Appendices

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Appendices
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APPENDIX A - BEST MANAGEMENT PRACTICES, DESIGN FEATURES, AND OPERATING PROCEDURES

This appendix provides a listing of best management practices (BMPs), design features, and operating procedures that, when applied with management actions in the ROD/RMP, would aid in achieving goals and objectives. These BMPs, design features, and operating procedures are tools to reduce adverse social, economic, and environmental effects. Additional practices may be added or included in this list as they are developed and determined to reduce unwanted impacts from management activities. Likewise, practices included in this list that do not achieve the desired results may be altered or removed from consideration. These BMPs, design features, and operating procedures were from many sources and could be applied alone or in combination as necessary to make progress towards or to achieve objectives.

While the overall vision embraces the use of these BMPs, design features, and operating procedures to reduce or minimize impacts, they are not to be considered a land use plan decision. They are dynamic and may be updated or modified based on future guidance, policy, and science without a plan amendment. BMPs, design features, and operating procedures used in site-specific situations would be incorporated into the proposed action or used as mitigation measures to reduce impacts. The determination of which BMPs, design features, and operating procedures to apply will be made during individual project planning. The use of BMPs, design features, or operating procedures will be analyzed through the NEPA process for site-specific projects.

The BMPs, design features, and operating procedures are categorized by resource use or activity. Because BMPs, design features, or operating procedures from programmatic Records of Decision are included, some are listed more than once. New information could result in BMPs being modified or added to reduce or mitigate impacts.

Vegetation Treatments

- The economic effects of alternative fuels management practices would be considered.
- Collaborate with local partners to assess wildland urban interface areas and to develop or update County Wildfire Protection Plans.
- Incorporate cultural protection practices in treatments using prescribed fire. Practices may include but are not limited to:
  - Reducing fuels manually on vulnerable sites or features.
  - Disposing of debris away from cultural features.
  - Using low-intensity backing fire in areas near historic features.
  - Saturating ground or grass adjacent to vulnerable structures with water, foam, or gel before burning.
  - Pre-burning site(s) at lower intensity than planned for the surrounding areas.
  - Limiting fire intensity and duration over vulnerable sites.
  - Using a fast-moving, higher intensity fire over lithic scatters, where rock materials are vulnerable to longer-duration heating.
  - Creating fire breaks near or around sites.
  - Wrapping structures in fire-proof materials or using retardant or foam to protect structures.
  - Covering rock art or wrapping carved trees or other such features in fire retardant fabric.
  - Reducing fuels and smoke near rock art.
  - Covering fuels near rock art with foam, water, or retardant, avoiding the rock art.
- Hazardous materials and abandoned mine sites identified in any specific fuels management or vegetation treatment area should be avoided.
- The use of hazardous substances (e.g., gasoline in riparian zones, explosives) for prescribed fire control should be avoided whenever practical.
- Treatments should be designed to minimize impacts to the character of the managed recreation setting in Special Recreation Management Areas and Extensive Recreation Management Areas and to the recreation experiences and benefits desired by the recreation participant.

- Wherever possible, vegetation treatments in Visual Resource Management Class I and II areas would replicate the natural line, form, color, and texture found in the surrounding area. Treatments that result in long-term disruption of natural visual qualities (e.g., drill seeding that establishes vegetation rows) should not be used unless the visual impacts can be hidden through treatment design.

Water Quality

The best management practices in this section expand and supplement the basic guidelines and minimum requirements of the Idaho Department of Lands (Forest Practices Regulations), Idaho Department of Water Resources Stream Channel Alteration Regulations, and the Corps of Engineers 404 Regulations.

Transportation and Travel

Road Planning – Design and Location

- Plan each road to the minimum standards for the intended use.
- Plan to dispose of excavated waste material on geologically stable sites and away from Riparian Conservation Areas (RCAs).
- Design full-bench roads for slopes over 60 percent. End-haul excess material to a geologically stable site for disposal and away from RCAs. Use balanced cut-and-fill road construction where practical.
- Design stream channel crossings as near to a right angle with the stream as possible to minimize disturbance to banks and existing channels.
- For road segments that parallel stream courses, consider the need for stream shade along with safety considerations during brushing operations. This may necessitate hand brushing, partial brushing, or limbing, with consideration for providing growth for future shade for the RCA.

Road Construction

- For any repair work in fish-bearing streams, instream work will be timed to avoid disturbance of staging adult fish, redds, or gravels with un-emerged juveniles where possible. Timing restrictions may be waived in cases of overriding safety concerns or the threat of severe resource damage.
- Fuel storage and fueling of equipment will not occur within RCAs.
- Before working in a stream channel or in a RCA, all heavy equipment or other machinery will be inspected for hydraulic or other leaks. Fix identified problems before entering areas that could affect water quality. Clean equipment with accumulations of oil, grease, or other toxic materials prior to use in these areas. An emergency spill containment kit will be located on site during construction activity.
- Clear drainage ways of all debris generated during construction or maintenance that may interfere with drainage or affect water quality.
- When constructing roads near RCAs, use hay bales, silt fences or other sediment filtering materials to minimize sediment reaching the RCA. Minimize the amount of woody debris buried in embankments and minimize the amount of snow, ice, and frozen soil added to embankments.
- Construct stream culverts, cross drains, or relief culverts to prevent erosion. Use riprap, woody debris, downspouts, or similar devices to prevent erosion of fills. Culverts in natural drainage ways would be oriented to minimize fill slope erosion or to carry water beyond fills.

Bridges

- Use an adequately long bridge span to avoid constricting the natural active flow channel and minimize constriction of any overflow channel.
- Avoid placing abutments in the active stream channel to the extent practicable.
- Place foundations onto nonscour-susceptible material (e.g., bedrock or coarse rock material) or below the expected maximum depth of scour.
- Set bridge abutments or footings into firm natural ground (e.g., not fill material or loose soil) when placed on natural slopes.

Low-Water Crossings

- Locate low-water crossings where streambanks are low with gentle slopes and channels are not deeply incised.
- Select and design low-water crossing structures to maintain the function and bedload movement of the natural stream channel.
- Construct the low-water crossing to conform to the site, channel shape, and original streambed elevation and to minimize flow restriction, site disturbance, and channel blockage to the extent practicable.
- Use suitable measures to stabilize or harden the streambed and approaches, including the entire bankfull width and sufficient clearance, where necessary to support the vehicle traffic design.
- Construct the driving surface with material suitable to resist expected shear stress or lateral forces of water flow at the site.

Road Drainage

- For insloped roads, generally design ditch gradients to be between two and eight percent to prevent sediment deposition and ditch erosion. The higher gradients may be suitable for more stable soils; use the lower gradients for less stable soils.
- Construct drain dips deep enough into the subgrade so that traffic will not obliterate them. Dips should be angled 20 to 45 degrees perpendicular to the road and have a drainage grade of 2% to 8%.
- Where possible, install relief culverts at the gradient of the original ground slope; otherwise armor outlets with rock or anchor downspouts to carry water across the fill slope.
- Skew relief culverts 20 to 30 degrees toward the inflow from the ditch to improve inlet efficiency. Develop the catch basin at sufficient size to prevent the culvert inlet from plugging.
- Construct at or near natural elevation of the streambed to avoid or minimize potential flooding upstream of the crossing and erosion below the outlet.
- Install culverts long enough to extend beyond the toe of the fill slopes to minimize erosion.
- Use suitable measures to avoid or minimize water from seeping around the culvert.

Road Maintenance

- Maintain erosion control features through periodic inspection and maintenance, including cleaning dips and cross-drains, repairing ditches, marking culvert inlets to aid in location, and clearing debris from catch basins and culverts.
- Avoid using roads during wet periods if such use would damage the road drainage features.
- Apply dust abatement or other surface stabilizing chemicals to prevent entry into streams. Do not place dust abatement chemicals in road ditches, and apply at rates which do not pooling of abatement chemicals on the road surface.
- When removing down logs in the road which extend into a stream, any woody material on the fill slope and in the stream will not be removed to provide for woody debris recruitment, except in cases where the retention of this material would result in a safety concern (i.e., downstream facilities).
- Grade road surfaces only as often as necessary to maintain a stable running surface and to retain the original surface drainage.
- Avoid cutting the toe of cut slopes when grading roads or pulling ditches.
- Avoid sidecasting material where these materials may be introduced into a stream, or where the placement of these materials will contribute to destabilization of the slope.

Snow Removal

- Snow will not be completely removed. In general, a minimum two inches of snow must be left on the roadway during plowing operations to protect the surface of the road.
- Prevent plugging ditches and culverts during snow plowing operations.
- Sidecast material will not include dirt and gravel.
- Snow berms will not be left on the road or shoulder unless drainage holes are opened and maintained. Drainage holes will be spaced as required to obtain satisfactory surface drainage without discharge on erodible fills.

- Damage from, or as a result of snow removal, will be restored in a timely manner.

Resources and Resource Uses

Livestock Grazing

- Collect no more water than is sufficient to meet the intended purpose of the spring development.
- Equip the spring box with a shut off valve to return water to the spring when not in use.
- Ensure that enough water remains in the spring to support the source groundwater, dependent ecosystem, and downstream aquatic ecosystems.

Recreation Management

- Educate the public to conduct their activities in ways that will not degrade water quality. Avoid discharges and disposal of human and animal waste, petroleum products, and other hazardous substances in or near RCAs in recreation areas.
- Provide primitive sanitation facilities in areas where perpetual concentrated dispersed recreation use is causing adverse effects to soil, water quality, or riparian resources.
- Design, construct, and maintain trail width, grades, curves, and switchbacks suitable to the terrain and designated use.
- Design stream crossings to use the most cost-efficient structure consistent with resource protection, facility needs, and types of use and safety obligations.
- Develop and designate campsites in appropriate locations where repeated use is causing adverse effects.
- Design and locate parking and staging areas of appropriate size and configuration to accommodate expected vehicles and avoid or minimize adverse effects to adjacent soil, water quality, and riparian resources. Use suitable measures to harden and avoid or minimize damage to parking area surfaces that experience heavy use or are used during wet periods.
- Locate and design watercraft launch sites to avoid, minimize, or mitigate adverse effects to soil, water quality, and riparian resources.

Fire Management

- Conduct water drafting at locations and in a manner that avoids or minimizes adverse effects to water quality.
- Avoid mixing chemicals (retardant, foam, etc.) in wetlands and riparian zones.
- Avoid refueling in wetlands and riparian zones. If refueling a pump drafting from a water source use measures to minimize and contain spills.
- During fire suppression efforts, avoid watershed damage in excess of that which would be caused by the fire itself. Avoid heavy equipment operation on fragile soils and steep slopes when possible. Use resource advisors and specialists to advise the incident commander on resource values during the suppression effort.
- Stabilize areas where erosion potential increased or drainage patterns are altered by wildfires or by suppression related activities. Treatments include, but are not limited to:
  - Installing water bars and other drainage diversions in fire roads, fire lines, and other cleared areas;
  - Seeding, planting and fertilizing to provide vegetative cover;
  - Spreading slash or mulch to protect bare soil;
  - Repairing damaged road drainage facilities; and
  - Installing erosion barriers.
- Provide for water quality protection in formulating prescribed fire prescriptions. Prescription elements include fire weather, slope, aspect, soil moisture, and fuel moisture. These elements influence the fire intensity and have a direct effect on whether desired ground cover remains after burning, and whether a water repellent layer is formed.
- Maintain soil productivity, minimize erosion, and prevent ash, sediment, nutrients, and debris from entering water bodies during prescribed fires. Some of the techniques used to prevent water quality impacts include:

  - Maintaining the integrity of the stream course and RCA width and
  - Planning prescribed fires with intensities that will not result in soils becoming hydrophobic.

Special Status Species

Greater Sage-Grouse

- Avoid spraying treatment areas for the control of grasshoppers and Mormon crickets in key sage-grouse habitat in May and June (or as appropriate to local circumstances) to provide insect availability for early development of sage-grouse chicks.
- Use approved chemicals with the lowest toxicity to sage-grouse that still provide effective control of grasshoppers and Mormon crickets. Coordinate with US Department of Agriculture Animal and Plant Health Inspection Service to determine the approved chemical with the lowest toxicity.

Slickspot Peppergrass

- A qualified biologist may be required to monitor slickspots to avoid impacts during projects in habitat categories for slickspot peppergrass.
- In occupied habitat, only hand sprayers will be used for the application of herbicide.
- Within 10 feet of occupied slickspots, weeds will only be treated by hand.

Noxious Weeds and Invasive Plants

- When relevant, incorporate noxious weed and invasive plant prevention into project designs, including but not limited to: Emergency Stabilization and Burned Area Rehabilitation, fuels, range infrastructure, wildlife, fisheries, botany, soil, watershed, cultural resource, paleontology, recreation, and stream restoration projects.
- Encourage noxious weed and invasive plant awareness and education in employee development, training plans, and orientation for field, fire, and administrative positions.
- Promptly treat recreation sites or other high use areas when noxious weeds and invasive species are found.

Wildland Fire Suppression

- In the event a wildland fire escapes initial attack, a resource advisor should be assigned to ensure that resource management concerns are adequately addressed and that necessary mitigation occurs.
- If one of the following is being threatened or has the potential to be threatened, the authorized officer must be notified and a resource advisor should be dispatched:
  - Public health and safety;
  - Wildland urban interface;
  - Sage-grouse habitat;
  - Occupied habitat for slickspot peppergrass; or
  - Areas of Critical Environmental Concern (ACECs); Wilderness Study Areas (WSAs); Wilderness; designated, eligible, or suitable Wild and Scenic Rivers; or National Historic Trails (NHTs).
- Use the minimum control line width necessary for containing fires; following containment, additional control lines should be avoided.
- Existing roads should be used for dozer lines before new dozer lines are constructed.
- Use of natural firebreaks and existing roads and trails to contain a wildland fire would be encouraged within special designations (e.g., WSAs, ACECs, and NHTs).
- Equipment used during extended attack should be cleaned before arriving on site and prior to demobilization to minimize the spread of noxious weeds and invasive plants. Wash stations should be set up in base camps and staging areas when practical.
- For fires requiring an incident management team, coordinate with the Field Office specialists prior to the establishment of base camps, staging areas, or support facilities so areas with special designations, special status species habitat, cultural resources sites, noxious weed patches, or riparian areas would be avoided to the extent practical.
- Through the authorized officer or resource advisor, an archaeologist should be notified to provide technical expertise, identify cultural resources that may be encountered, and identify best cultural protection practices to be used during suppression activities.

- Prior to wildland fire season, potential areas of conflict between archaeological resources and wildland fire suppression activities should be identified.
- Consider covering rock art or wrapping historic buildings or other such features in fire retardant fabric.
- To the extent practicable, suppress wildfires near rock art sites to minimize smoke damage. Rock art sites would be a suppression priority once the wildfire is contained. Avoid direct applications of foam, water, or retardant to rock art sites during suppression operations.

Livestock Grazing

General

- Ensure noxious weed and invasive plant prevention and control are considered in the management of grazing allotments.
- Implement grazing practices that allow for periodic rest during the growing season and promote rangeland health.
- Use annual indicators to evaluate implementation of grazing schedules.
- Manage water availability to alter distribution of livestock to maintain plant vigor and habitat for wildlife and special status plant species.
- Consider kind and breed of livestock to improve distribution patterns and forage use.
- Encourage the use of animal husbandry practices, such as early weaning of calves or culling of problem cattle, to achieve resource objectives.
- Remove and properly dispose of supplement tubs, old pipe, troughs, wire, and etc. from BLM managed lands.
- Pursue opportunities to incorporate multiple allotments under a single management plan/strategy where incorporation would result in enhanced management to promote rangeland health and resolve resource issues.

Upland Areas

- Periodically treat crested wheatgrass seedings to prevent widespread development of decadent plants undergoing a process of decline of vigor, production, and palatability to wildlife and livestock due to accumulation of previous year's biomass.
- Manage livestock grazing to reduce disturbance to special status birds in native plant communities during nesting. For example, deferring some pastures during nesting or active herding of livestock between pastures.
- Place salt and other supplements in annual grasslands or non-native perennial grassland sites. If specific pastures contain only native habitats, place salt and supplements in areas that are already disturbed including, but not limited to:
  - dirt road or jeep trail intersections,
  - water troughs located in the uplands,
  - gravel pits, or
  - areas previously used for salting.
- In pastures with non-native plant communities, place salt and other supplements at least 0.25 mile from native plant communities. If space limits this practice, place supplements to minimize livestock congregation in native plant communities.
- Consider placing livestock water or supplements away from agricultural land to provide relatively large blocks of suitable nesting and wintering habitat for pheasants, as well as nesting habitat for other taller grass dependent species such as northern harriers, short-eared owls, and several songbirds.

Riparian Areas

- Use water developments in upland areas to reduce livestock concentrations in riparian areas.
- Place salt and other supplements in the uplands at least 0.25 mile away from riparian zones and wetlands, unless determined necessary to meet specific resource objectives.
- Use localized hardened crossings to limit surface disturbance and reduce erosion at streamside livestock watering and crossing areas as long as fish migration through the watering areas is not impeded.

- Use riding and herding to control livestock distribution and use in areas with identified resource concerns such as in riparian areas, wet meadows, or stream crossings. Frequency of this method would vary by allotment, pasture and resource concern.
- Use gap fencing in conjunction with gullies, cliffs, and other natural barriers to limit livestock trailing and bedding in riparian areas; bed livestock in the uplands where possible.
- When water gaps are necessary, locate water gaps in rocky or hardened areas (natural or manmade) to minimize trampling damage to streambanks and streambeds. Use narrow water gaps to discourage livestock from loafing at the water source.
- Ensure utilization levels provide for sufficient herbaceous and woody vegetation during periods of high flow to protect streambanks, dissipate energy, and trap sediments.
- When entering a pasture, locate livestock near upland troughs or ponds to avoid impacts to riparian areas.

Range Infrastructure

Fences (Applicable to all programs)

- Encourage reducing fence densities by implementing alternative control methods such as herding, turning off waters, and placement of salt or supplements (Autenrieth et al., 2006; Yoakum, 2004).
- When reconfiguring pastures within an allotment and when the allotment size allows, larger pasture sizes (greater than 3,000 acres) are preferred to smaller pasture sizes to meet big game objectives.
- Modify fences that cross big game migration routes (e.g., Davison clips, let-down fence, or other techniques) to ensure that pronghorn and mule deer movements are not blocked.
- Exclosure fences should be at least 10 acres to accommodate big game use (Gross and Knight, 2000).
- If it is necessary to restrict big game to protect resource values, including rare plant habitat, such exclosures should be of adequate height (at least 8 feet) to prevent big game access. These types of exclosures would be sized to protect the resource value which may cover less than 10 acres.

Water Developments

Proposed Authorizations/Activities

- Design structures in a manner that minimizes potential for production of mosquitoes which may carry West Nile virus.
- Fences should not be placed on dams or berms to minimize waterfowl, shorebird, and other avian collisions. Fences should be beyond the high water mark surrounding the pond/reservoir to minimize collision with waterfowl and shorebirds. Anchor troughs without wires, poles, and other obstructions directly over the trough surface to reduce injuries and make the troughs more accessible to bats (Tuttle et al., 2006).
- Evaluate ponds and reservoirs as habitat for amphibians. Where habitat is occupied by amphibians, take measures to maintain or improve habitat quality, including planting aquatic cover, providing basking areas, reducing trampling at critical times of the year, and providing water from spring through fall (CSFTT, 2003).
- Explore alternative strategies to divert water that reduce impacts on the spring source or riparian habitat (e.g., locating collection devices far enough below the spring source that it reduces detrimental impacts on the spring source or surrounding riparian vegetation (CSFTT, 2003), leaving adequate water at the spring source to maintain or enhance the existing condition).

Recreation

Recreation Sites

- Develop site-specific measures to avoid impacts to sage-grouse at existing or new recreation sites (e.g., seasonal closures, location of facilities).
- In the sage-grouse management area, use perch deterrents on signs and kiosks to reduce raven or raptor use of this infrastructure as foraging perches.

Transportation and Travel

- In coordination with Idaho Department of Fish and Game, Nevada Department of Wildlife, and local highway districts, evaluate primitive roads and trails and consider seasonal restrictions. Primitive roads in sage-grouse nesting and big game winter habitat would have the highest priority for seasonal closures during sensitive periods (Mule Deer Working Group, 2004) (Idaho Sage-grouse Advisory Committee, 2006).
- Through the transportation and travel management planning process, address important wildlife habitat values including key sage-grouse breeding habitat (Idaho Sage-grouse Advisory Committee, 2006) and big game parturition and winter habitats (Mule Deer Working Group, 2004) through actions such as closing or rerouting roads and seasonal restrictions.
- To the extent practical, schedule road realignments and other major construction to occur between June 21 and November 30 in big game winter habitat and sage-grouse habitat.
- Spray herbicides along roadsides to minimize sources of noxious weed and invasive plant seed that could be transported to other areas. Follow conservation measures found in Appendix C when applying herbicide along roadsides in occupied habitat for slickspot peppergrass.
- Ensure road blading and roadside herbicide applications are coordinated chronologically to minimize herbicide use and increase effectiveness.
- Use spot grading whenever possible to reduce route braiding.
- Where culverts and water bars are installed, use methods to slow water flow to prevent erosion. Methods may include rock, filter cloth, straw rolls, or other methods.
- When culverts are removed, they will be hauled to a land fill or recycled.
- Place a high priority on closing and reclaiming unauthorized motor vehicle routes.
- Ditch outs should remain within the road's right-of-way. Avoid ending ditch outs in defined ephemeral channels.

Land Use Authorizations

Communication Towers and Overhead Transmission Lines

- Construct new power lines and bury cable next to existing roads or other linear disturbance features to the extent possible.
- Remove wires from abandoned overhead power or telephone lines; cut off poles near ground level and remove them.
- Design towers and configure power poles to prevent raptors from using them as perches or nest sites.
- Design towers and adjacent structures with the smallest footprint possible; however, a larger footprint for self-supporting towers is preferable to guy-supported towers with a smaller footprint.
- Install visual markers or other proven methods on guyed towers to prevent collisions by wildlife.
- Install downshield security lighting for on-the-ground facilities to minimize attraction to birds and bats.

Wind Energy Development

The design features for wind energy development are from the Implementation of a Wind Energy Development Program and Associated Land Use Plan Documents Record of Decision (BLM, 2005) which amended the 1987 Jarbidge Resource Management Plan (RMP) and Record of Decision. Applicable design features will be adopted as required elements of project-specific Plans of Development (PODs) and/or as right-of-way (ROW) authorization stipulations. They are categorized by development activity: site monitoring and testing, development of the POD, construction, operation, and decommissioning. The design features for development of the POD identify elements that address potential impacts associated with subsequent phases of development.

Site Monitoring and Testing

- The Federal Aviation Administration (FAA)-required notice of proposed construction shall be made as early as possible to identify any air safety measures that would be required.
- The area disturbed by installation of meteorological towers (i.e., footprint) shall be kept to a minimum.

- Existing roads shall be used to the maximum extent feasible. If new roads are necessary, they shall be designed and constructed to the appropriate standard.
- Meteorological towers shall not be located in sensitive habitats or in areas where ecological resources known to be sensitive to human activities (e.g., sage-grouse, golden eagle nest territories, etc.) are present. Installation of towers shall be scheduled to avoid disruption of wildlife reproductive activities or other important behaviors.
- Meteorological towers installed for site monitoring and testing shall be inspected periodically for structural integrity.

Plan of Development Preparation

General

- Project developers shall coordinate with the BLM, Department of Defense (DoD), and FAA early in the project planning process to identify and minimize impacts on airspace use. Identifying impacts on airspace use shall include, but is not limited to:
  - Consult with the FAA on proposed construction of any facility that is 100 feet (~61 m) or taller to evaluate potential safety hazards.
  - Consult with the DoD to minimize and/or eliminate impacts on military operations, and encourage compatible development.
- Available information describing the environmental and sociocultural conditions in the vicinity of the proposed project shall be collected and reviewed as needed to predict potential impacts of the project.
- To plan for efficient use of the land, necessary infrastructure requirements shall be consolidated wherever possible, and current transmission and market access shall be evaluated carefully.
- The project shall be planned to utilize existing roads and utility corridors to the maximum extent feasible, and to minimize the number and length/size of new roads, lay-down areas, and borrow areas.
- A monitoring program shall be developed to ensure that environmental conditions are monitored during the construction, operation, and decommissioning phases. The monitoring program requirements, including adaptive management strategies, shall be established at the project level to ensure that potential adverse impacts of wind energy development are mitigated. The monitoring program shall identify the monitoring requirements for each environmental resource present at the site, establish metrics against which monitoring observations can be measured, identify potential mitigation measures, and establish protocols for incorporating monitoring observations and additional mitigation measures into standard operating procedures and best management practices.
- “Good housekeeping” procedures shall be developed to ensure that during construction, operation and decommissioning the site will be kept clean of debris, garbage, fugitive trash or waste, and graffiti; to prohibit scrap heaps and dumps; and to minimize storage yards.

Wildlife and Other Ecological Resources

- Operators shall review existing information on species and habitats in the vicinity of the project area to identify potential concerns.
- Operators shall conduct surveys for Federal and/or State-protected species and other species of concern (including special status plant and animal species) within the project and adjoining areas, design the project to avoid (if possible), minimize, or mitigate impacts to these resources.
- Operators shall identify important, sensitive, or unique habitats in the vicinity of the project and design the project to avoid (if possible), minimize, or mitigate impacts to these habitats (e.g., locate the turbines, roads, and ancillary facilities in the least environmentally sensitive areas; i.e., away from riparian habitats, streams, wetlands, drainages, or critical wildlife habitats).
- The BLM will prohibit the disturbance of any population of Federally listed plant species.
- Operators shall use best available information to evaluate avian and bat use of the project area and design the project and site-specific BMPs to minimize or mitigate the potential for bird and bat strikes (e.g., development shall not occur in riparian habitats and wetlands). Scientifically rigorous avian and bat use surveys shall be conducted; the amount and extent of ecological baseline data required shall

be determined on a project basis. The surveys will cover all seasons and be at least two years in duration. An avian and bat protection plan shall be completed for wind energy development projects.

- Turbines shall be configured to avoid landscape features known to attract raptors, if site studies show that placing turbines there would pose a significant risk to raptors.
- Operators shall determine the presence of bat colonies and avoid placing turbines near known bat hibernation, breeding, and maternity/nursery colonies; in known migration corridors; or in known flight paths between colonies and feeding areas.
- Operators shall determine the presence of raptor nests (i.e., active raptor nests and alternate nest sites within breeding territories during the breeding season). Measures to reduce raptor use at a project site (e.g., minimize road cuts, maintain either no vegetation or non-attractive plant species around the turbines) shall be considered.
- A habitat restoration plan shall be developed to avoid (if possible), minimize, or mitigate negative impacts on vulnerable wildlife while maintaining or enhancing habitat values for other species. The plan shall identify revegetation, soil stabilization, and erosion reduction measures that shall be implemented to ensure that all temporary use areas are restored. The plan shall require that restoration occur as soon as possible after completion of activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.
- Procedures shall be developed to mitigate potential impacts to special status species. Such measures could include avoidance, relocation of project facilities or lay-down areas, and/or relocation of biota.
- Facilities shall be designed to discourage their use as perching or nesting substrates by birds. For example, power lines and poles shall be configured to minimize raptor electrocutions and discourage raptor and raven nesting and perching.

Visual Resources

- The public shall be involved and informed about the visual site design elements of the proposed wind energy facilities. Possible approaches include conducting public forums for disseminating information, offering organized tours of operating wind developments, and using computer simulation and visualization techniques in public presentations.
- Turbine arrays and turbine design shall be integrated with the surrounding landscape. Design elements to be addressed include visual uniformity, use of tubular towers, proportion of turbines, color of non-reflective paints, and prohibition of messages on turbines.
- Other site design elements shall be integrated with the surrounding landscape. Elements to address include minimizing the profile of the ancillary structures, burial of cables, prohibition of commercial symbols, and lighting. Regarding lighting, efforts shall be made to minimize the need for and amount of lighting on ancillary structures.

Roads

- An access road siting and management plan shall be prepared incorporating existing BLM standards regarding road design, construction, and maintenance, such as those described in the BLM 9113 Manual and the *Surface Operating Standards for Oil and Gas Exploration and Development* (i.e., the Gold Book, 4th Edition, 2007).

Ground Transportation

- A transportation plan shall be developed, particularly for the transport of turbine components, main assembly cranes, and other large pieces of equipment. The plan shall consider specific object sizes, weights, origin, destination, and unique handling requirements and shall evaluate alternative transportation approaches. In addition, the process to be used to comply with unique State requirements and to obtain all necessary permits shall be clearly identified.
- A traffic management plan shall be prepared for the site access roads to ensure that no hazards would result from the increased truck traffic and that traffic flow would not be adversely impacted. This plan shall incorporate measures such as informational signs, flaggers when equipment may result in blocked throughways, and traffic cones to identify any necessary changes in temporary lane configuration.

Noise

- Proponents of a wind energy development project shall take multiple measurements in multiple seasons to assess the existing background noise levels at multiple sites and compare them with the anticipated noise levels associated with the proposed project.

Noxious Weeds and Pesticides

- Operators shall develop a plan for control of noxious weeds and invasive plant species, which could occur as a result of new surface disturbance activities at the site. The plan shall address monitoring, education of personnel on weed identification, the manner in which weeds spread, and methods for treating infestations. The use of certified weed-free mulching shall be required. A controlled inspection and cleaning area shall be established to visually inspect construction equipment arriving at the project area and to remove and collect seeds that may be adhering to tires and other equipment surfaces.
- If pesticides are used on the site, an integrated pest management plan shall be developed to ensure that applications would be conducted within the framework of BLM and USDI (US Department of Interior) policies and entail only the use of Environmental Protection Agency-registered pesticides. Pesticide use shall be limited to non-persistent, immobile pesticides and shall only be applied in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications.

Cultural/Historic Resources

- BLM will consult with Indian tribal governments early in the planning process to identify issues regarding the proposed wind energy development, including issues related to the presence of cultural properties, access rights, disruption to traditional cultural practices, and impacts to visual resources important to the tribe(s).
- The presence of archaeological sites and historic properties in the area of potential effect shall be determined on the basis of a records search of recorded sites and properties in the area and/or, depending on the extent and reliability of existing information, an archaeological survey. Archaeological sites and historic properties present in the area of potential effect shall be reviewed to determine whether they meet the criteria of eligibility for listing on the National Register of Historic Places (NRHP).
- When any ROW application includes remnants of a National Historic Trail (NHT), is located within the viewshed of a NHT's designated centerline, or includes or is within the viewshed of a trail eligible for listing on the NRHP, the operator shall evaluate the potential visual impacts to the trail associated with the proposed project and identify appropriate mitigation measures for inclusion as stipulations in the POD.
- If cultural resources are present at the site, or if areas with a high potential to contain cultural material have been identified, a Cultural Resources Management Plan (CRMP) shall be developed. This plan shall address mitigation activities to be taken for cultural resources found at the site. Avoidance of the area is always the preferred mitigation option. Other mitigation options include archaeological survey and excavation (as warranted) and monitoring. If an area exhibits a high potential, but no artifacts were observed during an archaeological survey, monitoring by a qualified archaeologist could be required during all excavation and earthmoving in the high-potential area. A report shall be prepared documenting these activities. The CRMP also shall:
    - Establish a monitoring program,
    - Identify measures to prevent potential looting/vandalism or erosion impacts, and
    - Address the education of workers and the public to make them aware of the consequences of unauthorized collection of artifacts and destruction of property on public land.

Paleontological Resources

- Operators shall determine whether paleontological resources exist in a project area on the basis of the sedimentary context of the area, a records search for past paleontological finds in the area, and/or, depending on the extent of existing information, a paleontological survey.
- If paleontological resources are present at the site, or if areas with a high potential to contain paleontological material have been identified, a paleontological resources management plan shall be

developed. This plan shall include a mitigation plan for collection of the fossils; mitigation could include avoidance, removal of fossils, or monitoring. If an area exhibits a high potential but no fossils were observed during survey, monitoring by a qualified paleontologist could be required during all excavation and earthmoving in the sensitive area. A report shall be prepared documenting these activities. The paleontological resources management plan also shall:

- Establish a monitoring program,
- Identify measures to prevent potential looting/vandalism or erosion impacts, and
- Address the education of workers and the public to make them aware of the consequences of unauthorized collection of fossils on public land.

Hazardous Materials and Waste Management

- Operators shall develop a hazardous materials management plan addressing storage, use, transportation, and disposal of each hazardous material anticipated to be used at the site. The plan shall identify all hazardous materials that would be used, stored, or transported at the site. It shall establish inspection procedures, storage requirements, storage quantity limits, inventory control, nonhazardous product substitutes, and disposition of excess materials. The plan shall also identify requirements for notices to Federal and local emergency response authorities and include emergency response plans.
- Operators shall develop a waste management plan identifying the waste streams that are expected to be generated at the site and addressing hazardous waste determination procedures, waste storage locations, waste-specific management and disposal requirements, inspection procedures, and waste minimization procedures. This plan shall address all solid and liquid wastes that may be generated at the site.
- Operators shall develop a spill prevention and response plan identifying where hazardous materials and wastes are stored on site, spill prevention measures to be implemented, training requirements, appropriate spill response actions for each material or waste, the locations of spill response kits on site, a procedure for ensuring that the spill response kits are adequately stocked at all times, and procedures for making timely notifications to authorities.

Storm Water

- Operators shall develop a storm water management plan for the site to ensure compliance with applicable regulations and prevent off-site migration of contaminated storm water or increased soil erosion.

Human Health and Safety

- A safety assessment shall be conducted to describe potential safety issues and the means that would be taken to mitigate them, including issues such as site access, construction, safe work practices, security, heavy equipment transportation, traffic management, emergency procedures, and fire control.
- A health and safety program shall be developed to protect both workers and the general public during construction, operation, and decommissioning of a wind energy project. Regarding occupational health and safety, the program shall identify all applicable Federal and State occupational safety standards; establish safe work practices for each task (e.g., requirements for personal protective equipment and safety harnesses; Occupational Safety and Health Administration standard practices for safe use of explosives and blasting agents; and measures for reducing occupational electric and magnetic fields exposures); establish fire safety evacuation procedures; and define safety performance standards (e.g., electrical system standards and lightning protection standards). The program shall include a training program to identify hazard training requirements for workers for each task and establish procedures for providing required training to all workers. Documentation of training and a mechanism for reporting serious accidents to appropriate agencies shall be established.
- Regarding public health and safety, the health and safety program shall establish a safety zone or setback for wind turbine generators from residences and occupied buildings, roads, ROWs, and other public access areas that is sufficient to prevent accidents resulting from the operation of wind turbine generators. It shall identify requirements for temporary fencing around staging areas, storage yards, and excavations during construction or decommissioning activities. It shall also identify measures to

be taken during the operation phase to limit public access to hazardous facilities (e.g., permanent fencing would be installed only around electrical substations, and turbine tower access doors would be locked).

- Operators shall consult with local planning authorities regarding increased traffic during the construction phase, including an assessment of the number of vehicles per day, their size, and type. Specific issues of concern (e.g., location of school bus routes and stops) shall be identified and addressed in the traffic management plan.
- If operation of the wind turbines is expected to cause significant adverse impacts to nearby residences and occupied buildings from shadow flicker, low-frequency sound, or electric and magnetic fields site-specific recommendations for addressing these concerns shall be incorporated into the project design (e.g., establishing a sufficient setback from turbines).
- The project shall be planned to minimize electromagnetic interference (e.g., impacts to radar, microwave, television, and radio transmissions) and comply with Federal Communications Commission regulations. Signal strength studies shall be conducted when proposed locations have the potential to impact transmissions. Potential interference with public safety communication systems (e.g., radio traffic related to emergency activities) shall be avoided.
- The project shall be planned to comply with FAA regulations, including lighting regulations, and to avoid potential safety issues associated with proximity to airports, military bases or training areas, or landing strips.
- Operators shall develop a fire management strategy to implement measures to minimize the potential for a human-caused fire.

Construction

General

- All control and mitigation measures established for the project in the POD and the resource-specific management plans that are part of the POD shall be maintained and implemented throughout the construction phase, as appropriate.
- The area disturbed by construction and operation of a wind energy development project (i.e., footprint) shall be kept to a minimum.
- The number and size/length of roads, temporary fences, lay-down areas, and borrow areas shall be minimized.
- Topsoil from all excavations and construction activities shall be salvaged and reapplied during reclamation.
- All areas of disturbed soil shall be reclaimed using weed-free native grasses, forbs, and shrubs.
- Reclamation activities shall be undertaken as early as possible on disturbed areas.
- All electrical collector lines shall be buried in a manner that minimizes additional surface disturbance (e.g., along roads or other paths of surface disturbance). Overhead lines may be used in cases where burial of lines would result in further habitat disturbance.
- Operators shall identify unstable slopes and local factors that can induce slope instability (such as groundwater conditions, precipitation, earthquake activities, slope angles, and the dip angles of geologic strata). Operators also shall avoid creating excessive slopes during excavation and blasting operations. Special construction techniques shall be used where applicable in areas of steep slopes, erodible soil, and stream channel crossings.
- Erosion controls that comply with Federal, State, and local standards shall be applied. Practices such as jute netting, silt fences, and check dams shall be applied near disturbed areas.

Wildlife

- Guy wires on permanent meteorological towers shall be avoided, however, may be necessary on temporary meteorological towers installed during site monitoring and testing. If used guy wires would be marked to reduce wildlife mortality.
- In accordance with the habitat restoration plan, restoration shall be undertaken as soon as possible after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.

- All construction employees shall be instructed to avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship and nesting) seasons. In addition, pets shall not be permitted on site during construction.

Visual Resources

- Operators shall reduce visual impacts during construction by minimizing areas of surface disturbance, controlling erosion, using dust suppression techniques, and restoring exposed soils as closely as possible to their original contour and vegetation.

Roads

- Existing roads shall be used, but only if in safe and environmentally sound locations. If new roads are necessary, they shall be designed and constructed to the appropriate standard and be no higher than necessary to accommodate their intended functions (e.g., traffic volume and weight of vehicles). Excessive grades on roads, road embankments, ditches, and drainages shall be avoided, especially in areas with erodible soils. Special construction techniques shall be used, where applicable. Abandoned roads and roads that are no longer needed shall be recontoured and revegetated.
- Access roads and on-site roads shall be surfaced with aggregate materials, wherever appropriate.
- Access roads shall be located to follow natural contours and minimize side hill cuts.
- Roads shall be located away from drainage bottoms and avoid wetlands, if practicable.
- Roads shall be designed so that changes to surface water runoff are avoided and erosion is not initiated.
- Access roads shall be located to minimize stream crossings. All structures crossing streams shall be located and constructed so that they do not decrease channel stability or increase water velocity. Operators shall obtain all applicable Federal and State permits.
- Existing drainage systems shall not be altered, especially in sensitive areas such as erodible soils or steep slopes. Potential soil erosion shall be controlled at culvert outlets with appropriate structures. Catch basins, roadway ditches, and culverts shall be cleaned and maintained regularly.

Ground Transportation

- Project personnel and contractors shall be instructed and required to adhere to speed limits commensurate with road types, traffic volumes, vehicle types, and site-specific conditions, to ensure safe and efficient traffic flow and to reduce wildlife collisions and disturbance and airborne dust.
- Traffic shall be restricted to the roads developed for the project. Use of other unimproved roads shall be restricted to emergency situations.
- Signs shall be placed along construction roads to identify speed limits, travel restrictions, and other standard traffic control information. To minimize impacts on local commuters, consideration shall be given to limiting construction vehicles traveling on public roadways during the morning and late afternoon commute time.

Air Emissions

- Dust abatement techniques shall be used on unpaved, unvegetated surfaces to minimize airborne dust.
- Speed limits (e.g., 25 mph [40 km/h]) shall be posted and enforced to reduce airborne fugitive dust.
- Construction materials and stockpiled soils shall be covered if they are a source of fugitive dust.
- Dust abatement techniques shall be used before and during surface clearing, excavation, or blasting activities.

Excavation and Blasting Activities

- Operators shall gain a clear understanding of the local hydrogeology. Areas of groundwater discharge and recharge and their potential relationships with surface water bodies shall be identified.
- Operators shall avoid creating hydrologic conduits between two aquifers during foundation excavation and other activities.
- Foundations and trenches shall be backfilled with originally excavated material as much as possible. Excess excavation materials shall be disposed of only in approved areas or, if suitable, stockpiled for use in reclamation activities.

- Borrow material shall be obtained only from authorized and permitted sites. Existing sites shall be used in preference to new sites.
- Explosives shall be used only within specified times and at specified distances from sensitive wildlife or streams and lakes, as established by the BLM or other Federal and State agencies.

Noise

- Noisy construction activities (including blasting) shall be limited to the least noise-sensitive times of day (i.e., daytime only between 9 a.m. and 10 p.m.) and weekdays.
- All equipment shall have sound-control devices no less effective than those provided on the original equipment. All construction equipment used shall be adequately muffled and maintained.
- All stationary construction equipment (i.e., compressors and generators) shall be located as far as practicable from nearby residences.
- If blasting or other noisy activities are required during the construction period, nearby residents shall be notified in advance.

Cultural and Paleontological Resources

- Unexpected discovery of cultural or paleontological resources during construction shall be brought to the attention of the responsible BLM authorized officer immediately. Work shall be halted in the vicinity of the find to avoid further disturbance to the resources while they are being evaluated and appropriate mitigation measures are being developed.

Hazardous Materials and Waste Management

- Secondary containment shall be provided for all on-site hazardous materials and waste storage, including fuel. In particular, fuel storage (for construction vehicles and equipment) shall be a temporary activity occurring only for as long as is needed to support construction activities.
- Wastes shall be properly containerized and removed periodically for disposal at appropriate off-site permitted disposal facilities.
- In the event of an accidental release to the environment, the operator shall document the event, including a root cause analysis, appropriate corrective actions taken, and a characterization of the resulting environmental or health and safety impacts. Documentation of the event shall be provided to the BLM authorized officer and other Federal and State agencies, as required.
- Any wastewater generated in association with temporary, portable sanitary facilities shall be periodically removed by a licensed hauler and introduced into an existing municipal sewage treatment facility. Temporary, portable sanitary facilities provided for construction crews shall be adequate to support expected on-site personnel and shall be removed at completion of construction activities.

Public Health and Safety

- Temporary fencing shall be installed around staging areas, storage yards, and excavations during construction to limit public access.

Operations

General

- All control and mitigation measures established for the project in the POD and the resource-specific management plans that are part of the POD shall be maintained and implemented throughout the operational phase, as appropriate. These control and mitigation measures shall be reviewed and revised, as needed, to address changing conditions or requirements at the site, throughout the operational phase. This adaptive management approach would help ensure that impacts from operations are kept to a minimum.
- Inoperative turbines shall be repaired, replaced, or removed in a timely manner. Requirements to do so shall be incorporated into the due diligence provisions of the right-of-way (ROW) authorization. Operators will be required to demonstrate due diligence in the repair, replacement, or removal of turbines; failure to do so could result in termination of the ROW authorization.

Wildlife

- Employees, contractors, and site visitors shall be instructed to avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship and nesting) seasons. In addition, any pets shall be controlled to avoid harassment and disturbance of wildlife.
- Observations of potential wildlife problems, including wildlife mortality, shall be reported to the BLM authorized officer immediately.

Ground Transportation

- Ongoing ground transportation planning shall be conducted to evaluate road use, minimize traffic volume, and ensure that roads are maintained adequately to minimize associated impacts.

Monitoring Program

- Site monitoring protocols defined in the POD shall be implemented. These will incorporate monitoring program observations and additional mitigation measures to minimize future environmental impacts.
- Results of monitoring program efforts shall be provided to the BLM authorized officer.

Public Health and Safety

- Permanent fencing shall be installed and maintained around electrical substations.
- Turbine tower access doors shall be locked to limit public access.
- In the event an installed wind energy development project results in electromagnetic interference, the operator shall work with the owner of the impacted communications system to resolve the problem. Additional warning information may also need to be conveyed to aircraft with onboard radar systems so that echoes from wind turbines can be quickly recognized.

Decommissioning

General

- Prior to the termination of the ROW authorization, a decommissioning plan shall be developed and approved by the BLM. The decommissioning plan shall include a site reclamation plan and monitoring program.
- All management plans, best management practices, and stipulations developed for the construction phase shall be applied to similar activities during the decommissioning phase.
- All turbines and ancillary structures shall be removed from the site.
- Topsoil from all decommissioning activities shall be salvaged and reapplied during final reclamation.
- All areas of disturbed soil shall be reclaimed using weed-free native shrubs, grasses, and forbs.
- The vegetation cover, composition, and diversity shall be restored to values commensurate with the ecological setting.

Solar Energy Development

The following design features were adopted from the Approved Resource Management Plan Amendments/Record of Decision for Solar Energy Development in 6 Southwestern States (BLM and DOE, 2012) to provide consistency. Applicable design features will be adopted as required elements of project-specific Plans of Development (PODs) and/or as right-of-way (ROW) authorization stipulations.

Lands and Realty

General

- Project developers shall consult with the BLM in the early phases of project planning to identify potential land use conflicts and constraints. Identification of potential land use conflicts shall include, but is not limited to:
    - In coordination with the BLM, developers shall consult existing BLM land use plans and local land use plans, as well as appropriate affected Tribes; Federal, State, and local agencies; and adjacent property owners.
    - Identifying legal access to Federal, State, and private lands surrounding the proposed solar facilities and the potential to create areas that are inaccessible to the public.

  - Considering the effects on the uses of public lands around boundaries of solar energy facilities.
  - Considering the potential effects on prime and unique farmland.
  - Evaluating land use impacts and constraints for the project and consider options to avoid, minimize, and/or mitigate adverse impacts.
  - Informing existing BLM ROW authorization holders within solar energy development areas, pursuant to Title 43, Part 2807.14 of the Code of Federal Regulations (43 CFR 2807.14), that an application that might affect their existing ROW has been filed and request their comments.
  - Identifying public land boundaries. Proposed solar energy developments within 0.25 mile of any project boundary will require issuance of a Chain of Survey Certificate in conformance with the Departmental standard. In some cases, Land Description Reviews, Certificates of Inspection and Possession, Boundary Assurance Certificates, resurveys, re-monumentation, and/or referencing of Public Land Survey System corners may be required before the start of any action.
- Methods to minimize land use conflicts and constraints may include, but are not limited to:
  - Informing project personnel of all laws and regulations that they may be subject to, such as state borders limitations on the removal of salable materials such as stone or wood from a project site for personal use, and use of vehicles off of the project site in limited access areas. This information should be incorporated into a Worker Education and Awareness Plan that is provided to all project personnel prior to entering the project worksite. The worker education and awareness plan shall be provided on a regular basis, covering multiple resources, to ensure the awareness of mitigation efforts during all phases of the project's life. Information in the worker education and awareness plan shall be reviewed and approved by the BLM prior to the issuance of a Notice to Proceed and shall incorporate adaptive management protocols for addressing changes over the life of the project, should they occur.

Site Characterization, Siting and Design, Construction

- Solar facilities shall be sited, designed, and constructed to avoid, minimize, and/or mitigate impacts on BLM managed lands. Methods to minimize impacts on BLM managed lands may include:
  - Identifying and protecting evidence of the Public Land Survey System and related Federal property boundaries prior to commencement of any ground-disturbing activity. This will be accomplished by contacting the BLM Cadastral Survey to coordinate data research, evidence examination and evaluation, and locating, referencing, or protecting monuments of the Public Land Survey System and related land boundary markers from destruction. In the event of obliteration or disturbance of the Federal boundary evidence, the responsible party shall immediately report the incident, in writing, to the BLM-authorized officer. The BLM Cadastral Survey will determine how the marker is to be restored. In rehabilitating or replacing the evidence the responsible party will be instructed to use the services of a Certified Federal Surveyor, whose procurement shall be per qualification-based selection, or to reimburse the BLM for costs. All surveying activities will conform to the Manual of Surveying Instructions and appropriate State laws and regulations. Local surveys will be reviewed by Cadastral Survey before being finalized or filed in the appropriate State or county office. The responsible party shall pay for all survey, investigation, penalty, and administrative costs.
  - Considering opportunities to consolidate access to and other supporting infrastructure for single projects and for cases where there is more than one project in close proximity to another in order to maximize the efficient use of public land and minimize impacts.

Special Designations and Lands Managed for Wilderness Characteristics

General

- Protection of existing values of specially designated areas and Lands with Wilderness Characteristics shall be evaluated during the environmental analysis for solar energy projects, and the results shall be incorporated into the project planning and design.
- Assessing potential impacts on specially designated areas and Lands with Wilderness Characteristics shall include, but is not limited to, the following:
  - Identifying specially designated areas and Lands with Wilderness Characteristics in proximity to the proposed projects. In coordination with the BLM, developers shall consult existing land use plans and updated inventories.

  - Identifying lands that are within the geographic scope of a proposed solar energy project that have not been recently inventoried for wilderness characteristics or any lands that have been identified in a citizen's wilderness proposal in order to determine whether they possess wilderness characteristics. Developers shall consider including the wilderness characteristics evaluation as part of the processing of a solar energy ROW application for those lands without a recent wilderness characteristics inventory. All work must be completed in accordance with current BLM policies and procedures.
- Methods to mitigate unavoidable impacts on special designations and Lands with Wilderness Characteristics may include, but are not limited to:
  - Acquiring wilderness inholdings from willing sellers.
  - Acquiring private lands from willing sellers adjacent to designated wilderness.
  - Acquiring private lands from willing sellers within designated wilderness or Wilderness Study Areas.
  - Acquiring other lands containing important wilderness or related values, such as opportunities for solitude or a primitive, unconfined (type of) recreation.
  - Restoring wilderness (e.g., modifying routes or other structures that detract from wilderness character).

Site Characterization, Siting and Design, Construction

- Solar facilities shall avoid, minimize, and/or mitigate impacts on the values of special designations and Lands with Wilderness Characteristics.

Rangeland Resources – Grazing

General

- Project developers shall consult with the BLM and coordinate with affected grazing permittees/lessees to discuss how a proposed project may affect grazing operations and to address possible alternatives to avoid and minimize impacts, as well as mitigation and compensation strategies.

Site Characterization, Siting and Design, Construction

- Roads shall be constructed, improved, and maintained to minimize their impact on grazing operations. Road design shall include fencing, cattle guards, and speed control and information signs where appropriate.

Wild Horses

General

- Project developers shall coordinate with the BLM and other stakeholders early in the project planning process to assess and consider options to avoid, minimize, and/or mitigate impacts on wild horses and their management areas. Assessing impacts on wild horses and their management areas shall include:
  - Identifying wild horses and their use areas within the herd area in proximity to the proposed projects.
  - Evaluating potential impacts on wild horses and their management areas as part of the environmental impact analysis for the project and considering options to avoid, minimize, and/or mitigate adverse impacts in coordination with the BLM.
- Methods to minimize impacts on wild horses and their management areas may include:
  - Installing fencing and access control.
  - Providing for movement corridors.
  - Delineating open range.
  - Requiring traffic management measures (e.g., vehicle speed limits).
  - Ensuring access to or replacement of water sources.
  - Incorporating key mitigation elements for wild horse in a worker education and awareness plan that is provided to all project personnel prior to entering the project work sites.

Site Characterization, Siting and Design, Construction

- Project access roads shall be sited, designed, constructed, fenced, and/or improved to minimize potential wild horse collisions. Fences, or other appropriate structures, should be constructed to exclude wild horses from solar energy project site facilities. Either water sources or access routes to water sources for horses should be excluded from the solar energy development area, or alternate water sources or routes should be provided.

Wildland Fire Ecology and Management

General

- Project developers shall coordinate with the BLM and other appropriate fire organizations early in the project planning process to determine fire risk and methods to minimize fire risk. Identifying fire risk shall include:
  - Minimize the potential for fire risk associated of the proposed project in coordination with the BLM and other appropriate fire organizations. Developers shall consult existing land use plans and fire management plans.
  - Evaluating fire risk as part of the environmental impact analysis for the project and considering options to avoid, minimize, and/or mitigate such risk in coordination with the BLM.
- General methods to minimize fire risk may include:
  - Develop and implement fire management measures that include providing worker training.
  - Incorporate key elements to mitigate the potential for fire into a worker education and awareness plan that is provided to all project personnel prior to entering the project worksite.
  - Incorporate inspection and monitoring measures, including adaptive management protocols, to minimize fire risk during construction, operations, and decommissioning of a solar energy development.

Site Characterization, Siting and Design, Construction

- Solar facilities shall minimize fire risk. Methods to minimize fire risk may include, but are not limited to, the following:
  - Siting and designing the solar facilities to ensure sufficient room for fire management within the ROW and its facilities to minimize the risk of fire moving outside the ROW and the risk of fire threatening the facility from outside.
  - Consulting fire management personnel to determine actions, both active and passive (e.g., vegetation manipulation), that may minimize the need for protective responses by the BLM and State and local fire organizations.
  - Developing and implementing measures to integrate vegetation management to minimize the potential to increase the frequency of wildland fires and prevent the establishment of non-native, invasive species on the solar energy facility and its transmission line and roads.

Transportation, Travel, and Recreation

General

- Project developers shall consult with the BLM in the early phases of project planning to identify public access and recreation use areas in and adjacent to a project site. Identifying public access and recreation in and adjacent to a project shall include, but is not limited to, the following:
  - Considering existing public access through or around proposed solar facilities that allows for access to and use of BLM managed public lands and non-BLM managed lands. Developers shall conduct this assessment in coordination with the BLM and consult existing land use plans, recreation management plans, etc.
  - Identifying legal access to Federal, State, and private lands surrounding the solar facilities to avoid creating areas that are inaccessible to the public.
- Methods to minimize access and recreation conflicts may include, but are not limited to, the following:
  - Considering replacement of acreage lost for identified recreation opportunities, such as off-highway vehicle use.
  - Considering, to the extent practicable, providing access through or around a solar energy facility to provide for adequate public access and/or recreation.

- Incorporating environmental inspection and monitoring measures into the POD and other applicable plans to monitor and respond to impacts on recreation during construction, operations, and decommissioning of a solar energy development, including adaptive management protocols.

Site Characterization, Siting and Design, Construction

- Solar facilities shall not be sited in areas designated as unique or important recreation resources (such as Special Recreation Management Areas), where it has been determined that a solar facility or other such development of the land would be in direct conflict with the objectives of the relevant management plan.

Aviation

General

- Project developers shall coordinate with the BLM, Department of Defense (DoD), and Federal Aviation Administration (FAA) early in the project planning process to identify and minimize impacts on airspace use. Identifying impacts on airspace use shall include, but is not limited to:
  - Consult with the FAA on proposed construction of any facility that is 100 feet (~ 61 m) or taller to evaluate potential safety hazards.
    Consult with the DoD to minimize and/or eliminate impacts on military operations, and encourage compatible development.

Soil Resources and Geologic Hazards

General

- Project developers shall coordinate with the BLM and other Federal, State, and local agencies early in the project planning process to assess soil erosion and geologic hazard concerns and to minimize potential impacts. Assessing soil erosion and geologic hazard concerns shall include, but is not limited to, the following:
  - Identifying soil erosion and geologic hazard concerns on-site and in proximity to the proposed projects. In coordination with the BLM, developers shall consult existing land use plans, updated inventories, soil surveys, etc.
  - Identifying local factors that can cause slope instability (e.g., groundwater conditions, precipitation, earthquake activity, slope angles, and the dip angles of geologic strata).
  - Consulting with Federal, State, and local agencies regarding road design on the basis of local meteorological conditions, soil moisture, and erosion potential.
  - Determining the potential safety and resource impacts associated with soil erosion.
  - Evaluating soil erosion and geologic hazard concerns as part of the environmental impact analysis for the project and considering options to avoid, minimize, and/or mitigate adverse impacts.

Site Characterization, Siting and Design, Construction

- Solar facilities shall be sited to minimize soil erosion and geologic hazard concerns. Methods to minimize soil erosion may include, but are not limited to:
  - Designing structures to meet the requirements of all applicable Federal, State, and local permits and building codes.
  - Minimizing ground-disturbing activities.
  - Preventing channel erosion from project runoff.
  - Controlling culvert outlets with appropriate structures (e.g., rock lining or apron) to reduce soil erosion and scouring.
  - Recontouring and revegetating project roads that are no longer needed in order to increase infiltration and reduce soil compaction.
  - Utilizing excavated materials for backfill.
  - Controlling project vehicle and equipment speeds to reduce dust erosion.
  - Controlling water runoff and directing it to settling or rapid infiltration basins.
  - Retaining sediment-laden waters from disturbed, active areas within the project through the use of barriers and sedimentation devices (e.g., berms, straw bales, sandbags, jute netting, or silt

fences). Removing sediment from barriers and sedimentation devices to restore sediment-control capacity.
  - Placing barriers and sedimentation devices around drainages and wetlands.
  - Siting project structures and facilities to avoid disturbance in areas with existing biological soil crusts.
  - Replanting project areas with native or non-native perennial vegetation at spaced intervals to break up areas of exposed soil and reduce soil loss through wind erosion.
  - Minimizing land disturbance (including crossings) in natural drainage systems and groundwater recharge zones (i.e., ephemeral washes and playas).
  - Locating and constructing drainage crossing structures so as not to decrease channel stability or increase water volume or velocity.
  - Providing adequate space (i.e., setbacks) between solar facilities and natural washes to preserve hydrologic function.
  - Considering the use of existing roads, disturbance areas, and borrow pits before creating new infrastructure.
  - Siting, designing, and constructing new roads consistent with the appropriate design standards and criteria, such as those described in BLM Manual 9113 and 43 CFR 8342.1. Roads should follow natural land contours, and hill cuts should be minimized in the project area.
  - Avoiding areas with unstable slopes and soils.
  - Avoiding excessive grades on roads, road embankments, ditches, and drainages during site preparation and construction.
  - Considering use of special construction techniques in areas of steep slopes, erodible soil, and drainage ways.
  - Considering construction in stages to limit the areas of exposed and unstabilized soils.
  - Reducing construction activity timeframes so that ground-disturbing activities take place over as short a timeframe as possible.
  - Lessening fugitive dust by using dust abatement on designated roads used by construction traffic.
  - Lessening fugitive dust emissions and site soils compaction by gravelling surfaces used for construction traffic and watering unvegetated surfaces.
  - Avoiding clearing and disturbing areas outside the construction zone.
  - Clearly identifying construction zone boundaries on the ground (e.g., through the use of construction fencing) to minimize conflict with resource.
  - Avoiding ground disturbance in areas with intact biological soil crusts.
  - Burying electrical lines from solar collectors along existing features (e.g., roads or other paths of disturbance) to minimize the overall area of surface disturbance.
  - Obtaining borrow materials from authorized and permitted sites.
  - Conducting construction grading in compliance with industry practice (e.g., the American Society for Testing and Materials international standard methods) and other requirements (e.g., BLM and/or local grading and construction permits).
  - Using temporary stabilization devices (i.e., erosion matting blankets or soil stabilizing agents) for areas that are not actively under construction.
  - Salvaging topsoil from all excavation and construction and reapplying it to disturbed areas upon completion of construction.
  - Restoring native plant communities as quickly as possible in disturbed areas through revegetation or by seeding and transplanting (using weed-free native grasses, forbs, and shrubs).
  - Minimizing soil-disturbing activities on wet soils.
  - Incorporating environmental inspection and monitoring measures into the POD and other applicable plans to monitor and respond to impacts on soil resources during construction, operations, and decommissioning of a solar energy development, including adaptive management protocols.
- Methods to minimize geologic hazard concerns may include, but are not limited to, the following:
  - Building project structures in accordance with the design-based recommendations in the project-specific geotechnical investigation report.
  - Considering special siting, design, and engineering strategies in areas that have potential for flooding or debris flow.

Operations and Maintenance

- Compliance with the stipulations for soil resources and geologic hazards shall be monitored by the project developer. Consultation with the BLM shall be maintained through the operations and maintenance of the project, employing an adaptive management strategy and modifications, as necessary and approved by the BLM. Methods to minimize soil erosion and geologic hazard operations and maintenance of the project shall include, but are not limited to, the following:
  - Applying best management practices (BMPs) developed for the construction phase to similar activities during the operations phase to minimize soil loss.
  - Performing routine site inspections to assess the effectiveness of maintenance requirements for erosion and sediment control systems.
  - Maintaining permanent barriers and sedimentation devices to ensure effective control.
  - Regularly maintaining catch basins, roadway ditches, and culverts.
  - Identifying soil erosion and geologic hazard requirements within the POD and other applicable plans.

Reclamation and Decommissioning

- All BMPs for soil erosion and geologic hazards developed for the construction phase shall be applied to similar activities undertaken during the decommissioning and reclamation phase.
- To the extent possible, the original grade and drainage pattern shall be re-established.
- Native plant communities in disturbed areas shall be restored by revegetation or by seeding and transplanting (using weed-free native grasses, forbs, and shrubs), on the basis of recommendations by the BLM.

Mineral Resources

General

- Project developers shall consult with the BLM in the early phases of project planning to identify potential impacts on mineral development activities and ways to minimize potential adverse impacts. Assessing impacts on mineral resources shall include, but is not limited to, the following:
  - Identifying active mining claims or mineral development activities and potential for mineral development in proximity to a proposed project. In coordination with the BLM, developers shall consult existing land use plans and updated inventories.
- Solar energy development ROWs shall contain the stipulation that the BLM retains the right to issue oil and gas or geothermal leases with a stipulation of no surface occupancy within the ROW area.

Site Characterization, Siting and Design, Construction

- Solar energy development projects shall be located to minimize conflicts with valid existing mineral rights and/or ongoing mineral development.

Water Resources

General

- The following activities will be undertaken to minimize impacts on water resources. They are to be done in coordination with the appropriate Federal, State, and local regulating agencies.
- The project developer shall control project site drainage, erosion, and sedimentation related to stormwater runoff. The project developer shall identify site surface water runoff patterns and develop measures that prevent adverse impacts associated with project related soil deposition and erosion throughout and downslope of the project site and project related construction areas. This shall be implemented within a Stormwater Pollution Prevention Plan (SWPPP) and incorporated into the POD, as appropriate. Assessing stormwater runoff concerns shall include, but is not limited to, the following:
  - Conducting hydrologic analysis and modeling to define the 100-year, 24-hour rainfall for the project area and calculating projected runoff from this storm at the site.
  - Demonstrating the project will not increase off-site flooding potential, and including provisions for stormwater and sediment retention on the project site.

  - Demonstrating compliance with construction stormwater permitting through the Environmental Protection Agency (EPA) or State-run National Pollutant Discharge Elimination System program (whichever applies within the State).
  - Demonstrating compliance with the EPA requirement that any development larger than 20 acres (0.08 km^2) and begun after August 2011 must monitor construction discharges for turbidity concentrations.
- Methods to minimize stormwater runoff may include, but are not limited to, the following:
  - Managing runoff from parking lots, roofs, or other impervious surfaces.
  - Creating or improving landscaping used for stormwater treatment to capture runoff.
  - Considering reduction of impervious surfaces through the use of permeable pavement or other pervious surfaces.
  - Maintaining natural drainages and pre-project hydrographs for the project ROW to the extent practicable.
  - Maintaining pre-development flood hydrograph for all storms up to and including the 100-year rainfall event.
  - Incorporating environmental inspection and monitoring measures into the POD and other applicable plans to monitor and respond to impacts from stormwater runoff during construction, operations, and decommissioning of a solar energy development, including adaptive management protocols.
- Project developers shall conduct hydrologic study (or studies) that demonstrate a clear understanding of the local surface water and groundwater hydrology. Assessing surface water and groundwater hydrology may include, but is not limited to, the following:
  - Determining the relationship of the project site hydrologic basin to the basins in the region.
  - Identifying surface water bodies within the watershed or individual projects (including rivers, streams, ephemeral washes/drainages, reservoirs, wetlands, playas, and floodplains) and identifying the 100-year floodplain of any surface water feature on the site.
  - Identifying applicable groundwater aquifers.
  - Quantifying physical characteristics of surface water features, such as stream flow rates, stream cross sections, channel routings, seasonal flow rates.
  - Quantifying physical characteristics of the groundwater aquifer, such as physical dimensions of the aquifer, sediment characteristics, confined/unconfined conditions, hydraulic conductivity, and transmissivity distribution of the aquifer.
  - Quantifying the regional climate, including seasonal and long-term information on temperatures, precipitation, evaporation, and evapotranspiration.
  - Quantifying the sustainable yield of surface waters and groundwater available to the project.
  - Consulting with the US Army Corps of Engineers regarding the siting of solar energy generating facilities in relation to hydrological features that have the potential to be subject to USACE jurisdiction.
- Project developers shall coordinate with the BLM and other Federal, State, and local agencies early in the planning process in order to identify water use for the solar energy project, and to secure a reliable and legally available water supply to meet project water needs. Assessing water use shall include, but is not limited to, the following:
  - Quantifying water use requirements for project construction, operations, and decommissioning.
  - Meeting potable water supply standards of Federal, State, and local water quality authorities (e.g., Sections 303 and 304 of the Clean Water Act).
  - Identifying wastewater treatment measures and new or expanded facilities, if any, to be included as part of the facilities' National Pollutant Discharge Elimination System permit.
- Methods for minimizing water use may include, but are not limited to, the following:
  - Considering water conservation measures related to solar energy technology water needs to reduce project water requirements (i.e., use dry cooling, use recycled or impaired water).
  - Incorporating environmental inspection and monitoring measures into the POD and other applicable plans to monitor water use during construction, operations, and decommissioning of the solar energy development, including adaptive management protocols.
- Project developers shall avoid and/or minimize impacts on existing surface water features, including streams, reservoirs wetlands, floodplains, intermittent/ephemeral streams, and playas (from the development in accordance with the following:

- The Clean Water Act, including Sections 401, 402, and 404, addressing licensing and permitting issues;
- Executive Orders (E.O.s) 11988 and 11990 of May 24, 1977, regarding floodplain and wetland management: E.O. 11988, "Floodplain Management" (*Federal Register*, Volume 42, page 26951 [42 FR 26951]), and E.O. 11990, "Protection of Wetlands" (42 FR 26961);
- EPA stormwater management guidelines and applicable State and local guidelines;
- Consultation with the USACE, in accordance with the 1987 wetlands delineation manual and appropriate regional supplement; avoidance, minimization and compensation proposals;
- USACE permit, Nationwide verification, or other approved jurisdiction. This includes identification of a Least Environmentally Damaging Practicable Alternative within the environmental analysis. The USACE permit, Nationwide verification, or approved jurisdiction letter shall be provided to the BLM prior to a decision;
- National Wild and Scenic Rivers System (Public Law 90-542; 16 *United States Code* [U.S.C.] 1271 et seq.); and
- Required Clean Water Act Section 303(d) identification of impaired surface water bodies.

