

APPENDIX I: WILDLIFE INVENTORY, MONITORING, AND PROTECTION PLAN

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1. INTRODUCTION

This wildlife inventory, monitoring, and protection plan was prepared in conjunction with the Continental Divide-Creston Environmental Impact Statement (CD-C EIS) for the CD-C project area. The BLM is responsible for managing the biological integrity and habitat function of both terrestrial and aquatic ecosystems within the CD-C project area to sustain and optimize the distribution and abundance of all native, desirable non-native, and Special Status Species (Approved Rawlins Resource Management Plan and Record of Decision [Rawlins RMP] 2008a). The goal of the plan is to avoid and/or minimize adverse impacts to wildlife present on project-affected areas by:

- monitoring wildlife population trends within and adjacent to the CD-C project area during the course of project development and operations,
- developing appropriate mitigation actions, and
- analyzing the effectiveness of the mitigation measures.

Implementation of the plan will provide opportunities for land managers and project personnel to achieve and maintain desired levels of wildlife productivity and populations within and adjacent to the CD-C project area (e.g., at pre-project levels) by minimizing and/or avoiding potential adverse impacts to wildlife species. In addition, the implementation of this plan will facilitate the maintenance of a diverse assemblage of wildlife populations within and adjacent to the CD-C project area simultaneously with development of natural gas reserves.

Proposed inventory, monitoring, protection measures, cause and effect, and adaptive management mitigation will be implemented under the preferred alternative selected for the EIS. Implementation of the plan will begin upon the signing of the Record of Decision (ROD), and is estimated to continue for the life of the project. The plan will receive a review for effectiveness by the BLM annually.

2. IMPLEMENTATION PROTOCOL

This Wildlife and Plant Inventory/Monitoring, Protection/Adaptive Management, and Analysis Implementation Plan (Plan) contains four (4) basic steps that are required to determine if impacts are occurring to a species, how these impacts are occurring, what mitigation practices are required to reduce and/or remove these impacts, and an analysis to determine if the mitigation practices are effective in removing or reducing these impacts. The basis of the plan follows these four steps:

1. Inventory/monitor species and their associated habitats;
2. Monitor these species to determine changes in population numbers (cause and effect);
3. Identify and implement protection measures if the population shows negative changes; and
4. Analyze the effectiveness of the protection measures, making adjustments if required.

This section provides preliminary information pertaining to the protocols for each of the four steps. The wildlife species/categories for which specific inventory, monitoring, protection, and analysis procedures will be applied were developed based on management agency (Bureau of Land Management [BLM], U.S. Fish and Wildlife Service [USFWS], Wyoming Game and Fish Department [WGFD]) and individual concerns identified during the preparation of the EIS and through discussion at the Monitoring without Borders meetings. During annual meetings, yearly monitoring programs will be developed that would identify the species to be monitored during that particular year. The Monitoring Without Borders program, originally established through the Continental Divide/Wamsutter II EIS, would facilitate annual meetings and decisions. Monitoring programs would be developed cooperatively between the BLM, Operators, and other cooperators during the Monitoring Without Borders annual meetings and will be based on need, funding, and personnel availability for each upcoming field season and/or year. Not all species identified in this monitoring plan would be monitored on an annual basis.

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Considerable efforts will be required by agency and Operator personnel for Plan implementation each year. Many of the proposed annual agency data collection activities are consistent with current agency requirements. Additionally, during annual planning (**Section 2.1.2** below) and throughout project implementation, all efforts will be made to accommodate agency personnel schedules and responsibilities. In addition, further agency cost-sharing methodologies will be considered such that public demands and statutory directives are achieved.

2.1 Annual Reports and Meetings

2.1.1 Reports

Monitoring conducted by the Operators and/or the BLM will be provided to the Monitoring Without Borders group by November 15 of each calendar year, and will contain the following information, in report format and following the requirements identified in **Table I-1**:

1. During project development, Operators will provide an updated inventory/monitoring report and description of all existing project developments (i.e., well pad location, size, roads, and associated level of human activity at each feature), as well as those tentatively proposed for development during the next 12 months in a format that is Geographic Information System (GIS) compatible; and
2. Annual reports will:
 - a. summarize annual wildlife inventory/monitoring,
 - b. summarize monitoring results,
 - c. protection measures implemented, and effectiveness of protection measures,
 - d. note any trends across years
 - e. identify and assess protection measures implemented during past years,
 - f. specify monitoring and protection measures proposed for the upcoming year,
 - g. recommend modifications to the existing wildlife monitoring/protection plan based on the successes and/or failures of past years, and
 - h. identify additional species/categories to be monitored.

