitable nest cover and brood-rearing habitats within 3 miles (Connelly et al. 2000) of a lek.
 7. Select sites for construction that will not disturb wintering habitat.
 8. Locate any above-ground powerlines off of ridges and out of riparian areas (1,000 feet (300 meters) riparian buffer where feasible).
 9. Direct powerline construction (above or underground) to areas of existing disturbance corridors (i.e., existing roads, railroads, powerlines, etc.).
 10. Recommend the lowest voltage powerline needed for the project while considering future needs.

11. Reduce existing above ground powerlines by burying them as opportunities (such as rebuilds) arise.
 - a. If burying powerlines cannot be accomplished, install perch guards to prevent raptor use.
 - b. Recommend onsite power generation to minimize overhead powerlines.
 - c. Visibility markers should be included on above ground lines in high avian use areas such as across drainages, water bodies, prairie dog colonies, etc.

- **General Mineral Development**

1. Evaluate and address the needs of sage-grouse when placing well sites, mines, pits and infrastructure. Develop a plan for roads, pipelines, etc. to minimize impacts to sage-grouse.
2. Consider developing travel management plans that would allow seasonal closure of roads for all but permitted uses (i.e., recreation and hunting) and encourage the reclamation of unnecessary or redundant roads.
3. Where mineral development occurs in sage-grouse habitat, tailor reclamation to restore, replace or augment needed habitat types.
4. Where necessary to build or maintain fences, evaluate whether increased visibility, alternate location, or different fence design will reduce hazards to flying grouse.
5. Avoid construction of overhead lines and other perch sites in occupied sage-grouse habitat. Where these structures must be built, or presently exist, bury the lines, locate along existing utility corridors or modify the structures to prevent perching raptors, where possible.
6. Reduce noise from industrial development or traffic, especially in breeding and brood-rearing habitats.
7. Manage water production to enhance or maintain sage-grouse habitat.
8. Avoid surface and sub-surface water depletion that impacts sage-grouse habitats.
9. Consider an exception or waiver of seasonal stipulations if technologies that significantly reduce surface disturbance are used.
10. Control dust from roads and other surface disturbances within the population's seasonal habitats.
11. Continue research efforts to determine the effects of mineral development on sage-grouse populations.
12. Consider offsite mitigation as an alternative mitigation for mineral development impacts on known sage-grouse habitat. Work with mineral entities to develop and implement acceptable offsite mitigative measures for enhancing sage-grouse or habitat, as needed, to offset impacts of surface-disturbing activities.

- **Oil and Gas Development and Sand and Gravel Mining**

1. As a general rule, do not drill or permit new or expand existing sand and gravel activities within 3 miles (5 kilometer) (Connelly et al. 2000) of active leks between March 1st and July 15th. As seasonal habitat mapping efforts are completed, re-direct efforts towards protecting nesting habitat. (Dates and distances of agency proposed action will be used.)
2. Avoid surface disturbance or occupancy on or within 0.25 mile of known active lek sites. (Distances of agency proposed action will be used.)
3. Evaluate well spacing and location requirements under Wyoming Oil and Gas Conservation Commission jurisdiction in light of sage-grouse habitat needs and consider spacing exceptions that protect habitat. The limitations of obtaining spacing exceptions must be recognized.
4. To minimize disturbance during the breeding season, avoid human activity within 0.25 mile of occupied sage-grouse leks. (Dates and distances of agency proposed action will be used.)
5. Where technically and economically feasible, use directional drilling or multiple wells from the same pad.

6. Where facilities are developed within sage-grouse habitat, minimize potential use by predators (i.e., raptor proof power poles, eliminate crawlspaces under buildings).
7. Encourage the development of new technologies that would reduce total surface disturbance within occupied sage-grouse habitat (i.e., directional drilling, multiple wells from the same well pad and reinjection of produced water).
- **Vegetation Management**
 1. Develop priorities and implement habitat enhancements in areas currently occupied by sage-grouse.
 2. Develop priorities and implement habitat enhancements in historical or potential sage-grouse habitats.
 3. Develop and implement wildfire suppression guidelines that address sage-grouse habitat health and management.
 4. Remove juniper and other conifers where they have invaded sagebrush sites important to sage-grouse.
 5. Ensure vegetation treatments and post-treatment management actions are appropriate to the soil, climate, and landform of the area.
 6. Recognize that fire provides a natural diversity component in sagebrush habitats; manage fire on a landscape and patch scale at a local level.
 - a. Use prescribed fire to maintain, enhance or promote sagebrush ecosystem health by mimicking natural fire frequencies.
 - b. Where sage-grouse are present or desired, fire management objectives should recognize that fire generally burns the better sage-grouse nesting and severe winter habitat.
 - c. Evaluate all wildfires greater than 40 acres in occupied sage-grouse habitat to determine if rehabilitation of the burned area is needed with emphasis placed on habitats that would be susceptible to invasion by annual grasses.
 7. When rehabilitation is necessary, the first priority is protection of the soil resource. Use appropriate mixtures of sagebrush, native grasses, and forbs that permit burned areas to recover to a sagebrush-perennial grass habitat.
 8. Grazing management following sagebrush treatments or manipulations should be designed to benefit long-term sagebrush diversity and ecosystem health. Grazing management strategies should be designed to permit reestablishment of native sagebrush, grasses, and forbs that benefit sage-grouse.
 9. Experiments in habitat manipulation should be relatively small in comparison to a specific sage-grouse population.
 10. Determine threshold levels of habitat alteration that can occur without negatively impacting specific sage-grouse populations. As a general rule, treat no more than 20 percent of any seasonal habitat type until results are evaluated.
 11. Treat sagebrush in patches rather than contiguous blocks.
 12. Protect patches of sagebrush within burned areas from disturbance and manipulation.
 13. Consider all alternatives when designing sagebrush treatments.
 14. Additional treatments in adjacent areas should be deferred until the previously treated area again provides suitable sage-grouse habitat.
 15. Avoid removing sagebrush adjacent to sage-grouse foraging areas along riparian zones, meadows, lake beds and farmland unless such removal is necessary to achieve habitat management goals.
 16. Use mechanical or other appropriate treatments such as herbicides in areas with relatively high shrub cover (greater than 30%) and a poor herbaceous component in order to improve brood-rearing habitats.

17. Implement effective monitoring plans to determine the effectiveness of vegetation treatments.
 18. Develop and maintain cumulative records for all vegetation treatments to determine and evaluate site specific and cumulative impacts to sage-grouse habitats and identify recommended management practices for successful vegetation treatments.
- **Invasive Plants**
 1. Identify invasive plants of concern in sage-grouse habitats.
 2. Map areas where invasive plants of concern already exist.
 3. Implement strategies to assist in prevention of the spread of noxious weeds or invasive plants detrimental to sage-grouse.
 4. Prioritize and aggressively treat invasive plants in identified areas of concern.
 5. Employ appropriate site preparation techniques and timely reseeded with approved seed mixes of any disturbed areas to prevent encroachment of invasive plants.
 6. Maintain cumulative records for invasive plants treatment and prevention programs to evaluate site specific and cumulative impacts to sage-grouse habitats.
 - **Land Use**
 1. Encourage assimilation of sage-grouse information into plans as they are developed. Develop and distribute appropriate literature.
 2. Limit free-roaming dogs and cats.
 3. Maintain appropriate stocking rates of livestock.
 4. Encourage cluster development, road consolidation and common facilities that would have a reduced impact on sage-grouse.
 5. Where necessary to build or maintain fences, evaluate whether increased visibility, alternate location, or different fence design will reduce hazards to flying grouse.
 6. Maintain healthy sagebrush communities.
 7. Plan development to allow for sage-grouse movement.
 8. Where possible protect habitat through conservation (i.e., land exchanges, conservation easements, leases or Conservation Reservation Program type programs).
 9. Locate and manage facilities to eliminate predator impacts to sage-grouse.
 10. Provide education on the effects of development on sage-grouse habitat and populations. Facilitate conservation districts and extension agents' ability to educate the public about sage-grouse.
 11. Consider developing travel management plans that would allow seasonal closure and reclamation of roads.
 12. Reduce noise from industrial development or traffic especially in breeding and brood-rearing habitats.
 13. Avoid construction of overhead lines and other perch sites in occupied sage-grouse habitat. Where these structures must be built, or presently exist, bury the lines, locate along existing utility corridors or modify the structures in key areas (priority habitat).
 14. Control dust from roads and other surface disturbances.
 - **Parasites and Diseases**
 1. Investigate and record deaths that could be attributed to parasites or disease.
 2. Develop and implement strategies to deal with disease outbreaks where appropriate.
 3. Implement pond design standards to minimize mosquito breeding habitat.
 - a. Overbuild the size of ponds to accommodate a greater volume of water than is discharged. This will result in non-vegetated and muddy shorelines that breeding mosquitoes avoid.

- b. Build steep shorelines to reduce shallow water and aquatic vegetation around the perimeter of impoundments. Construction of steep shorelines also will increase wave action that deters mosquito production.
- c. Maintain the water level below that of rooted vegetation for a muddy shoreline that is unfavorable habitat for mosquito larvae. Rooted vegetation includes both aquatic and upland vegetative types. Always avoid flooding terrestrial vegetation in flat terrain or low lying areas.
- d. Construct dams or impoundments that restrict down slope seepage or overflow. Seepage and overflow results in down-grade accumulation of vegetated shallow water areas that support breeding mosquitoes.
- e. Line the channel where discharge water flows into the pond with crushed rock, or use a horizontal pipe to discharge inflow directly into existing open water, thus precluding shallow surface inflow and accumulation of sediment that promotes aquatic vegetation.
- f. Line the overflow spillway with crushed rock, and construct the spillway with steep sides to preclude the accumulation of shallow water and vegetation.
- g. Fence pond sites to restrict access by livestock and other wild ungulates that trample and disturb shorelines, enrich sediments with manure and create hoof print pockets of water that are attractive to breeding mosquitoes.

- **Predation**

Predation recommended management practices on public lands would only be implemented in coordination with U.S. Department of Agriculture (USDA) Wildlife Services.

1. Predator control may be warranted to maintain or enhance local sage-grouse populations when there is a demonstrated need such as a population is trending downward over a 3-year period; populations of "newcomer" predators are artificially high in sage-grouse habitat; specific sage-grouse populations need short-term help.
2. Develop and distribute educational materials regarding human practices that may allow establishment/expansion of predator populations. Examples of these activities include landfills and other garbage/waste disposal that may provide artificial food sources for a variety of predators, and buildings/structures that provide nesting/roosting habitat for ravens/raptors.
3. Avoid construction of overhead lines and other perch sites in occupied sage-grouse habitat. Where these structures must be built, or presently exist, bury the lines, locate along existing utility corridors or modify the structures in key areas.
4. Predator control to enhance sage-grouse survival should be targeted only predators identified as impacting that sage-grouse population.
5. Better quantify and qualify the role of predation on sage-grouse in Wyoming.
6. Discourage the establishment, and bring into balance artificially high populations of "newcomer" predators in sage-grouse habitat.
7. Monitor the effectiveness of any predator control efforts that are implemented.

- **Livestock Grazing Management**

1. In interactions between wildlife professionals, livestock producers and other interested parties, employ tolerance and understanding, and respect other perspectives. Focus on areas of mutual interest.
2. Evaluate effects of different grazing treatments on sage-grouse productivity, survival, and habitat use.
3. Actively educate stakeholders about grazing strategies that can be used to improve or maintain sage-grouse habitats. Cooperate to create and distribute a Wyoming guide to enhancing sage-grouse habitat.

4. In general, avoid yearlong and spring-to-fall continuous grazing schemes in sage-grouse habitat. Yearlong and spring-to-fall grazing may be a tool if it is not continued each year.
5. Where appropriate, implement livestock grazing systems that provide for areas and times of rest or deferment.
6. Where practicable, avoid heavy utilization of grazed pastures to compensate for rested pastures (a year of rest cannot compensate for a year of excessive use).
7. Design grazing systems that provide sage-grouse habitat in riparian areas and around water sources.
8. During periods of forage drought, utilize grazing schemes that reduce impacts to sage-grouse (e.g., adjust intensity, timing and/or duration of grazing).
9. Investigate the possibility of developing forage banks for use during periods of drought to alleviate inappropriate use by grazing animals on sage-grouse habitat.
10. Reduce disturbance to sage-grouse habitat from livestock management activities (e.g., salting or mineral placement, turnout or gathering, bed ground/camp locations, etc.)
11. Develop and implement management plans for grazing that take into consideration the seasonal sage-grouse habitat needs. These management plans could include a variety of grazing systems designed to reach habitat goals, including short-duration, rest rotation, etc.
12. Look for ways to minimize negative impacts and enhance sage-grouse habitat when establishing livestock range improvement projects (e.g., water overflow for sage-grouse from water developments, placement of fences, facilities that provide raptor perch sites, construction of roads, salt grounds).
13. Avoid human activity near leks during the breeding season between the hours of 8 p.m. to 8 a.m.
14. Except for livestock guard dogs, avoid allowing dogs to run unchecked in sage-grouse habitats.
15. Experiment with types of grazing to improve sage-grouse habitat accompanied by monitoring to determine effects on sage-grouse.
16. Use techniques such as increased visibility, alternate location, or different design to build and maintain fences that are not hazards to flying grouse.
17. During the breeding season (March 1st through May 15th), use sheep bedding grounds at least 0.5 mile from leks. Should herding practices regain popularity, herders should attempt to avoid disturbing occupied leks with their sheep bands, once they leave the bed ground and begin their daily movements.
18. During the breeding season (March 1st through May 15th), reduce physical disturbance to breeding sage-grouse by placing salt or mineral supplements beyond 0.25 mile of lek locations.
19. In suitable nesting habitats within 3 miles of leks, design grazing systems to manage for residual herbaceous vegetation to provide cover for nesting sage-grouse hens. Options to promote herbaceous cover include:
 - a. When circumstances allow, shift early-season livestock use to pastures with minimal, or no, potential for nesting (e.g., pastures lacking sagebrush, exotic grass seedings, annual grasslands, etc.).
 - b. When pastures with potential nesting habitat are grazed early in the season, use an appropriate stocking rate when herbaceous plants are not rapidly growing (generally prior to late-April). Options for monitoring grazing can be found in the Wyoming Rangeland Monitoring Guide.
20. Manage stocking rates and rotations to maintain the health and productivity of rangelands for livestock and sage-grouse. Incorporate one of the monitoring programs from the

Wyoming Rangeland Monitoring Guide to ensure proper grazing utilization and plant recovery.

21. If your goal is to increase production of grasses and forbs, manage for increased soil water intake by promoting residual vegetation and mulch through implementation of light grazing intensities.
 22. In pastures with riparian habitats (assuming riparian vegetation is actively growing), manage livestock grazing to allow herbaceous vegetation recovery.
 23. Supplemental winter-feeding of livestock in occupied sage-grouse winter habitats should be avoided for both sheep and cattle operations to prevent over-utilization of sagebrush resources by sheep and trampling damage by cattle.
 24. Utilization of sagebrush plants should not exceed 20 percent by livestock and big game.
 25. Placement of new fences and structures should include consideration of their impact on sage-grouse. In general, avoid constructing fences within 0.5 mile of leks. Avoid locating fences in swales and on ridge tops. Minimize fence height and maximize bottom wire height to the extent possible. In areas with documented collisions make fences as visible as possible, (e.g., wire markers, use white-topped steel fence posts, use wooden stays and/or reduce spacing between fence posts, etc.).
 26. Where feasible, place new, taller structures such as corrals, loading facilities, water storage tanks, windmills, etc. at least 0.5 mile from leks to reduce opportunities for perching raptors.
 27. New spring developments in sage-grouse habitat should be designed to maintain or enhance the free-flowing characteristics of springs and wet meadows with the use of float valves on troughs or other features where feasible. Spring and wet meadows should be protected from over utilization and trampling by livestock.
 28. Equip new and existing livestock troughs and open water storage tanks with ramps to facilitate the use of, and escape from, troughs by sage-grouse and other wildlife.
- **Weather**
 1. Where drought has been documented for two consecutive years, consider implementation of Recommended Management Practices in year three that may include:
 - a. Drought management of livestock and wildlife grazing.
 - b. Protection of critical sage-grouse habitats from wildfire and prescribed fire.
 - c. Reduced bag limits during sage-grouse hunting seasons. (not within BLM management authority)
 - d. Predator management programs to enhance nesting and early-brood-rearing success of impacted populations. (would only be implemented in coordination with USDA Wildlife Services when a need has been determined.)
 - e. Water hauling and protection of water sources from evaporation.
 - f. Installation of guzzlers, snow fences and fencing of water source overflows.
 - g. Insure wildlife escape ramps are in place on existing water sources.
 - h. Implement other appropriate management options developed by local sage-grouse working groups.
 - **Coal Exploration, Mining, and Reclamation**
 1. Evaluate and address the needs of sage-grouse when siting mines, and mining related infrastructure. Impacts to sage-grouse should be minimized where practicable.
 2. Tailor reclamation to replace or augment sage-grouse habitat to the extent practicable in instances where such habitat is adversely affected.
 3. Evaluate fence design, location and visibility to reduce hazards to flying grouse.
 4. Manage water production to enhance or maintain sage-grouse habitat.
 5. Control dust from roads.

6. Control mosquito larvae, to the extent practicable and feasible, in mine-related surface water impoundments.
 7. Install wildlife escape ramps in mine reclamation-related livestock watering facilities (tanks).
 8. Continue sage-grouse and sage-grouse habitat-related research and monitoring efforts.
 9. Remove only that amount of topsoil necessary to support continued mining operations on an annual basis or otherwise manage topsoil removal operations to minimize the impact on sage-grouse.
 10. Consider alternative mitigation measures for mining impacts on known sage-grouse habitat. This may include, but not be limited to, implementing offsite mitigative measures for enhancing sage-grouse habitat to offset the temporary impacts of coal mine surface-disturbing activities.
 11. When feasible and practicable, new or expanded exploration within two miles of active leks should occur prior to March 15th or after July 15th. Following initiation of mining (i.e., topsoil removal) this recommendation will not be applicable.
 12. When feasible and practicable, plan to avoid new surface occupancy or disturbance activities on or within 0.25 mile (400 meters) of the perimeter of known active lek sites from March 1 to May 15. Following initiation of mining (i.e., topsoil removal) this recommendation will not be applicable. (Active coal mines are located outside of priority habitat.)
 13. Continue the effort to establish Wyoming big sagebrush to meet shrub density requirements.
- **Other Solid Mineral Mining Operations**
 1. When feasible, new or expanded exploration and/or mining activities within 3 miles (5 kilometer) (Connelly et al. 2000) of active leks should be avoided between March 1st and July 15th. Following initiation of mining (i.e., topsoil stripping) this recommendation would not be applied. As seasonal habitat mapping efforts are completed, re-direct efforts towards protecting nesting habitat.
 2. When feasible, plan to avoid new surface occupancy or disturbance activities within 3 miles (5 kilometer) (Connelly et al. 2000) of the perimeter of known active lek sites from March 1 to May 15.
 3. Where sage-grouse are present or desired, avoid human activity adjacent to leks during the breeding season between the hours of 8 p.m. and 8 a.m.
 - **Pesticides**
 1. Determine the extent of pesticide use within sage-grouse habitats.
 2. Examine what, if any, effects each pesticide use may have on sage-grouse populations.
 3. Where possible, adjust management instead of applying pesticides.
 4. Make use of current laboratory analysis procedures where sage-grouse mortality is observed. Report where pesticides have caused mortality in sage-grouse.
 5. Determine which pesticides and application strategies are least harmful to sage-grouse.
 6. Research effects of pesticides on sage-grouse in Wyoming with a specific goal of testing impacts of actual rangeland applications.
 7. Work with county Weed and Pest Districts to identify low-toxicity alternatives to pesticides classified as a medium to very high risk to game birds.
 8. Assist in providing Wyoming retail dealers, Weed and Pest Districts, and county extension agents with information intended for users regarding product toxicity levels to sage-grouse, and alternatives that are effective while less toxic.
 9. Encourage simple, standardized record-keeping formats, and allow access to pesticide use information.
 10. Address grasshopper issues using Reduced Agent Area Treatments approach.

11. Avoid broadcast spraying during the nesting season, March 1 to July 15, within three miles of a sage-grouse lek site.

- **Recreation**

1. Develop travel management plans and enforce existing plans.
2. Restrict off-road-vehicle use in occupied sage-grouse habitats.
3. Avoid recreational activities in sage-grouse nesting habitat during the nesting season.
4. Restrict permitted organized recreational activities between March 1 and July 15 within 3 miles (5 kilometer) (Connelly et al. 2000) of a lek site.
5. Recreational facilities shall be located at least 3 miles (5 kilometer) (Connelly et al. 2000) from lek sites and in areas that are not in crucial sage-grouse habitat.
6. In coordination with the WGFD, establish and maintain a small number of lek viewing sites and minimize viewing impacts on these sites. Viewing sage-grouse on leks (and censusing leks) should be conducted so that disturbance to birds is minimized or preferably eliminated.
7. Do not provide all lek locations to individuals simply interested in viewing birds.
8. Develop and provide information related to recreation and its impacts on sage-grouse habitat.
9. Discourage dispersed camping within important riparian habitats occupied by sage-grouse during late summer.
10. Avoid construction of overhead lines and other perch sites in occupied sage-grouse habitat. Where these structures must be built, or presently exist, bury the lines, locate along existing utility corridors or modify the structures in key areas.
11. Control dust from roads and other surface disturbances.
12. Inform the public that dog training on sage-grouse outside the hunting season is wildlife harassment and therefore illegal.

Northeast Wyoming Sage-Grouse Working Group: Recommendations for Development Within Connectivity Corridors (NWSGLWG 2010)

1. Encourage the suspension of federal and state leases in the connectivity corridors where mutually agreed to by the leasing agency and the operator. These suspensions should be allowed until additional information clarifies their continued need. Where suspensions cannot be accommodated, or at the option of the operator, limit disturbance to no more than 5 percent (up to 32 acres) per 640 acres of suitable Greater Sage-Grouse habitat within connectivity corridors.
2. Carefully plan developments to avoid or minimize fragmentation of sagebrush habitats in connectivity corridors. The Northeast Wyoming Sage-Grouse Working Group expects industry, BLM and WGFD to work closely together to minimize the overall acreages disturbed with efficient road and well pad designs to avoid excessive engineering and size of pads. BLM should especially be judicious in its application of Gold Book Standards within connectivity corridors using minimum standards whenever possible.
3. The Northeast Wyoming Sage-Grouse Working Group recognizes that reducing human disturbance during the breeding season is beneficial for sage-grouse within important habitats in connectivity corridors. The Northeast Wyoming Sage-Grouse Working Group recommends that a Controlled Surface Use buffer of 0.6 mile around leks or their documented perimeters and a March 15 – June 30 Timing Limitation Stipulation (TLS) be required within nesting habitat within 4 miles of leks. These stipulations will be followed regardless of surface or mineral ownership.

4. Utility providers will work closely with state and federal agencies to ensure that new distribution powerlines are sited with consideration for sage-grouse habitat within connectivity corridors. Eliminate or minimize the use of overhead powerlines after power is delivered (“dropped”) to the development by the utility company. Electrical, gas and water lines should be constructed outside of sage-grouse habitat. Within sage-grouse habitat, consolidate these utility lines within a common corridor. Utility providers will work closely with WGFD, landowners and land management agencies to ensure that source lines are sited with consideration for sage-grouse habitat. Energy companies will be encouraged in the COAs in their plans of development to request overhead powerlines be immediately retired after they are no longer needed for development of minerals. Alternatives to overhead power will be investigated if the landowner requests the powerline to remain for developing water wells for livestock or wildlife.
5. Water reservoirs for Coalbed Natural Gas produced water or other uses may provide habitat for mosquitoes, which spread WNV, promote habitat for newcomer predators (e.g., red fox, raccoon and striped skunk) and occupy acreage that would otherwise be suitable for sage-grouse. Water management will minimize reservoir use. The Northeast Wyoming Sage-Grouse Working Group encourages treatment and discharge into perennial streams, reinjection or other nonsurface discharge options within connectivity corridors.
6. With an effort led by the Governor’s office or other agencies, develop a comprehensive larvicide program to manage mosquitoes for all waters within the connectivity corridor. This will include pre and post treatment monitoring to document presence of the primary WNV vector (*Culex tarsalis*) and determine efficacy of the treatment program.
7. Energy operators should use telemetry systems to remotely monitor system performance and safety issues. Non-emergency visits will observe timing restrictions during the TLS window, avoiding sunrise/sunset time periods when grouse are most active and obey conservative speed limits. Minimize noise levels and locations of compressors and generators within connectivity areas.
8. Require the use of site specific and beneficial seed mixtures for sage-grouse on interim and final reclamation. Reference ESDs from NRCS or other professional service. Allow for spring seeding exceptions from TLS to ensure that forb species are planted during optimum precipitation periods (e.g., spring). Promote the inclusion of sagebrush seeds in final reclamation efforts.
9. The Northeast Wyoming Sage-Grouse Working Group encourages landowners within connectivity corridors to consider participation in USDA/NRCS conservation programs for sage-grouse and other wildlife. These efforts should be further supported by industry, Conservation Districts, and state and federal agencies wherever possible by promoting participation, sponsoring education opportunities and cost sharing programs.
10. All stakeholders need to be vigilant in identifying invasive weed establishment, treating them appropriately and preventing further spread by routine washing of vehicles and equipment.
11. The WGFD will coordinate monitoring in connectivity corridors including:
 - lek counts and surveys;
 - perform genetic analyses using DNA from collected feathers, blood samples, etc.;
 - monitor a radio-marked sample of sage-grouse in this area for seasonal habitat use and assess the role that WNV may have in annual mortality rates.
12. Coordinate response to range fires in sagebrush habitats with respective counties and other appropriate agencies. Sagebrush habitats should receive a priority response.

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Appendix D. Greater Sage-Grouse Habitat Management Strategy

Introduction

The Buffalo Resource Management Plan (RMP) provides specific goals, objectives, management actions, and required design features for the conservation of Greater Sage-Grouse in Wyoming. These are the commitments made to meet the federal agencies' national policy and direction for the conservation of Greater Sage-Grouse in light of the 2010 U.S. Fish and Wildlife Service (USFWS) listing decision as warranted but precluded from listing under the Endangered Species Act (ESA). Through the National Planning Strategy, Bureau of Land Management (BLM) in coordination with USFWS have identified conservation measures to be included in the land use plans (LUPs) as the principal regulatory mechanisms to assure adequate conservation of the Greater Sage-Grouse and its habitat on public lands.

The measures identified in this RMP have been developed in coordination with not just the USFWS, but also the State of Wyoming, including the Wyoming Game and Fish Department (WGFD), and local cooperating agencies including conservation districts and counties.

Wyoming has established Core Population Areas to help delineate landscape planning units by distinguishing areas of high biological value. These areas are based on the locations of breeding areas and are intended to help balance Greater Sage-Grouse habitat requirements with demand for energy development (Doherty et al. 2011). The Approved RMP is consistent with the Core Area Strategy, but contains additional restrictions to protect other resources, which results in added protections to Greater Sage-Grouse habitat and achieving conservation objectives identified in the Conservation Objectives Team (COT) Report on BLM-managed public lands. The COT Report indicates that the Core Area Strategy is a substantial regulatory mechanism that contributes to the conservation of Greater Sage-Grouse and balances the priorities of retaining a healthy Greater Sage-Grouse population on the landscape and energy development.

This appendix will introduce the framework for implementation of Greater Sage-Grouse conservation measures within the Buffalo Field Office. Implementation is a combination of permitting activities under the auspices of management direction provided in the LUP, undertaking specific activities in pursuit of the goals and objectives identified in the plan and monitoring of sage brush habitat and populations.

The implementation framework outlined here is focused specifically towards Greater Sage-Grouse and is reflective of how the national strategy will be assimilated into the existing statewide implementation efforts currently in place in Wyoming. This framework has been developed mindful of the varying scales at which implementation will be evaluated: at the local level to define successful conservation measures, at the state level to assess success of the statewide strategy, and across the species' range.

In 2013, the Director of USFWS tasked staff with the development of range-wide conservation objectives for the sage-grouse to define the degree to which threats need to be reduced or ameliorated to conserve sage-grouse so that it is no longer in danger of extinction or likely to become in danger of extinction in the foreseeable future. Recognizing that state wildlife agencies

have management expertise and management authority for sage-grouse, the USFWS created a COT of state and USFWS representatives to accomplish this task.

The COT conservation framework consisted of (1) identifying sage-grouse population and habitat status and threats, (2) defining a broad conservation goal, (3) identifying Priority Areas for Conservation (PACs), and (4) developing specific conservation objectives and measures. The COT used three parameters—population and habitat representation, redundancy, and resilience (Shaffer and Stein 2010, Redford et al. 2011)—as guiding concepts in developing the conservation goal, priority areas for conservation, conservation objectives, and measures.

The COT report identified priority areas for Greater Sage-Grouse population habitats as PACs. PACs are recognized as key areas across the landscape that are necessary to maintain redundant, representative, and resilient populations” of the species. The COT Report describes maintaining the integrity of PACs as “the essential foundation for sage-grouse conservation.” PACs cover nearly 73 million acres across the west; within the Buffalo planning area, more than 1.2 million acres are considered priority habitat. Twenty-one percent of the priority habitat in the planning area is BLM-administered surface and 56 percent is BLM-administered minerals. Based upon 2007 lek counts and the population data contained in the COT Report, the Buffalo planning area contains an estimated four percent of the range-wide population of Greater Sage-Grouse (Table D.1, “Greater Sage-Grouse Habitat within the Buffalo Planning Area” (p. 326)).

Table D.1. Greater Sage-Grouse Habitat within the Buffalo Planning Area

| Populations/Subpopulations: Powder River Basin, Wyoming Portion, WAFWA Management Zone I (for the portion of the population that lies within the planning area; Wyoming 9-Plan (TBNG) removed) | | | | |
|---|----------------------------|--|---|----------------------------------|
| Surface Estate | Core Area Acres (%) | Connectivity Corridor Acres (%) | Priority Habitat Total (core + connectivity) | General Habitat Acres (%) |
| Private | 716,859 (79) | 235,843 (85) | 952,702 (81) | 3,772,508 (79) |
| State | 76,634 (8) | 16,467 (6) | 93,100 (8) | 391,374 (8) |
| BLM | 112,451 (12) | 24,989 (9) | 137,440 (12) | 628,162 (13) |
| Other | 0 (0) | 0 (0) | 0 (0) | 12,736 (0.3) |
| Total | 905,944 | 277,300 | 1,183,244 | 4,804,779 |
| Fluid Mineral Estate | Core Area Acres (%) | Connectivity Corridor Acres (%) | Priority Habitat Total (core + connectivity) | General Habitat Acres (%) |
| Non-federal | 385,488 (43) | 122,886 (44) | 508,375 (43) | 2,189,675 (46) |
| BLM | 520,456 (57) | 154,413 (56) | 674,869 (57) | 2,615,104 (54) |
| Total | 905,944 | 277,300 | 1,183,244 | 4,804,779 |
| % percent | | | | |
| BLM Bureau of Land Management | | | | |
| TBNG Thunder Basin National Grassland | | | | |
| WAFWA Western Association of Fish and Wildlife Agencies | | | | |

The conservation objectives identified in the COT Report, targeted at maintaining redundant, representative, and resilient sage-grouse habitats and populations, is the basis on which the Greater Sage-Grouse elements of the Buffalo Approved RMP were developed. Due to the variability in ecological conditions and the nature of the threats across the range of the sage-grouse, developing detailed, prescriptive species or habitat actions was not attainable at the range-wide scale. Specific strategies and actions necessary to achieve the conservation objectives have been developed by BLM in cooperation with State and local governments to ensure implementation of activities to meet the objectives identified in the COT report.

D.1. COT Objective 1: Stop Population Declines and Habitat Loss

There is an urgent need to ‘stop the bleeding’ of continued population declines and habitat losses by acting immediately to eliminate or reduce the impacts contributing to population declines and range erosion. There are no populations within the range of sage-grouse that are immune to the threat of habitat loss and fragmentation. (COT Report, 2013)

The COT Report identified a series of threats to Greater Sage-Grouse habitat and the extent of those threats at the population scale. The management actions identified in the RMP were specifically designed to reduce the threats, as they were identified. The Buffalo RMP encompasses lands within Western Association of Fish and Wildlife Agencies (WAFWA) Management Zone (MZ) I. To ensure that the threats are adequately addressed by the RMP, a strategy for reviewing activities and projects on public lands to determine the extent of their impact on Greater Sage-Grouse habitat has also been developed. The following outlines the process by which all activities on public lands will be reviewed.

The BLM will ensure that any activities or projects in Greater Sage-Grouse habitats would: (1) only occur in compliance with the Buffalo RMP Greater Sage-Grouse goals and objectives for priority management areas; and (2) maintain neutral or positive Greater Sage-Grouse population trends and habitat by avoiding, minimizing, and offsetting unavoidable impacts to assure a conservation gain at the scale of this LUP and within Greater Sage-Grouse population areas, State boundaries, and WAFWA MZs through the application of mitigation for implementation-level decisions. The mitigation process will follow the regulations from the White House Council on Environmental Quality (CEQ) (40 CFR 1508.20; e.g., avoid, minimize, and compensate), hereafter referred to as the mitigation hierarchy, while also following Secretary of the Interior Order 3330 and consulting BLM, USFWS and other current and appropriate mitigation guidance. If it is determined that residual impacts to Greater Sage-Grouse from implementation-level actions would remain after applying avoidance and minimization measures to the extent possible, then compensatory mitigation projects will be used to offset residual impacts, or the project may be deferred or denied if necessary to achieve the goals and objectives for priority and general management areas in the Buffalo RMP.

To ensure that impacts from activities proposed in sage-grouse Core Areas are appropriately approved and mitigated as necessary, the BLM will apply mitigation measures and conservation actions and potentially modify the location, design, construction, and/or operation of proposed land uses or activities to comply with statutory requirements for environmental protection. The mitigation measures and conservation actions (Appendix C (p. 285)) for proposed projects or activities in these areas will be identified as part of the National Environmental Policy Act (NEPA) environmental review process, through interdisciplinary analysis involving resource specialists, project proponents, government entities, landowners or other Surface Management Agencies. Those measures selected for implementation will be identified in the Record of Decision (ROD) or Decision Record (DR) for those authorizations and will inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM-administered public lands and minerals to mitigate, per the mitigation hierarchy referenced above, impacts from the activity or project such that sage-grouse goals and objectives are met. Because these actions create a clear obligation for the BLM to ensure any proposed mitigation action adopted in the environmental review process is performed, there is assurance that mitigation will lead to a reduction of environmental impacts in the implementation stage and include binding mechanisms for enforcement (CEQ Memorandum for Heads of Federal Departments and Agencies 2011).

*Appendix D Greater Sage-Grouse Habitat
Management Strategy
COT Objective 1: Stop Population Declines
and Habitat Loss*

To achieve the goals and objectives for Core Areas in the Buffalo Planning Area, the BLM will assess all proposed land uses or activities such as road, pipeline, communication tower, or powerline construction, fluid and solid mineral development, range improvements, and recreational activities proposed for location in Core Areas in a step-wise manner. The following steps identify a screening process for review of proposed activities or projects in these areas. This process will provide a consistent approach and ensure that authorization of these projects, if granted, will appropriately mitigate impacts and be consistent with the LUP goals and objectives for sage-grouse. The following steps provide for a sequential screening of proposals.

Table D.2. Implementation of RMP Decisions to Address COT Threats

| COT Threat | Threat Extent | Program Area | RMP Decision | Implementation Process | Tracking Mechanism |
|-------------------------------------|------------------------|---|--------------|------------------------|--------------------|
| Sagebrush Elimination | Present but Localized | Fire and Fuels Management Grassland and Shrubland Communities Livestock Grazing Management | | | |
| Weeds/Annual Grasses | Present but Localized | Fire and Fuels Management Special Status Species Grassland and Shrubland Communities Invasive Species and Pest Management Rights-of-Way Travel and Transportation Management Recreation | | | |
| Energy | Present and Widespread | Soil Water/Riparian and Wetland Communities Leasables- Fluid Minerals Grassland and Shrubland Communities Invasive Species and Pest Management Wildlife Resources Special Status Species Visual Resources Rights-of-Way | | | |
| Fire | Present but Localized | Fire and Fuels Management Grassland and Shrubland Communities Livestock Grazing Management | | | |
| Grazing Range Management Structures | Present and Widespread | Livestock Grazing Management Special Status Species | | | |
| Free-Roaming Equids | Not Present | Wild Horse and Burro Management | | | |
| Conifer Encroachment | Present but Localized | Fire and Fuels Management Grassland and Shrubland Communities Special Status Species | | | |
| Agriculture and Urbanization | Present but Localized | Lands and Realty | | | |

| COT Threat | Threat Extent | Program Area | RMP Decision | Implementation Process | Tracking Mechanism |
|--|------------------------|--|--------------|------------------------|--------------------|
| Mining | Present and Widespread | Locatable Minerals Leasable Minerals- Coal Salable Minerals Soil Water/Riparian and Wetland Communities Invasive Species and Pest Management Wildlife Resources Special Status Species Visual Resources Rights-of-Way | | | |
| Recreation | Present and Widespread | Recreation Travel and Transportation Management | | | |
| Infrastructure | Present and Widespread | Rights-of-Way Soil Water/Riparian and Wetland Communities Invasive Species and Pest Management Wildlife Resources Special Status Species Visual Resources | | | |
| COT Conservation Objectives Team RMP Resource Management Plan | | | | | |

D.1.1. Step 1 – Determine Proposal Adequacy

This screening process is initiated upon formal submittal of a proposal for authorization for use of BLM-administered lands. The actual documentation of the proposal would include at a minimum a description of the location, scale of the project and timing of the disturbance. The acceptance of the proposal(s) for review would be consistent with existing protocol and procedures for each type of use. Evaluating consistency with (at a minimum) State sage-grouse regulations.

D.1.2. Step 2 – Evaluate Proposal Consistency with LUP

Step 2.1

The proposal will be reviewed to determine whether it would be allowed as prescribed in the LUP. For example, some activities or types of development are prohibited in sage-grouse habitat, such as wind developments in Priority Habitat. Evaluation of projects will also include an assessment of the current state of the Adaptive Management hard and soft triggers. If the proposal is for an activity that is specifically prohibited, the applicant should be informed that the application is being rejected since it would not be allowed, regardless of the design of the project.

Step 2.2

The proposal will be reviewed to determine whether it conforms with the Density and Disturbance Limitations. If the proposed activity occurs within a Priority Habitat Management Area (PHMA), evaluate whether the disturbance from the activity exceeds the limit on the amount of disturbance allowed within the activity or project area (Density and Disturbance Calculation Tool [DDCT] process). If current disturbance within the activity area or the anticipated disturbance from the proposed activity exceeds this threshold, the project would be deferred until such time as the amount of disturbance within the area has been reduced below the threshold, redesigned so as to not result in any additional surface disturbance (collocation) or redesigned to move it outside of PHMA. Should the project be a result of a valid existing right, BLM will work to minimize the disturbance and determine any residual impacts that may require appropriate mitigation.

The maximum density of disruptive activities and surface disturbance allowed will be analyzed via the DDCT, and will be conducted by the Federal Land Management Agency on federal land and the project proponent on non-federal (private, state) land per the RMP 9 revision.

State Agency Permit is needed, without a need for a federal permit:

The first point of contact for addressing sage-grouse issues for any state permit application should be the WGFD. Project proponents (proponents) need to have a thorough description of their project and identify the potential effects on sage-grouse prior to submitting an application to the permitting agency. Project proponents should contact WGFD at least 45-60 days prior to submitting their application. More complex projects will require more time. It is understood that WGFD has a role of consultation, recommendation, and facilitation, and has no authority to either approve or deny the project. The purpose of the initial consultation with the WGFD is to become familiar with the project proposal and ensure the project proponent understands the DDCT and recommended stipulations.

Federal Agency Permit is needed, with or without a State permit:

When a project requires federal action prior to approval, the proponent should contact the federal agency responsible for reviewing the action. The federal agency and the proponent will determine the best process for completing the DDCT and receiving recommendations from WGFD. Project proponents (proponents) need to have a thorough description of their project and identify the potential effects on sage-grouse prior to submitting an application to the permitting agency.

Maximum Density and Disturbance Process

Density and Disturbance Calculation

The DDCT is a spatially based tool that calculates both the average density of disruptive activities and total surface disturbance within the area affected by the project, or DDCT assessment area. The DDCT assessment area is created based on buffers around proposed projects (first buffer) in protected sage-grouse core areas, and subsequent buffers around any occupied, core area leks within the first buffer. A four mile buffer is used to identify 75 percent of the sage-grouse use around a lek. All activities will be evaluated within the context of maximum allowable disturbance (disturbance percentages, location and number of disturbances) of suitable sage-grouse habitat within the DDCT assessment area. This tool allows for better siting of projects rather than averaging the density/disturbance calculation per section.

All lands within core area boundaries are considered suitable habitat unless documented. Mapped unsuitable habitat is treated neither as suitable habitat, nor disturbance, which results in the area being removed from the DDCT assessment area altogether.

1. Density and Disturbance Calculation Tool: Determine all occupied leks within a core population area that may be affected by the project by placing a four-mile boundary around the project boundary (as defined by the proposed area of disturbance related to the project) (see Figure D.1, “Four-Mile Buffer around the Proposed Project Boundary” (p. 331)). All occupied leks located within the four-mile boundary and within a core population area will be considered in this assessment.

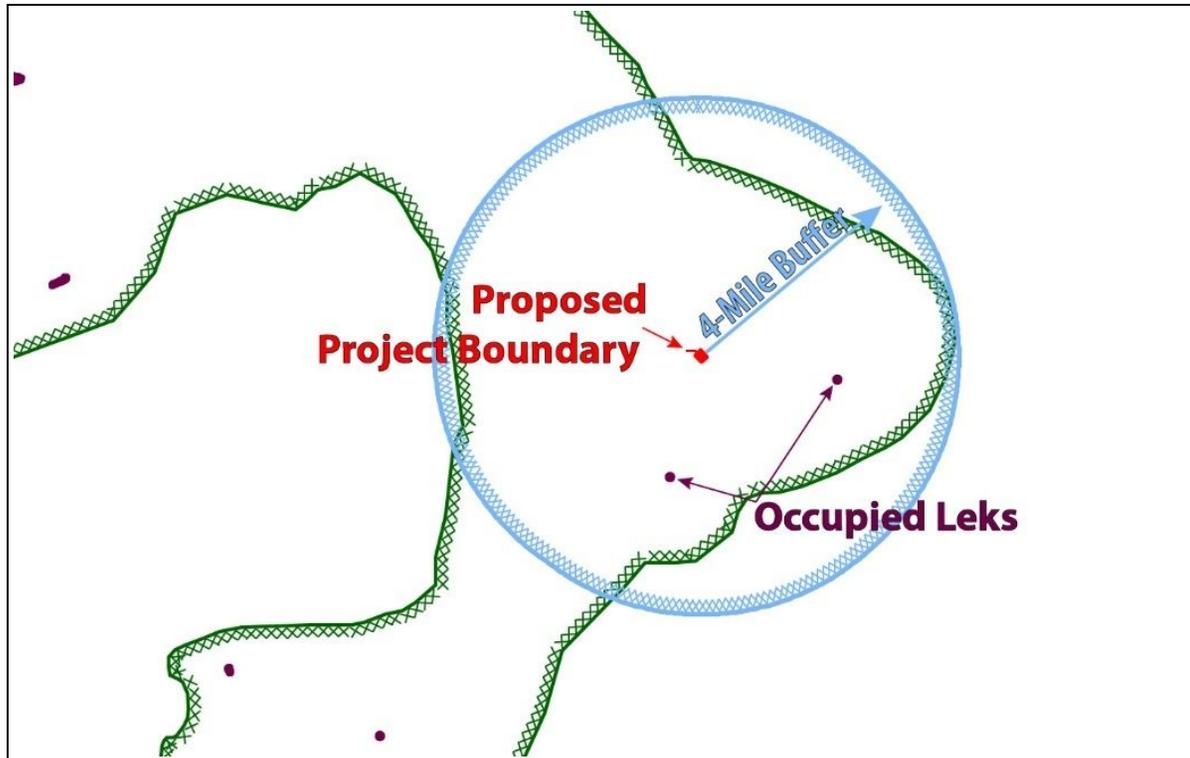


Figure D.1. Four-Mile Buffer around the Proposed Project Boundary

A four-mile boundary will then be placed around the perimeter of each of these lek(s) (see Figure D.2, “Four-Mile Boundary around Perimeter of Lek(s)” (p. 331)).

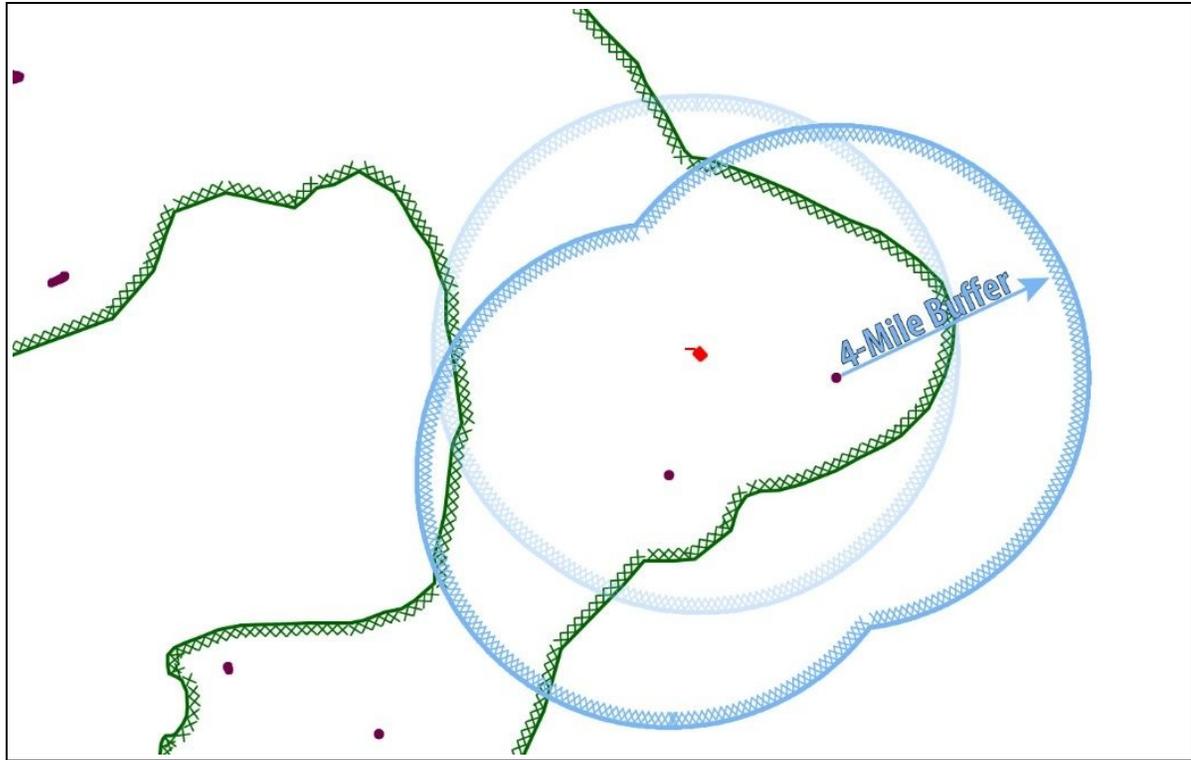


Figure D.2. Four-Mile Boundary around Perimeter of Lek(s)

The core population area within the combined four-mile buffer around both the leks and the project boundary creates the DDCT assessment area for each individual project (see Figure D.3, “DDCT Assessment Area” (p. 332)).

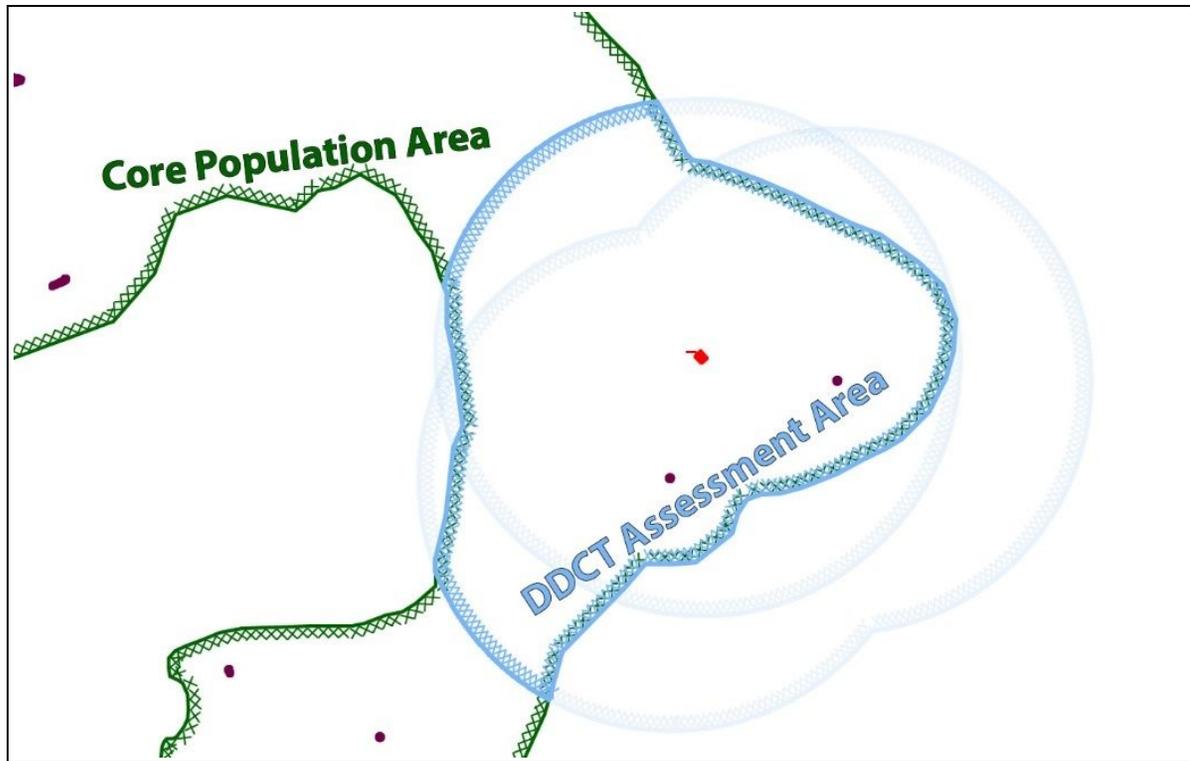
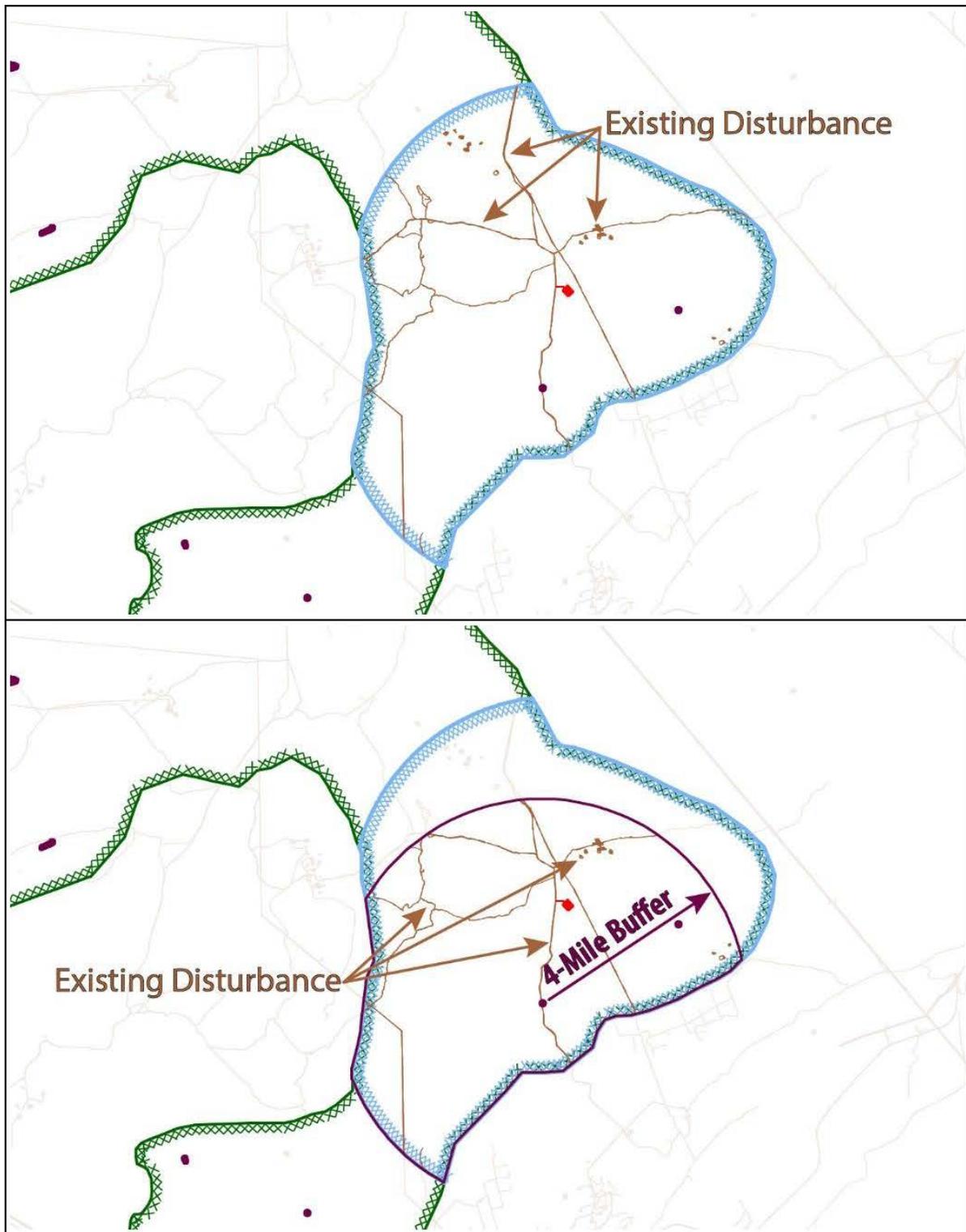


Figure D.3. DDCT Assessment Area

Disturbance will be analyzed for the DDCT assessment area as a whole and for each individual lek within the DDCT assessment area (see Figure D.4, “Existing Disturbance with Four-Mile Buffer” (p. 334)).



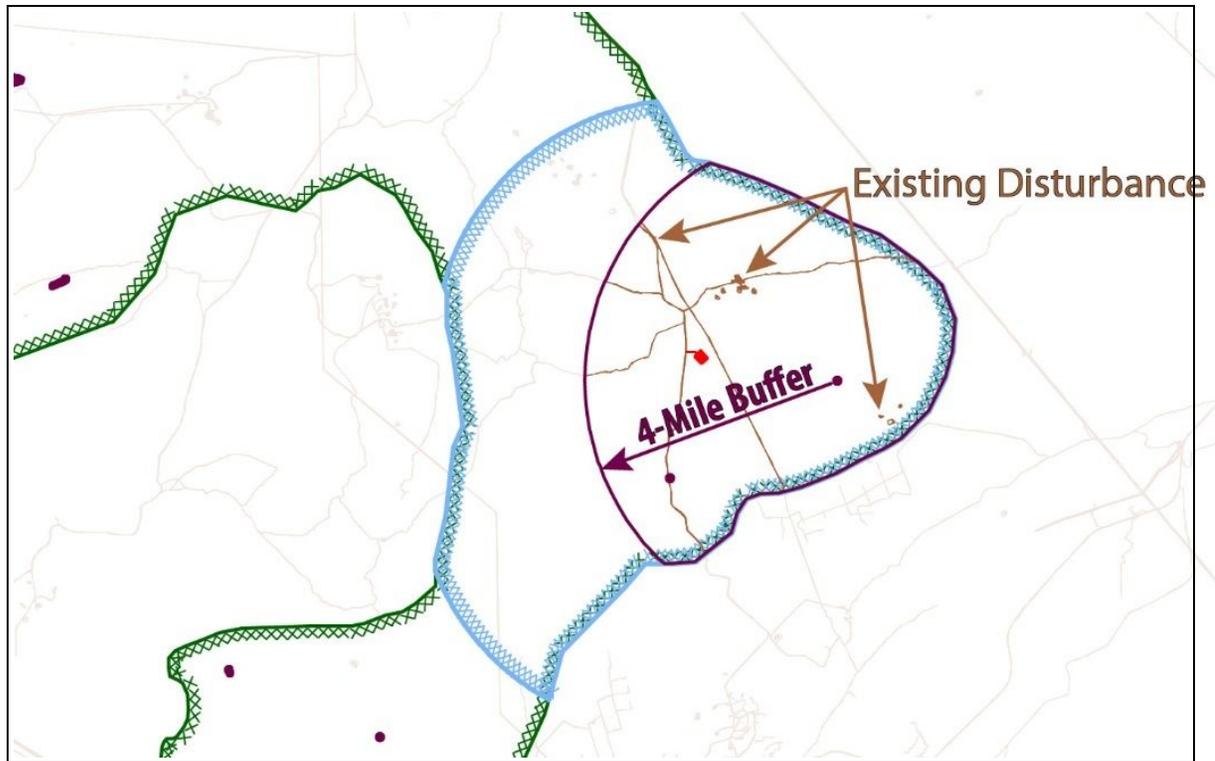
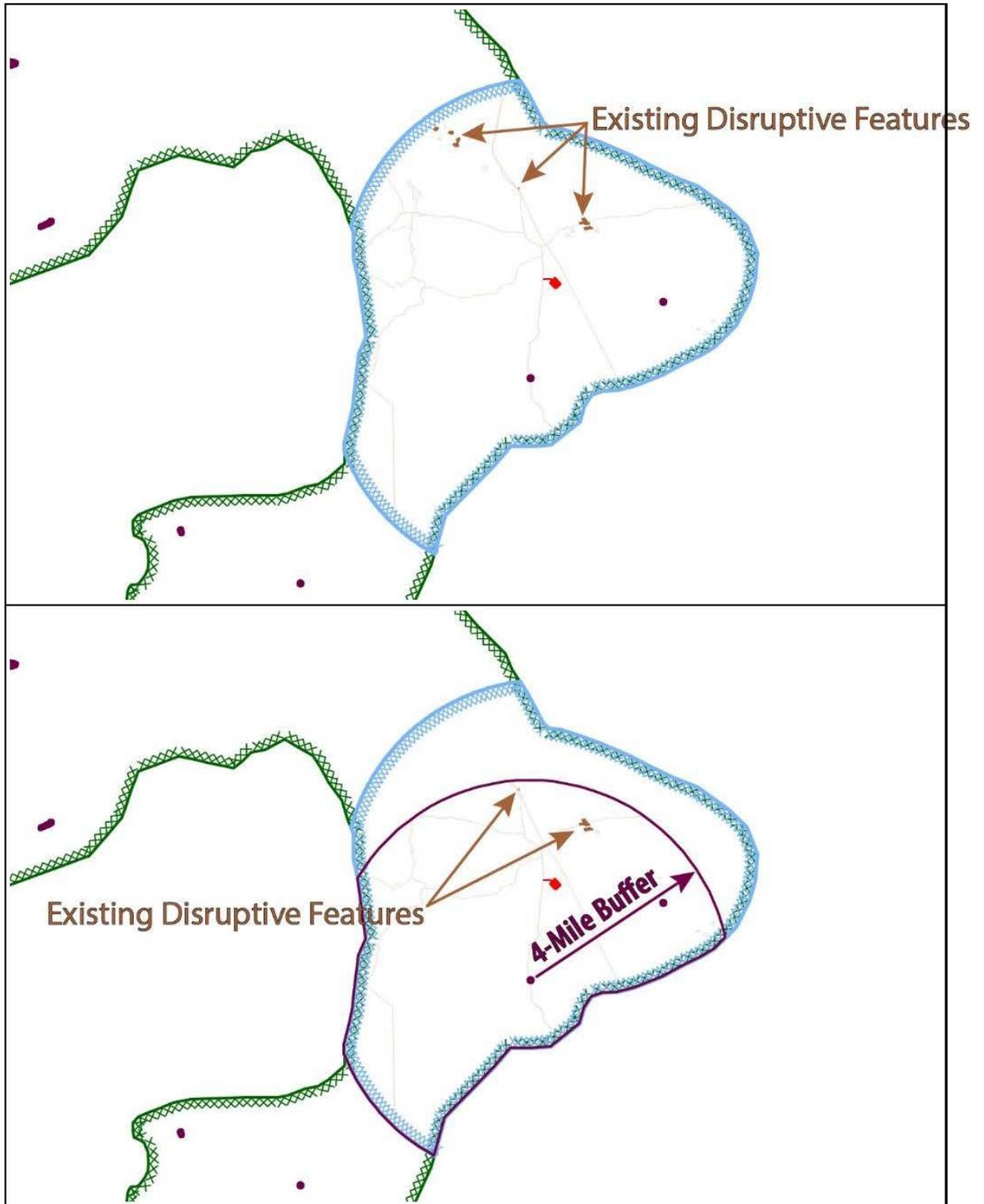


Figure D.4. Existing Disturbance with Four-Mile Buffer

Density of disruptive features will be analyzed for the DDCT assessment area as a whole and for each individual lek within the DDCT assessment area (see Figure D.5, “Density of Existing Disruptive Features in the DDCT Assessment Area” (p. 336)).



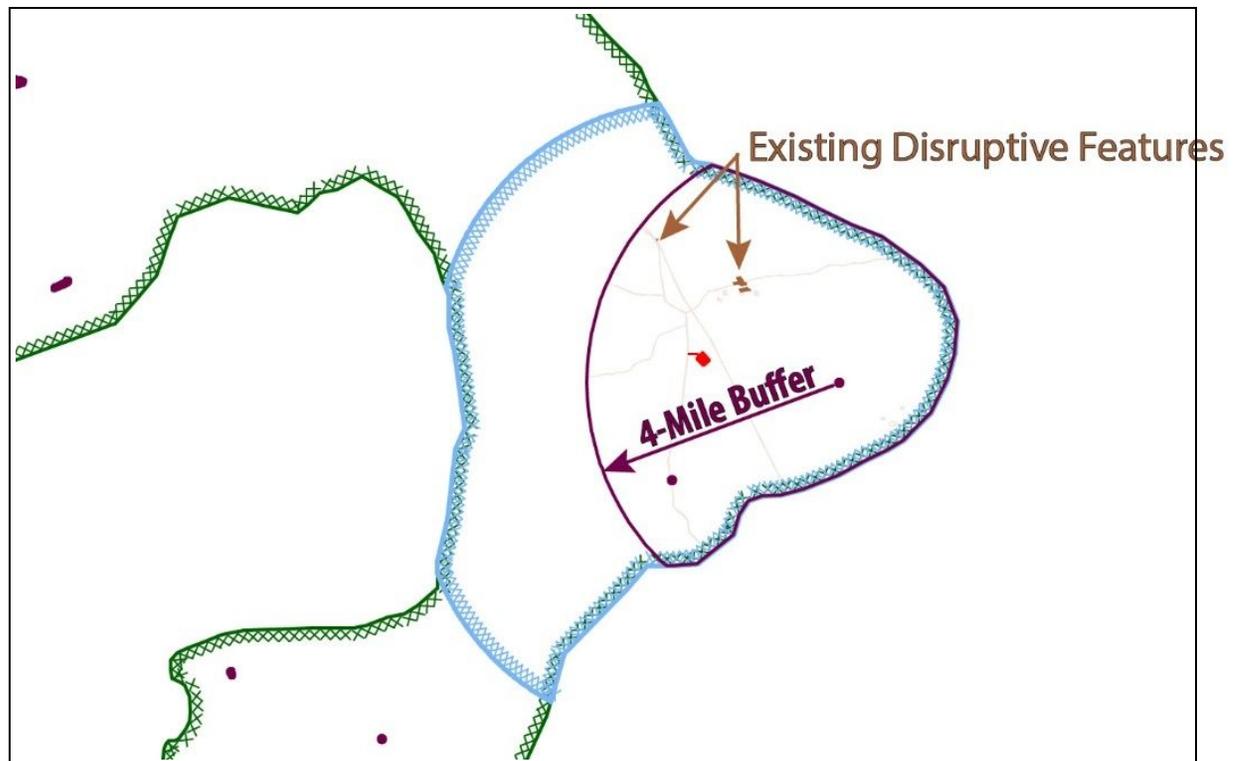


Figure D.5. Density of Existing Disruptive Features in the DDCT Assessment Area

If there are no leks identified for this assessment within the four-mile boundary around the project boundary, the DDCT assessment area will be that portion of the four-mile project boundary within the core population area.

2. Density and Disturbance Analysis: The total number of discrete disruptive activity features, as well as the total disturbance acres within the DDCT assessment area will be determined through an evaluation of:
 - a. Existing disturbance (sage-grouse habitat that is disturbed due to existing anthropogenic activity and wildfire).
 - b. Approved permits (that have approval for on the ground activity) not yet implemented.
 - c. Validating digitized disturbance through on the ground evaluation.

Permitting

The complete analysis package (DDCT results, mapbook, and Worksheet), and recommendations developed by consultation and review outlined herein will be forwarded to the appropriate permitting agency(s). WGFD recommendations will be included, as will other recommendations from project proponents and other appropriate agencies. Project proponent shall have access to all information used in developing recommendations. Where possible and when requested by the project proponent, State agencies shall provide the project proponent with potential development alternatives other than those contained in the project proposal.

If the permit for which a proponent has applied expires, another DDCT analysis is required before issuing a new permit. An additional DDCT is not required for Permit extensions or

renewals when no changes are being authorized. Any project will need to comply with the current Executive Order.

Step 2.3

The BLM's goal for any new activity or development proposal within core areas is to provide consistent implementation of project proposals which meet the BLM's LUP goals and the population management objectives of the State. Activities would be consistent with the strategy where it can be sufficiently demonstrated that no declines to core populations would be expected as a result of the proposed action. Published research suggests that impacts to sage-grouse leks associated primarily with infrastructure and energy development are discernible at a distance of at least 4 miles and that many leks within this radius have been extirpated as a direct result of development (Walker et al. 2007; Walker 2008). Research also suggests that an evaluation of habitats and sage-grouse populations that attend leks within an 11-mile radius from the project boundary in the context of "large" projects may be appropriate in order to consider all seasonal habitats that may be affected for birds that use the habitats associated with the proposal during some portion of the life-cycle of seasonally migratory sage-grouse (Connelly et al. 2000).

To determine the manner in which Greater Sage-Grouse may be impacted by proposed undertakings, the following will be reviewed in the site specific NEPA analysis to quantify the effects:

- Greater Sage-Grouse Habitat delineation maps.
- Current science recommendations.
- The 'Base Line Environment Report' (USGS) which identifies areas of direct and indirect effect for various anthropogenic activities.
- Consultation with agency or State Wildlife Agency biologist.
- Other methods needed to provide an accurate assessment of impacts.

If the proposal will not have a direct or indirect impact on either the habitat or population, document the findings in the NEPA and proceed with the appropriate process for review, decision and implementation of the project.

D.1.3. Step 3 – Apply Avoidance and Minimization Measures to Comply with Sage-Grouse Goals and Objectives

If the project can be relocated so as to not have an impact on sage-grouse and still achieve objectives of the proposal and the disturbance limitations, relocate the proposed activity and proceed with the appropriate process for review, decision and implementation (NEPA and DR). This Step does not consider redesign of the project to reduce or eliminate direct and indirect impacts, but rather authorization of the project in a physical location that will not impact Greater Sage-Grouse. If the preliminary review of the proposal concludes that there may be adverse impacts to sage-grouse habitat or populations in Step 2 and the project cannot be effectively relocated to avoid these impacts, proceed with the appropriate process for review, decision and implementation (NEPA and DR) with the inclusion of appropriate mitigation requirements to further reduce or eliminate impacts to sage-grouse habitat and populations and achieve compliance with sage-grouse objectives. Mitigation measures could include design modifications of the proposal, site disturbance restoration, post project reclamation, etc (see Appendix C (p. 285)). Compensatory or offsite mitigation may be required (Step 4) in situations where residual impacts remain after application of all avoidance and minimization measures.

Appendix D Greater Sage-Grouse Habitat Management Strategy

Step 3 – Apply Avoidance and Minimization Measures to Comply with Sage-Grouse Goals and Objectives

September 2015

D.1.4. Step 4 – Apply Compensatory Mitigation or Reject / Defer Proposal

If screening of the proposal has determined that direct and indirect impacts cannot be eliminated through avoidance or minimization, evaluate the proposal to determine if compensatory mitigation can be used to offset the remaining adverse impacts and achieve sage-grouse goals and objectives. If the impacts cannot be effectively mitigated, reject or defer the proposal. The criteria for determining this situation could include but are not limited to:

- The current trend within the Priority Habitat is down and additional impacts, whether mitigated or not, could lead to further decline of the species or habitat.
- The proposed mitigation is inadequate in scope or duration, has proven to be ineffective or is unproven in terms of science based approach.
- The project would impact habitat that has been determined to be a limiting factor for species sustainability.
- Other site specific information and analysis that determined the project would lead to a downward change of the current species population or habitat and not comply with sage-grouse goals and objectives.

If, following application of available impact avoidance and minimization measures, the project can be mitigated to fully offset impacts and assure conservation gain to the species and comply with sage-grouse goals and objectives, proceed with the appropriate process for review, decision and implementation (NEPA and DR).

Mitigation

General

In undertaking BLM management actions, and, consistent with valid existing rights and applicable law, in authorizing third party actions that result in habitat loss and degradation within PHMA, the BLM will require and assure mitigation that provides a net conservation gain to the species including accounting for any uncertainty associated with the effectiveness of such mitigation. This will be achieved by avoiding, minimizing, and compensating for impacts by applying beneficial mitigation actions. In Wyoming, the USFWS has found that “the core area strategy, if implemented by all landowners via regulatory mechanism, would provide adequate protection for sage-grouse and their habitats in the state.” The BLM will implement actions to achieve the goal of net conservation gain consistent with the Wyoming Strategy (Executive Order 2015-4). Compensatory mitigation would be used when avoidance and minimization measures consistent with Executive Order 2015-4 are inadequate to protect Core Population Area Greater Sage-Grouse.

Mitigation will follow the regulations from the White House CEQ (40 CFR 1508.20; e.g., avoid, minimize, and compensate), hereafter referred to as the mitigation hierarchy. If impacts from BLM management actions and authorized third party actions that result in habitat loss and degradation remain after applying avoidance and minimization measures (i.e., residual impacts), then compensatory mitigation projects will be used to provide a net conservation gain to the species. Any compensatory mitigation will be durable, timely, and in addition to that which would have resulted without the compensatory mitigation (see Glossary Terms (p. 387)).

*Appendix D Greater Sage-Grouse Habitat
Management Strategy
Step 4 – Apply Compensatory Mitigation or
Reject / Defer Proposal*

The BLM, via the WAFWA MZ Greater Sage-Grouse Conservation Team, will develop a WAFWA MZ Regional Mitigation Strategy that will inform the NEPA decision making process including the application of the mitigation hierarchy for BLM management actions and third party actions that result in habitat loss and degradation. A robust and transparent Regional Mitigation Strategy will contribute to Greater Sage-Grouse habitat conservation by reducing, eliminating, or minimizing threats and compensating for residual impacts to Greater Sage-Grouse and its habitat.

The BLM's Regional Mitigation Manual MS-1794 serves as a framework for developing and implementing a Regional Mitigation Strategy. The following sections provide additional guidance specific to the development and implementation of a WAFWA MZ Regional Mitigation Strategy.

Developing a WAFWA Management Zone Regional Mitigation Strategy

The BLM, via the WAFWA MZ Greater Sage-Grouse Conservation Team, will develop a WAFWA MZ Regional Mitigation Strategy to guide the application of the mitigation hierarchy for BLM management actions and third party actions that result in habitat loss and degradation. The Strategy should consider any State-level Greater Sage-Grouse mitigation guidance that is consistent with the requirements identified in this Appendix. The Regional Mitigation Strategy should be developed in a transparent manner, based on the best science available and standardized metrics.

As described in the Approved RMP, the BLM will establish a WAFWA MZ Greater Sage-Grouse Conservation Team (hereafter, Team) to help guide the conservation of Greater Sage-Grouse, within 90 days of the issuance of the ROD. The Strategy will be developed within one year of the issuance of the ROD.

The Regional Mitigation Strategy should include mitigation guidance on avoidance, minimization, and compensation, as follows:

- Avoidance
 - Include avoidance areas (e.g., right-of-way avoidance/exclusion areas, no surface occupancy areas) already included in laws, regulations, policies, and/or LUPs (e.g., RMPs, State Plans); and,
 - Include any potential, additional avoidance actions (e.g., additional avoidance best management practices) with regard to Greater Sage-Grouse conservation.
- Minimization
 - Include minimization actions (e.g., required design features, best management practices) already included in laws, regulations, policies, LUPs, and/or land-use authorizations; and,
 - Include any potential, additional minimization actions (e.g., additional minimization best management practices) with regard to Greater Sage-Grouse conservation.
- Compensation
 - Include discussion of impact/project valuation, compensatory mitigation options, siting, compensatory project types and costs, monitoring, reporting, and program administration. Each of these topics is discussed in more detail below.
 - Residual Impact and Compensatory Mitigation Project Valuation Guidance
 - A common standardized method should be identified for estimating the value of the residual impacts and value of the compensatory mitigation projects, including accounting for any uncertainty associated with the effectiveness of the projects.
 - This method should consider the quality of habitat, scarcity of the habitat, and the size of the impact/project.

- For compensatory mitigation projects, consideration of durability (see Glossary Terms (p. 387)), timeliness (see Glossary Terms (p. 387)), and the potential for failure (e.g., uncertainty associated with effectiveness) may require an upward adjustment of the valuation.
- The resultant compensatory mitigation project will, after application of the above guidance, result in proactive conservation measures for Greater Sage-Grouse (consistent with BLM Manual 6840 – Special Status Species Management, section .02).
- **Compensatory Mitigation Options**
 - Options for implementing compensatory mitigation should be identified, such as:
 - Utilizing certified mitigation/conservation bank or credit exchanges.
 - Contributing to an existing mitigation/conservation fund.
 - Authorized-user conducted mitigation projects.
 - For any compensatory mitigation project, the investment must be additional (i.e., additionality: the conservation benefits of compensatory mitigation are demonstrably new and would not have resulted without the compensatory mitigation project).
- **Compensatory Mitigation Siting**
 - Sites should be in areas that have the potential to yield a net conservation gain to the Greater Sage-Grouse, regardless of land ownership.
 - Sites should be durable (see Glossary Terms (p. 387)).
 - Sites identified by existing plans and strategies (e.g., fire restoration plans, invasive species strategies, healthy land focal areas) should be considered, if those sites have the potential to yield a net conservation gain to Greater Sage-Grouse and are durable.
- **Compensatory Mitigation Project Types and Costs**
 - Project types should be identified that help reduce threats to Greater Sage-Grouse (e.g., protection, conservation, and restoration projects).
 - Each project type should have a goal and measurable objectives.
 - Each project type should have associated monitoring and maintenance requirements, for the duration of the impact.
 - To inform contributions to a mitigation/conservation fund, expected costs for these project types (and their monitoring and maintenance), within the WAFWA MZ, should be identified.
- **Compensatory Mitigation Compliance and Monitoring**
 - Mitigation projects should be inspected to ensure they are implemented as designed, and if not, there should be methods to enforce compliance.
 - Mitigation projects should be monitored to ensure that the goals and objectives are met and that the benefits are effective for the duration of the impact.
- **Compensatory Mitigation Reporting**
 - Standardized, transparent, scalable, and scientifically-defensible reporting requirements should be identified for mitigation projects.
 - Reports should be compiled, summarized, and reviewed in the WAFWA MZ in order to determine if Greater Sage-Grouse conservation has been achieved and/or to support adaptive management recommendations.
- **Compensatory Mitigation Program Implementation Guidelines**
 - Guidelines for implementing the State-level compensatory mitigation program should include holding and applying compensatory mitigation funds, operating a transparent and credible accounting system, certifying mitigation credits, and managing reporting requirements.

Incorporating the Regional Mitigation Strategy into NEPA Analyses

*Appendix D Greater Sage-Grouse Habitat
Management Strategy
Step 4 – Apply Compensatory Mitigation or
Reject / Defer Proposal*

The BLM will include the avoidance, minimization, and compensatory recommendations from the Regional Mitigation Strategy in one or more of the NEPA analysis' alternatives for BLM management actions and third party actions that result in habitat loss and degradation and the appropriate mitigation actions will be carried forward into the decision.

Implementing a Compensatory Mitigation Program

The BLM needs to ensure that compensatory mitigation is strategically implemented to provide a net conservation gain to the species, as identified in the Regional Mitigation Strategy. In order to align with existing compensatory mitigation efforts, this compensatory mitigation program will be managed at a State-level (as opposed to a WAFWA MZ or a Field Office), in collaboration with our partners (e.g., federal, tribal, and state agencies).

To ensure transparent and effective management of the compensatory mitigation funds, the BLM will enter into a contract or agreement with a third-party to help manage the State-level compensatory mitigation funds, within one year of the issuance of the ROD. The selection of the third-party compensatory mitigation administrator will conform to all relevant laws, regulations, and policies. The BLM will remain responsible for making decisions that affect federal lands.

D.2. COT Objective 2: Implement Targeted Habitat Management and Restoration

Some sage-grouse populations warrant more than the amelioration of the impacts from stressors to maintain sage-grouse on the landscape. In these instances, and particularly with impacts resulting from wildfire, it may be critical to not only remove or reduce anthropogenic threats to these populations but additionally to improve population health through active habitat management (e.g., habitat restoration). This is particularly important for those populations that are essential to maintaining range-wide redundancy and representation. (COT Report, 2013)

In many areas of Wyoming, amelioration of threats isn't enough. Activities must be taken to enhance the habitat for continued success of Greater Sage-Grouse. This objective identifies the areas where RMPs will put forth the commitments for habitat restoration and enhancement.

The WGFD established local Greater Sage-Grouse working groups over 10 years ago. Each of these local working groups developed conservation plans which have served to guide conservation of Greater Sage-Grouse habitat at a local level. The management objectives for this federal LUP were developed in coordination with the State of Wyoming, recognizing the ongoing work which has been done over the last 10 years in Wyoming as a result of the conservation efforts identified by each of the local working groups.

Upon completion of the planning process, with issuance of an Approved Plan and ROD, subsequent implementation decisions will be put into effect by developing implementation (activity-level or project-specific) plans. These implementation decisions will be based upon the objectives identified in the Approved Plan and RODs, and will be coordinated with local working groups.

D.3. COT Objective 3: Develop and Implement State and Federal Conservation Strategies and Associated Incentive-based Conservation Actions and Regulatory Mechanisms

To conserve sage-grouse and habitat redundancy, representation, and resilience, state and federal agencies, along with interested stakeholders within range of the sage-grouse should work together to develop a plan, including any necessary regulatory or legal tools (or use an existing plan, if appropriate) that includes clear mechanisms for addressing the threats to sage-grouse within PACs. Where consistent with state conservation plans, sage-grouse habitats outside of PACs should also be addressed. We recognize that threats can be ameliorated through a variety of tools within the purview of states and federal agencies, including incentive-based conservation actions or regulatory mechanisms. Federal land management agencies should work with states in developing adequate regulatory mechanisms. Federal land management agencies should also contribute to the incentive-based conservation and habitat restoration and rehabilitation efforts. In the development of conservation plans, entities (states, federal land management agencies, etc.) should coordinate with FWS. This will ensure that the plans address the threats contributing to the 2010 warranted but precluded determination, and that conservation strategies will meaningfully contribute to future listing analyses. (COT Report, 2013)

D.3.1. Implementation Working Groups

Implementation strategies for a landscape scale species requires coordination across multiple scales, as the work that is conducted at the local scale must be tracked and evaluated for overall success within core areas, the state of Wyoming across the region. As the Greater Sage-Grouse is formally managed by the State of Wyoming, and has a statewide strategy through Governor's Executive Order 2011-05, implementation must be evaluated at that scale as well. For this reason, Wyoming Plans will utilize multiple types of working groups, representing each of the scales at which implementation will be tracked.

National Level

In December 2011, Wyoming Governor Matt Mead and Secretary of the Interior Ken Salazar co-hosted a meeting to address coordinated conservation of the sage-grouse across its range. Ten states within the range of the sage-grouse were represented, as were the USFS, the Natural Resources Conservation Service (NRCS), and the Department of the Interior (DOI) — including representatives from the DOI's BLM and USFWS. The primary outcome of the meeting was the creation of a Sage-Grouse Task Force (Task Force) chaired by Governors Mead (WY) and Hickenlooper (CO) and the Director of the BLM. The Task Force was directed to develop recommendations on how to best advance a coordinated, multi-state, range-wide effort to conserve the sage-grouse, including the identification of conservation objectives to ensure the long-term viability of the species.

Regional Level

Regional Level Teams (Sage Grouse Implementation Group)

*Appendix D Greater Sage-Grouse Habitat
Management Strategy
COT Objective 3: Develop and Implement
State and Federal Conservation Strategies and
Associated Incentive-based Conservation Actions
and Regulatory Mechanisms*

State Level

The Sage Grouse Implementation Team (SGIT) has been established through Wyoming Legislature (Wyoming Statute 9-19-101(a)) to review data and make recommendations to the Governor of Wyoming regarding actions and funding to enhance and restore Greater Sage-Grouse habitats in Wyoming. Additionally, the SGIT is responsible for making recommendations to the Governor regarding regulatory actions necessary to maintain Greater Sage-Grouse populations and Greater Sage-Grouse habitats.

Adaptive Management Working Group (AMWG) has been established in consultation with the SGIT to provide appropriate guidance for agencies with the ability to affect sage-grouse populations and/or habitat through their permitting authority. The AMWG includes BLM, USFS, USFWS, and State of Wyoming.

Local Level

In 2000, a Local Working Group was established by the WGFD to develop and facilitate implementation of local conservation plans for the benefit of sage-grouse, their habitats, and whenever feasible, other species that use sagebrush habitats. This group prepared the Wyoming Greater Sage-Grouse Conservation Plan (Wyoming Sage-Grouse Working Group 2003) to provide coordinated management and direction across the state. In 2004, local Greater Sage-Grouse working groups were formed to develop and implement local conservation plans. Eight local working groups around Wyoming have completed conservation plans, many of which prioritize addressing past, present, and reasonably foreseeable threats at the state and local levels, and prescribe management actions for private landowners to improve Greater Sage-Grouse conservation at the local scale, consistent with Wyoming's Core Population Area Strategy.

D.3.2. Implementation Tracking

Because the State of Wyoming continues to retain management of the species, and through implementation of the Executive Order, BLM Wyoming will continue to coordinate tracking of populations, disturbance and conservation actions.

- DDCT Geographic Information System (GIS) for tracking disturbance
- De-minimus Actions
- Population Counts
- Lek counts
- Conservation Actions

In addition to the tracking databases being maintained by the State of Wyoming, a national-Greater Sage-Grouse LUP Decision Monitoring and Reporting Tool is being developed to describe how the BLM will consistently and systematically monitor and report implementation-level activity plans and implementation actions for all plans within the range of sage-grouse. A description of this tool for collection and reporting of tabular and spatially explicit data will be included in the ROD or approved plan. The BLM will provide data that can be integrated with other conservation efforts conducted by state and federal partners.

D.3.3. Public Involvement

A website where the public can quickly and easily access data concerning implementation will be developed and kept current on the Wyoming BLM database. Creating this website and

maintaining it through the implementation cycle will be a vital part of implementation success. The public is welcome to provide implementation comments to the BLM any time during the cycle, but schedules for implementation planning decisions will be posted so the public can make timely comments. All Activity Plan Working Group meetings where recommendations are made to the BLM will be open to the public, and will provide for specific and helpful public involvement. This includes providing web-based information to the public prior to any Activity Plan Working Group meetings; such that members of the public can provide input to the working session, both early and mid-way through the scheduled meetings.

The state sponsored Local Working Group and SGIT meetings are advertised and open to the public.

D.4. COT Objective 4: Proactive Conservation Actions

Proactive, incentive based, voluntary conservation actions (e.g., Candidate Conservation Agreements with Assurances [CCAAs], NRCS programs) should be developed and/or implemented by interested stakeholders and closely coordinated across the range of the species to ensure they are complimentary and address sage-grouse conservation needs and threats. These efforts need to receive full funding, including funding for necessary personnel. (COT Report, 2013)

In addition to the conservation activities identified through implementation of the RMP in coordination with the Local Working Group Conservation Plans, BLM will continue to partner with other agencies and stakeholders to identify conservation actions to benefit Greater Sage-Grouse habitat. Actions which may occur could include Candidate Conservation Agreements (CCAs) with accompanying CCAAs and designation of conservation easements.

CCAs are entered into when a potential threat to habitat is identified. BLM enters into CCAs with USFWS to identify potential threats and plan for conservation measures to address potential threats. The purpose of federal land CCAs and the accompanying non-federal CCAAs, is to encourage conservation actions for species that are not yet listed as threatened or endangered. The goal is that enhancements in conservation can preclude the need for federal listing or so that conservation can occur before the status of the species has become so dire that listing is necessary. Although a single property owner's activities may not eliminate the need to list, conservation, if conducted by enough property owners throughout the species' range, can eliminate the need to list.

The BLM will work with partners and stakeholders to develop species-specific or ecosystem-based conservation strategies and will work cooperatively with other agencies, organizations, governments, and interested parties for the conservation of sensitive species and their habitats to meet agreed on species and habitat management goals. Cooperative efforts are important for conservation based on an ecosystem management approach and will improve efficiency by combining efforts and fostering collaborative working relationships.

Conservation Easements are identified private lands with Greater Sage-Grouse habitat where the private landowners enter into voluntary agreements with the government to give up developmental rights which may adversely affect habitat. The most common way these areas may be used in Wyoming is for mitigation banks. Allowing development within some areas of historic Greater Sage-Grouse habitat or marginal habitat will require appropriate mitigation. In some cases the most appropriate mitigation may be for project proponents to buy credits at a conservation easement, thus creating a mitigation bank. Overall, the benefit is to the Greater Sage-Grouse,

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as it reduces the overall potential for fragmented habitat by ensuring there are areas with no development potential which could adversely affect the viability of the species.

To learn more about what CCAs and CCAAs are in place for Greater Sage-Grouse, please see the US Fish and Wildlife website: <http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06W>

Sweetwater River Conservancy Habitat Conservation Bank

The Sweetwater River Conservancy Habitat Conservation Bank is the first conservation bank established for Greater Sage-Grouse. Located in central Wyoming, the bank manages habitat for Greater Sage-Grouse allowing energy development and other activities to proceed on other lands within Wyoming. A conservation bank is a site or suite of sites established under an agreement with the USFWS, intended to protect, and improve habitat for species. Credits may be purchased which result in perpetual conservation easements and conservation projects on the land to offset impacts occurring elsewhere. The Sweetwater River Conservancy Habitat Conservation Bank launched with 55,000 deeded acres of Greater Sage-Grouse habitat, and could expand up to 700,000 acres on other lands owned by the Sweetwater River Conservancy contingent upon demand (USFWS 2015).

Wyoming Landscape Conservation Initiative

The Wyoming Landscape Conservation Initiative is a long-term science based effort to assess and enhance aquatic and terrestrial habitats at a landscape scale in southwest Wyoming, while facilitating responsible development through local collaboration and partnership. Collaborative efforts address multiple concerns at a scale that considers all activities on the landscape, and can leverage resources that might not be available for single agency projects. Greater Sage-Grouse initiatives from the Wyoming Landscape Conservation Initiative have included habitat enhancement efforts (e.g., invasive weed treatment, prescribed grazing strategies), and Greater Sage-Grouse research studies (Wyoming Landscape Conservation Initiative 2013).

Powder River Basin Restoration Program

The Powder River Basin Restoration Program is a collaborative partnership to restore and enhance Greater Sage-Grouse habitat on a landscape level in the Powder River Basin. The basin encompasses 13,493,840 acres in northeast Wyoming and southeast Montana. Surface ownership is composed of approximately 70 percent private lands, 14 percent BLM-administered lands (including 8 percent in Wyoming and 6 percent in Montana), 8 percent USFS lands, and 8 percent States of Wyoming and Montana lands. Subsurface mineral ownership is 50 to 60 percent federal (BLM 2014).

The Powder River Basin Restoration Program is focusing on areas affected by the federal oil and gas development that has occurred over the past decade in the Powder River Basin in northeastern Wyoming. Its objectives are restoring or enhancing disturbed previously suitable habitat to suitable habitat for sagebrush obligate species, primarily Greater Sage-Grouse. This includes multiple sites affected by coalbed natural gas abandonment reclamation efforts, wildfires, and noxious and invasive plants. Priority will be given to those areas recognized as priority habitats (e.g., Core Population Areas and connectivity corridors).

Habitat objectives are meeting the needs for nesting, brood-rearing, and late brood-rearing. The program would contribute to efforts focused on the management and control of mosquitoes

carrying West Nile virus and would include funding, labor, treatment locations, and other needs as determined.

Additionally, efforts would be coordinated to reduce fuels in and near Greater Sage-Grouse habitat, to enhance sagebrush stands, support restoration efforts, and reduce the risk of high-severity wildfire. Pine stands and juniper woodlands would be managed for structural diversity and to reduce fuels, especially near PHMA, human developments, and recreation areas.

Natural Resources Conservation Service Sage Grouse Initiative

The US Department of Agriculture, NRCS's Sage-Grouse Initiative (SGI) is working with private landowners in 11 western states to improve habitat for Greater Sage-Grouse (Manier et al. 2013). With 13.5 million acres of Greater Sage-Grouse habitat in private ownership within MZ II/VII (Manier et al. 2013, p. 118), a unique opportunity exists for the NRCS to benefit Greater Sage-Grouse and to ensure the persistence of large and intact rangelands by implementing the SGI.

Participation in the SGI program is voluntary, but willing participants enter into binding contracts or easements to ensure that conservation practices that enhance Greater Sage-Grouse habitat, such as fence marking, protecting riparian areas, and maintaining vegetation in nesting areas, are implemented. Participating landowners are bound by a contract (usually 3 to 5 years) to implement, in consultation with NRCS staff, conservation practices if they wish to receive the financial incentives offered by the SGI. These financial incentives generally take the form of payments to offset costs of implementing conservation practices and easements or rental payments for long-term conservation.

While potentially effective at conserving Greater Sage-Grouse populations and habitat on private lands, incentive-based conservation programs that fund the SGI generally require reauthorization from Congress under subsequent farm bills, meaning future funding is not guaranteed.

D.5. COT Objective 5: Development of Monitoring Plans

A robust range-wide monitoring program must be developed and implemented for sage-grouse conservation plans, which recognizes and incorporates individual state approaches. A monitoring program is necessary to track the success of conservation plans and proactive conservation activities. Without this information, the actual benefit of conservation activities cannot be measured and there is no capacity to adapt if current management actions are determined to be ineffective. (COT Report, 2013)

D.5.1. The Greater Sage-Grouse Monitoring Framework

D.5.1.1. Introduction

The purpose of this Greater Sage-Grouse Monitoring Framework (hereafter, monitoring framework) is to describe the methods to monitor habitats and evaluate the implementation and effectiveness of the BLM planning strategy (BLM IM 2012-044) to conserve the species and its habitat. The regulations for the BLM (43 CFR 1610.4-9) require that LUPs establish intervals and standards, as appropriate, for monitoring and evaluations, based on the sensitivity of the resource to the decisions involved. Therefore, BLM will use the methods described herein to collect monitoring data to evaluate implementation and effectiveness of the Greater Sage-Grouse

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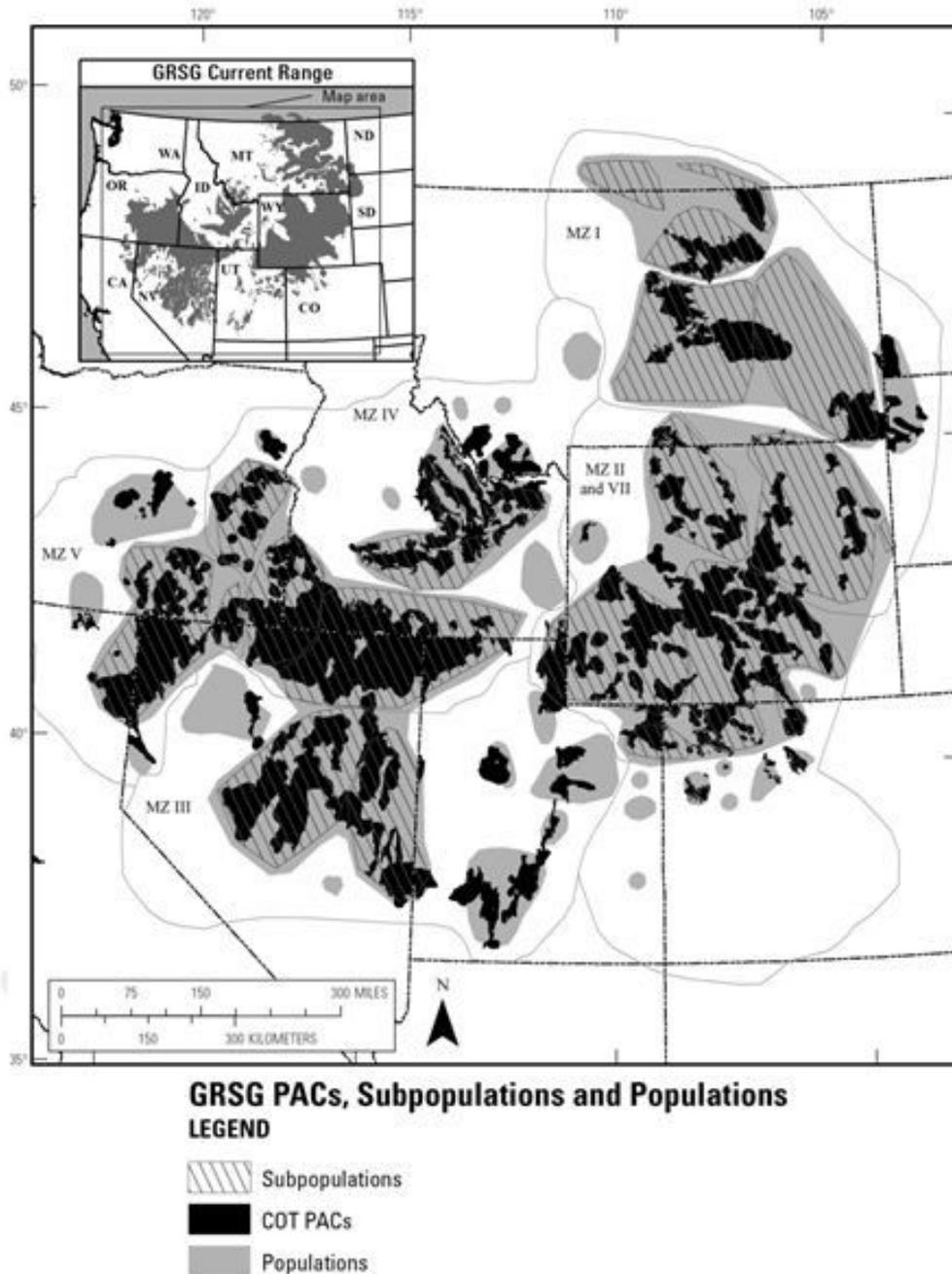
(hereafter, sage-grouse) planning strategy and the conservation measures contained in LUPs. The type of monitoring data to be collected at the LUP scale will be described in the monitoring plan which will be developed after the signing of the ROD. For a summary of the frequency of reporting see Attachment A. Adaptive management will be informed by data collected at any and all scales.

To ensure the BLM has the ability to make consistent assessments about sage-grouse habitats across the range of the species, this framework lays out the methodology for monitoring the implementation and evaluating the effectiveness of BLM actions to conserve the species and its habitat through monitoring that informs effectiveness at multiple scales. Monitoring efforts will include data for measurable quantitative indicators of sagebrush availability, anthropogenic disturbance levels, and sagebrush conditions. Implementation monitoring results will provide information to allow the BLM to evaluate the extent that decisions from the BLM RMPs to conserve sage-grouse and its habitat have been implemented. Population monitoring information will be collected by state fish and wildlife agencies and will be incorporated into effectiveness monitoring as it is made available.

This multi-scale monitoring approach is necessary as sage-grouse are a landscape species and conservation is scale-dependent whereby conservation actions are implemented within seasonal habitats to benefit populations. The four orders of habitat selection (Johnson 1980) used in this monitoring framework are described by Connelly et al. (2003) and Stiver et al. (2014) as first order (broad scale), second order (mid-scale), third order (fine scale), and fourth order (site scale) to apply them to sage-grouse habitat selection. The various scales may show differences because of the methods used. The broad and mid-scale may provide a generalized direction, however the suitability baseline (pre-euro) is not considered an accurate baseline. The current baseline will provide better information on trends provided the data used in the analysis is sound. Based upon the management actions related to the BLM and Wyoming Greater Sage-Grouse Executive Order, the broad and mid-scale may greatly underestimate the impacts of the threats outlined in the COT report. Habitat selection and habitat use by sage-grouse occurs at multiple scales and is driven by multiple environmental and behavioral factors. Managing and monitoring sage-grouse habitats are complicated by the differences in habitat selection across the range and habitat utilization by individual birds within a given season. Therefore, the tendency to look at a single indicator of habitat suitability or only one scale limits the ability for managers to identify the threats to sage-grouse and to respond at the appropriate scale. For descriptions of these habitat suitability indicators for each scale, see the Sage-grouse Habitat Assessment Framework (HAF) (Stiver et al. 2015).

Monitoring methods and indicators in this monitoring framework are derived from the current peer-reviewed science. Range wide best-available datasets for broad and mid-scale monitoring will be acquired. If these existing datasets are not readily available or are inadequate, but are necessary to effectively inform the three measurable quantitative indicators (sagebrush availability, anthropogenic disturbance levels, and sagebrush conditions), the BLM will strive to develop datasets or obtain information to fill these data gaps. Datasets that are not readily available to inform the fine and site scale indicators will be developed. These data will be used to generate monitoring reports at the appropriate and applicable geographic scales, boundaries and analysis units: across the range of sage-grouse as defined by Schroeder et al. (2004), and clipped by WAFWA MZ (Stiver et al. 2006) boundaries and other areas as appropriate for size (e.g., populations based on Connelly et al. 2004; Figure D.6, “Map of Greater Sage-Grouse Range, Populations, Subpopulations, and Priority Areas for Conservation as of 2013” (p. 349)). This broad and mid-scale monitoring data and analysis will provide context for RMP/land management plan areas; states; Greater Sage-Grouse Priority Habitat, General Habitat and other sage-grouse

designated management areas; and PACs as defined in the Greater Sage-grouse Conservation Objectives: Final Report (COT, U.S. Fish and Wildlife Service 2013). Throughout the remainder of the document, all of these areas will be referred to as “sage-grouse areas.”



Source: Schroeder et al. 2004, Connelly et al. 2004, USFWS 2013

COT Conservation Objectives Team
 PAC Priority Area for Conservation

Figure D.6. Map of Greater Sage-Grouse Range, Populations, Subpopulations, and Priority Areas for Conservation as of 2013

Appendix D Greater Sage-Grouse Habitat Management Strategy

The Greater Sage-Grouse Monitoring Framework

This monitoring framework is divided into two sections. The broad- and mid-scale methods, described in Section D.5.1.2, “Broad and Mid-Scales” (p. 350), provide a consistent approach across the range of the species to monitor implementation decisions and actions, mid-scale habitat attributes (e.g., sagebrush availability and habitat degradation), and population changes to determine the effectiveness of the planning strategy and management decisions. (See Table D.3, “Indicators for Monitoring Implementation of the Strategy, Decisions, Sage-Grouse Habitat, and Sage-Grouse Population at the Broad and Mid-scales” (p. 350)) For sage-grouse habitat at the fine and site scales, described in Section D.5.1.3, “Fine and Site Scales” (p. 375), this monitoring framework describes a consistent approach (e.g., indicators and methods) for monitoring sage-grouse seasonal habitats. Funding, support, and dedicated personnel for broad- and mid-scale monitoring will be renewed annually through the normal budget process. For an overview of BLM multiscale monitoring commitments (see Attachment A).

Table D.3. Indicators for Monitoring Implementation of the Strategy, Decisions, Sage-Grouse Habitat, and Sage-Grouse Population at the Broad and Mid-scales

| Implementation | | Habitat | | Population (State Wildlife Agencies) |
|---|---|--|--|--|
| Geographic Scales | | Availability | Degradation | Demographics |
| Broad Scale: From the range of sage-grouse to WAFWA Management Zones | BLM Planning Strategy goal and objectives | Distribution and amount of sagebrush within the range | Distribution and amount of energy, mining and infrastructure facilities | WAFWA Management Zone population trend |
| Mid-scale: From WAFWA Management Zone to populations | An analysis of RMP decisions across the designated scale | Mid-scale habitat indicators (HAF 2014; Table 2 e.g., percent of sagebrush per unit area) | Distribution and amount of energy, mining and infrastructure facilities (Table 2) | Individual population trend |
| Fine Scale: PACs | A summary of DDCT actions related to BLM mineral and surface resources in conjunction with other ownerships | Areas that have greater than 5% sagebrush cover and non-habitat (unsuitable) that is less than 0.6 miles from the suitable habitat | Distribution and amount of anthropogenic disturbances and wildfire occurrences impacting specific PACs | PAC trends |
| Site Scale: DDCT Level | A summary of DDCT actions related to BLM mineral and surface resources | The available occupied habitat using the DDCT process | Distribution and amount of anthropogenic disturbances and wildfire occurrences impacting specific PACs | Individual lek trends |
| BLM Bureau of Land Management DDCT Density and Disturbance Calculation Tool PAC Priority Area for Conservation WAFWA Western Association of Fish and Wildlife Agencies | | | | |

D.5.1.2. Broad and Mid-Scales

First-order habitat selection, the broad scale, describes the physical or geographical range of a species. The first-order habitat of the sage-grouse is defined by populations of sage-grouse associated with sagebrush landscapes, based on Schroeder et al. 2004, and Connelly et al.

2004, and on population or habitat surveys since 2004. An intermediate scale between the broad and mid scales was delineated by WAFWA from floristic provinces within which similar environmental factors influence vegetation communities. This scale is referred to as the WAFWA Sage-Grouse MZs. Although no indicators are specific to this scale, these MZs are biologically meaningful as reporting units.

Second-order habitat selection, the mid-scale, includes sage-grouse populations and PACs. The second order includes at least 40 discrete populations and subpopulations (Connelly et al. 2004). Populations range in area from 150 to 60,000 square miles and are nested within MZs. PACs range from 20 to 20,400 square miles and are nested within population areas.

Other mid-scale landscape indicators, such as patch size and number, patch connectivity, linkage areas, and landscape matrix and edge effects (Stiver et al. 2015) will also be assessed. The methods used to calculate these metrics will be derived from existing literature (Knick et al. 2011; Leu and Hanser 2011; Knick and Hanser 2011).

Midscale indicators using the HAF can grossly underestimate the occupation of anthropogenic activities because of the use of 30 meter pixels (page Table II – X). The HAF removes ‘non’ habitat from the suitability availability. There are no parameters that are provided to protect adjacent suitable habitat from development on these nonhabitat parcels, thus making the adjacent nonhabitat a potential threat by indirect impacts.

The Wyoming BLM Offices will be actively participating in a fine and site scale monitoring that will more accurately reflect the impacts associated with direct and indirect effects of anthropogenic and wildfire impacts.

D.5.1.2.1. Implementation (Decision) Monitoring

Implementation monitoring is the process of tracking and documenting the implementation (or the progress toward implementation) of RMP/land management plan decisions. The BLM will monitor implementation of project-level and/or site-specific actions and authorizations, with their associated conditions of approval/stipulations for sage-grouse, spatially (as appropriate) within Priority Habitat, General Habitat, and other sage-grouse designated management areas, at a minimum, for the Buffalo planning area. These actions and authorizations, as well as progress toward completing and implementing activity-level plans, will be monitored consistently across all planning units and will be reported to BLM headquarters annually, as well as reported to the State of Wyoming with numerical and spatial data twice a year, and a HQ summary report every 5 years, for the Buffalo planning area. A national-level Greater Sage-Grouse Land Use Plan Decision Monitoring and Reporting Tool is being developed to describe how the BLM will consistently and systematically monitor and report implementation-level activity plans and implementation actions for all plans within the range of sage-grouse. A description of this tool for collection and reporting of tabular and spatially explicit data will be included in the ROD or approved plan. The BLM will provide data that can be integrated with other conservation efforts conducted by state and federal partners.

D.5.1.2.2. Habitat (Vegetation) Monitoring

The USFWS, in its 2010 listing decision for the sage-grouse, identified 18 threats contributing to the destruction, modification, or curtailment of sage-grouse habitat or range (75 Federal Register 13910 2010). The BLM will, therefore, monitor the relative extent of these threats

that remove sagebrush, both spatially and temporally, on all lands within an analysis area, and will report on amount, pattern, and condition at the appropriate and applicable geographic scales and boundaries. These 18 threats have been aggregated into three broad- and mid-scale measures to account for whether the threat predominantly removes sagebrush or degrades habitat (see Table D.4, “Relationship Between the Eighteen Threats and the Three Habitat Disturbance Measures for Monitoring” (p. 352)). The three measures are:

1. Sagebrush Availability (percent of sagebrush per suitable unit area)
2. Habitat Degradation (percent of human activity per unit area)
3. Energy and Mining Density (facilities and locations per suitable unit area)

These three habitat disturbance measures will evaluate disturbance on all lands within priority habitat, regardless of land ownership. The direct area of influence will be assessed with the goal of accounting for actual removal of sagebrush on which sage-grouse depend (Connelly et al. 2000) and for habitat degradation as a surrogate for human activity. Measure 1 (sagebrush availability) examines where disturbances have removed plant communities that support sagebrush (or have broadly removed sagebrush from the landscape). Measure 1, therefore, monitors the change in sagebrush availability—or, specifically, where and how much of the sagebrush community is available on lands that can support sagebrush within the range of sage-grouse. The sagebrush community is defined as the ecological systems that have the capability of supporting sagebrush vegetation and seasonal sage-grouse habitats within the range of sage-grouse (see Section D.5.1.2.2.1, “Sagebrush Availability (Measure 1)” (p. 353)). Measure 2 (see Section D.5.1.2.2.2, “Habitat Degradation Monitoring (Measure 2)” (p. 364)) and Measure 3 (see Section D.5.1.2.2.3, “Energy and Mining Density (Measure 3)” (p. 369)) focus on where habitat degradation is occurring within suitable sagebrush soils by using the footprint/area of direct disturbance and the number of facilities at the mid scale to identify the relative amount of degradation per geographic area of interest and in areas that have the capability of supporting sagebrush and seasonal sage-grouse use. Measure 2 (habitat degradation) not only quantifies footprint/area of direct disturbance but also establishes a surrogate for those threats most likely to have ongoing activity. Because energy development and mining activities are typically the most intensive activities in sagebrush habitat, Measure 3 (the density of active energy development, production, and mining sites) will help identify areas of particular concern for such factors as noise, dust, traffic, etc. that degrade sage-grouse habitat.

Table D.4. Relationship Between the Eighteen Threats and the Three Habitat Disturbance Measures for Monitoring

| USFWS Listing Decision Threat | Sagebrush Availability | Habitat Degradation | Density of Energy and Mining |
|---|------------------------|---------------------|------------------------------|
| Agriculture | X | | |
| Urbanization | X | | |
| Wildfire | X | | |
| Conifer encroachment | X | | |
| Treatments | X | | |
| Invasive Species | X | | |
| Energy (oil and gas wells and development facilities) | | X | X |
| Energy (coal mines) | | X | X |
| Energy (wind towers) | | X | X |
| Energy (solar fields) | | X | X |
| Energy (geothermal) | | X | X |

| USFWS Listing Decision Threat | Sagebrush Availability | Habitat Degradation | Density of Energy and Mining |
|---|------------------------|---------------------|------------------------------|
| Mining (active locatable, leasable, and salable developments) | | X | X |
| Infrastructure (roads) | | X | |
| Infrastructure (railroads) | | X | |
| Infrastructure (powerlines) | | X | |
| Infrastructure (communication towers) | | X | |
| Infrastructure (other vertical structures) | | X | |
| Other developed rights-of-ways | | X | |
| Note: Data availability may preclude specific analysis of individual layers. See the detailed methodology for more information. | | | |
| USFWS U.S. Fish and Wildlife Service | | | |

The methods to monitor disturbance found herein differ slightly from methods used in the Sage-Grouse Baseline Environmental Report (BER) (Manier et al. 2013) that provided a baseline of datasets of disturbance across jurisdictions. One difference is that, for some threats, the data in the BER were for federal lands only. In addition, threats were assessed individually in that report, using different assumptions from those in this monitoring framework about how to quantify the location and magnitude of threats. The methodology herein builds on the BER methodology and identifies datasets and procedures to utilize the best available data across the range of the sage-grouse and to formulate a consistent approach to quantify impact of the threats through time. This methodology also describes an approach to combine the threats and calculate the three measures.

D.5.1.2.2.1. Sagebrush Availability (Measure 1)

Sage-grouse populations have been found to be more resilient where a percentage of the landscape is maintained in sagebrush (Knick and Connelly 2011), which will be determined by sagebrush availability. Measure 1 has been divided into two submeasures to describe sagebrush availability on the landscape:

- Measure 1a: the current amount of sagebrush on the geographic area of interest, and
- Measure 1b: the amount of sagebrush on the geographic area of interest compared with the amount of sagebrush the landscape of interest could ecologically support.

Measure 1a (the current amount of sagebrush on the landscape) will be calculated using this formula: [the existing updated sagebrush layer] divided by [the geographic area of interest]. The appropriate geographic areas of interest for sagebrush availability include the species' range, WAFWA MZs, populations, and PACs. In some cases these sage-grouse areas will need to be aggregated to provide an estimate of sagebrush availability with an acceptable level of accuracy.

Measure 1b (the amount of sagebrush for context within the geographic area of interest) will be calculated using this formula: [existing sagebrush divided by [pre-EuroAmerican settlement geographic extent of lands that could have supported sagebrush]]. This measure will provide information to set the context for a given geographic area of interest during evaluations of monitoring data. The information could also be used to inform management options for restoration or mitigation and to inform effectiveness monitoring.

The sagebrush base layer for Measure 1 will be based on geospatial vegetation data adjusted for the threats listed in Table D.2, “Implementation of RMP Decisions to Address COT Threats” (p. 328). The following subsections of this monitoring framework describe the methodology for determining both the current availability of sagebrush on the landscape and the context of the amount of sagebrush on the landscape at the broad and mid scales.

a. Establishing the Sagebrush Base Layer: The current geographic extent of sagebrush vegetation within the rangewide distribution of sage-grouse populations will be ascertained using the most recent version of the Existing Vegetation Type (EVT) layer in LANDFIRE (2013). LANDFIRE EVT was selected to serve as the sagebrush base layer for five reasons: 1) it is the only nationally consistent vegetation layer that has been updated multiple times since 2001; 2) the ecological systems classification within LANDFIRE EVT includes multiple sagebrush type classes that, when aggregated, provide a more accurate (compared with individual classes) and seamless sagebrush base layer across jurisdictional boundaries; 3) LANDFIRE performed a rigorous accuracy assessment from which to derive the rangewide uncertainty of the sagebrush base layer; 4) LANDFIRE is consistently used in several recent analyses of sagebrush habitats (Knick et al. 2011; Leu and Hanser 2011; Knick and Hanser 2011); and 5) LANDFIRE EVT can be compared against the geographic extent of lands that are believed to have had the capability of supporting sagebrush vegetation pre-EuroAmerican settlement (LANDFIRE Biophysical Setting). This fifth reason provides a reference point for understanding how much sagebrush currently remains in a defined geographic area of interest compared with how much sagebrush existed historically (Measure 1b). Therefore, the BLM has determined that LANDFIRE provides the best available data at broad and mid scales to serve as a sagebrush base layer for monitoring changes in the geographic extent of sagebrush. The BLM, in addition to aggregating the sagebrush types into the sagebrush base layer, will aggregate the accuracy assessment reports from LANDFIRE to document the cumulative accuracy for the sagebrush base layer. The BLM—through its Assessment, Inventory, and Monitoring (AIM) program and, specifically, the BLM’s landscape monitoring framework (Taylor et al. 2014) will provide field data to the LANDFIRE program to support continuous quality improvements of the LANDFIRE EVT layer. The sagebrush layer based on LANDFIRE EVT will allow for the mid-scale estimation of the existing percent of sagebrush across a variety of reporting units. This sagebrush base layer will be adjusted by changes in land cover and successful restoration for future calculations of sagebrush availability (Measures 1a and 1b).

This layer will also be used to determine the trend in other landscape indicators, such as patch size and number, patch connectivity, linkage areas, and landscape matrix and edge effects (Stiver et al. 2015). In the future, changes in sagebrush availability, generated annually, will be included in the sagebrush base layer. The landscape metrics will be recalculated to examine changes in pattern and abundance of sagebrush at the various geographic boundaries. This information will be included in effectiveness monitoring (see Section D.5.1.2.4, “Effectiveness Monitoring” (p. 370)).

Within the BLM, field office–wide existing vegetation classification mapping and inventories are available that provide a much finer level of data than what is provided through LANDFIRE. Where available, these finer-scale products will be useful for additional and complementary mid-scale indicators and local-scale analyses (see Section D.5.1.3, “Fine and Site Scales” (p. 375)). The fact that these products are not available everywhere limits their utility for monitoring at the broad and mid scale, where consistency of data products is necessary across broader geographies.

The sagebrush layer based on LANDFIRE EVT will allow for the mid-scale estimation of existing percent sagebrush across a variety of reporting units. This sagebrush base layer will be

adjusted by changes in land cover and successful restoration for future calculations of sagebrush availability (Measures 1a and 1b).

This layer will be used to determine the trend in other landscape indicators, e.g., patch size and number, patch connectivity, linkage areas, and landscape matrix and edge effects (Stiver et al. 2015). In the future, changes in sagebrush availability, generated bi-annually, will be included in the sagebrush base layer. The landscape metrics will be recalculated to examine changes in pattern and abundance of sagebrush at the various geographic boundaries. This information will be included in effectiveness monitoring (see Section D.5.1.2.4, “Effectiveness Monitoring” (p. 370)).

Data Sources for Establishing and Monitoring Sagebrush Availability

In much the same manner as how the LANDFIRE data was selected as the data source, described above, the criteria for selecting the datasets (see Table D.5, “Datasets for Establishing and Monitoring Changes in Sagebrush Activity” (p. 355)) for establishing and monitoring the change in sagebrush availability, Measure 1, were threefold:

- Nationally consistent dataset available across the range
- Known level of confidence or accuracy in the dataset
- Continual maintenance of dataset and known update interval

Table D.5. Datasets for Establishing and Monitoring Changes in Sagebrush Activity

| Dataset | Source | Update Interval | Most Recent Version Year | Use |
|--|--|------------------------|---------------------------------|---|
| BioPhysical Setting v1.1 | LANDFIRE | Static | 2008 | Denominator for Sagebrush Availability (1.b.) |
| Existing Vegetation Type v1.2 | LANDFIRE | Static | 2010 | Numerator for Sagebrush Availability |
| Cropland Data Layer | National Agricultural Statistics Service | Annual | 2012 | Agricultural Updates; removes existing sagebrush from numerator of sagebrush availability |
| National Land Cover Dataset Percent Imperviousness | Multi-Resolution Land Characteristics Consortium | 5 Year | 2011 available in March 2014 | Urban Area Updates; removes existing sagebrush from numerator of sagebrush availability |
| Fire Perimeters | GeoMac | Annual | 2013 | < 1,000 acres Fire updates; removes existing sagebrush from numerator of sagebrush availability |
| Burn Severity | Monitoring Trends in Burn Severity | Annual | 2012 available in April 2014 | > 1,000 acres Fire Updates; removes existing sagebrush from numerator of sagebrush availability except for unburned sagebrush islands |
| < less than > greater than | | | | |

LANDFIRE Existing Vegetation Type Version 1.2

LANDFIRE EVT represents EVTs on the landscape derived from remote sensing data. Initial mapping was conducted using imagery collected in approximately 2001. Since the initial mapping there have been two update efforts: version 1.1 represents changes before 2008, and version 1.2 reflects changes on the landscape before 2010. Version 1.2 will be used as the starting point to develop the sagebrush base layer.

Ecological systems from the LANDFIRE EVT to be used in the sagebrush base layer were determined by sage-grouse subject matter experts through the identification of the ecological systems that have the capability of supporting sagebrush vegetation and could provide suitable seasonal habitat for the sage-grouse (see Table D.6, “Ecological Systems in biophysical setting and EVT Capable of Supporting Sagebrush Vegetation and Could Provide Suitable Seasonal Habitat for Greater Sage-Grouse” (p. 356)). Two additional vegetation types that are not ecological systems were added to the EVT and are *Artemisia tridentata* ssp. *vaseyana* Shrubland Alliance and *Quercus gambelii* Shrubland Alliance. These alliances have species composition directly related to the Rocky Mountain Lower Montane - Foothill Shrubland ecological system and the Rocky Mountain Gambel Oak-Mixed Montane Shrubland ecological system, both of which are ecological systems in LANDFIRE Biophysical Setting. In LANDFIRE EVT however, in some map zones, the Rocky Mountain Lower Montane - Foothill Shrubland ecological system and the Rocky Mountain Gambel Oak-Mixed Montane Shrubland ecological system were named *Artemisia tridentata* ssp. *vaseyana* Shrubland Alliance and *Quercus gambelii* Shrubland Alliance respectively.

Table D.6. Ecological Systems in biophysical setting and EVT Capable of Supporting Sagebrush Vegetation and Could Provide Suitable Seasonal Habitat for Greater Sage-Grouse

| Ecological System | Sagebrush Vegetation that the Ecological System has the Capability to Produce |
|---|--|
| Colorado Plateau Mixed Low Sagebrush Shrubland | <i>Artemisia arbuscula</i> ssp. <i>longiloba</i> <i>Artemisia bigelovii</i> <i>Artemisia nova</i> <i>Artemisia frigida</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> |
| Columbia Plateau Scabland Shrubland | <i>Artemisia rigida</i> |
| Great Basin Xeric Mixed Sagebrush Shrubland | <i>Artemisia arbuscula</i> ssp. <i>longicaulis</i> <i>Artemisia arbuscula</i> ssp. <i>longiloba</i> <i>Artemisia nova</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> |
| Inter-Mountain Basins Big Sagebrush Shrubland | <i>Artemisia tridentata</i> ssp. <i>tridentata</i> <i>Artemisia tridentata</i> ssp. <i>xericensis</i> <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> |
| Inter-Mountain Basins Mixed Salt Desert Scrub | <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> <i>Artemisia spinescens</i> |
| Wyoming Basins Dwarf Sagebrush Shrubland and Steppe | <i>Artemisia arbuscula</i> ssp. <i>longiloba</i> <i>Artemisia nova</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> <i>Artemisia tripartita</i> ssp. <i>rupicola</i> |
| Columbia Plateau Low Sagebrush Steppe | <i>Artemisia arbuscula</i> <i>Artemisia arbuscula</i> ssp. <i>longiloba</i> <i>Artemisia nova</i> |

| Ecological System | Sagebrush Vegetation that the Ecological System has the Capability to Produce |
|---|--|
| Inter-Mountain Basins Big Sagebrush Steppe | <i>Artemisia cana</i> ssp. <i>cana</i> <i>Artemisia tridentata</i> ssp. <i>tridentata</i> <i>Artemisia tridentata</i> ssp. <i>xericensis</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> <i>Artemisia tripartita</i> ssp. <i>tripartita</i> <i>Artemisia frigida</i> |
| Inter-Mountain Basins Montane Sagebrush Steppe | <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> <i>Artemisia nova</i> <i>Artemisia arbuscula</i> <i>Artemisia tridentata</i> ssp. <i>spiciformis</i> |
| Northwestern Great Plains Mixed grass Prairie | <i>Artemisia cana</i> ssp. <i>cana</i> <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> <i>Artemisia frigida</i> |
| Northwestern Great Plains Shrubland | <i>Artemisia cana</i> ssp. <i>cana</i> <i>Artemisia tridentata</i> ssp. <i>tridentata</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> |
| Western Great Plains Sand Prairie | <i>Artemisia cana</i> ssp. <i>cana</i> |
| Western Great Plains Floodplain Systems | <i>Artemisia cana</i> ssp. <i>cana</i> |
| Columbia Plateau Steppe and Grassland | <i>Artemisia</i> spp. |
| Inter-Mountain Basins Semi-Desert Shrub-Steppe | <i>Artemisia tridentata</i> <i>Artemisia bigelovii</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> |
| Rocky Mountain Lower Montane-Foothill Shrubland | <i>Artemisia nova</i> <i>Artemisia tridentata</i> <i>Artemisia frigida</i> |
| Rocky Mountain Gambel Oak-Mixed Montane Shrubland | <i>Artemisia tridentata</i> |
| Inter-Mountain Basins Curl-Leaf Mountain Mahogany Woodland and Shrubland | <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> <i>Artemisia arbuscula</i> <i>Artemisia tridentata</i> |
| <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> Shrubland Alliance (EVT only) | <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> |
| <i>Quercus gambelii</i> Shrubland Alliance (EVT only) | <i>Artemisia tridentata</i> |
| EVT Existing Vegetation Type | |

Accuracy and Appropriate Use of LANDFIRE Datasets

Because of concerns over the thematic accuracy of individual classes mapped by LANDFIRE, all ecological systems listed in Table D.6, “Ecological Systems in biophysical setting and EVT Capable of Supporting Sagebrush Vegetation and Could Provide Suitable Seasonal Habitat for Greater Sage-Grouse” (p. 356) will be merged into one value that represents the sagebrush base layer. With all ecological systems aggregated, the combined accuracy of the sagebrush base layer (EVT) will be much greater than if all categories were treated separately.

LANDFIRE performed the original accuracy assessment of their EVT product on a map zone basis. There are 20 LANDFIRE map zones that cover the historic range of sage-grouse as defined by Schroeder (2004). Attachment C lists the user and producer accuracies for the aggregated ecological systems that make up the sagebrush base layer and also defines user and producer accuracies. The aggregated sagebrush base layer for monitoring had producer accuracies ranging from 56.7 percent to 100 percent and user accuracies ranging from 57.1 percent to 85.7 percent.

LANDFIRE EVT data are not designed to be used at a local level. In reports of the percent sagebrush statistic for the various reporting units (Measure 1a), the uncertainty of the percent

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sagebrush will increase as the size of the reporting unit gets smaller. LANDFIRE data should never be used at the 30m pixel level (900m² resolution of raster data) for any reporting. The smallest geographic extent for using the data to determine percent sagebrush is at the PAC level; for the smallest PACs, the initial percent sagebrush estimate will have greater uncertainties compared with the much larger PACs.

Agricultural Adjustments for the Sagebrush Base Layer

The dataset for the geographic extent of agricultural lands will come from the National Agricultural Statistics Service (NASS) Cropland Data Layer (CDL) (<http://www.nass.usda.gov/research/Cropland/Release/index.htm>). CDL data are generated annually, with estimated producer accuracies for “large area row crops ranging from the mid 80% to mid-90%,” depending on the state (http://www.nass.usda.gov/research/Cropland/sarsfaqs2.htm#Section3_18.0). Specific information on accuracy may be found on the NASS metadata website (<http://www.nass.usda.gov/research/Cropland/metadata/meta.htm>). CDL provided the only dataset that matches the three criteria (nationally consistent, known level of accuracy, and periodically updated) for use in this monitoring framework and represents the best available agricultural lands mapping product.

The CDL data contain both agricultural classes and nonagricultural classes. For this effort, and in the BER (Manier et al. 2013), nonagricultural classes were removed from the original dataset. The excluded classes are:

Barren (65 & 131), Deciduous Forest (141), Developed/High Intensity (124), Developed/Low Intensity (122), Developed/Med Intensity (123), Developed/Open Space (121), Evergreen Forest (142), Grassland Herbaceous (171), Herbaceous Wetlands (195), Mixed Forest (143), Open Water (83 & 111), Other Hay/Non Alfalfa (37), Pasture/Hay (181), Pasture/Grass (62), Perennial Ice/Snow (112), Shrubland (64 & 152), Woody Wetlands (190).

The rule set for adjusting the sagebrush base layer for agricultural lands (and for updating the base layer for agricultural lands in the future) is that once an area is classified as agriculture in any year of the CDL, those pixels will remain out of the sagebrush base layer even if a new version of the CDL classifies that pixel as one of the nonagricultural classes listed above. The assumption is that even though individual pixels may be classified as a nonagricultural class in any given year, the pixel has not necessarily been restored to a natural sagebrush community that would be included in Table D.6, “Ecological Systems in biophysical setting and EVT Capable of Supporting Sagebrush Vegetation and Could Provide Suitable Seasonal Habitat for Greater Sage-Grouse” (p. 356). A further assumption is that once an area has moved into agricultural use, it is unlikely that the area would be restored to sagebrush. Should that occur, however, the method and criteria for adding pixels back into the sagebrush base layer would follow those found in the Sagebrush Restoration Monitoring section of this monitoring framework.

Urban Adjustments for the Sagebrush Base Layer

The National Land Cover Dataset (NLCD) Percent Imperviousness was selected as the best available dataset to be used for urban updates. These data are generated on a five-year cycle and specifically designed to support monitoring efforts. Other datasets were evaluated and lacked the spatial specificity that was captured in the NLCD product. Any new impervious pixel will be removed from the sagebrush base layer during the update process. Although the impervious surface layer includes a number of impervious pixels outside of urban areas, there are two reasons

why this is acceptable for this process. First, an evaluation of national urban area datasets did not reveal a layer that could be confidently used in conjunction with the NLCD product to screen impervious pixels outside of urban zones because unincorporated urban areas were not being included thus leaving large chunks of urban pixels unaccounted for in this rule set. Secondly, experimentation with setting a threshold on the percent imperviousness layer that would isolate rural features proved to be unsuccessful. No combination of values could be identified that would result in the consistent ability to limit impervious pixels outside urban areas. Therefore, to ensure consistency in the monitoring estimates, it was determined to include all impervious pixels.

Fire Adjustments for the Sagebrush Base Layer

Two datasets were selected for performing fire adjustments and updates: GeoMac fire perimeters and Monitoring Trends in Burn Severity (MTBS). An existing data standard in the BLM requires that all fires of more than 10 acres are to be reported to GeoMac; therefore, there will be many small fires of less than 10 acres that will not be accounted for in the adjustment and monitoring attributable to fire. Using fire perimeters from GeoMac, all sagebrush pixels falling within the perimeter of fires less than 1,000 acres will be used to adjust and monitor the sagebrush base layer.

For fires greater than 1,000 acres, MTBS was selected as a means to account for unburned sagebrush islands during the update process of the sagebrush base layer. The MTBS program (<http://www.mtbs.gov>) is an ongoing, multiyear project to map fire severity and fire perimeters consistently across the United States. One of the burn severity classes within MTBS is an unburned to low-severity class. This burn severity class will be used to represent unburned islands of sagebrush within the fire perimeter for the sagebrush base layer. Areas within the other severity classes within the fire perimeter will be removed from the base sagebrush layer during the update process. Not all wildfires, however, have the same impacts on the recovery of sagebrush habitat, depending largely on soil moisture and temperature regimes. For example, cooler, moister sagebrush habitat has a higher potential for recovery or, if needed, restoration than does the warmer, dryer sagebrush habitat. These cooler, moister areas will likely be detected as sagebrush in future updates to LANDFIRE.

Conifer Encroachment Adjustment for the Sagebrush Base Layer

Conifer encroachment into sagebrush vegetation reduces the spatial extent of sage-grouse habitat (Davies et al. 2011; Baruch-Mordo et al. 2013). Conifer species that show propensity for encroaching into sagebrush vegetation resulting in sage-grouse habitat loss include various juniper species, such as Utah juniper (*Juniperus osteosperma*), western juniper (*Juniperus occidentalis*), Rocky Mountain juniper (*Juniperus scopulorum*), pinyon species, including singleleaf pinyon (*Pinus monophylla*) and pinyon pine (*Pinus edulis*), ponderosa pine (*Pinus ponderosa*), lodgepole pine (*Pinus contorta*), and Douglas-fir (*Pseudotsuga menziesii*) (Gruell et al. 1986; Grove et al. 2005; Davies et al. 2011).

A rule set for conifer encroachment was developed to be used for determination of the existing sagebrush base layer. To capture the geographic extent of sagebrush that is likely to experience conifer encroachment, ecological systems within LANDFIRE EVT version 1.2 (NatureServe 2011) were identified if they have the capability of supporting the conifer species (listed above) and have the capability of supporting sagebrush vegetation. Those ecological systems (see Table D.7, “Ecological Systems with Conifers Most Likely to Encroach into Sagebrush Vegetation” (p. 360)) were deemed to be the plant communities with conifers most likely to encroach into sagebrush vegetation. Sagebrush vegetation was defined as including sagebrush species (Attachment B) that provide habitat for the Greater Sage-Grouse and are included in the

Sage-Grouse HAF. An adjacency analysis was conducted to identify all sagebrush pixels that were directly adjacent to these conifer ecological systems and these immediately adjacent sagebrush pixels were removed from the sagebrush base layer.

Table D.7. Ecological Systems with Conifers Most Likely to Encroach into Sagebrush Vegetation

| EVT Ecological Systems | Coniferous Species and Sagebrush Vegetation that the Ecological System has the Capability to Produce |
|---|---|
| Colorado Plateau Pinyon-Juniper Woodland | <i>Pinus edulis</i> <i>Juniperus osteosperma</i> <i>Artemisia tridentata</i> <i>Artemisia arbuscula</i> <i>Artemisia nova</i> <i>Artemisia tridentata</i> ssp. <i>tridentata</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> <i>Artemisia bigelovii</i> <i>Artemisia pygmaea</i> |
| Columbia Plateau Western Juniper Woodland and Savanna | <i>Juniperus occidentalis</i> <i>Pinus ponderosa</i> <i>Artemisia tridentata</i> <i>Artemisia arbuscula</i> <i>Artemisia rigida</i> <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> |
| East Cascades Oak-Ponderosa Pine Forest and Woodland | <i>Pinus ponderosa</i> <i>Pseudotsuga menziesii</i> <i>Artemisia tridentata</i> <i>Artemisia nova</i> |
| Great Basin Pinyon-Juniper Woodland | <i>Pinus monophylla</i> <i>Juniperus osteosperma</i> <i>Artemisia arbuscula</i> <i>Artemisia nova</i> <i>Artemisia tridentata</i> <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> |
| Northern Rocky Mountain Ponderosa Pine Woodland and Savanna | <i>Pinus ponderosa</i> <i>Artemisia tridentata</i> <i>Artemisia arbuscula</i> <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> |
| Rocky Mountain Foothill Limber Pine-Juniper Woodland | <i>Juniperus osteosperma</i> <i>Juniperus scopulorum</i> <i>Artemisia nova</i> <i>Artemisia tridentata</i> |
| Rocky Mountain Poor-Site Lodgepole Pine Forest | <i>Pinus contorta</i> <i>Pseudotsuga menziesii</i> <i>Pinus ponderosa</i> <i>Artemisia tridentata</i> |

| EVT Ecological Systems | Coniferous Species and Sagebrush Vegetation that the Ecological System has the Capability to Produce |
|---|---|
| Southern Rocky Mountain Pinyon-Juniper Woodland | <i>Pinus edulis</i> <i>Juniperus monosperma</i> <i>Artemisia bigelovii</i> <i>Artemisia tridentata</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> |
| Southern Rocky Mountain Ponderosa Pine Woodland | <i>Pinus ponderosa</i> <i>Pseudotsuga menziesii</i> <i>Pinus edulis</i> <i>Pinus contorta</i> <i>Juniperus</i> spp. <i>Artemisia nova</i> <i>Artemisia tridentata</i> <i>Artemisia arbuscula</i> <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> |

Invasive Annual Grasses Adjustments for the Sagebrush Base Layer

There are no invasive species datasets from 2010 to the present (beyond the LANDFIRE data) that meet the three criteria (nationally consistent, known level of accuracy, and periodically updated) for use in the determination of the sagebrush base layer. For a description of how invasive species land cover will be incorporated in the sagebrush base layer in the future, see the Monitoring Sagebrush Availability section below.

Sagebrush Restoration Adjustments for the Sagebrush Base Layer

There are no datasets from 2010 to the present that could provide additions to the sagebrush base layer from restoration treatments that meet the three criteria (nationally consistent, known level of accuracy, and periodically updated); therefore, no adjustments were made to the sagebrush base layer calculated from the LANDFIRE EVT (version 1.2) attributable to restoration activities since 2010. Successful restoration treatments before 2010 are assumed to have been captured in the LANDFIRE refresh.

b. Monitoring Sagebrush Availability

Updating the Sagebrush Availability Sagebrush Base Layer

Sagebrush availability will be updated annually by incorporating changes to the sagebrush base layer attributable to agriculture, urbanization, and wildfire. The monitoring schedule for the existing sagebrush base layer updates is as follows:

2010 Existing Sagebrush Base Layer = [Sagebrush EVT] minus [2006 Imperviousness Layer] minus [2009 and 2010 CDL] minus [2009/10 GeoMac Fires < 1,000 acres] minus [2009/10 MTBS Fires excluding unburned sagebrush islands] minus [Conifer Encroachment Layer]

2012 Existing Sagebrush Update = [Base 2010 Existing Sagebrush Layer] minus [2011 Imperviousness Layer] minus [2011 and 2012 CDL] minus [2011/12 GeoMac Fires < 1,000 acres] minus [2011/12 MTBS Fires that are greater than 1,000 acres, excluding unburned sagebrush islands within the perimeter]

2013 and beyond Existing Sagebrush Updates = [Previous Existing Sagebrush Update Layer] minus [Imperviousness Layer (if new data are available)] minus [Next 2 years of CDL] minus [Next 2 years of GeoMac Fires < 1,000 acres] minus [Next 2 years MTBS Fires that

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are greater than 1,000 acres, excluding unburned sagebrush islands within the perimeter] plus [restoration/monitoring data provided by the field]

Sagebrush Restoration Updates

Restoration after fire, after agricultural conversion, after seedings of introduced grasses, or after treatments of pinyon pine and/or juniper, are examples of updates to the sagebrush base layer that can add sagebrush vegetation back in. When restoration has been determined to be successful through range wide, consistent, interagency fine and site-scale monitoring, the polygonal data will be used to add sagebrush pixels back into the broad and mid-scale sagebrush base layer.

Measure 1b – Context for the change in the amount of sagebrush in a landscape of interest

Measure 1b describes the amount of sagebrush on the landscape of interest compared with the amount of sagebrush the landscape of interest could ecologically support. Areas with the potential to support sagebrush were derived from the biophysical setting data layer that describes sagebrush pre Euro-American settlement (biophysical setting v1.2 of LANDFIRE). This measure (1b) will provide information during evaluations of monitoring data to set the context for a given geographic area of interest. The information could also be used to inform management options for restoration, mitigation and inform effectiveness monitoring.

The identification and spatial locations of natural plant communities (vegetation) that are believed to have existed on the landscape (biophysical setting) were constructed based on an approximation of the historical (pre Euro-American settlement) disturbance regime and how the historical disturbance regime operated on the current biophysical environment. biophysical setting is composed of map units which are based on NatureServe's (2011) terrestrial ecological systems classification.

The ecological systems within biophysical setting used for this monitoring framework are those ecological systems that have the capability of supporting sagebrush vegetation and could provide seasonal habitat for the sage-grouse. These ecological systems are listed in Table D.6, "Ecological Systems in biophysical setting and EVT Capable of Supporting Sagebrush Vegetation and Could Provide Suitable Seasonal Habitat for Greater Sage-Grouse" (p. 356) with the exception of the *Artemisia tridentata* ssp. *vaseyana* Shrubland Alliance and the *Quercus gambelii* Shrubland Alliance. Ecological systems selected included sagebrush species or subspecies that are included in the Sage-Grouse HAF and are found in Attachment B.

Attributable to the lack of any reference data, the biophysical setting layer does not have an associated accuracy assessment. Visual inspection, however, of the biophysical setting data reveals inconsistencies in the labeling of pixels among LANDFIRE map zones. The reason for these inconsistencies between map zones are the decision rules used to map a given ecological system will vary between map zones based on different physical, biological, disturbance and atmospheric regimes of the region. This can result in artificial edges in the map that are an artifact of the mapping process. However, metrics will be calculated at broad spatial scales using biophysical setting potential vegetation type, not small groupings or individual pixels, therefore, the magnitude of these observable errors in the biophysical setting layer is minor compared with the size of the reporting units. Therefore, since biophysical setting will be used to identify broad landscape patterns of dominant vegetation, these inconsistencies will only have a minor impact on the percent sagebrush availability calculation.

LANDFIRE biophysical setting data are not designed to be used at a local level. In reporting the percent sagebrush statistic for the various reporting units, the uncertainty of the percent sagebrush will increase as the size of the reporting unit gets smaller. LANDFIRE data should never be used at the pixel level (30m²) for any reporting. The smallest geographic extent use of the data for this purpose is at the PAC level and for the smallest PACs the initial percent sagebrush remaining estimate will have greater uncertainties compared with the much larger PACs.

Tracking

BLM will analyze and monitor sagebrush availability (Measure 1) on a bi-annual basis and it will be used to inform effectiveness monitoring and initiate adaptive management actions as necessary. The 2010 estimate of sagebrush availability will serve as the base year and an updated estimate for 2012 will be reported in 2014 after all datasets become available. The 2012 estimate will capture changes attributable to fire, agriculture, and urban development. Subsequent updates will always include new fire and agricultural data and new urban data when available. Restoration data that meets criteria of adding sagebrush areas back into the sagebrush base layer will begin to be factored in as data allows. Attributable to data availability, there will be a two year lag (approximately) between when the estimate is generated and when the data used for the estimate becomes available (e.g., the 2014 sagebrush availability will be included in the 2016 estimate).

Future Plans

Geospatial data used to generate the sagebrush base layer will be available through BLM's Enterprise GIS Web Portal and Geospatial Gateway or through the authoritative data source. Legacy datasets will be preserved, so that trends may be calculated. Additionally, accuracy assessment data for all source datasets will be provided on the portal either spatially, where applicable, or through the metadata. Accuracy assessment information was deemed vital to share to help users understand the limitation of the sagebrush estimates and will be summarized spatially by map zone and included in the Portal.

LANDFIRE plans to begin a remapping effort in 2015. This remapping has the potential to greatly improve overall quality of the data products primarily through the use of higher quality remote sensing datasets. Additionally, BLM and the Multi-Resolution Land Characteristics Consortium (MRLC) are working to improve the accuracy of vegetation map products for broad and mid-scale analyses through the Grass/Shrub mapping effort in partnership with the MRLC. The Grass/Shrub mapping effort applies the Wyoming multi-scale sagebrush habitat methodology (Homer et al. 2009) to spatially depict fractional percent cover estimates for five components range and west-wide. These five components are percent cover of sagebrush vegetation, percent bare ground, percent herbaceous vegetation (grass and forbs combined), annual vegetation, and percent shrubs. One of the benefits of the design of these fractional cover maps is that they facilitate monitoring "with-in" class variation (e.g., examination of declining trend in sagebrush cover for individual pixels). This "with-in" class variation can serve as one indicator of sagebrush quality that cannot be derived from LANDFIRE's EVT information. The Grass/Shrub effort is not a substitute for fine scale monitoring, but will leverage fine scale data to support the validation of the mapping products. An evaluation will be conducted to determine if either dataset is of great enough quality to warrant replacing the existing sagebrush layers. The earliest possible date for this evaluation will not occur until 2018 or 2019 depending on data availability.

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D.5.1.2.2.2. Habitat Degradation Monitoring (Measure 2)

The measure of habitat degradation will be calculated by combining the footprints of threats identified in Table D.4, “Relationship Between the Eighteen Threats and the Three Habitat Disturbance Measures for Monitoring” (p. 352). The footprint is defined as the direct area of influence of “active” energy and infrastructure; it is used as a surrogate for human activity. Although these analyses will try to summarize results at the aforementioned meaningful geographic areas of interest, some may be too small to report the metrics appropriately and may be combined (smaller populations, PACs within a population, etc.). Data sources for each threat are found in Table D.8, “Geospatial Data Sources for Habitat Degradation (Measure 2)” (p. 368), Geospatial data sources for habitat degradation. Specific assumptions (inclusion criteria for data, width/area assumptions for point and line features, etc.) and methodology for each threat, and the combined measure, are detailed below. All datasets will be updated annually to monitor broad- and mid-scale year-to-year changes and to calculate trends in habitat degradation to inform adaptive management. A 5-year summary report will be provided to the USFWS.

a. Habitat Degradation Datasets and Assumptions

Energy (oil and gas wells and development facilities)

This dataset will compile information from three oil and gas databases: the proprietary IHS Enerdeq database, the BLM Automated Fluid Minerals Support System (AFMSS) database, and the proprietary Platts (a McGraw-Hill Financial Company) GIS Custom Data (hereafter, Platts) database of power plants. Point data from wells active within the last 10 years from IHS and producing wells from AFMSS will be considered as a 5-acre (2.0ha) direct area of influence centered on the well point, as recommended by the BLM Washington Office (WO)-300 (Minerals and Realty Management). Plugged and abandoned wells will be removed if the date of well abandonment was before the first day of the reporting year (i.e., for the 2015 reporting year, a well must have been plugged and abandoned by 12/31/2014 to be removed). Platts oil and gas power plants data (subset to operational power plants) will also be included as a 5-acre (2.0ha) direct area of influence.

Additional Measure: Reclaimed Energy-related Degradation

This dataset will include those wells that have been plugged and abandoned. This measure thereby attempts to measure energy-related degradation that has been reclaimed but not necessarily fully restored to sage-grouse habitat. This measure will establish a baseline by using wells that have been plugged and abandoned within the last 10 years from the IHS and AFMSS datasets. Time lags for lek attendance in response to infrastructure have been documented to be delayed 2–10 years from energy development activities (Harju et al. 2010). Reclamation actions may require 2 or more years from the Final Abandonment Notice. Sagebrush seedling establishment may take 6 or more years from the point of seeding, depending on such variables as annual precipitation, annual temperature, and soil type and depth (Pyke 2011). This 10-year period is conservative and assumes some level of habitat improvement 10 years after plugging. Research by Hemstrom et al. (2002), however, proposes an even longer period—more than 100 years—for recovery of sagebrush habitats, even with active restoration approaches. Direct area of influence will be considered 3 acres (1.2ha) (J. Perry, personal communication, February 12, 2014). This additional layer/measure could be used at the broad and mid scale to identify areas where sagebrush habitat and/or potential sagebrush habitat is likely still degraded. This layer/measure could also be used where further investigation at the fine or site scale would be warranted to: (1) quantify the

level of reclamation already conducted, and (2) evaluate the amount of restoration still required for sagebrush habitat recovery. At a particular level (e.g., population, PACs), these areas and the reclamation efforts/success could be used to inform reclamation standards associated with future developments. Once these areas have transitioned from reclamation standards to meeting restoration standards, they can be added back into the sagebrush availability layer using the same methodology as described for adding restoration treatment areas lost to wildfire and agriculture conversion (see the Monitoring Sagebrush Restoration under the Monitoring Sagebrush Availability section). This dataset will be updated annually from the IHS dataset.

Energy (coal mines)

Currently, there is no comprehensive dataset available that identifies the footprint of active coal mining across all jurisdictions. Therefore, point and polygon datasets will be used each year to identify coal mining locations. Data sources will be identified and evaluated annually and will include at a minimum: BLM coal lease polygons, U.S. Energy Information Administration mine occurrence points, U.S. Office of Surface Mining Reclamation and Enforcement coal mining permit polygons (as available), and U.S. Geological Survey (USGS) Mineral Resources Data System mine occurrence points. These data will inform where active coal mining may be occurring. Additionally, coal power plant data from Platts power plants database (subset to operational power plants) will be included. Aerial imagery will then be used to digitize manually the active coal mining and coal power plants surface disturbance in or near these known occurrence areas. While the date of aerial imagery varies by scale, the most current data available from Esri and/or Google will be used to locate (generally at 1:50,000 and below) and digitize (generally at 1:10,000 and below) active coal mine and power plant direct area of influence. Coal mine location data source and imagery date will be documented for each digitized coal polygon at the time of creation. Subsurface facility locations (polygon or point location as available) will also be collected if available, included in density calculations, and added to the active surface activity layer as appropriate (if an actual direct area of influence can be located).

Energy (wind energy facilities)

This dataset will be a subset of the Federal Aviation Administration (FAA) Digital Obstacles point file. Points where “Type_” = “WINDMILL” will be included. Direct area of influence of these point features will be measured by converting to a polygon dataset as a direct area of influence of 3 acres (1.2 hectares) centered on each tower point. See the BLM’s “Wind Energy Development Programmatic Environmental Impact Statement” (BLM 2005). Additionally, Platts power plants database will be used for transformer stations associated with wind energy sites (subset to operational power plants), also with a 3-acre (1.2 hectares) direct area of influence.

Energy (solar energy facilities)

This dataset will include solar plants as compiled with the Platts power plants database (subset to operational power plants). This database includes an attribute that indicates the operational capacity of each solar power plant. Total capacity at the power plant was based on ratings of the in-service unit(s), in megawatts. Direct area of influence polygons will be centered over each point feature representing 7.3 acres (3.0 hectares) per megawatt of the stated operational capacity, per the report of the National Renewable Energy Laboratory (NREL), “Land-Use Requirements for Solar Power Plants in the United States” (Ong et al. 2013).