Site Characterization, Siting and Design, Construction

- Project developers shall minimize impacts on groundwater and surface water resources in accordance with the laws and policies above. Methods to minimize impacts on surface water and groundwater resources may include:
  - Reclaiming disturbed soils as quickly as possible.
  - Preventing the release of project waste materials into stormwater discharges.
  - Avoiding impacts on sole source aquifers according to EPA guidelines.
  - Developing measures to prevent potential groundwater and surface water contamination and incorporating them into the Spill Prevention and Emergency Response Plan and POD, as appropriate.
  - Minimizing land disturbance in ephemeral washes and playas. Stormwater facilities shall be designed to route flow through or around the facility using existing washes when feasible, instead of concrete-lined channels.
  - Designing culverts and water conveyances to comply with BLM, State, and local standards, or to accommodate the runoff of a 100-year storm, whichever is larger.
  - Designing stormwater retention and/or infiltration and treatment systems for storm events up to and including the 100-year storm event.
  - Utilizing geotextile matting to stabilize disturbed channels and stream banks.
  - Diverting worksite runoff from entering disturbed streams using earth dikes, swales, and lined ditches.
  - Placing sediment control devices so that sediment-laden water can pond, thus allowing sediment to settle out.
  - Considering placement of check dams (i.e., small barriers constructed of rock, gravel bags, sandbags, fiber rolls, or reusable products) across a swale or drainage ditch to reduce the velocity of flowing water.
  - Considering special construction techniques in areas of erodible soil, alluvial fans, and stream channel/wash crossings.
  - Backfilling foundations and trenches with originally excavated material.
  - Disposing of excess excavated material according to Federal and State laws.
  - Maintaining drilling fluids or cuttings in a manner so as not to contact aquatic habitats. Temporary impoundments for storing drilling fluids and cuttings shall be lined to minimize the infiltration of runoff into groundwater or surface water.
  - Avoiding washing equipment or vehicles in streams and wetlands.
  - Constructing entry and exit pits in work areas to trap sediments from vehicles so they do not enter streams at stream crossings.
  - Providing for periodic removal of wastewater generated in association with sanitary facilities by a licensed hauler.
  - Avoiding the creation of hydrologic conduits between two aquifers.

  - Using herbicides and pesticides within the framework of BLM and USDI policies and standard operating procedures, to include the use of only EPA-registered pesticides/herbicides that also comply with State and local regulations.
  - Transporting, storing, managing, and disposing of hazardous materials and vehicle/equipment fuels in accordance with accepted BMPs and in compliance with all applicable regulations, and where applicable, the SWPPP.

Operations and Maintenance

- Compliance with the terms and conditions for water resource mitigation shall be monitored by the project developer. The developer shall consult with the BLM through operations and maintenance of the project, employing an adaptive management strategy and modifications, as necessary and approved by the BLM. Maintaining the water resources during operations and maintenance of the project shall include:
  - Monitoring water quantity and quality in areas adjacent to or downstream from development areas through the life of the project to ensure that water flows and water quality are protected.
  - Treating of sanitary and industrial wastewater either on-site or off-site to comply with Federal, State, and local regulations. Any discharges to surface waters would require National Pollutant Discharge Elimination System permitting. Any storage or treatment of wastewater on-site must use proper lining of holding ponds and tanks to prevent leaks.
  - Implementing monitoring using adaptive management strategies to ensure that long-term water use during operations does not substantially and disproportionately contribute to the long-term decline of groundwater levels or surface water flows and volumes, considering any mitigation measures that have been taken.

Reclamation and Decommissioning

- Reclamation of the project site shall begin immediately after decommissioning to reduce the likelihood of water resource impacts from project activities. Developers shall coordinate with the BLM in advance of interim/final reclamation to have the BLM or other designated resource specialists on-site during reclamation to ensure water resource requirements and BMPs are implemented. Methods for minimizing water resource impacts associated with reclamation and decommissioning activities may include:
  - Restoring the project area to predevelopment water conditions or to the extent acceptable to the BLM.
  - Considering contouring of soil borrow areas, cut-and-fill slopes, berms, water bars, and other disturbed areas to approximate naturally occurring slopes.
  - Salvaging and reapplying topsoil from decommissioning activities during final reclamation.
  - Continuing groundwater and surface water monitoring activities for a limited period of time, if appropriate given the specific situation.

Ecological Resources

Many BMPs are similar for different types of ecological resources (plant communities and habitats, wildlife, aquatic resources, and special status species). BMPs for avoiding or minimizing impacts on ecological resources in general and during the various project phases are presented in the following sections.

General

- Project developers shall consult with the BLM and other Federal, State, and local agencies in the early phases of project planning to help ensure compliance with Federal regulations that address the protection of fish, wildlife, and plant resources, with appropriate Federal, State, and local agencies. Assessing compliance with pertinent regulations for ecological resources shall include, but is not limited to, the following:
  - Developing, in coordination with the BLM and US Fish and Wildlife Service (FWS), strategies for complying with regulatory requirements of the Bald and Golden Eagle Act.

  - Developing in coordination with appropriate Federal and State agencies (e.g., BLM, FWS, and State resource management agencies) measures to protect birds (including migratory species protected under the Migratory Bird Treaty Act).
  - Contacting appropriate agencies (e.g., BLM, FWS, and State resource management agencies) early in the project planning process to identify potentially sensitive ecological resources such as aquatic habitats, wetland habitats, unique biological communities, crucial wildlife habitats, and special status species locations and habitats located within or in the vicinity of the solar energy facility and associated access roads and ROWs.
  - Consulting with the USACE regarding the siting of solar energy generating facilities and energy transmission infrastructure in relation to hydrological features that have the potential to be subject to USACE jurisdiction.
  - Considering restrictions on timing and duration of activities developed in coordination with the BLM, FWS, and other appropriate agencies to minimize impacts from project activities on nesting birds (especially passerines and listed species).
  - Considering recommendations contained in the Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocol and Other Recommendations in Support of Golden Eagle Management and Permit Issuance (Pagel et al., 2010).
  - Adhering to Instruction Memorandum 2010-156, the Bald and Golden Eagle Protection Act—Golden Eagle National Environmental Policy Act and Avian Protection Plan Guidance for Renewable Energy, until programmatic permits from the FWS are available. The analysis of potential impacts on and mitigation for, golden eagles shall be made in coordination with the FWS.
  - Avoiding take of golden eagles and other raptors. Mitigation regarding the golden eagle shall be developed in consultation with the FWS and appropriate State natural resource agencies. A permit may be required under the Bald and Golden Eagle Protection Act.
- Methods to minimize impacts to ecological resources may include:
  - Including submittal of a jurisdictional delineation for consultation with the USACE, in accordance with the 1987 wetlands delineation manual and appropriate regional supplement; avoidance, minimization and compensation proposals.
  - Developing measures to ensure protection of raptors in coordination with appropriate Federal and State agencies (e.g., BLM, FWS, and State resource management agencies).
  - Developing measures to ensure protection of bats in coordination with appropriate Federal and State agencies (e.g., BLM, FWS, and State resource agencies).
  - Developing measures to ensure mitigation and monitoring of impacts on special status species in coordination with appropriate Federal and State agencies (e.g., BLM, FWS, and State resource management agencies).
  - Consulting with the FWS upon discovery of Federally listed threatened and endangered species during any phase of the project. All applicable terms and conditions and conservation measures listed in the programmatic Biological Opinion, issued by the FWS, shall be followed.
  - Informing project personnel that only qualified biologists are permitted to handle listed species according to specialized protocols approved by the FWS.
  - Considering plants, wildlife, and their habitats in the facility's Dust Abatement Plan.
  - Limiting herbicide use to non-persistent, immobile substances. Only herbicides with low toxicity to wildlife and non-target native plants species shall be used, as determined in consultation with the FWS. Section 5.10.2.1.5 of the Draft Solar Energy Development Programmatic Environmental Impact Statement (BLM and DOE, 2010) discusses the potential impacts of herbicides on wildlife. All herbicides shall be applied in a manner consistent with their label requirements and in accordance with guidance provided in the Draft Programatic Environmental Impact Statement for Solar Energy Development in Six South Western States, (BLM and DOE, 2010) and the Programmatic Environmental Impact Statement Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States (BLM, 2007b) using herbicides. Prior to application of herbicide treatments, a qualified person, such as a biologist, shall conduct surveys of bird nests and of special status species to identify the special measures or BMPs necessary to avoid and minimize impacts on migratory birds and special status species.
  - Developing a SWPPP for each project that avoids, to the extent practicable, changes in surface water or groundwater quality (e.g., chemical contamination, increased salinity, increased

temperature, decreased dissolved oxygen, and increased sediment loads) or flow that result in the alteration of terrestrial plant communities or communities in wetlands, springs, seeps, intermittent streams, perennial streams, and riparian areas (including the alteration of cover and community structure, species composition, and diversity) off the project site.
  - Utilizing block or check valves on both sides of the waterway or habitat to minimize product release from pipelines that transport hazardous liquids (e.g., oils) that pass through aquatic or other habitats. Such pipelines shall be constructed of double-walled pipe at river crossings.
  - Considering compensatory mitigation and monitoring of significant direct, indirect, and cumulative impacts on, and loss of habitat for, special status plant and animal species.
  - Incorporating key elements on the identification and protection of ecological resources (especially for special status species), including knowledge of required design features, in instructions to all personnel. Incorporate the knowledge into a worker education and awareness plan that is provided to all project personnel prior to entering the project worksite.
  - Planning for vegetation management that is consistent with applicable regulations and agency policies for the control of noxious weeds and invasive plant species.
  - Developing measures for fire management and protection that minimize the potential for a human- or facility-caused fire to affect ecological resources and that respond to natural fire situations.
  - Developing measures to investigate the possibility of revegetating parts of the solar array area.
  - Designating a qualified biologist who will be responsible for overseeing compliance with all design features related to the protection of ecological resources throughout all project phases, particularly in areas requiring avoidance or containing sensitive biological resources. This person shall be reviewed and approved by the FWS and the BLM for designation as a qualified biologist.
  - Conducting pre-construction surveys, in coordination with BLM, FWS, and State agency statutes, programs, and policies.
  - Conducting seasonally appropriate inspections by a qualified biologist or team of biologists to ensure that important or sensitive species or habitats are not present in or near project areas. Attendees at the inspections may include appropriate Federal agency representatives, State natural resource agencies, and construction contractors, as appropriate. Habitats or locations to be avoided shall be clearly marked.

<u>Site Characterization, Siting and Design, Construction</u>

- Solar facilities shall be sited to avoid, minimize, or mitigate impacts on ecological resources. Methods to mitigate impacts on ecological resources include:
  - Siting and designing projects to avoid on important, sensitive, or unique habitats in the project vicinity, including, but not limited to waters of the United States, wetlands (both jurisdictional and non-jurisdictional), springs, seeps, streams (ephemeral, intermittent, and perennial), 100-year floodplains, ponds and other aquatic habitats, riparian habitat, crucial wildlife habitats, and habitats supporting special status species populations (including designated and proposed critical habitat).
  - Reducing the attractiveness of solar energy development and infrastructure areas to opportunistic predators such as desert kit fox, coyotes, and common ravens. Considering opportunities to upgrade or maintain crossings along existing facilities (e.g., roads) such that listed species occupancy and connectivity are not compromised.
  - Avoiding siting projects in designated critical habitat, Areas of Critical Environmental Concern, or other specially designated areas that are identified as necessary for special status species and habitat conservation.
  - Consider siting projects on previously disturbed lands in close proximity to energy load centers to avoid and minimize impacts on remote, undisturbed lands.
  - Designing project facilities to reduce the number of stream (e.g., access roads and utilities could share common ROWs, where feasible), and locating facilities in pre-disturbed areas to reduce potential for habitat fragmentation.
  - Preventing establishment and spread of invasive plant species and noxious weeds within the ROW. Developers should consider siting project facilities and activities, including associated roads and utility corridors, out of occupied habitats of special status animal species.

- Coordinate with Federal and State agencies to translocate special status plants including long-term monitoring of populations at receptor sites to evaluate success. Considering conducting interim and final restoration activities as soon as possible after development activities are completed in order to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.
- Implementing revegetation, soil stabilization, and erosion reduction measures to ensure temporary use areas are restored.
- Conducting a nesting bird survey or other necessary survey for nesting birds. If active nests are detected, the nest area shall be flagged, and no activity shall take place near the nest (at a distance determined by the BLM in coordination with the FWS and/or appropriate State agencies), or until the appropriate agencies agree that construction can proceed with the incorporation of agreed-upon monitoring measures.
- To the extent practicable, avoiding entry into aquatic habitats, such as streams and springs, during site characterization activities until surveys by qualified biologists have evaluated the potential for unique flora and fauna to be present.
- Locating and designing individual project facilities to minimize disruption of animal movement patterns and connectivity of habitats.
- Avoiding surface water or groundwater withdrawals that adversely affect sensitive habitats (e.g., aquatic, wetland, playa, and riparian habitats) and habitats occupied by special status species.
- Designing water intake facilities to minimize the potential for aquatic organisms from surface waters to be entrained in cooling water systems.
- Demonstrating, through hydrologic modeling, that the withdrawals required for the project are not going to affect groundwater discharges that support special status species or their habitats.
- Considering the use of fencing and netting for evaporation ponds to prevent their use by wildlife.
- To the extent practicable, locating meteorological towers, solar sensors, soil borings, wells, and travel routes to avoid sensitive habitats or areas where wildlife (e.g., sage-grouse) is known to be sensitive to human activities.
- To the extent practicable, avoiding siting solar power facilities near open water or other areas that are known to attract large numbers of birds.
- To the extent practicable, placing tall structures, such as meteorological towers and solar power towers, to avoid known flight paths of birds and bats.
- Implementing current guidelines and methodologies in the design of proposed transmission facilities in order to minimize the potential for raptors and other birds to collide or be electrocuted by them.
- Placing mechanisms to visually warn birds (permanent markers or bird flight diverters) on transmission lines at regular intervals to prevent birds from colliding with the lines.
- Designing transmission line support structures and other facility structures to discourage use by raptors for perching or nesting (e.g., by using monopoles rather than lattice support structures or by use of anti-perching devices).
- Considering spanning important or sensitive habitats with transmission line conductors within the limits of standard structure design.
- Using low-water crossings (fords) during the driest time of the year. Developers should consider using rocked approaches to fords and returning the crossing to pre-existing stream channel conditions after the need for a low-water ford has passed.
- Employing noise reduction devices (e.g., mufflers) to minimize the impacts on wildlife and special status species populations.
- Explosives shall be used only within specified times and at specified distances from sensitive wildlife or surface waters as established by the BLM or other Federal and State agencies.
- Minimizing the number of areas where wildlife could hide or be trapped (e.g., open sheds, pits, uncovered basins, and laydown areas). Trapping of special status species wildlife is prohibited unless the animal is removed from the path of harmful activity. Trapped animals shall be released nearby in appropriate habitat.
- Implementing measures for proper trash removal and storage, such as using secured containers and periodic emptying, on the project site to reduce attractive opportunistic species, such as common ravens, coyotes, and feral cats and dogs.

- Constructing, improving, and maintaining access roads to minimize potential wildlife/vehicle collisions and facilitate wildlife movement through the project area.
- Limiting project vehicle speeds and using shuttle vans and carpooling in areas occupied by special status animal species. Traffic shall yield to wildlife, allowing safe road crossing.
- Utilizing existing access roads, utility corridors, and other infrastructure to the maximum extent feasible.
- Locating staging and parking areas within the site of the utility scale solar energy facility to minimize habitat disturbance.
- Considering rolled and compacted on-site construction access routes to allow trucks and equipment to access construction locations.
- Minimizing vehicle use off of access roads and foot traffic through undisturbed areas.
- Constructing fences (as practicable) to exclude livestock and wildlife from project facilities.
- Prohibiting project personnel from bringing firearms and pets to project sites.
- Placing food refuse and other garbage in closed containers so it is not available to scavengers.
- Reducing the collection, harassment, or disturbance of plants, wildlife, and their habitats (particularly special status species) through employee and contractor education about applicable Federal and State laws.
- Advising personnel to minimize stopping and exiting their vehicles in the winter ranges of large game while there is snow on the ground.
- Coordinating with BLM and appropriate project personnel to handle unreasonable traffic delays caused by wildlife in roads. Utilizing appropriate personnel to move live, injured, or dead wildlife off roads, ROWs, or the project site.
- Reporting any vehicle-wildlife collisions. Observations of potential wildlife problems, including wildlife mortality, shall be immediately reported to the BLM or other appropriate agency authorized officer.
- Considering road closures or other travel modifications (e.g., lower speed limits, no foot travel) during crucial periods (e.g., winter conditions, calving/fawning seasons, raptor nesting).
- Conducting pre-construction surveys by qualified personnel, such as a qualified biologist, in areas with potential to adversely affect special status species.
- Considering the number of qualified biological monitors (as determined by the Federal authorizing agency and FWS) to be on-site during initial site preparation and during the construction period to monitor, capture, and relocate animals that could be harmed and are unable to leave the site on their own.
- Relocating wildlife found in harm's way from the area of the activity. Qualified personnel shall be required to relocate some animals such as rattlesnakes.
- Establishing a controlled inspection and cleaning area to visually inspect construction equipment arriving at the project area and to remove and collect seeds that may be adhering to tires and other equipment surfaces.
- To the extent practicable, avoiding placement of transmission towers within aquatic and wetland habitats, or other sensitive habitats such as riparian habitats. If towers must be placed within these habitats, they shall be designed and installed to not impede flows or fish passage.
- Designing necessary stream crossings to provide in-stream conditions that allow for and maintain uninterrupted movement and safe passage of fish during all project periods.
- Considering cutting trees in stream buffers that are able to grow into a transmission line conductor clearance zone within three to four years.
- Considering the use of helicopters where access roads do not exist or where access roads could not be constructed without significantly impacting habitats.

Operations and Maintenance

- The developer shall manage vegetation utilizing the principles of integrated pest management, including biological controls to prevent the spread of invasive species, per the Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States, (BLM, 2007b) and the National Invasive Species Management Plan (National Invasive Species Council, 2008). Consultation with the BLM shall be maintained through operations and maintenance of the project, employing an adaptive management strategy and modifications, as necessary and approved by the BLM. Methods to

manage vegetation, including controlling for noxious weeds and invasive plant species, during operations and maintenance of the project may include, but are not limited to, the following:
  - Using certified weed-free seed and mulching.
  - Cleaning vehicles to avoid introducing noxious weeds and invasive plants.
  - Educating project personnel on noxious weed identification, the manner in which weeds spread, and methods for treating infestations.
  - Considering periodic monitoring, reporting, and immediate eradication of noxious weed or invasive plants occurring within the ROW.
  - Limiting vegetation maintenance and performing maintenance mechanically rather than with herbicides.
  - Considering retaining short (i.e., less than 7-in. (18-cm) tall) native species during maintenance and operation activities.
  - Reducing risk of non-native, invasive and nuisance species introductions. Developers should decontaminate equipment used in surface water, especially equipment used to convey water (i.e., pumps).
  - Monitoring for and eradicating non-native, invasive plants.
  - Reestablishing vegetation within temporarily disturbed areas immediately following the completion of construction activities.
  - Focusing revegetation efforts on the establishment of native plant communities similar to those present in the vicinity of the project site. Considering dominant native species within the plant communities that exist in adjacent areas and have similar soil conditions for revegetation.
- The developer shall, in consultation with the BLM and appropriate Federal, State, and local agencies, manage projects so as to minimize impacts on ecological resources during operations and maintenance of the project, employing an adaptive management strategy and modifications, as necessary and approved by the BLM. Methods to minimize impacts on ecological resources during operations and maintenance of the project shall include, but are not limited to, the following:
  - Monitoring for increase in predation of special status species (e.g., greater sage-grouse) from ravens and other species that are attracted to developed areas and use tall structures opportunistically to spot vulnerable prey.
  - Turning off all unnecessary lighting at night to limit attracting wildlife, particularly migratory birds.
  - Monitoring for and reporting bird mortality species (e.g., raptors) that are associated with power lines to the BLM and the FWS.
  - Monitoring for the effects of groundwater withdrawals on plant communities.
  - Monitoring unavoidable impacts on wetlands and waters of the United States.
  - Removing raptor nests only if the birds are not actively using the nest.
  - Considering relocating nests to nesting platforms. Report on relocated or destroyed nests to the appropriate Federal and/or State agencies.
  - Coordinating with the FWS and BLM project personnel in the event that a raptor nest is located on a transmission line structure.
  - Remove raven nests when inactive (i.e., no eggs or young).
  - Minimizing removal of deadfall or overhanging vegetation in streams for crossings.
  - Installing fish screens on cooling water intakes to limit the potential for impingement impacts on organisms in surface water sources used for cooling water.
  - Maintaining areas left in a natural condition during construction (e.g., wildlife crossings) in as natural a condition as possible within safety and operational constraints.
  - Avoiding use of guy wires to minimize impacts on birds and bats. If guy wires are necessary, permanent markers (e.g., bird flight diverters) shall be used to increase their visibility.
  - Maintaining native vegetation cover and soils and minimizing grading.
  - Instructing personnel to avoid harassment and disturbance of local plants and wildlife.
  - Informing personnel of the potential for wildlife interactions around facility structures.

Reclamation and Decommissioning

- Reclamation of the project site shall begin immediately after decommissioning to reduce the likelihood of resource impacts in disturbed areas as quickly as possible. Addressing resource impacts during reclamation and decommissioning may include, but is not limited to, the following:

- Applying design features developed for the construction phase to similar activities during the decommissioning and reclamation phase.
- Developing and implementing a Decommissioning and Site Reclamation Plan specific to the project, approved by the BLM in consultation with appropriate agencies, that incorporates adaptive management strategies.
- Using weed-free seed mixes of, grasses, forbs, and native shrubs of local sources where available.
- Developing and implementing monitoring measures to ensure successful reclamation.
- Lightly raking and/or ripping and reseeding with seeds from low stature plant species collected from the immediate vicinity in disturbed areas.
- Reclaiming access roads when they are no longer needed, considering seasonal restrictions.
- Filling or grading holes and ruts created by the removal of structures and access roads.
- Considering maximizing area reclaimed during solar energy operations to minimize habitat loss and fragmentation.
- Maintaining a clean and orderly worksite during and after decommissioning to ensure land is clear of debris.
- Returning land surfaces to pre-development contours immediately following decommissioning.
- Expediting the reestablishment of vegetation for site stabilization.
- Continuing vegetation reestablishment efforts until all success criteria have been met.
- Focusing revegetation on the establishment of native plant communities similar to those present in the vicinity of the project site. Considering dominant native species within the plant communities that exist in adjacent areas and have similar soil conditions for revegetation.
- Leaving the facility fencing in place for several years, or replacing it with new exclusion fencing, to assist reclamation (e.g., the fence could preclude large mammals and vehicles from disturbing revegetation efforts). Shorter times for maintaining fencing may be appropriate in cases where the likelihood of disturbance by cattle and wildlife is low.

Air Quality and Climate

General

- Project developers shall consult with the BLM in the early phases of project planning to help determine the potential conformance to air quality and other potential constraints. Assessing conformance to air quality and other related constraints may include the following:
  - Identify air quality and other related constraints associated with the project site. In coordination with BLM, the appropriate State and local air regulatory authorities shall be consulted to identify air quality and related constraints and requirements.
  - Minimize the PM_{10} and $PM_{2.5}$ particulate matter from the solar energy project and its facilities.

Site Characterization, Siting and Design, Construction

- Solar facilities shall be sited to minimize impacts on air quality. Methods to minimize air quality impacts shall include:
  - Use equipment that meets emission standards specified in the State code of regulations and meets the applicable EPA Tier 3 (motor vehicle emission and fuel) and Tier 4 (non-road diesel engines) emissions requirements.
  - The Dust Abatement Plan for the solar facilities may use multiple methods for dust suppressant (i.e., water, paving, gravel, and/or regulation-compliant palliatives).
- Other methods to minimize air quality impacts and related constraints may include:
  - Surfacing access roads with aggregate that is hard enough that vehicles cannot crush it.
  - Manage unpaved roads, disturbed areas (e.g., areas of scraping, excavation, backfilling, grading, and compacting), and loose materials generated during project activities as frequently as necessary to effectively minimize fugitive dust generation.
  - Use machinery that has air-emission-control devices as required by Federal, State, and local regulations or ordinances.
  - Limit travel to stabilized roads.
  - Consider paving the main access road to the main power block and the main maintenance building.

- Post and enforce speed limits (e.g., 10 mph [16 km/h]) within the construction site to minimize airborne fugitive dust.
- Cover vehicles that transport loose materials as they travel on public roads, using dust suppressants on truck loads, and keeping loads below the freeboard of the truck bed.
- Install wind fences around disturbed areas that could affect the area beyond the site boundaries (e.g., nearby residences).
- Suspend soil disturbance activities and travel on unpaved roads during periods of high winds. Site-specific wind speed thresholds shall be determined on the basis of soil properties determined during site characterization.
- Plant compatible native vegetative to limit dust generation from stockpiles that will be inactive for a relatively long period.
- To the extent practicable, avoid chemical dust suppressants that emit volatile organic compounds within or near ozone non-attainment areas.
- Use of ultra-low sulfur diesel with a sulfur content of 15 parts per million or less for project vehicles.
- Limit idling time of equipment to no more than five minutes, unless idling must be maintained for proper operation (e.g., drilling, hoisting, and trenching).
- Minimize use of dust palliatives in areas of close proximity to sensitive soil and streams.
- Access transmission lines from public roads and designated routes to minimize fugitive dust emissions.
- Minimize on-site vehicle use and require routine preventive maintenance, including tune-ups to meet the manufacturer's specifications, to ensure efficient combustion and minimal emissions.
- Encourage use of newer and cleaner equipment that meets more stringent emission controls.
- Limit access to the construction site and staging areas to authorized vehicles only through the designated treated roads.
- Schedule construction to limit the areas with exposed soil at any time.
- Inspect and clean the tires of all construction related vehicles to ensure they are free of dirt before they enter paved public roadways.
- Clean up visible track-out or runoff dirt on public roadways resulting from the construction site (e.g., street vacuum/ sweeping).
- Salvage topsoil from all excavations and construction activities during reclamation or interim reclamation and reapply and seed topsoil at construction areas not needed for facility operation as soon as activities in that area have ceased.
- Consider atmospheric conditions when planning construction activities to minimize dust.
- To the extent practicable, avoid ground disturbance from construction-related activities in areas with intact biological soil crusts and desert pavement. Developers should salvage soil crusts for restoration, on the basis of recommendations by the BLM once construction has been completed.
- Incorporate environmental inspection and monitoring measures into the Plan of Development and other relevant plans to monitor and respond to air quality during construction, operations, and decommissioning of a solar energy development, including adaptive management protocols.

Operations and Maintenance

- Compliance with the terms and conditions for air quality shall be monitored by the project developer. Consultation with BLM shall be maintained through operations and maintenance of the project, employing an adaptive management strategy and modifications, as necessary and approved by the BLM. Methods for maintaining compliance with the terms and conditions for air quality during operations and maintenance may include:
  - Monitoring and treating areas that have been graded, scraped, bladed, compacted, or denuded of vegetation ahead of actual construction/assembly.
  - Reapply palliatives or water as necessary to effectively manage fugitive dust.
  - Use dust abatement on the portions of facilities maintained free of vegetation during operations to limit fugitive dust from bare surfaces and unpaved access roads.
  - Combustion sources would comply with State emission standards.

Reclamation and Decommissioning

- Reclamation of the site shall incorporate the BMPs listed above for construction to reduce air quality impacts associated decommissioning.

Visual Resource Management

General

- Project developers shall consult with the BLM in the early phases of project planning to help determine the proposed project's potential conformance to Visual Resource Management (VRM) class designations and other potential constraints, thus avoiding costly unforeseen planning implications and re-design. Assessing conformance to VRM class designations and identifying visual resource conflicts shall include:
  - Consulting with the appropriate BLM field office for VRM class designations and associated management objectives during the early phases of project planning, including those related to project site selection, planning, and design.
  - Analyzing how the visual values influence project design and how the impacts on these values will be minimized through consideration for the proposed project location and its relationship to the surrounding viewshed.
  - Including a qualified professional, such as a landscape architect, with demonstrated experience of the BLM's VRM policies and procedures as part of the developer's and the BLM's respective planning teams, to evaluate visual resource issues as project siting options are considered.
  - Consulting with the locally based public to provide input on identifying important visual resources in the project area and on the siting and design process. The public shall be involved and informed about the visual site design elements of the proposed solar energy facilities.
  - Consult on viewshed protection objectives and practices with the respective land management agencies for landscapes having special designations, such as Wilderness Areas, National Scenic and Historic Trails, Wild and Scenic Rivers, and National Parks located within the project's viewshed. Developers shall demonstrate a concerted effort to reconcile conflicts while recognizing that the BLM retains authority for final decisions for project approval and stipulations.
  - For applications that include artifacts and remnants of a National Historic Trail (NHT), are located within the viewshed of a NHT's designated centerline, or include or are within the viewshed of a trail eligible for listing on the National Register of Historic Places by virtue of its important historical or cultural values and integrity of setting. Mitigate adverse effects to the potential visual impacts on the trail associated with the proposed project through the Section 106 consultation process.
  - Landscape settings observed from a unit of the National Park system, NHT, and cultural resources of tribal concern may be a part of the historic context contributing to the historic significance of the site or trail.
  - Project developers are encouraged to obtain topographical data of engineering-design quality and use digital terrain mapping tools at a landscape-viewshed scale for project location selection, site planning and design, visual impact analysis, and visual impact mitigation planning and design. The digital terrain mapping tools shall be at a resolution and contour interval suitable for site design and accurate placement of proposed developments into the digital viewshed. Visual simulations shall be prepared and evaluated in accordance with BLM Handbook H-8431-1 and other agency directives, to create spatially accurate and realistic depictions of the appearance of proposed facilities. Simulations shall depict proposed project facilities from Key Observation Points (KOPs) and other visual resource sensitive locations.
  - Conduct public outreach to disseminate visual resource information through methods such as offering organized tours of operating solar energy development projects, and using simulations in public presentations.
  - Performing visual mitigation planning and design through field assessments, applied global positioning system technology, photo documentation, use of computer-aided design and development software, three-dimensional geographic information system modeling software, and imaging software to depict visual simulations to reflect a full range of visual resource mitigation measures.

Site Characterization, Siting Design, and Construction

- Solar facilities shall minimize glint and glare. Identification of glint and glare effects shall include, but is not limited to, the following:
  - Assessing and quantifying potential glint and glare effects and determining the potential safety and visual impacts associated with glint and glare using appropriate and commonly accepted software, procedures, and past project examples.
  - Having qualified individuals conduct assessments for glint and glare.
- Methods to minimize glint and glare effects may include, but are not limited to, the following:
  - Limiting use of signs and project construction signs. Beyond those required for basic facility and company identification for safety, navigation, and delivery purposes, commercial symbols or signs and associated lighting on buildings and other structures should be prohibited.
  - Utilizing retro-reflective or luminescent markers in lieu of permanent lighting.
  - Minimizing off-site visibility of all commercial symbols and signs and associated lighting. Necessary signs should be made of non-glare materials and utilize unobtrusive colors. The reverse sides of signs and mounts should be painted or coated using a suitable color selected from the BLM Standard Environmental Color Chart to reduce contrasts with the existing landscape. However, placement and design of any signs required by safety regulations must conform to regulatory requirements.
  - Considering off-site mitigation of visual impacts. In some situations, off-site mitigation may serve as a means to offset and/or recover the loss of visual landscape integrity. For example, off-site mitigation could include reclaiming unnecessary roads, removing abandoned buildings, reclaiming abandoned mine sites, putting utility lines underground, rehabilitating and revegetating existing erosion or disturbed areas, or establishing scenic conservation easements. Appropriate off-site mitigation will be determined on a project specific basis in consultation with the BLM.
- Solar facilities shall minimize night-sky effects. Identification of night-sky effects shall include, but is not limited to the following:
  - Assessing and quantifying potential lighting impacts on the night sky and nocturnal wildlife, while providing lighting for hazard marking, safety, and other necessary site needs.
  - Conducting assessments for night-sky effects by qualified individuals using appropriate and commonly accepted procedures and past project examples.
- Methods to minimize night-sky effects may include, but are not limited to, the following:
  - Using minimum intensity lighting that meets safety criteria. When accurate color rendition is not required (e.g., roadway, basic security), lighting shall be amber in color, using low pressure sodium lamps, yellow LED lighting, or equivalent. When white light is required for accurate color rendition, it shall be equal to or less than 3500° Kelvin color temperature. Bluish white lighting is discouraged.
  - Prohibiting the use of red or white strobe lighting unless the BLM approves its use because of conflicting mitigation requirements.
  - Fully shielding all permanent lighting (e.g., full cut-off), except for collision markers required by the FAA or other emergency lighting triggered by alarms.
  - Mount lighting so that no light is emitted above an imaginary horizontal plane through the fixture.
  - Considering lighting control through timers, sensors, dimmers, or switches that are available to facility operators.
  - Considering vehicle-mounted lights over permanently mounted lighting for nighttime maintenance activities. When possible, such vehicle-mounted lighting shall be aimed toward the ground to avoid causing glare and skyglow.
- The siting and design of solar facilities, structures, roads, and other project elements shall explore and document design considerations for reducing visual dominance in the viewshed and shall comply with the VRM class objectives above. Assessing visual dominance shall include, but is not limited to, the following:
  - Conforming with VRM class objectives through the use of the BLM contrast rating procedures defined in BLM Handbook H-8431-1. Visual contrast rating mitigation of visual impacts shall abide by the requirements outlined in the handbook and other BLM directives. Revised project plans and simulations are to be reevaluated by using the contrast rating procedures.

  - Selecting KOPs by first determining the extent of the viewshed using the viewshed modeling tools previously cited above. The viewshed modeling shall illustrate the areas from which the proposed facilities may be seen out to 25 miles (40 km). From within the areas, KOPs are to be selected at places where people would be expected: scenic overlooks, roads, trails, campgrounds, recreationally active river corridors, residential areas, etc. For the purpose of conducting a visual contrast rating evaluation, the number of KOPs would be reduced to those that serve as the best representations for demonstrating conformance to the respective VRM class objectives. The BLM is consulted on the KOP selections, and reserves the right to require additional KOPs to further determine the extent of visual impacts and conformance to VRM class objectives.
  - Integrating visual design elements into the construction plans, details, drawings, and specifications for the project.
  - Incorporating facility siting measures to minimize the profile of all facility-related structures to reduce visibility and visual dominance within the viewshed, particularly for facilities proposed within the foreground/middleground distance zone (0–5 miles [0–8 km]) of sensitive viewing locations.
- Measures to minimize visual dominance may include, but are not limited to, the following:
  - Using existing topography and vegetation as screening or partially screening devices.
  - Incorporating visual design elements when planning for grubbing and clearing, vegetation thinning and clearing, grading, revegetation, drainage, and structural measures.
  - Minimizing visual dominance of projects by siting projects outside the viewsheds of KOPs or by diminishing dominance through maximizing visible separation with distance.
  - Avoiding, when feasible, locating facilities near visually prominent landscape features (e.g., knobs and waterfalls) that naturally draw an observer's attention.
  - Avoiding visual "skylining" by placing structures, transmission lines, and other facilities away from ridgelines, summits, or other locations where they would silhouette against the sky from important viewing locations; however, consideration should be given to the potential for increased ground disturbance and other resource impacts.
  - Designing linear features (e.g., ROWs and roads) to follow natural land contours rather than straight lines; however, consideration should be given to the potential for increased ground disturbance and other resource impacts.
  - Locating linear developments (e.g., transmission lines, pipelines, roads) at the edges of natural clearings or natural lines of transition between vegetation type and topography.
  - Considering alternative means of access in visually sensitive areas, to preserve the natural landscape conditions between tower locations.
  - Minimizing vegetation and ground disturbance, and taking advantage of existing clearings where feasible.
  - Reducing cut and fill for structures and roads by design and location. Retaining walls, binwalls, half bridges, etc., can be used to reduce cut and fill.
  - Considering rounded and varied road-cut slopes and the cut-and fill pitches to reduce contrasts in form and line; encouraging slope cuts to preserve specimen trees and nonhazardous rock outcroppings.
  - Considering sculpting and shaping natural or previously excavated bedrock landforms when excavation of these landforms is required. For example, percent backslope, benches, and vertical variations may be integrated into a final landform that repeats the natural shapes, forms, textures, and lines of the surrounding landscape. The earthen landform may be integrated and transitioned into the excavated bedrock landform. Sculpted rock face angles, bench formations, and backslope could adhere to the natural bedding planes of the natural bedrock geology. The color contrast from the excavated rock faces may be removed by color treating with a rock stain. Native vegetation or a mix of native and non-native species (if necessary to ensure successful revegetation) could be reestablished with the benches and cavities created within the created bedrock formation.
  - Designing and installing natural-looking earthwork landforms, or vegetative or architectural screening to minimize visual impacts. Considering shape and height of earthwork landforms for adaptation to the surrounding landscape.
  - Repeating the size, shape, and characteristics of naturally occurring openings in vegetation for facilities, structures, roads, etc.

  - Burying electrical collector lines, pipelines, and communication and local utility lines to minimize additional surface disturbance where feasible (e.g., along roads or other paths of surface disturbance).
  - Minimizing visual impacts associated with solar energy and electricity transmission projects by choosing appropriate building and structural materials and surface treatments (i.e., paints or coatings designed to reduce contrast and reflectivity). A careful study of the site should be performed to identify appropriate colors and textures for materials; both summer and winter appearance shall be considered, as well as seasons of peak visitor use. Materials and surface treatments shall repeat and/or blend with the existing form, line, color, and texture of the landscape.
  - Considering the typical viewing distances and landscape when choosing colors. Appropriate colors for smooth surfaces often need to be two to three shades darker than the background color to compensate for shadows that darken most textured natural surfaces. The BLM Standard Environmental Color Chart CC-001 and guidance shall be referenced when selecting colors.
  - Selecting appropriately colored materials for structures, or stains/coatings to blend with the project's backdrop. Materials, coatings, or paints having little or no reflectivity shall be used whenever possible.
  - Color treating solar panel/mirror/heliostat backs/supports to reduce visual contrast with the landscape setting.
  - Color treating solar towers to reduce visual contrast.
  - Considering multiple-color camouflage technology application projects within sensitive viewsheds and with a visibility distance that is between 0.25 and two miles (0.40 and 3.20 km).
  - Matching aboveground pipelines' paint or coating to their surroundings.
  - Considering the appropriate choice of monopoles versus lattice towers for a given landscape setting to further reduce visual impacts.
  - Utilizing non-specular conductors and non-reflective coatings on insulators for electricity transmission/distribution projects.
  - Minimizing the use of signs. Where signs are necessary, they shall be made of non-glare materials and utilize unobtrusive colors. The reverse sides of signs and mounts shall be painted or coated by using the most suitable color selected from the BLM Standard Environmental Color Chart; however, placement and design of any signs required by safety regulations must conform to regulatory requirements.
  - Clearly delineating construction boundaries and minimizing areas of surface disturbance; preserving vegetation to the greatest extent possible; utilizing undulating surface disturbance edges; stripping, salvaging, and replacing topsoil; using contoured grading; controlling erosion; using dust suppression techniques; and stabilizing exposed soils.
  - Preserving existing rocks, vegetation, and drainage patterns to the maximum extent possible.
  - Employing brush-beating, mowing, or the use of protective surface matting rather than removing vegetation.
  - Considering mulching and spreading slash from vegetation removal over fresh soil disturbances.
  - Avoiding leaving slash piles in sensitive viewing areas.
  - Considering restoration of disturbed soils by use of weed-free native grasses, forbs, and shrubs representative of the surrounding and intact native vegetation composition and/or using non-native species, if necessary, to ensure successful revegetation.
  - Reducing the visual color contrast of graveled surfaces with approved color treatment practices.
  - Considering segregating and spreading topsoil from cut-and-fill activities on freshly disturbed areas to reduce color contrast.
  - Avoiding leaving topsoil piles in sensitive viewing areas.
  - Spreading excess cut and fill material within project disturbance area and vegetate per approved restoration plan requirements while maintaining natural drainage pathways. Where soil cannot reasonably be spread within project disturbance areas, excess cut-and-fill materials should be hauled out to minimize ground disturbance and impacts from piles.
  - Removing stakes and flagging from the construction area after completion of construction.
- Project developer shall perform a pre-construction meeting with BLM or their designated visual/scenic resource specialists, such as a landscape architect, to coordinate the project construction VRM mitigation strategy. Final design and construction documents will be reviewed with regard to the

visual mitigation elements, assuring that requirements and commitments are adequately addressed. The review of construction documents will include, but not be limited to, grading, drainage, revegetation, vegetation clearing, and feathering.

Operations and Maintenance

- Compliance with the terms and conditions for VRM mitigation shall be monitored by the project developer. Consultation with the BLM shall be maintained through operations and maintenance of the project, employing an adaptive management strategy and modifications, as necessary and approved by the BLM. Maintaining the visual resource design elements during operations and maintenance shall include, but is not limited to, the following:
  - Maintaining revegetated surfaces until a self-sustaining stand of vegetation is reestablished and visually adapted to the undisturbed surrounding vegetation. No new disturbance shall be created during operations without completion of a VRM analysis and approval by the BLM authorized officer.
  - Keeping painted and color-treated facilities in good repair and repainting when the color fades or flakes.
  - Using interim restoration during the operating life of the project as soon as possible after land disturbances.
  - Including dust abatement and noxious weed control in maintenance activities.
  - Deploying and operating mirrors/heliostats to avoid high intensity light (glare) reflected off-site. Where off-site glare is unavoidable and project site/off-site spatial relationships favor effective results, fencing with privacy slats or similar screening materials should be considered.

Reclamation and Decommissioning

- Reclamation of the construction site shall begin immediately after construction to reduce the likelihood of visual contrasts associated with erosion and invasive weed infestation and to reduce the visibility of temporarily disturbed areas as quickly as possible. Developers shall coordinate with BLM in advance of interim/final reclamation to have BLM or other designated visual/scenic resource specialists, such as a landscape architect, on-site during reclamation to work on implementing visual resource requirements and BMPs. Methods for minimizing visual contrast associated with reclamation and decommissioning of the project may include, but are not limited to, the following:
  - Including treatments, such as thinning and feathering vegetation along project edges, enhanced contour grading, salvaging landscape materials from within construction areas, special revegetation requirements (e.g., use of mix of native and non-native species).
  - Designing and implementing restoration of the project area to predevelopment visual conditions and the inventoried visual quality rating, or to that of the surrounding landscape setting conditions to the best extent possible or to conditions agreed upon by the BLM.
  - Removing aboveground and near-ground-level structures. Some structures may need to be removed to a level below the ground surface to allow reclamation/restoration.
  - Considering contouring soil borrow areas, cut-and-fill slopes, berms, water bars, and other disturbed areas to approximate naturally occurring slopes. Contouring to a rough texture would trap seeds and discourage off-road travel, thereby reducing associated visual impacts. Cut slopes can be randomly scarified and roughened to reduce texture contrasts with existing landscapes and aid in revegetation.
  - Utilizing native vegetation to establish a composition consistent with the form, line, color, and texture of the surrounding undisturbed landscape.
  - Reapplying stockpiled topsoil to disturbed areas, where applicable, or using a mix of native and non-native species if necessary to ensure successful revegetation.
  - Removing or burying gravel and other surface treatments.
  - Restoring rocks, brush, and forest to approximate pre-existing visual conditions.
  - Integrating feathering edges of vegetation to reduce form and line contrasts with the existing landscapes.

Noise

General

- Project developers shall consult with the BLM in the early phases of project planning to assess and minimize the proposed project's noise impacts on sensitive noise receptors. Assessing noise impacts may include, but is not limited to:
  - Measuring the existing background ambient sound levels both within and outside the project site and comparing these with the anticipated noise levels proposed at the facility. Nearby residences and likely sensitive human and important wildlife habitat areas (e.g., leks, sage-grouse nesting areas, big game winter range) shall be identified.

Site Characterization, Siting and Design, Construction

- The siting and design of solar facilities, structures, roads, and other project elements shall seek to minimize impacts on sensitive noise receptors. Methods to minimize project impacts on sensitive noise receptors may include:
  - Enclose noisy equipment.
  - Post warning signs at high-noise areas and implement a hearing protection program for work areas with noise in excess of 85 Decibel A.
  - Implement a noise complaint process and hotline, including documentation, investigation, evaluation, and resolution of legitimate project-related noise complaints.
  - Maintain project equipment in accordance with manufacturers' specifications. For example, suitable mufflers and/or air-inlet silencers shall be installed on all internal combustion engines and certain compressor components.
  - Limit low-altitude (under 1,500 feet [457 m]) helicopter flights to install transmission lines near noise-sensitive locations where only helicopter activities can perform the installation.
  - Schedule construction to minimize disruption to nearby residents and existing operations surrounding the project areas.
  - Noisy construction activities near sensitive receptors would take place during the least noise-sensitive times of day (i.e., daytime between 7 a.m. and 7 p.m.), and on weekdays.
  - Schedule individual noisy activities to occur at the same time to reduce the frequency of site boundary noise.
  - Implement noise control measures (e.g., erection of temporary wooden noise barriers) where activities are expected near sensitive receptors.
  - Notify nearby residents in advance of noisy activities, such as blasting or pile driving, before and during the construction period.
  - Site immobile construction equipment (e.g., compressors and generators) away from nearby residences and other sensitive receptors to the extent practicable.
  - Site permanent sound-generating facilities (e.g., compressors, pumps) away from residences and other sensitive areas to the extent practicable. Acoustic screening may be required.
  - Use low-noise systems (e.g., for ventilation systems, pumps, generators, compressors, and fans) and equipment without prominent discrete tones.
  - Install louvered side(s) of wet cooling tower(s) away from sensitive receptors. Noise impacts may be further reduced by selecting quieter fans and fans that operate at a lower speed, particularly if they operate at night. Silencers on fan stacks may also be used.
  - Reduce potential noise impacts by taking advantage of existing topography and distances, constructing engineered sound barriers and/or berms, or sound insulated buildings.
  - Monitor and respond to noise impacts during construction, operations, and decommissioning of a solar energy development, including adaptive management protocols.

Operations and Maintenance

- Compliance with the terms and conditions for noise shall be monitored by the project developer. Consultation with the BLM shall be maintained through operations and maintenance of the project, employing an adaptive management strategy and modifications as necessary and approved by the BLM. Methods for maintaining compliance with the noise design elements during operations and maintenance may include:

- Manage cooling systems and dish engine technology so that noise levels at the nearest residences and sensitive receptor areas to the facility boundary are kept within applicable guidelines.
- Reduce vehicle noise within and around the project area with posted speed limits.
- Schedule activities to minimize disruption to nearby residents and existing operations surrounding the project areas.
- Notify nearby residents in advance of noisy activities, such as blasting or pile driving, before and during the site reclamation and decommissioning.
- Monitor and minimize to the extent practicable transformer noise levels. Install of new transformers with reduced flux density or construct a barrier walls, partial enclosures, or full enclosures to shield or contain the noise.

Reclamation and Decommissioning

Reclamation of the construction site shall minimize the project's noise impacts on sensitive noise receptors.

Paleontological Resources

General

Project developers shall coordinate with the BLM early in the project planning process to identify and minimize impacts on paleontological resources. Identifying paleontological resources shall include the following:

Determining in coordination with the BLM whether paleontological resources exist in a project area.

Determining the potential presence of paleontological resources on the basis of the following: the sedimentary context of the area and its potential to contain paleontological resources (potential fossil yield classification class); a records search of published and unpublished literature for past paleontological finds in the area; coordination with paleontological researchers working locally in potentially affected geographic areas and geologic strata; and/or depending on the extent of existing information, the completion of a paleontological survey.

Methods to minimize impacts on paleontological resources may include, but are not limited to, the following:

Instituting training/education programs in the worker education and awareness plan, to reduce the amount of inadvertent destruction to paleontological sites. Project-specific management practices shall be established in coordination with the BLM, incorporating BLM Instruction Memorandum 2009-011.

Planning for management and mitigation of paleontological resources of the project area for areas of known presence or high potential of presence.

Identifying measures to prevent potential looting/vandalism or erosion impacts and addressing the education of workers and the public to make them aware of the consequences of unauthorized collection of fossils on public land.

Incorporating environmental inspection and monitoring measures into Plans of Development and other relevant plans to monitor and respond to paleontological resource impacts during construction, operations, and decommissioning of a solar energy development, including adaptive management protocols.

Site Characterization, Siting and Design, Construction

Project developers should use a qualified paleontological monitor during excavation and earthmoving activities in areas with high potential for paleontological resources.

Project developers shall notify the BLM immediately upon discovery of fossils. Work shall be halted at the fossil site and continued elsewhere until qualified personnel, such as a paleontologist, can visit the site, determine the significance of the find, and, if significant, make site specific recommendations for collection or other resource protection. The area of the discovery shall be protected to ensure that the fossils are not removed, handled, altered, or damaged until the site is properly evaluated and further action determined.

Cultural Resources

General

- Project developers shall coordinate with the BLM early in the planning process to identify and minimize cultural resource impacts; the BLM will consult with other Tribal, Federal, State, and local agencies as appropriate. Determining cultural resource impacts shall include the following:
  - Initiating National Historic Preservation Act, Section 106 consultations between the BLM, State Historic Preservation Officer (SHPO), Indian tribes, and other consulting parties early in the project planning process.
  - Conducting site-specific Section 106 review for individual projects. The BLM will require the completion of inventory, evaluation, determinations of effect, and treatment in accordance with the National Programmatic Agreement (PA) and appropriate State protocol agreements.
- General methods to minimize cultural resource impacts may include the following:
  - If historic properties that could be adversely affected are present in the project location, developing a Memorandum of Agreement to address the mitigation steps that will be followed to avoid, minimize, or mitigate adverse effects on historic properties.
  - Where the BLM determines that a specific proposed solar energy project has the potential to adversely affect historic properties but those effects cannot be determined prior to its approval, the BLM may elect to review a proposed solar energy project using an undertaking-specific Programmatic Agreement executed pursuant to 36 CFR 800.6.
  - Using training/educational programs for solar company workers to reduce occurrences of disturbances, vandalism, and harm to nearby historic properties. The specifics of these sensitivity training programs shall be established in project-specific consultations between the applicant, BLM, SHPO, and affected Indian tribes.
  - Securing a performance and reclamation bond for all solar energy generation facilities to ensure compliance with the terms and conditions of the ROW authorization. When establishing bond amounts and conditions, the BLM authorized officer shall require coverage of all expenses tied to cultural resources identification, protection, and mitigation. These may include, but are not limited to, costs for ethnographic studies, inventory, testing, geomorphological studies, data recovery, curation, monitoring, treatment of damaged sites, and generation and submission of reports.

Site Characterization, Siting and Design, Construction

- Solar facilities shall be characterized, sited and designed, and constructed in coordination with the BLM to minimize cultural resource impacts. Methods to minimize impacts on cultural resources shall include the following:
  - The BLM determining the Area of Potential Effects (APE) for each proposed solar energy project, to include a review of existing information, and efforts to seek information from and views of tribes and other parties likely to have knowledge of or concerns with historic properties in the APE. This information will be supplemented by discussions at pre-application meetings with the solar energy project applicant, SHPO, and affected tribes regarding project designs, sacred sites, traditional cultural properties, and proposed cultural resource inventory strategies.
  - The BLM consulting the SHPO, affected tribes (regarding the treatment of adverse effects for those property types on which the tribes indicate at pre-application or other meetings they wish to provide input), and any other consulting parties, if the National Register of Historic Places the National Register of Historic Places (NRHP)-eligible properties are present at the site and would be adversely affected. The BLM will seek agreement to avoid, minimize, or mitigate adverse effects on historic properties. The BLM will execute a Memorandum of Agreement with the SHPO to conclude the Section 106 process and will file a copy with the Advisory Council on Historic Preservation. Where the BLM and the SHPO are unable to execute a Memorandum of Agreement, the BLM will invite the Advisory Council on Historic Preservation to participate in an undertaking-specific Memorandum of Agreement. The Memorandum of Agreement will specify the treatment for which the BLM will be responsible, and which will be implemented by the solar applicant.
  - Undertaking a Class III inventory of the APE. If the BLM decides to require less than a Class III inventory for the entire APE, the BLM will seek additional views of the SHPO, affected tribes, and

other parties and determine the final inventory strategy that best represents a reasonable and good-faith effort to carry out appropriate identification efforts.
  - Conducting inventories according to the standards set forth in the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716); BLM Handbook H-8110 (Handbook for Identifying Cultural Resources); revised BLM Manual 8110; and applicable BLM or SHPO survey, site record, or reporting standards. All inventory data must be provided to the BLM in digitized or paper format that meets BLM accuracy standards, including shape files for surveyed areas.
  - Bringing any unexpected discovery of cultural resources during any phase of development (construction, operations and maintenance, or decommissioning) to the attention of the responsible BLM authorized officer immediately, as specified in the PA. Work shall be halted in the vicinity of the find. The area of the find shall be protected to ensure that the resources are not removed, handled, altered, or damaged while they are being evaluated and to ensure that appropriate mitigative or protective measures can be developed and implemented.
- Methods to minimize cultural resource impacts may include, but are not limited to, the following:
  - Including in the Memorandum of Agreement measures for management of historic properties, in situations where historic properties require management or monitoring for avoidance and protection within or near a project's boundaries. Such measures will specify the preparation and implementation of steps to lessen the adverse effects of the undertaking upon those aspects of NRHP eligibility criteria that make the historic properties eligible for nomination to the NRHP.
  - Requiring that surface disturbance be restricted or prohibited within the viewshed of such property types when their eligibility is tied to their visual setting to protect NRHP-eligible traditional cultural properties, sacred sites, or historic trails from visual intrusion and to maintain the integrity of their historic setting unless acceptable mitigation is proposed.
  - Employing cultural field monitors (appropriate for the resource anticipated) to monitor ground-disturbing activities (for example in geomorphic settings, such as in shifting sands, where buried deposits may be present) in cases where there is a probability of encountering cultural resources during construction that could not be detected during prior Class III inventories. Monitoring plans shall be specified within Memorandums of Agreement.
  - Encouraging the use of previously disturbed lands and lands determined by archeological inventories to be devoid of historic properties.

Reclamation and Decommissioning

- Prior to reclamation activities, the BLM may require further planning for treatment of historic properties or planning for mitigation addressing reclamation activities.
- The BLM shall be notified prior to the demolition or substantial alteration of any building or structure. If judged necessary by the BLM, the developer will be required to evaluate the structures for their significance employing professionally qualified architects or historic architects. If structures slated for demolition are found to be eligible for listing on the NRHP, they will be recorded to Historic American Building Survey and/or Historic American Engineering Record standards before alteration or removal.
- Project developers shall confine soil-disturbing reclamation and decommissioning activities to previously disturbed areas. Known historic properties will be avoided during these activities.

Tribal Rights and Interests

General

- The BLM shall consult with Federally recognized Indian tribes early in the planning process to identify issues and areas of concern regarding any proposed solar energy project as required by the National Historic Preservation Act and other authorities to determine whether construction and operation of a project is likely to disturb traditional cultural properties or sacred sites, impede access to culturally important locations, disrupt traditional cultural practices, affect movements of animals important to tribes, or visually affect culturally important landscapes. Identifying issues and areas of concern to Federally recognized Indian tribes shall include, but is not limited to, the following:
  - Covering planning, construction, operation, and reclamation activities during consultation. Agreements or understandings reached with affected tribes shall be carried out in accordance with the terms of Memorandums of Agreement or project specific PAs.

  - The BLM consulting with affected Indian tribes during the Section 106 process at the points specified in the PA.
  - The BLM consulting with Indian tribes under the terms of the Native American Graves Protection and Repatriation Act (NAGPRA). Any planning for treatment of historic properties or mitigation will take such consultations into account.
  - The BLM seeking, during consultation, to develop agreements with affected tribes on how to appropriately respond to input and concerns in advance to save time and avoid confusion.
- Methods to minimize issues and areas of concern to Federally recognized Indian tribes may include, but are not limited to, the following:
  - Employing standard noise design features for solar facilities located near sacred sites to minimize the impacts of noise on culturally significant areas.
  - Employing health and safety design features for the general public for solar facilities located near Native American traditional use areas in order to minimize potential health and safety impacts on Native Americans.
  - Avoiding known human burial sites. Where there is a reasonable probability of encountering undetected human remains and associated funerary objects by a solar energy project, the BLM will carry out discussions with Indian tribes before the project is authorized, in order to provide general guidance on the treatment of any cultural items (as defined by NAGPRA) that might be exposed.
  - Avoiding visual intrusion on sacred sites through the selection of the solar facility location and solar technology. When complete avoidance is not practicable or economically feasible, the BLM shall engage in timely and meaningful consultation with the affected tribe(s) and shall attempt to formulate a mutually acceptable plan to mitigate or reduce the adverse effects.
  - Avoiding rock art (panels of petroglyphs and/or pictographs). These panels may be just one component of a larger sacred landscape, in which avoidance of all impacts may not be possible. Mitigation plans for eliminating or reducing potential impacts on rock art shall be formulated in consultation with the appropriate tribal cultural authorities.
  - Avoiding springs and other water sources that are or may be sacred or culturally important. If it is necessary for construction, maintenance, or operational activities to take place in proximity to springs or other water sources, appropriate measures, such as the use of geotextiles or silt fencing, should be taken to prevent silt from degrading water sources. The effectiveness of these mitigating barriers shall be monitored. Measures for preventing water depletion impacts on springs should also be employed. Particular mitigations shall be determined in consultation with the appropriate Indian tribe(s).
  - Avoiding culturally important plant species. When it is not possible to avoid affecting these plant resources, consultations shall be undertaken with the affected Indian tribe(s). If the species is available elsewhere on agency-managed lands, guaranteed access may suffice. For rare or less-common species, establishing (transplanting) or propagating an equal amount of the plant resource elsewhere on agency-managed land accessible to the affected tribe may be acceptable.
  - Avoiding culturally important wildlife species and their habitats. When it is not possible to avoid these habitats, solar facilities should be designed to minimize impacts on game trails, migration routes, and nesting and breeding areas of tribally important species. Mitigation and monitoring procedures should be developed in consultation with the affected tribe(s).
  - Securing a performance and reclamation bond for all solar energy generation facilities to ensure compliance with the terms and conditions of the ROW authorization. When establishing bond amounts and conditions, the BLM authorized officer shall require coverage of all expenses tied to identification, protection, and mitigation of cultural resources of concern to Indian tribes. These may include, but are not limited to, costs for ethnographic studies, inventory, testing, geomorphological studies, data recovery, curation, monitoring, treatment of damaged sites, and generation and submission of reports.

Site Characterization, Siting and Design, Construction

- Prior to construction, the project developer shall provide training to contractor personnel whose activities or responsibilities could affect issues and areas of concern to Federally recognized Indian tribes.

Operations and Maintenance

- Consultation with affected Federally recognized Indian tribes shall be ongoing during the life of the project.
- The project developer shall train facility personnel regarding their responsibilities to protect any known resources of importance to Federally recognized Indian tribes.

Reclamation and Decommissioning

- The project developer shall confine reclamation and decommissioning activities to previously disturbed areas and existing access roads to the extent practicable.
- The project developer shall return the site to its pre-construction condition, to the extent practicable and approved by the BLM.

Socioeconomic Impacts

General

- Project developers shall coordinate with the BLM and other Federal, State, and local agencies to identify and minimize potential socioeconomic impacts. Identifying socioeconomic impacts may include:
  - Project developers may need to collect and evaluate available information describing the socioeconomic conditions in the vicinity of the proposed project.
  - Develop options to minimize and/or mitigate adverse socioeconomic impacts in coordination with the BLM.
  - Develop a community monitoring program that would be sufficient to identify and evaluate socioeconomic impacts resulting from solar energy development. Measures developed for monitoring may include the collection of data reflecting the economic, fiscal, and social impacts of development at the Tribal, State, and local level.
  - Develop community outreach programs that would help communities adjust to changes triggered by solar energy development.
  - Establish vocational training programs for the local workforce to promote development of skills required by the solar energy industry.
  - Develop instructional materials for use in area schools to educate the local communities on the solar energy industry.

Environmental Justice

General

- Project developers shall coordinate with the BLM and other Federal, State, and local agencies to identify and minimize the potential for environmental justice impacts. Identifying environmental justice impacts may include:
  - Project developers shall identify all environmental justice communities and collect and evaluate available information describing the socioeconomic conditions in the vicinity of the proposed project, as needed, to predict potential environmental justice impacts of the project (i.e., environmental, economic, cultural, and health impacts on low-income and minority populations).
  - Evaluate environmental justice impacts as part of the environmental impact analysis for the project and consider options to mitigate such risk in coordination with the BLM.
  - Develop and implement focused public information campaigns providing technical and environmental health information directly to low-income and minority groups or to local agencies and representative groups. Include key information such as any likely impact on air quality, drinking water supplies, subsistence resources, public services, and the relevant preventative/minimization measures to be taken.
  - Provide community health screenings for low-income and minority groups.
  - Provide financial support to local libraries in low-income and minority communities for the development of information repositories on solar energy, including materials on the hazards and benefits of commercial development.
  - Establish vocational training programs for the local low income and minority workforce to promote development of skills for the solar energy industry.

  - Develop instructional materials for use in area schools to educate the local communities on the solar energy industry.
  - Provide key information to local governments and directly to low-income and minority populations on the scale and timeline of expected solar energy projects and on the experience of other low-income and minority communities that have followed the same energy development path.
  - Make information available about planning activities that may be initiated to provide local infrastructure, public services, education, and housing.

Transportation

Site Characterization, Siting and Design, Construction

- Project developers shall coordinate with the BLM and other Federal, State, and local agencies to identify and minimize impacts on transportation. Identifying impacts on transportation may include:
  - Consult land use plans, transportation plans, and local plans as necessary. The developer may be required to perform traffic studies, analyses, or other studies of the capacity of existing and proposed new roads to physically handle the added wear and tear from increased construction commuter and truck traffic.
  - Develop options to minimize risk of increased transportation in coordination with the BLM.
- Methods to minimize impacts on transportation may include:
  - Incorporate site access into the local and regional road network. Incorporation must be done under the supervision of the pertinent Federal, State, and local agencies.
  - Considering public roadway corridors through a site to maintain proper traffic flows and retain more direct routing for the local population.
  - Considering implementing local road improvements, providing multiple site access locations and routes, staggering work schedules, and implementing a ride-sharing or shuttle program to minimize daily commutes of construction workers.
  - Implement traffic control measures to reduce hazards for incoming and outgoing traffic and streamline traffic flow, such as intersection realignment and speed limit reductions; installing signage; and adding acceleration, deceleration, and turn lanes on routes with site entrances.
  - Inspect, monitor, and respond to transportation impacts during construction, operations, and decommissioning of a solar energy development using adaptive management protocols.

Hazardous Materials and Waste

General

- Project developers shall coordinate with the BLM and other Federal, State, and local agencies early in the planning process to assess hazardous material and waste concerns and to minimize potential impacts. Assessing hazardous material and waste concerns may include:
  - Identify expected waste generation streams at the solar energy site and hazardous waste storage locations for the proposed project.
  - Conduct site characterization, construction, operation, and decommissioning activities in compliance with applicable Federal and State laws and regulations, including the Toxic Substances Control Act of 1976, as amended (15 U.S.C. 2601, et seq.). An example of complying with applicable law is reporting any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR Part 117 as required by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, Section 102b.
- Methods to minimize hazardous material and waste related impacts may include:
  - Develop a Hazardous Materials and Waste Management Plan that addresses the selection, transport, storage, and use of all hazardous materials needed for construction, operations, and decommissioning of the facility for local emergency response and public safety authorities and for the designated BLM land manager. Furthermore, the plan shall address the characterization, on-site storage, recycling, and disposal of all resulting wastes. At minimum, the plan will discuss facility identification; comprehensive hazardous materials inventory; Material Safety Data Sheets for each type of hazardous material; emergency contacts and mutual aid agreements, if any; site map showing all hazardous materials and waste storage and use locations; copies of spill and emergency response plans, and hazardous materials–related elements of a Decommissioning and Site Reclamation Plan.

  - The waste management plan will address all solid and liquid wastes that may be generated at the site in compliance with the Clean Water Act requirements to obtain the project's National Pollutant Discharge Elimination System or similar permit.
  - Consider fire management in developing hazardous materials and waste management measures.
  - Identify and implement prevention measures, including material substitution of less hazardous alternatives, recycling, and waste minimization.
  - Establish procedures for fuel storage and dispensing that consider health and safety of personnel and methods for safe use (i.e., fire safety, authorized equipment use).
  - Ensure vehicles and equipment are in proper working condition to reduce potential for leaks of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials.
  - Establish schedules for regular removal of wastes (including sanitary wastewater generated in temporary, portable sanitary facilities) for delivery and removal by licensed haulers to appropriate off-site treatment or disposal facilities.

Site Characterization, Siting and Design, Construction

- Solar facilities shall be characterized, sited and designed, and constructed to minimize hazardous materials and waste management design elements. Methods to minimize hazardous material and waste management impacts may include:
  - Indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste on the facility or associated with facility activities.
  - Provide a copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances to the BLM authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.
  - Design and operate systems containing hazardous materials in a manner that limits the potential for their release.
  - Establish measures for construction with compatible materials in safe conditions.
  - Establish dedicated areas with secondary containment for loading or off-loading hazardous materials to transport vehicles.
  - Implement "just-in-time" ordering procedures to limit the amounts of hazardous materials present on the site to quantities minimally necessary to support continued operations. Excess hazardous materials shall be promptly disposed.
  - Survey project sites for unexploded ordnance if projects are within 20 miles of a current DoD installation or formerly utilized defense site.
  - Site refueling areas away from surface waters and drainages and on paved surfaces; features shall be added to direct any spilled materials to sumps or safe storage areas where they can be subsequently recovered.
  - Designate hazardous materials and waste storage areas and facilities. Limit access to designated areas to authorized personnel only.

Operations and Maintenance

- Compliance with the terms and conditions for hazardous materials and waste management shall be monitored by the project developer.
- Consultation with the BLM shall be maintained through the operations and maintenance of the project, employing an adaptive management strategy and modifications, as necessary and approved by the BLM.
- Methods for maintaining compliance with the terms and conditions for hazardous materials and waste management during operations and maintenance of the project may include the following:
  - Installing sensors or other devices to monitor system integrity and
  - Implementing robust site inspection and repair procedures.

Reclamation and Decommissioning

- Project developers shall maintain emergency response capabilities throughout the reclamation and decommissioning period as long as hazardous materials and wastes remain on-site.
- All design features developed for the construction phase shall be applied to similar activities during the reclamation and decommissioning phases.

Health and Safety

General

- Project developers shall coordinate with the BLM and other Federal, State, and local agencies early in the planning process to identify project health and safety risks and methods to minimize those risks. Assessing project health and safety risks may include:
  - Identifying and establishing Federal and State occupational health and safety standards, such as Occupational Safety and Health Administration's (OSHA's) Occupational Health and Safety Standards, 29 CFR Parts 1910 and 1926, respectively, for all phases of the project.
  - Identifying safety zones or setbacks for solar facilities and associated transmission lines from residences and occupied buildings, roads, ROWs, and other public access areas that are sufficient to prevent accidents resulting from various hazards during all phases of development.
- Methods to minimize project health and safety risks may include, but are not limited to, the following:
  - Identifying and accounting for general project injury prevention within the Plan of Development and the Health and Safety Plan, such as established personal protective equipment requirements, respiratory protection, hearing conservation measures, electrical safety considerations, hazardous materials safety and communication, housekeeping and waste handling, confined space identification, and rescue response and emergency medical support, including on-site first aid capability.
  - Implementing training and awareness measures for workers and the general public to minimize and address standard practices (such as OSHA's) for the safe use of explosives and blasting agents; occupational electric and magnetic field exposures; fire safety and evacuation procedures; and safety performance standards (e.g., electrical system standards and lighting protection standards). Consider further training for additional health and safety risks from the solar energy project and its ancillary facilities.
  - Establishing measures to document training activities and reporting of serious accidents to appropriate agencies.
  - Assessing cancer and non-cancer risks to workers and the general public from exposure to facility emission sources that exceed threshold levels.
  - Considering implementation of measures to reduce site emissions and the cancer and non-cancer from exposure to facility emissions.
  - Implementing a reporting structure for accidental release of hazardous substances to the environment where project developers shall document the event, including a root cause analysis, a description of appropriate corrective actions taken, and a characterization of the resulting environmental or health and safety impacts. Documentation of the event shall be provided to the permitting agencies and other Federal and State agencies within 30 days.
  - Considering manufacturer requirements, and Federal and State standards, when establishing safety zones or setbacks for solar facilities and associated transmission lines.
  - Project developers coordinating with the BLM and appropriate agencies (e.g., the Department of Energy and Transportation Security Administration to address critical infrastructure and key resource vulnerabilities at solar facilities in order to minimize and plan for potential risks from natural events, sabotage, and terrorism.