Where possible, the data presented in reports will be used to identify potential correlations between development and wildlife productivity and/or abundance, as well as sources of potential disturbance to wildlife. GIS will be used for information storage, retrieval, and planning, and annual GIS data updates will be conducted. Raw data collected each year will also be provided to other management agencies, at the request of the agencies.

The BLM will submit a final annual report to all potentially affected individuals and groups by early February of each year. Additional reports may be prepared in any year, as necessary, to comply with other relevant wildlife laws, rules, and regulations.

2.1.2 Meetings

A one-day meeting will be organized by the BLM and held in December (or as determined by the BLM) of each year to discuss and modify, as necessary, proposed wildlife inventory, monitoring, protection protocol, and analysis of protection measures for the subsequent year. Decisions regarding annual Operator-specific financing and personnel requirements will be made at these meetings. A protocol for accommodating previously unidentified development sites will also be determined during the annual meeting. Final decisions will be made by the BLM based on the input of all affected parties. Additional meetings may be required as necessary.

Additional meetings may be held in any given year as necessary to inform and update cooperators on the findings of additional reports.

2.2 Annual Inventory and Monitoring

Inventory/monitoring is the process of gathering field data on wildlife distribution, numbers, and/or composition. This includes traditional wildlife range determination and habitat association inventories. It also encompasses population monitoring which is the process of detecting a demographic (e.g., growth rate, recruitment and mortality rates) or distributional change in a population over the course of repeated inventories and relating these changes to either natural processes (e.g., winter severity, predation) or human-related activities (e.g., animal harvesting, mining, forestry, urban development, etc.). Population monitoring may include the development and use of population models that integrate existing demographic information (including harvest) on a species. Inventory/monitoring also includes the process of compiling general (overview) information on the historical and current abundance and distribution of a species, its habitat requirements, rate of population change, and limiting factors (species statistics). Species statistics enable prioritization of animal inventories and population monitoring. All of these activities are included under the term inventory/monitoring (Ministry of Environment, Lands and Parks, November 1998).

Monitoring studies are more site- and problem-specific than inventories. Longer-term monitoring studies better estimate fluctuations in wildlife uses of habitat. Conducting longer-term monitoring of wildlife species is more efficient and accurate for determining how certain land use practices affect wildlife and habitats. Inventories and monitoring procedures are grouped together here because usually the monitoring studies will result from the implementation of the CD-C project and will be based on a combination of these inventory and monitoring results. Monitoring studies involve collecting wildlife and habitat information over time to determine: (1) wildlife use of habitat components; (2) effects of certain land uses (e.g. well pads, roads, human activity in the field) on certain wildlife and habitats; (3) species or habitat changes caused by project implementation, as well as certain natural environmental conditions (e.g., drought); (4) accuracy of predictive models; (5) improvement in the accuracy of predictive models; (6) additional mitigation to protect wildlife and habitat in an area (i.e., from new data, new stipulations may be recommended or required to protect a species and its habitat); and (7) additional habitat improvement to benefit a species or habitat of concern. These actions can determine if the management objectives in the CD-C EIS are being met, can improve a biologist's predictive models (Cooperrider et. al., 1986), and are basically the fundamentals of adaptive management.

The most critical stage of implementing and completing an inventory/monitoring study is not data collection, presentation, or interpretation, but rather design. Years of data can be useless if a study is poorly designed. The use of this Plan, along with the BLM RFO Monitoring without Borders Program, can allow the BLM wildlife biologists to establish a flexible, systematic, and logical approach toward solving wildlife habitat management problems (Cooperrider et. al., 1986) within and adjacent to the CD-C project area. The inventory and monitoring protocols will be as identified below for each wildlife species/category. These protocols will be unchanged, except as authorized by the BLM or specified in this Plan. Additional wildlife species/categories and associated inventories and monitoring protocols may be added or may be omitted in future years, pending species status changes, as well as results presented in the coordinated review of annual reports. Opportunistic wildlife observations may be made throughout the year by agency and Operator personnel present in the project area.

The frequency of inventory and monitoring requirements will be dependent upon the level of development in the project area. In general, frequency will increase with increased levels of development. Monitoring results may lead to further, currently unidentified, scientific studies specifically designed to determine cause and effect. The BLM will identify the level of effort required by this Plan subject to these categories:

- Threatened, Endangered, Candidate, and Proposed Species (Special Status Species) (Plants/Animals) and associated habitats
- BLM Sensitive Species (Plants/Animals) and associated habitats

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- Big Game and associated habitats
- Raptors and associated habitats
- Song birds, waterfowl, and shorebirds and associated habitats
- Amphibians, reptiles, and fish and associated habitats

Although site- and species-specific surveys will be conducted in association with Application for Permit to Drill (APD) and right-of-way application field reviews, additional large-scale field work may be required based on need.