Energy (geothermal energy facilities)

This dataset will include geothermal wells in existence or under construction as compiled with the IHS wells database and power plants as compiled with the Platts database (subset to operational power plants). Direct area of influence of these point features will be measured by converting to a polygon dataset of 3 acres (1.2 hectares) centered on each well or power plant point.

Mining (active developments; locatable, leasable, salable)

This dataset will include active locatable mining locations as compiled with the proprietary InfoMine database. Aerial imagery will then be used to digitize manually the active mining surface disturbance in or near these known occurrence areas. While the date of aerial imagery varies by scale, the most current data available from Esri and/or Google will be used to locate (generally at 1:50,000 and below) and digitize (generally at 1:10,000 and below) active mine direct area of influence. Mine location data source and imagery date will be documented for each digitized polygon at the time of creation. Currently, there are no known compressive databases available for leasable or salable mining sites beyond coal mines. Other data sources will be evaluated and used as they are identified or as they become available. Point data may be converted to polygons to represent direct area of influence unless actual surface disturbance is available.

Infrastructure (roads)

This dataset will be compiled from the proprietary Esri StreetMap Premium for ArcGIS. Dataset features that will be used are: Interstate Highways, Major Roads, and Surface Streets to capture most paved and “crowned and ditched” roads while not including “two-track” and 4-wheel-drive routes. These minor roads, while not included in the broad- and mid-scale monitoring, may support a volume of traffic that can have deleterious effects on sage-grouse leks. It may be appropriate to consider the frequency and type of use of roads in a NEPA analysis for a proposed project. This fine- and site-scale analysis will require more site-specific data than is identified in this monitoring framework. The direct area of influence for roads will be represented by 240.2 feet, 84.0 feet, and 40.7 feet (73.2 meters, 25.6 meters, and 12.4 meters) total widths centered on the line feature for Interstate Highways, Major Roads, and Surface Streets, respectively (Knick et al. 2011). The most current dataset will be used for each monitoring update. Note: This is a related but different dataset than what was used in BER (Manier et al. 2013). Individual BLM planning units may use different road layers for fine- and site-scale monitoring.

Infrastructure (railroads)

This dataset will be a compilation from the Federal Railroad Administration Rail Lines of the USA dataset. Non-abandoned rail lines will be used; abandoned rail lines will not be used. The direct are of influence for railroads will be represented by a 30.8 feet (9.4 meters) total width (Knick et al. 2011) centered on the non-abandoned railroad line feature.

Infrastructure (powerlines)

This line dataset will be derived from the proprietary Platts transmission lines database. Linear features in the dataset attributed as “buried” will be removed from the disturbance calculation. Only “In Service” lines will be used; “Proposed” lines will not be used. Direct area of influence will be determined by the kilovolt (kV) designation: 1–199 kV (100 feet/30.5 meters), 200–399 kV (150 feet/45.7 meters), 400–699 kV (200 feet/61.0 meters), and 700-or greater kV (250 feet/76.2 meters) based on average right-of-way and structure widths, according to BLM WO-300 (Minerals and Realty Management).

Infrastructure (communication towers)

This point dataset will be compiled from the Federal Communications Commission (FCC) communication towers point file; all duplicate points will be removed. It will be converted to a polygon dataset by using a direct area of influence of 2.5 acres (1.0 hectare) centered on each communication tower point (Knick et al. 2011).

Infrastructure (other vertical structures)

This point dataset will be compiled from the FAA's Digital Obstacles point file. Points where "Type_" = "WINDMILL" will be removed. Duplicate points from the FCC communication towers point file will be removed. Remaining features will be converted to a polygon dataset using a direct area of influence of 2.5 acres (1.0 hectare) centered on each vertical structure point (Knick et al. 2011).

Other Developed Rights-of-Way

Currently, no additional data sources for other rights-of-way have been identified; roads, powerlines, railroads, pipelines, and other known linear features are represented in the categories described above. The newly purchased IHS data do contain pipeline information; however, this database does not currently distinguish between above-ground and underground pipelines. If additional features representing human activities are identified, they will be added to monitoring reports using similar assumptions to those used with the threats described above.

b. Habitat Degradation Threat Combination and Calculation

The threats targeted for measuring human activity (see Table D.8, "Geospatial Data Sources for Habitat Degradation (Measure 2)" (p. 368)) will be converted to direct area of influence polygons as described for each threat above. These threat polygon layers will be combined and features dissolved to create one overall polygon layer representing footprints of active human activity in the range of sage-grouse. Individual datasets, however, will be preserved to indicate which types of threats may be contributing to overall habitat degradation. This measure has been divided into three submeasures to describe habitat degradation on the landscape. Percentages will be calculated as follows:

Measure 2a. Footprint by geographic area of interest: Divide area of the active/direct footprint by the total area of the geographic area of interest (% disturbance in geographic area of interest).

Measure 2b. Active/direct footprint by historical sagebrush potential: Divide area of the active footprint that coincides with areas with historical sagebrush potential (biophysical setting calculation from habitat availability) within a given geographic area of interest by the total area with sagebrush potential within the geographic area of interest (% disturbance on potential historical sagebrush in geographic area of interest).

Measure 2c. Active/direct footprint by current sagebrush: Divide area of the active footprint that coincides with areas of existing sagebrush (EVT calculation from habitat availability) within a given geographic area of interest by the total area that is current sagebrush within the geographic area of interest (% disturbance on current sagebrush in geographic area of interest).

Table D.8. Geospatial Data Sources for Habitat Degradation (Measure 2)

| Degradation Type | Subcategory | Data Source | Direct Area of Influence | Area Source |
|---|-------------------------------|---|-----------------------------------|----------------------|
| Energy (oil & gas) | Wells | IHS; BLM (AFMSS) | 5.0 acres (2.0 hectares) | BLM WO-300 |
| | Power Plants | Platts (power plants) | 5.0 acres (2.0 hectares) | BLM WO-300 |
| Energy (coal) | Mines | BLM; USFS; Office of Surface Mining Reclamation and Enforcement; USGS Mineral Resources Data System | Polygon area (digitized) | Esri/ Google Imagery |
| | Power Plants | Platts (power plants) | Polygon area (digitized) | Esri Imagery |
| Energy (wind) | Wind Turbines | Federal Aviation Administration | 3.0 acres (1.2 hectares) | BLM WO-300 |
| | Power Plants | Platts (power plants) | 3.0 acres (1.2 hectares) | BLM WO-300 |
| Energy (solar) | Fields/Power Plants | Platts (power plants) | 7.3 acres (3.0 hectares)/megawatt | NREL |
| Energy (geothermal) | Wells | IHS | 3.0 acres (1.2 hectares) | BLM WO-300 |
| | Power Plants | Platts (power plants) | Polygon area (digitized) | Esri Imagery |
| Mining | Locatable Developments | InfoMine | Polygon area (digitized) | Esri Imagery |
| Infrastructure (roads) | Surface Streets (Minor Roads) | Esri StreetMap Premium | 40.7 feet (12.4 meters) | USGS |
| | Major Roads | Esri StreetMap Premium | 84.0 feet (25.6 meters) | USGS |
| | Interstate Highways | Esri StreetMap Premium | 240.2 feet (73.2 meters) | USGS |
| Infrastructure (railroads) | Active Lines | Federal Railroad Administration | 30.8 feet (9.4 meters) | USGS |
| Infrastructure (powerlines) | 1-199 kV Lines | Platts (transmission lines) | 100 feet (30.5 meters) | BLM WO-300 |
| | 200-399 kV Lines | Platts (transmission lines) | 150 feet (45.7m) | BLM WO-300 |
| | 400-699 kV Lines | Platts (transmission lines) | 200 feet (61.0 meters) | BLM WO-300 |
| | 700+ kV Lines | Platts (transmission lines) | 250 feet (76.2 meters) | BLM WO-300 |
| Infrastructure (communication) | Towers | Federal Communications Commission | 2.5 acres (1.0 hectare) | BLM WO-300 |
| AFMSS Automated Fluid Minerals Support System BLM Bureau of Land Management kV kilovolt NREL National Renewable Energy Laboratory USFS U.S. Forest Service USGS U.S. Geological Survey WO Washington Office | | | | |

D.5.1.2.2.3. Energy and Mining Density (Measure 3)

The measure of density of energy and mining will be calculated by combining the locations of energy and mining threats identified in Table D.8, “Geospatial Data Sources for Habitat Degradation (Measure 2)” (p. 368). This measure will provide an estimate of the intensity of human activity or the intensity of habitat degradation. The number of energy facilities and mining locations will be summed and divided by the area of meaningful geographic areas of interest to calculate density of these activities. Data sources for each threat are found in Table D.8, “Geospatial Data Sources for Habitat Degradation (Measure 2)” (p. 368). Specific assumptions (inclusion criteria for data, width/area assumptions for point and line features, etc.) and methodology for each threat, and the combined measure, are detailed below. All datasets will be updated annually to monitor broad- and mid-scale year-to-year changes and 5-year (or longer) trends in habitat degradation.

a. Energy and Mining Density Datasets and Assumptions

Energy (oil and gas wells and development facilities) (See Section D.5.1.2.2.2, “Habitat Degradation Monitoring (Measure 2)” (p. 364).)

Energy (coal mines) (See Section D.5.1.2.2.2, “Habitat Degradation Monitoring (Measure 2)” (p. 364).)

Energy (wind energy facilities) (See Section D.5.1.2.2.2, “Habitat Degradation Monitoring (Measure 2)” (p. 364).)

Energy (solar energy facilities) (See Section D.5.1.2.2.2, “Habitat Degradation Monitoring (Measure 2)” (p. 364).)

Energy (geothermal energy facilities) (See Section D.5.1.2.2.2, “Habitat Degradation Monitoring (Measure 2)” (p. 364).)

Mining (active developments; locatable, leasable, salable) (See Section D.5.1.2.2.2, “Habitat Degradation Monitoring (Measure 2)” (p. 364).)

b. Energy and Mining Density Threat Combination and Calculation

Datasets for energy and mining will be collected in two primary forms: point locations (e.g., wells) and polygon areas (e.g., surface coal mining). The following rule set will be used to calculate density for meaningful geographic areas of interest including standard grids and per polygon:

1. Point locations will be preserved; no additional points will be removed beyond the methodology described above. Energy facilities in close proximity (an oil well close to a wind tower) will be retained.
2. Polygons will not be merged, or features further dissolved. Thus, overlapping facilities will be retained, such that each individual threat will be a separate polygon data input for the density calculation.
3. The analysis unit (polygon or 640-acre section in a grid) will be the basis for counting the number of mining or energy facilities per unit area. Within the analysis unit, all point features will be summed, and any individual polygons will be counted as one (e.g., a coal mine will be counted as one facility within population). Where polygon features overlap multiple units (polygons or pixels), the facility will be counted as one in each unit where the polygon occurs (e.g., a polygon crossing multiple 640-acre sections would be counted as one in each 640-acre section for a density per 640-acre-section calculation).
4. In methodologies with different-sized units (e.g., MZs, populations, etc.) raw facility counts will be converted to densities by dividing the raw facility counts by the total area of the unit. Typically this will be measured as facilities per 640 acres.

5. For uniform grids, raw facility counts will be reported. Typically this number will also be converted to facilities per 640 acres.
6. Reporting may include summaries beyond the simple ones above. Zonal statistics may be used to smooth smaller grids to help display and convey information about areas within meaningful geographic areas of interest that have high levels of energy and/or mining activity.
7. Additional statistics for each defined unit may also include adjusting the area to include only the area with the historical potential for sagebrush (biophysical setting) or areas currently sagebrush (EVT).

Individual datasets and threat combination datasets for habitat degradation will be available through the BLM's Enterprise GIS web portal and geospatial gateway. Legacy datasets will be preserved so that trends may be calculated.

D.5.1.2.3. Population (Demographics) Monitoring

State wildlife management agencies are responsible for monitoring sage-grouse populations within their respective states. WAFWA will coordinate this collection of annual population data by state agencies. These data will be made available to the BLM according to the terms of the forthcoming Greater Sage-Grouse Population Monitoring Memorandum of Understanding (MOU) (2014) between WAFWA and the BLM. The MOU outlines a process, timeline, and responsibilities for regular data sharing of sage-grouse population and/or habitat information for the purposes of implementing sage-grouse LUPs/amendments and subsequent effectiveness monitoring. Population areas were refined from the "Greater Sage-grouse (*Centrocercus urophasianus*) Conservation Objectives: Final Report" (COT 2013) by individual state wildlife agencies to create a consistent naming nomenclature for future data analyses. These population data will be used for analysis at the applicable scale to supplement habitat effectiveness monitoring of management actions and to inform the adaptive management responses.

D.5.1.2.4. Effectiveness Monitoring

Effectiveness monitoring will provide the data needed to evaluate BLM actions toward reaching the objective of the national planning strategy (BLM IM 2012-044) – to conserve sage-grouse populations and their habitat– and the objectives for the land use planning area. Effectiveness monitoring methods described here will encompass multiple larger scales, from areas as large as the WAFWA MZ to the scale of the Buffalo LUP. Effectiveness data used for these larger-scale evaluations will include all lands in the area of interest, regardless of surface ownership/management, and will help inform where finer-scale evaluations are needed, such as population areas smaller than an LUP or PACs within an LUP (described in Section D.5.1.3, "Fine and Site Scales" (p. 375)). Data will also include the trend of disturbance within these areas of interest to inform the need to initiate adaptive management responses as described in the Buffalo LUP.

The BLM will coordinate with the State of Wyoming in evaluating the compliance of all actions within a sage-grouse core area. Evaluation of current disturbance, disruptions and conservation actions within a sage-grouse core area will be conducted to determine if all entities are in compliance with their specific standards and whether or not it indeed has not caused declines of sage-grouse populations. This approach also helps focus scarce resources to areas experiencing habitat loss, degradation, or population declines, without excluding the possibility of concurrent,

finer-scale evaluations as needed where habitat or population anomalies have been identified through some other means.

To determine the effectiveness of the sage-grouse national planning strategy, the BLM will evaluate the answers to the following questions and prepare a broad- and mid-scale effectiveness report:

1. Sagebrush Availability and Condition:
 - a. What is the amount of sagebrush availability and the change in the amount and condition of sagebrush?
 - b. What is the existing amount of sagebrush on the landscape and the change in the amount relative to the pre-EuroAmerican historical distribution of sagebrush (biophysical setting)?
 - c. What is the trend and condition of the indicators describing sagebrush characteristics important to sage-grouse?
2. Habitat Degradation and Intensity of Activities:
 - a. What is the amount of habitat degradation and the change in that amount?
 - b. What is the intensity of activities and the change in the intensity?
 - c. What is the amount of reclaimed energy-related degradation and the change in the amount?
 - d. What is the population estimation of sage-grouse and the change in the population estimation?
3. How is the BLM contributing to changes in the amount of sagebrush?
4. How is the BLM contributing to disturbance?

The compilation of broad- and mid-scale data (and population trends as available) into an effectiveness monitoring report will occur on a 5-year reporting schedule (see Attachment A), which may be accelerated to respond to critical emerging issues (in consultation with the USFWS and state wildlife agencies). In addition, effectiveness monitoring results will be used to identify emerging issues and research needs and inform the BLM adaptive management strategy (see Section D.6.1, “Wyoming Greater Sage-Grouse Adaptive Management Plan” (p. 383)).

To determine the effectiveness of the sage-grouse objectives of the LUP, the BLM will evaluate the answers to the following questions and prepare a plan effectiveness report:

1. Is this plan meeting the sage-grouse habitat objectives?
2. Are sage-grouse areas within the LUP meeting, or making progress toward meeting, land health standards, including the Special Status Species/wildlife habitat standard?
3. Is the plan meeting the disturbance objective(s) within sage-grouse areas?
4. Are the sage-grouse populations within this plan boundary and within the sage-grouse areas increasing, stable, or declining?

The effectiveness monitoring report for this LUP will occur on a 5-year reporting schedule (see Attachment A) or more often if habitat or population anomalies indicate the need for an evaluation to facilitate adaptive management or respond to critical emerging issues. Data will be made available through the BLM’s Enterprise GIS web portal and the geospatial gateway.

Methods

At the broad and mid scales (PACs and above) the BLM will summarize the vegetation, disturbance, and (when available) population data. Although the analysis will try to summarize results for PACs within each sage-grouse population, some populations may be too small to

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report the metrics appropriately and may need to be combined to provide an estimate with an acceptable level of accuracy. Otherwise, they will be flagged for more intensive monitoring by the appropriate landowner or agency. The BLM will then analyze monitoring data to detect the trend in the amount of sagebrush; the condition of the vegetation in the sage-grouse areas (MacKinnon et al. 2011); the trend in the amount of disturbance; the change in disturbed areas owing to successful restoration; and the amount of new disturbance the BLM has permitted. These data could be supplemented with population data (when available) to inform an understanding of the correlation between habitat and PACs within a population. This overall effectiveness evaluation must consider the lag effect response of populations to habitat changes (Garton et al. 2011).

Calculating Question 1, National Planning Strategy Effectiveness: The amount of sagebrush available in the large area of interest will use the information from Measure 1a (see Section D.5.1.2.2.1, “Sagebrush Availability (Measure 1)” (p. 353)) and calculate the change from the 2012 baseline to the end date of the reporting period. To calculate the change in the amount of sagebrush on the landscape to compare with the historical areas with potential to support sagebrush, the information from Measure 1b (see Section D.5.1.2.2.1, “Sagebrush Availability (Measure 1)” (p. 353)) will be used. To calculate the trend in the condition of sagebrush at the mid scale, three sources of data will be used: the BLM’s Grass/Shrub mapping effort (see Future Plans in Section D.5.1.2.2.1, “Sagebrush Availability (Measure 1)” (p. 353)); the results from the calculation of the landscape indicators, such as patch size (described below); and the BLM’s Landscape Monitoring Framework (LMF) and sage-grouse intensification effort (also described below). The LMF and sage-grouse intensification effort data are collected in a statistical sampling framework that allows calculation of indicator values at multiple scales.

Beyond the importance of sagebrush availability to sage-grouse, the mix of sagebrush patches on the landscape at the broad and mid scale provides the life requisite of space for sage-grouse dispersal needs (see the HAF). The configuration of sagebrush habitat patches and the land cover or land use between the habitat patches at the broad and mid scales also defines suitability. There are three significant habitat indicators that influence habitat use, dispersal, and movement across populations: the size and number of habitat patches, the connectivity of habitat patches (linkage areas), and habitat fragmentation (scope of unsuitable and non-habitats between habitat patches). The most appropriate commercial software to measure patch dynamics, connectivity, and fragmentation at the broad and mid scales will be used, along with the same data layers derived for sagebrush availability.

The BLM initiated the LMF in 2011 in cooperation with the NRCS. The objective of the LMF effort is to provide unbiased estimates of vegetation and soil condition and trend using a statistically balanced sample design across BLM-administered lands. Recognizing that sage-grouse populations are more resilient where the sagebrush plant community has certain characteristics unique to a particular life stage of sage-grouse (Knick and Connelly 2011, Stiver et al. 2015), a group of sage-grouse habitat and sagebrush plant community subject matter experts identified those vegetation indicators collected at LMF sampling points that inform sage-grouse habitat needs. The experts represented the Agricultural Research Service, BLM, NRCS, USFWS, WAFWA, state wildlife agencies, and academia. The common indicators identified include: species composition, foliar cover, height of the tallest sagebrush and herbaceous plant, intercanopy gap, percent of invasive species, sagebrush shape, and bare ground. To increase the precision of estimates of sagebrush conditions within the range of sage-grouse, additional plot locations in occupied sage-grouse habitat (Sage-Grouse Intensification) were added in 2013. The common indicators are also collected on sampling locations in the NRCS

National Resources Inventory Rangeland Resource Assessment (<http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/nri/?&cid=stelprdb1041620>).

The sage-grouse intensification baseline data will be collected over a 5-year period, and an annual sage-grouse intensification report will be prepared describing the status of the indicators. Beginning in year 6, the annual status report will be accompanied with a trend report, which will be available on an annual basis thereafter, contingent on continuation of the current monitoring budget. This information, in combination with the Grass/Shrub mapping information, the mid-scale habitat suitability indicator measures, and the sagebrush availability information will be used to answer Question 1 of the National Planning Strategy Effectiveness Report.

Calculating Question 2, National Planning Strategy Effectiveness: Evaluations of the amount of habitat degradation and the intensity of the activities in the area of interest will use the information from Measure 2 (see Section D.5.1.2.2.2, “Habitat Degradation Monitoring (Measure 2)” (p. 364)) and Measure 3 (see Section D.5.1.2.2.3, “Energy and Mining Density (Measure 3)” (p. 369)). The field office will collect data on the amount of reclaimed energy-related degradation on plugged and abandoned and oil/gas well sites. The data are expected to demonstrate that the reclaimed sites have yet to meet the habitat restoration objectives for sage-grouse habitat. This information, in combination with the amount of habitat degradation, will be used to answer Question 2 of the National Planning Strategy Effectiveness Report.

Calculating Question 3, National Planning Strategy Effectiveness: The change in sage-grouse estimated populations will be calculated from data provided by the state wildlife agencies, when available. This population data (see Section D.5.1.2.3, “Population (Demographics) Monitoring” (p. 370)) will be used to answer Question 3 of the National Planning Strategy Effectiveness Report.

Calculating Question 4, National Planning Strategy Effectiveness: The estimated contribution by the BLM to the change in the amount of sagebrush in the area of interest will use the information from Measure 1a (see Section D.5.1.2.2.1, “Sagebrush Availability (Measure 1)” (p. 353)). This measure is derived from the national datasets that remove sagebrush (Table D.5, “Datasets for Establishing and Monitoring Changes in Sagebrush Activity” (p. 355)). To determine the relative contribution of BLM management, the current Surface Management Agency geospatial data layer will be used to differentiate the amount of change for each management agency for this measure in the geographic areas of interest. This information will be used to answer Question 4 of the National Planning Strategy Effectiveness Report.

Calculating Question 5, National Planning Strategy Effectiveness: The estimated contribution by the BLM to the change in the amount of disturbance in the area of interest will use the information from Measure 2a (see Section D.5.1.2.2.2, “Habitat Degradation Monitoring (Measure 2)” (p. 364)) and Measure 3 (see Section D.5.1.2.2.3, “Energy and Mining Density (Measure 3)” (p. 369)). These measures are all derived from the national disturbance datasets that degrade habitat (Table D.8, “Geospatial Data Sources for Habitat Degradation (Measure 2)” (p. 368)). To determine the relative contribution of BLM management, the current Surface Management Agency geospatial data layer will be used to differentiate the amount of change for each management agency for these two measures in the geographic areas of interest. This information will be used to answer Question 5 of the National Planning Strategy Effectiveness Report.

Answers to the five questions for determining the effectiveness of the national planning strategy will identify areas that appear to be meeting the objectives of the strategy and will facilitate identification of population areas for more detailed analysis. Conceptually, if the broad-scale

monitoring identifies increasing sagebrush availability and improving vegetation conditions, decreasing disturbance, and a stable or increasing population for the area of interest, there is evidence that the objectives of the national planning strategy to maintain populations and their habitats have been met. Conversely, where information indicates that sagebrush is decreasing and vegetation conditions are degrading, disturbance in sage-grouse areas is increasing, and/or populations are declining relative to the baseline, there is evidence that the objectives of the national planning strategy are not being achieved. Such a determination would likely result in a more detailed analysis and could be the basis for implementing more restrictive adaptive management measures.

With respect to the LUP area, the BLM will summarize the vegetation, disturbance, and population data to determine if the LUP is meeting the plan objectives. Effectiveness information used for these evaluations includes BLM surface management areas and will help inform where finer-scale evaluations are needed, such as seasonal habitats, corridors, or linkage areas. Data will also include the trend of disturbance within the sage-grouse areas, which will inform the need to initiate adaptive management responses as described in the Buffalo LUP.

Calculating Question 1, Land Use Plan Effectiveness: The condition of vegetation and the allotments meeting land health standards (as articulated in “BLM Handbook 4180-1, Rangeland Health Standards”) in sage-grouse areas will be used to determine the LUP’s effectiveness in meeting the vegetation objectives for sage-grouse habitat set forth in the plan. The field office/ranger district will be responsible for collecting this data. In order for this data to be consistent and comparable, common indicators, consistent methods, and an unbiased sampling framework will be implemented following the principles in the BLM’s AIM strategy (Taylor et al. 2014; Toevs et al. 2011; MacKinnon et al. 2011), in the BLM’s Technical Reference “Interpreting Indicators of Rangeland Health” (Pellant et al. 2005), and in the HAF (Stiver et al. 2015) or other approved WAFWA MZ—consistent guidance to measure and monitor sage-grouse habitats. This information will be used to answer Question 1 of the Land Use Plan Effectiveness Report.

Calculating Question 2, Land Use Plan Effectiveness: Sage-grouse areas within the LUP that are achieving land health stands (or, if trend data are available, that are making progress toward achieving them)—particularly the Special Status Species/wildlife habitat land health standard—will be used to determine the LUP’s effectiveness in achieving the habitat objectives set forth in the plan. Field offices will follow directions in “BLM Handbook 4180-1, Rangeland Health Standards,” to ascertain if sage-grouse areas are achieving or making progress toward achieving land health standards. One of the recommended criteria for evaluating this land health standard is the HAF indicators.

Calculating Question 3, Land Use Plan Effectiveness: The amount of habitat disturbance in sage-grouse areas identified in this LUP will be used to determine the LUP’s effectiveness in meeting the plan’s disturbance objectives. National datasets can be used to calculate the amount of disturbance, but field office data will likely increase the accuracy of this estimate. This information will be used to answer Question 3 of the Land Use Plan Effectiveness Report.

Calculating Question 4, Land Use Plan Effectiveness: The change in estimated sage-grouse populations will be calculated from data provided by the state wildlife agencies, when available, and will be used to determine LUP effectiveness. This population data (see Section D.5.1.2.3, “Population (Demographics) Monitoring” (p. 370)) will be used to answer Question 4 of the Land Use Plan Effectiveness Report.

Results of the effectiveness monitoring process for the LUP will be used to inform the need for finer-scale investigations, initiate adaptive management actions as described in the Buffalo LUP, initiate causation determination, and/or determine if changes to management decisions are warranted. The measures used at the broad and mid scales will provide a suite of characteristics for evaluating the effectiveness of the adaptive management strategy.

D.5.1.3. Fine and Site Scales

Fine-scale (third-order) habitat selected by sage-grouse is described as the physical and geographic area within home ranges during breeding, summer, and winter periods. At this level, habitat suitability monitoring should address factors that affect sage-grouse use of, and movements between, seasonal use areas. The habitat monitoring at the fine and site scale (fourth order) should focus on indicators to describe seasonal home ranges for sage-grouse associated with a lek or lek group within a population or subpopulation area. Fine- and site-scale monitoring will inform LUP effectiveness monitoring (see Section D.5.1.2.4, “Effectiveness Monitoring” (p. 370)) and the hard and soft triggers identified in the LUP’s adaptive management section.

The BLM will coordinate with the State of Wyoming to share conservation, disturbance and vegetation analysis data to provide a core by core evaluation to make necessary adjustments in activity, priorities and other actions.

Site-scale habitat selected by sage-grouse is described as the more detailed vegetation characteristics of seasonal habitats. Habitat suitability characteristics include canopy cover and height of sagebrush and the associated understory vegetation. They also include vegetation associated with riparian areas, wet meadows, and other mesic habitats adjacent to sagebrush that may support sage-grouse habitat needs during different stages in their annual cycle.

As described in the Conclusion (see Section D.5.1.4, “Conclusion” (p. 376)), details and application of monitoring at the fine and site scales will be described in the implementation-level monitoring plan for the Buffalo LUP. The need for fine- and site-scale-specific habitat monitoring will vary by area, depending on proposed projects, existing conditions, habitat variability, threats, and land health. Examples of fine- and site-scale monitoring include: habitat vegetation monitoring to assess current habitat conditions; monitoring and evaluation of the success of projects targeting sage-grouse habitat enhancement and/or restoration; and habitat disturbance monitoring to provide localized disturbance measures to inform proposed project review and potential mitigation for project impacts. Monitoring plans should incorporate the principles outlined in the BLM’s AIM strategy (Toevs et al. 2011) and in “AIM-Monitoring: A Component of the Assessment, Inventory, and Monitoring Strategy” (Taylor et al. 2014). Approved monitoring methods are:

- “BLM Core Terrestrial Indicators and Methods” (MacKinnon et al. 2011);
- The BLM’s Technical Reference “Interpreting Indicators of Rangeland Health” (Pellant et al. 2005); and,
- “Sage-Grouse HAF: Multiscale Assessment Tool” (Stiver et al. 2015).

Other state-specific disturbance tracking models include: the BLM’s Wyoming DDCT (<http://ddct.wygisc.org/>) and the BLM’s White River Data Management System in development with the USGS. Population monitoring data (in cooperation with state wildlife agencies) should be included during evaluation of the effectiveness of actions taken at the fine and site scales.

Fine- and site-scale sage-grouse habitat suitability indicators for seasonal habitats are identified in the HAF. The HAF has incorporated the Connelly et al. (2000) sage-grouse guidelines as well as many of the core indicators in the AIM strategy (Toevs et al. 2011). There may be a need to develop adjustments to height and cover or other site suitability values described in the HAF; any such adjustments should be ecologically defensible. To foster consistency, however, adjustments to site suitability values at the local scale should be avoided unless there is strong, scientific justification for making those adjustments. That justification should be provided. WAFWA MZ adjustments must be supported by regional plant productivity and habitat data for the floristic province. If adjustments are made to the site-scale indicators, they must be made using data from the appropriate seasonal habitat designation (breeding/nesting, brood-rearing, winter) collected from sage-grouse studies found in the relevant area and peer-reviewed by the appropriate wildlife management agency(ies) and researchers.

When conducting land health assessments, the BLM should follow, at a minimum, “Interpreting Indicators of Rangeland Health” (Pellant et al. 2005) and the “BLM Core Terrestrial Indicators and Methods” (MacKinnon et al. 2011). For assessments being conducted in sage-grouse designated management areas, the BLM should collect additional data to inform the HAF indicators that have not been collected using the above methods. Implementation of the principles outlined in the AIM strategy will allow the data to be used to generate unbiased estimates of condition across the area of interest; facilitate consistent data collection and rollup analysis among management units; help provide consistent data to inform the classification and interpretation of imagery; and provide condition and trend of the indicators describing sagebrush characteristics important to sage-grouse habitat (see Section D.5.1.2.4, “Effectiveness Monitoring” (p. 370)).

D.5.1.4. Conclusion

This Greater Sage-Grouse Monitoring Framework was developed for all of the RMPs involved in the sage-grouse planning effort. As such, it describes the monitoring activities at the broad and mid scales and provides a guide for the BLM to collaborate with partners/other agencies to develop the Buffalo LUP-specific monitoring plan.

D.5.1.5. The BLM Greater Sage-Grouse Disturbance and Monitoring Subteam Membership

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D.5.1.6. Attachments

ATTACHMENT A: AN OVERVIEW OF MONITORING COMMITMENTS

Table D.9. Monitoring Commitments Overview

| | Broad and Mid-Scales | | | | | Fine & Site Scales |
|-----------------------------|---|---|---|---|---|--|
| | Implementation | Sagebrush Availability | Habitat Degradation | Population | Effectiveness | |
| How will the data be used? | Tracking and documenting implementation of LUP decisions and inform adaptive management | Tracking changes in land cover (sagebrush) and inform adaptive management | Tracking changes in disturbance (threats) to sage-grouse habitat and inform adaptive management | Tracking trends in sage-grouse populations (and/or leks; as determined by state wildlife agencies) and inform adaptive management | Characterizing the relationship among disturbance, implementation actions, and sagebrush metrics and inform adaptive management | Measuring seasonal habitat, connectivity at the fine scale, and habitat conditions at the site scale, calculating disturbance and inform adaptive management |
| Who is collecting the data? | BLM FO and USFS Forest | NOC and NIFC | National data sets (NOC), BLM FOs and USFS Forests as applicable | State wildlife agencies through WAFWA | Comes from other broad and mid-scale monitoring types, analyzed by the NOC | BLM FO and SO, USFS Forests and RO (with partners) including disturbance |

| | Broad and Mid-Scales | | | | | Fine & Site Scales |
|---|--|--|--|---|--|--|
| | Implementation | Sagebrush Availability | Habitat Degradation | Population | Effectiveness | |
| How often are the data collected, reported and made available to USFWS? | Collected and reported annually; summary every 5 years | Updated and changes reported annually; summary reports every 5 years | Collected and changes reported annually; summary reports every 5 years | State data reported annually per WAFWA MOU; summary reports every 5 years | Collected and reported every 5 years (coincident with LUP evaluations) | Collection and trend analysis ongoing, reported every 5 years or as needed to inform adaptive management |
| What is the spatial scale? | Summarized by LUP with flexibility for reporting by other units | Summarized by PACs (size dependent) with flexibility for reporting by other units | Summarized by PACs (size dependent) with flexibility for reporting by other units | Summarized by PACs (size dependent) with flexibility for reporting by other units | Summarized by MZ, and LUP with flexibility for reporting by other units (e.g., PAC) | Variable (e.g., projects and seasonal habitats) |
| What are the potential personnel and budget impacts? | Additional capacity or re-prioritization of ongoing monitoring work and budget realignment | At a minimum, current skills and capacity must be maintained; data mgmt cost are TBD | At a minimum, current skills and capacity must be maintained; data mgmt and data layer purchase cost are TBD | No additional personnel or budget impacts for BLM | Additional capacity or re-prioritization of ongoing monitoring work and budget realignment | Additional capacity or re-prioritization of ongoing monitoring work and budget realignment |
| Who has primary and secondary responsibilities for reporting? | 1. BLM FO & SO; USFS Forest & RO 2. BLM & USFS Planning | 1. NOC 2. WO | 1. NOC 2. BLM SO, USFS RO & appropriate programs | 1. WAFWA & state wildlife agencies 2. BLM SO, USFS RO, NOC | 1. Broad and mid-scale at the NOC, LUP at BLM SO | 1. BLM FO & USFS Forests 2. BLM SO & USFS RO |
| What new processes/ tools are needed? | National implementation data sets and analysis tools | Updates to national land cover data | Data standards and roll-up methods for these data | Standards in population monitoring (WAFWA) | Reporting methodologies | Data standards data storage; and reporting |
| BLM Bureau of Land Management FO Field Office LUP Land Use Plan MOU Memorandum of Understanding MZ Management Zone NIFC National Interagency Fire Center NOC National Operations Center PAC Priority Area for Conservation RO Regional Office SO State Office TBD To Be Determined USFS U.S. Forest Service USFWS U.S. Fish and Wildlife Service WAFWA Western Association of Fish and Wildlife Agencies | | | | | | |

ATTACHMENT B: LIST OF ALL SAGEBRUSH SPECIES AND SUBSPECIES INCLUDED IN THE SELECTION CRITERIA FOR BUILDING THE EVT AND biophysical setting LAYERS

Appendix D Greater Sage-Grouse Habitat Management Strategy

- *Artemisia arbuscula* subspecies *longicaulis*
- *Artemisia arbuscula* subspecies *longiloba*
- *Artemisia bigelovii*
- *Artemisia nova*
- *Artemisia papposa*
- *Artemisia pygmaea*
- *Artemisia rigida*
- *Artemisia spinescens*
- *Artemisia tripartita* subspecies *rupicola*
- *Artemisia tripartita* subspecies *tripartita*
- *Tanacetum nuttallii*
- *Artemisia cana* subspecies *bolanderi*
- *Artemisia cana* subspecies *cana*
- *Artemisia cana* subspecies *viscidula*
- *Artemisia tridentata* subspecies *wyomingensis*
- *Artemisia tridentata* subspecies *tridentata*
- *Artemisia tridentata* subspecies *vaseyana*
- *Artemisia tridentata* subspecies *spiciformis*
- *Artemisia tridentata* subspecies *xericensis*
- *Artemisia tridentata* variety *pauciflora*
- *Artemisia frigida*
- *Artemisia pedatifida*

ATTACHMENT C: USER AND PRODUCER ACCURACIES FOR AGGREGATED ECOLOGICAL SYSTEMS WITHIN LANDFIRE MAP ZONES

Table D.10. User and Producer Accuracies for Aggregated Ecological Systems within LANDFIRE Map Zones

| LANDFIRE Map Zone Name | User Accuracy | Producer Accuracy | Percent of Map Zone within Historic Schroeder |
|--|---------------|-------------------|---|
| Wyoming Basin | 76.9% | 90.9% | 98.5% |
| Snake River Plain | 68.8% | 85.2% | 98.4% |
| Missouri River Plateau | 57.7% | 100.0% | 91.3% |
| Grand Coulee Basin of the Columbia Plateau | 80.0% | 80.0% | 89.3% |
| Wyoming Highlands | 75.3% | 85.9% | 88.1% |
| Western Great Basin | 69.3% | 75.4% | 72.9% |
| Blue Mountain Region of the Columbia Plateau | 85.7% | 88.7% | 72.7% |
| Eastern Great Basin | 62.7% | 80.0% | 62.8% |
| Northwestern Great Plains | 76.5% | 92.9% | 46.3% |
| Northern Rocky Mountains | 72.5% | 89.2% | 42.5% |
| Utah High Plateaus | 81.8% | 78.3% | 41.5% |
| Colorado Plateau | 65.3% | 76.2% | 28.8% |
| Middle Rocky Mountains | 78.6% | 73.3% | 26.4% |
| Cascade Mountain Range | 57.1% | 88.9% | 17.3% |
| Sierra Nevada Mountain Range | 0.0% | 0.0% | 12.3% |

| LANDFIRE Map Zone Name | User Accuracy | Producer Accuracy | Percent of Map Zone within Historic Schroeder |
|------------------------------|---------------|-------------------|---|
| Northwestern Rocky Mountains | 66.7% | 60.0% | 7.3% |
| Southern Rocky Mountains | 58.6% | 56.7% | 7.0% |
| Northern Cascades | 75.0% | 75.0% | 2.6% |
| Mogollon Rim | 66.7% | 100.0% | 1.7% |
| Death Valley Basin | 0.0% | 0.0% | 1.2% |

Note: There are two anomalous map zones with 0% user and producer accuracies, attributable to no available reference data for the ecological systems of interest.

Note: User accuracy is a map-based accuracy that is computed by looking at the reference data for a class and determining the percentage of correct predictions for these samples. For example, if one selects any sagebrush pixel on the classified map, what is the probability that one will be standing in a sagebrush stand when one visits that pixel location in the field? Commission Error equates to including a pixel in a class when it should have been excluded (i.e., commission error = 1 – user’s accuracy).

Note: Producer accuracy is a reference-based accuracy that is computed by looking at the predictions produced for a class and determining the percentage of correct predictions. In other words, if one knows that a particular area is sagebrush, what is the probability that the digital map will correctly identify that pixel as sagebrush? Omission Error equates to excluding a pixel that should have been included in the class (i.e., omission error = 1 – producer’s accuracy).

% percent

D.6. COT Objective 6: Prioritize, Fund and Implement Research to Address Existing Uncertainties

Increased funding and support for key research projects that will address uncertainties associated with sage-grouse and sagebrush habitat management is essential. Effective amelioration of threats can only be accomplished if the mechanisms by which those threats are imposed on the redundancy, representation, and resilience of the species and its habitats are understood.” (COT Report, 2013)

In accordance with BLM policy, the ROD and Approved Plan will establish intervals and standards for evaluations as part of the implementation strategy. Priorities will be established based on the identified threats in the planning area, the conservation objectives included as part of the Approved Plan, and any potential uncertainties associated with sage-grouse and associated habitat management. A part of this strategy will include development of a budget to accomplish each of the identified tasks and fund potential research topics to address any uncertainties.

As new science pertaining to sage-grouse and habitat is continuously evolving, refined management strategies may be necessary to ensure that BLM is utilizing the most current science, information, and data regarding sage-grouse. It is for this reason that BLM has collaborated with the State of Wyoming and USFWS to develop an adaptive management strategy as a part of the planning process.

D.6.1. Wyoming Greater Sage-Grouse Adaptive Management Plan

The Greater Sage-Grouse adaptive management plan provides a means of addressing and responding to negative impacts to Greater Sage-Grouse and it’s habitat before consequences become severe or irreversible. This adaptive management plan:

- Utilizes science based soft and hard adaptive management triggers,

Appendix D Greater Sage-Grouse Habitat Management Strategy

COT Objective 6: Prioritize, Fund and Implement Research to Address Existing Uncertainties

- Addresses multiple scales of data, and
- Utilizes an AMWG.

D.6.1.1. Adaptive Management Triggers

Adaptive management triggers are essential for identifying when potential management changes are needed in order to continue meeting Greater Sage-Grouse conservation objectives. With respect to sage-grouse, all regulatory entities in Wyoming, including the BLM, use soft and hard triggers. Soft and hard triggers are focused on three metrics: (1) number of active leks, (2) acres of available habitat, and (3) population trends based on annual lek counts. The hard and soft trigger data will be analyzed as soon as it becomes available after the signing of the ROD and then at a minimum, analyzed annually thereafter.

Soft Triggers:

Soft triggers are indicators that management or specific activities may not be achieving the intended results of conservation action or that unanticipated changes to populations or habitats have occurred that have the potential to place habitats or populations at risk. The soft trigger is any deviation from normal trends in habitat or population in any given year. Metrics include, but are not limited to, annual lek counts, wing counts, aerial surveys, habitat monitoring, and DDCT evaluations. For population metrics, normal population trends are calculated as the five-year running mean of annual population counts. BLM, with the assistance of their respective RMP implementation groups, local WGFD offices, and local sage-grouse working groups will evaluate the metrics with the AMWG on an annual basis. The purpose of these strategies is to address localized Greater Sage-Grouse population and habitat changes by providing the framework in which management will change if monitoring identifies negative population and habitat anomalies in order to avoid crossing a hard trigger threshold.

Hard Triggers:

Hard triggers are indicators that management is not achieving desired conservation results. Hard triggers would be considered an indicator that the species is not responding to conservation actions, or that a larger-scale impact or set of impacts is having a negative effect.

Within the range of normal population variables (five-year running mean of annual population counts), hard triggers shall be determined to take effect when two of the three metrics exceeds 60 percent of normal variability for the area under management in a single year, or when any of the three metrics exceeds 40 percent of normal variability for a three year time period within a five-year range of analysis. A minimum of three consecutive years in a five-year period is used to determine trends (i.e., Y1-2-3, Y2-3-4, Y3-4-5).

D.6.1.2. Adaptive Management Response

Soft Triggers Response:

Soft triggers require immediate monitoring and surveillance to determine causal factors and may require curtailment of activities in the short- or long-term, as allowed by law. The project level adaptive management strategies will identify appropriate responses where the project's activities are identified as the causal factor. BLM and the AMWG will implement an appropriate response

strategy to address causal factors not attributable to a specific project or to make adjustments at a larger regional or statewide level.

Hard Trigger Response:

Upon determination that a hard trigger has been tripped, the BLM will immediately defer issuance of discretionary authorizations for new actions for a period of 90 days. In addition, within 14 days of a determination that a hard trigger has been tripped, the AMWG will convene to develop an interim response strategy and initiate an assessment to determine the causal factor or factors (hereafter called the causal factor assessment).

Interim Strategy

An interim response strategy will be developed, and implemented to the extent permitted by law, within 90 days of determination that a hard trigger has been tripped. The technical team (see Implementation Groups below) will be consulted to identify the scope and scale of the interim strategy. Based on the recommendation of the AMWG, the BLM will implement an interim response strategy through an Instruction Memorandum or other management mechanisms to direct management until the causal factor(s) and appropriate response(s) can be determined. The interim response strategy will consist of appropriate management measures undertaken at the project stage, supported by the best available science, to address the specific metric which has been tripped and may include deferral of some activities as appropriate. Measures that were analyzed in this EIS and the COT, NTT reports, and NPT guidance will be reviewed in addition to current science to identify the most appropriate measures to be implemented as part of the interim response strategy. The BLM will comply with all applicable law in implementing such response(s), and, if applicable, will undertake a plan amendment or revision under BLM's planning regulations and policies.

The interim strategy will be implemented for the biologically significant unit, which, in Wyoming, is the Core Area, regardless of whether the Core Area crosses multiple planning boundaries. If it has been identified that more than one Core Area has the same hard triggers being tripped, or is trending towards triggers being tripped, the interim strategy will be implemented at the appropriate scale.

Causal Factor Assessment

The causal factor assessment will be completed within 180 days of determination that a hard trigger threshold has been crossed. Once the causal factor assessment is completed by the AMWG, the interim response strategy will be modified to adequately address the causal factors in consultation with the technical team. If a causal factor or factors cannot be identified, the interim response strategy shall stay in place until the cause can be determined and any new planning decision can be implemented.

D.6.1.3. EIS Level Projects

Each major project (EIS level) will include adaptive management strategies in support of the population management objectives for Greater Sage-Grouse set by the State of Wyoming, and will be consistent with the Wyoming Greater Sage-Grouse Adaptive Management Plan. These adaptive management strategies will be developed in partnership with the AMWG, WGFD, project proponents, partners, and stakeholders, incorporating the best available science.

In making amendments to this plan, the BLM will coordinate with the USFWS as BLM continues to meet its objective of conserving, enhancing and restoring Greater Sage-Grouse habitat by reducing, minimizing or eliminating threats to that habitat. The hard and soft trigger data will be analyzed as soon as it becomes available after the signing of the ROD and then at a minimum, analyzed annually thereafter.

D.6.1.4. Implementation Groups

Sage-Grouse Implementation Team

The State of Wyoming's strategy is implemented by the SGIT, established by Executive Order in 2008 and codified in 2014 by the Wyoming Legislature (W.S. § 9-19-101). The SGIT is a Governor appointed body with representation by federal agencies (BLM, USFS, USFWS, NRCS), state agencies (Wyoming Game and Fish Commission, Department of Agriculture, Department of Environmental Quality, Wildlife and Natural Resource Trust Fund, Oil and Gas Conservation Commission, and Office of State Lands and Investments), the Wyoming Legislature, county governments, energy developers, mining companies, landowners, and non- governmental organizations. The BLM, USFWS, NRCS, and the USFS all have an equal role in the SGIT.

Land and Resource Management Plan – Implementation Teams

Land and RMPs are implemented through implementation teams. These implementation teams include cooperating agencies who participated in the development of this LUP representing local, state, and federal agencies. These implementation teams will coordinate with the AMWG and others to evaluate metrics and management responses necessary to meet Greater Sage-Grouse conservation objectives within their planning area.

Adaptive Management Working Group and Technical Team

An AMWG will be established in consultation with the SGIT to provide appropriate guidance for agencies with the ability to affect sage-grouse populations and/or habitat through their permitting authority. The AMWG will include BLM, USFS, USFWS, and State of Wyoming. The purpose of this group will be to initiate a response strategy should it be determined that a hard trigger has been tripped or if soft triggers are showing a trend across a region. A hard trigger may be tripped at any time, thus, upon identification of such event, current available population and habitat data will be reviewed by the AMWG with the assistance of a technical team comprised of agency biologists, scientists familiar with the MZ in question, and other individuals as appropriate (e.g., habitat managers, respective landowners, other appropriate representatives) to confirm that a hard trigger has been tripped. Upon verification of data showing that a hard trigger has been tripped, the AMWG will convene within 14 days.

The AMWG will review monitoring data which has been collected by the appropriate local sage-grouse working groups in conformance with data collection standards. This group will meet annually to review all data collected in the prior year regarding Greater Sage-Grouse populations and habitats. Monitoring data will have been analyzed (by WGFD for population based metrics (leks, wing counts, etc. and by land managers [BLM, USFS, State of Wyoming] for habitat based metrics [DDCT, etc.]) Should the monitoring data suggest a trend toward a soft or hard trigger being tripped, they will 1. Identify what metric is indicating that trend (population or habitat); and 2. Identify a technical team to review the data and compile a range of activities which may be causing the trend. Should review of the monitoring data identify that multiple soft triggers have

been tripped in one Core Area, or the same triggers have been tripped across multiple Core Areas, the technical team will be tasked with verifying the scope and intensity of the trends.

Once the analysis of the trends has been completed by the technical team and reported back to the AMWG, the AMWG will make recommendations to the appropriate land managing agency regarding an interim adaptive management strategy to be implemented. Implementation will occur via the appropriate regulations and policy applicable for that agency. At that time, the State of Wyoming will conduct a review of the regulatory authority implementing the Sage Grouse Core Area Strategy to determine if a State of Wyoming adaptive management strategy is warranted.

Upon review of the annual data by the AMWG and technical team, the State of Wyoming, as part of the AMWG, will contact neighboring states within the respective MZ to inform them of any findings. Should a hard trigger be tripped, the trigger which has been tripped and any recommended adaptive management strategy being implemented will be shared with the appropriate neighboring state(s). Should the need arise for implementation of a multi-state adaptive management strategy; the AMWG will coordinate to develop an effective response.

D.6.1.5. Small Leks

Small leks will be given special consideration. Due to geographic variations a definition of “small” is not provided, rather determination of “small” will be made by the AMWG based upon recommendations of the scientific community. Generally, “small” is considered 10 or fewer males for a three year time period within a five-year range of analysis. If a trigger is hit based upon such a lek, then the adaptive management working group will evaluate the site-specific circumstances and determine appropriate remedial action.

Glossary Terms

Additionality:

The conservation benefits of compensatory mitigation are demonstrably new and would not have resulted without the compensatory mitigation project (BLM Manual Section 1794).

Avoidance mitigation:

Avoiding the impact altogether by not taking a certain action or parts of an action (40 CFR 1508.20(a)) (e.g., may also include avoiding the impact by moving the proposed action to a different time or location).

Compensatory mitigation:

The restoration, creation, enhancement, and/or preservation of impacted resources (adopted and modified from 33 CFR 332), such as on-the-ground actions to improve and/or protect habitats (e.g., chemical vegetation treatments, land acquisitions, conservation easements).

Compensatory mitigation projects:

Specific, on-the-ground actions to improve and/or protect habitats (e.g., chemical vegetation treatments, land acquisitions, conservation easements).

Compensatory mitigation sites:

The durable areas where compensatory mitigation projects will occur.

Durability (protective and ecological):

The maintenance of the effectiveness of a mitigation site and project for the duration of the associated impacts, which includes resource, administrative/legal, and financial considerations.

Minimization mitigation:

Minimizing impacts by limiting the degree or magnitude of the action and its implementation (40 CFR 1508.20 (b)).

Residual impacts:

Impacts from an authorized land use that remain after applying avoidance and minimization mitigation; also referred to as unavoidable impacts.

Timeliness:

The lack of a time lag between impacts and the achievement of compensatory mitigation goals and objectives (BLM Manual Section 1794).

Appendix E. Legislation and Policy Pertaining to Specific Resources

| General Plans, Policies, and Regulations for All Resources |
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| Council on Environmental Quality (CEQ) Final Guidance for Department and Agencies on the Appropriate Use of Mitigation and Monitoring (2011) |
| Bureau of Land Management (BLM) Land Use Planning Handbook, H-1601-1, updated March 11, 2005 |
| BLM Instruction Memorandum 2014-146, Guidance on Preparing Federal Register Notices (2014) |
| BLM National Environmental Policy Act Handbook H-1790-1 (2008) |
| BLM Planning Regulations 40 Code of Federal Regulations (CFR) 1600 |
| Instruction Memorandum 2013-137, Peer Review of Influential Scientific Information (2013) |
| Federal Land Policy and Management Act |
| National Environmental Policy Act |
| Physical Resources |
| Clean Air Act |
| Clean Water Act of 1977, as amended |
| BLM Air Resources Manual 7300 |
| Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for Public Lands Administered by the BLM in the State of Wyoming (1998) |
| Mineral Resources |
| 2006 Oil and Gas Surface Operating Standards and Guidelines (Gold Book, 4th edition) |
| Energy Policy Act of 2005 (P.L. 109-58) |
| 43 CFR Parts 3100 (oil and gas), 3150 (geophysical), 3200 (geothermal), 3400 (coal), 3500 (other leasable solids), 3600 (salable), and 3800 (locatable) 43 CFR |
| BLM Manual 2880, Mineral Leasing Act Rights-of-Way, Glossary of Terms (2012) |
| BLM National Notice-to-Lessees |
| BLM Onshore Oil and Gas Orders |
| U.S. Department of the Interior Manual 3031601, Mineral Materials Disposals (2002) |
| U.S. Department of the Interior Manual 3031, Energy and Mineral Resource Assessments (1985) |
| Federal Coal Leasing Amendments Act of 1976. This act amended Section 2 of the Mineral Leasing Act of 1920 to require that all public lands available for coal leasing be offered competitively. Competitive leasing provides an opportunity for any qualified interested party to competitively bid for a federal coal lease. |
| Federal Oil and Gas Royalty Management Act of 1982 |
| Federal Oil and Gas Royalty Simplification and Fairness Act of 1996 |
| Federal Onshore Oil and Gas Leasing and Reform Act of 1987 |
| General Mining Law of 1872. This law allowed the location of placer and lode mining claims, as well as patents, declaring “all valuable mineral deposits in lands belonging to the United States ... to be free and open to exploration and purchase.” |
| Integration of Best Management Practices into applications for permit to drill approvals and associated rights-of-way (ROW; WO IM 2007-021) |
| Instruction Memorandum WY 2005–14, Water Disposal and Land Application Disposal in the Powder River Basin. U.S. Department of the Interior, BLM (2005) |
| Instruction Memorandum 2013–101, Oil and Gas Leasing Reform (2013) |
| Materials Act of 1947 (as amended by the Surface Resources Act of 1955). Under this act, certain mineral and vegetative materials may be disposed of either through a contract of sale or a free-use permit. These mineral materials include common varieties of sand, stone, gravel, pumice, pumicite, cinders, and clay. This act also provides for free use of material by government agencies or municipalities, or non-profit organizations if not used for commercial purposes. |
| Surface Resources Act of July 23, 1955. This act removed sand, gravel, cinders, pumice, pumicite, and clay from locatable mineral classification, unless they have some type of uncommon characteristic. |
| Mineral Leasing Act for Acquired Lands of 1947, as amended. This act authorizes and governs mineral leasing on acquired lands. It provides that minerals on these lands are subject to the federal mineral leasing system, even though the commodity may be locatable or salable on other types of lands retained by the federal government. |

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| Mineral Leasing Act of 1920, as amended. Under this law, the BLM issues leases for development of oil and gas, deposits of coal, phosphate, potash, sodium, sulfur and other leasable minerals on public domain lands and on lands having federally-reserved minerals. |
| Mining and Minerals Policy Act of 1970. This act identifies the continuing federal policy to foster and encourage private enterprise in the development of a stable domestic minerals industry, and the orderly and economic development of domestic mineral resources. |
| Petrified Wood Act of 1962. This act provides for free collection of limited amounts of petrified wood by the public, and for sale of larger quantities for commercial purposes. |
| Surface Mining Control and Reclamation Act of 1977. This law requires reclamation of surface coal mining operations, imposes bonding requirements, and set up the US Office of Surface Mining, also called the US Office of Surface Mining, Reclamation, and Enforcement, to oversee reclamation. |
| Unitization Handbook H-3180-1 (Exploratory) |
| Unitization Manual 3180 (Exploratory) |
| Fire and Fuels Management |
| The Interagency Prescribed Fire Planning and Implementation Procedures Guide (April 2014), with BLM Supplement (December 2013) |
| Federal Wildland Fire Management Policy and Program Review (1995 and 2001) and Guidance for the Implementation of Federal Wildland Fire Management Policy (February 2009) |
| Healthy Forest Restoration Act of 2003, which aids or directs the implementation of the goals of the: <ul style="list-style-type: none"> • National Fire Plan (2000) • 10-Year Comprehensive Strategy Implementation Plan (2001) • Community Wildfire Protection Plans |
| BLM Manual M-9211 – Fire Planning Manual (September 2012) |
| BLM Manual MS-1111 Fire Business Management |
| BLM Manual MS-9200 – Fire Program management (in final revision) |
| BLM Manual 9212 – Fire Prevention (in revision) |
| BLM Manual MS-9214 – Fuels Management |
| BLM Manual MS-9238 – Fire Trespass (in final revision) |
| BLM Manual MS-9400 – Aviation Management |
| BLM Handbook H-9212-1 – Fire Prevention Handbook |
| BLM Handbook H-9214-1 – Fuels Management Handbook |
| BLM Handbook H-9218-1 – Reports and Statistics Handbook |
| BLM Handbook H-9238-1 – Fire Trespass Handbook |
| BLM Handbook H-9211-1 – Fire Planning Handbook (September 2012) |
| Instruction Memorandum 2014–114, Sage-Grouse Habitat and Wildland Fire Management (2014) |
| Instruction Memorandum 2013–128, Sage-Grouse Conservation in Fire Operations and Fuels Management (2013) (supersedes IM 2011–138) |
| Interagency Fire Management Plan Template (2009) |
| Interagency Standards for Fire and Aviation Operations (published annually) |
| National Fire Plan (2000) |
| Protecting People and Natural Resources: A Cohesive Fuels Treatment Strategy (2006) |
| Secretary of the Interior. Secretarial Order 3336. Rangeland Fire Prevention, Management and Restoration. (2015) |
| U.S. Department of the Interior/U.S. Department of Agriculture Western Governors’ Association, 2001; A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy and Implementation Plan (2001) |
| Biological Resources |
| Applicable federal and state laws that make the federal government responsible for control of weeds on federal lands and provide direction for their control. |
| Animal and Plant Health Inspection Service Plant Protection and Quarantine Memorandum of Understanding # 08-8100-0870-MU: Management of Grasshoppers and Mormon Crickets on Lands Subject to the Jurisdiction of the Department of the Interior |
| BLM Handbook H-4700-1, Wild Horses and Burros Management Handbook (2010) |
| BLM Manual 1737 – Riparian-Wetland Area Management (1992) |
| BLM Manual 1740-2 – Integrated Vegetation Management (2008) |

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| BLM Manual 1745 – Introduction, Transplant, Augmentation, and Reestablishment of Fish, Wildlife, and Plants (1992) |
| BLM Manual 4180 – Land Health (2009) |
| BLM Manual 6500 – Wildlife and Fisheries Management (1988) |
| BLM Manual 6720 – Aquatic Resource Management (1991) |
| BLM Manual 6840 – Special Status Species Management (2008) |
| BLM Manual 7100 – Soil Classification |
| BLM Manual 9011 – Chemical Pest Control (1992) |
| BLM Manual 9014 – Use of Biological Control Agents of Pests on Public Lands (1990) |
| BLM Manual 9015 – Management and Coordination of noxious weeds activities |
| BLM Handbook H-9011-1 – Chemical Pest Control (1988) |
| BLM regulations contained in 43 CFR 8200 |
| BLM National Sage-Grouse Habitat Conservation Strategy (2004) |
| Carlson-Foley Act (P.L. 90-583) |
| Cave Resources Protection Act (16 United States Code [U.S.C.] 4301 et seq.) |
| CFR, Title 50, Section 402 (50 CFR 402), Interagency Cooperation: Endangered Species Act |
| Clean Water Act of 1977, as amended |
| Department of the Interior Manual 517 – Integrated Pest Management |
| Department of the Interior Manual 601, Mineral Materials Disposals (2007) |
| Emergency Wetlands Resources Act of 1986 (P.L. 99-645;100 Stat. 3582) |
| Endangered Species Act |
| Executive Order 11987, Exotic Organisms |
| Executive Order 11988, Floodplain Management |
| Executive Order 11990, Protection of Wetlands |
| Executive Order 13112, Establishment of the Invasive Species Council |
| Executive Order 13186, Migratory Birds |
| Executive Order 12962, Recreational Fisheries (June 7, 1995) |
| Executive Order 13112, Invasive Species Control |
| Federal Noxious Weed Act of 1974 (P.L. 93-629) (as amended by section 15 Management of Undesirable Plants on Federal Lands, 1990) (superseded by Plant Protection Act of 2000; Secs. 2801 to 2813 repealed) |
| Final Environmental Impact Statement: Vegetation Treatment on BLM Lands in the 13 Western States (1991) |
| Fish and Wildlife 2000 – National and state policies |
| Fish and Wildlife Conservation Act of 1980 |
| Fish and Wildlife Management Act of 1956 |
| Healthy Forests Act of 2003 |
| Instruction Memorandum 2006–073, Weed-Free Seed Use on Lands Administered by the BLM (2006) |
| Instruction Memorandum 2009–018, Process for Setting Priorities for Issuing Grazing Permits and Leases (2009) |
| Instruction Memorandum 2010–012, Greater Sage-Grouse Habitat Management Policy on Wyoming BLM Administered Public Lands Including the Federal Mineral Estate (2010) |
| Instruction Memorandum 2010–013, Oil and Gas Leasing Screen for Greater Sage-Grouse (2010) |
| Instruction Memorandum 2010–022, Managing Structures for the Safety of Sage-Grouse, Sharp-tailed Grouse, and Lesser Prairie-chicken (2009) |
| Instruction Memorandum 2010–181, White-Nose Syndrome (2010) |
| Instruction Memorandum 2011–138, Sage-Grouse Conservation Related to Wildland Fire and Fuels Management (2011) |
| Instruction Memorandum 2012–019, Greater Sage-Grouse Habitat Management Policy on Wyoming BLM Administered Public Lands Including the Federal Mineral Estate (2012) |
| Instruction Memorandum 2012-035, Interim Guidance on Exploration and Site Characterization for Potential Carbon Dioxide Geologic Sequestration (2011) |
| Instruction Memorandum 2012-043, Greater Sage-Grouse Interim Management Policies and Procedures |
| Instruction Memorandum 2012–044, BLM National Greater Sage-Grouse Land Use Planning Strategy (2012) |
| Instruction Memorandum 2013-176, Seed Collection Policy and Pricing (2013) |
| Neotropical Migratory Bird Conservation Act (P.L. 106-247) |
| North American Wetlands Conservation Act, as amended (P.L. 101-233; 16 U.S.C. 4401) |
| Noxious Weed Control and Eradication Act of 2004 (P.L. 108-412) |

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| Northwest Area Noxious Weed Control Program Environmental Impact Statement (1985) |
| Plant Protection Act of 2000 (P.L. 106-224) (supersedes Federal Noxious Weed Act of 1974 (7 U.S.C. 2801 et seq.) except for Sec. 2814) |
| Public Rangelands Improvement Act of 1978 |
| Riparian Habitat, Interior Department Manual 520 |
| Riparian-Wetlands Initiative for the 1990s, U.S. Department of the Interior, BLM, January 22, 1992 |
| Sikes Act of 1960, as amended |
| Soil and Water Resources Conservation Act of 1977 (16 U.S.C. 2001 et seq.) |
| Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for the Public Lands Administered by the BLM in the State of Wyoming |
| Supplement to the Northwest Area Noxious Weed Control Program Final Environmental Impact Statement |
| Taylor Grazing Act of 1934 (43 U.S.C. 315) |
| The Bald and Golden Eagle Protection Act |
| The Migratory Bird Treaty Act |
| Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic Environmental Impact Statement, 2007 and Final Programmatic Environmental Report |
| Water Quality Act of 1987, as amended from the Federal Water Pollution Control Act of 1977 (Clean Water Act) as amended (33 U.S.C. 1251 et seq.) |
| Wyoming Executive Order 2008-2, Greater Sage-Grouse Core Area Protection |
| Wyoming Executive Order 2010-4, Greater Sage-Grouse Core Area Protection (replaces Executive Order 2008-2) |
| Wyoming Executive Order 2011-5, Greater Sage-Grouse Core Area Protection (replaces Executive Order 2010-4) |
| Wyoming Executive Order 2013-3, Greater Sage-Grouse Core Area – Grazing Adjustments |
| Heritage and Visual Resources |
| 36 CFR Part 60: National Register of Historic Places – Identifies processes for the identification and evaluation of historic properties for the National Register, and specifies procedures for listing properties on the National Register |
| 36 CFR Part 78: Waiver of Federal Agency Responsibilities under Section 110 of the National Historic Preservation Act – Identifies limited circumstances when Agencies may waive responsibilities under Section 110 and procedures to follow |
| 36 CFR Part 800: Protection of Historic Properties – Identifies processes and procedures for federal agencies to follow to be in compliance with Section 106 and 110 of the National Historic Preservation Act |
| 43 CFR 8400 – Visual Resource Management |
| 43 CFR Part 10: Native American Graves Protection and Repatriation Regulations – Identifies processes and procedures for federal agencies to follow to comply with the Native American Graves Protection and Repatriation Act |
| 43 CFR Part 7: Protection of Archaeological Resources – Identifies processes and procedures for federal agencies to follow to comply with the Archaeological Resources Protection Act |
| American Indian Religious Freedom Act of 1978 (P.L. 95-431; 92 Stat. 469; 42 U.S.C. 1996) |
| Antiquities Act of 1906 (P.L. 59-209; 34 Stat. 225; 16 U.S.C. 432, 433) |
| Archaeological Resources Protection Act of 1979 (P.L. 96-95; 93 Stat. 721; 16 U.S.C. 470aa et seq.) as amended (P.L. 100-555; P.L. 100-588) |
| BLM Handbook H-8270-1, General Procedural Guidance for Paleontological Resource Management (1998) |
| BLM Handbook 8410-1, Visual Resource Inventory |
| BLM Information Bulletin No. 2002-101, Cultural Resource Considerations in Resource Management Plans |
| BLM Information Bulletins 98-135, 98-164, and 2000-096 |
| BLM Manuals: |
| 8100: Cultural Resource Management |
| 8120: Tribal Consultation under Cultural Resources |
| 8130: Planning For Uses of Cultural Resources |
| 8140: Protecting Cultural Resources |
| 8150: Permitting Uses of Cultural Resources |
| 8170: Interpreting Cultural Resources for the Public |
| Buffalo Resource Area: Resource Management Plan/Record of Decision |
| Executive Order 11593 – Protection and Enhancement of the Cultural Environment |
| Executive Order 13007 – Providing for American Indian and Alaska Native Religious Freedom and Sacred Land Protections |

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| Executive Order 13084 – Consultation and Coordination with Indian Tribal Governments |
| Historic Sites Act of 1935 (P.L. 74-292; 49 Stat. 666; 16 U.S.C. 461) |
| Instruction Memorandum 2002–096, Use of Visual Resource Management Class I Designation in Wilderness Study Area (2002) |
| Instruction Memorandum 2005–14, Water Disposal and Land Application Disposal in the Powder River Basin (2005) |
| Instruction Memorandum 2010–022, Managing Structures for the Safety of Sage-grouse, Sharp-tailed Grouse, and Lesser Prairie-chicken (2009) |
| Instruction Memorandum 2012–067, Clarification of Cultural Resource Considerations for Off-Highway Vehicle Designations and Travel Management (2012) |
| Instruction Memorandum 2012–140, Collecting Paleontological Resources Under the Paleontological Resources Preservation Act of 2009 (2012) |
| Instruction Memorandum 2012–141, Confidentiality of Paleontological Locality Information Under the Omnibus Public Lands Act of 2009 (2012) |
| National Historic Preservation Act of 1966 as amended (P.L. 89-665; 80 Stat. 915; 16 U.S.C. 470) |
| Native American Graves Protection and Repatriation Act of 1990 (P.L. 101-601; 104 Stat. 3048; 25 U.S.C. 3001) |
| Powder River Basin Oil and Gas Project Environmental Impact Statement and Proposed Plan Amendment Programmatic Agreement Among BLM, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in which BLM will meet its Responsibilities Under the National Historic Preservation Act (1997) |
| Reservoir Salvage Act of 1960, as amended by Archeological and Historic Preservation Act of 1974 (P.L. 86-523; 74 Stat. 220, 221; 16 U.S.C. 469; P.L. 93-291; 88 Stat. 174; 16 U.S.C. 469) |
| State Protocol Agreement Between the Wyoming BLM State Director and the Wyoming State Historic Preservation Officer (2006) |
| Update to Buffalo Resource Area: Resource Management Plan/Record of Decision (2001) |
| Land Resources |
| 40 CFR 2740, 2912, 2911, and 2920, Land Use Authorizations |
| 43 CFR 2091 |
| 43 CFR 2930, Permits for Recreation on Public Lands |
| BLM Handbook H-8342, Travel and Transportation Handbook (2012) |
| BLM Handbook H-9600-1, Cadastral Survey Handbook |
| BLM Manual 1626 — Travel and Transportation and Management (2011) |
| BLM Manual 1740 — Renewable Resource Improvements and Treatments (2008) |
| BLM Manual H-2101-4 — Preacquisition Environmental Site Assessment (2000) |
| BLM Manual 2200–1 — Land Exchange Handbook (2005) |
| BLM Manual 6250 — National Scenic and Historic Trail Administration (2012) |
| BLM Manual 6280 — Management of National Scenic and Historic Trails and Trails Under Study or Recommended as Suitable for Congressional Designation (2012) |
| BLM Manual 6301 — Wilderness Characteristics Inventory (2011) |
| BLM Manual 6302 — Consideration of Lands with Wilderness Characteristics in the Land Use Planning Process (2011) |
| BLM Manual 6303 — Consideration of Lands with Wilderness Characteristics for Project-Level Decisions in Areas not Analyzed in Accordance with Manual 6302 (2011) |
| BLM Manual 6310 — Conducting Wilderness Characteristics Inventory on BLM Lands (2012) |
| BLM Manual 6320 — Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process (2012) |
| BLM Manual 6330 — Management of Wilderness Study Area (2012) |
| BLM Manual 6820 — Management of National Scenic and Historic Trails and Trails Under Study or Recommended as Suitable for Congressional Designation (2012) |
| BLM Manual 9113 — Roads Manual (1958) |
| BLM Manual 4180 – Rangeland Health Standards |
| BLM regulations contained in 43 CFR 4100 et seq. |
| BLM Wyoming Standards for Healthy Public Rangelands |
| Department of the Interior Manual 600 DM 5, Standards for Federal Lands Boundary Evidence |
| Executive Order 12548 (1986): Establishment of annual fees for domestic livestock grazing on public rangelands |
| Federal Land Transfer Facilitation Act |

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| Federal Land Policy and Management Act, Sections 102, 201, 202, 302, 304, 307, 309, 310, 401, 402, and 403 |
| Hazardous Materials Transportation Act and Amendments |
| Interagency Ecological Site Handbook for Rangelands (2013) |
| Instruction Memorandum 2006–173, Travel and Transportation Management, Off-Highway Vehicle Management, Property, Engineering, Land Use Planning, and Lands and Realty (2006) |
| Instruction Memorandum 2008–014, Land Use Planning, Engineering, and All Resource Programs (2008) |
| Instruction Memorandum 2009–007, Process for Evaluating Status of Land Health and Making Determinations of Causal Factors When Land Health Standards Are Not Achieved (2009) |
| Instruction Memorandum 2009–043, Right-Of-Way Management, Wind Energy (2009) |
| Instruction Memorandum 2010–101, Oil and Gas Leasing Reform — Land Use Planning and Lease Parcel Reviews (2010) |
| Instruction Memorandum 2011–004, Transmittal of Revised Recreation and Visitor Services Land Use Planning Guidance (2011) |
| Instruction Memorandum 2011-154, Requirement to Conduct and Maintain Inventory Information for Wilderness Characteristics and to Consider Lands with Wilderness Characteristics in Land Use Plans (2011) |
| Instruction Memorandum 2012-032, Wyoming BLM Reclamation Policy (2012) |
| Instruction Memorandum 2012-169, Resource Management Plan Alternative Development for Livestock Grazing (2012) |
| Instruction Memorandum 2013-131, Guidance on Estimating Nonmarket Environmental Values (2013) |
| Memorandum of Agreement WY-7 between BLM and the Wyoming Recreation Commission, addresses land classifications and withdrawals to protect public lands generally, and specifically to protect historic trails. |
| Memorandum of Agreement WY-19 between BLM and the Wyoming Governor, addresses overall cooperation in public and state land management efforts |
| Memorandum of Agreement WY-20 between BLM and the Wyoming Game and Fish Commission, addresses a myriad of land and resource management issues, including classifications, land acquisition, disposal, and access |
| Memorandum of Agreement WY-21 between BLM and Region II and Region IV of the U.S. Forest Service, addresses overall coordination on a myriad of land and resource management issues |
| Memorandum of Agreement WY-63 between BLM, the U.S. Forest Service, Wyoming Department of Public Lands and the Wyoming Game and Fish Commission, addresses public land access and management of access problems |
| Memorandum of Agreement WY-65 between BLM and the Agricultural Stabilization and Conservation Service, addresses overall coordination on a myriad of land and resource management issues |
| Memorandum of Agreement WY-77 between BLM, the Agricultural Stabilization and Conservation Service, U.S. Forest Service, AES, and Wyoming State Conservation Commission, addresses overall coordination on conservation planning projects |
| Memorandum of Agreement WY-117 between BLM and the Wyoming Board of Land Commissioners, the Wyoming State Historic Preservation Office and the Advisory Council on Historic Preservation, addresses cultural resource protection in state exchanges |
| Memorandum of Agreement WY-118 between BLM and the Wyoming Board of Land Commissioners, addresses processing state exchanges |
| Memorandum of Agreement WY-119 between BLM and the Agricultural Stabilization and Conservation Service, addresses management of agricultural trespass |
| Memorandum of Agreement WY-121 between BLM and the National Park Service, addresses management of the Oregon National Historic Trails |
| Memorandum of Agreement WY-122 between BLM and the U.S. Forest Service, Wyoming Department of Public Lands, Wyoming Game and Fish Commission, Wyoming Recreation Commission, Wyoming Department of Agriculture, and the Wyoming State Planning Coordinator's Office, addresses access to public land |
| Memorandum of Agreement WY-131 between BLM and the Wyoming Game and Fish Department, addresses overall coordination on land and resource management |
| Memorandum of Agreement WY930-91-06-38 between BLM and the Wyoming Board of Land Commissioners, addresses exchange pooling |
| Memorandum of Agreement WY930-91-06-39 between BLM and the Wyoming Board of Land Commissioners, addresses exchange of state land in holdings in wilderness areas |
| Memorandum of Understanding between BLM and the Bureau of Reclamation addresses interaction and management of reclamation withdrawn lands |
| Omnibus Public Land Management Act of 2009 (P.L. 111–11) |

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| Programmatic Agreement for historic preservation regarding how BLM will meet its responsibilities under the National Historic Preservation Act by Bob Bennett, BLM Wyoming State Director dated 03/08/2006 |
| Public Rangelands Improvement Act of 1978 (P.L. 95-514) |
| Taylor Grazing Act of 1934 |
| Transportation Safety Act of 1974 |
| Special Designations |
| BLM Manual 1613, Areas of Critical Environmental Concern |
| BLM Manual 6400, Wild and Scenic Rivers (2012) |
| Socioeconomic Resources |
| Additional Guidance on the Treatment of Socioeconomic Issues in Land Use Plans, BLM IM 2002-167 |
| American Folklife Preservation Act of 1976 (20 U.S.C. 2101) |
| American Indian Religious Freedom Act of 1978 (P.L. 95-341; 42 U.S.C. 1996 and 1996a) |
| Archaeological Resources Protection Act of 1979 (16 U.S.C. 470) |
| Civil Rights Act of 1964 (P.L. 88-352) |
| Clean Water Act of 1972, as amended (33 U.S.C. 1251 et seq.) |
| Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (42 U.S.C. 9601 et seq.) |
| Environmental Justice Guidance under National Environmental Policy Act |
| Emergency Planning and Community Right-to-Know Act of 1986 |
| Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations |
| Executive Order 13006, Locating Federal Facilities on Historic Properties in Our Nation's Central Cities |
| Executive Order 13007, which mandates the protection and preservation of Indian religious practices |
| Executive Order 13148, Greening of the Government Through Leadership in Environmental Management, 2000 |
| Executive Order 13175, Consultation and Coordination with Indian Tribal Governments |
| Federal Facilities Compliance Act of 1992 (P.L. 102-386) |
| Guidance on the Recommended Formats for Land Use Plans, Records of Decision, and Their Supporting Environmental Impact Statements, BLM IB 2002-056 |
| Hazardous Materials Management, BLM Manual Section 1703 |
| Instruction Memorandum 2002-164, Guidance to Address Environmental Justice in Land Use Plans and Related National Environmental Policy Act Document. (2002) |
| Indian General Allotment Act of 1887 |
| Indian Mineral Development Act of 1982 (25 U.S.C. 2101 et seq.) |
| Indian Reorganization Act of 1934 (25 U.S.C. 461 et seq.) |
| Indian Self Determination and Education Assistance Act of 1975 (P.L. 93-658; 25 U.S.C. 450 et seq.) |
| Military Munitions and Explosives of Concern: A Handbook for Federal Land Managers with Emphasis on Unexploded Ordnance, Draft BLM Handbook H-1703-2 |
| National Contingency Plan Regulations (40 CFR 300) |
| National Historic Preservation Act of 1966 (16 U.S.C. 470) |
| Native American Coordination and Consultation, BLM Manual 8160 |
| Native American Graves Protection and Repatriation Act of 1990 (43 CFR 10) |
| Natural Resource Damage Assessment Regulations |
| Occupational Safety and Health Act of 1970 (29 U.S.C. 651 et seq.) |
| Oil Pollution Act of 1990 (33 U.S.C. 2715a) |
| Pre-acquisition Environmental Site Assessments, BLM Manual Handbook H-2101-4 |
| Recreational and Public Purposes Act of 1926, as amended in 1988 (43 U.S.C. 869) |
| Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6901 et seq.) |
| Rules applicable only within the State of Wyoming that have been adopted under the Surface Mining Control and Reclamation Act of 1977 (30 CFR 950) |
| Safe Water Drinking Act of 1974, as amended (42 U.S.C. 300 et seq.) |
| Secretarial Order 3206 for Implementing the Endangered Species Act |
| Surface Mining Control and Reclamation Act, Section 409 (P.L. 95-87, Section 401-C.1) |
| Use of the Economic Profile System in Planning, BLM IM 2003-169 |

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Appendix F. Mitigation Guidelines for Surface-Disturbing and Disruptive Activities, Wyoming Bureau of Land Management

F.1. Introduction

Wyoming Mitigation Guidelines are a compilation of practices employed by Bureau of Land Management (BLM) to mitigate impacts from surface disturbance. They apply to activities such as road or pipeline construction, range improvements, and permitted recreation activities. The guidelines are designed to protect resources such as soils and vegetation, wildlife habitat, and cultural or historic properties. The guidelines are presented as an appendix of the Approved Resource Management Plan (RMP) and Record of Decision (ROD) for easy reference as they apply to many resources and derive from many laws. All BLM RMPs have included these guidelines as appendices. Public comment on the guidelines, per se, has not been requested. The guidelines are not land use decisions; rather they are examples of mitigation measures that could be applied, as appropriate, based on site-specific National Environmental Policy Act (NEPA) analysis for individual proposals. Comment on the use and application of specific mitigation measures can be made during the NEPA process for individual proposals. Because mitigation measures change or are modified, based on new information, the guidelines are updated periodically for all field offices in Wyoming.

These guidelines are primarily for the purpose of attaining statewide consistency in how requirements are determined for avoiding and mitigating environmental impacts and resource and land use conflicts. Consistency in this sense does not mean that identical requirements would be applied for all similar types of land use activities that may cause similar types of impacts. Nor does it mean that the requirements or guidelines for a single land use activity would be identical in all areas.

There are two ways the mitigation guidelines are used in the RMP and EIS process: (1) as part of the planning criteria in developing the RMP alternatives; and (2) in the analytical processes of both developing the alternatives and analyzing the impacts of the alternatives. In the first case, an assumption is made that any one or more of the mitigations will be appropriately included as conditions of relevant actions being proposed or considered in each alternative. In the second case, the mitigations are used (1) to develop a baseline for measuring and comparing impacts among the alternatives; (2) to identify other actions and alternatives that should be considered; and (3) to help determine whether more stringent or less stringent mitigations should be considered.

The EIS for the RMP does not decide or dictate the exact wording or inclusion of these guidelines. Rather, the guidelines are used in the RMP and EIS process as a tool to help develop the RMP alternatives and to provide a baseline for comparative impact analysis in arriving at RMP decisions. These guidelines will be used in the same manner in analyzing activity plans and other site-specific proposals. These guidelines and their wording are matters of policy. As such, specific wording is subject to change primarily through administrative review, not through the RMP and EIS process. Any further changes that may be made in the continuing refinement of

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these guidelines and any development of program-specific standard stipulations will be handled in another forum, including appropriate public involvement and input.

F.1.1. Purpose

The purposes of the “Wyoming BLM Mitigation Guidelines” are (1) to reserve, for the BLM, the right to modify the operations of all surface and other human presence disturbance activities as part of the statutory requirements for environmental protection; and (2) to inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM-administered public lands. These guidelines have been written in a format that will allow for (1) their direct use as stipulations, and (2) the addition of specific or specialized mitigation following the submission of a detailed plan of development or other project proposal, and an environmental analysis.

Those resource activities or programs currently without a standardized set of permit or operation stipulations can use the mitigation guidelines as stipulations or as conditions of approval, or as a baseline for developing specific stipulations for a given activity or program.

Because use of the mitigation guidelines was integrated into the RMP EIS process and will be integrated into the site-specific environmental analysis process, the application of stipulations or mitigation requirements derived through the guidelines will provide more consistency with planning decisions and plan implementation than has occurred in the past. Application of the mitigation guidelines to all surface and other human presence disturbance activities concerning BLM-administered public lands and resources will provide more uniformity in mitigation than has occurred in the past.

F.2. Mitigation Guidelines

F.2.1. Surface Disturbance Mitigation Guideline

Surface disturbance will be prohibited in any of the following areas or conditions. Exception, waiver, or modification of this limitation may be approved in writing, including documented supporting analysis, by the authorized officer.

- Slopes in excess of 25 percent.
- Within important scenic areas (Class I and II Visual Resource Management Areas).
- Within 500 feet of surface water and/or riparian areas.
- Within either 0.25 mile or the visual horizon (whichever is closer) of historic trails.
- Construction with frozen material or during periods when the soil material is saturated or when watershed damage is likely to occur.

Guidance

The intent of the Surface Disturbance Mitigation Guideline is to inform interested parties (potential lessees, permittees, or operators) that when one or more of the five conditions exist, surface-disturbing activities will be prohibited unless or until a permittee or his designated representative and the surface management agency arrive at an acceptable plan for mitigation of anticipated impacts. This negotiation will occur prior to development.

Specific criteria (e.g., 500 feet from water) have been established based upon the best information available. However, such items as geographical areas and seasons must be delineated at the field level. Exception, waiver, or modification of requirements developed from this guideline must be based upon environmental analysis of proposals (e.g., activity plans, plans of development, plans of operation, and applications for permit to drill) and, if necessary, must allow for other mitigation to be applied on a site-specific basis.

F.2.2. Wildlife Mitigation Guideline

When a proposed discretionary land use has potential for affecting wildlife or their habitat, mitigation will be considered. BLM will consult with the U.S. Fish and Wildlife Service (USFWS) on any proposals that may affect Endangered Species Act (ESA) listed, proposed, or candidate species.

Guidance

The Wildlife Mitigation Guideline is intended to provide two basic types of protection: seasonal restriction and prohibition of activities or surface use. Legal descriptions will ultimately be required when applying mitigation and should be measurable and legally definable. There are no minimum subdivision requirements at this time. The area delineated can and should be defined as necessary, based upon current biological data, prior to the time of processing an application and issuing the use authorization. The legal description must eventually become a part of the condition for approval of the permit, plan of development, and/or other use authorization.

Seasonal restrictions protect wildlife during sensitive times of the year such as during the winter when many species are stressed and the spring when most species are bearing and rearing young.

The prohibition of activity or surface use, is intended for protection of specific wildlife habitat areas or values within the use area that cannot be protected by using seasonal restrictions. These areas or values must be factors that limit life-cycle activities (e.g., Greater Sage-Grouse strutting grounds, known Threatened and Endangered species habitat). Frequently, prohibition areas are found within seasonal restriction areas.

Exception, waiver, or modification of requirements developed from this guideline must be based upon environmental analysis of proposals (e.g., activity plans, plans of development, plans of operation, applications for permit to drill) and, if necessary, must allow for other mitigation to be applied on a site-specific basis.

F.2.3. Cultural Resource Mitigation Guideline

When a proposed discretionary land use has potential for affecting the characteristics which qualify a cultural property for the National Register of Historic Places (NRHP), mitigation will be considered. In accordance with Section 106 of the Historic Preservation Act, procedures specified in 36 Code of Federal Regulation (CFR) 800 will be used in consultation with the Wyoming State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation in arriving at determinations regarding the need and type of mitigation to be required.

Guidance

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Wildlife Mitigation Guideline*

The preferred strategy for treating potential adverse effects on cultural properties is “avoidance.” If avoidance involves project relocation, the new project area may also require cultural resource inventory. If avoidance is imprudent or unfeasible, appropriate mitigation may include excavation (data recovery), stabilization, monitoring, protection barriers and signs, or other physical and administrative measures.

Reports documenting results of cultural resource inventory, evaluation, and the establishment of mitigation alternatives (if necessary) shall be written according to standards contained in BLM Manuals, the cultural resource permit stipulations, and in other policy issued by the BLM. These reports must provide sufficient information for Section 106 consultation. Reports shall be reviewed for adequacy by the appropriate BLM cultural resource specialist. If cultural properties on, or eligible for, the NRHP are located within these areas of potential impact and cannot be avoided, the authorized officer shall consult with the SHPO in accordance with National Historic Preservation Act Section 106 and the procedures contained in 36 CFR 800.

Mitigation measures shall be implemented according to the mitigation plan approved by the BLM authorized officer. Such plans are usually prepared by the land use applicant according to BLM specifications. Mitigation plans will be reviewed as part of Section 106 consultation for NRHP eligible or listed properties. The extent and nature of recommended mitigation shall be commensurate with the significance of the cultural resource involved and the anticipated extent of damage. Reasonable costs for mitigation will be borne by the land use applicant. Mitigation must be cost effective and realistic. It must consider project requirements and limitations, input from concerned parties, and be BLM approved or BLM formulated.

Mitigation of paleontological and natural history sites will be treated on a project specific basis. Factors such as site significance, economics, safety, and project urgency must be taken into account when making a decision to mitigate. Authority to protect (through mitigation) such values is provided for in the Federal Land Policy and Management Act (FLPMA), Section 102(a)(8). When avoidance is not possible, appropriate mitigation may include excavation (data recovery), stabilization, monitoring, protection barriers and signs, or other physical and administrative protection measures.

F.2.4. Special Resource Mitigation Guideline

To protect (resource value), activities or surface use will not be allowed (i.e., within a specific distance of the resource value or between date to date) in (legal description).

Application of this limitation to operation and maintenance of a developed project must be based on environmental analysis of the operational or production aspects.

Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the authorized officer.

Example Resource Categories (select or identify category and specific resource value):

- Recreation areas
- Special natural history or paleontological features
- Special management areas
- Sections of major rivers
- Prior existing rights-of-way
- Occupied dwellings

- Other (specify)

Guidance

The Special Resource Mitigation Guideline is intended for use only in site-specific situations where one of the first three general mitigation guidelines will not adequately address the concern. The resource value, location, and specific restrictions must be clearly identified. A detailed plan addressing specific mitigation and special restrictions will be required prior to disturbance or development and will become a condition for approval of the permit, plan of development, or other use authorization.

Exception, waiver, or modification of requirements developed from this guideline must be based upon environmental analysis of proposals (e.g., activity plans, plans of development, plans of operation, applications for permit to drill) and, if necessary, must allow for other mitigation to be applied on a site-specific basis.

F.2.5. No Surface Occupancy Guideline

No Surface Occupancy (NSO) will be allowed on the following described lands (legal description) because of (resource value).

Example Resource Categories (select or identify category and specific resource value):

- Recreation areas (e.g., campgrounds, historic trails, national monuments)
- Major reservoirs/dams
- Special management area (e.g., known Threatened or Endangered species habitat, areas suitable for consideration for wild and scenic rivers designation)
- Other (specify)

Guidance

The NSO Mitigation Guideline is intended for use only when other mitigation is determined insufficient to adequately protect the public interest and is the only alternative to “no development” or “no leasing.” The legal description and resource value of concern must be identified and be tied to an NSO land use planning decision.

Waiver of, or exception(s) to, the NSO requirement will be subject to the same test used to initially justify its imposition. If, upon evaluation of a site-specific proposal, it is found that less restrictive mitigation would adequately protect the public interest or value of concern, then a waiver or exception to the NSO requirement is possible. The record must show that because conditions or uses have changed, less restrictive requirements will protect the public interest. An environmental analysis must be conducted and documented (e.g., environmental assessment, EIS, etc., as necessary) in order to provide the basis for a waiver or exception to an NSO planning decision. Modification of the NSO requirement will pertain only to refinement or correction of the location(s) to which it applied. If the waiver, exception, or modification is found to be consistent with the intent of the planning decision, it may be granted. If found inconsistent with the intent of the planning decision, a plan amendment would be required before the waiver, exception, or modification could be granted.

When considering the “no development” or “no leasing” option, a rigorous test must be met and fully documented in the record. This test must be based upon stringent standards described in the land use planning document. Since rejection of all development rights is more severe than the most restrictive mitigation requirement, the record must show that consideration was given to development subject to reasonable mitigation, including “no surface occupancy.” The record must also show that other mitigation was determined to be insufficient to adequately protect the public interest. A “no development” or “no leasing” decision should not be made solely because it appears that conventional methods of development would be unfeasible, especially where an NSO restriction may be acceptable to a potential permittee. In such cases, the potential permittee should have the opportunity to decide whether or not to go ahead with the proposal (or accept the use authorization), recognizing that an NSO restriction is involved.

Appendix G. Federal Oil and Gas Operations on Split Estate Lands

G.1. Purpose

The purpose of this appendix is to summarize the Bureau of Land Management's (BLM) procedures for considering proposals to conduct exploration and production operations on split estate federal oil and gas leases. This appendix is provided for information purposes only, and is not necessarily a complete statement of rights, obligations, or processes. This appendix is not a part of the BLM's land use plan decision for the Resource Management Plan (RMP). Any conflict with any statute or regulation is unintentional. In the event of a conflict, the statute or regulation controls. Federal oil and gas lessees and operators, and private surface owners, are advised to confer with the BLM at the time an action is proposed for BLM's consideration, in order to obtain information about the current regulations and policies that may apply to the proposal. Nothing in this appendix affects the authority of any Tribe or of the Bureau of Indian Affairs in any way. This RMP applies to federal lands as defined by the Federal Land Policy and Management Act (FLPMA), and does not apply to lands held in trust for any Tribe or for any individual Indian or Indians.

G.2. Definitions

Casual use (operations): "Casual use means activities involving practices that do not ordinarily lead to any appreciable disturbance or damage to lands, resources, or improvements. This term does not apply to private surface. Casual use includes surveying activities" (Onshore Oil and Gas Order No. 1, part II).

Lease: "means any contract, profitshare arrangement, joint venture or other agreement issued or approved by the United States under a mineral leasing law that authorizes exploration for, extraction of or removal of oil or gas" (Onshore Oil and Gas Order No. 1, part II).

Lease facility or production facility: "Production facilities means a lessee's or lease operator's pipes and equipment used on the leasehold to aid in extracting, processing, and storing oil and gas..." (64 Federal Register 32140). See also BLM Manual Section 2880 ("Mineral Leasing Act Rights-of-Way") at Page 9.

Lease site: "means any lands, including the surface of a severed mineral estate, on which exploration for, or extraction and removal of, oil or gas is authorized under a lease" (43 Code of Federal Regulations [CFR] 3160.0-5).

Lessee: "means any person holding record title or owning operating rights in a lease issued or approved by the United States" (43 CFR 3160.0-5).

Operator: "means any person or entity including but not limited to the lessee or operating rights owner, who has stated in writing to the authorized officer that it is responsible under the terms and conditions of the lease for the operations conducted on the leased lands or a portion thereof" (43 CFR 3160.0-5).

Public lands: “means any land and interest in land owned by the United States within the several States and administered by the Secretary of the Interior through the Bureau of Land Management...” (Federal Land Policy Management Act of 1976, Sec. 103(e)).

Private surface owner: “Private Surface Owner means a non-Federal or non-state owner of the surface estate and includes any Indian owner of surface estate not held in trust by the United States” (Onshore Oil and Gas Order No. 1, part II).

Split estate: “Split Estate means lands where the surface is owned by an entity or person other than the owner of the Federal or Indian oil and gas” (Onshore Oil and Gas Order No. 1, part II). “When tribal lands are held in trust or are subject to Federal restrictions against alienation the Bureau of Indian Affairs is the Surface Managing Agency, but if lands are held in unrestricted fee, those lands are treated the same as private surface” (Preamble to Onshore Oil and Gas Order No. 1 revisions, 72 Federal Register 10322-10323, March 7, 2007).

Surface Managing Agency: “Surface Managing Agency means any Federal or state agency having jurisdiction over the surface overlying Federal or Indian oil and gas” (Onshore Oil and Gas Order No. 1, part II).

G.3. General

In considering and authorizing exploration and development of split estate federal oil and gas leases, the BLM prefers that the operator and split estate surface owner reach a Surface Access Agreement for proposed oil and gas operations. The BLM coordinates with both the operator and surface owner, in accordance with the requirements of Onshore Oil and Gas Order No. 1, and generally provides the surface owner’s lands the same level of resource (soil, water, vegetation, air, visual, cultural, etc.) protection as would be required on BLM-administered public lands.

“The BLM will offer the surface owner the same level of surface protection that the BLM provides on Federal surface. The BLM will not apply standards or conditions that exceed those that would normally be applied to Federal surface, even when requested by the surface owner” (The Gold Book, page 12).

Federal mineral lessees may enter onto a privately-owned surface to the extent necessary to explore and produce the federal minerals in compliance with the relevant statutes and BLM regulations and land use designations. The BLM does not have the authority to regulate a surface owner’s use of the surface estate, but does have the authority to regulate the activities of federal mineral lessees and mining claimants. The BLM adds lease stipulations to split estate federal oil and gas leases, in order to ensure that leasing decisions conform to the approved RMP for the area.

G.4. Operations

X.4.1 Geophysical

The BLM’s authority to permit geophysical operations is described under 43 CFR §3150.0-1:

Geophysical exploration on public lands, the surface of which is administered by the Bureau, requires Bureau approval. The procedures in this part also apply to geophysical exploration conducted under the rights granted by any Federal oil and

gas lease unless the surface is administered by the U.S. Forest Service. However, a lessee may elect to conduct exploration operations outside the rights granted by the lease, in which case authorization from the surface managing agency or surface owner may be required... The procedures of this part do not apply to... operations conducted on private surface overlying public lands unless such operations are conducted by a lessee under the rights granted by the Federal oil and gas lease...

As BLM Handbook H-3150-1¹ at pages 1–2 explains:

In those situations where Federal minerals are underlying private surface and the private surface owner's consent is obtained, the BLM is not to become involved. However, when landowner consent for access to the surface cannot be obtained for geophysical exploration operations on a Federal lease by the lease operator, the geophysical operation is to be authorized using the Sundry Notice process...²

When the geophysical exploration operator is the Federal lessee or designated operator of the lessee, it is to file a Sundry Notice... with the BLM and provide notification to the surface owner by certified mail that it intends to enter onto the lands and conduct lease operations. The lessee/operator must then submit proof to the BLM authorized officer that the surface owner has been notified. The lessee or operator must also submit proof to the BLM authorized officer that it has a current and adequate bond payable to the United States for use by the surface owner for damages caused during exploration operations. The authorized officer must give the surface owner 30 days to comment on the proposed action before approving the Sundry Notice.

When a surface access agreement is reached to conduct geophysical operations on split estate lands with leased or unleased federal oil and gas, the BLM does not become involved.

The BLM will not accept a NOI to Conduct Geophysical Operations (NOI), BLM Form 3150-4 or bond to permit entry to split estate lands with unleased federal oil and gas, since the BLM has not issued an oil and gas lease to allow for operations under 43 CFR Part 3160 (see 43 CFR 3150.0-1).

In order to conduct geophysical operations on split estate lands where a federal oil and gas lease has been issued and where an agreement with the surface owner has not been reached, the lessee or the operator must first obtain BLM authorization through an NOI that proposes entry to those lands in order to conduct geophysical operations. The lessee or designated operator must provide to the BLM a certification (see Attachment 1) that a good-faith effort was made to: (a) notify the landowner prior to entry; (b) obtain a Surface Access Agreement; and (c) deliver a copy of the proposed NOI to the surface owner.³ The NOI must also identify the surface owner and include the owner's name, address, and telephone number, if known. A good and sufficient bond to secure payment of applicable damages for the use and benefit of the surface owner must be provided to the BLM on BLM Form 3160-19. The lessee or designated operator must also submit to the BLM evidence of service of a copy of the bond upon the surface owner. Prior to authorizing the

¹Onshore Oil and Gas Geophysical Exploration Surface Management Requirements. January 9, 2007.

²In BLM Washington Office Instruction Memorandum (IM) 2009-121, "Approval of Notice of Intent (NOI) to Conduct Geophysical Exploration to Federal Oil and Gas Lessee on Split Estate", dated May 8, 2009, the BLM recognized that the Sundry Notice form (BLM Form 3160-5) is an imperfect form to use for permitting of geophysical operations. This policy clarified that the BLM will "no longer require the lessee or its operator to file a Sundry Notice" for the purpose of proposing entry to federal leases where a surface owner denies access to the lessee or its operator. In its place the BLM would use the NOI form (BLM Form 3150-4).

³See Onshore Oil and Gas Order No. 1, Part VI.

NOI proposing entry to the lands for which the bond has been submitted, the BLM notifies the surface owner and provides a 30-day period during which the surface owner may protest the sufficiency of the bond. If the sufficiency of the bond is protested, the BLM reviews the bond amount and determines if it is adequate. That decision by the BLM is subject to State Director Review upon a request by any adversely affected party and the State Director's decision is subject to appeal to the Interior Board of Land Appeals.⁴

X.4.2 Notice of Staking/Application for Permit to Drill

X.4.2.1 Surveying and Staking Activities

The lessee or operator is encouraged to contact the surface owner of split estate lands early in the process of planning for exploration and development of a federal lease. This facilitates early discussion about the goals and objectives of both the surface owner and operator. Communication between the lessee or operator and surface owner can reduce potential conflicts, thereby reducing misunderstandings and permit processing times.

For surveying and staking activities, “[t]he operator is responsible for making access arrangements with the appropriate Surface Managing Agency (other than the BLM and the USFS) or private surface owner” (Onshore Oil and Gas Order No. 1, part III.D.2.a).

“No entry on split estate lands for surveying and staking should occur without the operator first making a good faith effort to notify the surface owner. Also, operators are encouraged to notify the BLM or the USFS, as appropriate, before entering private lands to stake for Federal mineral estate locations” (Onshore Oil and Gas Order No. 1, part III.D.2.b).

Aside from surveying and staking the proposed well location, road, pipeline, and/or other lease facilities, the operator may also be required to conduct resource condition surveys of the leased lands.

“As provided in the oil and gas lease, the BLM may request that the applicant conduct surveys or otherwise provide information needed for the BLM's National Historic Preservation Act consultation with the State Historic Preservation Officer or Indian tribe or its Endangered Species Act consultation with the relevant fisheries agency. The Federal mineral lessee has the right to enter the property for this purpose, since it is a necessary prerequisite to development of the dominant mineral estate. Nevertheless, the lessee or operator should seek to reach agreement with the surface owner about the time and method by which any survey would be conducted” (Onshore Oil and Gas Order No. 1, part VI).

X.4.2.2 Onsite Inspection(s)

On split estate lands, the onsite inspection provides the opportunity for the BLM, operator, and surface owner to evaluate and discuss the proposed well location or lease facility in the field.

“Within 10 days of receiving the application, the BLM, in coordination with the operator and Surface Managing Agency, including the private surface owner in the case of split estate minerals, will schedule a date for the onsite inspection (unless the onsite inspection has already been conducted as part of a Notice of Staking)” (Onshore Oil and Gas Order No. 1, part III.E.2.a).

⁴See 43 CFR §3165.3(b). See, e.g., *William P. Maycock*, 176 Interior Board of Land Appeals 206 (2008).

“On non-NFS lands, the BLM will invite the Surface Managing Agency and private surface owner, if applicable, to participate in the onsite inspection. If the surface is privately owned, the operator must furnish to the BLM the name, address, and telephone number of the surface owner if known” (Onshore Oil and Gas Order No. 1, part III.C).

At the onsite inspection, the BLM will consider applicable Best Management Practices (BMPs) that would avoid or mitigate environmental impacts to natural resources. The onsite inspection provides the surface owner with the opportunity to review the proposed well location and/or lease facilities; provide information to the BLM and operator about resources, improvements, and land uses; and express preferences for BMPs to be used for lease operations.

“All parties who attend the onsite inspection will jointly develop a list of resource concerns that the operator must address in the Application for Permit to Drill (APD). The operator will be provided a list of these concerns either during the onsite inspection or within 7 days of the onsite inspection. Surface owner concerns will be considered to the extent practical within the law” (Onshore Oil and Gas Order No. 1, part III.C).

“The BLM will invite the surface owner to the onsite inspection to assure that their concerns are considered” (Onshore Oil and Gas Order No. 1, part VI).

X.4.2.3 Required Components of a Complete APD for Split Estate Operations

X.4.2.3.1 Description of Surface Ownership

A description of the surface ownership (with name, address, and telephone number, if known) along with a certification must be included in the APD submitted by the operator to the BLM.

“The operator must indicate (in a narrative) the surface ownership at the well location, and of all lands crossed by roads that the operator plans to construct or upgrade, including, if known, the name of the agency or owner, phone number, and address. The operator must certify that they have provided a copy of the Surface Use Plan of Operations required in this section to the private surface owner of the well site location, if applicable, or that they made a good faith effort if unable to provide the document to the surface owner” (Onshore Oil and Gas Order No. 1, part III.D.4.k).

X.4.2.3.2 Surface Access Agreement or Waiver

For operations on leased split estate lands, the operator must undertake a good faith effort to reach a Surface Access Agreement.

“[I]n the case of actual oil and gas operations, the operator must make a good faith effort to notify the private surface owner before entry and make a good faith effort to obtain a Surface Access Agreement from the surface owner... The Surface Access Agreement may include terms or conditions of use, be a waiver, or an agreement for compensation. The operator must certify to the BLM that: (1) It made a good faith effort to notify the surface owner before entry; and (2) That an agreement with the surface owner has been reached or that a good faith effort to reach an agreement failed” (Onshore Oil and Gas Order No. 1, part VI).

“The operator must make a good faith effort to provide a copy of their Surface Use Plan of Operations to the surface owner” (Onshore Oil and Gas Order No. 1, part VI). The operator must also provide a copy of any revisions to the Surface Use Plan of Operations to the surface owner. If required under Onshore Oil and Gas Order No. 6 (“Hydrogen Sulfide Operations”), the BLM requires the operator to provide a copy of the Public Protection Plan to the surface owner.

“The surface use agreement between the surface owner and the operator is confidential. However, the APD Surface Use Plan of Operations must contain sufficient detail about any aspects of the agreement necessary for National Environmental Policy Act (NEPA) documentation and to determine that the operations will be in compliance with laws, regulations, Onshore Orders, and agency policies” (The Gold Book, page 12).

“If the BLM’s requirements conflict with provisions in the Surface [Access] Agreement, the operator or surface owner should disclose that conflict at the onsite or to the BLM in writing, and the BLM should consider those conflicts in making its final decision” (BLM’s Split Estate Report to Congress at page 15). Thus, to the extent terms of the agreement may conflict with Conditions of Approval, or Conditions of Approval, to the APD, the BLM should be made aware of those terms, so that they can be considered in the BLM’s final decision.

“The BLM does not review the Surface Use Agreement and does not enforce portions of the Surface Use Agreement that are not contained within the approved APD” (BLM’s Split Estate Report to Congress at page 17).

X.4.2.3.3 Bonding In Lieu of a Surface Access Agreement or Waiver

It is the preference of the BLM that the operator and surface owner reach a Surface Access Agreement. However, in those cases where an agreement is not reached, the BLM follows the procedural requirements in the BLM’s regulations and policies. A good and sufficient bond to secure payment of applicable damages for the use and benefit of the surface owner must be provided to the BLM on BLM Form 3160-19. The lessee or designated operator must also submit to the BLM evidence of service of a copy of the bond upon the surface owner. Prior to authorizing the APD proposing entry to the lands for which the bond has been submitted, the BLM notifies the surface owner and provides a 30-day period during which the surface owner may protest the sufficiency of the bond. If the sufficiency of the bond is protested, the BLM reviews the bond amount and determine if it is adequate. That decision by the BLM is subject to State Director Review upon a request by any adversely affected party and the State Director’s decision is subject to appeal to the Interior Board of Land Appeals.⁵

“If no agreement was reached with the surface owner, the operator must submit an adequate bond (minimum of \$1,000) to the BLM for the benefit of the surface owner sufficient to: (1) Pay for loss or damages; or (2) As otherwise required by the specific statutory authority under which the surface was patented and the terms of the lease. Surface owners have the right to appeal the sufficiency of the bond. Before the approval of the APD, the BLM will make a good faith effort to contact the surface owner to assure that they understand their rights to appeal” (Onshore Oil and Gas Order No. 1, part VI).

“The bond amount will be reviewed by the BLM to assure that it is sufficient based on the appropriate law” (Preamble to Onshore Oil and Gas Order No. 1 revisions, 72 Federal Register 10323, March 7, 2007).

If operations under an approved APD result in loss or damages that are compensable under the statutes by which the lands were patented, the surface owner may obtain judgment from a court of competent jurisdiction. The BLM will then release from the bond the amount ordered by the court to the surface owner.

⁵See 43 CFR §3165.3(b). See, e.g., *William P. Maycock*, 176 Interior Board of Land Appeals 206 (2008).

X.4.2.4 Approval of the APD

The BLM considers the views of the surface owner before approving the APD. The BLM must prepare an environmental record of review (43 CFR 3162.5-1(a)) to document its evaluation of potential resource impacts, including documentation of NEPA compliance.

“The BLM must comply with NEPA, the National Historic Preservation Act, the Endangered Species Act, and related Federal statutes when authorizing lease operations on split estate lands where the surface is not Federally owned and the oil and gas is Federal. For split estate lands within U.S. Forest Service (USFS) administrative boundaries, the BLM has the lead responsibility, unless there is a local BLM/USFS agreement that gives the USFS this responsibility” (Onshore Oil and Gas Order No. 1, part VI).

“After the APD is approved the operator must make a good faith effort to provide a copy of the Conditions of Approval to the surface owner. The APD approval is not contingent upon delivery of a copy of the Conditions of Approval to the surface owner” (Onshore Oil and Gas Order No. 1, part VI).

X.4.3 Sundry Notices

Operations proposed by Sundry Notice that will result in additional surface disturbance or re-disturbance of previously reclaimed areas require a Surface Use Plan of Operations.

“Prior to commencing any operation on the leasehold which will result in additional surface disturbance, other than those authorized under § 3162.3-1 or § 3162.3-2 of this title, the operator shall submit a proposal on Form 3160-5 to the authorized officer for approval. The proposal shall include a surface use plan of operations” (43 CFR 3162.3-3).

“The operator must certify on Form 3160-5 that they have made a good faith effort to provide a copy of any proposal involving new surface disturbance to the private surface owner in the case of split estate” (Onshore Oil and Gas Order No. 1, part VIII.A).

For review of Final Abandonment Notices submitted by an operator on split estate lands, the BLM will consider the views of the surface owner.

“If applicable, the private surface owner will be notified and their views will be carefully considered” (Onshore Oil and Gas Order No. 1, part XII).

“In cases where the Surface Managing Agency or private surface owner desires to acquire an oil and gas well and convert it to a water supply well or acquire a water supply well that was drilled by the operator to support lease operations, the Surface Managing Agency or private surface owner must inform the appropriate BLM office of its intent before the approval of the APD in the case of a dry hole and no later than the time a NOI to Abandon is submitted for a depleted production well... The Surface Managing Agency or private surface owner must reach agreement with the operator as to the satisfactory completion of reclamation operations before the BLM will approve any abandonment or reclamation. The BLM approval of the partial abandonment under this section, completion of any required reclamation operations, and the signed release agreement will relieve the operator of further obligation for the well. If the Surface Managing Agency or private surface owner acquires the well for water use purposes, the party acquiring the well assumes liability for the well” (Onshore Oil and Gas Order No. 1, part IX.B).

“Completion of a well as plugged and abandoned may also include conditioning the well as water supply source for lease operations or for use by the surface owner or appropriate Government Agency, when authorized by the authorized officer. All costs over and above the normal plugging and abandonment expense will be paid by the party accepting the water well” (43 CFR 3162.3-4(b)).

X.4.4 Emergency Operations

“In the event of an emergency, the operator may take immediate action without prior Surface Managing Agency approval to safeguard life or to prevent significant environmental degradation. The BLM or the USFS must receive notification of the emergency situation and the remedial action taken by the operator as soon as possible, but not later than 24 hours after the emergency occurred. If the emergency only affected drilling operations and had no surface impacts, only the BLM must be notified. If the emergency involved surface resources on other Surface Managing Agency lands, the operator should also notify the Surface Managing Agency and private surface owner within 24 hours” (Onshore Oil and Gas Order No. 1, part IV.d).

G.5. References

- Onshore Oil and Gas Order No. 1
- Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (“The Gold Book”)
- 43 CFR Part 3150
- 43 CFR Part 3160
- 43 CFR Subpart 3814
- BLM Wyoming – Wyoming Oil and Gas Conservation Commission Memorandum of Understanding
- BLM Handbook H-3150-1 (Geophysical Handbook)
- BLM Form 3160-019 (“Bond For Surface Owner Protection”)
- BLM Brochure: Split Estate – Rights, Responsibilities, and Opportunities
- BLM Brochure: Split Estate – Cultural Resource Requirements on Private Surface – Federal Minerals for Oil and Gas Development
- BLM-Washington Office Instruction Memorandum 2003-131 (“Permitting Oil and Gas on Split Estate Lands and Guidance for Onshore Oil and Gas Order No. 1”), April 2, 2003.
- BLM-Washington Office Instruction Memorandum 2007-165 (“Split Estate Report to Congress – Implementation of Fluid Mineral Leasing and Land Use Planning Recommendations”), July 26, 2007.
- Energy Policy Act of 2005, Section. 1835 (“Split-Estate Federal Oil and Gas Leasing and Development Practices”).

- Energy Policy Act of 2005 – Section 1835 – A Report to Congress (December 2006).
- BLM-Washington Office Instruction Memorandum 1989-201 (“Legal Responsibilities of BLM for Oil and Gas Leasing and Operations on Split Estate Lands”), January 4, 1989.

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Appendix H. Proposed Resource Management Plan and Approved Resource Management Plan Crosswalk Tables

This appendix provides a crosswalk for readers between the maps (Table H.1, “Maps Crosswalk” (p. 413)) and appendices (Table H.2, “Appendices Crosswalk” (p. 416)) listed in the Proposed Resource Management Plan (RMP) and Final Environmental Impact Statement (EIS) and the Approved RMP. Some appendices and maps included in the Proposed RMP and Final EIS have not been carried forward in the Approved RMP (denoted by “N/A” in the second column of the table). In addition, the Approved RMP contains new maps and appendices that were not included in the Proposed RMP and Final EIS (denoted by “N/A” in the first column of the table).

Table H.1. Maps Crosswalk

| Proposed RMP and Final EIS | Approved RMP |
|--|---|
| N/A | Map 1-1. Buffalo Planning Area, Surface Management and Sub-Surface Estate |
| N/A | Map 1-2. Buffalo Planning Area, Greater Sage Grouse Habitat Management Areas across All Jurisdictions |
| N/A | Map 1-3. Buffalo Decision Area, Greater Sage Grouse Habitat Management Areas for BLM Administered Lands |
| N/A | Map 2-1. Buffalo Habitat Management Areas |
| N/A | Map 2-2. Buffalo Livestock Grazing |
| N/A | Map 2-3. Buffalo Fluid Minerals (Oil and Gas) |
| N/A | Map 2-4. Buffalo Locatable Minerals |
| N/A | Map 2-5. Buffalo Salable Minerals (Mineral Materials) |
| N/A | Map 2-6. Buffalo Wind Energy |
| N/A | Map 2-7. Buffalo Designated Utility Corridors |
| N/A | Map 2-8. Buffalo Rights-of-Way |
| N/A | Map 2-9. Buffalo Land Tenure |
| N/A | Map 2-10. Buffalo Trails & Travel Management (OHV) |
| Map 1. Surface Estate in the Planning Area | Map 1-4. Surface Estate in the Planning Area |
| Map 2. Federal Mineral Estate in the Planning Area | Map 1-5. Federal Mineral Estate in the Planning Area |
| Map 3. Physical Resources - Severe Erosion Hazard Soils - All Alternatives | N/A |
| Map 4. Physical Resources - Lands with 25 Percent Slope or Greater - All Alternatives | Map 3-1. Physical Resources - Lands with 25 Percent Slope or Greater |
| Map 5. Physical Resources - Lands with Poor Reclamation Suitability - All Alternatives | Map 3-2. Physical Resources - Lands with Poor Reclamation Suitability |
| Map 6. Physical Resources - Limited Reclamation Potential (LRP) Areas - All Alternatives | Map 3-3. Physical Resources - Limited Reclamation Potential (LRP) Areas |
| Map 7. Physical Resources - Cave and Karst Formations - All Alternatives | N/A |
| Map 8. Mineral Resources - Locatable - Existing and Recommended Withdrawals - All Alternatives | Map 3-4. Mineral Resources - Locatable - Existing and Recommended Withdrawals |
| Map 9. Mineral Resources - Locatable - Potential/Active Mining Areas - All Alternatives | N/A |
| Map 10. Mineral Resources - Salable - Mineral Materials Development Potential - All Alternatives | N/A |
| Map 11. Mineral Resources - Leasable - Coal - All Alternatives | Map 3-5. Mineral Resources - Leasable - Coal |

Appendix H Proposed Resource Management Plan and Approved Resource Management Plan Crosswalk Tables

| Proposed RMP and Final EIS | Approved RMP |
|--|---|
| Map 12. Mineral Resources - Leasable - Oil and Gas - Existing Leases - All Alternatives | N/A |
| Map 13. Mineral Resources - Leasable - Oil and Gas Constraints - Alternative A | N/A |
| Map 14. Mineral Resources - Leasable - Oil and Gas Constraints - Alternative B | N/A |
| Map 15. Mineral Resources - Leasable - Oil and Gas Constraints - Alternative C | N/A |
| Map 16. Mineral Resources - Leasable - Oil and Gas Constraints - Alternative D | Map 3-6. Mineral Resources - Leasable - Oil and Gas Constraints |
| N/A | Map 3-7. Mineral Resources - Salable |
| Map 17. Overlapping Timing Limitation (TL) Stipulations for Biological Resources - Alternative D | Map 3-8. Overlapping Timing Limitation (TL) Stipulations for Biological Resources |
| Map 18. Overlapping Controlled Surface Use (CSU) Stipulations for Biological Resources - Alternative D | Map 3-9. Overlapping Controlled Surface Use (CSU) Stipulations for Biological Resources |
| Map 19. Overlapping No Surface Occupancy (NSO) Stipulations for Biological Resources - Alternative D | Map 3-10. Overlapping No Surface Occupancy (NSO) Stipulations for Biological Resources |
| Map 20. Overlapping Controlled Surface Use (CSU) Stipulations for Cultural Resources - Alternative D | Map 3-11. Overlapping Controlled Surface Use (CSU) Stipulations for Cultural Resources |
| Map 21. Overlapping No Surface Occupancy (NSO) Stipulations for Cultural Resources - Alternative D | Map 3-12. Overlapping No Surface Occupancy (NSO) Stipulations for Cultural Resources |
| Map 22. Overlapping Controlled Surface Use (CSU) Stipulations for Physical Resources - Alternative D | Map 3-13. Overlapping Controlled Surface Use (CSU) Stipulations for Physical Resources |
| Map 23. Mineral Resources - Fluid Minerals - Conventional Oil and Gas Potential - All Alternatives | N/A |
| Map 24. Mineral Resources - Fluid Minerals - Coalbed Natural Gas Potential - All Alternatives | N/A |
| Map 25. Biological Resources - Vegetation - All Alternatives | Map 3-14. Biological Resources - Vegetation |
| Map 26. Biological Resources - Forests and Woodlands - All Alternatives | N/A |
| Map 27. Biological Resources - Invasive Species Potential - All Alternatives | N/A |
| Map 28. Biological Resources - Fish and Wildlife - Streams with Fish Populations - All Alternatives | Map 3-15. Biological Resources - Fish and Wildlife - Streams with Fish Populations |
| Map 29. Biological Resources - Fish and Wildlife - Elk Seasonal Ranges and Big Game Migration Corridors - All Alternatives | Map 3-16. Biological Resources - Fish and Wildlife - Elk Seasonal Ranges and Big Game Migration Corridors |
| Map 30. Biological Resources - Fish and Wildlife - Sharp-tailed Grouse Leks - Alternatives A, B, and D | Map 3-17. Biological Resources - Fish and Wildlife - Sharp-tailed Grouse Leks |
| Map 31. Biological Resources - Fish and Wildlife - Raptors - Alternatives A and C | N/A |
| Map 32. Biological Resources - Fish and Wildlife - Raptors - Alternative B | N/A |
| Map 33. Biological Resources - Fish and Wildlife - Raptors - Alternative D | Map 3-18. Biological Resources - Fish and Wildlife - Raptors |
| Map 34. Biological Resources - Special Status Species - Plants - All Alternatives | N/A |
| Map 35. Biological Resources - Special Status Species - Prairie Dog Colonies - All Alternatives | Map 3-19. Biological Resources - Special Status Species - Prairie Dog Colonies |
| Map 36. Biological Resources - Special Status Species - Greater Sage-Grouse Habitat Classification | N/A |
| Map 37. Biological Resources - Special Status Species - Greater Sage-Grouse - Alternative A | N/A |

| Proposed RMP and Final EIS | Approved RMP |
|--|---|
| Map 38. Biological Resources - Special Status Species - Greater Sage-Grouse - Alternative B | N/A |
| Map 39. Biological Resources - Special Status Species - Greater Sage-Grouse - Alternative C | N/A |
| Map 40. Biological Resources - Special Status Species - Greater Sage-Grouse - Alternative D | Map 3-20. Biological Resources – Special Status Species – Greater Sage-Grouse |
| Map 41. Biological Resources - Special Status Species - Bald Eagle Roosts and Nests - All Alternatives | Map 3-21. Biological Resources - Special Status Species - Bald Eagle Roosts and Nests |
| Map 42. Biological Resources - Special Status Species - Mountain Plover - All Alternatives | N/A |
| Map 43. Heritage and Visual Resources - Cultural Resources - Alternative A | N/A |
| Map 44. Heritage and Visual Resources - Cultural Resources - Alternative B | N/A |
| Map 45. Heritage and Visual Resources - Cultural Resources - Alternative D | Map 3-22. Heritage and Visual Resources - Cultural Resources |
| Map 46. Heritage and Visual Resources - Cultural Sub-Regions - All Alternatives | N/A |
| Map 47. Heritage and Visual Resources - Potential Fossil Yield Classification - All Alternatives | Map 3-23. Heritage and Visual Resources - Potential Fossil Yield Classification |
| Map 48. Heritage and Visual Resources - Visual Resource Management - Alternative A | N/A |
| Map 49. Heritage and Visual Resources - Visual Resource Management - Alternative B | N/A |
| Map 50. Heritage and Visual Resources - Visual Resource Management - Alternative C | N/A |
| Map 51. Heritage and Visual Resources - Visual Resource Management - Alternative D | Map 3-24. Heritage and Visual Resources - Visual Resource Management |
| Map 52. Land Resources - Forest Products - All Alternatives | Map 3-25. Land Resources - Forest Products |
| Map 53. Land Resources - Disposal Lands - Alternative A | N/A |
| Map 54. Land Resources - Disposal Lands - Alternatives B, C, and D | Map 3-26. Land Resources - Disposal Lands |
| Map 55. Land Resources - Renewable Energy - Alternative B | N/A |
| Map 56. Land Resources - Renewable Energy - Alternative D | Map 3-27. Land Resources - Renewable Energy |
| Map 57. Land Resources - Rights-of-Way Corridors - Alternatives A and C | N/A |
| Map 58. Land Resources - Rights-of-Way Corridors - Alternatives B and D | Map 3-28. Land Resources - Rights-of-Way Corridors |
| Map 59. Land Resources - Rights-of-Way Avoidance and Exclusion - Alternative D | Map 3-29. Land Resources - Rights-of-Way Avoidance and Exclusion |
| Map 60. Land Resources - Preliminary Transportation Network | Map 3-30. Land Resources - Preliminary Transportation Network |
| Map 61. Land Resources - Sheridan Area Transportation Features - All Alternatives | N/A |
| Map 62. Land Resources - Gillette Area Transportation Features - All Alternatives | N/A |
| Map 63. Land Resources - Wright Area Transportation Features - All Alternatives | N/A |
| Map 64. Land Resources - Kaycee Area Transportation Features - All Alternatives | N/A |

| Proposed RMP and Final EIS | Approved RMP |
|---|--|
| Map 65. Land Resources - Transportation Access - Alternative A | N/A |
| Map 66. Land Resources - Transportation Access - Alternative B | N/A |
| Map 67. Land Resources - Transportation Access - Alternative C | N/A |
| Map 68. Land Resources - Transportation Access - Alternative D | Map 3-31. Land Resources - Transportation Access |
| Map 69. Land Resources - Recreation - ERMA and SRMA - Alternative B | N/A |
| Map 70. Land Resources - Recreation - ERMA and SRMA - Alternative C | N/A |
| Map 71. Land Resources - Recreation - ERMA and SRMA - Alternative D | Map 3-32. Land Resources - Recreation - ERMA and SRMA |
| Map 72. Land Resources - Grazing Management - Livestock Allotments - All Alternatives | Map 3-33. Land Resources - Grazing Management - Livestock Allotments |
| Map 73. ACECs, BCBs, and Lands with Wilderness Characteristics - Alternative B | N/A |
| Map 74. ACECs, BCBs, and Lands with Wilderness Characteristics - Alternative D | Map 3-34. ACECs, BCBs, and Lands with Wilderness Characteristics |
| Map 75. Special Designations - WSAs and WSRs - All Alternatives | Map 3-35. Special Designations - WSAs and WSRs |
| Map 76. Fortification Creek Planning Area - All Alternatives | Map 3-36. Fortification Creek Planning Area |
| ACEC Area of Critical Environmental Concern BCB Back Country Byway BLM Bureau of Land Management EIS Environmental Impact Statement ERMA Extensive Recreation Management Area N/A Not applicable OHV Off-highway Vehicle RMP Resource Management Plan SRMA Special Recreation Management Area WSA Wilderness Study Area WSR Wild and Scenic River | |

Table H.2. Appendices Crosswalk

| Proposed RMP and Final EIS | Approved RMP |
|---|---|
| Appendix A. Legislation and Policy Pertaining to Specific Resources | Appendix E. Legislation and Policy Pertaining to Specific Resources |
| Appendix B. Greater Sage-Grouse Implementation Framework | Appendix D. Greater Sage-Grouse Habitat Management Strategy |
| Appendix C. Public Involvement, Consultation, and Coordination | Appendix W. Public Involvement, Consultation, and Coordination |
| Appendix D. Best Management Practices | Appendix C. Best Management Practices and Required Design Features |
| Appendix E. Livestock Grazing Allotments within the Buffalo Planning Area | Appendix U. Livestock Grazing Allotments |
| Appendix F. Maps | Appendix A. Maps |
| Appendix G. Surface Disturbance and Reasonable Foreseeable Actions | Appendix J. Surface Disturbance and Reasonable Foreseeable Actions |
| Appendix H. Fluid Mineral Lease Notices; Lease Stipulations; and the Process for Exceptions, Modifications, and Waivers | Appendix B. Fluid Mineral Lease Notices; Lease Stipulations; and the Process for Exceptions, Modifications, and Waivers |

Appendix H Proposed Resource Management Plan and Approved Resource Management Plan Crosswalk Tables

| Proposed RMP and Final EIS | Approved RMP |
|---|---|
| Appendix I. Biological Assessment | N/A |
| Appendix J. Mitigation Guidelines for Surface-Disturbing and Disruptive Activities, Wyoming Bureau of Land Management | Appendix F. Mitigation Guidelines for Surface-Disturbing and Disruptive Activities, Wyoming Bureau of Land Management |
| Appendix K. Biological Resources Support Documents | Appendix Q. Biological Resources Support Document |
| Appendix L. Lands Identified for Disposal Through Exchange or Sale | Appendix R. Lands Identified for Disposal Through Exchange or Sale |
| Appendix M. Technical Support Document for Air Quality | N/A |
| Appendix N. Buffalo Air Resource Management Plan | Appendix L. Buffalo Air Resources Management Plan |
| Appendix O. Reclamation Policy for the Buffalo Field Office | Appendix M. Reclamation Policy for the Buffalo Field Office |
| Appendix P. Wyoming Standards for Healthy Rangelands | Appendix I. Wyoming Standards for Healthy Rangelands |
| Appendix Q. Fire and Fuels Management | Appendix P. Fire and Fuels Management |
| Appendix R. Travel and Transportation Management | Appendix S. Travel and Transportation Management |
| Appendix S. Areas of Critical Environmental Concern | Appendix V. Areas of Critical Environmental Concern |
| Appendix T. Recreation Management Areas | Appendix T. Recreation Management Activities |
| Appendix U. Economic Impact Analysis Methodology | N/A |
| Appendix V. Oil and Gas Operations | Appendix O. Oil and Gas Operations |
| Appendix W. Buffalo Water Resources Management Plan | Appendix N. Buffalo Water Resources Management Plan |
| Appendix X. Federal Oil and Gas Operations on Split Estate Lands | Appendix G. Federal Oil and Gas Operations on Split Estate Lands |
| Appendix Y. Comment Analysis | N/A |
| N/A | Appendix H. Proposed Resource Management Plan and Approved Resource Management Plan Crosswalk Tables |
| N/A | Appendix K. Biological Opinion |
| N/A | Appendix X. Implementation, Monitoring, and Evaluation |
| EIS Environmental Impact Statement N/A Not applicable RMP Resource Management Plan | |

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Appendix I. Wyoming Standards for Healthy Rangelands

I.1. Introduction

According to the Department of the Interior's final rule for grazing administration, effective August 21, 1995, the Wyoming Bureau of Land Management (BLM) State Director is responsible for the development of standards for healthy rangelands and guidelines for livestock grazing management on 18 million acres of Wyoming's public rangelands. The development and application of these standards and guidelines are to achieve the four fundamentals of rangeland health outlined in the grazing regulations (43 Code of Federal Regulations [CFR] 4180.1). Those four fundamentals are: (1) watersheds are functioning properly; (2) water, nutrients, and energy are cycling properly; (3) water quality meets State standards; and (4) habitat for special status species is protected.

Standards address the health, productivity, and sustainability of the BLM-administered public rangelands and represent the minimum acceptable conditions for the public rangelands. The standards apply to all resource uses on public lands. Their application will be determined as use-specific guidelines are developed. Standards are synonymous with goals and are observed on a landscape scale. They describe healthy rangelands rather than important rangeland by-products. The achievement of a standard is determined by measuring appropriate indicators. An indicator is a component of a system whose characteristics (e.g., presence, absence, quantity, and distribution) can be measured based on sound scientific principles.

Guidelines provide for, and guide the development and implementation of, reasonable, responsible, and cost-effective management practices at the grazing allotment and watershed level. The guidelines in this document apply specifically to livestock grazing management practices on the BLM-administered public lands. These management practices will either maintain existing desirable conditions or move rangelands toward statewide standards within reasonable timeframes. Appropriate guidelines will ensure that the resultant management practices reflect the potential for the watershed, consider other uses and natural influences, and balance resource goals with social, cultural/historic, and economic opportunities to sustain viable local communities. Guidelines, like standards, apply statewide.

Implementation of the Wyoming standards and guidelines will generally be done in the following manner. Grazing allotments or groups of allotments in a watershed will be reviewed based on the BLM's current allotment categorization and prioritization process. Allotments with existing management plans and high-priority allotments will be reviewed first. Lower priority allotments will then be reviewed as time allows. The permittees and interested public will be notified when allotments are scheduled for review and are encouraged to participate in the review. The review will first determine if an allotment meets each of the six standards. If it does, no further action will be necessary. If any of the standards aren't being met, rationale explaining the contributing factors will be prepared. If livestock grazing practices are found to be among the contributing factors, corrective actions consistent with the guidelines will be developed and implemented. If a lack of data prohibits the reviewers from determining if a standard is being met, a strategy will be developed to acquire the data in a timely manner.

Quantifiable resource objectives and specific management practices to achieve the standards will be developed at the BLM Field Office level and will consider all reasonable and practical options available to achieve desired results on a watershed or grazing allotment scale. The objectives shall be reflected in site-specific activity or implementation plans as well as in livestock grazing permits/leases for the public lands. Interdisciplinary activity or implementation plans will be used to maintain or achieve the Wyoming standards for healthy rangelands. These plans may be developed formally or informally through mechanisms available and suited to local needs (such as Coordinated Resource Management [CRM] efforts).

On a continuing basis, the Standards for Healthy Rangelands will direct on-the-ground management on public lands. They will serve to focus the ongoing development and implementation of activity plans toward the maintenance or attainment of healthy rangelands.

The development and implementation of standards and guidelines will enable on-the-ground management of the public rangelands to maintain a clear and responsible focus on both the health of the land and its dependent natural and human communities. This development and implementation will ensure that any mechanisms currently being employed or that may be developed in the future will maintain a consistent focus on these essential concerns.

These standards and guidelines are compatible with BLM's three-tiered land use planning process. The first tier includes the laws, regulations, and policies governing BLM's administration and management of the public lands and their uses. The previously mentioned fundamentals of rangeland health specified in 43 CFR 4180.1, the requirement for BLM to develop these state (or regional) standards and guidelines, and the standards and guidelines themselves, are part of this first tier. Also part of this first tier are the specific requirements of various federal laws and the objectives of 43 CFR 4100.2 that require BLM to consider the social and economic well-being of the local communities in its management process.

These standards and guidelines will provide for statewide consistency and guidance in the preparation, amendment, and maintenance of BLM land use plans, which represent the second tier of the planning process. The BLM land use plans provide general allocation decisions concerning the kinds of resource and land uses that can occur on the BLM-administered public lands, where they can occur, and the types of conditional requirements under which they can occur. In general, the standards will be the basis for development of planning area-specific management objectives concerning rangeland health and productivity, and the guidelines will direct development of livestock grazing management actions to help accomplish those objectives.

The third tier of the BLM planning process, activity or implementation planning, is directed by the applicable land use plan and, therefore, by the standards and guidelines. The standards and guidelines, as BLM statewide policy, will also directly guide development of the site-specific objectives and the methods and practices used to implement the land use plan decisions. Activity or implementation plans contain objectives which describe the site-specific conditions desired. Grazing permits/leases for the public lands contain terms and conditions which describe specific actions required to attain or maintain the desired conditions. Through monitoring and evaluation, the BLM authorized officer, in consultation with, grazing permittees, and other interested parties determine if progress is being made to achieve activity plan objectives.

Wyoming rangelands support a variety of uses which are of significant economic importance to the state and its communities. These uses include oil and gas production, mining, recreation and tourism, fishing, hunting, wildlife viewing, and livestock grazing. Rangelands also provide amenities which contribute to the quality of life in Wyoming such as open spaces, solitude, and

opportunities for personal renewal. Wyoming's rangelands should be managed with consideration of the state's historical, cultural, and social development and in a manner which contributes to a diverse, balanced, competitive, and resilient economy in order to provide opportunity for economic development. Healthy rangelands can best sustain these uses.

To varying degrees, BLM management of the public lands and resources plays a role in the social and economic well-being of Wyoming communities. The National Environmental Policy Act (part of the above-mentioned first planning tier) and various other laws and regulations mandate the BLM to analyze the socioeconomic impacts of actions occurring on public rangelands. These analyses occur during the environmental analysis process of land use planning (second planning tier), where resource allocations are made, and during the environmental analysis process of activity or implementation planning (third planning tier). In many situations, factors that affect the social and economic well-being of local communities extend far beyond the scope of BLM management or individual public land users' responsibilities. In addition, since standards relate primarily to physical and biological features of the landscape, it is very difficult to provide measurable socioeconomic indicators that relate to the health of rangelands. It is important that standards be realistic and within the control of the land manager and users to achieve.

I.2. Standards for Healthy Public Rangelands

I.2.1. Standard #1

Within the potential of the ecological site (soil type, landform, climate, and geology), soils are stable and allow for water infiltration to provide for optimal plant growth and minimal surface runoff.

This Means That:

The hydrologic cycle will be supported by providing for water capture, storage, and sustained release. Adequate energy flow and nutrient cycling through the system will be achieved as optimal plant growth occurs. Plant communities are highly varied within Wyoming.

Indicators May Include But Are Not Limited To:

- Water infiltration rates
- Soil compaction
- Erosion (rills, gullies, pedestals, capping)
- Soil micro-organisms
- Vegetative cover (gully bottoms and slopes)
- Bare ground and litter

The above indicators are applied as appropriate to the potential of the ecological site.

I.2.2. Standard #2

Riparian and wetland vegetation has structural, age, and species diversity characteristic of the stage of channel succession and is resilient and capable of recovering from natural and human disturbance in order to provide forage and cover, capture sediment, dissipate energy, and provide for groundwater recharge.

This Means That:

Wyoming has highly varied riparian and wetland systems on public lands. These systems vary from large rivers to small streams and from springs to large wet meadows. These systems are in various stages of natural cycles and may also reflect other disturbance that is either localized or widespread throughout the watershed. Riparian vegetation captures sediments and associated materials, thus enhancing the nutrient cycle by capturing and utilizing nutrients that would otherwise move through a system unused.

Indicators May Include But Are Not Limited To:

- Erosion and deposition rate
- Channel morphology and floodplain function
- Channel succession and erosion cycle
- Vegetative cover
- Plant composition and diversity (species, age class, structure, successional stages, desired plant community, etc.)
- Bank stability
- Woody debris and instream cover
- Bare ground and litter

The above indicators are applied as appropriate to the potential of the ecological site.

I.2.3. Standard #3

Upland vegetation on each ecological site consists of plant communities appropriate to the site which are resilient, diverse, and able to recover from natural and human disturbance.

This Means That:

In order to maintain desirable conditions and/or recover from disturbance within acceptable timeframes, plant communities must have the components present to support the nutrient cycle and adequate energy flow. Plants depend on nutrients in the soil and energy derived from sunlight. Nutrients stored in the soil are used over and over by plants, animals, and microorganisms. The amount of nutrients available and the speed with which they cycle among plants, animals, and the soil are fundamental components of rangeland health. The amount, timing, and distribution of energy captured through photosynthesis are fundamental to the function of rangeland ecosystems.

Indicators May Include But Are Not Limited To:

- Vegetative cover
- Plant composition and diversity (species, age class, structure, successional stages, desired plant community, etc.)
- Bare ground and litter
- Erosion (rills, gullies, pedestals, capping)
- Water infiltration rates

The above indicators are applied as appropriate to the potential of the ecological site.

I.2.4. Standard #4

Rangelands are capable of sustaining viable populations and a diversity of native plant and animal species appropriate to the habitat. Habitats that support or could support Threatened, Endangered, species of special concern, or sensitive species will be maintained or enhanced.

This Means That:

The management of Wyoming rangelands will achieve or maintain adequate habitat conditions that support diverse plant and animal species. These may include listed Threatened or Endangered species (U.S. Fish and Wildlife-designated), species of special concern (BLM-designated), and other sensitive species (State of Wyoming-designated). The intent of this standard is to allow the listed species to recover and be delisted.

Indicators May Include But Are Not Limited To:

- Noxious weeds
- Species diversity
- Age class distribution
- All indicators associated with the upland and riparian standards
- Population trends
- Habitat fragmentation

The above indicators are applied as appropriate to the potential of the ecological site.

I.2.5. Standard #5

Water quality meets State standards.

This Means That:

The State of Wyoming is authorized to administer the Clean Water Act. BLM management actions or use authorizations will comply with all federal and state water quality laws, rules and regulations to address water quality issues that originate on public lands. Provisions for the establishment of water quality standards are included in the Clean Water Act, as amended, and the Wyoming Environmental Quality Act, as amended. Regulations are found in Part 40 of the CFR and in Wyoming's Water Quality Rules and Regulations. The latter regulations contain Quality Standards for Wyoming Surface Waters.

Natural processes and human actions influence the chemical, physical, and biological characteristics of water. Water quality varies from place to place with the seasons, the climate, and the kind substrate through which water moves. Therefore, the assessment of water quality takes these factors into account.

Indicators May Include But Are Not Limited To:

- Chemical characteristics (e.g., pH, conductivity, dissolved oxygen)
- Physical characteristics (e.g., sediment, temperature, color)
- Biological characteristics (e.g., macro- and micro-invertebrates, fecal coliform, and plant and animal species)

I.2.6. Standard #6

Air quality meets State standards.

This Means That:

The State of Wyoming is authorized to administer the Clean Air Act. BLM management actions or use authorizations will comply with all federal and state air quality laws, rules, regulations and standards. Provisions for the establishment of air quality standards are included in the Clean Air Act, as amended, and the Wyoming Environmental Quality Act, as amended. Regulations are found in Part 40 of the CFR and in Wyoming Air Quality Standards and Regulations.

Indicators May Include But Are Not Limited To:

- Particulate matter
- Sulfur dioxide
- Photochemical oxidants (ozone)
- Volatile organic compounds (hydrocarbons)
- Nitrogen oxides
- Carbon monoxide
- Odors
- Visibility

I.3. BLM Wyoming Guidelines for Livestock Grazing Management

1. Timing, duration, and levels of authorized grazing will ensure that adequate amounts of vegetative ground cover, including standing plant material and litter, remain after authorized use to support infiltration, maintain soil moisture storage, stabilize soils, allow the release of sufficient water to maintain system function, and to maintain subsurface soil conditions that support permeability rates and other processes appropriate to the site.
2. Grazing management practices should restore, maintain, or improve riparian plant communities. Grazing management strategies consider hydrology, physical attributes, and potential for the watershed and the ecological site. Grazing management should maintain adequate residual plant cover to provide for plant recovery, residual forage, sediment capture, energy dissipation, and groundwater recharge.
3. Range improvement practices (instream structures, fences, water troughs, etc.) in and adjacent to riparian areas will ensure that stream channel morphology (e.g., gradient, width/depth ratio, channel roughness and sinuosity) and functions appropriate to climate and landform are maintained or enhanced. The development of springs, seeps, or other projects affecting water and associated resources shall be designed to protect the ecological and hydrological functions, wildlife habitat, and significant cultural, historical, and archaeological values associated with the water source. Range improvements will be located away from riparian areas if they conflict with achieving or maintaining riparian function.
4. Grazing practices that consider the biotic communities as more than just a forage base will be designed in order to ensure that the appropriate kinds and amounts of soil organisms, plants, and animals to support the hydrologic cycle, nutrient cycle, and energy flow are maintained or enhanced.
5. Continuous season-long or other grazing management practices that hinder the completion of plants' life-sustaining reproductive and/or nutrient cycling processes will be modified to

ensure adequate periods of rest at the appropriate times. The rest periods will provide for seedling establishment or other necessary processes at levels sufficient to move the ecological site condition toward the resource objective and subsequent achievement of the standard.

6. Grazing management practices and range improvements will adequately protect vegetative cover and physical conditions and maintain, restore, or enhance water quality to meet resource objectives. The effects of new range improvements (water developments, fences, etc.) on the health and function of rangelands will be carefully considered prior to their implementation.
7. Grazing management practices will incorporate the kinds and amounts of use that will restore, maintain, or enhance habitats to assist in the recovery of federal Threatened and Endangered species or the conservation of federally-listed species of concern and other state-designated special status species. Grazing management practices will maintain existing habitat or facilitate vegetation change toward desired habitats. Grazing management will consider Threatened and Endangered species and their habitats.
8. Grazing management practices and range improvements will be designed to maintain or promote the physical and biological conditions necessary to sustain native animal populations and plant communities. This will involve emphasizing native plant species in the support of ecological function and incorporating the use of non-native species only in those situations in which native plant species are not available in sufficient quantities or are incapable of maintaining or achieving properly functioning conditions and biological health.
9. Grazing management practices on uplands will maintain desired plant communities or facilitate change toward desired plant communities.

I.3.1. Definitions

Activity Plans – Allotment Management Plans (AMPs), Habitat Management Plans (HMPs), Watershed Management Plans, Wild Horse Management Plans, and other plans developed at the local level to address specific concerns and accomplish specific objectives.

Coordinated Resource Management (CRM) – A group of people working together to develop common resource goals and resolve natural resource concerns. CRM is a people process that strives for win-win situations through consensus-based decision making.

Desired Plant Community – A plant community which produces the kind, proportion, and amount of vegetation necessary for meeting or exceeding the land use plan/activity plan objectives established for an ecological site(s). The desired plant community must be consistent with the site's capability to produce the desired vegetation through management, land treatment, or a combination of the two.

Ecological Site – An area of land with specific physical characteristics that differs from other areas both in its ability to produce distinctive kinds and amounts of vegetation and in its response to management.

Erosion – (v.) Detachment and movement of soil or rock fragments by water, wind, ice, or gravity. (n.) The land surface worn away by running water, wind, ice, or other geological agents, including such processes as gravitational creep.

Grazing Management Practices – Grazing management practices include such things as grazing systems (rest-rotation, deferred rotation, etc.), timing and duration of grazing, herding, salting, etc. They do not include physical range improvements.

Guidelines (For Grazing Management) – Guidelines provide for, and guide the development and implementation of, reasonable, responsible, and cost-effective management actions at the allotment and watershed level which move rangelands toward statewide standards or maintain existing desirable conditions. Appropriate guidelines will ensure that the resultant management actions reflect the potential for the watershed, consider other uses and natural influences, and balance resource goals with social, cultural/historic, and economic opportunities to sustain viable local communities. Guidelines, and, therefore, the management actions they engender, are based on sound science, past and present management experience, and public input.

Indicator – An indicator is a component of a system whose characteristics (e.g., presence, absence, quantity, and distribution) can be measured based on sound scientific principles. An indicator can be measured (monitored and evaluated) at a site- or species-specific level. Measurement of an indicator must be able to show change within timeframes acceptable to management and be capable of showing how the health of the ecosystem is changing in response to specific management actions. Selection of the appropriate indicators to be monitored in a particular allotment is a critical aspect of early communication among the interests involved on the ground. The most useful indicators are those for which change or trend can be easily quantified and for which agreement as to the significance of the indicator is broad based.

Litter – The uppermost layer of organic debris on the soil surface, essentially the freshly fallen or slightly decomposed vegetal material.

Management Actions – Management actions are the specific actions prescribed by the BLM to achieve resource objectives, land use allocations, or other program or multiple use goals. Management actions include both grazing management practices and range improvements.

Objective – An objective is a site-specific statement of a desired rangeland condition. It may contain qualitative (subjective) elements, but it must have quantitative (objective) elements so that it can be measured. Objectives frequently speak to change. They may measure the avoidance of negative changes or the accomplishment of positive changes. They are the focus of monitoring and evaluation activities at the local level. Objectives may measure the products of an area rather than its ability to produce them, but if they do so, it must be kept in mind that the lack of a product may not mean that the standards have not been met. Instead, the lack of a particular product may reflect other factors such as political or social constraints. Objectives often focus on indicators of greatest interest for the area in question.

Range Improvements – Range improvements include such things as corrals, fences, water developments (reservoirs, spring developments, pipelines, wells, etc.) and land treatments (prescribed fire, herbicide treatments, mechanical treatments, etc.).

Rangeland – Land on which the native vegetation (climax or natural potential) is predominantly grasses, grass-like plants, forbs, or shrubs. This includes lands revegetated naturally or artificially when routine management of that vegetation is accomplished mainly through manipulation of grazing. Rangelands include natural grasslands, savannas, shrublands, most deserts, tundra, alpine communities, coastal marshes, and wet meadows.

Rangeland Health – The degree to which the integrity of the soil and ecological processes of rangeland ecosystems are sustained.

Riparian – An area of land directly influenced by permanent water. It has visible vegetation or physical characteristics reflective of permanent water influence. Lakeshores and stream banks are

typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not have vegetation dependent on free water in the soil.

Standards – Standards are synonymous with goals and are observed on a landscape scale. Standards apply to rangeland health and not to the important by-products of healthy rangelands. Standards relate to the current capability or realistic potential of a specific site to produce these by-products, not to the presence or absence of the products themselves. It is the sustainability of the processes, or rangeland health, that produces these by-products.

Terms and Conditions – Terms and conditions are very specific land use requirements that are made a part of the land use authorization in order to assure maintenance or attainment of the standard. Terms and conditions may incorporate or reference the appropriate portions of activity plans (e.g., AMPs). In other words, where an activity plan exists that contains objectives focused on meeting the standards, compliance with the plan may be the only term and condition necessary in that allotment.

Upland – Those portions of the landscape which do not receive additional moisture for plant growth from run-off, streamflow, etc. Typically these are hills, ridgetops, valley slopes, and rolling plains.

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Appendix J. Surface Disturbance and Reasonable Foreseeable Actions

This appendix includes tables that provide information on surface disturbance and reasonable foreseeable actions within the planning area. Table J.1, “RFA-1A Reasonable Foreseeable Development Assumptions: Oil and Gas” (p. 430) and Table J.2, “RFA-1B Reasonable Foreseeable Development Assumptions: Other Resource Uses” (p. 432) provide foreseeable development project assumptions by resource. Table J.3, “RFA-2 Summary of Projected Acres of Surface Disturbance by Resource” (p. 435) provides projected acres of surface disturbance by resource; the projected surface disturbances in Table J.3, “RFA-2 Summary of Projected Acres of Surface Disturbance by Resource” (p. 435) are based on the project assumptions in Table J.1, “RFA-1A Reasonable Foreseeable Development Assumptions: Oil and Gas” (p. 430) and Table J.2, “RFA-1B Reasonable Foreseeable Development Assumptions: Other Resource Uses” (p. 432).