Site Characterization, Siting and Design, Construction

- Solar facilities shall be characterized, sited and designed, and constructed to minimize risk to health and safety. Methods to minimize risk to health and safety may include:
  - Designing electrical systems to meet all applicable safety standards (e.g., National Electrical Code) and to comply with the interconnection requirements of the transmission system operator.
  - Complying with applicable FAA regulations, including lighting requirements, to avoid or minimize potential safety issues associated with proximity to airports, military bases or training areas, or landing strips.
  - Considering temporary fencing and other measures for staging areas, storage yards, and excavations during construction or decommissioning activities to limit public access to health and safety risks.
  - Planning for traffic management of site access to ensure that traffic flow would not be unnecessarily affected and that specific issues of concern (e.g., the locations of school bus routes

and stops) are identified and addressed. Planning may include measures such as informational signs and temporary lane configurations. Planning shall be coordinated with local planning authorities.
  - Considering use of alternative dielectric fluids that do not contain sulfur hexafluoride to reduce the global warming potential.
  - Considering measures to reduce occupational electric and magnetic fields) exposures, such as backing electrical generators with iron to block the electric and magnetic fields, shutting down generators when work is being done near them, and otherwise limiting exposure time and proximity while generators are running.

Operations and Maintenance

- Compliance with the terms and conditions for health and safety shall be monitored by the project developer. Consultation with the BLM shall be maintained through operations and maintenance of the project employing an adaptive management strategy and modifications, as necessary and approved by the BLM.

National Historic Trails

General

- Project developers shall consult with the BLM early in the project planning to help determine the proposed project's conformance with trail management prescriptions and other potential trail-related constraints. Assessing conformance to trail management prescriptions and other potential trail related constraints shall include, but is not limited to:
  - Consider the Oregon National Historic Trail management corridor as an avoidance area in order to prevent substantial interference with the nature and purposes of designated National Historic Trail, and to make efforts to avoid activities incompatible with trail purposes. Residual impacts on trails will be avoided, minimized, and/or mitigated to the extent practicable.
  - Apply on-site or off-site mitigation for any residual adverse impact according to program policy standards.

West Wide Energy Corridors Interagency Operating Procedures

These Interagency Operating Procedures are from the Approved Resource Management Plan Amendments/Record of Decision for Designation of Energy Corridors on Bureau of Land Management Administered Land in the 11 Western States (BLM, 2009) and are for projects proposed within the Section 368 corridors. Not all operating procedures will be appropriate for all projects; those that apply to pipelines, for instance, are not appropriate to transmission lines. These operating procedures are practicable means to avoid or minimize environmental impacts from future project development that may occur within the designated corridors.

Project Planning

Agency Coordination

- Applicants seeking to develop energy transport projects within corridors located on or near Saylor Creek Training Range or within military operating areas must, early in the planning process and in conjunction with the appropriate agency staff, inform and coordinate with the DoD regarding the characteristics and locations of the anticipated project infrastructure.
- Early in the planning process, applicants seeking a right-of-way (ROW) authorization within a Section 368 energy corridor that is located within five miles of a unit of the National Park Service (NPS) should contact the appropriate Agency staff and work with the NPS regarding the characteristics and locations of anticipated project infrastructure. In those instances where corridors cross lands within the boundaries of a unit of the NPS, the NPS Organic Act and other relevant laws and policies shall apply.
- For electricity transmission projects, the applicant shall notify the Federal Aviation Administration (FAA) as early as practicable in the planning process in order to identify appropriate aircraft safety requirements.

- All project applications must reflect applicable findings, mitigation, and/or standards contained in regional land management plans, such as the Northwest Forest Plan, when such regional plans have been incorporated into agency planning guidelines and requirements. Modification of some standards may be needed to reasonably allow for energy transport within a corridor.

Government-to-Government Consultation

- The appropriate agency, assisted by the project applicant, must initiate government-to-government consultation with affected tribes at the outset of project planning and shall continue consultation throughout all phases of the project, as necessary. Agencies should determine how to consult in a manner that reflects the cultural values, socioeconomic factors, and administrative structures of the interested tribes.
- The agency point-of-contact (POC) may require the project proponent to prepare an ethnographic study when tribal consultation indicates the need. The study shall be conducted by a qualified professional selected in consultation with the affected tribes.

General

- Applicants seeking to develop an electricity transmission or pipeline project will develop a project-specific Plan of Development (POD). The POD should display the location of the project infrastructure (i.e., towers, power lines) and identify areas of short- and long-term land and resource impacts and the mitigation measures for site-specific and resource-specific environmental impacts. The POD should also include notification of project termination and decommissioning to the agencies at a time period specified by the agencies.
- Applicants, working with the appropriate agencies, shall design projects to comply with all appropriate and applicable agency policies and guidance.
- Project planning shall be based on the current state of knowledge. Where corridors are subject to sequential projects, project-related planning (such as the development of spill-response plans, cultural resource management plans, and visual resource management plans) and project-specific mitigation and monitoring should incorporate information and lessons learned from previous projects.
- Applicants shall follow the best management practices for energy transport project siting, construction, and operations of the States in which the proposed project would be located, as well as Federal agency practices.
- Corridors are to be efficiently used. The applicant, assisted by the appropriate agency, shall consolidate the proposed infrastructure, such as access roads, wherever possible and utilize existing roads to the maximum extent feasible, minimizing the number, lengths, and widths of roads, construction support areas, and borrow areas.
- When concurrent development projects are proposed and implemented within a corridor, the agency POC shall coordinate the projects to ensure consistency with regard to all regulatory compliance and consultation requirements, and to avoid duplication of effort.
- Applicants, assisted by the appropriate agency, shall prepare a monitoring plan for all project-specific mitigation activities.
- Potential cumulative impacts to resources should be considered during the early stages of the project. Agency POCs must coordinate various development projects to consider and minimize cumulative impacts. A review of resource impacts resulting from other projects in the region should be conducted and any pertinent information be considered during project planning.

Project Design

- Applicants shall locate desired projects within energy corridors to promote effective use of the corridors by subsequent applicants and to avoid the elimination of use or encumbrance of use of the corridors by ROW holders. Proposed projects should be compatible with identified energy transport modes and avoid conflicts with other land uses within a corridor.
- Applicant shall identify and delineate existing underground metallic pipelines in the vicinity of a proposed electricity transmission line project and design the project to avoid accelerating the corrosion of the pipelines and/or pumping wells.

Transportation

- The applicant shall prepare an access road siting and management plan that incorporates relevant agency standards regarding road design, construction, maintenance, and decommissioning. Corridors will be closed to public vehicular access unless determined by the BLM authorized officer to be managed as part of an existing travel and transportation network in a land use plan or subsequent travel management plan(s).
- The applicant shall prepare a comprehensive transportation plan for the transport of transmission tower or pipeline components, main assembly cranes, and other large equipment. The plan should address specific sizes, weights, origin, destination, and unique equipment handling requirements. The plan should evaluate alternative transportation routes and should comply with State regulations and all necessary permitting requirements. The plan should address site access roads and eliminate hazards from truck traffic or adverse impacts to normal traffic flow. The plan should include measures such as informational signage and traffic controls that may be necessary during construction or maintenance of facilities.
- Applicants shall consult with local planning authorities regarding increased traffic during the construction phase, including an assessment of the number of vehicles per day, their size, and type. Specific issues of concern (e.g., location of school bus routes and stops) should be identified and addressed in the traffic management plan.

Groundwater

- Applicants must identify and delineate all sole source aquifers in the vicinity of a proposed project and design the project to avoid disturbing these aquifers or to minimize potential risks that the aquifers could be contaminated by spills or leaks of chemicals used in the projects.
- In instances where a project within an energy corridor crosses sole source aquifers, the applicant must notify the Environmental Protection Agency (EPA) and the agencies that administer the land as early as practicable in the planning process. Section 1424(e) of the Safe Drinking Water Act (42 U.S.C. Chapter 6A) and other relevant laws and policies pertinent to the corridors that cross sole source aquifers shall apply.

Surface Water

- Applicants must identify all wild and scenic rivers (designated by act of Congress or by the Secretary of the Interior under Section 3(a) or 2(a)(ii) of the Wild and Scenic Rivers Act (16 U.S.C. 1271-1287), respectively), congressionally authorized wild and scenic study rivers, and agency identified (eligible or suitable) wild and scenic study rivers in the vicinity of a proposed project and design the project to avoid the rivers or mitigate the disturbance to the rivers and their vicinity.
- In instances where a project within an energy corridor crosses a wild and scenic river or a wild and scenic study river, the appropriate Federal permitting agency, assisted by the project applicant, must coordinate and consult with the river-administrating agency regarding the protection and enhancement of the river's free-flowing condition, water quality, and Outstandingly Remarkable Values.
- Applicants shall identify all streams in the vicinity of proposed project sites that are listed as impaired under Section 303(d) of the Clean Water Act (33 U.S.C. Chapter 26) and provide a management plan to avoid or mitigate adverse impacts on those streams.

Paleontological Resources

- The applicant shall conduct an initial scoping assessment to determine whether construction activities would disturb formations that may contain important paleontological resources. Potential impacts to significant paleontological resources should be avoided by moving or rerouting the site of construction or removing or reducing the need for surface disturbance. When avoidance is not possible, a mitigation plan should be prepared to identify physical and administrative protective measures and protocols such as halting work, to be implemented in the event of fossil discoveries. The scoping assessment and mitigation plan should be conducted in accordance with the managing agency's fossil management practices and policies.
- If significant paleontological resources are known to be present in the project area, or if areas with a high potential to contain paleontological material have been identified, the applicant shall prepare a

paleontological resources management and mitigation plan. If adverse impacts to paleontological resources cannot be avoided or mitigated within the designated corridors, the agency may consider alternative development routes to avoid, minimize, or mitigate adverse effects.

- A protocol for unexpected discoveries of significant paleontological resources should be developed. Unexpected discovery during construction should be brought to the immediate attention of the responsible Federal agency's authorized officer. Work should be halted in the vicinity of the discovery to avoid further disturbance of the resource while the resource is being evaluated and appropriate mitigation measures are being developed.

Ecological Resources

- Applicants shall identify important, sensitive, or unique habitats and BLM-special status species and State-listed species in the vicinity of proposed projects and design the project to avoid or mitigate impacts to these habitats and species.
- To restore disturbed habitats, the applicant will prepare a habitat restoration plan that identifies the approach and methods to be used to restore habitats disturbed during project construction activities. The plan will be designed to expedite the recovery to natural habitats supporting native vegetation, and require restoration to be completed as soon as practicable after completion of construction, minimizing the habitat converted at any one time. To ensure rapid and successful restoration efforts, the plan will include restoration success criteria, including time frames, which will be developed in coordination with the appropriate agency and which must be met by the applicant. Bonding to cover the full cost of restoration will be required.
- In consultation with the US Army Corps of Engineers, the appropriate agency, assisted by the project applicant, will identify wetlands (including ephemeral, intermittent, and isolated wetlands), riparian habitats, streams, and other aquatic habitats in the project area and design the project to avoid or mitigate impacts to these habitats.

Vegetation Management

Applicants shall develop an integrated vegetation management plan consistent with applicable regulations and agency policies for the control of unwanted vegetation, noxious weeds, and invasive species (E.O. 13112). The plan should address monitoring; ROW vegetation management; the use of certified weed-seed-free hay, straw, and/or mulch; the cleaning of vehicles to avoid the introduction of noxious weeds and invasive plants; education of personnel on weed identification, the manner in which weeds spread, and the methods for treating infestations.

Cultural Resources

Cultural resources management services and individuals providing those services shall meet the Secretary of the Interior's Standards for Archaeology and Historic Preservation, 48 FR 44716 (Sept. 29, 1983).

The project applicant may, with the approval of the agency POC, assign a Cultural Resource Coordinator to ensure an integrated compliance process across administrative and jurisdictional boundaries. The Cultural Resource Coordinator will facilitate and coordinate compliance with laws, policies, regulations, and existing pertinent agreements (Memorandums of Agreement, protocoal agreements, or memoranda of understanding) among multiple agencies and other entities, jurisdictions, and Federally recognized tribes. The coordinator may assist with development of pertinent agreements among concerned parties during the course of the project. The coordinator shall be a qualified professional with experience in cultural resource compliance. Where appropriate, the Cultural Resource Coordinator may also serve as the Tribal Coordinator. Alternatively, the agency POC may assign such coordinators, to be paid for through project cost-recovery funds. The agencies, through the POC, remain responsible for consultation.

The project applicant may, with the approval of the agency POC, assign a Tribal Coordinator to facilitate and coordinate consultation and compliance with multiple laws, agencies, and tribes in order to ensure effective government-to-government consultation throughout the life of the project. Alternatively, the agency POC may assign such coordinators, to be paid for through project cost-recovery funds. The agencies, through the POC, remain responsible for consultation.

- All historic properties in the Area of Potential Effect (APE) will be identified and evaluated. The APE shall include that area within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties and shall include a reasonable construction buffer zone and laydown areas, access roads, and borrow areas, as well as a reasonable assessment of areas subject to effects from visual, auditory, or atmospheric impacts, or impacts from increased access.
- Project proponents must develop a Cultural Resources Management Plan (CRMP) to outline the process for compliance with applicable cultural resource laws during pre-project planning, management of resources during operation, and consideration of the effect of decommissioning. CRMPs should meet the specifications of the appropriate agency and address compliance with all appropriate laws. CRMPs should include the following, as appropriate: identification of the Federally recognized tribes, State Historic Preservation Officers (SHPOs), and consulting parties for the project; identification of long- and short-term management goals for cultural resources within the APE of the project; the definition of the APE; appropriate procedures for inventory, evaluation, and identification of effects to historic properties; evaluation of eligibility for the National Register of Historic Places (NRHP) for all resources in the APE; description of the measures to avoid, minimize, or mitigate adverse effects to historic properties; procedures for inadvertent discovery; procedures for considering Native American Graves Protection and Repatriation Act (NAGPRA) issues, monitoring needs, and plans to be employed during construction; curation procedures; anticipated personnel requirements and qualifications; public outreach and interpretation plans; and discussion of other concerns. The draft CRMP should be reviewed and approved by the agency POC in consultation with historic preservation partners, including appropriate SHPOs, tribes, and consulting parties. CRMPs must specify procedures that would be followed for compliance with cultural resource laws, should the project change during the course of implementation.
- Project applicants will provide cultural resources training for project personnel regarding the laws protecting cultural resources, appropriate conduct in the field (such as procedures for the inadvertent discovery of human remains), and other project-specific issues identified in the CRMP. Training plans should be part of the CRMP and should be subject to the approval of the POC. When government-to-government consultation identifies the need and the possibility, tribes may be invited to participate in or contribute to relevant sessions.
- If adverse effects to historic properties will result from a project, a Historic Property Treatment Plan will be developed in consultation with the SHPO, the appropriate Federally recognized tribes, and any consulting parties. The plan will outline how the impacts to the historic properties would be mitigated, minimized, or avoided.
- Cultural resources inventory, evaluation, and mitigation practices should incorporate modeling and sampling strategies to the extent practicable, in concurrence with SHPOs and other relevant parties, and as approved by the agency POC.
- Project applicants shall provide all cultural resources reports and data in an electronic format that is approved by the Agency POC and integrated across jurisdictional boundaries, that meets current standards, and that is compatible with SHPO systems. The Agency will submit this data to the SHPO in a timely fashion. Project proponents should submit cultural resources data on a regular basis to ensure that SHPO systems are kept up to date for reference as the different phases of the project proceed. Paper records may also be required by the agency.
- Cultural resources inventory procedures, specified in the CRMP, will include development of historic contexts based on the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716) sufficient to support the evaluation of cultural resources encountered in the APE.

<u>Government to Government Consultation</u>

- The appropriate agency, assisted by the applicant, must comply with all laws, policies, and regulations pertaining to government-to-government consultation with Federally recognized tribes. Agencies shall initiate consultation with affected tribes at the outset of project planning and shall continue consultation throughout project planning, construction, operation, and decommissioning. Consultation shall include, but not be limited to, the following:
    - Identification of potentially affected tribes;

  - Identification of appropriate tribal contacts and the preferred means of communication with these tribes;
  - Provision to the tribes of project-specific information (e.g., project proponents, maps, design features, proposed ROW routes, construction methods) at the outset of project planning and throughout the life of the project;
  - Identification of issues of concern specific to affected tribes (e.g., potential impacts to culturally sensitive areas or resources, hazard and safety management plans, treaty reserved rights and trust responsibilities);
  - Identification of areas and resources of concern to tribes; and
  - Resolution of concerns (e.g., actions to avoid, minimize, or mitigate impacts to important resources; Memoranda of Agreement stating what actions would be taken to mitigate project effects; or agreements for tribal participation in monitoring efforts or operator training programs).
- The appropriate agency, assisted by the applicant, must comply with all pertinent laws, policies, and regulations addressing cultural and other resources important to tribes, including the National Historic Preservation Act, the Archaeological Resources Protection Act, NAGPRA, and other laws and regulations.
- The agencies shall recognize the significance to tribes of traditional cultural places, such as sacred sites, sacred landscapes, gathering grounds, and burial areas, and shall seek to identify such areas through consultation with affected tribes early in the project planning process. Agencies shall seek to avoid, minimize, or mitigate impacts to such places in consultation with the tribes, project proponents, and other relevant parties. Where confidentiality concerning these areas is important to an affected tribe, agencies shall honor such confidentiality unless the tribe agrees to release the information.
- A protocol must be developed for inadvertent discovery of Native American human remains and funerary items to comply with the NAGPRA in consultation with appropriate Federally recognized tribes. Unexpected discovery of Native American human remains and funerary items during construction must be brought to the immediate attention of the BLM authorized officer. Work must be halted in the vicinity of the find of Native American graves and funerary items to avoid further disturbance to the resources while they are being evaluated and appropriate mitigation measures are being developed. The procedures for reporting items covered under NAGPRA must be identified in the CRMP.

Visual Resources

- Applicants shall identify and consider Visual Resource Management (VRM) issues early in the design process to facilitate integration of VRM into the overall site development program and construction documents. Visual management considerations, environmental analyses, mitigation planning, and design shall reference and be in accordance with the land management agency visual management policies and procedures applicable to the jurisdiction the project lies within. Applicants shall coordinate between multiple agencies on visual sensitive issues when projects transition from one jurisdiction to another, especially when transitions occur within a shared viewshed.
- Applicants shall prepare a VRM plan. The applicant's shall include an appropriately trained specialist, such as a landscape architect with demonstrated VRM experience. The VRM specialist shall coordinate with the BLM on the availability of the appropriate visual inventory data, VRM management class delineations, and Federal agency expectations for preparing project plans and mitigation strategies to comply with RMP direction related to visual resources. Applicants shall confirm that a current Visual Resource Inventory is available and that VRM classifications have been designated in the current land management plan. Project plans shall abide by the VRM class designations and consider sensitivities defined within the Visual Resource Inventory. If visual management objectives are absent, then the proper inventory and classification process shall be followed to develop them in accordance with the BLM VRM manual and handbooks. When the VRM classes are absent, then the project alternatives must reflect a range of management options related to visual resources that reflect the values identified in the visual inventory. Responsibility for developing an inventory or VRM classes will remain with the agency, but how to accomplish these tasks will be determined by the BLM authorized officer who will consider the applicant's role and financial participation in completing the work.

- Visual mitigation planning/design and analysis shall be performed through integrated field assessment, applied global positioning system technology, field photo documentation, use of computer-aided design and development software, 3-D modeling geographic information system software, and visual simulation software, as appropriate. Proposed activities, projects, and site development plans shall be analyzed and further developed using these technologies to meet visual objectives for the project area and surrounding areas sufficient to provide the full context of the viewshed. Visual simulations shall be prepared according to BLM Handbook H-8432-1, or other agency requirements, to create spatially accurate depictions of the appearance of proposed facilities, as reflected in the 3-D design models. Simulations shall depict proposed project appearance from sensitive/scenic locations as well as more typical viewing locations. Transmission towers, roads, compressor stations, valves, and other aboveground infrastructure should be integrated aesthetically with the surrounding landscape in order to minimize contrast with the natural environment.
- Applicants shall develop adequate terrain mapping on a landscape/viewshed scale for site planning/design, visual impact analysis, visual impact mitigation planning/design, and for full assessment and mitigation of cumulative visual impacts through applied, state-of-the-art design practices using the cited software systems. The landscape/viewshed scale mapping shall be geo-referenced and at the same Digital Elevation Model resolution and contour interval within the margin of error suitable for engineered site design. This level of mapping shall enable proper placement of proposed developments into the digital viewshed context. Final plans shall be field verified for compliance.
- The full range of visual best management practices (BMPs) shall be considered, and plans shall incorporate all pertinent BMPs. Visual resource monitoring and compliance strategies shall be included as a part of the project mitigation plans.

Public Health and Safety

- An electricity transmission project shall be planned by the applicant to comply with FAA regulations, including lighting regulations, and to avoid potential safety issues associated with proximity to airports, military bases or training areas, or landing strips.
- A health and safety program shall be developed by the applicant to protect both workers and the general public during construction, operation, and decommissioning of an energy transport project. The program should identify all applicable Federal and State occupational safety standards, establish safe work practices for each task (e.g., requirements for personal protective equipment and safety harnesses, Occupational Safety and Health Administration standard practices for safe use of explosives and blasting agents, measures for reducing occupational electric and magnetic fields exposures), and define safety performance standards (e.g., electrical system standards). The program should include a training program to identify hazard training requirements for workers for each task and establish procedures for providing required training to all workers. Documentation of training and a mechanism for reporting serious accidents to appropriate agencies should be established.
- The health and safety program shall establish a safety zone or setback from roads and other public access areas that is sufficient to prevent accidents resulting from various hazards. It should identify requirements for temporary fencing around staging areas, storage yards, and excavations during construction or decommissioning activities. It should also identify measures to be taken during the operations phase to limit public access to those components of energy facilities that present health or safety risks.

  Applicants shall develop a comprehensive emergency plan that considers the vulnerabilities of their energy system to all credible events initiated by natural causes (earthquakes, avalanches, floods, high winds, violent storms, etc.), human error, mechanical failure, cyber-attack, sabotage, or deliberate destructive acts of both domestic and international origin and the potential for and possible consequences of those events. Vulnerability, threat, and consequence assessment methodologies

and criteria in the sector-specific plan for energy[1] will be used and appropriate preemptive and mitigative response actions will be identified. The applicant must coordinate emergency planning with Tribal, State, and local emergency and public safety authorities and with owners and operators of other energy systems collocated in the corridor or in adjacent corridors that could also be impacted.

- In addition to directives contained in other BMPs herein, the applicant must identify all Federal, State, and local regulations pertaining to environmental protection, worker health and safety, public safety, and system reliability that are applicable throughout the construction, operation, and decommissioning phases of their facility's life cycle and must develop appropriate compliance strategies, including securing all necessary permits and approvals.

Hazardous Materials Management

- Applicants for petroleum pipelines and projects involving oil-filled electrical devices shall develop a spill prevention and response plan identifying spill prevention measures to be implemented, training requirements, appropriate spill response actions, and procedures for making timely notifications to authorities. The spill prevention and response plan should include identification of any sensitive biotic resources and locations (such as habitats) that require special measures to provide protection, as well as the measures needed to provide that protection.

Fire Management

- Applicants shall develop a fire management strategy and implement measures to minimize the potential for a human-caused fire during project construction, operation, and decommissioning. The strategy should consider the need to reduce hazardous fuels (e.g., native and non-native annual grasses and shrubs) and to prevent the spread of fires started outside or inside a corridor, and clarify who has responsibility for fire suppression and hazardous fuels reduction for the corridor.
- Applicants must work with the local land management agency to identify project areas that may incur heavy fuel buildups, and develop a long-term strategy on vegetation management of these areas. The strategy may include land treatment during project construction, which may extend outside the planned ROW clearing limits.

Project Construction

General

- To avoid conflict with Federal and non-Federal operations, the applicant shall be aware of liabilities pertaining to environmental hazards, safety standards, and military flying areas.
- The applicant shall locate all stationary construction equipment (i.e., compressors and generators) as far as practicable from nearby residences.
- Applicants shall pay fair market value to the land management agency for any merchantable forest products that will be cut during ROW clearing. The local land management agency will determine the fair market value, which will be paid prior to clearing. The applicant will either remove the forest products from the area or will stack the material at locations determined by the local land management agency. Treatment of unmerchantable products will be determined by the local land management agency.

Soils, Excavation and Blasting

- Applicants shall salvage, safeguard, and reapply topsoil from all excavations and construction activities during restoration.
- All areas of disturbed soil shall be restored by the applicant using weed-free native grasses, forbs, shrubs, and trees as directed by the agency. Restoration should not be unnecessarily delayed. If native species are not available, noninvasive vegetation recommended by agency specialists may be used.

[1] The sector-specific plan for energy, developed by the Department of Energy's Office of Electricity Delivery and Energy Reliability, is one of seventeen such SSPs that comprise the National Infrastructure Protection Plan. The energy sector-specific plan (redacted) is available at http://energy.gov/oe/downloads/energy-sector-specific-plan-annex-national-infrastructure-protection-plan. The National Infrastructure Protection Plan is available at http://www.dhs.gov/national-infrastructure-protection-plan.

- The applicant must not create excessive slopes during excavation. Areas of steep slopes, biological soil crusts, erodible soil, and stream channel crossings will often require site-specific and specialized construction techniques by the applicant. These specialized construction techniques should be implemented by adequately trained and experienced employees.
- Blasting activities will be avoided or minimized in the vicinity of sole source aquifer areas to reduce the risk of releasing sediments or particles into the groundwater and inadvertently plugging water supply wells.
- The applicant must backfill foundations and trenches with originally excavated material as much as possible. Excess excavation materials should be disposed of by the applicant only in approved areas.
- The applicant shall obtain borrow (fill) material only from authorized sites. Existing sites should be used in preference to new sites.
- The applicant shall prepare an explosives use plan that specifies the times and meteorological conditions when explosives will be used and specifies minimum distances from sensitive vegetation and wildlife or streams and lakes.
- If blasting or other noisy activities are required during the construction period, the applicant must notify nearby residents in advance.

Mitigation and Monitoring

- All control and mitigation measures established for the project in the Plan of Development (POD) and other required plans shall be maintained and implemented by the applicant throughout construction. Necessary adjustments may be made with the concurrence of the appropriate agency.

Surface and Groundwater Resources

- The applicant shall safeguard against the possibility of dewatering shallow groundwater and/or wetlands in the vicinity of project sites during foundation excavations or excavations for buried pipelines.
- The applicant shall implement erosion controls complying with Federal, State, and county standards, such as jute netting, silt fences, and check dams, and secure all necessary storm water pollution prevention plan (SWPPP) permits.
- The applicant shall minimize stream crossings by access roads to the extent practicable. All structures crossing intermittent and perennial streams should be located and constructed so that they do not decrease channel stability, increase water velocity, or impede fish passage.
- Applicants shall not alter existing drainage systems and should give particular care to sensitive areas such as erodible soils or steep slopes. Soil erosion should be reduced at culvert outlets by appropriate structures. Catch basins, roadway ditches, and culverts should be cleaned and maintained.
- Applicants must not create hydrologic conduits between aquifers.

Paleontological Resources

- Project construction activities will follow the protective measures and protocols identified in the paleontological resources mitigation plan.
- All paleontological specimens found on Federal lands remain the property of the US government. Specimens may only be collected by a qualified paleontologist under a permit issued by the managing agency and must be curated in an approved repository.

Ecological Resources

- Areas that are known to support Endangered Species Act-listed species, BLM-special-status species, and State-listed species or their habitats shall be identified and marked with flagging or other appropriate means to avoid direct impacts during construction activities. Construction activities upslope of these areas should be avoided to prevent indirect impacts of surface water and sediment runoff.
- All construction activities that could affect wetlands or waters of the United States shall be conducted in accordance with the requirements identified in permits issued by the US Army Corps of Engineers.

Visual Resources

- A pre-construction meeting with BLM landscape architects or other designated visual resource specialist shall be held before construction begins to coordinate on the VRM mitigation strategy and confirm the compliance-checking schedule and procedures. Applicants shall integrate interim/final reclamation VRM mitigation elements early in the construction, which may include treatments such as thinning and feathering vegetation along project edges, enhanced contour grading, salvaging landscape materials from within construction areas, special revegetation requirements, etc. Applicants shall coordinate with BLM in advance to have designated visual resource specialists onsite during construction to work with implementing BMPs.

Cultural Resources

- Project applicants shall provide all cultural resources reports and data in an approved electronic format that is integrated across jurisdictional boundaries, that meets current standards, and that is compatible with State Historic Preservation Officer (SHPO) systems. Project proponents shall submit cultural resources data on a regular basis to ensure that SHPO systems are kept up to date for reference as the different phases of the project proceed.
- When an area is identified as having a high potential for cultural resources but none are found during a pre-construction field survey, a professionally qualified cultural resources specialist will be required to monitor ground-disturbing activities during project construction, and to complete a report when the activities are finished. The protocol for monitoring should be identified in the Cultural Resources Management Plan (CRMP).
- When human remains, funerary objects, sacred objects, or objects of cultural patrimony are inadvertently discovered, the provisions of NAGPRA shall apply and the process identified in the CRMP must be followed.

Hazardous Materials and Wastewater Management

- Any wastewater generated by the applicant in association with temporary, portable sanitary facilities must be periodically removed on a schedule approved by the agency, by a licensed hauler, and introduced into an existing municipal sewage treatment facility. Temporary, portable sanitary facilities provided for construction crews should be adequate to support expected onsite personnel and should be removed at completion of construction activities.
- All hazardous materials (including vehicle and equipment fuels) brought to the project site will be in appropriate containers and will be stored in designated and properly designed storage areas with appropriate secondary containment features. Excess hazardous materials will be removed from the project site after completion of the activities in which they are used.

Air Emissions

- The applicant shall cover construction materials and stockpiled soils if these are sources of fugitive dust.
- To minimize fugitive dust generation, the applicant shall water land before and during surface clearing or excavation activities. Areas where blasting would occur should be covered with mats.

Noise

- The applicant shall limit noisy construction activities (including blasting) to the least noise-sensitive times of day (i.e., daytime only between 7 a.m. and 10 p.m.) and weekdays. The blasting period may be shortened during sage-grouse breeding and nesting or proximity to residences.

Fire Safety

- The applicant must ensure that all construction equipment used is adequately muffled and maintained and that spark arrestors are used with construction equipment in areas with, and during periods of, high fire danger.
- Flammable materials (including fuels) will be stored in appropriate containers.

Project Operation

Mitigation and Monitoring

- All control and mitigation measures established for the project shall be maintained and implemented by the applicant throughout the operation of the project. Necessary adjustments may be made with the concurrence of the BLM authorized officer.

Ecological Resources

- Project staff shall avoid harassment or disturbance of wildlife, especially during reproductive courtship, migratory, and nesting seasons.
- Observations by project staff of potential wildlife problems, including wildlife mortality, will be immediately reported to the applicable agency authorized officer.

Pesticide and Herbicide Use

- If pesticides are used, the applicant shall ensure that pesticide applications as specified in the integrated vegetation management plan are conducted within the framework of agency policies and entail only the use of EPA-registered pesticides that are applied in a manner consistent with label directions and State pesticide regulations. Pesticide use shall be limited to non-persistent immobile pesticides and shall be applied only in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications.
- Pesticide and herbicide uses must be avoided in the vicinity of sole source aquifer areas.

Visual Resources

- Terms and conditions for VRM mitigation compliance shall be maintained and monitored for compliance with visual objectives, with adaptive management adjustments and modifications as necessary, and approved by the BLM-authorized officer.

Hazardous Materials, Wastes, and Wastewater Management

- The applicant shall provide secondary containment for all on-site hazardous materials and waste storage areas.
- The applicant shall ensure that wastes are properly containerized and removed periodically for disposal at appropriate offsite permitted disposal facilities.
- In the event of an accidental release to the environment, the applicant shall initiate spill cleanup procedures and document the event, including a cause analysis; appropriate corrective actions taken; and a characterization of the resulting environmental or health and safety impacts. Documentation of the event shall be provided to the BLM authorized officer and other Federal and State agencies, as required.

Air Quality

- Dust abatement techniques (e.g., water spraying) shall be used by the applicant on unpaved, unvegetated surfaces to minimize airborne dust. Water for dust abatement should be obtained and used by the applicant under the appropriate State water use permitting system. Used oil will not be used for dust abatement.

Noise

- The applicant shall ensure that all equipment has sound-control devices no less effective than those provided on the original equipment.

Project Decommissioning

General

- Where applicable, decommissioning activities will conform to agency standards and guidance for mitigation and reclamation (e.g., the Gold Book, 4th Edition, 2007[2]).
- Applicants must receive approval for changes to the ROW authorization prior to any modifications to the ROW required for decommissioning.
- Gravel work pads will be removed; gravel and other borrow material brought to the ROW during construction will be disposed of as approved by the agency.
- Any wells constructed on the ROW to support operations may be removed and properly closed in accordance with applicable local or State regulations.
- All equipment, components, and above-ground structures shall be cleaned and removed from the site for reclamation, salvage, or disposal; all below-ground components shall be removed to a minimum depth of 3 feet to establish a root zone free of obstacles; pipeline segments and other components located at greater depths may be abandoned in place provided they are cleaned (of all residue) and filled with inert material to prevent possible future subsidence.
- Dismantled and cleaned components shall be promptly removed; interim storage of removed components or salvaged materials that is required before final disposition is completed will not occur on Federal land.
- At the close of decommissioning, applicants will provide the BLM authorized officer with survey data precisely locating all below grade components that were abandoned in place.

Mitigation and Monitoring

- All control and mitigation measures established for the project in the POD and other required plans shall be incorporated into a decommissioning plan that shall be approved by the BLM authorized officer); the decommissioning plan shall include a site reclamation plan and a monitoring program and shall be coordinated with owners and operators of other systems on the corridor to ensure no disruption to the operation of those systems.

Surface Water

- A SWPPP permit shall be obtained and its provisions implemented for all affected areas before any ground-disturbance activities commence.

Transportation

- Additional access roads needed for decommissioning shall follow the paths of access roads established during construction to the greatest extent possible; all access roads not required for the continued operation and maintenance of other energy systems present in the corridor shall be removed and their footprints reclaimed and restored.

Restoration

- Topsoil removed during decommissioning activities shall be salvaged and reapplied during final reclamation; all areas of disturbed soil shall be reclaimed using weed-free native shrubs, grasses, and forbs or other plant species approved by the BLM authorized officer; grades shall be returned to pre-development contours to the greatest extent feasible.
- The vegetation cover, composition, and diversity shall be restored to values commensurate with the ecological setting, as approved by the authorized officer.

Hazardous Materials and Waste Management

- All fuels, hazardous materials, and other chemicals shall be removed from the site and properly disposed of or reused.

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[2] Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, 4th Edition, revised 2007. Available electronically at http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices/gold_book.html.

- Incidental spills of petroleum products and other chemicals shall be removed and the affected area cleaned to meet applicable standards.
- Solid wastes generated during decommissioning shall be accumulated, transported, and disposed in permitted offsite facilities in accordance with State and local requirements; no solid wastes shall be disposed of within the footprint of the ROW or the corridor.
- Hazardous wastes generated as a result of component cleaning shall be containerized and disposed of in permitted facilities.

Minerals

Leasable Minerals

Geothermal Energy Development

The following best management practices (BMPs) are taken from the Record of Decision and Resource Management Plan Amendments for Geothermal Leasing in the Western United States (BLM, 2008b).

Information Collection and Monitoring

General

- Prior to geothermal exploration and development, a complete subsurface geotechnical investigation will be conducted to analyze the soil and geologic conditions. The investigation will evaluate and identify potential geologic hazards and would provide remedial grading recommendations, foundation and slab design criteria, and soil parameters for the design of geothermal power infrastructure.
- The operator will collect available information describing the environmental and socio-cultural conditions in the vicinity of the proposed project and will provide the information to the agency.
- A monitoring program will be developed by the operator to ensure that environmental conditions are monitored during the exploration and well drilling, testing, construction, and utilization and reclamation phases. The monitoring program requirements, including adaptive management strategies, will be established at the project level to ensure that potential adverse impacts of geothermal development are mitigated. The monitoring program will identify the monitoring requirements for each major environmental resource present at the site, establish metrics against which monitoring observations can be measured, identify potential mitigation measures, and establish protocols for incorporating monitoring observations and additional mitigation measures into ongoing activities. The operator will provide results of the monitoring program to the agency in an annual report.

Paleontological and Cultural Resources

- Before any specific permits are issued under leases, treatment of cultural resources will follow the procedures established by the Advisory Council on Historic Preservation for compliance with Section 106 of the National Historic Preservation Act. A pedestrian inventory will be undertaken of all portions that have not been previously surveyed or are identified by BLM as requiring inventory to identify properties that are eligible for the National Register of Historic Places (NRHP). Those sites not already evaluated for NRHP eligibility will be evaluated based on surface remains, subsurface testing, and archival and/or ethnographic sources. Subsurface testing will be kept to a minimum whenever possible if sufficient information is available to evaluate the site or if avoidance is an expected mitigation outcome. Recommendations regarding the eligibility of sites will be submitted to the BLM, and a treatment plan will be prepared to detail methods for avoidance of impacts or mitigation of impacts. The BLM will make determinations of eligibility and effect and consult with the State Historic Preservation Officer as necessary based on each proposed lease application and project plans. 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. Avoidance of impacts through project design will be given priority over data recovery as the preferred mitigation measure. Avoidance measures include moving project elements away from site locations or to areas of previous impacts, restricting travel to existing roads, and maintaining barriers and signs in areas of cultural sensitivity. Any data recovery will be preceded by

approval of a detailed research design, Native American consultation, and other requirements for BLM issuance of a permit under the Archaeological Resources Protection Act.

- If cultural resources are present at the site, or if areas with a high potential to contain cultural material have been identified, a Cultural Resources Management Plan (CRMP) will be developed. This plan will address mitigation activities to be taken for cultural resources found at the site. Avoidance of the area is always the preferred mitigation option. Other mitigation options include archaeological survey and excavation (as warranted) and monitoring. If an area exhibits a high potential, but no artifacts were observed during an archaeological survey, monitoring by a qualified archaeologist could be required during all excavation and earthmoving in the high potential area. A report will be prepared documenting these activities. The CRMP also will:
  - Establish a monitoring program,
  - Identify measures to prevent potential looting/vandalism or erosion impacts, and
  - Address the education of workers and the public to make them aware of the consequences of unauthorized collection of artifacts and destruction of property on public land.
- Operators will determine whether paleontological resources exist in a project area on the basis of the sedimentary context of the area, a records search for past paleontological finds in the area, and/or, depending on the extent of existing information, a paleontological survey.
- If paleontological resources are present at the site, or if areas with a high potential to contain paleontological material have been identified, a paleontological resources management plan will be developed. This plan will include a mitigation plan for avoidance, removal of fossils, or monitoring. If an area exhibits a high potential but no fossils were observed during survey, monitoring by a qualified paleontologist may be required during excavation and earthmoving in the sensitive area. The operator will submit a report to the agency documenting these activities. The paleontological resources management plan also will:
  - Establish a monitoring program,
  - Identify measures to prevent potential looting/vandalism or erosion impacts, and
  - Address the education of workers and the public to make them aware of the consequences of unauthorized collection of fossils on public land.

Water Resources

- In coordination with State regulatory agencies the operator will comply with all Federal and State surface and ground water rules and regulations for all phases of geothermal exploration, development, and reclamation.
- Operators will develop a storm water management plan for the site to ensure compliance with applicable regulations and prevent off-site migration of contaminated storm water or increased soil erosion.
- Operators will gain a clear understanding of the local hydrogeology. Areas of groundwater discharge and recharge and their potential relationships with surface water bodies will be identified.
- Operators will avoid creating hydrologic conduits between discrete aquifers during foundation excavation and other activities.
- Freshwater-bearing and other usable water aquifers will be protected from contamination by assuring all well casing (excluding the liner) is required to be cemented from the casing shoe to the surface.
- Periodic testing and monitoring via observation wells will be conducted in a manner to assure maximum protection of water resources from geothermal fluids or alterations in reservoir pressure.

Vegetation and Fish and Wildlife

- The operator will conduct surveys for plant and animal species that are listed or proposed for listing as threatened or endangered and their habitats in areas proposed for development where these species could potentially occur, following accepted protocols and in consultation with the US Fish and Wildlife Service or National Marine Fisheries Service, as appropriate. Particular care should be taken to avoid disturbing listed species during surveys in any designated critical habitat. The operator will monitor activities and their effects on Endangered Species Act-listed species throughout the duration of the project.
- The operator will identify important, sensitive, or unique habitat and biota in the project vicinity and site and should design the project to avoid (if possible), minimize, or mitigate potential impacts on

these resources. The design and siting of the facilities will follow appropriate guidance and requirements from the BLM and other resource agencies, as available and applicable.

National Scenic and Historic Trails

- When any right-of-way application includes remnants of a National Historic Trail, is located within the viewshed of a National Historic Trail's designated centerline, or includes or is within the viewshed of a trail eligible for listing on the National Register of Historic Places, the operator will evaluate the potential visual impacts to the trail associated with the proposed project and identify appropriate mitigation measures for inclusion in the operation plan.

Air Quality and Climate

- The operator will coordinate with the State Air Quality Division to develop and implement an air quality monitoring plan.

Planning, Location, And Design

Traffic Planning

- Operators will consult with local planning authorities regarding increased traffic prior to the construction phase, including an assessment of the number of vehicles per day, their size, and type. Specific issues of concern (e.g., location of school bus routes and stops) will be identified and addressed in the traffic management plan.

Roads and Pads

- To plan for efficient use of the land, necessary infrastructure will be consolidated wherever possible.
- Existing roads and pad sites will be used to the maximum extent feasible, but only if located in a safe and environmentally sound location. No new roads and pad sites will be constructed without agency authorization. If new roads and pad sites have been authorized, they will be designed and constructed by the operator to the appropriate agency standard, no higher than necessary to accommodate their intended function. Roads and pad sites will be routinely maintained by the operator to maintain public safety and to minimize impacts to the environment such as erosion, sedimentation, fugitive dust, and/or loss of vegetation.
- An access road siting and management plan will be prepared incorporating existing Agency standards regarding road design, construction, and maintenance such as those described in the BLM 9113 Manual and the *Surface Operating Standards for Oil and Gas Exploration and Development* (i.e., the Gold Book, 4th Edition, 2007).
- A traffic management plan will be prepared for the site access roads to ensure that no hazards would result from the increased truck traffic and that traffic flow would not be adversely impacted. This plan will incorporate measures such as informational signs, flaggers when equipment may result in blocked throughways, and traffic cones to identify any necessary changes in temporary lane configuration.
- Where possible, access roads will be located to follow natural contours and minimize side hill cuts and fills. Excessive grades on roads, road embankments, ditches, and drainages will be avoided, especially in areas with erodible soils.
- Roads will be designed so that changes to surface water runoff are minimized and new erosion is not initiated.
- Access roads will be located to minimize stream crossings. All structures crossing streams will be located and constructed so that they do not decrease channel stability or increase water velocity. Operators will obtain all applicable Federal and State water crossing permits.
- Roads will be located away from drainage bottoms and avoid wetlands, if practicable.

Geotechnical Analysis

- The operator will perform a detailed geotechnical analysis prior to the construction of any structures; so they will be sited to avoid any hazards from subsidence or liquefaction (i.e., the changing of a saturated soil from a relatively stable solid state to a liquid during earthquakes or nearby blasting).

Visual Design Considerations

- The operator will incorporate visual design considerations into the planning and design of the project to minimize potential visual impacts of the proposal and to meet the Visual Resource Management objectives including:
  - Construct low-profile structures whenever possible to reduce structure visibility.
  - Select and design materials and surface treatments to repeat or blend with landscape elements.
  - Site projects outside of the viewsheds of publicly accessible vantage points, or if this cannot be avoided, as far away as possible.
  - Site projects to take advantage of both topography and vegetation as screening devices to restrict views of projects from visually sensitive areas.
  - Site facilities away from and not adjacent to prominent landscape features (e.g., knobs and water features).
  - Avoid placing facilities on ridgelines, summits, or other locations such that they will be silhouetted against the sky from important viewing locations.
  - Co-locate facilities to the extent possible to use existing and shared rights-of-way (ROWs), existing and shared access and maintenance roads, and other infrastructure to reduce visual they do not bisect ridge tops or run down the center of valley bottoms.
  - Site linear features (aboveground pipelines, ROWs, and roads) to follow natural land contours rather than straight lines (particularly up slopes) when possible. Fall-line cuts should be avoided.
  - Site facilities, especially linear facilities, to take advantage of natural topographic breaks (i.e., pronounced changes in slope) to avoid siting facilities on steep side slopes.
  - Where available, site linear features such as ROWs and roads to follow the edges of clearings (where they will be less conspicuous) rather than passing through the centers of clearings.
  - Site facilities to take advantage of existing clearings to reduce vegetation clearing and ground disturbance, where possible.
  - Site linear features (e.g., trails, roads, rivers) to cross other linear features at right angles whenever possible to minimize viewing area and duration.
  - Site and design structures and roads to minimize and balance cuts and fills and to preserve existing rocks, vegetation, and drainage patterns to the maximum extent possible.
  - Use appropriately colored materials for structures or appropriate stains and coatings to blend with the project's backdrop. Refer to the Standard Environmental Colors chart available from the BLM.
  - Use non-reflective or low-reflectivity materials, coatings, or paints whenever possible.
  - Paint grouped structures the same color to reduce visual complexity and color contrast.
  - Design and install efficient facility lighting so that the minimum amount of lighting required for safety and security is provided but not exceeded and so that upward light scattering (light pollution) is minimized. This may include, for example, installing shrouds to minimize light from straying off-site, properly directing light to only illuminate necessary areas, and installing motion sensors to only illuminate areas when necessary.
  - Site construction staging areas and laydown areas outside of the viewsheds of publicly accessible vantage points and visually sensitive areas, where possible, including siting in swales, around bends, and behind ridges and vegetative screens.
  - Discuss visual impact mitigation objectives and activities with equipment operators prior to commencement of construction activities.
  - Mulch or scatter slash from vegetation removal and spread it to cover fresh soil disturbances or, if not possible, bury or compost slash.
  - If slash piles are necessary, stage them out of sight of sensitive viewing areas.
  - Avoid installing gravel and pavement where possible to reduce color and texture contrasts with existing landscape.
  - Use excess fill to fill uphill-side swales resulting from road construction in order to reduce unnatural-appearing slope interruption and to reduce fill piles.
  - Avoid downslope wasting of excess fill material.
  - Round road-cut slopes, vary cut and fill pitch to reduce contrasts in form and line, and vary slope to preserve specimen trees and nonhazardous rock outcroppings.
  - Leave planting pockets on slopes where feasible.

- Combine methods of re-establishing native vegetation through seeding, planting of nursery stock, transplanting of local vegetation within the proposed disturbance areas, and staging of construction enabling direct transplanting.
- Revegetate with native vegetation establishing a composition consistent with the form, line, color, and texture of the surrounding undisturbed landscape.
- Provide benches in rock cuts to accent natural strata.
- Use split-face rock blasting to minimize unnatural form and texture resulting from blasting.
- Segregate topsoil from cut and fill activities and spread it on freshly disturbed areas to reduce color contrast and to aid rapid revegetation.
- Bury utility cables in or adjacent to the road where feasible.
- Minimize signage and paint or coat reverse sides of signs and mounts to reduce color contrast with existing landscape.
- Prohibit trash burning; store trash in containers to be hauled off-site for disposal.
- Undertake interim restoration during the operating life of the project as soon as possible after disturbances. During road maintenance activities, avoid blading existing forbs and grasses in ditches and along roads.
- Randomly scarify cut slopes to reduce texture contrast with existing landscape and to aid in revegetation.
- Cover disturbed areas with stockpiled topsoil or mulch, and revegetate with a mix of native species selected for visual compatibility with existing vegetation.
- Restore rocks, brush, and natural debris whenever possible to approximate preexisting visual conditions.

Air Quality and Climate

- The operator will prepare and submit to the agency an Equipment Emissions Mitigation Plan for managing diesel exhaust. An Equipment Emissions Mitigation Plan will identify actions to reduce diesel particulate, carbon monoxide, hydrocarbons, and nitrogen oxides associated with construction and drilling activities. The Equipment Emissions Mitigation Plan will require that all drilling/construction related engines are maintained and operated as follows:
  - Are tuned to the engine manufacturer's specification in accordance with an appropriate time frame.
  - Do not idle for more than five minutes (unless, in the case of certain drilling engines, it is necessary for the operating scope).
  - Are not tampered with in order to increase engine horsepower.
  - Include particulate traps, oxidation catalysts, and other suitable control devices on all drilling/construction equipment used at the project site.
  - Use diesel fuel having a sulfur content of 15 parts per million or less, or other suitable alternative diesel fuel, unless such fuel cannot be reasonably procured in the market area.
  - Include control devices to reduce air emissions. The determination of which equipment is suitable for control devices should be made by an independent Licensed Mechanical Engineer. Equipment suitable for control devices may include drilling equipment, work over and service rigs, mud pumps, generators, compressors, graders, bulldozers, and dump trucks.

Health and Safety

- Operators will develop a hazardous materials management plan addressing storage, use, transportation, and disposal of each hazardous material anticipated to be used at the site. The plan will identify all hazardous materials that would be used, stored, or transported at the site. It will establish inspection procedures, storage requirements, storage quantity limits, inventory control, nonhazardous product substitutes, and disposition of excess materials. The plan will also identify requirements for notices to Federal and local emergency response authorities and include emergency response plans.
- Operators will develop a waste management plan identifying the waste streams that are expected to be generated at the site and addressing hazardous waste determination procedures, waste storage locations, waste-specific management and disposal requirements, inspection procedures, and waste minimization procedures. This plan will address all solid and liquid wastes that may be generated at the site.

- Operators will develop a spill prevention and response plan identifying where hazardous materials and wastes are stored on site, spill prevention measures to be implemented, training requirements, appropriate spill response actions for each material or waste, the locations of spill response kits on site, a procedure for ensuring that the spill response kits are adequately stocked at all times, and procedures for making timely notifications to authorities.
- A safety assessment will be conducted to describe potential safety issues and the means that would be taken to mitigate them, including issues such as site access, construction, safe work practices, security, heavy equipment transportation, traffic management, emergency procedures, and fire control.
- A health and safety program will be developed to protect both workers and the general public during construction and operation of geothermal projects.
- The safety program will identify all applicable Federal and State occupational safety standards; establish safe work practices for each task (e.g., requirements for personal protective equipment and safety harnesses; Occupational Safety and Health Administration standard practices for safe use of explosives and blasting agents; and measures for reducing occupational electric and magnetic fields exposures); establish fire safety evacuation procedures; and define safety performance standards (e.g., electrical system standards and lightning protection standards). The program will include a training program to identify hazard training requirements for workers for each task and establish procedures for providing required training to all workers. Documentation of training and a mechanism for reporting serious accidents to appropriate agencies will be established.
- The health and safety program will establish a safety zone or setback for generators from residences and occupied buildings, roads, ROWs, and other public access areas that is sufficient to prevent accidents resulting from the operation of generators. It will identify requirements for temporary fencing around staging areas, storage yards, and excavations during construction or rehabilitation activities. It will also identify measures to be taken during the operation phase to limit public access to hazardous facilities (e.g., permanent fencing would be installed only around electrical substations, and facility access doors would be locked).
- Operators will consult with local planning authorities regarding increased traffic during the construction phase, including an assessment of the number of vehicles per day, their size, and type. Specific issues of concern (e.g., location of school bus routes and stops) will be identified and addressed in the traffic management plan.
- Operators will develop a fire management strategy to implement measures to minimize the potential for a human-caused fire.

Livestock Grazing

- The operator will coordinate with livestock operators to minimize impacts to livestock operations.

Noxious Weeds and Pesticides

- Operators will develop a plan for control of noxious weeds and invasive plant species, which could occur as a result of new surface disturbance activities at the site. The most recent recommendations at the State and local level should be incorporated into any operating plan for the geothermal exploration and development. The plan will address monitoring, education of personnel on weed identification, the manner in which weeds spread, and methods for treating infestations. The use of certified weed-free mulching will be required. If trucks and construction equipment are arriving from locations with known invasive vegetation problems, a controlled inspection and cleaning area will be established to visually noxious weed and inspect construction equipment arriving at the project area and to remove and collect seeds that may be adhering to tires and other equipment surfaces.
- If pesticides are used on the site, an integrated pest management plan will be developed to ensure that applications would be conducted within the framework of all Federal, State, and local laws and regulations and entail only the use of Environmental Protection Agency-registered pesticides.

Vegetation and Fish and Wildlife

- The operator will prepare a habitat restoration plan to avoid (if possible), minimize, or mitigate negative impacts on wildlife while maintaining or enhancing habitat values for other species. The plan will identify revegetation, soil stabilization, and erosion reduction measures that will be implemented

to ensure that all temporary use areas are restored. The plan will require that restoration occur as soon as possible after completion of activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.

Construction

Traffic Management

- Traffic will be restricted to the roads developed for the project. Use of other unimproved roads will be restricted to emergency situations.
- Signs will be placed along roads to identify speed limits, travel restrictions, and other standard traffic control information. Signs directing vehicles to alternate park access and parking will be posted in the event construction temporarily obstructs recreational parking areas near trailheads. Whenever active work is being performed, the area will be posted with “construction ahead” signs on any adjacent access roads or trails that might be affected.
- Project personnel and contractors will be instructed and required to adhere to speed limits commensurate with road types, traffic volumes, vehicle types, and site-specific conditions, to ensure safe and efficient traffic flow and to reduce wildlife collisions and disturbance and fugitive dust.
- When practical, construction activities will be avoided during high recreational use periods.

Roads and Pads

- The operator will obtain agency authorization prior to using soil or rock material from agency lands. Road use will be restricted during the wet season if road surfacing is not adequate to prevent soil displacement, rutting, etc., and resultant stream sedimentation.
- Access roads and on-site roads will be surfaced with aggregate materials where necessary to provide a stable road surface, support anticipated traffic, reduce fugitive dust, and prevent erosion.
- Dust abatement techniques will be used before and during surface clearing, excavation, or blasting activities. Dust abatement techniques will be used on unpaved, unvegetated surfaces to minimize fugitive dust. Speed limits (e.g., 25 mph) will be posted and enforced to reduce fugitive dust. Construction materials and stockpiled soils will be covered if they are a source of fugitive dust.
- Culvert outlets will be rip-rapped to dissipate water energy at the outlet and reduce erosion. Catch basins, roadway ditches, and culverts will be cleaned and maintained regularly.

Pipelines

- Pipelines constructed above ground due to thermal gradient induced expansion and contraction will rest on cradles above ground level, allowing small animals to pass underneath. Projects should be analyzed to ensure adequate passage for all wildlife species. The pipeline will be raised higher to allow wildlife passage where needed. Because pipeline corridors through certain habitat types can alter local predator-prey dynamics by providing predators with lines of sight and travel corridors, large projects should be analyzed to ensure there will be no significant changes to predator-prey balance.

Utilities

- Underground utilities will be installed to minimize the amount of open trenches at any given time, keeping trenching and backfilling crews close together. Avoid leaving trenches open overnight. Where trenches cannot be back-filled immediately, escape ramps should be constructed at least every 100 feet.

Specific Resources

Cultural and Paleontological Resources

- Unexpected discovery of cultural or paleontological resources during construction will be brought to the attention of the BLM authorized officer immediately. Work will be halted in the vicinity of the find to avoid further disturbance to the resources while they are being evaluated and appropriate mitigation measures are being developed.

Noise

- The operator will take measurements to assess the existing background noise levels at a given site and compare them with the anticipated noise levels associated with the proposed project.
- Within two miles of existing, occupied residences, geothermal well drilling or major facility construction operations will be restricted to non-sleeping hours (7:00 am to 10:00 pm).
- All equipment will have sound-control devices no less effective than those provided on the original equipment. All construction equipment used will be adequately muffled and maintained.
- All stationary construction equipment (i.e., compressors and generators) will be located as far as practicable from nearby residences.
- If blasting or other noisy activities are required during the construction period, nearby residents will be notified by the operator at least one hour in advance.
- Explosives will be used only within specified times and at specified distances from sensitive wildlife or streams and lakes, as established by the Federal and State agencies.

Noxious Weeds and Pesticides

- The use of certified, weed-free mulch will be required when stabilizing areas of disturbed soil.
- If trucks and construction equipment are arriving from locations with known noxious weeds or invasive vegetation problems, a controlled inspection and cleaning area will be established to visually inspect construction equipment arriving at the project area and to remove and collect seeds that may be adhering to tires and other equipment surfaces.
- Fill materials and road surfacing materials that originate from areas with known noxious weeds and invasive vegetation problems will not be used.
- Revegetation, habitat restoration, and weed control activities will be initiated as soon as possible after construction activities are completed.
- Use of pesticides must be approved by the agency. Pesticide use will be limited to agency-approved pesticides and will only be applied in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications.

Waste Management

- All refueling will occur in a designated fueling area that includes a temporary berm to limit the spread of any spill.
- Drip pans will be used during refueling to contain accidental releases.
- Drip pans will be used under fuel pump and valve mechanisms of any bulk fueling vehicles parked at the construction site.
- Any containers used to collect liquids will be enclosed or screened to prevent access to contaminants by wildlife, livestock, and migratory birds.
- Spills will be immediately addressed per the spill management plan, and soil cleanup and removal initiated as soon as feasible.

Wild Horses and Burros

- The operator will ensure employees, contractors, and site visitors avoid harassment and disturbance of wild horses and burros, especially during reproductive (e.g., breeding and birthing) seasons. In addition, any pets will be controlled to avoid harassment and disturbance of wild horses and burros.
- Observations of potential problems regarding wild horses or burros, including animal mortality, will be immediately reported to the agency.

Wildlife

- The operator will ensure that employees, contractors, and site visitors avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship and nesting) seasons. In addition, pets will be controlled or excluded to avoid harassment and disturbance of wildlife.
- Ponds, tanks, and impoundments (including but not limited to drill pits) containing liquids can present hazards to wildlife. Any liquids contaminated by substances which may be harmful due to toxicity or fouling of the fur or feathers (detergents, oils), should be excluded from wildlife access by fencing, netting, or covering at all times when not in active use. Liquids at excessive temperature should

likewise be excluded. If exclusion is not feasible, such as a large pond, a hazing program based on radar or visual detection, in conjunction with formal monitoring, should be implemented. Clean water impoundments can also present a trapping hazard if they are steep-sided or lined with smooth material. All pits, ponds, and tanks should have escape ramps functional at any reasonably anticipated water level, down to almost empty. Escape ramps can take various forms depending on the configuration of the impoundment. Earthen pits may be constructed with one side sloped 3:1 or greater; lined ponds can use textured material; straight-sided tanks can be fitted with expanded metal escape ladders.

Operations/Utilization

- "Good housekeeping" procedures will be developed by the operator to ensure that during all phases of operation, the site will be kept clean of noxious weeds, debris, litter, garbage, fugitive trash or waste, and graffiti. Scrap heaps and dumps are prohibited. Storage yards are to be minimized to that which is absolutely necessary.

Reclamation

The following objectives, performance standards, and recommended reclamation BMPs and mitigation measures are based on the standards and guidelines found in the BLM Gold Book, 4th Edition, updated in 2007.

Reclamation Objectives

- The objective of interim reclamation is to restore vegetative cover and a portion of the landform sufficient to maintain healthy, biologically active topsoil; control erosion; and minimize habitat, visual, and forage loss during the life of the well or facilities.
- The long-term objective of final reclamation is to return the land to a condition approximating that which existed prior to disturbance. This includes restoration of the landform and natural vegetative community, hydrologic systems, visual resources, and wildlife habitats. To ensure that the long-term objective will be reached through human and natural processes, actions will be taken to ensure standards are met for site stability, visual quality, hydrological functioning, and vegetative productivity.

Reclamation Performance Standards

The following reclamation performance standards will be met:

Interim Reclamation:

- Includes disturbed areas that may be redisturbed during operations and will be redisturbed at final reclamation to achieve restoration of the original landform and a natural vegetative community.
- Disturbed areas not needed for active, long-term production operations or vehicle travel have been recontoured, protected from erosion, and revegetated with a self-sustaining, vigorous, diverse, native (or as otherwise approved) plant community sufficient to minimize visual impacts, provide forage, stabilize soils, and impede the invasion of noxious, invasive, and non-native weeds.

Final Reclamation:

- Includes disturbed areas where the original landform and a natural vegetative community have been restored.
- The original landform has been restored for all disturbed areas including well pads, production facilities, roads, pipelines, and utility corridors.
- **General:** A self-sustaining, vigorous, diverse, native (or otherwise approved) plant community is established on the site, with a density sufficient to control erosion and invasion by noxious weeds and invasive plants and to reestablish wildlife habitat or forage production. At a minimum, the established plant community will consist of species included in the seed mix and/or desirable species occurring in the surrounding natural vegetation.
- **Specific:** No single species will account for more than 30% total vegetative composition unless it is evident at higher levels in the adjacent landscape. Permanent vegetative cover will be determined successful when the basal cover of desirable perennial species is at least [80]% of the basal cover on adjacent or nearby undisturbed areas where vegetation is in a healthy condition; or [80]% of the

potential basal cover as defined in the National Resource Conservation Service Ecological Site(s) for the area. Plants must be resilient as evidenced by well-developed root systems and flowers. [Shrubs will be well established and in a "young" age class at a minimum (therefore, not comprised mainly of seedlings that may not survive until the following year).]

- In agricultural areas, irrigation systems and soil conditions are reestablished in such a way as to ensure successful cultivation and harvesting of crops.
- Erosion features are equal to or less than surrounding area and erosion control is sufficient so that water naturally infiltrates into the soil and gullying, headcutting, slumping, and deep or excessive rills (greater than three inches) are not observed.
- The site is free of State- or county-listed noxious weeds, oil field debris and equipment, and contaminated soil. Noxious weeds and invasive plants are controlled.

Reclamation Actions

- During initial well pad, production facility, road, pipeline, and utility corridor construction and prior to completion of the final well on the well pad, pre-interim reclamation stormwater management actions will be taken to ensure disturbed areas are quickly stabilized to control surface water flow and to protect both the disturbed and adjacent areas from erosion and siltation. This may involve construction and maintenance of temporary silt ponds, silt fences, berms, ditches, and mulching.
- When the last well on the pad has been completed, some portions of the well location will undergo interim reclamation and some portions of the well pad will usually undergo final reclamation. Most well locations will have limited areas of bare ground, such as a small area around production facilities or the surface of a rocked road. Other areas will have interim reclamation where work over rigs and fracturing tanks may need a level area to set up in the future. Some areas will undergo final reclamation where portions of the well pad will no longer be needed for production operations and can be recontoured to restore the original landform.
- The following minimum reclamation actions will be taken to ensure that the reclamation objectives and standards are met. It may be necessary to take additional reclamation actions beyond the minimum in order to achieve the Reclamation Standards.

Reclamation - General

Procedure:

- The agency will be notified 24 hours prior to commencement of any reclamation operations.

Housekeeping:

- Immediately upon well completion, the well location and surrounding areas(s) will be cleared of, and maintained free of, all debris, materials, trash, and equipment not required for production.
- No hazardous substances, trash, or litter will be buried or placed in pits. Upon well completion, any hydrocarbons in the pit will be remediated or removed.

Vegetation Clearing:

- Vegetation removal and the degree of surface disturbance will be minimized wherever possible.
    - Example of site-specific requirement: During vegetation clearing activities, trees and woody vegetation removed from the well pad and access road will be moved aside prior to any soil disturbing activities. Care will be taken to avoid mixing soil with the trees and woody vegetation. Trees left for wood gathering will be cut 12 inches or less from the ground, delimbed, and the trunks, 6 inches or more in diameter will be removed and placed either by the uphill side of the access road, or moved to the end of the road, or to a road junction for easy access for wood gatherers and to reduce vehicle traffic on the well pad. Trees with a trunk diameter less than six inches and woody vegetation will be used to trap sediment, slow runoff, or scattered on reclaimed areas to stabilize slopes, control erosion, and improve visual resources.

Topsoil Management:

- Operations will disturb the minimum amount of surface area necessary to conduct safe and efficient operations. When possible, equipment will be stored and operated on top of vegetated ground to minimize surface disturbance.

- In areas to be heavily disturbed, the top eight inches of soil material, will be stripped and stockpiled around the perimeter of the well location to control run-on and run-off, and to make redistribution of topsoil more efficient during interim reclamation. Stockpiled topsoil may include vegetative material. Topsoil will be clearly segregated and stored separately from subsoils.
- Earthwork for interim and final reclamation will be completed within 6 months of well completion or plugging unless a delay is approved in writing by the BLM authorized officer.
- Salvaging and spreading topsoil will not be performed when the ground or topsoil is frozen or too wet to adequately support construction equipment. If such equipment creates ruts in excess of four inches deep, the soil will be deemed too wet.
- No major depressions will be left that would trap water and cause ponding.

Seeding:

Seedbed Preparation

- Initial seedbed preparation will consist of recontouring to the appropriate interim or final reclamation standard. All compacted areas to be seeded will be ripped to a minimum depth of 18 inches with a minimum furrow spacing of two feet, followed by recontouring the surface and then evenly spreading the stockpiled topsoil. Prior to seeding, the seedbed will be scarified and left with a rough surface.
- If broadcast seeding is to be used and is delayed, final seedbed preparation will consist of contour cultivating to a depth of four to six inches within 24 hours prior to seeding, dozer tracking, or other imprinting in order to loosen up the soil and create seed germination micro-sites.

Seed Application

- Seeding will be conducted no more than 24 hours following completion of final seedbed preparation. A certified weed free seed mix designed by BLM to meet reclamation standards will be used.
- No seeding will occur from [May 15 to September 15]. Fall seeding is preferred and will be conducted after [September 15] and prior to ground freezing. [Shrub species will be seeded separately and will be seeded during the winter.] Spring seeding will be conducted after the frost leaves the ground and no later than [May 15].

Erosion Control and Mulching:

- Mulch, silt fencing, waddles, hay bales, and other erosion control devices will be used on areas at risk of soil movement from wind and water erosion.
- Mulch will be used if necessary to control erosion, create vegetation micro-sites, and retain soil moisture and may include hay, small grain straw, wood fiber, live mulch, cotton, jute, or synthetic netting. Mulch will be free from mold, fungi, and certified free of noxious or invasive weed seeds.
- If straw mulch is used, it will contain fibers long enough to facilitate crimping and provide the greatest cover.

Pit Closure:

- Reserve pits will be closed and backfilled within 60days of release of the rig. All reserve pits remaining open after 60 days will require written authorization of the authorized officer. Immediately upon well completion, any hydrocarbons or trash in the pit will be removed. Pits will be allowed to dry, be pumped dry, or solidified in-situ prior to backfilling.
- Following completion activities, pit liners will be completely removed or removed down to the solids level and disposed of at an approved landfill, or treated to prevent their reemergence to the surface and interference with long-term successful revegetation. If it was necessary to line the pit with a synthetic liner, the pit will not be trenched (cut) or filled (squeezed) while containing fluids. When dry, the pit will be backfilled with a minimum of five feet of soil material. In relatively flat areas the pit area will be slightly mounded above the surrounding grade to allow for settling and to promote surface drainage away from the backfilled pit.