2.2.1 Special Status Species and Associated Habitat: Inventory and Monitoring Protocols

The BLM is required to conduct Section 7(a) consultation (or conferencing for proposed species) under the Endangered Species Act of 1973 (ESA) with the USFWS if there is the potential for a proposed project to impact any listed species (directly or indirectly) within the CD-C project area. Listed species or proposed species discovered incidentally may require further investigation and consultation (BLM 2011).

The level of inventory and monitoring required for Special Status Species will be commensurate with established protocols for the potentially affected species. Inventory and monitoring surveys for Special Status Species will be conducted by the BLM or a BLM-approved Operator-financed biologist in areas of potential habitat within the CD-C project area and all surveys will be conducted in coordination with the BLM. Methodologies and results of these surveys will be included in annual reports as required in **Table I-1**. A preliminary list of Special Status Species proposed for management and that are known to occur, or have the potential to occur, in the vicinity of the project area is shown in **Table 3.9-3, Chapter 3** of the EIS. As Special Status Species are added to or withdrawn from the USFWS, BLM, and/or WGFD lists, appropriate modifications reflecting these changes will be incorporated into this Plan and specified in annual reports.

Surveys for species or associated habitats will be implemented for the APD and/or right-of-way application processes. If any Special Status Species or habitats are observed, the observations will be noted on appropriate data forms (**Table I-2a**) and efforts will be made to determine species activities (e.g., breeding, nesting, foraging, hunting, etc.). If any management agency identifies a potential for concern regarding any of these species, additional inventory and monitoring and mitigation may be implemented as specified in annual reports.

Special Status Species data collected during surveys and described below will be provided only as necessary to those requiring the data for specific management and/or project development needs. Site- and species-specific Special Status Species surveys will be conducted as necessary in association with all APD and right-of-way application field reviews. It should be noted that the following species or their associated habitats are not known to occur in the CD-C project area; therefore, inventories for these species will not be required at this time: Preble's meadow jumping mouse, yellow-billed cuckoo, Wyoming toad, blowout penstemon plant, and the Colorado butterfly plant. The project is located outside of the North Platte River watershed; therefore there will be no downstream impacts from activities associated with the proposed CD-C project within the North Platte River watershed.

Black-footed Ferret (Endangered). The USFWS, in coordination with the WGFD, has developed a list of habitat blocks that are not likely to be inhabited by black-footed ferrets (block cleared). In these areas, take of individual ferrets and effects to a wild population are not an issue and surveys for ferrets are no longer recommended. Although ferret surveys are not required in these areas, the area may still maintain value for the survival and recovery of the species in the future. The CD-C project area is located within three Black-footed Ferret Non-Block Cleared Areas (Complexes) which include: (1) the Continental Divide Complex, (2) the Desolation Flats Complex, and (3) the Dad Complex. Individual projects that are located within potential black-footed ferret habitat will require consultation with the BLM and WGFD

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and may require ferret surveys in areas that would likely result in a “take” of a black-footed ferret during project implementation.

BLM biologists will determine the presence/absence of prairie dog colonies at each proposed development site during the APD and right-of-way application field reviews and determine if these colonies meet the requirements for potential black-footed ferret habitat. In the event that a proposed project cannot be relocated, surveys will be conducted as deemed necessary, during consultation with the BLM, WGFD and USFWS. The prairie dog colonies in the project area will be mapped and burrow densities determined, if required, by a BLM-approved Operator-financed biologist in association with the proposed development plan. Colonies that meet USFWS criteria as potential black-footed ferret habitat (USFWS 1989), in non-block cleared areas, will be surveyed for black-footed ferrets by a USFWS-certified Operator-financed surveyor prior to BLM authorizing disturbance of these colonies. Black-footed ferret surveys will be conducted in accordance with USFWS guidelines and approved by BLM and USFWS (**Table I-2a**).

Ute Ladies’-Tresses Plant (Threatened). The Ute ladies’-tresses plant is located in riparian and wetland habitats between 4,300-7,000 feet in elevation. This species is not known to occur within the project area and the likelihood of occurrence is low; however, there is the potential of occurrence according to the USFWS. Locations of potential Ute ladies’-tresses plants within the CD-C project area will be mapped using the latest available aerial imagery, land use/land cover data (GAP and Landsat), and ground-truthing. This habitat information will be digitized into a GIS format and may be used to guide surveys for this threatened plant at the appropriate time of year (**Table I-2a**).