The well count projections in Table J.1, “RFA-1A Reasonable Foreseeable Development Assumptions: Oil and Gas” (p. 430) are derived from the Reasonable Foreseeable Development Scenario (RFD) for Oil and Gas prepared by the BLM Wyoming State Office Reservoir Management Group. The RFD projects future development potential and activity based on a technical analysis of the oil and gas resource known to occur and potentially occurring within the planning area, published industry reports, and input from local oil and gas operators and other federal and state agencies. Additional information regarding the assumptions used to develop projections for oil and gas activity can be found in the RFD Scenario for Oil and Gas which is available on the Buffalo Resource Management Plan (RMP) revision website.

The BLM developed the assumptions and projections in Table J.2, “RFA-1B Reasonable Foreseeable Development Assumptions: Other Resource Uses” (p. 432) based on BLM Interdisciplinary Team knowledge, historical and existing activity for all programs, and current project proposals.

Table J.1. RFA-1A Reasonable Foreseeable Development Assumptions: Oil and Gas

| Type of Development | Approved RMP |
|---|--------------|
| Mineral Resources – CBNG | |
| Federal CBNG Well Projections | |
| Existing Productive Federal CBNG Wells | |
| Number of Existing Federal CBNG Wells | 9,211 |
| Projected Number of Abandoned Existing Federal CBNG Wells | 9,211 |
| Remaining Number of Existing Productive Federal CBNG Wells | 0 |
| Projected New Federal CBNG Wells | |
| Number of Projected New Federal CBNG Wells | 2,721 |
| Projected Number of Abandoned New Federal CBNG Wells | 946 |
| Projected Productive New Federal CBNG Wells | 1,775 |
| Projected Total Productive Federal CBNG Wells | |
| Remaining Number of Existing Productive Federal CBNG Wells | 0 |
| Projected Productive New Federal CBNG Wells | 1,775 |
| Total Number Productive Federal CBNG Wells | 1,775 |
| Non-federal CBNG Well Projections (State and Fee Minerals) | |
| Existing Productive Non-federal CBNG Wells | |
| Number of Existing Non-federal CBNG Wells | 16,853 |
| Projected Number of Abandoned Non-federal CBNG Wells | 16,853 |
| Remaining Number of Existing Productive Non-federal CBNG Wells | 0 |
| Projected New Non-federal CBNG Wells | |
| Number of Projected New Non-federal CBNG Wells | 4,987 |
| Projected Number of Abandoned New Non-federal CBNG Wells | 1,734 |
| Projected Productive New Non-federal CBNG Wells | 3,253 |
| Projected Total Productive Non-federal CBNG Wells | |
| Remaining Number of Existing Productive Non-federal CBNG Wells | 0 |
| Projected Productive New Non-federal CBNG Wells | 3,253 |
| Total Number Productive Non-federal CBNG Wells | 3,253 |
| Cumulative CBNG Productive Wells | |
| Total Number Productive Federal CBNG Wells | 1,775 |
| Total Number Productive Non-federal CBNG Wells | 3,253 |
| Total Productive CBNG Wells | 5,028 |
| Mineral Resources – Conventional Oil and Gas | |
| Federal Conventional Well Projections | |
| Existing Productive Federal Conventional Wells | |
| Number of Existing Federal Conventional Wells | 2,189 |
| Projected Number of Abandoned Existing Federal Conventional Wells | 882 |

| Type of Development | Approved RMP |
|---|--------------|
| Remaining Number of Existing Productive Federal Conventional Wells | 1,307 |
| Projected New Federal Conventional Wells | |
| Number of Projected New Federal Conventional Wells | 1,773 |
| Projected Number of Abandoned New Federal Conventional Wells | 88 |
| Projected Productive New Federal Conventional Wells | 1,685 |
| Projected Total Productive Federal Conventional Wells | |
| Remaining Number of Existing Productive Federal Conventional Wells | 1,307 |
| Projected Productive New Federal Conventional Wells | 1685 |
| Total Number Productive Federal Conventional Wells | 2,992 |
| Non-federal Conventional Well Projections (State and Fee Minerals) | |
| Existing Productive Non-federal Conventional Wells | |
| Number of Existing Non-federal Conventional Wells | 1,944 |
| Projected Number of Abandoned Non-federal Conventional Wells | 727 |
| Remaining Number of Existing Productive Non-federal Conventional Wells | 1,217 |
| Projected New Non-federal Conventional Wells | |
| Number of Projected New Non-federal Conventional Wells | 1,875 |
| Projected Number of Abandoned New Non-federal Conventional Wells | 94 |
| Projected Productive New Non-federal Conventional Wells | 1,781 |
| Projected Total Productive Non-federal Conventional Wells | |
| Remaining Number of Existing Productive Non-federal Conventional Wells | 1,217 |
| Projected Productive New Non-federal Conventional Wells | 1781 |
| Total Number Productive Non-federal Conventional Wells | 2,998 |
| Cumulative Conventional Productive Conventional Wells | |
| Total Number Productive Federal Conventional Wells | 2,992 |
| Total Number Productive Non-federal Conventional Wells | 2,998 |
| Total Productive Conventional Wells | 5,990 |
| Cumulative Productive Wells | |
| Total Number Productive CBNG Federal Wells | 1,775 |
| Total Number Productive Conventional Federal Wells | 2,992 |
| Total Number Productive Federal Wells | 4,767 |
| Total Number Productive CBNG Non-federal Wells | 3,253 |
| Total Number Productive Conventional Non-federal Wells | 2,998 |
| Total Number Productive Non-federal Wells | 6,251 |
| Total Productive Wells | 11,018 |
| CBNG Coalbed Natural Gas RFA Reasonable Foreseeable Action | |

Table J.2. RFA-1B Reasonable Foreseeable Development Assumptions: Other Resource Uses

| Type of Development | Approved RMP |
|--|--|
| PHYSICAL RESOURCES | |
| Cave and Karst | |
| Gating of Specific Caves | 0 |
| Cave Inventory | Entire field office |
| Interpretive Signs | 3 |
| Cave Registers | 3 |
| Cave Management Plans | All caves |
| MINERAL RESOURCES | |
| Mineral Resources - Locatable | |
| Exploration for Locatable Minerals (numbers of Notices and acres disturbed) | 9 Notices/4.5 acres |
| Development of Locatable Minerals (numbers of POOs and acres disturbed) | 9 POOs/1,252 acres |
| Mineral Resources – Leasable Coal | |
| Exploration for Coal (number of licenses and acreage disturbed) | 65 licenses/700 acres |
| Development of Coal (number of leases and net acreage disturbed by mining, i.e., new disturbance – new reclamation) | 28 new leases (106,400 acres) to existing mine operators. |
| Development of Coal by Non-conventional Means (in place conversion) – number of authorizations and new acreage disturbed | No authorization policy |
| Mineral Resources – Leasable Geothermal | |
| Geothermal Development (number of leases and acres) | 0/0 |
| Mineral Resources – Other Leasable Minerals | |
| Development of Other Leasable Minerals (number of leases and acres) | 0/0 |
| Mineral Resources - Salable | |
| Exploration for Salable Minerals (numbers of exploration sites and acres disturbed) | 9 exploration sites/ 4.5 acres |
| Development of Salable Minerals (numbers of disposal operations and acres disturbed) | 137 operations/ 1,193 acres |
| FIRE AND FUELS MANAGEMENT | |
| Prescribed Fire (acreage) | 14,000 |
| Mechanical Fuels Management (acreage) | 0 |
| BIOLOGICAL RESOURCES | |
| Forests, Woodlands, and Forest Products | |
| Forest Products Sales (acreage) | 800 to 1000 acres annually or 16,000-20,000 acres for the lifetime of the plan |
| Invasive Species (treatment acres based on disturbance for other resources) | |
| Range Improvement Projects (acreage) | 24 |
| Prescribed Fire (acreage) | 420 |

| Type of Development | Approved RMP |
|---|---|
| BLM Road Maintenance (miles/acreage) | 1 mile/7 acres |
| Forests and Woodlands (acreage) | 1,000 |
| Not Associated with any Surface Disturbance (acreage) | 12,000 |
| Federal Oil and Gas Well Activities (acreage) | Short term: 16,473 Long term: 4,250 |
| Renewable Energy Projects (acreage) | 6,060 |
| Rights-of-way (miles/acreage) | 274 miles/1,990 acres |
| Fish and Wildlife Resources | |
| Wildlife Habitat Restoration and Enhancement: Mountain Mahogany (acreage) | 8,714 |
| Wildlife Habitat Restoration and Enhancement: Greater Sage-Grouse (acreage) | 77,560 |
| Watershed Restoration and Enhancement (acreage) | 0 |
| Stream Restoration, Structure Removal, and Other Fisheries Enhancements (number of sites and acreage) | 20 sites/20 acres |
| HERITAGE AND VISUAL RESOURCES | |
| Paleontological | |
| Fossil Collection (acreage) | 0 |
| LAND RESOURCES | |
| Renewable Energy | |
| Wind-Energy Testing – MET Towers (number of sites and acreage) | 80 sites/240 acres |
| Wind-Energy Development (number of sites and acreage) | 30 sites/up to 75,000 acres |
| Rights-of-Way | |
| Communication Site Development (number of sites/acreage) | 56 sites/28 acres |
| Powerline Development (number of sites and miles/acreage) | 740 rights-of-way/ 1,000 miles/ 3,600 acres |
| Pipeline Development – Total Number of Projects | 1,400 |
| Road Development (number of sites and miles/acres) | 1,100 rights-of-way/ 1,725 miles/ 6,275 acres |
| Compressor Stations (number of sites/acreage) | 52 sites/76 acres |
| Travel and Transportation Management | |
| Road Maintenance (miles/acreage) | 20 miles/145 acres |
| BLM Nonmotorized Trail Creation (miles/acreage) | 7 miles/50 acres |
| BLM Public Access Road Creation (miles) | 5 miles |
| Recreation | |
| Campsites (number of sites/acreage) | 8/16 |
| Interpretive Sites (number of sites/acreage) | 5/2.5 |
| Other Facilities (number of sites/acreage) | 3/3 |
| Livestock Grazing Management | |

| Type of Development | Approved RMP |
|--|--------------|
| Reservoir/Pit Development (number of sites/acreage) | 0/0 |
| Well Development (number of sites/acreage) | 6/<1 |
| Spring Development (number of sites/acreage) | 42/4 |
| Fence Development (number of sites/miles) | 200/200 |
| Reservoir Conversion from CBNG Development/water disposal to Range Improvement (acreage) | 150 |
| BLM Bureau of Land Management CBNG Coalbed natural gas POO Plan of Operations RFA Reasonable Foreseeable Action | |

Table J.3. RFA-2 Summary of Projected Acres of Surface Disturbance by Resource

| Type of Disturbance | Approved RMP |
|---|--------------|
| MINERAL RESOURCES | |
| Mineral Resources – Locatable Exploration | |
| Acres Disturbed from BLM Actions | 4 |
| Acres Reclaimed from BLM Actions | 4 |
| Acres Long-Term Disturbance from BLM Actions | 0 |
| Acres Disturbed from Non-BLM Actions | 450 |
| Acres Reclaimed from Non-BLM Actions | 450 |
| Acres Long-Term Disturbance from Non-BLM Actions | 0 |
| Mineral Resources – Locatable Development | |
| Acres Disturbed from BLM Actions | 1,252 |
| Acres Reclaimed from BLM Actions | 329 |
| Acres Long-Term Disturbance from BLM Actions | 923 |
| Acres Disturbed from Non-BLM Actions | 17,525 |
| Acres Reclaimed from Non-BLM Actions | 4,556 |
| Acres Long-Term Disturbance from Non-BLM Actions | 12,969 |
| Mineral Resources - Leasable Coal (It is assumed that the only solid leasable will be coal – all other solid leasable minerals activity is projected to be possible, but insignificant compared to coal activity over the planning horizon.) | |
| Acres Disturbed from BLM Actions | 195,700 |
| Acres Reclaimed from BLM Actions | 120,700 |
| Acres Long-Term Disturbance from BLM Actions (long-term mining facilities) ¹ | 75,000 |
| Acres Disturbed from Non-BLM Actions | 10,000 |
| Acres Reclaimed from Non-BLM Actions | 6,000 |
| Acres Long-Term Disturbance from Non-BLM Actions (long-term mining facilities) ² | 4,000 |
| Mineral Resources – Leasable Geothermal | |
| Acres Disturbed from BLM Actions | 0 |
| Acres Reclaimed from BLM Actions | 0 |
| Acres Long-Term Disturbance from BLM Actions | 0 |
| Acres Disturbed from Non-BLM Actions | 0 |
| Acres Reclaimed from Non-BLM Actions | 0 |
| Acres Long-Term Disturbance from Non-BLM Actions | 0 |
| Mineral Resources – Leasable Oil and Gas (Coalbed Natural Gas only) | |
| Acres Disturbed from BLM Actions | 6,803 |
| Acres Reclaimed from BLM Actions | 2,721 |
| Acres Long-Term Disturbance from BLM Actions | 4,082 |

| Type of Disturbance | Approved RMP |
|---|--------------|
| Acres Disturbed from Non-BLM Actions | 12,468 |
| Acres Reclaimed from Non-BLM Actions | 4,987 |
| Acres Long-Term Disturbance from Non-BLM Actions | 7,481 |
| Mineral Resources – Leasable Oil and Gas (Conventional only) | |
| Acres Disturbed from BLM Actions | 8,066 |
| Acres Reclaimed from BLM Actions | 5,406 |
| Acres Long-Term Disturbance from BLM Actions | 2,660 |
| Acres Disturbed from Non-BLM Actions | 8,531 |
| Acres Reclaimed from Non-BLM Actions | 5,719 |
| Acres Long-Term Disturbance from Non-BLM Actions | 2,812 |
| Mineral Resources – Salable Exploration | |
| Acres Disturbed from BLM Actions | 4.5 |
| Acres Reclaimed from BLM Actions | 4.5 |
| Acres Long-Term Disturbance from BLM Actions | 0 |
| Acres Disturbed from Non-BLM Actions | 450 |
| Acres Reclaimed at Non-BLM Actions | 450 |
| Acres Long-Term Disturbance from Non-BLM Actions | 0 |
| Mineral Resources – Salable Development | |
| Acres Disturbed from BLM Actions | 1,193 |
| Acres Reclaimed from BLM Actions | 224 |
| Acres Long-Term Disturbance from BLM Actions | 969 |
| Acres Disturbed from Non-BLM Actions | 10,728 |
| Acres Reclaimed at Non-BLM Actions | 3,123 |
| Acres Long-Term Disturbance from Non-BLM Actions | 7,605 |
| FIRE AND FUELS MANAGEMENT | |
| Prescribed Fire | |
| Acres Treated from BLM Actions | 14,000 |
| Acres Reclaimed from BLM Actions | 14,000 |
| Acres Long-Term Disturbance from BLM Actions | 0 |
| Acres Treated from Non-BLM Actions | 2,000 |
| Acres Reclaimed from Non-BLM Actions | 2,000 |
| Acres Long-Term Disturbance from Non-BLM Actions | 0 |
| Wildfire – Active Rehabilitation (fire lines, etc.) | |
| Acres Treated from BLM Actions | 27,596 |
| Acres Reclaimed from BLM Actions | 27,596 |
| Acres Long-Term Disturbance from BLM Actions | 0 |
| Acres Treated from Non-BLM Actions | 139,042 |
| Acres Reclaimed from Non-BLM Actions | 139,042 |

| Type of Disturbance | Approved RMP |
|--|---|
| Acres Long-Term Disturbance from Non-BLM Actions | 0 |
| Mechanical Fuels Treatment | |
| Acres Treated from BLM Actions | 0 |
| Acres Reclaimed from BLM Actions | 0 |
| Acres Long-Term Disturbance from BLM Actions | 0 |
| Acres Treated from Non-BLM Actions | 3,200 |
| Acres Reclaimed from Non-BLM Actions | 3,200 |
| Acres Long-Term Disturbance from Non-BLM Actions | 0 |
| BIOLOGICAL RESOURCES | |
| Forests, Woodlands, and Forest Products | |
| Acres Treated from BLM Actions | 800 to 1,000 acres annually or 16,000-20,000 acres for the lifetime of the plan |
| Acres Reclaimed from BLM Actions | 800 to 1,000 acres annually or 16,000-20,000 acres for the lifetime of the plan |
| Acres Long-Term Disturbance from BLM Actions | 0 |
| Acres Treated from Non-BLM Actions | 10,000 |
| Acres Reclaimed from Non-BLM Actions | 10,000 |
| Acres Long-Term Disturbance from Non-BLM Actions | 0 |
| Invasive Species | |
| Acres Treated Disturbance from BLM Actions | 12,000 |
| Acres Reclaimed from BLM Actions | 10,500 |
| Acres Long-Term Disturbance from BLM Actions | 1,500 |
| Acres Treated from Non-BLM Actions | 63,000 |
| Acres Reclaimed from Non-BLM Actions | 59,500 |
| Acres Long-Term Disturbance from Non-BLM Actions | 3,500 |
| Fish and Wildlife Resources | |
| Wildlife Habitat Enhancements Activities | |
| Acres Treated from BLM Actions | 86,274 |
| Acres Reclaimed from BLM Actions | 86,274 |
| Acres Long-Term Disturbance from BLM Actions | 0 |
| Acres Treated from Non-BLM Actions | 1,414,888 |
| Acres Reclaimed from Non-BLM Actions | 1,414,888 |
| Acres Long-Term Disturbance from Non-BLM Actions | 0 |
| Fisheries, Watershed, and Stream Enhancement Activities | |
| Miles/Acres Treated from BLM Actions | 1.5/20 |
| Acres Reclaimed from BLM Actions | 20 |
| Acres Long-Term Disturbance from BLM Actions | 0 |
| Miles/Acres Treated from Non-BLM Actions | 12/145 |
| Acres Reclaimed from Non-BLM Actions | 145 |
| Acres Long-Term Disturbance from Non-BLM Actions | 0 |

| Type of Disturbance | Approved RMP |
|---|---|
| HERITAGE AND VISUAL RESOURCES | |
| Paleontological | |
| Acres Disturbed from BLM Actions | 100 |
| Acres Reclaimed from BLM Actions | 100 |
| Acres Long-Term Disturbance from BLM Actions | 0 |
| Acres Disturbed from Non-BLM Actions | 900 |
| Acres Reclaimed from Non-BLM Actions | 900 |
| Acres Long-Term Disturbance from Non-BLM Actions | 0 |
| LAND RESOURCES | |
| Renewable Energy - Wind-Energy Development | |
| Acres Disturbed from BLM Actions | 240 acres MET Towers (3 year disturbance) and 75,000 acres wind towers and infrastructure |
| Acres Reclaimed from BLM Actions | 240 acres MET Towers and 50,000 acres for buried power and staging |
| Acres of Long-Term Disturbance from BLM Actions | 25,000 |
| Acres Disturbed from Non-BLM Actions | 161,818 |
| Acres Reclaimed from Non-BLM Actions | 141,591 |
| Acres of Long-Term Disturbance from Non-BLM Actions | 20,227 |
| Rights-of-Way (ROW) | |
| Pipelines (Mineral and Water) | |
| Acres Disturbed from BLM Actions | 14,000 |
| Acres Reclaimed from BLM Actions | 14,000 |
| Acres of Long-Term Disturbance from BLM Actions | 0 |
| Acres Disturbed from Non-BLM Actions | 113,272 |
| Acres Reclaimed from Non-BLM Actions | 113,272 |
| Acres of Long-Term Disturbance from Non-BLM Actions | 0 |
| Roads | |
| Miles/Acres Disturbed from BLM Actions | 1,035/18,550 |
| Miles/Acres Reclaimed from BLM Actions | 250/5,750 |
| Miles/Acres of Long-Term Disturbance from BLM Actions | 785/12,800 |
| Acres Disturbed from Non-BLM Actions | 150,086 |
| Acres Reclaimed from Non-BLM Actions | 46,523 |
| Acres of Long-Term Disturbance from Non-BLM Actions | 103,564 |
| Powerlines | |
| Miles/Acres Disturbed from BLM Actions | 1,000/4,916 |
| Miles/Acres Reclaimed from BLM Actions | 100/491 |
| Miles/Acres of Long-Term Disturbance from BLM Actions | 900/4,425 |
| Acres Disturbed from Non-BLM Actions | 39,775 |
| Acres Reclaimed from Non-BLM Actions | 3,973 |

Appendix J Surface Disturbance and Reasonable Foreseeable Actions

September 2015

| Type of Disturbance | Approved RMP |
|---|--------------|
| Acres of Long-Term Disturbance from Non-BLM Actions | 35,802 |
| Communication Sites | |
| Acres Disturbed from BLM Actions | 56 |
| Acres Reclaimed from BLM Actions | 20 |
| Acres of Long-Term Disturbance from BLM Actions | 36 |
| Acres Disturbed from Non-BLM Actions | 453 |
| Acres Reclaimed from Non-BLM Actions | 162 |
| Acres of Long-Term Disturbance from Non-BLM Actions | 291 |
| Compressor Sites | |
| Acres Disturbed from BLM Actions | 200 |
| Acres Reclaimed from BLM Actions | 40 |
| Acres of Long-Term Disturbance from BLM Actions | 160 |
| Acres Disturbed from Non-BLM Actions | 1,618 |
| Acres Reclaimed from Non-BLM Actions | 324 |
| Acres of Long-Term Disturbance from Non-BLM Actions | 1,295 |
| Other Facilities | |
| Acres Disturbed from BLM Actions | 1,040 |
| Acres Reclaimed from BLM Actions | 620 |
| Acres of Long-Term Disturbance from BLM Actions | 420 |
| Acres Disturbed from Non-BLM Actions | 8,415 |
| Acres Reclaimed from Non-BLM Actions | 5,016 |
| Acres of Long-Term Disturbance from Non-BLM Actions | 3,398 |
| Travel and Transportation Management | |
| Nonmotorized Trails | |
| Miles/Acres Disturbed from BLM Actions | 9/65 |
| Miles/Acres Reclaimed from BLM Actions | 0/0 |
| Miles/Acres Long-Term Disturbance from BLM Actions | 9/65 |
| BLM Public Access Road Creation | |
| Miles/Acres Disturbed from BLM Actions | 2/15 |
| Miles/Acres Reclaimed from BLM Actions | 0/0 |
| Miles/Acres Long-Term Disturbance from BLM Actions | 2/15 |
| BLM Public Access Road Reclamation³ | |
| Miles/Acres Disturbed from BLM Actions | 0/0 |
| Miles/Acres Reclaimed from BLM Actions | 5/36 |
| Miles/Acres Long-Term Disturbance from BLM Actions | 0/0 |
| Recreation | |
| Recreational Site Development | |
| Acres Disturbed from BLM Actions | 20 |

| Type of Disturbance | Approved RMP |
|--|--------------|
| Acres Reclaimed from BLM Actions | 0 |
| Acres Long-Term Disturbance from BLM Actions | 20 |
| Livestock Grazing Management | |
| Spring Development | |
| Acres Disturbed from BLM Actions | 4 |
| Acres Reclaimed from BLM Actions | 2 |
| Acres Long-Term Disturbance from BLM Actions | 2 |
| Acres Disturbed from Non-BLM Actions | 1 |
| Acres Reclaimed from Non-BLM Actions | 0.5 |
| Acres Long-Term Disturbance from Non-BLM Actions | 0.5 |
| Pipeline Development | |
| Acres Disturbed from BLM Actions | 40 |
| Acres Reclaimed from BLM Actions | 35 |
| Acres Long-Term Disturbance from BLM Actions | 5 |
| Acres Disturbed from Non-BLM Actions | 20 |
| Acres Reclaimed from Non-BLM Actions | 18 |
| Acres Long-Term Disturbance from Non-BLM Actions | 2 |
| Reservoir/Pit Development | |
| Acres Disturbed from BLM Actions | 0 |
| Acres Reclaimed from BLM Actions | 0 |
| Acres Long-Term Disturbance from BLM Actions | 0 |
| Acres Disturbed from Non-BLM Actions | 0 |
| Acres Reclaimed from Non-BLM Actions | 0 |
| Acres Long-Term Disturbance from Non-BLM Actions | 0 |
| Fence Development | |
| Miles/Acres Disturbed from BLM Actions | 150/38 |
| Miles/Acres Reclaimed from BLM Actions | 140/35 |
| Miles/Acres Long-Term Disturbance from BLM Actions | 10/3 |
| Miles/Acres Disturbed from Non-BLM Actions | 50/13 |
| Miles/Acres Reclaimed from Non-BLM Actions | 45/11 |
| Miles/Acres Long-Term Disturbance from Non-BLM Actions | 5/2 |
| Well Development | |
| Acres Disturbed from BLM Actions | <1 |
| Acres Reclaimed from BLM Actions | 0 |
| Acres Long-Term Disturbance from BLM Actions | <1 |
| Acres Disturbed from Non-BLM Actions | <1 |
| Acres Reclaimed from Non-BLM Actions | 0 |
| Acres Long-Term Disturbance from Non-BLM Actions | <1 |

| Type of Disturbance | Approved RMP |
|--|----------------|
| Reservoir Maintenance Development | |
| Acres Disturbed from BLM Actions | 0 |
| Acres Reclaimed from BLM Actions | 0 |
| Acres Long-Term Disturbance from BLM Actions | 0 |
| Acres Disturbed from Non-BLM Actions | 0 |
| Acres Reclaimed from Non-BLM Actions | 0 |
| Acres Long-Term Disturbance from Non-BLM Actions | 0 |
| CUMULATIVE DISTURBANCE⁴ | |
| Total Acres Disturbed from BLM Actions | 486,957 |
| Total Acres Reclaimed from BLM Actions | 358,871 |
| Total Acres Long-Term Disturbance from BLM Actions | 128,086 |
| Total Acres Disturbed from Non-BLM Actions | 2,168,799 |
| Total Acres Reclaimed from Non-BLM Actions | 1,965,851 |
| Total Acres Long-Term Disturbance from Non-BLM Actions | 202,949 |
| Cumulative Long-Term Acres of Disturbance | 331,035 |
| <p>¹Of the 75,000 acres of long-term disturbance from BLM actions, 45,500 acres are part of the active mine. ²Of the 4,000 acres of long-term disturbance from non-BLM actions, 2,500 acres are part of the active mine. The remaining long-term disturbance acreage includes buildings and processing areas. ³Represents the projected reclamation of existing roads in the planning area. As such, there is no long-term disturbance anticipated from this action. The projected acres reclaimed from this action are not included in the cumulative disturbance acreages. ⁴Numbers may not add up due to rounding.</p> <p>BLM Bureau of Land Management RFA Reasonable Foreseeable Action ROW right-of-way</p> | |

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Appendix K. Biological Opinion



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
5353 Yellowstone Road, Suite 308A
Cheyenne, Wyoming 82009



JUN 24 2015

In Reply Refer To:
06E13000-2015-F-0088

Memorandum

To: Field Manager, Bureau of Land Management, Buffalo Field Office,
Buffalo, Wyoming

From: Field Supervisor, U.S. Fish and Wildlife Service, Wyoming Field Office,
Cheyenne

Subject: Section 7 Consultation for the Buffalo Resource Management Plan

This correspondence transmits the U.S. Fish and Wildlife Service (USFWS) programmatic concurrence and programmatic biological opinion in response to the U.S. Bureau of Land Management (BLM) request for consultation for the impacts from the BLM Buffalo Resource Management Plan (RMP) Revision (BLM 2015b) and committed conservation measures (Proposed Action) to federally listed species in Wyoming in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Your March 6, 2015, request for formal consultation was received in our office on March 9, 2015. On April 7, 2015, the USFWS notified the BLM that all information necessary to begin consultation had been received or was otherwise accessible.

This correspondence addresses potential effects to the northern long-eared bat (*Myotis septentrionalis*) and the Ute ladies'-tresses orchid (*Spiranthes diluvialis*) from all planned programs (Appendix 1) of the Proposed Buffalo RMP as well as the BLM's commitment to the conservation measures listed in the Buffalo RMP Biological Assessment (BA) (BLM 2015a) and commitments in relevant Programmatic Statewide Species BAs.

The planned programs of the Buffalo RMP are: (1) Air Quality, (2) Soil, (3) Water, (4) Cave and Karst Resources, (5) Mineral Resources – Locatable, (6) Leasable Minerals – Coal, (7) Leasable Minerals – Oil and Gas, (8) Salable, (9) Fire and Fuels Management (Wildfire), (10) Fire and Fuels Management (Prescribed Fire), (11) Forests and Woodlands, (12) Grassland and Shrubland Communities, (13) Vegetation - Riparian/Wetland Resources, (14) Invasive Species and Pest Management, (15) Fish and Wildlife Resources, (16) Special Status Species (Plants), (17) Special Status Species (Fish and Wildlife), (18) Cultural Resources, (19) Paleontological

Resources, (20) Visual Resource Management, (21) Forest Products, (22) Lands and Realty, (23) Renewable Energy, (24) Rights of Way Corridors, (25) Travel and Transportation Management, (26) Recreation, (27) Non-Wilderness Study Area Lands with Wilderness Characteristics, (28) Livestock Grazing Management, (29) Areas of Critical Environmental Concern (ACECs), (30) National Back Country Byways, (31) Wild and Scenic Rivers, (32) Wilderness Study Areas, (33) Socioeconomic, and (34) Health and Safety.

This correspondence includes an acknowledgment of “no effect” (NE) determinations, an informal consultation for “not likely to adversely affect” (NLAA) determinations for effects to listed species and designated critical habitats, and a programmatic BO for potential adverse effects from BLM-authorized activities within the Buffalo Planning Area. The BLM-administered programs with potentially likely adverse effects include the Leasable Minerals – Coal, Leasable Minerals – Oil and Gas, Vegetation - Riparian/Wetland Resources, and the Livestock Grazing Management Programs. This consultation is based on our review of your BA (BLM 2015a) and your draft environmental impact statement (BLM 2013) and proposed RMP (BLM 2015b).

Consultation History

The USFWS and the BLM (numerous BLM Field Offices and the Wyoming State Office) began informal programmatic consultation on impacts of BLM Resource RMP activities to the Ute ladies'-tresses orchid (*Spiranthes diluvialis*) on October 23, 2001. Between October 23, 2001, and April 5, 2007, the USFWS provided statewide species-specific section 7 consultation on individual BLM RMPs (including the existing Buffalo RMP [BLM 1985]) throughout Wyoming for the effects of those RMPs to the Ute ladies'-tresses orchid. Between March 22, 2010, and March 6, 2015, the USFWS reviewed multiple drafts of the Buffalo RMP Revision and Buffalo RMP Revision BA. With the proposed listing of the northern long-eared bat on October 2, 2013 (78 FR 61046), the USFWS and the BLM began coordination efforts for the analysis of effects and development of appropriate conservation measures for that species as well. The USFWS received all information necessary to begin formal consultation on the proposed Buffalo RMP Revision (BLM 2015b) on March 6, 2015. The USFWS published the final rule to list the northern long-eared bat as a threatened species on April 2, 2015 (80 FR 17974). All necessary information to begin consultation was received on March 9, 2015. The USFWS provided the BLM with a draft BO on June 1, 2015. After receiving final comments from the BLM on June 11, 2015, the USFWS then began steps to finalize the BO and associated appendices.

Interim 4(d) rule for the northern long-eared bat

On April 2, 2015, the USFWS published a species-specific rule pursuant to section 4(d) of the ESA for the northern long-eared bat (80 FR 17974). The USFWS interim 4(d) rule exempts the take of the northern long-eared bat from the section 9 prohibitions of the ESA, if the species is found outside of a 150-mile buffer around counties determined to be positive for the pathogen (*Pseudogymnoascus destructans*) that causes white nose syndrome (WNS) in bats. Because northern long-eared bats in Wyoming are currently outside of the buffer, take is exempted from section 9 prohibitions by the interim 4(d) rule without the need to implement the conservation measures listed in the special rule. However, if the expansion of WNS in bats brings the

pathogen within 150 miles of northern long-eared bat populations in Wyoming, then, at the project level, the BLM may need to include conservation measures from the interim 4(d) rule for BLM-authorized activities that could cause incidental take of northern long-eared bats. In addition, the interim 4(d) rule does not afford exemption from the ESA's section 7 procedural requirements. Therefore, consultation remains appropriate when actions (even those within the scope of the interim 4(d) rule) are funded, authorized or carried out by a Federal agency. The purpose of section 7 consultation is broader than the mere evaluation of take and issuance of an incidental take statement; such consultations fulfill the requirements of section 7(a)(2) of the ESA, directing that all Federal agencies insure that their actions are not likely to jeopardize the continued existence of any listed species, or result in the destruction or adverse modification of designated critical habitat.

Informal Consultation

In the Buffalo RMP BA, the BLM made LAA, NLAA and NE determinations for the effect of certain programs on listed species in the Buffalo planning area in Wyoming. These are displayed in Table 1. When the BLM makes a “no effect” determination, concurrence from the USFWS is not required, although we appreciate receiving the information used to make the determination.

Table 1. Listed Species “likely to adversely affect” (LAA), “not likely to adversely affect (NLAA)”, and “no effect (NE)” determinations made by the BLM.

| Species Program | Northern long-eared bat | Ute ladies'-tresses |
|---|-------------------------|---------------------|
| ACECs | NE | NLAA |
| Air Quality | NLAA | NE |
| Cave and Karst Resources | NE | NE |
| Cultural Resources | NLAA | NLAA |
| Fire and Fuels Management (Prescribed Fire) | NLAA | NLAA |
| Fire and Fuels Management (Wildfire) | LAA | NLAA |
| Fish and Wildlife Resources | NLAA | NLAA |
| Forests and Woodlands | NLAA | NE |
| Forest Products | NLAA | NE |
| Grassland and Shrubland Communities | NE | NE |
| Health and Safety | NLAA | NLAA |
| Invasive Species and Pest Management | NLAA | NLAA |
| Lands and Realty | NLAA | NLAA |
| Leasable Minerals – Coal | NLAA | LAA |
| Leasable Minerals – Oil and Gas | NLAA | LAA |
| Livestock Grazing Management | NLAA | LAA |
| Mineral Resources – Locatable | NLAA | NLAA |
| National Back Country Byways | NE | NLAA |
| Non-Wilderness Study Area Lands with Wilderness Characteristics | NE | NE |
| Paleontological Resources | NLAA | NLAA |
| Recreation | NLAA | NLAA |
| Renewable Energy | NLAA | NLAA |
| Rights of Way Corridors | NLAA | NLAA |
| Vegetation - Riparian/Wetland Resources | NLAA | LAA |
| Salable | NLAA | NLAA |
| Socioeconomic | NE | NE |
| Soil | NLAA | NLAA |
| Special Status Species (Plants) | NE | NLAA |
| Special Status Species (Fish and Wildlife) | NLAA | NLAA |
| Travel and Transportation Management | NLAA | NLAA |
| Visual Resource Management | NLAA | NLAA |
| Water | NLAA | NLAA |
| Wild and Scenic Rivers | NE | NE |
| Wilderness Study Areas | NE | NE |

The Buffalo RMP is used by the BLM to guide and control future actions and set standards, upon which future decisions on site-specific activities are based. An RMP only establishes general management policy and is not used to make decisions that commit resources. An RMP identifies desired outcomes, also known as “desired future conditions.” These outcomes are expressed in RMPs as goals, standards, objectives, and allowable uses and actions needed to achieve desired outcomes, often referred to as RMP decisions or resource allocations. It is these decisions or resource allocations of the Buffalo RMP that the effects determinations in this consultation are

based. As such, the BLM is still obligated to conduct section 7 consultation at the project-specific level for all BLM-authorized activities that “may affect” a listed species.

Northern long-eared bat. The BA addressed activities that are not likely to adversely affect the northern long-eared bat. The USFWS concurs with your “may affect, not likely to adversely affect” determinations for those programs and activities described in the Proposed Action that are anticipated to not likely adversely affect this species. The USFWS concurrence is based on the commitment by the BLM to implement conservation measures to ensure any potential effects from BLM activities will be sufficiently minimized by protective buffers, timing restrictions, etc. (see Appendix 2). The BLM also made likely to adversely affect determinations for the Buffalo RMP Revision Fire and Fuels Management (Wildfire) Program. Adverse effects from this Program are the topic of the attached BO.

Ute ladies'-tresses. The BA addressed activities that are not likely to adversely affect the Ute ladies'-tresses orchid. The USFWS concurs with your may affect not likely to adversely affect determinations for those activities described in the Proposed Action that are anticipated to not likely adversely affect these plants. The USFWS concurrence is based on the commitment by the BLM to implement conservation measures to ensure any potential effects from BLM activities will be sufficiently minimized by protective buffers, timing restrictions, etc. (see Appendix 2). The BLM also made likely to adversely affect determinations for the Leasable Minerals – Coal, Leasable Minerals – Oil and Gas, Vegetation - Riparian/Wetland Resources, and the Livestock Grazing Programs. Adverse effects from these four programs are the topic of the attached BO.

Thank you for your assistance in the conservation of endangered, threatened, and candidate species. In future communications regarding this biological opinion, please refer to consultation number 06E13000-2015-F-0088. If we may be of further assistance, please contact Alex Schubert of my staff at (307) 772-2374, extension 238.

cc: BLM, Endangered Species Program Lead, Cheyenne, WY (C. Keefe) (ckeefe@blm.gov)
FWS, Endangered Species, Lakewood, CO (B. Fahey) (bridget_fahey@fws.gov)
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**PROGRAMMATIC BIOLOGICAL OPINION
FOR THE WYOMING BUREAU OF LAND MANAGEMENT'S
BUFFALO RESOURCE MANAGEMENT PLAN
06E13000-2015-F-0088**

**U.S. Fish and Wildlife Service
Wyoming Ecological Services Office
Cheyenne, Wyoming**

June 24, 2015

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PROGRAMMATIC BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed action examined is the management of U.S. Bureau of Land Management (BLM) lands according to the revised Buffalo Field Office (Buffalo) Resource Management Plan (RMP) as well as the BLM’s commitment to conservation measures (Appendix 2) listed in the Biological Assessment (BA) (BLM 2015a) for this RMP (BLM 2015b). The purpose of the Buffalo RMP is to provide direction for managing public lands administered by the BLM in accordance with its multiple use mandate. The purpose of revising the existing Buffalo RMP (BLM 1985) is to address conditions within the planning area that have changed and to evaluate new information in order to develop an appropriate management strategy. Decisions made as a result of the Record of Decision (ROD) for the Buffalo RMP will result in revising the existing Buffalo RMP.

RMPs are used by the BLM to guide and control future actions and set standards upon which future decisions on site-specific activities are based. RMPs only establish general management policy on a broad scale. RMPs are not used to make decisions that commit resources on a small scale. RMPs also identify desired outcomes, also known as “desired future conditions.” These outcomes are expressed in RMPs as goals, standards, objectives, and allowable uses and actions needed to achieve desired outcomes, often referred to as RMP decisions or resource allocations. It is these decisions or resource allocations upon which the effects determinations (Table 1) in this biological opinion (BO) are based. As such, the BLM is still obligated to conduct section 7 consultation at the project-specific level for all BLM-authorized activities that “may affect” a listed species.

Table 1. Listed species “likely to adversely affect” determinations made by the BLM.

| Species Program | Northern Long-eared Bat | Ute ladies’-tresses |
|---|-------------------------|---------------------|
| Fire and Fuels Management (Wildfire) | LAA | |
| Leasable – Coal | | LAA |
| Leasable – Oil and Gas | | LAA |
| Livestock Grazing | | LAA |
| Vegetation - Riparian/Wetland Resources | | LAA |

The Buffalo RMP incorporates current laws and regulations and public land resource management initiatives to guide long-range land management decisions for public lands and resources in Sheridan, Campbell, and Johnson Counties in Wyoming. The BLM administers 782,102 acres of public land surface and 4,803,277 acres of Federal mineral estate within the planning area. The Buffalo RMP does not include land management decisions where land

surfaces and minerals are both privately owned, or owned by the State of Wyoming, or local governments, or those lands that are managed by other Federal agencies.

This formal consultation only addresses adverse effects to listed species which are likely to occur as a result of the following programs in the Buffalo RMP: (1) Fire and Fuels Management (wildfire), (2) Leasable – Coal, (3) Leasable – Oil and Gas, (4) Livestock Grazing, and (5) Vegetation - Riparian/Wetland Resources Program activities. Informal consultation on other actions identified in the RMP was addressed previously in the cover memorandum for this document.

Conservation measures were included in the Buffalo BA (BLM 2015a) to address potential adverse effects. The BLM has committed to implementing the conservation measures listed in that conservation strategy as part of their proposed action (BLM 2015b). Therefore, the U.S. Fish and Wildlife Service (USFWS) has evaluated the implementation of these conservation measures as part of the proposed action.

Fire and Fuels Management (Wildfire)

The Buffalo Field Office fire management program attempts to balance suppression strategies with resource values and desired conditions. Wildfires may be managed to enhance other resources such as wildlife habitat and forest health. Response to wildfires could vary from full protection in areas where fire is undesirable, to monitoring fire behavior in areas where fire can be used as a management tool. The entire planning area is available to identify appropriate landscapes where wildfire could be managed for multiple objectives. Heavy equipment is prohibited in certain areas with sensitive resources such as riparian/wetland habitat, except where human safety is at risk or if the effects of the fire are anticipated to cause more resource damage than the use of heavy equipment (BLM 2015b).

BLM responds to wildfires based on: (1) ecological, (2) social, and (3) legal consequences while supporting other resource values. BLM maintains partnerships with interagency cooperators and the public to strengthen coordination of all fire suppression activities. BLM cooperates with stakeholders to enhance the local fire prevention, defensible space protection, and public education programs. BLM implements appropriate emergency stabilization and rehabilitation actions following wildland fire. BLM pursues wildland fire management agreements to achieve resource objectives while protecting life and property. A resource advisor appropriate to the potentially affected resource is consulted, or assigned, to all wildland fires that involve or threaten BLM-administered lands. BLM prohibits the use of retardant or foam within 300 feet of surface water sources. BLM uses protection strategies in the following areas: (1) wildlife urban interface areas (WUIs), (2) the wildland industrial interface, (3) developed recreation, (4) developed electronic communication sites of all types, and (5) where sensitive or high value resources would be adversely affected by fire (e.g., greater sage-grouse core population areas).

Table 2 lists the acres of wildfire from 1990 to 2007 that have occurred in different vegetation types in the planning area. The data include only fires in which BLM responded or assisted. Land status may include mixed surface ownership.

Table 2. Total Acres of Wildfire responded to by the BLM in Different Vegetative Types in the Planning Area from 1990 through 2007

| Vegetation Type | Wildfire (acres) |
|--|-------------------------|
| Agriculture | 72 |
| Aspen | 109 |
| Ponderosa pine | 9,726 |
| Lodgepole pine | 3,891 |
| Douglas-fir & limber pine | 1,787 |
| Spruce/Fir | 518 |
| Mixed grass prairie | 93,033 |
| Mountain shrub | 1,622 |
| Riparian forest-dominated | 173 |
| Riparian herbaceous-dominated | 5 |
| Riparian shrub-dominated | 298 |
| Sagebrush | 36,296 |
| Other (sparse vegetation or no record) | 2,445 |
| Total | 149,974 |

Best management practices (BMP) or standard operating procedures (SOP) are applied to wildfire response strategies in sensitive areas or habitats. The Buffalo Field Office emphasizes minimal use of heavy equipment for fireline construction, except where protection from wildfire is critical for safety or to preserve sensitive resources. In special management areas with BLM surface restrictions, the BLM attempts to coordinate actions with interagency cooperators. In areas where mineral resources have been developed, road networks offer fuel breaks and access to wildfires.

Within the planning area, new or expanding concerns have changed the focus of wildland fire management. Energy development and human activity in the Powder River Basin are expected to expand industrial interface areas and may lead to an increase of human-caused fires. Urban residential development is expanding throughout the planning area, especially in the southern Big Horn Mountains and foothills.

Suppression activities can result in temporary surface disturbance and soil compaction from increased vehicle traffic, staging, and fire camps. The construction of fire lines can increase erosion as a result the removal of vegetation, duff, and the organic layer of the soil. Fire lines may vary in length, width, and depth. Concentrated surface runoff and increased erosion may occur, especially in areas with steep slopes and soils with low reclamation suitability.

Human-caused fires may be accidental from fireworks, open-air burning, wood cutting, railroad and vehicle malfunction, cigarette smoking, escaped campfire, and escaped prescribed fire. Most wildfires in the planning area are ignited by lightning in fine fuels (cured grasses), especially cheatgrass. Management actions include rehabilitating fire lines constructed by heavy equipment or on steep slopes to prevent or control erosion. Rehabilitation will include, but not be limited to, water barring and reseeding. Surface disturbance and soil compaction resulting from fire line construction, use of heavy equipment, and other fire-suppression activities will result in direct adverse effects by flattening or removing vegetation, potentially removing root systems of plants, particularly trees and shrubs, and increasing erosion, especially on steep slopes. The response to

fire depends on the size, location, intensity, season, timing, and amount of post-fire precipitation, and preexisting plant community condition and the abundance of invasive plant species in the area. Large fires (100 acres or more) may occur at a frequency of every five to seven years. Management actions include cooperating and pursuing agreements with other agencies and landowners to perform landscape treatments to enhance fuels management and restore fire-adapted ecosystems.

Emergency stabilization actions are implemented soon after the fire to protect life and property; to stabilize soils and watersheds; to protect unique biological resources; and significant heritage sites. Stabilization actions include project planning and must be implemented within 1 year of fire containment. Burned-area rehabilitation projects are developed to restore fire-damaged lands that are unlikely to recover naturally. In rehabilitation plans there is no immediate threat to safety or a specific resource, and treatments may include repair or replacement of minor facilities such as fences and campgrounds. These plans must be completed within 3 years of fire containment. Emergency stabilization protection priorities are: (1) human life and safety; and (2) property and unique biological resources (designated critical habitat for Federal and state listed, proposed or candidate threatened and endangered species) and significant heritage sites. Burned area rehabilitation protection priorities are: (1) to repair or improve lands damaged directly by a wildland fire; and (2) to rehabilitate or establish healthy, stable ecosystems in the burned area.

Leasable Minerals – Coal

Wyoming produces approximately one-third of all coal produced in the United States. The Powder River Basin in northern Wyoming contains some of the largest low-sulfur coal deposits in the world. New coal lease applications are processed by the BLM using the coal-screening process. Exploration on Federal mineral lands is subject to the requirements and conditions of the coal exploration license process, the result being a set of project-specific stipulations and conditions designed to limit impacts from exploration on other resources. Before the area can be considered for leasing, the amount of overburden, volume and quality of coal, and other information needed to plan a mine is gathered (BLM 2015b).

Coal in Wyoming generally is extracted using surface mining methods, although in the past, some coal was mined underground. Surface mining involves the use of large equipment, such as draglines, shovels, and haul trucks. Small drill rigs are used for exploration to determine the location and thickness and to obtain cores (for determining quality). Extracting coal using surface mining methods often results in large areas of surface disturbance from road construction, removal of topsoil and overburden, and stock piling of these materials. Once an area is mined out, reclamation begins and includes recontouring as closely to the original landscape as possible, reconstruction of drainages, and reseeding and monitoring to ensure the habitats are useable (BLM 2015b).

Thick coal deposits occur at or near the surface along the eastern boundary of the Buffalo Planning Area, along a north-south trend situated east of both Gillette and Wright, and in the northwestern portion of the Buffalo Planning Area. Coal occurs at depth, below the surface, throughout most of the remainder of the Buffalo Planning Area. There are currently 12 (13 counting the Jacobs Ranch mine, which was recently consolidated with the Black Thunder mine) operating mines in the planning area. All are in Campbell County, though part of the Antelope

Mine is in Converse County. There are presently two mining operations proposed to be opened on existing Federal coal leases or on privately owned coal. One of these proposed mining operations is located in Sheridan County. All of the existing or proposed mining operations are surface coal mines, using truck/shovel or dragline mining methods (BLM 2015b).

Since 1985, Federal coal resources in the Buffalo Planning Area have been managed under the guidelines of the existing Buffalo RMP (BLM 1985), including a major update in April 2001. The RMP provides a framework for coal resource management, including exploration and leasing. The RMP includes specific land use planning and coal screening, and direction on competitive coal leasing. The BLM goal for coal resource management in the Buffalo planning area is to meet reserve needs to maintain currently operating mines, consistent with environmental protections, coal resource conservation, and fair market value return to the public and government (BLM 2015b). In the 1985 Buffalo RMP, the priority areas available for consideration of coal leasing covered approximately 484,000 acres. After the coal screening process, approximately 378,000 acres containing approximately 26 billion tons of coal remained.

A Federal coal lease conveys the rights to explore, develop, and remove the coal leased. The lessee must comply with the requirements of the Mineral Leasing Act, the Surface Mining Control and Reclamation Act (SMCRA), any relevant state and Federal laws, and the terms and conditions of the lease. A reclamation bond is required at the time the lease is permitted for mining. That bond amount is established by the Wyoming Department of Environmental Quality (DEQ).

Coal forecasts for the Powder River Basin through 2020 indicate total production is expected to grow at an annual rate of 2 to 3 percent, consistent with electric power demand. By 2030 the BLM expects Powder River Basin coal production to be between 500 and 700 million tons annually (BLM 2015b).

Leasable Minerals – Oil and Gas

Oil and gas reservoirs can be discovered by direct or indirect exploration methods. Direct methods include mapping of surface geology, observing seeps, and gathering information on hydrocarbon shows observed in drilling wells. Indirect methods, such as gravity, magnetic, and seismic surveys, are used to delineate subsurface features that could contain oil and gas that are not directly observable. The petroleum industry utilizes two-dimensional and three-dimensional seismic technology to gather subsurface stratigraphic information to aid in the search for oil and gas reserves. Seismic technology utilizes explosives in drilled shot holes for source points along linear survey lines and vibroseis or shaker trucks and buggies for source points in a grid pattern over a large area that can cover hundreds of square miles.

The BLM reviews and approves Notices of Staking, applications for permits to drill (APDs), and applications from companies to lease, explore, develop, and produce oil, gas, and geothermal resources on Federal lands (Table 3). The BLM also is responsible for inspection and enforcement of oil and gas wells and other development operations, to ensure that lessees and operators comply with lease requirements and BLM regulations.

Table 3. Number of oil and gas leases by county in the planning area

| County | Number of Leases | Acres Under Lease |
|---------------------------|------------------|-------------------|
| Campbell | 3,149 | 1,428,517 |
| Johnson | 1,092 | 803,511 |
| Sheridan | 255 | 301,947 |
| As presented in BLM 2015b | | |

Table 4 lists well statistics for the planning area as of 2008. After the BLM approves an application-for-permit-to-drill (APD) on Federal oil and gas leases, the developing company may proceed with drilling in accordance with applicable regulations, Onshore Oil and Gas Orders, Notices to Lessees, lease terms and conditions, and the approved APD (with the conditions of approval attached to the permit).

Table 4. Well Statistics for Campbell, Johnson, and Sheridan Counties, November 2008

| | Federal | Fee or State | Total |
|---|---------|--------------|--------|
| Campbell County | | | |
| Number of Plugged and Abandoned Wells | 3,911 | 5,236 | 9,147 |
| Number of Dormant Wells | 105 | 136 | 241 |
| Number of Completed Wells | 7,582 | 12,085 | 19,667 |
| Number of Monitoring Wells | 11 | 23 | 34 |
| Notice of Intent to Abandon | 204 | 415 | 619 |
| Number of Spuds | 385 | 513 | 898 |
| Number of Expired Permits | 9,079 | 8,825 | 17,904 |
| Number of Permits To Drill | 1,349 | 480 | 1,829 |
| Permits Issued (Total of all the above) | 22,626 | 27,713 | 50,339 |
| Total (Permits Issued and Waiting on Approval) | 22,653 | 27,729 | 50,382 |
| Johnson County | | | |
| Number of Plugged and Abandoned Wells | 1,000 | 698 | 1,698 |
| Number of Dormant Wells | 95 | 14 | 109 |
| Number of Completed Wells | 2,995 | 1,745 | 4,740 |
| Number of Monitoring Wells | 17 | 9 | 26 |
| Notice of Intent to Abandon | 34 | 39 | 73 |
| Number of Spuds | 219 | 113 | 332 |
| Number of Expired Permits | 4,075 | 2,854 | 6,929 |
| Number of Permits To Drill | 875 | 226 | 1,101 |
| Permits Issued (Total of all the above) | 9,310 | 5,698 | 15,008 |
| Waiting On Approval | 19 | 16 | 35 |
| Total (Permits Issued and Waiting on Approval) | 9,329 | 5,714 | 15,043 |
| Sheridan County | | | |
| Number of Plugged and Abandoned Wells | 104 | 366 | 470 |
| Number of Dormant Wells | 0 | 9 | 9 |
| Number of Completed Wells | 457 | 3,976 | 4,433 |
| Number of Monitoring Wells | 6 | 13 | 19 |
| Notice of Intent to Abandon | 2 | 91 | 93 |
| Number of Spuds | 18 | 125 | 143 |
| Number of Expired Permits | 1,187 | 4,631 | 5,818 |
| Number of Permits To Drill | 173 | 200 | 373 |
| Permits Issued (Total of all the above) | 1,947 | 9,411 | 11,358 |
| Waiting On Approval | 13 | 22 | 35 |
| Total (Permits Issued and Waiting on Approval) | 1,960 | 9,433 | 11,393 |

As presented in RMP (BLM 2015b)

Geophysical exploration is a tool of the oil and gas industry that bounces shock waves off subsurface rock layers to determine their thickness and geometry. The energy typically comes from the detonation of explosives in a shallow drill hole or from a heavy weight either dropped

or vibrated on the ground surface. Seismic operations use existing roads, when feasible, but also require off-road travel, which may include new surface disturbance. Geophysical exploration (primarily three-dimensional) is expected to continue through the life of the plan.

The BLM is responsible for authorizing and administering geophysical exploration operations on all public surface lands within the planning area, while the Wyoming Oil and Gas Conservation Commission (WOGCC) is responsible for authorizing all operations on State and private surface land. Once acreage in the planning area is nominated by the public to be included in an oil and gas lease sale, the acreage description is sent to the Buffalo Field Office to be reviewed, and stipulations for protection of wildlife and other sensitive resources are developed. These stipulations become part of the lease. After an oil and gas lease is acquired, and prior to development, an APD must be filed with the WOGCC and the Buffalo Field Office if the well is located on a Federal oil and gas lease in the planning area. Once the permit is approved, the company may proceed with drilling according to the conditions of the permit's approval. Coalbed natural gas (CBNG) has become one of the largest contributors to the total natural gas production in Wyoming, and the coals of the Powder River Basin (northern Wyoming) are the largest source of CBNG.

Ancillary oil and gas development involves allowing the construction of roads, pads, pipelines, and other facilities, such as aboveground powerlines. Stipulations involve implementing leases with no surface occupancy (NSO) or controlled surface use (CSU) restrictions, timing limitation stipulations (TLSs), or with other standard surface protection restrictions; negotiating mitigated impacts between lessees and the BLM authorized officer; and deciding mitigation measures and limitations, as well as reclamation plans. Reclamation actions take place following the expiration of a lease and may include reseeding, reshaping land contours, well pad and road closure, and revegetation.

Surface-disturbing and other activities associated with the Leaseable minerals – Oil and Gas program include, but are not limited to, the following actions: applying dust-control measures; restricting flaring of natural gas; controlling or limiting emissions; constructing and reclaiming well pads, access roads, and reserve pits; constructing reservoirs associated with water disposal; constructing compressor stations, product enhancements and disposal facilities; building pipelines associated with leases or units; installing powerlines associated with leases or units; and conducting geophysical exploration.

Livestock Grazing Management

The BLM is responsible for administering livestock grazing on public land across the planning area. Livestock grazing includes the grazing of domestic animals (e.g., cattle, sheep, horses, yaks, and bison). All public land in the planning area is designated for grazing unless otherwise prohibited and is governed under Taylor Grazing Act section 15, which concerns issuing grazing leases on public lands outside the original grazing district boundaries established by the Taylor Grazing Act of 1934. A grazing lease is a document that authorizes grazing use of public lands. Base property is land owned or controlled by a BLM lessee that may serve as a base for livestock operations. The land must have the capability to produce crops or forage that can be used to support the livestock authorized for a specified period. The base property supporting a section

15 grazing lease must adjoin the leased public lands unless no applicant owns adjoining lands. In most cases, the base property for a section 15 lease adjoins, surrounds, or is intermingled with the leased public lands. Public lands in the planning area comprise approximately 10 percent of the surface acres; the remaining 90 percent is a combination of private and state lands. The majority of lands with streams and springs (“live water”) were homesteaded and are in private ownership. Therefore, except for drilled water wells and associated stock water pipelines and constructed reservoirs, most of the water available for livestock and wildlife comes from private lands.

The BLM recognizes that production on its rangelands can be sustained only with proper management of livestock grazing activities. To evaluate rangeland health and keep production sustainable, the BLM utilizes the *Wyoming Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the State of Wyoming* (BLM 1998). In 1998, the BLM began assessing grazing allotments with these standards in accordance with the change in 1995 to the 43 CFR 4100 grazing regulations. An allotment is an area of land designated and managed for grazing of livestock. Management decisions and actions are made in accordance with the *Wyoming Standards for Healthy Rangelands*. The BLM uses these standards to allow sustainable livestock grazing to continue while protecting watersheds, riparian and upland ecosystems, and wildlife habitat.

Grazing standards address the health, productivity, and sustainability of BLM-administered public rangelands and represent the minimum acceptable health for public rangelands. The standards apply to all resource uses on public lands. Their application is determined as resource-specific guidelines are developed. Standards are synonymous with goals and are observed on a landscape scale. They describe healthy rangelands rather than important rangeland by-products. The achievement of a standard is determined by observing, measuring, and monitoring appropriate indicators. An indicator is a component of a system the characteristics (e.g., presence, absence, quantity, and distribution) of which can be observed, measured, or monitored based on sound scientific principles.

In the planning area, public lands comprise approximately 10 percent of the surface acres; the remaining 90 percent is a combination of private and state lands. Due to this scattered land pattern, livestock operations and management are run as seamless units regardless of surface ownership. To separate public lands to be managed as special units would not be feasible for the grazing lessee or the BLM. The BLM’s Buffalo Field Office administers 427 grazing leases on 477 allotments; approximately 370 of these are Category C (custodial) allotments where BLM is the minority surface owner. The BLM manages livestock on the majority of the BLM-administered surface acres in the planning area through leasing of grazing rights for determined levels of use. Levels of use are allocated in Animal-Unit-Months (AUMs). An AUM is a standardized measurement of the amount of forage necessary for the sustenance of one cow unit or its equivalent for one month (approximately 800 pounds of forage). The surface acreage leased for grazing in the planning area incorporates approximately 106,078 AUMs of livestock forage. The Buffalo Field Office also administers grazing use for public lands within the boundaries of adjacent BLM Field Office planning areas through cooperative management agreements.

Table 5. Livestock type and number of leases in the Buffalo planning area (BLM 2015)

| Livestock Type | Number of Leases |
|---------------------------|-------------------------|
| Cattle only | 362 |
| Sheep only | 18 |
| Cattle and sheep | 24 |
| Horses only | 5 |
| Bison only | 2 |
| Yak only | 1 |
| Cattle and horses | 11 |
| Cattle, sheep, and horses | 4 |
| Total | 427 |

Livestock grazing on allotments is authorized during various times during the year depending on management objectives. Grazing periods vary with elevation and geographical change, resource needs, and user preference. The higher-elevation allotments are generally grazed during summer and fall. The lower-elevation areas can be grazed during any season. Most of the allotments in the planning area are operating with prescribed use levels that provide for plant recovery to enhance rangeland health. When rangelands are not meeting resource objectives, the BLM implements changes in grazing management.

In 1985, all allotments in the Buffalo Planning Area were placed in categories established by BLM range management policies, as follows: “I” (Improve), “M” (Maintenance), and “C” (Custodial). The BLM categorizes allotments according to the greatest potential for resource improvement and the greatest economic return for applied management. Factors in the categorization process include public land acreage, estimated range health and trend, resource conflict or concerns, existing grazing systems, range suitability, production potential, wildlife habitat values, land patterns and acreages, and range improvement needs.

At present, 18 of the allotments in the Buffalo Planning Area are operated under allotment management plans (AMPs) or management agreements (Table 6). AMP and grazing agreements usually incorporate a deferred rotation grazing system to allow periodic rest during the critical growing season for vegetation from initial spring green-up through seedset (March 1 to July 10).

Table 6. Allotment management plans and management agreements (BLM 2015b)

| Allotment Number | Allotment Name | Type of Plan | Public Acres |
|-------------------------|---|---------------------|---------------------|
| 22213 | Tongue River | AMP | 1,767 |
| 22214 | Schooner Ranch | AMP | 12,482 |
| 32014 | North Windmill | AMP | 2,074 |
| 02275 | Remington Creek | AMP | 2,676 |
| 02310 | Little Willow | AMP | 6,080 |
| 02344 | Dry Vee | Agreement | 4,442 |
| 02371 | Slope/Mountain/Stubbs Draw/Poker Creek | AMP | 16,540 |

| | | | |
|---------------------------------|-----------------------|-----|----------------|
| 02380 | Wormwood Ranch/Beaver | AMP | 12,917 |
| 02390 | Olmstead | AMP | 832 |
| 02426 | Crooked Creek | AMP | 20,367 |
| 02430 | Powder River | AMP | 4,526 |
| 02438 | T.W. | AMP | 1,840 |
| 02476 | Gardner Mountain | AMP | 1,622 |
| 12033 | Red Fork | AMP | 10,000 |
| 12139 | Falxa | AMP | 14,759 |
| 12162 | Fence Creek | AMP | 4,820 |
| 22106 | Wagonhammer | AMP | 3,881 |
| Total | | | 123,247 |
| AMP = Allotment management plan | | | |

The BLM assesses approximately 10 percent of the public land grazing allotments in the planning area annually. Where livestock grazing has been identified as contributing to an allotment not meeting the rangeland health standards, allotment-specific guidelines or BMPs are being implemented to improve rangeland health. The BLM monitors to ensure proper grazing on the allotments and uses monitoring results to determine if present management is adequate for meeting rangeland health requirements or if a change in management is needed. Changes in management that have been applied include the construction or implementations of range improvements to aid in livestock management. Range improvement projects can include construction of fences, water delivery systems, and water holding facilities; prescribed burning; and ensuring reliable water sources. It can also include cultural changes such as a change in livestock type, deferment of a portion or all of an allotment, change or limitation of the season of use, or leasing additional lands.

As part of the livestock grazing management program, the BLM implements range improvement projects to help achieve management goals. The BLM's livestock grazing management program includes livestock management actions; range management; range improvements, such as fencing and water sources; detrimental impacts management; and lease management. Livestock grazing management includes converting to new types of livestock, and authorizing livestock grazing, such as adjusting season of use, distribution, kind, class, and number of livestock. One method that livestock producers can use to change the distribution of livestock is to provide salt or mineral supplements in specified areas. Range management actions include using prescribed fire, vegetation-manipulation projects, changing composition of existing vegetation, using noxious weed control, using mechanical or biological vegetative treatments to improve forage production, using heavy equipment, and herbicide treatment of sagebrush. Fencing actions include fence construction and repair, designing and implementing grazing systems, and building livestock enclosures for important riparian habitats. Water management actions include developing reservoirs, springs, pipelines, and wells, and providing access to these developments. Managing detrimental impacts include documenting, treating, and preventing resource damage. Potential detrimental impacts include the degradation of streambanks, the introduction and spread of invasive non-native species (INNS), increasing soil erosion, and a reduction in cottonwood tree recruitment. Lease management actions include conducting monitoring studies,

performing project work to enhance and improve riparian zones, designating stock trails, managing leases, developing management plans and agreements, and canceling or changing livestock trails.

Before 1997, an average of 6 to 10 range improvement projects were completed annually in the Buffalo planning area. Since 1998, an average of four to six range improvement projects have been completed annually. These projects consist primarily of fences, stock-water pipelines, spring developments, water wells, and vegetative treatments (BLM 2015b).

Vegetation – Riparian/Wetland Resources

Riparian and wetland areas occur throughout the planning area. Riparian and wetland communities have persistent water or obligate vegetation (e.g., sedges, rushes, and willows) reflecting the availability of surface water or groundwater. Due to the importance of riparian and wetland areas, the BLM performs assessments of the functional condition of these areas using a method referred to as the assessment of Properly Functioning Condition (PFC). The qualitative assessment process consists of an approach that considers the hydrology, vegetation, and erosion and deposition (water, soil, and vegetation) attributes of riparian-wetland areas. The PFC assessment reflects how well the physical processes that have been assessed are functioning. A resilient system allows for desirable characteristics. Riparian-wetland areas that are not functioning properly cannot sustain desirable characteristics over time. A riparian-wetland area is considered to be in PFC when adequate vegetation and landforms are present to: (1) dissipate stream energy associated with high-water flow, thereby reducing erosion and improving water quality, (2) filter sediment, capture bedload, and aid floodplain development, (3) improve flood-water retention and groundwater recharge, (4) develop root masses that stabilize stream banks against cutting action, (5) develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses, and (6) support greater biodiversity.

The BLM goal for riparian and wetland areas is to maintain, rehabilitate, and improve riparian ecosystems to achieve maximum long-term benefits. Management challenges for riparian and wetland communities include balancing the sometimes conflicting demands of livestock grazing and wildlife habitats; managing for PFC; protecting water quality; avoiding improper livestock grazing, especially during dry summer months without sufficient alternative water supplies; and fencing or other livestock exclusion options along riparian areas and wetlands. Livestock grazing is the most widespread activity that influences riparian habitat conditions in the planning area. Energy development, roads, forest management, dispersed recreation, and localized wildlife impacts also affect the functional capability of riparian-wetland areas. The cumulative impacts of overlapping uses complicate the effectiveness of applying management constraints to a single activity to achieve riparian objectives.

STATUS OF THE SPECIES

Northern Long-eared Bat Life History and Biology

The northern long-eared bat is a temperate, insectivorous, migratory bat that hibernates in mines and caves in the winter and spends summers in wooded areas. The key stages in its annual cycle are: hibernation, spring staging and migration, pregnancy, lactation, volancy/weaning, fall migration and swarming. Northern long-eared bats generally hibernate between mid-fall through mid-spring each year. The spring migration period likely runs from mid-March to mid-May each year, as females depart shortly after emerging from hibernation; females are pregnant when they reach their summer area. Young are born between mid-June and early July, with nursing continuing until weaning, which is shortly after young become volant (able to fly) in mid- to late-July. Fall migration likely occurs between mid-August and mid-October.

Suitable summer habitat for the northern long-eared bat consists of a wide variety of forested and wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. These areas include forests and woodlots containing potential roosts, as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure.

The northern long-eared bat consistently avoids foraging in or crossing large open areas, choosing instead to use tree-lined pathways or small openings (Patriquin and Barclay 2003, Yates and Muzika 2006). Further, wing morphology of the species suggests that they are adapted to moving in cluttered habitats. Thus, isolated patches of forest may not be suitable for foraging or roosting unless the patches are connected by a wooded corridor.

Upon emergence from the hibernacula in the spring, females seek suitable habitat for maternity colonies. Northern long-eared bats actively form colonies in the summer (Foster and Kurta 1999) and exhibit fission-fusion behavior (Garroway and Broders 2007), where members frequently coalesce to form a group (fusion), but composition of the group is in flux, with individuals frequently departing to be solitary or to form smaller groups (fission) before returning to the main unit (Barclay and Kurta 2007). As part of this behavior, northern long-eared bats switch tree roosts often (Sasse and Pekins 1996), typically every 2 to 3 days (Carter and Feldhamer 2005, Foster and Kurta 1999, Owen *et al.* 2002, Timpone *et al.* 2010). Northern long-eared bat maternity colonies range widely in size, although 30-60 bats may be most common (USFWS 2014). The northern long-eared bat shows some degree of inter-annual fidelity to single roost trees and/or maternity areas. Males are routinely found with females in maternity colonies. These bats use networks of roost trees often centered around one or more central-node roost trees (Johnson *et al.* 2012). The roost networks also include multiple alternate roost trees and male and non-reproductive females may also roost in cooler places, like caves and mines (Amelon and Burhans 2006, Barbour and Davis 1969).

Northern long-eared bats roost in cavities, underneath bark, crevices, or hollows of both live and dead trees and/or snags (typically ≥ 3 inches diameter at breast height). They are known to use a

wide variety of roost types, using tree species based on presence of cavities or crevices or presence of peeling bark. These bats have also been occasionally found roosting in structures like barns and sheds (particularly when suitable tree roosts are unavailable). Young northern long-eared bats are typically born in late-May or early June, with females giving birth to a single offspring. Lactation then lasts 3 to 5 weeks, with pups becoming volant (able to fly) between early July and early August. Males and non-reproductive females may summer near hibernacula, or migrate to summer habitat some distance from their hibernaculum. The northern long-eared bat is not considered to be a long distance migrant (typically 40-50 miles). Migration is an energetically demanding behavior, particularly in the spring when their fat reserves and food supplies are low and females are pregnant. Suitable winter habitat (hibernacula) includes underground caves and cave-like structures (e.g. abandoned or active mines, railroad tunnels). There may be other landscape features being used during the winter that have yet to be documented. Generally, northern long-eared bats hibernate from October to April depending on local climate (November-December to March in southern areas and as late as mid-May in some northern areas). Hibernacula typically have significant cracks and crevices for roosting; relatively constant, cool temperatures (0-9 degrees Celsius) and with high humidity and minimal air currents. Specific areas where they hibernate have very high humidity, so much so that droplets of water are often seen on their fur. Within hibernacula, surveyors find them in small crevices or cracks, often with only the nose and ears visible.

Northern long-eared bats tend to roost singly or in small groups (USFWS 2014), with hibernating population sizes ranging from just a few individuals to around 1,000 (USFWS unpublished data). Northern long-eared bats display more winter activity than other cave species, with individuals often moving between hibernacula throughout the winter (Caceres and Barclay 2000, Griffin 1940, Whitaker and Rissler 1992). Northern long-eared bats have shown a high degree of philopatry to the hibernacula used, returning to the same hibernacula annually. Upon arrival at hibernacula in mid-August to mid-November, these bats “swarm,” a behavior in which large numbers of bats fly in and out of cave entrances from dusk to dawn, while relatively few roost in caves during the day. Swarming continues for several weeks and mating occurs during the latter part of the period. After mating, females enter directly into hibernation but not necessarily at the same hibernaculum where mating occurred. The majority of bats of both sexes hibernate by the end of November (by mid-October in northern areas).

After hibernation ends in late March or early April (as late as May in some northern areas), most northern long-eared bats migrate to summer roosts. Females emerge from hibernation prior to males. Reproductively active females store sperm from autumn copulations through winter. Ovulation takes place after the bats emerge from hibernation in spring. The period after hibernation and just before spring migration is typically referred to as “staging,” a time when bats forage and a limited amount of mating occurs. This period can be as short as a day for an individual, but not all bats emerge on the same day.

In general, northern long-eared bats use roosts in the spring and fall similar to those selected during the summer. Suitable spring staging/fall swarming habitat consists of the variety of forested/wooded habitats where they roost, forage, and travel, which is most typically within 5 miles of a hibernaculum. This includes forested patches as well as linear features such as fencerows, riparian forests and other wooded corridors. These wooded areas may be dense or

loose aggregates of trees with variable amounts of canopy closure. Isolated trees are considered suitable habitat when they exhibit the characteristics of a suitable roost tree and are less than 1,000 feet from the next nearest suitable roost tree, woodlot, or wooded fencerow.

Northern Long-eared Bat Threats

White-nose syndrome (WNS) is a severe and immediate threat to the northern long-eared bat. Since the disease was first observed in New York in 2007 (later biologists found evidence from 2006 photographs), WNS has spread rapidly in bat populations. Population numbers of northern long-eared bats have declined by 99 percent in the northeastern portions of the species range, which along with Canada, has been considered the core of the species' range. Although there is uncertainty about how quickly WNS will spread through the remaining portions of this species range, it is expected to spread throughout its entire range. In general, the USFWS believes that WNS has significantly reduced the redundancy and resiliency of the northern long-eared bat.

Although significant northern long-eared bat population declines have only been documented due to the spread of WNS, other sources of mortality could further diminish the species' ability to persist as it experiences ongoing dramatic declines. Specifically, declines due to WNS have significantly reduced the number and size of northern long-eared bat populations in some areas of its range. This has reduced these populations to the extent that they may be increasingly vulnerable to other stressors that they may have previously had the ability to withstand. These impacts could potentially be seen on two levels. First, individual northern long-eared bats sickened or struggling with infection by WNS may be less able to survive other stressors. Second, northern long-eared bat populations impacted by WNS, with smaller numbers and reduced fitness among individuals, may be less able to recover making them more prone to extirpation. The status and potential for these impacts will vary across the range of the species.

Bats affected but not killed by WNS during hibernation may be weakened by the effects of the disease and may have extremely reduced fat reserves and damaged wing membranes. These effects may reduce their ability to fly or to survive long-distance migrations to summer roosting or maternity areas. In areas where WNS is present, there are additional energetic demands for northern long-eared bats. For example, WNS-affected bats have less fat reserves than non-WNS-affected bats when they emerge from hibernation (Reeder *et al.* 2012; Warnecke *et al.* 2012) and have wing damage (Meteyer *et al.* 2009; Reichard and Kunz 2009) that makes migration and foraging more challenging. Females that survive the migration to their summer habitat must partition energy resources between foraging, keeping warm, successful pregnancy and pup-rearing, and healing and may experience reduced reproductive success. In addition, with wing damage, there may be an increased chance of WNS-affected bats being killed or harmed as a result of human activities. For example, timber harvest or burns conducted early in the spring (April – May) when bats have just returned may expose them to colder temperatures at a time when they have depleted fat reserves, resulting in increased mortality or decreased reproduction.

Over the long-term, sustainable forestry benefits the northern long-eared bat by maintaining suitable habitat across a mosaic of forest treatments. However, forest practices can have a variety of impacts on the northern long-eared bat depending on the quality, amount, and location

of the lost habitat, and the time of year of clearing. Depending on their characteristics and location, forested areas can function as summer maternity habitat, staging and swarming habitat, migration or foraging habitat, or sometimes, combinations of more than one habitat type. Impacts from tree removal to individuals or colonies would be expected to range from indirect impact (e.g., minor amounts of forest removal in areas outside northern long-eared bat summer home ranges or away from hibernacula) to minor (e.g., largely forested areas, areas with robust northern long-eared bat populations) to significant (e.g., removal of a large percentage of summer home range, highly fragmented landscapes, areas with WNS impacts).

Lastly, there is growing concern that bats, including the northern long-eared bat may be threatened by the recent surge in construction and operation of wind turbines across the species' range. Mortality of northern long-eared bats has been documented at multiple operating wind facilities. The USFWS is now working with wind facility developers and operators to avoid and minimize incidental take of bats and assess the magnitude of the threat.

Northern Long-eared Bat Rangewide Status

The northern long-eared bat ranges across much of the eastern and north central United States, and all Canadian provinces west to the southern Yukon Territory and eastern British Columbia (Caceres and Pybus 1997, Environment Yukon 2011, Nagorsen and Brigham 1993)(Figure 1). In the United States, the species' range reaches from Maine west to Montana, south to eastern Kansas, eastern Oklahoma, Arkansas, and east through the Gulf States to the Atlantic Coast (Amelon and Burhans 2006, Caceres and Barclay 2000, Whitaker and Hamilton 1998). The species' range includes the following 37 States (plus the District of Columbia): Alabama, Arkansas, Connecticut, Delaware, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming. Historically, the species has been most frequently observed in the northeastern United States and in Canadian Provinces, Quebec and Ontario, with sightings increasing during swarming and hibernation (Caceres and Barclay 2000). However, throughout the majority of the species' range it is patchily distributed, and historically was less common in the southern and western portions of the range than in the northern portion of the range (Amelon and Burhans 2006). Critical habitat has not been proposed for the northern long-eared bat.

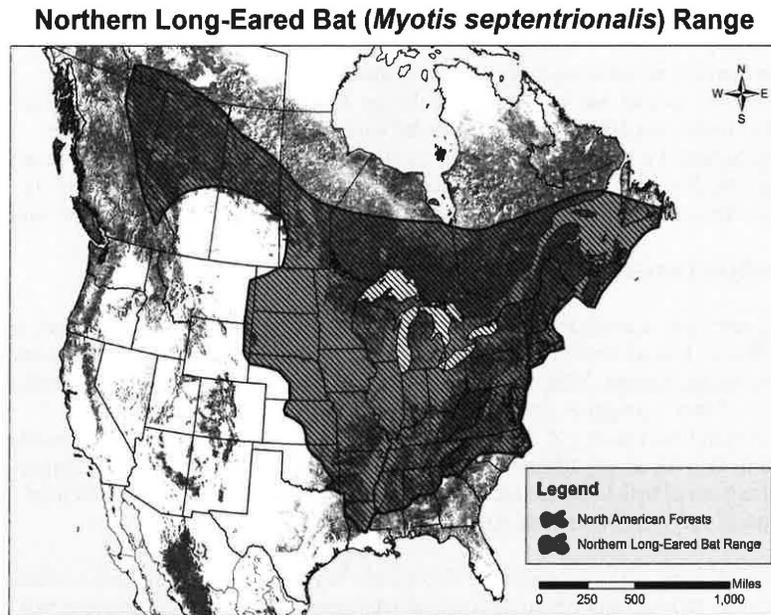


Figure 1.

Although they are typically found in low numbers in inconspicuous roosts, most records of northern long-eared bats are from winter hibernacula surveys (Caceres and Pybus 1997). More than 780 hibernacula have been identified throughout the species' range in the United States, although many hibernacula contain only a few (1 to 3) individuals (Whitaker and Hamilton 1998). Known hibernacula (sites with one or more winter records of northern long-eared bats) include: Alabama (2), Arkansas (41), Connecticut (8), Delaware (2), Georgia (3), Illinois (21), Indiana (25), Kentucky (119), Maine (3), Maryland (8), Massachusetts (7), Michigan (103), Minnesota (11), Missouri (more than 269), Nebraska (2), New Hampshire (11), New Jersey (7), New York (90), North Carolina (22), Oklahoma (9), Ohio (7), Pennsylvania (112), South Carolina (2), South Dakota (21), Tennessee (58), Vermont (16), Virginia (8), West Virginia (104), and Wisconsin (67). Northern long-eared bats are documented in hibernacula in 29 of the 37 States in the species' range. Other States within the species' range have no known hibernacula (due to no suitable hibernacula present, lack of survey effort, or existence of unknown retreats).

The current range and distribution of northern long-eared bats must be described and understood within the context of the impacts of WNS. Prior to the onset of WNS, the best available information on these bats came primarily from surveys (primarily focused on Indiana bat or other bat species) and some targeted research projects. In these efforts, the northern long-eared bat was frequently encountered and was considered the most common myotid bat in many areas.

Overall, the species was considered to be widespread and abundant throughout its historic range (Caceres and Barclay 2000).

WNS has been particularly devastating (substantial population declines) in the northeastern United States, where the species was believed to be the most abundant. In addition, WNS has been documented at more than 100 northern long-eared bat hibernacula in the southeastern United States, with apparent population declines at most sites. WNS has not been found in any of the western states to date, and the species is considered rarer in the western extremes of its range. Further declines are expected as the disease continues to spread across the species' range.

Status of the Northern Long-eared Bat in Wyoming

The northern long-eared bat is considered common in small, isolated portions of the western part of its range (e.g., Black Hills of South Dakota) and uncommon or rare in the western extremes of the range (e.g., Wyoming, Kansas, Nebraska)(Caceres and Barclay 2000); however, there have been limited survey efforts throughout much of the western portion of the species' range. To date, WNS has not been found in any of the western states, and the species is relatively abundant. Capture and banding data for survey efforts in the Black Hills of South Dakota and Wyoming showed northern long-eared bats to be the second most common bat banded (159 of 878 total bats) during 3 years of surveys (Tigner and Aney 1994).

During acoustic and mist-net surveys conducted throughout Wyoming in the summers of 2008–2011, 32 separate observations of northern long-eared bats were made in the northeastern part of the state, and breeding was confirmed (U.S. Forest Service (USFS) 2006, unpublished data; Wyoming Game and Fish Department (WGFD) 2012, unpublished data). Northern long-eared bats have also been observed at Devils Tower National Monument in Wyoming during the summer months and primarily were found to use forested areas of the Monument (USFWS 2015). There are no known hibernacula in Wyoming. The majority of potential hibernacula (abandoned mines) within Wyoming occur outside of the northern long-eared bat's range (Tigner and Stukel 2003; WGFD 2012, unpublished data). In contrast, South Dakota contains 21 known hibernacula, all within the Black Hills, 9 of which are abandoned mines (USFWS 2015).

Conservation Needs of the Northern Long-eared Bat

The species' conservation needs include what is needed in terms of reproduction, numbers, and distribution to ensure the species is no longer in danger of extinction. The primary conservation need of the northern long-eared bat is to reduce the threat of WNS. This includes minimizing mortality in WNS-affected areas, and slowing the rate of spread into currently unaffected areas. In addition, northern long-eared bats that continue to exist within WNS-affected areas need to continue to survive and reproduce in order to stabilize and/or increase their populations. This can be done by reducing the other threats to the species. Therefore, efforts to protect hibernacula from disturbances need to continue, including restricting human access to hibernacula particularly during the hibernation period, constructing and maintaining appropriately designed gates, and restoring microhabitat conditions in hibernacula that have been altered. Efforts should also be made to protect and restore (in some cases) adequate fall swarming habitat around hibernacula. Known maternity habitat should be maintained, and the removal of known roost

trees, particularly when pregnant females and/or young are present should be reduced or avoided. Research to identify important hibernacula and summer areas and to delineate the migratory relationship between summering and wintering populations should also be pursued.

Ute Ladies'-tresses Species Description

Ute ladies'-tresses (*Spiranthes diluvialis*) is a perennial, terrestrial orchid with stems 20 to 50 centimeters (cm) tall arising from tuberously thickened roots measuring up to 1 cm in diameter. It has narrow leaves about 28 cm long and 1.5 cm wide at the base of the stem and becomes reduced in size going up the stem. The flowers, in an inflorescence (flowering spike) of 3 to 30 or more flowers, are small white to ivory arranged in a spiral. The species is characterized by stout flowers that are gaping at the mouth. The sepals and petals, except for the lip, are straight, although the lateral sepals are variably oriented. These lateral sepals spread abruptly from the base of the flower and are free to the base. The rachis is densely pubescent with the longest trichomes (hairs) 0.2 millimeters long or longer (Sipes and Tepedino 1994, USFWS 1992, 1995).

Ute Ladies'-tresses Life History

Very little is known about the life history of Ute ladies'-tresses (USFWS 1995). Much of what is presumed about the species' life history is drawn from knowledge of other orchids. Orchids generally have very small seeds that require symbiotic associations with mycorrhizal fungi for germination. Many species of orchids are saprophytic; plants may persist underground for many years before emerging above ground. The mycorrhizal stage is reported to last 8 years in *S. spiralis* and green leaves are first produced up to 11 years after germination in that species (Wells 1967). Studies in western Kansas and Nebraska report that *S. magnicamporum* may bloom as rarely as once in 20 years. The mean life expectancy of *S. spiralis* plants studied over a nine year period was calculated to be more than 50 years (USFWS 1995).

Throughout its range, reproduction of the Ute ladies'-tresses orchid appears to be strictly sexual, with bumblebees (*Bombus* spp.) as the primary pollinators (Arditti 1992, Sheviak 1984). Flowers are protandrus (functionally male first and then female). As with other orchid species, it is thought that Ute ladies'-tresses does not reach sexual maturity for 5 to 10 years (USFWS 1995). Each orchid fruit can have several hundred to 10,000 seeds with an average of around 2,000 (Sipes and Tepedino 1994). These seeds may be dispersed by water (Carroll, *pers. comm.*) or wind (Wells 1967). The flowers, seed heads, and vegetative parts of the Ute ladies'-tresses orchid are palatable and can be incidentally eaten by grazing livestock. The possibility that grazers could disperse the seeds of this species has not been evaluated. The blooming period is from early August to early September, with fruits produced in mid-August to September (Fertig 2000). Not all individual mature Ute ladies'-tresses orchids bloom every year and some may remain dormant beneath the ground surface and not show any above ground parts for at least one growing season (Arft 1995).

The Ute ladies'-tresses orchid inhabits early successional riparian habitats such as moist stream beds, wet meadows, point bars, sand bars, abandoned stream channels, and low lying gravelly, sandy, or cobbly edges (Fertig *et al.* 1994, USFWS 1995, Fertig 2000). Ute ladies'-tresses appears to have a close affinity with floodplain areas where the water table is near the surface

throughout the growing season and into early autumn. The species is found in open riparian, floodplain areas where the competing vegetation has been removed by livestock grazing, mowing or by flooding events approximately one month prior to flowering. Ute ladies'-tresses is known to grow in agricultural lands managed for grazing in the winter and hay production in spring and summer, where mowing occurs in mid-July (USFWS 1995). The elevational range of known Ute ladies'-tresses occurrences is 1,800-6,800 feet (Arft and Ranker 1998), while the known Wyoming populations range from 4,650-5,420 feet (Fertig 2000).

Populations of Ute ladies'-tresses may do well under a regime of somewhat heavy use, i.e., livestock grazing and hay mowing. Grazing may have beneficial effects to the plants, especially in early summer prior to flowering or fruit production (Arft 1995, Moseley 1998). Grazing may mimic the effects of flooding, fire, or other disturbances in maintaining low vegetative cover or reducing weed cover (Moseley 1998). Mowing may be beneficial by reducing competing vegetation cover, but can be detrimental if done before fruits ripen or if hay is cut too low (Arft 1995; Hazlett 1996, 1997). Ute ladies'-tresses does not tolerate dense competition of vegetation, although a few populations are found in riparian woodlands.

Ute Ladies'-tresses Population Dynamics

Ute ladies'-tresses population levels and viability are, at least in part, determined by habitat conditions created and maintained by natural water processes. Therefore, the significance of population size and distribution within a watershed can, at least partially, be assessed in terms of the ability of the watershed factors to perpetuate it. However, the linkages between watershed processes, habitat conditions, and Ute ladies'-tresses population response are complex and not completely understood.

The locations of populations within a watershed vary with the availability of suitable habitat. Sizes of populations fluctuate naturally, and in some years, not one Ute ladies'-tresses orchid within a population appears above ground. The number of flowering adults does not give an accurate picture of population size nor tells us anything about population structure. More information is necessary regarding population viability (USFWS 1995).

If estimated population size is based on the number of Ute ladies'-tresses flowering spikes, then populations appear to fluctuate dramatically in size from year to year (USFWS 1992). For example, the primary site for the Boulder, Colorado population contained 5,435 plants in 1986, 200 plants in 1987, 131 plants in 1988, 1,137 plants in 1989, 1,894 plants in 1990, and at least 80 plants in 1991 (USFWS 1992). This variability in apparent population size is consistent with other observations made of other orchid species.

Apparent fluctuations in orchid numbers based on flowering individuals may not provide an accurate description of the actual dynamics of the orchid populations (Wells 1967). Using the number of flowering spikes displayed at the time of visit may be an unsatisfactory criterion for measuring a quantitative change in population, because plants may spend several years as vegetative rosettes or as underground tubers (as many as 11 years) with no above-ground parts (Wells 1967). Furthermore, according to Wells (1967), the autumn ladies'-tresses orchid (*S. spiralis*) grows mainly in short grassland which is typically maintained in that condition by some

kind of grazing which can damage some of the flowering spikes making a visual estimate of number based on count of flowering spikes unreliable. Additional research on Ute ladies'-tresses supports this theory (Arft 1995).

At the time of listing of Ute ladies'-tresses, most of the species' historic western populations on the Wasatch Front and in the Great Basin were believed to have been extirpated by urbanization. Most known populations contained fewer than 1,000 plants when counted in 1990 and 1991. Eastern Utah populations were also typically small in size. Local extirpations may have taken place in currently unoccupied potential habitat similar to extirpations which occurred along the Wasatch Front, the Great Basin, and certain historic populations in Colorado (USFWS 1992).

In 1992, when the species was listed, the total known population size of Ute ladies'-tresses was fewer than 6,000 individuals from 11 known populations in Colorado, Utah, and Nevada (USFWS 1992). Listing of Ute ladies'-tresses resulted in an increase in surveys for the species and since that time, additional populations have been located in Utah, Montana, Idaho, Nevada, Colorado, Nebraska, Washington, and Wyoming. In 1995, the total known population size of Ute ladies'-tresses was approximately 20,500 individuals (USFWS 1995). Since 1995, another 24 populations have been discovered, including several large occurrences along the Green River in Colorado and Utah, the Snake River in Idaho, and Niobrara River in Wyoming and Nebraska. The highest number of plants recorded in any one year was 38,438 in 1998, based on sampling 23 of 55 populations known at that time. Since these populations were not selected randomly, no useful extrapolations can be made to estimate rangewide numbers based on annual counts (Fertig *et al.* 2005).

Ute Ladies'-tresses Status and Distribution

On January 17, 1992, the USFWS listed Ute ladies'-tresses as threatened in its entire range under the ESA (57 FR 2053). The Ute ladies'-tresses was first described as a species in 1984 by Dr. Charles J. Sheviak from a population discovered near Golden, Colorado (Sheviak 1984). At the time of its listing, Ute ladies'-tresses was known from 11 populations occurring in Colorado, Utah, and Nevada. Critical habitat has not been designated at this time. To date, no recovery plan has been approved for this species; however, a draft recovery plan has been written (USFWS 1995).

Ute ladies'-tresses was first discovered in Wyoming by the University of Wyoming, Rocky Mountain Herbarium in 1993. Formal surveys for Ute ladies'-tresses then began in Wyoming in 1994, one year after B. Ernie Nelson, manager of the Rocky Mountain Herbarium, discovered the state's first population in Goshen County. Nelson along with other researchers conducted general floristic surveys in southeast Wyoming, the Green River Basin, and Laramie Basin from 1994-1999, finding an additional new colony along Antelope Creek in Converse County in 1994 (Hartman and Nelson 1994). The population on Antelope Creek occurs on BLM-administered land in the Casper Planning Area south of the Buffalo Planning Area. Hartman and Nelson (1994) found that populations discovered in Wyoming occurred on terraces, low slopes, and oxbows adjacent to small streams on sandy to coarse gravelly alluvium or alkaline clays in wet meadow communities (Nelson and Hartman 1995). Based on short-term observation data, the populations that they found were thought to be stable or increasing. The sites were on lands

managed for livestock grazing or hay production. Current land uses at the time appeared compatible with the habitat needs of Ute ladies'-tresses orchid populations. The timing of grazing and mowing was thought to be critical for successful seed production (Fertig 2000).

Surveys since 1992 have expanded the number of vegetation and hydrology types occupied by Ute ladies'-tresses to include seasonally flooded river terraces, subirrigated or spring-fed abandoned stream channels and valleys, and lakeshores. In addition, 26 populations have been discovered along irrigation canals, berms, levees, irrigated meadows, excavated gravel pits, roadside barrow pits, reservoirs, and other modified wetlands. New surveys have also expanded the elevational range of the species from 720-1,830 feet (220-558 meters) in Washington to 7,000 feet (2,134 meters) in northern Utah (Fertig *et al.* 2005).

Through coordination with and cooperation from a private landowner, permission was granted in 1996 to search an area along the Niobrara River in Sioux County, Nebraska. Hazlett (1996) counted several thousand Ute ladies'-tresses (Hazlett 1996). The area was previously mown in July of that year for hay and thousands of Ute ladies'-tresses were flowering in the pasture apparently flourishing from the reduced competition following the mowing and baling. The discovery was the first reported case of *S. diluvialis* in the State of Nebraska. Future plans for that area are to maintain it as a working ranch or as a youth camp/nature preserve for young people (Hazlett 1996).

The Wyoming Natural Diversity Database (WYNDD) surveyed public lands in Jackson Hole and the lower Green River Basin in 1999, but did not find any new *S. diluvialis* sites. Staff of the WYNDD also conducted unsuccessful searches in the Powder River Basin, National Elk Refuge, and F.E. Warren Air Force Base from 1995-1997.

Various environmental consulting firms (e.g., ERO Resources 1994) have searched for *S. diluvialis* across Wyoming since 1994. These efforts have not documented any new colonies (Fertig 2000). Because of the plant's irregular flowering pattern, sites which have been surveyed in the past could still harbor populations (Fertig 2000).

Since their discovery in Wyoming, Ute ladies'-tresses populations have been located in Goshen, Converse, Laramie, and Niobrara Counties of southeastern Wyoming. The Ute ladies'-tresses orchid is currently known from a small population along a tributary to Antelope Creek (a tributary to the Cheyenne River) in northwest Converse County; a population along Bear Creek in southwestern Goshen County; a population along the Niobrara River near McMaster's Reservoir in southeastern Niobrara County; a population along Sprager Creek in Laramie County, and a recently discovered population along Horse Creek in Laramie County. These populations are monitored on a limited basis and appear to be stable (USFWS 2002).

To date, no populations have been discovered on land administered by the BLM in the Buffalo Planning Area (BLM 2015a). However, surveys have yet to be conducted on all potential existing orchid habitat on BLM-administered lands within the Buffalo Planning Area. The variability of Ute ladies'-tresses emerging and flowering every year, makes it difficult to effectively locate populations and inventory them. Future surveys in the Buffalo Planning Area

may find populations of Ute ladies'-tresses on BLM-administered surface and/or split-estate lands on potential habitat along streams, rivers, and riparian areas with sandy or loamy clay soils.

Ute Ladies'-tresses Threats

In 1992, the USFWS identified habitat loss and alteration (through urbanization, water development, residential development, conversion of open space to parks, agricultural activities); overutilization for commercial, recreational, scientific, or educational purposes; excessive livestock grazing (although mild to moderate grazing may be beneficial); inadequacy of existing regulatory mechanisms; and other factors including localized catastrophic events, competition with invasive plant species, and indiscriminate use of herbicides as the primary threats to the long term conservation of this species. These activities historically have likely been a primary cause of the fragmentation of populations now currently observed. Fertig *et al.* (2005) identified additional threats including ecological succession, road and other construction, recreation, flooding, haying/mowing, natural herbivory, loss of pollinators, and drought. There is increasing pressure for urban, residential, and recreational development in these wetland and riparian areas, especially along the Front Range of Colorado and the Wasatch Front in Utah. As these areas are typically in private ownership, and the projects are often privately funded, there is very little regulatory protection for the orchid there, even though it is a federally listed species.

Incompatible agricultural or other land management practices could also threaten the Ute ladies'-tresses orchid. The orchid is quite tolerant of grazing and other forms of land and vegetation disturbance. However, continuous grazing during the flowering season, severe trampling and soil compaction, untimely herbicide applications, proliferation of aggressive native and exotic plant species indicative of site degradation, and practices that result in habitat alteration from grass/forb/sedge to shrub/tree dominance, can result in loss of vigor and eventual demise of the orchid and/or orchid pollinators. Many riparian and other wetland and wetland/upland habitats suffer from these impacts, as well.

Alterations of stream hydrology could also threaten Ute ladies'-tresses. The orchid is supported by moist soil throughout the growing season, and by wet habitats that are dominated by grass/forb/sedge communities. During the past 150 years, and continuing today, water developments, diversions, stream channel alterations for flood control or other purposes (including oil and gas development and mining), and changes in hydrograph have altered hydrology, floodplain geomorphology, and vegetation composition and trends. While in some streams and reaches this may have provided improved conditions for the orchid, in many cases it has resulted in the loss of suitable habitat and likely fragmentation or loss of the orchid within watersheds (USFWS 2004a). Although some BLM-authorized activities may affect stream hydrology, the BLM in the Buffalo Field Office is committed to not authorizing activities that might affect the hydrology of occupied Ute ladies'-tresses habitat with the exception of activities described herein.

ENVIRONMENTAL BASELINE

Regulations implementing the ESA (50 CFR 402.02) define the environmental baseline as the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed state or Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation process.

The action area is defined at 50 CFR 402 to mean “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.” For the purposes of this consultation, the USFWS defines the action area as all lands within the Buffalo Planning Area in Wyoming that could potentially be impacted by decisions made in the revised Buffalo RMP (BLM 2015b) to include 782,102 acres of BLM-administered public land surface in the Buffalo Planning Area in Wyoming, and the approximately 4.8 million acres of split-estate land (Federal subsurface/non-federal surface).

Historic activities within or adjacent to the action area include residential, urban, commercial, industrial, and agricultural development; road construction; development for recreational use; mining; oil and gas development and its associated infrastructure; airport construction; levee construction and maintenance; and small dam construction.

Northern Long-eared Bat Environmental Baseline

Status of the Northern Long-eared Bat in the Action Area

Within the BLM’s Buffalo Planning Area few northern long-eared bats have been captured as the species is considered rare in the area, particularly due to the lack of preferred habitat. WNS is not known to be present in Wyoming. There are currently no identified hibernacula or summer colonies known for the northern long-eared bat within Wyoming (USFWS 2015). No northern long-eared bat home ranges or maternity areas have been identified or delineated within the Buffalo Planning Area. The northern long-eared bat typically uses mature, intact interior forest for roosting and foraging, though younger, managed forests are also used. Mature, intact interior forests or karst geology are not found within the bats known range within the planning area.

Conservation Needs of the Northern Long-eared Bat in the Action Area

The conservation needs of the species in the action area are similar to the needs rangewide. The Buffalo Planning Area may provide habitat for summering northern long-eared bats, and northern long-eared bats in the Buffalo Planning Area have not yet been affected by WNS. Therefore, within the action area the conservation needs include: (1) providing suitable habitat conditions for northern long-eared bat foraging and roosting; (2) searching for previously unidentified areas of [maternity and hibernation] activity; (3) conducting research to understand the migration patterns of northern long-eared bat that use the area during the summer or winter, and (4) if hibernacula are found, avoiding disturbance and potential human-caused spread of WNS.

Ute Ladies'-tresses Environmental Baseline

Ute ladies'-tress may occur on floodplain areas in the Buffalo Planning Area. These areas are located where the water table is near the surface throughout the Ute ladies'-tresses growing season. The past and present impacts to Ute ladies'-tresses in the action area may have included increases, and decreases, in habitat suitability due to irrigation developments and other human-caused changes to stream hydrology. Human-caused changes to stream hydrology have taken the form of channelization of streams, construction and use of irrigation canals, water impoundment (pond) construction, increased water discharges to surface waters, and water depletions from surface waters. These activities were and continue to be widespread across the Buffalo Planning Area.

Invasive plant species occupy much of the planning area with resulting herbicide control by private citizens and/or the County Weed and Pest Districts. It is not known if any invasive plants may be adversely affecting Ute ladies'-tresses within the action area.

Grazing, haying and mowing activities are normally undertaken by private land owners as part of their agricultural operations. Grazing activities on BLM-administered lands are authorized by the BLM through a permitting process. These activities may be beneficial to Ute ladies'-tresses plants through the maintenance of habitat or they may be detrimental in that these activities if not timed properly may reduce the reproductive success of individual Ute ladies'-tresses plants.

Another impact to Ute ladies'-tresses plants in the action area may be herbivory by wildlife. Herbivory of the flowering spikes of *S. diluvialis* by voles (Arft 1994), deer (Fertig 2000), and moose (Moseley 1998) has been documented at some locations. Wells (1967) documented significant flowering stalk herbivory of the autumn ladies'-tresses orchid (*S. spiralis*) by rabbits. Arft (1994) speculated that vole herbivory could be the greatest single threat to the long-term survival of Ute ladies'-tresses at one study site. It is plausible that similar damage to Ute ladies'-tresses plants in the action area could be attributed to wildlife as well.

Numerous other existing actions including construction of electricity transmission lines, mining operations, and erection of telecommunication towers are present in the action area. It is possible that these activities could be placed near Ute ladies'-tresses populations or involve activities that cross riparian areas that could contain Ute ladies'-tresses habitat. These have been considered as part of the environmental baseline for this action.

Status of the Ute Ladies'-tresses Within the Action Area

Ute ladies'-tresses is currently not known to occur within the Buffalo Planning Area. However, undiscovered populations may exist there, since all potential habitat has not been surveyed. Within the Buffalo Planning Area, potentially suitable habitat exists along creeks, streams, and riparian areas that may support Ute ladies'-tresses. The BLM supports efforts to locate the orchid on BLM-administered or nearby state or private lands (Hazlett 1995, 1997, 1999). Surveys have been conducted in what appeared to be suitable habitat in some parts of the action area, but no Ute ladies'-tresses have been found to date. Future surveys may reveal that additional populations occupy BLM-administered surface lands, or on private lands where the

BLM may have some discretionary authority of grazing management through the allotment management plans of allotments containing isolated BLM-administered grazing parcels [section 15 parcels as defined by the Taylor Grazing Act of 1934 (43 U.S.C 315)] in the action area. Locations where populations of Ute ladies'-tresses may be discovered in the Buffalo Planning Area include but are not limited to moist meadows along streams.

Grazing activities may positively benefit Ute ladies'-tresses by reducing competing vegetation; however, if not timed properly, they can reduce the reproductive success of individual Ute ladies'-tresses plants. Wildlife herbivory of the flowering spikes of Ute ladies'-tresses orchids by voles (Arft 1994), deer (Fertig 2000), and moose (Moseley 1998) occurs at some locations across the species' range. Wells (1967) documented significant flowering stalk herbivory of the autumn ladies'-tresses orchid by rabbits.

Coal mining and coalbed natural gas development activities are present in the BLM's Buffalo Planning Area and will continue during the life of the proposed RMP. Coalbed natural gas development may adversely affect Ute ladies'-tresses if this activity were to occur adjacent to, upstream from, or downstream from populations.

Ten formal section 7 consultations have been completed which analyzed potential adverse effects to Ute ladies'-tresses orchids in Wyoming. Within the action area, two project-specific formal consultations analyzed potential adverse effects associated with coalbed natural gas development in the Powder River Basin (WY4287, March 9, 2001; ES-6-WY-02-F006, December 2002; WY07F0075, March 23, 2007) of Wyoming and analyzed potential effects within the action area. Additionally, the Ute ladies'-tresses statewide programmatic consultation for BLM analyzed effects of livestock grazing to Ute ladies'-tresses within the action area (WY06F0205b, April 5, 2007). Across the rest of Wyoming, two formal section 7 consultations analyzed surface disturbance in Ute ladies'-tresses habitat associated with pipeline construction (WY2567, July 16, 1999) and railroad expansion (ES-6-WY-01-F008, October 26, 2001), respectively. Additionally, five formal section 7 consultations have addressed potential effects from livestock grazing on Bureau of Land Management Lands in Wyoming. These consultations have included: Casper Grazing Allotment Renewals (WY10F0067b, March 12, 2000); Casper RMP Revision (WY06F0309d, November 2, 2007); Rawlins RMP Revision (WY06F0212e, January 16, 2007); Lander RMP Revision (WY13F0007, July 19, 2013); and Newcastle RMP (WY8796b, October 5, 2004).

Factors Affecting the Ute Ladies'-tresses Within the Action Area

Factors that could affect this orchid in the action area include irrigation developments and other human-caused changes to stream hydrology, introduction of invasive species, herbicide use, haying, mowing, or livestock grazing (USFWS 1995).

EFFECTS OF THE ACTION

Direct and Indirect Effects

Direct effects are effects that result directly or immediately from the proposed action on the species. For example, actions that would immediately remove or destroy habitat or displace the species from its habitat or an area would be considered direct effects. Indirect effects are effects that are caused by, or result from, the proposed action and occur later in time (after the proposed action is completed) and are reasonably certain to occur, e.g., grazing over the life of the RMP may maintain habitat for listed plants many years beyond 15 years from present.

The Proposed Action is the management of the Buffalo Planning Area in Wyoming for approximately 15 years. Given the length of the proposed action and the difficulty in distinguishing direct from indirect effects, the two types of effects are not differentiated here but instead are discussed jointly.

Effects on the Northern Long-eared Bat

Neither direct nor indirect effects are anticipated to wintering northern long-eared bats or their hibernacula from the proposed action. No hibernacula are known to occur within the action area. There are no caves or karst features within the bats known range with the planning area. No fall swarming activities are known to occur within the action area. No effects to these types of areas are anticipated. No timber harvest or prescribed burning within northern long-eared bat habitat is anticipated. Commercial quality forests are not present within the range of the northern long-eared bat within the planning area. Only limited tree removal is expected to occur during wildland fire suppression efforts.

Risk of death or injury of individual northern long-eared bats from tree removal varies depending on the timing of activities, the location, type of removal, and extent of removal. The timing of tree removal activities greatly influences the likelihood of exposure and the extent of impacts on individual bats and their populations. Female northern long-eared bats typically roost colonially, with their largest population counts occurring in the spring, presumably as one way to reduce thermal costs for individual bats (Foster and Kurta 1999). While bats do have the ability to flee their roosts during tree removal, removal of occupied roosts during the active season while bats are present (spring through fall) could also cause injury or mortality to those roosting bats. Bats could be injured or killed during the spring months when bats often use torpor (temporary unresponsive state) to survive cool weather and low prey availability. Bats also could be killed or injured during early to mid-summer (approximately June-July) when flightless pups or inexperienced flying juveniles are present. Removal of trees outside these periods is less likely to result in direct injury or mortality when the majority of bats can fly and are more dispersed.

The location of tree removal activities also influences the likelihood and extent of impacts. Tree removal activities outside of northern long-eared bat summer home ranges or away from hibernacula will not be expected to result in death or injury to individuals. The greatest risk of take is associated with projects within known northern long-eared bat home ranges (calculated from radio telemetry or estimated based on capture or detection of northern long-eared bats [see

USFWS 2014]) where no or few roost trees have been located. As discussed in the Environmental Baseline, [though lacking surveys] northern long-eared bat occupancy rates are assumed to be low and no maternity colonies are known within the action area.

Lastly, the likelihood and extent of impacts are influenced by the type/scope of the tree removal relative to the amount of remaining suitable roosting and foraging habitat. Within a given home range northern long-eared bats use multiple roosts throughout the season. Therefore, only a certain number of roosts are anticipated to be occupied in any given day and within any given year. Therefore, the risk of encountering roosting northern long-eared bats during a given tree removal event is associated with the percentage of home range impacted and the extent of tree removal. Larger areas of tree removal would have greater risk than smaller areas.

Based on the proposed action, the BLM may be involved with removal of trees during fire suppression efforts for wildfires. Such fire suppression efforts would be associated with the defense of human health or safety and could conceivably occur at any time of year. Such activities would fall under the purview of an emergency consultation for purposes of section 7 of the ESA. Emergency consultations are "after the fact" consultations and thus this Programmatic BO can only set the stage for an actual emergency consultation, if it were to occur during the life of the Buffalo RMP.

Firefighter and public safety should always be the first priority of incident response. Firefighters should not implement measures for the protection of listed species or their habitat if doing so may place firefighters or the public in danger. Firefighter and public safety comes first on every fire, every time. There is no need to consult on the effects of the wildfire itself. Wildland fire may have beneficial effects in a functioning ecosystem, but on occasion, fire can affect threatened or endangered species and their habitats and/or impact critical habitat. Initiation of consultation is only required if there may be an effect to a listed species, in this case the northern long-eared bat, resulting from wildfire suppression activities.

The USFWS can be contacted at any time for assistance in identifying areas occupied by federally protected species. If there is a question as to whether or not suppression activities may affect listed species or critical habitat, the USFWS should be contacted as soon as possible. If suppression activities may affect the northern long-eared bat, Resource Advisors should coordinate with the USFWS if there are any questions related to effects to northern long-eared bats or their habitat.

Chapter 8 of the Section 7 Consultation Handbook describes the emergency consultation process. (FWS 1998; http://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf). The BLM has a duty to meet its section 7(a)(2) and 7(d) obligations under the ESA even in emergency situations.

The most effective way to minimize impacts to listed species is through informal discussions with the USFWS during the development of the consulting agency's "Fire Management Plan." Listed species concerns can be identified before wildfires start, and suppression strategies can be designed to address listed species conservation. Strategies will provide important information to initial and extended attack Incident Commanders and facilitate implementation of the Wildland

Fire Decision Support System (WFSS), if necessary. The WFSS is an effective means of identifying resource considerations, including listed species and their critical habitats. The WFSS also provides the opportunity to pre-load information, such as maps of localized habitats for listed species, facilitating incident pre-planning.

Potential impacts to individual bats (adults or pups) that could result from emergency wildfire suppression efforts are that individuals could be disturbed, injured, or killed during these activities. Types of activities related to fire suppression that may impact individual bats include, but are not limited to, the placement of camps for firefighting crews, staging areas, aircraft landing areas, fueling areas, construction of fire lines, the ignition of backfires, and the felling of hazard trees. Impacts could include direct physical harm or death of individual bats, or elimination or reduction of resources necessary to maintain fitness, survival, or reproductive capacity of individual bats.

In summary, emergency consultations under section 7 are “after-the-fact” consultations, and thus will not occur until after the activity has been conducted. As such the BLM will be required to consult with the USFWS on all emergency wildfire suppression activities, that “may affect” the northern long-eared bat. Tree removal associated with wildland fire suppression efforts could have both adverse and beneficial effects on habitat suitability for the northern long-eared bat. The unknown numbers of acres of habitat that will be affected by these activities would be determined by unforeseen unplanned ignitions such as lightning strikes or other causes scattered throughout the Buffalo Planning Area. As a result, at this time we cannot accurately conclude the quantity of overall habitat that may be affected. However, we believe that the overall habitat suitability or availability within the action area should be minimally affected by tree removal under the proposed action.

The Buffalo FO has reported actively engaging in suppressing wildfires that occurred over 16,204 forested acres in the planning area from 1990-2007 (see Table 2 above). Tree removal during wildfire suppression efforts could occur during the non-hibernation period and could result in direct mortality or injury to northern long-eared bats by crushing, or other forms of trauma related to tree felling. Northern long-eared bats may be forced to flee from roosting and foraging areas. These adverse effects may be short-term and localized, or may be more serious resulting in loss of adults or pups. Given the northern long-eared bats’ frequent use of live trees and snags, multiple roosting structures, and ability to arouse and move during fires, northern long-eared bats are expected to experience minimal impacts from fire suppression activities.

Analysis for Effects of the Action on the Northern Long-eared Bat

Our analysis of effects for the northern long-eared bat entails: (1) evaluating individual northern long-eared bat exposure to action-related stressors and response to that exposure; (2) integrating those individual effects (exposure risk and subsequent response) to discern the consequences to the populations to which those individuals belong; and (3) determining the consequences of any population-level effects to the species rangewide.

Summary for Potential Effects on Northern Long-eared Bat

Because activities described by the BLM in the proposed action would receive section 7 consultation under the ESA “after-the-fact,” we will not complete the effects analysis for the proposed action on the northern long-eared bat at this time. However, the following summary of potential effects may help expedite any emergency consultations that may occur for the northern long-eared bat under the proposed action in the future. Potential effects of the action could include effects to any northern long-eared bats present within the action area when activities are being conducted, and indirect effects as a result of changes in habitat suitability. These effects could include mortality, injury, harm, or harassment as a result of removal of roost trees. Other effects from the proposed action may result from habitat modification and primarily involve changes to roosting and foraging suitability. Tree removal associated with fire suppression activities could have both adverse and beneficial effects on habitat suitability for the northern long-eared bat. Given the scope of the projects in relation to the overall action area, the proposed action may not substantially alter the overall availability or suitability of northern long-eared bat roosting or foraging habitat.

While none of the BLM’s proposed actions may alter the amount or extent of mortality or harm to the northern long-eared bat resulting directly from WNS, the BLM’s proposed action could potentially be negative to bats for other reasons. While analyzing the potential effects of the proposed action, we identified the life stages that could be exposed to the stressors associated with the proposed action, and analyzed how those individuals may respond upon exposure to the stressors. From this analysis, we determined, at this time, that:

1. There is currently no proposed critical habitat for the northern long-eared bat, and thus, none would be adversely affected.
2. No known hibernating bats nor their hibernacula will be exposed to the project stressors as there are no hibernacula known within the vicinity of the action area.
3. Northern long-eared bats during the spring-fall period may be exposed to various project stressors and may adversely respond to some of them. As stated in the environmental baseline, we are unaware of any maternity colonies that occur in the action area.

We considered the possibility for exposure of northern long-eared bats at currently unknown roost sites in the vicinity of fire suppression activities (including associated tree removal). If this should occur, we anticipate the possibility of harassment of northern long-eared bats that may flush during daylight and temporarily or permanently abandon their roosts and/or pups, if present. In addition, mortality of pups is possible from tree removal. In summary, there could be impacts to individual bats in either their annual survival or reproductive rates.

Individual bats could experience reductions in either their annual or lifetime survival or reproductive rates. Thus during “after-the-fact” emergency consultations, the BLM and the USFWS will need to assess the aggregated consequences of the anticipated reductions in fitness

(i.e., reproductive success and survival), of the exposed individuals on the population(s) to which these individuals belong.

To proactively work towards conserving the species, the BLM will engage in ongoing efforts to identify areas of northern long-eared bat potential maternity and hibernation activity. After completion of activities related to wildfire suppression, it is anticipated that the areas will continue to provide suitable habitat conditions for northern long-eared bat foraging and roosting during the non-hibernation season. While there is potential for direct take of the species, given the anticipated limited scale of the proposed wildfire suppression activities in relation to the action area, and the current limited distribution and abundance of the northern long-eared bat in the Buffalo Planning Area (as described in the Environmental Baseline), the northern long-eared bat is expected to continue to inhabit and properly forage in the Buffalo Planning Area.

WNS is the primary threat to the species continued existence. All of the other (non-WNS) threats combined did not lead to imperilment of the species. According to the interim 4(d) rule, the USFWS anticipated that tree removal will only have a minimal impact on northern long-eared bat habitat and individuals. This activity is expected to collectively impact only small percentages of northern long-eared bat habitat, if any, and may only result in low levels of take of individuals, if any, in the season during which they occur.

Effects on Ute Ladies'-tresses

The BLM's Buffalo RMP describes activities in the Livestock Grazing program that may affect and are likely to adversely affect the Ute ladies'-tresses orchid. These effects are (1) the trampling or destruction of the inflorescences (flowering spikes) of individual Ute ladies'-tresses plants by livestock grazing, and (2) any manipulation of the timing or intensity or cessation of grazing of the habitat of this plant.

Hydrologic change to Ute ladies'-tresses habitat due to activities authorized under the BLM's Buffalo RMP Leasable – Coal, Leasable – Oil and Gas, and Vegetation - Riparian/Wetland Resources Programs may render that habitat unsuitable by flooding or complete inundation, or by drying of the stream on which the plants depend for moisture. Similarly, a change in chemical composition, for example the sodium absorption ratio, of the soil inhabited by Ute ladies'-tresses could increase the salt content of the soil making the area unsuitable for Ute ladies'-tresses as well as other native plant species.

Coalbed natural gas produced water often contains high concentrations of dissolved salts, making it toxic to plants. Soil saturated with high salinity water will have the soil structure destroyed and water uptake by plants will be inhibited leading to plant stress or death. Bartos and Ogle (2002) characterized groundwater samples from coalbed aquifers in the Powder River Basin of northeastern Wyoming in the medium to very high salinity hazard classes.

Analysis for Effects of the Action on Ute Ladies'-tresses

Analysis for effects of Livestock Grazing Management on Ute ladies'-tresses. Habitat alterations resulting from agricultural use (grazing) may be beneficial, neutral, and/or detrimental to Ute

ladies'-tresses orchid depending on when it occurs (McClaren and Sundt 1992, USFWS 1995). The Ute ladies'-tresses orchid is edible to livestock and depressed inflorescence (flowering spike) and fruit production has been observed at sites that are grazed in late summer (Arft 1995). However, populations still capable of reproduction in the presence of long-term grazing, but may experience short-term impacts (Arft 1995).

Livestock grazing management activities have variable effects on Ute ladies'-tresses. Grazing livestock could reduce competition with other grasses and forbs thereby allowing Ute ladies'-tresses to take advantage of sunlight, water, and nutrients that might otherwise be deprived of the plant.

In a 4-year study of a separate species of ladies'-tresses orchid (*S. spiralis*) in Great Britain, Wells (1967) discussed damage done by herbivores to that species (autumn ladies'-tresses). Wells (1967) found that herbivores did very little damage to the leaves of that species even under years of heavy grazing by sheep. Wells (1967) speculated that this unusually small amount of damage indicated how well-adapted ladies'-tresses orchid is to an open habitat in which the turf is kept short by grazing animals.

In contrast, according to Wells (1967) damage to the flowering spike of some of those plants was observed in every year of the 4-year study. The number of plants with damage to the flowering spike varied in each year according to the type and intensity of grazing during the period of flowering. Wells (1967) reports that when sheep were removed in early June, less than 1 percent of the flowering spikes were recorded as damaged that year.

It can be presumed that similar damage could occur to Ute ladies'-tresses as it was recorded to occur to the autumn ladies'-tresses in Great Britain. The BLM office in Buffalo does permit sheep, cattle, horse, yak, and buffalo grazing on the surface lands which they administer. Therefore, the livestock grazing program administered by the BLM may influence the reproductive potential of any given Ute ladies'-tresses plant. Seed number is not thought to be limiting to populations of *S. diluvialis* as flowering spikes have the potential to produce 5 to 30 fruits per flowering spike and each fruit can contain between 100 to 10,000 seeds (Sipes and Tepedino 1994). Therefore, even under heavy grazing pressure as described by Wells (1967), even a small population of *S. diluvialis* has the potential to produce tens of thousands of seeds.

Arft (1994) studied the effects of cattle grazing on Ute ladies'-tresses orchids. The data suggested that the large fluctuations in population size reported in monitoring counts may actually be fluctuations in number of flowering individuals, with many individual plants remaining vegetative (non-flowering) or subterranean. During Arft's (1994) study, the proportion of flowering individuals fluctuated greatly between survey years, indicating flowering plants alone may not be a good indicator of population size.

It is plausible that livestock could also incidentally ingest Ute Ladies'-tresses seed heads and act as seed dispersal mechanisms to introduce the seeds to unoccupied areas and actually improve the reproductive fitness of any given plant although Wells (1967) did not mention any such documented occurrences in his study of the autumn ladies'-tresses. In that study, most of the damage done by cattle in his study was due to trampling and treading on the flowering spikes.

No other documentation has been found in the literature relative to the topic of livestock acting as a potential seed disperser of Ute ladies' tresses orchids.

It is currently accepted that grazing activities generally benefit the habitat necessary for Ute ladies'-tresses populations if these activities are timed to occur up to one month prior to flowering. Fencing, changes in livestock seasons of use or type of livestock, and riparian improvement projects may be used to protect the flowering spikes of individual plants from crushing or removal.

The BLM intends to continue grazing activities and surveys for Ute ladies'-tresses and if populations are discovered, grazing activities will be managed to maintain Ute ladies'-tresses populations (BLM 2005b). The BLM in Buffalo has committed to conservation measures to protect Ute ladies'-tresses (Appendix 2). The use of these conservation measures will reduce or eliminate the effects by ensuring that (1) populations are discovered prior to any surface disturbing activities, (2) surface disturbances do not take place in occupied habitat, (3) invasive plant species infestations are controlled in a manner conducive to the survival of Ute ladies'-tresses, (4) the hydrologic regime of the plant's habitat is maintained and studied, and (5) grazing activities are conducted in a manner that will maintain the habitat of the species while minimizing any removal of the plant's flowering spikes (BLM 2005b).

Analysis for Effects from Oil and Gas Leasing on Ute ladies'-tresses. The extraction of natural gas from coal seams has become a significant energy source in the Powder River Basin of northeastern Wyoming (USFWS 2005). From 1976 to 1996, 1,169 coalbed natural gas wells were drilled in the Powder River Basin. In 2001, the Powder River Basin of northeastern Wyoming had 4,000 coalbed natural gas wells in production. Presently, there are 15,662 Federal coalbed natural gas wells within the planning area. Expansion is expected to continue.

In Wyoming, coalbed natural gas is extracted by drilling wells into a coal seam and removing water to release the gas. As surveys for Ute ladies'-tresses have not been conducted over much of the area where coalbed natural gas development is and will be occurring, this form of energy development may affect undiscovered populations of these plants.

Coalbed natural gas wells dewater aquifers and discharge an average of 10 gallons of water per minute with a maximum of 100 gallons per minute. Coalbed natural gas discharged water is disposed of by direct discharge to surface drainages, passive treatment prior to surface discharge, discharge to upland and bottomland infiltration impoundments, discharge to containment impoundments, and deep well injection. Untreated discharge to surface drainages is the primary method of disposal provided that the coalbed natural gas well discharged water meets Wyoming water quality standards. It is the dewatering of aquifers or discharging of water to surface drainages which could potentially affect Ute ladies'-tresses by inundation, desiccation, erosion, sedimentation, or chemical manipulation of the habitat.

Coalbed natural gas water with lower water quality standards may be discharged into closed containment ponds for infiltration and evaporation. Soils irrigated with high salinity water will adversely impact vegetation and soils. Soils irrigated with high sodium absorption ratio water will alter the soils, creating hard pans and adversely affect vegetation. The sodium absorption

ratio of produced water typically is 10-12 times the level beyond which soil will maintain structure to support plant productivity. While there is debate over absolute values for acceptable limits for the sodium absorption ratio, there is consistent agreement that a high sodium absorption ratio for water can significantly impair many soils, particularly irrigated soils and soils located in arid or semi-arid regions (Bauder 2002). Consequently, important Ute ladies'-tresses habitat could be severely impacted or eliminated by surface discharge of coalbed natural gas water.

The construction of reservoirs and associated facilities for disposal of water produced during the development of coalbed natural gas wells can also adversely affect groundwater and surface water. Infiltration or percolation from reservoirs or other facilities of coalbed natural gas water containing high levels of salts or trace elements can reach groundwater and eventually seep out and reach surface waters. Additionally, groundwater could seep into low areas or basins in upland sites. Reservoirs typically raise the level of the water table of shallow aquifers. This raised water table level can extend a considerable distance down gradient within the water table (Winter *et al.* 1998). If site conditions are suitable, a shallow, underground water aquifer can surface downstream of coalbed natural gas water reservoir. Infiltration of coalbed natural gas produced water from a treatment reservoir through the underlying strata can leach salts and trace elements.

Based on the reasonable foreseeable development of coalbed natural gas wells in the Buffalo Planning Area, it is likely that some of these coalbed natural gas wells may adversely affect some, as of yet, undiscovered Ute ladies'-tresses populations either on BLM-administered lands or on private or state-owned lands downstream.

Under the BLM's current management scenario, it can be expected that coalbed natural gas produced water will be discharged into perennial, ephemeral, or dry drainages, increasing flows and changing the dynamics of the drainage systems. Some of this discharged water may be high in trace elements, and/or sodium, causing death, lack of vigor, or reduced reproductive capacity of Ute ladies'-tresses orchids and other plants. High volumes of discharged water may also cause significant erosion or sedimentation of the habitat leaving Ute ladies'-tresses populations buried under sediment, covered by water, or washed downstream. Lowering of the water table could result in significant drying of the stream bed and vegetative changes in some areas.

The BLM is committed to conducting surveys for Ute ladies'-tresses orchids in suitable Ute ladies'-tresses habitat on the lands they administer prior to beginning potentially disturbing projects (Appendix 2) and if necessary will modify the action to protect the habitat and/or the species. However, even surveys performed according to protocol may not be able to detect the presence of the plant in all cases. Due to the ability of Ute ladies'-tresses to persist below ground for years before emerging, negative survey results in suitable habitat do not guarantee that the plant is not present. Thus, direct impacts to Ute ladies'-tresses plants from coalbed natural gas development could occur on BLM-administered lands. In addition, direct impacts from BLM-authorized coalbed natural gas development could also occur on private and state-owned lands downstream from BLM-administered lands. The BLM may have no legal access or authority for performing surveys on those lands. If the plant is present on those lands

downstream, loss of the entire population or some part of it may occur if surface disturbance from streambank erosion, habitat inundation, or changes to hydrology or water quality occurs.

Although the BLM has committed to (1) avoidance of Ute ladies'-tresses orchid habitat where known populations exist, and (2) surveying in suitable habitat; impacts to Ute ladies'-tresses populations could still occur, given that surveys do not detect all plants present in any given location. The plant spends much of its life below ground in a non-flowering state. The construction of road crossings pipelines across streams could lead to ground disturbing activities possibly leading adverse effects to undocumented Ute ladies'-tresses plants in an area.

Analysis for Effects of Coal Leasing on Ute ladies'-tresses. According to the BA, coal planning was completed as part of the April 2001 BFO RMP update and is being carried forward in this RMP revision. Coal leasing and development could occur in northern Sheridan and eastern Campbell Counties. New lease applications are not foreseen within Sheridan County. Approximately 28 new coal leases encompassing 106,400 acres of disturbance are forecasted within Campbell County during the life of the RMP. Several coal mines and a portion of the area acceptable for further coal leasing consideration, southeast of Wright, are located within the Antelope Creek drainage downstream of three known Ute ladies'-tresses orchid populations. The area acceptable for coal leasing is more than ten miles downstream from the nearest known Ute ladies'-tresses orchid population.

The Campbell County area acceptable for further coal leasing is semi-arid. Many riparian areas located in the area of interest are intermittent or ephemeral in nature, receiving flow contributions primarily from thunderstorm runoff and to a much lesser extent from spring snowmelt. The main perennial stream in the vicinity of the Wright area coal mines is Antelope Creek, a stream where Ute ladies'-tresses population do occur. Wetlands within the basin are predominantly associated with ephemeral streams, playas, isolated depressions, reservoirs, and excavated upland areas; including all wetlands identified within six Wright area lease applications.

As part of the leasing process, the six Wright Area lease applications were surveyed for Ute ladies'-tresses orchid multiple times, over at least three different years. Several of the mines in the area have carried out and recorded many years of Ute ladies'-tresses orchid surveys within their permit areas. However, there have been no observations of Ute ladies'-tresses in this area. Populations, however, do have the potential to remain undetected even if present since the plants spend much of their life underground in a rhizomatous form, and only flower in certain years.

If undetected orchid populations were present within a mine area, they would be lost due to surface disturbing activities. Coal extraction activities would be expected to completely remove populations, if those populations were undetected. Indirect effects to the Ute ladies'-tresses orchid could also occur, including increased human use in the area, potential spread of invasive or noxious species, elevated dust levels, and degradation or loss of the habitat.

The potential destruction of, as of yet undetected population, would be the result of the inability to detect populations due to their presence in a non-flowering, state within potential coal development areas identified as acceptable for further coal leasing. BLM will consult with the USFWS if the Ute ladies'-tresses orchid may potentially be affected by a BLM coal leasing action.

Analysis for Effects of Vegetation - Riparian/Wetland Resources activities on Ute ladies'-tresses.

A few of the management actions of the Vegetation - Riparian/Wetland Resources Program include: developing activity and implementation plans to manage riparian systems to be at or above Properly Functioning Condition; managing riparian systems with sensitive species concerns to a succession state appropriate for that system, including vertical as well as horizontal vegetative structure and composition; expanding and enhancing riparian/wetland systems and habitat; and preventing the degradation, loss, or destruction of riparian/wetland habitat.

Due to BLM's multiple use mandate, a limited amount of surface disturbance will likely be authorized within riparian and wetland areas during the planning period for individual land use activities (i.e. fluid minerals, travel and transportation management, locatable minerals, etc.) which are each addressed within their own section. Under the proposed plan, surface disturbance could be allowed within 500 feet of riparian/wetlands systems, and aquatic habitats when the BLM has determined that resource objectives could be achieved.

According to the BA, riparian and wetland enhancement projects, although designed to improve the vegetative community, could still have adverse effects to some Ute ladies'-tresses individuals. For example, a stream and riparian enhancement project could be designed to increase the number and depth of in-stream pools and raise the water table by constructing a rock or log check dam. Check dams are small dams that lower the speed of water flow and tend to form stream pools and allow water to infiltrate into the ground raising the water table. Under high flow (flood) conditions, water flows over or through the structure. Coarse and medium-grained sediment from runoff tends to be deposited behind check dams, while finer grains are usually allowed through. Extra nutrients, phosphorus, nitrogen, heavy metals, and floating garbage are also trapped or eliminated by the presence of check dams. Heavy equipment and human labor would be used in check dam construction which would result in local surface and vegetation disturbance around the dam location. An undocumented orchid population could be harmed by the action; the potential will be reduced through the survey commitment.

Interrelated and Interdependent Effects: The highly interspersed surface and mineral ownership of coalbed natural gas development occurring in the Powder River Basin creates challenges for protection of the Ute ladies'-tresses orchid and suitable habitat. There will be some actions regarding non-federal surface and/or minerals that would not occur but for a Federal action (i.e., they are interrelated or interdependent to the Federal action). Rights-of-way for access to non-Federal in-holdings is an example of a common Federal action leading to interrelated and interdependent actions on non-federal lands.

Development of coalbed natural gas on non-federal lands as a result of a BLM action could have the same effects on the Ute ladies'-tresses orchid as coalbed natural gas development on Federal lands. To the extent that these actions are interrelated or interdependent to a Federal action, any effects to this orchid associated with development of non-federal minerals must be considered prior to permit issuance or other authorization by the BLM.

Summary of Effects on Ute Ladies'-tresses

Grazing. Ute ladies'-tresses populations in Wyoming are typically found in areas where livestock grazing has maintained the habitat in areas where competing vegetation has been removed and there is a fair amount of bare ground surface (Fertig 2004) characteristic of an area

that has been partially grazed regularly. However, activities authorized in the livestock grazing program may damage individual plants. The degree to which the plants can sustain damage and not be "adversely affected" is currently unknown but it is suspected that the activities authorized in the livestock grazing program may affect individual Ute ladies'-tresses orchid's reproductive success. The BLM has made a "may affect, likely to adversely affect" determination for the potential effect that BLM-authorized livestock grazing activities may have on Ute ladies'-tresses that may exist on BLM-administered surface acreage in the Buffalo Planning Area.

Oil and Gas Leasing – Coalbed Natural Gas Development. Ute ladies'-tresses populations in Wyoming are currently not known to occupy areas coinciding with or downstream from locations where coalbed natural gas development is occurring. However, surveys for Ute ladies'-tresses populations adjacent to and downstream from on-going coalbed natural gas development may not cover all areas potentially disturbed by the project. Surveys are done but they are for a limited area and do not extend downstream from the proposed disturbances. Given that surveys may not cover all areas of possible disturbance and the potential for plants to go undetected during survey efforts, it is possible that Ute ladies'-tresses are present in areas of coalbed natural gas development. With the large quantity and sometimes poor quality of coalbed natural gas produced water discharged into streams, the potential for adversely affecting Ute ladies'-tresses plants, if they do occur in those areas, remains high.

Coalbed natural gas development may cause dewatering of subterranean aquifers, drying of riparian habitat, desiccation of Ute ladies'-tresses plants and habitat, increased erosion rates, discharge of poor quality water, or direct habitat removal. The dewatering of subterranean aquifers underneath any Ute ladies'-tresses plant populations could cause major shifts in hydrologic regimes which could cause drying of the riparian areas upon which riparian plants such as Ute ladies'-tresses depend. Drying of the streams could cause desiccation of the plants and their habitat and could cause local extirpation of populations of this federally threatened plant species. Likewise, inundation of the habitat by increased water discharge could make it difficult or impossible for some populations to persist. Increased erosion rates may cause the soil comprising the habitat of the species and the plants themselves to wash downstream leading to death of the Ute ladies'-tresses plants and loss of their habitat. Discharge of poor quality water into the drainages with Ute ladies'-tresses plants could similarly result in death of plants and extirpation of populations as the habitat becomes too extreme in certain chemical parameters such as a high sodium absorption ratio which would make the plant unable to persist in its habitat. Direct habitat removal or destruction of Ute ladies'-tresses plants or habitat for access road, powerline, or pipeline construction activities may occur if surveys are implemented but fail to identify the presence of the plants even though a population of plants is present. This could occur since Ute ladies'-tresses orchids may remain underground for years with no identifying above-ground parts.

The BLM determined that coalbed natural gas development on their lands "may affect and is likely to adversely affect" the Ute ladies'-tresses based on the potential for changes in habitat and hydrology, sedimentation, and erosion. However, currently there are no known populations of this plant known to be adversely affected by these activities.

Coal leasing. If undetected orchid populations were present within a mine area, they would be lost due to surface disturbing activities. Coal extraction activities would be expected to completely remove populations. Indirect effects to the Ute ladies'-tresses orchid could also occur, including increased human use in the area, potential spread of invasive or noxious species, elevated dust levels, and degradation or loss of the habitat.

Vegetation - Riparian/Wetland Management Activities.

According to the BA (BLM 2015a), riparian and wetland enhancement projects, although designed to improve the vegetative community, could still have adverse effects to some Ute ladies'-tresses orchids. Ute ladies'-tresses individuals, in an undocumented population could be harmed by: (1) a raise in the water table, (2) extra nutrients, phosphorus, nitrogen, heavy metals, and floating garbage could increase in Ute ladies'-tresses habitat because of the check dams, and/or (3) other local surface or vegetation disturbance that could possibly occur in Ute ladies'-tresses habitat. These actions could cause death of Ute ladies'-tresses or loss of reproductive capacity in any given year.

Minimization of Effects to the Species

To minimize the effects to listed species, the BLM will implement the conservation measures listed in Appendix 2. For all listed species, the BLM will ensure that surveys are conducted in suitable habitat prior to implementation of potentially disturbing project activities. The BLM's implementation of the conservation measures of Appendix 2 will reduce human and project disturbance to riparian areas for the protection of individual Ute ladies'-tresses orchids. The BLM's implementation of the conservation measures will also minimize the potential for inadvertent spraying of herbicides or introduction of noxious weeds into the habitats of federally listed plants of the Buffalo Planning Area. The BLM's application and enforcement of buffer restrictions for spraying of insecticides near listed plants will help ensure that populations of necessary insect pollinators of listed plants will be maintained. In addition, on a case-by-case basis, BLM will consider implementing best management practices (Appendix 3). Best management practices are also intended to minimize, or eliminate, adverse impacts to threatened, endangered, candidate, and proposed species that are likely to result from implementation of the management actions provided in the Buffalo RMP.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Non-federal activities which may cumulatively affect northern long-eared bats or Ute ladies'-tresses across the Buffalo Planning Area include oil and gas (including coalbed natural gas) development, uranium mining, sand, gravel, and scoria mining, road and railroad construction, and rural and urban housing development, hard rock mining (including coal, trona, and phosphates), subdivision development along rivers, recreation along rivers and river corridors

(including camping, rafting, hunting, and golf course development), municipal solid waste landfill expansions, housing developments, stockyard operations for livestock grazing, and farming near and within riparian corridors. Other potential effects from non-federal actions in the planning area could include increases in urbanization (although this is not thought to be a significant impact in the planning area at this time).

Impacts to northern long-eared bats could also result from tree removal during wildfire suppression efforts, prescribed burning, or timber harvest by non-federal entities.

Impacts to Ute ladies'-tresses orchids could result from livestock operations on private lands in the BLM's planning areas in Wyoming. These impacts could be beneficial (maintaining habitat through grazing), or detrimental (limiting individual orchid reproductive fitness by removal of fruiting parts through trampling or ingestion). The nature of the impacts from livestock operations is likely to be fairly similar across land ownerships (BLM 2005b). Mowing and haying on private and state lands could be beneficial to Ute ladies'-tresses populations. However, these activities could also be detrimental if done before fruits have ripened, or if the height of hay cutting is too low. In many current management situations, the timing of mowing is related to growth conditions of the hay crop and weather patterns rather than the biological needs of these threatened plants.

A substantial amount of the surface ownership within the project area is private and many of the oil and gas rights are privately owned. Many new wells and many miles of roads and pipelines are reasonably certain to occur on private lands in the BLM's Buffalo Planning Area.

Finally, the data are not adequate to determine the distribution and abundance of all northern long-eared bats or Ute ladies'-tresses and the suitable habitats for these species on private or state-owned lands in the BLM's Buffalo Planning Area. Of the area within the Buffalo Planning Area, 782,102 surface acres are managed by the BLM with most available to livestock operations. The BLM in Buffalo also oversees the use of approximately 4.8 million subsurface acres within the planning area. The exact cumulative effects to these species are not known at this time due to a lack of specific information on future, state, local, or private actions in the Buffalo Planning Area over the life of the RMP.

CONCLUSION

Northern Long-eared Bat

As emergency consultations for listed species are conducted "after-the-fact," it is anticipated that the BLM, in consultation with the USFWS will complete section 7 consultation analysis for the effects described in the proposed action (emergency fire suppression efforts) that may affect the northern long-eared bat after, or during, the implementation of emergency wildfire control measures. However, after reviewing the current status of the northern long-eared bat; the environmental baseline for the action area; the effects of the Buffalo Resource Management Plan; and the cumulative effects, it is the USFWS's biological opinion that the direct and indirect effects of the implementation of the Buffalo Resource Management Plan, as proposed, are not

likely to jeopardize the continued existence of the northern long-eared bat. No critical habitat has been designated for the northern long-eared bat; therefore, none will be affected.

The USFWS has reached this conclusion by considering the following.

Northern Long-eared Bat

1. The northern long-eared bat habitat within the planning area is on the very western extreme of the species known range.
2. The northern long-eared bat currently has a limited distribution and abundance in the Buffalo Planning Area (as described in the Environmental Baseline) and is expected to continue to inhabit and properly forage in the Buffalo Planning Area given the BLM's proposed activities.
3. Tree removal activities associated with fire suppression efforts are expected to be small in scale and localized. According to the interim 4(d) rule, the USFWS anticipated that tree removal will only have a minimal impact on northern long-eared bat habitat and individuals. This activity is expected to collectively impact only small percentages of northern long-eared bat habitat, if any, and may only result in low levels of take of individuals, if any, in the season during which they occur.
4. The major threat to the continued existence of the northern long-eared bats in the United States is white-nose syndrome and this disease not currently known to affect northern long-eared bats in Wyoming or surrounding states. All of the other (non-WNS) threats combined did not lead to imperilment of the species.

Ute ladies'-tresses

After reviewing the current status of the Ute ladies'-tresses orchid; the environmental baseline for the action area; the effects of the Buffalo Resource Management Plan; and the cumulative effects, it is the USFWS's biological opinion that the direct and indirect effects of the implementation of the Buffalo Resource Management Plan, as proposed, are not likely to jeopardize the continued existence of the Ute ladies'-tresses orchid. No critical habitat has been designated for the Ute ladies'-tresses; therefore, none will be affected.

The USFWS has reached this conclusion by considering the following.

Ute Ladies'-tresses

1. It appears that this species is more widespread and numerous than was previously known. At the time of listing, the total known Ute ladies'-tresses population numbered approximately 6,000 individuals. Extensive census efforts between 1991-1995 revealed that known population size was approximately 20,500 individuals. Since 1995, several new populations have been located adjacent to the action area, one of which contained several thousand individuals. Between 1992-1999, the total known population of the Ute ladies'-tresses orchid observed across its range reached over 60,000 individuals (USFWS 2004b). It is expected that new populations

will continue to be discovered as not all potential habitat has been surveyed. As a response to the plant's more widespread distribution, the USFWS has undertaken a 5-year status review and has begun preparing a 12-month finding on a petition to delist the species (USFWS 2004b).

2. The BLM is not proposing to implement any significant changes to the management of any Ute ladies'-tresses potential habitat that may cause detrimental impacts to any populations.
3. The BLM is committed to implementing protective measures (Appendix 2) to minimize potential impacts to Ute ladies'-tresses.
4. Although individuals can be adversely impacted by livestock grazing activities (trampling, ingestion, etc.), the population seems to withstand some grazing pressure and may actually rely on these activities for maintenance of their habitat.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by the USFWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR § 17.3). Harass is defined by the USFWS as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR § 17.3). Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

Northern long-eared bat

On April 2, 2015, the USFWS published an interim species-specific rule pursuant to section 4(d) of the ESA for the northern long-eared bat (80 FR 17974). In areas not yet affected by WNS, the USFWS's interim 4(d) rule exempts all incidental take of northern long-eared bats associated with otherwise lawful activities from the section 9 prohibitions of the ESA. Because Wyoming is well outside the range of WNS, the interim 4(d) rule eliminates the need to quantify and include incidental take in this incidental take statement. Accordingly, there are no reasonable and prudent measures or terms and conditions that are necessary and appropriate for these actions because all incidental take has already been exempted.

Ute ladies'-tresses

Sections 7(b)(4) and 7(o)(2) of the ESA generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the ESA prohibits the removal and reduction to possession of federally listed plants.

AMOUNT OR EXTENT OF TAKE

If northern long-eared bats are present or utilize an area proposed for fire suppression efforts involving tree removal, incidental take of northern long-eared bat could occur. The USFWS anticipates incidental take of the northern long-eared bat will be difficult to detect for the following reasons: (1) the individuals are small and occupy summer habitats where they are difficult to find; (2) northern long-eared bats form small, widely dispersed maternity colonies under loose bark or in the cavities of trees, and males and non-reproductive females may roost individually which makes finding the species or occupied habitats difficult; (3) finding dead or injured specimens during or following project implementation is unlikely; (4) the extent and density of the species within its summer habitat in the action area is unknown; and (5) in many cases incidental take will be non-lethal and undetectable.

Monitoring to determine actual take of individual bats within an expansive area of habitat is a complex and arduous task. Unless every individual tree that contains suitable roosting habitat is inspected by a knowledgeable biologist before management activities begin, it would be impossible to know if a roosting northern long-eared bat is present in an area undergoing fire suppression efforts. Inspecting individual trees is not considered by the USFWS to be a practical survey method and is not recommended as a means to determine incidental take. However, the areal extent of potential roosting and foraging habitat affected can be used as a surrogate to monitor the level of take.

All incidental take of northern long-eared bats within the action area is currently exempted by the 4(d) rule exempting take outside of the WNS buffer, including all of Wyoming.

EFFECT OF THE TAKE

In the accompanying biological opinion, the USFWS determined that this level of anticipated take is not likely to result in jeopardy to the northern long-eared bat. No critical habitat has been designated for the northern long-eared bat, therefore none would be impacted.

REASONABLE AND PRUDENT MEASURES

Since all anticipated incidental take will be from activities addressed by the 4(d) rule and are therefore already exempted, no reasonable and prudent measures will be required.

TERMS AND CONDITIONS

Since all anticipated incidental take will be from activities addressed by the 4(d) rule and are therefore already exempted, no terms and conditions will be required.

CONSERVATION RECOMMENDATIONS

In order for the USFWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the USFWS requests notification of the conservation recommendations carried out.

Section 7(a)(1) of ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations (CR) are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibility for these species.

- CR1. Conduct research on the summer habitat requirements for the northern long-eared bat in the BLM Buffalo Planning Area.
 - a. Investigate habitat characteristics of the forest in areas where northern long-eared bat occurrences have been documented (acoustically or in the hand)(e.g. forest type, cover, distance to water).
 - b. Investigate northern long-eared bat use (acoustics, radio telemetry) of recently managed areas of different prescriptions.
- CR2. The USFWS recommends that the BLM follow all best management practices as identified in the BLM's Buffalo RMP Biological Assessment (BLM 2015a) and the BLM's Statewide Programmatic Ute ladies'-tresses Biological Assessment (BLM 2005b).
- CR3. In known occupied Ute ladies'-tresses habitat, the USFWS recommends that the BLM use management actions that are compatible with protection and conservation of pollinators of this species.
- CR4. The USFWS recommends that the BLM monitor and manage invasive species so these do not impact the Ute ladies'-tresses orchid or its habitats.

In order for the USFWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the USFWS requests notification of the implementation of any conservation recommendations.

RE-INITIATION NOTICE

This concludes formal consultation on the Buffalo Resource Management Plan Revision as outlined in your March 6, 2015, request for formal consultation. As provided in 50 CFR 402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing take must cease pending re-initiation.

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APPENDIX 1 – DESCRIPTION OF PROGRAM ACTIVITIES FOR THE BUFFALO RMP

These program descriptions are summarized from the U.S. Bureau of Land Management's (BLM) Buffalo Proposed Resource Management Plan (RMP) and Final Environmental Impact Statement (EIS)(BLM 2015b) and the Biological Assessment (BLM 2015a). It is expected that the activities described here will be implemented in the Buffalo planning area over the life of the approved Buffalo RMP (10-15 years).

Air Quality

The BLM's air quality program includes monitoring efforts in cooperation with the U.S. Forest Service (USFS), Wyoming Department of Environmental Quality (DEQ), and the U.S. Environmental Protection Agency (EPA), and evaluating and restricting surface development. Monitoring for air quality components (i.e., carbon monoxide, nitrogen dioxide, sulfur dioxide, ozone, particulate matter, visibility, and atmospheric deposition) is conducted from various facilities around Wyoming. Regional air quality is influenced by the interaction of several factors, including meteorology, climate, the magnitude and spatial distribution of local and regional air pollutant sources, as well as the chemical properties of emitted air pollutants. Air quality management actions typically are associated with limiting, reducing, and monitoring pollutant levels and dust during other BLM management actions. The BLM supports ambient air quality monitoring programs within Wyoming for criteria pollutants, visibility, and air quality-related values. The BLM works cooperatively with several other Federal agencies to measure visibility.

Soil

The primary regional or national demand placed on soils in the planning area results from surface-disturbing actions. Extraction of minerals generally involves surface-disturbing activities, including road building, well pad construction, pipeline installation, and vegetation treatments. Other actions that affect soils are a variety of surface uses that disturb native topsoil and remove vegetation or other ground cover, such as mining and energy development, concentrated grazing and browsing by animals, off-highway vehicle (OHV) use, development of trails and campgrounds and rights-of-way (ROWS), fire-suppression activities, and the use of prescribed fire. Soil compaction resulting from surface-disturbing activities and associated development can reduce infiltration, increase runoff, and hamper reclamation.