Management of Noxious Weeds and Invasive Plants:

- All reclamation equipment will be cleaned prior to use to reduce the potential for introduction of noxious weeds or other undesirable non-native species.
- An intensive weed monitoring and control program will be implemented prior to site preparation for planting and will continue until interim or final reclamation is approved by the authorized officer.

- Monitoring will be conducted at least annually during the growing season to determine the presence of any noxious weeds and invasive plant species. Noxious weeds and invasive plant species that have been identified during monitoring will be promptly treated and controlled. A Pesticide Use Proposal will be submitted to the BLM for approval prior to the use of herbicides.

Interim Reclamation Procedures

Recontouring:

- Interim reclamation actions will be completed no later than six months from when the final well on the location has been completed, weather permitting. The portions of the cleared well site not needed for active operational and safety purposes will be recontoured to the original contour if feasible, or if not feasible, to an interim contour that blends with the surrounding topography as much as possible. Sufficient semi-level area will remain for setup of a workover rig and to park equipment. In some cases, rig anchors may need to be pulled and reset after recontouring to allow for maximum interim reclamation.
- If the well is a producer, the interim cut and fill slopes prior to reseeding will not be steeper than a 3:1 ratio, unless the adjacent native topography is steeper. Note: Constructed slopes may be much steeper during drilling, but will be recontoured to the above ratios during interim reclamation.
- Roads and well production equipment will be placed on location so as to permit maximum interim reclamation of disturbed areas. If equipment is found to interfere with the proper interim reclamation of disturbed areas, the equipment will be moved so proper recontouring and revegetation can occur.

Application of Topsoil and Revegetation:

- Topsoil will be evenly re-spread and aggressively revegetated over the entire disturbed area not needed for all-weather operations including road cuts and fills and to within a few feet of the production facilities, unless an all-weather, surfaced, access route or small “teardrop” turnaround is needed on the well pad.
- In order to inspect and operate the well or complete workover operations, it may be necessary to drive, park, and operate equipment on restored, interim vegetation within the previously disturbed area. Damage to soils and interim vegetation will be repaired and reclaimed following use. To prevent soil compaction, under some situations, such as the presence of moist, clay soils, the vegetation and topsoil will be removed prior to workover operations and restored and reclaimed following workover operations.

Visual Resources:

- Trees, if present, and vegetation will be left along the edges of the pads whenever feasible to provide screening.
- To help mitigate the contrast of recontoured slopes, reclamation will include measures to feather cleared lines of vegetation and to save and redistribute cleared trees, debris, and rock over recontoured cut and fill slopes.
- To reduce the view of production facilities from visibility corridors and private residences, facilities will not be placed in visually exposed locations (such as ridgelines and hilltops)
- Production facilities will be clustered and placed away from cut slopes and fill slopes to allow the maximum recontouring of the cut and fill slopes.
- All long-term, above-ground structures will be painted [Covert Green] (from the Standard Environmental Colors chart) to blend with the natural color of the late summer landscape background.

Final Reclamation Procedures

- Final reclamation actions will be completed within six months of well plugging, weather permitting.
- All disturbed areas, including roads, pipelines, pads, production facilities, and interim reclaimed areas will be recontoured to the contour existing prior to initial construction or a contour that blends indistinguishably with the surrounding landscape. Re-salvaged topsoil will be re-spread evenly over the entire disturbed site to ensure successful revegetation. To help mitigate the contrast of recontoured slopes, reclamation will include measures to feather cleared lines of vegetation and to save and redistribute cleared trees, woody debris, and large rocks over recontoured cut and fill slopes.

- Water breaks and terracing will only be installed when absolutely necessary to prevent erosion of fill material. Water breaks and terracing are not permanent features and will be removed and reseeded when the rest of the site is successfully revegetated and stabilized.
- If necessary to ensure timely revegetation, the pad will be fenced to BLM standards to exclude livestock grazing for the first two growing seasons or until seeded species become firmly established, whichever comes later. End panels and 'H' braces for fencing will meet standards found on page 18 of the BLM Gold Book, 4th Edition. Metal "T" posts should be approximately 16.5 feet apart. Wire spacing for three strand fence would be bottom wire smooth 16 inches above ground, second strand 26 inches above ground, top strand 38 inches above ground. Wire spacing for strand fence (bottom wire smooth 16 inches above ground, second strand 22 inches above ground, third strand 28 inches above ground, and top strand not to exceed 40 inches above ground) to allow big game movements. In sage-grouse habitat the top strand will be marked with permanent markers to reduce sage-grouse collisions with the fence. Operational electric fence may be used in lieu of barbed wire fences. The top strand of electric fence would not exceed 42 inches. The electric fence has multiple wires bottom strand should be 20 inches or more above ground. If exclusion of big game is needed an eight foot tall fence could be constructed.
- Final abandonment of pipelines and flowlines will involve flushing and properly disposing of any fluids in the lines. All surface lines and any lines that are buried close to the surface that may become exposed in the foreseeable future due to water or wind erosion, soil movement, or anticipated subsequent use, must be removed. Deeply buried lines may remain in place unless otherwise directed by the authorized officer.

Reclamation Monitoring and Final Abandonment Approval

- Reclaimed areas will be monitored annually. Actions will be taken to ensure that reclamation standards are met as quickly as reasonably practical.
- Reclamation monitoring will be documented in an annual reclamation report submitted to the authorized officer by [March 1]. The report will document compliance with all aspects of the reclamation objectives and standards, identify whether the reclamation objectives and standards are likely to be achieved in the near future without additional actions, and identify actions that have been or will be taken to meet the objectives and standards. The report will also include acreage figures for: Initial Disturbed Acres; Successful Interim Reclaimed Acres; Successful Final Reclaimed Acres. Annual reports will not be submitted for sites approved by the authorized officer in writing as having met interim or final reclamation standards. Monitoring and reporting continues annually until interim or final reclamation is approved. Any time 30% or more of a reclaimed area is redisturbed, monitoring will be reinitiated.
- The authorized officer will be informed when reclamation has been completed, appears to be successful, and the site is ready for final inspection.

Salable Minerals

Ongoing Authorizations/Activities (i.e., an authorization has been issued)

- Minimize the spread of noxious weed and invasive plant species caused by moving infested gravel and fill material (e.g., close the pit, treat infested areas).

Proposed Authorizations/Activities

- Locate new salable mineral developments in annual or non-native grass communities rather than in native plant communities where practical.
- For gravel pits in big game or sage-grouse winter or breeding habitat, schedule blasting, crushing, screening, and other operations from mid-June through November.
- Issue decorative rock permits in big game or sage-grouse winter or breeding habitat so rock gathering occurs between mid-June and November. Monitoring of the pit areas in big game or sage-grouse habitat should include the monitoring of unauthorized routes to other areas that have rock. Sign unauthorized routes as closed.

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APPENDIX B: AQUATIC AND RIPARIAN MANAGEMENT STRATEGY

Introduction

The Aquatic and Riparian Management Strategy (ARMS) consolidates the Bureau of Land Management (BLM) Jarbidge Field Office guidance and programmatic direction for watershed and sub-watershed riparian and aquatic conservation and restoration. This strategy conforms to the direction issued on August 21, 2008 for implementation of the Aquatic and Riparian Habitat component of the Interior Columbia Basin Strategy and Aquatic Framework (USFS et al., 2008). Conservation of aquatic wildlife, plants, and habitats are considered together with the full array of broad-scale ecosystem components addressed by the strategy, which includes landscape dynamics, terrestrial source habitats, aquatic species, and riparian and hydrologic processes. The Approved Jarbidge Resource Management Plan (RMP) balances short-term risks to aquatic and other resources with long-term benefits through goals, objectives, and management actions designed to move these resources toward a natural variability of conditions or desired conditions. The Guidance for Developing Aquatic Conservation Strategies for BLM Resource Management Plans in the Interior Columbia Basin (BLM, 2008a) was referred to during the creation of the ARMS.

The ARMS contains the following key components:

- Establishment of Riparian Conservation Areas where aquatic and riparian-dependent resources receive management emphasis;
- Priorities for Conservation and Restoration of Special Status Species Habitat and Riparian Areas;
- Identification of population strongholds of special status fish and areas with priority for restoration of aquatic and riparian habitats;
- Aquatic and riparian management direction including goals, objectives, and management actions;
- Provisions for multi-scale analysis and how it will be used in project-level decisions; and
- Monitoring and adaptive management for determining if the plan is being implemented and is achieving desired results.

The guidance in this strategy was created to support the goals, objectives, and management actions identified in the ROD/RMP for *Water Resources*, *Riparian Areas and Wetlands*, *Fish*, and *Special Status Species* (specifically the *Management for Special Status Species in Riparian Areas, Wetlands, and Streams* section). The BLM adopted the Inland Native Fish Strategy (INFISH) (USDA, 1995) in bull trout occupied watersheds in an Instruction Memorandum (IM-ID-96-010). The justification for BLM to apply the ARMS to watersheds containing other special status aquatic species, such as redband trout, is included in the BLM Policy Manual 6840 and the BLM Land Use Planning Handbook (H-1610-1).

Riparian Conservation Areas[1]

Riparian Conservations Areas (RCAs) are portions of watersheds where riparian-dependent resources receive management emphasis and are likely to affect aquatic habitat condition or function. RCAs include riparian corridors, wetlands, intermittent headwater streams, and other areas where proper ecological function is essential for maintaining water, sediment, woody debris, and nutrient delivery to streams and either contain or are tributaries to streams that contain special status species or their habitat. Functionally, RCAs 1) influence the delivery of coarse sediment, organic matter, and woody debris to streams; 2) accommodate vegetation that provides root strength for channel stability; 3) provide streamside shade; and 4) protect water quality. Management of RCAs is designed to maintain and restore riparian structure and function; benefit fish and riparian-dependent resources; enhance conservation of organisms dependent on the transition zone between upslope and instream habitats; and improve connectivity of travel and dispersal corridors for terrestrial animals, plants, and aquatic organisms.

[1] This section addresses material for Component I, Riparian Conservation Areas, in the Guidance for Developing Aquatic Conservation Strategies (BLM, 2008a).

The values considered when identifying and managing RCAs may be specific to the riparian area or stream channel. The ARMS allows for adjusting management of RCAs to reflect site-specific conditions (e.g., conditions of specific stream channels, the life stage of specific fish), while also recognizing watershed (e.g., watershed characteristics and land uses) and riparian conditions and trends. RCAs are not intended to be treated as "no management zones" since treatments may be essential to achieving or maintaining desired riparian conditions.

Riparian Conservation Area Widths

RCA widths are to be adequate to protect the stream from non-channelized sediment inputs, to deliver organic matter and woody debris, and to provide stream shade and streambank stability. In the absence of a watershed or site-specific analysis, the default RCA widths for the stream categories described below will be applied. These default widths were recommended in INFISH (USDA, 1995) and the Interior Columbia Basin Science Assessment and literature review (Quigley and Arbelbide, 1997), which concluded that these prescribed RCA widths are sufficient to provide for riparian function.

Category 1—Fish-bearing Streams:

Category 1 RCAs contain the stream and the area from the edges of the active channel, on either edge of the stream, to the top of the inner gorge, the outer edges of the 100-year floodplain, the outer edges of the riparian vegetation, or 300 feet slope distance (600 feet, including both sides of the stream channel), whichever is widest.

Category 2—Permanently Flowing Non Fish-bearing Streams:

Category 2 RCAs contain the stream and the area from the edges of the active channel, on either edge of the stream, to the top of the inner gorge, the outer edges of the 100-year floodplain, the outer edges of the riparian vegetation, or 150 feet slope distance (300 feet, including both sides of the stream channel), whichever is widest.

Category 3—Ponds, Lakes, Reservoirs, and Wetlands Greater than One Acre:

Category 3 RCAs contain the body of water or wetland and the area from the edges of the body of water or wetland to the outer edges of the riparian vegetation, the extent of the seasonally saturated soil, or to the extent of moderately or highly unstable areas, or 150 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs or from the edge of the wetland, pond, or lake, whichever is widest.

Category 4—Seasonally Flowing or Intermittent Streams and Wetlands Less than One Acre; Landslides and Landslide-prone Areas:

This category includes features with high variability in size and site-specific characteristics. Category 4 RCAs for intermittent streams contain the intermittent stream channel and the area from the edges of the channel to the top of the inner gorge, the outer edges of the riparian vegetation, or 50 feet slope distance, whichever is greatest. Category 4 RCAs for wetlands less than one acre contain the wetland and the area from the edges of the wetland to the outer edges of the riparian vegetation or 50 feet slope distance, whichever is greatest. Category 4 RCAs for landslides or landslide-prone areas contain the landslide or landslide-prone area and the area within 50 feet slope distance, whichever is widest.

Modification of Riparian Conservation Area Widths

Modification of RCA widths requires a watershed- or reach-specific analysis to provide the ecological basis for the change (see the *Watershed Analysis* section below). The RCAs may be modified in the absence of watershed analysis where stream reach or site-specific data support the change. A watershed or reach-specific determination is not a decision process; it provides information that would support RCA width modification. Modifying RCA widths will be determined using scientific information in combination with local knowledge and information on riparian and aquatic processes and functions, resource values, and risks. Because stream channel characteristics can vary substantially between geographic areas, RCA modification needs to consider ecological and geomorphic factors of the specific reach.

Modification of RCA widths may occur during project-level planning or implementation of management activities that could affect attainment of the riparian objectives. Changes to RCA widths, along with information that explains the change, would be documented in the project file. Pertinent site-specific, stream reach, and watershed values (e.g., specific riparian or aquatic characteristics, slope, soils, etc.) would be addressed in the rationale for modifying RCAs.

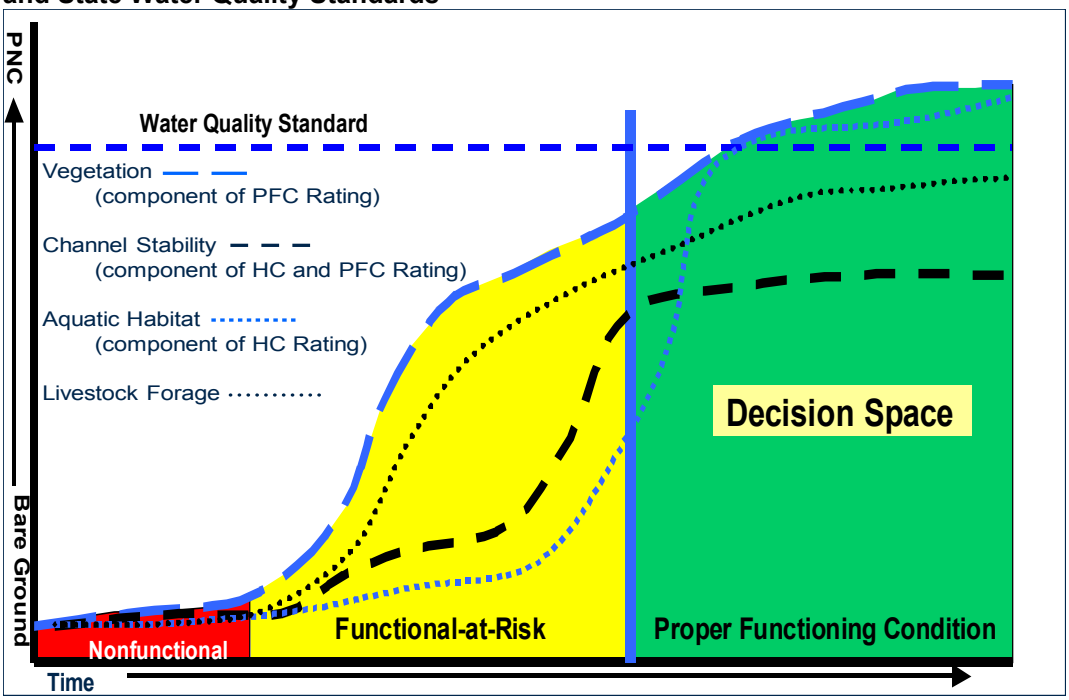
Priorities for Conservation and Restoration of Special Status Species Habitat and Riparian Areas[2]

Introduction

Relationship between Measures of Instream and Riparian Habitat Condition

Conditions within and near streams can be described from various perspectives. Assessments can focus on the condition of riparian areas, instream habitat for specific species, as well as water quality, and can be based on qualitative or quantitative data. Within the Jarbidge Field Office, data are available to describe riparian conditions in terms of proper functioning condition (PFC), special status fish habitat conditions in terms of habitat condition (HC), and water quality impaired streams as identified by Idaho Department of Environmental Quality and Nevada Division of Environmental Protection. These measures are all interrelated; some measures are even based on similar types of data. The relationships between these condition measures are displayed in Figure B-1.

Figure B-1. The Relationship between Riparian Functional Condition, Aquatic Habitat Condition, and State Water Quality Standards



As vegetation improves from non-functional to functional at risk, there is little improvement in the other resource values (e.g., vegetation, channel stability). There is an increased recovery rate of all the resource values within the functioning at risk (FAR) range as the stream channel begins to stabilize and vegetation and aquatic habitat values improve. At PFC, the stream channel stabilizes at a point when the vegetation, water, and landform are in a relative balance. After a stream reach has reached PFC, vegetation continues toward the potential natural community (PNC), livestock forage increases, and

[2] This section addresses material for Component II, Protection of Population Strongholds, and Component IV, Restoration Priorities and Guidance, in Guidance for Developing Aquatic Conservation Strategies (BLM, 2008a).

aquatic habitat improves. Improvement in water quality to levels that would result in the delisting of water quality impaired streams and attainment of designated beneficial uses would not occur until riparian condition improved beyond the initial rating of PFC. When the riparian area is functioning properly, there is an opportunity to make decisions as to the use or uses that will be emphasized.

Indicators of Instream and Riparian Habitat Condition

Indicators of instream and riparian habitat conditions form the basis for instream HC ratings and riparian PFC ratings. HC ratings were used to identify population strongholds for special status fish and determine priorities for special status fish habitat restoration (see *Special Status Fish Habitat* section), while PFC ratings were used to assess priority for riparian restoration (see *Riparian Habitat* section).

The indicators used to develop these ratings include an integrated suite of aquatic (including a biological component), riparian (including riparian-associated terrestrial species), and hydrologic (including uplands) condition measures that are primarily intended to be used at the watershed and sub-watershed scale and include both quantitative and qualitative measures. These watersheds and sub-watersheds are typically 5th to 6th field Hydrologic Unit Codes; both will be referred to as “watersheds” in the ARMS. These indicators are intended to serve three main purposes:

- To establish priorities and objectives for conservation or restoration of stream reaches;
- To design projects and determine the appropriateness of management activities with respect to aquatic, riparian, and hydrologic goals and objectives; and
- To serve as measures of the effectiveness of management in attaining broad-scale aquatic, riparian, and hydrologic goals and objectives.

The values for an indicator to be rated as functioning appropriately are not absolute criteria and are rated in comparison to the functional, ecological, or biological conditions of specific stream reaches. The indicators should be used as a suite of integrated indicators and should not be used individually as fixed targets to manage toward or as specific thresholds from which to make project implementation decisions. The indicators should be used to design or mitigate ongoing and proposed activities in order to move watersheds toward desired resource objectives. If certain indicators highlight a concern in a watershed, proposed activities could be modified or designed to take into account the resource concerns or determine when an action is needed to achieve goals and objectives.

HC ratings, PFC ratings, and the values for the indicators on which these ratings are based can be updated based on monitoring, inventory, scientific literature, or watershed analysis by local experts (e.g., fisheries biologist, ecologist, botanist, and/or hydrologist). Updates may be necessary to more accurately depict the characteristics and range of natural variability of aquatic and riparian habitats in the planning area or to reflect changes in condition on the ground. Instream and riparian indicators and thresholds may be refined at the watershed scale to illustrate the variability of conditions among watersheds within a landscape context.

The current status of instream and riparian habitat condition indicators is based on BLM stream survey data collected between 1999 and 2007; the majority of these data were collected between 2002 and 2006. BLM-managed lands in the planning area are continuous across watershed and sub-watershed boundaries except in a few areas of private and State inholdings and military withdrawals. This land ownership pattern allows for inventory and monitoring efforts to be conducted across broad areas where public land comprises the majority of the land base. Additional details on the methods used to collect and analyze the baseline data can be found in the Analysis of the Management Situation of the BLM Twin Falls District, Jarbidge Field Office (BLM, 2007a). How these indicators were used to develop priorities for special status fish habitat restoration and riparian restoration are described below.

Special Status Fish Habitat

Identifying Conservation and Restoration Reaches provides a means for prioritizing management and for establishing goals, objectives, and management actions for stream reaches containing special status fish habitat. It also provides a process that considers opportunities for conservation and restoration, with consideration for the availability of staff and budgetary resources. Some stream reaches will not be

restored to physical or biological potential within the life of the plan because of effects of past land management actions or activities outside the authority of the BLM. These stream reaches would have reduced priority for restoration treatment.

Conservation Reaches

Conservation Reaches are managed to maintain the condition of habitats in these reaches. Conservation Reaches are often associated with aquatic species strongholds and contain populations or subpopulations of high genetic integrity, connectivity, or potential for expansion into nearby stream reaches. Conservation Reaches are located in watersheds that often have watershed processes or functions that are relatively undisturbed and natural in setting. Hydrologic function, such as sediment routing and flow regimes, are within the natural range of frequency, duration, and intensity. Water quality generally meets the designated beneficial uses. Land uses and human activities minimally influence aquatic and hydrologic function, as indicated by low road density and few stream crossings. Examples of areas containing Conservation Reaches include wilderness, roadless areas, and undeveloped sub-watersheds; however, Conservation Reaches or portions thereof may be subject to management that allows land uses while maintaining natural processes. The goal is to maintain the existing condition of the habitats within these reaches.

In Conservation Reaches, management allows natural disturbance because vegetation composition and structure that trend outside the historic range of variability due to fire suppression may pose a risk to ecological processes. Management in Conservation Reaches may rely on active management to conserve physical and biological processes and patterns. For example, active management to conserve hydrologic and biological processes maintains roads and trails in a condition that minimizes erosion and sedimentation to nearby streams and water bodies. Passive management can also be effective for meeting habitat objectives. As a general rule, minimal investment in these watersheds over time is necessary to maintain function and critical elements on instream and upland habitat in these watersheds.

The criteria for identifying Conservation Reaches, which have important value for protecting populations of special status fish, are described in the *Habitat Dependency Network (Decision Support Model) and Habitat Condition Ratings* section below. There are currently several stream reaches in the planning area meeting the criteria for designation as Conservation Reaches for special status species. The intent of this designation and management for these watersheds is to provide high-quality habitat for species and support the expansion and recolonization of species into adjacent watersheds. These areas should conserve key processes likely to influence the persistence of metapopulations (core populations) and interconnected sub-populations of special status fish.

Restoration Reaches

Restoration Reaches are identified where biological and physical processes and functions do not reflect natural conditions because of past and on-going land disturbances. Common effects of disturbances to Restoration Reaches may include long-term (e.g., decades) increases of sediment input to streams, loss of large woody debris recruitment potential, altered hydrologic (e.g., streamflow) patterns, and elevated water temperatures. Cumulative impacts and natural disturbances such as large fires, landslides, and floods exacerbate altered watershed and biological conditions. The goal for these stream reaches is to restore habitat condition to an identified desired condition.

Active management may be necessary to restore the physical and biological function of systems to their natural range of variability. Identifying and assessing the impacts of management on habitat focuses restoration efforts to achieve goals and objectives for hydrologic and biological recovery. Within some Restoration Reaches, opportunities for active restoration management may be limited. In those cases, management that reduces or avoids adverse effects and does not delay the achievement of desired resource objectives in the long term also supports the restoration goal. In some instances, BLM managers will exercise individual discretion to balance short-term risks to aquatic and other resources with long-term benefits for multiple resources in order to move these reaches toward the natural range of variability.

The criteria used to identify Restoration Reaches and priorities for restoration of those reaches are described in the *Habitat Dependency Network (Decision Support Model) and Habitat Condition Ratings* section below. Priority rating (high, moderate, and low) for each Restoration Reach was based on habitat condition indicators, Endangered Species Act status, restoration feasibility, the extent of habitat, and relative fish abundance. Characteristics of Restoration Reaches within the three priority types are described below.

High Priority

High Priority Restoration Reaches have potential for highly productive or unique fish communities with restoration efforts. Loss of connected populations or competition or hybridization with non-native species has caused the loss of diversity of some unique populations of special status fish. The assumption is that the aquatic community is largely intact but is not resilient to landscape disturbance events, nor does it provide a source of individuals to nearby recovering populations.

Water quality may not support all designated beneficial uses or municipal water supplies.

Moderate Priority

Moderate Priority Restoration Reaches have potential for moderately productive fish habitat with restoration efforts. Long-term loss of connected populations or competition or hybridization with non-native species has caused the loss of diversity of some unique special status fish populations. The assumption is that the aquatic community is largely intact but is not resilient to landscape disturbance events, nor does it provide a source of individuals to nearby recovering populations.

Water quality may not support all designated beneficial uses or municipal water supplies.

Low Priority

Low Priority Restoration Reaches have a minor amount of fish habitat. Long-term loss of connected populations or competition or hybridization with non-native species has caused the loss of diversity of special status fish populations. The assumption is that the aquatic community is not intact, is not resilient to natural events, and does not provide a source of individuals to nearby recovering populations. Low priority restoration reaches also include reaches that are rated as PFC. These reaches are in a condition where the stream channel is functioning properly and therefore are a low priority for restoration.

Water quality may not support all designated beneficial uses, and municipal water is not considered as a future use.

Habitat Dependency Network (Decision Support Model) and Habitat Condition Ratings

Habitat dependency networks are used in decision support models to prioritize stream reaches containing special status species habitat based on instream and riparian habitat indicators, which reflect overall watershed condition. NetWeaver[3] was used as the decision support model for identifying Conservation and Restoration Reaches in the planning area. Thresholds for habitat functionality for each riparian and stream indicator were developed based on scientific literature, information gathered in the 2006 Jarbidge fish survey, and other habitat data for bull trout. The indicators and thresholds for bull trout and redband trout used in the NetWeaver analysis are provided in Table B-1 and Table B-2; these tables are based on the Matrix of Diagnostics/Pathways and Indicators of watershed and aquatic conditions developed by the National Marine Fisheries Service and adapted by the US Fish and Wildlife Service for use in watersheds containing bull trout (FWS, 1998). Indicator thresholds were validated using habitat and fish abundance data for stream reaches within the planning area.

[3] NetWeaver was developed by The Heron Group LLC.

Table B-1. Bull Trout Habitat Condition Indicators and Thresholds

Indicator Category	Indicator	Thresholds		
		Functioning Appropriately	**Functioning at Risk**	**Functioning at Unacceptable Risk**
Indicators for Species Characteristics				
Subpopulation Characteristics within Subpopulation Watersheds	Subpopulation Size	Mean total subpopulation size or local habitat capacity more than several thousand individuals. All life stages evenly represented in the subpopulation.[A]	< 500 but > 50 adults in subpopulation[A]	< 50 adults in subpopulation[A]
	Growth and Survival	Subpopulation has the resilience to recover from short-term disturbances (e.g., catastrophic events) or subpopulation declines within one to two generations (5 to 10 years).[A] The subpopulation is characterized as increasing or stable. At least 10 years of data support this estimate.[B]	When disturbed, the subpopulation will not recover to pre-disturbance conditions within one generation (5 years). Survival or growth rates have been reduced from those in the best habitats. The subpopulation is reduced in size, but the reduction does not represent a long-term trend.[A] At least 10 years of data support this characterization.[B] If less data are available and a trend cannot be confirmed, a subpopulation will be considered "at risk" until enough data are available to accurately determine trend.	The subpopulation is characterized as in rapid decline or is maintaining at alarmingly low numbers. Under current management, the subpopulation condition will not improve within two generations (5 to 10 years).[A] This is supported by a minimum of 5 years of data.
	Life History Diversity and Isolation	The migratory form is present, and the subpopulation exists in close proximity to other spawning and rearing groups. Migratory corridors and rearing habitat (lakes or large rivers) are in good to excellent condition for the species. Neighboring subpopulations are large with high likelihood of producing surplus individuals or straying	The migratory form is present but the subpopulation is not close to other subpopulations or habitat disruption has produced a strong correlation among subpopulations that do exist in proximity to each other.[A]	The migratory form is absent and the subpopulation is isolated to the local stream or small watershed not likely to support more than 2,000 fish.[A]

Indicator Category	Indicator	Thresholds		
		Functioning Appropriately	**Functioning at Risk**	**Functioning at Unacceptable Risk**
Subpopulation Characteristics within Subpopulation Watersheds		adults that will mix with other subpopulations.[A]		
	Persistence and Genetic Integrity	Connectivity is high among multiple (5 or more) subpopulations with at least several thousand fish each. Each of the relevant subpopulations has low risk of extinction.[A] The probability of hybridization or displacement by competitive species is low to nonexistent.	Connectivity among multiple subpopulations does occur, but habitats are more fragmented. Only one or two of the subpopulations represent most of the fish production.[A] The probability of hybridization or displacement by competitive species is imminent, although few documented cases have occurred.	Little or no connectivity remains for reestablishing subpopulations in low numbers, in decline, or nearing extirpation. Only a single subpopulation or several local populations that are very small or that otherwise are at high risk remain.[A] Competitive species readily displace bull trout. The probability of hybridization is high and documented cases have occurred.
Indicators for Habitat Characteristics				
Water Quality	Temperature	Mean maximum weekly temperature in a reach during the following life history stages:[A,C]		
		Incubation		
		2 - 5ºC	< 2ºC or = 6ºC	< 1ºC or > 6ºC
		Rearing		
		4 - 12ºC	< 4ºC or 13 - 15ºC	> 15ºC
		Spawning		
		4 - 9ºC	< 4ºC or = 10ºC	< 4ºC or > 10ºC
		Also, temperatures in areas used by adults during migration do not exceed 15ºC (no thermal barriers).	Also, temperatures in areas used by adults during migration sometimes exceed 15ºC.	Also, temperatures in areas used by adults during migration regularly exceed 15ºC (thermal barriers present).
	Sediment[D]	Similar to chinook salmon[A] (e.g., < 12% fines (< 0.85 mm) in gravel[E]); < 12% surface fines[F] (≤ 6 mm[G,H])	Similar to chinook salmon[A] (e.g., 12 - 17% fines (< 0.85 mm) in gravel[E]); 12-20% surface fines[F] (≤ 6 mm[G,H])	Similar to chinook salmon[A] (e.g., > 17% fines (< 0.85 mm) in gravel[E]); > 20% fines at surface or depth in spawning habitat[F] (≤ 6 mm[G,H])
	Chemical Contamination/ Nutrients	Low levels of chemical contamination from agricultural, industrial, and other sources; no excess nutrients; and no water quality impaired reaches.[I]	Moderate levels of chemical contamination from agricultural, industrial, and other sources; some excess nutrients; and one water quality impaired	High levels of chemical contamination from agricultural, industrial, and other sources; high levels of excess nutrients; and more than one water quality

Indicator Category	Indicator	Thresholds		
		Functioning Appropriately	**Functioning at Risk**	**Functioning at Unacceptable Risk**
			reach.[I]	impaired reach.[I]
Habitat Access	Physical Barriers[J]	Man-made structures present in watershed allow upstream and downstream fish passage at all flows.	Man-made structures present in watershed do not allow upstream and/or downstream fish passage at base/low flows.	Man-made structures present in watershed do not allow upstream and/or downstream fish passage at a range of flows.
Habitat Elements	Substrate Embeddedness[K]	Reach embeddedness < 20%.[F,L]	Reach embeddedness 20 - 30%.[F,L]	Reach embeddedness > 30%.[F,L]
	Large Woody Debris (LWD)[S]	LWD levels are commensurate with the vegetation potential of the surrounding landscape and contributing to high quality and complex habitat including deep pools and stable streambanks. Future LWD recruitment is occurring at a natural rate and not reduced by land management activities.	LWD is contributing to high quality and complex habitat commensurate with the vegetation potential of the surrounding landscape, but at rates below natural recruitment. Future LWD recruitment to the RCA is locally reduced by land management activities.	LWD contribution to habitat complexity is well below what is expected from the natural recruitment potential of the surrounding landscape. Future LWD recruitment to the RCA is reduced at a landscape scale by land management activities.
	Pool Frequency and Quality	Pool frequency in a reach closely approximated:[G] Wetted Width (ft) / # Pools/ Mile 0-5 / 39 5-10 / 60 10-15 / 48 15-20 / 39 20-30 / 23 30-35 / 18 35-40 / 10 40-65 / 9 65-100 / 4 Pools have good cover and cool water[E]; only minor reduction of pool volume by fine sediment.	Pool frequency is similar to values in "functioning appropriately," but pools have inadequate cover/temperature,[E] and/or there has been a moderate reduction of pool volume by fine sediment.	Pool frequency is considerably lower than values desired for "functioning appropriately;" also, cover/temperature is inadequate,[E] and there has been a major reduction of pool volume by fine sediment.
	Large Pools[N]	Each reach has many large pools > 1 meter deep.[E]	Each reach has few large pools > 1 meter deep.[E]	Reaches have no large pools > 1 meter deep.[E]
	Off-Channel	Watershed has many	Watershed has some	Watershed has few or

Indicator Category	Indicator	Thresholds		
		Functioning Appropriately	**Functioning at Risk**	**Functioning at Unacceptable Risk**
	Habitat	ponds, oxbows, backwaters, and other off-channel areas with cover, and side-channels are low-energy areas.[E]	ponds, oxbows, backwaters, and other off-channel areas with cover, but side-channels are generally high-energy areas.[E]	no ponds, oxbows, backwaters, or other off-channel areas.[E]
	Refugia	Habitats capable of supporting strong and significant populations are protected and are well distributed and connected for all life stages and forms of the species.[O,P]	Habitats capable of supporting strong and significant populations are insufficient in size, number and connectivity to maintain all life stages and forms of the species.[O,P]	Habitat refugia do not exist.[O]
Channel Condition and Dynamics	Average Wetted Width/ Maximum Depth Ratio in Scour Pools in a Reach	≤ 10[F,G]	11 - 20[G]	> 20[G]
	Streambank Condition	> 80% of any stream reach has ≥ 90% stability.[G]	50 - 80% of any stream reach has ≥ 90% stability.[G]	< 50% of any stream reach has ≥ 90% stability.[G]
	Floodplain Connectivity	Off-channel areas are frequently hydrogically linked to main channel; overbank flows occur and maintain wetland functions and riparian vegetation/ succession.	Reduced linkage of wetland, floodplains, and riparian areas to main channel; overbank flows are reduced relative to historic frequency, as evidenced by moderate degradation of wetland function and riparian vegetation/ succession.	Severe reduction in hydrologic connectivity between off-channel, wetland, floodplain, and riparian areas; wetland extent drastically reduced and riparian vegetation/succession altered significantly.
Flow/ Hydrology	Change in Peak/Base Flows	Watershed hydrograph indicates peak flow, base flow, and flow timing characteristics comparable to an undisturbed watershed of similar size, geology, and geography.	Some evidence of altered peak flow, base flow, and/or flow timing relative to an undisturbed watershed of similar size, geology, and geography.	Pronounced changes in peak flow, base flow, and/or flow timing relative to an undisturbed watershed of similar size, geology, and geography.
	Increase in Drainage	Zero or minimum increases in active	Low to moderate increase in active	Greater than moderate increase in active

Indicator Category	Indicator	Thresholds		
		Functioning Appropriately	**Functioning at Risk**	**Functioning at Unacceptable Risk**
	Network	channel length correlated with human caused disturbance.	channel length correlated with human caused disturbance.	channel length correlated with human caused disturbance.
Watershed Condition	Road Density and Location	< 1mi/mi^{2} [P]; no valley bottom roads.	1 - 2.4 mi/mi^{2} [P]; some valley bottom roads.	> 2.4 mi/mi^{2} [P]; many valley bottom roads.
	Disturbance History	< 15% of entire watershed with no concentration of disturbance in unstable or potentially unstable areas, refugia, and/or riparian areas.[Q]	< 15% of entire watershed but disturbance concentrated in unstable or potentially unstable areas, refugia, and/or riparian areas.[Q]	> 15% of entire watershed and disturbance concentrated in unstable or potentially unstable areas, refugia, and/or riparian areas.
Watershed Condition	Riparian Conservation Areas (RCAs)	RCAs provide adequate shade, large woody debris recruitment, and habitat protection and connectivity in sub-watersheds and buffers or include known refugia for Sensitive aquatic species (> 80% intact) and adequately buffer impacts on rangelands. Percent similarity of riparian vegetation to the potential natural community(PNC)/ composition is > 50%.[R]	RCAs have moderate loss of connectivity or function (shade, LWD recruitment, etc.) or provide incomplete protection of habitats and refugia for Sensitive aquatic species (70 - 80% intact) and adequately buffer impacts on rangeland. Percent similarity of riparian vegetation to the PNC/composition is 25 - 50% or better.[R]	RCAs are fragmented or poorly connected or provide inadequate protection of habitats for Sensitive aquatic species (< 70% intact, refugia do not occur) and inadequately buffer impacts on rangelands. Percent similarity of riparian vegetation to the PNC/ composition is < 25%.[R]
	Disturbance Regime	Environmental disturbance is short lived; predictable hydrograph, high-quality habitat and watershed complexity providing refuge and rearing space for all life stages or multiple life-history forms.[A] Natural processes are stable.	Scour events, debris torrents, or catastrophic fire are localized events that occur in several minor parts of the watershed. Resiliency of habitat to recover from environmental disturbances is moderate.	Frequent flood or drought, producing highly variable and unpredictable flows, scour events, debris torrents, or high probability of catastrophic fire exists throughout a major part of the watershed. The channel is simplified, providing little hydraulic complexity in the form of pools or side channels.[A] Natural processes are unstable.

Indicator Category	Indicator	Thresholds		
		Functioning Appropriately	**Functioning at Risk**	**Functioning at Unacceptable Risk**
Summary of Species and Habitat Conditions	NA	Habitat quality and connectivity among subpopulations is high. The migratory form is present. Disturbance has not altered channel equilibrium. Fine sediments and other habitat characteristics influencing survival or growth are consistent with pristine habitat. The subpopulation has the resilience to recover from short-term disturbance within one to two generations (5 to 10 years). The subpopulation is fluctuating around equilibrium or is growing.[A]	Fine sediments, stream temperatures, or the availability of suitable habitats have been altered and will not recover to pre-disturbance conditions within one generation (5 years). Survival or growth rates have been reduced from those in the best habitats. The subpopulation is reduced in size, but the reduction does not represent a long-term trend. The subpopulation is stable or fluctuating in a downward trend. Connectivity among subpopulations occurs, but habitats are fragmented.[A]	Cumulative disruption of habitat has resulted in a clear declining trend in the subpopulation size. Under current management, habitat conditions will not improve within two generations (5 to 10 years). Little or no connectivity remains among subpopulations. The subpopulation survival and recruitment responds sharply to normal environmental events.[A]

[A] (Rieman and McIntyre, 1993).
[B] (Rieman and Meyers, 1997).
[C] (Buchanan and Gregory, 1997).
[D] Applies to areas of spawning and incubation. Rearing areas are addressed under Substrate Embeddedness indicator.
[E] (WTFWCMERC, 1993).
[F] Inland Native Fish Strategy (USDA, 1995).
[G] (Overton et al., 1995).
[H] (Overton et al., 1997).
[I] (Regional Interagency Executive Committee and Intergovernmental Advisory Committee, 1995).
[J] Subsurface flows impeding fish passage are addressed under the Flow/Hydrology indicator category.
[K] Spawning and incubation areas are addressed under the Sediment indicator.
[L] (Shepard et al., 1984).
[M] (Quigley and Arbelbide, 1997).
[N] Applies to adult holding, juvenile rearing, and overwintering reaches where streams are >3m in wetted width at base flow.
[O] (Frissell et al., 1993).
[P] (Lee et al., 1997).
[Q] (USDI and USDA, 1995).
[R] (Winward, 1989).
[S] (Forster, 2014)

Table B-2. Redband Trout Habitat Condition Indicators and Thresholds

Indicator Category	Indicator	Thresholds		
		Functioning Appropriately	**Functioning at Risk**	**Functioning at Unacceptable Risk**
Habitat Elements	Pools/Pool Frequency[A,D]	Pool frequency falls within described natural conditions[G]: All streams: Geology-Volcanic	75 - 99% of natural condition for given stream width, geology, and channel type	< 75% of natural condition for given stream width, geology, and channel type
		Average Width (ft) / Pools per mile		
		Channel Type A		
		0-15 / 33		
		15-20 / 3		
		Channel Type B		
		0-10 / 28		
		10-15 / 59		
		15-20 / 24		
		20-25 / 21		
		Channel Type C		
		0-10 / 6		
		10-15 / 19		
		15-20 / 24		
		20-25 / 22		
	Large Pools[D,E,G]	At a minimum; > 75% of pools have a maximum pool depth appropriate for the stream's natural conditions based on geomorphology and stream width: Geology- Volcanic	At a minimum, 50 - 75% of pools have a maximum pool depth appropriate for the stream's natural conditions based on geomorphology and stream width.	At a minimum, < 50% of pools have a maximum pool depth appropriate for the stream's natural conditions based on geomorphology and stream width.
		Average Width (ft) / Max Depth (ft)		
		0-10 / 1.0		
		> 10 / 1.3		
	Streambank Condition[A,H]	> 80% of any stream reach is stable	50 - 80% of any stream reach is stable	< 50% of any stream reach is stable
Water Quality	Temperature[C,F,J]	Mean maximum weekly temperature is always < 65ºF (10 - 18°C) during summer months	Mean maximum weekly temperature within 65 - 75ºF during summer months	Mean maximum weekly temperature > 75ºF during summer months
Life History Diversity and Isolation	Connectivity/ Barriers[B,K]	Subpopulation is connected (barrier-free) to other sub-populations in the watershed throughout the year.	Subpopulation has seasonal barriers due to low water levels or drying of the stream bed.	Subpopulation is completely isolated throughout the entire year.

Indicator Category	Indicator	Thresholds		
		Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk
Watershed Condition	Functional Condition[I]	Adequate vegetation and land form is present to dissipate stream energy associated with high flow.	Riparian/wetland area is in functional condition but an existing soil, water, or vegetation attribute makes the area susceptible to degradation.	Riparian/wetland areas are non-functional and are not providing adequate vegetation and land form to dissipate stream energy associated with high stream flows.

[A] (Buffington et al., 2002).
[B] (Cegelski et al., 2005).
[C] (Meyer et al., 2010).
[D] (Muhlfeld et al., 2001a).
[E] (Muhfeld et al., 2001b).
[F] (Muhlfeld, 2002).
[G] (Overton et al., 1995).
[H] (USDA and USDI, 1995).
[I] (Prichard et al., 1998).
[J] (Raleigh et al., 1984).
[K] (Zoellick et al., 2005).

For each stream reach, values for each indicator were compared to the thresholds for that indicator and given a score that ranged between +1.0 and –1.0, where +1.0 reflects conditions functioning properly for fish and –1.0 reflects conditions functioning at an unacceptable risk for fish. Scores between +0.5 and –1.0 reflect stream reaches with reduced functional condition for fish.

Where indicators described different components of the same stream characteristic (e.g., pools per mile and large pools both describe pools), the NetWeaver model calculated the mean of the scores for those indicators to yield an overall score for that stream indicator. Finally, the NetWeaver model calculated the mean of the stream indicator scores to yield an overall NetWeaver score for each stream reach. The stream indicator scores were weighted equally in calculating the mean as scientific literature and field data suggest the indicators used in the model are all important in determining habitat functionality for special status fish.

The results of the analysis allow the identification of stream reaches not meeting desired conditions (Restoration Reaches) and those mostly meeting desired conditions (Conservation Reaches). Although indicator data are aggregated for the overall NetWeaver score, the model output also shows the relative condition of each individual indicator.

HC ratings for special status fish were based on the NetWeaver analysis combined with an evaluation of restoration feasibility, the extent of the habitat, and relative fish abundance. Stream reaches were classified as either Conservation Reaches or Restoration Reaches; restoration priorities for Restoration Reaches, as well as any indicators in a degraded condition, were identified as well. The process for determining the HC rating for a stream reach is outlined below:

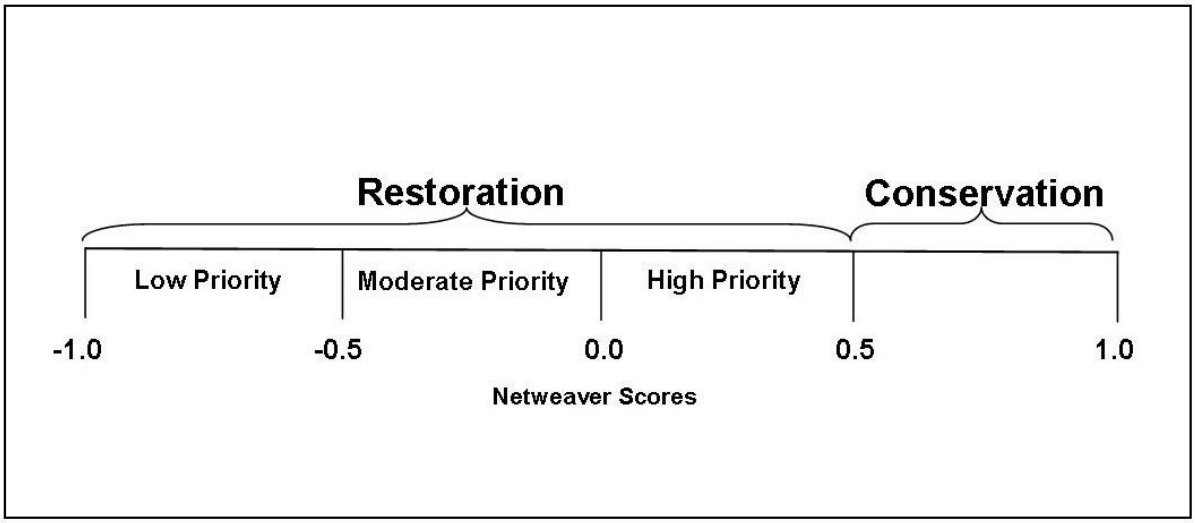
Step 1: Assign an initial HC rating based on NetWeaver scores (see Figure B-2):

Conservation Reaches: +0.5 to +1.0

Restoration Reaches: -1.0 to +0.5

- High Priority Restoration Reaches: 0.0 to +0.5
- Moderate Priority Restoration Reaches: -0.5 to 0.0
- Low Priority Restoration Reaches: -1.0 to -0.5

Figure B-2. HC rating based on NetWeaver scores.



Step 2: For Restoration Reaches, increase or decrease restoration priority according to the following guidelines:

Restoration feasibility: Increase restoration priority where BLM can address the limiting indicator (e.g., replacing a culvert, modifying livestock grazing season of use) or decrease restoration priority where BLM cannot address the limiting indicator (e.g., removing diversions).

Extent of habitat: Increase restoration priority if stream reach is longer than 0.6 mile and is primarily comprised of public lands.

Relative fish abundance: Increase restoration priority if the reach has high abundance of bull trout or redband trout.

Conservation and Restoration Reaches with Special Status Fish

As described above, HC ratings were used to describe priorities for restoration of special status fish habitat. Table B-3 displays the conservation and restoration priorities for streams occupied by special status fish; for Restoration Reaches, the indicators in a degraded condition (i.e., NetWeaver score -1.0 to +0.5) are identified. These indicators can help focus restoration efforts toward those indicators most in need of improvement with respect to habitat for special status fish. For Conservation Reaches, the indicators are in good condition (i.e., NetWeaver score +0.5 to +1.0). Maps B-1 through B-9 (in the *Maps* section below) display the locations of these reaches. HC data is available for 21% of the approximated 250 miles of streams containing special status species habitat. Restoration priorities would continue to focus on reaches containing special status fish but may be adjusted as additional HC inventories are completed.

Table B-3. HC Ratings and Indicators in a Degraded Condition for Stream Reaches Containing Special Status Fish

Stream	Reach	Miles	Indicators in a Degraded Condition
Streams Containing Bull Trout, Critical Habitat for Bull Trout, and Redband Trout			
Conservation Reaches			
Jack Creek[A]	Reach 1	0.1	None identified
Jarbidge River, East Fork[A]	Reach 3	2.3	None identified
	Reach 4	1.9	None identified
Jarbidge River, West Fork[A]	Reach 1	0.7	None identified
	Reach 2	2.1	None identified
	Reach 3	5.8	None identified
Total		**12.9**	
Restoration Reaches – High Priority			
Buck Creek	Reach 1	2.5	Spawning substrate (redband trout)
Dave Creek[A]	Reach 2	0.9	Habitat complexity, spawning substrate (bull trout)
Deer Creek[A] (NV)	Reach 1	0.9	Spawning substrate (redband trout)
Jarbidge River, East Fork[A]	Reach 1	1.9	Water temperature, spawning substrate (redband trout)
Total		**6.2**	
Restoration Reaches – Moderate Priority			
Dave Creek[A]	Reach 1	1.7	Habitat complexity, spawning substrate
Total		**1.7**	
Restoration Reaches – Low Priority			
Jarbidge River[A]	Reach 1	0.5	Water temperature – juvenile rearing, spawning substrate (redband trout)
	Reach 2	1.2	Water temperature – juvenile rearing, spawning substrate (redband trout)
	Reach 3	1.2	Water temperature – juvenile rearing (redband trout)
Restoration Reaches – Low Priority			
Jarbidge River[A]	Reach 4	0.9	Water temperature – juvenile rearing, spawning substrate (redband trout)
Jarbidge River, East Fork[A]	Reach 2	1.3	Pools/mile, water temperature – juvenile rearing
Total		**5.1**	
Streams Containing Redband Trout but not Bull Trout or Critical Habitat for Bull Trout			
Conservation Reaches			
Cedar Creek	Reach 1	0.2	None identified
	Reach 3	1.0	None identified
	Reach 4	1.2	None identified
	Reach 5	0.8	None identified
	Reach 6	2.1	None identified
Total		**5.3**	
Restoration Reaches – High Priority			
Deer Creek (ID)	Reach 3	0.6	Streambank stability, cover
	Reach 4	1.1	Pool volume
Flat Creek	Reach 2	1.1	Water temperature – juvenile rearing (redband trout)
House Creek, Lower	Reach 1	0.4	Pool volume
Three Creek, Lower	Reach 1	0.4	Water temperature, migration barrier
Total		**3.6**	

Stream	Reach	Miles	Indicators in a Degraded Condition
Restoration Reaches – Moderate Priority			
Bear Creek	Reach 1	0.4	Pool quality, volume
	Reach 2	0.4	Pool quality, volume
China Creek, Upper	Reach 1	0.1	Pool volume, quality, migration barrier
Deer Creek (ID)	Reach 1	0.8	Pool quality, streambank stability, cover
	Reach 2	0.2	Pool quality, streambank stability, cover, substrate
	Reach 5	0.7	Streambank stability, cover
Deadwood Creek	Reach 1	0.5	Streambank stability, pool volume
	Reach 2	0.5	Pool volume
House Creek, Lower	Reach 2	0.4	Pool volume, streambank stability, pool quality
	Reach 3	0.4	Pool volume, quality
House Creek, Upper	Reach 1	0.1	Streambank stability, pool volume, quality
	Reach 2	0.2	Pool volume, quality
	Reach 3	0.4	Pool volume
	Reach 4	0.3	Streambank stability, substrate, pool quality
Rocky Canyon Creek	Reach 1	0.8	Pool quality, substrate
	Reach 2	0.3	Pool quality, substrate
	Reach 3	0.5	Pool volume, quality
Total		**7.0**	
Restoration Reaches – Low Priority			
Cedar Creek	Reach 2	0.3	Streambank cover, stability
	Reach 7	1.2	Pool volume
Chimney Creek	Reach 1	0.1	Pool volume, quality
China Creek, Lower	Reach 1	0.3	Streambank stability, cover, substrate
	Reach 2	1.0	Streambank cover, stability, substrate, pool quality
	Reach 3	1.0	Streambank stability, substrate, pool quality
	Reach 4	0.4	Substrate, pool quality
Deadwood Creek, East Fork	Reach 1	0.1	Pool volume, quality
Deadwood Creek, West Fork	Reach 1	0.2	Pool volume, quality
Flat Creek	Reach 1	0.5	Substrate
	Reach 3	0.6	Pool quality
House Creek, Little	Reach 1	0.3	Streambank stability, pool volume
Restoration Reaches – Low Priority			
Pole Creek	Reach 1	0.8	Streambank stability, cover, pool volume, quality
	Reach 2	0.9	Streambank stability, cover, substrate, pool volume
Shack Creek	Reach 1	0.2	Pool quality, volume
	Reach 2	0.6	Pool quality, substrate
Three Creek, Lower	Reach 2	0.3	Substrate, pool quality
	Reach 3	0.3	Streambank stability, cover, substrate
Three Creek, Middle	Reach 1	0.3	Streambank cover, stability
Three Creek, Upper	Reach 1	0.1	Streambank stability, cover, pool volume, quality
Timber Canyon Creek	Reach 1	0.8	Streambank stability, pool volume
	Reach 2	1.1	Streambank stability, pool volume
Total		**11.4**	
Grand Total HC Rated Streams		**53.2**	

[A] Streams containing critical habitat for Jarbidge River bull trout.

Riparian Habitat

PFC ratings were used to assess priority for riparian restoration. Riparian restoration priorities focus on reaches that are functioning-at-risk with no apparent trend (FAR-NA) or functioning-at-risk with a downward trend (FAR-DN). Once an area is rated as non-functioning (NF), the effort, cost, and time required for recovery is dramatically increased (Prichard et al., 1998). Areas that are at PFC are usually not the highest priority for restoration because they are more resilient than the functional-at-risk reaches. Consequently, stream reaches rated as FAR-NA and FAR-DN were prioritized as Priority 1 for restoration, streams rated as functioning-at-risk with an upward trend (FAR-UP) and NF were prioritized as Priority 2, and streams rated as PFC were prioritized as Priority 3.

For the stream reaches with 2006 PFC and HC data, the PFC data were validated using the quantitative HC data for individual stream reaches. The PFC evaluation was used to assess riparian function at a watershed scale (general qualitative assessment), and the HC data were used to assess stream channel condition (i.e., hydrology, riparian vegetation, erosion, and deposition) at a site-specific scale (detailed quantitative assessment). The validation process used the HC data to answer PFC questions 3, 8, 9, 11, 14, and 15 (Prichard et al., 1998) to ensure consistency between the HC and PFC determination of functional condition.

Management of stream reaches is prioritized based on instream (HC) and riparian habitat condition (PFC) ratings, which are based on instream and riparian indicators; the relationship between habitat and riparian priorities are displayed in Table B-4. Where streams have both HC and PFC ratings, the priority based on the HC rating takes precedence.

Table B-4. Crosswalk between Priority Rating for Special Status Fish Habitat Management and Riparian Area Management

HC Rating	PFC Rating
Conservation Reach	NA
High Priority Restoration Reach	Priority 1 (FAR-NA, FAR-DN)
Moderate Priority Restoration Reach	Priority 2 (FAR-UP, NF)
Low Priority Restoration Reach	Priority 3 (PFC)

The validated PFC ratings were used to prioritize riparian reaches for restoration or conservation (maintenance). The priorities for riparian restoration are summarized in Table B-5. PFC data is available for 71% of the perennial streams within the planning area. Restoration priorities may be adjusted as additional PFC assessments are completed (see Map B-5).

Table B-5. Riparian PFC Ratings and Restoration Priorities

Stream	Stream Reach	Miles
Restoration Priority 1		
Antelope Springs	0.0 - 0.3	0.4
	1.4 - 2.7	1.3
Bear Creek	4.2 - 4.3	0.1
	4.3 - 4.6	0.3
	4.6 - 5.4	0.8
Bear Creek, East Fork	0.6 - 1.5	1.0
Bear Creek, Middle Fork	0.2 - 0.4	0.2
Browns Creek	1.4 - 3.1	1.7
Cedar Creek	15.2 - 15.7	0.5
	30.0 - 30.7	0.7
Cherry Creek	1.5 - 1.8	0.3
	5.1 - 5.2	0.1
	12.3 - 13.4	1.1
China Creek	1.4 - 1.8	0.4

Stream	Stream Reach	Miles
	2.0 - 2.8	0.8
China Creek, East Fork	0.0 - 3.5	3.4
Clover Creek	0.7 - 3.4	2.7
	0.0 - 0.7	0.6
	3.4 - 7.8	4.4
	7.8 - 9.3	1.5
	11.0 - 12.3	1.3
	18.5 - 21.9	3.4
	21.9 - 22.5	0.6
	30.9 - 31.1	0.2
	33.0 - 33.6	0.6
	40.2 - 41.8	1.6
Columbet Creek	0.0 - 1.2	1.5
	9.8 - 9.9	0.1
Cougar Creek	0.0 - 3.0	3.0
Deadwood Creek	1.8 - 2.7	0.9
	2.7 - 3.0	0.3
	16.8 - 17.8	1.0
Deep Creek	2.3 - 2.8	0.4
	2.8 - 3.2	0.4
Deer Creek (ID)	3.2 - 5.1	1.9
	5.7 - 6.3	0.6
	6.3 - 6.5	0.2
	6.5 - 7.7	1.2
Devil Creek	35.5 - 36.2	0.6
	34.7 - 35.5	0.8
	32.8 - 34.7	1.9
	28.7 - 32.8	0.4
	33.2 - 33.4	0.2
	33.4 - 34.0	0.6
	34.0 - 34.7	0.8
Hayes Canyon	1.0 - 2.4	1.3
	2.4 - 3.7	1.3
House Creek	0.0 - 0.3	0.3
Jarbidge River[A]	29.4 - 30.1	0.7
	30.1 - 30.7	0.6
	31.1 - 32.1	1.0
Restoration Priority 1		
Jarbidge River[A]	32.1 - 32.5	0.4
	32.5 - 33.2	0.7
	33.2 - 33.4	0.2
	33.4 - 37.5	4.0
	37.6 - 38.7	1.0
	38.7 - 39.8	1.0
Jarbidge River, East Fork[A]	0.0 - 1.2	1.1
	1.2 - 2.2	1.0
	2.9 - 4.7	1.8
Little House Creek	4.2 - 5.6	1.4
Pole Creek	0.4 - 0.7	0.3
Ross Pasture Creek	0.0 - 2.1	2.1
Shack Creek	3.6 - 3.8	0.2
	3.8 - 4.2	0.4

Stream	Stream Reach	Miles
Sheep Creek	0.1 - 0.3	0.2
Spring Creek	5.6 - 7.0	1.4
Three Creek	0.3 - 1.5	1.2
	4.7 - 5.8	1.1
	11.8 - 12.1	0.3
	12.1 - 12.3	0.2
Timber Canyon	2.0 - 2.3	0.3
	0.7 - 2.0	1.3
Tuana Gulch	5.9 - 6.9	1.0
Whiskey Slough	0.0 - 1.3	1.3
Yahoo Creek	3.3 - 3.4	0.1
Total		**76.0**
Restoration Priority 2		
Big Flat Creek	0.3 - 1.2	1.0
	12.6 - 12.8	0.2
Cedar Creek	16.7 - 17.3	0.6
	24.9 - 25.6	0.7
	25.6 - 26.1	0.5
	26.1 - 26.7	0.6
	28.2 - 28.4	0.2
	28.4 - 29.0	0.6
	29.0 - 30.0	1.0
Cherry Creek	9.3 - 10.1	0.9
	13.4 - 14.1	0.8
China Creek	0.0 - 0.2	0.2
	0.2 - 0.7	0.6
	0.7 - 1.4	0.7
	2.8 - 3.2	0.4
Clover Creek	12.3 - 13.5	1.0
	13.5 - 15.7	2.5
	17.4 - 18.3	1.1
	18.3 - 18.5	0.2
	23.0 - 23.8	0.9
	26.8 - 27.6	0.8
	27.6 - 29.2	1.4
	29.2 - 29.9	0.7
	29.9 - 30.2	0.3
Restoration Priority 2		
Clover Creek	30.2 - 30.9	0.7
	31.1 - 32.8	1.7
	32.8 - 33.0	0.2
	35.5 - 36.4	0.9
	36.4 - 38.0	1.6
	38.0 - 40.2	2.2
	41.8 - 46.0	4.2
	46.3 - 47.5	1.4
	52.0 - 52.2	0.3
	52.2 - 52.7	0.6
	52.7 - 53.5	0.8
Columbet Creek	2.3 - 3.4	1.2
	3.4 - 3.7	0.3
	3.7 - 5.0	1.4

Stream	Stream Reach	Miles
	9.0 - 9.3	0.3
Deadman Creek (NV)	0.0 - 0.8	0.8
Deadwood Creek	3.0 - 4.2	1.2
Deer Creek (ID)	3.2 - 4.3	0.9
House Creek	3.6 - 4.4	0.8
Little Spring Creek	2.5 - 2.8	0.3
	2.8 - 3.0	0.2
Pole Creek	0.7 - 1.3	0.7
	3.4 - 4.9	1.5
Ring Springs	0.9 - 1.5	0.9
	0.0 - 0.6	0.6
	0.6 - 0.9	0.3
Rocky Canyon	0.7 - 1.7	1.1
	1.7 - 2.0	0.6
Shack Creek, East Fork	0.0 - 0.2	0.2
Snake River	539.7 - 540.7	0.9
	563.4 - 567.7	4.0
	556.6 - 557.1	0.5
Three Creek	6.3 - 6.8	0.5
Tuana Gulch	2.5 - 3.5	1.0
	3.5 - 5.2	1.7
Total		**63.4**
Restoration Priority 3		
Big Flat Creek	7.7 - 8.6	0.9
	8.6 - 8.9	0.3
	12.0 - 12.6	0.7
	12.8 - 13.2	0.4
Browns Creek	3.1 - 4.2	1.1
Buck Creek	0.0 - 2.5	2.5
Cedar Creek	15.7 - 16.7	1.0
	17.3 - 18.8	2.0
	26.7 - 27.4	0.7
	27.4 - 27.9	0.6
	30.7 - 31.1	0.4
Cherry Creek	10.1 - 10.9	0.6
	10.9 - 12.3	1.3
	14.1 - 14.6	0.5
Restoration Priority 3		
China Creek	4.5 - 4.7	0.2
	4.7 - 5.0	0.3
	5.0 - 5.2	0.4
China Creek, Middle Fork	1.8 - 2.0	0.7
Clover Creek	49.5 - 52.0	2.5
Columbet Creek	5.0 - 6.0	1.0
	8.3 - 9.0	0.7
Corral Creek	0.4 - 1.1	0.6
Crawfish Springs Creek	0.5 - 0.9	0.3
Dave Creek[A]	0.0 - 2.2	2.3
	2.4 - 2.7	0.3
Deep Creek	0.0 - 2.3	2.4
	3.2 - 4.5	1.4
Deer Creek[A] (NV)	0.7 - 1.6	0.8

Stream	Stream Reach	Miles
Deer Creek (ID)	5.1 - 5.7	0.6
Dorsey Creek	14.2 - 14.7	0.4
Flat Creek	13.2 - 14.4	1.2
	15.7 - 16.6	0.9
House Creek	3.4 - 3.6	0.2
	16.8 - 17.5	0.7
	17.6 - 17.8	0.2
	17.8 - 18.1	0.3
	18.4 - 19.6	1.2
Jarbidge River[A]	0.0 - 2.6	2.6
	2.6 - 9.6	6.3
	9.6 - 13.0	3.3
	13.0 - 15.6	1.8
	15.6 - 21.7	6.2
	21.7 - 28.6	7.0
	28.6 - 29.1	0.5
	29.1 - 29.4	0.3
Jarbidge River, East Fork[A]	4.9 - 8.7	3.7
Little House Creek	5.6 - 6.2	0.7
Meadow Springs Creek	0.6 - 1.0	0.4
Player Creek	1.9 - 3.4	1.5
	trib. 1	0.3
	trib. 2	0.2
Pole Creek	0.0 - 0.4	0.4
	1.3 - 1.8	0.5
	1.8 - 3.4	1.5
Snake River	551.7 - 554.5	1.5
	541.4 - 545.6	0.3
	533.6 - 535.5	1.8
	530.2 - 532.5	2.3
	558.8 - 561.6	0.3
	558.8 - 561.6	1.8
	571.1 - 577.9	1.1
Taylor Canyon Creek	0.0 - 1.0	1.0
Three Creek	12.3 - 14.4	2.1
	14.4 - 15.3	1.0
Restoration Priority 3		
Tuana Gulch	5.2 - 5.6	0.4
	5.6 - 5.9	0.3
Yahoo Creek	0.6 - 0.9	0.3
	0.9 - 1.1	0.2
	1.1 - 2.1	1.0
Total		**85.2**
Grand Total PFC Rated Streams		**225.0**

[A] Streams containing critical habitat for Jarbidge River bull trout.

Management Direction[4]

Goals

The goals for aquatic resources (*Water Resources*, *Riparian Areas and Wetlands*, *Fish*, and *Special Status Fish and Aquatic Invertebrates*) establish an expectation of the characteristics of healthy, functioning watersheds, riparian areas, and associated fish habitats. Because the quality of water and condition of riparian and fish habitat is directly influenced by the integrity of upland and riparian areas within the watersheds, the aquatic resource goals are to move towards or accomplish the goals, as displayed in Table B-6.

Table B-6. Goals for Aquatic Resources

Goal Number	Goal
Water Resources	
WR-G-1	Maintain or improve the chemical, physical, and biological integrity of water resources.
Riparian Areas and Wetlands	
RI-G-1	Achieve healthy, functioning watersheds, riparian areas, wetlands, and associated aquatic habitats.
RI-G-2	Provide habitat to support populations of well-distributed native and desired non-native plant, vertebrate, and invertebrate populations that contribute to the sustainability of riparian-dependent communities.
RI-G-3	Maintain or improve naturally functioning vegetation communities that include natural timing and variability of surface and groundwater in riparian areas and wetlands, and diversity and productivity of native and desired non-native plant communities.
Fish	
FI-G-1	Manage public lands to promote diverse, structured, resilient, and connected habitats for non-game fish.
Special Status Fish and Aquatic Invertebrates	
SS-G-1	Manage public lands to contribute to the conservation and recovery of sage-grouse and other special status species.

Objectives

The ARMS is intended to guide management toward desired outcomes comprised of goals and objectives. The objectives for aquatic resources (*Water Resources, Riparian Areas and Wetlands, Fish, and Special Status Aquatic Fish and Aquatic Invertebrates*) are based on indicators that are measurable and relate to the specific resource or species of interest. Bull trout and redband trout population and habitat objectives that are appropriate for the watershed scale can be described in terms of the habitat condition indicators displayed in Table B-1 and Table B-2. The objective for streams containing bull trout or redband trout habitat is a rating of “Functioning Properly” for the indicators listed in Table B-1 and Table B-2, which reflect desired aquatic, riparian, and watershed conditions that are adapted locally. Optimum conditions may not always be achievable for every indicator in every stream reach because of historic land uses, land ownership patterns (e.g., private and other non-BLM managed lands), and specific watershed characteristics. Table B-7 describes objectives for stream reaches containing special status fish habitat relative to the NetWeaver scores that formed the basis for the HC ratings as Conservation or Restoration reaches.

[4] This section addresses material for Component V, Management Direction – Adaptive Management, related to management direction in the Guidance for Developing Aquatic Conservation Strategies (BLM, 2008a).