Colorado River Species (Endangered). The BLM is required to conduct Section 7(a) consultation with the USFWS for water depletions from the Colorado River Basin. It has been determined that upstream water depletions from this system may have a detrimental impact on four listed fish species and their Critical Habitat downstream. Depletions represent an annual reduction in the volume of stream flow that would have reached the Critical Habitat of the four endangered fish species residing in the Colorado River Basin. References for the water depletion determination form are located in **Table I-2a**.

2.2.2 BLM Wyoming State Sensitive Species (Plants/Animals) and Associated Habitats, Inventory and Monitoring Protocols

BLM Sensitive Species are species designated internally in accordance with BLM Manual 6840 (BLM 2008b). The document states: “*Actions authorized by the BLM shall further the conservation/recovery of federally listed species and conservation of Bureau sensitive species. Bureau sensitive species will be managed consistent with species and habitat management objectives in land use plans...to promote their conservation and to minimize the likelihood and need for listing under the ESA.*”

Surveys to inventory and monitor BLM Wyoming State Sensitive Species (BLM Sensitive Species) will be conducted by the BLM or a BLM-approved Operator-financed biologist in areas of potential habitat within the CD-C project area. Information on the habitats and use of the project area is required and sources of this information include the BLM, Wyoming Natural Diversity Database (WYNDD), the WGFD, and the USFWS. In addition, surveys for site-specific species or associated habitats will be implemented at the APD and/or right-of-way application processes. If any BLM Sensitive Species or habitats are observed, the observations will be noted on appropriate data forms (**Table I-2a**) and efforts will be made to determine their activities (e.g., breeding, nesting, foraging, hunting, etc.). If any management agency identifies a potential for concern regarding any of these species, additional inventory, monitoring, and mitigation may be implemented as specified in annual reports.

2.2.2.1 BLM Sensitive Small Mammals and Associated Habitats

The long-eared myotis, fringed myotis, spotted bat, Townsend’s big-eared bat, pygmy rabbit, Wyoming pocket gopher, and white-tailed prairie dog have been identified as BLM Sensitive Species in the RFO

and have the potential to occur within the CD-C project area. The swift fox and black-tailed prairie dog are also identified as BLM Sensitive Species in the RFO; however, they are not expected to occur within the CD-C project area.

Bat Species (long-eared myotis, fringed myotis, spotted bat, Townsend’s big-eared bat). Long-eared myotis, fringed myotis, spotted bats and Townsend’s big-eared bats inhabit conifer and deciduous forests, caves and mines, rock crevices, man-made structures and shrublands and have been observed within the CD-C project area. These bats could be both resident and migratory within the project area and utilize the project area for feeding; however, hibernation is unlikely because suitable habitat is limited. Inventory and monitoring specifically for bat species within the CD-C project area has not occurred; therefore, impacts to these species as a result of implementing the Proposed Action within the CD-C project area are not known. Acoustic bat surveys, bat carcass surveys, radar surveys and mist netting surveys are four (4) potential inventory and monitoring techniques that could be used to identify where bat species are present within the project area and potential impacts to these species. There is limited information pertaining to impacts to bat species as a result of natural gas drilling (**Table I-2a**).

Pygmy Rabbit. Pygmy rabbits are a sagebrush obligate and occur in basin prairie and riparian shrub and tall sagebrush in dense patches with sandy and loose soils. These rabbits are known to occur within the CD-C project area. The inventory and monitoring protocol for this species is identified in **Table I-2a**.

Wyoming Pocket Gopher. The Wyoming pocket gopher occurs in side-hills and ridge-tops, in cushion-plant communities within otherwise sagebrush-grasslands habitat. The species has the potential to occur within the CD-C project area. The inventory and monitoring protocol for this species is identified in **Table I-2a**. During 2009 interagency/industry survey efforts in the RFO followed WYNDD’s protocol of trapping for three consecutive nights or until a pocket gopher was captured. Trapping procedures are referenced in Table 1-2a.

White-Tailed Prairie Dog. The white-tailed prairie dog inhabits sagebrush-grasslands and is located within the project area.