Protection of soil resources is accomplished through the application of use restrictions or preferred management practices intended to limit soil erosion and loss of soil productivity. Some restrictions may be general, such as programmatic constraints, which are applied to all surface-disturbing activities, including limitations during periods of wet or frozen soils or prohibition of operations on steep slopes. Typically, the protection of soil resources is accomplished through the application of site-specific management techniques. These mitigation measures are designed to conserve topsoil, minimize erosion, and reestablish vegetation on disturbed areas with a long-term goal of maintaining soil productivity. Examples of site-specific mitigation measures include exclusion of mechanized vehicle use on highly erodible soils, use of

water bars or diversion channels to control surface water runoff around a disturbed area or off a road, or development of a specific seed mixture or seeding technique appropriate to the area and soil type being reclaimed. Additional mitigation measures typically are required on highly erodible soils to achieve adequate erosion control.

Actions associated with soil resources may include the identification and interpretation of existing soil resources and conditions; conducting soil inventories; identifying highly erosive soils; utilizing soil use limitation ratings for land use actions; evaluating current erosion condition of the soils in the planning area; preventing accelerated soil erosion from disturbed areas; utilizing effective Best Management Plans (BMPs); establishing successful reclamation or rehabilitation on disturbed areas within the planning area; restoring disturbed areas to pre-disturbance conditions; managing actions to maintain or improve soil chemical, physical, and biotic properties and maintain long-term soil stability; controlling the extent of surface disturbance in the planning area by establishing acreage limits for total surface disturbance; and periodically monitoring, evaluating, and adapting management actions.

Water

The BLM's Water Program conducts data collection, resource monitoring, and analysis in support of other management actions, such as range management, forest management, and mineral extraction. Watershed management actions include evaluating proposed projects, applying soil management practices, applying seasonal closures, monitoring public drinking water, and completing groundwater studies. Some of these field actions involve the use of heavy machinery and hand tools. Field actions can involve developing riparian exclosures and constructing stream crossings. Other actions can involve imposing restrictions on actions and structures, such as mineral exploration and development, pipelines, powerlines, roads, recreational sites, fences, and wells.

Through water resource management, the BLM seeks to maintain or improve surface and groundwater quality consistent with existing and anticipated uses and applicable State and Federal water quality standards, provide for the availability of water to facilitate authorized uses, and minimize harmful consequences of erosion and surface runoff. Water resources also are to be protected or enhanced through site-specific mitigation guidelines.

During watershed management actions, the BLM develops pollution prevention plans, ensures that rights to water-related projects are filed, delineates no chemical-use buffer zones, designs actions to promote reduction of channel erosion, and restores damaged wetlands or riparian areas. The BLM also provides technical expertise on other actions, such as for constructing livestock ponds, monitoring water quality actions, and providing impact analyses of oil and gas development or any surface disturbance projects.

Surface-disturbing and other activities associated with the Water Program include, but are not limited to (1) evaluating and permitting surface discharges of produced water; (2) restricting surface disturbance near water resources and sensitive soils; (3) closing areas, including roads, where accelerated erosion is occurring; (4) installing stream crossings for appropriate sediment and flow passage (e.g., culverts and bridges); (5) developing riparian and wetland exclosures;

(6) restoring channels using heavy equipment; and (7) cutting, planting, and seeding to restore function in riparian or wetland areas.

Cave and Karst Resources

Files for each cave or sensitive location on BLM surface are being compiled and will be maintained at the Buffalo Field Office. The Buffalo Field Office collects data for use in the successful management of cave and karst resources within its jurisdiction.

Minerals

The BLM's mineral development program is divided into three categories: locatable, leasable, and salable minerals. Leasables are further divided into coal, sodium (trona), oil and gas, and other solid leasables. The BLM has the statutory authority under the Mineral Leasing Act of 1920, the Mineral Leasing Act for Acquired Lands, and the Federal Land Policy and Management Act of 1976 to take reasonable measures to avoid or minimize adverse environmental impacts that may result from federally authorized mineral lease activities. This authority exists regardless of whether the surface is federally owned.

Mineral Resources – Locatable

All public lands are open to exploration for locatable minerals, except those withdrawn to protect other resource values and uses or those lands with acquired mineral status. The BLM has limited management authority and discretion over mining claim operations for locatable minerals conducted under the General Mining Law of 1872. These operations are managed using the surface regulations in 43 CFR 3809. Activity authorized under the General Mining Law is not subject to many of the special stipulations that are used in the salable and leasable mineral programs to protect sensitive resources from surface disturbance caused by mineral development.

Although mining claims recently have been staked for building and specialty stone, none of the deposits has been determined to be locatable under the Mining Law of 1872 at this time. Unlike leasable minerals (e.g., oil, gas, or coal) or salable minerals (e.g., sand and gravel), where issuance of a lease or permit is at the BLM's discretion, the discovery and location of a locatable mineral claim is at the discretion of the claimant.

Actions associated with commercial locatable minerals include surface disturbance for mining, reclamation, and construction of access roads, buildings, and utility lines. Uranium is the primary locatable mineral in the planning area and uranium mining activity is centered in southern Campbell and Johnson Counties. Small scale mining for locatable minerals occurs in the planning area, but individual casual use actions do not require an environmental assessment unless actions become significant. All lands must be reclaimed after closure of the mine.

Leasable Minerals – Coal

Wyoming produces approximately one-third of all coal produced in the United States. The Powder River Basin in northern Wyoming contains some of the largest low-sulfur coal deposits in the world.

New coal lease applications will be processed using the coal-screening process. Exploration on Federal mineral lands is subject to the requirements and conditions of the coal exploration license process, the result being a set of project-specific stipulations and conditions designed to limit impacts from exploration on other resources. Before the area can be considered for leasing, the amount of overburden, volume and quality of coal, and other information needed to plan a mine must be gathered.

Coal in Wyoming generally is extracted using surface mining methods, although in the past, some coal was mined underground. Surface mining involves the use of large equipment, such as draglines, shovels, and haul trucks. Small drill rigs are used for exploration to determine the location and thickness and to obtain cores (for determining quality). Extracting coal using surface mining methods often results in large areas of surface disturbance from road construction, removal of topsoil and overburden, and stock piling of these materials. Once an area is mined out, reclamation begins and includes recontouring as closely to the original landscape as possible, reconstruction of drainages, and reseeding and monitoring to ensure the habitats are useable.

Leasable Minerals – Oil and Gas

The Mineral Leasing Act of 1920 states that all public lands are open to oil and gas leasing unless a specific order has been issued to close an area. Oil and gas exploration and development is one of the major industries in the planning area.

Geophysical exploration is a tool of the oil and gas industry that bounces shock waves off subsurface rock layers to determine their thickness and geometry. The energy typically comes from the detonation of explosives in a shallow drill hole or from a heavy weight either dropped or vibrated on the ground surface. Seismic operations use existing roads, when feasible, but also require off-road travel, which may include new surface disturbance. Geophysical exploration (primarily three-dimensional) is expected to continue through the life of the plan. The BLM is responsible for authorizing and administering geophysical exploration operations on all public surface lands within the planning area, while the Wyoming Oil and Gas Conservation Commission (WOGCC) is responsible for authorizing all operations on State and private surface land.

Once acreage in the planning area is nominated by the public to be included in an oil and gas lease sale, the acreage description is sent to the Buffalo Field Office via the parcel list to be reviewed, and stipulations for protection of wildlife and other sensitive resources are developed. These stipulations become part of the lease. After an oil and gas lease is acquired, and prior to development, an Application-for-Permit-to-Drill (APD) must be filed with the WOGCC and the Buffalo Field Office if the well is located on a Federal oil and gas lease in the planning area.

Once the permit is approved, the company may proceed with drilling according to the conditions of the permit's approval.

Coalbed natural gas (CBNG) has become a large contributor to natural gas production in Wyoming, and the coals of the Powder River Basin (northern Wyoming) are a large source of CBNG.

Ancillary oil and gas development involves allowing the construction of roads, pads, pipelines, and other facilities, such as aboveground powerlines. Stipulations involve implementing leases with no surface occupancy (NSO) or controlled surface use (CSU) restrictions, timing limitation stipulations (TLSs), or with other standard surface protection restrictions; negotiating mitigated impacts between lessees and the BLM's authorized officer; and deciding mitigation measures and limitations, as well as reclamation plans. Reclamation actions take place before the expiration of a lease and may include reseeding, reshaping land contours, well pad and road closure, and revegetation.

Surface-disturbing and other activities associated with the minerals program include, but are not limited to, the following actions: applying dust-control measures; restricting flaring of natural gas; controlling or limiting emissions; constructing and reclaiming well pads, access roads, and reserve pits; constructing reservoirs associated with water disposal; constructing compressor stations, product enhancements and disposal facilities; building pipelines associated with leases or units; installing powerlines associated with leases or units; building wind-power facilities and turbines associated with leases or units; and conducting geophysical exploration.

Salable

Salable minerals, also known as mineral materials, include common variety materials, such as sand, stone, gravel, pumice, pumicite, cinders and clay, as well as petrified wood. The Buffalo Field Office administers the permits for salable minerals.

The Buffalo Field Office also issues exclusive use permits when the request is to obtain mineral materials from a specific location as an exclusive permittee. This is done as a "free use permit" (usually for government entities, such as city, county, or State) or as a commercial sale. Depending on the size and nature of a sale or free use permit, a mining and reclamation bond may be required. Another method to dispose of mineral materials, particularly borrow material and sand and gravel, is the Material Site ROW. The Wyoming Department of Transportation (WYDOT) uses Material Site ROW to obtain salable minerals from the BLM for road construction involving Federal funds. Most salable minerals are common construction materials; the demand for these materials is linked to the area's economy. Aggregate (sand and gravel) demand is expected to remain high.

Mineral materials are basic natural resources used in construction; however, they are generally bulky and have low unit prices. The sheer weight of mineral materials results in high transportation costs. Adequate local supplies of these basic resources are important to the area's economy. The BLM's policy is to make these materials available to the public and local government agencies whenever possible and wherever it is environmentally acceptable.

Before issuing contracts or free use permits for salable minerals, the BLM conducts appropriate environmental assessments. These include studies or inventories of threatened or endangered plant and wildlife species. Stipulations or conditions may be included in the terms of the contract to ensure protection of the natural resource found there and reclamation of the land following project completion. Site reclamation is required following any surface-disturbing mining activity for salable minerals.

Fire Management and Ecology – (Wildfire)

The BLM's fire management program focuses on two categories of fires: unplanned (or wildland fire) and planned (or prescribed fire). Wildfire occurs as the result of an act of nature, such as lightning, human accident, or by intent to cause damage.

An essential component of the fire management program in the planning area is protection of the public and property from the adverse impacts of wildland fires. The BLM has identified site-specific fire management practices for multiple sites within the planning area. These practices vary from site to site, but generally identify the acreage designated for full fire suppression, limited fire suppression, and sites designated for prescribed burns. Full suppression is a strategy requiring immediate and aggressive attack of the fire and typically relies heavily on mechanized equipment on or off roads. In contrast, limited suppression is a less aggressive strategy, generally used to keep a fire within a specified area.

Fire suppression activities depend on the severity and size of the fire and the resources determined to be in danger from the fire. Initial attack of a wildland fire will consist of a ground crew (or smoke-jumper crew if the fire is in a remote location) dispatched to the site to evaluate the fire and estimate the suppression requirements needed. Ground access to the site may be by road or trail, cross-country, by vehicle, or on foot. If the fire is small, the crew will immediately extinguish the fire using hand and power tools (e.g., pulaskis, shovels, and chainsaws), and sometimes water from an engine pumper unit or backpack pumps. If additional firefighting resources are needed, more personnel and equipment will be dispatched to the site. Additional work may include building fire lines by scraping a line down to mineral soil around the fire with hand tools. Hand-built fire lines (hand lines) typically are about 2-feet wide and generally surround the fire perimeter. If the fire increases in size or burns across the hand line, additional measures may be taken, including cutting trees, constructing wider fire lines with mechanized equipment, filling water pumper trucks from water bodies and spraying the water onto burning vegetation, water drops from helicopter buckets with water obtained at the nearest source accessible to helicopters, or air tanker drops of chemical retardant (a slurry of water, chemical fertilizers, and a binding agent, such as clay). If additional personnel are required to fight the fire, a camp will be established in a safe location close enough to the fire to allow efficient movement of personnel and equipment. Camps may require areas large enough to accommodate personnel, cooking facilities, equipment areas, and sufficient area for storage of supplies and equipment needed to suppress the fire. Following containment and control of the fire, "mop-up" operations will begin and continue until the fire is declared extinguished. Mop-up is a tactic to extinguish burning materials that could cause a fire to spread beyond the control lines. During mop-up operations, hazardous snags within the fireline are felled, and all remaining burning

embers are extinguished until cold. Rehabilitation currently is conducted on a case-by-case basis in the planning area.

Fire and Fuels Management (Prescribed Fire)

Prescribed, or planned, fire (as well as some wildland fires) is a management tool used to maintain or increase age-class diversity within vegetative types (e.g., big sagebrush/grassland); rejuvenate fire-dependent vegetative types (e.g., true mountain mahogany/ponderosa pine); maintain or increase vegetation productivity, nutrient content, and palatability; and maintain or improve wildlife habitats, rangeland, and watershed conditions. Fire also is considered a management tool for disposal of timber slash, seedbed preparation, reduction of hazardous fuel, control of disease or insects, grazing management, thinning, or plant species manipulation.

Over the past 100 years, fire exclusion in the planning area caused the general buildup of vegetative fuels and deadwood. In addition, drought conditions in recent years have caused vegetation to be less resistant to fire. Historic fire exclusion in the planning area has altered composition of vegetation communities, as well as natural fire regimes. For example, fire exclusion has allowed sagebrush and juniper communities to dominate some sites, causing a reduction in grass and forb production. In forested areas, suppression activities have increased fuel buildup, saplings, and small, early seral stage trees, making these areas more prone to catastrophic fires.

Prior to conducting a prescribed burn, fuel loads are identified and a burn plan is developed as to how the burn will be conducted and what safeguards must be in place to keep the fire under control. Vegetation thinning is sometimes used to reduce the fuel levels before a prescribed fire. Prescribed fire sites are usually accessed by road. The burn site is typically prepared prior to the actual prescribed fire by construction of firebreaks (often by black lining) and sometimes the windrowing or piling of the fuels to be burned within the firebreak. Fire engines generally are stationed on the site for emergency fire control, if needed, and for mop-up operations. Qualified fire personnel conduct the prescribed fire under stringent guidelines of temperature conditions, humidity, and wind speed and direction to minimize the chance of the fire escaping. If all site conditions are favorable, and the weather forecast for the time of the burn is favorable, the fuels to be burned are ignited and burned in small increments until the desired area is burned over. Once the fire burns out or is extinguished, the area is monitored to be sure the fire is out and will not start up again or spread to areas not included in the burn plan.

Forests and Woodlands

The Buffalo Field Office administers 77,229 acres of forests and woodlands. The BLM goal in this program is for healthy forest and woodland communities to be sustained in their desired ecological conditions while also considering clear management objectives of each forest and the supply and demand of the communities. BLM strives for forests and woodlands to be resilient, diverse, and able to recover from natural and human disturbances. As part of this program, the BLM assesses effects of prescribed burning and grazing and manages forests for recreation, livestock grazing, and wildlife habitats.

Grassland and Shrubland Communities

Under this program, the BLM evaluates the condition of the grassland and shrublands in the planning area. This analysis is used as the foundation for determining rangeland health status by identifying the soil types and potential vegetation communities. The process spelled out in BLM Handbook H-4180-1, Rangeland Health Standards, is used to assess and evaluate rangeland health status.

Livestock grazing is the largest and most historic use of grasslands and shrublands in the planning area. In the grassland and shrubland communities program, the BLM assesses impacts to grasslands including: (1) mineral development such as the extraction of gas, oil, coal, uranium, bentonite, and other minerals resulting in the removal of sagebrush and grasslands that involves mine excavation, roads, drill pads, fences, powerlines, pipelines, and other mining activities that fragment habitat, (2) surface-disturbing and other activities caused removal or mechanical damage to plants, invertebrates, and biological soil crusts, (3) introduction and spread of invasive species, and compaction of soils (4) drought, (5) lack of wildfires, (6) global climate change, (7) development of recreational sites, and (8) urban sprawl.

Vegetation - Riparian/Wetland Resources

Under this program, the BLM performs assessments of the functional condition of riparian areas using a method referred to as the assessment of “proper functioning condition” (PFC). The qualitative assessment process consists of an approach that considers the hydrology, vegetation, and erosion and deposition (water, soil, and vegetation) attributes of riparian-wetland areas. The BLM strives to keep riparian areas in conditions that (1) dissipate stream energy, (2) filter sediment, (3) capture bedload, (4) improve flood-water retention and groundwater recharge, (5) promote the development of root masses, and supports, (6) supports biodiversity. In the BLM’s riparian and wetland resources program, the BLM strives to maintain, rehabilitate, and improve riparian ecosystems. BLM attempts to balance the demands of livestock grazing, energy development, roads, forest management, dispersed recreation, and localized wildlife impacts.

Invasive Species and Pest Management

There are 25 noxious and prohibited weeds on the State of Wyoming Weed and Pest Control Act Designated List (BLM 2013). The State also lists four insects and two rodents as Weed and Pest Control Act Designated Pests. Individual counties declare additional INNS that are a problem within their jurisdictions. BLM’s resource users prepare pesticide-use proposals incorporating weed control district INNS control guidelines. The weed program is continually growing as a result of changing priorities, new INNS introductions, discovery of new infestations, and the rapid growth of known infestations. Geographic Information System mapping of weed locations is ongoing to determine locations of known weeds, as well as to locate new infestations. Potential new threats that may need to be addressed in the future include West Nile virus, avian influenza, tree pathogens, and other invasive plants and animals.

Non-plant pest control primarily includes controlling prairie dogs and outbreaks of insects, particularly Mormon crickets and grasshoppers. APHIS is the only authorized agent for controlling predators, treating epizootic outbreaks, and controlling prairie dogs and insect infestations. These actions are subject to established procedures and policies as outlined in the national and state level Memorandums-of-Understanding (MOUs) between BLM and United States Department of Agriculture-Animal and Plant Health Inspection Service (USDA-APHIS). The BLM cooperates with USDA-APHIS to assist with inspections of BLM-administered lands where potential outbreaks may occur and assists in developing and implementing control plans. When outbreaks occur, USDA-APHIS conducts control operations and is reimbursed for its expenses on BLM lands when these expenses exceed funding available to USDA-APHIS for this work. Prairie dogs may be controlled where public health and safety risks are documented; BLM works with adjacent landowners on a case-by-case basis to prevent prairie dog degradation of private land.

Fish and Wildlife Resources

Through wildlife and fisheries habitat management, the BLM seeks to maintain and enhance habitats for a diversity of fish and wildlife species and provide habitats for threatened, endangered, candidate, proposed, and special status species in compliance with the ESA, approved species Recovery Plans, and BLM's Manual 6840. The BLM's wildlife habitat management program supports population objective levels in the Wyoming Game and Fish Department strategic plan.

Wildlife program actions may include inventory and monitoring, habitat improvement projects, developing habitat management plans (HMPs), developing stipulations and protective measures, and acquiring land and easements. The BLM develops stipulations and protective measures for fish and wildlife resources, including the recommendation of withdrawals of some areas from mineral entry; limiting access of OHV use, snow machines, horseback riders, and pedestrians; prohibiting surface development; and implementing road closures. Habitat improvement projects include, but are not limited to, developing water sources, constructing and maintaining fences, managing other resource programs to conserve forage and protect habitats, improving forage production and quality of rangelands, and treating vegetation (e.g., prescribed fires; mechanical, chemical, and biological treatments; and cutting, thinning, planting, seeding, and pitting).

Other wildlife management actions include monitoring habitats; developing habitat islands; managing access; authorizing agricultural entry and disposal; using surface protection measures; modifying existing projects; constructing artificial nesting structures; using heavy equipment and hand tools; documenting resource damage; allowing new prairie dog towns to become established; improving aquatic and riparian habitat; reestablishing willows; implementing stream improvement practices; developing cooperative agreements to facilitate species transplants; chemically controlling pests; removing exotic fish; constructing instream barriers to protect species from nonnative invaders; installing revetments, fish passage structures, and logs; sampling macroinvertebrate; cabling junipers; building gabion baskets; and placing large boulders instream for fish habitats. The BLM's wildlife educational programs include the

distribution of information to landowners, the public, and lessees, as well as developing public education programs.

Special Status Species (Plants)

Special status plants are those listed as threatened or endangered, those proposed for listing, are candidates for listing under the provisions of the ESA, or are designated by the BLM's State director as sensitive.

Species in Wyoming are considered to be of special concern if (1) the species is vulnerable to extinction at the global or state level due to inherent rarity, (2) the species has experienced a significant loss of habitat, or (3) the species is sensitive to human-caused mortality or habitat disturbances. The Wyoming Natural Diversity Database (WYNDD) tracks, studies, and documents these special status species and other species considered to be rare within the State. By continuing to identify and avoid actions that could result in adverse impacts to these species and their habitats, their populations can be maintained so they will not need to be listed by the BLM as sensitive in the future.

The Buffalo Field Office determines the presence of special status plant species and applicable restrictions in areas with known populations on a case-by-case basis and has the specific goals of contributing to the recovery of species currently listed under the ESA and of promoting the recovery and conservation of all special status plant species within the planning area.

The BLM manages public lands to conserve and/or improve the habitats for special status plants. During special status species management actions, the BLM identifies habitat; protects known populations; enforces timing stipulations; conducts surveys; closes known locations to surface-disturbing activities; holds mineral material sales; monitors off-road vehicle use; and monitors and restricts the use of explosives and blasting.

Special Status Species (Fish and Wildlife)

Special status fish and wildlife species are those listed as threatened or endangered, are proposed or candidates for listing under the provisions of the ESA, or designated by the BLM's State Director as sensitive. The BLM manages public lands to conserve and/or improve the habitats for special status fish and wildlife.

During special status species management actions, the BLM identifies habitat; protects known populations; enforces timing stipulations; conducts surveys; closes known locations to surface-disturbing activities, holds mineral material sales; monitors off-road vehicle use; and monitors and restricts the use of explosives and blasting.

Cultural Resources

Cultural resource management actions within the planning area that could affect threatened or endangered species include (1) protecting and preserving significant cultural resources and

(2) conducting inventories and data collection for documenting and developing mitigation plans prior to surface-disturbing activities of other resource programs. The BLM normally conducts cultural resource inventories in response to other surface-disturbing activities. Inventory actions are usually small in scale, short-term, involve a small number of people, and require no surface disturbing activities other than the occasional use of hand tools for manual probing. If a significant cultural site is documented during the inventory, a large-scale excavation may be necessary. Excavations can entail heavy equipment, large numbers of people, and could take months.

The BLM performs a variety of actions to preserve, protect, and restore cultural and historical resources. During inventory actions, the BLM inventories, categorizes, and preserves cultural resources, conducts field actions, performs excavations, maps and collects surface materials, researches records, and photographs sites and cultural resources. Data collection actions are used for documenting and developing mitigation plans prior to surface-disturbing activities of other resource programs. Land management actions associated with cultural resources involve managing sites for scientific, public, and sociocultural use; developing interpretive sites; restricting certain land uses; closing certain areas to exploration; prohibiting some surface-disturbing activities; and preparing interpretive materials. The BLM also seeks listing of eligible sites on the National Registry of Historic Places (NRHP), installs protective fencing of trail segments, stabilizes deteriorating buildings, acquires access to sites when necessary, performs certain surface-disturbing activities, pursues withdrawal of areas from exploration and development of locatable minerals, designates avoidance areas, pursues cooperative agreements, and identifies and interprets historic trails.

Surface-disturbing and other activities associated with the cultural resource program include, but are not limited to, the following actions: record cultural resources; inventory cultural resources; develop interpretive sites; use hand tools, power tools, and heavy machinery; stabilize deteriorating buildings and resources; fence cultural resources; and construct temporary campgrounds.

Paleontological Resources

Paleontological resources, usually thought of as fossils, include the bones, teeth, body remains, traces, or imprints of plants and animals preserved in the earth through geologic time. All fossils offer scientific information, but not all fossils offer significant scientific information. Among paleontologists, fossils generally are considered scientifically significant if they are unique, unusual, rare, diagnostically or stratigraphically important, or add to the existing body of knowledge in a specific area of science. Most fossils occur in sedimentary rock formations. Although experienced paleontologists generally can predict which formations will contain fossils and what types of fossils will be found based on the age of the formation and its depositional environment, predicting the exact location where fossils will be found without field surveys is usually not possible.

Collecting fossils from public lands is allowed with some restrictions, depending on the significance of the fossils. Hobby collection of common invertebrate or plant fossils by the public for personal use is allowed in reasonable quantities using hand tools. Commercial

collecting of paleontological resources on public land is not permitted. Collecting significant fossils (all vertebrate and any administratively designated plant or invertebrate fossils) may occur only under permits issued by the BLM to qualified researchers.

The BLM performs a variety of actions to preserve, protect, and restore paleontological resources. During inventory actions, the BLM inventories, categorizes, and preserves paleontological resources, conducts field actions, performs excavations, maps and collects surface materials, researches records, and photographs sites and paleontological resources. Management actions involve managing sites for scientific and public use, developing interpretive sites, restricting certain land uses, closing certain areas to exploration, prohibiting some surface-disturbing activities, stabilizing erosion (e.g., burying exposed sites), preparing interpretive materials, allowing hobby collection of common invertebrate or plant fossils, and permitting collecting for scientific research. Inventory data-collection actions are used for documentation and development of mitigation plans prior to surface-disturbing activities of other resource programs. Inventory actions commonly entail the use of hand tools, power tools, or heavy machinery; collecting invertebrate and plant fossils; inventorying paleontological resources; developing interpretive sites; and stabilizing erosion.

Visual Resource Management

Visual Resource Management (VRM) involves applying methodologies for evaluating landscapes and determining appropriate techniques and strategies for maintaining visual quality and reducing adverse impacts. The inventory process evaluates landscapes based on scenic quality, public perception (sensitivity), and location from key observation points (distance). VRM class recommendations were made based on the inventory process, with final class determinations being set by the RMP.

Forest Products

Under this program, activities involve timber harvesting, cutting and removal of diseased trees, disease treatment by spraying, and the spraying of grasses and shrubs. The BLM allows precommercial thinning, chaining, and shearing. The BLM allows timber harvesting, permits clearcuts, ensures slash disposal, and allows commercial thinning, logging, and skidder-type yarding, as well as cable yarding. The BLM permits the construction of roads and landings for use in forest management operations. Slash is lopped and scattered, roller chopped, or burned. The BLM also permits helicopter logging. Noncommercial forest management involves collecting and cutting of firewood, Christmas trees, posts, poles, and wildlings. During restoration efforts following forest management, the BLM ensures site regeneration and stand replacement, fences regeneration areas, and conducts rehabilitation surveys.

In the past, approximately 95 percent of the volume removed was utilized for forest products, with post and poles being the largest component of removals from the growing stock, followed by sawlogs and fuelwood. The remaining 5 percent was left in the woods. Active timber sales within the area will continue, primarily in lodgepole and Douglas fir. Approximately, 5 to 10 thousand board-feet per acre is planned to be commercially available annually, with these volumes increasing or decreasing with the economy and opportunities, and natural occurrences.

The areas harvested in the past have successful natural regeneration in the openings and provide species and age class diversity. These stands will require future thinning and other silvicultural manipulations to reduce the density and promote healthy stands.

Forest management actions that the BLM engages in that involve all uses of the forest include acquiring easements, pursuing legal access, allowing road development, and installing drain culverts and water bars.

In summary, surface disturbance and other actions associated with the forest products program include, but are not limited to, the following actions: rehabilitation surveys; timber harvesting; artificial regeneration (e.g., planting harvested areas, including new seedlings); fencing regenerated areas; clearcutting (including stand replacement); selective cutting; slash disposal; site regeneration (natural); precommercial thinning; collection of firewood, posts, poles, Christmas trees, and wildings; commercial thinning; skidder-type yarding; logging operations; cable yarding; road and landing construction; shearing; installing drain culverts, water bars, or ditches; cutting and removing diseased trees; lopping, scattering, roller chopping, or burning slash; helicopter logging; disease treatment sprayings; and spraying of grasses and shrubs.

Lands and Realty

The Buffalo Field Office Lands and Realty Program is aimed at managing the underlying land base that hosts and supports all resources and management programs. The program's objectives are to (1) manage public lands to support goals and objectives of other resource programs, (2) provide for uses of public lands according to regulations and compatibility with other resources, and (3) improve management through land-tenure adjustments. The key actions of the lands and realty program include (1) land use authorizations (e.g., leases and permits, airport leases); (2) land tenure adjustments (e.g., sales, exchanges, donations, purchases); and (3) withdrawals, classifications, and other segregations. The BLM works cooperatively to execute the lands and realty program with other Federal agencies, the State of Wyoming, counties and cities, and other public and private landholders in the planning area.

In its lands and realty management program, the BLM implements stipulations and protective measures. These actions include processing stock trail withdrawals and locatable mineral entry withdrawals, establishing protective withdrawals, and developing stipulations. The BLM also pursues cooperative agreements, develops recreation site facilities, considers offsite mitigation, minimizes access in wildlife habitats, fences revegetation sites, blocks linear ROWs to vehicle use, considers temporary use permits, considers new withdrawals, and leases acres for landfills.

Land sales are disposals or transfers of public lands through desert land entry, public sale, exchange, State of Wyoming indemnity selection, or recreation and public purposes (R&PP) leases or patents.

Withdrawals are used to preserve sensitive environmental values, protect major Federal investments in facilities, support national security, and provide for public health and safety. Withdrawals segregate (close) Federal land to the operation of all or some of the public land laws and/or mineral laws.

Renewable Energy

The BLM manages renewable energy as part of the ROW program. Renewable-energy sources can include wind, solar, thermal, and water. Other renewable-energy sources not yet identified might also fall under this program in the future. Current management and development challenges are unknown because there have been no formal inquiries associated with renewable energy development in the planning area. Considering nationwide and statewide trends to pursue clean energy resources, it is reasonable to expect that the Buffalo Field Office will see increased interest in renewable energy development in the future. Recent wind-energy development on private surface in the planning area suggests there will be interest in wind-energy development on public lands in the future. There is moderate potential for wind-energy development in the southern and southeastern regions of the Buffalo planning area. The most notable areas identified for wind-energy development are in the southern region of the planning area outside of the Big Horn Mountains. Renewable energy development has been excluded in the southern Big Horn Mountains.

Rights-of-Way Corridors

A Right-of-Way (ROW) grant is an authorization to use portions of public land for specific facilities, utilities, or transportation for a specified period. The ROW program consists of the evaluation, authorization, and management of ROW for a variety of uses on public land. Most authorizations extend over a 30 year period. ROWs are removed and reclaimed upon termination of the grant. Most ROWs on BLM-administered lands in the planning area are associated with oil and gas development, electrical transmission, irrigation ditches, and communications. At present, the primary ROWs issued are for site facilities, reservoirs, oil and gas, water, electricity, and roads. The number of communication site ROWs continues to grow. Increasing populations and continued mineral development require utility ROWs to support those infrastructures. Also, changing telecommunications technology is increasing the need for more communication sites and fiber-optic routes. Access roads and utilities associated with development of private lands have become increasingly important. Authorizations must consider all other resource values and their locations. The Buffalo Field Office authorizes most ROW disturbances within corridors by placing linear roads, pipelines, and electric lines alongside one another to the extent practical. Generally, the existing identified major corridor routes are localized to major traffic routes. The Buffalo Field Office will continue to coordinate disturbances among operators or development entities to keep disturbance corridors to a minimum. Achieving this will reduce fragmentation of wildlife habitat and surface disturbance. The Buffalo Field Office historically managed ROWs related to livestock grazing and some oil and gas development. In recent years, oil and gas development has dominated ROW activities, and this is likely to continue during the planning period. The Buffalo Field Office will continue to coordinate disturbances among operators or development entities to keep disturbance corridors to a minimum. Achieving this will reduce fragmentation of wildlife habitat.

An important component of the ROW program is the intrastate and interstate transportation of commodities that ultimately are delivered as utility services (e.g., natural gas, electricity) to residential and commercial customers. Equally important on the local level is the growing

demand for legal access to private homes and ranches using ROW grants. These ROWs may be temporary or extended for 2 years or longer and are for a specific use of the land.

Travel and Transportation Management

The BLM's transportation program provides legal access to public lands and maintenance and development of various transportation facilities. The primary goals of the BLM's transportation and access program are (1) acquire access, and (2) manage the transportation system to meet resource management objectives. The Buffalo Field Office transportation program manages legal access to and across public lands utilized for recreation, renewable and nonrenewable energy development, range management, public access, and communication site management. The primary components of the transportation network and facilities in the planning area include roads and trails. A large number of the BLM's system roads that currently provide access to public lands were first built and maintained by the oil and gas industry. The transportation infrastructure within the planning area is closely related to historic trails, as many automobile routes and railroads eventually paralleled some of the trail routes. At the beginning of the twentieth century, there was a dramatic increase in Wyoming roadways as a result of increased automobile use and the burgeoning oil and gas industry.

The BLM rehabilitates access roads no longer needed, proposes easement negotiations, pursues access across private lands, acquires ROW or easements, and exchanges lands under the transportation program.

Recreation

Categories of recreation management actions include allowing recreational access and use by the public, administering special recreational permits, developing recreational areas and campsites, imposing restrictions, acquiring recreational access, and assessing effects of recreational use to the environment. The BLM allows recreational actions, including sightseeing, touring, photography, wildlife viewing, floating, mountain biking, camping, fishing, and hunting. Large recreational events may include organized group hikes, or horse endurance rides. Recreational land and access acquisition actions involve maintaining public access, pursuing ROW, providing continued access, and pursuing land acquisition. Recreational site development includes maintaining or developing recreational sites and facilities, developing campgrounds, providing fishing and floating opportunities, maintaining developed and undeveloped recreational sites, adding developments as opportunities arise, adding interpretive markers, and constructing roads and interpretive sites.

Development and enforcement of stipulations and protective measures include enforcing recreational-oriented regulations, patrolling high-use areas, and contacting users in the field. The BLM places boundary signs, identifies hazards on rivers, restricts recreational uses, designates recreational areas, requires facilities to blend with the natural environment, and conducts field inventories. Special recreation permits (SRP) are processed on a case-by-case basis; categories include competitive, vending, individual or group use in identified areas, organized group activity, and event use.

While assessing adverse effects of recreational actions to the environment, the BLM analyzes actions that increase human activity, especially in riparian areas. The BLM monitors recreational use, develops management plans, and evaluates and updates recreational potential in the planning area.

Surface disturbance and other activities associated with the recreational resources program include, but are not limited to, the following actions: (1) managing recreational use, (2) permitting competitive recreational events, (3) developing non-motorized recreational trails, (4) constructing recreational sites, (5) maintaining developed and undeveloped recreational sites (campgrounds), (6) placing boundary signs and interpretive markers, (7) allowing commercial recreational uses, and (8) developing public water sources for recreational facilities.

Lands with Wilderness Characteristics

Under this program, the BLM inventories lands potentially containing wilderness characteristics. BLM keeps a current inventory of resources on BLM-administered lands, including wilderness characteristics and updates these inventories periodically when new information is available. Lands with wilderness characteristics are managed to protect the wilderness characteristics. Managing for wilderness characteristics is part of the BLM's multiple use mission. Lands with wilderness characteristics are parcels that meet a size requirement of 5,000 acres (or exception criteria) and contain naturalness and either outstanding opportunities for solitude or primitive and unconfined recreation. In addition, they may also possess supplemental values (e.g., ecological, geological, or other features of scientific, educational, scenic, or historical value). They are identified through a process described in BLM Manual 6310 – Conducting Wilderness Characteristics Inventory on BLM Lands and considered in the land use planning process under BLM Manual 6320 – Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process.

Livestock Grazing Management

The BLM's livestock grazing management program includes livestock management actions; range management; range improvements, such as fencing and water sources; detrimental impacts management; and lease management. Livestock grazing management includes converting to new types of livestock, and authorizing livestock grazing, such as adjusting season of use, distribution, kind, class, and number of livestock. One method that livestock producers can use to change the distribution of livestock is to provide salt or mineral supplements in specified areas. Range management actions include using prescribed fire, vegetation-manipulation projects, changing composition of existing vegetation, using noxious weed control, using mechanical or biological vegetative treatments to improve forage production, using heavy equipment, and herbicide treatment of sagebrush. Fencing actions include fence construction and repair, designing and implementing grazing systems, and building livestock enclosures for important riparian habitats. Water management actions include developing reservoirs, springs, pipelines, and wells, and providing access to these developments. Managing detrimental impacts include documenting, treating, and preventing resource damage. Potential detrimental impacts include the degradation of streambanks, the introduction and spread of INNS, increasing soil erosion, and a reduction in cottonwood tree recruitment. Lease management actions include

conducting monitoring studies, performing project work to enhance and improve riparian zones, designating stock trails, managing leases, developing management plans and agreements, and canceling or changing livestock trails.

ACECs

Pursuant to the Federal Land Policy Management Act (FLPMA) of 1976, Section 103(a), an area of critical environmental concern (ACEC) is defined as an area “within public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards.” These areas are managed pursuant to BLM’s Handbook Section 1613. While an ACEC may emphasize one or more unique resources, other existing multiple-use management can continue within an ACEC, as long as the uses do not impair the values for which the ACEC was designated.

Currently, there are no designated ACECs in the planning area. Two ACECs are recommended (proposed) for designation, totaling 42,847 acres. They are the Pumpkin Buttes (1,731 acres) and Welch Ranch (1,116 acres). The following table describes these proposed ACECs in more detail.

| Proposed ACECs | Relevance Criteria | Importance Criteria |
|---|---|---|
| Pumpkin Buttes | Significant cultural and historic values (religious and cultural importance to Native Americans; used by early pioneers as a landmark destination); scenic values and unique geologic features (erosional remnants forming high buttes east of the Powder River). | Regional and national significance (Native American religious and cultural values) which are vulnerable to adverse change (wind and uranium potential; communication site). |
| Welch Ranch | Important scenic value, important fish and wildlife resource, and presence of a natural hazard (active coal seam fire). | More than locally important qualities that give it special worth; coal seam fire creates management concerns about safety and public welfare. |
| ACEC Area of Critical Environmental Concern | | |

National Back Country Byways

The BLM began a National Back Country Byway Program in 1989 to focus on enhancing recreational opportunities. The objectives of the byway program include: (1) enhancing opportunities for the American public to see and enjoy the unique scenic and historical opportunities on public lands, (2) fostering partnerships at local, state, and national levels, (3) contributing to local economies, (4) enhancing visitor’s recreation experience and communicating the multi-use management message through effective interpretative programs, (5) managing visitor use along the byway to minimize impacts to the environment and to protect

visitors, and (6) contributing to the National Scenic Byway System in a way that is uniquely suited to BLM-administered national public lands. Transportation corridors with high scenic, historic, archeological, or other public-interest values are eligible for inclusion in the National Scenic Byway System. Byways are nominated through a collaborative process and are usually designated through RMPs. Proposed byways must have attractions important on a state and national basis. Many have recreational, historical, wildlife, educational, scientific, or cultural features. The entire route must have legal access. All state, Federal, and local agencies with jurisdiction over road segments of the byway must agree to the designation.

There are no BLM-administered National Byways within the Buffalo Planning Area.

Wild and Scenic Rivers

The Wild and Scenic Rivers (WSR) Act of 1968 provides for protection of certain free-flowing rivers and their immediate environments that possess outstandingly remarkable values. A designated river is classified as wild, scenic, or recreational based on the presence of development and activity within a river's corridor.

Classifications serve as a baseline land use description and guide management activities within the river corridors. Comprehensive management plans for wild and scenic rivers (WSRs) are developed within 3 years of designation. A portion of the Middlefork Powder River (11.25 miles) has been determined to be eligible and suitable for WSR designation.

Wilderness Study Areas

Wilderness Study Areas (WSAs) were developed under the Federal Land Policy and Management Act of 1976 (FLPMA) so that Federal agencies would inventory and study roadless areas for potential wilderness characteristics to see if the areas qualify for wilderness designation. Pursuant to the Wilderness Act of 1964, areas qualify that (1) generally appear to have been affected primarily by the forces of nature, with the imprint of a human's work substantially unnoticeable; (2) have outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) have at least 5,000 acres of land or that are of sufficient size as to make practicable their preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value. Three WSAs are present within the planning area: the Fortification Creek WSA, the Gardiner Mountain WSA, and the North Fork WSA.

Socioeconomic

The BLM has the capacity, through its decision-making responsibilities, to manage resource development in the planning area and thereby influence the economy of the wider region. Industries most affected by BLM land management policies and programs are agriculture (especially livestock grazing), mining and mineral development, and recreation and tourism. Impacts to special status species from these management actions are discussed in the respective management sections (i.e., Livestock Grazing, Minerals, and Recreation). It is the policy of the U.S. Department of Interior to recognize and fulfill its legal obligation to identify, protect, and

conserve the trust resources of federally recognized American Indian tribes and tribal members, and to consult with tribes on a government-to-government basis whenever plans or actions affect tribal trust resources, trust assets, or tribal health and safety.

Health and Safety

The BLM is required to address hazards that create safety risks to visitors to BLM-administered lands.

References

- U.S. Bureau of Land Management (BLM). 2015a. Biological Assessment for the Buffalo Resource Management Plan. Buffalo Field Office.
- , 2015b. Proposed Resource Management Plan and Final Environmental Impact Statement for the Buffalo Field Office Planning Area. Bureau of Land Management, Buffalo Field Office, Buffalo, Wyoming.

APPENDIX 2 – CONSERVATION MEASURES FOR THE BUFFALO RESOURCE MANAGEMENT PLAN

These conservation measures are summarized from the Buffalo Resource Management Plan (RMP) Revision (BLM 2015b) Biological Assessment (BA)(BLM 2015a). For a complete description of the conservation measures as presented in the BA, see the BLM (2015a). Implementation of the following conservation measures are intended to minimize, or eliminate adverse impacts to threatened, endangered, candidate, and proposed species that are likely to result from implementation of the management actions provided in the Buffalo Planning Area. The U.S. Bureau of Land Management (BLM) has committed to implementing the following conservation measures. The BLM has been active in conservation of listed and candidate species, and is committed to playing a key role in the recovery effort for these species.

The binding conservation measures that follow will reduce potential effects to those species and their habitats and highlight the steps the BLM can take to work towards recovery of the species. The following conservation measures will be implemented within the Buffalo Planning Area where there is potential for listed species to occur. Conservation measures are binding measures which the BLM will implement to facilitate the conservation of threatened, endangered, candidate, and proposed species.

Coordination and Conservation Measures

Section 7(a)(1) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*) requires the Federal agency (e.g., the BLM) to utilize all of its authorities in furthering the purposes of the ESA by implementing programs for the conservation of threatened and endangered species. To meet the requirements of section 7(a)(1), the BLM needs to consider conservation programs for the management of threatened and endangered species separate from any consultation requirements for actions affecting other special status species (e.g., BLM-sensitive species, State or Federal species of concern).

Conservation measures serve several purposes, including (1) presenting ways the BLM can assist species conservation in furtherance of statutory responsibilities, (2) minimizing or avoiding the adverse impacts of a proposed action on threatened or endangered, and (3) identifying and recommending studies aimed at improving the understanding of a species' biology or ecology.

General Conservation Measures

1. The BLM Wyoming Field Offices incorporate the *Wyoming BLM Mitigation Guidelines for Surface-Disturbing and Disruptive Activities*. These guidelines state that before performing activities in known or suspected habitats, the lessee or permittee is required to perform inventories or studies in accordance with BLM and/or U.S. Fish and Wildlife Service (USFWS) guidelines to verify the presence or absence of federally-listed Threatened and Endangered species. If the presence of one or more of these species is verified, the operation plans of a proposed action will be modified to include the protection of the species and its habitat, as necessary. Possible protective measures include seasonal or activity limitations, or other surface management and occupancy constraints.

2. The BLM incorporates *Wyoming Standards for Healthy Rangelands* (BLM 1998). As stated, the “standards apply to all resource uses on public lands,” while the “guidelines apply specifically to livestock grazing management practices on BLM-administered public lands” [surface]. The development and application of these standards and guidelines are intended to achieve the following four fundamentals of rangeland health: (a) proper functioning of air and watersheds; (b) proper cycling of air, water, soil nutrients, and energy; (c) attainment of state water quality standards; and (d) sustained maintenance and management of the native fauna and flora of the area, including federally listed threatened and endangered species. These fundamental goals are achieved through inventory of natural resources, appropriate management actions aimed at these resources, monitoring and evaluation of the effectiveness of these management actions, and land management adjustments as necessary.
3. *BLM Manual 6840: Special Status Species Management* directs Field Office managers to implement special status species programs within their area of jurisdiction by: (a) implementing conservation strategies for BLM special status species as contained in approved recovery plans, cooperative agreements, and other instruments the BLM has cooperatively participated in the development of; (b) conducting and maintaining current inventories of BLM special status species on BLM-administered lands; (c) ensuring that all actions undertaken comply with the ESA, its implementing regulations, and other directives associated with ESA-listed and proposed species; (d) ensuring that the results of formal section 7 consultations, including mandatory terms and conditions in incidental take statement that are consistent with 50 CFR 402 regulations, are implemented and documented in the administrative record; (e) coordinating field office activities with Federal, state, and local groups to ensure the most effective program for BLM special status species; (f) ensuring that land use and implementation plans fully address appropriate conservation of BLM special status species; and (g) monitoring populations of BLM special status species to determine whether management objectives are being met. Records of monitoring activities are to be maintained and used to evaluate progress relative to such objectives. Monitoring shall be conducted consistent with the principles of adaptive management as defined in the U.S. Department of the Interior (DOI) policy, as appropriate.
4. The BLM will modify projects that may affect special status species to protect these species and will consult with the USFWS in such cases, as required by the ESA.
5. The BLM will consult with stakeholders in modifying projects that may affect special status species.
6. The BLM will assist authorized agencies in the restoration, reintroduction, augmentation, or reestablishment of threatened, endangered, and other special status species populations and/or habitats.
7. Motorized vehicle use is limited to designated roads and trails in essential and recovery habitat for threatened or endangered species.
8. All types of forest management will apply appropriate mitigation, that riparian/wetland areas will be managed to meet Proper Functioning Condition (PFC) and the *Wyoming*

Standards for Healthy Rangelands, and the BLM will work cooperatively to control outbreaks of grasshoppers and Mormon crickets.

9. Areas harvested for timber are to be regenerated by natural or artificial means consistent with BLM policy, and vegetative communities are managed in accordance with the *Wyoming Standards for Healthy Rangelands*.
10. Grazing management will consider threatened and endangered species and their habitats. Grazing management practices will incorporate the kinds and amounts of use that will restore, maintain, or enhance habitats to assist in the recovery of federally threatened and endangered species or the conservation of federally listed species of concern and other state-designated special status species. Grazing management practices will maintain existing habitats or facilitate vegetation change toward desired habitats by considering the hydrology, physical attributes, and potential for the watershed and the ecological site.
11. Management prescriptions for invasive species include developing and maintaining an invasive species and pest management plan, and coordinating with appropriate stakeholders to manage for the reduction of cheatgrass and other invasive species.
12. The BLM will continue to use and update existing Habitat Management Plans (HMPs) (including the South Big Horns HMP, Wetlands HMP, and Middle Fork Powder River HMP) as necessary to include management objectives and prescriptions for wildlife.
13. The BLM will participate in the development of species specific recovery plans in coordination with the USFWS and other agencies. Populations and habitats on BLM-administered lands will be monitored to determine if recovery objectives are being met.
14. In the event a dead or injured threatened or endangered species is discovered during project activities the BLM would notify the USFWS Ecological Field Office (307-772-2374) or Law Enforcement Office (406-247-7355) within 24 hours of the discovery.
15. BLM-administered public lands that contain identified habitat for threatened and endangered species will not be exchanged or sold, unless it benefits the species.

Northern Long-eared Bat Conservation Measures

Hibernacula, Spring Staging and Fall Swarming Habitat (Oct 1 - May 14):

1. BLM will take actions to protect northern long-eared bat hibernacula. Where a known Northern Long-Eared Bat hibernaculum is experiencing threats, BLM will work with the USFWS and other partners to provide the necessary protections (e.g., limit human disturbance, install bat-friendly gates, ensure the use of “clean” clothing and gear).
2. BLM will participate in actions to manage and reduce the impacts of WNS on northern long-eared bats. A national plan was prepared by the USFWS and other state and Federal agencies that details actions needed to investigate and manage WNS.

3. BLM will avoid disturbing/injuring hibernating bats by:
 - Not entering northern long-eared bat hibernacula during the hibernation season, unless coordinated with the USFWS for survey, research, or other management purposes
 - Complying with all cave and mine closures, advisories, and regulations.
 - Avoiding planned fire or other sources of smoke within 0.25 mile of known northern long-eared bat during hibernation season, or coordinate with the USFWS.
4. BLM will avoid destruction/alteration (e.g., fill, cause collapse of) of caves/mines that may support hibernating bats by:
 - Prohibiting woody vegetation or spoil (e.g., soil, rock, etc.) disposal within 100 feet of known hibernacula entrances and associated sinkholes, fissures, or other karst features.
 - When blasting within 0.5 miles of known or presumed occupied hibernacula entrances and passages, BLM will coordinate with the USFWS to ensure that the blasting will be conducted in a manner that will not compromise the structural integrity or alter the karst hydrology of the hibernacula.
 - When drilling or hydraulic fracturing within 0.5 miles of a known or presumed occupied hibernacula entrances and passages, BLM will coordinate with the USFWS to ensure that the drilling will be conducted in a manner that will not compromise the structural integrity or alter the karst hydrology of the hibernacula.
 - Avoiding modifying cave or mine entrances that support hibernating bats. If there are safety concerns or concerns about bats (e.g., disturbance, vandalism) at a site, only "bat friendly" cave/mine gates will be installed.
5. BLM will avoid/minimize alterations of clean drinking water and foraging areas by:
 - Protecting potential recharge areas of cave streams and other karst features that are hydrologically connected to known or assumed hibernacula.
 - Setting back equipment servicing and maintenance areas at least 300 feet away from streambeds, sinkholes, fissures, or areas draining into sinkholes, fissures, or other karst or mine features.
 - Following available standards on spill prevention, containment, and control.
 - Restricting use of herbicides for vegetation management near known or assumed northern long-eared bat hibernacula to those specifically approved for use in karst (e.g., sinkholes) and water (e.g., streams, ponds, lakes, wetlands).
 - Implement strict adherence to sediment and erosion control measures and reclamation standards.

6. BLM will avoid disturbing/killing/injuring northern long-eared bats during spring staging/fall swarming by:
 - not clearing occupied spring staging and fall swarming habitat near known northern long-eared bat hibernacula during the staging and swarming seasons. Surveys will be conducted to determine occupancy prior to any tree clearing activities.
 - avoiding planned fire or other sources of smoke in known northern long-eared bat habitat during the swarming/staging or hibernation season, or coordinate with the USFWS.
7. BLM will minimize the spread of WNS. If a cave or mine that could harbor hibernating bats must be entered, and it does not have a cave and mine closure policy, BLM follow approved WNS decontamination protocols. Under no circumstances will clothing, footwear, or equipment that was used in a WNS-affected state or region be used.

Summer Habitat (May 15 - Sep 30):

8. BLM will determine where northern long-eared bats occur in the summer.
 - Coordinate with partners to gather and evaluate northern long-eared bat location information.
 - Review both positive and negative data (e.g., acoustic transect surveys).
9. BLM will take actions to protect northern long-eared bats and their habitat within known northern long-eared bat home ranges.
10. BLM will avoid killing or injuring northern long-eared bats during tree-clearing activities by not clearing occupied maternity colony summer habitat during the summer maternity season. Surveys will be conducted to determine occupancy prior to any tree clearing activities.
11. BLM will minimize other direct effects to northern long-eared bats by not clearing occupied summer habitat during the time of year when females are pregnant or the pups are incapable of flight. Surveys will be conducted to determine occupancy prior to any tree clearing activities.
12. BLM will not conduct planned fire within occupied summer habitat during the time of year when females are pregnant or the pups are incapable of flight. Surveys will be conducted to determine occupancy prior to any tree clearing activities (fire only).
13. BLM will avoid/minimize altering clean drinking water and foraging areas by:
 - Implementing sediment and erosion control measures and reclamation standards.
 - Siting equipment servicing and maintenance areas at least 300 feet away from waterbodies (e.g., wetlands, streams). Following available standards on spill prevention, containment, and control.

14. BLM will maintain summer maternity habitat by:
 - Retaining known roost trees, which includes live or dead trees and snags ≥ 3 inches diameter at breast height that have exfoliating bark, cracks, crevices, or cavities. Surveys will be conducted to determine occupancy prior to any tree clearing activities.
 - Clearly demarcating trees to be protected vs. cut to help ensure that contractors do not do not accidentally remove more trees than anticipated.

Year round

15. BLM, in cooperation with the State of Wyoming and/or the USFWS, will implement inventory and monitoring to determine population status and habitat requirements, as additional information is necessary to guide management actions.
16. BLM will manage BLM-administered lands where *Myotis septentrionalis* occurs in such a way that provides adequate roosting and foraging habitat to maintain stable populations (that is, secure roosting sites; diverse, native foraging habitat; and uncontaminated water sources).
17. BLM will not harvest timber in areas close to occupied roosting sites during the maternity roosting period (Schmidt 2003). Surveys will be conducted to determine occupancy prior to any tree harvest activities. Patch cuts and selective harvesting will be utilized to provide regenerating forest and retain large-diameter snags (Lacki and Schwierjohann 2001).
18. BLM will evaluate and where appropriate require BMPs for natural caves and abandoned mines in areas where *Myotis septentrionalis* roost.
19. BLM will coordinate and conduct outreach with appropriate internal and external stakeholders to prevent or contain the spread of WNS.
20. BLM will identify caves and abandoned mine features with important bat resources.
21. BLM will follow the Containment and Decontamination Procedures for Bureau of Land Management Administered Lands to Minimize the Spread of White-Nose Syndrome in Caves and Abandoned Mines August 5, 2010 outlined in WO IM No. 2010-181.
22. BLM will participate in interagency groups to develop state WNS response plans.
23. BLM will recommend locations to test for the presence of WNS at a subset of the sites that have been identified as having important bat resources and support WNS research efforts where practicable and feasible within budgetary constraints.
24. BLM will coordinate with the State of Wyoming and the USFWS to implement Wyoming's strategic plan for WNS prevention, and continue to work with the WGFD and other stakeholders in minimizing the risk of WNS spread into Wyoming.

Ute Ladies'-tresses Conservation Measures

1. Surface disturbance will be prohibited within 500 feet of surface water and/or riparian areas. Exception, waiver, or modification of this limitation may be approved in writing, including documented supporting analysis, by the authorized officer. (Wyoming BLM Mitigation Guidelines for Surface-disturbing and Disruptive Activities). *Note: this conservation measure was revised from the programmatic BA by adding the second sentence to clarify that exception, waiver, or modifications from the prohibition are possible.*
2. No surface occupancy (NSO) will be allowed within special management areas (e.g., known threatened or endangered species habitat)(Wyoming BLM Mitigation Guidelines for Surface-disturbing and Disruptive Activities).
3. Portions of the authorized use area are known or suspected to be essential habitat for threatened or endangered species. Prior to conducting any onsite activities, the lessee/permittee will be required to conduct inventories or studies in accordance with BLM and USFWS guidelines to verify the presence or absence of this species. In the event that an occurrence is identified, the lessee/permittee will be required to modify operational plans to include the protection requirements of this species and its habitat (e.g., seasonal use restrictions, occupancy limitations, facility design modifications).
4. The BLM will ensure that grazing management practices will incorporate the kinds and amounts of use that will restore, maintain, or enhance habitats to assist in the recovery of federally threatened and endangered species or the conservation of federally-listed species of concern and other State-designated special status species. Grazing management practices will maintain existing habitat or facilitate vegetation change toward desired habitats. Grazing management will consider threatened and endangered species and their habitats.
5. The BLM will ensure that upland vegetation on each ecological site consists of plant communities appropriate to the site which are resilient, diverse, and able to recover from natural and human disturbance.
6. The BLM will maintain biological diversity of plant and animal species: support Wyoming Game and Fish Department strategic plan population objective levels to the extent practical and to the extent consistent with BLM multiple use management requirements; maintain, and where possible, improve forage production and quality of rangelands, fisheries, and wildlife.
7. Place mineral supplements, new water sources (permanent or temporary), or supplemental feed for livestock, wild horses, or wildlife at least 1.0 mile from known orchid populations. Hay or other feed and straw must be certified weed-free. These restrictions are intended to keep free-ranging livestock away from populations of the orchid and subsequent grazing on individual orchid plants. Surveys for the orchid will be conducted in potential orchid habitat prior to livestock operations projects. Placement of

mineral supplements, straw or other feed for livestock within 1.0 mile of known populations of the orchid will be evaluated and approved by the BLM with concurrence by USFWS and implemented on a case-by-case basis only.

8. The BLM will not increase permitted livestock stocking levels in any allotment with pastures containing known orchid populations without consulting with the USFWS. It is unknown to what extent overall impacts due to livestock grazing have on the orchid, whether it is detrimental due to actual grazing and trampling of plants or beneficial due to livestock removal of adjacent competing vegetation.
9. Grazing will be intensively managed within known habitat containing populations from July through September, to allow plants to bloom and go to seed.
10. Recreational site development will not be authorized in known Ute ladies'-tresses habitat.
11. The Bureau will manage stream habitats to retain, re-create, or mimic natural hydrology, water quality, and related vegetation dynamics. Projects that may alter natural hydrology or water quality, change the vegetation of the riparian ecosystem and cause direct ground disturbance will be evaluated and redesigned to ensure that adverse effects to populations of the orchid do not occur.
12. Biological control of noxious plant species will be prohibited within 1.0 mile from known orchid habitat until the impact of the control agent has been fully evaluated and determined not to adversely affect the plant population. BLM will monitor biological control vectors.
13. Except in cases of extreme ecological health (insect or weed outbreaks/infestations), herbicide treatment of noxious plants/weeds will be prohibited within 0.25 mile of known populations of the Ute ladies'-tresses orchid unless it is a narrow spectrum herbicide that would not harm the Ute ladies'-tresses orchid (herbicides specific to dicots) and insecticide/pesticide treatments will be prohibited within 1.0 mile of known populations of the orchid to protect pollinators.
14. Where insect or weed outbreaks have the potential to degrade area ecological health inside the buffers listed above, at the discretion of the BLM's authorized officer and with concurrence by the USFWS, the following will apply: where needed, and only on a case-by-case basis, a pesticide use proposal or other site specific plan will address concerns of proper timing, methods of use, and chemicals. Pesticides specific to dicots will be preferred where these are adequate to control the noxious weeds present.
15. Aerial application of herbicides will be carefully planned to prevent drift in areas near known populations of the orchid (outside of the 0.25-mile buffer). The BLM will work with the Animal and Plant Health Inspection Service (APHIS), the USFWS and County Weed and Pest Agencies to select pesticides and methods of application that will most effectively manage the infestation and least affect the orchid. *Note: The conservation measure was modified from the programmatic BA measure to allow the use of narrow*

spectrum herbicides when it has been determined that they would not harm the Ute ladies'-tresses orchid.

16. If revegetation projects are conducted within 0.25 mile of known habitat for the orchid, only native species will be selected.
17. Limit the use of off road vehicles (OHVs) to designated roads and trails within 0.5 mile of known populations of the orchid, with no exceptions for the “performance of necessary tasks” other than firefighting and hazardous material cleanup allowed using vehicles off of highways. No OHV competitive events will be allowed within 1.0 mile of known populations of the orchid. Roads that have the potential to impact the orchid and are not required for routine operations or maintenance of developed projects, or lead to abandoned projects will be reclaimed as directed by the BLM.
18. Apply a condition-of-approval (COA) on all applications for permit to drill (APDs) oil and gas wells for sites within 0.25 mile of any known populations of the orchid. This condition will prohibit all authorized surface disturbance and OHV travel from sites containing populations of the orchid. Operations outside of the 0.25 mile buffer of orchid populations, such as “directional drilling” to reach oil or gas resources underneath the orchid’s habitat, would be acceptable.
19. For known Ute ladies'-tresses populations, the BLM will place a controlled surface use (CSU) stipulation prohibiting all surface disturbances on new oil and gas leases, buffering the area within 0.25 mile of known Ute ladies'-tresses populations. For existing oil and gas leases with known Ute ladies'-tresses populations (these would be for newly discovered populations not currently documented), the BLM will require the COA in conservation measure 18 above including the same 0.25-mile buffer area around those known Ute ladies'-tresses populations.
20. Prohibit the sale and disposal of salable minerals in habitat containing known populations of the orchid (within a 0.25-mile buffer area of known orchid populations), and where possible pursue acquisition of property with known populations of the orchid with salable minerals. The disposal (sale and removal) of salable minerals is a discretionary BLM action and is prohibited within a 0.25-mile buffer area of known populations of the orchid.
21. To prevent loss of habitat for the orchid, the BLM “shall retain in Federal ownership all habitats essential for the survival and recovery of any listed species, including habitat that was used historically, that has retained its potential to sustain listed species, and is deemed to be essential to their survival.” Prior to any land tenure adjustments in known habitat for the orchid, the BLM will survey to assess the habitat boundary and retain that area in Federal ownership. BLM-administered public lands that contain identified habitat for the orchid will not be exchanged or sold, unless it benefits the species.
22. All proposed ROW projects (powerlines, pipelines, roads, etc.) will be designed and locations selected at least 0.25 mile from any known orchid habitat to minimize

disturbances. ROW actions for roads, powerlines, pipelines, etc. will avoid occupied habitat for the orchid. If avoidance of adverse effects is not possible, the BLM will re-initiate consultation with the USFWS.

23. All proposed projects will be designed and locations selected to minimize disturbances to known populations of the orchid, and if the avoidance of adverse effects beyond the scope of this consultation is not possible, the BLM will re-initiate consultation with the USFWS. Projects will not be authorized closer than 0.25 mile from any known populations of the orchid without concurrence of the USFWS and the BLM authorized officer. No ground disturbing construction activities will be authorized within 0.25 mile of any known populations of the orchid during the essential growing season time period (from July to September, the growing, flowering and fruiting stages) to reduce impacts to this species.
24. In order to conserve and protect natural areas, planned recreational foot trails are created to control human traffic. BLM will create programs that will strive to protect the orchid's habitat and prevent new trails from being constructed within 0.25 mile from known occurrences of the orchid.

References

- Avian Powerlines Interaction Committee and U.S. Fish and Wildlife Service (APLIC and USFWS). 2005. Avian Protection Plan (APP) Guidelines. A Joint Document Prepared By The Edison Electric Institute's Avian Powerline Interaction Committee and U.S. Fish and Wildlife Service. April.
- United States Bureau of Land Management (BLM). 1998. Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the State of Wyoming. U.S. Department of the Interior, Bureau of Land Management. January.
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APPENDIX 3 – BEST MANAGEMENT PRACTICES FOR THE BUFFALO RESOURCE MANAGEMENT PLAN

These Best Management Practices (BMPs) are taken from the U.S. Bureau of Land Management's (BLM) Buffalo Resource Management Plan (RMP)(BLM 2015b) Biological Assessment BA (BLM 2015a). Implementation of the following best management practices are intended to minimize, or eliminate, adverse impacts to threatened, endangered, candidate, and proposed species that are likely to result from implementation of the management actions provided in the Buffalo RMP. The BLM has been active in conservation of listed and candidate species, and is committed to playing a key role in the recovery effort for these species.

The use of the following recommended best management practices will reduce potential effects to species and their habitats.

Northern Long-eared Bat – Best Management Practices

Hibernacula, Spring Staging and Fall Swarming Habitat (Oct 1 - May 14):

1. Avoid disturbing/killing/injuring northern long-eared bats during spring staging/fall swarming by:
 - Avoid clearing suitable spring staging and fall swarming habitat within 5.0 miles of known northern long-eared bat hibernacula during the staging and swarming seasons.
 - Activities involving continuing (i.e., longer than 24 hours) noise disturbances greater than 75 decibels measured on the A scale (e.g., loud machinery) within a five-mile radius of known hibernacula would be avoided during the spring staging and fall swarming seasons.
 - During spring staging and fall swarming, use tanks to store waste fluids to ensure no loss of bats by entrapment in waste pits within 5 miles of known or presumed hibernacula.
 - Operate wind turbines during periods (e.g., months, hours, wind speeds) when northern long-eared bat activity is unlikely.
2. Maintain spring staging/fall swarming forested habitat within 5.0 miles of known northern long-eared bat hibernacula.
 - Retain snags, dead/dying trees, and trees with exfoliating (loose) bark ≥ 3 -inch diameter at breast height in areas \leq one mile from water.
 - Minimize impacts to all forest patches.
 - Maintain forest patches and forested connections (e.g., hedgerows, riparian corridors) between patches.
 - Maintain natural vegetation between forest patches/connections and developed areas.

Summer Habitat (May 15 - Sep 30):

3. Determine where northern long-eared bats occur in the summer by performing baseline bat surveys.
4. BLM will minimize direct effects by:
 - During prescribed burns, where the proposed perimeter fire line is constructed by hand, construct it at least two tree-lengths away from any known habitat, or potential roost trees that have been identified. If such trees are adjacent to a fixed part of the fire line such as the road, a trail, or the river, they will have fire line constructed around the bases, so long as their remaining in place does not jeopardize firefighter safety.
 - Whenever possible, conduct prescribed burns outside of the summer maternity season. Burns conducted during the summer maternity season should be low/moderate intensity to minimize direct impacts to northern long-eared bats.
 - Fire-effects monitoring should be used before, during, and after the burns to ensure that burning conditions and effects are within the desired ranges.
 - Use tanks to store waste fluids to ensure no loss of bats by entrapment in waste pits.
 - Avoid conducting construction activities after sunset in known or suitable summer habitat to avoid harassment of foraging northern long-eared bats.
 - Operate wind turbines during periods (e.g., months, hours, wind speeds) when northern long-eared bat activity is unlikely.
5. BLM will avoid/minimize altering clean drinking water and foraging areas by:
 - Minimizing use of herbicides and pesticides. If necessary, spot treatment is preferred over aerial application.
 - Minimizing use of chemicals in/around storm water detention basins.
 - Minimizing potential lighting impacts (e.g., reduce the number of lights, use motion sensors, use shields/full cut-off lens, angle lights downward and away from forest).
 - Contaminants, including but not limited to oils and solvents, would be controlled so the quality, quantity, and timing of prey resources are not affected.
 - Avoiding filling, channelizing, or degrading streams, wetlands, and other watering areas where possible.
6. BLM will maintain summer maternity habitat by:
 - Retaining and avoiding potential roost trees, which includes live or dead trees and snags ≥ 3 inches diameter at breast height that have exfoliating bark, cracks, crevices, or cavities. Not removing trees surrounding potential roosts to maintain the microclimate.
 - Where possible and not a safety hazard, leaving dead or dying trees standing.

- Avoiding reducing the suitability of forest patches with known northern long-eared bat use.
- Maintaining or improving forest patches.
- Avoiding/minimizing tree clearing that fragments large forested areas or tree lined corridors. For example, routing linear features along the edge of a woodlot instead of through the middle of it; using horizontal directional drilling for pipeline crossings of wooded stream corridors and upland tree lines.

Year round:

7. Retain all large-diameter snags, particularly those greater than 21 cm (8 in) diameter at breast height (Schmidt 2003), as potential roost sites for *Myotis septentrionalis* and other snag-dependent species. Provide large-diameter snags in early states of decay, particularly snags with large amounts of exfoliating bark (Lacki and Schwierjohann 2001). Retain mature and decadent trees for future snag production, particularly where existing snags are few. Because the northern myotis switches tree roosts frequently and may need several suitable roosts over the course of a summer (Foster and Kurta 1999; Caceres and Barclay 2000), retain all snags in areas where bats are known to roost.
8. Implement BMPs for natural caves and abandoned mines in areas where *Myotis septentrionalis* roosts.
9. Avoid or minimize pesticide use in areas where the *Myotis septentrionalis* is known to occur to avoid direct poisoning and to maintain a food source for this species and other insectivores. Where possible, allow insect outbreaks to proceed naturally.

Ute Ladies'-tresses – Best Management Practices

1. When project proposals are received, the BLM will initiate coordination with the USFWS at the earliest possible date so that both agencies can advise on project design. This should minimize the need to redesign projects at a later date to include orchid conservation measures, determined as appropriate by the USFWS.
2. The BLM will participate in the development of both a conservation agreement/assessment strategy and a species-specific Recovery Plan for the orchid in coordination with the USFWS and other agencies, as appropriate. Orchid habitats on BLM-administered lands will be monitored to determine if recovery and conservation objectives are being met.
3. The BLM will coordinate with the USFWS, the National Resource Conservation Service, and private landowners to ensure adequate protection for the orchid and its habitat when new activities are proposed and to work proactively to enhance the survival of the plant.
4. In the event that a new population of the orchid is found, the USFWS's Wyoming Field Office (307-772-2374) will be notified within 1 week of discovery.
5. Livestock grazing, mowing and haying, and some burning are specific management tools that the BLM may use to maintain favorable habitat conditions for the orchid where

- feasible. Mowing and grazing, with proper timing and intensity, reduce the native and exotic plant competition for light and possibly for water, space, and nutrients.
6. Recreational foot trails that may be located adjacent to Ute ladies'-tresses plant habitat should be constructed to reduce impacts to this species.
 7. To prevent loss of habitat for the orchid, the BLM "shall retain in Federal ownership all habitats essential for the survival and recovery of any listed species, including habitat that was used historically, that has retained its potential to sustain listed species, and is deemed to be essential to their survival." Prior to any land tenure adjustments in potential orchid habitats, the BLM will survey to assess the potential for the existence of the orchid. While it is difficult to assess whether the orchid was historically present on such sites, the BLM should try and retain in Federal ownership all habitats essential for the survival and recovery of the orchid, including habitat that was used historically, that has retained its potential to sustain this listed species, and is deemed to be essential to their survival. Potential orchid habitat may be used for reintroduction efforts and is important for the recovery and enhancement of the species.
 8. Prescribed fire and grazing activities shall be coordinated between biologists, rangeland management specialists, and fire personnel to ensure that no damage occurs to the plant habitat when being used to maintain the habitat for the species.
 9. Maintain and restore the dynamics of stream systems, including the movement of streams within their floodplains, which are vital for the life-cycle of the orchid. Flow timing, flow quantity, and water table characteristics should be evaluated to ensure that the riparian system is maintained where these plants occur.
 10. Maintain and restore the natural species composition and structural diversity of plant communities in riparian zones and wetlands.
 11. For the protection of Ute ladies'-tresses and its potential habitat, surface-disturbing activities should be avoided in the following areas when they occur outside the protective 0.25-mile buffer from known populations: (1) identified 100-year floodplains; (2) areas within 500 feet from perennial waters, springs, wells, and wetlands, and (3) areas within 100 feet from the inner gorge of ephemeral channels.
 12. Form a steering committee to develop and prioritize management practices and assist the BLM and the USFWS with research projects.
 13. Conduct inventories for the orchid in areas with potential habitat.
 14. Maintain a database of all searched, inventoried, or monitored orchid sites.
 15. Analyze vegetation treatments (mowing, prescribed fire, mechanical treatments, etc.) in potential habitats for the orchid to determine impacts to the species. The BLM does not currently anticipate that these treatments will ever occur in potential Ute ladies'-tresses

habitat, if such treatments are proposed, and adverse effects from vegetation treatments are anticipated from such projects, the BLM will reinitiate section 7 consultation.

16. Establish monitoring, biological, ecological, population demographics, and life-history studies as funding and staffing allow, such as monitoring current populations each year for trends, studies regarding identification of pollinators, genetics, life history, effects of pesticides and herbicides, seed viability and germination, and studies regarding monitoring the success of reintroduction efforts. Monitor orchid population sites for invasion by noxious and invasive plant species.
17. Perform monitoring and analysis pertaining to flow timing, flow quantity, and water table characteristics with the goal of ensuring that riparian vegetation in areas of potential habitat for the orchid is maintained.
18. When possible, collect and bank orchid seeds at local, regional, national, and international arboreta, seed banks, and botanical gardens as insurance against catastrophic events, for use in biological studies, and for possible introduction or reintroduction into potential habitat.
19. Train law enforcement personnel on protections for the orchid and its habitat, its status, and current threats to its existence.
20. Educate resource specialists, rangers, and fire crews about the orchid and its habitat to help with project design for the general area and for fire suppression actions occurring in potential habitat for the orchid and on the habitat characteristics and plant identification for the plant, so that if they encounter the orchid occurring in riparian habitat, they can report it to their office's threatened and endangered species specialist.
21. The BLM should work toward developing reintroduction sites in coordination with the USFWS and to maintain the integrity of these sites for the survival of the orchid. The objective would be to reintroduce populations of the orchid into areas of historic occurrence and introduce new populations in suitable habitat within the plant's historic range.
22. Develop propagation techniques and use them to reintroduce or introduce the orchid and to repopulate known populations in the event population recovery becomes necessary.
23. In known occupied Ute ladies'-tresses habitat, the USFWS recommends that the BLM use management actions that are compatible with protection and conservation of pollinators of the Ute ladies'-tresses orchid.
24. The USFWS recommends that the BLM monitor and manage invasive species so these do not impact the Ute ladies'-tresses orchid or its habitat.
25. The USFWS recommends that the BLM not authorize herbicide use in known or occupied Ute ladies'-tresses habitat without prior review by USFWS biologists.

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Appendix L. Buffalo Air Resources Management Plan

L.1. Introduction

L.1.1. Purpose

1. The purpose of this Air Resource Management Plan (RMP) is to further clarify air quality goals, objectives, and management actions set forth in Table 3.1, “1000 PHYSICAL RESOURCES (PR) – AIR QUALITY (AQ)” (p. 83) of the Approved RMP. This Air RMP describes air resources management and outlines specific requirements for proponents of projects that have the potential to generate air emissions and impact air resources within the planning area.
2. This Air RMP may be modified as necessary to comply with applicable laws, regulations, and policies and to address new information and changing circumstances.

L.1.2. Authority for Air Resource Management

1. **Federal Land Policy and Management Act of 1976.** The Federal Land Policy and Management Act (FLPMA) provides the Bureau of Land Management’s (BLM) basic operating authority. It establishes a unified, comprehensive, and systematic approach to managing and preserving public lands in a way that protects “the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values.” The BLM Air Resource Management Program, part of the BLM Soil, Water, and Air Program, coordinates and supports the BLM’s efforts to manage air resources within its “multiple use” and “sustained yield” mission, as provided by FLPMA. FLPMA directs that in developing and revising its RMPs, the BLM shall provide for compliance with applicable air pollution control laws, including state and federal pollution standards or implementation plans.
2. **Clean Air Act of 1970.** The Clean Air Act (CAA) is the comprehensive federal law that provides for regulation of air emissions from stationary and mobile sources, national ambient air quality standards (NAAQS) to protect public health and public welfare, and protection of visibility in relatively pristine areas such as Class I national parks and wilderness areas. Class I is a CAA designation that affords certain areas the strictest air quality protection. Areas include some wilderness areas, national parks, and Native American reservations. See the *Planning Process* section, in Chapter 1 paragraph 5, for additional information. The CAA prescribes the measures that the United States (U.S.) Environmental Protection Agency (EPA) and other federal agencies and state, local, and tribal governments must take in order to regulate air pollution and achieve air quality that meets the NAAQS. In its RMPs and implementing authorizations, the BLM provides for compliance with the CAA and other pollution control laws. The CAA also requires that federal land managers responsible for lands within Class I areas protect the air quality related values of those areas.

The Wyoming Department of Environmental Quality (DEQ) Air Quality Division (AQD) has been delegated authority by the EPA to implement federal programs of the CAA. The

Wyoming DEQ AQD is responsible for managing air quality through the Wyoming Air Quality Standards and Regulations and the Wyoming State Implementation Plan.

3. **Wilderness Act of 1964.** The Wilderness Act is the general legal authority for Congress to designate and for agencies to manage wilderness. Today, wilderness is designated for a variety of benefits, including clean air. The uses of wilderness include protection of air and watersheds; maintenance of soil and water quality, ecological stability, plant and animal gene pools, protection of archaeological and historical sites, habitat for wildlife; and livestock grazing. Wilderness provides opportunities for outdoor recreation and also provides for the exercise of valid existing rights such as water rights, mining claims, mineral leases, and rights-of-way. The majority of BLM Wilderness Areas allow some degradation of air quality associated with moderate industrial and population growth. The CAA allows States to require that Wilderness Areas meet a more stringent air quality standard using normal state processes.

Minerals in wilderness are withdrawn from all forms of appropriation under the mining laws and from disposition under mineral leasing laws. Prior existing claims or leases with valid existing rights may be developed, though mineral development within wilderness is rare. The BLM as a Federal Land Manager analyzes potential impacts to designated Class II wilderness areas, national parks and monuments. Essentially, all areas that are not designated as Class I are designated as Class II. Moderate incremental increases in pollutant concentrations are allowed, although the concentrations are not allowed to reach the concentrations set by Wyoming and federal standards (Wyoming Ambient Air Quality Standards [WAAQS] and NAAQS). See the *Background* section, paragraph 5 for additional information.

4. **National Environmental Policy Act.** The National Environmental Policy Act (NEPA) establishes a public, interdisciplinary framework for federal decision-making and ensures that the BLM and other federal agencies take environmental factors into account when considering federal actions. The BLM uses the NEPA process to analyze potential impacts of its proposed actions on air and other resources and to consider appropriate measures to mitigate adverse impacts.
5. **Air Quality Memorandum of Understanding.** In June 2011, the U.S. Department of Agriculture, U.S. Department of the Interior (DOI), and the EPA signed the Memorandum of Understanding (MOU) Regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions Through the NEPA Process. This MOU outlines an approach to the analysis of impacts to air quality and air quality related values, such as visibility in Class I and sensitive Class II areas, in connection with oil and gas development on federal lands, and identifies a path to protect air quality while allowing for oil and gas development on federally managed lands.

L.1.3. Background

1. Preparation of the Analysis of the Management Situation in 2009 disclosed that extensive energy development within the planning area, especially coal and fluid minerals, leads to dust, emissions, and other air quality impacts.
2. Monitoring air quality and establishing background concentrations can help to characterize changes over time. Table L.1, “National and State Primary Air Quality Standards for Criteria Pollutants and Representative Concentrations for the Planning Area” (p. 541) displays the applicable primary NAAQS and WAAQS and representative

maximum pollutant concentrations for the planning area, based on monitoring data. Figure L.1, “Representative Maximum Pollutant Concentrations in the Planning Area as Percentage of NAAQS” (p. 542) displays the representative maximum pollutant concentrations values from Table L.1, “National and State Primary Air Quality Standards for Criteria Pollutants and Representative Concentrations for the Planning Area” (p. 541) as percentages of the NAAQS. These representative concentrations indicate the status of air quality conditions within the planning area relative to the standards. These data indicate that ozone concentrations are at least 75 percent of the NAAQS; therefore, ozone is the primary pollutant of concern in the planning area.

Existing visibility from Interagency Monitoring of Protected Visual Environments (IMPROVE) stations in the planning area are shown in the *Air Quality* section of Chapter 3 of the Proposed RMP and Final EIS for the Thunder Basin site and the Cloud Peak site. Visibility data from the Badlands IMPROVE site outside the planning area are also included. Data from these sites indicate good visibility in the planning area.

Table L.1. National and State Primary Air Quality Standards for Criteria Pollutants and Representative Concentrations for the Planning Area

| Pollutant | Averaging Time | NAAQS | | | WAAQS | | | Representative Concentrations | | |
|-------------------|--|-------|--------|------------------------------|-------|--------|------------------------------|-------------------------------|-------|------------------------------|
| | | (ppm) | (ppb) | ($\mu\text{g}/\text{m}^3$) | (ppm) | (ppb) | ($\mu\text{g}/\text{m}^3$) | (ppm) | (ppb) | ($\mu\text{g}/\text{m}^3$) |
| Carbon Monoxide | 1 hour ¹ | 35 | 35,000 | 40,000 | 35 | 35,000 | 40,000 | 0.8 | 800 | 914 |
| | 8 hour ¹ | 9 | 9,000 | 10,000 | 9 | 9,000 | 10,000 | 0.3 | 300 | 333 |
| Nitrogen Dioxide | 1 hour ² | 0.10 | 100 | 188 | 0.10 | 100 | 188 | 0.011 | 11 | 21 |
| | Annual ³ (Arithmetic Mean) | 0.053 | 53 | 100 | 0.053 | 53 | 100 | 0.002 | 2.0 | 4 |
| Ozone | 8 hour ⁴ | 0.075 | 75 | 147 | 0.075 | 75 | 147 | 0.065 | 65 | 127 |
| PM ₁₀ | 24 hour ⁵ | N/A | N/A | 150 | N/A | N/A | 150 | N/A | N/A | 96 |
| PM _{2.5} | 24 hour ⁶ | N/A | N/A | 35 | N/A | N/A | 35 | N/A | N/A | 23 |
| | Annual ⁷ | N/A | N/A | 12 | N/A | N/A | 15 | N/A | N/A | 8.2 |

| Pollutant | Averaging Time | NAAQS | | | WAAQS | | | Representative Concentrations | | |
|----------------|---------------------|-------|-------|------------------------------|-------|-------|------------------------------|-------------------------------|-------|------------------------------|
| | | (ppm) | (ppb) | ($\mu\text{g}/\text{m}^3$) | (ppm) | (ppb) | ($\mu\text{g}/\text{m}^3$) | (ppm) | (ppb) | ($\mu\text{g}/\text{m}^3$) |
| Sulfur Dioxide | 1 hour ⁸ | 0.075 | 75 | 195 | 0.075 | 75 | 195 | 0.043 | 43 | 112 |

Source: EPA 2013; Wyoming DEQ 2013

¹ Not to be exceeded more than once per year. Data (2nd high) collected at Yellowstone National Park (AQS ID: 560391012) during 2012.

² To attain this standard, the 3-year average of the 98th percentile of 1-hour concentrations at each monitor within an area must not exceed 100 ppb. 3-year average of the 98th percentile 1-hour concentrations for Thunder Basin (AQS ID: 560050123) for 2010–2012.

³ To attain this standard, the annual average concentration in the calendar year must be less than or equal to 53 ppb. Thunder Basin (AQS ID: 560050123) annual average concentration for 2012.

⁴ To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 75 ppb. Design value (2010–2012) for the Thunder Basin (AQS ID: 560050123) site.

⁵ Not to be exceeded more than once per year on average over 3 years. 2010–2012 maximum PM₁₀ concentration at Sheridan Police Station Monitoring Site (AQS ID: 56–033–0002).

⁶ To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor in an area must not exceed 35 $\mu\text{g}/\text{m}^3$. 3-year (2010–2012) average of the 98th percentiles of 24-hour average PM_{2.5} concentration at Sheridan Police Station Monitoring Site (AQS ID: 56–033–0002).

⁷ To attain this standard, the 3-year average of the weighted annual mean concentrations from single or multiple community-oriented monitors must not exceed 12.0 $\mu\text{g}/\text{m}^3$. 3-year (2010–2012) average of the annual mean PM_{2.5} concentration at Sheridan Police Station Monitoring Site (AQS ID: 56–033–0002).

⁸ To attain this standard, the 3-year average of the 99th percentile of 1-hour concentrations at each monitor within an area must not exceed 100 ppb. 3-year (2010–2012) average of the 99th percentile 1-hour concentrations for Wyodak Site 4 (AQS ID: 56–005–0857).

$\mu\text{g}/\text{m}^3$ micrograms per cubic meter

EPA Environmental Protection Agency

N/A not applicable

NAAQS National Ambient Air Quality Standards

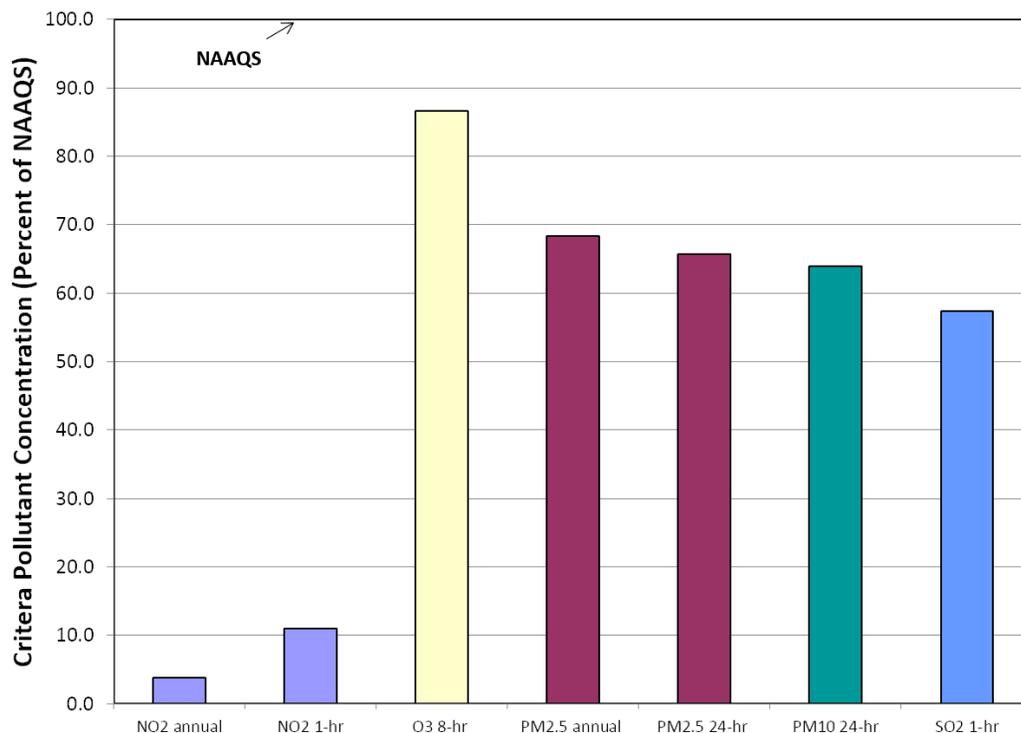
PM_{2.5} particulate matter with an aerodynamic diameter equal to or less than 2.5 microns

PM₁₀ particulate matter with an aerodynamic diameter equal to or less than 10 microns

ppm parts per million

ppb parts per billion

WAAQS Wyoming Ambient Air Quality Standards



Source: EPA 2013

Note: The representative maximum pollutant concentrations as a percentage of the NAAQS were calculated using the values in Table L.1, “National and State Primary Air Quality Standards for Criteria Pollutants and Representative Concentrations for the Planning Area” (p. 541), which also provides the location and time period associated with monitoring data.

NAAQS National Ambient Air Quality Standards

Figure L.1. Representative Maximum Pollutant Concentrations in the Planning Area as Percentage of NAAQS

- Consistent with the monitoring strategy of Management Action AQ-1002, the BLM Wyoming operates the Wyoming Air Resource Monitoring System (WARMS), a network of six air quality monitoring sites located throughout the state. Four of these sites are located in the planning area and two sites are located near the planning area – these sites are listed in Table L.2, “WARMS Network in and Near the Planning Area” (p. 544) along with location, parameters monitored, and monitored particulate matter less than 2.5 microns (PM_{2.5}) concentrations. These sites also monitor hourly meteorological conditions including wind speed, wind direction, temperature, relative humidity, solar radiation, precipitation, and barometric pressure. The purpose of the WARMS network is to provide a general indicator of existing air quality and long term trends in air quality; it is not intended for use in determining NAAQS compliance. As shown in Table L.2, “WARMS Network in and Near the Planning

Area” (p. 544), annual mean PM_{2.5} values are below the NAAQS of 12 micrograms per cubic meter (µg/m³) and the 98th percentile 24-hour average concentrations for any given year are below the NAAQS of 35 µg/m³. The only WARMS monitor in Table L.2, “WARMS Network in and Near the Planning Area” (p. 544) for which ozone data are available is the Basin monitor, which recorded a maximum 8-hour average of 0.061 parts per million (ppm) in 2011 and 0.065 ppm in 2012, both of which are below the NAAQS of 0.075 ppm.

- Two WARMS sites outside the planning area include the Basin site located approximately 40 miles west of the planning area and the Newcastle site located approximately 43 miles east of the planning area (Table L.2, “WARMS Network in and Near the Planning Area” (p. 544)). These sites were upgraded in 2012 to be fully compliant with, and part of, the Clean Air Status and Trends Network (CASTNET) system supported by the EPA (Sheridan and Buffalo sites are also part of the CASTNET system). CASTNET provides long-term monitoring of air quality in rural areas to determine trends in regional atmospheric nitrogen, sulfur, and ozone concentrations and dry deposition fluxes of sulfur and nitrogen pollutants in order to evaluate the effectiveness of national and regional air pollution control programs.

Table L.2. WARMS Network in and Near the Planning Area

| Site | Approximate Location | Parameters Monitored | | | PM _{2.5} Concentrations (ug/m ³) | | | | | |
|------------------------------|-----------------------------|----------------------------|----------------------------|----------------|---|-------------------------|-------------|-------------------------|-------------|-------------------------|
| | | | | | 2010 | | 2011 | | 2012 | |
| | | Speciated Aerosol (weekly) | PM _{2.5} (1-hour) | Ozone (1-hour) | Annual Mean | 24-hour 98th Percentile | Annual Mean | 24-hour 98th Percentile | Annual Mean | 24-hour 98th Percentile |
| In Planning Area | | | | | | | | | | |
| Buffalo | 30 miles SE of Buffalo | x | x | | 3.0 | 9 | 2.5 | 9 | 3.3 | 11 |
| Fortification Creek | 10 miles N of Gillette | x | x | | -- ¹ | -- | -- | -- | -- | -- |
| Sheridan | In Sheridan | x | x | x ² | 1.5 | 9 | 1.5 | 11 | 3.0 | 16 |
| South Coal | 50 miles NNW of Gillette | | x | | 0.8 | 6 | 0.8 | 10 | 1.8 | 14 |
| Outside Planning Area | | | | | | | | | | |
| Basin | 40 miles W of Planning Area | x | x | x | -- ³ | -- | -- | -- | 1.0 | 10 |

| Site | Approximate Location | Parameters Monitored | | | PM _{2.5} Concentrations (ug/m ³) | | | | | |
|-----------|-----------------------------|----------------------------|----------------------------|----------------|---|-------------------------|-------------|-------------------------|----------------------|-------------------------|
| | | Speciated Aerosol (weekly) | PM _{2.5} (1-hour) | Ozone (1-hour) | 2010 | | 2011 | | 2012 | |
| | | | | | Annual Mean | 24-hour 98th Percentile | Annual Mean | 24-hour 98th Percentile | Annual Mean | 24-hour 98th Percentile |
| Newcastle | 43 miles E of Planning Area | x | x | x ⁴ | 0.3 | 4 | 0.5 | 4 | 4.0/0.8 ⁵ | 8/8 ⁵ |

Source: WARMS 2013

¹ Fortification Creek is scheduled for installation Spring 2013; thus historic data not available.

² Sheridan did not start ozone monitoring until January 2013; thus historic ozone data not available.

³ Basin did not monitor for PM_{2.5} until upgraded to CASTNET status in late 2012; thus historic data not available.

⁴ Newcastle did not start ozone monitoring until late 2012; thus historic ozone data not available.

⁵ In 2012, an E-BAM replaced an e-sampler; data are provided from both monitors.

CASTNET Clean Air Status and Trends Network

E East

N North

NNW North northwest

PM_{2.5} particulate matter with an aerodynamic diameter equal to or less than 2.5 microns

µg/m³ micrograms per cubic meter

SE Southeast

W West

5. The CAA Prevention of Significant Deterioration (PSD) program protects air quality in areas where the air is clean and the area is in attainment or unclassifiable with respect to NAAQS. The PSD program is a permitting program that, in Wyoming, is implemented by the Wyoming DEQ AQD. PSD is designed to protect clean air so it does not significantly deteriorate, while a margin for future industrial growth is maintained. Under the PSD program, each area in the United States is classified according to the following system:
- **PSD Class I Areas** – Areas with pristine air quality, such as wilderness areas, national parks, and some Native American reservations, are accorded the strictest protection. Only very small incremental increases in pollutant concentrations are allowed in order to maintain the very clean air quality in these areas. Wilderness areas greater than 5,000 acres (and national parks greater than 6,000 acres) that had been established before August 7, 1977 were designated by the CAA as mandatory class I areas.
 - **PSD Class II Areas** – Essentially, all areas that are not designated as Class I are designated as Class II. Moderate incremental increases in pollutant concentrations are allowed, although the concentrations are not allowed to reach the concentrations set by Wyoming and federal standards (WAAQS and NAAQS). Some Class II areas are federally-managed Class II wilderness areas, which are afforded additional air quality protection under the Wilderness Act beyond that provided by CAA.
 - **PSD Class III Areas** – No areas have been designated yet as Class III. A larger incremental increase in pollutant concentrations would be allowed, up to the applicable WAAQS and NAAQS.

Class I areas near the planning area include: the Northern Cheyenne Indian Reservation (25 miles north), the North Absaroka Wilderness Area (75 miles west), the Washakie Wilderness Area (96 miles west), Yellowstone National Park (97 miles west), Wind Cave National Park (80 miles east), and Badlands National Park (110 miles east). The Northern Cheyenne Indian

Reservation received EPA redesignation approval on August 5, 1977, to become a Class I area under the PSD program (40 Code of Federal Regulations 52.1382(c)(2)).

L.1.4. Characterization of Air Resources in the Environmental Impact Statement

1. Emissions Inventory for Land Use Planning

- a. An air emissions inventory was compiled for the planning area to determine the relative magnitude of total air pollutant emissions and to compare emissions between alternatives. This emissions inventory is summarized in the *Technical Support Document for Air Quality* (Appendix M in the Proposed RMP and Final EIS). Emissions were calculated using assumptions about the likelihood of potential future activities occurring under each alternative. As a result, the compiled air emissions inventory represents a comparison of emissions of air pollutants based on best available information for future development projections. The methods and assumptions used in compiling the emissions inventory are provided in Chapter 4, *Air Quality* section, as well as the *Technical Support Document for Air Quality* (Appendix M in the Proposed RMP and Final EIS) which lists emissions generating activities and includes additional details on the computational methods.
- b. The emissions inventory is valuable for contrasting the impact of land use allocations on air resources among alternatives and useful for identifying those activities that are likely to be major contributors of emissions.
- c. The air emissions inventory supports two major conclusions: (1) for the majority of the pollutants examined, emissions are estimated to increase compared to baseline levels for all alternatives except Alternative B, and (2) oil and gas development activities and mining (primarily coal) are the largest contributors to total emissions compared to other managed activities in the planning area.

2. Class I Areas

- a. There are no Class I areas within the planning area. The nearest Class I areas include the Northern Cheyenne Indian Reservation (25 miles north), the North Absaroka Wilderness Area (75 miles west), the Washakie Wilderness Area (96 miles west), Yellowstone National Park (97 miles west), Wind Cave National Park (80 miles east), and Badlands National Park (110 miles east). See Table 3.4 in Chapter 3 of the Proposed RMP and Final EIS for a list of Class I and federally-managed Class II areas in or near the planning area.

Though not located in Class I areas, there are two IMPROVE sites in the planning area: Cloud Peak (western region of the planning area) and Thunder Basin (eastern region of the planning area). A third IMPROVE site is located in the Northern Cheyenne Indian Reservation Class I area, approximately 45 miles from the northern boundary of the planning area. Visibility estimates for these locations, as well as the Badlands, are shown in Chapter 3.

L.2. Air Resource Management Plan

L.2.1. Coal Lease by Application

1. The Wyoming DEQ and DOI Office of Surface Mining Reclamation and Enforcement have the permitting oversight and authority to mitigate air quality or land quality issues for a coal mining operation. The BLM does not stipulate any specific air quality or land quality permitting requirement for a coal lease, but requires lessees to comply with all applicable state and federal laws. A BLM EIS for a coal mining operation will analyze the potential effects to air quality, but any mitigation will be a requirement of the Wyoming DEQ through its permitting process.
2. The Wyoming DEQ AQD administers a permitting program to assist in managing the state's air resources. Under this program, anyone planning to construct, modify, or use a facility capable of emitting designated pollutants into the atmosphere must obtain an air quality permit to construct. Coal mines fall into this category.
3. A new coal mine, or a modification to an existing mine, must be permitted by Wyoming DEQ AQD, pursuant to the provisions of Wyoming Air Quality Standards and Regulations Chapter 6, Section 2. Under these provisions, a permittee must compile detailed emissions inventories and demonstrate compliance with all applicable aspects of Wyoming Air Quality Standards and Regulations, including compliance with WAAQS and NAAQS, before either a permit or amendment is granted.
4. A Best Available Control Technology (BACT) analysis is required to demonstrate the use of an appropriate level of emissions controls. Per Wyoming Air Quality Standards and Regulations Chapter 6, Section 2, BACT at large mining operations typically includes, but is not limited to: the paving of access roads; the treating of major haul roads with a suitable dust suppressant; the treatment of temporary haul roads; the use of silos, trough barns, or similar enclosed containers for the storage of large volumes of material awaiting load out and shipment; and the treatment of active work areas.

L.2.2. Mineral and Energy Development Authorizations

1. The BLM manages the location, density, and/or rate of development to protect air resources.
2. When reviewing a proposed project, the BLM will consider the magnitude of potential air emissions from the project, existing air quality conditions, proximity to Class I and sensitive Class II areas, and issues identified during project scoping to identify pollutants of concern and to determine the appropriate level of air analysis to be conducted for the project.
3. The BLM will require an emissions inventory, as set forth in the MOU, for proposed oil and gas development projects that are analyzed through an EIS. The BLM may require an emissions inventory for proposed oil and gas or mineral development projects that are analyzed through an Environmental Assessment, and may require project specific air quality modeling (see Management Action AQ-1006) depending on project characteristics, proximity to a federally mandated Class I area, sensitive Class II area, or population center, location within a non-attainment or maintenance area, meteorologic or geographic conditions, existing air quality conditions, magnitude of existing development in the area, or issues identified

during project scoping. The emissions inventory will quantify emissions of regulated air pollutants from all sources related to the proposed project, and emissions impacting Class I areas, including fugitive emissions and greenhouse gas emissions. Emissions will be estimated for each year for the life of the project. The BLM will use this estimated emissions inventory to identify pollutants of concern and to determine the appropriate level of air analysis to be conducted for the proposed project. This information will inform monitoring (see Section N.2.3 Monitoring), modeling (see Section N.2.4 Modeling) and mitigation (see Section N.2.5 Mitigation).

4. The BLM has the responsibility to implement the decisions of the RMP in a manner that protects air quality. The BLM also must recognize valid and existing leasing rights. At the project approval stage, the BLM can require specific actions and measures to protect air quality based on expected impacts (Management Actions AQ-1003 and AQ-1005). The BLM may require additional mitigation measures within its authority for emissions sources not otherwise regulated by Wyoming DEQ (see Section N.2.5 paragraph 2).
5. The proponent of a mineral and/or energy development project will be required to provide a detailed description of operator committed measures to reduce project related air pollutant emissions including greenhouse gases and fugitive dust. Project proponents for oil and gas development projects should refer to Table L.3, "Sample Emission Reduction Strategies for Oil and Gas Development Projects" (p. 550) as a reference for potential mitigation technologies and strategies. The list is not intended to preclude the use of other effective air pollution control technologies that may be proposed. Details of the mitigation measure would be submitted by the applicant and enforced as a condition of the BLM-issued authorization.
6. The BLM, in determining the suitability of the operator committed measures required in Section 2.2 paragraph 5, will take into account proximity to a federally mandated Class I area, sensitive Class II area, or population centers, location within a non-attainment or maintenance area, meteorologic or geographic conditions, existing air quality conditions, magnitude of existing development in the area, or issues identified during project scoping.

L.2.3. Monitoring

1. As part of a comprehensive Air RMP for the planning area, the BLM will continue to work cooperatively with federal and state agencies responsible for managing air resources to determine, characterize, and track air resource conditions (Management Action AQ-1002 and AQ-1004). BLM will cooperate with efforts of the Wyoming DEQ to evaluate monitored exceedances. Wyoming DEQ has authority and primacy for regulating and monitoring air quality within the state, including determining causes of monitored exceedances of NAAQS and WAAQS.
2. The BLM will support and participate in regional monitoring efforts to meet Management Action AQ-1002.

L.2.4. Modeling

1. Air dispersion and photochemical grid models are useful tools for predicting project specific impacts to air quality, predicting the potential effectiveness of control measures and strategies, and for predicting trends in regional concentrations of some air pollutants.

2. BLM may require project proponents to conduct air quality modeling based on the absence of sufficient data to ensure compliance with laws and regulations or to determine the effectiveness of mitigation options. The BLM will decide whether far-field modeling is required to support the NEPA analysis for an oil and gas project in accordance with the MOU, based on existing air quality conditions; magnitude of potential air emissions from the project or activity; magnitude of existing emission sources in the area; proximity to a federally mandated Class I area, sensitive Class II area, an area expected to exceed a NAAQS or PSD increment or population center; location within a non-attainment or maintenance area; meteorologic or geographic conditions; project duration; or issues identified during project scoping (Management Action AQ-1006). BLM will require project-specific near field modeling or apply a similar analysis completed for a nearby project, if, after reviewing a proposed project's emission inventory, BLM determines that the project may cause significant near field impacts.
3. BLM will leverage data from current and future modeling efforts being conducted in the region (such as Converse County, Moneta Divide, and other proposed projects that will analyze cumulative impacts with a photochemical grid model) to assess the air quality and air quality related values within the Buffalo Field Office. When results from these types of modeling analyses are used to evaluate impacts within the planning area, BLM will ensure that direct emissions from BLM's management actions within the Buffalo planning area are included in the particular analysis. Pending completion of these modeling analyses, the BLM, in cooperation with an interagency review team, will evaluate impacts from proposed federal actions within the planning area and identify and evaluate, in cooperation with Wyoming DEQ to whom EPA has delegated authority for regulating air quality in Wyoming, the need for additional emission mitigation measures or the need for a more refined modeling analysis.
4. Consistent with Management Action AQ-1004, the BLM will support and participate in regional modeling efforts through multi-state and/or multi-agency organizations such as Western Governors' Association – Western Regional Air Partnership, and the Federal Leadership Forum. If results from an interagency, regional modeling study are used to evaluate impacts within the planning area, the BLM will ensure that direct emissions from BLM's management actions within the region are included in the study.
5. The use of modeling to identify appropriate protection measures is more effective at the project approval stage rather than the leasing stage because the proposed action has been defined in terms of temporal and spatial characteristics as well as development processes and procedures. This better defined information allows more precise identification of impacts to air quality and appropriate level of mitigation.

L.2.5. Mitigation

1. Many of the activities that BLM authorizes, permits, or allows generate air pollutant emissions that have the potential to impact air quality. The primary mechanisms to reduce air quality impacts are to reduce emissions through strategies such as controlling the rate of development, or by implementation of mitigations such as use of emissions control technology.
2. The proponent of a project will be required to reduce air pollutant emissions by complying with all applicable state and federal regulations (including application of BACT) and may be required to apply additional mitigation and other control technologies or strategies.

3. BLM will ensure implementation of additional air emission control measures and strategies within its regulatory authority and in consultation with federal and state agencies responsible for managing air resources, if:
 - a. proposed or committed measures are insufficient to achieve air quality goal PR:1 and objectives PR:1.1, PR:1.2, PR:1.3, and PR:1.4 and Management Action AQ-1003; or
 - b. an air quality impact analysis shows that future impacts likely will be above acceptable levels; or
 - c. a BLM-authorized source caused or contributed to a monitored exceedance of the NAAQS as determined by Wyoming DEQ, in consultation with BLM.

Mitigation may include reduction in the number of locations, density, and/or rate of development, or other measures. Example mitigation strategies for oil and gas development activities are presented in Table L.3, “Sample Emission Reduction Strategies for Oil and Gas Development Projects” (p. 550).

Table L.3. Sample Emission Reduction Strategies for Oil and Gas Development Projects

| Emission Reduction Measure | Advantages and Disadvantages |
|--|--|
| Control Strategies for Drilling and Compression | |
| Directional or Horizontal Drilling | <p>May reduce construction related emissions (dust and vehicle and construction equipment emissions). Decreases surface disturbance and vegetation impacts (dust and carbon dioxide and nitrogen flux). Reduces habitat fragmentation. Applicability depends on geologic strata.</p> <p>May result in higher air impacts in one area with longer sustained drilling times.</p> |
| Improved engine technology (Tier 2 or better) for diesel drill rig engines. | Can reduce oxides of nitrogen (NO _x), particulate matter (PM), carbon monoxide (CO), and volatile organic compounds (VOC) emissions. Use depends on availability of technology from engine manufacturers. |
| Selective Catalytic Reduction (SCR) for drill rig engines and/or compressors. | <p>NO_x emissions reduction, potential decreased formation of visibility impairing compounds and ozone. NO_x control efficiency of 95% achieved on drill rig engines. NO_x emission rate of 0.1 (grams per horsepower per hour) achieved for compressors.</p> <p>Potential ammonia (NH₃) emissions and formation of visibility impairing ammonium sulfate. Regeneration/disposal of catalyst can produce hazardous waste. Not applicable to 2-stroke engines.</p> |
| Non-selective catalytic reduction (NSCR) for drill rig engines and/or compressors. | <p>NO_x emissions reduction, potential decreased formation of visibility impairing compounds and ozone. NO_x control efficiency of 80-90% achieved for drill rig engines. NO_x emission rate of 0.7 grams per horsepower per hour achieved for compressor engines greater than 100 horsepower.</p> <p>Regeneration/disposal of catalysts can produce hazardous waste. Not applicable to lean burn or 2-stroke engines.</p> |

| Emission Reduction Measure | Advantages and Disadvantages |
|---|--|
| Natural gas fired drill rig engines and/or compressors. | NO _x emissions reduction, potential decreased formation of visibility impairing compounds and ozone. Requires onsite processing of field gas. |
| Improved engine technology (Tier 2 or better) for all mobile and non-road diesel engines. | Reduced NO _x , PM, CO, and VOC emissions. Dependent on availability of technology from engine manufacturers. |
| Green (a.k.a. closed loop or flareless) completions and green workovers. | <p>Reduction in VOC and methane emissions. Reduces or eliminates flaring and venting and associated emissions. Reduces or eliminates open pits and associated evaporative emissions. Increased recovery of gas to pipeline rather than atmosphere.</p> <p>Temporary increase in truck traffic and associated emissions. Need adequate pressure and flow. Need onsite infrastructure (tanks/dehydrator). Sales line must be available. Green completion permits required by Wyoming best available control technology (BACT) in some areas.</p> |
| Minimize/eliminate venting and/or use closed loop process where possible during "blow downs." Utilize plunger lift systems with smart automation. | Same as above. Best Management Practices required by Wyoming BACT. |
| Reclaim/remediate existing open pits, no new open pits. | <p>Reduces VOC and greenhouse gas (GHG) emissions. Reduces potential for soil and water contamination. Reduces odors. Requires tank and/or pipeline infrastructure.</p> <p>May increase truck traffic and associated emissions.</p> |
| Electrification of wellhead compression/pumping | <p>Reduces local emissions of fossil fuel combustion and transfers to more easily controlled source. Depends on availability of power and transmission lines.</p> <p>Displaces emissions to Electric Generating Unit (EGU).</p> |
| Seasonally reducing or ceasing drilling during specified periods, or using only lower-emitting drill and completion rig engines during specified time periods. Restrict drilling and/or blowdown activity based on meteorological conditions. | Reduces emissions during periods when emissions are more likely to have impact in local area or at sensitive receptors. |
| Control Strategies Utilizing Centralized Systems | |
| Centralization (or consolidation) of gas processing facilities (separation, dehydration, sweetening, etc.). | <p>Reduces vehicle miles traveled (truck traffic) and associated emissions. Reduced VOC and GHG emissions from individual dehy/separator units.</p> <p>Requires pipeline infrastructure. Temporary increase in construction associated emissions. Higher potential for pipe leaks/groundwater impacts.</p> |
| Liquids gathering systems (for condensate and produced water). | <p>Reduces vehicle miles traveled and associated emissions. Reduced VOC and GHG emissions from tanks, truck loading/unloading, and multiple production facilities.</p> <p>Requires pipeline infrastructure. Temporary increase in construction associated emissions. Higher potential for pipe leaks/groundwater impacts.</p> |
| Water and/or fracturing liquids delivery system, including centralized ("hub and spoke") hydraulic fracturing. | <p>Reduced long term truck traffic and associated emissions. Requires pipeline infrastructure. Not feasible for some terrain.</p> <p>Temporary increase in construction associated emissions. Higher potential for pipe leaks/groundwater impacts.</p> |

| Emission Reduction Measure | Advantages and Disadvantages |
|--|--|
| Control Strategies for Tanks, Separators, and Dehydrators | |
| Capture and control of flashing emissions from all storage tanks and separation vessels with vapor recovery and/or thermal combustion units. | Reduces VOC and GHG emissions. 98% VOC control if greater than or equal to 10 tons per year required statewide by Wyoming BACT. Pressure build up on older tanks can lead to uncontrolled rupture. |
| Capture and control of produced water tank emissions. | Reduces VOC and GHG emissions. 98% VOC control and no open top tanks required by Wyoming Department of Environmental Quality in some areas. |
| Capture and control of dehydration equipment emissions with condensers, vapor recovery, and/or thermal combustion. | Reduces VOC, Hazardous Air Pollutants, and GHG emissions. Still vent condensers required and 98% VOC control if greater than or equal to 8 tons per year required statewide and in concentrated development area by Wyoming BACT. All dehy emissions controlled at 98% in Jonah Pinedale Anticline Development (no 8 tons per year threshold). |
| Control Strategies for Misc. Fugitive VOC Emissions | |
| Install and maintain low VOC emitting seals, valves, hatches on production equipment. | Reduces VOC and GHG emissions. |
| Initiate an equipment leak detection and repair program (including use of Forward Looking Infrared Radiometer cameras, grab samples, organic vapor detection devices, visual inspection, etc.), such as an enhanced direct inspection and maintenance program. | Reduction in VOC and GHG emissions. |
| Install or convert gas operated pneumatic devices and pumps to electric, solar, or instrument (or compressed) air driven devices/controllers. | Reduces VOC and GHG emissions. Required statewide by Wyoming BACT if no thermal combustion used. Electric or compressed air driven operations can displace or increase combustion emissions. Increase in noise due to compressor. |
| Use "low" or "no bleed" gas operated pneumatic devices/controllers. | Reduces VOC and GHG emissions. Closed loop required statewide by Wyoming BACT. |
| Use closed loop system or thermal combustion for gas operated pneumatic pump emissions. | Reduces VOC and GHG emissions. Required statewide by Wyoming BACT (98% VOC control or closed loop). |
| Install vapor recovery on truck loading/unloading operations at tanks. | Reduces emissions of VOC and GHG emissions. Wyoming BACT analysis required if VOC greater than or equal to 8 tons per year or Hazardous Air Pollutants greater than or equal to 5 tons per year. Pressure build up on older tanks can lead to uncontrolled rupture. |
| Control Strategies for Fugitive Dust and Vehicle Emissions | |
| Unpaved surface treatments including watering, chemical suppressants, and gravel. | 20% - 80% control of fugitive dust (particulates) from vehicle traffic. Potential impacts to water and vegetation from runoff of suppressants. |
| Use remote telemetry and automation of wellhead equipment. | Reduces vehicle traffic and associated emissions. |
| Speed limit control and enforcement on unpaved roads, and design of roads to reduce speed. | Reduction of fugitive dust emissions. |
| Reduce commuter vehicle trips through car pools, commuter vans or buses, innovative work schedules, or work camps. | Reduced combustion emissions, reduced fugitive dust emissions, reduced ozone formation, reduced impacts to visibility. |
| Miscellaneous Control Strategies | |

| Emission Reduction Measure | Advantages and Disadvantages |
|--|---|
| Use of ultra-low sulfur diesel in engines, compressors, construction equipment, etc. | Reduces emissions of particulates and sulfates. Fuel not readily available in some areas. |
| Reduce vehicle idling. | <p>Reduced combustion emissions, reduced ozone formation, reduced impacts to visibility, reduced fuel consumption.</p> <p>May not be feasible in remote locations where leaving vehicle in operation is a safety precaution.</p> |
| Reduced density or rate of development. | <p>Peak emissions of all pollutants reduced. May not be economically viable or feasible if multiple mineral interests.</p> <p>Emissions generated at a lower rate but for a longer period. Limited operating period, duration of impacts is longer.</p> |
| Restrict construction activity based on meteorological conditions. | Reduces emissions during periods when emissions are more likely to have impact in local area or at sensitive receptors. |
| <p>% percent BACT Best Available Control Technology CO Carbon monoxide EGU Electric Generating Unit GHG Greenhouse Gas NH₃ Ammonia NO_x Nitrogen oxide NSCR Non-Selective Catalytic Reduction PM Particulate Matter SCR Selective Catalytic Reduction VOC Volatile Organic Compound</p> | |

L.2.6. Contingency Plans

1. If observed effects (e.g., monitored exceedances of the NAAQS) or modeled impacts show state or federal regulatory standards or applicable thresholds for air quality related values may be exceeded, BLM may require mitigation measures within BLM's authority to ensure conformance with RMP air quality goals and objectives. For example, the BLM may manage the location, density and rate of development, or require smaller-emission projects to demonstrate compliance with standards or applicable thresholds.

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Appendix M. Reclamation Policy for the Buffalo Field Office

Introduction

Reclamation is required for any surface-disturbing activity occurring as part of a federal action. A reclamation plan appropriate in detail and complexity and tailored to a specific surface-disturbing activity will be required for each activity. The level of detail for the reclamation plan shall reflect the complexity of the project, the environmental concerns, the reclamation potential for the site, and the reclamation strategy. These plans shall also incorporate any program or regulatory specific requirements for reclamation. The reclamation plan shall address initial disturbance and stabilization, short-term and long term reclamation goals to achieve final restoration. Reclamation plans must set reasonable, achievable, and measurable reclamation goals which are consistent with the established land use plans. This appendix details the reclamation objectives and standards necessary to achieve a timely and proper recovery according to management objects of the disturbed site.

Wyoming Bureau of Land Management (BLM) Reclamation Policy, Instruction Memorandum (IM), No. WY-2012-032 (BLM 2012) states “A reclamation plan shall be developed for all surface disturbing activities and will become part of the proposed action in the National Environmental Policy Act document.” This policy was developed by the Buffalo BLM (hereafter referred to as BLM) to ensure the following: uniform application of exploration, development, and reclamation standards; ensure prompt reclamation of lands to productive uses consistent with land management policies; shall integrate appropriate disciplines in the natural sciences, engineering and design arts in establishing criteria for reclaiming disturbed land, reviewing reclamation plans, and monitoring reclamation activities; shall assist in the identification of information needs that can be provided by research and encourage research projects to provide such information; utilize the best available information in developing and reviewing reclamation plans.

In preparing and reviewing reclamation plans, the BLM and the project proponent will adhere to Wyoming Reclamation Policy for all surface-disturbing activities. In addition, *BLM's Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development “The Gold Book”* (BLM 2006) specially pertain to oil and gas related surface-disturbing activities.

Background

The reclamation plan will provide a framework to develop project level and site-specific reclamation actions and guide land management efforts toward a planned future condition for any surface disturbance. Sensitive areas may require site-specific reclamation measures; Alternatives considered should include: avoidance and/or unconventional site specific reclamation requirements. Early coordination between the BLM and project proponent is necessary to produce a comprehensive plan. The approved reclamation plan will serve as a binding agreement between the project proponent and the BLM for the expected reclamation condition of the disturbed lands and must be periodically reviewed and modified as necessary. The proponent will develop the reclamation plan, with appropriate BLM involvement in preplanning, data inventory, and approval. This is essential to develop the optimum reclamation proposal. Changes to an approved reclamation plan are allowed only with concurrence of the BLM authorized officer.

Site selection for the proposed action prior to disturbance activities is key to reclamation success and is an integral part of the operational plan. Every attempt should be made to develop and implement new ideas and technologies that limit or reduce the amount of land surface disturbance and its impacts. Such planning efforts are necessary for successful reclamation.

Some items to be included in reclamation planning should consider, in part, vegetative succession patterns and processes appropriate for restoration of the project area, salvaging and reusing all available topsoil, site stabilization/erosion control, controlling invasive non-native plants and noxious weeds, and maintenance and health of soils. Monitoring and reporting is the best way to track success and implement adaptive management strategies.

Goals and Objectives

The reclamation plan is designed to meet the following objectives for reclamation of areas disturbed by the Project. On split estate the BLM will consider the views of private surface owner (Onshore Order No.1.XII.B.4).

Initial Construction and Stabilization

- Immediately stabilizing the disturbed areas.
- Controlling and minimizing surface runoff, erosion, and sedimentation.

Interim Reclamation

The objective of interim reclamation is to restore desirable vegetative cover and a portion of the landform sufficient to maintain healthy, biologically active topsoil; control erosion; minimize habitat loss, reduce visual impact, and reduce forage loss during the life of the disturbance. Emphasis should be to reduce the footprint of the disturbed area to that which is necessary for not essential for operational function while minimizing the area to be redisturbed at the time of final reclamation. Items to be addressed under interim reclamation include, in part:

- Stabilizing the disturbed soil surface, controlling runoff and erosion, and establishing new vegetation.
- Ensuring adequate surface roughness to reduce runoff and to capture rainfall and snow.
- Controlling and minimizing surface runoff, erosion, and sedimentation using diversion and water treatment structures.
- Restoring primary productivity of the site and establishing vegetation that will provide for natural plant and community succession.
- Establishing a vigorous stand of desirable plant species that will limit or preclude the invasion of undesirable species, including noxious/invasive species.
- Reseeding the disturbed areas with native plant species beneficial to wildlife and livestock.

Final Reclamation and Restoration

The long-term objective of final reclamation is to return the land to an approximate condition and/or function of that which existed prior to disturbance. This includes restoration of the landform and natural vegetative community, soil health, hydrologic systems, visual resources, and wildlife habitats. To ensure that the long-term objective will be reached through human and natural processes, action will be taken to ensure requirements are met for site stability, visual quality, hydrological functioning and vegetative productivity. In addition to achieving the interim reclamation objectives, items to be addressed under final reclamation include, in part:

- Re-contouring to approximate pre-construction grade;

- Enhancing aesthetic values; in the long-term, reclaimed landscapes would have characteristics that approximate the visual quality of adjacent areas, including location, scale, shape, color, and orientation of undisturbed major landscape features.

Reclamation Plan

Reclamation plans provide detailed guidelines for the reclamation process and fulfill federal, state, county, and other local agencies requirements. They can be used by regulatory agencies to ensure that the reclamation measures are implemented, are appropriate for the site. Reclamation plans will be used by the project proponent throughout the operational period of the project and subsequent to cessation of surface-disturbing activities. In turn, responsible agencies, including the BLM, will use the reclamation plan as a basis to review and evaluate the success of the reclamation program. Reclamation plans should provide methods to assist in monitoring and compliance evaluations.

A reclamation plan is a planning document which will provide comprehensive as well as detailed reclamation procedures, methods and actions to successfully meet the final objective. The following items are emphasized to achieve reclamation goals:

1. Properly locate site prior to disturbance;
2. Minimize disturbance of the existing environment;
3. Conduct preliminary baseline surveys to allow for proper planning and timely implementation of planned activities. Such surveys may include existing plant communities, composition, structure, (e.g., Ecological Site Description [ESD]) and successional pathway are appropriate for restoration of the project area;
4. Establish desired native vegetation that fits in with the successional stage of the identified (ESD) or an alternate vegetative regime in consultation with the BLM;
5. Identify and map areas of Limited Reclamation Potential;
6. Identify and map soils with Poor Reclamation Suitability, Severe Erosion Potential, Slopes in Excess of 25 Percent;
7. Identify and map hydrologic features;
8. Additional detailed information would include:
 - a. ESDs, referenced plant communities, and soil map unit(s);
 - b. Methods planned to conserve suitable topsoil for use in reclamation;
 - c. Identify topsoil depth, and proposed location of stockpiled subsoil and topsoil;
 - d. Identify limiting soil factors through soil analysis;
 - e. Predisturbance photo or current photo documenting the condition of the site;
 - f. A statement of acreage of initial disturbance, acreage of disturbance for interim reclamation, and acreage that will be re-disturbed preparing the surface for final reclamation.

The level of detail for the reclamation plan shall reflect: the complexity of the project, the environmental concerns, and the reclamation potential for the site. The reclamation plan is considered complete when all the reclamation requirements in Wyoming Reclamation Policy IM 2010-022 have been addressed, the techniques to meet the reclamation requirements are described in detail, and the BLM concurs with the reclamation plan during the project planning process, as well as subsequent revisions.

The Resource Management Plan (RMP) indicates and identifies soils in the planning area that are severely erosive or otherwise sensitive to physical disturbance (see the Soils section in Chapter 3

of the Proposed RMP and Final Environmental Impact Statement [EIS]). Table M.1, “Sensitive Soil Areas on BLM-administered Surface in the Planning Area” (p. 558) shows the approximate acres and sensitive soils in the planning area. Surface disturbance in areas listed in Table M.1, “Sensitive Soil Areas on BLM-administered Surface in the Planning Area” (p. 558) will be strictly controlled or, if necessary, prohibited.

Table M.1. Sensitive Soil Areas on BLM-administered Surface in the Planning Area

| Relative Erosion Potential | Acres | Percent of Planning Area |
|-------------------------------|---------|--------------------------|
| Limited Reclamation Potential | 218,928 | 28 |
| Severe Erosion Potential | 215,496 | 28 |
| Slopes in Excess of 25% | 170,590 | 22 |

Source: NRCS 2010
 *For analysis purposes, sensitive soils and sites, NRCS SSURGO data were evaluated and displayed with GIS tools. The areas identified as sensitive could be substantially less due to the generalization in the applicable GIS shape file polygons. Soil mapping units may have cumulative sensitive features.

GIS Geographic Information System
 NRCS Natural Resources Conservation Service
 SSURGO Soil Survey Geographic Database

Where surface disturbance is proposed in areas identified in Table M.1, “Sensitive Soil Areas on BLM-administered Surface in the Planning Area” (p. 558) or in areas where there are other resource concerns such as habitat fragmentation, a more detailed reclamation plan may be required. These more detailed reclamation plans must be appropriate for the site and may include any or all of the following, in addition to those listed above:

1. Disturbance specific stabilization efforts and reclamation plans described by surveyed station number, latitude/longitude or by erosive feature;
2. Engineered diagrams layered on topographical maps showing cut/fills and limits of disturbance;
3. Additional information may be required at the discretion of the authorized officer; for example but not limited to a geotechnical analysis, and/or reclamation bonding depending upon specific site characteristics.

A qualified soil specialist will make all topsoil salvage recommendations prior to land disturbance. These recommendations will be based on review of soil mapping units of specific well sites and soil sampling within common soil mapping units and vegetation communities, as needed.

Wyoming Department of Environmental Quality’s Guideline 1 Topsoil and Overburden will be used as a reference to rank soils as good, fair, or poor for topsoil salvage. In no case will soils rated poor for topsoil salvage be used unless properly amended, as determined by a qualified soil specialist.

Re-vegetation:

Every effort should be made to use state of the art knowledge for successful reclamation of disturbed sites some applicable references may include: BLM Manual 5714 for seeding methods Refer to BLM Handbook 1740-2 for native seed and plant materials selection.

Success Criteria

The BLM will evaluate reclamation success using the requirements set forth in the BLM Reclamation Policy IM WY-2012-032 (BLM 2012) with emphasis on soil stabilization and

revegetation. Soil stabilization or erosion control is generally sufficient when water naturally infiltrates into the soil and no evidence of accelerated erosion on or adjacent to the reclaimed site. Reclamation can generally be judged successful when a self-sustaining, vigorous, diverse, native (or otherwise approved) plant community is established on the site with a density sufficient to control erosion and re-establish wildlife habitat or forage. Private surface owner rights will be respected when considering desired objectives, vegetation methods, including specific seed mix(s), and soil amendments.

Soil stability would be measured using an erosion condition class/soil surface factor rating method to numerically rate soil movement, surface litter, surface rock, pedestalling, flow patterns, and rill or gully formation. Information obtained through this rating system represents an expression of current erosion activity and can be used to reflect revegetation success as a function of soil stability. These methods are described in BLM Technical Note 346, Erosion Condition Classification System.

Baseline vegetation communities should be described prior to disturbance. Methods to gather such data should be discussed with the BLM. ESD may be more suitable than baseline conditions because baseline or current plant communities may not represent the ideal or most desirable plant communities for a given area. ESDs are useful for making decisions for plant communities under some type of disturbance, such as fire. In addition, they describe potential, suitable plants for reclamation under a wide range of adverse soil and climatic conditions.

Revegetation success will be determined by the BLM. In general, reclamation success would include the following qualitative and quantitative vegetation parameters:

- Percent of vegetation cover,
- Percent of total ground cover,
- Density of shrub and sub-shrub species,
- Aerial extent of shrub mosaics, and
- Species diversity and species composition.

When ascertaining if reclamation success criteria have been met, the Buffalo Field Office BLM will evaluate basal cover, canopy cover, species diversity, and soil stability to make their determination. The operator may use any BLM approved monitoring method to examine reclamation success.

Interim reclamation success criteria:

1. Disturbed areas not essential for operational function will be re-contoured to allow for restoration of the original landform; soil compaction is relieved and topsoil is respread;
2. The disturbance has been seeded with the approved seed mix;
3. Native, perennial vegetation is becoming established with desirable species and trending towards long-term goal(s) through qualitative or quantitative documentation;
4. Litter, bare ground and desirable vegetation trending to reflect the desired vegetative state and transition of the site as described in the appropriate ESD reference sheet for the site and field verified;
5. Reference areas selection and comparison methodology should be discussed with the BLM and approved by the authorized officer prior to data gathering.
6. Site should be free of all listed species on county, State of Wyoming, or federal noxious weed list;
7. Plants must be resilient as evidenced by well-developed root systems, flowers, and seed heads.
8. The operator has ensured that the site is in stable condition.

9. BLM will make the determination above by evaluating erosional features described in the Erosion Control Classification System (Clark 1980).
10. Erosion control measures are in place to prevent erosion.
11. Such criteria could be measured after a minimum of one growing season, as needed.

Final reclamation success criteria:

In addition to the success criteria listed under interim reclamation the following shall be evaluated:

1. Native Perennial Grasses: Reclaimed sites must have a minimum of 3 native perennial grass species within the overall data summary established in the disturbance area, 1 of which must be a bunchgrass species.
2. Native Perennial Forbs: Reclaimed sites must have a minimum of 3 native perennial forb species within the overall data summary established in the disturbance area.
3. Native Shrubs: Reclaimed sites must have a minimum of 2 native shrub species within the overall data summary established in the disturbance area. Some sub-shrubs may be substituted based on approval by the BLM.
4. Weeds: Sites must be free from all species listed on the county, Wyoming or federal noxious weed list. All state and federal laws regarding noxious weeds must be followed. Other highly competitive invasive species such as cheatgrass will not exceed 25% of background of an approved BLM reference site and maintains soil surface integrity.
5. Plant Vigor: Plants must be resilient as evidenced by well-developed root systems, lowers, and seed heads. All sites must exhibit the sustainability of the above desired attributes after the removal of external influences .
6. Plant cover and litter is each at 80%, respectively, of the ESD reference sheet or greater of soil surface or background of an approved BLM reference site and maintains soil surface integrity.
7. Bare Ground: Bare ground will not exceed 80% of the ESD reference sheet or background of an approved BLM reference site.
8. Such criteria could be measured after a minimum of two growing seasons.

Monitoring Protocol

Monitoring of reclaimed areas will ensure reclamation success criteria have been met. Reclamation monitoring protocol will be included in the reclamation plan. The authorized officer will be notified by the project proponent when reclamation operations have been completed, meet the success criteria, and are ready for final inspection. For final release BLM will utilize an approved monitoring methodology. Approved monitoring methods are described in BLM Technical Reference 4400-4, 1996 and can be located on the web at: <http://www.blm.gov/nstc/library/pdf/samplveg.pdf>. Alternative methodologies should be discussed with the BLM.

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Appendix N. Buffalo Water Resources Management Plan

N.1. Introduction

N.1.1. Purpose

1. The purpose of this Water Resources Management Plan (Plan) is to further clarify water quality goals, objectives, and management actions set forth in Table 3.3, “1000 PHYSICAL RESOURCES (PR) – WATER” (p. 85) of the Approved Resource Management Plan (RMP). This Plan describes water resources management, and outlines specific requirements for proponents of projects that have the potential to produce water as a by-product or waste which could impact water resources within the planning area. Where applicable, this Plan refers to the goals and objectives found in Table 3.3, “1000 PHYSICAL RESOURCES (PR) – WATER” (p. 85) of the Approved RMP.
2. This Plan may be modified as necessary to comply with law, regulation, and policy and to address new information and changing circumstances.

N.1.2. Authority for Water Resource Management

1. **Federal Land Policy and Management Act of 1976.** Federal Land Policy and Management Act (FLPMA) provides Bureau of Land Management’s (BLM) basic operating authority. It establishes a unified, comprehensive, and systematic approach to managing and preserving public lands in a way that protects “the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values.” FLPMA directs that in developing and revising its RMPs, the BLM shall provide for compliance with applicable water pollution control laws, including state and federal pollution standards or implementation plans.
2. **Clean Water Act of 1972.** The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. Under the CWA, United States (U.S.) Environmental Protection Agency (EPA) has implemented pollution control programs such as setting wastewater standards for industry and water quality standards for all contaminants in surface waters. The CWA made it unlawful to discharge any pollutant from a point source into navigable waters, unless a permit was obtained. EPA's National Pollutant Discharge Elimination System (NPDES) permit program controls discharges. Point sources are discrete conveyances such as pipes or man-made ditches. Industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters (EPA 2013).

The Wyoming Department of Environmental Quality (DEQ) Water Quality Division (WQD) has been delegated authority by the EPA to implement federal programs of the CWA. The Wyoming DEQ WQD is responsible for managing water quality through the Wyoming Water Quality Rules and Regulations and the Wyoming State Implementation Plan. In accordance with revisions to Chapter 2 of the Wyoming Water Quality Rules and Regulations the state program name, NPDES, was changed to the Wyoming Pollutant Discharge Elimination System (WYPDES). This change clarified that the Wyoming DEQ is the permitting authority for surface discharges within the

state. BLM's authority relating to water discharges is described in Onshore Oil and Gas Order No. 7; Disposal of Produced Water. **Approval by the Wyoming DEQ, Wyoming Oil and Gas Conservation Commission (WOGCC) or EPA is not considered as granting approval for discharge or disposal from a federal mineral action until and unless BLM approval is obtained.**

In 1990, the EPA published regulations requiring all storm water discharges associated with industrial facilities to obtain storm water discharge permits. In Wyoming, where the Wyoming DEQ is the permitting authority, Chapter 2, Section 6, of the Wyoming Water Quality Rules and Regulations requires permits for storm water discharges from all construction activities disturbing 1 or more acres. The type of facility being constructed does not change the requirement to obtain permit coverage. As such, construction of oil and gas facilities requires storm water discharge permits from the Wyoming DEQ.

Section 404 of the CWA requires approval prior to discharging dredged or fill material into waters of the United States, including wetlands. Any person or entity planning to work in waters of the United States, or dump or place dredged or fill material in waters of the United States, must first obtain a permit from the U.S. Army Corps of Engineers. Prior to issuing a permit, the U.S. Army Corps of Engineers must be presented with a certification from the state that the proposed project will not result in a violation of the state's water quality standards. This is referred to as a CWA Section 401 certification and is provided by the Wyoming DEQ, WQD.

3. Resource Conservation and Recovery Act of 1976. The Resource Conservation and Recovery Act gives EPA the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. Resource Conservation and Recovery Act also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to Resource Conservation and Recovery Act enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances.

4. Safe Drinking Water Act of 1974. The Safe Drinking Water Act is the main federal law that ensures the quality of Americans' drinking water. Under Safe Drinking Water Act, EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards. Authorities under the Safe Drinking Water Act reside with EPA; they have not been delegated, except in limited cases, to the State of Wyoming. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and groundwater wells.

5. National Environmental Policy Act. The National Environmental Policy Act (NEPA) establishes a public, interdisciplinary framework for federal decision-making and ensures that the BLM and other federal agencies take environmental factors into account when considering federal actions. The BLM uses the NEPA process to analyze potential impacts of its proposed actions on water and other resources and to consider appropriate measures to mitigate adverse impacts.

6. Powder River Basin Final Environmental Impact Statement and Record of Decision. The Powder River Basin (PRB) Final Environmental Impact Statement (EIS) and Record of Decision (ROD) for the PRB Oil and Gas Project (BLM 2003) is a programmatic document that provides guidance for managing BLM-administered oil and gas activities with the PRB. The analysis and decision document included a description of the management goals, objectives, management actions, and conditions of use that guide future management of oil and gas operations on public lands and federal mineral estate managed by the BLM within the Buffalo planning area.

The PRB Final EIS ROD is not the final approval for the action proposed within the PRB oil and gas area. A separate authorization is required from BLM (or other permitting agency such as U.S. Forest Service [USFS]) prior to approval of any application for permit to drill (APD), Plan of Development (POD), Sundry Notice, Right-of-way (ROW) Grant or Special-Use Permit before any construction can occur. (BLM 2003) Prior to the approval of an application, additional site-specific NEPA analyses would most likely be required.

The ROD requires that the operator of a coalbed natural gas (CBNG) project include a water management plan that addresses the handling of produced water during the testing and production of CBNG wells as part of the submission of APDs or PODs. The water management plan must provide adequate information for the BLM to complete site-specific NEPA analysis.

Water disposal for conventional oil and gas must conform with 43 Code of Federal Regulations (CFR) 3160 Onshore Oil and Gas Order No. 7; Disposal of Produced Water. For water management under this order, the operator must submit a sundry request which identifies the water quality to be disposed, type of disposal facility (well, pit, evaporation pond, etc.), method of transport to the disposal facility, and proof of authorization for that facility through the pertinent state agency (Wyoming DEQ or WOGCC).

Under both FLPMA and the CWA, the BLM cannot authorize any activity which does not comply with all applicable local, state, tribal, and federal air quality laws, statutes, regulations, standards, and implementation plans.

N.1.3. Background and Current Conditions

Preparation of the Analysis of the Management Situation in 2009, as well as the PRB Final EIS disclosed that extensive energy development within the planning area, especially coal and fluid minerals, could lead to water quality and quantity impacts. Since the production of CBNG requires that the coal zone pressure be reduced to the point of gas evolution and water management was identified as one of the major issues, there was extensive surface and groundwater analysis included in the NEPA assessment for the PRB Final EIS.

Establishment of baseline conditions and monitoring selected representative water components, such as water level, quality and flow rates, can continue to characterize changes over time.

N.1.3.1. Water Baseline

Surface Water

The PRB Final EIS ROD selected water management from Alternative 2A to reduce the volume of produced water that would reach basin mainstems and their tributaries in the PRB, reducing the potential for adverse effects on surface water quality. The Powder River, Little Powder River, and Tongue River watersheds are heavily used by downstream irrigators. Alternative 2A emphasized infiltration and storage of the produced waters in shallow aquifers for local beneficial use. Historic flow rates for the mainstems were summarized in the PRB Final EIS, Table 3-8, page 3-41. Data from 2001 through 2011 is presented below in Table N.1, “Monthly Mean Discharge (cubic feet per second) 2001 to 2011” (p. 566) and further discussed in the *Water Resources* section of Chapter 3.

Table N.1. Monthly Mean Discharge (cubic feet per second) 2001 to 2011

| Year | January | February | March | April | May | June | July | August | September | October | November | December |
|----------------------------|---------|----------|-------|-------|-------|-------|-------|--------|-----------|---------|----------|----------|
| Upper Powder River | | | | | | | | | | | | |
| 2001 | 118 | 101 | 408 | 189 | 140 | 61.2 | 232 | 2.4 | 0 | 38.2 | 92.2 | 65.3 |
| 2002 | 55.8 | 76.6 | 197 | 274 | 188 | 34.1 | 60.6 | 139 | 111 | 95.6 | 198 | 87.2 |
| 2003 | 97.8 | 112 | 360 | 375 | 344 | 301 | 76.8 | 10.3 | 17 | 40.9 | 89.4 | 102 |
| 2004 | 65.3 | 109 | 244 | 147 | 131 | 31.6 | 77.8 | 8.3 | 0.51 | 64.1 | 114 | 110 |
| 2005 | 151 | 192 | 132 | 176 | 683 | 383 | 70.7 | 42.2 | 0.26 | 80.8 | 111 | 81 |
| 2006 | 135 | 126 | 271 | 222 | 270 | 84.7 | 14.7 | 3.41 | 24.8 | 83.6 | 97.3 | 78.4 |
| 2007 | 64.8 | 80.3 | 267 | 342 | 688 | 440 | 208 | 84.8 | 25.8 | 104 | 136 | 94 |
| 2008 | 98.1 | 132 | 318 | 184 | 1,561 | 1,321 | 319 | 50.7 | 69.5 | 129 | 173 | 88.6 |
| 2009 | 131 | 293 | 347 | 472 | 439 | 338 | 189 | 144 | 73.4 | 184 | 182 | 57.1 |
| 2010 | 65.7 | 141 | 264 | 439 | 1,111 | 1,055 | 264 | 70 | 33.9 | 94.4 | 160 | 137 |
| 2011 | 96.2 | 171 | 299 | 217 | 1,059 | 1,984 | 399 | 71 | 75 | 174 | 174 | 106 |
| Monthly Mean | 105 | 139 | 283 | 276 | 601 | 549 | 174 | 57 | 39 | 99 | 139 | 91 |
| Middle Powder River | | | | | | | | | | | | |
| 2001 | 139 | 144 | 294 | 230 | 177 | 93 | 173 | 2.57 | 7.65 | 55.2 | 127 | 134 |
| 2002 | 196 | 237 | 185 | 312 | 181 | 67.2 | 53.8 | 250 | 185 | 160 | 190 | 131 |
| 2003 | 154 | 201 | 588 | 578 | 574 | 666 | 155 | 26.3 | 64 | 79 | 91.3 | 157 |
| 2004 | 56.6 | 76.4 | 368 | 212 | 124 | 31.1 | 117 | 33.3 | 58.1 | 162 | 222 | 142 |
| 2005 | 136 | 158 | 199 | 242 | 1,389 | 975 | 227 | 151 | 47.3 | 163 | 175 | 107 |
| 2006 | 196 | 173 | 339 | 323 | 315 | 126 | 10 | 0.97 | 45.8 | 118 | 180 | 86.5 |
| 2007 | 83.4 | 71.8 | 288 | 427 | 1,183 | 1,156 | 281 | 161 | 138 | 199 | 233 | 182 |
| 2008 | 93.9 | 158 | 540 | 292 | 2,514 | 3,204 | 1,030 | 92.2 | 148 | 250 | 289 | 191 |
| 2009 | 213 | 412 | 641 | 757 | 859 | 968 | 429 | 272 | 104 | 322 | 306 | 165 |
| 2010 | 180 | 248 | 419 | 513 | 1,430 | 2,013 | 548 | 116 | 60.6 | 149 | 233 | 216 |
| 2011 | 216 | 225 | 461 | 360 | 1,616 | 3,702 | 1,224 | 134 | 93.4 | 242 | 293 | 275 |
| Monthly Mean | 151 | 191 | 393 | 386 | 942 | 1,180 | 386 | 113 | 86 | 173 | 213 | 162 |
| Belle Fourche River | | | | | | | | | | | | |
| 2001 | 3.62 | 4.37 | 37.8 | 29.8 | 14.7 | 28.4 | 7.23 | 2.56 | 2.46 | 5.02 | 6.13 | 6.3 |
| 2002 | 2.41 | 4.7 | 14.1 | 39.2 | 23.9 | 22.1 | 3.77 | 15.7 | 5.98 | 5.14 | 7.27 | 4.89 |
| 2003 | 5.15 | 6.86 | 100 | 14.2 | 14 | 79.7 | 9.99 | 2.21 | 4.93 | 4.73 | 6.05 | 5.57 |
| 2004 | 3.61 | 12.9 | 11.9 | 6.72 | 4.24 | 1.67 | 16.3 | 2.32 | 1.45 | 2.51 | 6.4 | 3.43 |
| 2005 | 4.37 | 7.49 | 9.29 | 20.7 | 53.4 | 8.73 | 1.56 | 4.35 | 1.06 | 4.65 | 3.6 | 5.51 |
| 2006 | 6.5 | 5.56 | 9.49 | 7.05 | 15.9 | 3.02 | 0.17 | 2.87 | 3.61 | 3.86 | 5.11 | 3.21 |

| Year | January | February | March | April | May | June | July | August | September | October | November | December |
|--------------------------|---------|----------|-------|-------|------|-------|------|--------|-----------|---------|----------|----------|
| 2007 | 1.87 | 9.8 | 37.2 | 42.9 | 116 | 59.3 | 3.84 | 2.83 | 3.23 | 4.25 | 2.93 | 3.11 |
| 2008 | 2.84 | 8.57 | 49.9 | 13 | 173 | 101 | 15.2 | 5.88 | 6.67 | 9 | 8.35 | 4.21 |
| 2009 | 8.53 | 32.8 | 25.4 | 111 | 18.1 | 14.6 | 12.5 | 9.05 | 4.22 | 8.43 | 9.47 | 5.72 |
| 2010 | 4.09 | 8.44 | 26.2 | 18.3 | 63.3 | 41.9 | 10.4 | 6.76 | 2.39 | 3.7 | 5.17 | 3.14 |
| 2011 | 3.5 | 64 | 147 | 30.4 | 282 | 109 | 18.5 | 7.93 | 7.34 | 8.92 | 11.9 | 7.28 |
| Monthly Mean | 4.2 | 15 | 43 | 30 | 71 | 43 | 9 | 5.7 | 3.9 | 5.4 | 6.6 | 4.8 |
| Cheyenne River | | | | | | | | | | | | |
| 2003 | - | - | - | - | - | - | - | - | - | 0.06 | 0.09 | 0.08 |
| 2004 | 0.05 | 0.02 | 0.29 | 0.14 | 0.22 | 0.07 | 0.01 | 0 | 0 | 0 | 0.02 | 0.03 |
| 2005 | 0 | 0.06 | 0.15 | 1.84 | 7.98 | 28.6 | 4.35 | 6.36 | 0.68 | 0.28 | 0.56 | 0.04 |
| 2006 | 0.01 | 0 | 0 | 0.16 | 0.07 | 1.07 | 0 | 27.8 | 0.05 | 0.02 | 0.05 | 0.21 |
| 2007 | 0.13 | 0.04 | 5.71 | 2.91 | 56.2 | 1.6 | 0.92 | 3.79 | 0.02 | 0.03 | 0.62 | 0.17 |
| 2008 | 0 | 0.05 | 0.77 | 0.27 | 267 | 39 | 35.2 | 3.74 | 0.14 | 0.07 | 0.15 | 0.1 |
| 2009 | 0.02 | 4.3 | 1.18 | 52.8 | 14.3 | 25.4 | 53.3 | 10.3 | 0.2 | 0.35 | 0.32 | 0.17 |
| 2010 | 0.04 | 0.01 | 11.9 | 12.1 | 168 | 123 | 33.5 | 3.87 | 0.93 | 7 | 3.41 | 2.36 |
| 2011 | 2.86 | 182 | 330 | 36 | 86.9 | 67.6 | 24.5 | 5.79 | 2.12 | 1.72 | 2.59 | 1.72 |
| Monthly Mean | 0.39 | 23 | 44 | 13 | 75 | 36 | 19 | 7.7 | 0.52 | 1 | 0.87 | 0.54 |
| Clear Creek | | | | | | | | | | | | |
| 2003 | - | 48.9 | 117 | 142 | 195 | 235 | 60.5 | 20.6 | 53.9 | 52.7 | 66.8 | 56.3 |
| 2004 | 48.5 | 60.3 | 74.3 | 71.1 | 5.61 | 1 | 42.4 | 15.3 | 53.6 | 86.7 | 62.7 | 70 |
| 2005 | 59.7 | 75.1 | 62.7 | 70.8 | 650 | 511 | 159 | 115 | 45.5 | 93.3 | 92.3 | 64.3 |
| 2006 | 91.4 | 64.8 | 87.9 | 137 | 87.9 | 25 | 1.63 | 0.77 | 19.2 | 48.6 | 59.2 | 52.7 |
| 2007 | 45.2 | 44.3 | 103 | 102 | 495 | 704 | 92.8 | 20.7 | 101 | 106 | 94.2 | 72.4 |
| 2008 | 62.6 | 72.6 | 167 | 95.5 | 901 | 1466 | 478 | 24.9 | 71.6 | 113 | 102 | 59.1 |
| 2009 | 75 | 124 | 140 | 199 | 371 | 608 | 253 | 89 | 33.2 | 130 | 131 | 59.7 |
| 2010 | 59.9 | 57.9 | 105 | 93.5 | 392 | 1,124 | 258 | 37.3 | 26.8 | 63 | 77.3 | 64.5 |
| 2011 | 79.6 | 89.9 | 151 | 142 | 580 | 1,616 | 678 | 47.6 | 26.9 | 104 | 114 | 102 |
| Monthly Mean | 65 | 71 | 112 | 117 | 409 | 699 | 225 | 41 | 48 | 89 | 89 | 67 |
| Crazy Woman Creek | | | | | | | | | | | | |
| 2001 | 17.2 | 12.5 | 36.8 | 12.5 | 8.57 | 6.58 | 74.1 | 0.29 | 0.06 | 0.1 | 3.19 | 8.62 |
| 2002 | 5.61 | 7.94 | 14.6 | 20.5 | 7.09 | 4.18 | 8.08 | 14.4 | 1.87 | 4.05 | 12.2 | 11.4 |
| 2003 | 10 | 13 | 30.3 | 53.1 | 84.9 | 125 | 31.7 | 2.41 | 4.2 | 5.21 | 12.7 | 15.3 |
| 2004 | 8.65 | 15.4 | 27.5 | 8.76 | 5.5 | 1.78 | 12.3 | 0.95 | 0.11 | 3.94 | 10.8 | 13.9 |
| 2005 | 10.2 | 13.4 | 11.2 | 20.6 | 174 | 168 | 38.2 | 11.4 | 1.37 | 10.2 | 13.3 | 8.73 |
| 2006 | 14.8 | 11.3 | 18.6 | 13.9 | 7.73 | 2.05 | 0.01 | 0.02 | 0.02 | 0.05 | 0.45 | 1.04 |

| Year | January | February | March | April | May | June | July | August | September | October | November | December |
|---------------------|---------|----------|-------|-------|-------|-------|-------|--------|-----------|---------|----------|----------|
| 2007 | 0.64 | 3.5 | 15.5 | 11 | 29.4 | 48.4 | 14.1 | 3.9 | 0.11 | 4.29 | 9.22 | 6.48 |
| 2008 | 7.58 | 17.6 | 28.2 | 13 | 258 | 424 | 88.8 | 13.8 | 12.7 | 18 | 22.9 | 13.4 |
| 2009 | 14.3 | 35.4 | 52.3 | 58.1 | 33.6 | 102 | 52.5 | 28.7 | 11.9 | 21.5 | 19.5 | 12.1 |
| 2010 | 7.97 | 12.8 | 20.3 | 52 | 151 | 328 | 86.1 | 15.8 | 2.54 | 4.3 | 17.3 | 13.7 |
| 2011 | 15.4 | 19.3 | 25.5 | 20.1 | 163 | 580 | 145 | 22.6 | 13.5 | 23 | 22.8 | 20.1 |
| Monthly Mean | 10 | 15 | 26 | 26 | 84 | 163 | 50 | 10 | 4.4 | 8.6 | 13 | 11 |
| Tongue River | | | | | | | | | | | | |
| 2001 | 172 | 200 | 233 | 203 | 323 | 176 | 54.7 | 13.1 | 73.3 | 117 | 126 | 107 |
| 2002 | 78.7 | 79.8 | 88.5 | 147 | 268 | 354 | 83.3 | 78.1 | 128 | 148 | 136 | 122 |
| 2003 | 145 | 145 | 443 | 307 | 971 | 1264 | 287 | 69.9 | 168 | 174 | 180 | 144 |
| 2004 | 129 | 150 | 169 | 159 | 192 | 181 | 150 | 63.5 | 104 | 157 | 139 | 116 |
| 2005 | 93.9 | 86.1 | 124 | 158 | 1,703 | 1,527 | 384 | 180 | 162 | 215 | 169 | 139 |
| 2006 | 145 | 134 | 154 | 213 | 499 | 324 | 40.6 | 21.2 | 106 | 181 | 161 | 122 |
| 2007 | 104 | 97.1 | 348 | 496 | 2,176 | 2,203 | 290 | 128 | 164 | 244 | 185 | 151 |
| 2008 | 152 | 165 | 244 | 214 | 1,453 | 2,761 | 940 | 181 | 265 | 264 | 244 | 195 |
| 2009 | 226 | 221 | 279 | 551 | 928 | 1,655 | 507 | 268 | 201 | 254 | 216 | 149 |
| 2010 | 140 | 145 | 219 | 261 | 1,033 | 2,322 | 516 | 115 | 174 | 185 | 176 | 164 |
| 2011 | 161 | 212 | 243 | 281 | 1,688 | 3,659 | 1,454 | 311 | 211 | 310 | 268 | 221 |
| Monthly Mean | 141 | 148 | 231 | 272 | 1,020 | 1,490 | 428 | 130 | 160 | 204 | 182 | 148 |

Source: USGS 2013

The PRB Final EIS disclosed existing water quality and quantity conditions around the basin as of 2001 (see PRB Final EIS pgs. 3-36 to 3-53). Surface water quality in the planning area is generally affected by depletions and return flows from irrigation. Surface water withdrawals in the planning area are used to support agricultural, domestic, and stock water uses. Prior to 2000, irrigation use accounted for about 95 percent of the surface water withdrawals in the planning area. Existing water quality of the mainstems is monitored by the U.S. Geological Survey (USGS) at numerous locations throughout the basin.