Table B-7. Objectives for Aquatic Resources

Objective Number	Objective
Water Resources	
WR-O-1	Make progress towards meeting Federal and State water quality standards.
Riparian Areas and Wetlands	
RI-O-1	Maintain 85 miles of Priority 3 streams at PFC; improve 77 miles of Priority 1 streams and 21 miles of Priority 2 streams to achieve PFC; and improve the remaining 42 miles of Priority 2 streams to be moving toward PFC over the life of the plan.
RI-O-2	Manage wetlands not associated with streams (springs, seeps, playas) to achieve PFC.
Fish	
FI-O-1	Maintain 85 miles of Priority 3 streams at PFC; improve 77 miles of Priority 1 streams and 21 miles of Priority 2 streams to achieve PFC; and improve the remaining 42 miles of Priority 2 streams and 20 miles of streams with unknown PFC rating to move towards PFC over the life of the plan.
FI-O-2	Manage the 72 miles of stream containing only native non-game fish to maintain or improve habitat condition.
Status Special Fish and Aquatic Invertebrates	
SS-O-1	Maintain or improve the quality and quantity of habitat for sage-grouse and other special status species by managing public land activities to sustain or benefit those species.

Management Approaches

Four general types of management approaches that may be considered for achieving the aquatic and riparian objectives.

Protection

This management strategy would conserve aquatic and riparian areas that are ecologically intact and fully functional. Human activities that influence instream and riparian ecological functions are restricted. This management strategy strives to protect aquatic and riparian ecosystems currently in good condition so that naturally regenerative processes can continue to operate. Conservation designations that typically include wilderness and minimally developed watersheds would fall within this management strategy. High priority restoration projects do exist within portions of some Conservation Reaches. Also, some Restoration Reaches may have a stream segment or watershed area that is ecologically intact and functional.

Passive Restoration

This management strategy emphasizes preventing further decline in aquatic and riparian ecosystem integrity. To the extent possible, human disturbances to altered aquatic and riparian ecosystems would be removed or minimized in order to allow natural processes to be the primary agents of recovery. This management strategy would allow the natural disturbance regime to dictate the speed of recovery in areas that have a high probability of returning to a fully functional condition without human intervention. This management strategy can be applied to the low and moderate priority Restoration Reaches and Priority 2 and 3 riparian reaches. The rate of recovery may be several decades or more.

Active Restoration

This management strategy would focus on returning functionally impaired aquatic and riparian ecosystems to a state that would occur naturally at the site by actively managing certain aspects of habitat recovery. It uses a combination of elements of natural recovery along with management activities directed at accelerating development of self-sustaining, ecologically healthy riparian ecosystems. This management strategy applies to the high and some moderate priority Restoration Reaches and Priority 1 and 2 riparian reaches. Many watershed, riparian, and stream restoration projects fall into this category,

including vegetation treatments, stream channel restoration, stream crossings removal or improvement, reducing road densities, and improving road condition. The rate of recovery may be one to two decades.

Rehabilitation

This management strategy would re-establish naturally self-sustaining riparian ecosystems to the extent possible, while acknowledging that irreversible changes, such as dams, permanent channel changes due to urbanization and streamside roads, stream channel incision, and human development within the RCA, would only result in partial restoration of ecological functions. This management strategy applies to the high and some moderate and low priority Restoration Reaches and Priority 1 and 2 riparian reaches. It would use a combination of passive and active management approaches where fully functional ecological conditions cannot occur.

Management for Riparian Conservation Areas

Used in conjunction with adaptive management, the following management actions are designed to achieve aquatic and riparian goals (Table B-6) and objectives (Table B-7). This management is derived from the management direction contained in the Inland Native Fish Strategy (INFISH) (USDA, 1995) and the Interior Columbia Basin Ecosystem Management Project (Quigley and Arbelbide, 1997) and is consistent with existing conservation and recovery plans for special status aquatic species within the planning area (Table B- 9). The management actions in Table B-8 apply to all RCAs and to projects and activities in areas outside of RCAs that are identified through the NEPA analysis process as having the potential to degrade RCAs. Management to be applied to a specific project will be identified during project planning on a site- and project-specific basis.

Table B-8. Management Actions for Activities In or Affecting Riparian Conservation Areas

Management Action Number	Management Action
Water Resources	
WR-MA-6	Consult or coordinate with the tribes and with Federal, State, and local agencies when determining location and designs for new water development projects.
WR-MA-10	Consult or coordinate as appropriate with Tribal, Federal, State, and local governments to identify and secure instream flows needed to maintain riparian resources, channel conditions, and aquatic habitat.
WR-MA-11	Apply chemicals (i.e., herbicides, pesticides, insecticides, and other toxicants) in a manner that does not impair water quality or prevent attainment of objectives for riparian areas and wetlands and avoids adverse effects on inland non-game fish and their habitat. When applying chemicals in a RCA, a spill kit will be onsite as appropriate. Prohibit storing and mixing chemicals within RCAs unless there are no other practical alternatives.
WR-MA-12	Prohibit storage of fuels and other toxicants and refueling within RCAs unless there are no other practical alternatives. Any refueling sites and/or storage areas within an RCA will have an approved refueling and spill containment plan.
Riparian Areas and Wetlands	
RI-MA-8	Modify existing management activities and authorized uses in RCAs to attain PFC and ensure that habitat conditions of streams, riparian areas, and wetlands are moving toward achieving the goals and objectives for riparian areas and wetlands.
RI-MA-9	Conduct new management activities within or affecting RCAs only if they are consistent with achieving the goals and objectives for riparian areas and wetlands. New management activities will avoid or reduce adverse effects on inland non-game fish, their habitats, and RCAs.
RI-MA-10	Trees may be felled in RCAs when they pose a safety risk. Keep felled trees on-site when needed to maintain or improve riparian or instream conditions.
RI-MA-11	Cooperate with Tribal, Federal, State, and local agencies and private landowners to develop watershed-based coordinated resource management plans or other cooperative agreements to achieve the goals and objectives for riparian areas and wetlands.

Management Action Number	Management Action
Fish and Wildlife Resources	
FI-MA-4	To avoid adverse effects on non-game fish and instream flows, locate water drafting sites in upland areas (e.g., stock ponds, storage tanks, hydrants). Where these water sources are not available, locate water drafting sites at existing stream road crossings (e.g., bridges, culverts, fords) to divert water in a manner that does not retard or prevent achievement of the goals and objectives for riparian areas and wetlands.
FI-MA-5	Design and implement watershed restoration projects in a manner that promotes the long-term ecological integrity of ecosystems, conserves the genetic integrity of non-game fish species, and contributes to the achievement of the goals and objectives for riparian areas and wetlands.
FI-MA-6	New fisheries and instream channel restoration projects will avoid or minimize adverse effects on non-game fish, their habitats, and RCAs.
FI-MA-7	Cooperate with Federal and State fish management agencies to identify and reduce adverse effects on non-game fish associated with habitat manipulation, fish stocking, fish harvest, and illegal harvest.
Wildland Fire Ecology and Management	
WFM-MA-11	Fire suppression strategies, practices, and actions in RCAs should be designed to minimize disturbance to riparian vegetation.
WFM-MA-12	Minimum Impact Suppression Tactics will be used within RCAs unless safety to human life or property is an issue.
WFM-MA-13	Incident bases, camps, helibases, staging areas, helispots, and other centers for incident activities will be located outside of RCAs. If the only suitable location for these activities is within the RCA, an exemption may be granted by the BLM authorized officer.
WFM-MA-14	Avoid delivery of chemical retardant, foam, or additives into surface waters. An exception is warranted where overriding immediate safety imperatives exist or when the BLM determines a fire will cause more long-term damage to fish habitats than chemical delivery to surface waters.
FE-MA-5	Fuels treatments in RCAs will be designed to maintain or improve riparian vegetation.
FE-MA-15	Implement the Programmatic Emergency Stabilization and Burned Area Rehabilitation (ES&BAR) Plan and update as needed. Individual ES&BAR plans will be completed through the interdisciplinary process to reduce impacts of wildland fire and suppression and to achieve resource objectives. Coordinate with affected permittees when developing ES&BAR plans, as appropriate.
Livestock Grazing	
LG-MA-11	Grazing management activities (e.g., grazing, trailing, bedding, watering, salting, loading, other handling efforts) will be modified, discontinued, or relocated if they are not maintaining aquatic and riparian conditions.
LG-MA-12	In areas that are readily accessible to cattle and known or suspected special status fish spawning habitat, develop and implement grazing practices to avoid or restrict trampling of redds (eggs) and other direct and indirect effects that may result in adverse impacts to the species.
LG-MA-24	Grazing facilities and infrastructure (e.g., livestock handling and management facilities, fences, watering facilities) will be modified, discontinued, or relocated if they are not maintaining aquatic and riparian conditions.
Recreation	
REC-MA-3	New and existing recreation-related activities and facilities within or affecting RCAs will be designed, modified, relocated, or discontinued if they are not maintaining aquatic and riparian conditions.
Transportation and Travel	
TR-MA-9	Cooperate with tribes, Federal, State, and county agencies to reduce adverse effects

Management Action Number	Management Action
	and support the achievement of the goals and objectives for riparian areas and wetlands in the long term.
TR-MA-10	Minimize locating new roads or road-related facilities in RCAs. Before building new roads or other road-related facilities in RCAs, complete a watershed or site-specific analysis. The level of analysis should be commensurate with the scope and issues of the project and related aquatic resources. Analysis should identify how road design features will minimize or avoid adverse effects to aquatic and riparian resources at site-specific, reach, and watershed scales.
TR-MA-11	Temporary roads within or affecting RCAs will be fully decommissioned and rehabilitated once the road is no longer needed to meet the intended purpose.
TR-MA-12	Avoid or minimize sediment delivery to streams from the road surface to allow the achievement of the goals and objectives for riparian areas and wetlands.
TR-MA-13	Avoid sidecasting road surface material into areas where it may reach RCAs.
TR-MA-14	Design new, replacement, and reconstructed stream crossings (culverts, bridges, and other stream crossings) to: • Accommodate a 100-year flood, including associated bedload and debris in bull trout occupied watersheds. In watersheds containing other non-game fish, design new, replacement and reconstructed stream crossings to accommodate a 100-year flood event, unless a site-specific analysis determines the goals and objectives for riparian areas and wetlands could be achieved with fewer impacts to the RCA; • Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams; and • Accommodate mean bankfull channel widths to maintain channel integrity.
Land Use Authorizations	
LA-MA-16	New land use authorizations will avoid or minimize adverse effects on non-game fish, their habitats, and RCAs.
LA-MA-17	For existing land use authorizations that prevent the achievement of the goals and objectives for riparian areas and wetlands, use existing authorities to redesign, modify, or apply mitigations to reduce impacts to non-game fish, their habitats and RCAs.
LA-MA-18	During Federal Energy Regulatory Commission (FERC) licensing or relicensing of hydroelectric projects, terms and conditions that achieve the goals and objectives for riparian areas and wetlands over the new license term should be submitted to the FERC.
Land Tenure	
LT-MA-7	Use land acquisition, exchanges, and conservation easements to support achievement of the goals and objectives for riparian areas and wetlands and facilitate restoration of native species and their habitat.
Leasable Minerals	
LE-MA-9	For those leasable mineral development activities conducted pursuant to valid existing rights that pose risks to achievement of management objectives, use existing authorities to mitigate and/or require, to the extent authorized, design features that will contribute to the maintenance of streambanks, shorelines, streambed configuration, water quality, amount and distribution of woody debris, thermal regulation, characteristic erosion rates, and amount and distribution of source habitats.
LE-MA-10	Locate leasable mineral project related infrastructure outside RCAs. Where there is no alternative, locate and construct the infrastructure to avoid impacts on RCAs. Keep the number of roads to the minimum necessary for the approved mineral activity. Decommission and revegetate roads no longer required for mineral management and related activities.
LE-MA-11	New leasable mineral management projects and operations will avoid or minimize adverse effects on non-game fish, their habitats, and RCAs.

Management Action Number	Management Action
LE-MA-12	Develop inspection, monitoring, and reporting requirements for leasable mineral activities within or affecting RCAs. Evaluate and apply the results of inspection and monitoring to modify mineral plans, leases, or permits as needed to achieve the goals and objectives for riparian areas and wetlands.
Salable Minerals	
SA-MA-7	For those salable mineral development activities conducted pursuant to valid existing rights that pose risks to achievement of goals and objectives for riparian areas and wetlands, use existing authorities to mitigate and/or require, to the extent authorized, design features that will contribute to the maintenance of streambanks, shorelines, streambed configuration, water quality, amount and distribution of woody debris, thermal regulation, characteristic erosion rates, and amount and distribution of source habitats.
SA-MA-8	Locate salable mineral project related infrastructure outside RCAs. Where there is no alternative, locate and construct the infrastructure to avoid impacts on RCAs. Keep the number of roads to the minimum necessary for the approved mineral activity. Decommission and revegetate roads no longer required for mineral management and related activities.
SA-MA-9	New salable mineral management projects and operations will avoid or minimize adverse effects on non-game fish, their habitats, and RCAs.
Locatable Minerals	
LO-MA-2	Locate mineral project related infrastructure outside RCAs. Where there is no alternative, locate and construct the infrastructure to avoid impacts on RCAs. Keep the number of roads to the minimum necessary for the approved mineral activity. Decommission and revegetate roads no longer required for mineral management and related activities.
LO-MA-3	New locatable mineral management projects and operations will avoid or minimize adverse effects on non-game fish, their habitats, and RCAs.
LO-MA-4	Develop inspection, monitoring, and reporting requirements for locatable mineral activities within or affecting RCAs. Evaluate and apply the results of inspection and monitoring to modify mineral plans, leases, or permits as needed to achieve the goals and objectives for riparian areas and wetlands.

Management for Aquatic Species

Management for Non-Special Status Aquatic Species

The following management applies to aquatic species other than those listed under Endangered Species Act (ESA) or designated as Sensitive species under BLM's policy for special status species. In the planning area, these include sculpins (Cottidae), suckers (Catostomidae), and minnows (Cyprinidae). These non-special status fish, commonly referred to as native non-game fish, occur independent of special status fish in five streams in the planning area, including portions of Barbour Creek, Tuana Gulch, Big Flat Creek, Clover Creek, and Salmon Falls Creek. Clover Creek, which is identified as a stream containing only native non-game fish, is identified as a water quality impaired stream by the Idaho Department of Environmental Quality. Sediment and bacteria were identified as the factors limiting water quality. The goals, objectives, and management actions specific to non-special status fish are provided in the ROD/RMP, Fish and Wildlife section, and displayed above in Tables B-6, B-7, and B-8. Where these fish occur in streams containing special status species, the goals, objectives, and management actions in for Special Status Fish and Aquatic Invertebrates would also achieve the habitat requirement needs of non-special status fish.

Indicators for riparian HC and PFC ratings are used to determine if the desired riparian goals, objectives, and desired conditions are being met for native non-game fish. PFC addresses a variety of factors that

are linked to water quality. Any improvement in riparian function (i.e., the PFC rating) would improve water quality and instream habitat condition for native non-game fish.

In order to protect water quality resources in streams containing native non-game fish, the Idaho Stream Channel Alteration Rules (IDWR, 1993) would be applied to actions involving construction activities within the high water lines of streams in the planning area. These standards are intended to cover the ordinary type of stream channel alteration and to prescribe minimum conditions for approval of such construction.

For grazing management, these streams should be managed according to the management processes and strategies as described in Grazing Management Processes and Strategies for Riparian-Wetland Areas (Wyman et al., 2006).

Management for Special Status Aquatic Species

BLM Manual 6840, Special Status Species Management, provides policy and direction, consistent with appropriate laws, for the conservation of special status plants, fish, and wildlife and the ecosystems on which they depend. The special status aquatic species in the planning area are currently managed according to four special status aquatic species conservation or recovery plans as well as conservation requirements derived through ESA consultation with the US Fish and Wildlife Service (FWS). Recovery plans are developed by FWS to establish recovery objectives for a species, provide a list of tasks necessary to achieve those objectives, and recommend assignments to involve agencies to carry out these tasks. A primary function of recovery plans is to combine programs of all agencies involved in managing a species into a coordinated management effort. The BLM may adopt recovery plans. Even if a recovery plan is not officially adopted, BLM Manual 6840 directs the BLM to incorporate the objectives of the recovery plan into appropriate land use activity plans (BLM Manual 6840.04.E.5). These plans provide guidance and direction for protecting special status aquatic species and their habitat to ensure their long-term survival and recovery. The conservation and recovery plans for special status aquatic species in the planning area are identified in TableB-9; these plans will guide the protection and conservation of stronghold populations. For species for which there is an existing recovery plan, such as Snake River snails and Bruneau hot springsnail, or for which there is a draft recovery plan, such as Jarbidge River bull trout, the conservation measures identified in those plans will also be incorporated in restoration and recovery planning efforts at the watershed or site-specific scale.

Table B-9. Conservation and Recovery Plans for Special Status Aquatic Species in the Planning Area

Conservation/Recovery Plan	Date	Species Addressed	
		Common Name	Scientific Name
Snake River Aquatic Species Recovery Plan	1995	Idaho springsnail[A]	*Pyrgulopsis idahoensis*
		Utah valvata[B]	*Valvata utahensis*
		Snake River physa snail	*Physa natricina*
		Bliss Rapids snail	*Taylorconcha serpenticola*
		California floater	*Anodonta californiensis*
		Columbia pebblesnail	*Fluminicola columbianus*
		Shoshone sculpin	*Cottus greenei*
		Redband trout	*Oncorhynchus mykiss gairdeneri*
		Snake River white sturgeon	*Acipenser transmontanus*
Snake River White Sturgeon Conservation Plan	2003	Snake River white sturgeon	*Acipenser transmontanus*
Revised Draft Recovery Plan for the Conterminous United States Population of Bull Trout (*Salvelinus confluentus*)[C,D]	2014	Jarbidge River bull trout	*Salvelinus confluentus*
Recovery Plan for the Bruneau Hot Springsnail	2006	Bruneau hot springsnail	*Pyrgulopsis bruneauensis*

[A] Idaho springsnail was removed from the Endangered Species list in September 2007.
[B] Utah Valvata was removed from the Endangered Species list in August 2010.
[C] The recovery plan for the Jarbidge River Distinct Population Segment of Bull Trout was replaced by the 2014 Revised Draft Recovery Plan for the Conterminous United States Population of Bull Trout (*Salvelinus confluentus*).
[D]Appropriate conservations measures for bull trout were incorporated in Appendix C from both the 2004 Draft Recovery Plan for the Jarbidge River Distinct Population Segment of Bull Trout (FWS, 2004) and the 2014 Revised Draft Recovery Plan for the Conterminous United States Population of Bull Trout (Salvelinus confluentus) (FWS, 2014a).

Additional management for ESA-listed aquatic species include conservation requirements derived through ESA consultation with FWS; these requirements are intended to allow for activities to occur at levels that would not result in a decline in the ESA-listed species or their habitat. These conservation requirements are contained in Biological Opinions as well as Biological Assessments with letters of concurrence. Table B-10 displays those consultation documents currently in effect; these may be superseded through future consultation with the FWS. The conservation measures as derived through ESA consultation with the FWS are displayed in Appendix C.

Table B-10. FWS Biological Opinions and Letters of Concurrence for ESA-Listed Aquatic Species in the Planning Area

Document Name	Date	Species Addressed	Action(s) Addressed
Letter of Concurrence – BLM Twin Falls District Programmatic Emergency Stabilization and Rehabilitation Plan – Blaine, Cassia, Camas, Elmore, Gooding, Jerome, Lincoln, Minidoka, Oneida, Owyhee, Power, and Twin Falls Counties, Idaho and Elko County, Nevada.	May 10, 2013	Bull trout and Designated Critical Habitat, Bliss Rapids snail, Snake River physa snail, and Bruneau hot springsnail.	Post wildland fire rehabilitation and emergency stabilization actions.
Biological Opinion - Bureau of Land Management Ongoing Actions and Livestock Trailing – Bull Trout Critical Habitat –	November 2, 2012	Bull trout and Designated Critical Habitat.	RMP amended by INFISH, ongoing wildfire suppression, livestock grazing, and livestock

Document Name	Date	Species Addressed	Action(s) Addressed
Benewah, Bonner, Boundary, Kootenai, Owyhee, and Shoshone Counties, Idaho and Elko County, Nevada			trailing.
Biological Opinion – Restoration Activities at Stream Crossings (Stream Crossing Programmatic).	June 15, 2012.	Bull trout and Designated Critical Habitat.	Stream crossing replacements (culverts and bridges) and maintenance, road and trail decommissioning.
Letter of Concurrence – Idaho BLM Ongoing Actions (Bull Trout Critical Habitat).	May 25, 2011	Bull trout Critical Habitat.	Ongoing livestock grazing, irrigation diversion, normal wildfire rehabilitation plan, noxious weeds treatments, recreational special use permits, rights-of-way, and juniper thinning.
Biological Opinion – Existing BLM Land Use Plans	March 10, 2008	Bliss Rapids snail, Snake River physa snail, and Bruneau hot springsnail.	1987 Jarbidge Resource Management Plan.
Letter of Concurrence – Noxious and Invasive Weed Treatment Program for the Boise District and the Jarbidge Field Office of the Twin Falls District	September 21, 2005	Bull trout, Bliss Rapids snail, Snake River physa snail, and Bruneau hot springsnail.	Noxious weed and invasive plant treatments.
Biological Opinion – Biological Assessment of the BLM Boise District and the Jarbidge Field Office of the Twin Falls District, Ongoing Permitted Grazing Activities in 36 Allotments	August 15, 2005	Bliss Rapids snail and Snake River physa snail.	Livestock grazing on allotments in the Snake River watershed.
Biological Opinion – Ongoing Grazing Activities in the Bruneau Arm Allotment, the Hagerman Allotment, and Flat Iron Allotment, Owyhee County, Idaho	March 23, 2005	Bliss Rapids snail and Snake River physa snail.	Livestock grazing in the named allotments.
Biological Opinion on BLM's Ongoing Activities in the Jarbidge River Watershed in Owyhee County, Idaho, and Elko County, Nevada	November 17, 2004	Bull trout	Livestock grazing, pipelines, and fire suppression in the Jarbidge River Watershed.
Letter of Concurrence – Allocation of Forage in the 71 Desert, Blackrock Pocket, Bruneau Hill, Crawfish, North Fork, and Winter Camp Allotments for the Jarbidge Field Office	November 12, 2004	Bull trout	Forage allocation in named allotments.
Letter of Concurrence –	April 13, 2004	Bull trout,	Forage allocation and

Document Name	Date	Species Addressed	Action(s) Addressed
Excess Forage Allocation and Grazing Permit Renewal for the Yahoo Allotment, Twin Falls County, Idaho		Bliss Rapids snail, Snake River physa snail, and Bruneau hot springsnail.	permit renewal in the Yahoo allotment.

Multi-Scale Assessments and Ecosystem Analysis at the Watershed Scale[5]

Multi-Scale Assessments

Generally, no single assessment will adequately address the complex issues facing resource managers today. Fine-scale assessments provide context for management and project planning, but they cannot adequately address broad patterns and processes, such as habitat conditions for wide-ranging species. Broad-scale assessments provide context for policy formulation and for mid- and fine-scale assessment, but they cannot by themselves provide detailed information, such as site-specific habitat conditions. Together, multi-scale assessments provide comprehensive information for land management.

Multiple scales of review and assessment provide the context to implement broad-scale decisions within individual BLM District and Field Offices. As needed, multi-scale analysis may be used for future plan amendments or revisions and for subsequent project-level decisions. Analysis at the appropriate scale is generally recognized to provide the needed context for decision making. The four levels of review or assessment that may be used for multi-scale analysis are:

- Broad-scale (e.g., analysis at the basin scale, such as the Interior Columbia River Basin);
- Mid-scale (e.g., analysis at the subbasin scale, such as the Snake River subbasin);
- Fine-scale (e.g., analysis at the watershed scale, such as the Salmon Falls Creek Watershed); and
- Site-scale (e.g., analysis at the stream reach or project scale, such as China Creek).

Management considerations for multi-scale analysis include the following:

- Land Use Plans are generally developed and analyzed at the scale of the land management unit, normally analogous to a subbasin (or group of subbasins) scale.
- Subsequent finer-scale analysis, such as to support restoration prioritization and monitoring strategy development, should include interagency coordination.
- Assessments should include evaluation of existing conditions, factors limiting aquatic species populations, resource risks, management needs, and restoration opportunities.
- Information developed at the finer scale should be considered in implementing aquatic conservation or restoration measures and used to make adjustments or modifications to appropriate management actions, as warranted.
- Multi-scale analysis provides a basis for integrating and prioritizing conservation measures for wide-ranging species.

Watershed Analysis

The purpose of an ecosystem analysis at the watershed scale is to develop and document an understanding of the ecological structures, functions, processes, and interactions occurring at the watershed scale by systematically characterizing the watershed's human, aquatic, riparian, and terrestrial features, conditions, processes, and interactions. This process is designed to describe past and current conditions and develop restoration and management recommendations. The ultimate goal is to provide guidance for management activities that would sustain or improve the health and productivity of natural resources.

[5] This section addresses material for Component III, Multi-Scale Analysis, in the Guidance for Developing Aquatic Conservation Strategies (BLM, 2008a).

Objectives of Watershed Analysis

The following are the objectives of a watershed analysis:

- **Provide sufficient watershed context for understanding and carrying out land use activities in a geomorphic context –** Watershed analysis is an important tool used to meet ecosystem management objectives at larger scales.
- **Evaluate cumulative watershed effects –** Watershed analysis enhances the ability to estimate direct, indirect, and cumulative effects of management activities.
- **Define watershed restoration needs, goals, and objectives –** Watershed analysis provides guidance on the general type, location, and sequence of appropriate activities within a watershed.
- **Monitor the effectiveness of watershed protection measures –** Watershed analysis provides an iterative process for the adaptive management feedback loop.

Methodology for Watershed Analysis

The Federal Guide for Watershed Analysis-Ecosystem Analysis at the Watershed Scale, Version 2.2 (Regional Interagency Executive Committee and Intergovernmental Advisory Committee, 1995) was used as a guide; the process outlined in this guide provides resource managers with the flexibility to focus watershed analysis as necessary to meet management objectives. This six-step process is issue-driven; it focuses on analysis topics, along with specific watershed problems and concerns. Management discretion applies to defining the number and scope of topics and concerns to be analyzed, illustrating that "…It should be emphasized that watershed analyses can be a very simple and straightforward process taking a few days or weeks to develop or a complicated process. The complexity is intertwined with the issues and questions being addressed" (BLM Instruction Memorandum OR-2007-071). This analysis is not a decision-making process but helps identify opportunities for future management activities, including planning, project development, and regulatory compliance. The six-step process may also be used to guide analysis at the reach scale, including modification of Riparian Conservation Area (RCA) widths. Below is a summary of each of the six steps taken to develop an ecosystem analysis at the watershed scale.

Step 1 - Characterize the Watershed

The purpose of Step 1 is to identify the dominant physical, biological, and human processes or features of the watershed that affect ecosystem functions or conditions, including the relationship between these ecosystem elements and those occurring in the river basin and/or watersheds. When characterizing the watershed, team members identify the most important land allocations, plan objectives, and regulatory constraints that influence resource management in the watershed. At the reach scale, the RCA and stream are characterized, including aquatic and riparian habitats, channel type, valley type, and stream gradient.

Step 2 - Identify Issues and Key Questions

The purpose of Step 2 is to focus the analysis on the key elements of the ecosystem that are most relevant to the management questions and objectives, human values, or resource conditions within the watershed. Key analysis questions are formulated from instream and riparian indicators used to measure or interpret key ecosystem elements. At the reach scale, the issue(s) are described, including which instream and riparian indicators are affected by the proposed or past management action(s).

Step 3 - Describe Current Conditions

The purpose of Step 3 is to develop more detailed information relevant to the issues and key questions identified in Step 2. Step 3 is where the current range, distribution, and condition of the relevant ecosystem elements are documented. At the reach scale, this section describes the current condition of the RCA and may include a discussion of riparian function using proper functioning condition and quantitative stream and riparian condition assessments such as multiple indicator monitoring (Burton et al., 2011).

Step 4 - Describe Reference Conditions

Step 4 explains how ecological conditions have changed over time with respect to historic or reference conditions as a result of human influence and natural disturbances. At the reach scale, if an undisturbed reference reach similar in channel, valley, and vegetation type is available, current conditions are measured to establish reference conditions for future comparison. This section establishes objectives for the desired future condition.

Step 5 - Synthesize and Interpret Information

The purpose of Step 5 is to compare existing and reference conditions of specific ecosystem elements and to explain significant differences, similarities, or trends and their causes. The capability of the system to achieve key management plan objectives is also evaluated.

Step 6 - Identify Recommendations

The purpose of Step 6 is to bring the results of the previous steps to conclusion by addressing each of the issues and answering the key questions, focusing on recommendations that are responsive to watershed or reach-scale processes identified in the analysis. Step 6 identifies recommendations that address resource problems noted in this analysis in order to change the current watershed or reach conditions toward the desired future condition. Monitoring needs and data gaps are also identified and described.

Watershed Analysis for the Jarbidge Planning Area

BLM-managed lands in the planning area include large, contiguous blocks of public land interspersed with State lands, private lands, and two military withdrawal areas. Portions of the planning area are located in northern Nevada and are adjacent to land managed by the Humboldt-Toiyabe National Forest and other BLM Field Offices; these lands include the upper reaches of the Jarbidge River and its East Fork, the Bruneau River, and several headwater reaches of perennial streams in the Jarbidge Foothills. For analyses of these watersheds, the BLM Jarbidge Field Office will collaborate with the Forest Service and other BLM Field Offices to complete watershed analyses and subbasin assessments or updates, as appropriate. The level of site-specific or focused analysis will be commensurate with the scope, magnitude, and issues related to BLM activities or projects and related aquatic resources and values.

The BLM and Forest Service have completed two watershed analyses within the planning area; the Jarbidge Ranger District of the Humboldt-Toiyabe National Forest was the lead agency for both of these analyses. The Jarbidge Canyon Watershed Analysis (McNeill et al., 1997) included the upper West Fork of the Jarbidge River on USFS managed lands. The Watershed Analysis for the East Fork Jarbidge River (USDA, 2004) encompassed the East Fork Jarbidge River watershed above the confluence of Dave Creek and included a small portion of BLM managed land (3,640 acres). Both of these documents provide guidance for cumulative effects analysis, prioritization for restoration and management actions, and direction and information for landscape and ecosystem management in the Jarbidge Watershed.

Although no other watershed analyses have been completed in the planning area using the six-step process in the Federal Guide for Watershed Analysis, there have been several other multi-scale reviews that assessed aquatic resources in the planning area (Table B-10). Through these broad-scale (FWS, 1995) and mid-scale (FWS, 1998, 2002; Idaho Power Company, 2005) analyses, habitat was characterized, issues affecting the species were identified, current and reference conditions were described, and data were used to identify changes to reduce threats to the ESA-listed and BLM Sensitive aquatic species in the planning area. The ARMS, which uses site-specific data to identify conservation and restoration priorities, provides the framework for a fine-scale assessment for the planning area. Future watershed analysis in the planning area may be completed depending on the intensity, scope, or scale of issues that drive the need for additional fine-scale assessments.

Monitoring and Adaptive Management[6]

Monitoring

Monitoring provides a mechanism for observation and measurement to ensure that project design criteria and mitigation are being implemented and to determine if project and program goals and objectives are being achieved. The basics of plan-level monitoring should:

- Determine if the plan, project, or activity is being implemented correctly and is achieving desired results;
- Provide a mechanism for accountability and oversight;
- Evaluate the effectiveness of recovery and restoration efforts; and
- Provide a feedback loop so that management direction may be evaluated and modified (i.e., adaptive management).

Implementation monitoring is used to determine if management practices are implemented as identified in an activity plan, Environmental Assessment (EA), Environmental Impact Statement (EIS), Biological Assessment (BA) with a letter of concurrence, or Biological Opinion (BO). Effectiveness monitoring is used to determine if management practices, as designed and executed, are effective in meeting project goals and objectives as defined in an activity plan, EA, EIS, BA with a letter of concurrence, or BO.

The results of monitoring will be summarized and shared, as requested, with the tribes and Federal and State agencies. Management considerations for monitoring include the following:

- Monitoring should be focused on key questions that inform decision making and allow timely adjustments to management.
- Monitoring emphasis and intensity should be commensurate with the importance of the question being asked. For example, if adaptive management is being used, it is important to monitor the key parameters to the degree necessary to support the current course of action or to trigger an alternate approach.
- Plan-level monitoring should make use of and not duplicate broad-scale monitoring programs. To the extent practicable, monitoring done at the plan scale should be compatible with and complementary to broader- and finer-scale monitoring.
- Monitoring should be coordinated with and, where possible, consolidated with similar efforts of other agencies.
- Outcome-based management approaches rely on monitoring for their success. These approaches typically require a different level and type of monitoring than prescriptive approaches.
- Monitoring commitments in plans should be feasible and achievable.

The implementation and effectiveness monitoring protocols will be in accordance with appropriate BLM Technical Bulletins or other acceptable monitoring methods that would address the bull trout and redband trout habitat condition indicators in Table B-1 and Table B-2.

Adaptive Management

The ARMS allows for adaptive management, a continuing process of planning, implementation, monitoring, and evaluation to adjust management to meet goals and objectives of ecosystem-based management. Adaptive Management is a decision process that promotes decision making in the face of uncertainty as outcomes from management activities become better understood. The approach improves resource management by learning from prior management outcomes. The process of adaptive management uses the latest scientific information, site-specific information and monitoring data, and professional judgment to select the management strategy most likely to meet goals and objectives. By continually adjusting management strategies as needed, supported by monitoring or additional

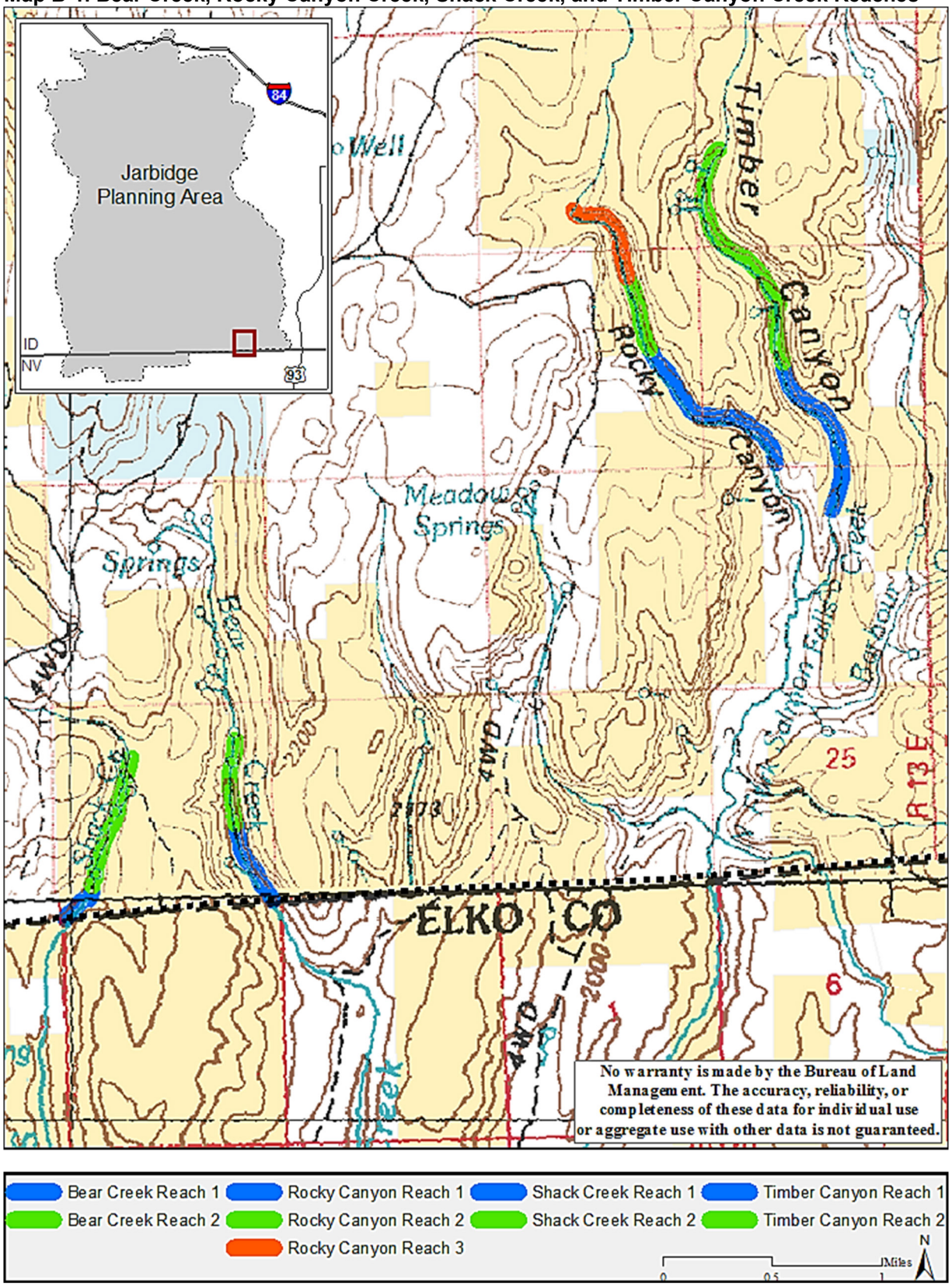
[6] This section addresses material for Component V, Management Direction – Adaptive Management, related to adaptive management and Component VI, Monitoring, Adaptive Management, and Oversight, in the Guidance for Developing Aquatic Conservation Strategies (BLM, 2008a).

information, adaptive management will result in achievement of short- and long-term trends toward meeting objectives. Adaptive management provides the capability to respond quickly to monitoring data with consideration given to past season monitoring or preseason conditions. It also allows changes needed to meet long-term objectives of the Jarbidge RMP including direction from ESA, the Clean Water Act, and Fundamentals for Rangeland Health. The USDI guidance on using adaptive management can be found in Williams and others (2009).

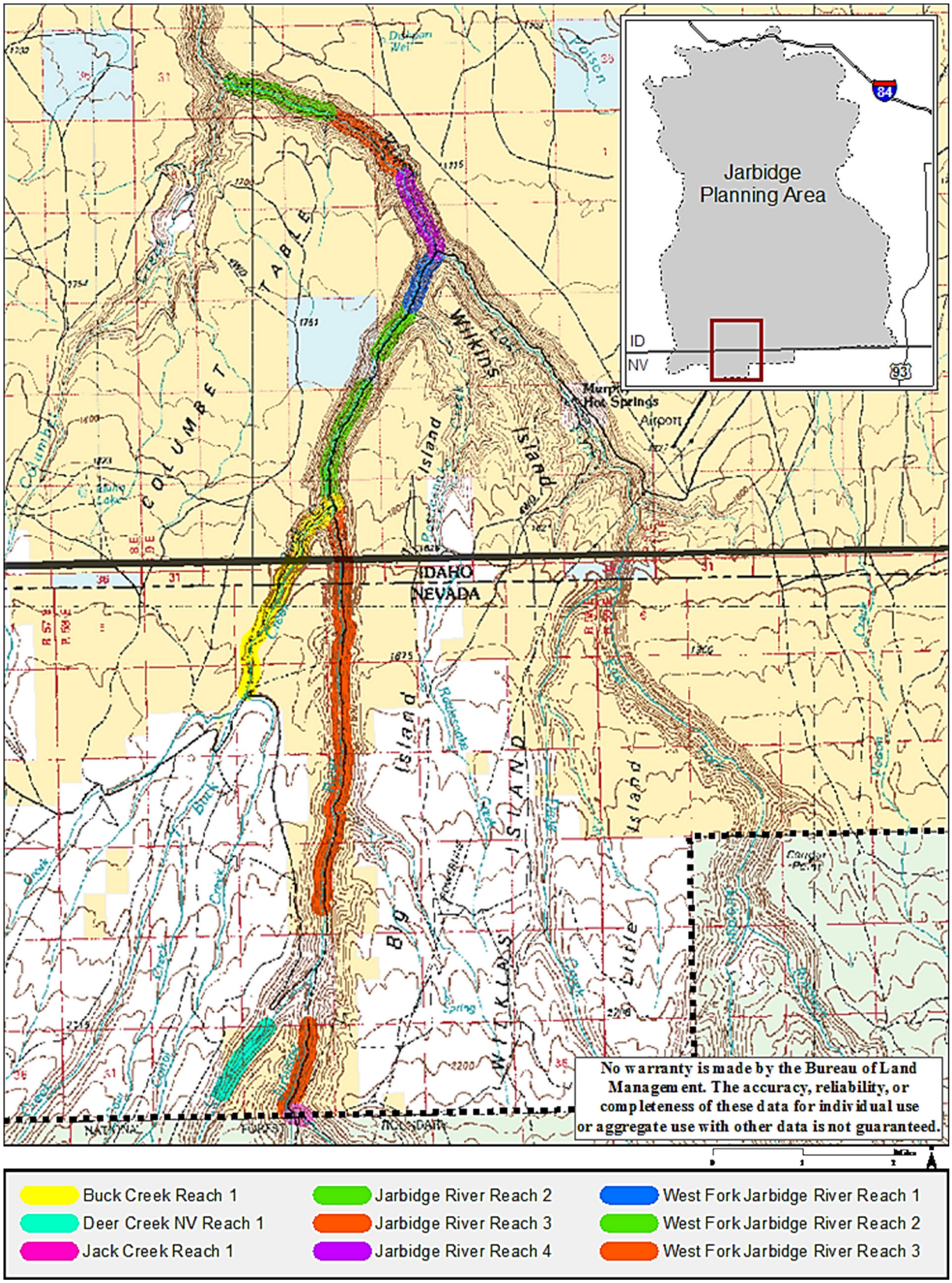
Adaptive management requires knowledge of the current conditions, potential or capability of riparian sites and streams, current management and effects of the management on the resources, and management changes that may be made to move the current condition toward the desired condition. Single indicators of conditions or trend are usually not adequate to make good decisions. Information on the condition and trend of the vegetation, streambanks, and aquatic resources and knowledge of current management practices can help establish cause-and-effect relationships that are important for making appropriate decisions. Such information allows refinement and development of locally-derived project or activity design standards or criteria.

Maps for the Aquatic and Riparian Management Strategy

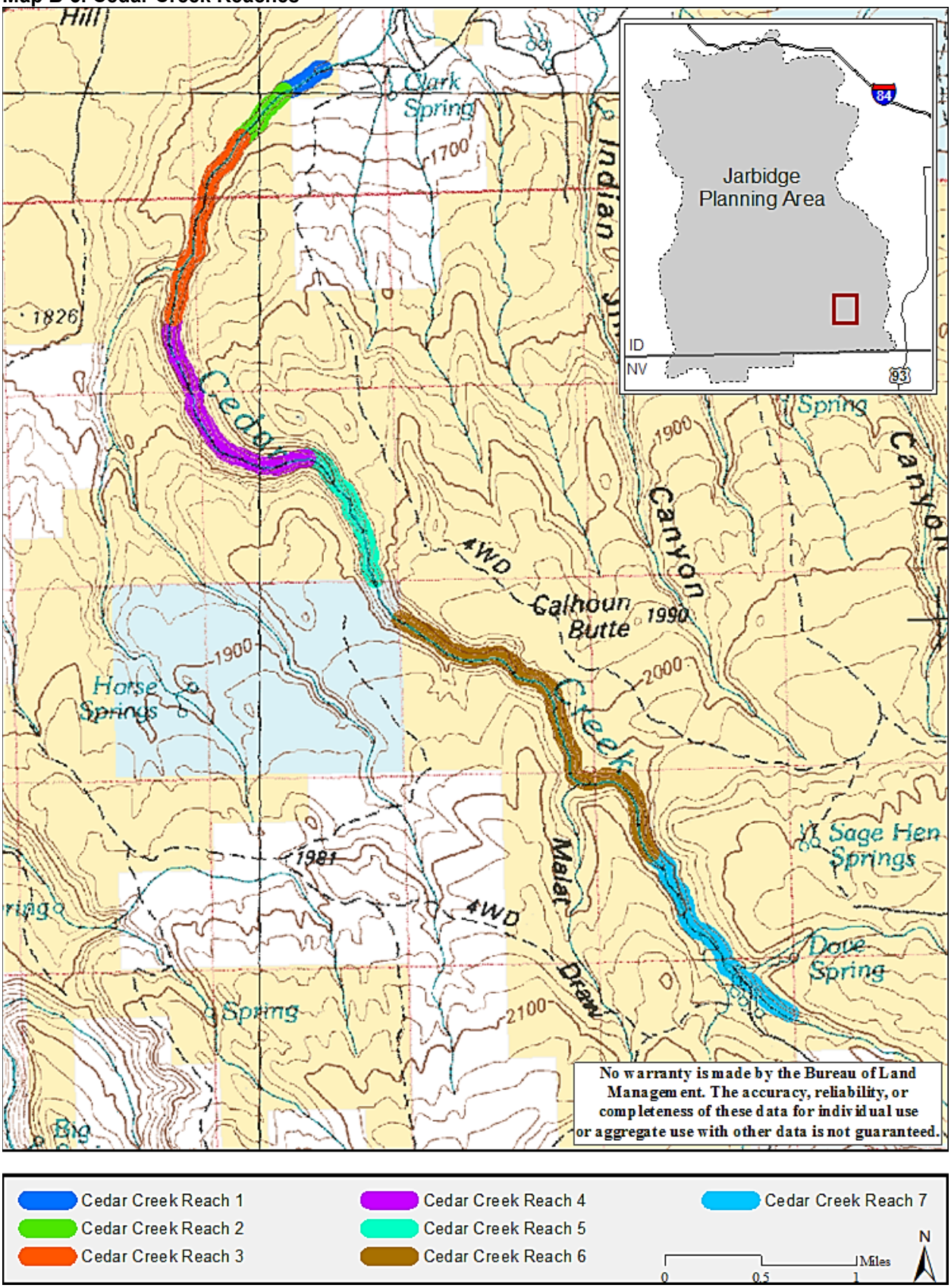
Map B-1. Bear Creek, Rocky Canyon Creek, Shack Creek, and Timber Canyon Creek Reaches



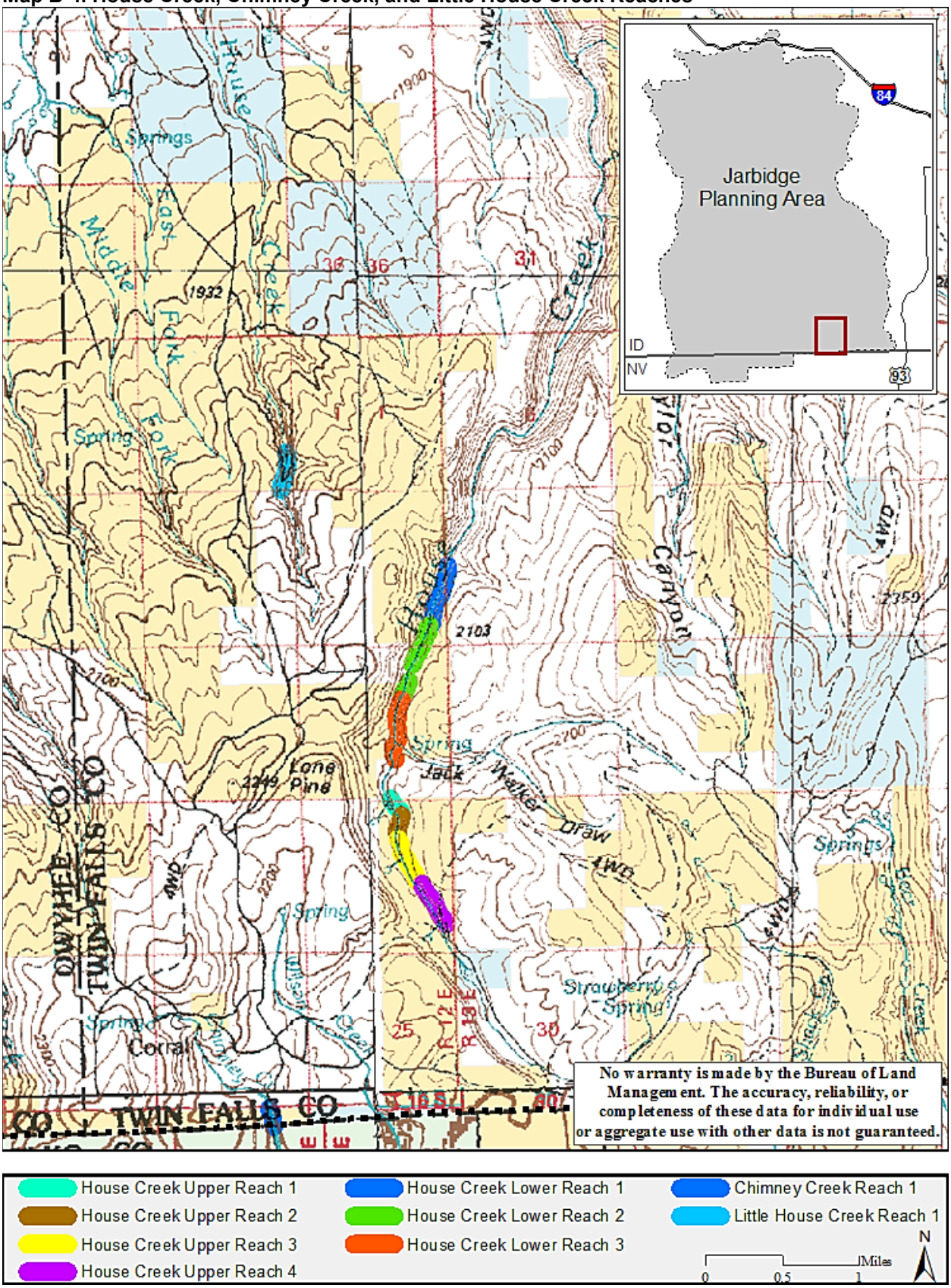
Map B-2. Buck Creek, Deer Creek (NV), Jack Creek, Jarbidge River, and West Fork Jarbidge River Reaches.



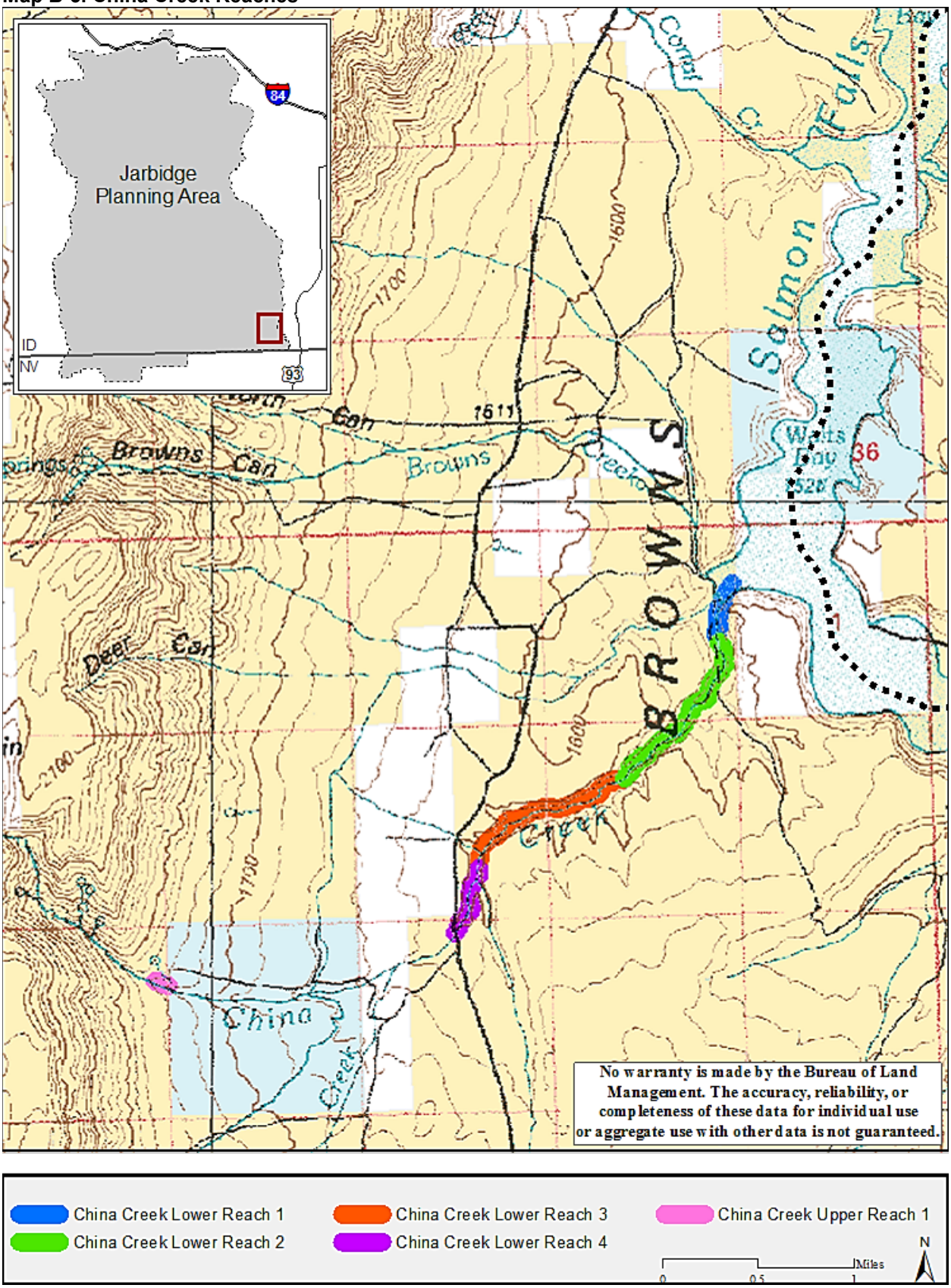
Map B-3. Cedar Creek Reaches



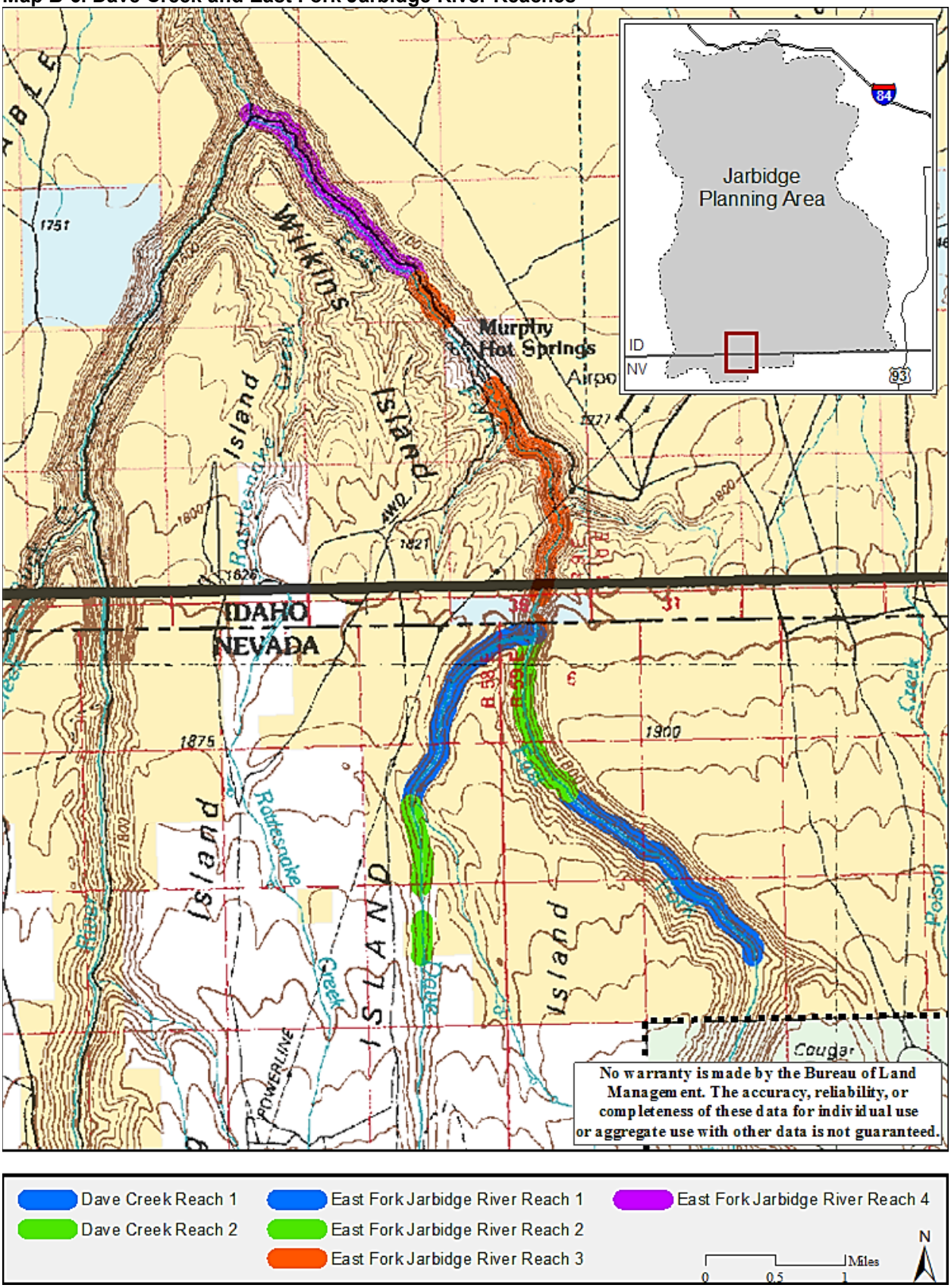
Map B-4. House Creek, Chimney Creek, and Little House Creek Reaches



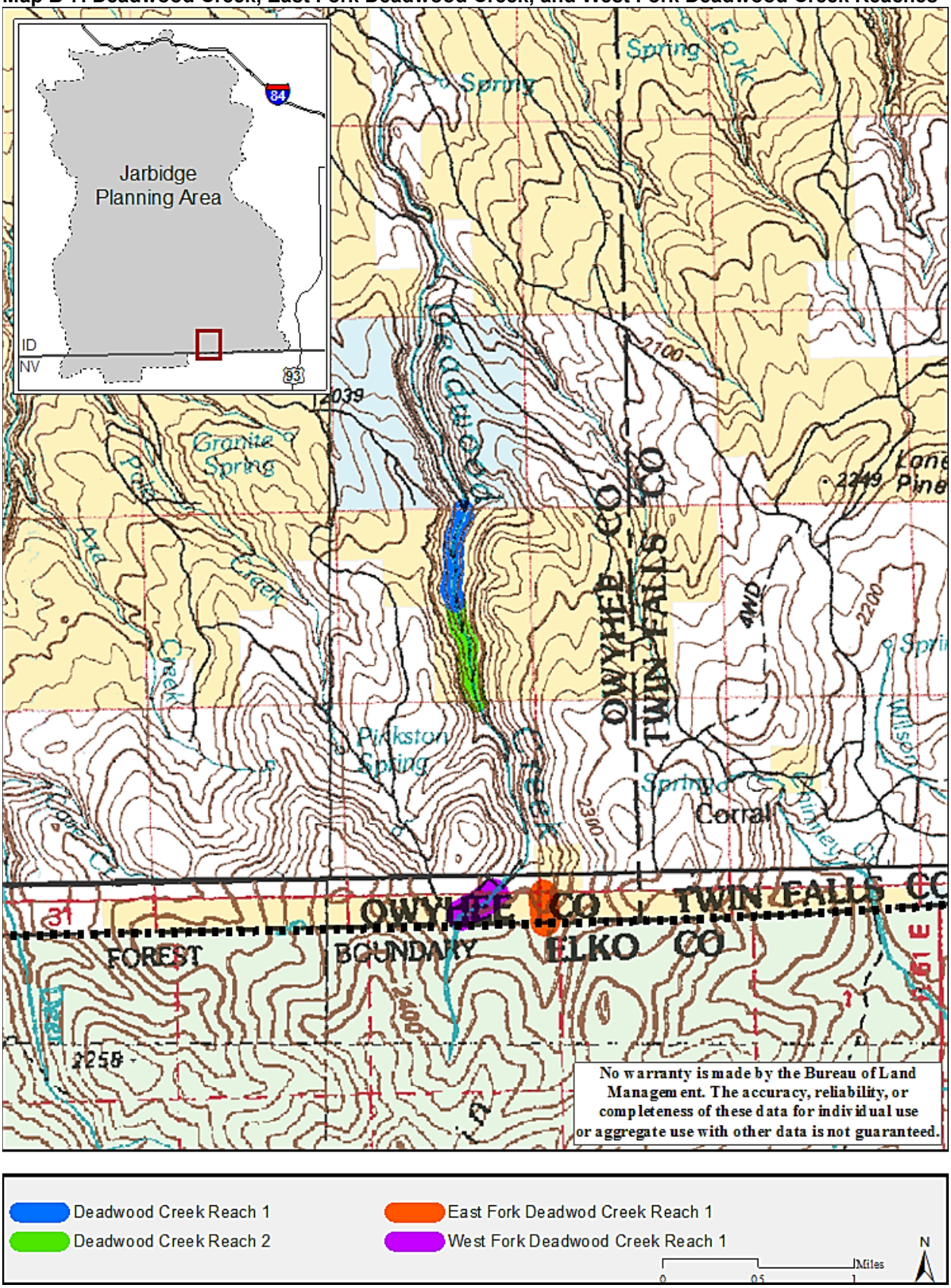
Map B-5. China Creek Reaches



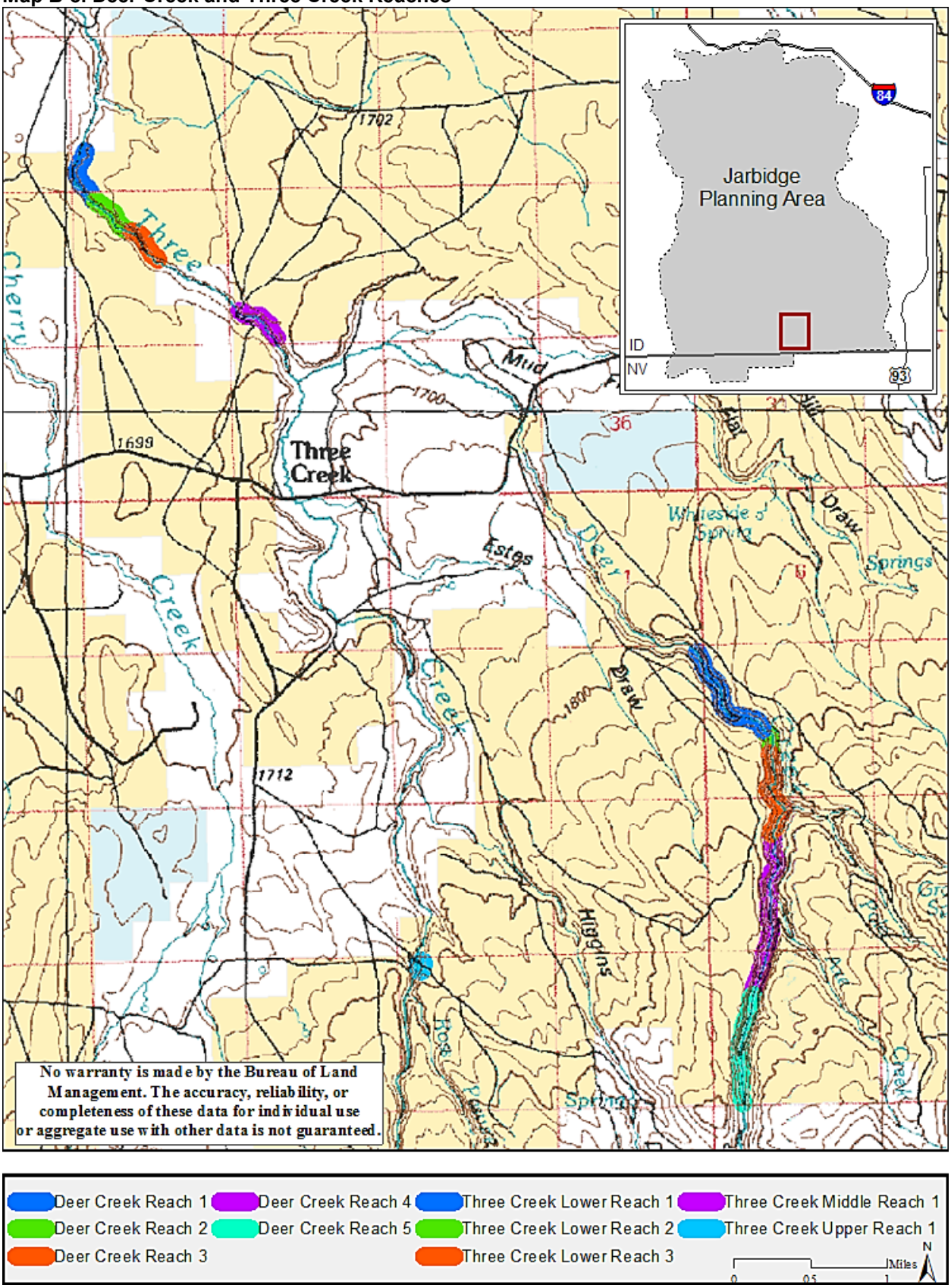
Map B-6. Dave Creek and East Fork Jarbidge River Reaches



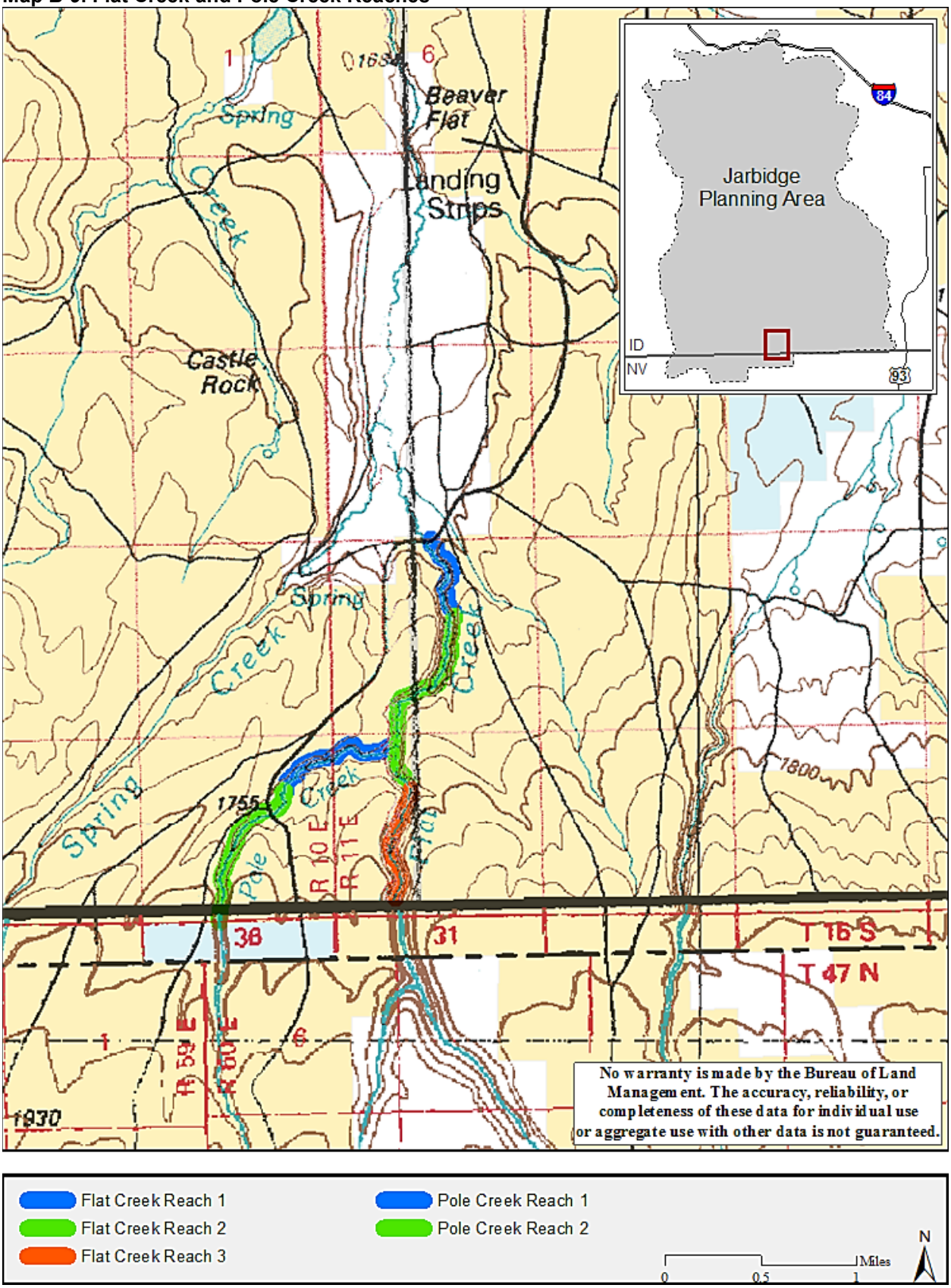
Map B-7. Deadwood Creek, East Fork Deadwood Creek, and West Fork Deadwood Creek Reaches



Map B-8. Deer Creek and Three Creek Reaches



Map B-9. Flat Creek and Pole Creek Reaches



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APPENDIX C – CONSERVATION MEASURES

The BLM Manual for Special Status Species Management (Section 6840) provides policy and guidance for the conservation of special status species, plants and animals, and the ecosystems upon which they depend on BLM-managed lands.