2.2.2.2 BLM Sensitive Upland Game Birds, Migratory Raptors, Songbirds, Shorebirds, Waterfowl and Habitats

The loggerhead shrike, sage thrasher, Brewer’s sparrow, sage sparrow, white-faced ibis, trumpeter swan, long-billed curlew, bald eagle, ferruginous hawk, mountain plover, and burrowing owl species have been identified as BLM Sensitive Species in the RFO and have the potential to occur within the CD-C project area. These species have the potential to occur in the following habitats:

- Loggerhead shrike, sage thrasher, Brewer’s sparrow, and sage sparrow occur within basin/prairie shrub and mountain foothills shrub habitats, sagebrush and are sagebrush obligate species.
- White-faced ibis inhabits marshes and wet meadows.
- Trumpeter swan inhabits lakes, ponds, and rivers.
- Long-billed curlew inhabits grasslands, plains, foothills and wet meadows.
- Bald eagle inhabits large rivers, streams and lakes, but have been observed in the project area primarily from November through April, forages on winter carrion and the nearest potential nesting habitat is along the Little Snake River nine miles south of the project area.
- Ferruginous hawk inhabits sagebrush-grasslands and has been found in the project area.
- Mountain plover inhabits grasslands and has been found within the project area.
- Burrowing owl has been observed in sagebrush-grasslands in the project area and has a close association with burrowing mammals such as prairie dogs, ground squirrels, and badgers.

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The following species are also identified as BLM Sensitive Species in the RFO; however, they are not expected to occur within the CD-C project area: Baird's sparrow, Columbian sharp-tailed grouse, northern goshawk, and peregrine falcon.

The BLM has responsibilities under the Migratory Bird Treaty Act (MBTA) to analyze and protect all migratory birds. Most of North America's birds are migratory and migrate during the night, usually at higher altitudes when weather conditions are favorable. Songbirds are vulnerable to colliding with man-made structures such as buildings, communication towers, power-poles or even wind turbines during poor weather conditions that force them to lower altitudes (BLM 2011).

Bird surveys are required to estimate the temporal and spatial use of the CD-C project area and vicinity by birds. Fixed-point count surveys can be used as a tool to inventory for songbird, raptor and other groups of birds. Radar surveys using marine radar surveillance can also be used to determine avian species flight patterns in the project area (i.e. foraging movements and migration). Multiple sampling locations should be identified within the selected study areas and surveyed in consultation with the BLM and WGFD (Table I-2a).

Songbirds (loggerhead shrike, sage thrasher, Brewer's sparrow, sage sparrow). Bird surveys are required to estimate the temporal and spatial use of the CD-C project area and vicinity by these four BLM Sensitive bird species. Fixed-point count surveys can be used as a tool to inventory for these birds. Radar surveys using marine radar surveillance can also be used to determine their flight patterns in the project area (i.e. foraging movements and migration). Multiple sampling locations should be identified within the selected study areas and surveyed in consultation with the BLM and WGFD (Table I-2a).

Shorebirds (white-faced ibis, long-billed curlew). Ground surveys can be used during the breeding season, mitigation season (migratory) and the non-breeding season (winter) to determine species numbers. Aerial surveys and four-wheelers can be used for inaccessible areas (Table I-2a).

Waterfowl (trumpeter swan). In the event that surveys are required, aerial surveys in the fall and mid-winter will be conducted. Ground surveys can be used for areas that are inaccessible. Ground surveys are used to verify species composition of some swan flocks. The primary purpose of these surveys is to document the size of the U.S. trumpeter swan flocks and to enumerate the annual production of cygnets to fledgling age. The survey also provides some information on territorial occupancy and the distribution of failed breeders and non-breeders from year to year (USFWS 2011).

Bald Eagle. When bald eagles are located within a proposed project area, then surveys are required that include nest and production surveys, winter use surveys, and eagle flight patterns and use of the project area throughout all phases of the project. In addition, analysis or mitigation measures necessary to comply with the Bald and Golden Eagle Protection Act are required by the BLM in coordination with the USFWS (BLM 2011). The CD-C project area does not have any known nesting habitat for bald eagles; however, bald eagles may fly over the area and feed in the area during certain times of the year, especially winter.

Marine surveillance radar may be required to determine eagle flight patterns in the CD-C project area (i.e. foraging movements and migration). Multiple sampling locations should be identified within the area and surveyed in consultation with the BLM. In addition, telemetry studies (radio or satellite) may be required to determine eagle flight patterns in the CD-C project area (BLM 2011)

Ferruginous Hawk. Ferruginous hawks are found in mixed-grass prairie and sagebrush steppe habitats during the spring, summer, and fall and generally build nests on rock outcrops, the ground, and cliff ledges.

Ferruginous hawk surveys are required to: (1) identify nest densities occurring within the CD-C project area and (2) record nest locations to identify areas with a potential increased risk of disturbance or collisions for adults or young associated with nest sites (BLM 2011). Ferruginous hawk inventories will be conducted by the BLM at least every five years (as identified in annual reports), to determine the

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location of new nests, based on funding availability. These surveys may be implemented aerially, via helicopter, or from the ground. Operators may provide financial assistance for aircraft rental, based on funding availability.