Parameters of primary interest include the electrical conductivity (EC) which is a manifestation of the concentration of solids dissolved in the water or salinity; Sodium Adsorption Ratio which represents the proportion of sodium ions to calcium and magnesium ions in water and suspended solids or sediment which is the result of erosion or sediment movement. Concentrations of suspended solids are high throughout the planning area which is reflective of the highly erosive nature of the shale deposits through which the rivers flow. Sodium Adsorption Ratio is an indicator of the potential for water to affect soil structure when used for irrigation (PRB Final EIS pgs. 3-47 to 3-48).

Surface discharge water quality is regulated by Wyoming DEQ through WYPDES permits. These permits establish discharge water quality criteria which specify maximum concentrations of pollutants which may be discharged into surface waters of the state. Concentrations permitted are based on the location of the discharge point with respect to the waters of the state, the volume to be discharged, and the quantity and nature of the pollutants. Any project subject to BLM approval would require compliance to state requirements. However, approval for discharge by the Wyoming DEQ is not considered as granting approval for a federal mineral action until and unless BLM approval is obtained.

Data published by the USGS (Clark 2012) summarized water quality for four major watersheds in the PRB for the period between the beginning of full scale CBNG development (2001) through peak production (2008) to 2010. The watersheds evaluated are the Powder, Tongue, Belle Fourche, and Cheyenne drainage basins. Clark concluded that CBNG developments may have contributed to some trends in the PRB, with upward trends (concentration of constituents) noted at some locations, and downward trends (dilution of constituents) noted at other locations.

Impaired Water Bodies

The quality of water in the rivers and streams within the planning area is protected for designated uses in accordance with the State of Wyoming's water quality standards. Section 303(d) of the CWA requires the state to develop a listing of all waters of the state that are impaired and do not fully support existing or designated uses. The most recent listing was issued in 2012. See the *Water Resources* section in Chapter 3 for a more complete discussion. Most sources of the impairments are unknown, although some have been attributed to agricultural practices as well as natural background sources.

Belle Fourche River Basin

Primary land uses in the Belle Fourche River Basin are livestock grazing, hay production, and mineral extraction. Mineral extraction includes rare earth, bentonite and coal mining, oil and gas, and CBNG development. There are two distinct topographic regions in this basin, the rolling plains of the Powder River geologic basin in the west and the Black Hills uplift in the east. Most streams originating in the plains are naturally intermittent; however, discharges from coal mines, CBNG production, and the City of Gillette provide perennial flow to Donkey Creek, portions of

the Belle Fourche River and several other plains streams. There are no BLM-administered lands associated with any impaired water bodies in the Belle Fourche River Basin.

The Belle Fourche River headwaters originate in the plains south of Gillette. The river flows northeast past the Bearlodge Mountains, where it then turns to the southeast and flows into South Dakota. South Dakota's 2008 303(d) list included the Belle Fourche River from the Wyoming and South Dakota state lines downstream to Fruitdale, South Dakota, for fecal bacteria and total suspended solids. The South Dakota Department of Environment and Natural Resources completed a Total Maximum Daily Load (TMDL) for total suspended solids on the Belle Fourche River in early 2005. The TMDL concluded that the most significant source of sediment in the river is likely from stream incision and bank failure. The South Dakota Department of Environment and Natural Resources has also completed a TMDL for fecal coliform. Bacterial source tracking used in the study provided no direct evidence that humans, livestock, or wildlife are fecal coliform sources for this segment of the Belle Fourche River.

Upper Belle Fourche Sub-basin

The Upper Belle Fourche Sub-basin includes those waters upstream of the confluence of Beaver Creek with the Belle Fourche River. Coal and CBNG development are important land uses in the western portion of the sub-basin, while logging, wildlife habitat, and recreation are common land uses in the Black Hills to the east. Livestock grazing and hay production are common land uses throughout this sub-basin.

Gillette is the fourth largest community in Wyoming and lies at the headwaters of the Donkey Creek drainage. Monitoring by Wyoming DEQ (2012) and Campbell County Conservation District (CCCD) indicate that the contact recreational use of Donkey Creek is impaired due to exceedances of the fecal bacteria criterion, from the confluence with the Belle Fourche River upstream 61.4 miles to Brorby Boulevard within the City of Gillette. Stonepile Creek, a tributary to Donkey Creek, is also on the 303(d) list for not supporting its contact recreation uses. Data from the 2008 Little Powder River and Belle Fourche Drainages Watershed Implementation Section 319 Project show that this impairment extends from the confluence with Donkey Creek upstream to the junction of Highways 14/16 and 59. The plan will likely be updated following completion of the Belle Fourche River TMDL. Implementation strategies will focus on septic system improvements, education of urban and rural residents, urban sewage treatment, storm water runoff, solid waste management, small acreage land use management, and rural development issues. CCCD completed a Section 319 project in 2010, which included data spanning 2007 to 2009. These data indicated that *Escherichia coli* (E. coli) concentrations at nearly all sampling sites along the currently listed segments of Stonepile and Donkey Creeks exceeded the state's primary recreational use criterion. The study also found elevated chloride and ammonia concentrations in both creeks, but because neither is classified as a fishery, the state's aquatic life acute and chronic chloride standards do not apply. The Campbell County Natural Resource District also completed a Section 319 project in 2010 for the upper Belle Fourche River Watershed, which included data spanning 2005 to 2009. Multiple E. coli samples during the sampling period showed that Donkey Creek exceeds the primary contact recreational use criterion from the confluence with the Belle Fourche River upstream to the Campbell County line. E. coli samples were also collected from the Belle Fourche River from the Campbell County line to below the outfall of the Hulett wastewater treatment facility that showed exceedances of the primary contact recreational use criterion. The study reported no chloride concentrations exceeding of the chronic aquatic life other than fish criterion on the Belle Fourche River. However, USGS data indicate that exceedances of the chronic chloride criterion continue to occur.

Gillette Fishing Lake is currently on the 303(d) list for sediment and phosphate impairments. The source of these pollutants was investigated by CCCD, and data suggested that storm water from the City of Gillette was the primary source. CCCD, in cooperation with the City of Gillette, has developed a Water Quality Improvement Plan to address these two impairments. Corrective actions have been initiated by the City of Gillette.

Wyoming DEQ currently identifies three segments of the Belle Fourche River as having impaired contact recreation uses. Of these, only sections of Donkey Creek and Stonepile Creek are within the planning area. Two TMDLs were initiated in 2009 for the upper Belle Fourche watershed 303(d) listings within the planning area. These are for bacterial impairments and fecal coliform listings on Donkey and Stonepile Creeks.

Cheyenne River Basin

The Cheyenne River Basin includes the southeast portion of the planning area, in east-central Wyoming and drains areas of the Powder River geologic basin and southern portion of the Black Hills uplift. Besides the southern Black Hills and some breaks and escarpments, most of the basin consists of rolling high plains. The Thunder Basin National Grasslands occupy a large portion of the central part of this basin. Primary land uses are livestock grazing, hay production, coal mining, oil and gas production, and some CBNG production. These activities occur primarily in the western portion of the basin. Lowland streams are usually intermittent or ephemeral, and most perennial streams originate in the Black Hills or Pine Ridge escarpment. Because the sedimentary rocks in the Powder River geologic basin contribute elevated levels of iron, manganese, and sulfate to surface waters, several streams have had their secondary (aesthetic) drinking water criteria removed for iron and manganese. There are no BLM-administered lands associated with any impaired water bodies in the Cheyenne River Basin.

Antelope Creek Sub-basin

The northern portion of the Antelope Creek Sub-basin of the Cheyenne River Basin lies within the planning area. The headwaters of the Antelope Creek Sub-basin are east of Edgerton. Land uses are primarily grazing and oil production, along with coal mining in the northeastern third of the sub-basin. Antelope Creek contains many beaver dam complexes in its lower reaches which store water, keeping it from reaching the Cheyenne River except during high flow periods. Concentrations of dissolved iron in Antelope Creek occasionally exceed the aquatic life other than fish chronic criterion; however, this is likely due to the natural geology and spring dominated hydrology. Wyoming DEQ (2007) monitoring indicated that the benthic macroinvertebrate community of Antelope Creek is comparable to reference condition for intermittent streams in this basin and is supporting its aquatic life other than fish use. There are no BLM-administered lands associated with any impaired water bodies in the Antelope Creek Sub-basin.

Upper Cheyenne Sub-basin

The Upper Cheyenne Sub-basin is the northeastern portion of the Cheyenne River Basin within the planning area. Coal mining occurs in the Upper Cheyenne Sub-basin east of Wright. Other land uses include grazing and oil and gas development. The Cheyenne River in this sub-basin typically has an intermittent flow regime, with flows reduced to standing pools of water fed by springs during the drier seasons. Assessment by Wyoming DEQ (2007) indicates that the Cheyenne River in this sub-basin, from Lance Creek upstream to the Dry Fork of the Cheyenne River, fully supports its fisheries and aquatic life other than fish uses and contains a diverse

assemblage of benthic macroinvertebrates and fish. There are no BLM-administered lands associated with any impaired water bodies in the Upper Cheyenne River Sub-basin.

Little Thunder and Black Thunder Creeks are ephemeral or intermittent with some perennial spring-fed pools and those created by beaver dams. Although Little Thunder Creek receives some discharge from oil treater and CBNG production, most is lost to evaporation and infiltration, or is stored within beaver dam complexes before reaching Black Thunder Creek. Wyoming DEQ (2007) found that the benthic macroinvertebrate community in Black Thunder Creek is comparable to the reference condition for similar intermittent streams and that it is fully supporting its aquatic life other than fish use.

Little Missouri River Basin

In Wyoming, the Little Missouri Basin includes only the Little Missouri Sub-basin. Only small portions of the Little Missouri Basin fall within the extreme east-northeast part of the planning area.

Area land uses include livestock grazing, dry land and irrigated farming, bentonite mining in the lower drainages, and oil production in the upper drainages. Streamflow is often intermittent, but pools typically persist, even during dry periods. Concerns with turbidity, siltation and flow alteration in the Little Missouri and the North Fork Little Missouri have been identified by Crook County Natural Resource District. However, bentonite clays often remain suspended in water and therefore, a certain degree of turbidity is natural. Approximately 500 acres of abandoned bentonite mine lands have been reclaimed by Abandoned Mine Land in the basin, although bentonite mining continues in the area.

Powder River Basin

The Powder River flows north from central Wyoming into Montana. Nearly all of the naturally perennial streams which reach the Powder River originate in the Big Horn Mountains. The Big Horn Mountains are composed of igneous and metamorphic rocks flanked by well-indurated sedimentary rocks. The water quality of these mountain streams is generally high, except in areas where land use practices have led to excessive erosion and sediment loading. In the lowlands of the Powder River geologic basin, the geology primarily consists of fine-grained sedimentary strata which are easily erodible and often high in dissolved constituents. Streams that originate in basin terrain are generally ephemeral and flow only in response to snowmelt or rainfall events unless receiving discharge water from industry (e.g., CBNG). These streams are generally high in dissolved solids and are often naturally turbid. Due to these conditions, site-specific criteria have been adopted and numeric secondary human health criteria for manganese and iron do not apply to most Class 2 waters originating in the basin. Wyoming DEQ, Wyoming Game and Fish Department (WGFD), and U.S. Fish and Wildlife (USFWS) have concerns about how aquatic communities may be affected by CBNG development, but the effects of development on aquatic biota are unknown. WGFD biologists and a University of Wyoming graduate student recently surveyed the basin from 2004 to 2008. Survey data confirmed that the Powder River still hosts the most diverse fish assemblage of any Wyoming river basin. However, biologists also noted the near absence of the sturgeon chub, a species that was common in the Powder River in the mid-1990s. Of the 16.4 miles of impaired water bodies in the planning area in 2012, 14.1 of them are within the PRB.

Middle Fork Powder Sub-basin

The headwaters of the Middle Fork Powder River flow through a steep canyon with little potential for disturbance. Wyoming DEQ data indicate that the Middle Fork Powder River above Buffalo Creek and Rock Creek, an upper tributary, fully support their aquatic life other than fish uses. Blue Creek and upper Beaver Creek were also assessed by Wyoming DEQ and fully support their aquatic life other than fish uses (Wyoming DEQ 2012).

Beartrap Creek is a spring-fed tributary of Red Fork. Historically, the upper Beartrap Creek drainage has been used as a stock driveway and holding ground. However, management practices have changed over the past 20 years, and livestock now have limited access to streams, are moved through relatively quickly, and are only in the drainage for a short period in spring and fall. Log spill structures were installed by BLM and WGFD in 1989 to create additional pool and riffle habitats. Monitoring by Wyoming DEQ shows that both upper Beartrap Creek and Sawmill Creek are fully supporting their aquatic life other than fish uses.

Monitoring by Wyoming DEQ (2004) in 1998 and 2003 indicates that Webb Creek, a Class 2AB tributary to the North Fork Powder River, is fully supporting its aquatic life other than fish uses.

Upper Powder River Sub-basin

The Upper Powder Sub-basin encompasses most of the drainages into the Powder River mainstem from the confluence of the North and Middle Forks downstream to the confluence of the Powder River and Clear Creek. Primary land uses are livestock grazing and oil and gas production. Except for the mainstem reaches, most reaches in this semi-arid sub-basin are non-perennial.

The Powder River got its name from the large amounts of very fine sediment it naturally carries. Sturgeon chub, a native fish considered rare by WGFD and now found only in the Powder River in Wyoming, is believed to be adapted to, and actually require, turbid water.

Monitoring by Wyoming DEQ in 1998 showed that Pumpkin Creek was an ephemeral or intermittent stream and was supporting its aquatic life other than fish uses. However, CBNG development has since progressed through the watershed. As part of the Wyoming DEQ's watershed based permitting process, physical data were collected in the Pumpkin Creek drainage (Wyoming DEQ 2012) to determine how much additional flow from CBNG discharges the drainage could accommodate without physically degrading. This monitoring showed that parts of the drainage now have perennial flows that reach the Powder River and identified areas of severe erosion and active headcutting. The 1998 data collected by Wyoming DEQ can no longer be considered representative of current conditions, and it is unknown whether Pumpkin Creek is fully supporting its aquatic life other than fish uses. Fortification Creek was also monitored by Wyoming DEQ in 1999 (Wyoming DEQ 2004) and showed full support of the aquatic life other than fish use. Ninemile (Wyoming DEQ 2007) and Fourmile (Wyoming DEQ 2007) Creeks, located near Sussex, are ephemeral Class 3B tributaries to the Powder River. Dikes and other small impoundments trap sediment and help support riparian vegetation. Assessments by Wyoming DEQ indicate that aquatic life other than fish uses are supported in these watersheds.

Analysis of chloride data in the PRB shows that the majority of chloride loading in the Powder River comes from Salt Creek. The Powder River below Salt Creek was added to the 1998 303(d) list for exceedances of the chloride criteria, which was 230 milligrams per liter (mg/L) at that time. Although the Powder River below Salt Creek now has a site-specific chloride criterion of 984 mg/L, because chloride concentrations occasionally exceed this criterion at the USGS sampling site near Sussex, the Powder River has remained on the 303(d) list for chloride. Although Salt Creek does not appear to exceed its site-specific chloride criterion of 1,600 mg/L, a TMDL or

watershed-based plan on the Powder River will need to address loading from Salt Creek. Data collected on the Powder River at the Sussex USGS station also showed exceedances of the state's aquatic life other than fish chronic selenium criterion and it was added to the 2000 303(d) list. Data collected on the Powder River and its tributaries while monitoring CBNG development in the basin have indicated that the selenium impairment extends from the confluence with the South Fork Powder River downstream to the confluence with Crazy Woman Creek. The relatively low selenium concentrations found in Crazy Woman Creek apparently dilute the Powder River at this point and enable the river to meet the aquatic life other than fish chronic selenium criterion. Historic USGS and Powder River Conservation District data indicate that the primary source of the selenium may be the South Fork Powder River drainage, but Salt Creek also occasionally has high concentrations and contributes to the loading in the Powder River. It is unknown whether the selenium loading to the Powder River is natural or anthropogenic. Data collected by the USGS show that the Powder River exceeded the total arsenic criterion protective of drinking water use between the sampling site near Sussex downstream to the Arvada site during 2009 and 2010 and two segments of the river have been added to the 2012 303(d) list for this pollutant. Data from the USGS Salt Creek sampling station indicate that this tributary contributes arsenic to the Powder River, but the source of arsenic within the Salt Creek watershed is unknown.

CCCD monitored portions of this sub-basin under a Section 319 Project. Results indicated exceedances of the fecal bacteria criterion in the lower reach of the Middle Prong of Wild Horse Creek, and this water was added to the 303(d) list in 2006 from its confluence with Wild Horse Creek to a point 4.6 miles upstream. CCCD and Natural Resources Conservation Service (NRCS) have assisted landowners in implementing 13 water quality improvement projects in the watershed, but the effects of these actions on water quality is unknown. Local stakeholders and CCCD initiated watershed planning in this watershed in 2007 (Wyoming DEQ 2012). CCCD completed a Section 319 Project in 2010, which included data spanning 2007 to 2009. Data indicated that *E. coli* concentrations in 2008 and 2009, continued to exceed the primary recreational use criterion.

South Fork Powder Sub-basin

The South Fork Powder Sub-basin lies mostly in Natrona County, and extends into the Waltman area. The most downstream portions of the sub-basin lie within the planning area. Livestock grazing and oil and gas development are the primary land uses. The few perennial stream reaches in this sub-basin are primarily in the Rattlesnake Hills for the Wallace Creek headwaters, the lower portions of Willow Creek, which partially lies within the planning area, and Cottonwood Creek, and the lower portion of the mainstem of South Fork. Cave Gulch and Okie Draw, tributaries to the South Fork Powder River, have perennial flow due to oil field discharges.

Data collected by USGS and Powder River Conservation District have showed exceedances of the aquatic life other than fish chronic selenium criteria on Willow Creek from the confluence with the South Fork Powder River to a point 10.5 miles upstream, and it was placed on the 303(d) list in 2006. Further monitoring by Powder River Conservation District showed that both Posey and Murphy Creeks, each tributaries to the South Fork Powder River immediately downstream of the Willow Creek confluence, also exceed the aquatic life other than fish chronic selenium criterion and were added to the 2008 303(d) list. The source of the selenium for both creeks appears to be related to the natural geology of the area, but additional loading from anthropogenic sources may also occur in the Posey Creek watershed, as lands are irrigated and selenium is dissolved from marine shales. Another possible source may be oil treater discharges.

Salt Creek Sub-basin

Most downstream portions of Salt Creek are within the planning area. The towns of Midwest and Edgerton are near the center of the Salt Creek Sub-basin but are outside of the planning area. Land uses are primarily livestock grazing and oil and gas production. Soils of the area have developed from fine-grained sandstone and calcareous shales, are dry, and easily eroded by wind or water.

Several natural oil seeps have been documented along Salt Creek in the Midwest area, which prompted the development of the oil fields beginning in 1908. While most reaches in this semi-arid sub-basin are non-perennial, Salt Creek now has perennial flow due to oil treater discharges. Even prior to these discharges, the creek naturally carried a high load of salts; however, studies conducted by Powder River Conservation District have confirmed that the vast majority of perennial flow and chloride loading are from oil production discharge water. High chloride concentrations in the creek exceed Wyoming's aquatic life other than fish chronic criteria, and thus it was added to the 303(d) list. A Use Attainability Analysis proposing a site-specific chloride criterion of 1,600 mg/L for Salt Creek has been approved, and because there have been no exceedances of this criterion, chloride has been removed from the 303(d) list as a cause of impairment on Salt Creek. However, since Salt Creek is the primary contributor of chloride loading to the Powder River, any TMDL or watershed-based plan on the Powder River will need to address loading from Salt Creek. Data collected as part of the chloride Use Attainability Analysis on Salt Creek showed exceedances of the chronic aquatic life other than fish criterion for selenium, and this pollutant was added on the 303(d) list in 2008. It is unknown whether the primary source of this selenium exceedance is natural or anthropogenic, but both of these sources are likely contributors. Salt Creek was also added to the 303(d) list of threatened waters in 1996, due to the regular occurrence of oil and produced water spills in the watershed. Most of the oil field infrastructure dates to the 1960s and spills have been primarily due to a combination of the age of the infrastructure and bacterial corrosion in the injection lines. Most spills have been contained before they enter Salt Creek. At the request of Wyoming DEQ, the current operator has developed a long-term upgrade and maintenance plan for the field to reduce the potential for large spills that may affect water quality. The operator is also phasing into carbon dioxide flood injection to enhance oil recovery, which will also reduce spills because it requires the replacement of both injection and production lines. Lastly, a biocide treatment has been added to many water flood lines since 2003 to reduce bacterial corrosion.

Crazy Woman Sub-basin

The headwaters of the Crazy Woman Sub-basin are on the eastern slope of the Big Horn Mountains. Land uses are primarily oil and gas development, recreation, grazing, and irrigated agriculture.

The North Fork Crazy Woman Creek was added to the 1996 303(d) list due to water quality threats from habitat degradation, nutrients and bioindicators. A mistake was made in the listing process when bioindicators was added as a cause and it has thus been removed from the 2012 303(d) list. Several Section 319 projects have been conducted in this watershed, resulting in changes to both irrigation and livestock grazing practices in many areas. Considerable water quality data have been gathered in this watershed; however, it remains uncertain whether these practices are effective because effectiveness monitoring of the implemented best management practices (BMPs) has been inconsistent (Wyoming DEQ 2012). Wyoming DEQ (2012) has conducted monitoring in the watershed, but the effectiveness of the above Section 319 Project

BMPs in improving physical degradation was not examined. A Wyoming DEQ summary report, including a use support determination for North Fork Crazy Woman Creek, is expected in 2012.

The EPA has established National Secondary Drinking Water Regulations that set water quality standards for 15 contaminants, including manganese. EPA does not enforce these secondary maximum contaminant levels. Instead, they are intended to serve as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor. These contaminants are not considered to present a risk to human health at these secondary maximum contaminant levels (EPA 1992). Wyoming's aesthetic drinking water criterion for manganese is set at the EPA secondary maximum contaminant levels. Crazy Woman Creek exceeds the aesthetic drinking water criterion for manganese, primarily during low flows, but the aquatic life other than fish chronic criterion for manganese has not been exceeded. Lower Crazy Woman Creek was added to the 303(d) list in 2002 for manganese. However, high manganese concentrations are common in streams in the Powder River Structural Basin due to the natural geology (Wasatch and Fort Union Formations), and thus much of the basin does not have a human health criterion for this pollutant in Chapter 1. There are no known sources of anthropogenic manganese in Lower Crazy Woman Creek, and the creek will unlikely ever be used as a drinking water source due to its intermittent hydrology. Lake DeSmet Conservation District requested that the manganese drinking water criterion from Crazy Woman Creek be removed by Wyoming DEQ.

Several other streams in this watershed have been monitored by Wyoming DEQ and are fully supporting their aquatic life other than fish uses. These streams include: Crazy Woman Creek (from confluence of North and Middle Crazy Woman Creek to approximately 2 miles below Wallows Creek), Little North Fork Crazy Woman Creek, Pole Creek, Poison Creek, Middle Fork Crazy Woman Creek, Doyle Creek, South Fork Crazy Woman Creek, Beaver Creek, and Billy Creek.

Clear Creek Sub-basin

The headwaters of Clear Creek, Piney Creek and Rock Creek are in granitic geology in the Cloud Peak Wilderness within the Bighorn National Forest. Recreation, livestock grazing, and logging are land uses within the mountains, while livestock grazing, oil and gas development, irrigated agriculture, and residential development are the primary land uses at lower elevations. Clear Creek is the last major tributary to join the Powder River upstream of the Wyoming and Montana state lines.

A Section 205j water quality assessment project in Rock Creek and the North and South Fork Shell Creek drainages indicated that these watersheds were threatened by physical degradation of the stream channel and they were added to the 1996 303(d) list. The primary sources of degradation to Rock Creek were identified as heavy livestock grazing in small horse pastures near the stream. Landowners implemented BMPs specifically designed to improve irrigation efficiency. Data indicate that Rock Creek now supports its aquatic life other than fish use and it was removed from the 2004 303(d) list. Impacts to the North and South Fork Shell Creek drainages are primarily due to irrigation diversions and conveyance. Lake DeSmet Conservation District completed a Section 319 Project which addressed these problems, primarily through the installation of more efficient irrigation systems. Biological data collected as part of the project were highly variable across collection dates and were inconclusive. Wyoming DEQ (2012) monitoring suggests that the BMPs used on the North and South Forks of Shell Creek were somewhat effective, but that additional data were needed. Wyoming DEQ conducted biomonitoring on these streams again in

2006. Several nongame fish were observed while sampling North and South Fork Shell Creeks, suggesting that these streams may be better classified as 2C. Data now indicate full support of the aquatic life other than fish use in these creeks. EPA Section 319 Nonpoint Source Success Stories have been written for both Rock Creek and the North and South Forks of Shell Creek.

In response to citizen concerns of suspected sewage contamination from failed septic systems in surface waters, Wyoming DEQ (2012) collected E. coli samples in several waters in and near the town of Story. There are no other known sources of fecal contamination in the area. Results showed exceedances of the primary contact E. coli criterion in Dalton Ditch and North Piney Creek. Thus, North Piney Creek from the confluence with Piney Creek to a point 6.4 miles upstream, and Dalton and Piney-Cruse Ditches were added to the 2006 303(d) list. As part of a 2009 Section 205j planning grant, Sheridan County investigated impacts from septic systems on shallow groundwater and the possibility of linkages between potentially contaminated groundwater and surface water in the area. The high E. coli levels recorded in 2005 are considered a potential human health risk. These waters have been posted with health risk warnings and have been prioritized for TMDL development.

A short reach of Hunter Creek was impacted by excessive sediment from an adjacent road and was added to the 1998 303(d) list. Road modifications and changes in maintenance have since been implemented by the USFS to reduce this impact, and subsequent Wyoming DEQ data indicate that the creek fully supports its aquatic life other than fish use. As a result, Hunter Creek was removed from the 2004 303(d) list. A Section 319 Nonpoint Source Success Story has been written for Hunter Creek.

Wyoming DEQ assessment data suggest that Little Piney Creek (Wyoming DEQ 2002) and Boxelder Creek (Wyoming DEQ 2012) support their aquatic life other than fish uses. Wyoming DEQ observed many nongame fish during the assessment of Boxelder Creek, and therefore this creek may be better classified as a nongame fishery. Clear Creek was monitored by Wyoming DEQ (2004) in 1999, and data indicated full support of aquatic life other than fish uses; however, WGFD records indicate that streamflow alterations may sometimes have an adverse effect on cold water fishes. Several stream restoration projects on Clear Creek have improved the connection between the stream and its floodplain and improved riparian condition. The potential impacts of future CBNG development in the Clear Creek drainage are currently a concern. Wyoming DEQ's CBNG monitoring network is designed to assess these potential impacts.

Wyoming DEQ (2004) monitoring identified impacts to French Creek from flow augmentation; however, the stream is meeting its aquatic life other than fish use. Although the creek is not currently on the 303(d) list, Lake DeSmet Conservation District has developed a watershed plan as a proactive measure to improve water quality in this watershed.

Middle Powder Sub-basin

The Middle Powder Sub-basin includes the lower portion of the Powder River. Historic land uses have been primarily livestock grazing with some oil and gas development. CBNG development has also become a major land use in much of the sub-basin. Except for the mainstem of the Powder River, reaches in this sub-basin are naturally ephemeral or intermittent. However, many of these streams (e.g., LX Bar, SA, and Fence Creeks) now have perennial flows due to the discharge of CBNG produced water.

Wyoming DEQ monitored the Powder River in 2000, but due to very low streamflows, the absence of reference streams and fluctuating environmental conditions from CBNG development, data

were considered inconclusive. Since 2005, water quality and biological (i.e., macroinvertebrates, fish, and algae) data have been collected as part of a long term, interstate and interagency (e.g., Wyoming DEQ, USGS, and BLM) monitoring program by PRB Interagency Working Group. These data are primarily intended to support an adaptive management approach to CBNG development, but may also be used by Wyoming DEQ to make use support determinations.

Little Powder Sub-basin

The Little Powder River originates near Gillette and flows north into Montana. Primary land uses in the Little Powder Sub-basin include coal mining, CBNG development, and livestock grazing. Moyer Spring is fed by water accumulated in porcelanite (clinker) beds and supports a small brook trout population. Moyer Spring Creek and the Little Powder River are Class 2AB waters, while all other creeks in the sub-basin are Class 3B waters.

Wyoming DEQ monitored the Little Powder River in 1999 and 2005, but aquatic life other than fish use support has not been determined. USGS data collected from the Little Powder River near the Montana border have shown exceedances of the fecal bacteria criterion, and the river was placed on the 303(d) list in 2002. A Section 319 Project sponsored by CCCD reported in 2008 that the impairment extends upstream to the confluence with Spring Creek, and this information has been used to better define the extent of impairment in the 2010 303(d) list from the Wyoming and Montana state lines upstream to the confluence with Spring Creek. CCCD and local citizens have sponsored a watershed plan for the river, and to date, 8 animal feeding operations and 14 septic improvement projects have been implemented (Wyoming DEQ 2012). CCCD completed a Section 319 Project in 2010, which included data spanning 2007 to 2009. These data indicated that *E. coli* concentrations in 2008 at Soda Well still exceed the primary recreational use criterion. CCCD completed a watershed plan for Little Powder River in 2006.

Tongue River Basin

The Tongue River Basin originates in the Big Horn Mountains west of Sheridan. Land uses within the Bighorn National Forest are recreation, livestock grazing, and logging, while in the lower sub-basin, primary land uses are irrigated agriculture, livestock grazing, and coal mining, with increasing residential and CBNG development. Wohl et al. (2007) reported that many streams within the Bighorn National Forest have been substantially impacted by cattle ranching, irrigated crop production, flow regulation and diversion, and timber harvest. The Tongue River passes through approximately 2.1 miles of BLM-administered land at Welch Ranch north of Sheridan. This section of the Tongue River is impaired for temperature.

Tongue River Sub-basin

Big and Little Goose Creeks were placed on the 1996 303(d) list due to exceedances of the fecal coliform criterion. Subsequent monitoring by Wyoming DEQ in 1998 and 1999 revealed exceedances in several other locations within these watersheds, including Kruse Creek, Sacket Creek, and Jackson Creek irrigation canal, which are all tributaries of Little Goose Creek; Beaver Creek, Park Creek, and Rapid Creek, which are tributaries of Big Goose Creek; and Goose and Soldier Creeks. Sheridan County Conservation District monitored fecal bacteria in the Goose Creek Watershed in 2001 and 2002, and results corroborate the 1998-1999 Wyoming DEQ data (Wyoming DEQ 2012). The Sheridan County Conservation District study also resulted in the extension of the impaired reach of Goose Creek from the confluence of Big and Little Goose Creeks downstream to the Highway 339 bridge crossing, and indicated that McCormick Creek is not meeting its contact recreation uses from the confluence of Little Goose Creek upstream an

undetermined distance. All of the streams listed above are on the 303(d) list. Sheridan County Conservation District, with the guidance of a local watershed steering committee, developed a watershed plan for the Goose Creek watershed, which was approved by Wyoming DEQ in 2005. Implementation projects have begun, including septic system improvements, animal feeding operations, riparian buffer development, stream bank stabilization, reservoir development, and changes in grazing management. A Section 205j Little Goose Creek Wastewater Treatment Feasibility Study was completed by Sheridan County in 2009.

Monitoring by Wyoming DEQ (2009) on Soldier Creek spanning the years 1998 to 2003 showed that the aquatic life other than fish use is impaired from PK ditch downstream to the confluence with Goose Creek and supported from PK ditch upstream to the headwaters of the creek. Because the impairment is thought to be caused by flow alterations in the watershed, the segment was placed in category 4C in 2010 and a TMDL is not necessary.

Sheridan County Conservation District data collected in 2001 and 2002 showed exceedances of the temperature criteria for cold water fisheries in lower portions of the Goose Creek drainage and poor biotic condition close to Sheridan. Because the data were collected during near record low streamflows, definitive aquatic life other than fish and cold water fisheries use determinations could not be made. Sheridan County Conservation District and Wyoming DEQ monitoring indicated that storm water discharges are contributing excessive fine sediment to, and causing physical degradation of, Little Goose Creek (Wyoming DEQ 2012) from the confluence with Goose Creek upstream to Brundage Lane in Sheridan and Goose Creek (Wyoming DEQ 2012) within Sheridan. Aquatic life other than fish and cold water fisheries uses are not supported, and both of these reaches were added to the 303(d) list for this pollutant in 2006. TMDLs for 13 of the listed waters in the Goose Creek watershed were approved by EPA in 2010 and these waters were subsequently removed from the 303(d) list in 2012. These de-listed waters included 11 for fecal coliform on Park, Rapid, Big Goose, Beaver, Sackett, Jackson, Little Goose, McCormick, Kruse, Goose, and Soldier Creeks; and two for sediment on Little Goose and Goose Creeks.

Sheridan County Conservation District reports that Beaver Creek (a Class 3B water) has perennial streamflow, even during drought conditions, and suggested that it should be reclassified to Class 2AB (Wyoming DEQ 2012).

Wyoming DEQ (2002) monitoring on the Tongue River concluded that the cold water fishery use of lower Tongue River is impaired due to high temperatures. The USGS began continuously monitoring temperature on the stream, and showed that the cold water temperature criterion was exceeded every day for a 30-day period in 2001. Elevated temperatures were again observed by USGS during the 2002-2004 water years. Wyoming DEQ has conducted continuous temperature monitoring on the Tongue River at several sites. It has not been determined to what extent these high temperatures are due to anthropogenic influences, but the data suggest that the loss of riparian cover and an irrigation diversion may contribute. Because of these consistently high temperatures, the Tongue River below Goose Creek was added to the 303(d) list in 2002.

Assessments conducted by Sheridan County Conservation District (Wyoming DEQ 2012) indicate that the lower reach of the Little Tongue River from its mouth upstream to the confluence with Frisbee Ditch above the town of Dayton is not meeting its contact recreation uses, and it was added to the 303(d) list in 2002. Sheridan County Conservation District data also identified concerns with the effects of habitat degradation on the biological community in and near Dayton. Above Frisbee Ditch, the Little Tongue River is fully supporting its aquatic life other than fish and coldwater fisheries uses.

Bacteria samples collected by Sheridan County Conservation District on Smith Creek in Dayton, Columbus Creek near the Highway 14 crossing, Fivemile and Wolf Creeks near Ranchester, and the Tongue River between Monarch and Ranchester indicate that these streams are not supporting their contact recreational uses, and were added to the 303(d) list in 2002. Sheridan County Conservation District developed a watershed plan for the Tongue River watershed from Ranchester upstream to the Bighorn National Forest boundary and has received a Section 319 Grant to address the above issues. Implementation measures include animal feeding operations projects, riparian buffer development, stream bank stabilization, reservoir development, and grazing management changes.

Prairie Dog Creek, a tributary to the Tongue River, receives trans-basin diversion water, and this additional streamflow has contributed to habitat degradation in portions of the stream channel (Wyoming DEQ 2012). A riparian improvement project implemented by the WGFD and a landowner has rehabilitated portions of the instream and riparian habitats. Wyoming DEQ (2012) and Sheridan County Conservation District have conducted considerable monitoring in the Prairie Dog Creek watershed, and data indicate that most streams support their aquatic life other than fish uses, though isolated areas of poor habitat and high water temperatures in the lower watershed are concerns. *E. coli* counts in Prairie Dog Creek exceed the Wyoming DEQ criterion, indicating that it does not support its contact recreational use, so the stream was added to the 303(d) list in 2004. As part of a 2009 Sheridan County Watershed Improvement Project, Sheridan County Conservation District, NRCS, and local citizens used a Section 319 Grant to implement 31 projects designed to address bacterial impairments in the Tongue River, Goose and Prairie Dog Creek Watersheds; including 6 to replace septic systems, 3 stream bank stabilization projects, and 1 large scale river restoration project. Effectiveness monitoring for these projects was planned for 2009 through 2011. Prairie Dog Creek is also on the 303(d) list for exceedances of the secondary (aesthetic) human health criterion for manganese. Concentrations of manganese in the creek are far below the human health criteria, but can cause the discoloration of water and the staining of cooking utensils. It is likely that the high manganese concentrations are due to the natural geology of the basin (Rice et al. 2002), and a site specific criterion for the watershed is being considered. Sheridan County Conservation District completed the final report for the Prairie Dog Creek Watershed Assessment (2007-2008) in 2009. The report indicated that sedimentation may be affecting the macroinvertebrate community in Prairie Dog Creek and the impact of this pollutant is a concern. Data collected during this project resulted in seven additions to the 2012 303(d) list. The 2012 listings include: manganese and water temperature along lower Prairie Dog Creek, from Interstate 90 to a point 47.2 miles downstream; temperature from the confluence with the Tongue River to a point 6.7 miles upstream; manganese and primary contact recreation on Meade Creek, a tributary to Prairie Dog Creek, from the confluence with Prairie Dog Creek upstream to the confluence with an unnamed tributary; primary contact recreation on Dutch Creek from the confluence with Prairie Dog Creek to a point 1.9 miles upstream; and primary contact recreation on Wildcat Creek from the confluence with Prairie Dog Creek to a point 0.8 miles upstream. Sheridan County Conservation District completed a watershed-based plan for Prairie Dog Creek in 2011, which has been approved by Wyoming DEQ.

In 2004, the North Fork Tongue River was placed on the 303(d) list for non-support of its contact recreation use. In 2010, USFS data were used to modify the extent of the impairment from Road 171 upstream to the confluence with Pole Creek. A diverse stakeholder group, sponsored by the USFS, is working to manage this resource. Projects initiated by the stakeholder group include monitoring the watershed and using the resulting data to recommend, implement, and assess stocking rates and herding changes on the allotments within the watershed. These actions, along with federal land management and allotment planning is considered equivalent

to watershed planning, and therefore, the North Tongue River has been given a low priority for TMDL development.

USFS completed a channel stabilization project on the South Fork Tongue River in 2003 that helped to reduce sediment input to the South Tongue Watershed from the vicinity of the Dead Swede Campground. Wyoming DEQ (2008) monitoring conducted in 1993, 1995, 1998, and 2003 on the South Fork Tongue River indicated that it supports its aquatic life other than fish and cold water fisheries uses from Highway 14 upstream to the confluence with the East Fork South Fork Tongue River.

Wyoming DEQ monitoring of Prune Creek (Wyoming DEQ 2002), and Coney and West Fork of Big Goose Creeks (Wyoming DEQ 2002) indicates that these streams are supporting their aquatic life other than fish uses. USFS and Wyoming DEQ have removed improperly designed fish habitat structures within a livestock grazing enclosure on Bull Creek that were causing channel widening and excessive sediment deposition.

Groundwater

Two systems of differing groundwater chemistry are described within the PRB (Bartos and Ogle 2002; Rice et al. 2002). A shallow, chemically dynamic system, generally 200 to 500 feet deep, exhibits localized flow and consists of groundwater with a mixed composition of ions (charged particles in solution). Shallow groundwater contains calcium, magnesium, and lesser amounts of sodium as cations (positively charged ions) and bicarbonate or sulfate as the dominant anion (negatively charged ion). A deeper, underlying system that is chemically static exhibits regional flow and consists of groundwater with sodium and bicarbonate as the dominant ions (PRB Final EIS pg. 3-5).

The PRB Final EIS conducted extensive groundwater modeling efforts to determine existing conditions and enable forecasting for fluid mineral development. Volumes of water produced in association with CBNG were estimated by watershed based on Reasonable Foreseeable Development (RFD) predictions (PRB Final EIS Table 2-8 pg. 2-26). The WOGCC accumulates production figures for all wells in the state, including water production. Table N.2, “Coalbed Natural Gas Water Production” (p. 581) presents comparison of actual water production (for all CBNG wells) by watershed to the predictions made in the PRB Final EIS. In general, actual production figures are much less than half of predictions, with the exception of the Middle Powder River and the Cheyenne River watersheds. In no cases have water production rate approached those anticipated, therefore impacts associated with water production should also not have achieved full force. For more information, regarding groundwater quality and quantity see the PRB Final EIS at pages 3-1 to 3-36 and the *Water Resources* section of Chapter 3.

Table N.2. Coalbed Natural Gas Water Production

| Year | Predicted (Annual Acre-feet) | Predicted (Cumulative Acre-feet from 2002) | Actual (Annual Acre-feet) | | Actual (Cumulative Acre-feet Beginning 2002) | |
|---------------------------|------------------------------|--|---------------------------|----------------------|--|----------------------|
| | | | Acre-feet | Percent of Predicted | Acre-feet | Percent of Predicted |
| Upper Tongue River | | | | | | |
| 2002 | 11,019 | 11,019 | 8,675 | 78.7 | 8,675 | 78.7 |
| 2003 | 16,950 | 27,969 | 8,574 | 50.6 | 17,248 | 61.7 |
| 2004 | 20,272 | 48,241 | 7,971 | 39.3 | 25,220 | 52.3 |
| 2005 | 22,133 | 70,374 | 9,397 | 42.5 | 34,617 | 49.2 |

| Year | Predicted (Annual Acre-feet) | Predicted (Cumulative Acre-feet from 2002) | Actual (Annual Acre-feet) | | Actual (Cumulative Acre-feet Beginning 2002) | |
|----------------------------|------------------------------|--|---------------------------|----------------------|--|----------------------|
| | | | Acre-feet | Percent of Predicted | Acre-feet | Percent of Predicted |
| 2006 | 22,351 | 92,725 | 10,795 | 48.3 | 45,412 | 49.0 |
| 2007 | 19,945 | 112,670 | 11,984 | 60.1 | 57,396 | 50.9 |
| 2008 | 20,282 | 132,952 | 13,114 | 64.7 | 70,558 | 53.1 |
| 2009 | 15,782 | 148,734 | 10,523 | 66.7 | 81,081 | 54.5 |
| 2010 | 15,782 | 164,516 | 8,986 | 56.9 | 90,067 | 54.7 |
| 2011 | 15,654 | 180,170 | 7,739 | 49.4 | 97,806 | 54.3 |
| 2012 | 8,646 | 188,816 | 6,580 | 76.1 | 104,386 | 55.3 |
| 2013 | 4,721 | 193,537 | - | - | - | - |
| 2014 | 2,522 | 196,059 | - | - | - | - |
| 2015 | 1,290 | 197,349 | - | - | - | - |
| 2016 | 601 | 197,950 | - | - | - | - |
| 2017 | 214 | 198,164 | - | - | - | - |
| Total | 198,164 | | 104,386 | | | |
| Upper Powder River | | | | | | |
| 2002 | 100,512 | 100,512 | 15,846 | 15.8 | 15,846 | 15.8 |
| 2003 | 137,942 | 238,454 | 18,578 | 13.5 | 34,424 | 14.4 |
| 2004 | 159,034 | 397,488 | 20,991 | 13.2 | 55,414 | 13.9 |
| 2005 | 167,608 | 565,096 | 27,640 | 16.5 | 83,054 | 14.7 |
| 2006 | 171,423 | 736,519 | 40,930 | 23.9 | 123,984 | 16.8 |
| 2007 | 163,521 | 900,040 | 42,112 | 25.8 | 166,096 | 18.5 |
| 2008 | 147,481 | 1,047,521 | 45,936 | 31.1 | 212,522 | 20.3 |
| 2009 | 88,046 | 1,135,567 | 43,079 | 48.9 | 255,601 | 22.5 |
| 2010 | 60,319 | 1,195,886 | 43,263 | 71.7 | 298,864 | 25.0 |
| 2011 | 44,169 | 1,240,055 | 43,163 | 97.7 | 342,027 | 27.6 |
| 2012 | 23,697 | 1,263,752 | 31,755 | 134.0 | 373,782 | 29.6 |
| 2013 | 12,169 | 1,275,921 | - | - | - | - |
| 2014 | 5,672 | 1,281,593 | - | - | - | - |
| 2015 | 2,242 | 1,283,835 | - | - | - | - |
| 2016 | 1,032 | 1,284,867 | - | - | - | - |
| 2017 | 366 | 1,285,233 | - | - | - | - |
| Total | 1,285,233 | | 373,782 | | | |
| Middle Powder River | | | | | | |
| 2002 | 8,257 | 8,257 | 3,929 | 47.6 | 3,929 | 47.6 |
| 2003 | 10,421 | 18,678 | 3,860 | 37.0 | 7,789 | 41.7 |
| 2004 | 11,640 | 30,318 | 3,547 | 30.5 | 11,336 | 37.4 |
| 2005 | 12,328 | 42,646 | 4,588 | 37.2 | 15,924 | 37.3 |
| 2006 | 12,044 | 54,690 | 6,368 | 52.9 | 22,292 | 40.8 |
| 2007 | 9,897 | 64,587 | 7,020 | 70.9 | 29,312 | 45.4 |
| 2008 | 9,689 | 74,276 | 7,624 | 78.7 | 36,939 | 49.7 |
| 2009 | 6,030 | 80,306 | 6,253 | 103.7 | 43,192 | 53.8 |
| 2010 | 6,030 | 86,336 | 5,649 | 93.7 | 48,841 | 56.6 |
| 2011 | 5,899 | 92,235 | 4,764 | 81 | 53,605 | 58.1 |
| 2012 | 3,276 | 95,511 | 4,072 | 124.3 | 57,677 | 60.4 |
| 2013 | 1,797 | 97,308 | - | - | - | - |
| 2014 | 964 | 98,272 | - | - | - | - |
| 2015 | 495 | 98,767 | - | - | - | - |
| 2016 | 231 | 98,998 | - | - | - | - |
| 2017 | 82 | 99,080 | - | - | - | - |
| Total | 99,080 | | 57,677 | | | |
| Little Powder River | | | | | | |
| 2002 | 18,613 | 18,613 | 11,391 | 61.2 | 11,391 | 61.2 |

| Year | Predicted (Annual Acre-feet) | Predicted (Cumulative Acre-feet from 2002) | Actual (Annual Acre-feet) | | Actual (Cumulative Acre-feet Beginning 2002) | |
|----------------------------------|------------------------------|--|---------------------------|----------------------|--|----------------------|
| | | | Acre-feet | Percent of Predicted | Acre-feet | Percent of Predicted |
| 2003 | 20,822 | 39,435 | 8,767 | 42.1 | 20,158 | 51.1 |
| 2004 | 21,832 | 61,267 | 8,266 | 37.9 | 28,424 | 46.4 |
| 2005 | 22,427 | 83,694 | 8,529 | 38.0 | 36,953 | 44.2 |
| 2006 | 21,330 | 105,024 | 8,383 | 39.3 | 45,336 | 43.2 |
| 2007 | 18,607 | 123,631 | 7,566 | 40.7 | 52,902 | 42.8 |
| 2008 | 19,121 | 142,752 | 7,690 | 40.2 | 60,608 | 42.5 |
| 2009 | 8,016 | 150,768 | 4,266 | 53.2 | 64,874 | 43.0 |
| 2010 | 7,124 | 157,892 | 3,361 | 47.2 | 68,235 | 43.2 |
| 2011 | 6,439 | 164,331 | 1,558 | 24.2 | 69,793 | 42.5 |
| 2012 | 3,930 | 168,261 | 1,821 | 46.3 | 71,614 | 42.6 |
| 2013 | 2,340 | 170,601 | - | - | - | - |
| 2014 | 1,335 | 171,936 | - | - | - | - |
| 2015 | 699 | 172,635 | - | - | - | - |
| 2016 | 350 | 172,985 | - | - | - | - |
| 2017 | 133 | 173,118 | - | - | - | - |
| Total | 173,118 | | 71,614 | | | |
| Antelope Creek | | | | | | |
| 2002 | 15,460 | 15,460 | 2,668 | 17.3 | 2,668 | 17.3 |
| 2003 | 17,271 | 32,731 | 4,042 | 23.4 | 6,710 | 20.5 |
| 2004 | 17,685 | 50,416 | 5,181 | 29.3 | 11,891 | 23.6 |
| 2005 | 17,503 | 67,919 | 5,234 | 29.9 | 17,125 | 25.2 |
| 2006 | 17,385 | 85,304 | 5,869 | 33.8 | 22,994 | 27.0 |
| 2007 | 16,180 | 101,484 | 2,327 | 14.4 | 25,321 | 25.0 |
| 2008 | 12,613 | 114,097 | 1,983 | 15.7 | 27,304 | 23.9 |
| 2009 | 5,226 | 119,323 | 1,295 | 24.8 | 28,599 | 24.0 |
| 2010 | 3,574 | 122,897 | 1,097 | 30.7 | 29,696 | 24.2 |
| 2011 | 2,956 | 125,853 | 985 | 33.3 | 30,681 | 24.4 |
| 2012 | 1,041 | 126,894 | 769 | 73.9 | 31,450 | 24.8 |
| 2013 | 363 | 127,257 | - | - | - | - |
| 2014 | 124 | 127,381 | - | - | - | - |
| 2015 | 40 | 127,421 | - | - | - | - |
| 2016 | 13 | 127,434 | - | - | - | - |
| 2017 | 3 | 127,437 | - | - | - | - |
| Total | 127,437 | | 31,450 | | | |
| Upper Belle Fourche River | | | | | | |
| 2002 | 54,735 | 54,735 | 26,761 | 48.9 | 26,761 | 48.9 |
| 2003 | 67,481 | 122,216 | 24,309 | 36.0 | 51,070 | 41.8 |
| 2004 | 76,259 | 198,475 | 18,906 | 24.8 | 69,975 | 35.3 |
| 2005 | 82,713 | 281,188 | 12,817 | 15.5 | 82,792 | 29.4 |
| 2006 | 85,761 | 366,949 | 12,502 | 14.6 | 95,294 | 26.0 |
| 2007 | 84,507 | 451,456 | 8,677 | 10.3 | 103,971 | 23.0 |
| 2008 | 79,493 | 530,949 | 7,275 | 9.2 | 111,602 | 21.0 |
| 2009 | 49,435 | 580,384 | 4,541 | 9.2 | 116,142 | 20.0 |
| 2010 | 39,170 | 619,554 | 2,954 | 7.5 | 119,097 | 19.2 |
| 2011 | 31,277 | 650,831 | 2,073 | 6.6 | 121,170 | 18.6 |
| 2012 | 21,215 | 672,046 | 887 | 4.2 | 122,057 | 18.2 |
| 2013 | 13,495 | 685,541 | - | - | - | - |
| 2014 | 7,630 | 693,171 | - | - | - | - |
| 2015 | 3,347 | 696,518 | - | - | - | - |
| 2016 | 1,849 | 698,367 | - | - | - | - |
| 2017 | 790 | 699,157 | - | - | - | - |

| Year | Predicted (Annual Acre-feet) | Predicted (Cumulative Acre-feet from 2002) | Actual (Annual Acre-feet) | | Actual (Cumulative Acre-feet Beginning 2002) | |
|--------------------------|------------------------------------|---|---------------------------|-------------------------|---|-------------------------|
| | | | Acre-feet | Percent of Predicted | Acre-feet | Percent of Predicted |
| Total | 699,157 | | 121,170 | | | |
| Upper Cheyenne | | | | | | |
| 2002 | 7,978 | 7,978 | 7,118 | 89.2 | 7,118 | 89.2 |
| 2003 | 8,421 | 16,399 | 7,420 | 88.1 | 14,538 | 88.6 |
| 2004 | 8,365 | 24,764 | 7,926 | 94.7 | 22,463 | 90.7 |
| 2005 | 8,275 | 33,039 | 7,203 | 87.0 | 29,666 | 89.8 |
| 2006 | 8,228 | 41,267 | 7,291 | 88.6 | 36,957 | 89.6 |
| 2007 | 7,002 | 48,269 | 3,159 | 45.1 | 40,116 | 83.1 |
| 2008 | 5,897 | 54,166 | 2,760 | 46.8 | 43,207 | 79.8 |
| 2009 | 2,144 | 56,310 | 1,869 | 87.2 | 45,076 | 80.1 |
| 2010 | 1,456 | 57,766 | 1,475 | 101.3 | 46,551 | 80.6 |
| 2011 | 1,013 | 58,779 | 1,271 | 125.5 | 47,822 | 81.4 |
| 2012 | 357 | 59,136 | 1,169 | 327.5 | 48,991 | 82.8 |
| 2013 | 125 | 59,261 | - | - | - | - |
| 2014 | 43 | 59,304 | - | - | - | - |
| 2015 | 14 | 59,318 | - | - | - | - |
| 2016 | 4 | 59,322 | - | - | - | - |
| 2017 | 1 | 59,323 | - | - | - | - |
| Total | 59,323 | | 48,991 | | | |
| Crazy Woman Creek | | | | | | |
| 2002 | 9,449 | 9,449 | 4 | 0.0 | 4 | 0.0 |
| 2003 | 15,185 | 24,634 | 1 | 0.0 | 5 | 0.0 |
| 2004 | 18,418 | 43,052 | 126 | 0.7 | 130 | 0.3 |
| 2005 | 20,240 | 63,292 | 113 | 0.6 | 243 | 0.4 |
| 2006 | 21,135 | 84,427 | 392 | 1.9 | 635 | 0.8 |
| 2007 | 21,036 | 105,463 | 349 | 1.7 | 984 | 0.9 |
| 2008 | 20,279 | 125,742 | 560 | 2.8 | 1,573 | 1.3 |
| 2009 | 15,962 | 141,704 | 605 | 3.8 | 2,178 | 1.5 |
| 2010 | 13,716 | 155,420 | 1,113 | 8.1 | 3,291 | 2.1 |
| 2011 | 12,240 | 167,660 | 1,124 | 9.2 | 4,415 | 2.6 |
| 2012 | 6,731 | 174,391 | 649 | 9.6 | 5,064 | 2.9 |
| 2013 | 3,629 | 178,020 | - | - | - | - |
| 2014 | 1,881 | 179,901 | - | - | - | - |
| 2015 | 910 | 180,811 | - | - | - | - |
| 2016 | 422 | 181,233 | - | - | - | - |
| 2017 | 150 | 181,383 | - | - | - | - |
| Total | 181,383 | | 5,064 | | | |
| Clear Creek | | | | | | |
| 2002 | 10,697 | 10,697 | 875 | 8.2 | 875 | 8.2 |
| 2003 | 18,192 | 28,889 | 1,489 | 8.2 | 2,364 | 8.2 |
| 2004 | 22,415 | 51,304 | 1,434 | 6.4 | 3,798 | 7.4 |
| 2005 | 24,795 | 76,099 | 1,228 | 5.0 | 5,026 | 6.6 |
| 2006 | 26,267 | 102,366 | 752 | 2.9 | 5,778 | 5.6 |
| 2007 | 25,997 | 128,363 | 622 | 2.4 | 6,400 | 5.0 |
| 2008 | 24,879 | 153,242 | 2,081 | 8.4 | 8,486 | 5.5 |
| 2009 | 22,762 | 176,004 | 1,849 | 8.1 | 10,335 | 5.9 |
| 2010 | 22,071 | 198,075 | 1,504 | 6.8 | 11,839 | 6.0 |
| 2011 | 21,576 | 219,651 | 1,257 | 5.8 | 13,096 | 6.0 |
| 2012 | 11,969 | 231,620 | 1,270 | 10.6 | 14,366 | 6.2 |
| 2013 | 6,552 | 238,172 | - | - | - | - |
| 2014 | 3,500 | 241,672 | - | - | - | - |

| Year | Predicted (Annual Acre-feet) | Predicted (Cumulative Acre-feet from 2002) | Actual (Annual Acre-feet) | | Actual (Cumulative Acre-feet Beginning 2002) | |
|--------------|------------------------------|--|---------------------------|----------------------|--|----------------------|
| | | | Acre-feet | Percent of Predicted | Acre-feet | Percent of Predicted |
| 2015 | 1,780 | 243,452 | - | - | - | - |
| 2016 | 832 | 244,284 | - | - | - | - |
| 2017 | 299 | 244,583 | - | - | - | - |
| Total | 244,583 | | 14,366 | | | |

Source: WOGCC 2013

Drilling and completion procedures for CBNG and conventional oil and gas wells are strictly controlled by WOGCC and BLM requirements which ensure each formation remains as isolated as it is under natural conditions and that the integrity of the wellbore remains intact. Development that occurs in accordance with these requirements is not likely to have allowed any leakage or mixing of groundwater in the formations that were penetrated due to recent development. However, many existing non-fluid mineral wellbores may not effectively isolate the formations penetrated and may serve as conduits for mixing of waters from different aquifers. Water wells frequently are screened over multiple aquifer zones, which would facilitate mixing of groundwater from different aquifer zones. Many older, conventional oil and gas wells likely are inadequately cased, which could have allowed any groundwater present to leak from one formation to another. Numerous uncased boreholes were drilled in the PRB to evaluate uranium potential and were not properly plugged, which could have allowed any groundwater present to leak through the formations penetrated. For additional information see Appendix O (p. 601) as well as the Buffalo RMP RFD.

An additional groundwater use in the planning area is related to ISR uranium. There are several locations in the PRB where uranium is currently being solution mined (see the *Locatable Minerals* section in the Proposed RMP and Final EIS). Potential surface and groundwater issues could arise from the development of in situ recovery uranium. However, in situ recovery development is under the regulatory authority of the U.S. Nuclear Regulatory Commission (NRC), and water quality regulation and protection would be under the authority of Wyoming DEQ. In these active mining areas, the ambient groundwater is circulated as mining solution when oxidants are added for dissolving the uranium in the target formation. Mine areas are maintained in an under-balanced condition with respect to water quantity, which means that slightly more water is removed than the amount injected to prevent excursion of the solution from the targeted areas. The mined area is ringed with groundwater monitor wells in the target zone as well as above and below to monitor for leakage of the mine solution. Additionally, the mines are required to determine pre-mining baseline water quality which serves to set the goal for groundwater restoration after mining is complete. The Wyoming DEQ Land Quality Division (LQD) and WQD have authority over the restoration of the groundwater in a mined area, in concert with the requirements of the NRC. BLM's only nexus to the mining of uranium would be the management of BLM-administered surface within the mine boundary.

In areas where there is potential for conflict between oil and gas development of federal minerals and potential uranium extraction, the BLM requires that the operator's project includes design features to minimize impacts to the fluid mineral (oil and gas), as well as the locatable mineral (uranium).

N.1.3.2. Monitoring Programs

Federal and state government agencies, the oil and gas industry, local municipalities, and the mining industry have numerous programs for monitoring surface and groundwater quality, as well as quantity.

Surface Water

As noted above, the USGS is funded by numerous entities, including the BLM, to perform water quality and flow monitoring on selected mainstem locations within the planning area, such locations where some of the primary watersheds leave the planning area or state (Tongue River, Powder River, Little Powder River, Belle Fourche River, and Cheyenne River). Due to funding availability and decline of CBNG production, some of these locations may be discontinued or changed over time, based on results and related issues.

Every surface discharge is permitted through the Wyoming DEQ with conditions that the water quality be monitored at specific intervals with the results submitted to the state. These results provide information to guide the WYPDES permitting program. The BLM is obligated to insure compliance with all applicable state and federal laws and regulations, but in this case for water quality issues, the Wyoming DEQ is the enforcement agency.

Impaired Streams

The Wyoming DEQ is in the process of establishing TMDLs for pollutants for the impaired water bodies in the planning area. The BLM will continue to cooperate with the state in those efforts. As working groups are formed to address issues of impairment for specific reaches, the BLM will participate if, and when surface management authority dictates.

Groundwater

Beginning in the early 1990s with the onset of CBNG development, the BLM in concert with Wyoming State Engineer's Office (WSEO) and USGS, began a groundwater monitoring program to document the changes in water levels in the producing coal zones. The PRB Final EIS modeled the extent of drawdown in the Ft. Union coalbeds based on this historic production and groundwater levels. Since 1989, the monitoring program has been expanded to include most of the areas of current CBNG production (62 sites). The anticipated effects of CBNG production on groundwater were summarized as follows: "Because coal mining and CBM operations are dynamic, the maximum areal extent of drawdown may change over time and may increase in some areas of the PRB while it recovers in others. The maximum drawdown in any sub-watershed generally coincides with or closely follows the period of peak water production in the watershed." PRB Final EIS pg. 4-15.

Ongoing groundwater monitoring by the BLM has been documented and summarized by the Wyoming State Geological Survey in several updates available on their website at <http://www.wsgs.uwyo.edu/public-info/onlinepubs/PRB-Drawdown.aspx>. The updated data summary through 2012 will be available by the end of 2013. This summary validates the statement that the maximum area of drawdown will be the areas of peak water production. In the report, drawdown results are compared with aggregate CBNG production volumes (gas and water) within 1.5 miles of the monitoring well. In general, water levels have dropped where

CBNG water production has been highest. Gas pressures at the monitor wells have increased as gas production in the surrounding area increases and water production generally decreases.

The PRB Final EIS also predicted that there could be impacts to shallow groundwater sources due to infiltration at or near surface discharge points and containment impoundments, but made no predictions regarding changes to quality or quantity. In the early days of CBNG development, BLM began monitoring shallow groundwater at selected locations around the planning area. Results from this and other monitoring eventually led the Wyoming DEQ to apply additional requirements for testing through “Compliance Monitoring for Groundwater Protection Beneath Unlined Coalbed Methane Produced Water Impoundments” June 2004. Wyoming DEQ requires that prior to new impoundment construction, the proponent must determine the class of any groundwater located below the site of installation and estimate the volume of water by drilling an investigative well to at least 150 feet below ground surface or to bedrock, depending on the proposed size of impoundment. Depending on the designated class of use determined, the operator may be required to relocate the impoundment, monitor impacts to the groundwater or perform no additional monitoring (Wyoming DEQ 2006). Table N.3, “Summary of Wyoming DEQ WQD Coalbed Natural Gas Groundwater Database: 4th Quarter 2011” (p. 587) below presents the data collected by the Wyoming DEQ regarding the shallow groundwater protection program as of the end of 2011.

Table N.3. Summary of Wyoming DEQ WQD Coalbed Natural Gas Groundwater Database: 4th Quarter 2011

| Category | Number | Explanation |
|---|--------|---|
| Operators | 42 | Unique company names |
| POD and/or Projects | 285 | Unique POD or Project names |
| Impoundments | 2,017 | Unique impoundment names |
| Wells or borings | 2,306 | Unique well and/or boring names and dry boreholes which were not given names |
| Permits (compliance monitoring authorization) | 111 | Chapter 3 as-built monitoring well permits (often includes multiple wells) |
| Permitted impoundments | 249 | Impoundments with permitted (CH ₃) monitor wells and thus require ongoing compliance monitoring |
| Permitted: Class I Groundwater | 2 | As above over Class I Groundwater |
| Permitted: Class II Groundwater | 1 | As above over Class II Groundwater |
| Permitted: Class III Groundwater | 234 | As above over Class III Groundwater |
| Permitted: Class IV Groundwater | 10 | As above over Class IV Groundwater (likely a mix of Classes III and IV) |
| Compliance monitoring wells | 307 | - |
| Permitted impoundments in use (submitting monitoring data) | 125 | Impoundments with permitted (CH ₃) monitor wells and confirmed in use by submitting data |
| Permitted impoundments not receiving discharge | 91 | Impoundments with permitted (CH ₃) monitor wells and confirmed not in use (operator's word) |
| Permitted impoundments for which permits have been terminated | 47 | Permits terminated at operators request, not needed after all, did not receive discharge |
| Exempt impoundments total) | 1,493 | Impoundments which do not require further groundwater monitoring |
| Exempt: Class IV Groundwater | 309 | As above: exempt because groundwater is Class IV |
| Exempt: No groundwater encountered | 1,091 | As above: exempt because no groundwater was encountered |

| Category | Number | Explanation |
|---|--------|---|
| Exempt: Small capacity | 39 | As above: exempt because capacity of reservoir is less than 2 acre-feet |
| Exempt: Other reasons (Class V, ET uptake, etc.) | 54 | As above: miscellaneous |
| Data submitted, groundwater authorization denied or not requested by operator | 216 | Impoundments for which a review or decision has not been made |
| Impoundments which have wells that have ever exceeded class of use limits for any parameter | 26 | - |
| Source: Wyoming DEQ 2012 | | |
| CH ₃ Methyl | | |
| DEQ Department of Environmental Quality | | |
| ET Evapotranspiration | | |
| POD Plan of Development | | |
| WQD Water Quality Division | | |

N.1.3.3. Reclamation Efforts

As stated previously, water produced in association with CBNG development is primarily discharged to impoundments. Through 2011, over 2,000 impoundments have been approved for water management associated with federal mineral development. All impoundments detaining waters of the state must be properly permitted through the WSEO. The WSEO began documenting impoundments permitted for CBNG development around 2003. As of 2011, over 3,100 CBNG-related impoundment permits were still active in the PRB. These impoundments contain over 36,000 acre-feet of water and disturb over 7,500 acres of surface area.

As CBNG production decreases and the volume of water containment/management facilities is also decreased, the operators are required to reclaim impoundments no longer needed for water management, as is required for all other federal actions that result in surface disturbance. In 2010, the Buffalo Field Office (BFO) issued a guidance document for the reclamation of impoundments which addresses some of the potential issues identified in the PRB Final EIS. The document "BFO Impoundment Reclamation Guidelines" can be accessed at: http://www.blm.gov/wy/st/en/field_offices/Buffalo/minerals.html. At reclamation, the operator is required to quantify the amount and chemical character of sediment deposited in the impoundment and propose disposition based on contaminants detected. As part of the reclamation process the location must be reclaimed to approximate the channel geometry that existed prior to disturbance to restore natural flow regimes. If the location is split estate, landowner notification is required.

At the time of abandonment, the BLM reviews requests from landowners or grazing lessees that desire to leave impoundments in place for range or grazing management. Additional reviews are also completed by the WSEO.

In 2005, the BFO began to require that operators proposing to construct impoundments or modify an existing structure submit a bond in the amount of the cost of reclamation for the facility. If for some reason the operator would default on their responsibilities to reclaim an impoundment, any bond monies held could be applied to the cost of reclamation of the site.

Currently, the WOGCC is in the process of adopting baseline groundwater monitoring requirements for all oil and gas development in the state. Operators will be required to sample for baseline water quality of any existing permitted functional water well within a 0.5 mile radius of the proposed well site. Additional sampling will be required at regular intervals following

development to determine if there were impacts to the water well resulting from the drilling and completion of the fluid mineral well. When this requirement is adopted by the state, the BLM will require compliance from any related federal action.

N.2. Water Resource Management Plan

N.2.1. Locatable Mineral Development and Coal Lease by Application

1. Mining plans for locatable minerals, including Bentonite and uranium are developed in cooperation with the Wyoming DEQ LQD. The NRC also has authority for the permitting of uranium development projects, in concert with the LQD. In all cases, the proponent would include a water management component in the POD or operation. Even locatable minerals projects not directly under BLM permitting authority can be reviewed by the BLM to ensure that no undue or unnecessary degradation would occur.
2. In the case of uranium mining, including in situ recovery, the LQD and NRC are the permitting authorities, including the water management. Only in cases where there is BLM-administered surface included within the mine boundary would the BFO be responsible for conducting a NEPA review and approval of the project for the use of that surface. The BLM BFO has opportunity to comment on any and all mineral development projects as necessary.
3. The Wyoming DEQ and U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement have the permitting oversight and authority to mitigate water quality issues for a coal mining operation. The BLM does not stipulate any specific water quality permitting requirement for a coal lease, but requires lessees to comply with all applicable state and federal laws. A BLM EIS for a coal mining operation will analyze the potential effects to water quality, but any mitigation will be a requirement of the Wyoming DEQ through its permitting process.
4. The Wyoming DEQ WQD administers a WYPDES storm water permitting program to assist in managing the state's water resources. Under this program, anyone planning to construct, modify, or use a facility capable of emitting storm water and related effluents into waters of the state must obtain coverage under a Permit to Discharge Storm Water Under the WYPDES. Mineral and coal mining projects are required to prepare pollutant prevention plans as part of the permit application.
5. Water disposal through subsurface injection would require a permit from the Wyoming DEQ Underground Injection Control division of the WQD.
6. All permitted activities that include surface disturbance are required to address the eventual reclamation of that disturbance. (Management Action Water-1016 to achieve goals PR:3.1, PR:3.3, and PR:3.5) Authority for this is documented in 30 United States Code 226(g) which states: "The Secretary concerned shall, by rule or regulation, establish such standards as may be necessary to ensure that an adequate bond, surety, or other financial arrangement will be established prior to the commencement of surface-disturbing activities on any lease, to ensure the complete and timely reclamation of the lease tract, and the restoration of any lands or surface waters adversely affected by lease operations after the abandonment or cessation of oil and gas operations on the lease."
7. A new coal mine, or a modification to an existing mine, must be permitted by Wyoming DEQ LQD. A permittee must compile detailed water quality and quantity inventories and demonstrate compliance with all applicable aspects of Wyoming Water Quality Standards

and Regulations, including compliance with CWA, before either a permit or amendment is granted.

8. A Best Available Control Technology analysis is required to demonstrate the use of an appropriate level of air emissions controls, specifically for air quality issues in mining applications (Wyoming Air Quality Standards and Regulations Chapter 6, Section 2). Some of these control measures at mining operations would also be protective of water quality as well as air quality. Protective measures would include, but are not limited to: the paving of access roads to reduce erosion potential; the treating of major and temporary haul roads and work areas with a suitable dust suppressant which improves the erosion resistance of the surface; and the use of silos, trough barns, or similar enclosed containers for the storage of large volumes of material awaiting load out and shipment reducing the potential for impacts to surface waters.

N.2.2. Mineral and Energy Development Authorizations

1. The BLM manages the location, density, and/or rate of development on a site-specific basis to protect surface and water resources. 43 CFR 3101.1-2 allows that the BLM authorized officer may relocate a proposed action to a location within 200 meters (656 feet) of the original location to minimize adverse impacts to other resource values. This flexibility would enable the BLM to move any proposed action to a more suitable location, such as farther away from surface water, if there were potential environmental issues identified.
2. When reviewing a proposed project, the BLM will consider the magnitude of potential water impacts from the project, existing water quality conditions including impairments, proximity to riparian areas and other surface waters, and other issues identified during project scoping to identify pollutants of concern and to determine the appropriate level of water analysis to be conducted for the project.
3. Prior to approval, all projects submitted to BLM that involve construction, drilling or other surface disturbance will be assigned to an interdisciplinary team of specialist for site specific environmental analysis. The interdisciplinary team could consist of a Natural Resource Specialist, Wildlife Biologist, Archeologist, Civil Engineer, Realty Specialist, Geologist, Soil Scientist, Hydrologist, Legal Instruments Examiner, Petroleum Engineer, and Legal Assistant. All proposed disturbance is inspected (onsited) to identify site-specific resource protection concerns and requirements.
4. As required in the PRB Final EIS ROD, the proponent must submit a water management plan for proposed CBNG projects that are analyzed through an Environmental Assessment, Categorical Exclusion or Determination of NEPA Adequacy. The Water Management Plan requirements can be found in the ROD. The operator is required to estimate the quantity and quality of water produced in association with CBNG, describe the water management strategy selected (i.e., channel discharge, discharge to containment, re-injection, etc.), identify potential impacts from the management strategies and recommend or incorporate design features to address potential impacts. This information will inform monitoring (see the *Monitoring* section), and mitigation (see the *Mitigation* section).
5. The RFD for this RMP and Appendix J (p. 429) projects that up to 10,000 additional CBNG wells may be drilled in the planning area from 2012 through 2028. Production from these wells is estimated at 2,473 billion cubic feet of gas and 318,754 acre-feet of water. The total volume of water estimated to be produced from development under the PRB Final EIS from 2002 through 2011 was 2,912,756 acre-feet. According to the data collected by the WOGCC, actual cumulative water production associated with CBNG through 2011 totaled 754,271 acre-feet or 26 percent of the total volume of water estimated to be produced. The additional

- water production associated with newly constructed wells falls well within the volume estimated for CBNG development and thus should not exceed the impacts predicted. For more information, refer to the Proposed RMP and Final EIS Chapter 4, *Water Resources* section.
6. The quality of the water produced in association with CBNG predicted through 2028 is expected to be similar to that analyzed in the PRB Final EIS.
 7. Water produced in association with CBNG will continue to be managed through surface discharge to containment impoundments, direct discharge to a receiving stream, storage and retrieval injection, injection in deep disposal wells, land application or discharge to evaporation ponds. The Wyoming DEQ has permitting authority for all the options with the exception of any injection associated with conventional oil and gas production. The Wyoming DEQ has revised the requirements for surface discharge and direct discharge to streams in specific watersheds to protect active irrigation downstream. The BLM reserves the right to deny any water management option that does not meet agency environmental standards.
 8. The BLM will require a water management plan for proposed oil and gas development projects that are analyzed through an EIS.
 9. For conventional oil and gas development, the operator must comply with Onshore Oil and Gas Order No. 7 by submitting a sundry notice to propose the water management for each well or groups of wells if it was not included in the design features of the original proposal.
 10. Historically, the volume of water produced in association with oil starts very low and increases with time, dependent on reservoir characteristics. The RFD presents volumes of oil, gas and water produced through 2008 by formation in Table N.1, “Monthly Mean Discharge (cubic feet per second) 2001 to 2011” (p. 566). For the average barrel of oil produced, 2.9 barrels of water have been produced considering all formations for a total of 451,791 acre-feet of water since the beginning of record keeping.
 11. As described in Appendix O (p. 601), conventional produced water is often used for secondary recovery or waterflooding through reinjection into the producing zone to increase oil recovery. However in the planning area, there are several locations where the water quality in various oil-bearing formations is such that it can be treated to meet WYPDES surface discharge water quality standards. The Wyoming DEQ has authority for permitting and monitoring surface discharge in the State of Wyoming.
 12. The BLM has the responsibility to implement the decisions of the RMP in a manner that protects water quality. The BLM also must recognize valid and existing leasing rights. At the project approval stage, the BLM can require specific actions and measures to protect water quality based on expected impacts (Management Actions Water-1004, Water-1005, Water-1007, Water-1009, Water-1013, and Water-1014).
 13. The proponent of an energy development project will be required to provide a detailed description of operator committed measures. These measures would include specific components to reduce project related potential water pollutant discharges, including petroleum product release and sediment movement due to surface erosion. Following, in the *Mitigation* section, is a list of potential mitigation measures. The list is not intended to preclude the use of other effective water pollution control technologies that may be proposed. Details of the mitigation measure would be submitted by the applicant and enforced as a condition of the BLM-issued authorization.
 14. Prior to approval, all projects submitted to the BLM for review that are in close proximity to any identified impaired water body will be evaluated for their likelihood to contribute to the impairment and appropriate mitigation measures will be applied. The BLM will coordinate efforts with Wyoming DEQ in any programs they may have initiated to address the impairment.

15. In compliance with Executive Order 11190, BLM's initial recommendation for wetland and riparian areas is for the proponent to avoid the areas to the extent possible. However, if it is necessary to develop in those areas, mitigation will be required to be included in the design of the project. Alternatively, the BLM will apply any mitigation deemed necessary at the time of approval as a Condition of Approval.

N.2.3. Monitoring

1. As part of a comprehensive Water Management Plan for the planning area, the BLM will continue to work cooperatively with federal and state agencies responsible for managing water resources to determine, characterize, and track water resource conditions (Management Action Water-1006). BLM will cooperate with efforts of the Wyoming DEQ to evaluate monitored exceedances. Wyoming DEQ has authority and primacy for regulating and monitoring water quality within the state, including determining causes of monitored exceedances.
2. The BLM will support and participate in regional monitoring efforts to meet Management Actions Water-1004 and Water-1006.
3. The BLM will continue to perform Groundwater Monitoring to document changes to groundwater levels in the planning area due to fluid mineral or locatable mineral development to comply with Objective PR:3.6 through Management Action Water-1005. The Groundwater Monitoring program will also continue to document existing or potential migration between coal zones and adjacent sands.
4. A water quality exceedance would be the hard trigger requiring adaptive management to occur; Chapter 4 identifies NEPA significance criteria which would be additional hard triggers for adaptive management. Adaptive management can also be implemented prior to a water quality exceedance, such as when monitoring demonstrates a trend towards exceedance. BLM is committed to working cooperatively with the Wyoming DEQ, EPA, and other stakeholders to address water resource concerns.

N.2.4. Mitigation

The BLM reserves the right to modify the operations of surface-disturbing or disruptive activities as part of the statutory requirements for environmental protection. Those measures selected for implementation will be identified in the site-specific ROD or decision record for those activities and will inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM-administered public lands and minerals.

1. Many of the activities that the BLM authorizes, permits, or allows include surface disturbance (vegetation removal or excavations) that have the potential to impact water quality. The primary mechanisms to reduce water quality impacts are to control and reduce erosion through strategies such as adjusting the rate of development, or by implementation of mitigations such as insuring interim reclamation success through use of surface stabilizing technologies.
2. The proponent of a project will be required to comply with all applicable state and federal regulations and may be required to apply additional mitigation and other technologies or strategies.
3. The BLM will ensure implementation of additional control measures and strategies within its regulatory authority and in consultation with federal and state agencies responsible for managing water resources, if:

- a. Proposed or committed measures are insufficient to achieve water quality Goal PR:3 and objectives PR:3.1, PR:3.4, PR:1.3, and PR:3.7 and Management Actions Water-1004, Water-1005, and Water-1006; or
- b. A BLM-authorized source caused or contributed to a monitored exceedance of the CWA as determined by Wyoming DEQ, in consultation with BLM.

Mitigation may include reduction in the number of locations, density, and/or rate of development, or other measures. BLM would apply mitigation as conditions of approval as a result of site-specific NEPA where design features of the project do not include adequate environmental protections.

Required Design Features

1. As required in the PRB Final EIS ROD, for CBNG development or for field development fluid mineral projects, the operator must include a water management plan for review with the APD or POD. The water management plan must provide adequate information for the BLM to complete site-specific NEPA analysis and to ensure compliance with all state and federal requirements prior to approval.
2. Operators need to certify that all potentially affected landowners (with water wells properly permitted by the WSEO) within each proposed oil or gas well's circle-of-influence were offered a Water Well Agreement. This agreement should commit the operator to replacing or repairing the water source if it is determined that the development has degraded or impaired the well. Example language for the Water Well Agreement is included in the PRB Final EIS ROD.
3. Proof of approved permit from the authorizing agency will be required prior to any surface water discharge or subsurface injection.
4. Lease Notice No. 1, which is attached to all leases, identifies that there are areas not specifically addressed by lease stipulations that may contain special values that require additional attention to prevent damage to surface and/or other resources. These areas include: slopes in excess of 25 percent; locations within 500 feet of surface water and/or riparian areas; locations within 0.25 mile of occupied dwellings.
5. Management action Water-1013 restricts surface disturbance within 500 feet of springs, reservoirs, water wells, and perennial streams. Similarly, management action Riparian-4009 restricts surface disturbance within 500 feet of riparian systems, wetlands, and aquatic habitats (144,045 acres). BLM has determined these management actions are sufficiently protective of most aquatic resources within the planning area as the primary water resource is ephemeral streams. In addition, there are several other management actions that provide benefit to aquatic resources such as (all listed acreage represent federal fluid mineral estate):
 - Soil-1004: surface disturbance is restricted in areas with a severe erosion hazard (669,739 acres);
 - Soil-1006 surface disturbance is restricted on slopes >25% (170,590 acres);
 - Soil-1010 surface disturbance is restricted in areas with limited reclamation potential (685,950 acres);
 - Fish-4013 surface disturbance is restricted within 0.25 mile of naturally occurring water bodies containing native or desirable non-native fish species (261,870 acres);
 - SS Fish-4008 no surface occupancy or use is allowed within 0.25 mile of any waters containing special status fish species (4,846 acres);
 - SS WL-4028 no surface occupancy or use is allowed within 0.5 mile of consistently used bald or golden eagle winter roosts and the following consistently used riparian corridors:

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Clear Creek, Crazy Woman Creek, Piney Creek, Powder River, and Tongue River (58,902 acres);

- SS WL-4034 surface disturbance is restricted within 1,640 feet (500 meters) of perennial water, vernal pools, playas, and wetlands (1,217,959 acres).

This suite of management actions has been determined to be protective of the aquatic resources within the planning area. BLM reviews all project proposals and requires the appropriate mitigation to conserve water and other affected resources.

6. For CBNG development, the operator will be responsible for monitoring the natural springs which were identified within a 0.5 mile radius of the development. The springs will be sampled for a water analysis and the discharge rates will be determined at 6-month intervals for the duration of the associated CBNG development, or until the data trend indicates otherwise.
7. The operator is responsible for ensuring that the BLM has access to the area for monitoring and inspections in accordance with 43 CFR 3162.1(b) and 3164.3(b).

Recommended Design Features

1. Coordinate road construction and use among ROW and/or mineral lease holders to reduce the number of duplicate surface disturbance areas. Close and rehabilitate duplicate roads.
2. To reduce potential for surface and groundwater contamination, use only closed-loop systems for drilling operations, with no reserve pits.
3. In accordance with CWA Section 404, construct road crossing at right angles to ephemeral drainages and stream crossings.
4. Use directional and horizontal drilling to reduce surface disturbance and vegetation impacts (dust, erosion and sediment movement). Applicability depends on geologic strata.
5. Consider using oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling. This will reduce erosion potential.
6. Use mulch, soil amendments, and/or erosion control blankets to expedite reclamation and to protect soils.
7. The use of green (also known as closed-loop mud system) completions and green workovers, reduce or eliminate open pits and associated potential water contamination.
8. To reduce potential impacts to riparian areas or other sensitive wetlands or surface waters, locate disturbance activities 500 feet away from the water body, or further depending on site specific conditions.
9. To reduce potential impacts to surface water bodies impaired reaches or segments, locate 750 foot setback from reaches identified as being impaired due to surface flow contributions.
10. In order to provide protection for an aquifer that is currently being used for a domestic water supply, the operator should not attempt to locate an unlined produced water pit within 0.25 mile of a domestic use well.
11. In order to protect the surface waters of the state, produced water pits should be located 0.25 mile (1,320 feet) from the outermost alluvium (and adjacent mixtures) of any current stream system and, at a minimum, five hundred (500) feet from the edge of any bank-to-bank stream channel, pond, reservoir, wetland or lake.
12. General Guidance for Water Management Plan Development
 - a. Consult private surface owner(s) early in the planning process and throughout the development of Water Management Plans.
 - b. Develop Water Management Plans on a watershed basis, coordinating with other companies within the same watershed.

- c. Consider all existing and anticipated upstream contributions (natural flow, runoff and other discharges) and determine through sound hydrologic analysis if the produced CBNG water from the wells, based on known or anticipated water production rates, will adversely impact downstream improvements, uses, and users (reservoirs, hay meadows, etc.).
- d. Depending on the water quality and quantity, centralize the water discharge to localize the associated disturbance.
- e. The BLM encourages innovative methods of using and managing produced CBNG water. Any proposed method will be evaluated and authorized on a case-by-case basis.
- f. Locate discharge points and reservoirs in readily accessible areas for ease of installation and monitoring. Consider access options which involve the least surface disturbance in any erosion feature modification.

13. Discharge Points

- a. Locate discharge points in areas that will minimize erosion and impacts to the receiving channel, existing improvements, and downstream users.
- b. Locate discharge points in stable, low gradient drainage systems and below active headcuts when possible. If discharge is located above a headcut, mitigation measures will be required by the BLM authorized officer on a site-specific basis. Some mitigation measures will require engineering design.
- c. All discharge points will require energy dissipation measures.
- d. Discharge points may not be authorized by BLM regardless of WYPDES status or previous use and may be relocated or otherwise mitigated during onsite inspections where environmental issues exist.
- e. Cumulative produced water discharge must not exceed the naturally occurring 2-year peak flow of the receiving channel.
- f. Do not locate discharge points in playas or enclosed basins unless it can be demonstrated that it can be done without resulting in adverse impacts. Discharges into valley bottoms with no defined low-flow channel will generally not be allowed, but will be reviewed on a site-specific basis.

14. Channel Crossings

- a. Minimize channel disturbance as much as possible by limiting pipeline and road crossings.
 - i. Avoid running pipelines and access roads within floodplains or parallel to a stream channel.
- b. Channel crossings by road and pipelines will be constructed perpendicular to flow. Culverts will be installed at appropriate locations for streams and channels crossed by roads as specified in the BLM Manual 9112-Bridges and Major Culverts and Manual 9113-Roads. Streams will be crossed perpendicular to flow where possible, and all stream crossing structures will be designed to pass the 1-year discharge event without the buildup of static head and carry the 25-year discharge event or other capacities as directed by the BLM.
- c. Channel crossings by pipelines will be constructed so that the pipe is buried at least four feet below the channel bottom.
- d. Low water crossings will be constructed at original streambed elevation in a manner that will prevent any blockage or restriction of the existing channel. Material removed will be stockpiled for use in reclamation of the crossings.

15. Water Control Structures

- a. Reservoirs must be designed in accordance with WSEO standards. The reservoir should be designed to accommodate the proposed POD discharge volume as well as potential upstream development.
- b. Locate off-channel pits so that negative impacts on the adjacent surface, surface water or groundwater are minimized.
- c. On federal surface, if passage of water through a spillway is to be frequent, the spillway must be reinforced and designed for continual flow (regular flows on earthen spillways will not be allowed).

Mitigation Measures or Potential Conditions of Approval

1. The operator will be responsible for monitoring of the physical condition of the discharge point(s) on a monthly basis for the first year of operation. Inspectors will note the condition of each discharge point, check for evidence of erosion, and schedule any necessary maintenance work. (Note: the Wyoming DEQ is responsible for coordinating monitoring and compliance for the discharged water quality.)
2. Dam outlets (spillways and pipes) and culverts will be inspected quarterly and after major storm events for the first year of operation, for evidence of erosion, and schedule any necessary maintenance work.
3. Erosion stabilization measures and sediment control BMPs (head cut repairs, etc.) will be inspected on a monthly basis for the first year of operation and after major storm events. Inspectors will note condition and schedule any necessary maintenance work.
4. Channels within and below the project area will be inspected on a monthly basis and after major storm events for signs of accelerated erosion for the first year of operation.
5. The operator will inspect any wetland and/or riparian areas which are affected by the development for impacts resulting from the development.
6. Any mitigation work, repairs or other maintenance outside the scope of the initially authorized action will require approval by the BLM authorized officer prior to the initiation of any work. The proposed actions will be submitted as a Sundry Notice (Form 3160-5) to the BLM BFO.
7. After the first year of operation, inspections will occur annually unless specific sites have required mitigation action, then inspections will continue at the previous intervals until no action has been required for a full year.
8. If Land Application Disposal is a part of the Water Management Plan, monitoring of the soils and vegetation may be required on representative sites. Monitoring may include analysis of the water that is being applied and the affected soils.
9. The operator will monitor areas adjacent to discharge points and impoundments for vegetative changes, including the influx of noxious weeds and weeds of concern.
10. If the groundwater is designated as Class I by ambient quality, an unlined CBNG produced water pit may be allowed if it can be demonstrated that the water quality being discharged into the unlined CBNG produced water pit is of equal or better quality than the groundwater. If this condition cannot be met, the unlined CBNG produced water pit should not be located within that area, or an acceptable, alternative disposal method used. If the ambient quality of the groundwater is equal to or less than the quality of the CBNG produced water no restrictions would apply.

Best Management Practices

Environmental BMPs are state-of-the-art mitigation measures designed to provide for safe and efficient operations while minimizing undesirable impacts to the environment (BLM 2006).

1. Eliminate the surface disposal of CBNG wastewater, as well as the construction of evaporation or infiltration reservoirs to hold wastewater. Inject CBNG wastewater underground into a formation of equal or lower water quality.
2. Place roads outside of riparian areas where possible.
3. Design and construct mineral exploration and development operations so as to disturb the smallest footprint practical on the landscape while meeting all safety requirements. Where feasible, consider mowing of parking and storage areas on portions of oil and gas well drilling locations rather than stripping the topsoil and vegetation from the entire location, and the use of two-track trails to conduct exploration activities.
4. Encourage the development of new technologies that would reduce total surface disturbance (i.e., directional drilling, multiple wells from the same well pad and reinjection of produced water).
5. The number of river, stream (including ephemeral streams), lake, and wetland crossings should be minimized, where possible. Bridges, culverts, and other drainage structures should be incorporated to ensure the free flow of water when drainage ways are intersected. Different flood stages should be considered for the design and construction of the crossings.
6. Injection and/or disposal wells should be completed so the injected fluids enter the desired formations and do not enter other formations or drinking water zones. Typical injections are completed with three levels of protection for drinking water formations:
 - a. Surface casing and cement,
 - b. Long string casing and cement, and
 - c. Tubing and packer.
7. Also, the area around the injection should be reviewed to see if any wells (active, inactive or abandoned) were drilled through the injection and/or disposal zone. If wells were drilled close to the injection/disposal well that penetrated the injection and/or disposal formation and those wells did not isolate those zones, the injected fluids could flow from the injection zone through the improperly plugged or completed well to other oil and gas zones or drinking water zones.
8. For both new and existing wells, the known and anticipated needs for remedial cementing to protect underground sources of drinking water should be considered in the planning stage.
9. Natural drainage patterns of the area should be considered in the location of equipment, pads, and pits so that storm water runoff does not create an environmental hazard by erosion of base material, which could lead to equipment instability, or by flooding of pits, which could cause a discharge of oil or other fluids into the local surface waters.
10. Discharges of storm water from inside facilities such as bermed areas around tank batteries (including oil and gas exploration, production, processing, or treatment operations or a transmission facility), which can reach waters of the United States, require a storm water discharge permit and submittal of a storm water pollution plan to the Wyoming DEQ. Contamination includes storm water that comes into contact with any overburden, raw materials, or waste products on the site.
11. Construction designs should include installation of erosion and sedimentation control systems. Site construction should be inspected routinely and after each significant storm event. Any repairs to the control systems should be completed promptly. During the drilling and completion phases, all raw materials should be stored in a manner to prevent contaminating the natural runoff of precipitation. Temporary containment and liners should be used to minimize the impact of spills and to prevent impacted precipitation from affecting surface or groundwater.
12. Drip pans should be provided under equipment and storage containers potentially subject to minor leaks. These drip pans should be monitored on a routine basis to recover and recycle or dispose of accumulated oil and other liquids.

13. Bulk storage, recyclable, and reusable containers should be considered in order to reduce the number of containers that must be maintained and disposed. All reusable containers should be well marked to denote contents and the fact that they are to be reused.
14. For production equipment, the installation or use of double stuffing boxes, leak detectors, and shutdown devices should be considered in areas of particular environmental sensitivity.
15. Flare pits, sometimes called blowdown or emergency pits, cannot be used for storage or disposal. The primary purpose of a flare pit is to catch any incidental fluid that might be associated with the gas stream that does not burn. Fluids in a flare pit should be removed daily, or as quickly as practical.
16. Siting and construction of flare pits should minimize the risk of surface and groundwater contamination. The size of the flare pit should be proportionate to the volume of liquid effluent that might be expelled from the gas flare. Use of a knockout vessel should be considered.
17. It is essential that all formations bearing usable quality water, oil, gas, or geothermal resources be protected and/or isolated. The prevention of gas or fluid migration to other zones or to the surface is of primary importance. Open-hole plugs, casing plugs, or cement squeezed through casing perforations will isolate the target formations in most cases. However, special procedures, such as perforating casing and circulating cement, may be necessary to isolate that potential production or injection formations existing behind uncemented casing. It is important to prevent interzonal flow in an abandoned well so that such cross-flow does not interfere in the commercial exploitation of the zones through nearby wellbores.
18. Proximity to lakes, streams (including dry washes and ephemeral streams), wetlands, drainage and irrigation ditches, canals, flood plains, and shallow water wells should be evaluated in terms of disturbances during construction and routine operations, and in the event of accidental releases of production or completion fluids.
19. Depth to, and quality of, groundwater should be determined for the construction area. The potential impact to groundwater, particularly from any releases from buried lines should be considered.
20. Water handling facilities are typically located adjacent to, or within, production facilities. Initial planning for these facilities within a field should consider future development potential in order to minimize surface disturbance. When practical and economic, central field locations should be considered to avoid the use of multiple facilities. Facility sizing should consider future throughput increases to minimize the need for additional tankage and treating vessels.
21. Production and water handling facilities should be planned to utilize the smallest practical surface area consistent with safe, prudent, and economic operations. In addition, produced water may be saline and corrosive. Therefore, special care should be taken to minimize the possibility of environmental damage due to equipment upsets, spills, and leaks.
22. Baseline conditions and past land-use in the area should be documented. At a minimum, drinking water supplies should be identified and sampled before any development. Water usage should be determined during the planning phase so that water rights can be secured and disposal options evaluated and selected.
23. Whenever practical, tanks should be used instead of pits.
24. Pits should be designed and constructed to have 2 feet of freeboard, or provide adequate reserve capacity, to prevent overflow under maximum anticipated operating requirements and precipitation.
25. Installation of safety equipment and systems should be considered, i.e., emergency shutdown systems which have the ability to shut wells in, shut down compressors or other engines, or divert production during malfunctions or accidental releases. Where appropriate, alarm systems should be installed to notify the public or company officials of equipment failure or accidental releases.

26. Minimize and/or eliminate venting and/or use closed loop process where possible during "blow downs."
27. Reclaim and/or remediate existing open pits. Do not construct new open pits. This reduces potential for soil and water contamination.
28. Centralization (or consolidation) of water processing facilities (separation, disposal, injection, etc.) would reduce vehicle miles traveled (truck traffic) and associated erosion as well as surface disturbance.
29. Initiate an equipment leak detection and repair program, such as an enhanced direct inspection and maintenance program to reduce potential surface and groundwater contamination due to leakage.
30. Protect unpaved travel surfaces using treatments including watering, chemical suppressants, and gravel to reduce potential impacts to water and vegetation from runoff.

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Appendix O. Oil and Gas Operations

The purpose of this appendix is to summarize the Bureau of Land Management's (BLM) procedures for considering proposals to conduct exploration, leasing and production operations for federal oil and gas. This appendix is provided for information purposes only, and is not necessarily a complete statement of rights, obligations, or processes. This appendix is not a part of the BLM's land use plan decision for the RMP. Any conflict with any statute or regulation is unintentional. In the event of a conflict, the statute or regulation controls. Federal oil and gas lessees and operators, and private surface owners, are advised to confer with the BLM at the time an action is proposed for BLM's consideration, in order to obtain information about the current regulations and policies that may apply to the proposal. Nothing in this appendix affects the authority of any Tribe or of the Bureau of Indian Affairs in any way. This RMP applies to federal lands as defined by the Federal Land Policy and Management Act (FLPMA), and does not apply to lands held in trust for any Tribe or for any individual Indian or Indians.

O.1. Geophysical Exploration

Oil and gas can be discovered by direct or indirect exploration methods, such as the mapping of rock outcrops, seeps, borehole data, and remote sensing data. In many cases, indirect methods, such as seismic, gravity, and magnetic surveys are required to delineate subsurface features that could contain oil and gas. Geophysical exploration could provide information that increases the chances of drilling a discovery well, as well as information that could discourage drilling and the associated surface disturbance. More sophisticated geophysical techniques, such as three-dimensional seismic surveys, could supply enough information to model a reservoir and optimize drilling to prevent excess wells and the associated surface disturbance. Economics and past information also play a role in determining the method used.

O.1.1. Seismic Reflection Surveys

Seismic prospecting is the best and most popular indirect method for locating subsurface structures and stratigraphy that might contain hydrocarbons. Seismic energy (shock waves) is induced into the Earth using one of several methods. As these waves travel downward and outward, they encounter various rock strata, each having a different seismic velocity characteristic. As the wave energy encounters the interface between rock layers, where the lower layer is of lower seismic velocity, some of the seismic energy is reflected upward. Sensing devices, commonly called geophones, are placed on the surface to detect these reflections. The geophones are connected to a recording truck that stores the data. The time required for the shock waves to travel from the shot point down to a given reflector and back to the geophone is related to depth, and this value is mapped to give an underground picture of the geologic structure.

There are many methods available today that an explorationist can use to induce the initial seismic energy into the Earth. All methods require preliminary surveying and laying of geophones. The thumper and vibrator methods pound or vibrate the ground to create a shock wave. Usually large trucks are used, each equipped with vibrator pads (about 4 feet square). The pads are lowered to the ground, and vibrators on all trucks are triggered electronically from the recording truck. Information is recorded, and then the trucks move forward a short distance, and the process is repeated. Less than 50 square feet of surface area is required to operate the equipment at

each test site. The trucks are equipped with large flotation type tires, which reduce the impact of driving over undisturbed terrain.

The drilling method uses vehicle-mounted or heli-portable drills that drill small-diameter holes to depths down to 100 feet. Depending on type of survey, over 100 holes are drilled per mile of line. Usually, a 20-pound charge of explosives is placed in the hole, covered, and detonated. The detonated explosive sends a shock wave below the Earth's surface that is subsequently reflected back to the surface from various subsurface rock layers. In rugged topography, a portable drill is sometimes carried in by helicopter. In remote areas where there is little known subsurface data, a series of short seismic lines might be required to determine the subsurface geology. Subsequently, more extensive seismic lines are arranged to obtain the greatest amount of geologic information.

Seismic information can be obtained in two- (2D) or three- (3D) dimensional configurations. To obtain 3D seismic information, the seismic sensors and energy source are located along lines in a grid pattern. This type of survey differs from the more common 2D surveys because of the large volume of data and the intensive computerization of the data. The results are expensive to obtain but give a more detailed and informative subsurface picture. The orientation and arrangement of the components in 3D seismic surveys are less tolerant of adjustments to the physical locations of the lines and geophones, but they are also more compact in the area they cover. Although alignment can be fairly critical, spacing of the lines can often be changed to significantly increase the information collected. The depth of the desired geologic information dictates the spacing of the grid lines, with smaller spacing detailing shallower formations. The 3D surveys are more detailed and are usually conducted after 2D surveys or drilling has delineated a geologic prospect. Extensive computer processing of the raw data is required to produce a usable seismic section from which geophysicists can interpret structural relationships to depths of 30,000 feet or more. The effective depth of investigation and resolution are determined, to some degree, by which method is used.

A typical drilling seismic operation can use 10 to 15 people operating 5 to 7 trucks. Under normal conditions, 3 to 5 miles of line can be surveyed each day using the explosive method. Larger seismic operations may require up to approximately 160 personnel onsite during project operations. Work day shifts are 13 to 14 hour days, although some workers may occasionally be present earlier or later during the day, if necessary. The vehicles used for a drilling program include several vehicle-mounted or heli-portable drill rigs, helicopters, water trucks, a computer recording truck, and several light pickup trucks for the surveyors, shot hole crew, geophone crew permit man, and party chief.

Use of off-highway vehicle (OHV) travel may be authorized to carry out cross-country tasks. Vehicles are spread out so that vehicle routes are not straight, and vehicles do not retrace the same route. In some cases, this approach has prevented the establishment of new vehicle routes and has reduced impacts. Drilling water, when needed, is usually obtained from a permitted source.

Reconnaissance type surveys of gravity and geomagnetic can be run in areas where there is limited information with the attendant lower costs and less impact. More expensive and higher impact seismic surveys are run when more detailed information is required.

O.2. Geophysical Management (Permitting Process)

Geophysical operations on and off an oil and gas lease are reviewed by the appropriate federal surface management agency (e.g., BLM, Bureau of Reclamation, or U.S. Forest Service).

Effective administration and surface protection can only be accomplished through close cooperation between the operator and the affected agency. The responsibilities of the geophysical operator and the authorized officer are as follows (BLM 2006).

Geophysical Operator: An operator is required to file with the authorized officer a Notice of Intent to Conduct Oil and Gas Exploration Operations. The Notice of Intent shall include site-specific project information and field techniques to minimize surface impacts; a map showing the location of the proposed 2D geophysical lines or 3D source and receiver proposed locations; all access routes and ancillary facilities; and a proposed schedule of field activities. The map should be at a minimum scale of one-half inch equals 1 mile; however, a 1:24,000 USGS topographic map is recommended.

The party filing the Notice of Intent should be bonded. When applicable, a copy of the bond or other evidence of satisfactory bonding must accompany the Notice of Intent. Holders of statewide or nationwide oil and gas lease bonds may satisfy this requirement by obtaining a rider to include coverage of geophysical operations.

For geophysical operation methods involving surface disturbance, a cultural resources survey may be necessary. In some circumstances, sensitive or Threatened and Endangered species surveys may also be necessary. A pre-work field conference is recommended and may be conducted by the surface management agency. Earth moving equipment shall not be used without prior approval. Upon completion of operations, including any required reclamation, the operator is required to file a Notice of Completion of Oil and Gas Geophysical Exploration Operations (BLM Form 3150-5).

Authorized Officer: The authorized officer will contact the operator after the Notice of Intent (BLM Form 3150-4) is filed and inform the operator of the practices and procedures to be followed and the estimated timeframe for approval.

The authorized officer will complete a final post-work inspection of the site and notify the operator that the terms and conditions of the Notice of Intent have been met or that additional action is required by the operator. Consent to release the bond or terminate liability will not be granted by the surface management agency until the operator has met the terms and conditions of the Notice of Intent (e.g., National Environmental Policy Act [NEPA], approved Form 3040-1) before commencing operations on BLM- administered lands. After the operations are completed, as specified by the Notice of Completion, the authorized officer should complete a final inspection and notify the operator if the terms and conditions of the Notice of Intent have been met or if additional action is required. Consent to release the bond or termination of liability should not be granted until the terms and conditions have been met.

O.2.1. State Standards

The operator is required to register with the Wyoming Oil and Gas Conservation Commission (WOGCC). WOGCC standards for plugging shot holes and personnel safety will be followed.

O.2.2. Mitigation

Seasonal restrictions may be imposed to reduce conflicts with wildlife, watershed damage, and hunting activity. The most critical management practice is compliance monitoring during and after seismic activity. Compliance inspections during the operation ensure that stipulations are

being followed. Compliance inspections upon completion of work ensure that the lines are clean, and the drill holes are properly plugged.

O.3. Oil and Gas Leasing

Based on the Federal Onshore Oil and Gas Leasing Reform Act of 1987, all leases must be available for competitive lease sales. Lands for which bids are not received at the lease sale will be available for noncompetitive leasing for a period not to exceed 2 years. Competitive sales will be held at least quarterly and by oral auction. Competitive and noncompetitive leases are issued for a 10-year term or for as long as oil and/or gas are produced. The federal government receives yearly rental fees on non-producing leases. Royalty is received at the rate of 12.5 percent of the total salable production, one-half of which is returned to the State of Wyoming.

Lease stipulations may be attached to each parcel and become part of the lease after sale. Initially, stipulations are attached to a parcel by the BLM State Office leasing section from various databases. The parcel list is segregated and sent to the field office that has the parcel lands in its area. In the field office, the parcel is reviewed by a group of resource specialists to ensure that lands are in conformance with the RMP, the stipulations are correct, and that any missing stipulations are included. This completes the process and allows the parcel to be included in a sale package.

The authorized officer has the authority to relocate, control timing, and impose other mitigation measures under Section 6 of the Standard Lease Form. This authority is invoked when lease stipulations are not attached to the lease, or new resources are discovered on a lease. Lease stipulations are conditions of lease issuance that provide protection for other resource values or land uses by establishing authority for delay, site changes, or the denial of operations within the terms of the lease contract. The stipulations are specified for each applicable parcel in the Notice of Competitive Oil and Gas Lease Sale and are intended to inform interested parties (potential lessees, operators) that certain activities will be regulated or prohibited unless the operator and the surface management agency arrive at an acceptable plan for mitigation of anticipated impacts. These stipulations are either attached to the entire lease, or by aliquot portions identifying the protection measure specific to the lease.

Lease stipulations are based on the perceived resource requirements and land uses as specified in NEPA documentation. New science, comprehensive documentation of resource requirements, land pattern interference, and ongoing monitoring of the effectiveness of a stipulation may allow granting of a waiver, exception, or modification to a stipulation. A lease stipulation waiver is a permanent exemption to a lease stipulation. An exception is a one-time exemption to a lease stipulation and is determined on a case-by-case basis. A modification is a change to the provisions of a lease stipulation, either temporarily, or for the term of the lease.

There are three lease notices and three lease stipulations that are attached to every lease issued within the planning area. These and the site-specific lease stipulations are included in Appendix B (p. 223).

O.4. Drilling Permit Process

In the initial permitting process, the operator selects the location of a proposed drill site. This selection is based on WOGCC spacing requirements, the subsurface geology, the topography, and the avoidance of known protected surface resource values.

Location of wells and spacing requirements are established by the WOGCC to protect the correlative rights of offsetting mineral owners and efficiently recover the resource. This applies to all mineral ownership (i.e., fee, state, and federal minerals). The spacing requirements are to be applied to the subsurface point of production. A proposed location may be moved beyond the designated tolerance by a spacing exception granted by WOGCC. A spacing exception requires notification of the offsetting mineral lease owners. If there is a protest, the matter must be presented at a public hearing with full evidence of the need to relocate the well before a decision can be made by WOGCC. Surface density of wells would be a variable based on the surface resource conflicts, economics of directional drilling and the subsurface density. Coalbed natural gas (CBNG) wells are typically spaced on an 80 acre pattern, vertical oil and gas wells are typically spaced on a 40 acre pattern, and horizontal oil and gas wells are spaced from 1,280 acres down to 320 acres depending on geologic conditions.

O.4.1. Permitting

Permitting a new well is governed by Onshore Oil and Gas Order No. 1 and other applicable federal and state laws and regulations. This includes new and future laws and regulations such as the residence setback being finalized by the WOGCC. After the operator makes a decision to drill a well, the well, access road, and pipeline can be surveyed and staked without prior approval from BLM. Cultural resource inventories and wildlife surveys can also take place without prior approval from BLM. An Application for Permit to Drill (APD) or Reenter, on Form 3160-3, is required for each proposed well, and for reentry of existing plugged and abandoned wells (including disposal and service wells). Further details on the APD process are described below. Three methods of notification are as follows:

Early Notification - The operator may wish to contact the BLM and any applicable surface management agency, as well as all private surface owners, to request an initial planning conference as soon as the operator has identified a potential area of development. Early notification is voluntary and would precede the Notice of Staking option or filing of an APD.

Notice of Staking Option - After the operator makes the decision to drill a well, it must decide whether to submit an Notice of Staking or an APD. The Notice of Staking is an abbreviated notice that consists of a filled Notice of Staking form, a sketch showing road entry onto pad, pad dimensions, and reserve pit(s), and a topographical or other acceptable map showing location, access road and lease boundaries. This notice is posted for a 30-day public review. The Notice of Staking triggers the onsite inspection of the well, which determines whether there are any conflicts with critical resources, as well as provides the preliminary data to assess what additional items are necessary to complete the APD. The onsite inspection is conducted by an interdisciplinary team of specialists from the BLM including but not limited to a Natural Resource Specialist, wildlife biologist, archeologist, soil scientist, civil engineer, hydrologist, petroleum engineer and geologist. Along with the BLM representatives there will be company representatives and other agency specialists such as U.S. Fish and Wildlife Service, Wyoming Department of Environmental Quality, and Wyoming Game and Fish Department. In the case of

split estate the landowner or a representative of the landowner may be present. During the onsite inspection any notes taken are incorporated into the administrative record for the processing of the APD. Any conflicts identified during the onsite inspection will be addressed and mitigated when the APD is submitted. Some conflicts may be addressed by moving the surface location of the well up to 200 meters from the original location. The proposed access route and pipeline can also be proposed to be moved at this time.

Application for Permit to Drill - The operator can submit a completed APD in lieu of an Notice of Staking, but in either case, no surface-disturbing activity can be conducted in conjunction with the drilling operations until the APD is approved by the authorized officer. Operators are encouraged to consider and incorporate Best Management Practices (BMPs) into their APDs because BMPs can result in reduced processing times and reduced number of Conditions of Approval (COAs).

If the APD option is used, an APD is submitted to the authorized officer. In order for the APD to be approved it has to be deemed complete and appropriate site specific NEPA has to be conducted. A complete APD contains a completed form 3160-3, a well plat, a 9 point drilling plan, a 12 point surface use plan, appropriate bonding, an operator certification as described in Onshore Oil and Gas Order 1 III.D.6., and an onsite inspection as described in the Notice of Staking option. In the Buffalo Field Office (BFO), a water management plan is required for processing of the APD as explained in the 2003 Powder River Basin EIS and associated Record of Decision. Included with the approval of an APD, site-specific mitigations are added to the APD as COA for protection of surface and subsurface resource values in the vicinity of the proposed activity that were not mitigated as part of the proposed action.

The field office is responsible for preparing environmental documentation necessary to satisfy the NEPA requirements and provide any mitigation measures needed to protect the affected surface and subsurface resource values. The drilling program is reviewed by geologists, petroleum engineers, and possibly hydrologists to ensure the proposed plan meets applicable federal laws and isolates identified zones of interest. These zones of interest include but are not limited to usable water zones (defined as waters containing less than 10,000 ppm total dissolved solids), coal zones, uranium bearing zones, bentonite zones, salt zones, hydrocarbon zones, waste disposal zones, lost circulation zones, high pressure zones, and zones containing hydrogen sulfide (H₂S). This review looks at how the casing and cement program is designed to ensure the design is sufficient to isolate and protect the formations of interest while also being strong enough to handle any pressures that the well may encounter. These pressures come from the muds used in drilling the well, the formation pressure exerted by the producing zone, or the pressures exerted during the hydraulic fracturing of the well.

Usable water is protected by casing and cement. The shallower fresh water zones (containing less than 5,000 parts per million Total Dissolved Solids) are typically isolated by the surface casing and associated cement job. Within the planning area for this RMP there are deeper fresh water zones that cannot be isolated with the surface casing and associated cement job. When the formations cannot be isolated with the surface casing and cement job then they are isolated with either the intermediate or production casings and cement operations. The zones that are typically deeper are the Fox Hills Sandstone and Madison Formation. Neither of these zones are encountered when drilling CBNG wells but the Fox Hills is always encountered when drilling deeper oil and gas wells. The Madison is not typically encountered during drilling in the planning area as it is located below the economically producible hydrocarbon bearing zones. Determining the depth of fresh water requires specific water quality data in the proposed well vicinity or geophysical log determination of water quality, depending on existing well proximity and log

availability. If water quality data or logs from nearby wells are not available, the area within a 2-mile radius of the proposed well is checked for water wells. If wells exist, the entire formation in which the wells are located is required to be isolated in the new well. In the BFO, usable water can be available to great depths and beyond the surface casing setting point. In order to protect all usable water, the surface casing is set anywhere from 1,000 feet to 3,500 feet in depth and cemented back to surface. The next string of casing is set at least 100 feet below the deepest usable water zone expected to be encountered in the well and the casing is cemented back to a point where the usable waters are isolated from deeper hydrocarbon bearing zones. These depths are verified on a case-by-case permit basis by a staff geologist and petroleum engineer. An additional protection measure that is required is the use of fresh water based muds while drilling through a usable water zone until that zone is isolated by casing and cement. If there is not enough information to determine whether the water is usable it is treated as usable for protection purposes. Figure O.1, “Generalized Stratigraphic Chart of the Powder River Basin and Buffalo Planning Area Showing Water and Mineral Zones” (p. 608) highlights those formations that will be isolated and protected in relation to all formations in the planning area.

| Rock Unit | | | |
|--|--|---|---------------------|
| Western | Eastern | | |
| White River Formation | | | |
| Wasatch Formation | | | |
| Fort Union Formation | Tongue River Member | Fort Union Formation | |
| | Lebo Shale Member | | |
| | Tullock Member | | |
| Lance Formation | | Hell Creek Formation | |
| Fox Hills Sandstone | | | |
| Bear Paw Shale | Lewis Shale (Teckla Sandstone Member) | Pierre Shale | |
| Mesa Verde Formation (Teapot Sandstone and Parkman Sandstone members) | Pierre Shale | | |
| Cody Shale (Sussex and Shannon sandstones, Steele Shale, Niobrara and Sage Breaks members) | Niobrara Formation | | |
| Frontier Formation (wall Creek, 2nd Wall Creek, and Belle Fourche members) | Carlisle Shale (Sage Breaks, Turner Sandy, and Pool Creek members) | | |
| | | | Greenhorn Formation |
| | | | Belle Fourche Shale |
| Mowry Shale | | | |
| Muddy Sandstone | | | Newcastle |
| Thermopolis Shale | | | Skull Creek Shale |
| Clovery Formation | Fall River Formation | | Inyan Kara Group |
| | Lakota Formation | | |
| Morrison Formation | | | |
| Sundance Formation ("Upper" and "Lower" Sandstone) | | Sundance Formation (Redwater Shale, Pine Butte, Lak, Hullet Sandstone, Stockade Beaver, and Canyon Springs members) | |
| Gypsum Spring Formation | | | |
| Popo Agie Formation | Spearfish Formation (Pine Salt, Forelle Limestone, and Glendo Shale members) | | |
| Crow Mountain Sandstone | | | |
| Alcova Limestone | | | |
| Red Peak Formation | | | |
| Goose Egg Formation (Little Medicine Limestone, Freezeout Shale, Ervay, Difficulty Shale, Forelle Limestone, Glendo Shale, Minnekahta Limestone, and Opeche Shale members) | | Minnekahta Limestone | |
| | | Opeche Shale | |
| Tensleep Sandstone | | Minnelusa Formation | |
| Amsden Formation | | | |
| Madison Limestone | | Pahasapa Limestone | |
| | | Englewood Limestone | |
| Bighorn Dolomite | | Whitewood Dolomite | |
| | | Winnipeg Formation | |
| Gallatin Limestone | | Deadwood Formation | |
| Gros Venture Formation | | | |
| Flathead Sandstone | | | |

Source: Stilwell et al. 2012
 All Formations colored in blue are isolated and protected water zones.
 All Formations colored in grey are isolated and protected hydrocarbon bearing zones.
 All Formations colored in green are isolated and protected for both water and hydrocarbon bearing zones.

Figure O.1. Generalized Stratigraphic Chart of the Powder River Basin and Buffalo Planning Area Showing Water and Mineral Zones

All casing used in the construction of a well has to meet American Petroleum Institute standards for that grade and weight of casing. The standard is to use new casing but there is an allowance for using used casing when it meets a minimum wall thickness of 87.5 percent of the new pipe. Used casing has to be approved on a site specific basis by the authorized officer. The casing design has to meet minimum safety factors for burst rating, collapse rating and yield ratings. These designs take into account the maximum pressure and stress that will be applied to the casing in the given permit.

The cements used in the construction of the well are tested in a lab under simulated field conditions. The cements have to meet minimum design criteria in order to be approved for use. All non-“neat” cements require the lab data to accompany the permit for review by the petroleum engineer. “Neat” cement is cement that has no additives to modify its setting time or rheological properties. In the planning area additives are typically added to reduce the weight of the cement thereby reducing the hydrostatic head exerted on the formation. This ensures the cement does not break down the formation and stays where it was intended to be. The top of all cement that is not circulated back to surface is verified through electric logging operations and any remedial actions are taken before the well is put into production. Remedial actions would be undertaken when the logging operations show that the formations of interest have not been isolated.

When final approval is given by BLM, the operator can commence construction and drilling operations in accordance with the approved permit. Approval of an APD is valid for 2 years. If drilling does not begin within the 2 years the permit may be extended up to 2 more years at the operator’s request. This extension may be granted after the appropriate NEPA analysis is conducted. The operator is responsible for reclaiming any surface disturbance that resulted from its actions, even if a well was not drilled.

Economic conditions dramatically affect drilling activity. A downturn in the oil and gas market could create a significant decrease in the number of drilling wells within the BFO. More information on drilling and production trends for the BFO can be found in the reasonable foreseeable development (RFD) scenario created for the RMP and EIS.

O.4.2. Standard Drilling Conditions of Approval

In addition to any COAs that are developed during the environmental analysis, APDs are also subject to BFO’s standard drilling COAs which are listed below.

For CBNG wells:

1. The operator shall complete wells (case, cement and under ream) as soon as possible, but no later than 30 days after drilling operations, unless an extension is given by the BLM authorized officer.
2. If in the process of air drilling the wells there is a need to utilize mud, all circulating fluids will be contained either in an approved pit or in an aboveground containment tank. The pit or containment tank will be large enough to safely contain the capacity of all expected fluids without danger of overflow. Fluid and cuttings will not be squeezed out of the pit, and the pit will be reclaimed in an expedient manner.

Well Control Equipment

1. The flow line shall be a minimum of 30 feet from the wellbore and securely anchored. The 30-foot length of line is a minimum and operators must make consideration for increasing this length for topography and/or wind direction.
2. The flow line shall be a straight run.
3. The flow line must be constructed from non-flammable material.
4. All cuttings and circulating medium shall be directed to and contained in a reserve pit.
5. The nearest edge of the pits shall be a minimum of 25 feet from the rig.
6. A minimum of 2 feet of freeboard shall be maintained in the pits at all times.
7. The authorized officer may modify these requirements at any time if it is determined that increased pressure control is deemed necessary.
8. Verbal notification shall be given to the authorized officer at least 24 hours before formation tests, Blow Out Prevention tests, running and cementing casing, and drilling over lease expiration dates.

Cement Program

1. If there are indications of inadequate primary cementing of the surface, intermediate, or production casing strings; such as but not limited to no returns to surface, cement channeling, fallback or mechanical failure of equipment, the operator will evaluate the adequacy of the cementing operations. This evaluation will consist of running a cement bond log or an alternate method approved by the authorized officer no sooner than 12 hours and no later than 24 hours from the time the cement was first pumped.
2. If the evaluation indicates inadequate cementing, the operator shall contact a BLM BFO Petroleum Engineer for approval of remedial cementing work.
3. The adequacy of the remedial cementing operations shall be verified by a cement bond log or an alternate method approved by the authorized officer. All remedial work shall be completed and verified prior to drilling out the casing shoe or perforating the casing for purposes other than remedial cementing.
4. The cement mix water used must be of adequate quality so as not to degrade the setting properties of the cement. Any water that does not meet municipal quality water standards shall be tested by mixing the water and cement in a lab and comparing the results to the municipal quality water mix results. If the results show that the cement qualities are not the same or greater, then the non-municipal water shall not be used for mixing cement in the well.

Production Equipment

Other actions such as off-lease measurement, commingling, allocation, etc. shall be approved via a Notice of Intent sundry (Form No. 3160-5). Submission of additional information in the Plan of Development (POD) shall not be construed as permission for these items. If the operator wishes to use off-lease gas measurement for wells approved in this POD, they are required to obtain approval via a Notice of Intent sundry (Form No. 3160-5) prior to any gas production.

Well and POD Building Identification

1. From the time a well pad is constructed or a well is spudded (if no well pad needed), until abandonment, all well locations must be properly identified with a legible sign. The sign will include the well name and number, operator name, lease number, and the surveyed location.
2. At each POD building site where federal wells are metered, the operator is required to maintain a legible sign displayed in a conspicuous place. This sign is required to be in place at the time metering goes online. The sign shall include: POD name, Operator, federal well

names and numbers, federal lease numbers being metered at the POD building, and surveyed location of the building.

Protection of Fresh Water Resources

All oil and gas operations shall be conducted in a manner to prevent the pollution of all freshwater resources. All fresh waters and waters of present or probable future value for domestic, municipal, commercial, stock, or agricultural purposes will be confined to their respective strata and shall be adequately protected. Special precautions will be taken to guard against any loss of artesian water from the strata in which it occurs and the contamination of fresh water by objectionable water, oil, condensate, gas or other deleterious substance to such fresh water.

Miscellaneous Conditions

1. Any changes to the approved drilling plan and/or these COAs shall be approved by the BLM BFO Petroleum Engineer prior to being implemented.
2. If any cores are collected, a copy of all analysis performed shall be submitted to the BLM BFO Petroleum Engineer.

For Conventional and Unconventional Oil and Gas Wells:

1. Verbal notification shall be given to the authorized officer at least 24 hours before formation tests, Blow Out Prevention tests, running, and cementing casing, and drilling over lease expiration dates.
2. New hard-band drill pipe shall not be rotated inside any casing. Hard-band drill pipe shall be considered new until it has been run at least once.
3. All Blow Out Prevention Equipment tests shall include a 5 minute low pressure test between 250 psi and 500 psi with no drop in pressure with the only exception being the chokes. The chokes are only required to have the high pressure test held for a minimum length of time necessary to verify their functional integrity.
4. All operations must be conducted in accordance with all applicable laws and regulations: with the lease terms, Onshore Oil and Gas Orders, Notice to Lessee's; and with other orders and instructions of the authorized officer, unless a variance has been granted in writing by the authorized officer.
5. The Operator shall install an identification sign consistent with the requirements of 43 Code of Federal Regulation (CFR) 3162.6 immediately upon or before the completion of the well pad construction operations.
6. All Blow Out Prevention Equipment rated 5M or greater shall be isolated from the casing and tested to stack working pressure. All Blow Out Prevention Equipment tests shall be performed by a suitable test pump, not the rig-mud pumps and recorded on a chart. The chart shall be submitted to the BFO.
7. Low test on Blow Out Prevention Equipment shall be performed and passed before moving onto the high test for each component.
8. If there are indications of inadequate primary cementing of the surface, intermediate, or production casing strings; such as but not limited to no returns to surface, cement channeling, fallback or mechanical failure of equipment, the operator will evaluate the adequacy of the cementing operations. This evaluation will consist of running a cement bond log or an alternate method approved by the authorized officer no sooner than 12 hours and no later than 24 hours from the time the cement was first pumped.
9. If the evaluation indicates inadequate cementing, the operator shall contact a BLM BFO Petroleum Engineer for approval of remedial cementing work.

10. The adequacy of the remedial cementing operations shall be verified by a cement bond log or an alternate method approved by the authorized officer. All remedial work shall be completed and verified prior to drilling out the casing shoe or perforating the casing for purposes other than remedial cementing.
11. The cement mix water used must be of adequate quality so as not to degrade the setting properties of the cement. Any water that does not meet municipal quality water standards shall be tested by mixing the water and cement in a lab and comparing the results to the municipal quality water mix results. If the results show that the cement qualities are not the same or greater, than the non-municipal water shall not be used for mixing cement in the well.
12. All oil and gas operations shall be conducted in a manner to prevent the pollution of all freshwater resources. All fresh waters and waters of present or probable future value for domestic, municipal, commercial, stock or agricultural purposes will be confined to their respective strata and shall be adequately protected. Special precautions will be taken to guard against any loss of artesian water from the strata in which it occurs and the contamination of fresh water by objectionable water, oil, condensate, gas or other deleterious substance to such fresh water.
13. Any changes to the approved drilling plan and/or these COAs shall be approved by the BLM BFO Petroleum Engineer prior to being implemented.

O.4.3. Surface Disturbance Associated With Oil and Gas Drilling

Upon receiving approval to drill the proposed well, the operator moves construction equipment over existing roads to the point where the access road will begin. Generally, the types of equipment include trackhoe, dozers (track-mounted and rubber-tired), scrapers, and motor-graders. Moving equipment to the construction site requires moving several loads (some overweight and overwidth) over public and private roads. Existing roads and vehicle routes are improved in places and occasionally, culverts and cattleguards are installed as specified in the approved APD.

The length of the access road varies. Generally the route is selected to reduce impacts to resources identified in the NEPA document. Environmental factors or the landowner's preference might dictate a longer route. Roads will be existing two-track roads with only spot upgrades to crowned and ditched with up to a 30-foot running surface. The type of road is selected based on drilling and completions activities as well as production activities. Soil texture, steepness of the topography, and moisture conditions might require surfacing (e.g., gravel, dust suppressants) the access road. For CBNG wells the equipment is smaller and will typically be serviced by a two-track or primitive road. The production from CBNG wells is piped off location. The deeper oil and gas wells require a bigger road because the equipment used to construct an oil or gas well is much larger. The gas production from oil and gas wells is typically piped off location but the liquids are stored at either the wellsite or a centralized point for the field. The methods of production and the disposition of that production are described later on in this document.

All soil material suitable for plant growth is first removed and stockpiled in a designated area. Sites on flat terrain usually require slightly more than removing the topsoil material and vegetation. Drilling sites on ridge tops and hillsides are constructed by cutting and filling portions of the location. The majority of the excess cut material is stockpiled in an area that will allow it to be easily recovered for rehabilitation. It is important to confine extra cut material in a stockpile rather than to cast it down hillsides and drainages where it cannot be recovered for rehabilitation. The proposed wellpad design has to be balanced in there is no excess spoil dirt and fill dirt does

not have to be brought in from offsite to level the pad. Offsite materials may be brought in for surfacing of the wellpad and access road.

The amount of level surface required for safely assembling and operating a drilling rig varies with the type of rig, the depth, type of the well, and number of wells on the pad. The average size for a CBNG well pad is 2.5 acres initial disturbance with a long term disturbance of 1.5 acres. The average size for an oil and gas location varies from 2.75 acres to 23 acres of initial disturbance with a long term disturbance of 2 to 10 acres depending on the type and number of wells on the wellpad. In addition to the drilling rig footprint, a reserve pit may be constructed, usually square or oblong, but sometimes in another shape to accommodate topography. Generally, the reserve pit is 8 to 12 feet deep, but could be deeper to compensate for smaller length and width or deeper drilling depths. Most horizontally drilled wells utilize a closed loop or semi-closed loop system. With the closed loop system the drill cuttings are hauled to an approved disposal site for remediation. The semi-closed loop system has the cuttings buried on location. The cuttings are separated between water based mud cuttings and oil based mud cuttings. Both types of cuttings are dried and solidified before burial. If there is a reserve pit on location, the pit has to be dried and solidified before it can be reclaimed. Depending on the relationship of the location to natural drainages, it might be necessary to construct water bars or diversions. The amount of area disturbed for construction depends largely on the steepness of the slope and the size of the pad. Depending on the soil permeability, pits may be lined with an impermeable material to contain the drilling fluids. If water is encountered while digging the reserve pit, a closed loop mud system, consisting of steel tanks, will be required.

Moving a drill rig will require from 5 to 50 truck trips of construction equipment over public highways and private roads. Drill rigs for CBNG as compared to deep drilling rigs are smaller, require fewer loads, and are generally only on location for a couple of days to a week. The bigger rigs used to drill the vertical and horizontal wells will be on location anywhere from a week to 8 months depending on the depth and number of wells on the location.

Water for drilling and well completion may be hauled or piped to drilling locations. Water sources are usually commercial water sources or recycled water if drilling is below the surface casing and fresh water aquifer zones. When drilling commences, and as long as it progresses, water is continually transported to the rig location. Depending on the type of well being drilled anywhere from 5,000 barrels to 100,000 barrels of water is needed for drilling and completion activities. More water would be required if circulation is lost, or permeable zones that cannot withstand the pressure of the drilling fluid are encountered.

O.4.4. Issuance of Rights-of-Way

Rights-of-way (ROW) are required for all facilities, tank batteries, pipelines, powerlines, and access roads that occupy federally owned land outside the lease or unit boundary. When a third party (someone other than the operator) constructs a facility or installation on or off the lease, a ROW is also required. The ROW is issued by BLM.

O.5. Drilling Operations

This section describes more conventional or traditional drilling operation techniques. BLM encourages the use of other new alternative construction and drilling techniques and technologies designed to limit environmental effects.

O.5.1. Rotary Drilling

Initially, drilling proceeds rapidly because of the less competent nature of shallow formations. Drilling is accomplished by rotating the drill string and putting variable weights on the bit located at the bottom of the string. While drilling, the derrick and associated hoisting equipment bear a majority of the drill string's weight. The combination of rotary motion and weight on the bit causes rock to be gouged away at the bottom of the hole. There are two types of rotary drilling. The first type is the older style which includes a kelly and rotary table. The second type is a top drive system. The rotary motion on the older style is created by a square or hexagonal rod, called a kelly, which fits through a square or hexagonal hole in a large turntable, called a rotary table. The rotary table sits on the drilling rig floor and as the bit advances, the kelly slides down through it. When the kelly has gone as deep as it can, it is raised, and a new piece of drill pipe about 30 feet in length is attached in its place. The drill pipe is then lowered, the kelly is reattached, and drilling recommences. The top drive system does not have a rotary table or a kelly. The rotation of the drill string is accomplished with the top drive unit which is hydraulically driven. Since there is no kelly a piece of drill pipe is screwed together at the top and drill string. When this piece of pipe reaches the rig floor drilling stops and a new piece of pipe is connected. The drill pipe is the same for both styles of rotary drilling. When the bit becomes dull, it is necessary to trip the drill string and replace the bit. This is a time-consuming process of withdrawing 90-foot sections of the drill pipe until the bit is out of the hole. This trip can be anywhere from a couple of hours roundtrip to a couple of days depending on the length of the drill pipe and any hole problems that may be encountered. Each time a string of casing is run you must first trip the drill pipe out of the hole. New bits constructed with modern metals and manufactured polycrystalline diamonds along with down hole mud motors have revolutionized drilling operations, whereby thousands of feet of hole can be drilled with one bit run. The mud motor is a positive displacement pump (moineau pump run in reverse) driven by high-pressure mud and is placed at the top of the bit to enable more rotational power to be transmitted to the bit and thus increase penetration rates.

Drilling a directional or horizontal well requires extra tools to be used in the drill string. These tools include bent pieces of pipe to angle the drilling direction of the hole, measurement while drilling tools, and mud motors. The bent pipe is manufactured with a bend in the pipe of 0.5 degrees to 3 degrees. Having a mud motor after the bent piece of pipe allows the driller to rotate the drill bit without having to rotate the drill string thus causing the bit to drill away from vertical at a controlled rate. Within a couple of joints of drill pipe from the drill bit the measurement while drilling tools are installed to relay the direction and penetration angle of the drill string. Once the desired angle has been attained rotary drilling may commence again to the total depth of the well.

Drilling mud is circulated through the drill pipe to the bottom of the hole, through the bit, up the annulus (i.e., the space around a pipe in a wellbore) of the well, across a screen that separates the rock chips, and into holding tanks from which finer sediments settle from the mud before it is pumped back into the well. The mud is maintained at a required weight and viscosity to cool the bit, reduce the drag of the drill pipe on the sides of the hole, seal off any porous zones, contain formation fluids to prevent a blowout, and bring the rock chips to the surface for disposal. Various additives are used in maintaining the mud at the appropriate viscosity and weight. Most of the mud consists of bentonite. Some of the additives are caustic, toxic, or acidic, but these hazardous additives are used in small amounts during the drilling operations and later contained at the surface.

Within the BFO, drilling is usually accomplished with water or light mud to depths within about 1,000 feet of the prospective formation. Water and natural clays recovered during the

drilling operation, or light drilling mud, allow fast drilling rates and the attendant reduction in mud chemicals. Once the bit reaches the target depth, the mud system is gradually made more sophisticated by addition of bentonite, chemicals, and natural weight materials to reduce water loss to the potential producing zones and to control the subsurface pressure. In almost all cases except CBNG, the subsurface pressure is higher than an equivalent water column, and it is necessary to increase the mud weights to control the pressure and prevent a blowout or uncontrolled flow of formation fluids. Many wells are drilled in an underbalanced condition, whereby the mud pressure is slightly less than the formation pressure, which increases penetration rate and reduces the time on the well, or in the formations of interest. Drilling in this condition also reduces the potential of damaging the formation, with the attendant loss of flow capacity and recovery. The wells are always overbalanced for safety requirements when a bit trip is made, the well is logged, or the casing is installed.

Drilling operations are continuous, 24 hours a day, 7 days a week. The crews usually work three 8-hour shifts or two 12-hour shifts a day. Pickup trucks or cars are used for workers' transportation to and from the site. During normal drilling operations typically the only people on location are the rig crew, company man, tool pusher, and mud logger. Other operations, such as cementing, running casing, and rig maintenance will require additional personnel who will not remain on location once their part of the operation is completed.

Upon completion of the drilling, a determination is made regarding the productive potential of the well. If oil or gas is not discovered in commercial quantities, the well is considered dry. The operator is then required to follow BLM procedures to properly plug the dry hole. These procedures are described in depth later in this appendix. The drill site and access road are then rehabilitated in accordance with the stipulations attached to the APD and the plugging approval. If the well is a producer, drilling operations continue until the production casing is cemented into the well and the well is secured. Once the casing has been cemented in place and the well is secure rig down operations commence to remove the drilling equipment from the location. The completion equipment and crews will come in at a later time and complete the well as described later in this appendix.

0.5.2. Logging

Geophysical logs are obtained by running various instruments into the hole on a wire cable or attached to the drill string for Measuring While Drilling. Logs are usually run at a depth point where casing will be installed. A log is not usually run before surface casing is set, but in most instances a log recording natural gamma radiation is run through the surface casing to determine the geology of that section. If cement was not circulated to surface a cement bond log or temperature log will be run and interpreted to decide the course of remedial operations. The logs can determine water resistivity, hydrocarbon saturations, natural gamma radiations, porosity of the rock by density, nuclear receptivity and sonic measurements, permeability, pressure, temperature, hole geometry including hole size for cement calculations, and subsurface direction. Logs are used to evaluate whether the well is dry or has the potential for a satisfactory completion. Logs also delineate the various geologic horizons; hydrocarbon zones; fresh, usable, and unusable water; and sands, shales, limestone, coal, and other minerals. Logs are required to specify productive intervals so that they can be perforated and stimulated during the completion program. Normally in the BFO, logs recording resistivity and a combined porosity log of density and nuclear receptivity are run in the well. The dual porosity logs are a direct indicator of oil and gas because the measured values can be compared to provide contrasting porosities.

O.5.3. Casing

Various types of casing are placed in the drilled hole to enhance completion operations and safety. Casing is a string of steel pipe composed of approximately 40-foot lengths of pipe that are threaded together. Centralizers are attached to casing to ensure that the casing is centered in the hole. This practice improves the efficacy of cement jobs. Casing is cemented into the well to protect against migration of fluids along the annulus between the casing and the hole. Cementing isolates the formations so they can be completed and produced without interference from other zones containing hydrocarbons or water. Hole deviation, depth, bore hole environment, placement of centralizers, and a myriad of other factors affect the integrity of the casing and cement job, and must be considered in the original design.

Surface casing that is properly set and cemented also protects surface aquifers from contamination by drilling and production operations. Surface casing should be set to a depth greater than the deepest fresh water aquifer that could be reasonably developed. Surface casing is designed to be large enough to allow subsequent strings of smaller casing to be set as the well is drilled deeper. Cement is placed in the annulus of the surface casing from casing shoe to ground level. The surface casing is the first string on which blowout preventer equipment is installed. The blowout preventer equipment allows the well to be shut in at any time that conditions warrant, protecting against unanticipated formation pressures and allowing safe control of the well. Blowout preventer equipment is tested and inspected regularly by both the rig personnel and the inspection and enforcement branch of BLM. Minimum standards and enforcement provisions are part of Onshore Order No. 2.

Casing strings subsequent to the surface string are required to be cemented from the casing shoe to above any zone of interest as described previously. In the BFO, the annulus (i.e., the space around a pipe in a wellbore) is required to be filled with sufficient cement to provide adequate protection from interzonal migration of unsuitable water and hydrocarbons. Production casing or production liner is designed to provide isolation of oil and gas formations, and a high-pressure conduit to the hydrocarbon zones that allows stimulation of these intervals to improve the productivity.

For CBNG wells the surface casing is required to be set at a minimum of 60 feet or 10 percent of the well depth, whichever is greater. This is then required to be cemented back to surface. The next string of casing is the production casing which is set through the coalbeds or to the top of the coalbed depending on the type of completion that will occur. This casing string is then cemented back to the surface at the well site.

For the deeper oil and gas wells a conductor pipe is set to 60 feet to 80 feet, to control sloughing of the ground under the rig, and it is cemented back to surface. The next string of pipe is the surface casing. It is set anywhere from 750 feet to 3,000 feet and cemented back to surface. This depth is determined by the depth of the shallower fresh water zones, the lost circulation zones (i.e., coals), and where a competent formation can be found. The next string of pipe that is installed in the well is typically the production string for vertical wells and the intermediate string for horizontal wells. These strings of pipe are required to be cemented from the shoe to the Lance formation. Many operators choose to cement all the way into the surface casing. This operation will isolate the Fox Hills Formation from any other zone both below and above it. For vertical wells there is no more casing installed but for a horizontal well the next string of pipe installed is the production liner. Depending on the geology this liner may be cemented from the shoe to the top of the liner. Other times it is set with swellable packers located on the outside of the casing. These packers help to

centralize the casing in the hole and provide a method for isolation of the production. The liner has to be set at least 100 feet above the shoe of the intermediate casing.

During completion operations, there are three ways to get a pathway for the oil and gas to migrate from the formation into the casing. The first way is to perforate the casing in the zone(s) of interest. The second option is called an openhole completion. The third option is to use a pre-slotted or perforated casing. All three methods can be used in both CBNG wells and the deeper oil and gas wells. Perforating the casing is usually done after the casing has been cemented in place. This is accomplished with a perforating gun. It consists of shaped explosive charges that will penetrate through the steel casing, cement sheath, and into the formation as much as 48 inches depending on the size of the explosive charge. This will leave a hole from 0.25 inch to 0.4 inch in the casing, cement and formation depending on the requested hole size. These perforations can be spaced from 1 shot per foot to 48 shot per foot.

With an openhole completion casing is set to the top of the productive formation and then a smaller drill bit drills through the casing shoe and into the formation. The hydrocarbons are then produced through the well without an additional casing and cement. For those formations where sloughing occurs a steel or plastic pipe is run into the openhole to hold the formation back. This openhole may be under-reamed to enhance production. The under-reaming is accomplished by a drill bit that expands in diameter as it is rotated. Currently technology allows the under-ream to be about double the size of the casing that the under-reamer passes through. Under-reaming cannot be accomplished inside cased hole.

The third option for completions goes along with an openhole completion. For CBNG once the well has been under-reamed a pre-slotted liner is installed in the well to keep the coals from sloughing into the under-ream and closing off the path for the CBNG to flow. In horizontal wells, a slotted liner is sometimes used. This liner has swellable packers on the outside that provide both centralization and isolation within the formation for both completion operations and administrative purposes. The swellable packers absorb the drilling mud around them to swell like a sponge filling the annular space between the pipe and the formation. The slots in the liner are hydraulically actuated sleeves that open when a rubber ball is pushed through them. Each sleeve in the pipe requires a little larger ball so they can be opened from the end of the pipe back to the beginning of the pipe. Once the sleeve is opened the formation can be hydraulically fractured as described later in this appendix.

0.5.4. Hydraulic Fracturing

Hydraulic fracturing is the process of creating small cracks, or fractures, in deep, underground geological formations to liberate oil or natural gas and allow it to flow up the well for capture. To fracture the formation, fracturing fluids – approximately 99.5 percent water and sand, with the remaining percentage chemical additives – are injected down the wellbore into the formation. The fluid, injected under pressure, causes the rock to fracture along weak areas. These fractures typically range from 0.1 to 0.3 inches in width, 20 to 300 feet in height, and 300 to 1,500 feet in length. When the fractures are complete, and pressure is relieved, the fluids flow back up the well where they are captured and stored for later treatment or disposal. As the fluids flow back up, sand remains in the fractures and props the rock open. This allows the oil and gas to seep from the rock into the pathway, up the well and to the surface for collection. In the planning area, the targeted formations for hydraulic fracturing are often more than 7,000 feet underground, and some 2,000 feet below any drinking water aquifers.

The process is much different for CBNG wells than the deeper oil and gas wells. CBNG wells have water enhancements and are not hydraulic fractured as defined above. The water enhancement consists of up to 3,000 barrels of chlorinated water pumped at high rates into the coals. The pressure rarely exceeds 1,500 psi and other chemicals and sand are not used. This process cleans the cleats of the coals around the wellbore and allows the formation water and CBNG to flow more freely into the casing for extraction.

O.5.5. Oil and Gas Exploratory Units

Surface use in an oil or gas field could be affected by unitization of the leaseholds. In areas of federal and mixed mineral ownership, an exploratory unit can be formed before a wildcat exploratory well is drilled. The boundary of the unit is based on geologic data and attempts to consolidate the interests in an entire structure or geologic play. The developers of the unit enter into an agreement to develop and operate as a single entity, regardless of separate lease ownerships. Costs and benefits are allocated according to agreed-upon terms. Development in a unitized field can proceed more efficiently than in a field composed of individual leases because competition between lease operators and drainage considerations is not a primary concern. Unitization also can reduce surface use requirements because all wells are operated as though under a single lease, and operations can be planned for more efficiency. Duplication of field processing facilities is eliminated, and consolidation of facilities into more efficient systems is probable. Unitization can also involve wider spacing than usual, or spacing based on reservoir factor rather than a set rule, which could result in fewer wells and higher recovery efficiency. Through planning, access roads are usually shorter and better organized, and facilities are usually consolidated. Units are voluntary for operators to propose and cannot be required by BLM.

O.5.6. Field Development

New field development is analyzed in an environmental assessment (EA) or EIS after the sufficient confirmation wells are drilled. The operator generally can estimate the extent of drilling and disturbance required to extract and produce the oil and gas at that time. Many fields go through several development stages. A field can be considered fully developed, and can produce for many years when it is determined that a well can be drilled to a deeper pay zone, a new interval is discovered to be economically attractive, or drilling and completion technology changes. In this case, there is typically less new disturbance because the old wellbores or the old well pads are used for the new completions. With changes in drilling and completion technology the surface disturbance maybe reduced because fewer wells are required to drain the reservoir. A new stage of field development, such as infill drilling, can lead to increases in roads and facilities. All new construction, reconstruction, or alterations of existing facilities, including roads, flow lines, pipelines, tank batteries, or other production facilities must be approved by BLM and could require a new environmental document. Throughout field development, partial restoration and rehabilitation is required to reduce the surface impacts to the minimum required to produce the resource.