The following tables identify conservation measures to bring the species and their habitat to the condition under which the provisions of the Endangered Species Act (ESA) are not necessary, current listings under special status species categories are no longer needed, and future listings under special status species categories would not be necessary. The sources of these conservation measures (i.e. land use plan consultations or existing species recovery plans) are identified.

The following comprise the conservation plans, strategies, and agreements in place for species in the planning area. This list will be updated as new plans, strategies, and agreements are adopted and existing plans, strategies, and agreements become obsolete, expire, or are replaced.

The BLM intends that the species-specific conservation measures included in the documents identified below will be implemented. While a high priority for BLM, both the BLM and US Fish and Wildlife Service (FWS) recognize that funding constraints may affect the ability to implement specific conservation measures as planned. Where funding is lacking, BLM and FWS will cooperate to set priorities and timelines for accomplishing recovery objectives for listed and proposed species.

Conservation Agreements

- **Conservation Agreement between BLM Idaho State Office and the US Fish and Wildlife Service Snake River Fish and Wildlife Office. September 2014 –** The purpose of the Conservation Agreement is to provide for the conservation of slickspot peppergrass related to existing Idaho BLM land use plans and a subset of ongoing actions.
- **Conservation Agreement for Bureau of Land Management – Idaho State Office, US Fish and Wildlife Service – Snake River Basin and Spokane Field Offices: Idaho Bureau of Land Management Existing Land Use Plans Consultation. Signed by Idaho BLM State Director. December 2005** – This Conservation Agreement is intended to promote the conservation of Listed, Proposed, and Candidate species that have not previously undergone land use plan-level consultation under the ESA.
- **Candidate Conservation Agreement for Slickspot Peppergrass (*Lepidium papilliferum*). 2006. Governor's Office of Species Conservation, et al. 158 pp. –** The purpose of this Candidate Conservation Agreement is to expedite implementation of conservation measures for slickspot peppergrass in Idaho. Threats that warrant listing should be significantly reduced, mitigated, or eliminated through implementation of this Candidate Conservation Agreement, and additional measures to enhance slickspot peppergrass occurrences and habitat are provided for.

Memoranda of Understanding

- **Interagency Memorandum of Understanding to Implement the Interior Columbia Basin Strategy. November 2002** – This Memorandum of Understanding (MOU) provides guidance to all BLM offices to implement the Interior Columbia Basin Strategy to ensure an ecosystem-based process is used in resource management plan (RMP) revisions within the Columbia River Basin (IB-ID-2003-062).
- **Memorandum of Understanding to Support and Implement to the Extent Practicable and Where Appropriate the Intent and Actions Contained in the 2006 Conservation Plan for the Greater Sage-grouse in Idaho. July 2006** – This MOU was signed by Idaho Department of Fish and Game, Idaho Department of Lands, Idaho State Department of Agriculture, Office of Species Conservation, Idaho BLM, United States Forest Service Region 4, Animal and Plant Health Inspection Service-Wildlife Service, and Natural Resource Conservation Service to support and implement the sage-grouse conservation plan. This candidate species is not addressed under Section 7 consultation but is covered under this MOU between the BLM and FWS.

Memoranda of Agreement

- **Memorandum of Agreement for Endangered Species Act Section 7 Programmatic Consultation and Coordination among Bureau of Land Management, Forest Service, National Marine Fisheries Service, and US Fish and Wildlife Service. August 30, 2000 –** This agreement outlines consultation procedures for the BLM and other Federal agencies.

Conservation Strategies

- **Interior Columbia Basin Strategy. 2002. A Strategy for Applying the Knowledge gained by the Interior Columbia Basin Ecosystem Management Project to the Revision of Forest and Resource Management Plans and Project Implementation. Included as Attachment 1 in Bureau of Land Management IB No. ID-2003-062. 11 pp. –** The strategy has been used to guide the amendment and revision of this land and resource management plan. The Strategy includes guidance for terrestrial and aquatic ecosystems and to use multi-scale analysis in resource management planning. It also identified emphasis areas for preparing an Aquatic Conservation Strategy as a component of the RMP. An Aquatic Conservation Strategy was incorporated into the Approved Jarbidge RMP (see Appendix B).
- **National Sage-Grouse Habitat Conservation Strategy. 2004. Prepared by the Bureau of Land Management. 25 pp. –** This strategy sets goals and objectives, assembles guidance and resource materials, and provides comprehensive management direction for the BLM's contributions to the on-going multi-state greater sage-grouse conservation effort.

Recovery Plans

- **Snake River Aquatic Species Recovery Plan. 1995. US Fish and Wildlife Service, Snake River Basin Office, Ecological Services, Boise, Idaho. 92 pp. –** The recovery plan includes short- and long-term objectives to protect known live colonies of Federally listed snails, as well as redband trout, Snake River white sturgeon, and Shoshone sculpin, by eliminating or reducing known threats to these species and their habitat.
- **Recovery Plan for the Bruneau Hot Springsnail (*Pyrgulopsis bruneauensis*). 2002. US Fish and Wildlife Service, Region 1, Portland, Oregon. 52 pp. –** The primary objective of the recovery plan is to recover the species to a point where listing is no longer warranted by implementing groundwater management activities and monitoring species recovery.
- **Draft Recovery Plan for the Jarbidge River Distinct Population Segment of Bull Trout (*Salvelinus confluentus*). 2004. US Fish and Wildlife Service, Portland, Oregon. –** The primary objective of the plan is to reduce threats to bull trout and their habitat and to increase population numbers to habitat potential.
- **Revised Draft Recovery Plan for the Coterminous United States Population of Bull Trout (*Salvelinus confluentus*). 2014. US Fish and Wildlife Service, Portland, Oregon. –** The primary objective of the plan is to reduce threats to bull trout and their habitat and to increase population numbers to habitat potential.

Conservation Measures

Slickspot Peppergrass

Table C-1. Conservation Measures for Slickspot Peppergrass.

Conservation Measures	BLM Implementation Actions
Air and Atmospheric Values	
None	None
None	None
1) Although non-chemical methods will be the preferred approach in occupied habitat, when appropriate, projects involving the application of pesticides (including herbicides, fungicides, and other related chemicals) in slickspot peppergrass habitat and potential habitat that may affect the species will be analyzed at the project level and designed such that pesticide applications will support conservation and minimize risks of exposure.	1) Site-specific stipulations will be developed locally using these criteria: a) Evaluate the benefits and risks of vegetation treatment including the following: application methods; pesticides, carriers, and surfactants used; needed treatment buffers; and use of non-chemical noxious weed control (for example, bio-controls, hand pulling). b) Apply appropriate spatial and temporal buffers to avoid species' exposure to harmful chemicals. c) Explore opportunities to eradicate competing non-native invasive plants in occupied habitat where slickspots are being invaded by such plants. d) Implement revegetation and noxious weed control measures to reduce the risks of non-native invasive plant infestations following ground/soil disturbing actions in slickspot peppergrass habitat. BLM will provide the US Department of Agriculture Animal and Plant Health Inspection Service with the location of habitat categories for slickspot peppergrass. Mormon cricket, grasshopper, or other insect control in habitat categories for slickspot peppergrass will only include those methods that minimize impacts to the plant's pollinators.
2) Where needed and feasible, coordinate with adjacent land owners and local governments regarding control of invasive plants in upland areas through cooperative weed management programs. One of BLM's priorities within the cooperative weed management program is the protection of special status plants on BLM-managed lands.	2) Take advantage of coordination opportunities as they arise.
3) BLM will promote diversity, richness, and health of native plant communities to support pollinators and habitat for slickspot peppergrass.	3) BLM will focus slickspot peppergrass habitat conservation and restoration efforts in or adjacent to occupied habitat to encourage connectivity among populations through the following measures: a) Where habitat categories for slickspot peppergrass exist, BLM will conserve remaining

Conservation Measures	BLM Implementation Actions
	stands of sagebrush and native vegetation in making activity plan and project-level decisions. b) Vegetation treatment projects undertaken in habitat categories for slickspot peppergrass will be compatible with species habitat restoration objectives, as described in item (d) below. c) BLM will select and implement specific projects to restore habitat categories for slickspot peppergrass in degraded areas as funding allows, such as planting shrubs and forbs and controlling noxious weeds, within and adjacent to occupied habitat. Apply methods described in item (d) below. When conducting vegetation treatment projects, BLM will use seeding techniques that minimize soil disturbance such as minimum-till drills and rangeland drills equipped with depth bands, use native plant materials and seed during restoration activities, and select native forbs that benefit slickspot peppergrass insect pollinators.
Fish	
None	None
Wildlife	
1) Manage facilities installed for wildlife to promote maintenance of habitat categories for slickspot peppergrass.	1) For review of ongoing actions, see Special Status Species management program section item (2). For new actions, see Special Status Species management program section item (3). As appropriate to avoid or minimize negative impacts, modify existing and avoid placement of new wildlife facilities in occupied habitat.
2) Restore wildlife habitat while promoting slickspot peppergrass conservation.	2) Any restoration efforts for wildlife within habitat categories for slickspot peppergrass will be compatible with the species' habitat requirements.
Special Status Species: Common to All Programs	
1) In cooperation with Idaho Department of Fish and Game, Idaho Natural Heritage Program (INHP), US Fish and Wildlife Service (FWS), Idaho Army National Guard (IDARNG), the US Air Force, and others:	1) Following actions to be completed in cooperation with others:
a) Use survey protocols consistent with the FWS Rare Plant Survey Guidelines to conduct Stage 1, 2, and 3 surveys (see Figure C-2 at the end of this table for the general survey process).	Apply current survey methods, and assure that inventories are done at the appropriate time of the year by qualified botanists or by persons who are under the guidance of qualified botanists.
b) Cooperate to refine slickspot peppergrass habitat and potential habitat maps (Stage 1 survey, Figure C-2), and to identify and map slickspot peppergrass occurrences (Stage 2 survey, Figure C-2).	a) Surveys, mapping, and data management (refer to Figure C-2, Survey Flowchart for Slickspot Peppergrass): i). Cooperate with INHP and FWS to record, refine, and map all habitat features including potential habitat, slickspot peppergrass habitat, non-habitat, occupied habitat, and element occurrences (EOs) on BLM-

Conservation Measures	BLM Implementation Actions
	managed lands. Use current geographic information system standards for mapping and database management. In cooperation with INHP, maintain a spatial database of species population and habitat information for BLM-managed lands. ii). BLM will continue to conduct Stage 1 and 2 surveys, report survey information to the INHP, and incorporate the information into the adaptive management strategy. iii). BLM's intent will be to conduct Stage 1 surveys (slickspot survey) for at least 25,000 acres of potential habitat averaged over 10 years. BLM will work collaboratively with FWS to prioritize surveys during the first 5 years to areas that have a high likelihood of species occurrence, or that are needed for BLM project purposes. BLM will also target at least 10,000 acres of Stage 2 surveys (slickspot peppergrass plant surveys) that can be done concurrently with the Stage 1 surveys. The amount of habitat to be surveyed each year will be based on available annual funding. Stage 3 plant surveys will be conducted as necessary and desired. Prioritize Stage 1 and 2 surveys to address slickspot peppergrass habitat with a high likelihood of species occurrence. Surveys should be scheduled to complement other program needs.
b) Cooperate in regular monitoring of slickspot peppergrass population trends and land health conditions on BLM-managed lands, and follow current monitoring protocols. Land health conditions include forb diversity to support pollinators and habitat for slickspot peppergrass.	c) Follow the Habitat Integrity and Population (HIP) monitoring protocol or other accepted monitoring methodology. BLM will cooperate with others to conduct annual monitoring within all EOs on BLM-managed lands to assess the effectiveness of the conservation measures as part of the adaptive management strategy. i). Establish permanent ecological reference areas in selected EOs to evaluate land health conditions associated with slickspot peppergrass. Use data from the ecological reference areas to assist in completing land health assessments. This information will be used to evaluate permitted management actions and to design restoration projects for slickspot peppergrass.
d) Participate in research essential to conservation of the species.	d) BLM will participate in research as funding allows. Areas to focus on include, but are not limited to, the following: i). Elimination and control of invasive species. ii). Pollination, forb restoration, and effects of ground disturbance on the species. iii). Determination of specific limiting factors in

Conservation Measures	BLM Implementation Actions
	terms of habitat needs and characteristics. Population viability analyses.
e) Continue to support seed banks in a long-term seed storage facility.	As needed, make seed available to a suitable repository to support a seed bank.
e) Support the establishment and maintenance of new populations in habitat categories for slickspot peppergrass. The goal of these activities is to maintain or enhance viable populations.	Reintroduce slickspot peppergrass at selected experimental reintroduction or historic sites as funding allows.
2) Ensure that ongoing Federal actions support or do not preclude species conservation in habitat categories for slickspot peppergrass.	2) Ongoing BLM authorized activities: a) Based on the results of Stage 1 and 2 surveys, review ongoing activities in habitat categories for slickspot peppergrass. The Level 1 Team will conduct these reviews in a manner consistent with streamlining procedures where local section 7 compliance activities with FWS (if necessary) have not yet been completed. b) If reviews indicate that direct or indirect negative impacts to the species or its habitat are occurring as a result of ongoing discretionary BLM actions, the activity will be modified to avoid or minimize anticipated negative impacts and, where feasible, promote species conservation. Where habitat categories for slickspot peppergrass exist, BLM will conserve remaining stands of sagebrush and native vegetation in making activity plan and project-level decisions.
3) Ensure that new Federal actions support or do not preclude species conservation in habitat categories for slickspot peppergrass.	3) New proposed BLM authorized activities: a) Consistent with streamlining procedures, BLM will require project-level inventories for any project in slickspot peppergrass habitat and in potential habitat during project planning if inventory information is not available or adequate. BLM will use the protocols described in (1) (a). b) If direct or indirect negative impacts to the species or its habitat are anticipated as a result of new BLM actions, the activity will be modified to avoid or minimize negative impacts and, where feasible, promote species conservation. c) Where needed, complete section 7 compliance for new activities that may affect this species and its habitat. d) Where slickspot peppergrass habitat exists, BLM will conserve remaining stands of sagebrush and native vegetation in making activity plan and project-level decisions. .

Conservation Measures	BLM Implementation Actions
4) Implement adaptive management as needed to achieve conservation objectives.	4) Conduct site-specific implementation and effectiveness monitoring of management actions. Adjust management as needed to ensure that objectives are met. See additional details within other programs.
5) Support programs to conserve and enhance slickspot peppergrass on non-Federal lands.	5) Take advantage of opportunities to support conservation of slickspot peppergrass through easements, cooperative management efforts, and other programs.
6) Include language in all land use authorizations to require rehabilitation of habitat categories for slickspot peppergrass in case of trespass or permit violations, if damage occurs.	6) As a part of management authorizations, require rehabilitation to native vegetation in habitat categories for slickspot peppergrass if trespass or permit violation occurs and the habitat is damaged. If ecological site conditions preclude the use of native species, use non-invasive, non-native plant species for rehabilitation in trespass or permit violation situations.
Wildland Fire Ecology and Management: Fire Suppression	
1) Fire suppression efforts will be conducted, as possible, to protect habitat categories for slickspot peppergrass. Place a high priority on protecting habitat categories for slickspot peppergrass.	1) Fire management activities: a) Fire Management Plans will include Standard Operating Procedures that address conservation of slickspot peppergrass. i). BLM will provide adequate fire suppression coverage at all stations to meet objectives with the intent to suppress 90% of fires to the acreages specified in the fire management plans for slickspot peppergrass. BLM will maintain existing remote fire guard stations easily accessible to occupied habitat (for example, Juniper Butte fire guard station) and explore opportunities to establish additional stations to provide better initial attack and reduced response times for wildfires in habitat categories for slickspot peppergrass. ii). Apply Minimum Impact Suppression Tactics (MIST) in habitat categories for slickspot peppergrass, as appropriate. Consult with resource advisors to determine where MIST tactics should be applied to avoid or minimize negative impacts. iii). Although MIST are preferred, aggressive fire suppression tactics (e.g., blade lines, back fires) may be applied in habitat if EOs are threatened. Do not locate fire base camps, staging areas, and fueling areas within occupied habitat.
2) As needed, coordinate with appropriate agency personnel regarding fire suppression activities in or adjacent to habitat categories for slickspot peppergrass.	2) Ongoing interagency coordination. a) BLM and cooperators will expand on and continue to provide special status plant and

Conservation Measures	BLM Implementation Actions
	habitat awareness training to fire resource advisors, Incident Commanders, Engine Operators, and Fire Operations Supervisors. BLM and cooperators will distribute maps and inform fire crews on locations of the EOs to maximize fire protection and to avoid or minimize impacts from fire suppression activities.
Wildland Fire Ecology and Management: Emergency Stabilization and Burned Area Rehabilitation	
1) Implement Emergency Stabilization and Burned Area Rehabilitation (ES&BAR) activities to consider slickspot peppergrass in and adjacent to slickspot peppergrass habitat rehabilitation.	1) The following measures will be applied: a) All wildfires within habitat categories for slickspot peppergrass will be evaluated for ES&BAR treatments, regardless of size. b) As needed, protect disturbed and recovering areas using temporary closures or other measures. BLM will continue to rest areas from land use activities to meet ES&BAR objectives, defined through the ES&BAR plans. c) BLM will initiate and complete ES&BAR efforts for slickspot peppergrass, such as planting shrubs and forbs, within habitat categories for slickspot peppergrass. BLM will implement the following measures during fire ES&BAR efforts: i). BLM will use seeding techniques that minimize soil disturbance such as minimum-till drills and rangeland drills equipped with depth bands when ES&BAR projects have the potential to impact slickspot peppergrass habitat. ii). BLM will use native plant materials and seed during ES&BAR activities. BLM will include native forbs in seed mixtures that will benefit slickspot peppergrass insect pollinators. iii). If native plant materials and seed are not available, non-invasive, non-native species may be used for stabilization activities in habitat categories for slickspot peppergrass. In areas adjacent to habitat categories for slickspot peppergrass, if natives are not available, non-invasive non-native species are acceptable for stabilization activities.
2) Fire rehabilitation projects involving the application of pesticides in habitat categories for slickspot peppergrass will be analyzed and implemented in accordance with the approach described in the Upland Vegetation management program section.	2) See Upland Vegetation management program section.
Wildland Fire Ecology and Management: Wildland Fire Use	
1) Wildland fire use projects will not be allowed in slickspot peppergrass habitat.	1) Wildland fire use is not an option in the planning area per WFM-A-1.
Wildland Fire Ecology and Management: Prescribed Fire	
1) Prescribed fire projects will be designed to conserve and enhance slickspot peppergrass	1) Prescribed fire in slickspot peppergrass habitat will only be used as a tool for assisting

Conservation Measures	BLM Implementation Actions
habitat.	with species conservation (for example, a burn in preparation to decrease cheatgrass litter before herbicide application, or to clear fence lines of accumulated windblown weeds).
Wildland Fire Ecology and Management: Fuels	
1) Implement projects involving the application of pesticides in accordance with the approach described in the Upland Vegetation management program section.	1) See Upland Vegetation management program section.
2) Fuels management projects conducted in habitat categories for slickspot peppergrass should have long-term benefits to slickspot peppergrass.	2) Avoid fuels management projects in occupied habitat, unless such projects would enhance species conservation or are necessary for hazardous fuels reduction near the urban interface. Implement protection measures to avoid or minimize negative impacts to the species. In habitat categories for slickspot peppergrass, design native seed mixes that emphasize local stock and will promote species conservation. a) Because of potential negative impacts to habitat categories for slickspot peppergrass from linear fuel breaks, which can act as weed dispersal corridors, the following measures will be applied in or adjacent to habitat categories for slickspot peppergrass: i). BLM will evaluate the effectiveness of existing fuel breaks (location, dry fuel load, and noxious weed and invasive plant composition) in protecting habitat categories for slickspot peppergrass. ii). BLM may create and maintain fuel breaks where frequent fires can threaten habitat categories for slickspot peppergrass. New fuel breaks in habitat categories for slickspot peppergrass will be designed to conserve and enhance species habitat. Where appropriate and where objectives will be met, native vegetation should be emphasized in the creation of new fuel breaks. If native vegetation or seed is not available or if objectives would be met through their use, fuel breaks may include non-native, non-invasive, species that will not invade slickspots. In areas adjacent to habitat categories for slickspot peppergrass, fuel breaks may include potentially invasive non-native species such as intermediate wheatgrass and forage kochia as a last resort if the benefits of their use are demonstrated to outweigh the risks to slickspot peppergrass and its habitat. If potentially invasive non-native species are used, monitoring for spread will occur. If spread is found to occur outside the original treatment area, control

Conservation Measures	BLM Implementation Actions
	measures will be applied to eliminate further spread. Apply conservation measure (2) in the Wildland Fire Ecology and Management: ES&BAR program section and conservation measure (4) in the Upland Vegetation Management program. iii). Consider actions to repair or restore fuel breaks so they function as desired. Apply conservation measure (2) in the Wildland Fire Ecology and Management: ES&BAR program section and conservation measure (4) in the Upland Vegetation Management program. In addition to the reduction in fuels associated with managed livestock grazing (see relevant conservation measures from Livestock Grazing Management section), BLM may create fuel breaks using techniques such as mowing or targeted grazing to strategically reduce fuel loads where frequent fires can threaten habitat categories for slickspot peppergrass if the benefit of these actions can be demonstrated to outweigh the risks to slickspot peppergrass and its habitat.
Wildland Fire Ecology and Management: Community Assistance	
1) Follow all measures included throughout the Wildland Fire Ecology and Management program sections.	1) See actions within Wildland Fire Ecology and Management program sections. Incorporate into community assistance agreements.
Wild Horses	
1) If the range of wild horses and occupied habitat for slickspot peppergrass overlaps now or in the future, protect these areas from wild horses by including applicable conservation measures in herd management plans.	1) Manage wild horse herd size to minimize conflicts with slickspot peppergrass. Limit trampling in occupied habitat by implementing appropriate range management practices, such as fencing and water trough placement.
Paleontological Resources	
1) Activities within the Paleontological Resources management program will implement relevant conservation measures as described in the Special Status Species management program section to promote conservation.	1) Apply relevant conservation measures from the Special Status Species management program section in this table.
Cultural Resources	
1) Activities within the Cultural Resources management program will implement relevant conservation measures as described in the Special Status Species management program section to promote conservation.	1) Apply relevant conservation measures from the Special Status Species management program section in this table.
Visual Resources/ LWC	
None	None
Livestock Grazing: Permits and Leases	
1) Manage livestock grazing and trailing to conserve suitable habitat conditions for slickspot peppergrass while implementing rangeland health standards and guidelines. Apply the Implementation of Annual Grazing Adaptive Management (Figure C-1), located at the end of	1) Permit or lease renewal actions and annual authorizations: a) For review of ongoing actions, see Special Status Species management program section item (2).

Conservation Measures	BLM Implementation Actions
this conservation measures table, to adjust livestock use as appropriate.	b) Schedule surveys in habitat categories for slickspot peppergrass as needed for rangeland health assessments associated with permit and lease renewals. Surveys will be prioritized for habitat with a medium to high potential for species occurrence. Unsurveyed habitat with a low potential for species occurrence will be treated as unoccupied by slickspot peppergrass until surveys can be completed. The BLM Slickspot Peppergrass Occurrence Potential Map will be used to determine potential for occurrence within the Jarbidge planning area. Use survey procedures and flowchart (Figure C-2, Survey Flowchart for Slickspot Peppergrass) referenced in Special Status Species management program section 1(b). c) For new actions, see Special Status Species management program section item (3). d) As part of adaptive management to avoid or minimize negative impacts, modify livestock grazing activities as outlined in Figure C-1, Implementation of Annual Grazing Adaptive Management, located at the end of this conservation measures table. In addition, the following measures will be implemented, as appropriate: i). Minimize gathering livestock in EOs. ii). Avoid impacts to EOs from herd movement through rested and deferred pastures. iii). Trailing permits will not be authorized through EOs. iv). Sheep grazing permits will be modified to restrict bedding, trailing or watering herds within ½ mile of EOs. v). Supplements will be placed at least ½ mile from EOs. Supplements will be placed so that livestock will be drawn away from the EO and avoid traveling through the EO en route to the supplement or water source. Management requirements will be adjusted to maintain an appropriate distance between supplements and existing EOs to avoid impacts. vii). No new domestic horse animal unit months (AUMs) will be authorized in pastures containing EOs to avoid trampling impacts.
2) As part of adaptive management, BLM will conduct scheduled compliance inspections in pastures with occupied habitat as part of BLM range use supervision to minimize impacts.	2) BLM, in coordination with the FWS, will create a schedule to prioritize compliance inspections associated with livestock grazing permits in occupied habitat areas. These compliance inspections are a complement to the HIP monitoring listed under Special Status Species and where practical the efforts may be combined. BLM staff will conduct

Conservation Measures	BLM Implementation Actions
	inspections as determined by the schedule. a) BLM range staff will conduct pre-season range readiness checks for soil moisture conditions in allotments with occupied habitat. b) BLM will conduct post-use monitoring for trampling in slickspots within EOs (could be done in conjunction with utilization compliance checks). c) Monitoring results will be documented in a standard format (to be developed by BLM) in the grazing allotment files. Copies will be provided to the FWS as completed. Apply Grazing Adaptive Management Implementation Flowchart, Figure C-1.
3) Provide adequate rest from livestock use for areas treated after major disturbances in habitat categories for slickspot peppergrass. Major disturbances include fire, fire rehabilitation, or other soil-disturbing occurrences.	3) Protect treated areas by using temporary livestock closures or other measures. The length of rest will be determined by achieving certain goals associated with plant establishment outlined in the restoration, fire rehabilitation, or other plan.
4) BLM will work cooperatively with the livestock permittees to promote slickspot peppergrass conservation.	4) BLM will train permittees on slickspot peppergrass habitat and plant recognition. BLM will also work with permittees to use the Idaho Natural Heritage Program rare plant observation form to report survey information in a standard format.
Livestock Grazing: Range Infrastructure	
1) Manage livestock facilities to promote slickspot peppergrass conservation while implementing rangeland health standards and guidelines.	1) For review of ongoing actions, see Special Status Species management program section item (2). For new actions, see Special Status Species management program section item (3). As appropriate to avoid or minimize negative impacts, modify existing and avoid placement of new livestock facilities in occupied habitat areas. a) Within pastures, place water facilities to support slickspot peppergrass conservation: i). Existing water troughs (includes troughs that are tied into pipelines, as well as both permanent and movable troughs to which water is delivered throughout the grazing season) will be moved at least 1/2 mile from EOs, when feasible. Where troughs cannot be moved (for example, because of topographical constraints, additional disturbance, or impacts to sensitive species), management will be adjusted to mitigate the impacts during the periods of critical concern for slickspot peppergrass (such as when soils are saturated and subject to trampling impacts). Management adjustments could include shutting the water off seasonally, changing pasture boundary fences, or other appropriate measures.

Conservation Measures	BLM Implementation Actions
	ii). New water troughs (not including existing water troughs moved in [1][a][i], above) will be placed at least 1 mile from EOs. A deviation from this standard may be developed on a case-by-case basis through collaboration with the FWS. New water troughs will be placed so that cattle are drawn away from the EO and avoid trailing through an EO en route to a water source. iii). Temporary water troughs (short-term, emergency, or single-season use) will be located at least 1 mile from EOs. A deviation to this standard may be developed on a case-by-case basis through collaboration with the FWS. New water troughs will be placed so that cattle are drawn away from the EO and avoid trailing through an EO en route to a water source. Placement of new livestock infrastructure will be compatible with slickspot peppergrass habitat conservation. Avoid placement of new fences within EOs.
Recreation	
1) Developed facilities (paved campgrounds, vault toilets, interpretive kiosks, etc.): Manage existing and new recreation facilities to promote conservation of species habitat.	1) Management of existing and new facilities: a) For review of existing facilities, see Special Status Species management program section item (2). As appropriate to avoid or minimize negative impacts, modify existing facilities. For new facilities, or for expansion of uses at existing facilities, see Special Status Species management program section item (3). In addition, avoid development of new recreation facilities or expansion of existing facilities in habitat categories for slickspot peppergrass if negative impacts are anticipated.
2) Dispersed use areas (informal areas, including camping areas and tie-up areas for pack animals): Manage dispersed use sites to promote conservation of species habitat. This includes	2) For review of ongoing activities, see Special Status Species management program section item (2). In addition, minimize human activity in and adjacent to occupied habitat if negative impacts are

Conservation Measures	BLM Implementation Actions
limiting disturbances to the species resulting from human uses.	occurring. Close areas, either seasonally or year-round, as needed to protect the species and its habitat.
3) Commercial and noncommercial recreation permits, including hunting guides and outfitter camps: issue commercial and noncommercial recreation permits to promote conservation of habitat categories for slickspot peppergrass. This includes management of physical facilities (such as camps), as well as disturbances to habitat categories for slickspot peppergrass resulting from human uses.	3) Issuance and review of existing and new permits: a) For review of existing permits, see Special Status Species management program section item (2). If needed, modify existing permits that negatively impact habitat for this species. b) For new permits, see Special Status Species management program section item (3). Avoid issuing recreation permits in habitat categories for slickspot peppergrass if negative impacts are expected. In particular, avoid permitting new recreation activities in and adjacent to occupied habitat. If a recreation permit is to be issued, apply stipulations to the permit to support or to not preclude species conservation and educate permit holders about species' biology and needs. BLM will not authorize organized recreation activities in habitat categories for slickspot peppergrass if negative impacts are anticipated (for example, off-highway vehicle [OHV] races, equestrian events, and other events).
Transportation and Travel	
1) Manage roads, OHV routes and areas, as well as non-motorized trails, to promote species habitat conservation. This includes management of roads and trails, as well as ground disturbance resulting from human uses.	1) Review of existing and new roads, OHV routes and areas, and non-motorized trails: a) For existing roads, designated routes, designated areas open to cross-county motorized travel, and non-motorized trails, see Special Status Species management program section item (2). Modify roads and routes in and adjacent to habitat categories for slickspot peppergrass if negative impacts are occurring. Implement restrictions to reduce ground disturbance. Seek opportunities to close and revegetate non-designated roads and routes, non-motorized trails, and use areas in and adjacent to habitat if negative impacts are occurring. b) For new roads, routes, areas open to cross-county motorized travel, and non-motorized trails, see Special Status Species management program section item (3). Avoid creating new roads, trails, routes, and areas if negative impacts are expected in and adjacent to habitat categories for slickspot peppergrass. Evaluate off-road vehicle use in occupied habitat, and where needed, limit access or close areas to motorized and mechanized vehicles to promote species conservation.

Conservation Measures	BLM Implementation Actions
2) Perform compliance checks on OHV closures to protect occupied habitat, identify problems as soon as possible, and take immediate corrective measures.	2) See Special Status Species management program section item (2).
Land Use Authorizations: Land Use Permits, Leases, and Rights-of-Way	
1) Issue new land use permits, leases, and rights-of-way (ROWs) and review existing permits, leases, and ROWs at renewal to conserve species habitat. This includes management of physical facilities, as well as ground disturbance resulting from human uses.	1) For new authorizations or new ROWs, as well as those being renewed, see Special Status Species management program section item (3). Avoid issuing new authorizations or new ROWs, or renewing existing authorizations or ROWs, in or adjacent to habitat categories for slickspot peppergrass if negative impacts are expected. If an authorization is to be issued or re-issued in such areas, apply stipulations to the authorization that support species conservation and that avoid or minimize negative impacts. BLM will require control of invasive non-native plant or noxious weed species on new, renewing, or amending land use permits and leases in habitat categories for slickspot peppergrass. a) Conduct periodic project compliance inspections during implementation of projects involving soil disturbance. BLM may require a qualified botanist to monitor slickspots to avoid ground disturbing activities in habitat categories for slickspot peppergrass. BLM will require that new or renewing permit or lease holders establish at least 50% perennial cover after all ground-disturbing activities, unless ecological site conditions preclude that level of cover. If a native species component existed prior to the ground disturbance, then the native species component of the perennial cover should be restored.
Land Tenure (sale, exchanges, withdrawals, etc.)	
1) Where feasible and funding is available, acquire through land exchange or purchase private lands that contain habitat categories for slickspot peppergrass.	1) BLM will opportunistically acquire habitat categories for slickspot peppergrass, particularly occupied habitat and critical habitat, in land exchanges and purchases.
2) Retain occupied habitat and critical habitat for slickspot peppergrass Federal ownership unless such a transfer would result in a net benefit to the species.	2) Occupied habitat and critical habitat for slickspot peppergrass within the planning area are allocated as land tenure zone 1, lands for retention that are not available for disposal.
Minerals: Salable and Leasable Minerals	
1) Approve development of salable or leasable minerals so as not to preclude species habitat conservation. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	1) Approval of salable and leasable minerals: a) For review of existing mineral leases, see Special Status Species management program section item (2). Modify existing mineral leases if negative impacts are occurring. For new sales or leases, see Special Status Species management program section item (3). Avoid development of salable or leasable minerals in or adjacent to habitat categories for slickspot

Conservation Measures	BLM Implementation Actions
	peppergrass if negative impacts are expected. If a minerals lease or sale is to be issued in or adjacent to habitat, apply stipulations to support or to not preclude species conservation.
Minerals: Locatable Minerals	
1) Approve plans of operations or allow notice-level operations so as not to preclude species habitat conservation. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	1) Approval of plans of operations and notice-level operations: a) For review of existing plans of operation and notice-level operations, see Special Status Species management program section item (2). To the extent allowed by law, modify plans of operation or notice-level operations that may have negative impacts on the species or its habitat. For notice-level operations, notify the operator that modifications to proposed activities will be required to avoid negative impacts. For new plans of operation and notice-level operations, see Special Status Species management program section item (3). To the extent allowed by law, avoid approving plans of operation or notice-level operations that may have negative impacts on the species or its habitat. For notice-level operations, notify the operator that modifications to proposed activities will be required to avoid negative impacts. If a plan of operations is to be approved in or adjacent to habitat categories for slickspot peppergrass, apply stipulations to support or to not preclude species conservation. A notice will require modification by the operator until BLM determines that it will not result in undue or unnecessary degradation.
Special Designations	
1) Explore the potential for new designations that would enhance species conservation.	1) Evaluate establishing Areas of Critical Environmental Concern (ACEC) for several stronghold populations of slickspot peppergrass during land use plan amendments.

Figure C-1. Implementation of Annual Grazing Adaptive Management

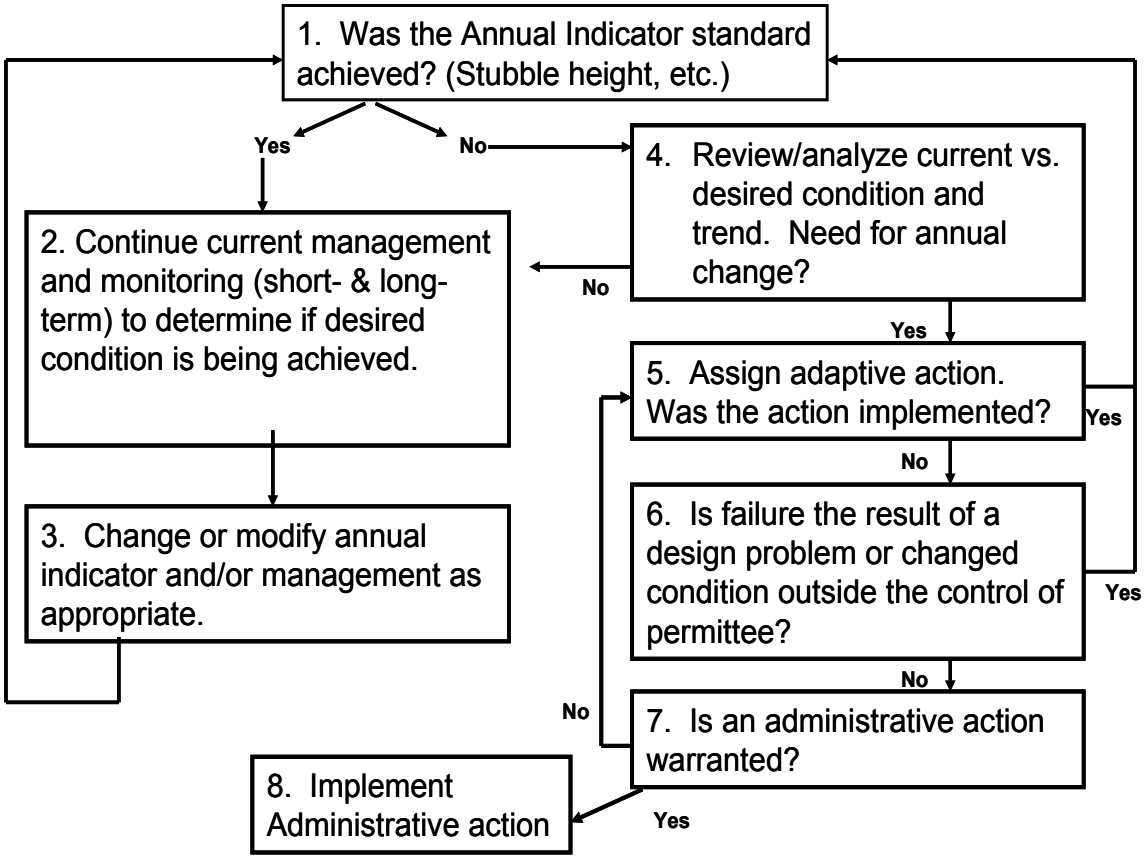
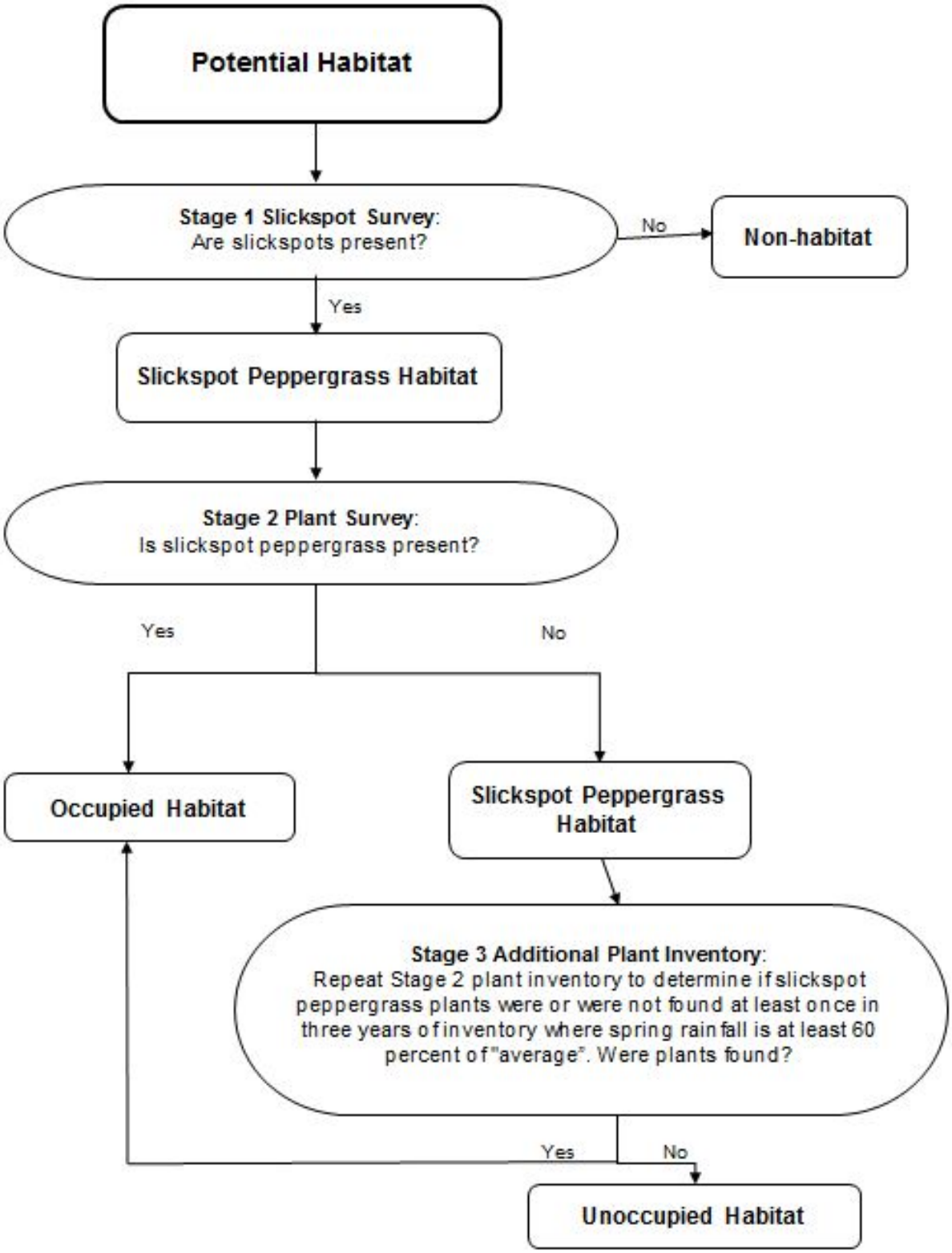


Figure C-2. Inventory Flowchart for Slickspot Peppergrass.



Proposed Critical Habitat for Slickspot Peppergrass

The FWS has identified Primary Constituent Elements (PCEs), those physical and biological features essential to the conservation of the species and its habitat, and within areas occupied by the species at the time of listing, that may require special management considerations and protection. The conservation measures from Table C-1. Conservation Measures for Slickspot Peppergrass are designed to enhance slickspot peppergrass occurrences and habitat. The following table contains a crosswalk between PCEs for slickspot peppergrass proposed critical habitat and Corresponding Pathway Indicators for making effects determinations on the species and its habitat. The most effective way to evaluate the impact an activity will have on slickspot peppergrass proposed critical habitat is to analyze the effects that the activity will have on the PCEs.

Table C-2. PCEs for Proposed Critical Habitat for Slickspot Peppergrass and the Associated Matrix Indicators.

PCE	PCE Description	Corresponding Pathway Indicator
1	Ecologically functional microsites or “slickspots” that are characterized by: (a) a high sodium and clay content and a three-layer soil horizonation and (b) sparse vegetation with low to moderate invasive non-native plant species cover	A-1. Density of non-native annual and/or non-native perennial plants established within slickspots A-2. Level of ground disturbance within slickspots A-3. Level of organic debris (litter or feces) and/or soil deposition and accumulation within slickspots
2	Relatively intact native Wyoming big sagebrush vegetation assemblages within 820 feet (250 meters) of slickspot peppergrass EOs	B-1. Level of ground disturbance within the action area B-2. Condition of native vegetation within the action area - level of habitat fragmentation B-3. Condition of native vegetation within the action area - presence of non-native annuals and/or non-native perennial plants B-4. Condition of native vegetation within the action area - percent cover of biological soil crusts B-5. Condition of native vegetation within the action area - percent cover of native forbs
3	A diversity of native plants to provide for insect pollinator foraging, nesting, and sheltering	B-3. Condition of native vegetation within the action area - presence of non-native annuals and/or non-native perennial plants B-5. Condition of native vegetation within the action area - percent cover of native forbs
4	Sufficient pollinators for successful fruit and seed production	B-1. Level of ground disturbance within the action area B-2. Condition of native vegetation within the action area - level of habitat fragmentation B-3. Condition of native vegetation within the action area - presence of non-native annuals and/or non-native perennial plants B-5. Condition of native vegetation within the action area - percent cover of native forbs

Listed Snake River Aquatic Snails

Table C-3. Conservation Measures for Listed Snake River Aquatic Snails (Snake River Physa and Bliss Rapids Snail).

Conservation Measures	BLM Implementation Actions
Air and Atmospheric Values	
None	None
Soil Resources, Water Resources, and Riparian Areas and Wetlands (includes noxious weed and invasive plant management)	
1) Projects involving the application of pesticides (herbicides, insecticides, etc.) that may affect the species will be analyzed at the project level and designed such that pesticide applications will support conservation and recovery and minimize risks of exposure.	1) Site-specific stipulations will be developed locally using the following criteria: a) Evaluate the benefits and risks of vegetation treatment, including the following: application methods; pesticides, carriers, and surfactants used; needed treatment buffers; and use of non-chemical weed control (for example, bio-controls, hand pulling). If objectives can be effectively accomplished using non-chemical methods, such is the preferred alternative. b) Apply appropriate spatial and temporal buffers to avoid species' exposure to harmful chemicals. Implement appropriate revegetation measures to reduce the risks of soil erosion and water quality impacts adjacent to suitable habitat.
2) Where needed and feasible, coordinate with adjacent landowners and local governments regarding control of noxious weeds and invasive plants in riparian areas through cooperative weed management programs.	2) Take advantage of opportunities as they arise.
3) Where needed, improve watershed conditions adjacent to suitable habitat to prevent soil erosion and negative water quality impacts. Conserve riparian vegetation near suitable habitat to minimize potential for erosion and sediment delivery to the Snake River.	3) Management actions: a) Identify areas with unsuitable watershed conditions that are negatively impacting suitable habitat. Develop and implement a restoration plan to reduce or eliminate negative impacts. b) Emphasize soil stabilization and avoid ground disturbance when risks of erosion and sediment delivery are high.
1) Projects involving the application of pesticides in uplands adjacent to riparian areas located near suitable listed Snake River snail habitat will be designed and implemented in accordance with the approach described in the Soil Resources, Water Resources, and Riparian Areas and Wetlands management program section.	1) See Soil Resources, Water Resources, and Riparian Areas and Wetlands management program section.
2) Manage upland areas to minimize sediment delivery into suitable habitat.	2) Emphasize soil stabilization and avoid ground disturbance when risks of erosion and sediment delivery to suitable habitat are high.

Conservation Measures	BLM Implementation Actions
Fish	
1) Activities within the Fish management program section will implement relevant conservation measures as described in the Special Status Species management program section to promote recovery.	1) Apply relevant conservation measures from the Special Status Species management program section in this table.
2) Activities within the Fish management program will implement relevant conservation measures as described in the Soil Resources, Water Resources, and Riparian Areas and Wetlands and Upland Vegetation (includes noxious weed and invasive plant management) management program sections when implementing actions in occupied or suitable habitat for special status fish and aquatic invertebrates.	2) Apply relevant conservation measures from the Soil Resources, Water Resources, and Riparian Areas and Wetlands and Upland Vegetation (includes noxious weed and invasive plant management) management program sections.
Wildlife	
1) Activities within the Wildlife management program will implement relevant conservation measures as described in the Special Status Species management program section to promote recovery.	1) Apply relevant conservation measures from the Special Status Species management program section in this table.
2) Activities within the Wildlife management program will implement relevant conservation measures as described in the Soil Resources, Water Resources, Riparian Areas and Wetlands, and Upland Vegetation (includes noxious weed and invasive plant management) management programs when implementing actions in occupied or suitable habitat for special status wildlife.	2) Apply relevant conservation measures from the Soil Resources, Water Resources, and Riparian Areas and Wetlands and Upland Vegetation (includes noxious weed and invasive plant management) management program sections.
Special Status Species: Common to All Programs	
1) In cooperation with Idaho Department of Fish and Game, US Fish and Wildlife Service, Bureau of Reclamation, hydroelectric power companies, and others: a) Cooperate in gathering existing information to understand the distribution of known populations, and contribute new information as opportunities arise.	1) Following actions to be completed: a) Provide new occurrence information to Idaho Natural Heritage Program as project-level clearance inventories are completed. Cooperate with other agencies to develop and update a map or spatial database of known listed Snake River snail locations.
2) Ensure that ongoing Federal actions support or do not preclude species recovery.	2) Ongoing BLM activities: a) As needed, review ongoing activities in and adjacent to occupied suitable habitat where local consultation has not yet been completed. b) Determine if direct or indirect negative impacts to the species or its habitat are occurring as a result of ongoing discretionary BLM actions. If so, modify the activity to avoid or minimize anticipated negative impacts and, where feasible, promote species recovery. Where needed, complete section 7 consultations for ongoing activities that may affect any of these

Conservation Measures	BLM Implementation Actions
	species and their habitat.
3) Ensure that new Federal actions support or do not preclude species recovery.	3) New BLM activities: a) Project-level inventories will be completed in suitable habitat during project planning if inventory information is not available or adequate. b) b) If direct or indirect negative impacts to the species or their habitats are anticipated as the result of new BLM actions, modify the activity to avoid or minimize negative impacts and, where feasible, promote species recovery. Where needed, complete section 7 consultation for new activities that may affect any of these species and their habitats.
4) Implement adaptive management as needed to achieve conservation objectives.	4) Conduct site-specific implementation and effectiveness monitoring. Adjust management as needed to ensure that management objectives are met.
5) Support conservation easements, cooperative management efforts, and other programs on adjacent non-Federal land to support recovery of the listed Snake River snails.	5) Take advantage of opportunities as they arise.
Wildland Fire Ecology and Management: Fire Suppression	
1) Fire suppression efforts will be conducted, as possible, to protect listed Snake River snail habitat. Place a high priority on protecting highly erosive areas adjacent to suitable habitat from wildfire.	1) Fire management activities: a) Review Fire Management Plan for adequacy in addressing conservation measures. Modify the plan if needed. b) Apply Minimum Impact Suppression Tactics (MIST) adjacent to suitable habitat, as appropriate. Consult with resource advisors to determine where MIST tactics should be applied to avoid or minimize negative impacts. Avoid fire base camps, staging areas, fueling areas, or other related activities in highly erosive areas adjacent to suitable habitat.
2) Coordinate with US Forest Service, Idaho Department of Lands, the Military, or other applicable agency personnel regarding fire suppression activities in or adjacent to suitable habitat.	2) Ongoing interagency coordination.
Wildland Fire Ecology and Management: Emergency Stabilization and Burned Area Rehabilitation	
1) Implement Emergency Stabilization and Burned Area Rehabilitation (ES&BAR) activities to promote restoration of areas adjacent to suitable listed Snake River snail habitat.	1) ES&BAR activities: a) If needed and if natural recovery would not achieve habitat objectives, implement ES&BAR activities to promote rehabilitation of areas adjacent to suitable habitat. Plant locally appropriate vegetation to prevent erosion, if

Conservation Measures	BLM Implementation Actions
	natural recovery of such vegetation is doubtful. Include requirements that protect listed Snake River snail habitat, for example, install sediment barriers. As needed, protect disturbed areas using temporary closures or other measures until site specific stabilization, rehabilitation, and revegetation plan goals are met.
2) Fire rehabilitation projects involving the application of pesticides will be analyzed and implemented in accordance with the approach described in Soil Resources, Water Resources, and Riparian Areas and Wetlands and all Wildland Fire Ecology and Management program sections.	2) See Soil Resources, Water Resources, and Riparian Areas and Wetlands and all Wildland Fire Ecology and Management program sections.
Wildland Fire Ecology and Management: Wildland Fire Use	
1) Wildland fire use projects will be designed to conserve suitable listed Snake River snail habitat.	1) Wildland fire use is not an option in the planning area per WFM-A-1.
Wildland Fire Ecology and Management: Prescribed Fire	
1) Prescribed fire projects will be designed to conserve suitable listed Snake River snail habitat.	1) When developing and implementing prescribed fire plans, avoid or minimize negative impacts to suitable habitat. Avoid prescribed fire use adjacent to suitable habitat, unless adequate erosion protections are implemented.
Wildland Fire Ecology and Management: Fuels	
1) Projects involving the application of pesticides will be designed in accordance with the approach described in Soil Resources, Water Resources, and Riparian Areas and Wetlands and all Wildland Fire Ecology and Management program sections.	1) See Soil Resources, Water Resources, and Riparian Areas and Wetlands and all Wildland Fire Ecology and Management program sections.
2) Promote the establishment of plant species needed to control erosion adjacent to suitable habitat.	2) Incorporate conservation actions into the fuels projects, as needed, to control erosion and prevent sediment delivery to suitable habitat.
Wildland Fire Ecology and Management: Community Assistance	
1) Follow all measures included throughout the Wildland Fire Ecology and Management program sections.	1) See actions within Wildland Fire Ecology and Management program sections. Incorporate into community assistance agreements.
Wild Horses	
1) Activities within the Wild Horse Management program will implement relevant conservation measures as described in the Special Status Species management program section to promote recovery.	1) Apply relevant conservation measures from the Special Status Species management program section in this table.
Paleontological Resources	
1) Activities within the Paleontological Resources management program will implement relevant conservation measures as described in the Special Status Species management program section to promote recovery of Snake River snails.	1) Apply relevant conservation measures from the Special Status Species management program section in this table.
Cultural Resources	
1) Activities within the Cultural Resources management program will implement relevant	1) Apply relevant conservation measures from the Special Status Species management program

Conservation Measures	BLM Implementation Actions
conservation measures as described in the Special Status Species management program section to promote recovery of Snake River snails.	section in this table.
Visual Resources	
1) Activities within the Visual Resource management program will implement relevant conservation measures as described in the Soil Resources, Water Resources, Riparian Areas and Wetlands, and Upland Vegetation (includes noxious weed and invasive plant management) management programs when implementing actions in occupied or suitable habitat for special status wildlife.	1) Apply relevant conservation measures from the Soil Resources, Water Resources, and Riparian Areas and Wetlands and Upland Vegetation (includes noxious weed and invasive plant management) management program sections.
Livestock Grazing: Permits and Leases	
1) Manage livestock grazing and trailing adjacent to suitable listed Snake River snail habitat to promote healthy watershed conditions while implementing rangeland health standards and guidelines.	1) Permit or lease renewal actions: a) For review of ongoing actions, see Special Status Species management program section item (2). b) For new actions, see Special Status Species management program section item (3). As appropriate to avoid or minimize negative impacts, modify livestock grazing permits and leases.
2) Promote restoration of areas in or adjacent to suitable habitat following fire, fire rehabilitation, restoration treatments, or other major disturbances through adjustments in livestock grazing, as appropriate.	2) As needed, protect disturbed areas using temporary closures or other measures until vegetation is re-established and self-sustaining.
3) Maintain regular compliance checks on grazing allotments in or adjacent to suitable habitat to identify problems as soon as possible and take immediate corrective measures.	3) Ongoing, day-to-day BLM action.
Livestock Grazing: Range Infrastructure	
1) Manage livestock facilities to promote healthy riparian communities or to prevent erosion, or a combination of these objectives, while implementing rangeland health standards and guidelines.	1) For review of ongoing actions, see Special Status Species management program section item (2). For new actions, see Special Status Species management program section item (3). As appropriate to avoid or minimize negative impacts, modify existing and avoid placement of new livestock facilities adjacent to suitable habitat. Consider fencing livestock away from suitable habitat, and developing water gaps for livestock.
2) Protect springs in or adjacent to suitable habitat to conserve and recover listed Snake River snail habitat.	2) Avoid development of springs or other water sources in or adjacent to suitable habitat unless the activity will have beneficial long-term or neutral effects on listed Snake River snail populations. If a spring or water site is to be developed, install facilities as needed to avoid or minimize negative impacts.

Conservation Measures	BLM Implementation Actions
Recreation	
1) Developed facilities (boat access, paved campgrounds, vault toilets, interpretive kiosks, etc.): Manage existing and new recreation facilities so as not to preclude species habitat conservation and recovery. This includes management of the physical facilities, as well as disturbances to the species resulting from human uses.	1) Management of existing and new facilities: a) For review of existing facilities, see Special Status Species management program section item (2). As appropriate to avoid or minimize negative impacts, modify existing facilities. For new facilities, or for expansion of uses at existing facilities, see Special Status Species management program section item (3). In addition, modify new recreation facilities in or adjacent to suitable habitat if negative impacts are anticipated.
2) Dispersed use areas (informal areas including camping, spring access, and tie-up areas for pack animals and boats): Manage dispersed use sites so as not to preclude species habitat conservation and recovery. This includes limiting disturbance to the species resulting from human uses.	2) For review of ongoing activities, see Special Status Species management program section item (2). In addition, minimize human activity in and adjacent to known populations, if negative impacts are occurring. Close areas, either seasonally or year-round, as needed, and post and monitor the closure.
3) Commercial and non-commercial recreation permits including outfitter camps: Issue commercial and non-commercial recreation permits so as not to preclude species habitat conservation and recovery. This includes management of physical facilities (such as camps), as well as disturbance to the species resulting from human uses.	3) Issuance and review of existing and new permits: a) For review of existing permits, see Special Status Species management program section item (2). If needed, modify existing permits if the permitted activity is causing negative impacts. For new permits, see Special Status Species management program section item (3). If a recreation permit is to be issued in or adjacent to suitable habitat, apply stipulations to the permit to support or to not preclude species conservation and recovery.
4) Protect springs with known populations to conserve listed Snake River snail habitat.	4) Discourage or prohibit human entry in springs with known listed Snake River snail populations, if such entry causes negative impacts.
5) Educate the public on the listed Snake River snails' unique ecological requirements, sensitivity to habitat alteration and need for protection.	5) Take advantage of opportunities as they arise.
Transportation and Travel	
1) Manage roads, off-highway vehicle (OHV) routes and areas, and non-motorized trails, so as not to preclude species habitat conservation and recovery. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	1) Review of existing and new roads, OHV routes, and areas, and non-motorized trails: a) For existing roads, OHV routes and areas, and non-motorized trails, see Special Status Species management program section item (2). Limit OHV activities in areas adjacent to suitable habitat that are particularly susceptible to erosion and thus sediment delivery. Seek opportunities to close and revegetate OHV routes or non-motorized trails and use areas if negative impacts are occurring.

Conservation Measures	BLM Implementation Actions
	For new roads, OHV routes and areas, and non-motorized trails, see Special Status Species management program section item (3). Avoid constructing new roads, trails, routes, and areas if negative impacts are expected. In particular, avoid opening new roads, trails, routes, and areas adjacent to suitable habitat particularly susceptible to erosion and thus sediment delivery.
2) Maintain regular compliance checks on OHV closures to protect known populations and to identify problems as soon as possible and take immediate corrective measures.	2) Ongoing, day-to-day BLM activities.
Land Use Authorizations: Land Use Permits, Leases, and Rights-of-Way	
1) Issue new land use permits, leases, and rights-of-way (ROWs) and review existing permits, leases, and ROWs at renewal so as not to preclude species habitat conservation and recovery. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	1) For new permits or ROWs, and renewal of existing permits or ROWs, see Special Status Species management program section item (3). Avoid issuing new permits, leases or ROWs, or renewing existing permits, leases or ROWs adjacent to suitable habitat if negative impacts are expected. If a permit, lease, or ROW is to be issued or re-issued adjacent to suitable habitat, apply stipulations to the permit or ROW that support or do not preclude species recovery and that avoid or minimize negative impacts.
2) Protect the watershed contributing to listed Snake River snail habitat.	2) Conduct appropriate hydrologic studies or analysis before permitting developments on BLM-managed lands where the extraction of groundwater may negatively impact suitable habitat. Depending on the scope of the activity, this may require coordination and cooperation with other agencies.
Land Tenure (sale, exchanges, withdrawals, etc.)	
1) Where feasible and funding is available, acquire through land exchange or purchase, private lands that support known populations or could enhance habitat for listed Snake River snails.	1) Take advantage of opportunities as they arise. Priority should be given to lands that are adjacent to or near public lands.
2) Retain listed Snake River snail habitat in Federal ownership to the extent possible, while balancing other needs.	2) Review each land tenure decision in terms of species habitat. Avoid the loss of riparian habitat along the Snake River from Federal ownership. If property is to be transferred out of Federal ownership, permanent conservation easements may be attached to the transfer that would result in equal or greater protection than under Federal management. Such measures must be approved by the State Director.
Minerals: Salable and Leasable Minerals	
1) Approve development of salable or leasable minerals so as not to preclude species habitat conservation and recovery. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	1) Approval of salable and leasable minerals: a) For review of existing mineral leases, see Special Status Species management program section item (2). Modify existing mineral leases if negative impacts are occurring.

Conservation Measures	BLM Implementation Actions
	For new sales or leases, see Special Status Species management program section item (3). Avoid development of salable or leasable minerals adjacent to suitable habitat if negative impacts are expected. If a minerals lease or sale is to be issued adjacent to suitable habitat, apply stipulations to support or to not preclude species recovery.
2) Protect the watershed contributing to listed Snake River snail habitat.	2) Conduct appropriate hydrologic studies or analysis before permitting developments on BLM-managed lands where the extraction of groundwater may negatively impact suitable habitat. Depending on the scope of the activity, this may require coordination and cooperation with other agencies.
Minerals: Locatable Minerals	
1) Approve plans of operations or allow notice-level operations so as not to preclude species habitat conservation and recovery. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	1) Approval of plans of operations and notice-level operations: a) For review of existing plans of operation and notice-level operations, see Special Status Species management program section item (2). To the extent allowed by law, modify plans of operation or notice-level operations that negatively impact Snake River snail habitat. For notice-level operations, notify the operator that modifications to proposed activities will be required to avoid negative impacts. For new plans of operation and notice-level operations, see Special Status Species management program section item (3). To the extent allowed by law, avoid approving plans of operation or notice-level operations that negatively impact listed Snake River snail habitat. For notice-level operations, notify the operator that modifications to proposed activities will be required to avoid negative impacts. If a plan of operations is to be approved in suitable habitat, apply stipulations to support or to not preclude species recovery. A notice will require modification by the operator until BLM determines that it will not result in undue or unnecessary degradation.
Special Designations	
1) Explore the potential for new designations that would enhance species recovery.	1) Take advantage of opportunities as they arise.

Bruneau Hot Springsnail

Table C-4. Conservation Measures for Bruneau Hot Springsnail.

Conservation Measures	BLM Implementation Actions
Air and Atmospheric Values	
None	None
Soil Resources, Water Resources, and Riparian Areas and Wetlands (includes noxious weed and invasive plant management)	
1) Projects involving the application of pesticides (herbicides, insecticides, etc.) that may affect the species will be analyzed at the project level and designed such that pesticide applications will support conservation and recovery and minimize risks of exposure.	1) Site specific stipulations will be developed locally using the following criteria: a) Evaluate the benefits and risks of vegetation treatment, including the following: application methods; pesticides, carriers, and surfactants used; needed treatment buffers; and use of non-chemical weed control (for example, bio-controls, hand pulling). If objectives can be effectively accomplished using non-chemical methods, such is the preferred alternative. b) Apply appropriate spatial and temporal buffers to avoid species' exposure to harmful chemicals. Implement appropriate revegetation and noxious weed control measures to reduce the risks of non-native species infestations and soil erosion following any ground or vegetation disturbing actions in or adjacent to suitable habitat.
2) Where needed and feasible, coordinate with adjacent landowners and local governments regarding control of noxious weeds and invasive plants in riparian area through cooperative weed management programs.	2) Take advantage of opportunities as they arise.
3) Where needed, improve watershed conditions adjacent to suitable habitat to prevent soil erosion and negative water quality impacts. Conserve riparian vegetation near suitable habitat to minimize potential for erosion and sediment delivery to geothermal seeps, springs, and the lower Bruneau River.	3) Management actions: a) Identify areas with unsuitable watershed conditions that are negatively impacting suitable habitat. Restore to reduce or eliminate negative impacts. Emphasize soil stabilization and avoid ground disturbance when risks of erosion and sediment delivery are high.
Upland Vegetation (includes noxious weed and invasive plant management)	
1) Projects involving the application of pesticides in uplands adjacent to riparian areas located near suitable habitat for the Bruneau hot springsnail will be designed and implemented in accordance with the approach described in the Soil Resources, Water Resources, and Riparian Areas and Wetlands management program section.	1) See Soil Resources, Water Resources, and Riparian Areas and Wetlands management program section.
2) Protect upland areas adjacent to riparian areas where management activities could affect suitable habitat.	2) Emphasize soil stabilization and avoid ground disturbance when risks of erosion and sediment delivery to springs are high.