Breeding and nesting monitoring will be conducted annually between April and July at known nest locations by the BLM or a BLM-approved Operator-financed biologist, in order to ascertain nest activity status. Monitoring generally will be conducted from the ground, and attempts will be made to determine the cause of any documented nest failure. Operators may provide financial assistance for aircraft rental, as necessary. Site- and species-specific ferruginous hawk nest inventories will be conducted as necessary in association with all APD and right-of-way application field reviews.

All nest/productivity surveys will be conducted using procedures that minimize potential adverse effects to nesting ferruginous hawks. Specific survey measures for reducing detrimental effects are listed in Grier and Fyfe (1987) and Call (1978) and include the following:

- a. Nest visits will be delayed for as long as possible in the nesting season;
- b. Nests will be approached cautiously, and their status (e.g., nestlings/fledglings) will be determined from a distance with binoculars/scope;
- c. Nests will be approached tangentially and in an obvious manner to avoid startling adults;
- d. Nests will not be visited during adverse weather conditions (e.g., precipitation events, windy periods, and the hottest part of the day);
- e. Visits will be kept as brief as possible;
- f. All inventories will be coordinated by the BLM;
- g. The number of nest visits in any year will be kept to a minimum; and
- h. All raptor nest location data will be considered confidential.

Greater Sage-Grouse (Candidate). Greater Sage-Grouse depend on extensive areas of sagebrush for food and cover and their breeding grounds (leks) are located in open patches with sagebrush habitat. Grouse exhibit site fidelity to leks, winter and summer areas. Greater Sage-Grouse lek inventories will be conducted by the BLM and WGFD within and adjacent to the project area to determine lek locations. These surveys will use the WGFD protocol (**Table I-2a**). Surveys may be conducted aerially, based on funding availability, or on the ground, in order to determine lek locations and will follow the protocols identified in Table I-2a.

Selected leks, identified by the BLM, will be monitored annually to determine lek attendance by the BLM or a BLM-approved Operator-financed biologist, in coordination with the WGFD and using the WGFD protocol (**Table I-2a**). Monitoring will occur between April 1 and May 15, such that all leks within the CD-C project area are monitored at least once every 3 years. Population trend analysis may also be required and will be completed with a suitable nearby reference area. The BLM will direct lek monitoring efforts such that efforts are made to have the same individuals monitor the same leks within and across years. Data collected during these surveys will be provided on a standardized form (Table I-2a).

Helicopter surveys for wintering areas will occur when weather conditions provide the best opportunity for these types of surveys and will be scheduled between December 15 and February 30. These winter surveys should be flown at about 25 – 50 meters above ground at ¼-mile intervals. These surveys are designed to visually identify sage-grouse and/or their tracks (BLM 2011).

On September 22, 2015 the BLM published the Record of Decision and Approved Resource Management Plan Amendment for Greater Sage-Grouse (ARMPA (BLM 2015b)). The ARMPA calls for the BLM, in coordination with the State of Wyoming and other stakeholders, to establish a monitoring framework for Sage-Grouse populations and habitat within Priority Habitat Management Areas (PHMAs). The monitoring framework will be incorporated into individual project approvals, as appropriate and

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necessary(MD SSS 1).

The ARMPA also directs that the Sage-Grouse Habitat Assessment Framework (HAF) or best available assessment tool be used when assessing Sage-Grouse habitats at multiple scales (MD GMD 15). The HAF is described in ARMPA Appendix D, The Greater Sage-Grouse Habitat Management Strategy.

Mountain Plover. Mountain plover breeding habitat includes short-grass prairie and shrub-steppe landscapes, dry land, cultivated farms, and are frequently associated with prairie dog towns. Plovers usually nest on sites where vegetation is sparse or absent; conditions that can be created by herbivores, including domestic livestock and prairie dogs. Vegetation in shortgrass prairie sites is typically less than 4 inches tall. Nest sites within the shrub-steppe landscape are also confined to areas with little to no vegetation, although surrounded by areas visually dominated by shrubs. Commonly, nest sites within shrub-steppe areas are on active prairie dog towns. Nests are commonly located near a manure pile or rock. In addition to areas disturbed by prairie dogs or livestock, nests have also been found on bare ground created by oil and gas development activities and on dryland, cultivated agriculture in the southern part of their breeding range. Mountain plovers are rarely found near water. Positive indicators for mountain plovers therefore include level terrain, prairie dogs, bare ground, cactus pads, cattle, widely spaced plants, and horned larks. It would be unusual to find mountain plovers on sites characterized by irregular or rolling terrain, dense, matted vegetation, grass taller than 4 inches, wet soils, or the presence of killdeer.