The most important factor in further development of an oil or gas field is the economics of production. When an oil or gas discovery is made, a well spacing pattern can be established before development drilling begins. This pattern is dependent on the current statewide or area wide spacing. Well spacing is regulated by WOGCC, and factors considered in the establishment of a spacing pattern include data from the discovery well that translate into recovery efficiency. These data include porosity, permeability, pressure, composition of reservoir and fluids, depth of

formations, well production rates, and the economic effect of the proposed spacing on recovery. These data are relatively sparse in the initial phase of development, and extended production permits refinement of these values. Because these data are so tentative, WOGCC tends to define large spacing until the data are more conclusive. Spacing requirements can pose problems in selecting an environmentally sound location or in the cumulative impacts because spacing is based on administration of correlative rights and not reservoir characteristics. Reservoir characteristics determine the most efficient spacing to achieve maximum recovery. If an operator determines that a different spacing is necessary to achieve maximum recovery, the State of Wyoming (with input from BLM) may grant exceptions to the spacing requirements.

O.6. Production

Gas, oil, and water are being produced in the BFO by means of natural pressure (flowing or plunger lifts) and artificial lift (gas and electric pumping units and submersible pumps). Gas and oil production methods are equivalent for vertical, horizontal and directional wells and are not separated in the discussion that follows.

O.6.1. Gas Production (other than CBNG)

A typical gas well facility consists of methanol injection equipment (to keep production and surface lines from freezing), separator (which separates gas, oil, and water), dehydrator (uses glycol or calcium chloride to extract entrained water in the gas), and an orifice meter. An intermitter is sometimes used to either shut-in the well to build up pressure, or to blow the well down if it is being loaded with fluid. If the gas well is producing some oil or condensate, oil tanks are used to store the oil or condensate until it is sold by truck or pipeline. Pipeline quality gas at the wellhead requires a minimum of processing equipment. As the quality of gas decreases with the increased presence of water, solids, or liquid hydrocarbons, the amount of processing equipment increases. Water or liquid hydrocarbons in the gas are removed before the gas is sold, usually in the separation equipment near the wellhead. If liquid hydrocarbons are present, storage facilities (tank batteries) are required to store the liquids until they accumulate in sufficient quantities to be hauled out by large trucks. Gas dehydration equipment might also be onsite to remove water entrained in the gas to a water content defined by pipeline specifications. Gas production data can be found in the RFD scenario for oil and gas that was developed for the revised RMP.

Gas that occurs with oil is separated by collecting it into feeder lines leading to compressors that boost the pressure to the transportation system, venting or flaring. If enough casing head gas is separated to make it economical for marketing, a plant can be constructed to process the gas, or a pipeline can be constructed to carry the product to an existing plant. If the volume of casing head gas is insufficient to warrant treatment in a gas plant, it is usually used as fuel for pump engines in the field, or as heating fuel for the heater-treaters. Gas may be flared or vented into the atmosphere if the quantity exceeds the fuel requirements on the lease but is not recoverable in commercial quantities. Venting and flaring has to meet the requirements of NTL-4A and be approved prior to commencing. Typically for federal wells, gas is flared within the first 30 days after completion or until the well has produced 50,000 MCF of gas whichever occurs first. Any venting or flaring beyond this limit has to have approval prior to commencing. The request for venting or flaring has to include economic data along with other reasons as to why the gas cannot be inserted into a pipeline for sales.

O.6.2. Oil Production

In the BFO, oil is generally produced using artificial lift methods (pump units). The oil production equipment, such as heater-treater, tank battery, and holding facility for production water, are either placed on a portion of the location (on cut rather than fill) and located a safe distance from the wellhead, or placed as a centralized facility that services a number of wells with pipeline connections. The heater treater and tanks are surrounded by earthen dikes to contain accidental spills. Either all the facilities or only the produced water pit (if present) will be fenced. Production facility colors are required to be from the standard color chart and are specified in the APD COAs.

Production from several wells on one lease can be carried by pipeline to a central tank battery. Use of a central tank battery can depend on whether the oil is from the same formation, the same lease ownership, or multiple lease ownerships and formations, or whether a commingling agreement is approved. Because of the nature of the oil, adequate separation of oil and water is enhanced or accelerated through applications of heat and chemicals. The fluid stream arrives at a separator point where the flash gas is taken off. In most cases, this flash gas is used for lease operations. The remainder of the flash gas is either compressed and sold or flared. Flash gas is defined as solution gas liberated from the oil through a reduction in pressure. Water and oil are also being separated at this point by gravity segregation. The oil is sent to storage tanks, and the water is sent to a disposal or injection facility. Two main methods of oil measurement used in the BFO are lease automatic custody transfer units and tank gauging. Measurement is required by 43 CFR 3162.7-2 and Onshore Order No. 4 to ensure proper and full payment of federal royalty.

Oil wells can be completed as flowing (those wells with sufficient underground pressure to raise the oil to the surface), or if the pressure is inadequate, they are completed with the installation of subsurface pumps. The subsurface pumps are usually mechanically powered by a pumping unit. Pumping units come in a variety of sizes, the larger ones reaching a height of 30 to 40 feet. The units are powered by internal combustion engines or electric motors. Fuel for the engines may be casing head gas or propane. In cases where large volumes of water are produced with the oil, electric submersible pumps can be installed. These pumps could produce up to 6,000 barrels of fluid per day at an oil cut of $\frac{1}{2}$ of 1 percent oil. Oil production data can be found in the RFD scenario for oil and gas that was developed for the revised RMP.

O.6.3. CBNG Production

CBNG production combines high water production rates of some oil fields with low- pressure operations of some gas fields. Because of the reservoir characteristics of coal, high water production rates are initially required to dewater the reservoir and allow gas to be liberated from cleat surfaces (i.e., the vertical cleavage in coal seams) within the coal. In a coal reservoir, gas is primarily trapped on the face of the coal within the cleat system by molecular attraction. Pressure must be reduced to liberate the gas molecules from the coal face. The production history shows that water production rates begin high, with little or no gas. The water rate then drops at a constant rate, with increasing gas rates until a maximum gas rate is achieved relative to the original gas saturation and reservoir pressures. The gas rate then declines to the economic limit. This process is the exact opposite of that associated with most oil and gas production, which starts at high hydrocarbon rates and low water rates and advances to low hydrocarbon rates and high water rates. The reservoir depths of CBNG production are generally shallow (less than 3,500 feet) compared with most oil and gas production in the BFO. The depth limit is based on coal permeability, which is highly sensitive to overburden weight. A CBNG operation usually

consists of a high-capacity submersible or progressive cavity pump, with water produced out of the tubing, and low-pressure gas produced out of the casing. Centralized facilities collect the gas for compression to pipeline pressures and the water for disposal. Electric power is usually used to power the well pumps and is connected to the well by a subsurface cable laid with the water and gas lines. The producing well pad is very small, with only the wellhead and an insulating house to cover the wellhead. The centralized production facilities contain well header buildings where the individual well gas is measured, and where house collection tanks, injections wells, and pumps for disposal of the water as well as multistage compressors that bring the very low pressure gas to sales line pressure. Sometimes the water can be disposed of in the local drainages if the Wyoming Department of Environmental Quality, and the Wyoming State Engineer's Office (WSEO) and the BLM approve this type of disposal. Currently in the BFO, CBNG production is past its peak and is in a decline both from the amount of production and the number of wells expected to be drilled. The RFD has further discussions production and the future prognosis of CBNG on development within the BFO.

O.6.4. Water Production

Produced water associated with oil, gas, or CBNG is disposed of by trucking or piping the water to an authorized disposal pit, placing the water in lined pits, discharging the water into surface drainages, or through subsurface injection. Water disposal is controlled by both the BLM and WOGCC for subsurface disposal and secondary recovery purposes. The quality of the water often dictates the appropriate disposal method, and Wyoming Department of Environmental Quality has primacy through the Environmental Protection Agency to approve surface disposal of this water. Produced water is also used in enhanced recovery projects. The RFD contains further discussions on produced water production rates.

O.6.5. Production Problems

Weather extremes pose problems for producers by causing roads to become impassable, equipment to malfunction, and flow lines, separators, and tanks to freeze up. Other problems producers may encounter in the area are production of H₂S, carbon dioxide (CO₂), and paraffin; corrosion; electrolysis; and broken flow lines.

O.6.6. Secondary and Enhanced Oil Recovery

Gas reservoirs typically have no secondary recovery associated with the recovery of gas because natural gas is produced by expansion resulting from the reduction of reservoir pressure. A high reservoir recovery factor can be expected from this expansion process unless the reservoir is of such low permeability that economics becomes a factor in the recovery efficiency. Economics is a determining factor because of the expense of operating compression facilities to reduce the reservoir pressure to the minimum.

Secondary recovery in coal reservoirs has been tested in the San Juan Basin and found to be technically feasible. This recovery process involves the molecular replacement of natural gas by CO₂ or nitrogen. An oil reservoir typically contains oil, gas, and water trapped within the rock matrix under pressure. Because of the pressure, much or all of the gas is dissolved in the oil. Primary drive is accomplished by expanding gas in solution, which forces oil out of the reservoir into the well and up to the surface. Oil flowing out of the reservoir drains energy from

the formation and the primary drive diminishes. To keep oil flowing in the reservoir, pressure drawdown is required, and subsurface pumps could be used to lift oil to the surface. As reservoir pressures continue to drop, solution gas in the oil escapes, forming bubbles in the pore space. These bubbles further retard the flow of oil and increase the gas saturation and the flow of solution gas. This process accelerates as the pressure declines, and at some point, production rates become uneconomical, with as much as 80 percent of the original oil remaining in the reservoir. Currently, in the United States, primary oil recovery accounts for less than half of the current oil production. The remaining oil is produced by secondary and enhanced recovery techniques.

Two basic secondary recovery methods are in use—water flooding and displacement by gas. The preferred secondary recovery method is water flooding, which involves injecting water into oil reservoirs to maintain or increase pressure. The process is usually most efficient when the pressure has not fallen to the point where the reservoir is highly saturated with gas. Reservoir heterogeneity in the form of fractures, directional permeability, and thin zones could limit the success of this process.

The process of injecting gas is a less popular secondary recovery technique. Historically, produced gas was considered a waste product and was flared (burned) at the point of production. Later, it was recognized that the energy could be conserved and the recovery of oil increased if the produced gas was reinjected into the reservoir. Increased production was achieved by maintaining reservoir pressure by injecting the gas into the existing gas cap and also by injecting the gas directly into the oil-saturated zone, creating an immiscible gas drive that displaced the oil. To achieve miscibility, the reservoir must have reasonably high pressures and temperatures and contain high-gravity oil. Many gas injection projects use the water alternating gas process, which is injecting water and gas alternately to achieve better contact with the oil within the reservoir.

The term enhanced recovery is used to describe recovery processes other than the more traditional secondary recovery procedures. These enhanced recovery methods include thermal, chemical, and miscible (mixable) drives. Currently, no enhanced recovery techniques are being implemented within the BFO, but there is a large CO₂ enhanced recovery project to the south of the planning area in the Salt Creek Field. There are also preliminary CO₂ enhanced recovery projects being developed.

Some reservoirs contain large quantities of heavy oil that cannot be produced using normal or secondary methods. These reservoirs can be stimulated by thermal drive processes in which heat is introduced from the surface or developed in place in the subsurface reservoir. In the surface introduction process, hot water or steam is injected. Raising the temperature of heavy oil reduces the viscosity and makes the oil more mobile. In the in-situ process, both heavy and light oils can be processed. Spontaneous or induced ignition within the reservoir is induced by injected air to develop a fire front that burns the hydrocarbons. Evaporation of the lighter ends immediately ahead of the fire front, and later condensation is the primary recovery mechanism. The remaining hydrocarbons are consumed by the fire and are generally not considered of any value. These techniques are very expensive and must have large reserves and thick pay zones to be economical. It is unlikely these techniques will be used within the BFO in the immediate future unless new discoveries are made.

Several chemical drive techniques are currently in use, including polymer flooding, caustic flooding, and surfactant-polymer injection. These methods attempt to change reservoir conditions to allow recovery of additional oil. Caustic and surfactant-polymer flooding have not been economical in the past, and unless a breakthrough in technology is achieved, these techniques

will probably not be considered during the planning period. Polymer flooding is an economically viable process but is used mainly in viscous reservoirs with high permeability.

O.6.7. Gas Storage

Pipeline-quality gas can be stored in good quality reservoirs with sufficient sealing parameters. This gas is pumped into the reservoir during nonpeak, usually lower priced time periods, and then pumped out into the transmission lines at times of peak demand and higher prices. The price differential pays for the governmental fees required the use of the storage reservoir and the injection/compression costs required to store and retrieve the gas. Gas storage also serves as a buffer for cold periods when demand is high and levels out the summer slack period of production. There is one active gas storage reservoir within the BFO.

O.7. Plugging and Abandonment Of Wells

The purpose of plugging and abandoning a well is to prevent fluid migration between zones, to protect mineral and water resources from damage, and to restore the surface area. Each well must be handled individually because of a combination of factors, including geology, subsurface well design, and specific rehabilitation concerns; therefore, only minimum requirements can be established, and these must be modified for individual wells.

The first step in the plugging process is the filing of the Notice of Intent to Abandon. This notice is reviewed by both the surface management agency and BFO petroleum engineer and geologist. The notice must be filed and approved before plugging a previously producing well. Verbal plugging instructions can be given for plugging current drilling operations, but a notice must be filed after the work is completed. If usable fresh water was encountered while the well was being drilled, the surface management agency may be allowed, if interested, to assume future responsibility for the well. This assumption of responsibility becomes effective after the deeper zones are plugged back to the usable water zone. In all cases the productive zone is isolated prior to being turned over to the surface management agency.

The operator's plan for securing the hole is reviewed. The minimum requirements, as stated in Onshore Order No. 2, are as follows: In open hole situations, cement plugs must extend at least 50 feet above and below zones that have fluid with the potential to migrate, zones of lost circulation (this type of zone could require an alternate method to isolate it), and zones of potentially valuable minerals. Thick zones may be isolated using cement plugs across the top and bottom of the zone. In the absence of productive zones and minerals, long sections of open hole may be plugged with cement plugs placed every 3,000 feet. In cased holes, cement plugs must be placed opposite perforations and extending 50 feet above and below, except where limited by plug back depth. The length of the plug is 100 feet plus 10 percent per 1,000 feet (i.e., at 10,000 feet the plug will be 200 feet long).

Cement plugs could be replaced with a cement retainer, if the retainer is set 50 feet above the open perforations and the perforations are squeezed with cement. A bridge plug could also be used to isolate a producing zone and must be capped, if placed through tubing, with a minimum of 50 feet of cement. If the cap is placed using a dump bailer, a minimum of 35 feet of cement is required. A dump bailer is an apparatus run on wire line to convey the cement to the bottom of the hole. In the event that the casing has been cut and recovered, a plug is placed 50 feet within the casing stub, and the 100 feet plus 10 percent per 1,000 feet rule is used for the space

above the cutoff point. In all cases, a plug is set at the bottom of the surface casing that has a volume of cement using the 100 feet plus 10 percent per 1,000 feet rule. This could require perforating the casing and circulating or squeezing cement behind the production casing if that casing is not removed. Annular space at the surface will be plugged with 50 feet of cement using small-diameter tubing or by perforating and circulating cement.

If the integrity of a plug is questionable, or the position is extremely vital, it can be tested with pressure or by tagging the plug with the tubing or drill string. Tagging the plug involves running a pipe into the hole until the plug is encountered, and placing a specified amount of weight on the plug to verify its placement and competency. The surface plug within the casing must be a minimum of 50 feet. The interval between plugs must be filled with mud that will balance the subsurface pressures, and if this balance point is unknown, a minimum of 9 pounds per gallon is specified. After the casing has been cut off below the ground level, any void at the top of the casing must be filled with cement. A metal plate is welded over the top of the casing, a weep hole is placed in the plate. A permanent abandonment marker is required on all wells unless otherwise requested by the surface management agency. After the plugging operations have been completed a subsequent report of abandonment is filed detailing the operations and giving a status update on the reclamation of the well site. Once reclamation has occurred and the wellsite is ready for release a Final Abandonment Notice is submitted to the BLM for review. Usually this will occur after two full growing seasons have elapsed since seeding was finished.

The Surface Management Agency is responsible for establishing and approving methods for surface rehabilitation, and determining when this rehabilitation has been satisfactorily accomplished. With satisfactory rehabilitation, a final abandonment notice is approved, and the well bond is released.

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Appendix P. Fire and Fuels Management

P.1. Emergency Stabilization and Rehabilitation

Introduction

Emergency stabilization plans and/or rehabilitation plans are prepared after a wildland fire to minimize threats to life or property and stabilize and prevent unacceptable degradation to natural and cultural resources resulting from the effects of the fire. Not all fires need emergency stabilization and/or rehabilitation.

Wyoming Bureau of Land Management's (BLM) Reclamation policy identifies certain requirements which must be addressed when developing reclamation plans or proposals for surface-disturbing activities. For information about reclamation requirements, please refer to Appendix M (p. 555).

The Burned Area Emergency Stabilization and Rehabilitation Handbook (BLM 2007) provides detailed information specific to BLM policies, standards, and procedures used in the Burned Area Emergency Stabilization and Rehabilitation (ES&R) programs. The Handbook is intended to be the primary guidance to BLM ES&R activities. ES&R activities and treatment undertaken in the Buffalo Field Office will follow the Handbook guidance. As updates and revisions to the departmental manuals are completed, conformance to the new direction will supersede the criteria included herein.

Emergency stabilization is defined as "Planned actions to stabilize and prevent unacceptable degradation to natural and cultural resources, to minimize threats to life and property resulting from the effects of a fire, or to repair/replace/construct physical improvements necessary to prevent degradation of land or resources. Emergency stabilization actions must be taken within one year following containment of a wildland fire" (DOI 2004).

Rehabilitation is defined as "Efforts undertaken within three years of containment of a wildland fire to repair or improve fire-damaged lands unlikely to recover naturally to management approved conditions, or to repair or replace minor facilities damaged by fire" (DOI 2004).

ES&R funds are not used for rehabilitation of wildland fire suppression efforts; this includes rehabilitating firelines, helispots, fire camp, etc. Costs for rehabilitating wildland fire suppression efforts will be funded by the wildland fire project code.

Emergency Stabilization and Rehabilitation Protocols

Emergency stabilization protection priorities are: (1) human life and safety; and (2) property and unique biological resources (designated critical habitat for federal and state listed, proposed or candidate Threatened and Endangered species) and significant heritage sites (DOI 2004). Burned area rehabilitation protection priorities are: (1) to repair or improve lands damaged directly by a wildland fire; and (2) to rehabilitate or establish healthy, stable ecosystems in the burned area (DOI 2004).

Emergency Stabilization

The objective of emergency stabilization is “To determine the need for and to prescribe and implement emergency treatments to minimize threats to life or property or to stabilize and prevent unacceptable degradation to natural and cultural resources resulting from the effects of a fire” (DOI 2004).

Emergency stabilization plans are prepared by an interdisciplinary team, immediately following a wildland fire and specify emergency treatments and activities to be carried out within one year following containment of the wildfire. Generally, activities are only prescribed within the perimeter of a burned area.

Allowable emergency stabilization actions are limited to the following items, grouped by issue topic:

Human Life and Safety

- Replacing or repairing minor facilities essential to public health and safety when no other protection options are available.

Soil/Water Stabilization

- Placing structures to slow soil and water movement.
- Stabilizing soil to prevent loss of degradation or productivity.
- Increasing road drainage frequency and/or capacity to handle additional post-fire runoff.
- Installing protective fences or barriers to protect treated or recovering areas.

Designated Critical Habitat for Federal/State Listed, Proposed, or Candidate Species

- Conducting assessments of critical habitat in those areas affected by emergency stabilization treatments.
- Seeding or planting to prevent permanent impairment of designated critical habitat for federal and state listed, proposed or candidate Threatened and Endangered species.

Critical Heritage Resources

- Conducting assessments of significant heritage sites in those areas affected by emergency stabilization treatments.
- Stabilizing critical heritage resources.
- Patrolling, camouflaging, burying significant heritage sites to prevent looting.

Invasive Plants

- Seeding to prevent establishment of invasive plants, and direct treatment of invasive plants. Such actions will be specified in the emergency stabilization plan only when immediate action is required and when standard treatments are used that have been validated by monitoring data from previous projects, or when there is documented research establishing the effectiveness of such actions.

- Using integrated pest management techniques to minimize the establishment of non-native invasive species within the burned area. When there is an existing approved management plan that addresses non-native invasive species, emergency stabilization treatments may be used to stabilize the invasive species

Monitoring

- Monitoring of treatments and activities for up to three years from date of fire containment.

Burned Area Rehabilitation

The objectives of rehabilitation are: (1) to evaluate actual and potential long-term post-fire impacts to critical cultural and natural resources and identify those areas unlikely to recover naturally from severe wildland fire damage; (2) to develop and implement cost-effective plans to emulate historical or pre-fire ecosystem structure, function, diversity, and dynamics consistent with approved land management plans, or if that is infeasible, then to restore or establish a healthy, stable ecosystem in which native species are well represented; and (3) to repair or replace minor facilities damaged by wildland fire (DOI 2004).

Rehabilitation plans are prepared by an interdisciplinary team as a separate plan, independent of an emergency stabilization plan. The rehabilitation plan specifies non-emergency treatments and activities to be carried out within three years following containment of a wildfire. Generally, rehabilitation activities are prescribed only within the perimeter of a burned area.

Allowable rehabilitation actions are limited to the following items, grouped by issue topic:

Lands Unlikely to Recover Naturally

- Repair or improve lands unlikely to recover naturally from wildland fire damage by emulating historical or pre-fire ecosystem structure, function, diversity, and dynamics consistent with existing land management plans.

Weed Treatments

- Chemical, manual, and mechanical removal of invasive species, and planting of native and non-native species, restore or establish a healthy, stable ecosystem even if this ecosystem cannot fully emulate historical or pre-fire conditions.

Tree Planting

- Tree planting to reestablish burned habitat, reestablish native tree species lost in fire, prevent establishment of invasive plants.

Repair/Replace Fire Damage to Minor Facilities

- Repair or replace fire damage to minor operating facilities (e.g., fences, campgrounds, interpretive signs and exhibits, shade shelters, wildlife guzzlers, etc.) Rehabilitation may not include the planning or replacement of major infrastructure, such as visitor centers, residential

structures, administration offices, work centers and similar facilities. Rehabilitation does not include the construction of new facilities that did not exist before the fire, except for temporary and minor facilities necessary to implement burned area rehabilitation efforts.

Monitoring

- Monitoring of treatments and activities for up to three years from date of fire containment.

Policies on timeframes for ES&R planning funding, and implementation are very specific. ES&R treatments must be implemented, to the extent possible, before additional damage occurs to the burned area, immediately down slope of the burned area, or before undesirable vegetation becomes established. Treatments must be implemented at a time that will ensure a high or maximum probability of success. The ES&R Program timeframes in relations to tasks and responsibilities are shown in Table P.1, “Emergency Stabilization and Rehabilitation Program Timeframes, Tasks, and Responsibilities” (p. 628).

Table P.1. Emergency Stabilization and Rehabilitation Program Timeframes, Tasks, and Responsibilities

| Event | Timeframes | Task |
|--|---|--|
| Wildfire occurs | Immediately, prior to fire containment | Manager assigns a Resource Advisor. While the fire is still burning, the Resource Advisor, in consultation with resource specialists and the appropriate Manager, decides if ES&R is warranted bases on Values-at-Risk/Resources-at-Risk. |
| Initial Emergency Stabilization Plan needed. Submit Form 1310-2 plus supplemental attachments (Both 2822 and 2881 may be indicated on Form, though funding under 2881 may not occur until the following fiscal year) | Within 7 days of fire containment | Concurrently to State ES&R Program Lead, National ES&R Program Lead, and Denver Budget Office (BC-612). |
| Complete Emergency Stabilization Plan needed. Prepare/Submit complete Emergency Stabilization Plan | Within 21 days of fire containment | Less than \$100,000 submit to State ES&R Program Lead. Greater than or equal to \$100,000 submit to State ES&R Program Lead (for review) and concurrently to National ES&R Program Lead. |
| Receive approval/disapproval of Emergency Stabilization Plan | Within 6 working days of receipt by Approval Office | Requesting Office receives memo approving funding, or need for revision on a plan by plan basis. State Director or acting has funding approval authority for plans less than \$100,000. Bureau of Land Management Budget Officer, after concurrence with Assistant Director WO-200 or their designee, has funding approval authority for plans greater than or equal to \$100,000. |
| Receive notification of Emergency Stabilization funding approval | Immediately | Local fire office enters project data into National Fire Plan Operations and Reporting System. |

| Event | Timeframes | Task |
|---|--|---|
| Burned Area Rehabilitation Plan needed. Prepare/Submit Burned Area Rehabilitation Plan | Timely, ideally soon after submitting Emergency Stabilization Plan, but no later than September 5 annually | To State ES&R Program Lead and National ES&R Program Lead. Field Office. Local fire office enters project data into National Fire Plan Operations and Reporting System. |
| Receive approval/disapproval of Burned Area Rehabilitation Plan funding | Before October 31 annually | Funding for Rehabilitation Plans is approved via the Annual Work Plan. |
| Accomplishment Report and Funding Request Form for next Fiscal Year 2881 funds | Early September | To State ES&R Program Lead for review and submission to National ES&R Program Lead for concurrence. Funding for years 2 and 3 is approved via the Annual Work Plan. |
| Close-out Report | Early September of 3rd year | To State ES&R Program Lead for review and submission to National ES&R Program Lead. |
| \$ U.S. dollar ES&R Emergency Stabilization and Rehabilitation WO Washington Office | | |

Due to the broad spectrum of situations encountered in emergency stabilization and/or rehabilitation, several options of possible treatments, either separately or in combination, must be considered. The ES&R Handbook list several treatments under the Treatment Guidance section.

Emergency Stabilization and Rehabilitation Guidelines for Wilderness Study Areas

Emergency stabilization and/or rehabilitation following wildland fire in a Wilderness Study Area (WSA) will comply with Manual 6330 - Management of Wilderness Study Areas (BLM 2012). The following italicized text condenses excerpts from the manual:

Emergency stabilization, rehabilitation, and restoration of the wilderness resource created by impacts from wildfires must satisfy the non-impairment criteria unless an exception applies. These activities will be more intensive: where the effects of the fire were greater than would occur in an area where fire already plays its natural role on the landscape; in ecosystems that evolved without broad-scale fire; and for fires whose effects (even within the natural range) pose an unacceptable risk to life, property, or resources outside the WSA. Where wildfires have been managed for resource benefits, most stabilization, rehabilitation, and restoration activities are expected to be limited to the impacts caused by direct management actions or to prevent the spread of exotic vegetation. These activities will not be used to establish, or re-establish, conditions not provided for in sections 1.6.D.8 or 1.6.D.11 of this manual.

Any emergency stabilization and/or rehabilitation actions must maintain an area's suitability for preservation as wilderness and should be accomplished using methods and equipment that causes the least damage to wilderness resources. The use of motorized vehicles and mechanical equipment will be minimized to the extent possible.

When seeding is considered, the appropriate species and methods for seeding will be considered on a case-by-case basis to determine if the proposed method meets the policy and guidelines for WSAs. Seed and planting will utilize native species, and will minimize cross-country use of motorized equipment. Seedings and plantings will be staggered or irregular so as to avoid a

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straight-line plantation appearance. Seed will be applied aerially unless the area to be stabilized and/or rehabilitated is small, or ground application will not impair wilderness characteristics. Because the covering of seed greatly affects its successful germination, mechanized equipment may be considered to cover the seed after aerial application. If the burned area is determined to be crucial wildlife habitat, and shrub seed is not applied aerially, then seedlings may be hand planted.

When a proposed emergency stabilization and/or rehabilitation project addresses a WSA, interested parties will be allowed a 30-day comment period on the proposed treatment, unless it is not possible to do so because of emergency conditions (i.e., the 30-day comment period would result in missing the optimum period for treatment). If a full 30-day period would result in missing the optimum period for emergency stabilization and/or rehabilitation, key contacts would be notified for immediate comment, and a follow up copy of the treatment prescription would be forwarded.

If it is determined that wilderness suitability is affected by damages from fire suppression actions, the disturbance must be repaired by fire suppression resources. ES&R funds may not be used to repair suppression damages.

P.2. Fire Management Policy for Wilderness Study Areas

The following paragraphs are condensed excerpts from Manual 6330 - Management of Wilderness Study Areas (BLM 2012). For complete policy and guidance regarding WSAs, refer to the manual.

Policies for Specific Activities — Vegetation

Whenever possible, natural processes will be relied on to maintain native vegetation and to influence natural fluctuations in populations. Natural disturbance processes, including fire, insect outbreaks, and droughts, are important functions of the ecosystem. Manipulation of vegetation through management-ignited fire, chemical application, mechanical treatment, or human controlled biological means is allowed only where it meets the non-impairment standard or one of the exceptions. Exceptions that may pertain to vegetative treatment include emergencies, the protection or enhancement of wilderness characteristics, grandfathered uses, valid existing rights, and actions taken to recover a federally listed Threatened, Endangered, or Candidate species. Establishing non-native plants is an example of vegetation management that may impair and therefore may not be permitted within a WSA.

Emergencies:

As an exception to the non-impairment standard, vegetative manipulation in emergency situations may be allowed, e.g., there is no effective alternative for controlling insect and disease outbreaks or fires that threaten lands outside of a WSA. Reseeding or planting of native species may be undertaken following fire or other natural disaster if natural seed sources are not adequate to compete with non-native vegetation or substantial soil loss is expected.

Insect and Disease Control:

Native insect and disease control activities on vegetation will be allowed only to the extent that they meet the non-impairment criteria or one of the exceptions. When specific insects and diseases are documented to be non-native or introduced organisms, then it may be reasonable to consider whether the protection and enhancement of wilderness characteristics exception to the non-impairment standard applies.

Restoration:

Where it meets the non-impairment standard or one of the exceptions, management action may be taken to restore vegetation to characteristic conditions of the ecological zone in which the area is situated where:

- Natural successional processes have been disrupted by past human activity, to the extent that intervention is necessary in order to return the ecosystem to a condition where natural process can function;
- Restoration through natural processes would require lengthy periods of time during which the impacted area would receive unwanted human use or be susceptible to substantial soil loss without intervention, or further ecological departure would occur; or,
- It is necessary to maintain fire-dependent ecosystems when adjacent land uses do not allow for natural fire occurrence. (see section 1.6.D.2.c).

Manipulation should only occur when restoration by natural forces is no longer attainable, and only to restore or maintain vegetative communities to the closest approximation of the natural range of conditions.

Restoration treatments should use the least disruptive techniques that have the best likelihood for success. Patient, incremental treatments should be favored over aggressive attempts to restore long-term changes all at once, unless repeated treatments would pose greater impairment risk to wilderness characteristics.

Policies for Specific Activities — Fire

The overall goal of managing fire in WSAs is to allow the frequency and intensity of the natural fire regime to play its inherent role in the ecosystem. This means both allowing fire where ecosystems evolved in the presence of fire, and preventing unnatural spread of fire in ecosystems that evolved without broad-scale fires.

Wildfires can be considered emergencies and, as such, management response to a wildfire falls under one of the exceptions to the non-impairment criteria. Nevertheless, the non-impairment criteria will be met to the extent practical. This means using "minimum impact suppression tactics" or "light hand on the land" suppression techniques wherever possible, while providing for the safety of firefighters and the public and meeting fire management objectives. Fire managers should inform suppression personnel during dispatch that the [wild]fire is in a WSA and that special constraints may apply to prevent impairment of wilderness characteristics. A fire resource advisor with experience in WSA management should be assigned to all fires in WSAs to assist in the protection of wilderness characteristics.

The goal of prescribed fire is to make conditions possible for natural fire to return to the WSA. In some instances, the goal may be to mimic a natural fire regime where reliance on wildfire is not feasible. Use of prescribed fires in WSAs is limited to instances where this use meets the non-impairment standard or one of the exceptions, such as to clearly protect or enhance the land's wilderness characteristics. The BLM may utilize prescribed fire in WSAs where the natural role of fire cannot be returned solely by reliance on wildfire or where relying on wildfires might create unacceptable risks to life, property, or natural resources outside the WSA.

Fuel treatments include thinning or removing vegetation, either mechanically or chemically, in advance of, or as a replacement for, wildland fire (either wildfire or prescribed fire). The goal of fuel treatment is to make conditions possible for natural wildfire to return to the WSA. In some

instances, fuel treatment may be necessary to protect site-specific resources in advance of a prescribed fire to prevent the loss of those resources. This necessity must be clearly demonstrated in the prescribed fire plan. Pre-fire treatment used to replace either type of wildland fire... is only allowed in WSAs where it meets the non-impairment standard or one of the exceptions. Due to their controversial nature and the complexities of analyzing the effects of these treatments on the non-impairment criteria, more extensive National Environmental Policy Act (NEPA) analysis (e.g., an Environmental Impact Statement) including public involvement may be required when fuel treatments are proposed for use as a replacement for wildland fire. The policy in 1.6.D.8.b.iii [vegetation restoration] must be satisfied. Fuel treatments *may* be permitted under the restoration or public safety exceptions to the non-impairment standard when:

- A. prescribed fire in the WSA will inevitably cause unacceptable risks to life, property, or natural resources outside the WSA; or
- B. natural successional processes have been disrupted by past human activity to the extent that intervention is necessary in order to return the ecosystem to a condition where natural process can function; or
- C. non-native species have altered the fire regime so that wildland fires pose an undue risk to the native ecosystem.

Conclusive documentation of A, B, or C, above, must be included in the NEPA analysis of the proposed action. When fuel treatment is allowed, the BLM must strive to achieve the desired conditions through the least impacting method. Fuel treatments should not be authorized in a WSA if the same objectives can be accomplished by the BLM through fuel treatments on public lands outside of the WSA.

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Appendix Q. Biological Resources Support Document

Q.1. Raptor Management

Protections for Raptors

Raptors, or birds of prey, and the majority of other birds in the United States are protected by the Migratory Bird Treaty Act (MBTA), 16 United States Code (U.S.C.) 703. A complete list of migratory bird species can be found in the Code of Federal Regulations (CFR) at 50 CFR 10.13. Eagles are also protected by the Bald and Golden Eagle Protection Act, 16 U.S.C. 668 (Eagle Act).

The MBTA protects migratory birds, eggs and nests from possession, sale, purchase, barter, transport, import, export, and take. The regulatory definition of take, defined in 50 CFR 10.12, means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to hunt, shoot, wound, kill, trap, capture, or collect a migratory bird. Activities that result in the unpermitted take (e.g., result in death, possession, collection, or wounding) of migratory birds or their eggs are illegal and fully prosecutable under the MBTA. Removal or destruction of active nests (i.e., nests that contain eggs or young), or causing abandonment of an active nest, could constitute a violation of the MBTA, the Eagle Act, or both statutes. Removal of any active migratory bird nest or any structure that contains an active nest (e.g., tree) where such removal results in take is prohibited. Therefore, if nesting migratory birds are present on or near a project area, project timing is an important consideration during project planning. As discussed below, the Eagle Act provides additional protections for bald and golden eagles and their nests. For additional information concerning nests and protections under the MBTA, please see the U.S. Fish and Wildlife Service's (USFWS) Migratory Bird Permit Memorandum, MBMP-2.

The USFWS Wyoming Ecological Services Field Office works to raise public awareness about the possible occurrence of birds in proposed project areas and the risk of violating the MBTA, while also providing guidance to minimize the likelihood that take will occur. They encourage you to coordinate with their office before conducting actions that could lead to the take of a migratory bird, their young, eggs, or active nests (e.g., construction or other activity in the vicinity of a nest that could result in a take). If nest manipulation is proposed for a project in Wyoming, the project proponent should also contact the USFWS's Migratory Bird Office in Denver at 303-236-8171 to see if a permit can be issued. Permits generally are not issued for an active nest of any migratory bird species, unless removal of the nest is necessary for human health and safety. If a permit cannot be issued, the project may need to be modified to ensure take of migratory birds, their young or eggs will not occur.

For infrastructure (or facilities) that have potential to cause direct avian mortality (e.g., wind turbines, guyed towers, airports, wastewater disposal facilities, transmission lines), the USFWS recommends locating structures away from high avian-use areas such as those used for nesting, foraging, roosting or migrating, and the travel zones between high-use areas. If the wildlife survey data available for the proposed project area and vicinity do not provide the detail needed to identify normal bird habitat use and movements, they recommend collecting that information prior to determining locations for any infrastructure that may create an increased potential for avian mortalities. The USFWS also recommends contacting the USFWS Wyoming Ecological Services Office for project-specific recommendations.

Additional Protections for Eagles

The Eagle Act protections include provisions not included in the MBTA, such as the protection of unoccupied nests and a prohibition on disturbing eagles. Specifically, the Eagle Act prohibits knowingly taking, or taking with wanton disregard for the consequences of an activity, any bald or golden eagle or their body parts, nests, chicks or eggs, which includes collection, possession, molestation, disturbance, or killing. The term “disturb” is defined as “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior” (50 CFR 22.3 and see also 72 Federal Register [FR] 31132).

The Eagle Act includes limited exceptions to its prohibitions through a permitting process. The USFWS has issued regulations concerning the permit procedures for exceptions to the Eagle Act’s prohibitions (74 FR 46836), including permits to take golden eagle nests which interfere with resource development or recovery operations (50 CFR 22.25). The regulations identify the conditions under which a permit may be issued (i.e., status of eagles, need for action), application requirements, and other issues (e.g., mitigation, monitoring) necessary in order for a permit to be issued.

For additional recommendations specific to Bald Eagles please see the USFWS Bald Eagle information web page (http://www.fws.gov/wyominges/Pages/Species/Species_SpeciesConcern/BaldEagle.html).

Recommended Steps for Addressing Raptors in Project Planning

Using the following steps in early project planning proponents can more easily minimize impacts to raptors, streamline planning and permitting processes, and incorporate measures into an adaptive management program:

1. Coordinate with appropriate USFWS offices, Wyoming Game and Fish Department (WGFD), Tribal governments, and land-management agencies at the earliest stage of project planning.
2. Identify species and distribution of raptors occurring within the project area by searching existing data sources (e.g., WGFD, federal land-management agencies) and by conducting onsite surveys.
3. Plan and schedule short-term and long-term project disturbances and human-related activities to avoid raptor nesting and roosting areas, particularly during crucial breeding and wintering periods
4. Determine location and distribution of important raptor habitat, nests, roost sites, migration zones and, if feasible, available prey base in the project impact area.
5. Document the type, extent, timing, and duration of raptor activity in important use areas to establish a baseline of raptor activity.
6. Ascertain the type, extent, timing, and duration of development or human activities proposed to occur, and the extent to which this differs from baseline conditions.
7. Consider cumulative effects to raptors from proposed projects when added to past, present, and reasonably foreseeable actions. Ensure that project mitigation adequately addresses cumulative effects to raptors.
8. Minimize loss of raptor habitats and avoid long-term habitat degradation. Mitigate for unavoidable losses of high-valued raptor habitats, including (but not limited to) nesting, roosting, migration, and foraging areas.

9. Monitor and document the status of raptor populations and, if feasible, their prey base post project completion, and evaluate the success of mitigation efforts.
10. Document meaningful data and evaluations in a format that can be readily shared and incorporated into wildlife databases (contact the USFWS Wyoming Ecological Services Office for details).

Protection of nesting, wintering (including communal roost sites), and foraging activities is considered essential to conserving raptors. In order to promote the conservation of migratory bird populations and their habitats, federal agencies should implement those strategies directed by Executive Order (EO) 13186, “Responsibilities of Federal Agencies To Protect Migratory Birds” (66 FR 3853).

Recommended Seasonal and Spatial Buffers to Protect Nesting Raptors

Because many raptors are particularly sensitive to disturbance (that may result in take) during the breeding season, the USFWS recommends implementing spatial and seasonal buffer zones to protect individual nest sites/territories (Table Q.1, “Wyoming Ecological Services Field Office’s Recommended Spatial and Seasonal Buffers for Breeding Raptors” (p. 636)). The buffers serve to minimize visual and auditory impacts associated with human activities near nest sites. Ideally, buffers would be large enough to protect existing nest trees and provide for alternative or replacement nest trees. The size and shape of effective buffers vary depending on the topography and other ecological characteristics surrounding the nest site. In open areas where there is little or no forested or topographical separation, distance alone must serve as the buffer. Adequate nesting buffers will help ensure activities do not take breeding birds, their young or eggs. For optimal conservation benefit, the USFWS recommends that no temporary or permanent surface occupancy occur within species-specific spatial buffer zones. For some activities with very substantial auditory impacts (e.g., seismic exploration and blasting) or visual impacts (e.g., tall drilling rig), a larger buffer than listed in Table Q.1, “Wyoming Ecological Services Field Office’s Recommended Spatial and Seasonal Buffers for Breeding Raptors” (p. 636) may be necessary, please contact the USFWS Wyoming Ecological Services Office for project specific recommendations on adequate buffers.

As discussed above, for infrastructure that may create an increased potential for raptor mortalities, the spatial buffers listed in Table Q.1, “Wyoming Ecological Services Field Office’s Recommended Spatial and Seasonal Buffers for Breeding Raptors” (p. 636) may not be sufficient to reduce the incidence of raptor mortalities (for example, if a wind turbine is placed outside a nest disturbance buffer, but inadvertently still within areas of normal daily or migratory bird movements); therefore, please contact the USFWS Wyoming Ecological Services Office for project specific recommendations on adequate buffers.

Buffer recommendations may be modified on a site-specific or project-specific basis based on field observations and local conditions. The sensitivity of raptors to disturbance may be dependent on local topography, density of vegetation, and intensity of activities. Additionally, individual birds may be habituated to varying levels of disturbance and human-induced impacts. Modification of protective buffer recommendations may be considered where biologically supported and developed in coordination with the USFWS Wyoming Ecological Services Field Office.

Because raptor nests are not always identified to species (e.g., preliminary aerial surveys in winter), nests of unknown raptor species will be considered as golden eagle nests when located in trees or similar vertical structure and as ferruginous hawk nests when located on the ground (including creek bank, rock outcrop, cliff, or erosional feature). Ferruginous hawks receive

the most conservative buffers of ground-nesting species while golden eagles receive the most conservative buffers of those species which typically nest in trees. The Buffalo Field Office database (queried September 12, 2013) contains 1,403 nests identified as ferruginous hawk of which 1,278 or 91 percent are ground nests; of the remaining 9 percent of ferruginous hawk nests many did not have the nest substrate recorded. Once the raptor species is confirmed, we then make species-specific and site-specific recommendations on seasonal and spatial buffers (Table Q.1, “Wyoming Ecological Services Field Office’s Recommended Spatial and Seasonal Buffers for Breeding Raptors” (p. 636)).

Activities should not occur within the spatial/seasonal buffer of any nest (occupied or unoccupied) when raptors are in the process of courtship and nest site selection. Long-term land-use activities and human-use activities should not occur within the species-specific spatial buffer of occupied nests. Short-term land use and human-use activities proposed to occur within the spatial buffer of an occupied nest should only proceed during the seasonal buffer after coordination with the USFWS, state, and land-management agency biologists. If, after coordination, it is determined that due to human or environmental safety or otherwise unavoidable factors, activities require temporary incursions within the spatial and seasonal buffers, those activities should be planned to minimize impacts and monitored to determine whether impacts to birds occurred. Mitigation for habitat loss or degradation should be identified and planned in coordination with applicable agencies.

Please contact the USFWS Wyoming Ecological Services Field Office if you have any questions regarding the status of the bald eagle, permit requirements, or if you require technical assistance regarding the MBTA, Eagle Act, or the above recommendations. The recommended spatial and seasonal buffers do not supersede provisions of the MBTA, Eagle Act, (Migratory Bird Permit Memorandum (MBMP-2), and Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.). Assessing legal compliance with the MBTA or the Eagle Act and the implementing regulations is ultimately the authority and responsibility of the USFWS law enforcement personnel. The USFWS recommendations also do not supersede federal, state, local, or tribal regulations or permit conditions that may be more restrictive.

Table Q.1. Wyoming Ecological Services Field Office’s Recommended Spatial and Seasonal Buffers for Breeding Raptors

| Common Name | Spatial buffer (miles) | Seasonal buffer |
|---|--|------------------------|
| Raptors of Conservation Concern (see below for more information) | | |
| Golden Eagle | 0.50 | January 15 - July 31 |
| Ferruginous Hawk | 1.00 | March 15 - July 31 |
| Swainson's Hawk | 0.25 | April 1 - August 31 |
| Bald Eagle | see Bald Eagle information web page ¹ | |
| Prairie Falcon | 0.50 | March 1 - August 15 |
| Peregrine Falcon | 0.50 | March 1 - August 15 |
| Short-eared Owl | 0.25 | March 15 - August 1 |
| Burrowing Owl | 0.25 | April 1 - September 15 |
| Northern Goshawk | 0.50 | April 1 - August 15 |
| Additional Wyoming Raptors | | |
| Osprey | 0.25 | April 1 - August 31 |
| Cooper's Hawk | 0.25 | March 15 - August 31 |
| Sharp-shinned Hawk | 0.25 | March 15 - August 31 |
| Red-tailed Hawk | 0.25 | February 1 - August 15 |
| Rough-legged Hawk (winter resident only) | ---- | ---- |

| Common Name | Spatial buffer (miles) | Seasonal buffer |
|-----------------------|------------------------|---------------------------|
| Northern Harrier | 0.25 | April 1 - August 15 |
| Merlin | 0.50 | April 1 - August 15 |
| American Kestrel | 0.125 | April 1 - August 15 |
| Common Barn Owl | 0.125 | February 1 - September 15 |
| Northern Saw-whet Owl | 0.25 | March 1 - August 31 |
| Boreal Owl | 0.25 | February 1 - July 31 |
| Long-eared Owl | 0.25 | February 1 - August 15 |
| Great Horned Owl | 0.125 | December 1 - September 30 |
| Northern Pygmy-Owl | 0.25 | April 1 - August 1 |
| Eastern Screech-owl | 0.125 | March 1 - August 15 |
| Western Screech-owl | 0.125 | March 1 - August 15 |
| Great Gray Owl | 0.25 | March 15 - August 31 |

¹ http://www.fws.gov/wyominges/Pages/Species/Species_SpeciesConcern/BaldEagle.html

Raptors of Conservation Concern

The USFWS Birds of Conservation Concern (2008) report identifies “species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing” under the ESA (16 U.S.C. 1531 et seq.). This report is intended to stimulate coordinated and proactive conservation actions among federal, state, and private partners. The Wyoming Partners in Flight Wyoming Bird Conservation Plan identifies priority bird species and habitats, and establishes objectives for bird populations and habitats in Wyoming. This plan also recommends conservation actions to accomplish the population and habitat objectives.

We encourage project planners to develop and implement protective measures for the Birds of Conservation Concern as well as other high-priority species identified in the Wyoming Bird Conservation Plan. For additional information on the Birds of Conservation Concern that occur in Wyoming, please see the USFWS Birds of Conservation Concern web page.

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Appendix R. Lands Identified for Disposal Through Exchange or Sale

The Buffalo Field Office (BFO) Resource Management Plan (RMP) revision project specifically identifies areas available for consideration for disposal by employing the “isolated, difficult or expensive to manage, or needed-for community expansion” disposal criteria in the Federal Land Policy and Management Act (FLPMA). The areas in the table below were identified during the RMP revision process as meeting the FLPMA disposal criteria. Inclusion in this table does not constitute a decision that the land will be disposed. Before taking any disposal action, consideration will be given to each individual tract and will include public involvement.

The preferred method of disposal or acquisition of lands is through land exchanges. Proposals for disposal of lands not identified in this table will be considered if they are consistent with the objectives of the Approved RMP and may require a land use plan amendment.

| Legal Description | Approximate Acreage |
|----------------------------------|---------------------|
| Range 69 West | |
| T. 45 N., R. 69 W., | |
| Sec. 3: Lots 11, 18 ^a | 79.69 |
| Sec. 10: Lots 2-4 | 122.46 |
| Sec. 11: Lots 1-4 | 165.76 |
| Sec. 12: Lots 2-8 | 285.17 |
| Sec. 14: Lot 4 | 41.98 |
| Sec. 15: Lot 12 | 41.37 |
| Sec. 22: Lots 1, 2, 5 | 125.89 |
| Sec. 23: Lots 3-6, 10-13 | 333.05 |
| Sec. 25: Lot 6 | 41.65 |
| Sec. 26: Lots 11-14 | 161.54 |
| Sec. 27: Lots 2, 4-6, 9, 10 | 243.21 |
| Sec. 28: Lots 1, 6-9, 14, 15 | 295.51 |
| Sec. 34: Lot 2, 3, 7, 10, 16 | 199.74 |
| Sec. 35: Lots 1-4, 7-10 | 327.86 |
| T. 46 N., R. 69 W., | |
| Sec. 2: Lots 5-19 | 617.51 |
| Sec. 3: Lot 16 | 38.44 |
| Sec. 34: Lot 1 | 39.82 |
| T. 47 N., R. 69 W., | |
| Sec. 11: Lot 2 | 40.82 |
| Sec. 20: Lot 1 | 43.21 |
| Sec. 21: Lot 1 | 40.89 |
| T. 48 N., R. 69 W., | |
| Sec. 6: Lots 10-13, 17-20 | 309.58 |
| Sec. 11: Lots 1, 2 | 79.64 |
| Sec. 18: Lots 6, 7 | 79.39 |
| Sec. 19: Lots 7-9, 15, 16 | 194.16 |
| T. 49 N., R. 69 W., | |
| Sec. 20: Lot 1 | 40.53 |
| Sec. 22: Lot 5 | 41.25 |
| Sec. 31: Lots 11, 14, 19 | 123.35 |
| T. 50 N., R. 69 W., | |
| Sec. 5: Lot 6 | 39.81 |
| T. 51 N., R. 69 W., | |

| Legal Description | Approximate Acreage |
|---|----------------------------|
| Sec. 2: Lots 5, 6, 9, 10, 13 | 205.18 |
| Sec. 22: Lot 12 | 40.12 |
| Sec. 23: Lot 5 | 40.23 |
| T. 52 N., R. 69 W., | |
| Sec. 15: Lots 9, 10 | 84.01 |
| Sec. 20: Lot 12 | 39.02 |
| Sec. 22: Lots 1, 2, 5, 6 | 170.40 |
| Sec. 27: Lots 1, 2, 4, 5, 11-14 | 355.16 |
| T. 53 N., R. 69 W., | |
| Sec. 10: Lot 5 | 39.75 |
| Sec. 13: Lot 7 | 45.25 |
| Sec. 15: Lots 9, 16 | 84.01 |
| Sec. 18: Lots 5, 10, 11 14 | 144.46 |
| Sec. 22: Lots 3-6 | 171.53 |
| Sec. 30: Lots 6, 7 | 77.87 |
| T. 56 N., R. 69 W., | |
| Sec. 1: SWSW | 39.92 |
| Sec. 12: NWNW | 39.93 |
| Sec. 13: Lots 2-4, NWNE, W2SW | 252.41 |
| Sec. 14: Lots 4-6, S2NE | 148.72 |
| Sec. 15: Lots 1, 3, 4 | 38.65 |
| Sec. 19: S2SE | 79.89 |
| Sec. 29: W2NW, NWSW | 119.80 |
| Sec. 30: Lots 6-10, 15-18, 20, NWNE, NESE | 434.41 |
| Sec. 31: Lots 5, 12, 14 | 110.46 |
| Sec. 32: SWNE | 39.95 |
| Sec. 35: Lot 6 | 18.41 |
| T. 56 1/2 N., R. 69 W., | |
| Sec. 35: Lot 1 | 13.77 |
| T. 57 N., R. 69 W., | |
| Sec. 17: Lot 4 | 34.29 |
| Sec. 28: Lot 6 | 23.80 |
| T. 58 N., R. 69 W., | |
| Sec. 30: Lots 9, 10 | 74.67 |
| Range 70 West | |
| T. 45 N., R. 70 W., | |
| Sec. 29: Lot 12 | 41.15 |
| Sec. 30: Lot 16 | 39.48 |
| T. 46 N., R. 70 W., | |
| Sec. 3: Lots 14, 15 | 82.53 |
| Sec. 4: Lots 5, 7-10, 14 | 244.06 |
| Sec. 5: Lots 5, 6, 11-14, 19, 20 | 322.94 |
| Sec. 6: Lots 18, 19, 21 | 119.16 |
| Sec. 8: Lots 1, 8 | 79.85 |
| Sec. 9: Lots 5,7,10, 12 | 159.41 |
| Sec. 10: Lots 1, 5, 11, 12 | 163.52 |
| Sec. 11: Lots 4, 7, 8 | 120.53 |
| Sec. 13: Lot 13 | 40.09 |
| Sec. 14: Lots 10, 15, 16 | 120.76 |
| Sec. 15: Lots 5, 6 | 81.34 |
| Sec. 20: Lots 1, 8, 9 | 121.67 |
| Sec. 21: Lots 11, 12, 14 | 121.99 |
| Sec. 22: Lots 5, 12 | 80.87 |
| Sec. 23: Lots 2, 5, 8, 11-13 | 242.73 |

| Legal Description | Approximate Acreage |
|---------------------------------|----------------------------|
| Sec. 24: Lots 4, 5 | 80.28 |
| Sec. 26: Lot 12 | 40.33 |
| Sec. 27: Lot 5 | 41.13 |
| Sec. 31: Lots 6, 18 | 80.07 |
| Sec. 32: Lots 1, 2, 11 | 127.02 |
| Sec. 34: Lots 1, 2 | 80.73 |
| T. 47 N., R. 70 W., | |
| Sec. 21: Lots 1, 8 | 79.75 |
| Sec. 22: Lots 1, 3-6 | 198.53 |
| Sec. 33: Lot 14 | 40.44 |
| T. 48 N., R. 70 W., | |
| Sec. 1: Lots 7-10 | 152.59 |
| Sec. 2: Lot 5 | 39.40 |
| Sec. 3: Lots 13, 19, 20 | 113.83 |
| Sec. 12: Lots 1-3, 6 | 160.33 |
| Sec. 13: Lots 1, 2, 7-9 | 204.62 |
| Sec. 22: Lot 3 | 40.27 |
| Sec. 24: Lots 1, 8, 9, 15 | 161.41 |
| Sec. 25: Lots 1, 2, 7, 8 | 164.65 |
| Sec. 29: Lot 16 | 40.86 |
| T. 49 N., R. 70 W., | |
| Sec. 27: Lot 3 | 40.09 |
| Sec. 33: Lots 1, 8, 13 | 122.12 |
| T. 50 N., R. 70 W., | |
| Sec. 4: Lot 6 | 35.23 |
| Sec. 15: Lot 4 | 39.90 |
| Sec. 19: Lot 15 | 40.69 |
| Sec. 30: Lot 15 | 39.39 |
| Sec. 34: Lots 3, 4 | 82.19 |
| T. 51 N., R. 70 W., | |
| Sec. 4: Lot 7 | 40.35 |
| Sec. 7: Lot 10 | 40.40 |
| Sec. 10: Lot 3 | 41.33 |
| Sec. 18: Lots 5, 11 | 83.61 |
| T. 52 N., R. 70 W., | |
| Sec. 4: Lot 11 | 39.97 |
| Sec. 28: Lot 1 | 40.24 |
| Sec. 32: Lots 1, 4 | 83.51 |
| Sec. 33: Lot 3 | 39.59 |
| Sec. 35: Lot 7 | 41.61 |
| T. 53 N., R. 70 W., | |
| Sec. 2: Lot 9 | 39.91 |
| Sec. 15: Lots 14, 15 | 81.23 |
| Sec. 22: Lot 2 | 41.57 |
| Sec. 23: Lots 4, 5 | 81.69 |
| T. 56 N., R. 70 W., | |
| Sec. 6: Lots 25, 29, 30 | 119.85 |
| Sec. 7: Lots 5-10, 13, 14 | 201.61 |
| Sec. 9: NW | 159.62 |
| Sec. 18: Lot 10 | 15.49 |
| Sec. 19: Lots 5-11 | 174.17 |
| Sec. 20: SWSE | 39.95 |
| Sec. 24: Lots 4, 7 | 40.55 |
| Sec. 25: Lots 2-5, 7, 8, 11, 12 | 319.92 |

*Appendix R Lands Identified for Disposal
Through Exchange or Sale*

| Legal Description | Approximate Acreage |
|--|----------------------------|
| Sec. 26: N2NE, NWSW | 119.87 |
| Sec. 29: N2NE | 79.89 |
| Sec. 30: Lots 5-10, NWSE | 252.40 |
| Sec. 33: S2NW | 79.97 |
| Sec. 35: Lots 1, 2 | 80.84 |
| T. 57 N., R. 70 W., | |
| Sec. 6: Lot 12 | 31.49 |
| Sec. 19: SESE | 39.95 |
| Sec. 20: S2SW | 80.10 |
| Sec. 22: SESE | 39.94 |
| Sec. 25: SWNE, S2SW, SE | 279.96 |
| Sec. 26: NESW | 39.94 |
| Sec. 29: NENW, N2SW, NWSE | 160.04 |
| Sec. 30: Lots 5, 6, SWNE, SENW, NESW, NWSE | 238.93 |
| Sec. 31: Lot 7, NWNE | 53.22 |
| Sec. 32: N2NW | 79.94 |
| Sec. 33: S2NE, NENW | 119.99 |
| Sec. 36: Lots 1, 2 | 34.70 |
| Sec. 36: N2NE, NENW | 119.99 |
| T. 58 N., R. 70 W., | |
| Sec. 25: Lot 6 | 27.76 |
| Sec. 27: SWSE | 40.01 |
| Sec. 31: Lots 6, 12 | 22.12 |
| Sec. 32: Lot 4 | 36.95 |
| Sec. 34: S2NE, NENW | 119.99 |
| Range 71 West | |
| T. 44 N., R. 71 W., | |
| Sec. 30: Lots 17, 18 | 76.31 |
| T. 45 N., R. 71 W., | |
| Sec. 3: Lot 14 | 41.19 |
| Sec. 4: Lots 5, 12 | 84.99 |
| T. 46 N., R. 71 W., | |
| Sec. 1: Lot 11 | 40.28 |
| Sec. 2: Lot 13 | 40.60 |
| Sec. 4: Lots 19, 20 | 81.30 |
| Sec. 9: Lots 1, 2, 4-7 | 245.18 |
| Sec. 10: Lots 3-5, 8-10 | 243.59 |
| Sec. 11: Lot 4 | 40.61 |
| Sec. 15: Lots 1, 2 | 81.21 |
| T. 47 N., R. 71 W., | |
| Sec. 29: Lot 7 | 40.70 |
| T. 49 N., R. 71 W., | |
| Sec. 8: Lot 9 | 40.79 |
| Sec. 9: Lots 8, 10 | 81.13 |
| T. 50 N., R. 71 W., | |
| Sec. 4: Lot 5 | 38.70 |
| T. 51 N., R. 71 W., | |
| Sec. 35: Lot 7 | 40.50 |
| T. 52 N., R. 71 W., | |
| Sec. 25: Lot 5 | 39.64 |
| Sec. 30: Lots 5, 12 | 75.11 |
| T. 53 N., R. 71 W., | |
| Sec. 15: Lots 2, 7 | 78.98 |
| Sec. 21: Lot 1 | 39.39 |

| Legal Description | Approximate Acreage |
|-------------------------------------|----------------------------|
| Sec. 28: Lot 1, W2NW | 124.25 |
| Sec. 29: Lots 1, 8, 9 | 119.05 |
| T. 54 N., R. 71 W., | |
| Sec. 10: Lot 4 | 40.74 |
| Sec. 17: Lots 9, 10 | 80.83 |
| T. 55 N., R. 71 W., | |
| Sec. 1: Lot 7 | 41.13 |
| Sec. 2: Lots 10, 11, 14, 15, 19, 20 | 248.02 |
| Sec. 8: Lot 1 | 37.70 |
| Sec. 24: Lots 3, 5, 6, 9 | 147.24 |
| Sec. 25: Lot 11 | 39.76 |
| Sec. 28: Lot 3 | 42.34 |
| T. 56 N., R. 71 W., | |
| Sec. 6: Lot 10 | 38.62 |
| Sec. 12: E2NE | 79.87 |
| Sec. 13: SESW | 39.95 |
| Sec. 24: Lot 1, E2W2, W2SE | 276.75 |
| Sec. 25: Lot 1, W2NE, E2NW | 162.14 |
| Sec. 29: NWNW | 40.00 |
| T. 57 N., R. 71 W., | |
| Sec. 1: Lot 5 | 11.64 |
| Sec. 1: Lots 6, 9 | 2.17 |
| Sec. 3: Lot 8 | 40.03 |
| Sec. 4: Lot 8, SWNW | 79.97 |
| Sec. 5: ALL | 640.78 |
| Sec. 8: N2NW | 80.05 |
| Sec. 10: SWSE | 39.95 |
| Sec. 13: Lot 3 | 43.52 |
| Sec. 27: E2SE | 79.90 |
| Sec. 31: SESE | 39.97 |
| Sec. 34: SENW | 39.96 |
| Sec. 35: Track 46D | 39.95 |
| Range 72 West | |
| T. 44 N., R. 72 W., | |
| Sec. 7: Lots 13, 14, 19, 20 | 163.72 |
| Sec. 18: Lots 5, 11, 12 | 122.29 |
| Sec. 19: Lot 5 | 40.14 |
| T. 45 N., R. 72 W., | |
| Sec. 15: Lot 10 | 40.95 |
| Sec. 18: Lot 6 | 43.61 |
| Sec. 23: Lot 12 | 40.97 |
| T. 46 N., R. 72 W., | |
| Sec. 14: Lot 10 | 40.36 |
| Sec. 25: Lots 5, 6, 7 | 119.89 |
| Sec. 26: Lot 6 | 37.82 |
| Sec. 31: Lot 20 | 42.86 |
| T. 47 N., R. 72 W., | |
| Sec. 2: Lots 8, 9 | 81.23 |
| Sec. 3: Lot 10 | 39.91 |
| Sec. 7: Lots 16, 17 | 85.15 |
| T. 48 N., R. 72 W., | |
| Sec. 14: Lot 13 | 41.02 |
| Sec. 15: Lot 13 | 40.34 |
| Sec. 22: Lot 6 | 40.62 |

*Appendix R Lands Identified for Disposal
Through Exchange or Sale*

| Legal Description | Approximate Acreage |
|-----------------------------|----------------------------|
| T. 49 N., R. 72 W., | |
| Sec. 12: Lot 11 | 39.99 |
| T. 50 N., R. 72 W., | |
| Sec. 1: Lot 5 | 39.38 |
| Sec. 7: Lots 13, 20 | 83.09 |
| T. 51 N., R. 72 W., | |
| Sec. 11: Lot 4 | 35.91 |
| T. 53 N., R. 72 W., | |
| Sec. 6: Lot 8 | 37.83 |
| Sec. 7: Lots 5-7 | 111.18 |
| T. 54 N., R. 72 W., | |
| Sec. 3: Lots 6-11, 14-19 | 474.25 |
| Sec. 8: Lots 1-8, 10-16 | 609.34 |
| Sec. 11: Lots 9-13 | 226.36 |
| T. 55 N., R. 72 W., | |
| Sec. 6: Lots 15-17 | 117.75 |
| Sec. 7: Lots 11, 12, 14, 19 | 159.91 |
| Sec. 8: Lots 3, 4 | 79.36 |
| Sec. 9: Lots 8-11 | 160.91 |
| Sec. 10: Lot 8 | 39.62 |
| Sec. 11: Lot 4 | 39.69 |
| Sec. 12: Lots 2, 7, 10, 15 | 157.01 |
| Sec. 17: Lots 1-3 | 120.30 |
| Sec. 18: Lots 9, 10 | 77.33 |
| Sec. 19: Lot 10 | 40.69 |
| Sec. 21: Lots 2, 13 | 78.26 |
| Sec. 22: Lot 3 | 38.56 |
| Sec. 28: Lot 4 | 38.67 |
| Sec. 29: Lots 5-9 | 198.21 |
| Sec. 30: Lots 9, 13, 15, 16 | 156.33 |
| Sec. 31: Lots 12-14 | 119.92 |
| Sec. 33: Lots 3-5, 7, 8 | 197.84 |
| Sec. 34: Lots 6-8 | 119.38 |
| T. 56 N., R. 72 W., | |
| Sec. 3: Lots 17, 19 | 77.85 |
| Sec. 5: Lot 17 | 39.92 |
| Sec. 6: Lots 16, 17, 22, 23 | 159.80 |
| Sec. 8: Lot 1 | 49.81 |
| Sec. 19: Lots 8, 11-14 | 114.62 |
| Sec. 23: SESE | 40.00 |
| Sec. 24: N2SE, SESE | 119.89 |
| Sec. 25: NWNW, SENW | 79.94 |
| T. 57 N., R. 72 W., | |
| Sec. 7: Lots 6, 7 | 74.53 |
| Sec. 15: SESE | 39.91 |
| Sec. 16: Lot 5 | 11.42 |
| Sec. 18: Lot 8, E2SE | 38.84 |
| Sec. 19: N2NE, SENE | 119.87 |
| Sec. 20: N2NW, SENW | 119.89 |
| Sec. 21: Lot 3 | 4.26 |
| Sec. 22: Lot 3 | 0.57 |
| Sec. 26: NWSW | 39.93 |
| Sec. 29: Lot 2, SWSW, E2SW | 159.34 |
| Sec. 30: Lot 10, SESE | 79.25 |

| Legal Description | Approximate Acreage |
|---|----------------------------|
| Sec. 31: Lots 5-7 | 4.17 |
| Sec. 32: Lot 1, NENW | 43.07 |
| Sec. 33: Lots 3, 4 | 48.91 |
| Sec. 34: Lot 2, E2SW | 106.58 |
| T. 58 N., R. 72 W., | |
| Sec. 19: Lot 11 | 37.29 |
| Sec. 30: Lot 5 | 35.62 |
| Range 73 West | |
| T. 44 N., R. 73 W., | |
| Sec. 6: Lot 17 | 40.15 |
| Sec. 14: Lots 1-3, 6-13, 15 | 477.17 |
| T. 45 N., R. 73 W., | |
| Sec. 2: Lot 18 | 40.20 |
| Sec. 33: Lot 15 | 39.64 |
| T. 51 N., R. 73 W., | |
| Sec. 3: Lots 9-11 | 119.44 |
| Sec. 4: Lots 11, 12, 15 | 119.86 |
| Sec. 5: Lots 11-14, 19 | 198.82 |
| Sec. 6: Lot 16 | 40.05 |
| Sec. 9: Lot 7 | 40.27 |
| Sec. 30: Lot 13 | 39.94 |
| T. 52 N., R. 73 W., | |
| Sec. 29: Lot 14 | 40.02 |
| Sec. 33: Lots 13-16 | 156.13 |
| T. 53 N., R. 73 W., | |
| Sec. 3: Lot 19 | 42.07 |
| Sec. 9: Lots 9, 16 | 80.42 |
| Sec. 12: Lot 2 | 41.90 |
| Sec. 13: Lots 2-4 | 121.91 |
| Sec. 14: Lot 3 | 39.34 |
| Sec. 15: Lots 2, 3 | 81.08 |
| T. 54 N., R. 73 W., | |
| Sec. 2: Lot 10 | 39.30 |
| Sec. 10: Lots 3, 4 | 80.10 |
| Sec. 13: Lots 1-14 | 564.50 |
| Sec. 15: Lot 4 | 40.11 |
| Sec. 17: Lot 5 | 38.99 |
| Sec. 24: Lots 3, 4, 13, 14 | 162.24 |
| Sec. 33: Lots 2-4, 7, 9, 10 | 243.38 |
| Sec. 35: Lots 9, 10, 15, 16 | 162.26 |
| T. 55 N., R. 73 W., | |
| Sec. 1: Lot 5 | 40.27 |
| Sec. 2: Lots 5-7, Tracts 42A, 42B, 42C, 42D | 161.69 |
| Sec. 11: Tract 42D | 11.74 |
| Sec. 12: Lots 3, 7 | 68.88 |
| Sec. 13: Lot 6 | 44.90 |
| Sec. 14: Lot 1 | 27.42 |
| Sec. 23: Lot 2 | 12.84 |
| T. 56 N., R. 73 W., | |
| Sec. 5: Lots 5 | 36.37 |
| Sec. 8: Lots 1, 15 | 81.29 |
| Sec. 12: Lots 1 | 41.29 |
| Sec. 15: Lots 12, 13 | 80.57 |
| Sec. 17: Lots 3, 6, 7 | 122.50 |

*Appendix R Lands Identified for Disposal
Through Exchange or Sale*

| Legal Description | Approximate Acreage |
|----------------------------------|----------------------------|
| Sec. 21: Lots 2, 7, 10 | 121.91 |
| Sec. 22: Lots 3, 6 | 81.42 |
| Sec. 27: Lot 16 | 40.68 |
| Sec. 35: Lot 1, NWNW, S2NW, SESW | 166.94 |
| T. 57 N., R. 73 W., | |
| Sec. 3: Lot 8, SWNW | 78.60 |
| Sec. 4: SENE | 39.97 |
| Sec. 7: Lot 8 | 39.25 |
| Sec. 9: E2SW | 79.90 |
| Sec. 18: Lot 5 | 39.31 |
| Sec. 22: NW, N2SW | 239.79 |
| Sec. 25: SENW | 39.95 |
| Sec. 28: NESW | 39.92 |
| Sec. 32: Lot 12 | 13.41 |
| T. 58 N., R. 73 W., | |
| Sec. 21: Lot 6, NWSW, S2SE | 164.28 |
| Sec. 22: Lot 3 | 44.42 |
| Sec. 27: Lot 1, NWNE, W2NW | 56.03 |
| Sec. 28: NWNW | 40.03 |
| Sec. 31: Lots 5, 6 | 71.11 |
| Sec. 32: NWNE, N2NW | 119.82 |
| Range 74 West | |
| T. 42 N., R. 74 W., | |
| Sec. 22: Lot 10 | 40.05 |
| T. 46 N., R. 74 W., | |
| Sec. 10: Lots 2, 7, 10 | 122.06 |
| Sec. 11: Lot 16 | 40.53 |
| T. 47 N., R. 74 W., | |
| Sec. 26: Lot 9 | 40.17 |
| T. 48 N., R. 74 W., | |
| Sec. 3: Lots 16, 17 | 77.17 |
| Sec. 4: Lots 13-15, 18-20 | 230.52 |
| Sec. 9: Lots 1-3, 6-8 | 228.99 |
| Sec. 10: Lots 2, 4, 5 | 116.08 |
| T. 50 N., R. 74 W., | |
| Sec. 10: Lots 4, 5, 11, 12, 14 | 203.72 |
| Sec. 15: Lot 3 | 40.76 |
| Sec. 20: Lot 8 | 40.35 |
| Sec. 21: Lot 13 | 40.23 |
| Sec. 22: Lot 8 | 40.74 |
| Sec. 23: Lots 3, 14 | 81.73 |
| Sec. 27: Lot 4 | 40.27 |
| T. 51 N., R. 74 W., | |
| Sec. 3: Lots 7, 8, 10 | 108.98 |
| Sec. 4: Lot 20 | 37.17 |
| Sec. 5: Lot 17 | 36.78 |
| Sec. 7: Lots 8, 9, 11, 12 | 142.45 |
| Sec. 9: Lot 3 | 41.06 |
| Sec. 18: Lots 6, 7 | 77.71 |
| Sec. 27: Lots 1, 2 | 80.12 |
| Sec. 28: Lots 3, 7 | 81.99 |
| Sec. 34: Lot 8 | 43.01 |
| T. 52 N., R. 74 W., | |
| Sec. 4: Lots 16, 17 | 81.94 |

| Legal Description | Approximate Acreage |
|---|----------------------------|
| Sec. 18: Lots 17, 18 | 79.63 |
| T. 53 N., R. 74 W., | |
| Sec. 6: Lots 15 | 40.17 |
| Sec. 7: Lot 8 | 36.14 |
| Sec. 8: Lot 15, SENW | 79.73 |
| Sec. 9: Lot 14 | 39.59 |
| Sec. 10: Lots 3, 4 | 80.17 |
| Sec. 11: Lots 1, 2, 7-9 | 239.02 |
| Sec. 12: Lots 1, 7-10 | 199.14 |
| Sec. 13: Lots 2-4 | 121.53 |
| Sec. 15: Lots 5, 6, 11-13 | 202.08 |
| Sec. 17: Lots 1, 8 | 79.33 |
| Sec. 22: Lot 1 | 40.25 |
| Sec. 26: Lots 1, 2 | 80.80 |
| T. 54 N., R. 74 W., | |
| Sec. 4: Lot 7 | 41.11 |
| Sec. 5: Lot 20 | 39.56 |
| Sec. 9: Lot 16 | 40.17 |
| Sec. 15: Lots 15, 16 | 80.69 |
| Sec. 17: Lot 10 | 40.32 |
| Sec. 19: Lot 5 | 39.56 |
| Sec. 20: Lots 1-4 | 157.89 |
| Sec. 21: Lots 11-14 | 158.91 |
| T. 55 N., R. 74 W., | |
| Sec. 4: Lot 5 | 59.84 |
| Sec. 5: Lots 6, 11, NWSW | 79.77 |
| Sec. 16: Lot 5 | 4.56 |
| Sec. 20: NWSE | 40.00 |
| Sec. 21: Lot 1 | 35.40 |
| Sec. 27: NESW | 40.00 |
| T. 56 N., R. 74 W., | |
| Sec. 3: Lot 19 | 41.26 |
| Sec. 6: Lots 14-17, 22, 23 | 245.17 |
| Sec. 7: Lots 6, 11 | 81.74 |
| Sec. 9: Lots 3, 4 | 80.98 |
| Sec. 10: Lot 2 | 41.15 |
| Sec. 11: Lot 8 | 40.85 |
| Sec. 12: Lot 1 | 39.43 |
| Sec. 13: Lot 9 | 39.88 |
| Sec. 17: Lots 4, 6 | 81.65 |
| Sec. 18: Lots 5, 20 | 81.64 |
| Sec. 19: Lots 6, 11 | 81.45 |
| Sec. 20: Lots 3, 4, 6, 7, 9, 10, 13, 16 | 327.03 |
| Sec. 23: Lot 9 | 39.20 |
| Sec. 29: Lots 1, 8 | 81.70 |
| Sec. 33: Lots 9, 10 | 80.67 |
| T. 57 N., R. 74 W., | |
| Sec. 4: SWNW | 40.03 |
| Sec. 5: Lot 13, SESE | 59.30 |
| Sec. 7: E2NW | 80.04 |
| Sec. 8: Lot 1 | 38.57 |
| Sec. 14: S2NW, NWSW | 120.41 |
| Sec. 15: NE, NESE | 200.18 |
| Sec. 17: Lots 1, 2, NWNW | 81.00 |

*Appendix R Lands Identified for Disposal
Through Exchange or Sale*

| Legal Description | Approximate Acreage |
|-------------------------------|----------------------------|
| Sec. 18: NENE | 40.00 |
| Sec. 23: Lot 2, SENW | 66.13 |
| Sec. 27: Lots 6, 7 | 72.46 |
| Sec. 31: Lots 7, 8, 14 | 120.05 |
| Sec. 32: Lots 9-12 | 205.95 |
| Sec. 34: Lots 1, 2, NENE | 84.82 |
| Sec. 35: SWNW | 39.92 |
| T. 58 N., R. 74 W., | |
| Sec. 26: W2SE | 80.00 |
| Sec. 29: Lot 8 | 20.55 |
| Sec. 30: Lot 13 | 21.90 |
| Sec. 32: SWNE | 40.01 |
| Range 75 West | |
| T. 43 N., R. 75 W., | |
| Sec. 3: SENW | 43.08 |
| T. 47 N., R. 75 W., | |
| Sec. 2: Lots 5, 6, 11-20 | 483.93 |
| Sec. 3: Lots 6-8 | 120.44 |
| Sec. 5: Lots 7, 8 | 82.22 |
| Sec. 7: Lots 9, 10, 13-20 | 393.41 |
| Sec. 8: Lot 3 | 40.94 |
| Sec. 12: Lots 3-6, 13 | 202.11 |
| Sec. 13: Lot 14 | 39.91 |
| Sec. 21: Lot 13 | 39.42 |
| Sec. 23: Lots 3, 6 | 80.48 |
| T. 48 N., R. 75 W., | |
| Sec. 4: Lots 8, 9 | 75.35 |
| Sec. 5: Lots 7, 8 | 70.38 |
| Sec. 33: Lots 9-16 | 323.43 |
| Sec. 34: Lots 12, 13, SWSW | 119.95 |
| T. 49 N., R. 75 W., | |
| Sec. 4: E2SE | 81.61 |
| Sec. 5: Lots 3, 4, S2NW, N2S2 | 322.49 |
| Sec. 6: Lots 1, 2, S2NE, SE | 323.18 |
| Sec. 9: E2E2 | 163.32 |
| Sec. 10: W2SW | 81.31 |
| Sec. 31: NWSE, N2SE | 80.02 |
| Sec. 32: SENE | 39.82 |
| T. 50 N., R. 75 W., | |
| Sec. 5: Lots 13, 20 | 79.79 |
| Sec. 6: Lots 14, 15 | 83.73 |
| Sec. 9: Lots 3, 7, 15, 16 | 158.12 |
| Sec. 15: Lots 5, 12 | 79.28 |
| Sec. 31: Lots 9, 10 | 79.28 |
| T. 51 N., R. 75 W., | |
| Sec. 1: Lots 5, 12, 13 | 114.96 |
| Sec. 2: Lot 5 | 40.05 |
| Sec. 7: Lots 18, 19 | 81.64 |
| Sec. 10: Lot 14 | 39.84 |
| Sec. 11: Lots 2, 5, 12 | 119.26 |
| Sec. 13: Lot 13 | 39.91 |
| Sec. 14: Lot 14 | 40.04 |
| Sec. 15: Lots 11, 12 | 80.54 |
| Sec. 19: Lots 11, 19 | 80.55 |

| Legal Description | Approximate Acreage |
|---|---------------------|
| Sec. 20: Lot 7 | 40.73 |
| Sec. 22: Lots 1, 8, 11, 13, 14 | 203.46 |
| Sec. 24: Lots 2-4 | 120.64 |
| Sec. 25: Lots 1-2, 13-15 | 201.18 |
| Sec. 26: Lot 8 | 40.54 |
| Sec. 27: Lots 2, 3, 6, 7 | 165.74 |
| Sec. 32: Lots 9, 16 | 81.03 |
| Sec. 33: Lots 1, 8, 9, 12, 13, 16 | 246.11 |
| Sec. 34: Lots 2-4, 6, 7, 10, 11, 14, 15 | 369.94 |
| Sec. 35: Lots 3, 8, 9 | 122.79 |
| T. 52 N., R. 75 W., | |
| Sec. 6: Lots 11, 17 | 72.32 |
| Sec. 13: Lots 7, 9, 10, 15, 16 | 203.06 |
| Sec. 21: Lot 12 | 39.77 |
| Sec. 24: Lots 1, 2, 7-10 | 246.41 |
| Sec. 26: Lot 6 | 41.57 |
| Sec. 28: Lots 3, 4 | 85.94 |
| Sec. 33: Lots 1-3 | 126.71 |
| Sec. 34: Lots 5-7, 9-12 | 291.97 |
| Sec. 35: Lot 10 | 42.37 |
| T. 53 N., R. 75 W., | |
| Sec. 5: Lot 12 | 39.80 |
| Sec. 12: Lots 2, 8 | 80.39 |
| Sec. 19: Lots 6, 7, 10, 11, 16, NESW | 238.86 |
| T. 54 N., R. 75 W., | |
| Sec. 7: Lot 16 | 37.24 |
| Sec. 18: Lot 8 | 37.21 |
| Sec. 22: Lots 10, 11, 14, 15 | 160.24 |
| T. 55 N., R. 75 W., | |
| Sec. 5: Lot 10 | 40.70 |
| Sec. 6: Lot 16 | 40.72 |
| Sec. 7: Lots 6, 11 | 81.37 |
| Sec. 15: Lots 9-12 | 158.48 |
| Sec. 21: Lots 2, 3 | 80.07 |
| Sec. 26: Lots 2, 3 | 80.78 |
| Sec. 31: Lot 5 | 35.37 |
| Sec. 34: Lot 14 | 34.88 |
| T. 56 N., R. 75 W., | |
| Sec. 2: Lots 5, 6 | 84.23 |
| Sec. 4: Lots 7, 11-13, 20 | 216.21 |
| Sec. 7: Lots 8-10, 16, 17 | 182.66 |
| Sec. 8: Lot 5 | 41.94 |
| Sec. 15: Lots 15, 16 | 79.69 |
| Sec. 27: Lot 4 | 40.63 |
| T. 57 N., 75 W., | |
| Sec. 3: SENE, SWNW | 79.96 |
| Sec. 4: Lot 6, SENE, SESE | 119.12 |
| Sec. 5: Lot 10, SENE | 69.00 |
| Sec. 8: SWNE | 40.02 |
| Sec. 9: NESE | 39.88 |
| Sec. 10: SESW, SWSE | 79.95 |
| Sec. 12: N2SW | 79.95 |
| Sec. 15: NW, NESW | 199.96 |
| Sec. 17: Lots 1, 3 | 45.34 |

Appendix R Lands Identified for Disposal
Through Exchange or Sale

| Legal Description | Approximate Acreage |
|--|----------------------------|
| Sec. 19: Lot 5 | 39.71 |
| Sec. 25: S2NW | 80.03 |
| Sec. 26: SENW | 40.00 |
| Sec. 28: Lot 8 | 14.30 |
| Sec. 33: Lots 5, 8, 13, 14, E2NW | 263.62 |
| Sec. 35: Lot 9 | 7.78 |
| T. 58 N., R. 75 W., | |
| Sec. 21: Lots 6-8, NWSW | 172.91 |
| Sec. 22: Lots 5, 6, N2SE, SESE | 210.14 |
| Sec. 23: Lot 8, W2SW | 125.04 |
| Sec. 26: SENE, NWNW, E2SW, SE | 319.43 |
| Sec. 33: NWNE, S2NE, NENW, E2SW, W2SE, NENSE | 359.86 |
| Sec. 34: S2NE, SWNW, W2SW, SE | 360.00 |
| Sec. 35: Lot 1, SWSW | 52.12 |
| Range 76 West | |
| T. 41 N., R. 76 W., | |
| Sec. 6: Lots 5-7 | 118.81 |
| Sec. 24: ALL | 652.01 |
| Sec. 25: NENE | 40.40 |
| Sec. 29: E2NE | 83.51 |
| T. 42 N., R. 76 W., | |
| Sec. 19: Lots 5-8 | 166.56 |
| Sec. 20: SESE | 41.03 |
| Sec. 21: SWNW, NWSW | 81.46 |
| Sec. 29: NENE | 41.01 |
| Sec. 31: Lot 5 | 40.13 |
| T. 43 N., R. 76 W., | |
| Sec. 30: SENE | 40.54 |
| T. 46 N., R. 76 W., | |
| Sec. 12: Lots 14, 15 | 78.97 |
| Sec. 13: Lots 2, 3, 6 | 117.16 |
| Sec. 14: Lots 4,5, 12 | 119.14 |
| Sec. 15: Lot 13 | 39.33 |
| Sec. 23: Lots 3, 4, 11 | 119.08 |
| T. 47 N., R. 76 W., | |
| Sec. 1: Lot 18 | 37.62 |
| Sec. 35: Lot 13 | 40.32 |
| T. 48 N., R. 76 W., | |
| Sec. 1: Lot 18 | 39.84 |
| Sec. 2: Lot 11 | 39.62 |
| Sec. 3: Lot 5 | 34.72 |
| Sec. 10: Lot 10 | 39.49 |
| Sec. 12: Lots 6, 7 | 79.36 |
| T. 49 N., R. 76 W., | |
| Sec. 1: SENW, NESW | 80.68 |
| Sec. 14: NWSE | 40.59 |
| Sec. 23: SWNE, SENW, NESW, W2SE | 202.64 |
| Sec. 26: NWSE | 40.11 |
| Sec. 34: SESE | 39.94 |
| T. 50 N., R. 76 W., | |
| Sec. 6: Lots 12, 23 | 81.48 |
| Sec. 13: Lots 7, 8 | 80.79 |
| Sec. 22: Lots 3-8 | 243.11 |
| Sec. 26: Lot 7 | 40.52 |

| Legal Description | Approximate Acreage |
|--------------------------------|----------------------------|
| Sec. 33: Lot 10 | 40.70 |
| Sec. 34: Lots 12, 13 | 81.30 |
| T. 51 N., R. 76 W., | |
| Sec. 5: Lots 9, 10 | 81.70 |
| Sec. 6: Lots 8, 9, 15 | 122.32 |
| Sec. 20: Lots 3-6, 11-14 | 330.23 |
| Sec. 31: Lots 19, 20 | 41.00 |
| Sec. 32: Lots 1, 8 | 83.40 |
| T. 52 N., R. 76 W., | |
| Sec. 1: Lots 17 | 40.33 |
| Sec. 2: Lots 7, 10, 19, 20 | 166.93 |
| Sec. 11: Lots 1, 15, 16 | 123.23 |
| Sec. 12: Lots 11, 14 | 82.34 |
| Sec. 31: Lot 18 | 40.86 |
| T. 53 N., R. 76 W., | |
| Sec. 2: Lot 9 | 39.47 |
| Sec. 10: Lots 7-10, 15, 16 | 234.60 |
| Sec. 14: Lot 11 | 39.24 |
| Sec. 15: Lots 1, 2 | 78.13 |
| Sec. 24: Lots 15, 16 | 78.70 |
| Sec. 27: Lot 3 | 39.36 |
| Sec. 31: Lots 9, 10 | 76.22 |
| T. 54 N., R. 76 W., | |
| Sec. 1: Lot 20 | 40.16 |
| Sec. 9: Lots 9, 10, 15, 16 | 155.52 |
| Sec. 12: Lots 9, 10, 14, NESE | 160.04 |
| Sec. 17: Lots 9, 16 | 81.10 |
| Sec. 20: Lot 7 | 39.75 |
| Sec. 31: Lots 13, 14, 20 | 117.80 |
| T. 55 N., R. 76 W., | |
| Sec. 7: Lots 17, 18 | 67.68 |
| Sec. 17: Lot 12 | 40.16 |
| Sec. 18: Lots 5, 6, 11, 14, 20 | 182.69 |
| Sec. 19: Lot 16 | 31.50 |
| Sec. 20: Lot 11 | 39.81 |
| Sec. 25: Lot 13 | 37.41 |
| Sec. 26: Lots 3, 6 | 77.74 |
| Sec. 29: Lots 4, 5 | 78.69 |
| Sec. 35: Lots 1-3 | 110.82 |
| T. 56 N., R. 76 W., | |
| Sec. 1: Lots 19, 20 | 89.68 |
| Sec. 11: Lots 1, 7, 8, 10 | 172.39 |
| Sec. 12: Lots 1-8 | 314.93 |
| Sec. 13: Lots 4, 5, 12, 13 | 157.61 |
| Sec. 14: Lots 1, 8, 10, 11, 14 | 199.08 |
| Sec. 15: Lots 3, 4, 8 | 118.16 |
| Sec. 21: Lots 8, 10 | 80.33 |
| Sec. 23: Lots 1, 7-10, 14, 15 | 276.79 |
| Sec. 31: Lot 13 | 39.26 |
| Sec. 32: Lot 13 | 39.19 |
| T. 57 N., R. 76 W., | |
| Sec. 19: Lots 11, 14 | 53.67 |
| Sec. 31: Lot 9 | 39.91 |
| T. 58 N., R. 76 W., | |

*Appendix R Lands Identified for Disposal
Through Exchange or Sale*

| Legal Description | Approximate Acreage |
|----------------------------|----------------------------|
| Sec. 28: Lot 4 | 25.21 |
| Sec. 32: Lot 1, 3 | 50.40 |
| Sec. 36: Lots 1, 3-8 | 139.31 |
| Range 77 West | |
| T. 41 N., R. 77 W., | |
| Sec. 2: S2SE | 80.36 |
| Sec. 4: SWNW | 41.59 |
| Sec. 11: N2NE | 79.06 |
| Sec. 13: SWSW | 41.64 |
| Sec. 14: SWNE, S2 | 371.80 |
| Sec. 24: SESW | 40.97 |
| T. 42 N., R. 77 W., | |
| Sec. 2: W2SE | 83.16 |
| Sec. 12: E2SE | 81.50 |
| Sec. 13: E2E2 | 163.01 |
| Sec. 14: W2SW | 82.37 |
| Sec. 22: E2SE, SE | 164.24 |
| Sec. 23: W2 | 329.67 |
| Sec. 24: Lots 1-4 | 167.66 |
| Sec. 27: S2 | 322.91 |
| Sec. 32: SENE | 40.54 |
| Sec. 34: N2 | 320.17 |
| T. 43 N., R. 77 W., | |
| Sec. 23: SENE, NESE | 80.98 |
| Sec. 24: SWNW, NWSW | 80.89 |
| Sec. 34: N2SW | 80.03 |
| T. 44 N., R. 77 W., | |
| Sec. 19: Lot 13 | 40.59 |
| Sec. 30: Lots 11, 13-16 | 205.11 |
| Sec. 33: Lot 12 | 40.05 |
| Sec. 34: Lots 7, 8 | 78.61 |
| Sec. 35: Lots 13, 14 | 78.28 |
| T. 45 N., R. 77 W., | |
| Sec. 4: Lot 21 | 39.89 |
| Sec. 5: Lot 18 | 40.51 |
| Sec. 6: Lot 19 | 40.01 |
| Sec. 7: Lots 6-20 | 609.64 |
| Sec. 8: Lots 10, 13-15 | 161.94 |
| Sec. 18: Lots, 7-10 | 162.10 |
| Sec. 23: Lots 1, 8 | 80.42 |
| T. 47 N., R. 77 W., | |
| Sec. 13: Lots 7-10 | 151.26 |
| Sec. 35: Lots 3, 4, 8 | 112.10 |
| T. 48 N., R. 77 W., | |
| Sec. 20: Lot 3 | 40.16 |
| Sec. 30: Lots 8, 14, 16 | 120.87 |
| T. 49 N., R. 77 W., | |
| Sec. 22: SWSW | 39.70 |
| T. 50 N., R. 77 W., | |
| Sec. 5: Lot 6 | 13.95 |
| Sec. 7: Lots 5-8 | 94.64 |
| Sec. 8: Lots 1, 3 | 44.51 |
| Sec. 9: Lot 5, SWSE | 58.75 |
| Sec. 10: Lot 1 | 6.02 |

| Legal Description | Approximate Acreage |
|----------------------------------|----------------------------|
| Sec. 11: Lot 2, W2NW | 85.86 |
| Sec. 16: Lot 3 | 16.37 |
| Sec. 17: Lot 3 | 31.70 |
| Sec. 21: Lots 2, 6 | 64.67 |
| Sec. 27: Lot 2 | 16.84 |
| Sec. 34: Lot 5, NESW | 88.12 |
| T. 51 N., R. 77 W., | |
| Sec. 12: NWNW | 39.98 |
| Sec. 29: Lots 4, 6 | 25.31 |
| Sec. 30: Lots 5, 10 | 39.98 |
| Sec. 32: SWNW | 39.98 |
| T. 52 N., R. 77 W., | |
| Sec. 1: Lots 5-8, 11-14 | 276.65 |
| Sec. 4: Lots 5-12, SWSW | 282.99 |
| Sec. 5: Lots 5, 6, 11, 12, 14 | 157.97 |
| Sec. 6: Lots 15, 16, NESE | 119.68 |
| Sec. 8: NWNE | 39.96 |
| Sec. 16: Lot 1 | 2.89 |
| Sec. 21: Lots 6, 7 | 17.48 |
| Sec. 26: Lots 8, 9, 10 | 28.39 |
| T. 53 N., R. 77 W., | |
| Sec. 7: Lot 11 | 17.04 |
| Sec. 8: Lots 1-3 | 22.88 |
| Sec. 17: Lot 4 | 19.84 |
| Sec. 26: Lot 5 | 41.53 |
| Sec. 28: S2NW | 79.91 |
| Sec. 29: W2SE | 80.03 |
| T. 54 N., R. 77 W., | |
| Sec. 27: NWNW | 39.83 |
| Sec. 32: NW, N2SW | 239.91 |
| T. 55 N., R. 77 W., | |
| Sec. 4: SWNE | 40.00 |
| Sec. 6: Lot 8 | 32.12 |
| Sec. 9: Lots 1, 2, SWNE | 108.55 |
| Sec. 12: SWSE | 39.86 |
| Sec. 13: Lot 1, W2SE | 119.33 |
| Sec. 14: Lots 2, 4, 5 | 80.93 |
| Sec. 15: Lots 10, 11 | 43.18 |
| Sec. 20: E2E2 | 161.08 |
| Sec. 21: SWNW, NWSW | 80.47 |
| Sec. 23: Lot 1, SENW, NESW, NWSE | 151.94 |
| Sec. 25: W2SW, SESW, SWSE | 161.13 |
| Sec. 28: NWNW | 40.02 |
| Sec. 29: E2NE | 79.85 |
| Sec. 32: NWNE, S2NE, N2SE | 196.28 |
| Sec. 33: Lots 3, 4, NWSW | 103.37 |
| Sec. 35: Lot 2, NWNE | 68.81 |
| T. 56 N., R. 77 W., | |
| Sec. 4: Lot 19 | 45.93 |
| Sec. 8: Lots 1, 4, NWSE | 112.67 |
| Sec. 16: Lots 1, 2 | 14.01 |
| Sec. 18: Lots 5-9 | 94.19 |
| Sec. 19: Lot 8, SESE | 69.22 |
| Sec. 26: Lot 3, NWSW | 54.35 |

| Legal Description | Approximate Acreage |
|---------------------------------|----------------------------|
| Sec. 29: Lots 1, 4 | 39.04 |
| Sec. 30: Lot 5 | 13.62 |
| Sec. 31: Lot 8 | 39.96 |
| Sec. 32: NWNE | 40.03 |
| Sec. 34: SWSE | 39.61 |
| Sec. 35: Lot 7 | 33.03 |
| Sec. 36: Lots 1, 2 | 10.99 |
| T. 57 N., R. 77 W., | |
| Sec. 7: Lot 6, Tract 41E | 57.60 |
| Sec. 11: N2NE, NENW, SENE, NESE | 199.89 |
| Sec. 12: Lots 3, 4, S2, W2SE | 324.70 |
| Sec. 13: NENW | 39.29 |
| Sec. 16: Lot 1 | 5.66 |
| Sec. 17: Lots 6, 7 | 10.87 |
| Sec. 18: Lot 8 | 30.57 |
| Sec. 19: SENW, SESW | 79.66 |
| Sec. 21: Lot 1 | 4.97 |
| Sec. 35: Lot 3, NWSE | 84.05 |
| T. 58 N., R. 77 W., | |
| Sec. 19: NWSE | 39.97 |
| Sec. 21: Lots 6-8 | 70.60 |
| Sec. 21: Lots 9, 10 | 21.26 |
| Sec. 22: Lot 14 | 6.38 |
| Sec. 26: Lot 4 | 6.27 |
| Sec. 27: Lot 1 | 8.77 |
| Sec. 28: W2SW | 79.93 |
| Sec. 29: NWNE, NENW | 79.91 |
| Range 78 West | |
| T. 42 N., R. 78 W., | |
| Sec. 2: SW | 167.65 |
| Sec. 3: SE | 166.49 |
| Sec. 4: S2NW, N2SW, SESW | 204.87 |
| Sec. 5: SENE | 39.53 |
| Sec. 8: NWNW | 39.11 |
| Sec. 13: SW | 158.91 |
| Sec. 17: S2NE, SENW, NESE | 156.17 |
| Sec. 18: Lot 3, NESW | 75.43 |
| Sec. 19: SENE | 39.71 |
| T. 43 N., R. 78 W., | |
| Sec. 12: W2 | 309.90 |
| Sec. 20: SWSE | 39.70 |
| Sec. 28: ALL | 628.67 |
| Sec. 29: NWNE, NESE | 78.57 |
| Sec. 30: Lots 1, 2, NE, E2NW | 307.20 |
| Sec. 31: Lots 3, 4, E2SW | 145.12 |
| Sec. 32: W2NW | 77.61 |
| T. 44 N., R. 78 W., | |
| Sec. 3: Lot 17 | 41.64 |
| Sec. 4: Lot 19 | 40.57 |
| Sec. 9: Lot 3 | 40.40 |
| Sec. 23: Lot 6 | 42.24 |
| Sec. 25: Lots 2-4, 8, 9, 14, 15 | 295.09 |
| Sec. 30: Lot 7 | 31.35 |
| T. 45 N., R. 78 W., | |

| Legal Description | Approximate Acreage |
|-------------------------------------|----------------------------|
| Sec. 1: NESW, S2SW | 123.54 |
| Sec. 5: Lot 1, SENE | 81.43 |
| Sec. 9: SWSE | 41.22 |
| Sec. 12: SENE | 40.20 |
| Sec. 26: SESW | 39.96 |
| T. 47 N., R. 78 W., | |
| Sec. 6: Lots 10, 13 | 82.76 |
| Sec. 19: Lots 6, 11 | 81.25 |
| T. 48 N., R. 78 W., | |
| Sec. 10: Lots 1, 2, 7, 8 | 158.76 |
| T. 50 N., R. 78 W., | |
| Sec. 19: Lots 15, 16 | 77.61 |
| T. 51 N., R. 78 W., | |
| Sec. 10: Lots 9, 12, 16 | 119.63 |
| Sec. 29: Lots 7-10 | 160.93 |
| T. 52 N., R. 78 W., | |
| Sec. 1: Lot 8 | 55.21 |
| Sec. 2: Lot 5 | 54.89 |
| Sec. 17: SENW | 39.96 |
| Sec. 18: Lots 7, 9, NE, NESE | 269.25 |
| Sec. 20: Lot 1 | 10.63 |
| Sec. 33: Lot 4 | 44.73 |
| T. 53 N., R. 78 W., | |
| Sec. 1: Lots 5-10, S2NW | 299.66 |
| Sec. 2: Lots 5-8, S2N2, E2SE | 332.81 |
| Sec. 3: Lot 7 | 16.14 |
| Sec. 15: Lot 1 | 15.96 |
| Sec. 22: W2E2 | 159.54 |
| Sec. 25: Lot 3, NWSE | 70.57 |
| Sec. 27: N2 | 319.26 |
| Sec. 28: NE, E2SE | 239.59 |
| Sec. 32: E2NE, SWNE | 119.65 |
| Sec. 33: Lot 1, E2NE, NESE | 155.09 |
| Sec. 35: NESE | 39.94 |
| T. 54 N., R. 78 W., | |
| Sec. 2: Lots 7-9, 11 | 160.74 |
| Sec. 3: Lots 5-7, 10-20 | 559.46 |
| Sec. 4: Lots 13, 20 | 79.28 |
| Sec. 6: Lots 19, 20, 24, 25 | 114.15 |
| Sec. 7: Lots 17, 18, 23, 32 | 119.22 |
| Sec. 8: Lot 5 | 40.13 |
| Sec. 10: Lots 6, 11, 14 | 120.71 |
| Sec. 15: Lots 1, 2 | 80.42 |
| Sec. 20: Lots 1, 2, 8 | 120.71 |
| Sec. 22: Lots 11-14 | 161.95 |
| Sec. 24: Lot 7 | 39.87 |
| Sec. 29: Lots 3-6, 11-14 | 320.85 |
| Sec. 30: Lots 13, 14, 21-24, 31, 32 | 322.21 |
| Sec. 33: Lot 4 | 40.61 |
| Sec. 35: Lot 16 | 40.42 |
| T. 55 N., R. 78 W., | |
| Sec. 1: Lot 8 | 52.59 |
| Sec. 9: Lots 4-6 | 114.63 |
| Sec. 10: Lot 5 | 28.68 |

*Appendix R Lands Identified for Disposal
Through Exchange or Sale*

| Legal Description | Approximate Acreage |
|---------------------------------|----------------------------|
| Sec. 15: Lot 1 | 1.49 |
| Sec. 16: Lot 1 | 5.91 |
| Sec. 17: Lots 5, 6 | 69.51 |
| Sec. 22: Lot 4 | 23.34 |
| Sec. 23: Lots 1,2 | 11.13 |
| Sec. 27: Lot 2, SESE | 62.50 |
| Sec. 29: Lot 4 | 2.34 |
| Sec. 30: Lots 5, 6 | 24.08 |
| Sec. 31: Lots 7-8, 13-24 | 472.76 |
| Sec. 32: Lot 2 | 7.21 |
| Sec. 34: NWSE | 39.95 |
| T. 56 N., R 78 W., | |
| Sec. 3: Lot 15 | 19.66 |
| Sec. 25: E2NE | 79.81 |
| T. 57 N., R. 78 W., | |
| Sec. 2: Lot 2, SWNE | 80.79 |
| Sec. 3: Lot 3 | 39.43 |
| Sec. 4: SENE | 39.37 |
| Sec. 5: SENW, NWSW | 78.76 |
| Sec. 7: SENE | 39.51 |
| Sec. 12: W2NW | 78.71 |
| Sec. 13: SWNE | 38.33 |
| Sec. 23: SENW | 37.56 |
| Sec. 24: NESE | 39.47 |
| T. 58 N., R. 78 W., | |
| Sec. 23: Lots 1, 2 | 35.51 |
| Sec. 26: NESE | 37.61 |
| Sec. 27: NENE | 37.93 |
| Sec. 30: Lot 1 | 36.77 |
| Sec. 31: SWNE | 39.56 |
| Sec. 33: N2SW, SESW, NWSE, S2SE | 232.77 |
| Sec. 34: S2SW | 76.90 |
| Sec. 35: S2SE | 75.58 |
| Range 79 West | |
| T. 42 N., R. 79 W., | |
| Sec. 25: W2NW, SENW | 116.15 |
| Sec. 26: N2NE, NENW | 117.30 |
| Sec. 27: N2NW | 79.27 |
| Sec. 28: NENE | 39.29 |
| T. 43 N., R. 79 W., | |
| Sec. 19: Lot 4, SESW, NESE | 115.72 |
| Sec. 20: S2NE, SWNW, NWSW | 152.06 |
| Sec. 21: S2NW, S2SW | 160.40 |
| Sec. 23: NENW | 40.75 |
| Sec. 25: SW | 157.61 |
| Sec. 27: S2SW, NESW, SE | 271.79 |
| Sec. 30: Lot 1, NENW | 74.30 |
| T. 44 N., R. 79 W., | |
| Sec. 4: Lots 1, 2 | 66.90 |
| Sec. 6: Lots 4-7 | 121.76 |
| Sec. 24: N2NW | 78.62 |
| T. 45 N., R. 79 W., | |
| Sec. 3: SW, W2SE, SESE | 279.54 |
| Sec. 4: SENW | 40.15 |

| Legal Description | Approximate Acreage |
|--|----------------------------|
| Sec. 12: SWNE | 40.29 |
| Sec. 30: NE | 160.61 |
| T. 46 N., R. 79 W., | |
| Sec. 3: Lots 1, 2, S2NE, SE | 318.75 |
| Sec. 11: NE | 161.19 |
| T. 47 N., R. 79 W., | |
| Sec. 4: Lots 19, 20 | 80.19 |
| Sec. 9: Lots 1, 2, 7-10, 15, 16 | 321.17 |
| Sec. 10: Lot 4 | 40.20 |
| Sec. 22: Lots 15, 16 | 80.09 |
| T. 48 N., R. 79 W., | |
| Sec. 5: Lots 15-18, SW | 160.10 |
| Sec. 6: Lots 16, 22, 23 | 120.58 |
| Sec. 7: Lots 5-13, 20 | 391.81 |
| Sec. 10: Lots 13, 15, SESW | 119.81 |
| Sec. 14: Lots 3, 4, 6, 7, 9-11 | 280.61 |
| Sec. 15: Lots 1, 5, 11 | 119.84 |
| T. 49 N., R. 79 W., | |
| Sec. 17: Lots 12-15 | 160.30 |
| Sec. 20: Lots 2-5, 12, 13 | 239.82 |
| Sec. 24: Lots 10, 15 | 79.83 |
| Sec. 26: Lots 3-5, 12 | 158.95 |
| Sec. 27: Lot 13 | 40.04 |
| Sec. 29: Lots 3-11, 14-16 | 476.01 |
| Sec. 30: Lots 8, 17 | 79.85 |
| Sec. 35: Lot 8 | 39.82 |
| T. 50 N., R. 79 W., | |
| Sec. 17: SESW | 39.96 |
| Sec. 20: SESE | 39.88 |
| Sec. 22: Lot 13 | 39.90 |
| Sec. 27: Lots 4, 11, 12, SWNW | 159.97 |
| T. 52 N., R. 79 W., | |
| Sec. 1: Lots 9-11 | 25.44 |
| Sec. 3: Lots 5-7 | 37.89 |
| Sec. 5: Lots 6, 9, 10 | 65.90 |
| Sec. 7: Lot 7, Tracts 43A, 43B | 88.44 |
| Sec. 10: Lots 2, 4, 7, SWSW | 132.49 |
| Sec. 14: Lot 5 | 12.53 |
| Sec. 17: Tracts 43C, 43H | 79.95 |
| Sec. 18: Lots 3, 4 | 16.92 |
| Sec. 19: Lots 5, 6 | 75.78 |
| Sec. 22: W2NE, NWSE | 119.90 |
| Sec. 31: S2NENE | 18.58 |
| Sec. 35: Lots 1, 2 | 20.97 |
| T. 53 N., R. 79 W., | |
| Sec. 11: NESE | 39.71 |
| Sec. 17: Lot 7 | 22.86 |
| Sec. 19: Lot 21, SWSE | 81.76 |
| Sec. 20: Lot 1, Tracts 55A, 55B, 55C, 55D, 55G, 55H | 227.66 |
| Sec. 21: Lots 2-6, Tract 55E, portion of 55E, SENE, NESW, W2SE | 340.36 |
| Sec. 28: NWSW, portion of Tract 55F | 50.01 |
| Sec. 29: Portions of tracts 55H, 55G, 55F | 26.16 |
| Sec. 30: Tract 57I | 39.56 |
| Sec. 32: Lot 1 | 12.36 |

| Legal Description | Approximate Acreage |
|---------------------------------------|----------------------------|
| Sec. 34: Tract 67, SENW | 87.13 |
| T. 54 N., R. 79 W., | |
| Sec. 2: Lots 14, 15 | 84.49 |
| Sec. 3: Lot 5 | 42.81 |
| Sec. 10: Lot 1 | 40.53 |
| Sec. 25: Lot 13 | 40.25 |
| T. 55 N., R. 79 W., | |
| Sec. 6: Lot 9 | 40.14 |
| Sec. 13: Lot 13 | 39.61 |
| Sec. 14: Lots 9-11 | 118.53 |
| Sec. 15: Lots 7, 8 | 78.21 |
| Sec. 17: Lot 4 | 39.82 |
| Sec. 18: Lots 5, 6, 12 | 118.93 |
| Sec. 19: Lots 5, 11-14 | 197.71 |
| Sec. 20: Lots 3-6, 9, 11-16 | 436.67 |
| Sec. 21: Lot 13 | 39.61 |
| Sec. 26: Lot 5 | 40.41 |
| Sec. 27: Lots 1, 2, 8 | 119.21 |
| Sec. 32: Lot 4 | 38.98 |
| Sec. 33: Lots 8, 9 | 80.83 |
| Sec. 34: Lot 2 | 40.06 |
| T. 56 N., R. 79 W., | |
| Sec. 1: Lots 5-12 | 337.85 |
| Sec. 2: Lots 5-7, 10-12, 14, 15 | 292.65 |
| Sec. 4: Lots 5-17, N2SW, SESW | 541.01 |
| Sec. 5: NWSE | 40.16 |
| Sec. 6: Lots 8, 9 | 108.21 |
| Sec. 13: TRACT 51B | 39.10 |
| Sec. 17: Lot 1 | 12.03 |
| Sec. 23: Lot 1 | 11.68 |
| Sec. 26: Lots 1, 2 | 24.37 |
| T. 57 N., R. 79 W., | |
| Sec. 5: SENE, NWSW | 80.56 |
| Sec. 6: Lot 1 | 40.68 |
| Sec. 7: NWNE | 40.65 |
| Sec. 7: SENE | 40.00 |
| Sec. 8: SENW, SW | 200.89 |
| Sec. 11: SENW | 40.10 |
| Sec. 18: Lots 3, 4, SESW, NESE | 157.52 |
| Sec. 19: Lot 1, NWNE, NENW | 118.95 |
| Sec. 22: SENW | 39.61 |
| Sec. 26: W2NW | 78.61 |
| Sec. 27: SWNE, SWSW, NWSE, SESE | 157.76 |
| Sec. 28: SW, W2SE, SESE | 274.68 |
| Sec. 30: Lot 4, NESW, S2SE | 156.29 |
| Sec. 31: Lots 1-4, NE, SENW, E2SW, SE | 593.74 |
| Sec. 33: N2, SW | 469.76 |
| Sec. 34: NENW, W2NW, SESE | 157.18 |
| Sec. 35: S2SW, NESE | 117.10 |
| T. 58 N., R. 79 W., | |
| Sec. 18: Lot 2 | 32.97 |
| Sec. 19: Lot 4, E2NE | 121.32 |
| Sec. 20: E2NE | 82.31 |
| Sec. 25: SE | 162.08 |

| Legal Description | Approximate Acreage |
|-------------------------------|----------------------------|
| Sec. 31: Lots 1, 4, E2SE | 158.26 |
| Sec. 34: NESW | 40.99 |
| Range 80 West | |
| T. 41 N., R. 80 W., | |
| Sec. 17: NENE, NWNW | 75.96 |
| Sec. 21: E2NW, SESE | 117.18 |
| Sec. 22: E2SW | 77.22 |
| T. 42 N., R. 80 W., | |
| Sec. 17: S2SW, SWSE | 115.57 |
| Sec. 18: SESE | 37.30 |
| Sec. 20: NESW, NESE | 77.14 |
| Sec. 21: NWSW | 38.97 |
| Sec. 29: SESW | 38.85 |
| T. 43 N., R. 80 W., | |
| Sec. 7: E2NE, NESE | 102.60 |
| Sec. 8: N2, N2S2 | 467.52 |
| Sec. 11: E2SE | 80.59 |
| Sec. 14: NWNE | 40.71 |
| Sec. 17: SWSE | 36.96 |
| Sec. 18: Lots 1, 2, SESE | 104.99 |
| Sec. 19: E2NE | 79.23 |
| T. 45 N., R. 80 W., | |
| Sec. 5: SENW, E2SW, W2SE | 200.91 |
| Sec. 7: Lot 1, SESE | 83.31 |
| T. 48 N., R. 80 W., | |
| Sec. 10: NENE | 40.35 |
| Sec. 21: SENW | 40.49 |
| Sec. 23: Lots 13, 14 | 81.26 |
| Sec. 26: Lots 3-6, 11-14 | 319.80 |
| T. 49 N., R. 80 W., | |
| Sec. 2: SENW | 39.97 |
| T. 50 N., R. 80 W., | |
| Sec. 2: Lots 9, 10, NESE | 52.29 |
| Sec. 10: E2 | 318.33 |
| Sec. 15: W2E2 | 158.83 |
| Sec. 28: NENE, W2NE | 120.09 |
| Sec. 34: W2E2, E2NW | 239.58 |
| T. 51 N., R. 80 W., | |
| Sec. 4: Lots 7, 10 | 79.99 |
| Sec. 5: Lots 5, 6, 7 | 67.93 |
| Sec. 7: Lots 5, 6 | 49.99 |
| Sec. 8: Lots 1-3, NWNE | 127.91 |
| Sec. 12: Lots 2, 3 | 79.15 |
| Sec. 28: Lot 1 | 39.96 |
| T. 52 N., R. 80 W., | |
| Sec. 1: Lot 12, SWSE | 50.41 |
| Sec. 9: Tract 48A | 18.15 |
| Sec. 10: Tract 48A | 21.68 |
| Sec. 12: Lots 5, 8 | 49.24 |
| Sec. 14: Lot 1 | 11.16 |
| Sec. 15: Lot 1 | 38.49 |
| Sec. 23: Lot 1 | 26.26 |
| Sec. 29: Lot 6, N2SW, SESW | 137.60 |
| Sec. 32: Tracts 91E, 91F, 91G | 91.71 |

*Appendix R Lands Identified for Disposal
Through Exchange or Sale*

| Legal Description | Approximate Acreage |
|----------------------------|----------------------------|
| Sec. 33: Lot 1 | 5.89 |
| T. 53 N., R. 80 W., | |
| Sec. 4: N2SE | 81.10 |
| T. 54 N., R. 80 W., | |
| Sec. 10: NWNE | 39.76 |
| Sec. 11: SWNW | 40.29 |
| T. 55 N., R. 80 W., | |
| Sec. 3: SWSW | 39.44 |
| Sec. 10: SESW | 40.10 |
| Sec. 23: NESE | 38.76 |
| Sec. 24: SWSW | 39.43 |
| Sec. 26: NESW | 39.18 |
| T. 56 N., R. 80 W., | |
| Sec. 31: Lot 6 | 43.60 |
| T. 57 N., R. 80 W., | |
| Sec. 3: Lot 2 | 39.31 |
| Sec. 11: N2NE, SENE | 118.82 |
| Sec. 12: N2, SE | 478.23 |
| Sec. 25: SWNE, S2NW | 118.25 |
| T. 58 N., R. 80 W., | |
| Sec. 13: Lots 1, 2 | 74.90 |
| Sec. 14: Lot 1 | 36.95 |
| Sec. 21: NENW | 40.42 |
| Range 81 West | |
| T. 42 N., R. 81 W., | |
| Sec. 11: NESW | 40.53 |
| T. 43 N., R. 81 W., | |
| Sec. 5: NWSE | 40.07 |
| Sec. 14: SESE | 39.56 |
| Sec. 19: Lot 2, SWNE, SENW | 119.94 |
| Sec. 23: SESE | 39.96 |
| T. 44 N., R. 81 W., | |
| Sec. 9: SESW, SWSE | 79.95 |
| Sec. 14: W2SW | 80.14 |
| Sec. 15: SWNW | 39.91 |
| Sec. 17: NW, NESW | 200.47 |
| Sec. 18: Lots 3, 4, E2NE | 157.34 |
| Sec. 20: SESW | 40.02 |
| Sec. 21: SENE | 39.86 |
| Sec. 22: NE, N2NW, E2SE | 319.90 |
| Sec. 23: W2W2 | 159.84 |
| Sec. 25: W2W2, NESW | 201.59 |
| Sec. 26: E2 | 320.05 |
| Sec. 29: E2NW, NWSE | 120.08 |
| Sec. 31: E2NE | 79.68 |
| Sec. 32: W2NW | 80.08 |
| Sec. 33: SESW | 40.07 |
| T. 45 N., R. 81 W., | |
| Sec. 3: S2NW, NWSW | 119.98 |
| Sec. 7: Lot 1 | 38.45 |
| Sec. 21: SWSW | 40.30 |
| Sec. 28: SE | 161.94 |
| Sec. 29: SWSE | 40.34 |
| Sec. 33: SENE | 40.44 |

| Legal Description | Approximate Acreage |
|---|----------------------------|
| T. 46 N., R. 81 W., | |
| Sec. 4: Lot 2 | 38.66 |
| T. 47 N., R. 81 W., | |
| Sec. 7: Lot 1, NWNE, NENW | 114.45 |
| Sec. 8: NWNW | 39.78 |
| Sec. 25: NWSE | 40.05 |
| T. 48 N., R. 81 W., | |
| Sec. 18: Lot 4 | 35.85 |
| Sec. 19: Lots 1-4 | 143.91 |
| Sec. 30: Lot 1, 2 | 72.31 |
| Sec. 31: SENE, W2SE | 121.90 |
| T. 50 N., R. 81 W., | |
| Sec. 27: W2SW | 80.44 |
| Sec. 28: E2SE | 80.18 |
| Sec. 33: NENE | 40.06 |
| Sec. 34: N2NW | 80.34 |
| T. 52 N., R. 81 W., | |
| Sec. 7: SWSE | 39.50 |
| Sec. 18: Lot 2 | 39.98 |
| Sec. 33: E2NE | 79.90 |
| T. 53 N., R. 81 W., | |
| Sec. 35: SESE | 40.12 |
| T. 55 N., R. 81 W., | |
| Sec. 1: SWSE | 40.55 |
| Sec. 8: NWSW | 39.91 |
| Sec. 10: SENW, NESW, NWSE | 121.59 |
| Sec. 11: SWNW, NWSW | 79.53 |
| Sec. 15: SENW | 40.17 |
| Sec. 26: Lots 1-5 | 199.74 |
| T. 56 N., R. 81 W., | |
| Sec. 20: NWSE | 39.58 |
| Sec. 23: NENW | 39.73 |
| Sec. 27: SWSW | 39.07 |
| Sec. 31: Lot 2, SENE | 78.55 |
| T. 57 N., R. 81 W., | |
| Sec. 29: W2NW | 79.95 |
| Sec. 32: NWSW | 39.98 |
| Range 82 West | |
| T. 41 N., R. 82 W., | |
| Sec. 1: Lot 4, SENE, E2SE | 158.00 |
| Sec. 12: NESE | 38.92 |
| Sec. 19: SENE, S2SE | 119.98 |
| Sec. 21: SWNW | 40.01 |
| Sec. 22: NENE | 39.83 |
| Sec. 29: W2NE, NW | 239.13 |
| Sec. 30: E2NE | 79.99 |
| T. 42 N., R. 82 W., | |
| Sec. 6: Lots 1-3, SENW, NESW, N2SE, SESE | 314.83 |
| Sec. 7: Lot 1 | 37.53 |
| Sec. 8: NE, E2NW | 238.36 |
| Sec. 18: W2E2 | 158.51 |
| Sec. 19: Lots 2-4, E2NW, E2SW, W2SE, NESE | 397.39 |
| T. 43 N., R. 82 W., | |
| Sec. 2: Lot 4 | 39.51 |

*Appendix R Lands Identified for Disposal
Through Exchange or Sale*

| Legal Description | Approximate Acreage |
|---------------------------------|----------------------------|
| Sec. 3: SWNW, NWSW | 79.64 |
| Sec. 4: Lots 1, 2, N2SE, SWSE | 197.20 |
| Sec. 9: SESE | 40.19 |
| Sec. 14: E2SW | 79.29 |
| Sec. 15: SESW | 38.87 |
| Sec. 18: Lots 3, 4, E2SW | 154.26 |
| Sec. 22: N2NE, E2NW | 157.08 |
| Sec. 23: N2N2, SWNW, SESE | 237.72 |
| Sec. 26: NE, E2NW | 237.80 |
| Sec. 28: SENE | 39.62 |
| Sec. 31: E2SW, NWSSE, E2SE | 199.95 |
| T. 44 N., R. 82 W., | |
| Sec. 2: SWSW | 40.35 |
| Sec. 3: SESW, S2SE | 121.10 |
| Sec. 7: S2SE | 82.55 |
| Sec. 8: W2NE, NWSE | 123.45 |
| Sec. 9: W2NE, N2SE | 165.09 |
| Sec. 11: NWNW | 40.61 |
| Sec. 17: N2NE, SENE | 121.99 |
| Sec. 18: NENE | 40.46 |
| Sec. 19: Lot 2, SENW | 77.37 |
| Sec. 30: NWSE | 40.51 |
| Sec. 34: S2NE, SENW, NESW, N2SE | 240.37 |
| Sec. 35: SWNW, W2SW | 120.71 |
| T. 45 N., R. 82 W., | |
| Sec. 2: N2SW, W2SE | 160.53 |
| Sec. 13: NENE | 40.73 |
| Sec. 23: NWNW | 40.56 |
| Sec. 25: NENE | 40.33 |
| T. 46 N., R. 82 W., | |
| Sec. 4: SWSE | 39.78 |
| T. 47 N., R. 82 W., | |
| Sec. 31: NESE | 39.51 |
| T. 48 N., R. 82 W., | |
| Sec. 9: NWSW | 40.12 |
| Sec. 18: NWSE | 39.58 |
| Sec. 20: NENW | 40.04 |
| Sec. 29: SWNW | 39.90 |
| Sec. 32: SESE | 39.84 |
| T. 49 N., R. 82 W., | |
| Sec. 31: Lot 4 | 39.43 |
| T. 50 N., R. 82 W., | |
| Sec. 30: NWNE | 40.14 |
| T. 52 N., R. 82 W., | |
| Sec. 2: Lots 3, 4, N2SW | 167.28 |
| Sec. 3: Lot 1 | 43.49 |
| T. 53 N., R. 82 W., | |
| Sec. 13: NENE | 41.19 |
| Sec. 17: SESW, SWSE | 81.57 |
| Sec. 18: NESE | 42.07 |
| Sec. 33: NWNE, NESW | 78.99 |
| Sec. 35: SWSW | 39.45 |
| T. 56 N., R. 82 W., | |
| Sec. 11: SWSE | 40.40 |

| Legal Description | Approximate Acreage |
|--|----------------------------|
| Sec. 27: SWNW, NWSE | 80.40 |
| Sec. 28: E2NE, NESE | 121.03 |
| Sec. 31: SENE, E2SE | 120.81 |
| T. 57 N., R. 82 W., | |
| Sec. 7: SWSE | 40.41 |
| Sec. 20: W2SE | 81.24 |
| Sec. 30: S2NE | 81.09 |
| T. 58 N., R. 82 W., | |
| Sec. 21: SENE | 40.91 |
| Range 83 West | |
| T. 42 N., R. 83 W., | |
| Sec. 2: S2NE, SENW, NESW | 156.08 |
| Sec. 11: S2SWNW, NWSNW, NENWSW, N2SWSW, SWSWSW | 69.45 |
| Sec. 12: N2SE | 77.34 |
| Sec. 14: NWNWNW, S2NWNW | 30.55 |
| Sec. 20: SESW | 40.64 |
| Sec. 25: W2NE | 80.00 |
| Sec. 29: NWNE | 40.69 |
| T. 43 N., R. 83 W., | |
| Sec. 3: Lots 5, 6 | 22.36 |
| Sec. 4: Lots 7-8, 11, SESE | 138.63 |
| Sec. 9: Lots 1, 4, Tract 44 I, NENE | 141.68 |
| Sec. 10: Lots 1, 2 | 23.49 |
| Sec. 11: Lots 1-5 | 139.64 |
| Sec. 12: Lot 1 | 4.12 |
| Sec. 13: Lots 1, 2, 5, 6 | 63.13 |
| Sec. 14: Lots 1-5, E2NE, NWNE | 248.88 |
| Sec. 24: Lot 1 | 30.68 |
| Sec. 26: Lots 6, 7 | 70.35 |
| Sec. 27: Lots 3, 4 | 56.21 |
| Sec. 35: Lot 4 | 38.19 |
| T. 44 N., R. 83 W., | |
| Sec. 2: Lot 5 | 61.82 |
| Sec. 3: W2SW | 79.55 |
| Sec. 6: Lot 16 | 39.82 |
| Sec. 12: SESE | 39.83 |
| Sec. 13: SESE | 39.53 |
| Sec. 23: NWNE, NENW, SESE | 121.20 |
| Sec. 24: SWNE, SENW, SW, W2SE | 318.63 |
| Sec. 25: E2NE, N2NW | 160.19 |
| Sec. 26: NENE | 40.46 |
| Sec. 33: SE | 158.46 |
| Sec. 34: E2NW, SWNW, SW | 283.38 |
| T. 45 N., R. 83 W., | |
| Sec. 5: Lot 8 | 46.00 |
| Sec. 7: Lots 8, 9 | 23.39 |
| Sec. 8: Lots 2, 5 | 24.10 |
| Sec. 9: Lot 9 | 23.13 |
| Sec. 10: W2NE | 81.64 |
| Sec. 11: SWSE | 48.14 |
| Sec. 16: Tract 67, Lots 1, 2 | 10.21 |
| Sec. 17: Lots 1-6, NWSW | 211.41 |
| Sec. 18: Lots 5, 6, 9 | 79.99 |
| Sec. 20: Lot 2 | 17.61 |

| Legal Description | Approximate Acreage |
|---|----------------------------|
| Sec. 21: Lots 1, 2 T. 47 N., R. 83 W., | 65.23 |
| Sec. 26: NESW | 40.21 |
| Sec. 27: W2NE, S2NW T. 48 N., R. 83 W., | 158.54 |
| Sec. 1: SWSW T. 49 N., R. 83 W., | 39.40 |
| Sec. 1: SWNW | 40.41 |
| Sec. 2: Lots 1, 2 T. 50 N., R. 83 W., | 78.98 |
| Sec. 22: SENW | 40.47 |
| Sec. 27: SENW, NESW T. 55 N., R. 83 W., | 80.60 |
| Sec. 4: Lot 3 T. 56 N., R. 83 W., | 39.90 |
| Sec. 12: W2E2 T. 57 N., R. 83 W., | 161.23 |
| Sec. 10: SENE | 40.66 |
| Sec. 13: SWSW | 40.81 |
| Sec. 14: SESE | 40.68 |
| Sec. 24: NWNW T. 58 N., R. 83 W., | 40.78 |
| Sec. 24: Lot 2 | 32.36 |
| Sec. 25: W2SE | 81.66 |
| Range 84 West | |
| T. 57 N., R. 84 W., | |
| Sec. 5: Lot 3, SESW, SWSE | 127.50 |
| Sec. 6: Lot 5 | 39.68 |
| Sec. 9: SENW T. 58 N., R. 84 W., | 39.69 |
| Sec. 17: Lot 1 | 31.81 |
| Sec. 18: Lot 1 | 44.47 |
| Sec. 20: N2NE | 81.09 |
| Sec. 21: NWNW | 40.27 |
| Range 85 West | |
| T. 42 N., R. 85 W., | |
| Sec. 4: Lots 3, 4, SWNE, S2NW, SW, SESE | 406.89 |
| Sec. 5: Lots 1-3, S2NE | 202.71 |
| Sec. 18: N2NE T. 43 N., R. 85 W., | 80.52 |
| Sec. 4: SWNE, NWSE | 79.26 |
| Sec. 5: Lots 1, 2 | 79.30 |
| Sec. 8: N2NE, SENE | 121.96 |
| Sec. 17: W2NW, N2SW | 160.49 |
| Sec. 20: NWNE | 40.33 |
| Sec. 22: SWSW | 39.80 |
| Sec. 27: NWNE, NWNW | 79.76 |
| Sec. 35: N2SW T. 44 N., R. 85 W., | 82.18 |
| Sec. 32: SESE | 39.88 |
| Sec. 33: N2SW T. 45 N., R. 85 W., | 79.27 |
| Sec. 3: S2SW, SWSE | 121.69 |
| Sec. 4: SE, S2SE | 80.70 |

| Legal Description | Approximate Acreage |
|---|----------------------------|
| Sec. 5: SESE | 40.06 |
| Sec. 6: Lot 6, NESW | 81.06 |
| Sec. 7: SESE | 39.82 |
| Sec. 9: NENE | 40.70 |
| Sec. 10: NENW | 39.92 |
| Sec. 12: W2SE | 80.60 |
| Sec. 15: NWNE, SENE, W2SW, E2SE | 241.56 |
| Sec. 18: Lots 1, 2, N2NE, NENW | 198.96 |
| Sec. 19: SENE, E2SE | 119.52 |
| Sec. 20: NWNW | 40.15 |
| Sec. 23: NESE | 40.54 |
| Sec. 24: NWSW | 40.72 |
| Sec. 30: E2NE | 80.69 |
| Sec. 34: SENE | 40.43 |
| Sec. 35: W2SW | 79.69 |
| T. 46 N., R. 85 W., | |
| Sec. 5: SWNE, SENW | 81.33 |
| Sec. 6: Lot 2 | 40.22 |
| T. 47 N., R. 85 W., | |
| Sec. 19: Lots 3, 4 | 80.94 |
| T. 53 N., R. 85 W., | |
| Sec. 12: Lots 1-8, SENE, N2SW, SESW, N2SE, SWSE | 317.57 |
| T. 54 N., R. 85 W., | |
| Sec. 27: NWNE, W2NW, NWSW, S2S2 | 319.08 |
| T. 56 N., R. 85 W., | |
| Sec. 8: N2NE | 80.68 |
| T. 58 N., R. 85 W., | |
| Sec. 22: SWNE | 40.83 |
| Sec. 26: S2SW | 80.54 |
| Sec. 27: S2SE | 81.13 |
| Sec. 29: SENE | 42.60 |
| Range 86 West | |
| T. 55 N., R. 86 W., | |
| Sec. 27: SW | 160.40 |
| Sec. 34: N2N2, SENE, SENW, NESW | 279.15 |
| T. 58 N., R. 86 W., | |
| Sec. 13: Lots 1, 2 | 100.20 |
| Sec. 14: Lot 4 | 37.76 |
| Sec. 15: Lot 1 | 39.73 |
| Sec. 22: NENE, SE | 213.67 |
| Sec. 23: W2SW | 84.47 |
| Sec. 26: W2SW | 84.46 |
| Sec. 27: SWNE, NWSE | 84.96 |
| Sec. 34: SWSW | 42.20 |
| Range 87 West | |
| T. 56 N., R. 87 W., | |
| Sec. 5: Lots 5-7, 9-11 | 60.59 |
| Sec. 23: S2S2 | 160.07 |
| Sec. 25: S2SW | 80.04 |
| Sec. 36: ALL | 648.59 |
| T. 57 N., R. 87 W., | |
| Sec. 19: Lots 1, 3, 4, E2SW, SE | 342.96 |
| Sec. 20: S2SW | 78.40 |
| Sec. 29: SW | 154.32 |

| Legal Description | Approximate Acreage |
|---|---------------------|
| Range 88 West | |
| T. 57 N., R. 88 W., | |
| Sec. 14: Lot 1 | 19.71 |
| Sec. 15: Lots 5, 6, S2SW | 152.09 |
| Sec. 16: Lot 3 | 26.29 |
| Range 89 West | |
| T. 58 N., R. 89 W., | |
| Sec. 20: NWNW | 38.32 |
| E East N North R Range RMP Resource Management Plan S South Sec. Section T Township W West | |

^a The number of lots indicates the number of parcels within the section; i.e., 2 parcels within this section.

Appendix S. Travel and Transportation Management

The Bureau of Land Management's (BLM) present transportation network has been largely created from past resource uses and public access patterns. In order to effectively manage for a complete and comprehensive transportation network throughout the BLM-administered public lands within the Buffalo Field Office (BFO), the BLM must assess present and future access needs; evaluate existing trails, primitive roads, and roads; and determine an appropriate travel and transportation system.

As required by Executive Order (EO) 11644 (as amended by EO 11989) and regulation (43 Code of Federal Regulations [CFR] 8340), and in conformance with the BLM Washington Office Instruction Memorandum (IM) No. 2008-014 (BLM 2007) and Manual 1626 - Travel and Transportation Management (BLM 2011), BLM-administered lands within the BFO are identified as "Limited to Designated Roads and Trails," "Closed," or "Open". Those areas that are designated "Limited" may have seasonal restrictions or travel limitations to designated roads and vehicle routes. A travel management plan designating roads Open for motorized and nonmotorized use throughout the BFO will be completed for each Travel Management Area (TMA). A conscientious effort, subject to financial and resource availability, will be made to complete these plans within five years of the signing of the Resource Management Plan (RMP) Record of Decision (ROD). TMA planning will be accomplished through a community-based process by involving cooperating agencies, community groups, and special interest groups. Modifications to the transportation network (new routes, reroutes, or closures) in "Limited" areas may be made through activity level planning or with site-specific National Environmental Policy Act (NEPA) analysis. Modifications to off-highway vehicle (OHV) designations (Open, Closed, or Limited) require an RMP amendment.

Developing a Travel and Transportation Management Network

During the development of a travel management plan, the BLM will seek to balance access needs of motorized and nonmotorized users while sustaining the natural and cultural resources. Through site-specific planning, roads and trails will be inventoried, mapped, and analyzed as necessary to evaluate and designate the roads and trails as "Open," "Seasonally Open," or "Closed" to various types of use (foot, equestrian, bicycle, motorized, and others). Site-specific planning includes identifying opportunities for trail construction or improvement of specific areas where intensive use may be appropriate. Intensive use areas may be identified with use restricted to designated trails under the Limited designation.

Off-Highway Vehicle Designations

Specific criteria for "Open," "Limited," and "Closed" OHV designations are provided in definitions outlined in 43 CFR 8340.0-5 (f), (g), and (h) and 43 CFR 8342.1, Designation Criteria. Generally, the BLM will designate Limited areas where use is limited to identified existing roads and trails (Limited to existing) or emphasize the designation of travel networks (Limited to designated). The following further clarifies these designations:

- **Open:** Areas designated as Open are intended for intensive OHV or other transportation use areas where all types of vehicle use is permitted at all times, anywhere in the area subject to the operating regulations and vehicle standards set forth in 43 CFR 8341 and 8342.
- **Closed:** Areas where OHV use is prohibited. Areas, roads, and/or trails are designated Closed if closure to all OHV use is necessary to protect resources, promote visitor safety, or reduce user conflicts. Administrative use of motor vehicles may be allowed within these areas.
- **Limited:** Areas where transportation use must be restricted to meet specific objectives. For areas classified as Limited, the BLM must consider a full range of possibilities, including travel that will be limited to types or modes of travel; limited to identified roads and trails; limited to time or season of use; limited to certain types of vehicles (i.e., OHVs, motorcycles, all-terrain vehicles, high clearance, etc.); limited to authorized or permitted vehicles or users; limited to BLM administrative use only; or other types of limitations. In addition, the BLM must provide specific guidance about the process for managing motorized vehicle access for authorized, permitted, or otherwise approved vehicles for those specific categories of motorized vehicle uses that are exempt from a Limited OHV designation.

Travel and Transportation Planning Process

Motorized travel in areas to be managed as designated roads and trails will be limited to existing roads, primitive roads, and trails prior to the formal designation of routes. In areas where the travel network has been inventoried and travel routes have been defined, only designated routes will be open for travel prior to the completion of a new travel management plan. Areas currently limited to designated routes include Burnt Hollow, Middle Fork, Welch Ranch and Weston Hills Management Areas.

Travel Management Area Delineation

TMAs will be delineated for the entire field office. TMAs will often consist of other designated management areas (i.e., Special Recreation Management Areas [SRMAs], Wildlife Management Areas, etc.). Topography, land tenure and ecosystem types will also assist in delineation of TMAs. Initial TMAs include individual SRMAs, Wilderness Study Areas (WSAs), and the Powder River Basin. Modifications to TMAs will occur through interdisciplinary team review prior to beginning subsequent NEPA documentation for travel planning.

For areas managed as “Limited to designated roads and trails” a travel management plan will be developed that defines designated motorized and nonmotorized transportation networks. These travel management plans will be developed to address site-specific, geographical areas identified as TMAs. The TMAs will be prioritized in response to current issues such as current OHV use, areas with sensitive resources, areas with special or specific designations (i.e., Areas of Critical Environmental Concern, SRMAs, Wildlife Habitat Management Areas, etc.), public health and safety, use and user conflicts, and resource protection.

Travel and Transportation Management (TTM) planning guidance (H-1601-Land Use Planning Handbook) (BLM 2005), Appendix C; Manual 1626 - Travel and Transportation Management (BLM 2011) requires a completed travel and transportation network upon completion of the Land Use plan to the extent possible. If this is not possible, a preliminary network must be identified and a process established to select a final travel management network. Determination of the final travel and transportation network for the BFO has been deferred until the completion of the

Buffalo RMP because of the complexity of the road network and land tenure pattern, and the need to verify the roads and trails inventory for the planning area.

In general, TTM for designated roads and trails includes the following:

- During the planning process, teams made up of BLM, cooperating agencies, and members of the public will be used to ensure resource concerns and OHV user needs are properly addressed. Maps will be available to the teams that include all known roads to aid identification of roads and vehicle routes to be considered for designation as Open to OHV use.
- From inventory data, complete a map of the TMA, and identify the baseline of roads, primitive roads, and trails. The BFO travel network is only partially inventoried. Map 3-30 illustrates the preliminary transportation network for the BFO. Aerial photos and satellite imagery will be used to establish which routes existed at the time of the ROD. The final travel and transportation network will not be designated until the inventory is completed.

The following steps outline the process in completing a travel and transportation inventory:

1. Acquire funding to be used to inventory data in each TMA for those areas known to have an incomplete route inventory.
2. Analyze aerial photos, satellite imagery and Geographic Information Systems data to collect route data.
3. Data collected from aerial photos and satellite imagery will be ground truthed.
4. Existing routes will be assigned a definition, interim route category, and interim maintenance level and a map will be prepared for each TMA. (Note: Final designations will not take place until the completion of the travel management plan.)

A travel management plan will be prepared for each TMA using an interdisciplinary approach. Goals and objectives will be defined for each TMA. Each travel management plan will include a clear and concise purpose and need statement and alternatives for the designated road network will be prepared.

Route Designation Criteria

The following factors are considered when developing route designations:

- Are resource conflicts present?
- Are critical resources such as Threatened and Endangered or WSAs present?
- Are high-priority resources such as crucial wildlife habitat, cultural or paleontological sites present?
- What are management objectives for the area?
- What are the travel and transportation needs in the area?
- Is there evidence of OHV- related problems?
- Are needs and desires of public land users being met?
- Is visitor use high or low?
- How would OHV proposals affect activity and experience opportunities in the area?
- What benefits or outcomes would accrue from various options?
- Are other issues or problems present (noxious weeds, etc.)?
- Are sufficient data sources available to support the decision?
- Are budget and manpower resources sufficient to implement this designation?

All route designations shall be based on protecting public land resources, the promotion of user safety, and the minimization of conflicts amongst the various public land uses; and in accordance with the following criteria:

- Routes shall be located to minimize damage to soil, watershed, vegetation, air, cultural or other public land resources, and to prevent impairment of wilderness suitability in relevant areas.
- Routes shall be located to minimize harassment of wildlife or major disruption of wildlife habitats. Special attention will be given to protect Threatened or Endangered species and their habitats.
- Routes shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account visibility, noise and other factors.
- Motorized areas and routes shall not be located in officially designated wilderness areas or primitive areas. Motorized areas and routes shall be located in natural areas only if the authorized officer determines that off-road vehicle use in such locations will not adversely affect their natural, aesthetic, scenic, or other values for which such areas are established.

A subsequent NEPA document will be developed with an array of alternatives that will identify the travel routes open for motorized use. The document must address all modes of transportation and primary use for the TMA. Additionally, the plan should identify maintenance intensities and legal access needs and indicate changes in the status of existing routes and areas. The plan will also address necessary improvements, trailheads, staging areas and signs, where applicable.

The public will be notified of the objective of the proposed travel management plan and of scoping meetings through local media, as appropriate, to reach the potentially affected user groups. Resource Advisory Councils, local government, state and federal agencies, gateway communities, and local organizations, as applicable, will be invited. Maps of the planning area will be prepared and available to facilitate discussion in identifying public issues, concerns, and access needs.

Substantive public comments will be incorporated into the travel management plan, the NEPA document will be completed and the signed Finding Of No Signification Impact and Decision Record made available for public review. Completion of the travel management plan for a TMA will establish a transportation network for a particular TMA through the identification of roads, primitive roads, and trails as “Open,” “Limited,” or “Closed” for a particular use.

The travel management plan will be implemented on the ground which will include corresponding public information, education, and signing efforts. Please refer to the TTM Implementation section for further information.

Upon completion of the travel management plan and subsequent NEPA document, the final travel and transportation network will be published in the Federal Register notice, where required.

Definitions, route categories, and maintenance levels of all of the designated routes will be entered into the Facility Asset Management System (FAMS).

A map will be produced and made available to the public depicting the designated roads, primitive roads, trails and permitted uses.

As per 43 CFR 8342.3, the BLM will monitor effects of the off-road vehicle use within TMAs. The BLM may amend, revise, or revoke designated routes, or take other actions to address any issues identified through monitoring. Additionally, where off-road vehicles are causing or will

cause considerable adverse effects upon soil, vegetation, wildlife, wildlife habitat, cultural resources, historical resources, threatened or endangered species, wilderness suitability, other authorized uses, or other resources, the affected areas shall be immediately closed to the type(s) of vehicle causing the adverse effect until the adverse effects are eliminated and measures implemented to prevent recurrence (43 CFR 8341.2).

Provisions for route decommission and rehabilitation of closed or illegal routes include the following:

- OHV use is causing, or will cause, considerable adverse effects.
- A road or vehicle route poses a threat to public safety.
- Road density is adversely affecting resources.
- Closure is necessary for desired future conditions for access.
- Closure is necessary for visual resource protection.
- Closure is necessary for sensitive habitat management.

Travel and Transportation Management Implementation

The BLM uses several means to implement travel management designations. A major component of travel management is a series of well-designed maps and/or brochures that clearly portray TMA designations. Another component is the BLM sign program. Signing in the field must be sufficient to ensure that the public understands the regulations for any given area. Law enforcement and public education provide further assistance in implementation. The final step in the process is monitoring and evaluation, which may lead to adaptive management.

1. OHV Signs

- Signs are designed to notify the public of travel management designations in the field. They should be simple to understand, inexpensive, durable, and easy to install and replace.
- Signs will be standardized. OHV signs must be standardized within the BLM, especially among neighboring field offices. The message on the sign may vary according to the nature of the individual OHV designation but the size, type of substrate, layout and design should be the same. Efforts will be made to use alternative materials deemed as effective as being “vandal-proof,” or made of environmentally-friendly products.
- Signs will indicate places where access roads leave public roads and enter TMAs, where appropriate. Due to the land tenure patterns within the planning area, signs may not be available at all access points. Portal signs will explain the travel management designation for the TMA.
- For areas designated as “Limited to Designated Roads,” all designated roads may be identified with numbers on travel management maps, consistent with statewide road & trail signing efforts. Every effort will be made to number routes with on-the-ground signs, but land tenure and the scope of the planning area may prevent the numbering of all routes.
- Until travel management plans are completed, areas designated as “Limited to Designated Roads” will be managed as “Limited to Existing Roads.” In such areas, only portal signs are necessary. Individual roads and vehicle routes need not be signed.
- For road closures and closed areas, documentation stating the rationale for the closure must be made available to the public.

2. Maps and Brochures

Maps will provide detailed information to the public regarding travel management designations. A site-specific map will be published for each TMA following completion of the travel management

plan. travel management plan decisions may eventually be reflected on 1:100,000-scale Surface Management Status maps. However, given the scope of the Surface Management Status maps and the cost and timeframe for updating such maps, the public must not rely on 1:100,000-scale maps for travel management plan decisions. Brochures for specific areas may also be published.

3. Education

Educational programs will be included in travel management implementation planning. The BFO will initiate programs for the public that emphasize responsible OHV-use, respect for the land, resources, and private property rights. Information about regulations, penalties, consequences for irresponsible behavior, and potential impacts to resources from inappropriate use will be incorporated into the outreach program.

4. Enforcement

Law Enforcement is essential for successful OHV implementation and management. All federal and state laws that apply to motor vehicle use (including the Wyoming Off-Road Recreational Vehicles Act) are subject to enforcement. The BLM may also enter into cooperative law enforcement agreements with other federal, state and local agencies.

When OHV designations (which may include closures or restrictions) are developed through RMPs, publication of the Federal Register Notice for ROD, is required and is sufficient for legal enforcement. When the BLM issues an order that closes or restricts the use of public lands, adequate public notification is required. For those orders to be legally enforceable and upheld in court the requirements found in 43 CFR Subpart 8364, Closures and Restrictions, must be followed.

5. Monitoring and Evaluation

Monitoring is an integral component of OHV management (BLM 2012a). The BLM will monitor the effectiveness and appropriateness of the OHV designations.

Items to monitor include, but are not limited to the following:

- Resource damage resulting from OHV use
- Unauthorized route development
- Effects of OHV use on wildlife
- Effects of OHV use on other recreation or resource uses
- OHV user conflicts and complaints
- Trends in the number of OHV violations and incident reports
- OHV associated private land conflicts
- Identification of maintenance needs
- Fence and barrier conditions

Other Travel and Transportation Management Elements

Authorized and Permitted Uses

Use of OHVs may be administratively authorized or permitted for non-casual activities, such as accessing range improvements, exploration for energy or minerals, and access to inholdings. Temporary excursions leaving existing vehicular routes are permitted only to accomplish necessary tasks. Necessary tasks are actions that support commercial or industrial uses of public

lands which need to be accomplished by a person or organization seeking or holding authorization from the BLM to build, maintain, or place infrastructure necessary to achieve planning goals and objectives, or exercise valid existing rights.

Necessary tasks that support commercial or industrial uses of public lands may be allowed under permit in areas managed under limited designations (motorized use limited to designated roads and trails), and should not be authorized in areas closed to motorized use, such as WSAs or in areas with seasonal limitations unless exercising valid existing rights.

Authorizations or permits that include OHV activities will address the use of OHVs as part of the authorization or permit. Authorized OHV activities require an appropriate level of NEPA environmental analysis, should be compatible with the land use plan goals, and may have use stipulations associated with the authorization or permit. Relevant NEPA documents should analyze whether any new roads would remain open to the public, open solely for administrative access, or reclaimed following completion of the original proposed action. Mitigation measures pertaining to motor vehicle use or the necessary task exemption will be included in the terms and conditions, conditions of approval, and/or stipulations.

Sometimes necessary tasks are and will be accomplished without formal written approval or in advance of receiving an authorization in accordance with Onshore Order 1. Another example is mineral activities defined as casual use (except in areas designated as Closed to OHV use) by 43 CFR 3809 – Surface Management Regulations. Cross-country or off-road vehicle travel in these cases is authorized so long as resource damage does not occur. In these cases actions proposed by the proponent leads to the issuance of a permit or authorization and may be authorized after initial contact with the field office.

It is recognized that in many cases cross-country or off-road motorized vehicle use is the most efficient tool for operators and industry to achieve BLM objectives and requirements. Livestock herding, scientific studies, habitat treatments, etc. all are examples of actions that may require cross-country or off-road motorized vehicle travel. The BLM may grant administrative use authorizations on a case-by-case basis with written approval from the authorized officer or as part of the permitted use.