Conservation Measures	BLM Implementation Actions
Fish	
1) Cooperate with IDFG in protecting Bruneau hot springsnails from competition and predation from non-native species.	1) Protection from predators and competition actions: a) Cooperate in seeking opportunities to remove non-native competitive or predatory fish from watersheds with suitable habitat. Work with IDFG to inform the public of the adverse effects of introducing non-native predator and competitive species to Bruneau hot springsnail-occupied thermal springs and seeps.
2) Cooperate in restoring habitat for possible reintroduction of the species.	2) Participate with other agencies in restoring habitats for potential re-colonization, as opportunities allow.
Wildlife	
1) Activities within the Wildlife management program will implement relevant conservation measures as described in the Special Status Species management program section to promote recovery.	1) Apply relevant conservation measures from the Special Status Species management program section in this table.
Special Status Species: Common to All Programs	
1) In cooperation with Idaho Department of Fish and Game (IDFG), US Fish and Wildlife Service (FWS), Bureau of Reclamation, hydroelectric power companies, and others:	1) Following actions to be completed in cooperation with others:
a) Continue to cooperate to identify and map all known populations and suitable habitat.	a) Mapping and data inventory: i). Cooperate with IDFG, Idaho Natural Heritage Program (INHP), and FWS to update maps of all known populations and suitable habitat on BLM-managed lands. In cooperation with INHP, maintain a spatial database of species population and habitat information for BLM-managed lands.
b) Follow current monitoring protocols and cooperate in monitoring Bruneau hot springsnail population trends and habitat conditions.	Cooperate with FWS, IDFG, and INHP to conduct regular monitoring of populations on BLM-managed lands.
b) Manage BLM lands with or adjacent to suitable habitat and populations to promote species recovery and support re-colonization of suitable habitat.	Develop a habitat management plan, as funding allows.
d) Participate in research essential to recovery of the species. Support the geothermal aquifer groundwater modeling and monitoring program. Cooperate in determining specific limiting factors in terms of habitat needs and characteristics. Cooperate in population viability analyses to ensure that recovery criteria objectives are being met.	BLM will participate as funding allows.
e) Cooperate in incorporating geothermal aquifer	As opportunities arise, work with FWS and Idaho

Conservation Measures	BLM Implementation Actions
conservation measures.	Department of Water Resources to pursue the permanent acquisition of non-use groundwater rights from current groundwater rights holders and protect these rights to support species conservation.
f) Working with other agencies, pursue funding for implementation of recovery tasks.	Cooperate with other agencies to identify potential sources of funding for actions that promote recovery, such as monitoring.
2) Ensure that ongoing Federal actions support or do not preclude species recovery.	2) Ongoing BLM activities: a) As needed, review ongoing activities within and adjacent to suitable habitat, where local consultation has not yet been completed. b) Determine if direct or indirect negative impacts to the species or its habitat are occurring as a result of ongoing discretionary BLM actions. If so, modify the activity to avoid or minimize anticipated negative impacts and, where feasible, promote species recovery. Where needed, complete section 7 consultation for ongoing activities that may affect this species and its habitat.
3) Ensure that new Federal actions support or do not preclude species recovery.	3) New BLM activities: a) Project-level inventories will be completed in suitable habitat during project planning if inventory information is not available or adequate. b) If direct or indirect negative impacts to the species or its habitat are anticipated as a result of new BLM actions, modify the activity to avoid negative impacts and, where feasible, promote species recovery. Where needed, complete section 7 consultation for new activities that may affect this species and its habitat.
4) Implement adaptive management for conservation actions.	4) Conduct site-specific implementation and effectiveness monitoring. Adjust management as needed to ensure that management objectives are met.
5) Support conservation easements, cooperative management efforts, and other programs on adjacent non-Federal lands to support conservation of suitable habitat.	5) Take advantage of opportunities as they arise.
Wildland Fire Ecology and Management: Fire Suppression	
1) Fire suppression efforts will be conducted, as much as possible, to protect Bruneau hot springsnail habitat. Place a high priority on protecting highly erosive areas in or adjacent to	1) Fire management activities: a) Review Fire Management Plan for adequacy in addressing conservation measures. Modify

Conservation Measures	BLM Implementation Actions
suitable habitat.	the plan if needed. b) Apply Minimum Impact Suppression Tactics (MIST) in or adjacent to suitable habitat, as appropriate. Consult with resource advisors to determine where MIST tactics should be applied to avoid or minimize negative impacts. Do not locate fire base camps, staging areas, fueling areas, or other related activities in highly erosive areas in or adjacent to suitable habitat.
2) Coordinate with Idaho Department of Lands, the Military, or other applicable agency personnel regarding fire suppression activities in or adjacent to suitable habitat.	2) Ongoing interagency coordination.
Wildland Fire Ecology and Management: Emergency Stabilization and Burned Area Rehabilitation	
1) Implement Emergency Stabilization and Burned Area Rehabilitation (ES&BAR) activities to promote restoration in or adjacent to suitable Bruneau hot springsnail habitat.	1) ES&BAR activities: a) If needed and if natural recovery would not achieve habitat objectives, implement ES&BAR activities to promote rehabilitation in or adjacent to suitable habitat. Plant locally appropriate vegetation to prevent erosion, if the natural drainage regime has been altered or if natural recovery of such vegetation is doubtful. Include requirements that protect Bruneau hot springsnail habitat, for example, install sediment barriers. As needed, protect disturbed areas using temporary closures or other measures until site-specific stabilization, rehabilitation, and revegetation plan goals are met.
2) Fire rehabilitation projects involving the application of pesticides will be analyzed and implemented in accordance with the approach described in Soil Resources, Water Resources, and Riparian Areas and Wetlands, Upland Vegetation (includes noxious weed and invasive plant management), and all Wildland Fire Ecology and Management program sections.	2) See Soil Resources, Water Resources, and Riparian Areas and Wetlands, Upland Vegetation (includes noxious weed and invasive plant management), and all Wildland Fire Ecology and Management program sections.
Wildland Fire Ecology and Management: Wildland Fire Use	
1) Wildland fire use projects will be designed to conserve suitable Bruneau hot springsnail habitat.	1) Wildland fire use is not an option in the planning area per WFM-A-1. Reword similar to original
Wildland Fire Ecology and Management: Prescribed Fire	
1) Prescribed fire projects will be designed to conserve suitable Bruneau hot springsnail habitat.	1) When developing and implementing prescribed fire plans, avoid negative impacts in or adjacent to suitable habitat.
Wildland Fire Ecology and Management: Fuels	
1) Implement projects involving the application of pesticides in accordance with the approach described in the Soil Resources, Water Resources, and Riparian Areas and Wetlands, Upland Vegetation (includes noxious weed and	1) See Soil Resources, Water Resources, and Riparian Areas and Wetlands, Upland Vegetation (includes noxious weed and invasive plant management), and all Wildland Fire Ecology and Management program sections.

Conservation Measures	BLM Implementation Actions
invasive plant management), and all Wildland Fire Ecology and Management program sections.	
Wildland Fire Ecology and Management: Community Assistance	
1) Follow all measures included throughout the Wildland Fire and Ecology Management program sections.	1) See actions within Wildland Fire Ecology and Management program sections. Incorporate into community assistance agreements.
Wild Horses	
None	None
Paleontological Resources	
1) Activities in the Paleontological Resources management program will implement relevant conservation measures as described in the Special Status Species management program section to promote conservation.	1) Apply relevant conservation measures from the Special Status Species management program section in this table.
Cultural Resources	
1) Activities in the Cultural Resources management program will implement relevant conservation measures as described in the Special Status Species management program section to promote conservation.	1) Apply relevant conservation measures from the Special Status Species management program section in this table.
Visual Resources	
1) Activities within the Visual Resource management program will implement relevant conservation measures as described in the Soil Resources, Water Resources, Riparian Areas and Wetlands, and Upland Vegetation (includes noxious weed and invasive plant management) management programs when implementing actions in occupied or suitable habitat for special status wildlife.	1) Apply relevant conservation measures from the Soil Resources, Water Resources, and Riparian Areas and Wetlands and Upland Vegetation (includes noxious weed and invasive plant management) management program sections.
Livestock Grazing: Permits and Leases	
1) Manage livestock grazing and trailing adjacent to suitable Bruneau hot springsnail habitat to promote healthy watershed conditions. Maintain and promote suitable habitat conditions for the Bruneau hot springsnail while implementing rangeland health standards and guidelines.	1) Permit or lease actions: a) For review of ongoing actions, see Special Status Species management program section item (2). b) For new actions, see Special Status Species management program section item (3). As appropriate to avoid or minimize negative impacts, modify livestock grazing permits and leases.
2) Promote restoration in or adjacent to suitable habitat following fire, fire rehabilitation, restoration treatments, or other major disturbances through adjustments in livestock grazing, as appropriate.	2) As needed, issue temporary pasture closures until vegetation is re-established, self-sustaining, and on an upward trend for controlling erosion and preventing sediment delivery.
3) Maintain regular compliance checks on grazing allotments within or adjacent to suitable habitat to identify problems as soon as possible and take immediate corrective measures.	3) Ongoing, day-to-day BLM action.
4) Protect suitable Bruneau hot springsnail habitat	4) Continue to exclude grazing in the portion of the

Conservation Measures	BLM Implementation Actions
in the Bruneau Canyon.	Bruneau canyon that contains springs and seeps occupied by the Bruneau hot springsnail and formalize this by modifying the appropriate grazing decisions.
Livestock Grazing: Range Infrastructure	
1) Manage livestock facilities to promote healthy riparian communities or to prevent erosion, or a combination of these objectives, while implementing rangeland health standards and guidelines.	1) For review of ongoing actions in or adjacent to suitable habitat, see Special Status Species management program section item (2). For new actions in or adjacent to suitable habitat, see Special Status Species management program section item (3). As appropriate to avoid or minimize negative impacts, modify existing and avoid placement of new livestock facilities.
2) Protect all springs in or adjacent to suitable habitat to conserve and recover Bruneau hot springsnail habitat.	2) Facilities management actions: a) On BLM managed lands, prohibit development of springs or other water sources in or adjacent to suitable habitat unless the activity will have beneficial long-term or neutral effects on Bruneau hot springsnail populations. Continue to maintain livestock exclosure fencing annually and assess the need for additional measures to promote species recovery.
Recreation	
1) Developed facilities (boat access, paved campgrounds, vault toilets, interpretive kiosks, etc.): Manage existing and new recreation facilities so as not to preclude species habitat conservation and recovery. This includes management of the physical facilities, as well as disturbances to the species resulting from human uses.	1) Management of existing and new facilities: a) For review of existing facilities near known populations, see Special Status Species management program section item (2). As appropriate to avoid or minimize negative impacts, modify existing facilities. Prohibit development of new recreation facilities in or adjacent to suitable habitat.
2) Dispersed use areas (informal areas, including camping, spring access, and tie-up areas for pack animals and boats): Protect thermal springs in or adjacent to suitable habitat to conserve Bruneau hot springsnail habitat. Manage dispersed use sites so as not to preclude species habitat conservation and recovery. This includes limiting disturbance to the species resulting from human uses.	2) Dispersed use areas: a) Minimize human activity in suitable habitat. Close areas, either seasonally or year-round, as needed if negative impacts are occurring to protect the species and its habitat, and post and monitor the closure. Discourage human entry in springs in suitable habitat. Post and monitor needed closures.
3) Commercial and non-commercial recreation permits including outfitter camps: Issue commercial and non-commercial recreation permits in accordance with goals for promoting species habitat conservation and recovery. This includes management of physical facilities (such as camps), as well as disturbance to the species resulting from human uses.	3) Issuance and review of existing and new permits: a) For review of existing permits near known populations, see Special Status Species management program section item (2). If needed, modify existing permits if the permitted activity is causing negative impacts. For new permits in or adjacent to suitable habitat, see Special Status Species management program

Conservation Measures	BLM Implementation Actions
	section item (3). Avoid issuing recreation permits if negative impacts are expected. In particular, avoid permitting new recreation activities in or adjacent to suitable habitat. If a recreation permit is to be issued, apply stipulations to the permit to support or to not preclude species conservation and recovery.
4) Educate the public on the springsnail's unique ecological requirements, sensitivity to habitat alteration and need for protection.	4) Take advantage of opportunities as they arise.
Transportation and Travel	
1) Manage roads, off-highway vehicle (OHV) routes and areas, and non-motorized trails, so as not to preclude species habitat conservation and recovery. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	1) Review of existing and new roads, OHV routes and areas, and non-motorized trails: a) For existing roads, OHV routes and areas, and non-motorized trails near known populations, see Special Status Species management program section item (2). Limit OHV activities in areas particularly susceptible to erosion and thus sediment delivery to springs. Seek opportunities to close and revegetate OHV routes or non-motorized trails and use areas if negative impacts are occurring. For new roads, OHV routes and areas, and non-motorized trails, see Special Status Species management program section item (3). Avoid constructing new roads, trails, routes, and areas if negative impacts are expected. Avoid opening new roads, trails, routes, and areas in or adjacent to suitable habitat particularly susceptible to erosion and thus sediment delivery to springs.
2) Seek opportunities to close and revegetate designated and user-created OHV routes or non-motorized trails and use areas, if such use causes negative impacts to suitable habitat.	2) See Special Status Species management program section item (2).
3) Maintain regular compliance checks on OHV closures to protect known populations and to identify problems as soon as possible and take immediate corrective measures.	3) Ongoing, day-to-day BLM activities.
Land Use Authorizations: Land Use Permits, Leases, and Rights-of-Way	
1) Issue new land use permits, leases, and rights-of-way (ROWs) and review existing permits, leases, and ROWs at renewal so as not to preclude species habitat conservation and recovery. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	1) For new permits or ROWs, and renewal of existing permits or ROWs near known populations and suitable habitat, see Special Status Species management program section item (3). Avoid issuing new permits leases, or ROWs, or renewing existing permits, leases, or ROWs in or adjacent to suitable habitat if negative impacts are expected. If a permit, lease, or ROW is to be issued or re-issued in suitable habitat, apply stipulations to the permit or ROW that support or do not preclude species recovery and that avoid negative impacts.

Conservation Measures	BLM Implementation Actions
2) Protect the groundwater contributing to Bruneau hot springsnail habitat.	2) Conduct appropriate hydrologic studies or analysis before permitting developments on BLM-managed lands where the extraction of groundwater may reduce or eliminate flows in suitable habitat. Depending on the scope of the activity, this may require coordination and cooperation with other agencies.
Land Tenure (sale, exchanges, withdrawals, etc.)	
1) Where feasible and funding is available, acquire through land exchange or purchase, private lands that support known populations or could enhance habitat for Bruneau hot springsnails.	1) Take advantage of opportunities as they arise. Priority should be given to lands that are adjacent to or near public lands.
2) Retain Bruneau hot springsnail habitats in Federal ownership.	2) Land tenure adjustments: a) Retain all suitable habitat in Federal ownership. Within areas adjacent to suitable habitat review each land tenure decision in terms of species recovery. Retain these areas in Federal ownership unless the land tenure adjustment results in a long-term benefit to species recovery.
Minerals: Salable and Leasable Minerals	
1) Approve development of salable or leasable minerals so as not to preclude species habitat conservation and recovery. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	1) Approval of salable and leasable minerals: a) For review of existing mineral leases, see Special Status Species management program section item (2). Modify existing mineral leases if negative impacts are occurring. For new sales or leases in or adjacent to suitable habitat, see Special Status Species management program section item (3). Avoid development of salable or leasable minerals in or adjacent to suitable habitat if negative impacts are expected. If a minerals lease or sale is to be issued in or adjacent to suitable habitat, apply stipulations to support or to not preclude species recovery.
2) Protect the groundwater sources that contribute to Bruneau hot springsnail habitat.	2) Conduct appropriate hydrologic studies or analysis before permitting developments on BLM-managed lands where the extraction of groundwater may reduce or eliminate flows in or adjacent to habitats. Depending on the scope of the activity, this may require coordination and cooperation with other agencies.
Minerals: Locatable Minerals	
1) Approve plans of operations or allow notice-level operations so as not to preclude species habitat conservation and recovery. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	1) Approval of plans of operations and notice-level operations: a) For review of existing plans of operation and notice-level operations near known populations, see Special Status Species management program section item (2). To the

Conservation Measures	BLM Implementation Actions
	extent allowed by law, modify plans of operation or notice-level operations that conflict with Bruneau hot springsnail objectives in or adjacent to suitable habitat. For notice-level operations, notify the operator that modifications to proposed activities will be required to avoid negative impacts. For new plans of operation and notice-level operations in or adjacent to suitable habitat, see Special Status Species management program section item (3). To the extent allowed by law, avoid approving plans of operation or notice-level operations that conflict with Bruneau hot springsnail objectives in or adjacent to suitable habitat. For notice-level operations, notify the operator that modifications to proposed activities will be required to avoid negative impacts. If a plan of operations is to be approved in or adjacent to suitable habitat, apply stipulations to support or to not preclude species recovery. A notice will require modification by the operator until BLM determines that it will not result in undue or unnecessary degradation.
Special Designations	
1) Explore the potential for new designations that would enhance species recovery.	1) As opportunities arise, recommend suitable habitat for Area of Critical Environmental Concern designation.

Jarbidge River Bull Trout

Recovery plans are developed by the US Fish and Wildlife Service (FWS) and/or National Marine Fisheries Service and establish recovery objectives for a species, provide a listing of tasks necessary to achieve those objectives, and recommend assignments to involve agencies to carry out these tasks. A primary function of recovery plans is to combine programs of all agencies involved in managing a species into a coordinated management effort. The BLM has incorporated conservation measures for Jarbidge River bull trout into the Approved Jarbidge RMP to promote the attainment of the objectives from the 2004 Draft Recovery Plan for the Jarbidge River Distinct Population Segment of Bull Trout (FWS, 2004) and the 2014 Revised Draft Recovery Plan for the Conterminous United States Population of Bull Trout (*Salvelinus confluentus*) (FWS, 2014a). The conservation measures and implementation actions from these plans are consistent with to the goals, objectives and management actions in the ROD/RMP. Conservation measures are subject to revision in cooperation with the Federal and State agencies identified below.

Table C-5. Conservation Measures for Jarbidge River Bull Trout.

Conservation Measures	BLM Implementation Actions
Interagency Cooperation and Coordination	
1) In cooperation with Nevada Department of Wildlife, Idaho Department of Fish and Game, US Department of Agriculture Forest Service (USFS), Idaho Department of Environmental Quality (DEQ), Nevada Division of Environmental Protection (NDEP), Duck Valley Paiute-Shoshone Tribes, US Geologic Survey, and FWS (Boise, ID and Reno, NV), provide long-term habitat protection for bull trout on BLM managed land.	1) Cooperate with other Federal and State agencies as BLM staffing and budgets allow. Support opportunities for interagency conservation and restoration actions on BLM managed land as they become available.
	2) Support collaborative efforts by local watershed groups to implement bull trout recovery actions and provide long-term habitat protection for Jarbidge River bull trout.
Population Characteristics	
1) Cooperate with other Federal and State agencies as BLM staffing and budgets allow. Support opportunities for interagency conservation and restoration actions on BLM managed land as they become available.	a) Identify and implement a standardized, statistically sound bull trout population monitoring program on BLM-managed land. Increase bull trout surveys to locate and assess bull trout spawning habitats on BLM land. b) Coordinate and evaluate scientific data collection to determine seasonal movement patterns and habitat use of migratory bull trout on BLM-managed land. c) Determine basic genetic and resident and migratory life history characteristics for bull trout on BLM-managed land. Determine range of water temperature tolerances for bull trout life stages and life history forms on BLM-managed land.
Habitat Condition Assessment	
1) Cooperate with other Federal and State agencies as BLM staffing and budgets allow. Support opportunities for interagency conservation and restoration actions on BLM managed land as they become available.	a) Assess, restore and maintain riparian habitat and stream channels on BLM-managed land. Minimize stream channel degradation on BLM-managed land. b) Assess and reduce sources of thermal loading, sediment delivery, and nutrient delivery to streams on BLM-managed land. Reduce instream and riparian wood harvest on BLM-managed land. Determine the effect

Conservation Measures	BLM Implementation Actions
	of water withdrawals on stream temperatures and flows on streams. Work cooperatively with DEQ and NDEP to attain water quality objectives for streams on BLM-managed land.
Habitat Restoration	
1) Cooperate with other Federal and State agencies as BLM staffing and budgets allow. Support opportunities for interagency conservation and restoration actions on BLM managed land as they become available. 2) Consider working cooperatively with the U.S. Forest Service, Three Creek Highway Department, and Owyhee and Elko counties, Nevada, to develop a road maintenance agreement that minimizes sediment contributions to bull trout critical habitat.	a) Assess habitat restoration techniques and effectiveness on BLM managed land. b) Assess and minimize livestock grazing and recreation related impacts on BLM managed lands. Assess suitability of degraded and unoccupied habitats for expanding distribution and abundance of bull trout on BLM managed land.

Critical Habitat for Bull Trout

The FWS has identified Primary Constituent Elements (PCEs) as those physical and biological features essential to the conservation of the species, and within areas occupied by the species at the time of listing, that may require special management considerations and protection (Endangered and Threatened Wildlife and Plants, 2010). These include space for individual and population growth and for normal behavior; food, water, air, light, minerals or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, rearing of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species. The PCEs and their associated matrix indicator are displayed in Table C-6.

The FWS evaluates the impacts of activities on critical habitat for bull trout by determining the impact of the activity on the PCEs of critical habitat. The impacts of BLM land management activities were evaluated using the Bull Trout Matrix of Pathways and Indicators (matrix) (FWS, 1998). The matrix of pathways and indicators for Jarbidge River bull trout is displayed in Appendix B, Table B-1). The matrix indicators correspond to the critical habitat for bull trout PCEs. The matrix contains 23 indicators, four of which are tied to subpopulation characteristics and 19 of which are tied to habitat. Twenty of the 23 indicators are directly or indirectly related to one or more of the nine PCEs, and each PCE corresponds to one or more indicators. Essentially, if an action impacts one of the 23 indicators in the matrix, then at least one of the PCEs for critical habitat would also be impacted.

Table C-6. PCEs for Critical Habitat for Bull Trout and the Associated Matrix Indicators.

PCE	PCE Description	Associated Matrix Indicators
1	Springs, seeps, groundwater sources, and sub-surface water to contribute to water quality and quantity as a cold water source.	Floodplain connectivity, sediment, substrate embeddedness, chemical contamination and nutrients, off-channel habitat, streambank condition, change in peak/base flows, increase in drainage network, road density and location, disturbance history, riparian conservation areas, and refugia.

PCE	PCE Description	Associated Matrix Indicators
2	Migratory corridors with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and foraging habitats, including intermittent or seasonal barriers induced by high water temperatures or low flows.	Physical barriers, substrate embeddedness, average wetted width/maximum depth ratio, change in peak/base flows, persistence and genetic integrity, temperature, chemical contamination and nutrients, and refugia.
3	An abundant food base, including terrestrial organisms of riparian origin, aquatic macro invertebrates, and forage fish.	Sediment, substrate embeddedness, chemical contamination/nutrients, large woody debris, off-channel habitat, floodplain connectivity, streambank condition, riparian conservation areas, and refugia.
4	Complex stream channels with features such as woody debris, side channels, pools, and undercut banks to provide a variety of depths, velocities, and instream structures.	Sediment, substrate embeddedness, large woody debris, pool frequency and quality, large pools, off-channel habitat, average wetted width/maximum depth ratio, streambank condition, riparian conservation areas, floodplain connectivity, road density and location, disturbance regime, and refugia.
5	Water temperatures that support bull trout use. Bull trout have been documented in streams with temperatures from 32 to 72°F (0 to 22°C) but are found more frequently in temperatures ranging from 36 to 59°F (2 to 15 °C). These temperature ranges may vary depending on bull trout life history stage and form, geography, elevation, diurnal and seasonal variation, shade, such as that provided by riparian habitat, and local groundwater influence.	Temperature, off-channel habitat, floodplain connectivity, average wetted width/maximum depth ratio, streambank condition, change in peak/base flows, road density and location, disturbance history, riparian conservation areas, and refugia.
6	Substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. This should include a minimal amount of fine substrate less than 0.25 inch in diameter. The size and amounts of fine sediment suitable to bull trout will likely vary from system to system.	Sediment, substrate embeddedness, streambank condition, riparian conservation areas, floodplain connectivity, increase in drainage network, road density and location, disturbance regime, and refugia.
7	A natural hydrograph, including peak, high, low, and base flows within historic ranges or, if regulated, that operates under a Biological Opinion that addresses bull trout or a hydrograph that demonstrates the ability to support bull trout populations by minimizing daily and day-to-day fluctuations and minimizing departures from the natural cycle of flow levels corresponding with seasonal variation.	Change in peak/base flows, streambank condition, floodplain connectivity, increase in drainage network, road density and location, disturbance history, riparian conservation areas, and refugia.

PCE	PCE Description	Associated Matrix Indicators
8	Permanent water of sufficient quantity and quality such that normal reproduction, growth, and survival are not inhibited.	Temperature, chemical contamination/nutrients, streambank condition, riparian conservation areas, floodplain connectivity, increases in drainage network, road density and location, disturbance regime, and refugia.
9	Sufficiently low levels of occurrence of non-native predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.	Persistence and genetic integrity.

The BLM consults with the FWS on actions that may affect Endangered Species Act (ESA)-listed species or their habitat according to the Streamlined Consultation Procedures for Section 7 of the Endangered Species Act (USFS et al., 1999). Actions that May Affect, but are Not Likely to Adversely Affect ESA-listed species or their habitat are implemented under letters of concurrence provided by the FWS. Actions that "may affect, and are Likely to Adversely Affect ESA-listed species or their habitat are implemented under FWS Biological Opinions which include reasonable and prudent measures and mandatory terms and conditions that are to be applied to implemented actions to avoid jeopardizing the species. There are two Biological Opinions for bull trout and their critical habitat in the Jarbidge planning area; one is for stream crossing replacements and the other is for livestock trailing. The terms and conditions specific to these consultations are displayed in Table C-7. This list of terms and conditions is dynamic and subject to change with future actions that may result in adverse impacts to ESA-listed species or their habitat.

Table C-7 Conservation Measures for Jarbidge River Bull Trout Derived from ESA Consultation

Reasonable and Prudent Measures	Terms and Conditions
Biological Opinion – Restoration Activities at Stream Crossings (Stream Crossing Programmatic; Terms and Conditions)	
1) Minimize incidence of take and site disturbance during stream crossing installations and replacement.	1) Ensure the stream crossing project design team seeks input and agreement from the Level 1 team during the design process and during pre-project reviews. The project design team shall remain flexible in the design process in order to adapt to various and unique site conditions and ensure the likelihood that completed projects meet programmatic objectives.
2) Minimize the incidence of take that occurs as a result of programmatic stream crossing replacements.	2) Ensure the following: see the terms and conditions a) through e) in the programmatic stream crossing consultation (2012) a) Implement the following best management practices in addition to implementing all programmatic activities consistent with the project design criteria, activity types, and mitigation measures presented in the proposed action: i). Determine, based on site characteristics, whether or not reducing streamflow in order to passively move fish out of the construction site prior to electroshocking would reduce the potential for take of bull trout associated with electroshocking. Prioritize this passive movement of fish as appropriate. ii). Electroshocking, where utilized, will be conducted with a three pass methods to ensure the greatest level of fish salvage unless previously approved by the Level 1 Team to perform more or fewer passes. iii). Ensure that holding conditions for any transported fish provide the lowest level of stress to captures individuals by ensuring the availability of cold, well oxygenated water in holding vessels, minimizing holding time, and avoiding any predation in holding vessels. To avoid predation, consider separate holding vessels for different age classes of bull trout. iv). While block nets are set, inspect them regularly for fish and remove any living to an area far enough away from the crossing to void additional impingement risk. v). Stream dewatering is not expected to last more than two weeks. If site specific conditions require dewatering and diverting the stream channel for longer than two weeks, Level 1 teams shall be consulted to determine if additional measures are necessary to ensure that project effects are

Reasonable and Prudent Measures	Terms and Conditions
	within those described in the Biological Opinion. vi). For projects in bull trout spawning and rearing habitat, if instream work is required, it shall be completed by August 15th and instream work may not commence until May 1, to avoid potential effects to spawning bull trout, eggs, alevins, and fry. If site specific information and rationale shows that these time frames can be adjusted without additional harm to bull trout, the Level 1 team has the discretion to do so. Rationale for work in spawning areas in the spring prior to May 1 should also include site specific survey data that indicates bull trout did not spawn there the previous year. b) The NOAA (2009) guidelines shall be used for any installation of treated wood if copper or creosote-based treatments are used. For other treated wood products, adhere to guidelines in Preservative-Treated Wood and Alternative Products in the Forest Service (Groenier and Lebow, 2006) and Best Management Practices for the Use of Treated Wood in Aquatic Environments (Western Wood Preservers Institute, 1996). c) Survey all proposed ford sites prior to design and implementation to evaluate the stream for potential bull trout spawning habitat and to ensure project design does not promote spawning at or immediately downstream of the proposed ford site. d) Provide Level 1 Teams with a written rationale statement (attached to project checklist) supporting any determination that overall impacts to stream channels will be reduced at crossing sites proposed for conversion to a ford. e) If a temporary crossing is needed, the project design team will ensure that the designated temporary crossing area minimizes effects to bull trout and critical habitat. i). Provide Level 1 Teams with a written rationale statement (attached to the pre-project checklist) as to why the temporary crossing is necessary and what steps are being taken to ensure effects are minimized. ii). The area shall be cleared of bull trout prior to equipment crossing, and the block nets will be removed immediately after equipment crosses. iii). Minimize the frequency of crossings by equipment: only allow equipment and vehicles to cross that are absolutely necessary. Width of temporary crossings will be approximately

Reasonable and Prudent Measures	Terms and Conditions
	14 feet wide, the average road width of Forest Service roads.
3) Establish a monitoring plan to confirm projects implemented under the programmatic BO meet the objectives of the programmatic BO and are also not exceeding the amount and/or extent of take from permitted activities.	a) Ensure the following: i). All captured, handled and killed ESA-listed fish shall be identified, counted, and reported on the "post-project checklist" in Appendix A of the BO. ii). The BLM will implement a suspended sediment/turbidity monitoring program. Under the monitoring plan, a reasonable sample of project implemented under this consultation will be assessed to assure that the incidental take associated with suspended sediment and exempted in the BO has not been exceeded. At a minimum, 25 percent of the projects completed under the BO will have monitoring completed that assesses the duration and intensity of turbidity. Monitoring can be adjusted as needed, but should consider the following recommendations: a. Monitoring should occur above the site once for reference conditions before project begins and prior to stream re-watering. b. Monitoring should occur below the construction site where the bypass or stream diversion enters the stream and 600 feet below the site. Alternative sites may be chosen if 600 feet is excessive for a particular site. c. Measurements shall be recorded at the following times: i. Prior to re-watering the stream and Every 30 minutes after re-watering for 4 hours or until turbidity decreases to background levels.
Biological Opinion - Bureau of Land Management Ongoing Actions and Livestock Trailing – Bull Trout Critical Habitat – Benewah, Bonner, Boundary, Kootenai, Owyhee, and Shoshone Counties, Idaho and Elko County, Nevada	
1) Minimize the potential for harassment of bull trout and disruption of riparian and aquatic habitat from project activities.	1) Ensure the following: a) Livestock trailing activities occur as described in the livestock trailing EA (DOI-BLM-ID-T010-2012-0004-EA) and associated trailing permits. Individual livestock stream crossing events shall be completed in the minimum amount of time possible within the allowable 1 hour stream crossing time window.

Yellow-Billed Cuckoo

Table C-8. Conservation Measures and Implementation Actions for Yellow-Billed Cuckoo.

Conservation Measures	BLM Implementation Actions
Air and Atmospheric Values	
None	None
Soil Resources, Water Resources, and Riparian Areas and Wetlands (includes noxious weed and invasive plant management)	
1) Projects involving the application of pesticides (herbicides, insecticides, etc.) that may affect the species will be analyzed at the project level and designed such that pesticide applications will support conservation and minimize risks of exposure.	1) Site-specific stipulations will be developed locally using the following criteria: a) Evaluate the benefits and risks of vegetation treatment, including the following: application methods; pesticides, carriers, and surfactants used; needed treatment buffers; and use of non-chemical noxious weed control (for example, bio-controls, hand pulling). If objectives can be effectively accomplished using non-chemical methods, such is the preferred alternative. b) Apply appropriate spatial and temporal buffers to avoid species' exposure to harmful chemicals. Implement appropriate revegetation and noxious weed control measures to reduce the risks of invasive plant species infestations following any ground/soil-disturbing actions in or near suitable habitat.
2) Where needed and feasible, coordinate with adjacent landowners and local governments regarding control of noxious weeds and invasive plants in riparian areas through cooperative weed management programs.	2) Take advantage of opportunities as they arise.
3) Conserve riparian vegetation in suitable habitat (for example, healthy willow stands and cottonwood trees) to maintain their integrity for use by yellow-billed cuckoos, and initiate management in restoration areas.	3) Implementation actions: a) Emphasize eradication of non-native invasive species in riparian areas that compete with willow and cottonwood tree regeneration. Continue to identify problem areas and implement appropriate noxious weed control measures. b) Avoid issuing commercial firewood cutting permits in suitable habitats in riparian forests. If permits are issued, ensure that such activities are consistent with the long-term maintenance of suitable habitat and enhancement of restoration areas. As needed, close suitable habitat in riparian forests to non-commercial firewood cutting and post the closure.
Upland Vegetation (includes noxious weed and invasive plant management)	
1) Projects involving the application of pesticides in uplands adjacent to suitable yellow-billed cuckoo habitat or in restoration areas will be designed and	1) See Soil Resources, Water Resources, and Riparian Areas and Wetlands management program section.

Conservation Measures	BLM Implementation Actions
implemented in accordance with the approach described in the Soil Resources, Water Resources, and Riparian Areas and Wetlands management program section.	
2) Projects involving the application of pesticides in forested areas and woodlands adjacent to suitable yellow-billed cuckoo habitat or in restoration areas will be designed and implemented in accordance with the approach described in the Soil Resources, Water Resources, and Riparian Areas and Wetlands management program section.	2) See Soil Resources, Water Resources, and Riparian Areas and Wetlands management program section.
Fish	
1) Activities within the Fish management program section will implement relevant conservation measures as described in the Special Status Species management program section to promote conservation.	1) Apply relevant conservation measures from the Special Status Species management program section in this table.
Wildlife	
1) In restoration areas, cooperate in creating opportunities for yellow-billed cuckoo occupancy by enhancing habitat.	1) Consider planting or other habitat enhancement measures to improve yellow-billed cuckoo habitat.
Special Status Species: Common to All Programs	
1) In cooperation with Idaho Department of Fish and Game (IDFG), US Fish and Wildlife Service (FWS), and others:	1) Following actions to be completed in cooperation with others:
a) Continue to cooperate in determining the distribution of known populations and suitable habitats.	a) Mapping and data inventory: i). Use IDFG, Idaho Natural Heritage Program (INHP), FWS, and other data to identify, record, and map known populations and suitable habitat on BLM managed lands. ii). Maintain a spatial database of species population and habitat information for BLM managed lands. Participate in surveys and map new populations as found. Systematic inventories will continue to be conducted in cooperation with other agencies.
b) Follow current monitoring protocols and continue to cooperate in monitoring for species presence on a regular basis.	Cooperate with IDFG and FWS to conduct regular monitoring of populations on BLM managed lands. Assist in documenting whether cuckoos are using habitats and the type of use.
c) Participate in research essential to conservation of the species. Cooperate in determining specific limiting factors in terms of habitat needs and characteristics.	c) BLM will participate as funding allows.
d) Cooperate in the management and improvement of suitable habitat to promote species conservation.	Where appropriate, update or develop management plans for suitable habitat, particularly in areas with known populations, as well as in restoration areas.

Conservation Measures	BLM Implementation Actions
e) Working with other agencies, compile a general list of best management practices (BMPs) that would apply to all programs, to the extent that such a list would assist with species and habitat conservation. The intent of implementing BMPs is to avoid or minimize negative impacts.	e) BMPs: i). State Office to coordinate development of BMPs with Field Office, District Office, FWS, and IDFG. Instruction memorandum to be issued by State Office. Field Office to implement BMPs.
2) Ensure that ongoing Federal actions support or do not preclude species conservation.	2) Ongoing BLM activities: a) Review ongoing activities in locations with known populations. Determine if direct or indirect negative impacts to the species or its habitat are occurring as a result of ongoing discretionary BLM actions. If so, modify the activity to avoid or minimize negative impacts and, where feasible, promote species conservation.
3) Ensure that new Federal actions support or do not preclude species conservation.	3) New BLM activities: a) Project-level inventories will be completed in suitable habitat during project planning if inventory information is not available or adequate. b) If direct or indirect negative impacts to the species or its habitat are anticipated as a result of new BLM actions, modify the activity to avoid or minimize negative impacts and, where feasible, promote species conservation. Avoid implementing activities that have the potential to disturb or displace known populations of cuckoos during the breeding season (May into early September) (Franzreb and Laymon, 1993).
4) Implement adaptive management as needed to achieve conservation objectives.	4) Conduct site-specific implementation and effectiveness monitoring. Adjust management as needed to ensure that management objectives are met.
5) Support conservation easements, cooperative management efforts, and other programs on adjacent non-Federal lands to support conservation of the yellow-billed cuckoo.	5) Take advantage of opportunities as they arise.
Wildland Fire Ecology and Management: Fire Suppression	
1) Fire suppression efforts will be conducted, as possible, to protect yellow-billed cuckoo habitat.	1) Fire management activities: a) Review Fire Management Plan for adequacy in addressing conservation measures. Modify the plan if needed. b) Apply Minimum Impact Suppression Tactics (MIST) in suitable habitat, as appropriate. Consult with resource advisors to determine where MIST tactics should be applied to avoid or minimize negative impacts.

Conservation Measures	BLM Implementation Actions
	Do not locate fire base camps, staging areas, and fueling areas in suitable habitat. Avoid locating these and other related activities in suitable habitat.
2) Coordinate with US Forest Service, Idaho Department of Lands, or other applicable agency personnel regarding fire suppression activities in or near suitable habitat.	2) Ongoing interagency coordination.
Wildland Fire Ecology and Management: Emergency Stabilization and Burned Area Rehabilitation	
1) Implement Emergency Stabilization and Burned Area Rehabilitation (ES&BAR) activities to promote yellow-billed cuckoo habitat rehabilitation.	1) ES&BAR activities: a) If needed and if natural recovery would not achieve habitat objectives, implement ES&BAR activities to promote rehabilitation of suitable habitat. Plant locally appropriate trees and shrubs, if natural recovery of such vegetation is doubtful. As needed, protect disturbed areas using temporary closures or other measures until the cottonwood saplings (and other target tree and shrub species) are re-established and self-sustaining.
2) Fire rehabilitation projects involving the application of pesticides in or adjacent to suitable habitat areas will be analyzed and implemented in accordance with the approach described in the Soil Resources, Water Resources, and Riparian Areas and Wetlands management program section.	2) See Soil Resources, Water Resources, and Riparian Areas and Wetlands management program section.
Wildland Fire Ecology and Management: Wildland Fire Use	
1) Wildland fire use projects (where allowed) will be designed to conserve suitable yellow-billed cuckoo habitat.	1) Wildland fire use is not an option in the planning area per WFM-A-1.
Wildland Fire Ecology and Management: Prescribed Fire	
1) Prescribed fire use projects will be designed to conserve suitable yellow-billed cuckoo habitat and restoration areas.	1) When developing and implementing prescribed fire plans, avoid or minimize negative impacts to suitable habitat, and use prescribed fire as a tool for enhancing restoration areas.
Wildland Fire Ecology and Management: Fuels	
1) Implement projects involving the application of pesticides in or adjacent to suitable habitat or restoration areas in accordance with the approach described in the Soil Resources, Water Resources, and Riparian Areas and Wetlands management program section.	1) See Soil Resources, Water Resources, and Riparian Areas and Wetlands management program section.
2) Promote establishment of vegetation needed to achieve suitable yellow-billed cuckoo habitat.	2) Incorporate conservation actions into the fuels projects, as needed. For example, design seed mixes or plantings that will enhance or promote the growth of willows, cottonwoods, or other target shrub and tree species.
Wildland Fire Ecology and Management: Community Assistance	
1) Follow all measures included throughout the Wildland Fire and Ecology Management program sections.	1) See actions within Wildland Fire and Ecology Management program sections. Incorporate into community assistance agreements.

Conservation Measures	BLM Implementation Actions
Wild Horses	
1) Activities within the Wild Horse Management program will implement relevant conservation measures as described in the Special Status Species management program section to promote conservation.	1) Apply relevant conservation measures from the Special Status Species management program section in this table.
Paleontological Resources	
1) Activities within the Paleontological Resources management program will implement relevant conservation measures as described in the Special Status Species management program section to promote conservation.	1) Apply relevant conservation measures from the Special Status Species management program section in this table.
Cultural Resources	
1) Activities within the Cultural Resources management program will implement relevant conservation measures as described in the Special Status Species management program section to promote conservation.	1) Apply relevant conservation measures from the Special Status Species management program section in this table.
Visual Resources	
None	None
Livestock Grazing: Permits and Leases	
1) Manage livestock grazing and trailing to promote growth and recruitment of healthy riparian vegetation communities (for example, willows and cottonwood trees). Maintain and promote suitable habitat and restore areas for the yellow-billed cuckoo while implementing rangeland health standards and guidelines.	1) Permit or lease renewal actions: a) For review of ongoing actions, see Special Status Species management program section item (2). b) For new actions, see Special Status Species management program section item (3). As appropriate to avoid or minimize negative impacts, modify livestock grazing permits and leases.
2) Promote restoration of suitable habitat following fire, fire rehabilitation, restoration treatments, or other major disturbances.	2) As needed, protect disturbed areas using temporary closures or other measures until the willow shrubs and cottonwood saplings (or other target riparian species) are re-established and self-sustaining.
3) Maintain regular compliance checks on grazing allotments with known populations to identify problems as soon as possible and take immediate corrective measures.	3) Ongoing, day-to-day BLM action.
Livestock Grazing: Range Infrastructure	
1) Manage livestock facilities to promote healthy riparian vegetation communities (for example, willows and cottonwood trees). Maintain and promote suitable habitat and restore areas for the yellow-billed cuckoo while implementing rangeland health standards and guidelines.	1) For review of ongoing actions, see Special Status Species management program section item (2). For new actions, see Special Status Species management program section item (3). As appropriate to avoid or minimize negative impacts, modify existing and avoid placement of new livestock facilities.
Recreation	
1) Developed facilities (boat access, paved campgrounds, vault toilets, interpretive kiosks, etc.): Manage existing and new recreation facilities	1) Management of existing and new facilities: a) For review of existing facilities, see Special

Conservation Measures	BLM Implementation Actions
so as not to preclude species habitat conservation. This includes management of the physical facilities, as well as disturbances to the species resulting from human uses.	Status Species management program section item (2). As appropriate to avoid or minimize negative impacts, modify existing facilities. For new facilities, or for expansion of uses or seasons of use at existing facilities, see Special Status Species management program section item (3). In addition, avoid development of new recreation facilities or expansion of existing facilities in suitable habitat, if negative impacts are anticipated.
2) Dispersed use areas (informal areas, including camping areas and tie-up areas for pack animals and boats): Manage dispersed use sites so as not to preclude species habitat conservation. This includes limiting disturbances to the species resulting from human uses.	2) For review of ongoing actions, see Special Status Species management program section item (2). In addition, minimize human activity in suitable habitat if negative impacts are occurring. Close areas, either seasonally or year-round, as needed to protect the species and its habitat, and post and monitor the closure.
3) Commercial and noncommercial recreation permits, including outfitter camps: Issue commercial and non-commercial recreation permits in accordance with goals for promoting species habitat conservation. This includes management of physical facilities (such as camps), as well as disturbances to the species resulting from human uses.	3) Issuance and review of existing and new permits: a) For review of existing permits, see Special Status Species management program section item (2). If needed, modify existing permits that conflict with achieving or maintaining suitable habitat conditions. For new permits, see Special Status Species management program section item (3). Avoid issuing recreation permits if negative impacts are expected. Consider the seasonal nature of the proposed activities, and whether this conflicts with yellow-billed cuckoo conservation needs. In particular, avoid permitting new recreation activities in suitable habitat. If a recreation permit is to be issued, apply stipulations to the permit to support or to not preclude species conservation.
4) Coordinate with the IDFG to educate recreation users at boat ramps and at designated camp areas about the need to conserve yellow-billed cuckoo habitat.	4) Take advantage of opportunities as they arise
Transportation and Travel	
1) Manage roads, off-highway vehicle (OHV) routes and areas, as well as non-motorized trails, so as not to preclude species habitat conservation. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	1) Review of existing and new roads, OHV routes, and areas and non-motorized trails: a) For existing roads, designated OHV routes and areas, and designated non-motorized trails, see Special Status Species management program section item (2). Modify routes in locations with known populations, if negative impacts are occurring. Evaluate the need for seasonal OHV use restrictions in suitable habitat and, if needed, implement restrictions to reduce disturbance to the species and its

Conservation Measures	BLM Implementation Actions
	habitat. Seek opportunities to close and revegetate OHV routes or non-motorized trails and use areas in suitable habitat, if negative impacts are occurring. For new roads, OHV routes and areas, and trails, see Special Status Species management program section item (3). Avoid constructing new roads, trails, routes, and areas if negative impacts are expected. Consider the seasonal nature of the proposed activities, and whether this conflicts with yellow-billed cuckoo conservation needs. In particular, avoid opening new roads, trails, routes, and areas in suitable habitat.
2) Maintain regular compliance checks on OHV closures to protect known populations and to identify problems as soon as possible and take immediate corrective measures.	2) Ongoing, day-to-day BLM activities.
Land Use Authorizations: Rights-of-Way, Land Use Permits, and Leases	
1) Issue new land use permits and leases and review existing permits and leases at renewal so as not to preclude species habitat conservation. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	1) For new permits and renewal of existing permits, see Special Status Species management program section item (3). Avoid issuing new permits or leases, or renewing existing permits or leases, in suitable habitat if negative impacts are expected. Consider the seasonal nature of the proposed activities, and whether this conflicts with yellow-billed cuckoo conservation needs. If a permit or lease is to be issued or re-issued in suitable habitat, apply stipulations to the permit that support or do not preclude species conservation and that avoid or minimize negative impacts.
Land Tenure (sale, exchanges, withdrawals, etc.)	
1) Where feasible and funding is available, acquire through land exchange or purchase private lands that support known populations or could enhance habitat for yellow-billed cuckoo.	1) Take advantage of opportunities as they arise. Priority should be given to lands that are adjacent to or near public lands.
2) Retain yellow-billed cuckoo habitat in Federal ownership to the extent possible, while balancing other needs.	2) Review each land tenure decision in terms of species habitat. Retain suitable habitat in public ownership unless compelling circumstances necessitate the land tenure adjustment. If property with suitable habitat is to be transferred out of Federal ownership, permanent conservation easements may be attached to the transfer that would result in equal or greater protection than under Federal management. Such measures must be approved by the State Director.
Minerals: Salable and Leasable Minerals	
1) Approve development of salable or leasable minerals so as not to preclude species habitat conservation. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	1) Approval of salable and leasable minerals: a) For review of existing mineral leases, see Special Status Species management program section item (2). Modify existing mineral leases if negative impacts are occurring.

Conservation Measures	BLM Implementation Actions
	For new sales or leases, see Special Status Species management program section item (3). Avoid development of salable or leasable minerals in suitable habitat if negative impacts are expected. Consider the seasonal nature of the proposed activities, and whether this conflicts with yellow-billed cuckoo conservation needs. If a minerals lease or sale is to be issued in suitable habitat, apply stipulations to support or to not preclude species conservation.
Minerals: Locatable Minerals	
1) Approve plans of operations or allow notice-level operations so as not to preclude species habitat conservation. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	1) Approval of plans of operations and notice-level operations: a) For review of existing plans of operation and notice-level operations, see Special Status Species management program section item (2). To the extent allowed by law, modify plans of operation or notice-level operations that conflict with yellow-billed cuckoo objectives in suitable habitat. For notice-level operations, notify the operator that modifications to proposed activities will be required to avoid negative impacts. For new plans of operation and notice-level operations, see Special Status Species management program section item (3). To the extent allowed by law, avoid approving plans of operation or notice-level operations that conflict with yellow-billed cuckoo objectives in suitable habitat. Consider the seasonal nature of the proposed activities, and whether they conflict with yellow- billed cuckoo conservation needs. For notice-level operations, notify the operator that modifications to proposed activities will be required to avoid negative impacts. If a plan of operations is to be approved in suitable habitat, apply stipulations to support or to not preclude species conservation. A notice will require modification by the operator until BLM determines that it will not result in undue or unnecessary degradation.
Special Designations	
1) Explore the potential for new designations that would enhance species conservation, such as good-condition cottonwood/willow riparian forest.	1) Take advantage of opportunities as they arise.

Columbia Spotted Frog

Table C-9. Conservation Measures and Implementation Actions for Columbia Spotted Frog.

Conservation Measures	BLM Implementation Actions
Air and Atmospheric Values	
None	None
Soil Resources, Water Resources, and Riparian Areas and Wetlands (includes noxious weed and invasive plant management)	
1) Projects involving the application of pesticides (herbicides, insecticides, etc.) that may affect the species will be analyzed at the project level and designed such that pesticide applications will support conservation and minimize risks of exposure.	1) Site-specific stipulations will be developed locally using the following criteria: a) Evaluate the benefits and risks of vegetation treatment, including the following: application methods; pesticides, carriers, and surfactants used; needed treatment buffers; and use of non-chemical weed control (for example, bio-controls, hand pulling). If objectives can be effectively accomplished using non-chemical methods, such is the preferred alternative. b) Apply appropriate spatial and temporal buffers to avoid species' exposure to harmful chemicals. c) Implement appropriate revegetation and noxious weed control measures to reduce the risks of non-native species infestations following any ground/soil-disturbing actions in or near suitable habitat within occupied sub-watersheds.
2) Where needed and feasible, coordinate with adjacent landowners and local governments regarding control of noxious weeds and invasive plants in occupied sub-watersheds through cooperative weed management programs.	2) Take advantage of opportunities as they arise.
3) Conserve and, where possible, enhance watershed conditions for Columbia spotted frogs to prevent soil erosion, promote riparian health, and prevent negative impacts to water quality.	3) Implementation actions in occupied sub-watersheds: a) Identify riparian and upland areas with unsuitable watershed conditions near occupied habitat. Restore to improve habitat and habitat connectivity. b) Emphasize soil stabilization and avoid ground disturbance when risks of erosion and sediment delivery are high. c) Seek opportunities, as funding allows, to expand suitable habitat by restoring riparian and wetland habitats.
Upland Vegetation (includes noxious weed and invasive plant management)	
1) Within occupied sub-watersheds, projects involving the application of pesticides in uplands adjacent to riparian areas that provide suitable Columbia spotted frog habitat or in restoration areas will be designed and implemented in accordance with the approach described in the Soil Resources, Water Resources, and Riparian Areas	1) See Soil Resources, Water Resources, and Riparian Areas and Wetlands program section.

Conservation Measures	BLM Implementation Actions
and Wetlands program section.	
2) Protect upland areas adjacent to riparian areas where management activities could affect known populations.	2) Emphasize soil stabilization and avoid ground disturbance when risks of erosion and sediment delivery to suitable habitat are high.
3) Manage woodland areas adjacent to riparian areas where management activities could affect suitable habitat and restoration areas.	3) Implementation actions in occupied sub-watersheds: a) Emphasize soil stabilization and avoid ground disturbance when risks of erosion and sediment delivery to suitable habitat are high. b) Control juniper that encroach into suitable habitat or restoration areas if the trees are affecting spring recharge or degrading Columbia spotted frog habitat.
Fish	
1) Cooperate with IDFG in protecting Columbia spotted frogs from competition and predation by non-native species.	1) If needed, work with IDFG to avoid introduction of competitive or predatory species into watersheds with known populations of Columbia spotted frogs. Cooperate in seeking opportunities to remove non-native competitive or predatory species (for example, smallmouth bass) from watersheds with known populations of Columbia spotted frogs.
Wildlife	
1) Cooperate in protecting Columbia spotted frogs from competition and predation.	1) Work with IDFG to avoid introduction of competitive or predatory species into sub-watersheds with known populations of Columbia spotted frogs. Cooperate in seeking opportunities to remove non-native competitive or predatory species (for example, bullfrogs) from sub-watersheds with known populations of Columbia spotted frogs.
2) Cooperate in creating opportunities for Columbia spotted frog occupancy by enhancing habitat.	2) Work with IDFG to transplant beavers to enhance suitable habitat and restoration areas in occupied sub-watersheds, where appropriate.
Special Status Species: Common to All Programs	
1) In cooperation with Idaho Department of Fish and Game (IDFG), US Fish and Wildlife Service (FWS), and others:	1) Following actions to be completed in cooperation with others:
a) Continue to cooperate to identify and map all known populations and suitable habitat.	a) Mapping and data inventory: i). Use Idaho Natural Heritage Program and other data to identify, record, and map known populations and suitable habitat on BLM managed land. ii). Participate in surveys and map new populations as found. Systematic inventories will continue to be conducted in cooperation with other agencies. iii). Maintain a spatial database of species population and habitat information for BLM managed lands.
b) Following current monitoring protocols,	b) Continue to cooperate with IDFG and FWS to

Conservation Measures	BLM Implementation Actions
cooperate in monitoring Columbia spotted frog population trends and habitat conditions.	conduct regular monitoring of populations on BLM managed lands.
c) Promote species conservation by maintaining or improving habitat conditions in occupied sub-watersheds.	c) Habitat management and species conservation in occupied sub-watersheds: i). Develop and implement habitat management plans for sub-watersheds, as funding allows. ii). Identify barriers or impediments to seasonal movements or dispersal. This could include nonfunctioning stream sections or poor watershed conditions adjacent to suitable habitat within the scope of the sub-watershed plans. iii). Identify restoration areas where habitat improvements will be emphasized within the scope of the sub-watershed plans. iv). Cooperate with IDFG and others to improve habitat, as funding and opportunities allow.
d) Cooperate to expand the distribution of Columbia spotted frogs.	d) Cooperate with IDFG and others to reintroduce spotted frogs into suitable habitat.
e) Participate in research essential to recovery of the species. Cooperate in determining specific limiting factors in terms of habitat needs and characteristics. Cooperate in population viability analyses.	e) BLM will participate as funding allows.
f) Participate in research essential to recovery of the species. Cooperate in determining specific limiting factors in terms of habitat needs and characteristics. Cooperate in population viability analyses.	f) BLM will participate as funding allows.
2) Ensure that ongoing Federal actions support species conservation.	2) Ongoing BLM activities: a) As needed, review ongoing activities in areas with known populations and associated suitable habitat. b) Determine if direct or indirect negative impacts to the species or its habitat are occurring as a result of ongoing discretionary BLM actions. If so, modify the activity to avoid or minimize anticipated negative impacts and, where feasible, promote species conservation.
3) Ensure that new Federal actions support or do not preclude species conservation.	3) New BLM activities: a) Project-level inventories will be completed using currently accepted survey protocols in suitable habitat during project planning if inventory information is not available or adequate. b) If direct or indirect negative impacts to the

Conservation Measures	BLM Implementation Actions
	species or its habitat are anticipated as a result of new BLM actions, modify the activity to avoid or minimize negative impacts and, where feasible, promote species conservation.
4) Implement adaptive management as needed to achieve conservation objectives.	4) Conduct site-specific implementation and effectiveness monitoring. Adjust management as needed to ensure that management objectives are met.
5) Support conservation easements, cooperative management efforts, and other programs on adjacent non-Federal lands to support conservation of the Columbia spotted frog.	5) Take advantage of opportunities as they arise.
Wildland Fire Ecology and Management: Fire Suppression	
1) Fire suppression efforts will be conducted, as possible, to protect occupied Columbia spotted frog habitat.	1) Fire management activities in occupied sub-watersheds: a) Review Fire Management Plan for adequacy in addressing conservation measures. Modify the plan if needed. b) Apply Minimum Impact Suppression Tactics (MIST) in suitable habitat, as appropriate. Consult with resource advisors to determine where MIST tactics should be applied to avoid or minimize negative impacts. c) Avoid fire base camps, staging areas, fueling areas, or other related activities in or adjacent to areas with known populations. d) Avoid drawing water from springs, streams, and ponds occupied by Columbia spotted frogs unless required to do so to protect life or property.
2) Coordinate with Idaho Department of Lands or other applicable agency personnel regarding fire suppression activities in or near suitable habitat.	2) Ongoing interagency coordination.
Wildland Fire Ecology and Management: Emergency Stabilization and Burned Area Rehabilitation	
1) Implement Emergency Stabilization and Burned Area Rehabilitation (ES&BAR) activities to promote spotted frog habitat rehabilitation.	1) ES&BAR activities in occupied sub-watersheds: a) If needed and if natural recovery would not achieve habitat objectives, implement ES&BAR activities to promote rehabilitation of suitable habitat. In areas where the natural drainage regime has been altered, plant locally appropriate vegetation to reestablish suitable habitat. b) As needed, protect disturbed areas using temporary closures or other measures until riparian vegetation is re-established and self-sustaining.
2) Fire rehabilitation projects involving the application of pesticides will be analyzed and implemented in accordance with the approach described in the Soil Resources, Water Resources, and Riparian Areas and Wetlands program section.	2) See Soil Resources, Water Resources, and Riparian Areas and Wetlands program section.

Conservation Measures	BLM Implementation Actions
Wildland Fire Ecology and Management: Wildland Fire Use	
1) Wildland fire use projects (where allowed) will be designed to conserve suitable Columbia spotted frog habitat.	1) When developing wildland fire use plans in occupied sub-watersheds, avoid burning in and adjacent to suitable habitat and develop burn prescriptions that promote habitat conservation.
Wildland Fire Ecology and Management: Prescribed Fire	
1) Prescribed fire projects will be designed to conserve suitable Columbia spotted frog habitat.	1) When developing and implementing prescribed fire plans, avoid or minimize negative impacts to suitable habitat, and use prescribed fire as a tool for assisting with species conservation. Consider allowing prescribed fires to burn in and adjacent to suitable habitat if it is likely to benefit Columbia spotted frog habitat or have a neutral effect. Management actions in occupied sub-watersheds: a) Emphasize soil stabilization and avoid ground disturbance when risks of erosion and sediment delivery to suitable habitat are high. b) Control juniper that encroach into suitable habitat or restoration areas, if the trees are affecting spring recharge or degrading Columbia spotted frog habitat.
Wildland Fire Ecology and Management: Fuels	
1) Implement projects involving the application of pesticides in accordance with the approach described in the Soil Resources, Water Resources, and Riparian Areas and Wetlands program section.	1) See Soil Resources, Water Resources, and Riparian Areas and Wetlands program section.
2) Non-fire fuels management projects will be designed to conserve Columbia spotted frog habitat.	2) Incorporate conservation actions into the fuels projects, as needed. Avoid non-fire fuels management activities in or adjacent to suitable habitat, if negative impacts may occur. Management actions in occupied sub-watersheds: a) Emphasize soil stabilization and avoid ground disturbance when risks of erosion and sediment delivery to suitable habitat are high. b) Control juniper that encroach into suitable habitat or restoration areas if the trees are affecting spring recharge or degrading Columbia spotted frog habitat.
Wildland Fire Ecology and Management: Community Assistance	
1) Follow all measures included throughout the Wildland Fire Ecology and Management program sections.	1) See actions within Wildland Fire Ecology and Management program sections. Incorporate into community assistance agreements.
Wild Horses	
1) If the range of wild horses and Columbia spotted frogs is found to overlap in the future, protect suitable habitat areas in occupied sub-watersheds from damage by wild horses by including applicable conservation measures in herd management plans.	1) Apply relevant conservation measures from the Special Status Species management program section at the beginning of this table.
Paleontological Resources	
1) Activities within the Paleontological Resources program will implement relevant conservation	1) Apply relevant conservation measures from the Special Status Species management program

Conservation Measures	BLM Implementation Actions
measures as described in the Special Status Species management program section to promote conservation.	section at the beginning of this table.
Cultural Resources	
1) Activities within the Cultural Resources management program will implement relevant conservation measures as described in the Special Status Species management program section to promote conservation.	1) Apply relevant conservation measures from the Special Status Species management program section at the beginning of this table.
Visual Resources	
None	None
Livestock Grazing: Permits and Leases	
1) Manage livestock grazing and trailing to promote healthy riparian communities in sub-watersheds occupied by Columbia spotted frogs. Maintain and promote suitable habitat and restore areas for the Columbia spotted frog while implementing rangeland health standards and guidelines.	1) Permit or lease renewal actions: a) For review of ongoing actions, see Special Status Species management program section item (2). In unsurveyed suitable habitat, schedule surveys so Columbia spotted frog occurrence information is available for rangeland health assessments associated with permit and lease renewals. b) For new actions, see Special Status Species management program section item (3). c) As appropriate to avoid or minimize negative impacts, modify livestock grazing permits and leases.
2) Promote restoration of suitable habitat following fire, fire rehabilitation, restoration treatments, or other major disturbances.	2) As needed to protect disturbed areas in occupied sub-watersheds, use temporary closures or other measures until desired riparian or wetland vegetation species are re-established and self-sustaining.
3) Maintain regular compliance checks on grazing allotments with known populations to identify problems as soon as possible and take immediate corrective measures.	3) Ongoing, day-to-day BLM action.
Livestock Grazing: Range Infrastructure	
1) Manage livestock facilities to promote healthy riparian communities. Maintain and promote suitable habitat and restore areas for the Columbia spotted frog while implementing rangeland health standards and guidelines.	1) For review of ongoing actions, see Special Status Species management program section item (2). For new actions, see Special Status Species management program section item (3). a) As appropriate to avoid or minimize negative impacts to Columbia spotted frogs in occupied sub-watersheds, modify existing and avoid placement of new livestock facilities in or adjacent to areas with known populations. b) Protect hibernacula and water sources from spring or other water developments in occupied sub-watersheds unless the activity will have beneficial long-term or neutral effects on Columbia spotted frogs and their habitat. c) Construct livestock exclosures to protect locally important habitats in occupied sub-watersheds.

Conservation Measures	BLM Implementation Actions
Recreation	
1) Developed facilities (boat access, paved campgrounds, vault toilets, interpretive kiosks, etc.): Manage existing and new recreation facilities so as not to preclude species habitat conservation. This includes management of the physical facilities, as well as disturbances to the species resulting from human uses.	1) Management of existing and new facilities in occupied sub-watersheds: a) For review of existing facilities, see Special Status Species management program section item (2). As appropriate to avoid or minimize negative impacts, modify existing facilities. b) For new facilities, or for expansion of uses at existing facilities, see Special Status Species management program section item (3). In addition, avoid development of new recreation facilities or expansion of existing facilities in or adjacent to areas with known populations, if negative impacts are anticipated.
2) Dispersed use areas (informal areas, including camping areas and tie-up areas for pack animals and boats): Manage dispersed use sites so as not to preclude species and habitat conservation. This includes limiting disturbances to species habitat resulting from human uses.	2) For review of ongoing activities, see Special Status Species management program section item (2). In addition, minimize human activity in and adjacent to known populations, if negative impacts are occurring. Close areas, either seasonally or year-round, as needed to protect the species and its habitat, and post and monitor the closure.
3) Commercial and non-commercial recreation permits, including outfitter camps: Issue commercial and non-commercial recreation permits so as not to preclude species habitat conservation. This includes management of physical facilities (such as camps), as well as disturbances to habitat resulting from human uses.	3) Issuance and review of existing and new permits in occupied sub-watersheds: a) For review of existing permits, see Special Status Species management program section item (2). If needed, modify existing permits if the permitted activity is causing negative impacts. b) For new permits, see Special Status Species management program section item (3). Avoid issuing recreation permits in and adjacent to areas with known populations if negative impacts are expected. If a recreation permit is to be issued, apply stipulations to the permit to support or to not preclude species conservation.
4) Coordinate with the IDFG to educate the public on the frog's unique ecological requirements, sensitivity to habitat alteration, and need for protection in order to reduce recreation impacts and stop collection of frogs.	4) Take advantage of opportunities as they arise.
Transportation and Travel	
1) Manage roads, off-highway vehicle (OHV) routes and areas, as well as non-motorized trails, so as not to preclude species habitat conservation. This includes management of physical facilities, as well as disturbances to habitat resulting from human uses.	1) Review of existing and new roads, OHV routes and areas, and non-motorized trails in occupied sub-watersheds: a) For existing roads, designated OHV routes and areas, and designated non-motorized trails, see Special Status Species management program section item (2). Modify routes in and

Conservation Measures	BLM Implementation Actions
	adjacent to areas with known populations if negative impacts are occurring. Seek opportunities to close and revegetate roads, OHV routes, or non-motorized trails and use areas in and adjacent to suitable habitat, if negative impacts are occurring. b) For new roads, OHV routes and areas, and non-motorized trails, see Special Status Species management program section item (3). Avoid constructing new roads, trails, routes, and areas in suitable habitat if negative impacts to riparian or wetland habitat are expected. In particular, avoid opening new roads, trails, routes, and areas adjacent to suitable habitat particularly susceptible to erosion and thus sediment delivery to suitable habitat.
2) Maintain regular compliance checks on OHV closures to protect suitable habitat and to identify problems as soon as possible and take immediate corrective measures.	2) Ongoing, day-to-day BLM activities.
Land Use Authorizations: Rights-of-Way, Land Use Permits, and Leases	
1) Issue new rights-of-way (ROWs) and review existing ROWs at renewal so as not to preclude species habitat conservation. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	1) For new ROWs and renewal of existing ROWs, see Special Status Species management program section item (3). In occupied sub-watersheds, avoid issuing ROWs, or renewing existing ROWs, in or adjacent to suitable habitat if negative impacts are expected. If a ROW is to be issued or re-issued, apply stipulations to the ROW that support or do not preclude species conservation and that avoid or minimize negative impacts.
2) Issue new land use permits and leases and review existing permits and leases at renewal so as not to preclude species habitat conservation. This includes management of physical facilities, as well as disturbances to the species or its habitat resulting from human uses.	2) For new permits and renewal of existing permits, see Special Status Species management program section item (3). In occupied sub-watersheds avoid issuing new permits or leases, or renewing existing permits or leases, in or adjacent to areas with known populations if negative impacts are expected. If a permit or lease is to be issued or reissued in suitable habitat, apply stipulations to the permit that promote species conservation and that avoid or minimize negative impacts.
Land Tenure (sale, exchanges, withdrawals, etc.)	
1) Where feasible and funding is available, acquire through land exchange or purchase private lands in suitable habitat areas that could enhance habitat for Columbia spotted frogs.	1) Take advantage of opportunities as they arise. Priority should be given to lands that are adjacent to or near public lands and/or a population occurring on BLM and private lands.
2) Retain spotted frog habitat in Federal ownership to the extent possible, while balancing other needs.	2) Review each land tenure decision in terms of species habitat. Retain areas with known populations in public ownership unless compelling circumstances necessitate the land tenure adjustment. Avoid the loss of suitable habitat from Federal ownership. If property with known populations is to be transferred out of Federal

Conservation Measures	BLM Implementation Actions
	ownership, permanent conservation easements may be attached to the transfer that would result in equal or greater protection than under Federal management. Such measures must be approved by the State Director.
Minerals: Salable and Leasable Minerals	
1) Approve plans of operations or allow notice-level operations so as not to preclude species habitat conservation. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	1) Approval of plans of operations and notice-level operations: a) For review of existing plans of operation and notice-level operations, see Special Status Species management program section item (2). To the extent allowed by law, in occupied sub-watersheds modify plans of operation or notice-level operations that conflict with Columbia spotted frog objectives in suitable habitat. For notice-level operations, notify the operator that modifications to proposed activities will be required to avoid negative impacts. b) For new plans of operation and notice-level operations, see Special Status Species management program section item (3). To the extent allowed by law, in occupied sub-watersheds avoid approving plans of operation or notice-level operations that conflict with Columbia spotted frog objectives in suitable habitat. For notice-level operations, notify the operator that modifications to proposed activities will be required to avoid negative impacts. If a plan of operations is to be approved in suitable habitat, apply stipulations to conserve Columbia spotted frogs. A notice will require modification by the operator until BLM determines that it will not result in undue or unnecessary degradation.
2) Protect the groundwater sources that contribute to Columbia spotted frog habitat.	2) Conduct appropriate hydrologic studies or analysis before permitting mineral extraction on BLM managed lands where the extraction of groundwater may reduce or eliminate flows in occupied sub-watersheds. Depending on the scope of the activity, this may require coordination and cooperation with other agencies.
Minerals: Locatable Minerals	
1) Approve plans of operations or allow notice-level operations so as not to preclude species habitat conservation. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	1) Approval of plans of operations and notice-level operations: a) For review of existing plans of operation and notice-level operations, see Special Status Species management program section item (2). To the extent allowed by law, in occupied sub-watersheds modify plans of operation or notice-level operations that conflict with Columbia spotted frog objectives in suitable habitat. For notice-level operations, notify the

Conservation Measures	BLM Implementation Actions
	operator that modifications to proposed activities will be required to avoid negative impacts. b) For new plans of operation and notice-level operations, see Special Status Species management program section item (3). To the extent allowed by law, in occupied sub-watersheds avoid approving plans of operation or notice-level operations that conflict with Columbia spotted frog objectives in suitable habitat. For notice-level operations, notify the operator that modifications to proposed activities will be required to avoid negative impacts. If a plan of operations is to be approved in suitable habitat, apply stipulations to conserve Columbia spotted frogs. A notice will require modification by the operator until BLM determines that it will not result in undue or unnecessary degradation.
Special Designations	
1) Explore the potential for new designations that would enhance species conservation, such as healthy riparian and emergent aquatic vegetation.	1) Take advantage of opportunities as they arise.

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APPENDIX D: DROUGHT MANAGEMENT GUIDELINES

Implementation of management actions may be necessary when it is anticipated or evident that, in addition to existing terms and conditions of livestock grazing permits, temporary measures are necessary to protect public land resources due to developing or existing drought conditions.