Mountain plover habitat within the CD-C EIS has been mapped within the project area; however, standard site-specific habitat surveys will be conducted as necessary in association with all APD and right-of-way application field reviews. Surveys, if required, will be conducted by the BLM or a BLM-approved Operator-financed biologist to detect the presence of plovers. Surveys will generally be conducted during the period of April 24 through May 10 to determine presence/absence of mountain plovers and June 25 through July 10 to determine density of nesting mountain plovers (**Table I-2a**). These dates may change after consultation with the USFWS and WGFD.

Burrowing Owl. Burrowing owls are commonly found in prairie dog towns, are migratory, breed throughout the plains and prairies of the western United States and winter in the southern United States and throughout Mexico. Federal and state laws prohibit the harming and killing of burrowing owls and the destruction of active nests.

Prairie dog colonies and other suitable burrowing owl nesting areas on and within 0.75 miles of existing and proposed disturbance areas will be searched for western burrowing owls by the BLM from April 15 through September 15 to determine the presence or absence of nesting owls within the CD-C project area (BLM 2011). If burrowing owls are found, attempts will be made to determine reproductive success. In addition, standard site-specific surveys will be conducted in association with all APD and right-of-way application field reviews.

2.2.2.3 BLM Sensitive Amphibians, Reptiles, and Fish Species and Associated Habitats

The northern leopard frog, Great Basin spadefoot toad, Colorado River cutthroat trout, roundtail chub, flannelmouth sucker, and bluehead sucker have been identified as BLM Sensitive Species in the RFO and have the potential to occur within the CD-C project area. The Western boreal toad and hornyhead chub are also identified as BLM Sensitive Species in the RFO; however, they are not expected to occur within the CD-C project area.

There are no sensitive reptile species identified in the CD-C project area at this time. If species are identified in the future, then presence/absence surveys and hibernacula/maternity den site searches will be required in sensitive reptile habitat (BLM 2011) at the CD-C project area and site-specific APD and/or right-of-way level.

Northern Leopard Frog and Great Basin Spadefoot Toad. Habitat mapping, Acoustic Breeding Surveys, and Visual Encounter Surveys (**Table I-2a**) can be used to determine if the northern leopard frog and Great Basin Spadefoot species are present within the CD-C project area and at the APD and/or right-of-way application process.

Colorado River Cutthroat Trout, Roundtail Chub, Flannelmouth Sucker, and Bluehead Sucker. At this time, the fish species inventory in the CD-C project area has been completed. BLM sensitive fish species population monitoring will continue to be conducted by the WGFD and the BLM. Monitoring for the associated habitats for sensitive fish species will be required and may include channel morphology, water quality, and in-stream habitat.

2.2.2.4 BLM Sensitive Plant Species and Associated Habitats

The meadow milkvetch, Cedar Rim thistle, Gibbens' beardtongue, and persistent sepal yellowcress plants have been identified as BLM Sensitive Species in the RFO and have the potential to occur within the CD-C project area. The many-stemmed spider flower, Laramie columbine, dune wild rye, Laramie false sagebrush, and limber pine are also identified as BLM Sensitive Plant Species in the RFO; however, they are not expected to occur within the CD-C project area.

Locations for BLM Sensitive Plant Species within the CD-C project area will be mapped using the best available data from WYNDD modeling and ground-truthing. This habitat information will be digitized into a GIS format and may be used to guide these plant surveys at the appropriate time of the year (BLM 2011).

Meadow Milkvetch, Cedar Rim Thistle, Gibbens' Beardtongue, and Persistent Sepal Yellowcress Plants. Sensitive plant surveys will be required within the CD-C project area. In addition, surveys for site-specific species or associated habitats will be implemented at the APD and/or right-of-way application processes to determine the potential to affect these plant species (**Table I-2a**).

2.2.3 Big Game and Associated Habitats

Data on big game use of crucial winter ranges and migration corridors within and adjacent to the project area will be requested by the BLM from the WGFD, as deemed necessary by the BLM. Surveys are required to fully understand the big game use in the project area and the associated impacts that may occur (BLM 2011). This information will be used to assess the effectiveness of protection measures implemented for the project. In the event that BLM, in consultation with the WGFD and other interested parties, determines that additional data should be collected for big game, these issues will be discussed at the annual meeting.