Authorizations will be conditional upon consistency with Land Use and Activity level planning decisions and other BLM objectives. The project proponent is encouraged to be as detailed as possible in the application for authorization. The BLM will consider an application complete when the information provided is sufficient to facilitate impact analysis, enforcement, monitoring, and evaluation. Project proponents are encouraged to submit the waiver request in tandem with other applications, renewals, or proposals, but the agency will accept the applications at all times. Waiver applications may not be accepted for individuals that are being actively investigated for violation of an OHV rule. Waivers and authorizations may not be granted to individuals who have been convicted of an OHV violation. Additionally, individuals conducting off-road travel under an authorization must carry a copy of the authorization and any relevant stipulations and conditions.

Limited cross-country vehicle travel is allowed for the purpose of maintaining existing range improvements or animal husbandry efforts if established access routes do not exist, so long as resource damage does not occur. Travel on wet or muddy soils should be avoided to prevent rutting and erosion. In these cases the project proponent is expected to submit a request for exemption from travel management regulations.

Recreational Use to Accommodate Necessary Tasks

*Appendix S Travel and Transportation Management
Other Travel and Transportation Management Elements*

In areas with Limited travel designations, the public is allowed to pursue certain recreational activities up to 300 feet from designated roads and trails as long as such activity does not cause resource damage, create new roads or extend existing roads. Valid reasons for pursuing recreational activities include direct access for big game carcass retrieval or to dispersed campsites. Additionally, parking alongside a route to remove the vehicle from the traffic lane is considered a necessary task. Any motorized travel outside of these parameters or that causes resource damage is a violation of the RMP decisions and is subject to enforcement action including citation and fine.

Off-Highway Vehicle Access for Persons with Disabilities

Section 504 of the Rehabilitation Act (Public Law 93-112 as amended) requires federal land managing agencies to provide reasonable opportunities for access for persons with disabilities. Accordingly, during hunting seasons, individuals possessing a valid Wyoming Game & Fish Department "Permit for Hunters with Qualifying Disabilities" will be allowed to use an OHV to retrieve big game carcasses in areas designated as "Limited to designated" routes beyond the 300 foot travel zone without any additional authorization, provided that resource damage or the creation of new roads does not occur. *Note: Personal mobility devices (such as wheelchairs, mobility scooters, etc.) utilized for medical purposes are exempt from travel management restrictions.*

In addition, Field Managers will consider requests by persons with disabilities for authorization for cross-country travel for the purposes of gaining access to the public lands for recreational purposes. These requests will be considered on case-by-case basis. Decisions will be based on a combination of factors including need, other available opportunities, resource management considerations, and the assurance that the activity can be carried out without causing resource damage. If OHV use authorizations are granted, the above criteria will be included in the written authorization.

BLM Administrative Use

Off-road travel by BLM employees conducting official business is allowed only for necessary tasks and only if such travel does not cause resource damage or create unauthorized or unplanned roads and trails. Such travel by BLM employees must meet the same standard required of permit holders who are performing necessary tasks in conjunction with their permit or authorization. Administrative use of motor vehicles may be allowed within closed areas outside of WSAs, however, written approval from the authorizing officer must be obtained prior to off-road use in closed areas unless an emergency situation exists. Additionally, emergency operations such as firefighting will use existing roads whenever feasible.

Over-Snow Travel

Over-snow travel is restricted in closed areas and during relevant seasonal closures. However, the BLM recognizes that snowmobiles may not cause resource damage when operated off-route in an appropriate manner. Historically there have been few places within the planning area that receive sufficient snow cover (4 inches - 6 inches) for the safe and sustainable operation of snowmobiles. However, should snow cover be sufficient to prevent resource damage, snowmobiles may operate off of designated routes in areas "Limited to designated routes," provided that no seasonal restrictions or temporary closures exist and resource damage does not occur.

Temporary Closures and Restrictions

*Appendix S Travel and Transportation Management
Other Travel and Transportation Management
Elements*

The purpose of a temporary closure and restriction is to protect public health and safety, or prevent undue or unnecessary resource degradation due to unforeseen circumstances. Where OHVs are causing or will cause considerable adverse effects upon soil, vegetation, wildlife, wildlife habitat, cultural resources, historical resources, Threatened or Endangered species, wilderness suitability, other authorized uses, or other resources, the affected areas shall be immediately closed to the type(s) of vehicle causing the adverse effect until the adverse effects are eliminated and measures implemented to prevent recurrence.

Wilderness Study Areas

OHV designations for lands in WSAs must conform to Manual 6330 - Management of Wilderness Study Areas (BLM 2012b). Cross-country travel by motor vehicle is strictly prohibited in WSAs. Signs, maps, publications, outreach and enforcement will be used to inform the public aware of motorized restrictions. Exceptions will be allowed in accordance with Manual 6330 (BLM 2012b). The 300 foot travel exception which applies to the "Limited" category does not apply in WSAs as these areas are closed entirely to motorized use. In addition, the exemption for retrieving harvested big and trophy game animals within 300 feet of an existing road or trail is not allowed in WSAs, nor is any exemption for cross-country travel for hunters with qualifying disabilities.

Known existing routes within WSAs were documented and mapped during the original wilderness inventory process (BLM 1979) and updated during this RMP revision. This route inventory data is the baseline for the travel and transportation network for the following WSAs: Fortification Creek, Gardner Mountain, and North Fork.

In WSAs, motorized and mechanized use may be permitted to continue along existing routes identified in the wilderness inventory conducted in support of Sections 603 and 202 of FLPMA. None of the WSAs within the planning area contain documented ways in the original inventory that meet exception criteria for motorized travel. Therefore, no motorized use is allowed in WSAs except as defined for valid and existing rights in Manual 6330 (BLM 2012b).

Resource Damage

While generally defined (see glossary) the determination of whether resource damage has occurred is left to the discretion of Field Managers and law enforcement personnel. Project proponents are encouraged to contact their local field offices prior to using any vehicle off of established routes, so as to ensure that they will not cause resource damage. In addition project proponents must notify the BLM in writing when and where off-road travel has occurred prior to an authorization. This may be done at the application phase, but must occur prior to final authorization.

Revised Statute 2477 Assertions

A travel management plan is not intended to provide evidence bearing on or addressing the validity of any Revised Statute 2477 assertions. Revised Statute 2477 rights are adjudicated through a separate, judicial and administrative process that is entirely independent of the BLM's planning process. Consequently, travel management planning should not take into consideration Revised Statute 2477 assertions or evidence. Travel management planning should be founded on an independently determined purpose and need that is based on resource uses and associated access to public lands and waters. At such time as a decision is made on Revised Statute 2477 assertions, the BLM will adjust its travel routes accordingly.

Route Definitions, Route Management Categories, Maintenance Levels

*Appendix S Travel and Transportation Management
Other Travel and Transportation Management Elements*

Road maintenance, construction, and any other related TTM is mandated by BLM Manual 9113 (BLM 1985). BLM Manual 9113 (BLM 1985) provides for “best management practices” to be used in evaluating, maintaining, and constructing BLM travel and transportation routes. As guided in Manual 9113 (BLM 1985), “Bureau roads must be designed to an appropriate standard no higher than necessary to accommodate their intended functions adequately (timber hauling administrative access, public travel); and design, construction, and maintenance activities must be consistent with national policies for safety, esthetics, protection and preservation of cultural, historic, and scenic values, and accessibility for the physically handicapped.”

Route Definitions

IM 2006-173 (BLM 2006), “Implementation of the Roads and Trails Terminology Report,” dated June 16, 2006, established BLM definitions for road, primitive road (which was added as a new transportation asset category), and trail, and required transportation assets to be classified as such. As part of this BLM-wide classification process, existing FAMS transportation assets were reviewed and reclassified to accurately reflect the new definitions.

- **Road:** A linear route declared a road by the owner, managed for use by low clearance vehicles having four or more wheels, and maintained for regular and continuous use.
- **Primitive Road:** A linear route managed for use by four-wheel drive or high-clearance vehicles. Primitive roads do not normally meet any BLM road design standards.
- **Trail:** A linear route managed for human-powered, stock, or OHV forms of transportation or for historical or heritage values. Trails are not generally managed for use by four-wheel drive or high clearance vehicles.

Primitive roads shall not be designated within a WSA or within lands that have been identified as having wilderness characteristics for which a land use plan has determined that wilderness characteristics are to be protected. Any linear feature located within areas that have been identified as WSAs and/or those lands outside of WSAs with wilderness characteristics will be identified in a transportation inventory as a "route." Except for nonmotorized and nonmechanized trails, these routes will not be classified as a transportation asset and will not be entered into FAMS unless one of the following conditions is met:

- Congress designates the area as Wilderness (then nonmotorized and nonmechanized trails only), or
- RMP decision is made to not protect the area for wilderness characteristics, or
- Congress releases the area from Wilderness consideration.

Route Management Categories

Route Management Categories describe the primary purposes and uses for the routes. Many routes fall under more than one management category. Much use by private landowners, grazing permittees, and the public occurs on Collector Roads and is provided under casual use; therefore, a formal use authorization is not required. Maintenance levels outline the degree of maintenance to be performed, dependent on funding levels. Maintenance of routes with limited or no public access may be the responsibility of the landowner.

Private landowner maintenance of routes on BLM-administered land will be supervised by the BLM. Route maintenance is generally prioritized, based on safety concerns and degree of use. Inadequate funding may preclude the BLM from maintaining routes at levels assigned in this travel management plan. Route Management Categories and Maintenance Levels are monitored and may be modified as needs and conditions change.

Items A through C of this list conform to BLM guidelines included in the Pocket Field Guide: Road Standards, Excerpts from BLM Manual Section 9113. The types of roads that exist on the public lands are as follows:

- **Collector Road:** These roads normally provide primary access to large blocks of public land, and connect with or are extensions of a public road system. Collector roads accommodate mixed traffic and serve many uses. They are generally capable of handling high traffic volumes. Collector roads usually require application of the highest engineering standards used by the BLM. Collector roads receive routine maintenance.
- **Local Roads:** These BLM roads normally serve a smaller area than collectors, and connect to collectors or the public road system. Local roads receive lower volumes of traffic, carry fewer traffic types, and generally serve fewer users. Low volume local roads in mountainous terrain, where speeds are reduced, may be single lane roads with turnouts, and may be maintained to a lower standard than collector roads.
- **Resource Roads:** These are normally spur roads that provide point access and may connect to local or collector roads. They carry low traffic volumes and accommodate few uses.

Maintenance Levels

Route management categories and route maintenance levels on roads, primitive roads, and trails designated Open to motorized or nonmotorized use within the BFO will be stored in a FAMS database. Guidance directs the BLM that upon approval of the RMP ROD, designated travel routes must be entered into FAMS. The FAMS data will serve as the current information on the BLM's transportation system. There are five maintenance levels assigned to a travel route ranging from low maintenance priority to high priority. The following further details the maintenance levels:

- **Level 1:** This level is assigned to roads where maintenance is limited to protecting adjacent land and resource values. These roads are no longer needed and are closed to traffic. The objective is to remove these roads from the transportation system. At a minimum, drainage and runoff patterns will be maintained as needed to protect adjacent land. Grading, brushing, or slide removal will not be performed unless roadbed drainage is being adversely affected or is causing erosion. Closure and traffic restrictive devices will be maintained.
- **Level 2:** This level is assigned to roads open seasonally or year-round and uses may include commercial, recreation, private property access, and administration purposes. Typically, these roads are passable by high clearance vehicles and are maintained, as needed, depending on funding levels. Seasonal closures or other restrictions may be needed to meet resource objectives or because of snow levels or other weather conditions. At a minimum, drainage structures will be inspected within a 3-year period and maintained as needed. Grading will be conducted as necessary to correct drainage problems. Brushing will be conducted as needed and slides may be left in place provided they do not adversely affect drainage.
- **Level 3:** This level is assigned to roads open seasonally or year-round and uses may include commercial, recreation, private property access, and administrative purposes. Typically, these roads are natural or have an aggregate surface, but may include bituminous surface roads. These roads have a defined cross section with drainage structures such as rolling dips, culverts or ditches and may normally be negotiated by passenger cars driven cautiously. User comfort and convenience are not considered a high priority. At a minimum, drainage structures will be inspected annually and maintained as needed. Grading will be conducted to provide a reasonable level of riding comfort at prudent speeds for the road conditions. Brushing will be conducted as needed to improve sight distance. Slides adversely affecting drainage will receive high priority for removal and other slides will be removed on a scheduled basis.

- **Level 4:** This level is assigned to roads open seasonally or year-round. Uses include commercial, recreation, private property access, and administrative purposes. Typically, these roads are single or double lane and have an aggregate or bituminous surface. This maintenance level provides access for passenger cars driven at prudent speeds. At a minimum, the entire roadway will be maintained at least annually, although a preventive maintenance program may be established. Major problems will be repaired as discovered.
- **Level 5:** This level is assigned to roads open seasonally or year-round that carry the highest traffic volume of the transportation system. Uses include commercial, recreation, private property access, and administrative purposes. Typically, these roads are single or double lane and have an aggregate or bituminous surface. This maintenance level provides access for passenger cars traveling at prudent speeds. The entire roadway will be maintained at least annually and a preventive maintenance program will be established. Problems will be repaired as discovered.

Routes (ways) within WSAs are not maintained other than by the passage of vehicles, with certain exceptions. Exceptions are limited to the minimum mechanical maintenance necessary under Manual 6330 (BLM 2012b).

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Appendix T. Recreation Management Activities

Special Recreation Management Areas

Special Recreation Management Areas (SRMAs) are administrative units where a commitment has been made to prioritize recreation by managing for specific recreation opportunities and settings on a sustained or enhanced, long-term basis. For each SRMA the Bureau of Land Management (BLM) Buffalo Field Office (BFO) has identified supporting information, established objective decisions, described recreation setting characteristics (RSCs), identified management actions and allowable use decisions and, as necessary, identified implementation decisions.

Land use plan level recreation and visitor services objective decisions define intended activities and specific recreation opportunities to be offered. Objectives describe the intended recreation activities, experiences and benefits derived from those experiences. SRMAs may be subdivided into recreation management zones with discrete objectives.

SRMAs are managed:

1. For their unique value, importance, and/or distinctiveness, especially as compared to other areas used for recreation.
2. To protect and enhance a targeted set of activities, experiences, benefits, and desired RSCs.
3. As the predominant land use plan focus.
4. To protect specific recreation opportunities and RSCs on a long-term basis.

T.1. Burnt Hollow Management Area

Supporting Information and Rationale

The Burnt Hollow SRMA is necessary to accommodate national visitor demand for semi-primitive nonmotorized recreational opportunities in semiarid sagebrush steppe ecoregions; this demand has been identified by local organizations, community involvement workshops, and through visitor use data. Burnt Hollow is one of the largest contiguous parcels of BLM-administered land with public access in northeastern Wyoming. The area has abundant prairie wildlife, a nearly pristine Powder River Basin viewshed, and a high probability for solitude. SRMA management will sustain and enhance these amenities as well as accommodate the visitor demand.

BURNT HOLLOW SPECIAL RECREATION MANAGEMENT AREA (SRMA) OBJECTIVES & DECISIONS

Objective Statement: Within the Burnt Hollow SRMA, by the year 2016 and thereafter, participants in recreation assessments will report an average 4.0 realization of the targeted experiences and benefits (4.0 on a probability scale, where 1.0 equals not realized and 5.0 equals totally realized) listed below. The Burnt Hollow SRMA will offer opportunities for nonmotorized recreationists to engage in horseback riding, hiking, hunting, mountain biking, environmental education, and nature viewing. Within the management area, the existing natural and physical character of the landscape will be modified only by primitive trail developments.

Activities: Hunting, horseback riding, hiking, mountain biking, environmental education, camping, backpacking; user conflicts between horseback riding and mountain biking opportunities would be mitigated through travel management allocations on designated trails if demand increases and recreation assessments indicate the necessity to separate conflicting uses.

Experiences: Developing skills and abilities, testing endurance, enjoying having access to hands-on environmental learning, enjoying having access to close-to-home outdoor amenities, savoring the total sensory experience of a landscape.

Benefits: Greater freedom from urban living, improved understanding of this community's dependence and impact on public lands, greater retention of distinctive natural landscape features, improved physical fitness/better health maintenance.

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics: Within a 0.5 mile of paved/primary roads and highways. The character of the natural landscape within the Highway 59 viewshed is partially maintained, with infrastructure and several ranch facilities visible. In the interior of the Burnt Hollow Management Area, the character of the natural landscape is retained with few modifications contrasting (fences, two-tracks, etc.). Desired future conditions will include maintained and marked trails, simple trailhead developments and basic toilets.

Social Characteristics: From 2006 to 2010, the average annual estimated visitation was 729 visits and 1116 visitor days. During the peak use season (Sept. through Nov.) contacts are characterized by 3-6 encounters off travel routes and 7-15 encounters per day on travel routes. Outside of peak season, contacts are rare. Most groups consist of less than 3 people. Small areas of terrain alteration are present near major roads. The sounds of other people are rarely heard once out of the Highway 59 viewshed.

Operational Characteristics: Foot and horse travel and mechanized use (mountain bikes) are allowed; all public use must be nonmotorized. Basic maps provided on trailhead kiosks, staff infrequently present to provide onsite assistance. Some regulatory and ethics signing is present in parking lots. Moderate use restrictions apply at trailheads and staging areas.

MANAGEMENT ACTIONS & ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program: Standard 14-day camping limit applies; currently not eligible for Federal Lands Recreation Enhancement Act but may be evaluated if future investments in visitor services meet eligibility requirements. Recreational target shooting is prohibited within developed recreation sites. Dispersed camping is allowed outside of the developed parking lots.

Oil & Gas Leasing/Minerals: Closed to leasing. Recommended for withdrawal from mineral entry. Salable mineral development for administrative use only.

VRM: Class II

Renewable Energy: Renewable energy exclusion area

Lands and Realty: ROW exclusion area

Travel Management: The area will be managed as limited to designated routes, with very few routes designated for administrative motorized use only. Identify routes to close and reclaim. Modify appropriate routes into nonmotorized trails. Designated routes will be primarily for provision of access to inholdings within Burnt Hollow Management Area and to provide egress for administrative use.

Special Recreation Permits (SRPs): SRPs will be issued as a discretionary action for a wide variety of uses, consistent with resource/program objectives, and within budgetary/workload constraints. Recreation area management plan will include criteria for potential limitations on issuance of SRPs to clarify when noncommercial activities may take place under a letter of agreement or to avoid saturation of commercial or organized use. Develop special stipulations for SRPs to protect the recreation setting as appropriate.

| IMPLEMENTATION DECISIONS |
|--|
| <p>Marketing: Provide maps and information at the field office. Directional signage present from both Highway 59 and Cow Creek Road. Develop interpretive signs at trailhead/parking area on general location, history, geology, and wildlife resources. Provide stewardship information to help preserve the special landscape character. Make available for outreach programs such as Conservation and Outdoor Recreation Education, Take It Outside, National Public Lands Day, etc.</p> <p>Monitoring: Vehicle counters with routine surveys and observation. Informal visitor surveys and formal focus groups as funding allows.</p> <p>Management: Signs present at key access points; additional informational signs present along trails.</p> <p>Administrative:</p> <p><i>Agreements:</i> Establish cooperative agreements with Wyoming State Land Board and Wyoming Department of Game and Fish.</p> <p><i>Partners:</i> Burnt Hollow Coordinated Resource Management Working Group. Pursue partnerships with Campbell County School Districts and Gillette College to establish an outdoor classroom.</p> |

| COW CREEK BREAKS RECREATION MANAGEMENT ZONE (RMZ) | | |
|---|---|--|
| Outcome Objective | | |
| <p>The Cow Creek Breaks RMZ of the Burnt Hollow Special Recreation Management Area (SRMA) will be sustained or enhanced for visitors to engage in hiking, horseback riding, and hunting (fall) so that participants in visitor assessments/surveys indicate a higher than average (mean average of 4.0 on a 5 point scale) realization of experience and benefit outcomes listed below in Back Country and Middle Country settings.</p> | | |
| TARGETED OPPORTUNITIES & OUTCOMES | | |
| Activity Opportunities | Outcomes | |
| | Experiences | Benefits |
| <ul style="list-style-type: none"> ● Horse riding/packing ● Hiking/backpacking ● Mountain Biking ● Hunting (fall season) ● Nature Viewing | <ul style="list-style-type: none"> ● Enjoying the sensory experience of a natural landscape ● Enjoying ability to frequently participate in desired activities in preferred settings ● Testing endurance ● Being isolated and independent ● Enjoying exploring on my own or in small groups ● Enjoying nature ● Feeling good about solitude ● Developing skills and abilities ● Escaping everyday responsibilities | <p>Personal:</p> <ul style="list-style-type: none"> ● Enhanced awareness and understanding of nature ● Closer relationship with the natural world ● Improved opportunity to view wildlife close-up ● Improved mental health ● Improved physical health ● Greater appreciation of the outdoor environment <p>Community/Social:</p> <ul style="list-style-type: none"> ● Feeling good about how natural resources and facilities are being managed <p>Environmental:</p> <ul style="list-style-type: none"> ● Greater retention of distinctive natural landscape features ● Increased sense of stewardship for the resource <p>Economic:</p> <ul style="list-style-type: none"> ● Enhanced ability for visitors and resident to find areas providing desired recreation experiences and benefits ● Enhanced ability for visitors to find areas providing wanted recreation experiences and benefits ● Greater protection of fish, wildlife, and plant habitat from growth, development, and public use impacts |
| DESIRED FUTURE RECREATION SETTING CHARACTER | | |

| Physical | Social | Operational |
|---|--|---|
| <p><i>Remoteness:</i> On or near mechanized routes but at least one mile from improved roads, though they may be visible.</p> <p><i>Naturalness:</i> Natural setting may have modifications that would be noticed but not draw the attention of an observer wandering through the area.</p> <p><i>Facilities:</i> Developed trails made mostly of native materials. Structures are rare and isolated.</p> | <p><i>Contacts With Others:</i> Average encounters per day during peak hunting use season (September - November) should not exceed 5 encounters per day at staging areas, and 3 encounters per day on travel routes.</p> <p><i>Group Size:</i> Group sizes are expected to remain small (less than 3 people per group).</p> <p><i>Evidence of use:</i> Areas of alteration uncommon. Little surface vegetation wear observed. Sounds of people infrequent.</p> | <p><i>Mechanized Use:</i> Nonmotorized, mechanized use is allowed on trails. Should conflicts arise between mechanized use and other nonmotorized recreationists, the recreation area management plan will be adapted via a public comment period.</p> <p><i>Management Controls and Visitor Services:</i> On site controls and services are present but subtle. Offsite services and controls provided in the minimum amount necessary to reach management objectives.</p> |

SUPPORT ACTIONS

| | |
|--|---|
| Recreation Management Actions | <p>Utilize adaptive management techniques to provide identified recreation opportunities (activities, experiences, and benefits) and reach desired future setting conditions.</p> <p>Special Recreation Permits will be allowed in this area so long as setting condition and outcome objectives can be maintained.</p> <p>Continue to enhance the availability of dependable non-potable water sources for recreationists.</p> |
| Information and Education (including promotion and interpretation) | <p>Ensure targeted experiences and benefits as well as recreation setting information is included and explained in all visitor information.</p> <p>Existing offsite and onsite visitor orientation (kiosk, signs, and informational brochures) will be maintained and enhanced.</p> |
| Administration | <p>Consider the use of a Memorandum of Understanding or other cooperative agreement between the Bureau of Land Management (BLM) and pertinent partners to maintain and enhance the area.</p> |
| Monitoring (and Evaluation) | <ul style="list-style-type: none"> • Solicit partnerships and cooperative agreements to: monitor outcome attainment and preferences through focus group interviews or visitor studies. • Monitor recreation setting condition through onsite patrols during the high use season (August-November). |
| Interdisciplinary Support Actions | <p>Visual Resource Management Class II; closed to public motorized use.</p> |

BURNT HOLLOW FRONT COUNTRY RECREATION MANAGEMENT ZONE (RMZ)

Outcome Objective

The Burnt Hollow Front Country RMZ will be sustained or enhanced for individuals or small groups of nonmotorized recreationists, to engage in nature and wildlife viewing, horseback riding, hiking, hunting and mountain biking. The Front Country RMZ will be promoted for environmental education opportunities. The Front Country RMZ of the Burnt Hollow Special Recreation Management Area (SRMA) will be sustained or enhanced for visitors to engage in hiking, hunting (fall), mountain biking and horseback riding, so that participants in visitor assessments/surveys indicate a higher than average (mean average of 4.0 on a 5 point scale) realization of experience and benefit outcomes listed below in these Front Country and Middle Country settings.

TARGETED OPPORTUNITIES & OUTCOMES

| Activity Opportunities | Outcomes | |
|------------------------|-------------|----------|
| | Experiences | Benefits |
| | | |

| | | |
|---|---|--|
| <ul style="list-style-type: none"> ● Horse riding/packing ● Hiking/backpacking ● Mountain biking ● Nature Viewing ● Environmental Education ● Hunting | <ul style="list-style-type: none"> ● Enjoying the sensory experience of a natural landscape ● Enjoying nature ● Developing skills and abilities ● Enjoying learning outdoor social skills | <p>Personal:</p> <ul style="list-style-type: none"> ● Enjoying easy access to natural landscapes ● Improved mental health ● Improved physical health <p>Community/Social:</p> <ul style="list-style-type: none"> ● More informed citizenry about where to go for different kinds of recreation experiences and benefits <p>Environmental:</p> <ul style="list-style-type: none"> ● Greater retention of distinctive natural landscape features ● Increased sense of stewardship for the resource <p>Economic:</p> <ul style="list-style-type: none"> ● Enhanced ability for visitors and resident to find areas providing desired recreation experiences and benefits |
|---|---|--|

DESIRED FUTURE RECREATION SETTING CHARACTER

| Physical | Social | Operational |
|--|--|---|
| <p><i>Remoteness:</i> Within one mile of paved/primary roads and highways.</p> <p><i>Naturalness:</i> Character of the natural landscape considerably modified.</p> <p><i>Facilities:</i> Rustic facilities such as basic toilets, kiosks and interpretive displays.</p> | <p><i>Contacts With Others:</i> Contact with others unlikely outside of peak season, except for cars passing on highway. During peak season, 3-6 encounters in parking lots are possible.</p> <p><i>Group Size:</i> Group sizes are expected to be between 2-6 people per group.</p> <p><i>Evidence of use:</i> Small areas of alteration prevalent. Surface vegetation gone with compacted soils. Sounds of people regularly heard.</p> | <p><i>Mechanized Use:</i> Nonmotorized, mechanized use is allowed on trails. Should conflicts arise between mechanized use and other nonmotorized recreationists, the recreation area management plan will be adapted via a public comment period.</p> <p><i>Management Controls and Visitor Services:</i> On site controls and services are present but subtle. Offsite services and controls provided in the minimum amount necessary to reach management objectives.</p> |

SUPPORT ACTIONS

| | |
|---|---|
| <p>Recreation Management Actions</p> | <p>Utilize adaptive management techniques to provide identified recreation opportunities (activities, experiences, and benefits) and reach desired future setting conditions.</p> <p>Special Recreation Permits will be allowed in this area so long as setting condition and outcome objectives can be maintained.</p> <p>Continue to enhance the availability of dependable non-potable water sources for recreationists.</p> |
| <p>Information and Education (including promotion and interpretation)</p> | <p>Ensure targeted experiences and benefits as well as recreation setting information is included and explained in all visitor information.</p> <p>Existing offsite and onsite visitor orientation (kiosk, signs, and informational brochures) will be maintained and enhanced.</p> |
| <p>Administration</p> | <p>Consider the use of a Memorandum of Understanding (MOU) or other cooperative agreement between the Bureau of Land Management (BLM) and pertinent partners to maintain and enhance the area.</p> <p>Place notification of target shooting restriction on sections containing and adjacent to developed recreation facilities.</p> |

| | |
|-----------------------------------|---|
| Monitoring (and Evaluation) | <ul style="list-style-type: none"> • Solicit partnerships and cooperative agreements to: monitor outcome attainment and preferences through focus group interviews or visitor studies. • Monitor recreation setting condition through onsite patrols during the environmental education high use season (early fall and late spring). |
| Interdisciplinary Support Actions | Visual Resource Management Class II; closed to public motorized use. |

T.2. Dry Creek Petrified Tree Management Area

Supporting Information and Rationale

The Dry Creek Petrified Tree SRMA is necessary to accommodate national visitor demand for nonmotorized recreational opportunities in semiarid sagebrush steppe ecoregions; this demand has been identified through focus groups, community involvement workshops, and through visitor use data. Dry Creek Petrified Tree is a unique parcel of BLM-administered land in respect to its abundant paleontological resources. This parcel provides seamless recreational opportunities as it connects with additional public lands. SRMA management will sustain and enhance these amenities as well as accommodate the visitor demand. The area has abundant prairie wildlife, a nearly pristine Powder River Basin viewshed, and a high probability for solitude. SRMA management will sustain and enhance these amenities as well as accommodate the visitor demand.

| |
|---|
| DRY CREEK/PETRIFIED TREE SPECIAL RECREATION MANAGEMENT AREA (SRMA) |
| OBJECTIVES & DECISIONS |
| <p><i>Objective Statement:</i> Within the Dry Creek Petrified Tree SRMA, by the year 2015 and thereafter, participants in recreation assessments will report an average 4.0 realization of the targeted experiences and benefits (4.0 on a probability scale, where 1.0 equals not realized and 5.0 equals totally realized) listed below. The Dry Creek Petrified Tree SRMA will offer opportunities for recreationists to engage in picnicking, walking, nature viewing, and other forms of nonmotorized dispersed recreation in a partially modified physical recreation setting with predominantly nonmotorized public use. Within the management area, the existing natural and physical character of the landscape will be modified by recreational trail developments and associated recreation and interpretive facilities.</p> <p><i>Activities:</i> Picnicking, walking, nature viewing, environmental education, hunting</p> <p><i>Experiences:</i> Enjoying having access to hands-on environmental learning, enjoying having access to close-to-home outdoor amenities, enjoying the closeness of friends and family</p> <p><i>Benefits:</i> Greater retention of distinctive natural landscape features, increased appreciation of the area's geologic history.</p> |
| RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS |
| <p><i>Physical Characteristics:</i> Within a 0.5 mile of passenger vehicle routes. The character of the natural landscape within the Tipperary Road viewshed is partially maintained, with infrastructure and several ranch facilities visible. Desired future conditions will include maintained and marked trails, simple trailhead developments, a basic toilet and an interpretive display.</p> <p><i>Social Characteristics:</i> From 2006 to 2010, the average annual estimated visitation was 956 visits and 110 visitor days (RMIS). Contacts with other groups are rare. Most groups consist of 2-5 people. Small areas of terrain alteration are present near the trailhead roads. The sounds of other people are rarely heard.</p> <p><i>Operational Characteristics:</i> Foot travel is allowed; all use must be nonmotorized. Basic maps provided on trailhead kiosks, staff infrequently present to provide onsite assistance. Some regulatory and ethics signing is present in parking lots.</p> |
| MANAGEMENT ACTIONS & ALLOWABLE USE DECISIONS |

Recreation and Visitor Services Program: Standard 14-day camping limit applies; developed site closed to recreational target shooting; currently not eligible for Federal Lands Recreation Enhancement Act but may be evaluated if future investments in visitor services meet eligibility requirements.

Oil & Gas Leasing/Minerals: Closed to leasing. Recommended for withdrawal from mineral entry. Salable mineral development for administrative use only.

VRM: Class II

Renewable Energy: Renewable energy exclusion area

Lands and Realty: Right-of-way (ROW) exclusion area

Travel Management: The interpretive trail area is closed to motorized use (~20 acres). Travel is limited to designated routes throughout the remainder of the SRMA. Identify routes to close and reclaim.

Special Recreation Permits (SRPs): Commercial guiding for hunting and competitive events will be prohibited within the 22 acre enclosure. Elsewhere, SRPs will be issued as a discretionary action for a wide variety of uses, consistent with resource/program objectives, and within budgetary/workload constraints. Develop criteria for potential limitations on issuance of SRPs to clarify when noncommercial activities may take place under a letter of agreement or to avoid saturation of commercial or organized use. Develop special stipulations for SRPs to protect the recreation setting as appropriate.

Livestock Grazing: The 22-acre enclosure around the interpretive site is closed to grazing.

IMPLEMENTATION DECISIONS

Marketing: Provide maps and information at the field office. Directional signage present from both TW Road and Tipperary Road at I-90. Develop interpretive signs at trailhead/parking area on general location, history, paleontology, geology, and wildlife resources. Provide stewardship information to help preserve the special landscape character. Make available for outreach programs such as Conservation and Outdoor Recreation Education, Take It Outside, National Public Lands Day, etc.

Monitoring: Vehicle counters with routine surveys and observation. Informal visitor surveys and formal focus groups as funding allows.

Management: Signs present at key access points; additional informational signs present along interpretive trail. Update interpretive trail signs as time and funding allow.

Administrative:

Recreation: Modify appropriate routes into nonmotorized trails.

Agreements: Establish cooperative agreements with Wyoming State Land Board and Wyoming Department of Game and Fish.

Partners: Pursue partnerships with Johnson County School Districts to establish an outdoor classroom.

Other administration: Recreational target shooting is prohibited within the developed site. Standard 14-day camping limit applies.

INTERPRETIVE TRAIL RECREATION MANAGEMENT ZONE (RMZ)

Outcome Objective

The Interpretive Trail RMZ will be sustained or enhanced for individuals or small groups of visitors to engage in nature and wildlife viewing, picnicking, environmental education and walking the interpretive trail so that participants in visitor assessments/surveys indicate a higher than average (mean average of 4.0 on a 5 point scale) realization of experience and benefit outcomes listed below in these Front Country settings:

TARGETED OPPORTUNITIES & OUTCOMES

| Activity Opportunities | Outcomes | |
|------------------------|-------------|----------|
| | Experiences | Benefits |
| | | |

| | | |
|--|--|--|
| <ul style="list-style-type: none"> ● Environmental Education ● Picnicking ● Walking ● Nature Viewing | <ul style="list-style-type: none"> ● Enjoying the sensory experience of a natural landscape ● Enjoying having access to hands-on environmental learning ● Learning more about this specific area ● Enjoying having access to close-to-home outdoor amenities ● Enjoying the closeness of friends and family | <p>Personal:</p> <ul style="list-style-type: none"> ● Enhanced awareness and understanding of nature ● Closer relationship with the natural world ● Greater retention of distinctive natural landscape features ● Increased appreciation of the area’s geologic history ● Improved mental health ● Improved physical health ● Greater appreciation of the outdoor environment <p>Community/Social:</p> <ul style="list-style-type: none"> ● Feeling good about how natural resources and facilities are being managed <p>Environmental:</p> <ul style="list-style-type: none"> ● Greater retention of distinctive natural landscape features. ● Increased sense of stewardship for the resource ● Greater protection of paleontological sites ● Reduced looting and vandalism of historic/prehistoric sites ● Reduced negative human impacts such as litter, vegetative trampling, and unplanned trails <p>Economic:</p> <ul style="list-style-type: none"> ● Enhanced ability for visitors and resident to find areas providing desired recreation experiences and benefits |
|--|--|--|

DESIRED FUTURE RECREATION SETTING CHARACTER

| Physical | Social | Operational |
|---|--|--|
| <p><i>Remoteness:</i> Within a 0.5 mile of passenger vehicle routes.</p> <p><i>Naturalness:</i> Natural setting may have modifications that would be noticed but not draw the attention of an observer wandering through the area.</p> <p><i>Facilities:</i> Maintained and marked trails, simple trailhead developments and basic toilets. Interpretive displays may also be incorporated.</p> | <p><i>Contacts With Others:</i> Encounters with other groups are rare for visiting members of the general public.</p> <p><i>Group Size:</i> Group sizes are expected to remain small (less than 5 people per group), unless an organized school or community groups visits as part of a field trip.</p> <p><i>Evidence of use:</i> Areas of alteration uncommon. Little surface vegetation wear observed. Sounds of people infrequent.</p> | <p><i>Mechanized Use:</i> Foot travel is allowed on trails. Mechanized and motorized use are prohibited within the interpretive site.</p> <p><i>Management Controls and Visitor Services:</i> On site controls and services are present but subtle. Offsite services and controls provided in the minimum amount necessary to reach management objectives.</p> |

SUPPORT ACTIONS

| | |
|--|--|
| Recreation Management Actions | Utilize adaptive management techniques to provide identified recreation opportunities (activities, experiences, and benefits) and reach desired future setting conditions. |
| Information and Education (including promotion and interpretation) | Ensure targeted experiences and benefits as well as recreation setting information is included and explained in all visitor information. Existing offsite and onsite visitor orientation (kiosk, signs, and informational brochures) will be maintained and enhanced. |
| Administration | Consider the use of a Memorandum of Understanding or other cooperative agreement between the Bureau of Land Management and pertinent partners to maintain and enhance the area. |

| | |
|-----------------------------------|---|
| Monitoring (and Evaluation) | Solicit partnerships and cooperative agreements to: monitor outcome attainment and preferences through focus group interviews or visitor studies. |
| Interdisciplinary Support Actions | Visual Resource Management Class II. Limit travel to designated routes; close interpretive site to motorized and mechanized use. |

RED HORSE ACCESS RECREATION MANAGEMENT ZONE (RMZ)

Outcome Objective

The Red Horse Access RMZ will be sustained or enhanced for individuals or small groups of nonmotorized recreationists, to engage in nature and wildlife viewing, mountain biking and hiking so that participants in visitor assessments/surveys indicate a higher than average (mean average of 4.0 on a 5 point scale) realization of experience and benefit outcomes listed below in these Middle Country settings:

TARGETED OPPORTUNITIES & OUTCOMES

| Activity Opportunities | Outcomes | |
|--|---|--|
| | Experiences | Benefits |
| <ul style="list-style-type: none"> • Hiking • Mountain Biking • Hunting | <ul style="list-style-type: none"> • Enjoying the sensory experience of a natural landscape • Enjoying having access to close-to-home outdoor amenities • Enjoying the closeness of friends and family | <p>Personal:</p> <ul style="list-style-type: none"> • Enhanced awareness and understanding of nature • Greater understanding of the importance of recreation and tourism in our community • Increased appreciation of the area’s geologic history • Improved mental health • Improved physical health • Greater appreciation of the outdoor environment • Greater sense of responsibility for own quality of life • Greater appreciation for my public lands and how managers care for it <p>Community/Social:</p> <ul style="list-style-type: none"> • More informed citizenry about where to go for different kinds of recreation experiences and benefits <p>Environmental:</p> <ul style="list-style-type: none"> • Greater retention of distinctive natural landscape features • Increased sense of stewardship for the resource <p>Economic:</p> <ul style="list-style-type: none"> • Enhanced ability for visitors and resident to find areas providing desired recreation experiences and benefits |

DESIRED FUTURE RECREATION SETTING CHARACTER

| Physical | Social | Operational |
|--|---|---|
| <p><i>Remoteness:</i> Within a 0.5 mile of four-wheel drive vehicle routes.</p> <p><i>Naturalness:</i> Natural setting may have modifications that would be noticed but not draw the attention of an observer wandering through the area.</p> <p><i>Facilities:</i> Maintained and marked trails, simple trailhead developments and basic toilets.</p> | <p><i>Contacts With Others:</i> Encounters with other groups are rare.</p> <p><i>Group Size:</i> Group sizes are expected to remain small (less than 3 people per group)</p> <p><i>Evidence of use:</i> Areas of alteration uncommon. Little surface vegetation wear observed. Sounds of people infrequent.</p> | <p><i>Mechanized Use:</i> Mechanized travel is allowed on designated trails.</p> <p><i>Management Controls and Visitor Services:</i> On site controls and services are present but subtle. Offsite services and controls provided in the minimum amount necessary to reach management objectives.</p> |

SUPPORT ACTIONS

| | |
|--|--|
| Recreation Management Actions | Utilize adaptive management techniques to provide identified recreation opportunities (activities, experiences, and benefits) and reach desired future setting conditions. Special Recreation Permits will be allowed in this area so long as setting condition and outcome objectives can be maintained. |
| Information and Education (including promotion and interpretation) | Ensure targeted experiences and benefits as well as recreation setting information is included and explained in all visitor information. Existing offsite and onsite visitor orientation (kiosk, signs, and informational brochures) will be maintained and enhanced. |
| Administration | Consider the use of a Memorandum of Understanding or other cooperative agreement between the Bureau of Land Management and pertinent partners to maintain and enhance the area. |
| Monitoring (and Evaluation) | Solicit partnerships and cooperative agreements to: monitor outcome attainment and preferences through focus group interviews or visitor studies. |
| Interdisciplinary Support Actions | Visual Resource Management Class II; travel limited to designated routes. |

T.3. Hole-in-the-Wall Management Area

Supporting Information and Rationale

The Hole-in-the-Wall SRMA is necessary to accommodate national visitor demand for semi-primitive nonmotorized recreational opportunities in the Red Wall/southern Big Horns region; this demand has been identified by local organizations, community involvement workshops, and through visitor use data. The area has abundant wildlife, a nearly pristine Red Wall viewshed, and a moderate probability for solitude. SRMA management will sustain and enhance these amenities as well as accommodate the visitor demand.

| HOLE-IN-THE-WALL SPECIAL RECREATION MANAGEMENT AREA (SRMA) OBJECTIVES & DECISIONS |
|--|
| <i>Objective Statement:</i> Within the Hole-in-the-Wall SRMA, by the year 2017 and thereafter, participants in recreation assessments will report an average 4.0 realization of the targeted experiences and benefits (4.0 on a probability scale, where 1.0 equals not realized and 5.0 equals totally realized) listed below. The Hole-in-the-Wall SRMA will offer opportunities for nonmotorized recreationists to engage in hiking, horseback riding, and nature viewing and other forms of nonmotorized dispersed recreation. Within the management area, the existing natural and physical character of the landscape will be modified only by primitive trail developments and minimal associated recreation and interpretive facilities. |
| <i>Activities:</i> Hiking, horseback riding, nature viewing, interpretation of natural and cultural resources, hunting, camping |
| <i>Experiences:</i> Developing skills and abilities, testing endurance, savoring the total sensory experience of a landscape |
| <i>Benefits:</i> Greater retention of distinctive natural landscape features; greater protection of area archeological sites |
| RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS |

Physical Characteristics: Within a 0.5 mile of four-wheel drive routes. The character of the natural landscape within the viewshed is maintained, with a few modifications, such as ranch facilities visible. Desired future conditions will include maintained and marked trails, and simple trailhead developments, including interpretive panels.

Social Characteristics: Quantitative data related specifically to Hole-in-the-Wall does not yet exist. The majority of use is associated with commercially guided activities through neighboring ranches. During the peak visitation season (May, through Oct.) contacts are characterized by less than 3 encounters off travel routes and 3–6 encounters per day on travel routes. Outside of peak season, contacts are rare. Most groups consist of less than 3 people. Small areas of terrain alteration are present near major roads. The sounds of other people are rarely heard.

Operational Characteristics: Foot and horse travel are allowed cross-country; mechanized and motorized use is limited to designated routes. Basic maps provided on trailhead kiosks, staff infrequently present to provide onsite assistance. Some regulatory and ethics signing is present in parking lots. Moderate use restrictions apply at trailheads and staging areas.

MANAGEMENT ACTIONS & ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program: Standard 14-day camping limit applies; prioritized for education efforts to mitigate recreational target shooting; currently not eligible for Federal Lands Recreation Enhancement Act but may be evaluated if future investments in visitor services meet eligibility requirements.

VRM: Class II

Travel Management: The area will be managed as limited to designated routes, with very few routes designated. Identify routes to close and reclaim. Modify appropriate routes into nonmotorized trails. Designated routes will be primarily for provision of public access to Hole-in-the-Wall trailhead and to provide egress for administrative use.

Renewable Energy: Renewable energy exclusion area

Lands and Realty: ROW exclusion area

Oil & Gas Leasing/Minerals: Closed to Leasing. Recommended for withdrawal from mineral entry. Salable mineral development for administrative use only.

Special Recreation Permits (SRPs): SRPs will be issued as a discretionary action for a wide variety of uses, consistent with resource/program objectives, and within budgetary/workload constraints. Develop criteria for potential limitations on issuance of SRPs to clarify when noncommercial activities may take place under a letter of agreement or to avoid saturation of commercial or organized use. Develop special stipulations for SRPs to protect the recreation setting as appropriate.

IMPLEMENTATION DECISIONS

Marketing: Provide maps and information at the field office. Directional signage necessary from TTT Road, Willow Creek Road, and NC 105. Develop interpretive signs at trailhead/parking area on general location, history, geology, cultural and wildlife resources. Provide stewardship information to help preserve the special landscape character. Make available for outreach programs such as Conservation and Outdoor Recreation Education, Take It Outside, National Public Lands Day, etc.

Monitoring: Vehicle counters with routine surveys and observation. Informal visitor surveys and formal focus groups as funding allows.

Management: Signs present at key access points; additional directional signs present along trails. High priority area for development of interpretive signs.

Administrative:

Agreements: Maintain cooperative agreements with Wyoming State Land Board and Wyoming Department of Game and Fish.

| HOLE-IN-THE-WALL RECREATION MANAGEMENT ZONE (RMZ) | | |
|---|--|--|
| Outcome Objective | | |
| The Hole-in-the-Wall RMZ will be sustained or enhanced for visitors to engage in hiking, camping, horseback riding, and hunting (fall) so that participants in visitor assessments/surveys indicate a higher than average (mean average of 4.0 on a 5 point scale) realization of experience and benefit outcomes listed below in Back Country and Middle Country settings. | | |
| TARGETED OPPORTUNITIES & OUTCOMES | | |
| Activity Opportunities | Outcomes | |
| | Experiences | Benefits |
| <ul style="list-style-type: none"> ● Hiking/backpacking ● Camping ● Hunting (fall season) ● Horse riding/packing ● Nature Viewing | <ul style="list-style-type: none"> ● Enjoying the sensory experience of a natural landscape ● Developing skills and abilities ● Testing endurance ● Being isolated and independent ● Enjoying exploring on my own or in small groups ● Enjoying nature ● Feeling good about solitude | <p>Personal:</p> <ul style="list-style-type: none"> ● Enhanced awareness and understanding of nature ● Closer relationship with the natural world ● Improved opportunity to view wildlife close-up ● Improved mental health ● Improved physical health ● Greater appreciation of the outdoor environment ● Feeling good about how this attraction is being used and enjoyed <p>Community/Social: none identified</p> <p>Environmental:</p> <ul style="list-style-type: none"> ● Greater retention of distinctive natural landscape features ● Increased sense of stewardship for the resource ● Reduced negative human impacts such as litter, vegetative trampling, and unplanned trails <p>Economic:</p> <ul style="list-style-type: none"> ● Maintenance of community’s distinctive recreation/tourism market niche or character |
| DESIRED FUTURE RECREATION SETTING CHARACTER | | |
| Physical | Social | Operational |
| <p><i>Remoteness:</i> Within a 0.5 mile of four-wheel drive routes.</p> <p><i>Naturalness:</i> Natural setting may have modifications that would be noticed but not draw the attention of an observer wandering through the area.</p> <p><i>Facilities:</i> Rustic facilities such as campsites, a basic toilet, small kiosks, basic trailheads and marked trails.</p> | <p><i>Contacts With Others:</i> Average encounters per day during peak hunting use season (September - November) would be fewer than 3 encounters off travel routes and 3–6 encounters on travel routes.</p> <p><i>Group Size:</i> Group sizes are expected to remain small (less than 3 people per group).</p> <p><i>Evidence of use:</i> Areas of alteration uncommon. Little surface vegetation wear observed. Sounds of people infrequent.</p> | <p><i>Mechanized Use:</i> Nonmotorized, mechanized use is allowed on designated trails. Due to the steep topography, mechanized recreation is prohibited within the canyon. Should conflicts arise between mechanized use and other nonmotorized recreationists, the recreation area management plan will be adapted via a public comment period.</p> <p><i>Management Controls and Visitor Services:</i> On site controls and services are present but subtle. Offsite services and controls provided in the minimum amount necessary to reach management objectives.</p> |
| SUPPORT ACTIONS | | |

| | |
|--|--|
| Recreation Management Actions | Utilize adaptive management techniques to provide identified recreation opportunities (activities, experiences, and benefits) and reach desired future setting conditions. Special Recreation Permits will be allowed in this area so long as setting condition and outcome objectives can be maintained. Continue to enhance the availability of dependable non-potable water sources for recreationists. |
| Information and Education (including promotion and interpretation) | Ensure targeted experiences and benefits as well as recreation setting information is included and explained in all visitor information. Existing offsite and onsite visitor orientation (kiosk, signs, and informational brochures) will be maintained and enhanced. |
| Administration | Consider the use of a Memorandum of Understanding or other cooperative agreement between the Bureau of Land Management and pertinent partners to maintain and enhance the area. |
| Monitoring (and Evaluation) | <ul style="list-style-type: none"> • Solicit partnerships and cooperative agreements to: monitor outcome attainment and preferences through focus group interviews or visitor studies. • Monitor recreation setting condition through onsite patrols during the high use season (August-November). |
| Interdisciplinary Support Actions | Visual Resource Management Class II; travel limited to designated routes. |

| BUFFALO CREEK RECREATION MANAGEMENT ZONE (RMZ) | | |
|---|--|---|
| Outcome Objective | | |
| <p>The Buffalo Creek RMZ of the Hole-in-the-Wall Special Recreation Management Area (SRMA) will be sustained or enhanced for visitors to engage in camping, hiking, horseback riding, hunting (fall) and fishing so that participants in visitor assessments/surveys indicate a higher than average (mean average of 4.0 on a 5 point scale) realization of experience and benefit outcomes listed below in Back Country and Middle Country settings.</p> | | |
| TARGETED OPPORTUNITIES & OUTCOMES | | |
| Activity Opportunities | Outcomes | |
| | Experiences | Benefits |
| <ul style="list-style-type: none"> • Camping • Fishing • Hiking/backpacking • Hunting (fall season) • Horse riding/packing • Nature Viewing | <ul style="list-style-type: none"> • Enjoying the sensory experience of a natural landscape • Developing skills and abilities • Testing endurance • Enjoying exploring on my own or in small groups • Enjoying nature • Feeling good about solitude, isolation, and independence | <p>Personal:</p> <ul style="list-style-type: none"> • Enhanced awareness and understanding of nature • Closer relationship with the natural world • Improved opportunity to view wildlife close-up • Improved mental health • Improved physical health • Greater appreciation of the outdoor environment • Enlarged sense of personal accountability for acting responsibly on public lands <p>Community/Social: none identified</p> <p>Environmental:</p> <ul style="list-style-type: none"> • Greater retention of distinctive natural landscape features • Increased sense of stewardship for the resource • Reduced wildlife disturbance from recreation facility development <p>Economic:</p> <ul style="list-style-type: none"> • Enhanced ability for visitors and resident to find areas providing desired recreation experiences and benefits |
| DESIRED FUTURE RECREATION SETTING CHARACTER | | |
| Physical | Social | Operational |

| | | |
|--|---|--|
| <p><i>Remoteness:</i> Within 0.5 mile of four-wheel drive routes.</p> <p><i>Naturalness:</i> Natural setting may have modifications that would be noticed but not draw the attention of an observer wandering through the area.</p> <p><i>Facilities:</i> Rustic facilities such as campsites, a basic toilet, small kiosks, basic trailheads and marked trails.</p> | <p><i>Contacts With Others:</i> Average encounters per day during peak hunting use season (September - November) would be less than 3 encounters off travel routes and 3–6 encounters on travel routes.</p> <p><i>Group Size:</i> Group sizes are expected to remain small (less than 3 people per group).</p> <p><i>Evidence of use:</i> Areas of alteration uncommon. Little surface vegetation wear observed. Sounds of people infrequent.</p> | <p><i>Mechanized Use:</i> Nonmotorized, mechanized use is allowed on designated trails. Due to the steep topography, mechanized recreation is prohibited within the canyon. Should conflicts arise between mechanized use and other nonmotorized recreationists, the recreation area management plan will be adapted via a public comment period.</p> <p><i>Management Controls and Visitor Services:</i> On site controls and services are present but subtle. Offsite services and controls provided in the minimum amount necessary to reach management objectives.</p> |
| SUPPORT ACTIONS | | |
| Recreation Management Actions | <p>Utilize adaptive management techniques to provide identified recreation opportunities (activities, experiences, and benefits) and reach desired future setting conditions.</p> <p>Special Recreation Permits will be allowed in this area so long as setting condition and outcome objectives can be maintained.</p> <p>Continue to enhance the availability of dependable non-potable water sources for recreationists.</p> | |
| Information and Education (including promotion and interpretation) | <p>Ensure targeted experiences and benefits as well as recreation setting information is included and explained in all visitor information.</p> <p>Existing offsite and onsite visitor orientation (kiosk, signs, and informational brochures) will be maintained and enhanced.</p> | |
| Administration | <p>Consider the use of a Memorandum of Understanding or other cooperative agreement between the Bureau of Land Management and pertinent partners to maintain and enhance the area.</p> | |
| Monitoring (and Evaluation) | <ul style="list-style-type: none"> • Solicit partnerships and cooperative agreements to: monitor outcome attainment and preferences through focus group interviews or visitor studies. • Monitor recreation setting condition through onsite patrols during the high use season (August-November). | |
| Interdisciplinary Support Actions | <p>Visual Resource Management Class II; travel limited to designated routes.</p> | |

T.4. Middle Fork Powder River Management Area

Supporting Information and Rationale

This SRMA is necessary to accommodate national visitor demand for semi-primitive nonmotorized recreational opportunities in the Red Wall/southern Big Horns region; this demand has been identified by local organizations, community involvement workshops, and through visitor use data. The area has abundant wildlife, a nearly pristine Red Wall viewshed, and a moderate probability for solitude. SRMA management will sustain and enhance these amenities as well as accommodate the visitor demand.

| MIDDLE FORK POWDER RIVER SPECIAL RECREATION MANAGEMENT AREA (SRMA) |
|--|
| <p>OBJECTIVES & DECISIONS</p> <p><i>Objective Statement:</i> Within the Middle Fork Powder River SRMA, by the year 2016 and thereafter, participants in recreation assessments will report an average 4.0 realization of the targeted experiences and benefits (4.0 on a probability scale, where 1.0 equals not realized and 5.0 equals totally realized) listed below. The Middle Fork Powder River SRMA will offer opportunities for nonmotorized recreationists to engage in fishing, hunting, horseback riding, hiking, mountain biking, nature viewing and appropriate related off-highway vehicle (OHV) use. Within the management area, the existing natural and physical character of the landscape will be modified only by primitive trail developments and minimal associated recreation and interpretive facilities.</p> <p><i>Activities:</i> Fishing, camping, hunting, horseback riding, hiking, mountain biking, interpretation of natural and cultural resources, backpacking, OHV use in conjunction with aforementioned activities</p> <p><i>Experiences:</i> Developing skills and abilities, testing endurance, enjoying having a wide variety of environments within a single recreation area, savoring the total sensory experience of a landscape</p> <p><i>Benefits:</i> Greater sense of adventure, greater retention of distinctive natural landscape features; improved skills for outdoor enjoyment</p> |
| <p>RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS</p> <p><i>Physical Characteristics:</i> Within a 0.5 mile of four-wheel drive routes in most of the region. The character of the natural landscape within the Middle Fork viewshed is largely maintained, with primitive routes and several ranch facilities visible. In the interior of the Middle Fork region, modification to the natural landscape is in harmony with surroundings. Desired future conditions will include maintained and marked trails, simple trailhead developments in the Ed O. Taylor Recreation Management Zone (RMZ) and rustic facilities such as campsites, basic toilets and interpretive displays in the Outlaw Cave RMZ.</p> <p><i>Social Characteristics:</i> From 2006 to 2010, the average annual estimated visitation to the Middle Fork Region was 4701 visits and 4871 visitor days. During the peak use season (July through Oct.) contacts are characterized by 3-6 encounters off travel routes and 7-15 encounters per day on travel routes. Outside of peak season, contacts are rare. Most groups consist of less than 4-6 people. Small areas of terrain alteration are present near major roads. The sounds of other people are rarely heard.</p> <p><i>Operational Characteristics:</i> Foot and horse travel and mechanized use (mountain bikes) are allowed; motorized use is limited to designated routes. Basic maps provided on trailhead kiosks, staff infrequently present to provide onsite assistance. Some regulatory and ethics signing is present in parking lots.</p> |
| <p>MANAGEMENT ACTIONS & ALLOWABLE USE DECISIONS</p> |

Recreation and Visitor Services Program: Standard 14-day camping limit applies; prioritized for education efforts to mitigate impacts from recreational target shooting; currently not eligible for Federal Lands Recreation Enhancement Act but may be evaluated if future investments in visitor services meet eligibility requirements.

Oil & Gas Leasing/Minerals: Closed to leasing. Recommended for withdrawal from mineral entry. Salable mineral development for administrative use only.

VRM: Class II

Renewable Energy: Renewable energy exclusion area

Lands and Realty: ROW exclusion area

Travel Management: The area will be managed as limited to designated routes. Identify routes to close and reclaim. Modify appropriate routes into nonmotorized trails.

Special Recreation Permits (SRPs): SRPs will be issued as a discretionary action for a wide variety of uses, consistent with resource/program objectives, and within budgetary/workload constraints. Develop criteria for potential limitations on issuance of SRPs to clarify when noncommercial activities may take place under a letter of agreement or to avoid saturation of commercial or organized use. Develop special stipulations for SRPs to protect the recreation setting as appropriate.

Livestock Grazing: Middle Fork Canyon is deemed unsuitable for grazing due to steep slopes.

WSRs: The canyon within 0.25 mile of the Middle Fork Powder River is managed under Manual 6400 – Wild and Scenic Rivers and the Middle Fork Powder River Interim Management Plan to protect outstandingly remarkable values.

IMPLEMENTATION DECISIONS

Marketing: Provide maps and information at the field office. Directional signage present from Highway 191 and Barnum Road. Develop interpretive signs at entrance to management area and at Outlaw Cave Campground on general location, history, geology, and wildlife resources. Provide stewardship information to help preserve the special landscape character. Make available for outreach programs such as Conservation and Outdoor Recreation Education, Take It Outside, National Public Lands Day, etc.

Monitoring: Vehicle counters with routine surveys and observation. Informal visitor surveys and formal focus groups as funding allows.

Management: Signs present at key access points; additional directional signs present along trails. High priority area for development of interpretive signs.

Administrative:

Agreements: Maintain cooperative agreements with Wyoming State Land Board and Wyoming Department of Game and Fish.

OUTLAW CAVE RECREATION MANAGEMENT ZONE (RMZ)

Outcome Objective

The Outlaw Cave RMZ of the Middle Fork Canyon Special Recreation Management Area (SRMA) will be sustained or enhanced for visitors to engage in fishing, camping, hiking, horseback riding, hunting (fall) and appropriate off-highway vehicle (OHV) use so that participants in visitor assessments/surveys indicate a higher than average (mean average of 4.0 on a 5 point scale) realization of experience and benefit outcomes listed below in Back Country and Middle Country settings.

TARGETED OPPORTUNITIES & OUTCOMES

| Activity Opportunities | Outcomes | |
|------------------------|-------------|----------|
| | Experiences | Benefits |
| | | |

| | | |
|--|---|---|
| <ul style="list-style-type: none"> ● Camping ● Fishing ● Hiking/backpacking ● Hunting (fall season) ● Horse riding/packing ● Nature Viewing ● OHV Use | <ul style="list-style-type: none"> ● Enjoying the sensory experience of a natural landscape ● Developing skills and abilities ● Testing endurance ● Being isolated and independent ● Enjoying exploring on my own or in small groups ● Enjoying nature ● Feeling good about solitude | <p>Personal:</p> <ul style="list-style-type: none"> ● Enhanced awareness and understanding of nature ● Closer relationship with the natural world ● Improved opportunity to view wildlife close-up ● Improved mental health ● Improved physical health ● Greater appreciation of the outdoor environment ● Increased appreciation of area’s cultural history <p>Community/Social: none identified</p> <p>Environmental:</p> <ul style="list-style-type: none"> ● Greater retention of distinctive natural landscape features ● Increased sense of stewardship for the resource <p>Economic:</p> <ul style="list-style-type: none"> ● Enhanced ability for visitors and resident to find areas providing desired recreation experiences and benefits |
|--|---|---|

DESIRED FUTURE RECREATION SETTING CHARACTER

| Physical | Social | Operational |
|--|--|--|
| <p><i>Remoteness:</i> Within 0.5 mile of four-wheel drive routes.</p> <p><i>Naturalness:</i> Natural setting may have modifications that would be noticed but not draw the attention of an observer wandering through the area.</p> <p><i>Facilities:</i> Rustic facilities such as campsites, a basic toilet, small kiosks, basic trailheads and marked trails.</p> | <p><i>Contacts With Others:</i> Average encounters per day during peak hunting use season (September - November) would be approximately 3–6 encounters off travel routes and 7–15 encounters on travel routes.</p> <p><i>Group Size:</i> Group sizes are expected to remain small (4–6 people per group).</p> <p><i>Evidence of use:</i> Small areas of alteration present. Surface vegetation showing wear with some bare soils. Sounds of people infrequent.</p> | <p><i>Mechanized Use:</i> Nonmotorized, mechanized use is allowed on designated trails. Due to the steep topography, mechanized recreation is prohibited within the canyon. Should conflicts arise between mechanized use and other nonmotorized recreationists, the recreation area management plan will be adapted via a public comment period.</p> <p><i>Management Controls and Visitor Services:</i> On site controls and services are present but subtle. Offsite services and controls provided in the minimum amount necessary to reach management objectives.</p> |

SUPPORT ACTIONS

| | |
|---|--|
| <p>Recreation Management Actions</p> | <p>Utilize adaptive management techniques to provide identified recreation opportunities (activities, experiences, and benefits) and reach desired future setting conditions.</p> <p>Special Recreation Permits will be allowed in this area so long as setting condition and outcome objectives can be maintained.</p> <p>Enhance the availability of dependable both potable and non-potable water sources for recreationists and packstock.</p> |
| <p>Information and Education (including promotion and interpretation)</p> | <p>Ensure targeted experiences and benefits as well as recreation setting information is included and explained in all visitor information.</p> <p>Existing offsite and onsite visitor orientation (kiosk, signs, and informational brochures) will be maintained and enhanced.</p> |
| <p>Administration</p> | <p>Consider the use of a Memorandum of Understanding or other cooperative agreement between the Bureau of Land Management and pertinent partners to maintain and enhance the area.</p> |

| | |
|-----------------------------------|--|
| Monitoring (and Evaluation) | <ul style="list-style-type: none"> • Solicit partnerships and cooperative agreements to: monitor outcome attainment and preferences through focus group interviews or visitor studies. • Monitor recreation setting condition through onsite patrols during the high use season (August-November). |
| Interdisciplinary Support Actions | Visual Resource Management Class II; travel limited to designated routes. |

ED O. TAYLOR RECREATION MANAGEMENT ZONE (RMZ)

Outcome Objective

The Ed O. Taylor RMZ of the Middle Fork Canyon Special Recreation Management Area (SRMA) will be managed in cooperation with Wyoming Game and Fish Department for visitors to engage in fishing, camping, hiking, horseback riding, hunting (fall) and appropriate related off-highway vehicle (OHV) use so that participants in visitor assessments/surveys indicate a higher than average (mean average of 4.0 on a 5 point scale) realization of experience and benefit outcomes listed below in Back Country and Middle Country settings.

TARGETED OPPORTUNITIES & OUTCOMES

| Activity Opportunities | Outcomes | |
|--|---|--|
| | Experiences | Benefits |
| <ul style="list-style-type: none"> • Camping • Fishing • Hiking/backpacking • Hunting (fall season) • Horse riding/packing • Nature Viewing • OHV Use | <ul style="list-style-type: none"> • Enjoying the sensory experience of a natural landscape • Developing skills and abilities • Testing endurance • Feeling good about solitude, isolation and independence | <p>Personal:</p> <ul style="list-style-type: none"> • Enhanced awareness and understanding of nature • Closer relationship with the natural world • Improved opportunity to view wildlife close-up • Improved mental health • Improved physical health • Greater appreciation of the outdoor environment • Better understanding of wildlife’s contribution to own quality of life <p>Community/Social: none identified</p> <p>Environmental:</p> <ul style="list-style-type: none"> • Greater retention of distinctive natural landscape features • Increased sense of stewardship for the resource • Reduced wildlife harassment by recreation users • Reduced wildlife disturbance from recreation facility development <p>Economic:</p> <ul style="list-style-type: none"> • Enhanced ability for visitors and resident to find areas providing desired recreation experiences and benefits |

DESIRED FUTURE RECREATION SETTING CHARACTER

| | | |
|----------|--------|-------------|
| Physical | Social | Operational |
|----------|--------|-------------|

| | | |
|--|--|--|
| <p><i>Remoteness:</i> Within 0.5 mile of four-wheel drive routes.</p> <p><i>Naturalness:</i> Natural setting may have modifications that would be noticed but not draw the attention of an observer wandering through the area.</p> <p><i>Facilities:</i> Rustic facilities such as campsites, a basic toilet, small kiosks, basic trailheads and marked trails.</p> | <p><i>Contacts With Others:</i> Average encounters per day during peak hunting use season (September - November) would be approximately 3–6 encounters off travel routes and 7–15 encounters on travel routes.</p> <p><i>Group Size:</i> Group sizes are expected to remain small (4–6 people per group).</p> <p><i>Evidence of use:</i> Small areas of alteration present. Surface vegetation showing wear with some bare soils. Sounds of people infrequent.</p> | <p><i>Mechanized Use:</i> Nonmotorized, mechanized use is allowed on designated trails. Due to the steep topography, mechanized recreation is prohibited within the canyon. Should conflicts arise between mechanized use and other nonmotorized recreationists, the recreation area management plan will be adapted via a public comment period.</p> <p><i>Management Controls and Visitor Services:</i> On site controls and services are present but subtle. Offsite services and controls provided in the minimum amount necessary to reach management objectives.</p> |
| SUPPORT ACTIONS | | |
| <p>Recreation Management Actions</p> | <p>Utilize adaptive management techniques to provide identified recreation opportunities (activities, experiences, and benefits) and reach desired future setting conditions.</p> <p>Special Recreation Permits will be allowed in this area so long as setting condition and outcome objectives can be maintained.</p> <p>Continue to enhance the availability of dependable non-potable water sources for recreationists.</p> | |
| <p>Information and Education (including promotion and interpretation)</p> | <p>Ensure targeted experiences and benefits as well as recreation setting information is included and explained in all visitor information.</p> <p>Existing offsite and onsite visitor orientation (kiosk, signs, and informational brochures) will be maintained and enhanced.</p> | |
| <p>Administration</p> | <p>Consider the use of a Memorandum of Understanding or other cooperative agreement between the Bureau of Land Management and pertinent partners to maintain and enhance the area.</p> | |
| <p>Monitoring (and Evaluation)</p> | <ul style="list-style-type: none"> • Solicit partnerships and cooperative agreements to: monitor outcome attainment and preferences through focus group interviews or visitor studies. • Monitor recreation setting condition through onsite patrols during the high use season (August-November). | |
| <p>Interdisciplinary Support Actions</p> | <p>Visual Resource Management Class II; travel limited to designated routes.</p> | |

T.5. Mosier Gulch Management Area

Supporting Information and Rationale

The Mosier Gulch SRMA is necessary to accommodate local visitor demand for nonmotorized recreational opportunities near the City of Buffalo; this demand has been identified through focus groups, community involvement workshops, and through visitor use data. Mosier Gulch is located within 3 miles of the Buffalo City Limits. This parcel provides seamless recreational opportunities as it connects with the Buffalo Greenbelt and additional public lands. SRMA management will sustain and enhance these amenities as well as accommodate the visitor demand. The area boasts excellent fishing opportunities and easy access to natural resource based recreational opportunities. SRMA management will sustain and enhance these amenities as well as accommodate the visitor demand.

MOSIER GULCH SPECIAL RECREATION MANAGEMENT AREA (SRMA) OBJECTIVES & DECISIONS

Objective Statement: Within the Mosier Gulch SRMA, by the year 2015 and thereafter, participants in recreation assessments will report an average 4.0 realization of the targeted experiences and benefits (4.0 on a probability scale, where 1.0 equals not realized and 5.0 equals totally realized) listed below. The Mosier Gulch SRMA will offer opportunities for recreationists to engage in jogging, hiking, mountain biking, fishing, hunting and nature viewing and other forms of nonmotorized dispersed recreation in a partially modified physical recreation setting with predominantly nonmotorized public use. Within the management area, the existing natural and physical character of the landscape will be modified by recreational trail developments and associated recreation and interpretive facilities.

Activities: Trail system access for jogging, walking, hiking, mountain biking, picnicking, and fishing.

Experiences: Enjoying frequent exercise, enjoying having easy access to natural landscapes, enjoying having access to close-to-home outdoor amenities.

Benefits: Improved physical fitness and health maintenance, heightened sense of community sense of place, lifestyle improvement, increased desirability as a place to live or retire.

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics: Within 0.5 mile of paved/primary roads and highways; character of the natural landscape partially modified but none overpower the natural landscape; maintained and marked trails, simple trailhead developments and basic toilet.

Social Characteristics: From 2006 to 2010, the average annual estimated visitation was 2386 visits and 355 visitor days (RMIS). Approximately 5-8 encounters per day off travel routes (staging areas) and approximately 5 encounters on travel routes. Most groups consist of 2-5 people. Small areas of terrain alteration are prevalent near the trailhead and parking areas. Surface vegetation gone with compacted soils observed. The sounds of other people are regularly heard.

Operational Characteristics: Foot travel and mountain bikes are predominate, motorized use allowed only on main road. Basic information provided, staff infrequently present. Some regulatory and ethics signing, moderate use restrictions.

MANAGEMENT ACTIONS & ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program: Standard 14-day camping limit applies; developed site closed to camping and recreational target shooting; currently not eligible for Federal Lands Recreation Enhancement Act but may be evaluated if future investments in visitor services meet eligibility requirements.

Oil & Gas Leasing/Minerals: Closed to leasing. Recommended for withdrawal from mineral entry. Salable mineral development for administrative use only.

VRM: Class II

Renewable Energy: Renewable energy exclusion area

Lands and Realty: Rights-of-Way (ROW) exclusion area

Special Recreation Permits (SRPs): SRPs will be issued as a discretionary action for a wide variety of uses, consistent with resource/program objectives, and within budgetary/workload constraints. Develop criteria for potential limitations on issuance of SRPs to clarify when noncommercial activities may take place under a letter of agreement or to avoid saturation of commercial or organized use. Develop special stipulations for SRPs to protect the recreation setting as appropriate.

Travel Management: The area will be managed as limited to designated routes, with very few routes designated. Identify routes to close and reclaim. Modify appropriate routes into nonmotorized trails. Designated routes will be primarily for provision of access to provide egress for administrative use.

Livestock Grazing: The picnic area is closed to grazing. The 120-acre parcel along Clear Creek Trail on Grouse Mountain is deemed unsuitable for grazing due to steep slopes.

| IMPLEMENTATION DECISIONS |
|--|
| <p>Marketing: Provide maps and information at the field office. Directional signage present from Highway 16. Develop interpretive signs at trailhead/parking area on general location, history, geology, and wildlife resources. Provide stewardship information to help preserve the special landscape character. Make available for outreach programs such as Conservation and Outdoor Recreation Education, Take It Outside, National Public Lands Day, etc.</p> <p>Monitoring: Vehicle counters with routine surveys and observation. Informal visitor surveys and formal focus groups as funding allows.</p> <p>Management: Signs present at key access points. Develop trailheads for foot, horse and bicycle travel.</p> <p>Administrative:</p> <p><i>Agreements:</i> Maintain cooperative agreements with City of Buffalo, U.S. Forest Service and Johnson County.</p> <p><i>Partners:</i> City of Buffalo, Buffalo Trails Board, U.S. Forest Service Powder River Ranger District, Johnson County Recreation District, and Wyoming Department of Game and Fish.</p> |

| MOSIER PICNIC AREA RECREATION MANAGEMENT ZONE RMZ | | |
|--|---|---|
| Outcome Objective | | |
| <p>The Mosier Gulch Picnic Area RMZ will be sustained or enhanced for individuals or small groups of nonmotorized recreationists, to engage in nature and wildlife viewing, picnicking and walking the interpretive trail so that participants in visitor assessments/surveys indicate a higher than average (mean average of 4.0 on a 5 point scale) realization of experience and benefit outcomes listed below in these Front Country settings:</p> | | |
| TARGETED OPPORTUNITIES & OUTCOMES | | |
| Activity Opportunities | Outcomes | |
| | Experiences | Benefits |
| <ul style="list-style-type: none"> ● Picnicking ● Fishing ● Nature Viewing | <ul style="list-style-type: none"> ● Increased desirability as a place to live or retire ● Enjoying having easy access to natural landscapes ● Enjoying having access to close-to-home outdoor amenities ● Enjoying the closeness of friends and family | <p>Personal:</p> <ul style="list-style-type: none"> ● Closer relationship with the natural world ● Improved mental health ● Improved physical health ● Greater appreciation of the outdoor environment ● Greater awareness that this community is a special place ● Improved sense of personal responsibility for control of domestic pets <p>Community/Social:</p> <ul style="list-style-type: none"> ● Improved community integration ● Lifestyle improvement or maintenance ● Heightened sense of community satisfaction <p>Environmental:</p> <ul style="list-style-type: none"> ● Greater community ownership and stewardship of park, recreation, and natural resources ● Reduced negative human impacts such as litter, vegetative trampling, and unplanned trails <p>Economic:</p> <ul style="list-style-type: none"> ● Increased desirability as a place to live or retire |
| DESIRED FUTURE RECREATION SETTING CHARACTER | | |
| Physical | Social | Operational |

| | | |
|--|--|--|
| <p><i>Remoteness:</i> Within a 0.5 mile of paved/primary roads and highways.</p> <p><i>Naturalness:</i> Character of natural landscape partially modified but none overpower natural landscape.</p> <p><i>Facilities:</i> Maintained and marked trails, simple trailhead developments and basic toilets. Interpretive displays may also be incorporated.</p> | <p><i>Contacts With Others:</i> Encounters with other groups average 2-4 encounters per day in staging areas and fewer than 5 encounters on travel routes.</p> <p><i>Group Size:</i> Group sizes are expected to remain small (less than 5 people per group).</p> <p><i>Evidence of use:</i> Small areas of terrain alteration are prevalent near the trailhead and parking areas. Surface vegetation gone with compacted soils observed. Sounds of other people common.</p> | <p><i>Mechanized Use:</i> Mechanized travel is allowed only on designated trails.</p> <p><i>Management Controls and Visitor Services:</i> On site controls and services are present but subtle. Offsite services and controls provided in the minimum amount necessary to reach management objectives.</p> |
|--|--|--|

| SUPPORT ACTIONS | |
|--|--|
| Recreation Management Actions | Utilize adaptive management techniques to provide identified recreation opportunities (activities, experiences, and benefits) and reach desired future setting conditions. Special Recreation Permits will be allowed in this area so long as setting condition and outcome objectives can be maintained. |
| Information and Education (including promotion and interpretation) | Ensure targeted experiences and benefits as well as recreation setting information is included and explained in all visitor information. Existing offsite and onsite visitor orientation (kiosk, signs, and informational brochures) will be maintained and enhanced. |
| Administration | Continue Memorandum of Understanding and consider other cooperative agreements between the Bureau of Land Management and pertinent partners to maintain and enhance the area. |
| Monitoring (and Evaluation) | Solicit partnerships and cooperative agreements to: monitor outcome attainment and preferences through focus group interviews or visitor studies. |
| Interdisciplinary Support Actions | Visual Resource Management Class II; travel limited to designated routes. |

CLEAR CREEK TRAIL SYSTEM RECREATION MANAGEMENT ZONE (RMZ)

Outcome Objective

The Clear Creek Trail System RMZ will be sustained or enhanced for individuals or small groups of nonmotorized recreationists, to engage in nature and wildlife viewing, walking and hiking the Clear Creek trail so that participants in visitor assessments/surveys indicate a higher than average (mean average of 4.0 on a 5 point scale) realization of experience and benefit outcomes listed below in these Front Country settings:

| TARGETED OPPORTUNITIES & OUTCOMES | | |
|--|-------------|----------|
| Activity Opportunities | Outcomes | |
| | Experiences | Benefits |
| | | |

| | | |
|---|--|---|
| <ul style="list-style-type: none"> ● Jogging ● Mountain Biking ● Walking ● Hiking ● Nature Viewing | <ul style="list-style-type: none"> ● Enjoying frequent exercise ● Enjoying having easy access to natural landscapes ● Enjoying having access to close-to-home outdoor amenities ● Enjoying the closeness of friends and family | <p>Personal:</p> <ul style="list-style-type: none"> ● Closer relationship with the natural world ● Improved mental health ● Improved physical health ● Greater appreciation of the outdoor environment ● Improved sense of personal responsibility for control of domestic pets <p>Community/Social:</p> <ul style="list-style-type: none"> ● Improved community integration ● Lifestyle improvement or maintenance ● Heightened sense of community satisfaction <p>Environmental:</p> <ul style="list-style-type: none"> ● Greater community ownership and stewardship of park, recreation, and natural resources ● Maintenance of distinctive recreation setting character <p>Economic:</p> <ul style="list-style-type: none"> ● Increased desirability as a place to live or retire |
|---|--|---|

DESIRED FUTURE RECREATION SETTING CHARACTER

| Physical | Social | Operational |
|--|--|--|
| <p><i>Remoteness:</i> Within a 0.5 mile of paved/primary roads and highways.</p> <p><i>Naturalness:</i> Character of natural landscape partially modified but none overpower natural landscape.</p> <p><i>Facilities:</i> Maintained and marked trails, simple trailhead developments and basic toilets. Interpretive displays may also be incorporated.</p> | <p><i>Contacts With Others:</i> Encounters with other groups average 2-4 encounters per day in staging areas and fewer than 5 encounters on travel routes.</p> <p><i>Group Size:</i> Group sizes are expected to remain small (less than 5 people per group).</p> <p><i>Evidence of use:</i> Small areas of terrain alteration are prevalent near the trailhead and parking areas. Surface vegetation gone with compacted soils observed. Sounds of other people common.</p> | <p><i>Mechanized Use:</i> Mechanized travel is allowed only on designated trails.</p> <p><i>Management Controls and Visitor Services:</i> On site controls and services are present but subtle. Offsite services and controls provided in the minimum amount necessary to reach management objectives.</p> |

SUPPORT ACTIONS

| | |
|---|---|
| <p>Recreation Management Actions</p> | <p>Utilize adaptive management techniques to provide identified recreation opportunities (activities, experiences, and benefits) and reach desired future setting conditions.</p> <p>Special Recreation Permits will be allowed in this area so long as setting condition and outcome objectives can be maintained.</p> |
| <p>Information and Education (including promotion and interpretation)</p> | <p>Ensure targeted experiences and benefits as well as recreation setting information is included and explained in all visitor information.</p> <p>Existing offsite and onsite visitor orientation (kiosk, signs, and informational brochures) will be maintained and enhanced.</p> |
| <p>Administration</p> | <p>Continue Memorandum of Understanding and consider other cooperative agreements between the Bureau of Land Management and pertinent partners to maintain and enhance the area.</p> |
| <p>Monitoring (and Evaluation)</p> | <p>Solicit partnerships and cooperative agreements to: monitor outcome attainment and preferences through focus group interviews or visitor studies.</p> |
| <p>Interdisciplinary Support Actions</p> | <p>Visual Resource Management Class II; travel limited to designated routes.</p> |

| NORTH RIDGE RECREATION MANAGEMENT ZONE (RMZ) | | |
|---|--|--|
| Outcome Objective | | |
| The North Ridge RMZ will be sustained or enhanced for individuals or small groups of nonmotorized recreationists, to engage in nature and wildlife viewing, hunting and fishing so that participants in visitor assessments/surveys indicate a higher than average (mean average of 4.0 on a 5 point scale) realization of experience and benefit outcomes listed below in these Front Country: | | |
| TARGETED OPPORTUNITIES & OUTCOMES | | |
| Activity Opportunities | Outcomes | |
| | Experiences | Benefits |
| <ul style="list-style-type: none"> • Hunting • Nature Viewing | <ul style="list-style-type: none"> • Enjoying having easy access to natural landscapes • Enjoying maintaining out-of-town country solitude | <p>Personal:</p> <ul style="list-style-type: none"> • Closer relationship with the natural world • Improved mental health • Improved physical health • Greater appreciation of the outdoor environment <p>Community/Social:</p> <ul style="list-style-type: none"> • Heightened sense of community satisfaction <p>Environmental:</p> <ul style="list-style-type: none"> • Greater community ownership and stewardship of park, recreation, and natural resources • Greater protection of fish, wildlife, and plant habitat from growth, development, and public use impacts <p>Economic:</p> <ul style="list-style-type: none"> • Increased desirability as a place to live or retire |
| DESIRED FUTURE RECREATION SETTING CHARACTER | | |
| Physical | Social | Operational |
| <p><i>Remoteness:</i> Within a 0.5 mile of paved/primary roads and highways.</p> <p><i>Naturalness:</i> Character of natural landscape retained. A few modifications contrast with character of the landscape (e.g., fences, primitive roads).</p> <p><i>Facilities:</i> No structures. Foot/horse trails only.</p> | <p><i>Contacts With Others:</i> Encounters with other groups average fewer than 3 encounters off of travel routes.</p> <p><i>Group Size:</i> Group sizes are expected to remain small (less than 3 people per group).</p> <p><i>Evidence of use:</i> Areas of alteration uncommon. Little surface vegetation wear observed. Sounds of people infrequent.</p> | <p><i>Mechanized Use:</i> Mechanized travel is allowed only on designated trails.</p> <p><i>Management Controls and Visitor Services:</i> On site controls and services are present but subtle. Offsite services and controls provided in the minimum amount necessary to reach management objectives.</p> |
| SUPPORT ACTIONS | | |
| Recreation Management Actions | Utilize adaptive management techniques to provide identified recreation opportunities (activities, experiences, and benefits) and reach desired future setting conditions. | |
| | Special Recreation Permits will be allowed in this area so long as setting condition and outcome objectives can be maintained. | |
| Information and Education (including promotion and interpretation) | Ensure targeted experiences and benefits as well as recreation setting information is included and explained in all visitor information. | |
| | Existing offsite and onsite visitor orientation (kiosk, signs, and informational brochures) will be maintained and enhanced. | |
| Administration | Continue Memorandum of Understanding and consider other cooperative agreements between the Bureau of Land Management and pertinent partners to maintain and enhance the area. | |

| | |
|-----------------------------------|---|
| Monitoring (and Evaluation) | Solicit partnerships and cooperative agreements to: monitor outcome attainment and preferences through focus group interviews or visitor studies. |
| Interdisciplinary Support Actions | Visual Resource Management Class II; travel limited to designated routes. |

T.6. Welch Ranch Management Area

SUPPORTING INFORMATION

This SRMA is necessary to accommodate local visitor demand for nonmotorized recreational opportunities near the City of Sheridan; this demand has been identified through focus groups, community involvement workshops, and through visitor use data. The Welch Ranch is located approximately 10 miles from Sheridan city limits. The Welch Ranch parcel offers public access to riparian areas, a unique opportunity for BLM-administered lands in northeastern Wyoming. SRMA management will sustain and enhance these amenities as well as accommodate the visitor demand. The area boasts excellent fishing opportunities and easy access to natural resource based recreational opportunities. SRMA management will sustain and enhance these amenities as well as accommodate the visitor demand.

| |
|---|
| WELCH RANCH SPECIAL RECREATION MANAGEMENT AREA (SRMA) OBJECTIVES & DECISIONS |
| <p><i>Objective Statement:</i> Within the Welch Ranch SRMA, by the year 2015 and thereafter, participants in recreation assessments will report an average 4.0 realization of the targeted experiences and benefits (4.0 on a probability scale, where 1.0 equals not realized and 5.0 equals totally realized) listed below. The Welch Ranch SRMA will offer opportunities for recreationists to engage in physical exercise, hiking, mountain biking, fishing, hunting and nature viewing and other forms of nonmotorized dispersed recreation in a partially modified physical recreation setting with predominantly nonmotorized public use. Within the management area, the existing natural and physical character of the landscape will be modified by recreational trail developments and associated recreation and interpretive facilities.</p> <p><i>Activities:</i> Hiking, mountain biking, fishing, hunting, environmental education.</p> <p><i>Experiences:</i> Enjoying frequent exercise, enjoying having easy access to natural landscapes, enjoying having access to close-to-home outdoor amenities.</p> <p><i>Benefits:</i> Improved physical fitness and health maintenance, a heightened sense of community sense of place, lifestyle improvement, greater freedom from urban living.</p> |
| RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS |
| <p><i>Physical Characteristics:</i> Within 0.5 mile of paved/primary roads and highways at east entrance; character of the natural landscape partially modified but none overpower the natural landscape; maintained and marked trails, simple trailhead developments.</p> <p><i>Social Characteristics:</i> From 2006 to 2010, the average annual estimated visitation was 1181 visits and 510 visitor days (RMIS). Contacts with other groups are not uncommon during high use seasons. Most groups consist of 2-4 people. Small areas of terrain alteration are present, but are attributed mostly to cattle operations. The sounds of other people are rarely heard. Approximately 1-2 encounters per day off travel routes (staging areas) and few encounters on travel routes.</p> <p><i>Operational Characteristics:</i> Foot travel and mountain bikes are predominate, motorized use prohibited. Basic information provided, staff infrequently present. Some regulatory and ethics signing, moderate use restrictions.</p> |
| MANAGEMENT ACTIONS & ALLOWABLE USE DECISIONS |

Recreation and Visitor Services Program: Campfires prohibited, camping prohibited in the parking areas and at trailheads; standard 14-day camping limit applies outside of parking areas; closed to recreational target shooting; currently not eligible for Federal Lands Recreation Enhancement Act but may be evaluated if future investments in visitor services meet eligibility requirements.

Oil & Gas Leasing/Minerals: Recommended for withdrawal from mineral entry. Salable mineral development for administrative use only. The area is closed to leasing of fluid minerals. Note: A portion of the leasable fluid minerals are not administered by the BLM.

VRM: Class II

Renewable Energy: Renewable energy exclusion area

Lands and Realty: ROW exclusion area

Special Recreation Permits (SRPs): SRPs will be issued as a discretionary action for a wide variety of uses, consistent with resource/program objectives, and within budgetary/workload constraints. Develop criteria for potential limitations on issuance of SRPs to clarify when noncommercial activities may take place under a letter of agreement or to avoid saturation of commercial or organized use. Develop special stipulations for SRPs to protect the recreation setting as appropriate.

Travel Management: The area will be managed as limited to designated routes; designated routes will provide egress for administrative use only. Identify routes to close and reclaim.

Areas of Critical Environmental Concern (ACECs): Welch Ranch ACEC relevant and important values will be incorporated into an ACEC and/or Recreation Area Management Plan.

IMPLEMENTATION DECISIONS

Marketing: Provide maps and information at the field office. Directional signage present from Highway 339. Develop interpretive signs at trailhead/parking area on general location, history, geology, and wildlife resources. Provide stewardship information to help preserve the special landscape character. Make available for outreach programs such as Conservation and Outdoor Recreation Education, Take It Outside, National Public Lands Day, etc.

Monitoring: Vehicle counters with routine surveys and observation. Informal visitor surveys and formal focus groups as funding allows.

Management: Signs present at key access points. Develop trailheads for foot, horse and bicycle travel.

Administrative:

Agreements: Seek out cooperative agreements with interested organizations.

Partners: Sheridan Community Land Trust, Sheridan Public Land Users, Wyoming State Land Board and Wyoming Department of Game and Fish, Sheridan County Conservation District. Pursue partnerships with Sheridan College, Sheridan County School District, private schools, non-profit organization including the YMCA, Boys and Girls Club and Science Kids to establish an outdoor classroom.

Other administration: Travel limited to designated routes and for administrative use only. Modify appropriate routes into nonmotorized trails. Livestock grazing will be managed in concert with other resource values under a site-specific allotment management plan. Overlaps ACEC (Appendix V (p. 757)).

TONGUE RIVER RECREATION MANAGEMENT ZONE (RMZ)

Outcome Objective

The Tongue River RMZ will be sustained or enhanced for individuals or small groups of nonmotorized recreationists, to engage in nature and wildlife viewing, fishing, hunting and foot and horse travel so that participants in visitor assessments/surveys indicate a higher than average (mean average of 4.0 on a 5 point scale) realization of experience and benefit outcomes listed below:

TARGETED OPPORTUNITIES & OUTCOMES

| Activity Opportunities | Outcomes | |
|------------------------|-------------|----------|
| | Experiences | Benefits |
| | | |

| | | |
|---|--|---|
| <ul style="list-style-type: none"> ● Boating ● Fishing ● Environmental Education ● Nature Viewing | <ul style="list-style-type: none"> ● Enjoying frequent exercise ● Enjoying having easy access to natural landscapes ● Enjoying having access to close-to-home outdoor amenities ● Enjoying the closeness of friends and family | <p>Personal:</p> <ul style="list-style-type: none"> ● Closer relationship with the natural world ● Improved mental health ● Improved physical health ● Greater appreciation of the outdoor environment <p>Community/Social:</p> <ul style="list-style-type: none"> ● Improved community integration ● Lifestyle improvement or maintenance ● Heightened sense of community satisfaction <p>Environmental:</p> <ul style="list-style-type: none"> ● Greater community ownership and stewardship of park, recreation, and natural resources ● Maintenance of distinctive recreation setting character ● Reduced wildlife disturbance from recreation facility development ● Improved soil, water, and air quality ● Greater protection of fish, wildlife, and plant habitat from growth, development, and public use impacts <p>Economic:</p> <ul style="list-style-type: none"> ● Increased desirability as a place to live or retire |
|---|--|---|

DESIRED FUTURE RECREATION SETTING CHARACTER

| Physical | Social | Operational |
|--|--|--|
| <p><i>Remoteness:</i> Within a 0.5 mile of paved/primary roads and highways.</p> <p><i>Naturalness:</i> Character of natural landscape partially modified but none overpower natural landscape.</p> <p><i>Facilities:</i> Maintained and marked trails, simple trailhead developments and basic toilets. Interpretive displays may also be incorporated.</p> | <p><i>Contacts With Others:</i> Encounters with other groups average 2-4 encounters per day in staging areas and fewer than 5 encounters on travel routes.</p> <p><i>Group Size:</i> Group sizes are expected to remain small (less than 5 people per group).</p> <p><i>Evidence of use:</i> Small areas of terrain alteration are prevalent near the trailhead and parking areas. Surface vegetation gone with compacted soils observed. Sounds of other people common.</p> | <p><i>Mechanized Use:</i> Mechanized travel is allowed only on designated trails.</p> <p><i>Management Controls and Visitor Services:</i> On site controls and services are present but subtle. Offsite services and controls provided in the minimum amount necessary to reach management objectives.</p> |

SUPPORT ACTIONS

| | |
|---|---|
| <p>Recreation Management Actions</p> | <p>Utilize adaptive management techniques to provide identified recreation opportunities (activities, experiences, and benefits) and reach desired future setting conditions.</p> <p>Special Recreation Permits will be allowed in this area so long as setting condition and outcome objectives can be maintained.</p> |
| <p>Information and Education (including promotion and interpretation)</p> | <p>Ensure targeted experiences and benefits as well as recreation setting information is included and explained in all visitor information.</p> <p>Existing offsite and onsite visitor orientation (kiosk, signs, and informational brochures) will be maintained and enhanced.</p> |
| <p>Administration</p> | <p>Consider other cooperative agreements between the Bureau of Land Management and pertinent partners to maintain and enhance the area.</p> |

| | |
|-----------------------------------|---|
| Monitoring (and Evaluation) | Solicit partnerships and cooperative agreements to: monitor outcome attainment and preferences through focus group interviews or visitor studies. |
| Interdisciplinary Support Actions | Visual Resource Management Class II. Mechanized and nonmotorized travel on designated trails. Motorized travel for administrative use only. Area of Critical Environmental Concern designation; discussed in Appendix V (p. 757). |

RIVER BOTTOM RECREATION MANAGEMENT ZONE (RMZ)

Outcome Objective

The River Bottom RMZ will be sustained or enhanced for individuals or small groups of nonmotorized recreationists, to engage in nature and wildlife viewing, fishing, hunting and foot and horse travel so that participants in visitor assessments/surveys indicate a higher than average (mean average of 4.0 on a 5 point scale) realization of experience and benefit outcomes listed below:

TARGETED OPPORTUNITIES & OUTCOMES

| Activity Opportunities | Outcomes | |
|--|--|--|
| | Experiences | Benefits |
| <ul style="list-style-type: none"> ● Jogging ● Walking ● Hiking ● Environmental Education ● Mountain Biking ● Horseback Riding ● Fishing ● Nature Viewing ● Hunting | <ul style="list-style-type: none"> ● Enjoying frequent exercise ● Enjoying having easy access to natural landscapes ● Enjoying having access to close-to-home outdoor amenities ● Enjoying the closeness of friends and family | <p>Personal:</p> <ul style="list-style-type: none"> ● Closer relationship with the natural world ● Improved mental health ● Improved physical health ● Greater appreciation of the outdoor environment <p>Community/Social:</p> <ul style="list-style-type: none"> ● Improved community integration ● Lifestyle improvement or maintenance ● Heightened sense of community satisfaction <p>Environmental:</p> <ul style="list-style-type: none"> ● Greater community ownership and stewardship of park, recreation, and natural resources ● Maintenance of distinctive recreation setting character ● Improved soil, water, and air quality ● Greater protection of fish, wildlife, and plant habitat from growth, development, and public use impacts <p>Economic:</p> <ul style="list-style-type: none"> ● Increased desirability as a place to live or retire |

DESIRED FUTURE RECREATION SETTING CHARACTER

| Physical | Social | Operational |
|---|--|--|
| <p><i>Remoteness:</i> Within a 0.5 mile of mechanized routes.</p> <p><i>Naturalness:</i> Character of natural landscape partially modified but none overpower natural landscape.</p> <p><i>Facilities:</i> Maintained and marked trails, simple trailhead developments and basic toilets. Interpretive displays may also be incorporated.</p> | <p><i>Contacts With Others:</i> Encounters with other groups average 2-4 encounters per day in staging areas and fewer than 5 encounters on travel routes.</p> <p><i>Group Size:</i> Group sizes are expected to remain small (less than 5 people per group).</p> <p><i>Evidence of use:</i> Small areas of terrain alteration are prevalent near the trailhead and parking areas. Surface vegetation gone with compacted soils observed. Sounds of other people common.</p> | <p><i>Mechanized Use:</i> Mechanized travel is allowed only on designated trails.</p> <p><i>Management Controls and Visitor Services:</i> On site controls and services are present but subtle. Offsite services and controls provided in the minimum amount necessary to reach management objectives.</p> |

SUPPORT ACTIONS

| | |
|--|--|
| Recreation Management Actions | Utilize adaptive management techniques to provide identified recreation opportunities (activities, experiences, and benefits) and reach desired future setting conditions. Special Recreation Permits will be allowed in this area so long as setting condition and outcome objectives can be maintained. |
| Information and Education (including promotion & interpretation) | Ensure targeted experiences and benefits as well as recreation setting information is included and explained in all visitor information. Existing offsite and onsite visitor orientation (kiosk, signs, and informational brochures) will be maintained and enhanced. |
| Administration | Continue Memorandum of Understanding and consider other cooperative agreements between the Bureau of Land Management and pertinent partners to maintain and enhance the area. |
| Monitoring (and Evaluation) | Solicit partnerships and cooperative agreements to: monitor outcome attainment and preferences through focus group interviews or visitor studies. |
| Interdisciplinary Support Actions | Visual Resource Management Class II. Mechanized and nonmotorized travel on designated trails. Motorized travel for administrative use only. Area of Critical Environmental Concern designation; discussed in Appendix V (p. 757). |

| UPLAND RECREATION MANAGEMENT ZONE (RMZ) | | |
|--|---|---|
| Outcome Objective | | |
| The Upland RMZ will be sustained or enhanced for individuals or small groups of nonmotorized recreationists, to engage in horseback riding, hiking, camping, hunting and nature viewing so that participants in visitor assessments/surveys indicate a higher than average (mean average of 4.0 on a 5 point scale) realization of experience and benefit outcomes listed below: | | |
| TARGETED OPPORTUNITIES & OUTCOMES | | |
| Activity Opportunities | Outcomes | |
| | Experiences | Benefits |
| <ul style="list-style-type: none"> • Hiking • Camping • Hunting | <ul style="list-style-type: none"> • Enjoying having easy access to natural landscapes • Enjoying having access to close-to-home outdoor amenities • Enjoying maintaining out-of-town country solitude | Personal: <ul style="list-style-type: none"> • Closer relationship with the natural world • Improved mental health • Improved physical health • Greater appreciation of the outdoor environment Community/Social: <ul style="list-style-type: none"> • Heightened sense of community satisfaction Environmental: <ul style="list-style-type: none"> • Greater community ownership and stewardship of park, recreation, and natural resources • Maintenance of distinctive recreation setting character Economic: <ul style="list-style-type: none"> • Increased desirability as a place to live or retire |
| DESIRED FUTURE RECREATION SETTING CHARACTER | | |
| Physical | Social | Operational |

| | | |
|---|--|--|
| <p><i>Remoteness:</i> Within a mile of paved/primary roads and highways.</p> <p><i>Naturalness:</i> Character of natural landscape retained. A few modifications contrast with character of the landscape (e.g., fences, primitive roads).</p> <p><i>Facilities:</i> No structures. Foot/horse trails only.</p> | <p><i>Contacts With Others:</i> Encounters with other groups average fewer than 3 encounters off of travel routes.</p> <p><i>Group Size:</i> Group sizes are expected to remain small (less than 3 people per group).</p> <p><i>Evidence of use:</i> Areas of alteration uncommon. Little surface vegetation wear observed. Sounds of people infrequent.</p> | <p><i>Mechanized Use:</i> Mechanized travel is allowed only on designated trails.</p> <p><i>Management Controls and Visitor Services:</i> On site controls and services are present but subtle. Offsite services and controls provided in the minimum amount necessary to reach management objectives.</p> |
| SUPPORT ACTIONS | | |
| Recreation Management Actions | Utilize adaptive management techniques to provide identified recreation opportunities (activities, experiences, and benefits) and reach desired future setting conditions. Special Recreation Permits will be allowed in this area so long as setting condition and outcome objectives can be maintained. | |
| Information and Education (including promotion and interpretation) | Ensure targeted experiences and benefits as well as recreation setting information is included and explained in all visitor information. Existing offsite and onsite visitor orientation (kiosk, signs, and informational brochures) will be maintained and enhanced. | |
| Administration | Continue Memorandum of Understanding and consider other cooperative agreements between the Bureau of Land Management and pertinent partners to maintain and enhance the area. | |
| Monitoring (and Evaluation) | Solicit partnerships and cooperative agreements to: monitor outcome attainment and preferences through focus group interviews or visitor studies. | |
| Interdisciplinary Support Actions | Visual Resource Management Class II. Mechanized and nonmotorized travel on designated trails. Motorized travel for administrative use only. Area of Critical Environmental Concern designation; discussed in Appendix V (p. 757). | |

T.7. Weston Hills Management Area

Supporting Information

This SRMA is necessary to accommodate local visitor demand for motorized recreational opportunities near the City of Gillette; this demand has been identified by community involvement workshops, and through visitor use data. Weston Hills is located within 25 miles of the Gillette city limits. This parcel provides seamless recreational opportunities as it connects with Thunder Basin National Grassland and additional public lands. SRMA management will sustain and enhance these amenities as well as accommodate the visitor demand. SRMA management will sustain and enhance these amenities as well as accommodate the visitor demand.

| |
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| WESTON HILLS SPECIAL RECREATION MANAGEMENT (SRMA) OBJECTIVES & DECISIONS |
| <p><i>Objective Statement:</i> Within the Weston Hills SRMA, by the year 2016 and thereafter, participants in recreation assessments will report an average 4.0 realization of the targeted experiences and benefits (4.0 on a probability scale, where 1.0 equals not realized and 5.0 equals totally realized) listed below. The Weston Hills SRMA will offer opportunities for recreationists to engage in off-highway vehicle (OHV) use, camping, hunting and nature viewing and other forms of dispersed recreation in a partially modified physical recreation setting with both motorized and nonmotorized public use. Within the management area, the existing natural and physical character of the landscape will be modified by recreational trail developments and associated recreation facilities.</p> |

Activities: OHV use, fishing, hunting, and camping.

Experiences: Enjoying having easy access to natural landscapes, enjoying having access to close-to-home outdoor amenities.

Benefits: Heightened sense of community sense of place, lifestyle improvement.

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics: Within 0.5 mile of paved/primary roads and highways; character of the natural landscape partially modified but none overpower the natural landscape; maintained and marked trails, simple trailhead developments and basic toilet.

Social Characteristics: From 2006 to 2010, the average annual estimated visitation was 3,920 visits and 2,167 visitor days (RMIS). Most groups consist of 3-6 people. Approximately 3-6 encounters per day off travel routes (staging areas) and approximately 4-8 encounters on travel routes. Small areas of terrain alteration are prevalent near the trailhead and parking areas. Surface vegetation gone with compacted soils observed. The sounds of other people are regularly heard.

Operational Characteristics: Motorized use predominates, motorized use allowed on designated routes. Basic information provided, staff infrequently present. Some regulatory and ethics signing, moderate use restrictions.

MANAGEMENT ACTIONS & ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program: Campfires prohibited. Not a fee site; not currently suitable for Federal Lands Recreation Enhancement Act (FLREA). The site may be evaluated in conjunction with U.S. Forest Service under FLREA if additional amenities are provided in the future.

Oil & Gas Leasing/Minerals: Lease fluid minerals with a Controlled Surface Use (CSU). Recommended for withdrawal from mineral entry. Salable mineral development for administrative use only.

VRM: Class II

Renewable Energy: Renewable energy exclusion area

Lands and Realty: ROW exclusion area

Travel Management: The area will be managed as limited to designated routes, with several routes designated. Routes will be classified by type of use (public or administrative), vehicle type (i.e., passenger vehicle, four-wheel drive, vehicles 50" or less) and maintenance level. Identify routes to close and reclaim.

Special Recreation Permits (SRPs): SRPs will be issued as a discretionary action for a wide variety of uses, consistent with resource/program objectives, and within budgetary/workload constraints. Develop criteria for potential limitations on issuance of SRPs to clarify when noncommercial activities may take place under a letter of agreement or to avoid saturation of commercial or organized use. Develop special stipulations for SRPs to protect the recreation setting as appropriate.

| IMPLEMENTATION DECISIONS |
|--|
| <p>Marketing: Provide maps and information at the field office. Directional signage present from Highway 59. Develop interpretive signs at trailhead/parking area on general location, history, geology, and wildlife resources. Provide stewardship information to help preserve the special landscape character. Make available for outreach programs such as Conservation and Outdoor Recreation Education, Take It Outside, National Public Lands Day, etc.</p> <p>Monitoring: Vehicle counters with routine surveys and observation. Informal visitor surveys and formal focus groups as funding allows.</p> <p>Management: Signs present at key access points. Develop trailheads for foot, horse and bicycle travel.</p> <p>Administrative:</p> <p><i>Agreements:</i> Create and maintain cooperative agreements with U.S. Forest Service and other interested organizations.</p> <p><i>Partners:</i> U.S. Forest Service Douglas Ranger District, Campbell County, Wyoming State Land Board and Wyoming Department of Game and Fish.</p> |

| THE LOOP RECREATION MANAGEMENT ZONE (RMZ) | | |
|---|--|--|
| Outcome Objective | | |
| <p>The Loop RMZ will be sustained or enhanced for individuals or small groups of motorized recreationists, to engage in off-highway vehicle (OHV) use, camping and nature and wildlife viewing so that participants in visitor assessments/surveys indicate a higher than average (mean average of 4.0 on a 5 point scale) realization of experience and benefit outcomes listed below in these Front Country settings:</p> | | |
| TARGETED OPPORTUNITIES & OUTCOMES | | |
| Activity Opportunities | Outcomes | |
| | Experiences | Benefits |
| <ul style="list-style-type: none"> ● OHV use ● Camping | <ul style="list-style-type: none"> ● Enjoying having easy access to natural landscapes ● Enjoying having access to close-to-home outdoor amenities ● Enjoying the closeness of friends and family | <p>Personal:</p> <ul style="list-style-type: none"> ● Improved mental health ● Improved physical health <p>Community/Social:</p> <ul style="list-style-type: none"> ● Lifestyle improvement or maintenance ● Heightened sense of community satisfaction <p>Environmental:</p> <ul style="list-style-type: none"> ● Greater community ownership and stewardship of park, recreation, and natural resources ● Maintenance of distinctive recreation setting character <p>Economic:</p> <ul style="list-style-type: none"> ● Increased desirability as a place to live or retire |
| DESIRED FUTURE RECREATION SETTING CHARACTER | | |
| Physical | Social | Operational |

| | | |
|---|---|--|
| <p><i>Remoteness:</i> Within a 0.5 mile of passerger roads.</p> <p><i>Naturalness:</i> Character of natural landscape considerably modified.</p> <p><i>Facilities:</i> Maintained and marked routes, simple trailhead developments and basic toilets. Interpretive displays may also be incorporated.</p> | <p><i>Contacts With Others:</i> Encounters with other groups average 2-4 encounters per day in staging areas and fewer than 5 encounters on travel routes.</p> <p><i>Group Size:</i> Group sizes are expected to remain small (less than 5 people per group).</p> <p><i>Evidence of use:</i> Large areas of terrain alteration are prevalent near “the Loop” and parking areas. Surface vegetation gone with compacted soils observed. Sounds of other people common.</p> | <p><i>Mechanized Use:</i> Mechanized travel is allowed only on designated trails.</p> <p><i>Management Controls and Visitor Services:</i> On site controls and services are present but subtle. Offsite services and controls provided in the minimum amount necessary to reach management objectives.</p> |
|---|---|--|

SUPPORT ACTIONS

| | |
|---|---|
| <p>Recreation Management Actions</p> | <p>Utilize adaptive management techniques to provide identified recreation opportunities (activities, experiences, and benefits) and reach desired future setting conditions.</p> <p>Special Recreation Permits will be allowed in this area so long as setting condition and outcome objectives can be maintained.</p> |
| <p>Information and Education (including promotion and interpretation)</p> | <p>Ensure targeted experiences and benefits as well as recreation setting information is included and explained in all visitor information.</p> <p>Existing offsite and onsite visitor orientation (kiosk, signs, and informational brochures) will be maintained and enhanced.</p> |
| <p>Administration</p> | <p>Continue Memorandum of Understanding and consider other cooperative agreements between the Bureau of Land Management and pertinent partners to maintain and enhance the area.</p> |
| <p>Monitoring (and Evaluation)</p> | <p>Solicit partnerships and cooperative agreements to: monitor outcome attainment and preferences through focus group interviews or visitor studies.</p> |
| <p>Interdisciplinary Support Actions</p> | <p>Visual Resource Management Class II</p> |

DISPERSED USE RECREATION MANAGEMENT ZONE (RMZ)

Outcome Objective

The Weston Hills Dispersed Use RMZ will be sustained or enhanced for individuals or small groups of motorized recreationists, to engage in off-highway vehicle (OHV) use, camping and nature and wildlife viewing so that participants in visitor assessments/surveys indicate a higher than average (mean average of 4.0 on a 5 point scale) realization of experience and benefit outcomes listed below in these Front Country and Middle Country settings:

TARGETED OPPORTUNITIES & OUTCOMES

| Activity Opportunities | Outcomes | |
|------------------------|-------------|----------|
| | Experiences | Benefits |
| | | |

| <ul style="list-style-type: none"> ● Hunting ● Hiking ● Camping | <ul style="list-style-type: none"> ● Enjoying having easy access to natural landscapes ● Enjoying having access to close-to-home outdoor amenities ● Enjoying the closeness of friends and family | <p>Personal:</p> <ul style="list-style-type: none"> ● Improved mental health ● Improved physical health <p>Community/Social:</p> <ul style="list-style-type: none"> ● Lifestyle improvement or maintenance ● Heightened sense of community satisfaction <p>Environmental:</p> <ul style="list-style-type: none"> ● Greater community ownership and stewardship of park, recreation, and natural resources ● Maintenance of distinctive recreation setting character <p>Economic:</p> <ul style="list-style-type: none"> ● Increased desirability as a place to live or retire |
|---|---|--|
| DESIRED FUTURE RECREATION SETTING CHARACTER | | |
| Physical | Social | Operational |
| <p><i>Remoteness:</i> Within a 0.5 mile of four-wheel drive roads.</p> <p><i>Naturalness:</i> Character of natural landscape partially modified.</p> <p><i>Facilities:</i> Maintained and marked routes, simple trailhead developments and basic toilets. Interpretive displays may also be incorporated.</p> | <p><i>Contacts With Others:</i> Encounters with other groups average 2-4 encounters per day in staging areas and fewer than 5 encounters on travel routes.</p> <p><i>Group Size:</i> Group sizes are expected to remain small (less than 5 people per group).</p> <p><i>Evidence of use:</i> Large areas of terrain alteration are prevalent near “the Loop” and parking areas. Surface vegetation gone with compacted soils observed. Sounds of other people common.</p> | <p><i>Mechanized Use:</i> Mechanized travel is allowed only on designated trails.</p> <p><i>Management Controls and Visitor Services:</i> On site controls and services are present but subtle. Offsite services and controls provided in the minimum amount necessary to reach management objectives.</p> |
| SUPPORT ACTIONS | | |
| Recreation Management Actions | <p>Utilize adaptive management techniques to provide identified recreation opportunities (activities, experiences, and benefits) and reach desired future setting conditions.</p> <p>Special Recreation Permits will be allowed in this area so long as setting condition and outcome objectives can be maintained.</p> | |
| Information and Education (including promotion and interpretation) | <p>Ensure targeted experiences and benefits as well as recreation setting information is included and explained in all visitor information.</p> <p>Existing offsite and onsite visitor orientation (kiosk, signs, and informational brochures) will be maintained and enhanced.</p> | |
| Administration | <p>Continue Memorandum of Understanding and consider other cooperative agreements between the Bureau of Land Management and pertinent partners to maintain and enhance the area.</p> | |
| Monitoring (and Evaluation) | <p>Solicit partnerships and cooperative agreements to: monitor outcome attainment and preferences through focus group interviews or visitor studies.</p> | |
| Interdisciplinary Support Actions | <p>Visual Resource Management Class II; travel limited to designated routes.</p> | |

T.8. Extensive Recreation Management Areas

Extensive Recreation Management Areas (ERMAs) are administrative units managed:

1. To address recreation use, demand, or existing Recreation and Visitor Services program investments.
2. To support and sustain the principal recreation activities and the associated qualities and conditions.
3. Commensurate with the management of other resources and resource uses.

The Approved Resource Management Plan does not generally propose any special management restrictions (i.e., rights-of-way avoidance, closures to leasing, etc.) to protect the recreation values within ERMAs. The objectives of the recreation program within ERMAs will be considered commensurate with other resources and resource uses in site-specific analysis. Mitigation of impacts to recreation in ERMAs in subsequent site-specific National Environmental Policy Act documents will be an implementation level decision, subject to consideration of the objectives identified for each ERMA. ERMAs do overlap with management actions proposed for other resources and the “Management Actions and Allowable Uses” sections listed below reflect the management selected in the Approved Resource Management Plan across all resources.

T.8.1. Cabin Canyon Management Area

Supporting Information and Rationale

This ERMA is necessary to accommodate multiple use mandates through reduction of user conflicts primarily related to user created motorized routes. This ERMA is also necessary to accommodate local visitor demand for motorized recreational opportunities near the City of Gillette; this demand has been identified by onsite customers, community involvement workshops, and through visitor use data. Cabin Canyon is located within 25 miles of the Gillette city limits. ERMA management will accommodate visitor demand, minimize conflicts with other uses (i.e., mineral development) and prevent inadvertent trespass.

| CABIN CANYON EXTENSIVE RECREATION MANAGEMENT AREA (ERMA) OBJECTIVES & DECISIONS |
|--|
| <i>Objective Statement:</i> Manage the Cabin Canyon ERMA for motorized recreationists to engage in off-highway vehicle (OHV) use, hunting and nature viewing so that they realize a “moderate” level of the targeted experience and benefit outcomes in the Front and Middle Country settings. |
| <i>Activities:</i> OHV use, hunting, camping and nature viewing. |
| <i>Experiences:</i> Enjoying having easy access to natural landscapes, enjoying having access to close-to-home outdoor amenities, improved respect for privately owned lands. |
| <i>Benefits:</i> Improved understanding of how this community’s rural-urban interface impacts its quality of life; greater respect for private property and local lifestyles. |
| RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS |
| <i>Physical Characteristics:</i> Within 0.5 mile of paved/primary roads and highways; character of the natural landscape partially modified but none overpower the natural landscape; maintained and marked trails, simple trailhead developments. |
| <i>Social Characteristics:</i> Quantitative visitor use data does not yet exist for the Cabin Canyon area. A few large areas of terrain alteration exist; largely associated with user created routes and campsites. Surface vegetation is absent in places with hardened soils observed. The sounds of other people are occasionally heard. |
| <i>Operational Characteristics:</i> Motorized use predominates, motorized use allowed on designated routes. Basic information should be provided, staff infrequently present. Some regulatory and ethics signing, moderate use restrictions. |
| MANAGEMENT ACTIONS & ALLOWABLE USE DECISIONS |

Recreation and Visitor Services Program: Campfires prohibited, standard 14-day camping limit applies; prioritized for education efforts to mitigate recreational target shooting; currently not eligible for Federal Lands Recreation Enhancement Act but may be evaluated if future investments in visitor services meet eligibility requirements.

Oil & Gas Leasing/Minerals: Lease fluid minerals with a CSU. Salable mineral development for administrative use only.

VRM: Class IV

Lands and Realty: ROW exclusion area

Special Recreation Permits (SRPs): SRPs will be issued as a discretionary action for a wide variety of uses, consistent with resource/program objectives, and within budgetary/workload constraints. Develop criteria for potential limitations on issuance of SRPs to clarify when noncommercial activities may take place under a letter of agreement or to avoid saturation of commercial or organized use. Develop special stipulations for SRPs to protect the recreation setting as appropriate.

IMPLEMENTATION DECISIONS

Marketing: Provide maps and information at the field office. Directional signage necessary from Highway 59 and Bishop Road. Provide stewardship information to help preserve the special landscape character. Make available for outreach programs such as National Public Lands Day, etc.

Monitoring: Vehicle counters with routine surveys and observation. Informal visitor surveys and formal focus groups as funding allows.

Management: Signs needed at key access points.

Administrative:

Travel Management: The area will be managed as limited to designated routes, with several routes designated. Identify routes to close and reclaim.

Agreements: State of Wyoming

Other administration: Prioritized for education efforts to mitigate recreational target shooting; recreational target shooting would be prohibited within any future developed recreation facilities.

T.8.2. Face of the Bighorns/North Fork Extensive Recreation Management Area

Supporting Information and Rationale

This ERMA is necessary to accommodate multiple use mandates through reduction of user conflicts primarily related to limited legal access and protection of high-quality hunting and wildlife viewing opportunities. The Face of the Bighorns/North Fork ERMA includes lands from the Poison Creek Trail area south along the Face of the Bighorns, the Horn, and the North Fork Wilderness Study Area (WSA). ERMA management will promote development of additional public access and sustain and enhance recreation amenities to accommodate visitor demand while honoring valid existing rights and preventing inadvertent trespass.

FACE OF THE BIGHORNS/NORTH FORK EXTENSIVE RECREATION MANAGEMENT AREA (ERMA) OBJECTIVES & DECISIONS

Objective Statement: By 2020, the Face of the Bighorns/North Fork ERMA will offer recreation opportunities, in a relatively unchanged physical recreation setting, that facilitate the visitor's freedom to participate in a variety of dispersed, nonmotorized/nonmechanized recreation activities.

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|--|
| <p><i>Activities:</i> Hiking, hunting, fishing, camping, wildlife and nature viewing.</p> <p><i>Experiences:</i> Developing skills and abilities, testing endurance, savoring the total sensory experience of a landscape.</p> <p><i>Benefits:</i> Greater sense of adventure, greater retention of distinctive natural landscape features; improved skills for outdoor enjoyment.</p> |
| MANAGEMENT ACTIONS & ALLOWABLE USE DECISIONS |
| <p><i>Recreation and Visitor Services Program:</i> Camping allowed, subject to 14-day limit.</p> <p><i>Oil & Gas Leasing/Minerals:</i> North Fork WSA and lands with wilderness characteristics unit are recommended for withdrawal from mineral entry, closed to oil and gas leasing and closed to salable mineral development.</p> <p><i>VRM:</i> North Fork WSA is VRM Class I; remainder is Class II and III</p> <p><i>Renewable Energy:</i> The entire ERMA falls within a renewable energy exclusion area.</p> <p><i>Lands and Realty:</i> North Fork WSA and lands with wilderness characteristics unit are rights-of-way exclusion areas.</p> <p><i>Special Recreation Permits (SRPs):</i> SRPs will be issued as a discretionary action for a wide variety of uses, consistent with resource/program objectives, and within budgetary/workload constraints. Develop criteria for potential limitations on issuance of SRPs to clarify when noncommercial activities may take place under a letter of agreement or to avoid saturation of commercial or organized use. Develop special stipulations for SRPs to protect the recreation setting as appropriate. Ensure that SRPs include sufficient mitigation to protect WSAs and lands with wilderness characteristics.</p> <p>North Fork WSA and lands with wilderness characteristics unit are closed to motorized travel. Elsewhere, travel is limited to designated routes. Visual Resources Management (VRM) Class I, II, and III.</p> |
| IMPLEMENTATION DECISIONS |
| <p>Marketing: Provide maps and information at the field office. Directional signage necessary from Hazelton Road. Provide stewardship information to help preserve the special landscape character.</p> <p>Monitoring: Vehicle and trail counters with routine surveys and observation. Informal visitor surveys and formal focus groups as funding allows.</p> <p>Management: Signs needed at key access points.</p> <p>Administrative:</p> <p><i>Travel Management:</i> North Fork WSA and lands with wilderness characteristics unit and a 500-foot buffer of the Poison Creek Trail are closed to motorized travel. Elsewhere, travel is limited to designated routes. A travel management plan will be developed to designate routes open for administrative or public use, to consider seasonal closures, and to identify routes to close and reclaim. North Fork WSA is closed to motorized use.</p> <p><i>WSA:</i> North Fork WSA is managed under Manual 6330 to prevent impairment of wilderness characteristics.</p> <p><i>Agreements:</i> State of Wyoming</p> <p><i>Partners:</i> Wyoming Game and Fish Department</p> <p><i>Other administration:</i> Recreational target shooting is prohibited within developed recreation sites. Currently, the Poison Creek trailhead is the only existing development.</p> |

T.8.3. Gardner Mountain Extensive Recreation Management Area

Supporting Information and Rationale

This ERMA is necessary to accommodate multiple use mandates through reduction of user conflicts primarily related to limited legal access and protection of high-quality hunting and wildlife viewing opportunities. The Gardner Mountain ERMA includes lands along and south of the Mayoworth-Slip Road and north of Barnum Mountain Road. The ERMA encompasses the Gardner Mountain Trail and the Gardner Mountain WSA. ERMA management will promote development of additional public access and sustain and enhance recreation amenities to accommodate visitor demand while honoring valid existing rights and preventing inadvertent trespass.

GARDNER MOUNTAIN EXTENSIVE RECREATION MANAGEMENT AREA (ERMA) OBJECTIVES & DECISIONS

Objective Statement: By 2020, the Gardner Mountain ERMA will offer recreation opportunities, in a relatively unchanged physical recreation setting, that facilitate the visitor's freedom to participate in a variety of dispersed, nonmotorized/nonmechanized recreation activities.

Activities: Hiking, hunting, fishing, camping, wildlife and nature viewing.

Experiences: Developing skills and abilities, testing endurance, savoring the total sensory experience of a landscape.

Benefits: Greater sense of adventure, greater retention of distinctive natural landscape features; improved skills for outdoor enjoyment.

MANAGEMENT ACTIONS & ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program: Campfires prohibited. Camping allowed, subject to 14-day limit.

Oil & Gas Leasing/Minerals: Gardner Mountain WSA is recommended for withdrawal from mineral entry, closed to oil and gas leasing and closed to salable mineral development.

VRM: Gardner Mountain WSA is VRM Class I; remainder is Class II and III

Renewable Energy: The entire ERMA falls within a renewable energy exclusion area.

Lands and Realty: Gardner Mountain WSA is a rights-of-way exclusion area.

Special Recreation Permits (SRPs): SRPs will be issued as a discretionary action for a wide variety of uses, consistent with resource/program objectives, and within budgetary/workload constraints. Develop criteria for potential limitations on issuance of SRPs to clarify when noncommercial activities may take place under a letter of agreement or to avoid saturation of commercial or organized use. Develop special stipulations for SRPs to protect the recreation setting as appropriate. Ensure that SRPs include sufficient mitigation to protect WSA.

| IMPLEMENTATION DECISIONS |
|---|
| <p>Marketing: Provide maps and information at the field office. Directional signage necessary from Hazelton, Slip, Mayoworth, Brock and Barnum Roads. Provide stewardship information to help preserve the special landscape character.</p> |
| <p>Monitoring: Vehicle and trail counters with routine surveys and observation. Informal visitor surveys and formal focus groups as funding allows.</p> |
| <p>Management: Signs needed at key access points.</p> |
| <p>Administrative:</p> <p><i>Travel Management:</i> Gardner Mountain WSA and a 500-foot buffer of the Gardner Mountain Trail is closed to motorized travel. Elsewhere, travel is limited to designated routes. A travel management plan will be developed to designate routes open for administrative or public use, to consider seasonal closures, and to identify routes to close and reclaim.</p> <p><i>WSA:</i> Gardner Mountain WSA is managed under Manual 6330 to prevent impairment of wilderness characteristics.</p> <p><i>Agreements:</i> State of Wyoming</p> <p><i>Partners:</i> Wyoming Game and Fish Department</p> <p><i>Other administration:</i> Recreational target shooting is prohibited within developed recreation sites. Currently, the Gardner Mountain trailhead is the only existing development.</p> |

T.8.4. Kaycee Stockrest Extensive Recreation Management Area

Supporting Information and Rationale

This ERMA is necessary to accommodate multiple use mandates through reduction of user conflicts primarily related to motorized use overlapping traditional livestock use. This ERMA is also necessary to accommodate local visitor demand for motorized recreational opportunities and recreational target shooting near the City of Kaycee; this demand has been identified by onsite evaluation and through visitor use data. The Kaycee Stockrest ERMA is located within 1.0 mile of the Kaycee city limits. ERMA management will sustain and enhance recreation amenities to accommodate the visitor demand while honoring valid existing rights and preventing inadvertent trespass.

| KAYCEE STOCKREST EXTENSIVE RECREATION MANAGEMENT AREA (ERMA) OBJECTIVES & DECISIONS |
|--|
| <p><i>Objective Statement:</i> By 2018, the Kaycee Stockrest ERMA will provide recreational opportunities that meet the desires of local residents for nearby recreation opportunities while protecting human health and safety and minimizing conflicts between recreation and valid existing rights.</p> |
| <p><i>Activities:</i> Off-highway vehicle use, hunting, camping and recreational target shooting.</p> |
| <p><i>Experiences:</i> Enjoying having easy access to natural landscapes, enjoying having access to close-to-home outdoor amenities.</p> |
| <p><i>Benefits:</i> Heightened sense of community sense of place, lifestyle improvement. Protection of both public and private land resources through boundary marking and active management.</p> |
| MANAGEMENT ACTIONS & ALLOWABLE USE DECISIONS |

Recreation and Visitor Services Program: Campfires prohibited. Camping prohibited in 200 acres encompassing stockrest, except under stock trailing permit. Camping allowed on 2,685-acre parcel north of state section, subject to 14-day limit. Pursue agreement with City of Kaycee and local organizations to actively manage recreational target shooting.

VRM: Class II

Renewable Energy: The entire ERMA falls within a renewable energy exclusion area.

Special Recreation Permits (SRPs): SRPs will be issued as a discretionary action for a wide variety of uses, consistent with resource/program objectives, and within budgetary/workload constraints. Develop criteria for potential limitations on issuance of SRPs to clarify when noncommercial activities may take place under a letter of agreement or to avoid saturation of commercial or organized use. Develop special stipulations for SRPs to protect the recreation setting as appropriate.

IMPLEMENTATION DECISIONS

Marketing: Provide maps and information at the field office. Directional signage necessary from Highway 59 and Bishop Road. Provide stewardship information to help preserve the special landscape character. Make available for outreach programs such as National Public Lands Day, etc.

Monitoring: Vehicle counters with routine surveys and observation. Informal visitor surveys and formal focus groups as funding allows.

Management: Signs needed at key access points.

Administrative:

Travel Management: Travel is limited to designated routes. A travel management plan will be developed to designate routes open for administrative or public use, to consider seasonal closures, and to identify routes to close and reclaim.

Agreements: State of Wyoming

Partners: City of Kaycee, Johnson County

Other administration: Recreational target shooting is prohibited within developed recreation sites. Currently, no developments exist.

T.8.5. North Bighorns Extensive Recreation Management Area

Supporting Information and Rationale

This ERMA is necessary to accommodate multiple use mandates through reduction of user conflicts primarily related to limited legal access and protection of high-quality hunting and wildlife viewing opportunities. The North Bighorns ERMA includes lands along and south of the parcels in Sheridan County adjacent to the Bighorn National Forest.

ERMA management will promote coordination with the U.S. Forest Service and local organizations to meet community-driven recreation proposals and to facilitate seamless recreation opportunities.

NORTH BIGHORNS EXTENSIVE RECREATION MANAGEMENT AREA (ERMA) OBJECTIVES & DECISIONS

Objective Statement: By 2020, the North Bighorns ERMA will provide seamless opportunities for recreation in conjunction with the Bighorn National Forest.

| |
|--|
| <p><i>Activities:</i> Hiking, hunting, fishing, camping, wildlife and nature viewing.</p> <p><i>Experiences:</i> Developing skills and abilities, testing endurance, savoring the total sensory experience of a landscape.</p> <p><i>Benefits:</i> Greater sense of adventure, greater retention of distinctive natural landscape features; improved skills for outdoor enjoyment.</p> |
| MANAGEMENT ACTIONS & ALLOWABLE USE DECISIONS |
| <p><i>Recreation and Visitor Services Program:</i> Campfires prohibited. Camping allowed, subject to 14-day limit. Not a fee site; not currently suitable for Federal Lands Recreation Enhancement Act (FLREA). The site may be evaluated under FLREA if additional amenities are provided in the future.</p> <p><i>VRM:</i> Class II</p> <p><i>Renewable Energy:</i> The entire ERMA falls within a renewable energy exclusion area.</p> <p><i>Special Recreation Permits (SRPs):</i> SRPs will be issued as a discretionary action for a wide variety of uses, consistent with resource/program objectives, and within budgetary/workload constraints. Develop criteria for potential limitations on issuance of SRPs to clarify when noncommercial activities may take place under a letter of agreement or to avoid saturation of commercial or organized use. Develop special stipulations for SRPs to protect the recreation setting as appropriate.</p> |
| IMPLEMENTATION DECISIONS |
| <p>Marketing: Provide maps and information at the field office. Directional signage necessary from Hazelton Road. Provide stewardship information to help preserve the special landscape character.</p> <p>Monitoring: Vehicle and trail counters with routine surveys and observation. Informal visitor surveys and formal focus groups as funding allows.</p> <p>Management: Signs needed at key access points.</p> <p>Administrative:</p> <p><i>Travel Management:</i> Travel is limited to designated routes. A travel management plan will be developed to designate routes open for administrative or public use, to consider seasonal closures, and to identify routes to close and reclaim.</p> <p><i>Agreements:</i> State of Wyoming</p> <p><i>Partners:</i> U.S. Forest Service Bighorn National Forest, Wyoming Game and Fish Department</p> <p><i>Other administration:</i> Recreational target shooting would prohibited within any future developed recreation sites. Currently, no development exists.</p> |

T.8.6. Powder River Basin Extensive Recreation Management Area

Supporting Information and Rationale

This ERMA is necessary to accommodate multiple use mandates through reduction of user conflicts primarily related to limited legal access and protection of high-quality hunting and wildlife viewing opportunities. ERMA management will promote development of additional public access and sustain and enhance recreation amenities to accommodate visitor demand while honoring valid existing rights and preventing inadvertent trespass.

*Appendix T Recreation Management Activities
Powder River Basin Extensive Recreation
Management Area*

| POWDER RIVER BASIN EXTENSIVE RECREATION MANAGEMENT AREA (ERMA) OBJECTIVES & DECISIONS |
|---|
| <p><i>Objective Statement:</i> By 2018, the Powder River Basin ERMA will provide opportunities for recreationists to engage in hunting, camping and other dispersed recreational opportunities on accessible public lands while preventing inadvertent trespass onto adjacent private lands.</p> |
| <p><i>Activities:</i> Hunting, hiking, camping, and nature viewing.</p> |
| <p><i>Experiences:</i> Enjoying having access to close-to-home outdoor amenities, greater understanding of the importance of recreation and tourism in our community, improved understanding of this/our community's dependence and impact on public lands.</p> |
| <p><i>Benefits:</i> Heightened sense of community sense of place, lifestyle improvement. Protection of both public and private land resources through boundary marking and active management.</p> |
| MANAGEMENT ACTIONS & ALLOWABLE USE DECISIONS |
| <p><i>Recreation and Visitor Services Program:</i> Campfires subject to Wyoming Interagency Fire Restrictions. Camping allowed, subject to 14-day limit.</p> |
| <p><i>Oil & Gas Leasing/Minerals:</i> Fortification Creek WSA is recommended for withdrawal from mineral entry, closed to oil and gas leasing and closed to salable mineral development.</p> |
| <p><i>VRM:</i> Fortification Creek WSA is VRM Class I; remainder is Class II, III, and IV</p> |
| <p><i>Renewable Energy:</i> The majority of the ERMA falls within a renewable energy exclusion or avoidance area.</p> |
| <p><i>Lands and Realty:</i> Fortification Creek WSA is a rights-of-way exclusion area.</p> |
| <p><i>Special Recreation Permits (SRPs):</i> SRPs will be issued as a discretionary action for a wide variety of uses, consistent with resource/program objectives, and within budgetary/workload constraints. Develop criteria for potential limitations on issuance of SRPs to clarify when noncommercial activities may take place under a letter of agreement or to avoid saturation of commercial or organized use. Develop special stipulations for SRPs to protect the recreation setting as appropriate. Ensure that SRPs include sufficient mitigation to protect WSA.</p> |
| IMPLEMENTATION DECISIONS |
| <p>Marketing: Provide maps and information at the field office. Directional signage necessary from exits along I-90. Provide stewardship information to help preserve the special landscape character.</p> |
| <p>Monitoring: Vehicle counters with routine surveys and observation. Informal visitor surveys and formal focus groups as funding allows.</p> |
| <p>Management: Signs needed at key access points.</p> |
| <p>Administrative:</p> |
| <p><i>Travel Management:</i> Fortification Creek WSA is closed to motorized travel. Elsewhere, travel is limited to designated routes. A travel management plan will be developed to designate routes open for administrative or public use, to consider seasonal closures, and to identify routes to close and reclaim.</p> |
| <p><i>WSA:</i> Fortification Creek WSA is managed under Manual 6330 to prevent impairment of wilderness characteristics.</p> |
| <p><i>Agreements:</i> State of Wyoming</p> |
| <p><i>Partners:</i> Wyoming Game and Fish Department</p> |
| <p><i>Other administration:</i> Recreational target shooting would be prohibited within any future developed recreation sites. Currently, no developments exist.</p> |

T.8.7. South Bighorns Extensive Recreation Management Area

Supporting Information and Rationale

*Appendix T Recreation Management Activities
South Bighorns Extensive Recreation Management
Area*

September 2015

This ERMA is necessary to accommodate multiple use mandates through reduction of user conflicts primarily related to limited legal access and protection of high-quality hunting and wildlife viewing opportunities. The South Bighorns ERMA includes lands in southwestern Johnson County, south of Barnum Mountain Road, and generally west of Bar C Road that are not part of the Middle Fork Powder River or Hole-in-the-Wall SRMAs.

ERMA management will promote coordination with the Worland and Casper Field Offices, Wyoming Game and Fish Department, State of Wyoming, and local organizations to meet community-driven recreation proposals and to facilitate seamless recreation opportunities. ERMA management will promote development of additional public access and sustain and enhance recreation amenities to accommodate visitor demand while honoring valid existing rights and preventing inadvertent trespass.

| SOUTH BIGHORNS EXTENSIVE RECREATION MANAGEMENT AREA (ERMA) OBJECTIVES & DECISIONS |
|--|
| <p><i>Objective Statement:</i> By 2018, the South Bighorns ERMA will offer seamless recreation opportunities, in a relatively unchanged physical recreation setting, that facilitate the visitor’s freedom to participate in a variety of dispersed, recreation activities. Motorized access across the region will be accommodated through limited routes and public motorized access between Outlaw Cave, Hole-in-the-Wall, and Hazelton Road will be pursued.</p> <p><i>Activities:</i> Hiking, hunting, fishing, camping, wildlife and nature viewing.</p> <p><i>Experiences:</i> Developing skills and abilities, testing endurance, savoring the total sensory experience of a landscape.</p> <p><i>Benefits:</i> Greater sense of adventure, greater retention of distinctive natural landscape features; improved skills for outdoor enjoyment.</p> |
| MANAGEMENT ACTIONS & ALLOWABLE USE DECISIONS |
| <p><i>Recreation and Visitor Services Program:</i> Camping allowed, subject to 14-day limit. Not a fee site; not currently suitable for Federal Lands Recreation Enhancement Act (FLREA). The site may be evaluated under FLREA if additional amenities are provided in the future.</p> <p><i>VRM:</i> Class II and III</p> <p><i>Renewable Energy:</i> The entire ERMA falls within a renewable energy exclusion area.</p> <p><i>Special Recreation Permits (SRPs):</i> SRPs will be issued as a discretionary action for a wide variety of uses, consistent with resource/program objectives, and within budgetary/workload constraints. Develop criteria for potential limitations on issuance of SRPs to clarify when noncommercial activities may take place under a letter of agreement or to avoid saturation of commercial or organized use. Develop special stipulations for SRPs to protect the recreation setting as appropriate.</p> |

IMPLEMENTATION DECISIONS

Marketing: Provide maps and information at the field office. Directional signage necessary from Hazelton Road. Provide stewardship information to help preserve the special landscape character.

Monitoring: Vehicle and trail counters with routine surveys and observation. Informal visitor surveys and formal focus groups as funding allows.

Management: Signs needed at key access points.

Administrative:

Travel Management: Travel is limited to designated routes. A travel management plan will be developed to designate routes open for administrative or public use, to consider seasonal closures, and to identify routes to close and reclaim.

Wild and Scenic Rivers: The canyon within 0.25 mile of Middle Fork Powder River is managed under Manual 6400 – Wild and Scenic Rivers to protect outstandingly remarkable values.

Agreements: State of Wyoming

Partners: Wyoming Game and Fish Department

Other administration: Recreational target shooting would be prohibited within any future developed recreation sites.

T.8.8. Walk-in Area Extensive Recreation Management Area

Supporting Information and Rationale

This ERMA is necessary to accommodate multiple use mandates through reduction of user conflicts primarily related to limited legal access and protection of high-quality hunting and wildlife viewing opportunities. The Walk-in Area ERMA includes BLM-administered lands adjacent to Walk-in Areas with agreements that are negotiated between Wyoming Game and Fish Department (WGFD) and private landowners.

WGFD manages the Private Lands Public Wildlife Access program to improve public access for hunting and fishing opportunities. Walk-in agreements are negotiated between WGFD and private landowners for a specific period of time, usually several years, and thus the status of an access areas can change during the life of this plan. BLM-administered lands adjacent to Walk-in Areas provide additional access and hunting and fishing opportunities for recreationists. While the WGFD and the adjacent private landowner have authority over any lands enrolled in the program, the BLM can support the objectives of the Private Lands Public Wildlife Access program through collaborative management.

Several parcels adjacent to current or historic Walk-in Areas overlap portions of other SRMAs and ERMAs. The objectives of the Walk-in Area ERMA apply to any BLM-administered lands that are adjacent to currently enrolled lands in the Private Lands Public Wildlife Access program and may be concurrently applied to parcels in an ERMA or SRMA.