Drought is defined by the Society for Range Management as a period of time when the precipitation is less than 75% of normal (Holecheck et al., 1998) and occurs seasonally or over long periods of time. Normal precipitation is based on the median of 30 years or more of precipitation (Thurow and Taylor Jr., 1999; Wilhite and Glantz, 1985). Regional indicators such as the US Drought Monitor (http://droughtmonitor.unl.edu/) and the Vegetation Drought Response Index (VegDRI) (http://vegdri.unl.edu/) may be used to provide regional depictions of existing or developing climatic conditions. However, because drought can occur at a range of spatial scales these tools may or may not accurately represent local conditions so when available, local climatic data should be used.

Within the planning area average annual precipitation varies substantially from north to south (see the Air and Atmospheric Values: Climate and Meteorology section in Chapter 3). Additionally, plant growth is dependent on timing of precipitation as well as quantity. The April-May-June precipitation period is most important for determining vegetation production and making annual adjustments to livestock stocking rates (Comstock and Ehleringer, 1992; Sharp et al., 1990). However, the October-through-March precipitation period is important for maintenance of vegetation communities through soil moisture recharge and initiation of early spring plant growth (Comstock and Ehleringer, 1992). Therefore, to the extent possible local climate data should be used to provide site-specific information on the amount and timing of precipitation, as well as other environmental factors such as temperature and wind that affect the occurrence and severity of drought. In addition to climate data, site visits to allotments would be used to evaluate the current condition of water resources and forage production to better define drought affected areas.

Wang and others (2012) found wet-dry cycles in the Great Basin to be about six to nine years, making it reasonable to expect that during the life of a 10-year grazing permit some level of drought could occur. Relative to the effects of livestock grazing, the degree to which drought impairs the range's potential for future forage production can be affected by the intensity, frequency, and timing of grazing (Howery, 1999). Properly stocked rangelands should maintain rangeland conditions (Martin and Cable, 1974) and require fewer adjustments to grazing operations during periods of drought. Therefore, drought management should begin with the determination of livestock stocking rates, seasons of use, and utilization levels for an allotment during the permitting process. The likelihood that drought could occur during the period of the permit should be considered and stocking rates set at a level that would not require frequent annual adjustments in order to provide for watershed protection through retention of litter, physiological function of vegetation communities, and wildlife habitat.

Implementation

When drought conditions develop, and it is determined additional temporary measures are necessary to maintain resource values, one or more of the following actions should be implemented. The selection of temporary actions will consider the severity of drought, vegetation type, and soil characteristics of the affected area.

The term of temporary measures would reflect the severity of the drought and ensure adequate protection of resources during the drought as well as allow for resource recovery following resumption of non-drought climate conditions. As the length and severity of the drought increase, livestock grazing management would be more constrained to reduce impacts to soil, water, upland and riparian vegetation, and fish and wildlife habitat. Pre-drought grazing levels should not be implemented too rapidly following a return to normal precipitation levels as drought-stressed plants require time to regain vigor and be able to resist normal grazing pressure (Vallentine, 2001).

Triggers for implementation of temporary actions:

The following list of actions is not exclusive and can be used singularly or in combinations as field conditions require. Persistence of drought through multiple years could result in additional and more restrictive actions taken to protect resource values.

- If precipitation between October and January is less than 75% of normal, initiate communication with affected permittees to coordinate potential changes to their grazing operations if drought conditions persist.
- If drought continues to the April-May-June precipitation period, and allotment inspections identify resource concerns such as reduced production that would limit maintenance of achievement of resource objectives, implement the following measures as appropriate. The specific measures to be implemented would depend on the length and severity of the drought as well as vegetation and soil characteristics.
    - Adjust stocking rate using April-May-June precipitation to match current forage production available for livestock (Heitschmidt et al., 2005) and ensure adequate residual ground cover for watershed protection and wildlife habitat needs.
    - Adjust timing and duration of grazing to reduce utilization of key native grasses and riparian vegetation.
    - Monitor utilization closely and remove livestock from pastures or the allotment if allowable use criteria will be exceeded early.
    - Adjust timing and duration of grazing to reduce the opportunity for upland and riparian plants to be grazed repeatedly during the growing season[1].
    - During the growing season, shift use to pastures managed as non-native to defer grazing of native pastures until after the growing season.
    - Encourage permittees to closely manage livestock watering systems (e.g., turn off troughs when not needed by livestock, eliminate overflow) to facilitate conservation of water within streams and springs.
    - Consistent with water rights, consider authorizing water hauling or temporary pipelines to reduce impacts to riparian areas and wetlands.
    - Pastures which are managed as native that are grazed during the growing season one year would be deferred until after the end of the growing season the following year.
    - Defer spring grazing until end of growing season.
    - Do not allow spring grazing.
    - Close pasture and/or allotment.

[1] The growing season is defined as the portion of the year during which temperature and moisture typically enable plant growth (Vallentine, 2001). For key species in the planning area, this period typically falls between April 1 and July 15; however, drought conditions typically shorten the growing period.

APPENDIX E: CULTURAL RESOURCE USE CATEGORIES

All cultural properties in the planning area, whether already recorded or projected to occur, are allocated to one or more of the uses described below. Allocations apply to individual properties and to classes of similar properties. The purpose of these allocations is to provide up-front management direction to aid the authorized officer in responding to conflicts between specific cultural resources and land uses and to enable the authorized officer to analyze needs and develop appropriate mitigation and treatment options during the compliance process for proposed actions. Managing cultural properties according to use categories does not relieve the Bureau of Land Management (BLM) of its obligations to consult with the tribes, the State Historic Preservation Officer (SHPO), or the Advisory Council on Historic Preservation (ACHP) regarding the specific treatment of historic properties, or the potential effects of land use proposals on cultural resources.

Allocations of individual sites may be revised when site conditions change or new information becomes available. Changes that may warrant revision of a site's use allocation include:

- Destruction of a site's primary use values due to natural or human-caused disturbance.
- When ethnographic, historical, or archaeological research reveals important but previously unrecognized values that may be damaged or destroyed under the current allocation or that may more effectively meet Resource Management Plan (RMP) goals and objectives if used in another way.
- When a site's primary values are legitimately expended or its use potential is fully realized.
- Following consultation with the tribes, SHPO, or ACHP, as appropriate for the resource and use category being revised.

Traditional Use

The Traditional Use category applies to any cultural resource in the planning area known to be perceived by the Shoshone-Paiute Tribes or the Shoshone-Bannock Tribes as important in maintaining their cultural identity, heritage, or well-being. Cultural properties assigned to this category are managed in ways that recognize the importance ascribed to them and seek to accommodate their continuing traditional use.

Management Direction

- Avoidance is the preferred treatment.
- If impacts are unavoidable, data recovery and/or other measures will be implemented after appropriate consultation and before implementation of a proposed activity.
- Sites in this category are available for use by members of the Shoshone-Paiute Tribes and the Shoshone-Bannock Tribes for traditional uses. Access to these sites will be accommodated to the extent practicable.
- Ethnographic studies may be initiated when funding is available to identify these types of properties and to ensure that they receive the appropriate level of management.

The following property types in the planning area are allocated to Traditional Use:

- Historic/Ethnographic Tribal Sites,
- Ceremonial Locations,
- Burial Sites[1],
- Sacred Sites,
- Natural Resource Collection Sites, and
- Native American Trails.

[1] Native American burials on public lands would normally be subject to the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA).

Conservation for Future Use

The Conservation for Future Use category is reserved for any cultural property in the planning area that is unusual because of scarcity or has a research potential that surpasses the current state of the art, singular historic importance, cultural importance, architectural interest, or comparable reasons. These properties are not currently available for consideration as the subject of scientific or historical study that would result in their physical alteration.

Management Direction

- Avoidance is the preferred mitigation measure. Discretionary activities will usually be denied within the boundaries of these resources if such activities are likely to result in adverse effects to the cultural property.
- If impacts are unavoidable, data recovery or other measures may be allowed after going through the required consultation processes. Avoidance should be possible in most cases.
- Sites in this category have the highest priority for protection and preservation and will generally not be available for other uses.
- A resource listed in the Conservation for Future Use category may be placed in another use management category if: (a) BLM identifies the specific criteria underlying this classification (e.g., outstanding research potential), (b) the specific reasons for prohibitions or limitations are identified, and (c) BLM identifies or accepts methodological, technological, or other criteria that, if met or implemented, justify alterations to the integrity of the resource and placement in another use category.
- Protective actions may be taken to ensure preservation of those qualities providing the basis for classification. These actions, such as fencing, installation of erosion control structures, road closures, etc., must not impinge on the values and integrity of the site. Sites in this category are generally the highest priority for monitoring of potential threats.

The following property types in the planning area are allocated to Conservation for Future Use:

- Oregon Trail (Main Route and South Alternate) – Undisturbed Ruts,
- Kelton Freight Road – Undisturbed Ruts,
- Toana Freight Road – Undisturbed Ruts, and
- Cemeteries and Grave Sites.

Scientific Use

The Scientific Use category applies to any cultural property in the planning area available for consideration as the subject of scientific or historical study at the present time, using currently available research techniques. Study includes methods that would result in the property's physical alteration or destruction. This category applies almost entirely to archaeological properties, where the method of use is generally archaeological excavation, controlled surface collection, and/or controlled recordation (data recovery). Recommendations to allocate individual properties to this use must be based on documentation of the kinds of data the property is thought to contain and the data's importance for pursuing specified research topics. Properties in this category need not be conserved in the face of a research or data recovery (mitigation) proposal that would make adequate and appropriate use of the property's research importance.

Management Direction

- Data recovery rather than avoidance is the preferred option; although sites should be preserved until research potential is realized. Data recovery should be accomplished prior to impacts from conflicting uses or natural or human-caused deterioration and may be undertaken to mitigate impacts that have already occurred.
- Resources in this category are available for testing and excavation by qualified researchers operating under valid permits with acceptable research designs. Resources in this category may be discharged from use or assigned to a category other than Conservation for Future Use once the resource has no further scientific use.

The following property types in the planning area are allocated to Scientific Use:

- Fur Trade Camps;
- Cabins/Line Shacks, including Ruins;
- Abandoned Homesteads, including Ruins;
- Historic Cairns;
- Trash Dumps – Community;
- Irrigation Project Construction Camps;
- Moonshine Distilleries; and
- Archaeological Sites that are not identified through research or consultation as traditional cultural properties or sacred sites.

Public Use

This category may be applied to any cultural property in the planning area found to be appropriate for use as an interpretive exhibit in place or for related educational and recreational uses by members of the general public. This category may also be applied to historic features (e.g., roads, dams, canals) that are still in use.

Management Direction

- Interpretation through the development of on-site facilities and/or published materials made available to the public is the preferred treatment. Interpretation will be based on appropriate archaeological, historic, or ethnographic research and will reflect consultation with the Shoshone-Paiute Tribes and the Shoshone-Bannock Tribes when Native American information is included.
- These sites are available for educational and recreational use by the general public. Testing, data recovery, historic research, oral histories, ethnographic research, and other treatments may be necessary to gather sufficient information for suitable educational and interpretive uses and to prevent damage from proposed recreational or educational uses.
- Interpretive facility designs will be consistent with the area's Visual Resource Management class and compatible with the physical setting of the interpreted site.
- Fences, erosion control devices, vehicle barriers, parking areas, and other protective structures may be constructed to prevent or limit site damage.

The following property types in the planning area are allocated to Public Use:

- Crippen Grade;
- Portions of Historic Roads and Trails that are improved for Modern Use;
- Civilian Conservation Corps (CCC) Dams, Roads, and Related Sites – Still in Use;
- Non-CCC Reservoirs – Still in Use; and
- Irrigation Canals and Ditches – Still in Use.

Experimental Use

This category may be applied to a cultural property in the planning area determined to be well-suited for controlled experimental study, conducted by BLM or others concerned with the techniques of managing cultural properties, which would result in the property's alteration, possibly including loss of integrity and destruction of physical elements. Committing cultural properties or the data they contain to loss must be justified in terms of specific information that would be gained and how it would aid in the management of other cultural properties. Experimental study should aim toward understanding the kinds and rates of natural or human-caused deterioration, testing the effectiveness of protection measures, or developing new research or interpretation methods and similar kinds of practical management information. It would not be applied to cultural properties with traditional cultural importance, research potential, or public use potential.

Management Direction

- These sites are reserved for studies concerning the effects of erosion, fire, land treatments, or other site formational processes on cultural resources. The preferred treatment for sites placed in an Experimental Use category will be avoidance unless the proposed impacts are related to the study being conducted.
- If impacts unrelated to the study are unavoidable, then the site may be placed in the Discharged from Management category, or may undergo data recovery or other treatment depending on eligibility for the National Register of Historic Places (NRHP) or other factors and after appropriate consultation.
- If BLM determines the useful experimental life of the site is exhausted, then it can be placed into the Discharged from Management or other appropriate category.

Individual sites within the following property types in the planning area may be allocated to Experimental Use as needed:

- Temporary Camps – Livestock Industry and
- Trash Dumps – Unassociated Household Refuse.

Discharged from Management

This category is assigned to cultural properties in the planning area that have no remaining identifiable use. These are most often prehistoric and historic properties, such as small surface scatters of artifacts or debris, whose limited research potential is effectively exhausted during documentation. More complex archaeological properties that have had their salient information collected and preserved through mitigation or research may be discharged from management, as should cultural properties destroyed by any natural or human activity. Properties discharged from management remain in the inventory, but are removed from further management attention and do not constrain other land uses. Particular classes of unrecorded cultural resources may be named and described in advance as dischargeable upon documentation, but specific cultural properties must be inspected in the field and recorded before they may be discharged from management.

Management Direction

- Preservation is not required.
- Tribal consultation is required before any site of cultural or religious significance to the tribes is placed in this category.
- SHPO consultation is required before any property previously determined eligible for the NRHP or any unevaluated property is placed in this category.

The following property types in the planning area are Discharged from Management:

- General Transportation Routes (e.g., ranching, recreation, farming);
- Temporary Camps – Livestock Industry;
- Generic Range Developments (e.g., fences, corrals, water tanks, ponds);
- Irrigation Canals and Ditches – No Longer Used and Not Eligible for NRHP Listing;
- Trash Dumps – Unassociated Household Refuse;
- Non-CCC Reservoirs – Breached;
- Military – Aircraft Debris;
- Military – Expended Ordnance;
- Small, Non-Diagnostic Lithic Scatters;
- Isolated Artifacts; and
- Modern Period (post 1960) Sites, Facilities, and Features.

Traditional/Scientific Use

This category is assigned to cultural properties in the planning area important because of their links to traditional values, but also important for the archaeological information they contain.

Management Direction

- Access for traditional use will be accommodated to the extent and manner practicable.
- Non-destructive recordation, photography, mapping, and analysis, as well as actions needed to protect artifacts and sites threatened by theft or physical destruction will be allowed, including research and stabilization related to investigations of criminal violations of the Archaeological Resources Protection Act.
- Research that does not conflict with traditional use may be allowed after consultation with the tribes, SHPO, and the Advisory Council on Historic Preservation, as appropriate.
- Public dissemination of research results will take into account the confidentiality and privacy concerns of the tribes.
- Cultural resource data recovery, using standard archaeological methods, may be allowed, after appropriate consultation, if impacts to sites are unavoidable and non-destructive conservation measures are not adequate or feasible, or when necessary to determine a site's eligibility for the NRHP or mitigate adverse effects to NRHP-eligible or -listed properties.

The following property types in the planning area are allocated to Traditional/Scientific Use:

- Native American Rock Art Sites (petroglyphs and pictographs);
- Native American Cave and Rock Shelter Sites;
- Native American Open Habitation Sites;
- Lithic Scatters;
- Tool Stone Quarries; and
- Native American Rock Features (e.g., hunting blinds, rock circles, linear rock alignments, and cairns)
- Isolated Native American Artifacts.

Public/Scientific Use

This category is assigned to cultural properties in the planning area that are most valuable for public use, but that may require scientific data collection to enhance their interpretive potential.

Management Direction

- Sites assigned to this category will be available for educational and recreational use by the general public. Interpretive and educational actions, including but not limited to on-site interpretation, signage, or publications, are the preferred management actions.
- Data recovery or other treatments deemed necessary to provide sufficient information for suitable educational and interpretive uses, or to treat damage from recreational uses, may be authorized providing they do not diminish the public use potential of the site.
- Data recovery and stabilization actions for investigations and treatments related to criminal violations of the Archaeological Resources Protection Act will be allowed.
- To the extent practical, data recovery and other treatment actions will involve volunteers.

The following property types in the planning area are allocated to Public/Scientific Use:

- Oregon Trail Campsites;
- Pilgrim Stage Station;
- Historic School Sites;
- Historic Inscriptions;
- CCC Dams, Roads, and Related Sites – No Longer Used; and
- Irrigation Canals and Ditches – No Longer Used.

Conservation/Public Use

This category includes cultural resources in the planning area that are suitable for long-term preservation, but also possess high public use values.

Management Direction

- Sites in this category will be managed to avoid degradation from competing land uses and from natural processes.
- Sites may be used for interpretation or other public purposes and for data recovery and other treatments if these uses do not conflict with conservation of the property.

The following property types in the planning area are allocated to Conservation/Public Use:

- Oregon Trail (Main Route and South Alternate) – the NHRP Contributing Segments,
- Kelton Freight Road – NRHP Contributing Segments,
- Toana Freight Road – NRHP Contributing Segments, and
- Wilkins Rock Fence.

Summary of Cultural Resource Use Allocations

Table E-1 summarizes the cultural resource use categories to which properties of cultural and religious importance and prehistoric and historic sites would be allocated.

Table E-1. Cultural Resource Property Types and Use Allocations

Property Type	Use Category
Properties of Cultural and Religious Importance to Native American Tribes	
Historic/Ethnographic Tribal Sites	Traditional
Ceremonial Locations	Traditional
Burial Sites	Traditional
Sacred Sites	Traditional
Natural Resource Collection Sites	Traditional
Native American Trails	Traditional
Native American Archaeological Sites	
Petroglyphs	Traditional/Scientific
Pictographs	Traditional/Scientific
Caves and Rock Shelters	Traditional/Scientific
Open Habitation Sites	Traditional/Scientific
Lithic Scatters with potential for subsurface deposits, diagnostic artifacts, surface patterning of cultural debris, or evidence of cultural features	Traditional/Scientific
Lithic Scatters with no or little potential for subsurface deposits, and no diagnostic artifacts, surface artifact patterning, or evidence of cultural features	Traditional/Scientific or Discharged from Management
Tool Stone Quarries	Traditional/Scientific
Hunting Blinds	Traditional/Scientific
Rock Circles	Traditional/Scientific
Linear Rock Alignments	Traditional/Scientific
Cairns	Traditional/Scientific
Isolated Artifacts	Traditional/Scientific or Discharged from Management
Archaeological sites that are not identified through research or consultation as traditional cultural properties or sacred sites	Scientific

Property Type	Use Category
Historic Sites	
Fur Trade Camps	Scientific
Oregon Trail (Main Route)	Conservation or Conservation/Public
Oregon Trail (South Alternate)	Conservation or Conservation/Public
Oregon Trail Campsites	Public/Scientific
Kelton Freight Road	Conservation or Conservation/Public
Pilgrim Stage Station	Public/Scientific
Toana Freight Road	Conservation or Conservation/Public
Crippen Grade	Public
General Transportation Routes (Ranching, Recreation, Farming, etc.)	Discharged from Management
Portions of Historic Roads and Trails that are Improved for Modern Use	Public
Cabins/Line Shacks, including Ruins	Scientific
Temporary Camps – Livestock Industry	Experimental or Discharged from Management
Historic School Sites	Public/Scientific
Abandoned Homesteads, including Ruins	Scientific
Cemeteries and Grave Sites	Conservation
Cairns	Scientific
Wilkins Rock Fence	Conservation/Public
Generic Range Developments (Fences, Corrals, Water Tanks, Ponds, etc.)	Discharged from Management
Trash Dumps – Community	Scientific
Trash Dumps – Unassociated Household Refuse	Experimental or Discharged from Management
Historic Inscriptions	Public/Scientific
Irrigation Project Construction Camps	Scientific
Irrigation Canals and Ditches – Still in Use	Public
Irrigation Canals and Ditches – No Longer Used	Public/Scientific or Discharged from Management
CCC Dams, Roads, and Related Sites – Still in Use	Public
CCC Dams, Roads, and Related Sites – No Longer Used	Public/Scientific
Non-CCC Reservoirs – Still in Use	Public
Non-CCC Reservoirs – Breached	Discharged from Management
Moonshine Distilleries	Scientific
Military – Aircraft Debris	Discharged from Management
Military – Expended Ordnance	Discharged from Management
Isolated Artifacts	Discharged from Management
Modern Period (post 1960) Sites, Facilities, and Features	Discharged from Management

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APPENDIX F: RECREATION MANAGEMENT AREAS

Recreation Setting Characteristics

Recreation settings are the collective, distinguishing attributes of landscapes that influence and sometimes determine what kinds of recreation opportunities are produced. Recreation setting characteristics are objectively defined along a continuum ranging from primitive to urban landscapes, expressed in terms of the nature of the component parts of its physical, social, and administrative attributes; recreation setting characteristics are described for both the existing and desired condition of a landscape.

The physical setting addresses the land and facilities and describes the character of the natural landscape; remoteness, naturalness, and facilities are all components of the physical setting. The continuum of setting characteristics for physical setting is displayed in Table F-1.

Table F-1. Physical Setting

		Remoteness	Naturalness	Facilities
Primitive	**Pristine**	More than 10 miles from any road.	Undisturbed natural landscape.	None.
	Transition	More than 3 miles from any road.		
Back Country		More than .5 mile from any kind of road, but not as distant as 3 miles, and no road is in sight.	Naturally-appearing landscape having modifications not readily noticeable.	Structures are rare and isolated.
Middle Country		On or near four-wheel drive roads, but at least 1/2 mile from all improved roads, though they may be in sight.	Naturally-appearing landscape except for obvious primitive roads.	Maintained and marked trails, simple trailhead development and basic toilets.
Front Country		On or near improved country roads, but at least 1/2 mile from all highways.	Landscape partially modified by roads, utility lines, etc., but none overpower natural landscape features.	Rustic facilities such as campsites, restrooms, trailheads, and interpretive displays.
Rural		On or near primary highways, but still within a rural area.	Natural landscape substantially modified by agriculture or industrial development.	Modern facilities such as campgrounds, boat launches, and group shelters.
Urban		On or near primary highways, municipal streets, and roads within towns or cities.	Urbanized developments dominate landscape.	Elaborate full-service facilities.

The social setting addresses visitor use and users and describes the character of recreation and tourism use; the number of contacts with other groups, group size, and evidence of use are all components of the social setting. The continuum of setting characteristics for social setting is displayed in Table F-2.

The administrative setting addresses recreation administration and services and describes how public land managers, county commissioners and municipal governments, and local businesses care for the area and serve visitors and local residents. The amount and type of mechanized use, visitor services, and management controls are all components of the administrative setting. The continuum of setting characteristics for administrative setting is displayed in Table F-3.

Table F-2. Social Setting

		Contacts with Other Groups	Group Size	Evidence of Use
Primitive	**Pristine**	Fewer than 3 encounters per day at camp sites and fewer than 6 encounters per day on travel routes.	Fewer than or equal to 3 people per group.	Only footprints observed. No noise or litter.
Back Country		3-6 encounters per day off travel routes (e.g., campsites) and 7-15 encounters per day on travel routes.	4-6 people per group.	Footprints and bicycle tracks observed. Noise and litter infrequent. Slight vegetation trampling at campsites and popular areas. Fire rings seen.
Middle Country		7-14 encounters per day off travel routes (e.g., staging areas) and 15-29 encounters per day en route.	7-12 people per group.	Vehicle tracks observed. Occasional noise and litter. Vegetation and soils becoming worn at campsites and at high-use areas.
Front Country		15-29 encounters per day off travel routes (e.g., campgrounds) and 30 or more encounters per day en route.	13-25 people per group.	Vehicle tracks common. Some noise and litter. Vegetation and soils commonly worn at campsites, along travel routes, and at popular areas.
Rural		People seem to be generally everywhere.	26-50 people per group.	Frequent noise and litter. Large but localized areas with vegetation damage and soil compaction.
Urban		Busy place with other people constantly in view.	More than 50 people per group.	Unavoidable noise and litter. Widespread vegetation damage and soil compaction.

Table F-3. Administrative Setting

		Mechanized Use	Visitor Services	Management Controls
Primitive	**Pristine**	None whatsoever.	None is available on-site.	No visitor controls apparent. No use limits. Enforcement presence very rare.
	Transition			
Back Country		Mountain bikes and perhaps other mechanized use, but all is non-motorized.	Basic maps, but area personnel seldom available to provide on-site assistance.	Signs at key access points on basic user ethics. May have back country use restrictions. Enforcement presence rare.

	Mechanized Use	Visitor Services	Management Controls
Middle Country	Four-wheel drives, all-terrain vehicles, dirt bikes, or snowmobiles in addition to non-motorized, mechanized use.	Area brochures and maps, plus area personnel occasionally present to provide on-site assistance.	Occasional regulatory signing. Motorized and mechanized use restrictions. Random enforcement presence.
Front Country	Two-wheel drive vehicles predominant, but also four-wheel drive vehicles and non-motorized, mechanized use.	Information materials describe recreation areas and activities. Area personnel are periodically available.	Rules clearly posted with some seasonal or day-of-week use restrictions. Periodic enforcement presence.
Rural	Ordinary highway auto and truck traffic is characteristic.	Information materials same as described in Front Country, plus experience and benefit descriptions, staff regularly present.	Regulations prominent. Total use limited by permit, reservation, etc. Routine enforcement presence.
Urban	Wide variety of street vehicles and highway traffic is ever-present.	Information described to the left, plus regularly scheduled on-site outdoor skills demonstrations and clinics.	Continuous enforcement to redistribute use and reduce user conflicts, hazards, and resource damage.

Special Recreation Management Areas

The Special Recreation Management Area (SRMA) is an administrative unit where the existing or proposed recreation opportunities and recreation setting characteristics are recognized for their unique value, importance, and/or distinctiveness, especially as compared to other areas used for recreation. The SRMA is managed to protect and enhance a targeted set of activities, experiences, benefits, and desired recreation setting characteristics. The Approved Jarbidge Resource Management Plan (RMP) subdivides the SRMA into Recreation Management Zones (RMZs) to further delineate specific recreation opportunities. Within an SRMA, recreation and visitor services management is recognized as the predominant focus, where specific recreation opportunities and recreation setting characteristics are managed and protected on a long-term basis. Below are management strategies for SRMAs under the Approved RMP. The existing and prescribed setting characteristics for the physical, social, and administrative settings as described in Table F-1, Table F-2, and Table F-3 are identified for each SRMA.

Balanced Rock Special Recreation Management Area

Supporting Information		
Appreciation of an area important to the local community.		
SRMA/RMZ Objective(s)		
Objective Statement: Manage the Balanced Rock SRMA to provide opportunities for visitors to engage in activities in an area of importance to the local communities so they realize a "moderate" level of the targeted experience and benefit outcomes. **Activities:** Hiking, viewing wildlife/natural scenery, non-motorized boating. **Experiences:** Enjoying natural scenery and wildlife, escaping everyday responsibilities, enjoying solitude, and being with friends and family. **Benefits:** Personal: Nature/aesthetic appreciation, improved mental wellbeing, and opportunity to view wildlife close-up. Community/Social: Improved image of the area and its recreational opportunities, improved perceived quality of life, and family bonding/better family life. Environmental: Creates sense of "ownership" and stewardship of the area, provides natural habitat and open space. Economic: Increased desirability of a place to live and work.		
Recreation Setting Characteristics		
Physical Components: Remoteness – Front Country Naturalness – Front/Middle Country Facilities – Middle Country	**Social Components:** Contacts – Middle Country Group Size – Back Country Evidence of Use – Middle Country	**Administrative Components:** Mechanized Use – Back Country Visitor Services – Middle Country Management Controls – Middle Country
Management Actions and Allowable Use Decisions		
Recreation and Visitor Services Program: Focus on developing a hiking trail to enhance existing facilities. Improvements will be preceded by formal site plans and will adhere to guidelines developed for the area. **Other Programs:** Manage as Visual Resource Management (VRM) Classes I and III.		
Implementation Decisions		
Encourage and develop cooperative partnerships with volunteer groups, State, County, and local agencies to facilitate management and additional development of the area. Marketing activities will include directional signing, interpretation, and brochures. Support active volunteer programs and develop new partnerships (e.g., National Public Lands Day and National Trails Day events and volunteer projects for local groups). Routine monitoring of area and facilities, periodic visitor contact, and monitoring to assess achievement of objectives.		

Jarbidge Forks Special Recreation Management Area

Supporting Information		
Fishing and camping in a remote area with few contacts with other people.		
SRMA/RMZ Objective(s)		
Objective Statement: Manage the Jarbidge Forks SRMA to provide opportunities for visitors to engage in fishing and camping so they achieve a "moderate" level of the targeted experiences and benefits outcomes. **Activities:** Rafting, fishing, camping, picnicking, viewing wildlife, and viewing natural scenery. **Experiences:** Engaging in preferred activities with family and friends, relaxing physically, enjoying natural scenery and wildlife, and enjoying leisure activities. **Benefits:** Personal: Nature/aesthetic appreciation, positive change in mood and emotion, social bonding/cohesion/cooperation, and identification with a special place. Community/Social: Improved image of the area and its recreational opportunities, improved image of land management agencies, and family/friends bonding. Environmental: Better preservation of riparian environment, creates sense of "ownership" and stewardship of the area. Economic: Retain recreation spending in local area and increase desirability of a place to live and work.		
Recreation Setting Characteristics		
Physical Components: Remoteness – Front Country Naturalness – Middle Country Facilities – Front Country	**Social Components:** Contacts – Back Country Group Size – Back Country Evidence of Use – Middle Country	**Administrative Components:** Mechanized Use – Front Country Visitor Services – Front Country Management Controls – Middle Country
Management Actions and Allowable Use Decisions		
Recreation and Visitor Services Program: Focus on access, whitewater boat launch, parking, resource protection, and sanitation. Maintain or upgrade existing facilities. **Other Programs:** Manage Jarbidge River portion as VRM Class I (eligible Wild and Scenic River segments with a scenic Outstandingly Remarkable Value) and manage the East Fork of the Jarbidge River portion as VRM Class II.		
Implementation Decisions		
Seek cooperative relationships with local groups and other agencies to facilitate management. Occasional visitor contact and law enforcement. Marketing activities would include word of mouth, brochures, and interpretative and directional signing. Routine monitoring of physical facilities; visitor number collections will continue to include whitewater boating registration forms; periodic visitor surveys to assess achievement of objectives.		

Little Pilgrim Special Recreation Management Area

Supporting Information		
Vehicle-accessible fishing.		
SRMA/RMZ Objective(s)		
Objective Statement: Manage the Little Pilgrim SRMA to provide opportunities for visitors to engage in sturgeon fishing so they realize a "moderate" level of the targeted experiences and benefit outcomes. **Activities:** Fishing and bird hunting. **Experiences:** Enjoying activities in a natural setting, enjoying natural scenery and wildlife, engaging in preferred activities with family and friends, and testing and improving outdoor skills. **Benefits:** Personal: Nature/aesthetic appreciation, positive change in mood and emotion, social bonding/cohesion/cooperation, and identification with a special place. Community/Social: Lifestyle improvement or maintenance, family and friends bonding, improved image of the area and its recreational opportunities. Environmental: Protection of wildlife and fish habitat and provide natural habitat and open space. Economic: Retain recreation spending in local area and increase desirability of a place to live and work.		
Recreation Setting Characteristics		
Physical Components: Remoteness – Middle Country Naturalness – Middle Country Facilities – Middle Country	**Social Components:** Contacts – Back Country Group Size – Back Country Evidence of Use – Middle Country	**Administrative Components:** Mechanized Use – Front Country Visitor Services – Middle Country Management Controls – Middle Country
Management Actions and Allowable Use Decisions		
Recreation and Visitor Services Program: Focus on public access, parking, resource protection, and sanitation. Develop facilities for parking, camping, and sanitation. Improvements will be preceded by a formal site plan and will adhere to guidelines developed for the area. **Other Programs:** Manage as VRM Class II.		
Implementation Decisions		
Encourage and develop cooperative relationships with land owners and other entities to facilitate responsible recreational use of the area. Marketing activities would include word of mouth and brochures. Routine monitoring of physical facilities and periodic visitor contact to assess achievement of objectives.		

Salmon Falls Reservoir Special Recreation Management Area

Antelope Bay Recreation Management Zone

Supporting Information

Fishing, camping, and boating on a reservoir with consistent water levels and within proximity to major transportation routes.

SRMA/RMZ Objective(s)

Objective Statement: Manage the Antelope Bay RMZ to provide opportunities for visitors to engage in fishing, camping, and boating so they realize a "moderate" level of the targeted experience and benefit outcomes.

Activities: Fishing, camping, water sports, hunting, boat launching and take out, equestrian, hiking, all-terrain vehicle (ATV) riding, and motorcycle riding.

Experiences: Enjoying having easy access to natural landscapes, engaging in preferred activities with family and friends, enjoying activities in a natural setting, relaxing physically, and feeling good about how natural resources and facilities are being managed.

Benefits:

Personal: Positive change in mood and emotion, identification with a special place, and nature/aesthetic appreciation.

Community/Social: Improved image of the area and its recreational opportunities, improved image of land management agencies, and family and friends bonding/ better family life.

Environmental: Greater protection of fish, wildlife, and plant habitat from public use impact, creates sense of "ownership" and stewardship of the area.

Economic: Contribution to Recreation and Tourism sector of the local economy and retain recreation spending in local area.

Recreation Setting Characteristics

Physical Components:	Social Components:	Administrative Components:
Remoteness – Front Country Naturalness – Middle/Front Country Facilities – Front/Rural Country	Contacts – Middle/Front Country Group Size – Middle Country Evidence of Use – Middle/Front Country	Mechanized Use – Front Country Visitor Services – Front Country Management Controls – Front Country

Management Actions and Allowable Use Decisions

Recreation and Visitor Services Program: Focus on access, boat launch, parking, resource protection, and sanitation.

Develop facilities to provide for access, visitor parking, boat launching and take out, and sanitation.

Develop multiple-use designated trail system.

Facility development will be preceded by project planning and will adhere to guidelines developed for the area.

Other Programs: Manage as VRM Class II.

Implementation Decisions

Develop cooperative relationships with volunteer groups, State and county agencies to facilitate responsible planning and use of the area.

Marketing activities would include directional signing, interpretative signing, brochures, and word of mouth.

Provide information and a regular management presence to allow the visitors to enjoy the area while protecting its natural resources.

Cedar Creek Recreation Management Zone

Supporting Information		
Easily accessed fishing and camping on a stocked reservoir.		
SRMA/RMZ Objective(s)		
Objective Statement: Manage the Cedar Creek RMZ to provide opportunities for visitors to engage in fishing and camping so they realize a "moderate" level of the targeted experience and benefit outcomes. **Activities:** Fishing, camping, boat launching and take out. **Experiences:** Being with friends and family, engaging in preferred activities, relaxing physically, and enjoying activities in a natural setting. **Benefits:** Personal: Positive change in mood and emotion and nature/aesthetic appreciation. Community/Social: Improved image of the area and its recreational opportunities and bonding with family and friends. Environmental: Creates sense of "ownership" and stewardship of the area. Economic: Retain recreation spending in local area and increase desirability of a place to live and work.		
Recreation Setting Characteristics		
Physical Components: Remoteness – Front Country Naturalness – Front Country Facilities – Front Country	**Social Components:** Contacts – Back Country Group Size – Back/Middle Country Evidence of Use – Front Country	**Administrative Components:** Mechanized Use – Front Country Visitor Services – Middle Country Management Controls – Middle Country
Management Actions and Allowable Use Decisions		
Recreation and Visitor Services Program: Focus on access, boat launch facilities, parking, resource protection, and sanitation. Develop and upgrade existing facilities to provide for access, visitor parking, and sanitation. Facility development will be preceded by project planning and will adhere to guidelines developed for the area. **Other Programs:** Manage as VRM Class III.		
Implementation Decisions		
Develop cooperative relationships with land owners and Twin Falls County Parks and Waterways. Marketing activities would include directional signing, brochures, and word of mouth. Routine monitoring of physical facilities and periodic visitor contact to assess achievement of objectives. Provide information and a regular management presence to allow the visitors to enjoy the area while protecting its natural resources.		

Yahoo Special Recreation Management Area

Supporting Information		
Off-highway vehicle (OHV) riding in sand washes within proximity to major transportation systems and available during the winter season.		
SRMA/RMZ Objective(s)		
Objective Statement: Manage the Yahoo SRMA to provide opportunities for visitors to engage in OHV riding so they realize a "moderate" level of the targeted experience and benefit outcomes. **Activities:** OHV riding (e.g., ATV, motorcycle, utility terrain veheicle). **Experiences:** Exhilaration and excitement, testing and improving riding skills, being with friends and family, enjoying preferred activities in an appropriate setting, and risk taking. **Benefits:** Personal: Positive change in mood and emotion, social bonding/cohesion/ cooperation, and improve skills for outdoor enjoyment. Community/Social: Improved image of the area and its recreational opportunities creates a positive image of OHV motorized activities. Environmental: Creates a sense of "ownership" and stewardship of the area. Increased awareness and protection of landscapes. Economic: Retains recreation spending in the local area and increases attractiveness of southern Idaho as a place to live.		
Recreation Setting Characteristics		
Physical Components: Remoteness – Front Country Naturalness – Front Country Facilities – Front Country	**Social Components:** Contacts – Middle/Front Country Group Size – Middle Country Evidence of Use – Front Country	**Administrative Components:** Mechanized Use – Front Country Visitor Services – Front Country Management Controls – Front Country
Management Actions and Allowable Use Decisions		
Recreation and Visitor Services Program: Improvements geared toward facilitating parking, sanitation, and reducing sediment into Yahoo Creek. Designated open/play areas and trail system. **Other Programs:** Manage areas open to cross-county travel and areas outside the Oregon National Historic Trail visual corridor as VRM Class III. Manage the Oregon National Historic Trail visual corridor as VRM Class II.		
Implementation Decisions		
Encourage and pursue cooperative partnerships with user groups, land owners, and Idaho Department of Parks and Recreation (IDPR) to facilitate responsible recreational use of the area. Pursue partnerships with user groups and IDPR for a formal site plan. Marketing activities will include word-of-mouth, directional signing, and brochures. Routine monitoring of area and facilities and periodic visitor contact and monitoring to assess achievement of objectives.		

Deadman Special Recreation Management Area

Supporting Information		
Off-highway vehicle (OHV) riding within proximity to major transportation systems and available during the winter season.		
SRMA/RMZ Objective(s)		
Objective Statement: Manage the Deadman SRMA to provide opportunities for visitors to engage in OHV riding so they realize a "moderate" level of the targeted experience and benefit outcomes. **Activities:** OHV riding (e.g., ATV, motorcycle, utility terrain vehicle). **Experiences:** Exhilaration and excitement, testing and improving riding skills, being with friends and family, enjoying preferred activities in an appropriate setting, and risk taking. **Benefits:** Personal: Positive change in mood and emotion, social bonding/cohesion/ cooperation, and improve skills for outdoor enjoyment. Community/Social: Improved image of the area and its recreational opportunities creates a positive image of OHV motorized activities. Environmental: Creates a sense of "ownership" and stewardship of the area. Increased awareness and protection of landscapes. Economic: Retains recreation spending in the local area and increases attractiveness of southern Idaho as a place to live.		
Recreation Setting Characteristics		
Physical Components: Remoteness – Front Country Naturalness – Front Country Facilities – Front Country	**Social Components:** Contacts – Middle/Front Country Group Size – Middle Country Evidence of Use – Front Country	**Administrative Components:** Mechanized Use – Front Country Visitor Services – Front Country Management Controls – Front Country
Management Actions and Allowable Use Decisions		
Recreation and Visitor Services Program: Improvements geared toward facilitating parking, sanitation for users, and developing an OHV training area. Designated Open/Play areas and trail system. **Other Programs:** None.		
Implementation Decisions		
Encourage and pursue cooperative partnerships with user groups, land owners, and IDPR to facilitate responsible recreational use of the area. Pursue partnerships with user groups and IDPR for a formal site/layout/facility plan. Marketing activities will include word-of mouth, directional signing, and brochures. Routine monitoring of area and facilities and periodic visitor contact and monitoring to assess achievement of objectives.		

Extensive Recreation Management Areas

The Extensive Recreation Management Area (ERMA) is an administrative unit that requires specific management consideration in order to address recreation use, demand, or recreation and visitor services program investments. The ERMA is managed to support and sustain the principal recreation activities and the associated qualities and conditions of the ERMA. Management of ERMAs is commensurate with the management of other resources and resource uses. While generally unnecessary, ERMAs may be subdivided into Recreation Management Zones to ensure recreation and visitor services are managed commensurate with the management of other resources and resource uses. Below are management strategies for ERMAs that designated under the Approved RMP.

Canyonlands ERMA

ERMA Objective(s)
Objective Statement: Manage the Canyonlands ERMA to provide opportunities for visitors to engage in motorized and non-motorized recreation experiences including hunting, hiking, and equestrian so they realize a “moderate” level of the targeted experience and benefit outcomes.
Management Actions and Allowable Use Decisions
Recreation and Visitor Services Program: Maintain the backcountry character and primarily undisturbed natural landscape to allow visitors to enjoy opportunities for solitude. Primarily manage for backcountry recreation opportunities, including non-motorized hunting and whitewater boating. Maintain and protect natural and cultural resource values. Any improvements will be preceded by site/area plans. **Other Programs:** Manage wilderness portion of Canyonlands ERMA as VRM Class I (Wilderness).
Implementation Decisions
Marketing activities will include word of mouth, Owyhee & Bruneau River Systems Boating Guide, interpretive and educational signing, and directional signing. Visitor number collections will continue to include registration forms for whitewater boating. Periodic visitor surveys will assess achievement of objectives.

Jarbidge Foothills ERMA

ERMA Objective(s)
Objective Statement: Manage the Jarbidge Foothills ERMA to provide opportunities for visitors to engage in motorized and non-motorized recreation experiences including hunting, hiking, and equestrian so they realize a "moderate" level of the targeted experience and benefit outcomes.
Management Actions and Allowable Use Decisions
Recreation and Visitor Services Program: Motorized routes would be designated to maximize wildlife habitat core size. Primarily manage for backcountry recreation opportunities, including non-motorized hunting. Maintain and protect natural and cultural resource values. Any improvements will be preceded by site/area plans. **Other Programs:** Manage Browns Bench portion of Jarbidge Foothills ERMA as VRM Class II.
Implementation Decisions
Encourage and develop cooperative relationships with land owners, volunteer groups, and state agencies to facilitate responsible recreational use of the area. Marketing activities will include directional and informational signing. Periodic visitor contact and monitoring to assess achievement of objectives.

Rosevear ERMA

ERMA Objective(s)
Objective Statement: Manage the Rosevear Gulch ERMA to provide opportunities for visitors to engage in motorized trail riding opportunities on a series of designated routes so they realize a "moderate" level of the targeted experience and benefit outcomes.
Management Actions and Allowable Use Decisions
Recreation and Visitor Services Program: Improvements geared toward facilitating access and accommodating users. Develop designated trail system. **Other Programs:** None.
Implementation Decisions
Encourage and pursue cooperative partnerships with user groups and state/county agencies to facilitate responsible recreational use of the area. Project plan will be developed and will adhere to guidelines developed for the area. Marketing activities will include word-of mouth, directional signing, brochures, and maps. Routine monitoring of area and periodic visitor contact to assess achievement of objectives. Off-highway vehicle a primary focus of monitoring.

Luds Point ERMA

ERMA Objective(s)
Objective Statement: Manage the Luds Point ERMA to provide opportunities for visitors to engage in fishing, primitive camping, and hunting so they realize a "moderate" level of the targeted experience and benefit outcomes.
Management Actions and Allowable Use Decisions
Recreation and Visitor Services Program: Focus on public access, resource protection, and sanitation. Improvements will be preceded by project planning and will adhere to guidelines developed for the area. **Other Programs:** None.
Implementation Decisions
Encourage and develop cooperative relationships with user groups and State and county agencies to facilitate responsible recreational use of the area. Occasional visitor contact and law enforcement. Marketing activities would include directional and interpretative signing, brochure, and word of mouth. Routine monitoring of facilities and periodic visitor contact to assess achievements of objectives.

Public Lands Not Established as Recreation Management Areas

Those areas not identified in the planning area as recreation management areas (SRMAs or ERMAs) are managed to meet basic recreation and visitor services and resource stewardship needs. Recreation is not emphasized on these lands; however, recreation activities may occur, except on those lands closed to public use. The recreation and visitor services are managed to allow recreation uses that are not in conflict with the primary uses of these lands. Public lands not managed as recreation management areas include the following objectives:

- **Visitor Health and Safety -** Ensure that participants in dispersed recreational activities have a low potential for serious accidents due to human-created conditions and minimal exposure to hazardous health conditions.
- **Use and User Conflicts -** Mitigate conflicts with other uses through visitor outreach efforts. Direct administration of conflicts may be implemented by way of recreation use restrictions, realignments, signage, and closures.
- **Resource Protection -** Create an increased awareness and understanding and a sense of stewardship in recreational activity participants so their conduct safeguards natural resource values. Implementation actions for public lands not designated as recreation management areas include:
    - Managing the lands to provide a variety of recreational opportunities including primitive, back country, middle country, and front country. Provide outdoor settings ranging from areas with a high-to-moderate opportunity for solitude and closeness to nature and to areas where visitors have a higher interaction with other users.
    - Limiting recreational access, season of use, and numbers of users, if needed, to protect other resources.
    - Implementing site-specific facility development on a case-by-case basis, based on needs for resource protection, user demand, and visitor health and safety.

- Providing signs, brochures, and maps to facilitate the use and enjoyment of public lands and to protect visitor health, safety, and resources.
- Managing BLM lands adjacent to other Federal and State lands to complement the recreational experience on the adjoining lands.
- Monitoring recreational activities and implementing adaptive management where there are conflicts with other uses (e.g., grazing, wilderness management) and private lands.

APPENDIX G: LANDS AVAILABLE FOR DISPOSAL

The parcels listed below meet Federal Land Policy and Management Act (FLPMA) Section 203 criteria for disposal by sale. These lands, in addition to lands outside of Zone 1, may also be considered for disposal under FLPMA Section 206 exchange or under the Recreation and Public Purposes Act of 1954.

Criteria for Land Ownership Adjustment

Lands with Highest Priority for Retention or Acquisition

Those lands specifically identified by the Shoshone-Bannock and/or Shoshone-Paiute Tribes as having special importance related to treaty and/or traditional uses and values;
Important, crucial, or critical habitat for special status species including proposed species, listed species, and candidate species under the Endangered Species Act; State-listed species; and BLM State Director-designated sensitive species;
Riparian areas and wetlands;
Parcels that provide public and/or administrative access to larger blocks of public land; and
Lands with special designation or management emphasis (see category below).

Special Designation/Management Areas Where it is a High Priority to Acquire Inholdings

Areas of Critical Environmental Concern, or lands adjacent to and important for expansion of such areas;
National Historic Trails;
Wild and Scenic Rivers (eligible, recommended suitable, or designated);
Significant cultural resources and sites eligible for inclusion on the National Register of Historic Places; and
Wilderness and Wilderness Study Areas.

Areas Generally Retained, but May be Exchanged for Parcels with Higher Resource Values

Important habitat for fish or wildlife,
Developed recreation sites and recreation access,
Recreation opportunities and benefits,
Significant energy and mineral resources,
Significant cave resources,
Significant cultural resources and sites eligible for inclusion on the National Register of Historic Places, and
Significant paleontological resources.

Areas that Are a High Priority for Disposal

Parcels which are difficult or costly to administer (manageability and/or isolation of the parcel);
Parcels more suitable for management by another Federal or State agency; and
Parcels of special importance to (and generally adjacent to) local communities for purposes including, but not limited to, community expansion, extended community services, or economic development.

Other Issues to be Considered Prior to any Land Tenure Adjustment Action

To what extent the individual action will help achieve overall land ownership management objectives at the watershed level, in cooperation with State and private landowners;
Existing legal accessibility of the land for public uses;
Amount of public investments in facilities or improvements and the potential for recovering those investments; and
Consistency with cooperative agreements and plans or policies of other agencies.

Table G-1. Lands Available for Disposal

Township and Range	Section	Legal Description	Approximate Acres
T. 5 S., R. 10 E.,	25	SE¼NE¼, W½SW¼, SE¼	279
	26	SW¼NE¼, W½NW¼, SE¼NW¼, N½S½, SE¼SW¼, S½SE¼	437
	27	S½NE¼, NE¼SE¼	120
	33	SE¼NE¼, N½SE¼	119
	34	N½SW¼, SE¼SW¼, SE¼	277
	35	NE¼NE¼, W½SW¼, SE¼SW¼	159
T. 5 S., R. 11 E.,	17	NW¼SW¼	40
	18	SE¼SE¼	40
	30	Lots 1-4, SE¼NW¼	183
	31	Lot 5, NW¼NE¼, NE¼NW¼	88
	32	E½NW¼	81
T. 6 S., R. 9 E.,	2	SW¼NW¼, NE¼SW¼, S½SE¼	160
	3	Lot 1	43
	4	SW¼	159
	5	S½	321
	8	W½NE¼, NW¼	240
	9	E½NW¼	80
	14	SE¼NW¼, S½SW¼, NE¼SW¼	160
	15	SE¼	160
	17	All	640
	20	All	641
	21	All	639
	22	W½NE¼, W½, W½SE¼	480
	23	W½SW¼	80
	26	NW¼NW¼, W½SE¼	120
	27	N½NE¼, SW¼NE¼, NW¼, N½SW¼, NW¼SE¼	400
	28	N½, N½S½	481
	29	All	642
	32	All	640
	33	S½N½, S½,	483
	35	E½SW¼, N½SE¼	160
T. 6 S., R. 10 E.,	2	Lots 2-4, SW¼NE¼, S½NW¼, N½S½, SE¼SW¼, SW¼SE¼	486
T. 6 S., R. 11 E.,	6	SE¼SW¼, SW¼SE¼	80
T. 6 S., R. 12 E.,	8	Lots 5, 8	70
T. 7 S., R. 9 E.,	1	SW¼SW¼	40
	2	S½	321
	3	Lots 2-4, S½	442
T. 7 S., R. 9 E.,	4	All	480
	9	N½	320
	10	N½N½, SW¼NE¼, S½NW¼	283
	11	N½N½, SE¼NW¼	203
	12	S½N½, N½NW¼, N½SE¼, SE¼SE¼	359
T. 7 S., R. 10 E.,	7	Lots 2-4, E½SW¼, S½SE¼	253
	17	W½NW¼, NW¼SW¼	120
	18	Lot 1, NE¼, E½NW¼, N½SE¼	351
	22	NE¼NW¼, SW¼SE¼	80
	28	S½SW¼	80
	32	N½NE¼	80

Township and Range	Section	Legal Description	Approximate Acres
	33	N½NW¼	80
T. 8 S., R. 13 E.,	14	NW¼SW¼	40
T. 8 S., R. 14 E.,	7	NE¼SW¼	40
T. 9 S., R. 12 E.,	20	SE¼SE¼	40
	24	SE¼SE¼	40
T. 9 S., R. 13 E.,	19	Lots 3-4, NE¼NE¼	82
T. 10 S., R. 12 E.,	12	SW¼NW¼	40
Total			**12,962**

Federal Land Transaction Facilitation Act

The lands listed below were identified for potential disposal as of July 25, 2000, and may therefore be considered for disposal under the Federal Land Transaction Facilitation Act of 2000 (FLTFA). Under FLTFA, the monies received from sales or exchanges of lands identified for disposal in land use plans as of July 25, 2000 are retained in an account and can be used by the BLM and other Federal agencies to purchase additional lands; they are not deposited in the General Treasury.

Table G-2. Lands Available for Disposal under the Federal Land Transaction Facilitation Act

Township and Range	Section	Legal Description	Approximate Acres
T. 6 S., R. 9 E.,	8	S½NW¼	80
	17	All	640
	20	W½NE¼, NW¼, E½SW¼, SE¼	480
	21	N½, SW¼, W½SE¼	560
	22	W½NE¼, W½, W½SE¼	480
	27	SW¼NE¼, NW¼, N½SW¼, NW¼SE¼	320
	28	N½, N½S½	480
	29	NE¼, SW¼NW¼, N½SW¼	280
	32	SW¼SW¼	80
Total			**3,400**

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APPENDIX H: IMPORTANT SEASONAL PERIODS AND HABITAT REQUIREMENTS FOR PLANT, FISH, AND WILDLIFE SPECIES

Plants

In general, critical time periods for special status plants are during the flowering period (Table H-1). Exceptions are earth lichen and slickspot peppergrass, which have habitats that are sensitive to disturbance while soils are saturated (January through May), and cowpie and matted buckwheat, which are sensitive to disturbance year-round.

Table H-1. Flowering Periods for Special Status Plants in the Planning Area

Common Name	Scientific Name	Flowering Period
Annual/Biennial Forbs		
Alkali cleomella	*Cleomella plocasperma*	May through September
Desert pincushion	*Chaenactis stevioides*	April through June
Rigid threadbush	*Nemacladus rigidus*	May through June
Slickspot peppergrass	*Lepidium papilliferum*	April through July
Spreading gilia	*Ipomopsis polycladon* [syn. *Gilia polycladon*]	April through June
White eatonella	*Eatonella nivea*	April through July
White-margined wax plant	*Glyptopleura marginata*	May through June
Perennial Forbs		
American wood sage	*Teucrium canadense* var. *occidentale*	April through August
Bruneau River prickly phlox	*Linanthus glabrum* [syn. *Leptodactylon glabrum*]	April through July
Chatterbox orchid	*Epipactis gigantea*	April through early August
Davis peppergrass	*Lepidium davisii*	May through July
Four-wing milkvetch	*Astragalus tetrapterus*	April through early July
Fringed waterplantain	*Damasonium californicum*	April through June
Greeley's wavewing	*Cymopterus acaulis* var. *greeleyorum*	March through April
Janish penstemon	*Penstemon janishiae*	April through mid-June
Matted cowpie buckwheat	*Eriogonum shockleyi* [syn. *Eriogonum shockleyi* var. *shockleyi*]	May through June
Mudflat milkvetch	*Astragalus yoder williamsii*	June through July
Newberry's milkvetch	*Astragalus newberryi* var. *castoreus*	April through early July
Packard's buckwheat	*Eriogonum shockleyi* [syn. *Eriogonum shockleyi* var. *packardiae*]	May through July
Simpson hedgehog cactus	*Pediocactus simpsonii*	May through June
Snake River milkvetch	*Astragalus purshii* var. *ophiogenes*	Late April through June
Spine-noded milkvetch	*Peteria thompsoniae*	Late April through June
Two-headed onion	*Allium anceps*	Early April through June
Waterthread pondweed	*Potamogeton diversifolius*	April through May
Non-Vascular Plants		
Earth lichen	*Catapyrenium congestum*	September through November

Fish and Aquatic Invertebrates

Table H-2 includes the majority of identified important seasonal periods for special status fish and aquatic invertebrates in the planning area, as well as the habitats in which they occur in the planning area. These periods may vary annually due to environmental variables.

Table H-2. Important Seasonal Periods and Habitats for Special Status Fish and Aquatic Invertebrates in the Planning Area

Species	Important Seasonal Periods	Approximate Dates	Habitats
Fish			
Bull trout	Spawning	August through November	Occupies habitats varying from small headwater streams to 3rd and 4th order streams. Prefer streams where water temperatures do not exceed 59ºF. Prefer stream substrates with loose, clean gravel, numerous large pools (>3.3 ft deep), stable and undercut streambanks and abundant large wood debris (FWS, 2004).
	Incubation	November through May	
Redband trout [A]	Spawning	May through June	Occupies habitats with large pools (1-1.3 ft deep) that span half the width of the stream and adjacent to the thalweg (deepest part of the stream), stable streambanks (>80%), and water temperatures from 50-68ºF (Muhlfeld, 2002). Prefers stream substrates with low fines (Muhlfeld, 2002).
	Incubation	June through August	
Snake River white sturgeon [A]	Spawning	March through June	Occurs in isolated populations in the Snake River but require free-flowing cold water environments for successful spawning. Often found in turbulent pools with high velocity. White sturgeon prefer deep pool habitat with a fine-bottom substrate. Spawning occurs in waters >3 m deep and over a cobble-sized substrate (64-256 mm) (Idaho Power Company, 2005).
	Incubation	March through mid July	
Shoshone sculpin [A]	Spawning	March through August	Endemic to cold-water springs in the Snake River in the Hagerman Valley. Prefer spawning habitats with non-embedded cobbles or boulders, water temperatures less than 63ºF, and surface velocity <40 cm/second. Normally are associated with cover such as rocks, cobble, gravel or vegetation. Juveniles can be found on sand or mud substrates with submerged vegetation (FWS, 1995).
	Incubation	March through September	
Aquatic Invertebrates			
Bliss Rapids snail	Reproduction	October through February	Occurs in stable cobbles and boulders in flowing waters of unimpounded reaches of the Snake River and in a few spring habitats in the Hagerman Valley. Also found in spring influenced areas or along the edges of rapids that flank the shoreline. Can be locally abundant, especially on smooth rock surfaces with red algae (FWS, 1995).
Bruneau hot springsnail	Reproduction	Year-round	Only found in warm water springs and seeps along a 5 mile reach of the lower Bruneau River and its tributary Hot Creek. Occupies flowing geothermal springs and seeps with temperatures ranging from 60ºF to 98ºF (24ºC to 35ºC). Found on exposed rock, gravel, sand, mud, and algae substrates (FWS, 2002).

Species	Important Seasonal Periods	Approximate Dates	Habitats
California floater [A]	Reproduction	Dates unknown	Found in well-oxygenated mud to fine gravel beds. Often is found immediately above or below rapids in mud-sand substrates with good water quality. Life history requirements have not been thoroughly investigated (FWS, 1995).
Columbia pebblesnail [A]	Reproduction	Dates unknown	Found in flowing waters with gravel- to boulder-sized substrate at the edges or downstream of rapids and whitewater areas. Avoids areas with swift current and spring systems. Life history requirements have not been thoroughly investigated (FWS, 1995).
Short-face lanx [A]	Reproduction	Dates unknown	Found in areas with steady to strong current on the under surfaces of large rocks in the Snake River. Can also be found in large springs in rapids and boulder bars below rapids. Requires water with high amounts of oxygen (FWS, 1995).
Snake River physa snail	Reproduction	Dates unknown	Prefers the underside of gravel- to boulder-sized rock in swift currents and deep waters at the margins of rapids. Also found on boulders in the deepest part of the river. Prefers cold, clean, well-oxygenated, flowing water with low turbidity. Much of the habitat for this species may be in deep water beyond the range of routine sampling. Life history requirements have not been thoroughly investigated (FWS, 1995).
[A] Egg incubation periods and emergence dates are estimates. Rates vary according to local water temperatures.			

Wildlife

Table H-3 and H-4 include the majority of identified important seasonal periods for special status wildlife and selected general wildlife in the planning area, as well as the habitats in which they occur in the planning area. These periods may vary annually due to environmental variables like temperature, precipitation, and habitat condition.

Table H-3. Important Seasonal Periods and Habitats for Special Status Wildlife in the Planning Area

Species	Important Seasonal Periods	Approximate Dates	Habitats
Invertebrates (terrestrial)			
Bruneau Dunes tiger beetle	Breeding	March through mid June	Sparsely vegetated, lower elevation dunelands. Adults burrow into sand dunes. Larval habitat is sparsely vegetated areas between dunes. Known only from the Bruneau Dunes State Park and Indian Cove areas. Larval burrows are vulnerable to collapse (Bauer, 1991) year round.
	Larval	Year-round	
Amphibians			
Columbia spotted frog	Breeding	Mid April through July	Higher elevation wetlands associated with rivers, creeks, springs, and marshes with slack water areas (e.g., beaver ponds, oxbows) for reproduction and ponds and springs for hibernation (Howard and Munger, 2003).
	Winter	October through March	
Northern leopard frog	Breeding	April through July	Wetlands associated with rivers, creeks, springs, and marshes with slack water areas (e.g., beaver ponds,

Species	Important Seasonal Periods	Approximate Dates	Habitats
	Winter	October through March	oxbows) for reproduction and ponds and springs for hibernation (Nussbaum et. al., 1983).
Western toad	Breeding	April through July	Wetlands associated with rivers, creeks, and springs with slack water areas for reproduction. Adults use small mammal burrows in uplands for hibernation (Nussbaum, et al., 1983).
	Winter	October through March	
	Winter	October through March	
Reptiles			
Great Basin black-collared lizard	Breeding	Dates unknown locally	Generally lower elevation areas with rock outcrops and/or boulder piles and sparse herbaceous vegetation (Groves et al., 1997).
Longnose snake	Breeding	Dates unknown locally	Generally lower elevation areas with sandy soil for burrowing. Uses rodent burrows for reproduction and hibernation (Groves et al., 1997).
Birds			
Bald eagle	Winter	Mid November through February	Found foraging primarily along the Snake River Canyon during winter. Limited habitat for nesting in the planning area.
	Breeding	Mid May through August	
Black tern	Breeding/ Nesting	Mid-May to mid-July	Freshwater marsh, occasionally seen along the Snake River,
Black-throated sparrow	Breeding/ Nesting	Mid April through mid July	Sagebrush steppe habitats.
Brewer's sparrow	Breeding/ Nesting	Mid April through mid July	Sagebrush steppe habitats.
Burrowing owl	Breeding/ Nesting	April through August	Grassland, sagebrush steppe habitats
Columbian sharp-tailed grouse	Display/ Breeding	Mid March through June	Display, breeding, and nesting in mountain shrub, sagebrush steppe to grasslands. Time of day restrictions (sunrise to 2 hours after sunrise) could reduce or mitigate adverse impacts of some activities (routine maintenance, SRP, etc.).
	Nesting	May through mid July	
	Winter	November through mid March	Aspen and mountain shrub habitats are critical when snow is deep.
Ferruginous hawk	Breeding/ Nesting	March through July	Sagebrush steppe and grasslands. Nests in isolated trees (junipers) or in juniper stringers, or on the ground on bluffs or rock outcrops.
Golden eagle	Breeding/ Nesting	April through July	Nests in canyons forages in multiple habitats
Grasshopper sparrow	Breeding/ Nesting	June through July	Grassland habitat
Greater sage-grouse	Display/ Breeding	Mid February through mid May	Sagebrush steppe habitats (Connelly et. al., 2000); Idaho Sage-grouse Advisory Committee, 2006). Time of day restrictions (sunrise to 2 hours after sunrise) could reduce or mitigate adverse impacts of some activities (routine maintenance, SRP, etc.).

Species	Important Seasonal Periods	Approximate Dates	Habitats
	Nesting/ Early Brood Rearing	Mid March through mid June	Sagebrush steppe habitats (Connelly et al., 2000; Idaho Sage-grouse Advisory Committee, 2006).
	Winter	January through mid March	Windswept ridges when snow is deep in lowland areas (Connelly et al., 2000).
Green-tailed towhee	Breeding/ Nesting	May through July	Mountain mahogany and mountain shrub habitats
Lewis woodpecker	Breeding/ Nesting	May through mid July	Stands of mature aspen with larger diameter (>10 inches in diameter at breast height) trees.
Loggerhead shrike	Breeding/ Nesting	Mid April through mid July	Sagebrush steppe areas with tall sagebrush and black greasewood habitats
Long billed curlew	Breeding/ Nesting	April through July	Grassland habitat
Mountain quail	Breeding	May through mid July	Riparian zones and mountain shrub to forested areas.
	Winter	Mid November through April	Typically winter in riparian zones and mountain shrub habitats.
Northern goshawk	Breeding/ Nesting	March through July	Stands of mature aspen with larger diameter (>10 inches in diameter at breast height) and branches large enough to support the nest.
Olive-sided flycatcher	Breeding/ Nesting	Late May through August	Locally, occasionally in aspen habitat
Peregrine falcon	Breeding/ Nesting	March through July	Canyonlands usually with perennial water source in bottom. Forages in canyon and adjacent uplands.
Sage sparrow	Breeding/ Nesting	Mid April through mid July	Sagebrush steppe habitats.
Sage thrasher	Breeding/ Nesting	Mid March through July	Sagebrush steppe habitats.
Short-eared owl	Breeding/ Nesting	April through July	Grassland, sagebrush steppe habitats
Trumpeter swan	Winter	Mid November through April	Winters along Snake River. Not known to nest locally.
Virginia's warbler	Breeding/ Nesting	May through July	Locally, mountain mahogany/mountain shrub habitats
Willow flycatcher	Breeding/ Nesting	Mid May through mid July	Riparian zones dominated by willows, occasionally aspen habitats.
Yellow-billed cuckoo	Breeding	May through early September	Observed rarely on islands in the Snake River with overstory trees and dense shrub understory.
Mammals*			
Big brown bat	Winter	November through March	Canyonlands with perennial water. Forages in canyon or well away from canyon in the uplands

Species	Important Seasonal Periods	Approximate Dates	Habitats
California bighorn sheep	Breeding	Mid October through December	Canyonlands with perennial water and adjacent upland plateaus. Prefer areas with little competition from other ungulates.
	Winter	December through March	
	Lambing	Mid April through June	
Canyon bat	Winter	November through March	Canyons and rock outcrops. Forages in canyons or well away from canyons in the uplands.
Kit fox	Denning	Dates unknown locally	Sagebrush steppe
Little brown bat	Winter	November through March	Canyons and pinyon/juniper forests. Forages in canyons or well away from canyons in the uplands.
Long-eared myotis	Winter	November through March	Canyonlands with perennial water. Forages in canyon or well away from canyon in the uplands
Long-legged myotis	Winter	November through March	Canyonlands with perennial water. Forages in canyon or well away from canyon in the uplands
Pallid bat	Winter	November through March	Canyonlands and talus with perennial water (Hermanson and O'Shea, 1983).
Piute [Great Basin] ground squirrel	Spring through early summer	Early March through June	Sagebrush steppe and in meadows, usually with deeper soils.
Pygmy rabbit	Year-round	Year-round	Sagebrush steppe usually with deeper soils also in salt desert shrub, mountain shrub habitats.
Spotted bat	Winter	Dates unknown locally	Canyonlands with perennial water. Forages in canyon or well away from canyon in the uplands.
Townsend big-eared bat	Winter	November through March	Canyonlands with perennial water. Uses caves, lava tubes, mine adits for communal roosts (maternity and winter). Forages in canyons or well away from canyons in the uplands.
Western small-footed myotis	Winter	November through March	Canyonlands with perennial water. Forages in canyon or well away from canyon in the uplands
Yuma myotis	Winter	November through March	Canyonlands with perennial water. Forages in canyon or well away from canyon in the uplands

*Hoary bat and silver-haired bat were not included because they have not been documented within the planning area. Additionally both species migrate from Idaho during the winter.

Table H- 4. Important Seasonal Periods for General Wildlife in the Planning Area

Species or Group of Species	Important Seasonal Periods	Approximate Dates
Pronghorn	Winter	December through March
	Fawning	Mid May through June
Mule Deer	Winter	December through March
	Fawning	May through June
Elk	Winter	December through March
	Calving	May through June

Species or Group of Species	Important Seasonal Periods	Approximate Dates
Upland game birds	Breeding/Nesting	March through June
	Winter	December through February
Neo-tropical migratory birds	Breeding/Nesting	Mid April through mid July
	Spring migration	March through mid May
	Fall migration	August through October
Raptors	Pair formation/Nesting	Mid February through mid June
	Fledging young	Mid June through mid July
Amphibians	Breeding	April through June
	Hibernation	Mid October through mid April

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