ERMA management will promote coordination with the WGFD, State of Wyoming, and private landowners to promote public access to public lands and facilitate seamless recreation opportunities. ERMA management will promote development of additional public access and sustain and enhance recreation amenities to accommodate visitor demand while honoring valid existing rights and preventing inadvertent trespass.

| WALK-IN AREA EXTENSIVE RECREATION MANAGEMENT AREA (ERMA) OBJECTIVES & DECISIONS |
|---|
| <p><i>Objective Statement:</i> By 2018, Bureau of Land Management-administered lands adjacent to Wyoming Game and Fish Department Walk-In Areas will provide seamless opportunities for the nonmotorized recreation, specifically hunting and fishing. Travel management, camping restrictions and fire restrictions may be negotiated to support additional public access to public lands through the Private Lands Public Wildlife Access program objectives.</p> |
| <p><i>Activities:</i> Hunting, fishing, camping, wildlife and nature viewing.</p> |
| <p><i>Experiences:</i> Greater community ownership and stewardship of recreation, and natural resources, improved understanding of how this community's rural-urban interface impacts its quality of life, improved understanding of this/our community's dependence and impact on public lands.</p> |
| <p><i>Benefits:</i> Greater sense of adventure, greater retention of distinctive natural landscape features; improved skills for outdoor enjoyment.</p> |
| MANAGEMENT ACTIONS & ALLOWABLE USE DECISIONS |
| <p><i>Recreation and Visitor Services Program:</i> Campfires may be prohibited to facilitate negotiations with private landowners. Wyoming Interagency Fire Restrictions would be posted at access points. Camping may be allowed, subject to 14-day limit. Restrictions on camping would be analyzed on a case-by-case basis and permanent closures would require a land use plan amendment.</p> |
| <p><i>VRM:</i> Currently, Class II-IV</p> |
| <p><i>Special Recreation Permits (SRPs):</i> SRPs may be issued as a discretionary action for a wide variety of uses, consistent with resource/program objectives, and within budgetary/workload constraints. Develop criteria for potential limitations on issuance of SRPs to clarify when noncommercial activities may take place under a letter of agreement or to avoid saturation of commercial or organized use. Develop special stipulations for SRPs to protect the recreation setting as appropriate.</p> |
| IMPLEMENTATION DECISIONS |
| <p>Marketing: Provide maps and information at the field office. Provide stewardship information related to outdoor ethics.</p> |
| <p>Monitoring: Vehicle and trail counters with routine surveys and observation. Informal visitor surveys and formal focus groups as funding allows.</p> |
| <p>Management: Signs needed at key access points.</p> |
| <p>Administrative:</p> |
| <p><i>Travel Management:</i> Travel is limited to designated routes. A travel management plan will be developed to designate routes open for administrative or public use, to consider seasonal closures, and to identify routes to close and reclaim.</p> |
| <p><i>Agreements:</i> State of Wyoming</p> |
| <p><i>Partners:</i> Wyoming Game and Fish Department</p> |
| <p><i>Other administration:</i> Recreational target shooting would be prohibited within any future developed recreation sites.</p> |

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Appendix U. Livestock Grazing Allotments

U.1. Livestock Grazing Allotments within the Buffalo Planning Area

Table U.1. Current Livestock Grazing Allotment Information

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Type Management | Permitted Use (AUMs) |
|------------------|---------------------|---------------------|---------------------|-----------------|----------------------|
| 12182 | 4mile Creek/RC | C | 369 | | 41 |
| 02378 | 76 Creek | C | 200 | | 33 |
| 02314 | Adon | C | 40 | | 6 |
| 22115 | Allemandll | C | 1,520 | | 184 |
| 02246 | Anderson Draw | C | 178 | | 21 |
| 12173 | Antelope Basin | C | 449 | | 47 |
| 02366 | Antelope Draw | C | 40 | | 6 |
| 02493 | Armstrong Prong | C | 223 | | 51 |
| 02433 | Arpan Butte | C | 1,259 | | 137 |
| 00698 | Ash Draw | C | 240 | | 47 |
| 02323 | Bader Gulch | C | 83 | | 20 |
| 02377 | Badger Creek | C | 40 | | 8 |
| 02437 | Badger Tract | C | 40 | | 7 |
| 22204 | Baldwin Creek | C | 640 | | 47 |
| 22009 | Bales Ranch Inc | C | 80 | | 11 |
| 02328 | Banner | C | 120 | | 24 |
| 22011 | Barbe Dorie J | C | 120 | | 13 |
| 32013 | Barlow | C | 89 | | 13 |
| 02442 | Barnum Mountain Rd. | C | 2,735 | | 277 |
| 02414 | Barnum Mtn Road | C | 40 | | 8 |
| 22224 | Barnum Mtn Spring | C | 80 | | 13 |
| 12236 | Bates Creek | C | 80 | | 12 |
| 02475 | Bayer Creek | C | 120 | | 34 |
| 12191 | Bear Gulch | M | 3,837 | | 612 |
| 12168 | Beartrap | C | 483 | | 76 |
| 12072 | Beartrap Creek | I | 2,171 | | 249 |
| 22111 | Beaver Creek | C | 440 | | 54 |
| 12157 | Beaver Creek Slope | I | 8,098 | | 546 |
| 12041 | Bed Springs Draw | C | 358 | | 23 |
| 02478 | Beebee | C | 320 | | 211 |
| 22127 | Bekebrede Draw | C | 80 | | 20 |
| 12209 | Belle Fourche Tr | C | 800 | | 159 |
| 02288 | Belus | C | 120 | | 30 |
| 22017 | Belus Ranch | C | 292 | | 51 |
| 32019 | Betz Alvin F. | C | 185 | | 21 |
| 02262 | Billy Creek | C | 280 | | 44 |
| 12228 | Billy Creek Camp | C | 80 | | 6 |
| 02324 | Billy Creek School | C | 40 | | 10 |
| 22021 | Bishop | M | 8,632 | | 1,483 |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Type Management | Permitted Use (AUMs) |
|------------------|-----------------------|---------------------|---------------------|-----------------|----------------------|
| 12048 | Bitter Creek | C | 1,025 | | 122 |
| 22022 | Bittercreek | C | 80 | | 16 |
| 22028 | Black Draw | C | 2,581 | | 300 |
| 12230 | Black Stump Draw | C | 200 | | 50 |
| 42013 | Blue Creek | M | 2,221 | | 223 |
| 12189 | Bode Gulch | C | 560 | | 59 |
| 22210 | Bone Pile Creek | C | 241 | | 45 |
| 02254 | Box Elder Draw | C | 71 | | 8 |
| 32005 | Bridge Draw | M | 2,720 | | 274 |
| 12219 | Bright Spring Draw | C | 240 | | 61 |
| 02243 | Brower Draw | C | 310 | | 30 |
| 12035 | Brown Kennedy Ranch | M | 2,122 | | 501 |
| 12192 | Bugher Draw | C | 1510 | | 123 |
| 12213 | Bull Camp | M | 2,475 | | 252 |
| 02474 | Bull Camp Canyon | C | 315 | | 24 |
| 22212 | Bull Creek | C | 2,713 | | 250 |
| 32018 | Bull Creek | C | 278 | | 40 |
| 12161 | Burnt Hollow | I | 13,790 | AMP IMPLEMENTED | 2,400 |
| 12046 | Butcher | C | 640 | | 119 |
| 12047 | Butcher Ranch | C | 240 | | 61 |
| 12208 | Caballo Draw | C | 680 | | 113 |
| 02258 | Cabin Canyon | C | 2,366 | | 356 |
| 02299 | Cabin Creek | M | 3,139 | | 309 |
| 12049 | Camblin | C | 690 | | 130 |
| 02289 | Campbell Draw | C | 413 | | 56 |
| 22201 | Carpenter Draw | C | 760 | | 81 |
| 02265 | Carr | C | 400 | | 43 |
| 12053 | Carson Dan | C | 80 | | 16 |
| 12052 | Carson, O. And R.J. | C | 240 | | 37 |
| 02450 | Carter Draw | C | 220 | | 30 |
| 12165 | Carter Draw | C | 880 | | 45 |
| 12054 | Cash | C | 80 | | 14 |
| 12177 | Castle Rock | M | 5,256 | | 610 |
| 02376 | Cat Creek | I | 5,696 | | 552 |
| 12175 | Cates Draw | C | 1,689 | | 173 |
| 12057 | Chabot, August, Et Al | C | 280 | | 19 |
| 02384 | Chabot, August, Et Al | C | 147 | | 14 |
| 02468 | Chalk Hills | C | 203 | | 29 |
| 12211 | Charlie Draw | C | 1,482 | | 306 |
| 02290 | Chicken Creek Divide | C | 40 | | 7 |
| 32020 | Clark, Glen L | C | 1,247 | | 131 |
| 02398 | Claypit, Trough Draw | C | 1,120 | | 132 |
| 02093 | Clear Creek | C | 396 | | 39 |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Type Management | Permitted Use (AUMs) |
|------------------|------------------------------|---------------------|---------------------|-----------------|----------------------|
| 12065 | Clear Creek Grazing | C | 908 | | 92 |
| 12149 | Coal Creek | C | 117 | | 18 |
| 12069 | Cook | C | 40 | | 6 |
| 02248 | Coon Track Creek | C | 121 | | 18 |
| 22027 | Cordero Allotment | C | 480 | | 78 |
| 12024 | Corral Creek | C | 36 | | 5 |
| 00754 | Cotton | C | 40 | | 4 |
| 02424 | Cottonwood (Knudson) | C | 923 | | 106 |
| 02261 | Cottonwood Creek | C | 120 | | 26 |
| 22130 | Cottonwood Creek E | C | 80 | | 12 |
| 12143 | Cottonwood Creek I | C | 160 | | 47 |
| 02427 | Cottonwood Draw | C | 400 | | 72 |
| 12179 | Cottonwood Draw | C | 1,020 | | 105 |
| 02357 | County Line | C | 1,122 | | 153 |
| 22132 | Coutant Creek | C | 320 | | 39 |
| 12186 | Cow Creek | C | 2,706 | | 251 |
| 22125 | Cow's Face | C | 360 | | 24 |
| 12059 | Craney Draw | M | 0 | | 0 |
| 12094 | Crazy Woman Creek | C | 760 | | 80 |
| 12218 | Crenshaw Hill | C | 719 | | 87 |
| 12090 | Cromack Draw | C | 427 | | 93 |
| 02426 | Crooked Creek | I | 20,367 | AMP IMPLEMENTED | 2,694 |
| 22206 | Cross H Creek | C | 313 | | 49 |
| 12184 | Croton | M | 1,028 | | 174 |
| 02352 | Cutler Draw | C | 161 | | 27 |
| 02332 | Dabney | C | 80 | | 11 |
| 12074 | Daly | C | 120 | | 22 |
| 12075 | Daly Livestock Co. | C | 6,138 | | 1,107 |
| 02397 | Davis Draw | M | 788 | | 81 |
| 12105 | Davis Draw Common | M | 970 | | 156 |
| 02400 | Davis Draw/Johnson Allotment | M | 1,394 | | 149 |
| 02322 | Dead Horse | C | 85 | | 8 |
| 12176 | Dead Horse Creek | I | 9,119 | | 993 |
| 22113 | Dead Horse Creek Oilfield | C | 1,261 | | 216 |
| 12062 | Deadman Draw | C | 1,890 | | 186 |
| 02396 | Dean Graves | C | 720 | | 94 |
| 02267 | Deep Creek | C | 160 | | 41 |
| 22102 | Deer Creek | M | 10,958 | | 1,245 |
| 32004 | Deer Creek I | C | 80 | | 10 |
| 12096 | Deer Gulch | M | 5,566 | | 1,135 |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Type Management | Permitted Use (AUMs) |
|------------------|----------------------|---------------------|---------------------|-----------------|----------------------|
| 02270 | Dixie Reece | C | 263 | | 30 |
| 02402 | Donlin | C | 501 | | 134 |
| 12039 | Drainage Draw | C | 80 | | 11 |
| 02412 | Dry Creek | C | 372 | | 42 |
| 22229 | Dry Creek Basin | C | 79 | | 14 |
| 12080 | Dry Creek Ranch Inc. | M | 4,948 | | 1,074 |
| 02285 | Dry Creek Res. | C | 40 | | 4 |
| 02250 | Dry Fork | C | 3,314 | | 488 |
| 02341 | Dry Fork P.R. | C | 1,406 | | 235 |
| 02407 | Dry Muddy Creek | C | 80 | | 18 |
| 12144 | Dry Trail Creek | C | 2,086 | | 389 |
| 02344 | Dry Vee | M | 4,442 | AMP PROPOSED | 911 |
| 02374 | Duck Creek | C | 41 | | 12 |
| 22026 | Duck Creek 2 | C | 217 | | 60 |
| 02453 | Dugout Creek | I | 9,341 | | 1,217 |
| 22124 | Dull Knife | I | 9,173 | | 553 |
| 12031 | Dull Knife Pass | M | 5,047 | | 603 |
| 02317 | Dutch Creek | C | 80 | | 14 |
| 12200 | E.K. Mountain | C | 156 | | 26 |
| 12037 | East Fork | C | 680 | | 128 |
| 22225 | East Spring Draw | M | 5,683 | | 550 |
| 12232 | Echeta | C | 320 | | 37 |
| 02388 | Eighty-Five Divide | C | 1,319 | | 328 |
| 12100 | Eighty-Five Divide | M | 1,679 | | 384 |
| 12034 | Elk Creek Road | C | 40 | | 8 |
| 12086 | Elliot Curtis | C | 114 | | 24 |
| 12089 | Elsom Brothers | C | 1,760 | | 133 |
| 12067 | Encres Draw | C | 40 | | 7 |
| 22215 | Erickson Draw | C | 840 | | 96 |
| 12139 | Falxa | I | 14,759 | AMP IMPLEMENTED | 1,546 |
| 12097 | Fauber George | C | 120 | | 7 |
| 12162 | Fence Creek | I | 4,820 | AMP IMPLEMENTED | 655 |
| 14811 | Figure 8 | C | 494 | | 42 |
| 12099 | Fitch Draw | M | 1,840 | | 250 |
| 32006 | Flats | C | 2,947 | | 254 |
| 12078 | Flying E | I | 16,603 | | 1,672 |
| 12066 | Flying U Ranch | M | 4,236 | | 826 |
| 12045 | Forest Tract | C | 320 | | 16 |
| 12151 | Fort Creek | M | 19,376 | | 2,235 |
| 42001 | Fortification Creek | C | 894 | | 102 |
| 22107 | Fortin Draw | C | 40 | | 10 |
| 22109 | Foster, Ralph T. | C | 880 | | 147 |
| 12076 | Four Corners | M | 2,109 | | 422 |
| 22126 | Four Horse | C | 1,175 | | 215 |
| 02242 | Four Horse Creek | C | 320 | | 84 |
| 12050 | Fourmile | M | 4,879 | | 433 |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Type Management | Permitted Use (AUMs) |
|------------------|-----------------------|---------------------|---------------------|-----------------|----------------------|
| 02293 | Fourmile 94 | C | 156 | | 15 |
| 02379 | Fourmile Ranch | I | 7,595 | | 623 |
| 12070 | Fowler Draw | C | 151 | | 18 |
| 12088 | Freeman Camp | C | 800 | | 32 |
| 02391 | Freeman Draw | M | 2,710 | | 445 |
| 12079 | Gammon Draw | C | 37 | | 9 |
| 22112 | Garber Victor Et Al | C | 280 | | 62 |
| 02306 | Gardner Lake | C | 40 | | 13 |
| 02476 | Gardner Mt. (South) | M | 1,622 | AMP IMPLEMENTED | 193 |
| 02336 | Gates-Yonkee | C | 560 | | 86 |
| 22120 | Gibbs Brothers | C | 95 | | 12 |
| 12085 | Goble Draw | C | 478 | | 48 |
| 12226 | Gold Mine Road | C | 494 | | 63 |
| 22121 | Gordon | M | 6,674 | | 761 |
| 02335 | Gordon Creek | I | 2,118 | | 285 |
| 02428 | Gosney Airstrip | C | 40 | | 2 |
| 02395 | Gosney, Elmer | C | 278 | | 61 |
| 12193 | Government Draw | M | 3,590 | | 380 |
| 02421 | Grandma's Bend | C | 84 | | 14 |
| 02360 | Gray Cabin Draw | C | 2,230 | | 270 |
| 12174 | Green Draw | C | 160 | | 29 |
| 32003 | Green Hill | C | 40 | | 5 |
| 02469 | Grub Draw | I | 10,120 | | 1,019 |
| 22129 | Hamm Don Robert | C | 362 | | 77 |
| 12154 | Hampshire | C | 1,144 | | 129 |
| 12134 | Harlan James S. | C | 441 | | 24 |
| 12136 | Harper George Mary | C | 120 | | 30 |
| 14812 | Harper Reservoir | C | 23 | | 2 |
| 12147 | Hat Ranch | M | 6,573 | | 493 |
| 32002 | Hay Creek | C | 80 | | 26 |
| 02440 | Healy | C | 280 | | 35 |
| 12153 | Hepp Charles | M | 2,404 | | 228 |
| 12231 | Hilight | C | 40 | | 8 |
| 02443 | Hill Prong | C | 80 | | 13 |
| 22114 | Hines | C | 120 | | 24 |
| 12180 | Hoblit | C | 140 | | 23 |
| 12169 | Hoe Ranch | I | 15,279 | | 1,676 |
| 02393 | Hole In The Wall | I | 9,000 | | 738 |
| 22116 | Holler Draw | C | 482 | | 62 |
| 02410 | Homestead Draw 4150' | C | 80 | | 11 |
| 10342 | Hope | I | 3,423 | AMP IMPLEMENTED | 555 |
| 12240 | Horse Creek | M | 1,110 | | 231 |
| 02434 | Horse Creek | C | 2,071 | | 427 |
| 02423 | Horse Creek/ Pipeline | C | 40 | | 8 |
| 02327 | Horseshoe Ranch | C | 880 | | 24 |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Type Management | Permitted Use (AUMs) |
|------------------|------------------------|---------------------|---------------------|-----------------|----------------------|
| 02461 | HQ and Taylor Spring | C | 912 | | 101 |
| 02415 | Indian Creek | M | 2,587 | | 301 |
| 02274 | Ivy Creek | C | 83 | | 8 |
| 12061 | Jackplane | C | 2,664 | | 266 |
| 02394 | Jeep Trail | C | 200 | | 20 |
| 02320 | Jeffers Draw | C | 39 | | 6 |
| 12158 | Jiggs Reservoir | C | 117 | | 28 |
| 02257 | Jim Crow Creek | C | 597 | | 113 |
| 02460 | Johnson Creek | C | 354 | | 31 |
| 02401 | Johnson Draw | C | 2,288 | | 232 |
| 02382 | Jones Draw | C | 40 | | 6 |
| 02447 | K Ranch | C | 1,361 | | 187 |
| 12148 | Kaycee L And L | C | 761 | | 43 |
| 02251 | Keathley Draw | C | 385 | | 39 |
| 12178 | Kendrick | M | 5,351 | | 874 |
| 02277 | Keyes Draw | C | 79 | | 9 |
| 22202 | Kingsbury/Wild Horse | C | 160 | | 32 |
| 12038 | Kline Draw | C | 400 | | 43 |
| 12056 | Kurtley Draw | C | 1,277 | | 135 |
| 02364 | Lanabaugh No. 4 Draw | C | 40 | | 10 |
| 02301 | Larey Draw | C | 2,320 | | 385 |
| 02347 | Lariat | C | 200 | | 20 |
| 22108 | Larrechea | C | 280 | | 48 |
| 12190 | Lawrence Charles | C | 2,838 | | 285 |
| 12188 | Lawrence Land Co. Inc. | C | 165 | | 19 |
| 12023 | Lawver | M | 4,646 | | 815 |
| 12194 | Legerski Ranch | C | 359 | | 72 |
| 02325 | Linch | C | 1,441 | | 173 |
| 12197 | Linch | C | 80 | | 15 |
| 02305 | Linn Draw | C | 1,440 | | 236 |
| 12198 | Little Bighorn Ranch | C | 40 | | 8 |
| 12233 | Little Cedar Draw | C | 200 | | 28 |
| 32007 | Little Poison Creek | C | 2,244 | | 218 |
| 02358 | Little Powder River | M | 3,711 | | 750 |
| 02279 | Little Rawhide | C | 40 | | 10 |
| 02310 | Little Willow | I | 6,080 | AMP IMPLEMENTED | 823 |
| 02307 | Little Youngs Creek | C | 169 | | 34 |
| 22123 | Lone Tree | C | 40 | | 7 |
| 02343 | Long Draw | C | 719 | | 99 |
| 02466 | Lower Willow Glen | C | 80 | | 11 |
| 02355 | Lx Bar | C | 1,230 | | 126 |
| 02368 | Mark Gordon | C | 1,282 | | 132 |
| 02445 | Marton | C | 41 | | 7 |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Type Management | Permitted Use (AUMs) |
|------------------|----------------------|---------------------|---------------------|-----------------|----------------------|
| 02309 | Mary Straatsma Est. | C | 40 | | 6 |
| 22221 | Maycock Draw | C | 719 | | 72 |
| 02406 | Mayer | C | 98 | | 12 |
| 02346 | Mayor | I | 3,157 | | 384 |
| 12032 | Mayoworth S. Of Sdw | C | 240 | | 20 |
| 02370 | Meadow Creek | M | 2,355 | | 248 |
| 02303 | Meadow Draw | C | 160 | | 16 |
| 12227 | Michelena | M | 3,405 | AMP PROPOSED | 348 |
| 22055 | Mickelberry Creek | C | 160 | | 16 |
| 12030 | Middleberry Draw | C | 1,778 | | 178 |
| 14952 | Mitchell Breaks | M | 2,268 | AMP IMPLEMENTED | 391 |
| 02429 | Mitchell Draw | M | 4,306 | | 419 |
| 12140 | Montgomery | C | 1,861 | | 204 |
| 00749 | Moore Reservoir | C | 40 | | 8 |
| 12235 | Moore, James R. | C | 3,971 | | 782 |
| 02408 | Moriarty, Jack L. | C | 40 | | 8 |
| 02435 | Morris Draw | C | 1,272 | | 144 |
| 22029 | Mosier Gulch | M | 160 | | 41 |
| 02373 | Mountain | I | 8,390 | AMP IMPLEMENTED | 778 |
| 02446 | Mountain | C | 1,846 | | 223 |
| 02449 | Mountain (Elm) | C | 241 | | 35 |
| 02338 | Mountain East | C | 260 | | 26 |
| 02367 | Mud Spring Creek | C | 80 | | 16 |
| 22223 | Muddy Creek | C | 40 | | 18 |
| 22128 | Mumma Draw | C | 240 | | 54 |
| 02354 | Murray Draw | C | 40 | | 8 |
| 02362 | N. Fork 9 Mile Creek | C | 283 | | 40 |
| 02431 | N. Gray Cabin Draw | C | 723 | | 87 |
| 32014 | N. Windmill | I | 2,074 | AMP IMPLEMENTED | 276 |
| 02418 | N. Fork Powder R. | C | 212 | | 34 |
| 02340 | N. Leiter | C | 117 | | 40 |
| 02444 | N. Scotch | C | 201 | | 105 |
| 02092 | N. Cottonwood Cr. | C | 79 | | 23 |
| 02348 | Napier | M | 3,242 | | 529 |
| 12095 | Neil Butte | C | 40 | | 6 |
| 12238 | Niedringhaus Lambert | C | 440 | | 24 |
| 02425 | Ninemile | C | 40 | | 5 |
| 12081 | Nipple Butte | C | 1,928 | | 389 |
| 02239 | Norfolk John | M | 1,840 | | 299 |
| 22119 | North Mitten | C | 103 | | 21 |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Type Management | Permitted Use (AUMs) |
|------------------|----------------------|---------------------|---------------------|-----------------|----------------------|
| 02363 | North Ridge | C | 335 | | 57 |
| 02295 | North Trabing | M | 560 | | 78 |
| 02436 | North West - Iberlin | C | 320 | | 32 |
| 22008 | Number Two Draw | C | 1,078 | | 170 |
| 02457 | OK Creek | C | 2,302 | | 216 |
| 02390 | Olmstead | I | 832 | AMP IMPLEMENTED | 179 |
| 02058 | Olsen Draw | C | 4,892 | | 592 |
| 02249 | Osborn | C | 280 | | 39 |
| 02287 | Padlock Ranch Co. | C | 440 | | 88 |
| 12068 | Pass Reservoir | C | 1,225 | | 118 |
| 02405 | Peterson Draw | C | 2,736 | | 335 |
| 12156 | Petrified Tree | M | 1,867 | | 218 |
| 12159 | Phinney Draw | C | 878 | | 91 |
| 02413 | Pine Ridge | C | 720 | | 76 |
| 12166 | Pine Ridge | C | 240 | | 49 |
| 02454 | Pine Ridge | C | 320 | | 27 |
| 02256 | Pinette Draw | C | 200 | | 48 |
| 12229 | Piney Creek | C | 40 | | 7 |
| 02252 | Ploesser | C | 385 | | 38 |
| 02472 | Plosser | C | 415 | | 47 |
| 02441 | Plum Creek Draw | C | 390 | | 84 |
| 32012 | Pointed Butte | C | 40 | | 11 |
| 12195 | Poison Creek | M | 1,315 | | 148 |
| 02419 | Poker Creek | I | 3,697 | AMP IMPLEMENTED | 837 |
| 02404 | Pollard Draw | C | 798 | | 79 |
| 02430 | Powder River | I | 4,526 | AMP IMPLEMENTED | 944 |
| 02260 | Powder River Ranch | I | 17,085 | | 1,779 |
| 02422 | Prairie Creek | C | 38 | | 13 |
| 02350 | Prong | C | 534 | | 92 |
| 12164 | Prong Spotted Horse | C | 2,129 | | 271 |
| 22226 | Pugsley Hill | C | 40 | | 6 |
| 12138 | Pumpkin Creek | I | 13,325 | | 1,454 |
| 12172 | Quinn, John, Bonnie | C | 40 | | 7 |
| 02264 | Rafter L. | C | 1,514 | | 238 |
| 02266 | Ramsbottom | M | 7,189 | | 430 |
| 02319 | Rattlesnake Creek | C | 40 | | 12 |
| 12098 | Rattlesnake Springs | C | 432 | | 46 |
| 12040 | RBL | C | 360 | | 43 |
| 12171 | Read Draw | C | 40 | | 4 |
| 02269 | Reclusa | C | 160 | | 42 |
| 12051 | Red Canyon | C | 2,264 | | 270 |
| 02365 | Red Draw | M | 2,115 | | 128 |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Type Management | Permitted Use (AUMs) |
|------------------|------------------------|---------------------|---------------------|-----------------|----------------------|
| 12033 | Red Fork | I | 10,000 | AMP IMPLEMENTED | 917 |
| 02409 | Red Fork Mtn Camp | C | 203 | | 7 |
| 02253 | Red Hills | C | 759 | | 127 |
| 02416 | Red Wall | C | 459 | AMP IMPLEMENTED | 78 |
| 02271 | Reece Ernest | M | 2,715 | | 414 |
| 02330 | Reel | C | 40 | | 6 |
| 02275 | Remington Creek | M | 2,676 | AMP IMPLEMENTED | 290 |
| 02385 | Reno | C | 160 | | 16 |
| 02268 | Reno Draw | C | 558 | | 63 |
| 22205 | Robinson Draw | C | 69 | | 9 |
| 12155 | Robinson Place | C | 630 | | 68 |
| 02329 | Rochelle Hills | C | 80 | | 12 |
| 12087 | Rock Ridge | C | 1,360 | | 93 |
| 02321 | Rocky Butte | C | 2,075 | | 367 |
| 12118 | Rosie Draw | C | 200 | | 29 |
| 02491 | Rossnecker Draw | C | 42 | | 6 |
| 02278 | Rourke & Offutt | C | 477 | | 125 |
| 02263 | Rozet | C | 40 | | 8 |
| 02465 | Ryan | C | 160 | | 46 |
| 02259 | S. Wyodak | C | 120 | | 32 |
| 02386 | S. Fork Otter Creek | C | 120 | | 17 |
| 02452 | S. Gillette Forty | C | 40 | | 10 |
| 22203 | S. Leiter | C | 1,457 | | 146 |
| 02372 | S.F. Crazy Woman | C | 80 | | 14 |
| 02281 | S.F. Three Bar | C | 215 | | 43 |
| 22110 | Sahara Draw | C | 120 | | 20 |
| 02411 | Salt Creek | M | 4,249 | | 551 |
| 02272 | Sand Rock/Hoe Creek | C | 74 | | 11 |
| 00743 | Sawmill | C | 240 | | 12 |
| 12185 | Schiermiester | C | 800 | | 114 |
| 22122 | School Sec Dr/Mdlfrk | C | 160 | | 27 |
| 12073 | School Section Draw | C | 478 | | 43 |
| 22214 | Schoonover Ranch | I | 12,482 | AMP IMPLEMENTED | 1,528 |
| 12137 | Scotch | C | 200 | | 10 |
| 02353 | Scott Draw | C | 306 | | 32 |
| 02286 | Scott Marion | C | 560 | | 124 |
| 12083 | Scotty Draw | C | 4,500 | | 624 |
| 02276 | Se Of Buffalo Creek | C | 1,140 | | 152 |
| 02369 | Senff Ditch | C | 80 | | 13 |
| 02463 | SF Holler Draw | C | 280 | | 26 |
| 02375 | S. Fork Arkansas Creek | C | 200 | | 36 |
| 02292 | Simpson, John H. | C | 1,156 | | 198 |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Type Management | Permitted Use (AUMs) |
|------------------|---------------------------|---------------------|---------------------|-----------------|----------------------|
| 02471 | Sioux Battle | C | 241 | | 26 |
| 02459 | Sippie Mine | C | 520 | | 53 |
| 02291 | Skidmore Estate | C | 26 | | 9 |
| 02371 | Slope | I | 3,960 | AMP IMPLEMENTED | 1,044 |
| 02399 | Slope/Mountain, Allotment | C | 2,032 | | 256 |
| 02297 | Smith | C | 322 | | 34 |
| 02300 | Smith | C | 120 | | 23 |
| 32010 | Smith Creek | C | 160 | | 10 |
| 02383 | Smith Cut | C | 3,235 | | 615 |
| 02294 | Soldier Creek Ranch | C | 1,343 | | 229 |
| 02495 | Sony Draw | M | 5,101 | | 513 |
| 02498 | South Carpenter Draw | C | 240 | | 2 |
| 02451 | South Fork | I | 7,466 | | 726 |
| 02389 | South Fork Powder R. | M | 4,890 | | 380 |
| 02280 | South Middle Butte | C | 639 | | 67 |
| 12183 | South Middle Prong | C | 640 | | 73 |
| 02467 | South Sussex Stkrst | C | 27 | | 14 |
| 00744 | South Tabletop | C | 120 | | 15 |
| 02296 | South Trabing | M | 1,039 | | 111 |
| 02351 | South Twin Creek | C | 200 | | 33 |
| 22220 | Spellman | C | 1,278 | | 163 |
| 02477 | Spotted Horse Creek | C | 961 | | 105 |
| 02241 | Spring Creek | C | 1,231 | | 287 |
| 22025 | Squaw Butte | C | 40 | | 11 |
| 02298 | Squaw Creek | M | 2,566 | | 289 |
| 02255 | Stateline | C | 71 | | 18 |
| 12131 | Steel Creek | C | 200 | | 20 |
| 02308 | Stephenson, Marie | C | 80 | | 20 |
| 02387 | Stone Draw | C | 80 | | 20 |
| 12160 | Stotts Draw | C | 1,934 | | 193 |
| 02312 | Stuart, James R. | C | 80 | | 16 |
| 02403 | Stubbs Draw | C | 493 | AMP IMPLEMENTED | 69 |
| 02313 | Suel Anna Trustee | C | 200 | | 40 |
| 12167 | Sussex Cutoff | I | 1,318 | | 105 |
| 12133 | Sussex Oil Company | C | 920 | | 46 |
| 02420 | Sussex Stockrest | I | 305 | | 50 |
| 02316 | Swartz, Edward H. | M | 2,480 | | 621 |
| 02438 | T.W. | I | 1,840 | AMP IMPLEMENTED | 184 |
| 12141 | Tabletop | C | 80 | | 8 |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Type Management | Permitted Use (AUMs) |
|------------------|---------------------------|---------------------|---------------------|-----------------|----------------------|
| 12145 | Tarver Trust | C | 689 | | 128 |
| 02458 | Td Southwest | C | 120 | | 20 |
| 02333 | Thom Brothers | C | 31 | | 4 |
| 02349 | Three Mile Creek | C | 441 | | 90 |
| 12101 | Threemile Creek Reservoir | C | 80 | | 18 |
| 02337 | Throne John And Earl | C | 120 | | 24 |
| 02432 | Timar East | C | 1,122 | | 116 |
| 12199 | Timber Draw | C | 74 | | 10 |
| 02494 | Tipperary | C | 360 | | 38 |
| 22213 | Tongue River | I | 1,767 | AMP IMPLEMENTED | 476 |
| 02339 | Trail Creek | M | 7,244 | | 2,624 |
| 02417 | Trail Side | C | 40 | | 14 |
| 12043 | Trough Draw | C | 760 | | 34 |
| 00697 | Truman Draw | M | 2,032 | | 347 |
| 02282 | Ttt | M | 14,155 | | 1,563 |
| 02456 | Tuttle Draw | C | 320 | | 92 |
| 02470 | Tuttle Draw/Deep Crk | C | 554 | | 154 |
| 12187 | Twenty Mile Creek | I | 6,100 | | 808 |
| 12142 | Tyree Place | C | 40 | | 8 |
| 02448 | Upper Cabin Creek | C | 240 | | 43 |
| 02273 | Upper Fort Creek | C | 920 | | 205 |
| 12152 | Upper Grub | C | 1,640 | | 164 |
| 12207 | Upper Kaufman Draw | M | 1920 | | 262 |
| 12163 | Ute Creek | C | 117 | | 17 |
| 02284 | V Bar F | M | 2,797 | | 364 |
| 02345 | Vanderhoff | C | 360 | | 26 |
| 02311 | Vanhouten | M | 1,057 | | 107 |
| 12077 | W. Sussex (Hickey) | I | 3,320 | | 483 |
| 02381 | Wagensen Don Et Al | C | 80 | | 20 |
| 22106 | Wagonhammer | M | 3,881 | AMP IMPLEMENTED | 1,352 |
| 02492 | Walker Draw | C | 440 | | 48 |
| 12146 | Wall (East) | C | 1,840 | | 247 |
| 22104 | Walsh | C | 340 | | 34 |
| 02304 | Washout Dr. | M | 1,859 | | 315 |
| 02318 | Water Gap Draw | M | 9,043 | | 1,127 |
| 02356 | Watt Ranch | C | 46 | | 6 |
| 12181 | West Bowman Hill | C | 2,311 | | 522 |
| 02490 | West Coutant Creek | C | 80 | | 14 |
| 02462 | West Fork | C | 240 | | 26 |
| 12091 | West Timber Creek | C | 240 | | 32 |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Type Management | Permitted Use (AUMs) |
|------------------|------------------|---------------------|---------------------|-----------------|----------------------|
| 02170 | West Timber Draw | C | 960 | | 100 |
| 12063 | Weston SW | M | 4,435 | | 829 |
| 02326 | White Rock | C | 440 | | 58 |
| 02247 | White Tail Creek | C | 200 | | 62 |
| 12237 | Whitetail Creek | M | 3,391 | | 751 |
| 22222 | Whitetail Pines | M | 1,493 | | 299 |
| 02455 | Whitmeyer | C | 120 | | 21 |
| 02302 | Whitmeyer Creek | C | 40 | | 6 |
| 12082 | Wild Horse Creek | C | 120 | | 24 |
| 32015 | Wild Horse Creek | C | 80 | | 8 |
| 02283 | Wildcat | C | 80 | | 16 |
| 10069 | Willow Creek | I | 26,822 | | 4,412 |
| 12036 | Willow Creek | C | 2,715 | | 462 |
| 02331 | Winter Draw | C | 40 | | 6 |
| 12216 | Wolf Mountain | C | 515 | | 57 |
| 02380 | Wormwood Ranch | I | 20,699 | AMP IMPLEMENTED | 2,497 |
| 12042 | Wyarno | C | 120 | | 24 |
| 02334 | Wythom Road | C | 120 | | 20 |
| 12150 | Yellowhammer | M | 1,776 | | 206 |

Source: BLM 2009
AMP Allotment Management Plan
AUM Animal Unit Month
C Custodial
I Improve
M Maintain

U.2. Standards and Guidelines Status

Table U.2. Summary of Standards and Guidelines Evaluations

| Allotment Name | Allotment Number | Year Completed | Progress | Standard ^{1, 2} | | | | | |
|--------------------|------------------|----------------|----------|--------------------------|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 |
| Bear Gulch | 12191 | 2006 | | Y | Y | Y | Y | U | U |
| Beartrap Creek | 12072 | 2000 | | Y | Y | Y | Y | U | U |
| Beaver Creek Slope | 12157 | 2002 | | Y | Y | Y | Y | U | U |
| Bishop | 22021 | 2001 | | Y | Y | Y | Y | U | U |
| Bridge Draw | 32005 | 2006 | | Y | Y | Y | Y | U | U |
| Bull Camp | 12213 | 2005 | | Y | Y | Y | Y | U | U |
| Butcher | 12046 | 2007 | | Y | Y | Y | Y | U | U |
| Cabin Creek | 02299 | 2003 | | Y | Y | Y | Y | U | U |
| Castle Rock | 12177 | 2007 | | Y | Y | Y | Y | U | U |

| Allotment Name | Allotment Number | Year Completed | Progress | Standard ^{1, 2} | | | | | |
|------------------------------|------------------|----------------|----------|--------------------------|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 |
| Castle Rock | 12177 | 2007 | | Y | Y | Y | Y | U | U |
| Cat Creek | 02376 | 2002 | | Y | Y | Y | Y | U | U |
| Clear Creek | 02093 | 2008 | | Y | Y | Y | Y | U | U |
| Crooked Creek | 02426 | 1999 | | Y | Y | Y | Y | U | U |
| Croton | 12184 | 2006 | | Y | Y | Y | Y | U | U |
| Daly | 12074 | 2007 | | Y | Y | Y | Y | U | U |
| Daly Livestock Co. | 12075 | 2007 | | Y | Y | Y | Y | U | U |
| Davis Draw | 02397 | 2005 | | Y | Y | Y | Y | U | U |
| Davis Draw Common | 12105 | 2005 | Y | N | Y | N | Y | U | U |
| Davis Draw/Johnson Allotment | 02400 | 2005 | | Y | Y | Y | Y | U | U |
| Dead Horse Creek | 12176 | 1999 | | Y | Y | Y | Y | U | U |
| Deer Creek | 22102 | 2000 | | Y | Y | Y | Y | U | U |
| Deer Gulch | 12096 | 2002 | | Y | Y | Y | Y | U | U |
| Donlin | 02402 | 2001 | | Y | Y | Y | Y | U | U |
| Dry Creek Ranch Inc. | 12080 | 2005 | | Y | Y | Y | Y | U | U |
| Dugout Creek | 02453 | 1999 | | Y | Y | Y | Y | U | U |
| Dull Knife | 22124 | 2002 | | Y | Y | Y | Y | U | U |
| Dull Knife Pass | 12031 | 2005 | | Y | Y | Y | Y | U | U |
| Eagle Creek | 02344 | 1998 | | Y | Y | Y | Y | U | U |
| East Spring Draw | 22225 | 2006 | | Y | Y | Y | Y | U | U |
| Eighty-Five Divide | 12100 | 2005 | | Y | Y | Y | Y | U | U |
| Elsom Brothers | 12089 | 2001 | | Y | Y | Y | Y | U | U |
| Falxa | 12139 | 1999 | | Y | Y | Y | Y | U | U |
| Fence Creek | 12162 | 1999 | | Y | Y | Y | Y | U | U |
| Fitch Draw | 12099 | 1999 | | Y | Y | Y | Y | U | U |
| Flying E | 12078 | 1998 | | Y | Y | Y | Y | U | U |

| Allotment Name | Allotment Number | Year Completed | Progress | Standard ^{1, 2} | | | | | |
|---------------------|------------------|----------------|----------|--------------------------|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 |
| Flying U Ranch | 12066 | 2006 | | Y | Y | Y | Y | U | U |
| Fort Creek | 12151 | 2002 | | Y | Y | Y | Y | U | U |
| Four Corners | 12076 | 2005 | | Y | Y | Y | Y | U | U |
| Fourmile | 12050 | 2006 | | Y | Y | Y | Y | U | U |
| Fourmile Ranch | 02379 | 2002 | | Y | Y | Y | Y | U | U |
| Gardner Mt. (South) | 02476 | 1999 | | Y | Y | Y | Y | U | U |
| Gordon | 22121 | 2002 | | Y | Y | Y | Y | U | U |
| Gordon Creek | 02335 | 1999 | | Y | Y | Y | Y | U | U |
| Government Draw | 12193 | 2008 | | Y | Y | Y | Y | U | U |
| Grub Draw | 02469 | 2001 | | Y | Y | Y | Y | U | U |
| Hat Ranch | 12147 | 2004 | | Y | Y | Y | Y | U | U |
| Hepp Charles | 12153 | 2005 | | Y | Y | Y | Y | U | U |
| Hoe Ranch | 12169 | 2000 | | Y | Y | Y | Y | U | U |
| Hole In The Wall | 02393 | 2002 | Y | Y | N | N | Y | U | U |
| Hope | 10342 | 1999 | | Y | Y | Y | Y | U | U |
| Horse Creek | 02434 | 2007 | | Y | Y | Y | Y | U | U |
| Indian Creek | 02415 | 2006 | | Y | Y | Y | Y | U | U |
| Jackplane | 12061 | 2008 | | Y | Y | Y | Y | U | U |
| Johnson Draw | 02401 | 2008 | | Y | Y | Y | Y | U | U |
| Kendrick | 12178 | 2006 | | Y | Y | Y | Y | U | U |
| Lawver | 12023 | 2007 | | Y | Y | Y | Y | U | U |
| Little Powder River | 02358 | 2001 | | Y | Y | Y | Y | U | U |
| Little Willow | 02310 | 2002 | | Y | Y | Y | Y | U | U |
| M. Gordon | 02368 | 2008 | | Y | Y | Y | Y | U | U |
| Mayor | 02346 | 2001 | | Y | Y | Y | Y | U | U |
| Meadow Creek | 02370 | 2006 | | Y | Y | Y | Y | U | U |
| Michelena | 12227 | 2004 | | Y | Y | Y | Y | U | U |
| Mitchell Draw | 02429 | 2006 | | Y | Y | Y | Y | U | U |
| Morris Draw | 02435 | 2008 | | Y | Y | Y | Y | U | U |
| Mosier Gulch | 22029 | 2006 | | Y | Y | Y | Y | U | U |

| Allotment Name | Allotment Number | Year Completed | Progress | Standard ^{1, 2} | | | | | |
|----------------------|------------------|----------------|----------|--------------------------|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 |
| Mountain | 02373 | 1999 | | Y | Y | Y | Y | U | U |
| N Windmill | 32014 | 1998 | | Y | Y | Y | Y | U | U |
| Napier | 02348 | 2006 | | Y | Y | Y | Y | U | U |
| North Trabling | 02295 | 2004 | | Y | Y | Y | Y | U | U |
| Olmstead | 02390 | 1998 | | Y | Y | Y | Y | U | U |
| Olsen Draw | 02058 | 2007 | | Y | Y | Y | Y | U | U |
| Petrified Tree | 12156 | 2004 | | Y | Y | Y | Y | U | U |
| Plosser | 02472 | 2008 | | Y | Y | Y | Y | U | U |
| Poison Creek | 12195 | 2005 | | Y | Y | Y | Y | U | U |
| Poker Creek | 02419 | 1999 | | Y | Y | Y | Y | U | U |
| Powder River | 02430 | 1998 | | Y | Y | Y | Y | U | U |
| Powder River Ranch | 02260 | 2003 | | Y | Y | Y | Y | U | U |
| Pumpkin Creek | 12138 | 2001 | | Y | Y | Y | Y | U | U |
| Red Draw | 02365 | 2006 | | Y | Y | Y | Y | U | U |
| Red Fork | 12033 | 1999 | | Y | Y | Y | Y | U | U |
| Reece Ernest | 02271 | 2006 | | Y | Y | Y | Y | U | U |
| Remington Creek | 02275 | 2008 | | Y | Y | Y | Y | U | U |
| Rock Ridge | 12087 | 2006 | | Y | Y | Y | Y | U | U |
| Salt Creek | 02411 | 2005 | | Y | Y | Y | Y | U | U |
| Schiermister | 12185 | 2008 | | Y | Y | Y | Y | U | U |
| Schoonover Ranch | 22214 | 1998 | | Y | Y | Y | Y | U | U |
| Sioux Battle | 02471 | 2003 | Y | Y | Y | N | Y | U | U |
| Slope | 02371 | 1999 | | Y | Y | Y | Y | U | U |
| Sony Draw | 02495 | 2006 | | Y | Y | Y | Y | U | U |
| South Fork | 02451 | 2003 | | Y | Y | Y | Y | U | U |
| South Fork Powder R. | 02389 | 2000 | | Y | Y | Y | Y | U | U |
| South Trabling | 02296 | 2004 | | Y | Y | Y | Y | U | U |
| Squaw Creek | 02298 | 2005 | | Y | Y | Y | Y | U | U |
| Stubbs Draw | 02403 | 1999 | | Y | Y | Y | Y | U | U |

| Allotment Name | Allotment Number | Year Completed | Progress | Standard ^{1, 2} | | | | | |
|--------------------|------------------|----------------|----------|--------------------------|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 |
| Sussex Cutoff | 12167 | 2000 | | Y | Y | Y | Y | U | U |
| Sussex Stockrest | 02420 | 2000 | | Y | Y | Y | Y | U | U |
| Swartz, Edward H. | 02316 | 2007 | | Y | Y | Y | Y | U | U |
| T.W. | 02438 | 1998 | | Y | Y | Y | Y | U | U |
| Timar East | 02432 | 2004 | | Y | Y | Y | Y | U | U |
| Trail Creek | 02339 | 2006 | | Y | Y | Y | Y | U | U |
| Trough Draw | 12043 | 2008 | | Y | Y | Y | Y | U | U |
| Ttt | 02282 | 2000 | | Y | Y | Y | Y | U | U |
| Twenty Mile Creek | 12187 | 2000 | | Y | Y | Y | Y | U | U |
| Upper Grub | 12152 | 2005 | | Y | Y | Y | Y | U | U |
| Upper Kaufman Draw | 12207 | 2006 | | Y | Y | Y | Y | U | U |
| V Bar F | 02284 | 2006 | | Y | Y | Y | Y | U | U |
| Van-houten | 02311 | 2003 | | Y | Y | Y | Y | U | U |
| W. Sussex (Hickey) | 12077 | 2001 | | Y | Y | Y | Y | U | U |
| Wagonhammer | 22106 | 1998 | | Y | Y | Y | Y | U | U |
| Washout Dr. | 02304 | 2005 | | Y | Y | Y | Y | U | U |
| Water Gap Draw | 02318 | 2005 | | Y | Y | Y | Y | U | U |
| Whitetail Creek | 12237 | 2001 | | Y | Y | Y | Y | U | U |
| Whitetail Pines | 22222 | 2002 | | Y | Y | Y | Y | U | U |
| Willow Creek | 10069 | 2004 | | Y | Y | Y | Y | U | U |
| Wormwood Ranch | 02380 | 1998 | | Y | Y | Y | Y | U | U |

| Allotment Name | Allotment Number | Year Completed | Progress | Standard ^{1, 2} | | | | | |
|--|------------------|----------------|----------|--------------------------|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 |
| Yel-lowhammer | 12150 | 2004 | | Y | Y | Y | Y | U | U |
| Source(s): BLM 1998 - 2008 | | | | | | | | | |
| ¹ Codes in Progress and Standard columns are as follows: Y Yes meets standard N No does not meet standard U Unknown | | | | | | | | | |
| ² Standards 5 and 6 are dependent upon determinations made by the Wyoming Department of Environmental Quality (DEQ). Standard 5 is Unknown if allotment specific data is not available. Wyoming DEQ has not identified air quality impairments within the Buffalo Field Office resulting in Standard 6 being met. | | | | | | | | | |

U.3. Livestock Grazing Allotments Within Greater Sage-Grouse Habitat

Table U.3. Grazing Allotments within 4.0 Miles of Occupied Greater Sage-Grouse Leaks

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Management Type | Permitted Use (AUMs) | All or a portion of the Federal acres are within 4.0 Miles of a Greater Sage-Grouse Lek |
|------------------|----------------------|---------------------|---------------------|-----------------|----------------------|---|
| 12182 | 4mile Creek/RC | C | 369 | | 41 | |
| 02378 | 76 Creek | C | 200 | | 33 | X |
| 02314 | Adon | C | 40 | | 6 | |
| 22115 | Allemand | C | 1,520 | | 184 | X |
| 02246 | Anderson Draw | C | 178 | | 21 | |
| 12173 | Antelope Basin | C | 449 | | 47 | X |
| 02366 | Antelope Draw | C | 40 | | 6 | X |
| 02493 | Armstrong Prong | C | 223 | | 51 | X |
| 02433 | Arpan Butte | C | 1,259 | | 137 | X |
| 00698 | Ash Draw | C | 240 | | 47 | X |
| 02323 | Bader Gulch | C | 83 | | 20 | |
| 02377 | Badger Creek | C | 40 | | 8 | X |
| 02437 | Badger Tract | C | 40 | | 7 | X |
| 22204 | Baldwin Creek | C | 640 | | 47 | |
| 22009 | Bales Ranch Inc | C | 80 | | 11 | X |
| 02328 | Banner | C | 120 | | 24 | |
| 22011 | Barbe Dorie J | C | 120 | | 13 | X |
| 32013 | Barlow | C | 89 | | 13 | X |
| 02442 | Barnum Mountain Road | C | 2,735 | | 277 | |

*Appendix U Livestock Grazing Allotments
Livestock Grazing Allotments Within Greater
Sage-Grouse Habitat*

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Management Type | Permitted Use (AUMs) | All or a portion of the Federal acres are within 4.0 Miles of a Greater Sage-Grouse Lek |
|------------------|---------------------|---------------------|---------------------|-----------------|----------------------|---|
| 02414 | Barnum Mtn. Road | C | 40 | | 8 | |
| 22224 | Barnum Mtn. Spring | C | 80 | | 13 | |
| 12236 | Bates Creek | C | 80 | | 12 | |
| 02475 | Bayer Creek | C | 120 | | 34 | |
| 12191 | Bear Gulch | M | 3,837 | | 612 | |
| 12168 | Beartrap | C | 483 | | 76 | |
| 12072 | Beartrap Creek | C | 2,171 | | 249 | |
| 22111 | Beaver Creek | C | 440 | | 54 | |
| 12157 | Beaver Creek Slope | I | 8,098 | | 546 | |
| 12041 | Bed Spring Draw | C | 358 | | 23 | X |
| 02478 | Beebee | C | 320 | | 211 | |
| 22127 | Bekebrede Draw | C | 80 | | 20 | X |
| 12209 | Belle Fourche Tr. | C | 800 | | 159 | X |
| 02288 | Belus | C | 120 | | 30 | |
| 22017 | Belus Ranch | C | 292 | | 51 | X |
| 32019 | Betz Alvin F | C | 185 | | 21 | X |
| 02262 | Billy Creek | C | 280 | | 44 | |
| 12228 | Billy Creek Camp | C | 80 | | 6 | |
| 02324 | Billy Creek School | C | 40 | | 10 | |
| 22021 | Bishop | C | 8,632 | | 1,483 | X |
| 12048 | Bitter Creek | C | 1,025 | | 122 | |
| 22022 | Bittercreek | C | 80 | | 16 | |
| 22028 | Black Draw | C | 2,581 | | 300 | |
| 12230 | Black Stump Draw | C | 200 | | 50 | |
| 42013 | Blue Creek | C | 2,221 | | 223 | |
| 12189 | Bode Gulch | C | 560 | | 59 | |
| 22210 | Bone Pile Creek | C | 241 | | 45 | X |
| 02254 | Box Elder Draw | C | 71 | | 8 | X |
| 32005 | Bridge Draw | C | 2,720 | | 274 | X |
| 12219 | Bright Spring Draw | C | 240 | | 61 | X |
| 02243 | Brower Draw | C | 310 | | 30 | X |
| 12035 | Brown Kennedy Ranch | M | 2,122 | | 501 | X |
| 12192 | Bugher Draw | C | 1,510 | | 123 | X |
| 12213 | Bull Camp | M | 2,475 | | 252 | |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Management Type | Permitted Use (AUMs) | All or a portion of the Federal acres are within 4.0 Miles of a Greater Sage-Grouse Lek |
|------------------|----------------------|---------------------|---------------------|-----------------|----------------------|---|
| 02474 | Bull Camp Canyon | C | 315 | | 24 | |
| 22212 | Bull Creek | C | 2,713 | | 250 | |
| 32018 | Bull Creek | C | 278 | | 40 | |
| 12161 | Burnt Hollow | I | 13,790 | | 2,400 | X |
| 12046 | Butcher | C | 640 | | 119 | X |
| 12047 | Butcher Ranch | C | 240 | | 61 | X |
| 12208 | Caballo Draw | C | 680 | | 113 | X |
| 02258 | Cabin Canyon | C | 2,366 | | 356 | X |
| 02299 | Cabin Creek | M | 3,139 | | 309 | X |
| 12049 | Camblin | C | 690 | | 130 | X |
| 02289 | Campbell Draw | C | 413 | | 56 | X |
| 22201 | Carpenter Draw | C | 760 | | 81 | X |
| 02265 | Carr | C | 400 | | 43 | X |
| 12053 | Carson, Dan | C | 80 | | 16 | X |
| 12052 | Carson, O. and R.J. | C | 240 | | 37 | X |
| 02450 | Carter Draw | C | 220 | | 30 | X |
| 12165 | Carter Draw | C | 880 | | 45 | X |
| 12054 | Cash | C | 80 | | 14 | X |
| 12177 | Castle Rock | M | 5,256 | | 610 | X |
| 02376 | Cat Creek | I | 5,696 | | 552 | X |
| 12175 | Cates Draw | C | 1,689 | | 173 | X |
| 12057 | Chabot August Et Al | C | 280 | | 19 | X |
| 02384 | Chabot August Et Al | C | 147 | | 14 | |
| 02468 | Chalk Hills | C | 203 | | 29 | X |
| 12211 | Charlie Draw | C | 1,482 | | 306 | X |
| 02290 | Chicken Creek Divide | C | 40 | | 7 | X |
| 32020 | Clark, Glen L. | C | 1,247 | | 131 | X |
| 02398 | Claypit | C | 1,120 | | 132 | X |
| 02093 | Clear Creek | C | 396 | | 39 | X |
| 12065 | Clear Creek Grazing | C | 908 | | 92 | X |
| 12149 | Coal Creek | C | 117 | | 18 | X |
| 12069 | Cook | C | 40 | | 6 | X |
| 02248 | Coon Track Creek | C | 121 | | 18 | X |
| 22027 | Codero Allotment | C | 480 | | 78 | X |
| 12024 | Corral Creek | C | 36 | | 5 | X |
| 00754 | Cotton | C | 40 | | 4 | X |
| 02424 | Cottonwood (Knudson) | C | 923 | | 106 | X |

*Appendix U Livestock Grazing Allotments
Livestock Grazing Allotments Within Greater
Sage-Grouse Habitat*

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Management Type | Permitted Use (AUMs) | All or a portion of the Federal acres are within 4.0 Miles of a Greater Sage-Grouse Lek |
|------------------|---------------------------|---------------------|---------------------|-----------------|----------------------|---|
| 022661 | Cottonwood Creek | C | 120 | | 26 | X |
| 22130 | Cottonwood Creek E | C | 80 | | 12 | X |
| 12143 | Cottonwood Creek I | C | 160 | | 47 | X |
| 02427 | Cottonwood Draw | C | 400 | | 72 | X |
| 12179 | Cottonwood Draw | C | 1,020 | | 105 | X |
| 02357 | County Line | C | 1,122 | | 153 | X |
| 22132 | Coutant Creek | C | 320 | | 39 | X |
| 12186 | Cow Creek | C | 2,706 | | 251 | X |
| 22125 | Cow's Face | C | 360 | | 24 | |
| 12094 | Crazy Woman Creek | C | 760 | | 80 | X |
| 12218 | Crenshaw Hill | C | 719 | | 87 | X |
| 12090 | Cromack Draw | C | 427 | | 93 | X |
| 02426 | Crooked Creek | I | 20,367 | AMP Implemented | 2694 | X |
| 22206 | Cross H Creek | C | 313 | | 49 | X |
| 12184 | Croton | M | 1,028 | | 174 | X |
| 02352 | Cutler Draw | C | 161 | | 27 | |
| 02332 | Dabney | C | 80 | | 11 | X |
| 12074 | Daly | C | 120 | | 22 | |
| 12075 | Daly Livestock Co. | C | 6,138 | | 1107 | X |
| 02397 | Davis Draw | M | 788 | | 81 | X |
| 12105 | Davis Draw common | M | 970 | | 156 | X |
| 02400 | Davis Draw/Johnson | M | 1,394 | | 149 | X |
| 02322 | Dead Horse | C | 85 | | 8 | |
| 12176 | Dead Horse Creek | I | 9,119 | | 993 | X |
| 22113 | Dead Horse Creek Oilfield | C | 1,261 | | 216 | X |
| 12062 | Deadman Draw | C | 1,890 | | 186 | |
| 02396 | Dean Graves | C | 720 | | 94 | |
| 02267 | Deep Creek | C | 160 | | 41 | X |
| 22102 | Deer Creek | M | 10,958 | | 1245 | X |
| 32004 | Deer Creek I | C | 80 | | 10 | X |
| 12096 | Deer Gulch | M | 5,566 | | 1135 | X |
| 02270 | Dixie Reese | C | 263 | | 30 | X |
| 02402 | Donlin | C | 501 | | 134 | |
| 12039 | Drainage Draw | C | 80 | | 11 | X |
| 02412 | Dry Creek | C | 372 | | 42 | |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Management Type | Permitted Use (AUMs) | All or a portion of the Federal acres are within 4.0 Miles of a Greater Sage-Grouse Lek |
|------------------|---------------------|---------------------|---------------------|-----------------|----------------------|---|
| 22229 | Dry Creek Basin | C | 79 | | 14 | X |
| 12080 | Dry Creek Ranch | C | 4,948 | | 1074 | X |
| 02285 | Dry Creek Res | C | 40 | | 4 | X |
| 02250 | Dry Fork | C | 3,314 | | 488 | X |
| 02341 | Dry Fork P.R. | C | 1,406 | | 235 | X |
| 02407 | Dry Muddy Creek | C | 80 | | 18 | |
| 12144 | Dry Trail Creek | C | 2,086 | | 389 | X |
| 02344 | Dry Vee | M | 4,442 | AMP PROPOSED | 911 | X |
| 02374 | Duck Creek | C | 41 | | 12 | X |
| 22036 | Duck Creek 2 | C | 217 | | 60 | |
| 02453 | Dugout Creek | I | 9,341 | | 1217 | |
| 22124 | Dull Knife | I | 9,173 | | 553 | |
| 12031 | Dull Knife Pass | M | 5,047 | | 603 | X |
| 02317 | Dutch Dreek | C | 80 | | 14 | |
| 12200 | E.K. Mountain | C | 156 | | 26 | X |
| 12037 | East Fork | C | 680 | | 128 | X |
| 22225 | East Spring Draw | M | 5,683 | | 550 | X |
| 12232 | Echeta | C | 320 | | 37 | X |
| 02388 | Eightyfive Divide | C | 1,319 | | 328 | X |
| 12100 | Eighty-five Divide | M | 1,679 | | 384 | X |
| 12034 | Elk Creek Road | C | 40 | | 8 | X |
| 12086 | Elliot Curtis | C | 114 | | 24 | |
| 12089 | Elsom Brothers | C | 1,760 | | 133 | |
| 12067 | Encres Draw | C | 40 | | 7 | X |
| 22215 | Erickson Draw | C | 840 | | 96 | X |
| 12139 | Falxa | I | 14,759 | AMP Implemented | 1,546 | X |
| 12097 | Fauber George | C | 120 | | 7 | |
| 12162 | Fence Creek | I | 4,820 | AMP Implemented | 655 | X |
| 14811 | Figure 8 | C | 494 | | 42 | X |
| 12099 | Fitch Draw | M | 1,840 | | 250 | X |
| 32006 | Flats | C | 2947 | | 254 | X |
| 12078 | Flying E | I | 16,603 | | 1,672 | X |
| 12066 | Flying U Ranch | M | 4,236 | | 826 | |
| 12045 | Forest Tract | C | 320 | | 16 | |
| 12151 | Fort Creek | M | 19,376 | | 2,235 | X |
| 42001 | Fortification Creek | C | 894 | | 102 | |
| 22107 | Fortin Draw | C | 40 | | 10 | X |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Management Type | Permitted Use (AUMs) | All or a portion of the Federal acres are within 4.0 Miles of a Greater Sage-Grouse Lek |
|------------------|---------------------|---------------------|---------------------|-----------------|----------------------|---|
| 22109 | Foster, Ralph | C | 880 | | 147 | X |
| 12076 | Four Corners | M | 2,109 | | 422 | X |
| 22126 | Four Horse | C | 1,175 | | 215 | X |
| 02242 | Four Horse Creek | C | 320 | | 84 | X |
| 12050 | Fourmile | M | 4,879 | | 433 | X |
| 02293 | Fourmile 94 | C | 156 | | 15 | |
| 02379 | Fourmile Ranch | I | 7,595 | | 623 | X |
| 12070 | Fowler Draw | C | 151 | | 18 | X |
| 12088 | Freeman Camp | C | 800 | | 32 | |
| 02391 | Freeman Draw | M | 2,710 | | 445 | |
| 12079 | Gammon Draw | C | 37 | | 9 | |
| 22112 | Garber Victor Et Al | C | 280 | | 62 | |
| 02306 | Gardner Lake | C | 40 | | 13 | X |
| 02476 | Gardner Mt. (South) | M | 1,622 | AMP Implemented | 193 | X |
| 02336 | Gates-Yonkee | C | 560 | | 86 | X |
| 22120 | Gibbs Brothers | C | 95 | | 12 | |
| 12085 | Goble Draw | C | 478 | | 48 | X |
| 12226 | Gold Mine Road | C | 494 | | 63 | |
| 22121 | Gordon | M | 6,674 | | 761 | X |
| 02335 | Gordon Creek | I | 2,118 | | 285 | |
| 02428 | Gosney Airstrip | C | 40 | | 2 | X |
| 02395 | Gosney, Elmer | C | 278 | | 61 | X |
| 12193 | Government Draw | M | 3,590 | | 380 | X |
| 02421 | Grandma's Bend | C | 84 | | 14 | X |
| 02360 | Gray Cabin Draw | C | 2,230 | | 270 | X |
| 12174 | Green Draw | C | 160 | | 29 | X |
| 32003 | Green Hill | C | 40 | | 5 | X |
| 02469 | Grub Draw | I | 10,120 | | 1019 | X |
| 22129 | Hamm Don Robert | C | 362 | | 77 | X |
| 12154 | Hampshire | C | 1,144 | | 129 | X |
| 12134 | Harlan James S | C | 441 | | 24 | |
| 14812 | Harper Reservoir | C | 23 | | 2 | X |
| 12147 | Hat Ranch | M | 6,573 | | 493 | X |
| 32002 | Hay Creek | C | 80 | | 26 | X |
| 02440 | Healy | C | 280 | | 35 | X |
| 12153 | Hepp Charles | M | 2,404 | | 228 | X |
| 12231 | Hilight | C | 40 | | 8 | |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Management Type | Permitted Use (AUMs) | All or a portion of the Federal acres are within 4.0 Miles of a Greater Sage-Grouse Lek |
|------------------|--------------------------|---------------------|---------------------|-----------------|----------------------|---|
| 02443 | Hill Prong | C | 80 | | 13 | X |
| 2213 | Hines | C | 120 | | 24 | X |
| 12180 | Hoblit | C | 140 | | 23 | X |
| 12169 | Hoe Ranch | I | 15,279 | | 1676 | X |
| 02393 | Hole In The Wall | I | 9,000 | | 738 | X |
| 22116 | Holler Draw | C | 482 | | 62 | X |
| 02410 | Homestead Draw 4150' | C | 80 | | 11 | X |
| 10342 | Hope | I | 3,423 | AMP Implemented | 555 | X |
| 12240 | Horse Creek | M | 1,110 | | 231 | X |
| 02434 | Horse Creek | C | 2,071 | | 427 | X |
| 02434 | Horse Creek/ Pipeline | C | 40 | | 8 | X |
| 02327 | Horseshoe Ranch | C | 880 | | 24 | |
| 02461 | HQ and Taylor Spring | C | 912 | | 101 | X |
| 02415 | Indian Creek | M | 2,587 | | 301 | X |
| 02274 | Ivy Creek | C | 83 | | 8 | X |
| 12061 | Jackplane | C | 2,664 | | 266 | X |
| 02394 | Jeep Trail | C | 200 | | 20 | X |
| 02320 | Jeffers Draw | C | 39 | | 6 | X |
| 12158 | Jiggs Reservoir | C | 117 | | 28 | X |
| 02257 | Jim Crow Creek | C | 597 | | 113 | X |
| 02460 | Johnson Creek | C | 354 | | 31 | |
| 02401 | Johnson Draw | C | 2,288 | | 232 | |
| 02382 | Jones Draw | C | 40 | | 6 | |
| 02447 | K Ranch | C | 1,361 | | 187 | |
| 12148 | Kaycee L and L | C | 761 | | 43 | |
| 02251 | Keathley Draw | C | 385 | | 39 | X |
| 12178 | Kendrick | M | 5,351 | | 874 | X |
| 02277 | Keyes Draw | C | 79 | | 9 | X |
| 22202 | Kingsbury/ Wild Horse | C | 160 | | 32 | X |
| 12038 | Kline Draw | C | 400 | | 43 | X |
| 12056 | Kurtley Draw | C | 1,277 | | 135 | |
| 02364 | Lanabaugh No. 4 Draw | C | 40 | | 10 | |
| 02301 | Larey Draw | C | 2,310 | | 385 | X |
| 02347 | Lariat | C | 200 | | 20 | |
| 22108 | Larrechea | C | 280 | | 48 | X |
| 12190 | Lawrence Charles | C | 2838 | | 285 | X |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Management Type | Permitted Use (AUMs) | All or a portion of the Federal acres are within 4.0 Miles of a Greater Sage-Grouse Lek |
|------------------|-----------------------|---------------------|---------------------|-----------------|----------------------|---|
| 12188 | Lawrence Land Co. Inc | C | 165 | | 19 | X |
| 12023 | Lawver | M | 4646 | | 815 | X |
| 12194 | Legerski Ranch | C | 359 | | 72 | |
| 02325 | Linch | C | 1441 | | 173 | X |
| 12197 | Linch | C | 80 | | 15 | |
| 02305 | Linn Draw | C | 1440 | | 236 | X |
| 12198 | Little Bighorn Ranch | C | 40 | | 8 | |
| 12233 | Little Cedar Draw | C | 200 | | 28 | X |
| 32007 | Little Poison Creek | C | 2244 | | 218 | |
| 02358 | Little Powder River | M | 3711 | | 750 | X |
| 02279 | Little Rawhide | C | 40 | | 10 | X |
| 02310 | Little Willow | I | 6080 | AMP Implemented | 823 | X |
| 02307 | Little Youngs Creek | C | 169 | | 34 | X |
| 22123 | Lone Tree | C | 40 | | 7 | X |
| 02343 | Long Draw | C | 719 | | 99 | X |
| 02466 | Lower Willow Glen | C | 80 | | 11 | |
| 02355 | LX Bar | C | 1,230 | | 126 | X |
| 02368 | Mark Gordon | C | 1,282 | | 132 | X |
| 02445 | Marton | C | 41 | | 7 | |
| 02309 | Mary Straatsma Est. | C | 40 | | 6 | X |
| 22221 | Maycock Draw | I | 719 | | 72 | X |
| 02406 | Mayer | C | 98 | | 12 | X |
| 02346 | Mayor | C | 3,157 | | 384 | |
| 12032 | Mayoworth S. of SDW | C | 240 | | 20 | X |
| 02370 | Meadow Creek | M | 2,355 | | 248 | X |
| 02303 | Meadow Draw | C | 160 | | 16 | |
| 12227 | Michelena | M | 3,405 | AMP Proposed | 348 | X |
| 22055 | Mickelberry Creek | C | 160 | | 16 | |
| 12030 | Middleberry Draw | C | 1,778 | | 178 | |
| 14952 | Mitchell Breaks | M | 2,268 | AMP Implemented | 391 | |
| 02429 | Mitchell Draw | M | 4,306 | | 419 | X |
| 12140 | Montgomery | C | 1,861 | | 204 | X |
| 00749 | Moore Reservoir | C | 40 | | 8 | X |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Management Type | Permitted Use (AUMs) | All or a portion of the Federal acres are within 4.0 Miles of a Greater Sage-Grouse Lek |
|------------------|----------------------|---------------------|---------------------|-----------------|----------------------|---|
| 12235 | Moore, James R | C | 3,971 | | 782 | X |
| 02408 | Moriarty, Jack L. | C | 40 | | 8 | X |
| 02435 | Morris Draw | C | 1,272 | | 144 | X |
| 22029 | Mosier Gulch | M | 160 | | 41 | |
| 02373 | Mountain | I | 8,390 | AMP Implemented | 778 | X |
| 02446 | Mountain | C | 1,846 | | 223 | |
| 02449 | Mountain (Elm) | C | 241 | | 35 | |
| 02338 | Mountain East | C | 260 | | 26 | |
| 02367 | Mud Spring Creek | C | 80 | | 16 | |
| 22223 | Muddy Creek | C | 40 | | 18 | |
| 22128 | Mumma Draw | C | 240 | | 54 | X |
| 02354 | Murray Draw | C | 40 | | 8 | X |
| 02362 | N Fork 9 Mile Creek | C | 283 | | 40 | |
| 02431 | N Gray Cabin Creek | C | 723 | | 87 | X |
| 32014 | N Windmill | I | 2,074 | AMP Implemented | 276 | X |
| 02418 | N. Fork Powder R. | C | 212 | | 34 | |
| 02340 | N. Leiter | C | 117 | | 40 | X |
| 02444 | N. Scotch | C | 201 | | 83 | |
| 02092 | N. Cottonwood Cr. | C | 79 | | 23 | X |
| 02348 | Napier | M | 3,242 | | 529 | X |
| 12095 | Neil Butte | C | 40 | | 6 | X |
| 12238 | Niedringhaus Lambert | C | 440 | | 24 | |
| 02425 | Ninemile | C | 40 | | 5 | X |
| 12081 | Nipple Butte | C | 1,928 | | 389 | X |
| 02239 | Norfolk John | M | 1,840 | | 299 | |
| 22119 | North Mitten | C | 103 | | 21 | X |
| 02363 | North Ridge | C | 335 | | 57 | |
| 02295 | North Trabing | M | 560 | | 78 | |
| 02436 | North-West Iberlin | C | 320 | | 32 | X |
| 22008 | Number Two Draw | C | 1,078 | | 170 | X |
| 02457 | OK Creek | C | 2,302 | AMP Implemented | 216 | X |
| 02390 | Olmstead | I | 832 | | 179 | X |
| 02058 | Olsen Draw | C | 4,862 | | 592 | X |
| 02249 | Osborn | C | 280 | | 39 | X |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Management Type | Permitted Use (AUMs) | All or a portion of the Federal acres are within 4.0 Miles of a Greater Sage-Grouse Lek |
|------------------|---------------------|---------------------|---------------------|-----------------|----------------------|---|
| 02287 | Padlock Ranch Co. | C | 440 | | 88 | X |
| 12068 | Pass Reservoir | C | 1,225 | | 118 | X |
| 02405 | Peterson Draw | C | 2,736 | | 335 | X |
| 12156 | Petrified Tree | M | 1,867 | | 218 | X |
| 12159 | Phinney Draw | C | 878 | | 91 | X |
| 02413 | Pine Ridge | C | 720 | | 76 | X |
| 12166 | Pine Ridge | C | 240 | | 49 | |
| 02454 | Pine Ridge | C | 320 | | 27 | X |
| 02256 | Pinette Draw | C | 200 | | 48 | X |
| 12229 | Piney Creek | C | 40 | | 7 | X |
| 02252 | Ploesser | C | 385 | | 38 | X |
| 02472 | Plosser | C | 415 | | 47 | X |
| 02441 | Plum Creek Draw | C | 390 | | 84 | X |
| 32012 | Pointed Butte | C | 40 | | 11 | X |
| 12195 | Poison Creek | M | 1,315 | | 148 | |
| 02419 | Poker Creek | I | 3,697 | AMP Implemented | 837 | X |
| 02404 | Pollard Draw | C | 798 | | 79 | |
| 02430 | Powder River | I | 4,526 | AMP Implemented | 944 | X |
| 02260 | Powder River Ranch | I | 17,085 | | 1,779 | X |
| 02422 | Prairie Creek | C | 38 | | 13 | X |
| 02350 | Prong | C | 534 | | 92 | X |
| 12164 | Prong Spotted Horse | C | 2,129 | | 271 | X |
| 2226 | Pugsley Hill | C | 40 | | 6 | X |
| 12138 | Pumpkin Creek | I | 13,325 | | 1,454 | X |
| 12172 | Quinn, John, Bonnie | C | 40 | | 7 | X |
| 02264 | Rafter L | C | 1,514 | | 238 | X |
| 02266 | Ramsbottom | M | 7,189 | | 430 | X |
| 02319 | Rattlesnake Creek | C | 40 | | 12 | X |
| 12098 | Rattlesnake Spring | C | 432 | | 46 | X |
| 12040 | RBL | C | 360 | | 43 | X |
| 12171 | Read Draw | C | 40 | | 4 | |
| 02269 | Reclusa | C | 160 | | 42 | |
| 12051 | Red Canyon | C | 2,264 | | 270 | X |
| 02365 | Red Draw | M | 2,115 | | 128 | |
| 12033 | Red Fork | I | 10,000 | AMP Implemented | 917 | X |
| 02409 | Red Fork Mtn Camp | C | 203 | | 7 | |
| 02253 | Red Hills | C | 759 | | 127 | X |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Management Type | Permitted Use (AUMs) | All or a portion of the Federal acres are within 4.0 Miles of a Greater Sage-Grouse Lek |
|------------------|----------------------|---------------------|---------------------|-----------------|----------------------|---|
| 02416 | Red Wall | C | 459 | AMP Implemented | 78 | X |
| 02271 | Reece Ernest | M | 2,715 | | 414 | X |
| 02330 | Reel | C | 40 | | 6 | X |
| 02275 | Remington Creek | M | 2,676 | AMP Implemented | 290 | X |
| 02385 | Reno | C | 160 | | 16 | |
| 02268 | Reno Draw | C | 558 | | 63 | X |
| 22205 | Robinson Draw | C | 69 | | 9 | |
| 12155 | Robinson Place | C | 630 | | 68 | X |
| 02329 | Rochelle Hills | C | 80 | | 12 | |
| 12087 | Rock Ridge | C | 1,360 | | 93 | |
| 02321 | Rocky Butte | C | 2,075 | | 367 | X |
| 12118 | Rosie Draw | C | 200 | | 29 | |
| 02491 | Rossnecker Draw | C | 42 | | 6 | X |
| 02278 | Rourke & Offutt | C | 477 | | 125 | X |
| 02263 | Rozet | C | 40 | | 8 | X |
| 02465 | Ryan | C | 160 | | 46 | X |
| 02259 | S. Wyodak | C | 120 | | 32 | X |
| 02386 | S. Fork Otter Creek | C | 120 | | 17 | |
| 22203 | S. Leiter | C | 1,457 | | 146 | X |
| 02372 | S.F. Crazy Woman | C | 80 | | 14 | |
| 02281 | S.F. Three Bar | C | 215 | | 43 | X |
| 22110 | Sahara Draw | C | 120 | | 20 | |
| 02411 | Salt Creek | M | 4,249 | | 551 | X |
| 02272 | Sand Rock/Hoe Creek | C | 74 | | 11 | |
| 00743 | Sawmill | C | 240 | | 12 | |
| 12185 | Schiermiester | C | 800 | | 114 | X |
| 22122 | School Sec Dr/Mdlfrk | C | 160 | | 27 | X |
| 12073 | School Section Draw | C | 478 | | 43 | X |
| 22214 | Schoonover Ranch | I | 12,482 | AMP Implemented | 1,528 | X |
| 12137 | Scotch | C | 200 | | 10 | |
| 02353 | Scott Draw | C | 306 | | 32 | X |
| 02286 | Scott Marion | C | 560 | | 124 | X |
| 12083 | Scotty Draw | C | 4,500 | | 624 | X |
| 02276 | Se of Buffalo Creek | C | 1140 | | 152 | X |
| 02369 | Senff Ditch | C | 80 | | 13 | X |
| 02463 | SF Holler Draw | C | 280 | | 26 | X |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Management Type | Permitted Use (AUMs) | All or a portion of the Federal acres are within 4.0 Miles of a Greater Sage-Grouse Lek |
|------------------|------------------------|---------------------|---------------------|-----------------|----------------------|---|
| 02375 | S. Fork Arkansas Creek | C | 200 | | 36 | |
| 02292 | Simpson, John H | C | 1,156 | | 198 | X |
| 02471 | Sioux Battle | C | 241 | | 26 | |
| 02459 | Sippie Mine | C | 250 | | 53 | X |
| 02291 | Skidmore Estate | C | 26 | | 9 | |
| 02371 | Slope | I | 3,960 | AMP Implemented | 1,044 | X |
| 02399 | Slope/ Mountain | C | 2,032 | | 256 | |
| 02297 | Smith | C | 322 | | 34 | |
| 02300 | Smith | C | 120 | | 23 | X |
| 32010 | Smith Creek | C | 160 | | 10 | X |
| 02383 | Smith Cut | C | 3,235 | | 615 | X |
| 02294 | Soldier Creek Ranch | C | 1,343 | | 229 | |
| 02495 | Sony Draw | M | 5,101 | | 513 | X |
| 02498 | South Carpenter Draw | C | 240 | | 2 | X |
| 02451 | South Fork | I | 7,433 | | 726 | X |
| 02389 | South Fork Powder R. | M | 4,890 | | 380 | X |
| 02280 | South Middle Butte | C | 639 | | 67 | X |
| 12183 | South Middle Prong | C | 640 | | 73 | X |
| 02467 | South Sussex Strst | C | 27 | | 14 | |
| 00744 | South Tabletop | C | 120 | | 15 | |
| 02296 | South Trabing | M | 1,039 | | 111 | X |
| 02351 | South Twin Creek | C | 200 | | 33 | X |
| 22220 | Spellman | C | 1,278 | | 163 | X |
| 02477 | Spotted Horse Creek | C | 961 | | 105 | X |
| 02241 | Spring Creek | C | 1,231 | | 287 | X |
| 22025 | Squaw Butte | C | 40 | | 11 | X |
| 02298 | Squaw Creek | M | 2,566 | | 289 | X |
| 02255 | Stateline | C | 71 | | 18 | X |
| 12131 | Steel Creek | C | 200 | | 20 | |
| 02308 | Stephenson, Marie | C | 80 | | 20 | |
| 02387 | Stone Draw | C | 80 | | 20 | X |
| 12160 | Stotts Draw | C | 1,934 | | 193 | |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Management Type | Permitted Use (AUMs) | All or a portion of the Federal acres are within 4.0 Miles of a Greater Sage-Grouse Lek |
|------------------|---------------------------|---------------------|---------------------|-----------------|----------------------|---|
| 02312 | Stuart, James R. | C | 80 | | 16 | X |
| 02403 | Stubbs Draw | C | 493 | AMP Implemented | 69 | |
| 02313 | Suel Anna Trustee | C | 200 | | 40 | |
| 12167 | Sussex Cutoff | I | 1,318 | | 105 | |
| 12133 | Sussex Oil Company | C | 920 | | 46 | |
| 02420 | Sussex Stockrest | I | 305 | | 50 | |
| 02316 | Swartz, Edward H. | M | 2,480 | | 621 | X |
| 02438 | T.W. | I | 1,840 | AMP Implemented | 184 | X |
| 12141 | Tabletop | C | 80 | | 8 | |
| 12145 | Tarver Trust | C | 689 | | 128 | X |
| 02458 | TD Southwest | C | 120 | | 20 | X |
| 02333 | Thom Brothers | C | 31 | | 4 | |
| 02349 | Three Mile Creek | C | 441 | | 90 | X |
| 12101 | Threemile Creek Reservoir | C | 80 | | 18 | |
| 02337 | Throne John and Earl | C | 120 | | 24 | X |
| 02432 | Timar East | C | 1,122 | | 116 | X |
| 12199 | Timber Draw | C | 74 | | 10 | X |
| 02494 | Tipperary | C | 360 | | 38 | X |
| 22213 | Tongue River | I | 1,767 | AMP Implemented | 476 | X |
| 02339 | Trail Creek | M | 7,244 | | 2,624 | X |
| 02417 | Trail Side | C | 40 | | 14 | |
| 12043 | Trough Draw | C | 760 | | 34 | X |
| 00697 | Truman Draw | M | 2,032 | | 347 | X |
| 02282 | TTT | M | 14,155 | | 1,563 | X |
| 02456 | Tuttle Draw | C | 320 | | 92 | X |
| 02470 | Tuttle Draw/ Deep Crk | C | 554 | | 154 | X |
| 12187 | Twenty Mile Creek | I | 6,100 | | 808 | X |
| 12142 | Tyree Place | C | 40 | | 8 | |
| 02448 | Upper Cabin Creek | C | 240 | | 43 | X |
| 02273 | Upper Fort Creek | C | 920 | | 205 | X |
| 12152 | Upper Grub | C | 1,340 | | 164 | X |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Management Type | Permitted Use (AUMs) | All or a portion of the Federal acres are within 4.0 Miles of a Greater Sage-Grouse Lek |
|------------------|--------------------|---------------------|---------------------|-----------------|----------------------|---|
| 12207 | Upper Kaufman Draw | M | 1,920 | | 262 | X |
| 12163 | Ute Creek | C | 117 | | 17 | |
| 02284 | V Bar F | M | 2,797 | | 364 | X |
| 02345 | Vanderhoff | C | 360 | | 26 | |
| 02311 | Vanhouten | M | 1,057 | | 107 | X |
| 12077 | W. Sussex (Hickey) | I | 3,320 | | 483 | |
| 02381 | Wagensen Don et al | C | 80 | | 20 | X |
| 22106 | Wagonhammer | M | 3,881 | AMP Implemented | 1,352 | X |
| 02492 | Walker Draw | C | 440 | | 48 | X |
| 12146 | Wall (East) | C | 1840 | | 247 | |
| 22104 | Walsh | C | 340 | | 34 | |
| 02304 | Washout Dr. | M | 1,859 | | 315 | X |
| 02318 | Water Gap Draw | M | 9,043 | | 1,127 | X |
| 02356 | Watt ranch | C | 46 | | 6 | |
| 12181 | West Bowman Hill | C | 2,311 | | 522 | X |
| 02490 | West Coutant Creek | C | 80 | | 14 | |
| 02462 | West Fork | C | 240 | | 26 | X |
| 12091 | West Timber Creek | C | 240 | | 32 | X |
| 02170 | West Timber Draw | C | 960 | | 100 | X |
| 12063 | Weston SW | M | 4,435 | | 829 | X |
| 02326 | White Rock | C | 440 | | 58 | X |
| 02247 | White Tail Creek | C | 200 | | 62 | X |
| 12237 | Whitetail Creek | M | 3,391 | | 751 | X |
| 22222 | Whitetail Pines | M | 1,493 | | 299 | X |
| 02455 | Whitmeyer | C | 120 | | 21 | |
| 02302 | Whitmeyer Creek | C | 40 | | 6 | |
| 12082 | Wild Horse Creek | C | 120 | | 24 | |
| 32015 | Wild Horse Creek | C | 80 | | 8 | X |
| 02283 | Wildcat | C | 80 | | 16 | X |
| 10069 | Willow Creek | I | 26,822 | | 4,412 | X |
| 12036 | Willow Creek | C | 2,715 | | 462 | X |
| 02331 | Winter Draw | C | 40 | | 6 | |
| 12216 | Wolf Mountain | C | 515 | | 57 | |

| Allotment Number | Allotment Name | Management Category | Total Federal Acres | Management Type | Permitted Use (AUMs) | All or a portion of the Federal acres are within 4.0 Miles of a Greater Sage-Grouse Lek |
|--|----------------|---------------------|---------------------|-----------------|----------------------|---|
| 02380 | Wormwood Ranch | I | 20,699 | AMP Implemented | 2,497 | X |
| 12042 | Wyarno | C | 120 | | 24 | |
| 02334 | Wythom Road | C | 120 | | 20 | X |
| 12150 | Yellowhammer | M | 1,776 | | 206 | X |
| AMP Allotment Management Plan AUM Animal Unit Month C Custodial I Improve M Maintain | | | | | | |

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Appendix V. Areas of Critical Environmental Concern

V.1. Proposed Areas of Critical Environmental Concern Designated by the Approved RMP

V.1.1. Pumpkin Buttes

SUPPORTING INFORMATION

The boundary of Pumpkin Buttes Areas of Critical Environmental Concern (ACECs) includes all portions of the Pumpkin Buttes Traditional Cultural Property that are Bureau of Land Management (BLM)-administered surface (1,731 acres). The Pumpkin Buttes are approximately 45 miles southwest of Gillette, rising approximately 800 feet above the surrounding landscape. The buttes consist of five flat topped mesas referred to as North Butte, North Middle Butte, South Middle Butte, South Butte and Indian Butte. The top of North Middle Butte is 6049 feet, which is the highest elevation in Campbell County. All of South Middle Butte and roughly one third of North Middle Butte are BLM-administered surface. The majority of the mineral estate under the buttes was reserved by the government. There is no public access to the BLM-administered surface on either butte, although, BLM purchased an administrative easement to South Middle Butte. South Middle Butte is currently used as a communication site and includes six transmission towers. There are several uranium claims on and near the buttes, with one proposed uranium mining operation on BLM-administered surface on North Middle Butte. Nearly all the fluid minerals under the buttes are currently leased. There is extensive coalbed natural gas development around the buttes, and an existing oil field within three miles. A proposed 200 turbine wind-energy development is located on fee surface within two miles of the east side of the buttes.

Recent consultations with several Native American tribes revealed that the buttes have been used for many types of traditional, religious and ceremonial purposes. Numerous past indications of traditional and religious uses (stone circles, eagle traps, cairns, etc.) remain on most of the buttes. Numerous lithic scatters and prehistoric camps are recorded on and near the buttes, indicating occupational use dating back to at least 10,000 years. There are stone circle sites on top of and around the base of the buttes. Although most archeologists interpret stone circles to be the remains of tepee locations, many tribes indicate that they represent ceremonial use and are more accurately interpreted as effigies. Numerous cairns have also been recorded on and around the buttes. Tribes have indicated to the BLM that cairns can mark the location of ceremonial areas such as fasting locations or may represent burials. The buttes contain many eroded cliff faces with deep crevasses, which were often utilized as burial locations. One eagle trap location is documented on top of one of the buttes. The tribes indicated to BLM that eagle traps are significant religious and cultural sites. In 2007 the BLM determined in consultation with fifteen tribes that the Pumpkin Buttes in their entirety is a traditional cultural property and that the area has an ongoing connection to traditional beliefs and practices of several Native American tribes. During the consultation process, some tribes expressed an interest in using the buttes for ceremonial or educational purposes.

The Pumpkin Buttes are also a prominent landmark associated with several historic events. All of the explorers of the Powder River Basin in the early and mid 19th century mention the buttes in their journals. The name "Pumpkin Buttes" was credited to the unique geographic features by Jim Bridger in the 1850s. They are also often mentioned as a landmark in several emigrant diaries from travelers on the Bozeman Trail in the 1860s. The buttes had a secondary role in the Red Cloud War and Great Sioux War, documented as a lookout for the U.S. Army and Native American tribes.

There are active golden eagle and prairie falcon nests on top of the buttes. Wildlife common to the area include mule deer, pronghorn, Greater Sage-Grouse, coyote, bobcat, raptors and numerous song birds. Bald eagles frequent the buttes in the winter. There are no Threatened or Endangered species on the buttes. Sensitive species in the area that may occur include: Greater Sage-Grouse, loggerhead shrike, Brewer's sparrow, sage sparrow.

The site meets the relevance criteria since it contains several a rare and sensitive archeological resources, and is a significant religious and cultural resource important to several Native American tribes. The site meets the importance criteria since it retains has qualities which give it special worth and distinctiveness. The area also has qualities that make it fragile, sensitive, irreplaceable and vulnerable to adverse change. The area also meets the importance criteria because it warrants protection in order to carry out the mandates of Federal Land Policy and Management Act.

Current and proposed management is insufficient to protect the relevance and importance criteria. In compliance with the National Historic Preservation Act, any impacts to the site as a result of a federal undertaking must be considered and adverse effects must either be avoided or mitigated. The creation of a Cultural Resource Project Plan, surface disturbance restrictions, and application of no surface occupancy (NSO) and controlled surface use stipulations to fluid minerals leases will result in a degree of protection for the area. The existence of fluid mineral leases under the majority of the area, numerous uranium claims and proposed mining operations, nearby wind-energy development and the existence of multiple communications towers on the buttes creates a difficult management condition in which it is exceedingly difficult to effectively balance resource concerns. Additionally, there are intangible significant aspects of the area, such as cultural and religious significance to the tribes that standard surface occupancy management decisions cannot adequately address. Since the area may be an important part of several tribes' ongoing cultural identity, special management is necessitated. Federal agencies are mandated by the American Indian Religious Freedom Act to provide access for tribes to sites with cultural significance on federal surface.

Development of existing minerals leases, locatable minerals development, wind-energy projects and the existence of communications towers on the Pumpkin Buttes directly conflict with the legal rights of Native American tribes to utilize the area for traditional cultural rights and practices. Because of these factors, the site should be designated as an ACEC.

ACEC OBJECTIVE(S) DECISIONS

Objective Statement: Management of the Pumpkin Buttes ACEC is consistent with Native American religious practices. The Pumpkin Buttes are preserved and protected as a nationally significant cultural resource.

MANAGEMENT ACTIONS & ALLOWABLE USE DECISIONS

Mineral Resources:

The area will be recommended for withdrawal from mineral entry and closed to disposal of mineral materials. A no surface occupancy (NSO) on fluid leasable minerals will be applied to all lands within the ACEC.

Fire and Fuels Management:

Fire suppression activity should avoid the use of heavy equipment unless there is a direct and measurable risk to life or property.

Biological Resources:

Do not allow non-native plant species for initial reclamation activities.

Heritage and Visual Resources:

Establish tribal access and allow for traditional cultural rights and practices.

Develop a Cultural Resource Project Plan (CRPP) in cooperation with stakeholders.

Manage as Visual Resource Management Class II.

Land Resources:

ACEC will be managed as a rights-of-way exclusion area that is also closed to renewable energy development.

Travel is limited to designated routes.

New surface-disturbing activities will be prohibited in the ACEC.

Special Designations:

No other Special Designations exist within the proposed boundaries of the ACEC.

IMPLEMENTATION DECISIONS

Implementation Decisions: (e.g., The land use plan decision may be to designate motorized travel areas while the supporting implementation decisions would address specific route designations)

Marketing: The area will not be marketed for recreational use. There is no public access to the ACEC.

Monitoring:

Management: A management plan will be created for the ACEC which includes input from Native American tribes and all other stakeholders.

Administrative:

Travel Management: The area will be managed as Limited to designated routes. Designated routes will be primarily for provision of access to communication sites and for administrative use.

Special Recreation Permits: Commercial guiding will not be allowed.

Agreements:

Partners:

Other administration:

V.1.2. Welch Ranch

| SUPPORTING INFORMATION |
|--|
| <p>The Welch Management Area is a 1,748-acre parcel, located approximately 10 miles north of Sheridan, Wyoming. The Welch area is accessible from Sheridan via Wyoming State Highway 338 (Decker Road). Two developed parking areas exist at the junction of Highway 338 and the Tongue River with directional signs identifying the area. Several unimproved primitive roads totaling 6.1 miles facilitate administrative use and livestock operations on the property both from Highway 338 and from the Ash Creek Road located just north of the property.</p> <p>The Welch Ranch was acquired in 2004 as part of a land exchange (BLM 2005). As a new acquisition, the Bureau of Land Management (BLM) must evaluate the area as a potential Area of Critical Environmental Concern (ACEC). The Welch area is located in the Powder River Basin, a part of the Northern Great Plains, which includes most of northeastern Wyoming and a portion of southeastern Montana. The Welch property occupies a portion of the Tongue River valley floor and the adjacent dissected uplands between Ash Creek and Hidden Water Creek. At least two homesteads were present on the property, including the Tryor homestead and the Evans homestead, which included a post office. There is also evidence of prehistoric use, including lithic scatters and quarries. Approximately 1.5 miles of the Tongue River runs through the Welch Ranch. A coal seam fire exists on a ridge in the southwestern corner of the parcel. The Big Horn Mountains are visible from the majority of the Welch Ranch.</p> <p>The coal fire origin is not certain, but historical records indicate that it began or reached the Welch Ranch boundary between 1911 and 1940, and is related to an abandoned coal mine fire at the Acme mine. While the origin is unclear, the fire is now considered to be part of the natural process. The Office of Surface Mining has expressed concerns regarding human health and safety in relation to the coal fire and has suggested that special management may be necessary to prevent unsafe exposure to this hazard. The coal fire on the north side of the river is an important resource because it represents a potential threat to health and safety, influences plant and animal distribution and form, and represents historical mining operations (BLM 2003). To date no known injuries have resulted from public interaction with the fire vents.</p> <p>The riparian corridor is important for migratory birds and boasts excellent habitat for mule deer and other big game. The Tongue River is a free-flowing prairie river with easy public access from a major population center in Wyoming as well as a red ribbon fishery identified as having regional importance. The State of Wyoming's 305(b) Report for 2012 lists water-bodies with impairments to water quality in the Tongue River Basin for temperature, turbidity and fecal coliform (Wyoming DEQ 2012). Without special designation and management, there is a strong possibility that visitation will degrade the importance and relevance criteria. Increased public awareness of riparian health will assist in improving the habitat and subsequently increasing the species diversity and numbers of birds to the point that the area will be acknowledged as an Important Bird Area.</p> <p>The Welch Ranch offers nonmotorized dispersed recreation including camping, mountain bicycling, freshwater fishing, hiking, small and big game hunting, upland bird hunting, picnicking, wildlife viewing, bird watching and float trips. Motorized use is prohibited within the management area. Prohibitions within the developed parking area include overnight camping, open fires and discharge or use of fireworks, firearms, or weapons.</p> <p>The area meets the relevance criteria for significant scenic values, fish and wildlife resources, and presence of a natural hazard (coal fire). The Welch Ranch meets the importance criteria in that it has more than locally significant qualities which give it special worth and which warrant special management for safety or public welfare. Welch constitutes one of very few riparian areas managed by the BLM and one of the few areas in Sheridan County with public river access for fishing and boating. Prairie riparian habitats represent less than 1% of the planning area. The combination of the rarity of the habitat type, the accessibility of the location in close proximity to a population center, and the high recreational use underscore the need for special management at the Welch Ranch. The ACEC boundary in the Approved Resource Management Plan (RMP) encompasses 1,116 acres and include BLM-administered surface in T57N, R84W Sections 1, 2 and a portion of Section 3. This boundary includes the entirety of the riparian area and the coal seam fire. Special management attention is necessary to protect human health and safety and address documented issues within the river corridor and riparian area and an ACEC should be designated.</p> |
| ACEC OBJECTIVE(S) DECISIONS |
| <p><i>Objective Statement:</i> The Welch Ranch ACEC will be sustained or enhanced for nonmotorized and wildlife based recreational opportunities, preservation of outstanding scenic values and for the safety of visitors.</p> |
| MANAGEMENT ACTIONS & ALLOWABLE USE DECISIONS |

Physical Resources:

Prohibit surface disturbance resulting in impacts to physical resources (soil, water resources) unless those activities can be demonstrated to protect the relevance and importance criteria.

Mineral Resources:

The area will be recommended for withdrawal from mineral entry and closed to disposal of mineral materials. The area is closed to leasing of fluid minerals. Note: A portion of the fluid leasable minerals are not administered by the BLM.

Fire and Fuels Management:

Fire suppression activity should avoid the use of heavy equipment unless there is a direct and measurable risk to life or property.

Biological Resources:

Prohibit the use of non-native plant species for all reclamation activities.

Prohibit the introduction of desirable non-native wildlife species.

Heritage and Visual Resources:

Manage as Visual Resource Management Class II.

Land Resources:

This ACEC will be managed as a right-of-way (ROW) exclusion area that is also closed to renewable energy development. The burying of low voltage powerlines is preferred in ROW that have been authorized but not developed.

Travel is limited to administrative use on designated routes.

The area will be managed as a Special Recreation Management Area (Appendix T (p. 679)).

Livestock grazing will be managed in concert with other resource values under a site-specific allotment management plan.

Special Designations:

No other Special Designations (Wilderness Study Area [WSA], Wild and Scenic River [WSR], Back Country Byway [BCB]) exist within the proposed boundaries of the ACEC.

Socioeconomic Resources:

Mitigation of coalbed fires at Welch Ranch will be in concert with other resource values and should result in the least disruptive and surface disturbance possible.

IMPLEMENTATION DECISIONS

Implementation Decisions: (e.g., The land use plan decision may be to designate motorized travel areas while the supporting implementation decisions would address specific route designations)

Marketing: Provide maps and information at the field office. Directional signage present from Highway 339. Develop interpretive signs at trailhead/parking area on general location, history, geology, and wildlife resources. Provide stewardship information to help preserve the special landscape character. Make available for outreach programs such as Conservation and Outdoor Recreation Education, Take It Outside, International Migratory Bird Day, National Public Land Day, etc.

Monitoring: Vehicle counters with routine surveys and observation. Informal visitor surveys and formal focus groups as funding allows. Riparian and upland range monitoring began in 2010. A green-line based riparian monitoring regime will be used to document changes in the riparian system through time. Upland transects were also established in 2010 to monitor changes in native v. non-native grass cover as well as rangeland health and will be monitored on at least a biennial basis. Riparian bird surveys (4 times per year) began in 2009 and will continue on at least a biennial basis.

Management: Signs present at key access points. Additional signage may be necessary to apprise public of coal seam fire hazards. Develop trailheads for foot, horse and bicycle travel. Increase river corridor accessibility for boaters and anglers.

Administrative:

Travel Management: The area will be managed as Limited to designated routes, with very few routes designated. Designated routes will be primarily to provide egress for administrative use.

Special Recreation Permits: Allowed with general stipulations.

Agreements: Maintain cooperative agreements with Wyoming Department of Game and Fish and Wyoming Department of Environmental Quality.

Partners: University of Wyoming, Sheridan Community Land Trust, Sheridan Public Land User Committee, Wyoming State Land Board and Wyoming Department of Game and Fish.

Other administration: Closed to recreational target shooting. The parking lots and trailheads are closed to camping. Dispersed camping is otherwise allowed.

Bibliography

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Appendix W. Public Involvement, Consultation, and Coordination

W.1. Introduction

Public involvement, consultation, and coordination initiated prior to and occurred throughout preparation of the Buffalo Resource Management Plan (RMP) revision and associated Environmental Impact Statement (EIS). The Bureau of Land Management (BLM) incorporated public involvement, consultation, and coordination through public meetings, informal meetings, individual contacts, news releases, planning bulletins, workshops, a planning website, and the Federal Register. This appendix describes the public involvement process, as well as other key consultation and coordination activities undertaken to prepare the EIS in support of the RMP revision.

The BLM decision-making process is conducted in accordance with the requirements of the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations implementing NEPA, and the United States (U.S.) Department of the Interior (DOI) and BLM policies and procedures implementing NEPA. NEPA and the associated regulatory and policy framework require that all federal agencies involve the interested public and potentially affected parties in their decision-making, consider reasonable alternatives to proposed actions, and prepare environmental documents that disclose the potential impacts of proposed actions and alternatives.

A Notice of Intent (NOI) published in the Federal Register on November 14, 2008, formally announced the BLM's intent to revise the existing plans and prepare the associated EIS. The NOI initiated the scoping process and invited participation of affected and interested agencies, organizations, and members of the public in determining the scope and issues to be addressed by alternatives and analyzed in the EIS. The BLM solicited additional public involvement, including cooperating agency meetings and workshops, to help identify issues to be addressed in developing a full range of land management alternatives. Following release of the Draft RMP and EIS on June 28, 2013, the BLM hosted four public meetings in August 2013 to respond to questions and solicit comments on the Draft RMP and EIS. The BLM released the Proposed RMP and Final EIS, which incorporated changes based on comments received on the Draft RMP and EIS, on May 29, 2015 which initiated a 30-day protest period and a 60-day Governor's Consistency Review. Table W.1, "Public Involvement, Coordination, and Consultation Events" (p. 763) lists public involvement, coordination, and consultation events.

Table W.1. Public Involvement, Coordination, and Consultation Events

| Date | Location | Event |
|---------------------|-------------------|---|
| December 1, 2008 | Wright, Wyoming | Public Scoping Meeting |
| December 2, 2008 | Buffalo, Wyoming | Public Scoping Meeting |
| December 3, 2008 | Gillette, Wyoming | Public Scoping Meeting |
| December 4, 2008 | Sheridan, Wyoming | Public Scoping Meeting |
| December 5, 2008 | Kaycee, Wyoming | Public Scoping Meeting |
| October 22, 2008 | Buffalo, Wyoming | Socioeconomic Workshop |
| October 22-23, 2008 | Buffalo, Wyoming | Cooperating Agency Training |
| May 20 – 22, 2009 | Buffalo, Wyoming | Goals and Objectives Development Workshop |

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| Date | Location | Event |
|-------------------------|-------------------|--|
| June 17 – 18, 2009 | Buffalo, Wyoming | Range of Alternatives Development Workshop |
| July 15 – 16, 2009 | Buffalo, Wyoming | Range of Alternatives Development Workshop |
| August 19 – 20, 2009 | Buffalo, Wyoming | Range of Alternatives Development Workshop |
| September 16 – 17, 2009 | Buffalo, Wyoming | Range of Alternatives Development Workshop |
| October 7 – 8, 2009 | Buffalo, Wyoming | Range of Alternatives Development Workshop |
| December 14, 2009 | Buffalo, Wyoming | Open House |
| December 15, 2009 | Gillette, Wyoming | Open House |
| April 27 – 29, 2010 | Buffalo, Wyoming | Preferred Alternative Development Workshop |
| August 5, 2013 | Buffalo, Wyoming | Open House |
| August 6, 2013 | Gillette, Wyoming | Open House |
| August 19, 2013 | Sheridan, Wyoming | Open House |
| August 20, 2013 | Kaycee, Wyoming | Open House |

W.2. Public Involvement

In accordance with CEQ scoping guidance, the BLM provided opportunities for public involvement as an integral part of revising the RMP and preparing the EIS. CEQ scoping guidance defines scoping as the process by which lead agencies solicit input from the public and interested agencies on the nature and extent of issues and impacts to be addressed and the methods by which they will be evaluated. The scoping report, which summarizes public participation during scoping and issues identified during the scoping process, is available on the Buffalo RMP website at <http://www.blm.gov/wy/st/en/programs/Planning/rmps/buffalo.html>.

The intent of the scoping process is to provide an opportunity for the public, tribes, other government agencies, and interest groups to learn about the project and provide input on the planning issues, impacts, and potential alternatives that will be addressed in the EIS, and the extent to which those issues will be analyzed. In general, public involvement during scoping assists the agency through the following:

- Broadening the information base for decision-making.
- Informing the public about the EIS and proposed RMP and the potential impacts associated with various management decisions.
- Ensuring public needs and viewpoints are brought to the attention of the agency.
- Determining the scope and the significant issues to be analyzed in depth in the EIS.

Scoping Period

The scoping process for the Buffalo RMP revision began with the publication of the NOI in the Federal Register on November 14, 2008 and went through January 5, 2009. The scoping period provides an opportunity for the public to identify potential planning issues and concerns associated with the RMP and EIS. Information obtained by the BLM during scoping is combined with issues identified by the agencies to form the scope of the EIS.

Public Notification of Scoping

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Public Involvement*

September 2015

News Release

The BLM issued a news release to local media on August 13, 2008 announcing plans to revise the Buffalo RMP. On November 10, 2008, the BLM issued a news release describing the public scoping period and listing the time, date, and location of the public scoping meetings. The news releases went out to numerous radio stations and newspapers within and outside of the planning area.

Planning Bulletin

Another means of outreach prior to the public scoping meetings included a bulletin announcing the scoping meetings. This bulletin included general information about the planning process and planning area for the RMP; contact information and comment submission instructions; and a list of the dates, times, and locations of the public scoping meetings. The BLM mailed the bulletin to potentially interested individuals and organizations who had participated in past BLM projects.

Website

The website provided background information on the project, a description of the scoping process and meeting locations, instructions on how to submit comments, a general overview of potential planning topics, and copies of public information documents such as the NOI and the existing plan. The website is one of the methods used to communicate project news and updates to the public. The website may be accessed at: <http://www.blm.gov/wy/st/en/programs/Planning/rmps/buffalo.html>.

Scoping Meetings

During the week of December 1, 2008, the BLM hosted scoping meetings in five locations across the planning area. All meetings ran from 3:00 p.m. until 8:00 p.m. Table W.1, “Public Involvement, Coordination, and Consultation Events” (p. 763) lists the scoping meeting locations and dates. The five public scoping meetings provided the public with an opportunity to learn and ask questions about the project and the planning process and to submit their issues and concerns to the BLM. The BLM gave two formal presentations, one at 3:30 p.m. and one at 6:00 p.m., each of which was followed by an open house format discussion between the BLM and meeting attendees. The formal presentations were designed to provide participants a good foundation in the RMP revision process, how to provide effective comments, and some of the resource issues to be covered in the RMP revision. Each formal presentation also included a question and answer session. The open house portions of the meetings were designed to allow attendees to learn about the project at their own pace and to enable them to ask BLM representatives questions in an informal one-on-one setting.

In addition to members of the BLM interdisciplinary team, a total of 129 people attended the scoping meetings. The BLM provided four handouts and displayed a series of four 3-panel table top boards at each scoping meeting.

The BLM encouraged meeting attendees to comment by submitting written comment forms (either at the meetings or via mail), or by sending an email. Comment forms were available to attendees at all meetings, as was a computer kiosk where the public could type and submit their comments. The BLM also provided an easel with a pad of paper for meeting attendees to write comments on.

Open Houses/Public Meetings

The BLM held two open house meetings in December 2009 in Buffalo and Gillette, Wyoming. Similar to the public scoping meetings, the open house meetings provided the public an opportunity to ask questions of BLM staff and learn about the progress of the project. Several BLM specialists and other representatives of the BLM were in attendance to provide information and address questions and concerns.

Mailing List

The BLM compiled a list of 1,217 individuals, agencies, and organizations that participated in past BLM projects or requested to be on the general mailing list. The BLM mailed the initial planning bulletin to each individual on this list. Visitors to the scoping meetings were asked to sign in and provide their mailing address so that they could also be added to the mailing list. Other additions to the mailing list include those individuals who have submitted requests to be added to the list. Duplicate entries, changes of address, and return-to-sender mailings were deleted from the official project mailing list as identified. Through this process, the general mailing list was revised to approximately 1,500 entries. Requests to be added to or to remain on the official mailing list will continue to be accepted throughout the planning process.

Planning Bulletins

Periodic planning bulletins have been developed and distributed to keep the public informed of the Buffalo RMP revision. Nine planning bulletins have been emailed and mailed to individuals on the Buffalo RMP mailing. The planning bulletins have also been made available for download on the Buffalo RMP revision website.

Website

The Buffalo RMP revision website can be found at: <http://www.blm.gov/wy/st/en/programs/Planning/rmps/buffalo.html>. The site provides individuals with RMP news and information and access to documents related to the revision. The website serves as a virtual repository for documents related to the development of the RMP, including announcements, planning bulletins, and documents. The documents are available in PDF format to ensure they are accessible to the widest range of interested parties. The website provides the public an opportunity to submit their comments for consideration as part of the planning process and to be added to the project mailing list.

Public Comment Period on the Draft RMP and EIS

A Notice of Availability announcing release of the Draft RMP and EIS was published in the Federal Register on June 28, 2013, initiating the 90-day public comment period. The public comment period closed on September 26, 2013. During the public comment period, the public was provided the opportunity to review and comment on the Draft RMP and EIS.

Notification

The BLM issued a press release on July 19, 2013 announcing the dates, times, and locations of the public meetings. The BLM also distributed a newsletter via U.S. mail and email to individuals on the BLM mailing list, which provided dates and locations of the public meetings. In addition to news releases and other notifications from the BLM regarding the comment period, some members of the public received notification from other sources. Several articles and news bulletins regarding the release of the Draft RMP and EIS were published in local newspapers. Many of the articles listed the dates for the public meetings.

Public Meetings

During the public comment period, the BLM hosted four public meetings in August 2013 in towns and cities throughout the planning area (see Table W.1, “Public Involvement, Coordination, and Consultation Events” (p. 763) for meeting dates and locations). The public meetings provided the opportunity for the public to ask questions and submit comments. The meetings were held in an open house format with a formal presentation provided by BLM managers. BLM managers, resource specialists and other representatives of the BLM were present during these meetings to discuss the RMP and answer questions.

Comment Analysis

Based on comments received during this period, the BLM revised the RMP where appropriate. Changes made to the Draft RMP and EIS based on comments are reflected in the Proposed RMP and Final EIS. The Comment Analysis Report summarizes all substantive comments received during the 90-day public comment period and the BLM responses to those comments, including how the document was revised based on comments. The report is presented in Appendix Y of the Proposed RMP and Final EIS.

Protest Period for the Proposed RMP and Final EIS

A Notice of Availability announcing the release of the Proposed RMP and Final EIS was published in the Federal Register on May 29, 2015, initiating the 30-day public protest period. The public protest period closed on June 28, 2015. During the public protest period, members of the public with standing were provided the opportunity to protest the Proposed RMP and Final EIS.

Notification

The BLM formally announced the availability of the Proposed RMP and Final EIS in Cheyenne on May 28, 2015. A press release accompanied the formal announcement. The BLM distributed a newsletter via U.S. mail and email to individuals on the BLM mailing list, which provided instructions on filing a protest. In addition to news releases and other notifications from the BLM regarding the protest period, some members of the public received notification from other sources. Several articles and news bulletins regarding the release of the Proposed RMP and Final EIS were published in local newspapers. Many of the articles identified the opportunity to protest.

Protests

During the public protest period, the BLM received 18 protests representing a diversity of publics and interests. The BLM received nine industry protests from companies or organizations representing fluid minerals (4), electric utilities (2), uranium (2), and coal (1). Six conservation organizations, one sporting organization, one land owner, and the State of Wyoming also submitted protests on the Proposed RMP and Final EIS.

Protest issues were equally diverse. A common protest issue was that proposed management actions were insufficient; the conservation organizations protested that the proposed management actions would not adequately conserve sensitive resources while industry protested that many management actions were too restricting, not the minimum actions necessary to conserve sensitive resources, and violated valid existing rights. Several protesters charged that some proposed management actions were not consistent with the State’s management (particularly for Greater Sage-Grouse) or did not properly recognize the State’s management authority (air resources). Protesters asserted that the BLM presented significant new information in the Proposed RMP and Final EIS that required a Supplemental EIS be prepared and circulated for public review. The protests declared other NEPA failures such as an inadequate range of alternatives, inadequate

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analysis of alternatives, alternatives analyzed did not meet the BLM's purpose and need, insufficient analysis and response to the public comments on the Draft RMP and EIS, and that the BLM did not utilize the best available science. The protests included requests for greater protection for split estate landowners including increased bond amounts.

Resolution

The Director concluded that the BLM followed all applicable laws, regulations, and policies and considered all relevant resource information and public input in developing the Proposed Land Use Plan and Final EIS. Each protesting party has been notified in writing of the Director's findings and the disposition of their protests. The BLM Director resolved the protests without making significant changes to the Proposed Land Use Plan and Final EIS, though minor clarifications were made and are summarized in Section 2.4.1. The BLM Director's decisions on the protests are summarized in the Director's Protest Resolution Report, which is available on the following BLM website: http://www.blm.gov/wo/st/en/prog/planning/planning_overview/protest_resolution/protestreports.html.

W.3. Consultation and Coordination

This section documents the consultation and coordination efforts undertaken by the BLM throughout the process of revising the RMP and developing the EIS. Title II, Section 202 of the Federal Land Policy and Management Act (FLPMA) directs the BLM to coordinate inventory, planning, and management efforts with the land use planning and management programs of Native American Tribes, other federal departments, and agencies of the state and local governments as part of its land use planning process, to the extent consistent with the laws governing the administration of the public lands. The BLM is directed to integrate NEPA requirements with other environmental review and consultation requirements to reduce paperwork and delays (40 Code of Federal Regulations 1500.4-5). The BLM accomplished coordination with other agencies and consistency with other plans through ongoing communications, meetings, and collaborative efforts with the BLM Interdisciplinary Team, which includes BLM specialists, and federal, state, and local agencies.

The BLM is aware that there are specific state laws and local plans relevant to aspects of public land management that are discrete from, and independent of, federal law. However, BLM is bound by federal law. As a consequence, there may be inconsistencies that cannot be reconciled. The FLPMA and its implementing regulations require that BLM's land use plans be consistent with State and local plans only if those plans are consistent with the purposes, policies, and programs of federal laws and regulations applicable to public lands. Where state and local plans conflict with the purposes, policies, and programs of federal law there will be an inconsistency that cannot be resolved. While county and federal planning processes, under FLPMA, are required to be as integrated and consistent as practical, the federal agency planning process is not bound by or subject to county plans, planning processes, or planning stipulations.

Cooperating Agencies

The BLM invited local, state, federal, and tribal representatives to participate as cooperating agencies on the Buffalo RMP revision and EIS. The BLM invited the following entities to participate because they have jurisdiction by law or because they could offer special expertise:

Counties

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Consultation and Coordination

September 2015

- Campbell County Commission
- Crook County Commission
- Johnson County Commission
- Sheridan County Commission

Conservation Districts

- Campbell County Conservation District
- Lake DeSmet Conservation District
- Powder River Conservation District
- Sheridan County Conservation District

Wyoming State Agencies

- Office of the Governor
- Office of State Lands and Investments
- Wyoming Department of Agriculture
- Wyoming Department of Environmental Quality
- Wyoming Department of Revenue
- Wyoming Department of State Parks and Cultural Resources
- Wyoming Department of Transportation
- Wyoming Game and Fish Department
- Wyoming Oil and Gas Conservation Commission
- Wyoming State Engineer's Office
- Wyoming State Forestry Division
- Wyoming State Geological Survey
- Wyoming State Historic Preservation Office
- Wyoming State Planning Office
- Wyoming Trails
- Wyoming Water Development Commission

Federal Agencies

- Bighorn National Forest
- Medicine Bow-Routt National Forest, Thunder Basin National Grasslands
- U.S. DOI – Office of Surface Mining
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- U.S. Nuclear Regulatory Commission

Tribes

- Cheyenne River Sioux
- Oglala Lakota Nation
- Rosebud Sioux Tribe
- Ft. Peck Sioux Tribe
- Standing Rock Sioux Tribe
- Lower Brule Sioux Tribe
- Yankton Sioux Tribe
- The Sisseton-Wahpeton Oyate
- Crow Creek Sioux Tribe
- Santee Sioux Tribe of Nebraska
- Northern Cheyenne Tribe

- Northern Arapaho Tribe
- Crow Nation
- Eastern Shoshone Tribe
- Three Affiliated Tribes

The BLM formally invited the cooperating agencies to participate in developing the alternatives and RMP and EIS, and to provide data and other information relative to their agency responsibilities, goals, mandates, and expertise. Cooperating agencies provided input during the initial scoping process. The BLM held general meetings with cooperators to discuss procedures and processes. The BLM and cooperating agencies held several workshops to develop goals and objectives, a range of alternatives, and the Preferred Alternative between May 2009 and April 2010. Cooperating agencies have also provided comments on draft RMP related documents throughout the revision process.

In addition, the following federal Congressional Offices participated in the meetings with cooperating agencies.

- U.S. Senator Michael Enzi's Office
- U.S. Senator John Barrasso's Office
- U.S. Representative Cynthia Lummis' Office

Endangered Species Act Consultation

The Buffalo Field Office (BFO) contacted the U.S. Fish and Wildlife Service (USFWS) regarding Section 7 of the Endangered Species Act and the Buffalo RMP revision. The BLM sent a scoping letter to the USFWS requesting comments concerning Section 7 consultation and the Buffalo RMP revision project. On January 5, 2010 the USFWS provided comments on (1) Threatened and Endangered species, (2) migratory birds, and (3) wetlands and riparian areas. Within these comments the USFWS provided a list of Threatened and Endangered species likely to occur on BLM-administered land in the BFO, for evaluating BLM Section 7 responsibilities. The USFWS was also provided opportunities to comment on the Draft RMP and EIS. Consultation letters concerning the Buffalo RMP revision project are located at the end of this appendix. The BLM's Final Biological Assessment was placed on the Buffalo RMP website for public review. The USFWS submitted a Biological Opinion concurring with the BLM's effects determination (Appendix K (p. 443)).

Native American Consultation

Consultation with Native American tribes is part of the National Historic Preservation Act (NHPA) compliance process, the NEPA process and a requirement of FLPMA. The BLM invited numerous Native American tribes to be cooperating agencies as part of the RMP revision. The Northern Cheyenne Tribe accepted the invitation and attended cooperator meetings.

BFO invited Native American tribes to comment on interests or concerns related to management in the planning area and asked tribes to identify any places of traditional religious or cultural importance within the planning area. An example consultation letter between the Native American tribes and the BLM is located at the end of this appendix. In November 2010, May 2011, June 2011, February 2012, May 2012, and June 2012, the BLM met with representatives from the Standing Rock, Cheyenne River Sioux, Rosebud Sioux, Crow Creek Sioux, Lower Brule Sioux, Oglala Lakota, Sisseton Wahpeton Oyate, Yankton Sioux, Flandreau Santee, Fort

Peck, Three Affiliated, Crow, Northern Arapaho, and Northern Cheyenne Tribes to coordinate and discuss the RMP. The Northern Cheyenne Tribe is a cooperating agency for this planning effort and their representatives attended formal cooperators meetings. BFO also travelled to the headquarters of the Northern Cheyenne Tribe in Lama Deer Montana to discuss the RMP with tribal representatives and Northern Cheyenne Cultural Commission in January 2014. These meetings were not considered government-to-government consultation by either party, but the BLM did take note of several tribal concerns from official tribal representatives and elected officials. The BLM will continue to engage Native American tribes during implementation of the Approved RMP.

W.4. Distribution List

The BLM distributed the Record of Decision and Approved RMP to other federal agencies, state and local governments, tribal governments, state agencies, state boards and commissions, non-government organizations, congressional delegations, libraries, educational institutions, newspapers, and radio stations.

W.5. Consultation Letters

Section 7 Consultation Letter



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
5353 Yellowstone Road, Suite 308A
Cheyenne, Wyoming 82009

In Reply Refer To:
 ES-61411/W.02/WY09FA0031

JAN 05 2009

Memorandum

To: Field Manager, Bureau of Land Management, Buffalo Field Office; Buffalo, Wyoming

From: *Joe* Field Supervisor, U.S. Fish and Wildlife Service, Wyoming Field Office, Cheyenne, Wyoming *Scott Hicks*

Subject: Scoping Comments for Buffalo Resource Management Plan

Thank you for the opportunity to provide scoping comments on the proposed Buffalo Resource Management Plan (RMP). The Buffalo RMP will replace the current Buffalo RMP. The revised Buffalo Field Office RMP will provide future direction for managing approximately 800,000 acres of U.S. Bureau of Land Management (Bureau)-administered surface land and 4.7-million acres of Bureau-administered mineral estate in Campbell, Johnson, and Sheridan counties in north-central Wyoming. Emerging issues and changing laws necessitate revision of the Buffalo RMP as described in the 2008 scoping notice. The Bureau is requesting the help of the public in identifying additional issues to be addressed in the planning effort.

In response to your request to review the proposed action, we are providing you with comments on (1) threatened and endangered species, (2) migratory birds, and (3) wetlands and riparian areas. The Service provides recommendations for protective measures for threatened and endangered species in accordance with the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Protective measures for migratory birds are provided in accordance with the Migratory Bird Treaty Act (MBTA), 16 U.S.C. 703 and the Bald and Golden Eagle Protection Act (BGEPA), 16 U.S.C. 668. Wetlands are afforded protection under Executive Orders 11990 (wetland protection) and 11988 (floodplain management), as well as section 404 of the Clean Water Act. Other fish and wildlife resources are considered under the Fish and Wildlife Coordination Act and the Fish and Wildlife Act of 1956, as amended, 70 Stat. 1119, 16 U.S.C. 742a-742j.

Threatened and Endangered Species

The following threatened or endangered species could occur in the project area:

Black-footed ferret: Black-footed ferrets (*Mustela nigripes*) may be affected if prairie dog towns are impacted. Please be aware that black-footed ferret surveys are no longer recommended in black-tailed prairie dog towns (see our February 2, 2004, letter previously provided to you)

office). However, we encourage the Bureau to protect all prairie dog towns for their value to the prairie ecosystem and the many species that rely on them. We further encourage you to analyze potentially disturbed prairie dog towns for their value to future black-footed ferret reintroduction.

Blowout penstemon: Blowout penstemon (*Penstemon haydenii*) is a perennial herb with stems less than 12 inches tall. The inflorescence is 2-6 inches long and has 6-10 compact whorls of milky-blue to pale lavender flowers. Blowout penstemon was listed as endangered on October 1 1987. Blowout penstemon is known from multiple populations in western Nebraska (Fertig 2001). The plant's current known range in Wyoming consists of the Ferris dunes area in northwest Carbon County where the plant is restricted to two habitat types: steep, northwest facing slopes of active sand dunes with less than 5 percent vegetative cover; and on north facing sandy slopes, on the lee side of active blowouts with 25-40 percent vegetative cover. Known populations in Wyoming are found between 6680-7440 feet (Fertig 2001). However, recent surveys have indicated that systematic surveys may be warranted in some lower elevations (below 6700 feet) in Wyoming where active sand blowout features occur (BLM 2005, Fertig 2001).

Blowouts are formed as strong winds deposit sands from the windward side of a dune to the leeward side and result in a sparsely vegetated crater-like depression. Associated vegetation includes blowout grass, thickspike wheatgrass, lemon scurfpea, Indian ricegrass and western wheatgrass. Threats to the plant occur when sand dunes are removed or overly disturbed by vehicular traffic. Surveys should be conducted from mid-June to early-July when flowering occurs by knowledgeable botanists trained in conducting rare plant surveys. The Service does not maintain a list of "qualified" surveyors but can refer those wishing to become familiar with the blowout penstemon to experts who can provide training/services.

Ute ladies'-tresses: Ute ladies'-tresses (*Spiranthes diluvialis*) is a perennial, terrestrial orchid, 8 to 20 inches tall, with white or ivory flowers clustered into a spike arrangement at the top of the stem. *S. diluvialis* typically blooms from late July through August; however, depending on location and climatic conditions, it may bloom in early July or still be in flower as late as early October. *S. diluvialis* is endemic to moist soils near wetland meadows, springs, lakes, and perennial streams where it colonizes early successional point bars or sandy edges. The elevation range of known occurrences is 4,200 to 7,000 feet (although no known populations in Wyoming occur above 5,500 feet) in alluvial substrates along riparian edges, gravel bars, old oxbows, and moist to wet meadows. Soils where *S. diluvialis* have been found typically range from fine silt/sand, to gravels and cobbles, as well as to highly organic and peaty soil types. *S. diluvialis* is not found in heavy or tight clay soils or in extremely saline or alkaline soils. *S. diluvialis* seems intolerant of shade and small scattered groups are found primarily in areas where vegetation is relatively open. Surveys should be conducted by knowledgeable botanists trained in conducting rare plant surveys. *S. diluvialis* is difficult to survey for primarily due to its unpredictability of emergence of flowering parts and subsequent rapid desiccation of specimens. The Service does not maintain a list of "qualified" surveyors but can refer those wishing to become familiar with the orchid to experts who can provide training or services.

Species of Concern

Greater Sage-grouse: The Service is currently conducting a review to determine if the greater sage-grouse (*Centrocercus urophasianus*) warrants listing. Greater sage-grouse are dependent on sagebrush habitats year-round. Habitat loss and degradation, as well as loss of population connectivity have been identified as important factors contributing to the decline of greater sage-

grouse populations rangewide (Braun 1998, Wisdom *et al.* 2002). Therefore, any activities that result in loss or degradation of sagebrush habitats that are important to this species should be closely evaluated for their impacts to sage-grouse. If important breeding habitat (leks, nesting, or brood rearing habitat) is present in the project area, the Service recommends no project-related disturbance March 1 through June 30, annually. Minimization of disturbance during lek activity, nesting, and brood rearing is critical to sage-grouse persistence within these areas. Likewise, if important winter habitats are present (Doherty *et al.* 2008), we recommend no project-related disturbance November 15 through March 14, annually.

We recommend you contact the Wyoming Game and Fish Department to identify important greater sage-grouse habitats within the project area, and appropriate mitigative measures to minimize potential impacts from the proposed project. The Service recommends surveys and mapping of important greater sage-grouse habitats where local information is not available. The results of these surveys should be used in project planning, to minimize potential impacts to this species. No project activities that may exacerbate habitat loss or degradation should be permitted in important habitats. Additionally, unless site-specific information is available, greater sage-grouse habitat should be managed following the guidelines by Connelly *et al.* 2000 (also known as the Western Association of Fish and Wildlife Agencies [WAFWA] guidelines).

In Wyoming, information suggests that greater sage-grouse populations are negatively affected by energy development activities, especially those that degrade important sagebrush habitat, even when mitigative measures are implemented (Braun 1998, Lyon 2000, Naugle *et al.* 2006). Greater sage-grouse populations can repopulate areas developed for resource extraction after habitat reclamation for the species (Braun 1987). However, there is no evidence that populations attain their previous levels and reestablishment of sage-grouse in a reclaimed area may take 20 to 30 years, or longer (Braun 1998). Therefore, this project should be carefully evaluated for long-term and cumulative effects on the greater sage-grouse, since reclamation may not restore populations to pre-activity levels. The Bureau should ensure this activity does not exacerbate greater sage-grouse declines on either a local or range-wide level.

Black-tailed prairie dog: The Service is currently conducting a review to determine if the black-tailed prairie dog (*Cynomys ludovicianus*) warrants listing under the Act (73 FR 73211). The black-tailed prairie dog may be found scattered in remnant populations throughout much of the range that it once occupied. A significant portion of existing occupied habitat rangewide occurs in a few large complexes. We encourage you to protect all prairie dog towns for their value to the prairie ecosystem and the many species that rely on them.

Migratory Birds

Under the MBTA and BGEPA, the Federal agency has a mandatory obligation to protect the many species of migratory birds, including eagles and other raptors which may occur on lands under its jurisdiction. Of particular focus are the species identified in the Service's *Birds of Conservation Concern 2002*. In accordance with the Fish and Wildlife Coordination Act (16 USC 2912 (a)(3)), this report identifies "species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing" under the Act. This report is intended to stimulate coordinated and proactive conservation actions among Federal, State, and private partners and is available at <http://www.fws.gov/migratorybirds/reports/bcc2002.pdf>.

In order to promote the conservation of migratory bird populations and their habitats, the Service recommends that the Federal agency implement those strategies outlined within the Memorandum of Understanding directed by the President of the U.S. under Executive Order 13186, where possible.

During project planning analysis of the following information is recommended to determine project effects to migratory birds:

1. The current status and habitat use of migratory birds in the project area. This may include number of individuals, breeding pairs, population trends, and active nests within and adjacent to the project area.
2. An analysis of the effects of the proposed action on migratory birds and their habitats. Measures that will reduce or eliminate adverse impacts to migratory birds, including protective buffers, seasonal restrictions, maintenance of habitat within the project area, raptor-proofing power lines, and netting of waste pits.
3. The projected short and long term impacts to migratory birds and their trends during and after project completion using monitoring, modeling and current literature.

Potential adverse effects to migratory birds from power lines should be identified and every attempt to mitigate such effects should be implemented. Structures that are identified as affecting birds should be made safe to prevent subsequent mortalities. If you determine that power poles and/or stretches of power line are resulting in electrocution of migratory birds, especially raptors, the Service requests that specific information be documented regarding these mortalities. Based on regulations pursuant to the MBTA and BGEPA, migratory bird carcasses may only be collected, possessed or moved by state game wardens, Service refuge officers, Service special agents, or persons holding a valid salvage permit issued by the Service and the applicable state. When a migratory bird mortality is observed the Service recommends that as much of the following information as possible be documented: legal location, GPS location, all identifying numbers from the nearest power pole, date of observation, species, photographs of pole (top section), and the dead bird, and directions to the scene. Please contact our office with the information and call or email Dominic Domenici of the Service's Law Enforcement Office at 307-261-6365 /dominic_domenici@fws.gov to report your observation and obtain further guidance. The Service appreciates your efforts to protect migratory birds.

Wetlands

The functions and values of wetlands are well documented and are especially important in the arid west. Substantial degradation diminishes the effectiveness of wetlands to function as food, cover, and breeding sites for wetland dependent species; sediment transport systems; water retention/storage sites; contaminant sinks; and chemical exchange sites. To ensure the Service has sufficient information to assess project impacts on wetlands, assessments should include:

1. An enumeration of the acreage of wetlands, by type, impacted by the proposed action.
2. A discussion of why wetlands cannot be avoided.
3. A description of the functions and values of the wetlands, including sediment transport, water storage, habitat for aquatic and terrestrial organisms, and contaminant sinks, as well as the potential risks of water removal for these functions and values.

4. Measures that will reduce or eliminate adverse impacts to wetlands such as a mitigation plan to offset unavoidable impacts, protective buffers, seasonal and physical restrictions, maintenance of the natural hydrograph, and development and implementation of a monitoring program to track the effectiveness of mitigation measures.
5. Results of wetland monitoring or management activities in, or adjacent to, the proposed project site.
6. The anticipated short and long term effects to wetland and riparian areas during and after project completion.

We recommend addressing each of the above concerns where applicable to the project. We appreciate your efforts to ensure the conservation of Wyoming's natural resources. If you have questions regarding this letter or resources described above, please contact Alex Schubert of my office at the letterhead address or phone (307) 772-2374, extension 238.

cc: WGFD, Statewide Habitat Protection Coordinator, Cheyenne, WY (M. Flanderka)
WGFD, Non-Game Coordinator, Lander, WY (B. Oakleaf)

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Tribal Consultation Letter

L. Stone
9-19-08

SEP 22 2008

In Reply Refer To:
1610/Buffalo RMP Revision

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

Mr. Carl Venne
Crow Tribal Council
P.O. Box 159
Crow Agency, MT 59022

Dear Mr. Venne:

The Buffalo Field Office is revising its 1985 land use plan. The revised Buffalo Resource Management Plan (RMP) will serve as our general direction for all resource and land use management decisions for the BLM-administered public lands and resources in our administrative area. The plan will guide the use, protection, and management of natural and cultural resources on the public lands in Campbell, Johnson, and Sheridan counties in Wyoming.

In an effort to keep you informed of the status of our planning effort, we are contacting tribes who have previously expressed cultural concerns relating to the planning area, or whose traditional lands coincide with the planning area. We greatly appreciate the coordination we have accomplished with you in the past and would like to continue our relationship.

We would like to invite you to become a cooperating agency. Cooperating agency status is available to government entities with jurisdiction by law or special expertise. A cooperating agency provides staff to the BLM planning team to develop analysis for which they have particular expertise. The cooperating agency must develop a Memorandum of Understanding with the federal agency and must fund its own participation. Please note that the tribe's participation as a cooperating agency does not satisfy the BLM's obligation to consult on a government-to-government basis. Therefore, regardless of your tribe's decision to participate or not as a cooperating agency, our government-to-government consultation will continue.

Enclosed for your consideration are several documents: 1) a cooperating agency return form and self-addressed, stamped envelope for ease in responding to our invitation, 2) two announcements on no-cost training opportunities sponsored by the BLM in the near future along with a listing of hotel accommodations in the Buffalo area, and 3) an example Memorandum of Understanding to be executed should you accept our invitation to become a cooperator in the RMP revision.

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MANAGEMENT

We value your knowledge, concerns, and perspectives relating to the planning area. If you would like further information regarding cooperating agency status, please contact Linda Slone, Project Manger, at 307-261-7520. With regard to cultural heritage issues, you may wish to contact Buck Damone, Archaeologist, at 307-684-1100.

Sincerely,

/s/ Paul Beels

Acting Field Manager
Buffalo Field Office

Chris E. Hanson
Field Manager, Casper

5 Attachments:

- 1 – Cooperating Agency Return Form
- 2 – Planning Nuts & Bolts Training
- 3 – Cooperating Agency Training with Economic Profile System Workshop
- 4 – List of Buffalo Motels
- 5 – Example Memorandum of Understanding

cc: Mr. Dale Old Horn
Crow Tribal Cultural Resources
P.O. Box 159
Crow Agency, MT 59022

bcc: Buffalo RMP Revision – Administrative Record (LSlone)
L.Slone:lms:09/19/08

BUREAU OF LAND
MANAGEMENT
CASPER FIELD OFFICE
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Appendix X. Implementation, Monitoring, and Evaluation

X.1. Implementation

Implementation of the Buffalo Resource Management Plan (RMP) will require continued involvement of cooperating agencies, both in terms of funding and time, and continued public participation. This appendix describes the basic elements of implementing the Buffalo RMP.

X.1.1. Implementation Working Group

To ensure implementation coordination, the Bureau of Land Management (BLM) and the cooperating agencies should meet at least yearly to provide support for the implementation prioritization, review recommendations for changes to implementation strategies, and review monitoring evaluation results. This group is called the Implementation Working Group. The Implementation Working Group will serve in a recommending capacity as the BLM cannot relinquish its decision-making authority or responsibility. All Implementation Working Group meetings will be open to the public, and announced on the BLM website.

The Implementation Working Group will ensure implementation is orderly and without duplication or confusion. The Implementation Working Group will look at interdisciplinary and interagency implementation rather than resource-by-resource implementation to make recommendations regarding the best use of funding and personnel from both cooperating agencies and the BLM.

X.1.2. Implementation Tracking Database

A database has been developed for the Buffalo Field Office to track the budget, monitoring, and implementation actions. Once the database has been populated, it will require continual maintenance and updates to accurately track the implementation process. Information will be collected based on quarterly performance evaluation accomplishment reporting, and complete fiscal year reports will be published with analysis on the BLM website by December 31 of each calendar year.

X.1.3. Monitoring Working Group

To ensure that monitoring methods are in place, a Monitoring Working Group will be assembled to develop an overall monitoring plan, utilizing existing monitoring information from the various members of the Implementation Working Group. The team's guidance and direction will be provided through the Section X.2, "Monitoring and Evaluation" (p. 782) section of this appendix. The BLM is responsible to apply monitoring procedures and protocols that are based on BLM policies, field office priorities, and available funding. The Field Manager will make final decisions on the monitoring plans, monitoring priorities, and whether or not monitoring data collected by other agencies meets the specific needs of the BLM. The BLM Field Manager will assess the monitoring needs and consider additions or changes proposed by the Monitoring Working Group.

*Appendix X Implementation, Monitoring,
and Evaluation
Implementation*

Since some monitoring data is being collected and provided by other federal and state agencies to the extent of their specific missions and expertise, a system will be established to regularly collect and coordinate this data. The team will also be responsible for collecting data to determine if the implemented actions are meeting stated goals and objectives or desired outcomes.

X.1.4. Activity Plan Working Groups

Activity Plan Working Groups consisting of local, state, and federal governments will be formed for new projects when circumstances dictate. Cooperating agencies in these Activity Plan Working Groups will assist the BLM in developing alternatives and preparing environmental analyses. Activity Plan Working Groups will serve in a recommending capacity as the BLM cannot relinquish its decision-making authority or responsibility. As an example, travel management plans would be developed with an Activity Plan Working Group.

The objectives of Activity Plan Working Groups include:

- Minimizing analysis and decision making controversy by being proactive rather than reactive to public land use and resource conflicts.
- Providing effective, cost-efficient, and collaboratively-based solutions to resource conflicts.
- Improving resource conditions by recommending practices appropriate to special situations.
- Streamlining public land authorizations, increasing implementation flexibility, and notifying public land users of required practices.
- All Activity Plan Working Group meetings where recommendations are made to the BLM will be open to the public, and will provide for specific and helpful public involvement. This includes providing web-based information to the public prior to any Activity Plan Working Group meetings; such that members of the public can provide input to the working session, both early and mid-way through the scheduled meetings.

X.1.5. Public Involvement

A website where the public can quickly and easily access data concerning implementation should be developed and kept current. Creating this website and maintaining it through the implementation cycle will be a vital part of implementation success. The public is welcome to provide implementation comments to the BLM any time during the cycle, but schedules for implementation planning decisions will be posted so the public can make timely comments. All Activity Plan Working Group meetings where recommendations are made to the BLM will be open to the public, and will provide for specific and helpful public involvement. This includes providing web-based information to the public prior to any Activity Plan Working Group meetings; such that members of the public can provide input to the working session, both early and mid-way through the scheduled meetings.

X.2. Monitoring and Evaluation

This section provides an overview of the Buffalo Monitoring and Evaluation protocol. Conditions may change over the life of the land use plan and these changes may require different management actions to protect resources and minimize resource conflicts. To address the changing conditions and provide management flexibility that incorporates best management practices, the BLM reviews effectiveness of management actions, assesses the current resource conditions and, if needed, alters management actions.

Due to staffing and funding levels monitoring will be prioritized consistent with the goals and objectives of the RMP in cooperation with local, state, and other federal agencies. A system, as identified in the Section X.1, “Implementation” (p. 781) section of this appendix, will be established to regularly collect, coordinate and distribute monitoring data collected by other federal and state agencies. Changes to monitoring may result from developing technologies or a better understanding of information.

X.2.1. Data Collection

In cooperation with local, state and other federal agencies, the BLM will collect, analyze, and report monitoring data that allows for the determination of cause and effect, conditions, trends and predictive modeling of land use authorizations. Monitoring methods are implemented to collect data that establish current conditions and reveal any change in the indicators. Monitoring techniques consider when, where, and frequency. The data collected through monitoring provide a variety of information applicable to one or more resource uses. To increase effectiveness, efficiency and eliminate duplication, monitoring methods should be designed to address as many uses as possible. The BLM will rely upon cooperating agencies for the funding, facilities, and labor to assist in or perform this data collection.

X.2.2. Data Analysis

Data will be analyzed to determine the change that has occurred as a result of management actions. Data analysis will be conducted on a predetermined schedule that considers the data collection frequency for detecting change. Data will also be recorded and organized to facilitate analysis to be used in assessing management actions. Analyzed data will be assessed to determine whether the resource conditions are meeting the planned goals; whether a change has occurred, and if so, identify the cause; and what appropriate action should be taken to achieve the desired outcome if the objective is not being met. New technology and management methods will be reviewed to determine their applicability in modifying or replacing current management actions. The BLM will rely upon cooperating agencies for the funding, facilities, and labor to assist in or perform this data analysis.

X.2.3. Decision

When the assessment shows that the goals are still valid but the outcome is not being achieved, the cause of non-achievement will be documented and a change or modification in management actions would be warranted to address the causal factors. The assessment will develop recommendations to be considered by management for continuation, modification, or replacement of current management actions. Because adoption of a new management action may require changes in the monitoring plan, the assessment will also evaluate the effectiveness of the monitoring and data collection methods and recommend continued use, modification, or elimination of those methods.

X.2.4. Establishment of Monitoring Protocols

Establishing monitoring protocols will follow BLM program specific policy and, where appropriate, in accordance with the following seven principles:

1. Specify monitoring goals and objectives.

2. Characterize anthropogenic stressors that may affect receptors and parameters of interest.
3. Develop regional questions and conceptual models to describe the process and pathways anthropogenic stressors may affect receptors.
4. Suggest indicators to measure the effects of anthropogenic stressors, and define existing information availability and needs.
5. Estimate the sensitivity of the indicators to detect change, to guide final indicator choice, and monitoring design.
6. Describe a process by which management can identify thresholds of change requiring a management response as indicated by causal factors.
7. Identify clear connections between the overall monitoring program and management decision process.

X.2.5. Resource Monitoring Table

The resource monitoring table (Table X.1, “Resource Monitoring Table” (p. 785)) identifies the indicator that will be monitored to detect change in resource conditions, the method or technique of monitoring, the locations for monitoring, the unit of measurement for monitoring, the frequency for monitoring, and the action triggers that indicate the effectiveness of the management action. Footnotes in Table X.1, “Resource Monitoring Table” (p. 785) indicate where monitoring is generally conducted by stakeholders or cooperating agencies.

Table X.1. Resource Monitoring Table

| Resource | Record Number | Indicator | Method or Technique | Location | Unit of Measure | Frequency | Action Triggers |
|---------------------------|---------------|---|--|--|---|--|---|
| Physical Resources | | | | | | | |
| Air Quality ¹ | Air-1 | Criteria Pollutants | Ambient air sampling | Air quality monitoring stations | Varies (e.g., parts per million, parts per billion, micrograms per cubic meter) | Varies (e.g., hourly, 8-hour, 24-hour) | Monitored exceedance of National Ambient Air Quality Standards |
| | Air-2 | Air Quality Related Values | Ambient air sampling; monitoring of deposition, visibility, lake chemistry | Air quality monitoring stations; sampling locations in Class II sensitive areas; National Atmospheric Deposition Program and Interagency Monitoring of Protected Visual Environments monitoring stations | Varies (e.g., parts per million, kilograms per hectare, change in light extinction) | Varies (e.g., hourly, 8-hour, 24-hour, annual) | Critical loads exceeded, decreasing visibility trends, and/or increasing lake acidification |
| Soils | Soil-1 | Soil erosion uplands | Visual observation and surveyed erosion pins | Area wide where land use activities are occurring | Soil loss in tons per acre | Visual examination while land use activity is active and annual site surveys | When soil loss is accelerated beyond natural levels |
| | Soil-2 | Soil erosion on stream banks and floodplains | Visual observation and surveyed erosion pins | Area wide where land use activities are occurring | Area affected in square feet or acres | Visual examination while land use activity is active and annual site surveys | Water table is shrinking beyond average precipitation fluctuations |
| | Soil-3 | Soil compaction | Penetrometer or visual inspection | Area affected by land use activities | Pounds per square inch | 1 to 2 times annually | Compaction restricts water infiltration and plant growth |
| | Soil-4 | Soil compaction, porosity, permeability, and depth to water | Monitoring wells (peizometers) | Riparian areas | Depth to water table | Every 2 to 3 years | Accelerated stream bank soil loss |

| Resource | Record Number | Indicator | Method or Technique | Location | Unit of Measure | Frequency | Action Triggers |
|-------------------------------------|---------------|------------------------------------|---|---|--|--|---|
| Water Resources | Water-1 | Surface water quality ² | Water sampling | All surface water | Milligrams per liter and tons per day | On a priority basis | Water quality does not meet state standards |
| | Water-2 | Groundwater quality ² | Groundwater sampling | Established monitoring stations | Representative sample of water quality | Annually | Water quality does not meet state standards and water is migrating from one aquifer to another |
| | Water-3 | Channel geometry | Riparian cross sections | Priority streams | Change in stream channel (width, depth, side channel modification, and bank sloughing) | Every 1 to 3 years | Conditions are moving away from Proper Functioning Condition (PFC) |
| Mineral Resources | | | | | | | |
| Minerals | Min-1 | Surface disturbance | Remote sensing or site inspection | Mineral exploration & development sites | Acres disturbed | Annually | Acres disturbed exceeding the range established for the area |
| | Min-2 | Compliance with authorization | Area inspection | Area wide | Compliance | As determined by the Bureau of Land Management's (BLM) Inspection & Enforcement Strategy | Non-compliance |
| Fire and Fuels Management | | | | | | | |
| Fire | Fire-1 | Fire Regime Condition Class | Fire behavior. Re-assessment of the biophysical settings listed in Chapter 3. | Buffalo Field Office | Acres in each condition class. | 3 to 5 years. Sooner as per action triggers in next column. | Fires larger than 20,000 acres where BLM within the perimeter is at least 20% ownership. |
| Biological Resources | | | | | | | |
| Forest and Woodland Communities | Forest-1 | Forest Health | Ecological site condition and trend | Forested lands | Representative sample area | Every 3 to 5 years | Disease, insect infestation, or encroachment of undesirable plant species threatens forest health |
| Grassland and Shrubland Communities | Grass-1 | Trend | BLM approved monitoring methods | Area wide | Representative sample | On a priority basis | Not achieving desired conditions set forth in SS WL-4010 |
| Riparian and Wetland Communities | Rip-1 | Wetland/ riparian condition | PFC | Priority wetlands/ riparian areas | Stream miles and acres along with rating | On a priority basis | Not achieving PFC or not exhibiting and upward trend |

| Resource | Record Number | Indicator | Method or Technique | Location | Unit of Measure | Frequency | Action Triggers |
|--|---------------|--|--------------------------------------|---|--|---|---|
| Invasive Species | Pest-1 | Noxious weed and invasive plant trends ³ | Remote sensing or site visit | Priority areas | Acres of established weeds and potential habitat areas | Annually | Spreading or establishment of invasive species in new areas |
| Special Status Species – Plants | SSP-1 | Special Status Species | Site inspection | Special status species' habitats | Population and trend | Every 2 to 10 years | A declining trend in populations |
| Fish ⁴ | Fish-1 | Fish Populations | Population sampling | Perennial water bodies | Species and populations of game fish | According to Wyoming Game and Fish Department (WGFD) schedule | A change in numbers beyond the normal fluctuations |
| | Fish-2 | Macroinvertebrate indicator species | Collecting macroinvertebrate species | Perennial streams | Species and condition of macroinvertebrates | According to WGFD schedule | No presence of macroinvertebrates that represent good quality water in the stream |
| Wildlife ⁴ | Wldf-1 | Big game seasonal habitat | Aerial and field inspections | Crucial wildlife habitat areas | Numbers during occupancy periods | Annually | A change in numbers beyond the normal fluctuations |
| | Wldf-2 | Special Status Species occupancy and productivity | Aerial and field inspections | Suitable habitat and established management buffer zones (i.e., areas where lease stipulations have been applied) | Numbers during occupancy periods | According to WGFD schedule | A decline in numbers beyond the normal fluctuations |
| | Wldf-3 | Neotropical bird habitat | Field inspections and site visits | Area wide | Species numbers during occupancy period | According to WGFD schedule | Declining trend in habitat occupancy |
| | Wldf-4 | Raptors | Field inspections and site visits | Area wide | Nest occupancy rate | According to WGFD schedule | Declining trend in nest site occupancy |
| Special Status Species – Wildlife ⁴ | Wldf-5 | Threatened and Endangered species occupancy and productivity | Aerial and field inspections | Suitable habitat and established management buffer zones (i.e., areas where lease stipulations have been applied) | Numbers during occupancy periods | According to WGFD schedule | A decline in numbers beyond the normal fluctuations |
| Heritage and Visual Resources | | | | | | | |

Appendix X Implementation, Monitoring, and Evaluation
 Resource Monitoring Table

| Resource | Record Number | Indicator | Method or Technique | Location | Unit of Measure | Frequency | Action Triggers |
|----------------------------------|---------------|---|---|--------------------------------------|--|---|---|
| Cultural ⁵ | Cult-1 | National Register eligible sites | Site inspection | Area wide | Disturbance | Annually | Disturbance as a result of land uses or vandalism |
| Paleontology | Paleo-1 | Significant paleontological resources | Site inspection | Site | Degradation or loss of significant fossil resources | Annually | Loss or damage to significant fossil resources as a result of human or natural causes |
| Visual Resource Management (VRM) | VRM-1 | Project conformance with VRM Class Objectives | Remote sensing or site visit; Visual Contrast Rating from Key Observation Point | Class I, II, and sensitive III areas | Repetition of elements of the natural landscape (color, form, line, etc.) before and after implementation of an action | Visual Contrast Ratings will be prepared for projects in visually sensitive areas; Comparison of pre- and post-implementation data will evaluate and sufficiency of project design features in meeting VRM Class Objectives | Intrusion that exceeds thresholds for meeting VRM objectives |
| Land Resources | | | | | | | |
| Forest Products | FP-1 | Timber stands | Timber stand examination | Commercial forested areas | Board feet, age class, and damages | Every 10 to 20 years | Basal area growth does not meet timber type standards |
| Lands and Realty | LR-1 | Realty authorization compliance | Site compliance inspection | Area wide | Number of site inspections | Annually | Non-compliance or non-use |

| Resource | Record Number | Indicator | Method or Technique | Location | Unit of Measure | Frequency | Action Triggers |
|--------------------------------------|---------------|---|---|---|---|---|---|
| Travel and Transportation Management | TTM-1 | Roads and trails ⁶ | Route management categories and maintenance levels; onsite inspection or remote sensing; traffic counter data | Area wide | Miles | Per Facility Asset Management System Condition Assessment Plans | Conditions represent a hazard to public health and safety or property; route conditions do not meet identified road standards |
| | TTM-2 | Effect of seasonal closures on wildlife | Remote sensing; radio collar data, or site visit | Travel Management Areas (TMAs) with seasonal closures for wildlife | Acres | Monitoring objectives developed in conjunction with WGFD; Each TMA should be monitored at least every 5 years | Changes in target species use or occupation of seasonal habitat requiring closure |
| | TTM-3 | Off-highway vehicle disturbance; establishment of unauthorized vehicle routes | Remote sensing or site visit; traffic counter data | TMA; site-specific to area of disturbance | Miles of routes; acres of disturbance | Prioritize areas and monitor higher priority areas every 1-3 years and lower priority areas every 5-10 years | Disturbance exceeding the baseline, accelerated soil erosion occurring, and intense vegetation removal |
| Recreation | Rec-1 | General recreation use | Onsite inspection, visitor use data, surveys; documented user conflicts or complaints | Area wide with emphasis on Special Recreation Management Areas and Extensive Recreation Management Areas with high visitation | Changes to recreation setting characteristics; changes in types, seasons or levels of use | Prioritize areas and monitor higher priority areas every 1-3 years and lower priority areas every 3-5 years | When visitor surveys or public comments indicate that recreation area management objectives are not met |
| | Rec-2 | Concentrated recreation use | Inspect developed recreation sites or areas that have facilities | Recreation site | Condition of developed recreation site, facilities, visits and visitor days | Annually | When change is causing undue or unnecessary degradation of facilities and use areas; public complaints |
| | Rec-3 | Compliance with Special Recreation Permit authorization | Administrative review, site inspection | Activity site | Permit stipulations, resource conditions, and site restoration | During and after an event; annually for other commercial users | When non-compliance is determined or degradation of resources is documented |

| Resource | Record Number | Indicator | Method or Technique | Location | Unit of Measure | Frequency | Action Triggers |
|---|---------------|--|---|----------------------------------|---|---|--|
| Lands with Wilderness Characteristics (LWC) | LWC-1 | Wilderness Characteristics (size, naturalness, outstanding opportunities for primitive and unconfined recreation or solitude, supplemental values) | Site visit or remote sensing | 6,864 acres | Miles of linear human intrusions; acres disturbed; impacts to wilderness characteristics identified by onsite visit or public comment | Annually | Failure to meet the objectives outlined in the Approved Resource Management Plan (LWC-6002) (6,864 acres) |
| Livestock Grazing | Graz-1 | Vegetation condition | BLM approved monitoring methods; monitoring plans are included in Allotment Management Plans (AMPs) | All areas being grazed | Representative sample of grazed area | Monitor allotments on a priority basis | Conditions are not meeting goals and objectives for vegetation due specifically to livestock grazing management. Conditions are not meeting goals and objectives for vegetation. Inconsistent with Wyoming Healthy Rangelands and Guidelines for Livestock Grazing Management, and similar guidance updated over time. |
| | Graz-2 | Forage utilization | Utilization study plot or site visit; monitoring plans are included in AMPs | Priority Allotments or as needed | Representative sample of grazed area | On a priority basis, monitor allotments before and after the area has been grazed | Utilization exceeds prescribed levels or key plants vigor declining |
| | Graz-3 | Livestock numbers | Counts and site visits; monitoring plans are included in AMPs | Allotments | Number of allotments or operators inspected | Monitor allotments on a priority basis | Livestock numbers exceeding permitted numbers or in areas unauthorized |
| Special Designations | | | | | | | |

| Resource | Record Number | Indicator | Method or Technique | Location | Unit of Measure | Frequency | Action Triggers |
|---|---------------|--------------------|------------------------------|--|--|--------------------|--|
| Areas of Critical Environmental Concern (ACECs) | ACEC-1 | Resource condition | Site visit or remote sensing | ACEC (2,847 acres) | Miles of linear human intrusions; acres disturbed; Impacts to relevant and important values | Every 1 to 5 years | Undue or unnecessary degradation or loss of identified resources or relevant and important values as a result of human or natural causes |
| Wild and Scenic Rivers (WSR) | WSR-1 | Resource condition | Site visit or remote sensing | WSR corridor (Middle Fork Powder River, 2,664 acres) | Miles of linear human intrusions; acres disturbed; impacts to outstandingly remarkable values identified by onsite visit or public comment | Annually | Documented impacts to the free-flowing condition, water quality or outstandingly remarkable values or other objectives outlined in Manual 6400 |

| Resource | Record Number | Indicator | Method or Technique | Location | Unit of Measure | Frequency | Action Triggers |
|--|---------------|--|------------------------------|---------------------|---|-----------|---|
| Wilderness Study Areas (WSAs) | WSA-1 | Wilderness Characteristics (size, naturalness, outstanding opportunities for primitive and unconfined recreation or solitude, supplemental values) | Site visit or remote sensing | WSAs (28,931 acres) | Miles of linear human intrusions; acres disturbed; impacts to wilderness characteristics identified by onsite visit or public comment | Annually | Failure to meet the non-impairment standard or other objectives outlined in Manual 6330 |
| <p>1 Wyoming Department of Environmental Quality, Air Quality Division is responsible for data collection. 2 Wyoming Department of Environmental Quality, Water Division is responsible for data collection. 3 The Weed and Pest District and the Animal and Plant Health Inspection Service are responsible for data collection. 4 WGFD is responsible for data collection. 5 The State Historic Preservation Officer is responsible for data collection. 6 The agencies with jurisdiction over the various public roads are responsible for data collection.</p> <p>Note: Monitoring for Greater Sage-Grouse is described in Appendix D (p. 325).</p> <p>ACEC Area of Critical Environmental Concern AMP Allotment Management Plan BLM Bureau of Land Management LWC Lands with Wilderness Characteristics PFC Proper Functioning Condition TMA Travel Management Area VRM Visual Resource Management WGFD Wyoming Game and Fish Department WSA Wilderness Study Area</p> | | | | | | | |