Big Game Crucial Winter Range. A radio or satellite telemetry study will be developed in cooperation between the BLM and WGFD to monitor the use of big game crucial winter range within the CD-C project area. In addition, Pellet Count Surveys can be used to evaluate the seasonal spatial distribution of big game species based on the presence of pellet groups.

Shrub age can be an important aspect, within mule deer habitat, often indicating that older-aged plants are more typical with most inventory and monitoring studies. Older plants typically produce leaders with greater lignin, greater secondary compounds which limit digestibility and less vigor. Current research in various locations (e.g., Colorado, Idaho, Nevada, Utah) have identified nutrition as an aspect currently limiting mule deer's ability to increase in numbers. This occurs in both winter ranges as well as transitional ranges for mule deer (BLM JIO-PAPO, 2012).

Big Game Migration Corridors. A radio or satellite telemetry study will be developed in cooperation between the BLM and WGFD to determine movement of big game and potential migration corridors within the CD-C project area.

2.2.4 Raptors and Associated Habitats

Raptor surveys are required to: (1) identify the species and nest densities occurring within the CD-C project area and (2) record raptor nest locations to identify areas with a potential increased risk of disturbance or collisions for adults or young associated with nest sites (BLM 2011). Raptor inventories will be conducted by the BLM at least every five years (as identified in annual reports), to determine the location of new raptor nests, based on funding availability. These surveys may be implemented aerially, via helicopter, or from the ground. Operators may provide financial assistance for aircraft rental, based on funding availability.

Breeding and nesting monitoring will be conducted by the BLM or a BLM-approved Operator-financed biologist, annually, at known nest locations, between February and August, in order to ascertain nest activity status. Monitoring generally will be conducted from the ground, and attempts will be made to determine the cause of any documented nest failure. Operators may provide financial assistance for aircraft rental, as necessary. Site- and species-specific raptor nest inventories will be conducted as necessary in association with all APD and right-of-way application field reviews.

All raptor nest/productivity surveys will be conducted using procedures that minimize potential adverse effects to nesting raptors. Specific survey measures for reducing detrimental effects are listed in Grier and Fyfe (1987) and Call (1978) and are located in **Section 2.2.2.2, Inventory/Monitoring Protocol for Ferruginous Hawks**.

Winter use raptor surveys are required to (1) identify the species and winter densities occurring within the CD-C project area and (2) record raptor hunting use areas with a potential increased risk of disturbance or collisions for raptors to predict potential impacts. Suitable raptor perch sites such as cliffs, rock outcrops, man-made structures, tree tops, and areas of relatively high prey densities should be searched for hunting raptors. Helicopters can be used for these surveys; however, care should be taken to minimize disturbance to raptors during surveys (BLM 2011).

2.2.5 Songbirds, Waterfowl, and Shorebirds and Associated Habitats

The BLM has responsibilities under the MBTA to analyze and protect all migratory birds. Bird surveys are required to estimate the temporal and spatial use of the CD-C project area and vicinity by birds (see **Section 2.2.2.2**). Marine surveillance radar surveys and ground surveys such as point counts, line transect surveys, and spot mapping could be used to determine presence of these species.

Point count surveys can be used as a tool to determine songbird and other groups of birds. Radar surveys using marine radar surveillance can also be used to determine avian species flight patterns in the project area (i.e. foraging movements and migration). Multiple sampling locations should be identified within the selected study areas and surveyed in consultation with the BLM and WGFD (**Table I-2a**).

2.2.6 Amphibians, Reptiles, and Fish and Associated Habitats

Amphibian surveys would be required since there are riparian habitats or playas within the CD-C project area. In addition, surveys for site-specific species or associated habitats will be implemented at the APD and/or right-of-way application processes to determine the potential to affect amphibians, reptile and fish species.

Amphibian Species and Associated Habitats. Habitat mapping, Acoustic Breeding Surveys, and Visual Encounter Surveys (**Table I-2a**) can be used to determine amphibian species presence within the CD-C project area and at the APD and/or right-of-way application process.

Reptile Species and Associated Habitats. Presence/absence surveys and hibernacula/maternity den site searches will be required in potential reptile habitat (BLM 2011) at the CD-C project area and site-specific APD and/or right-of-way level.

Fish Species and Associated Habitats. The use of hydroacoustics, gill netting, seining, and electrofishing by boat, canoe, or backpack can be used to measure fish abundance and distribution (AZGFD 2009, Taylor and Maxwell 2007).

2.2.7 General Wildlife Species

BLM staff will be responsible for maintaining records of selected wildlife species observed during the course of their activities on the project area. Operator personnel may also provide data on wildlife observations. The information provided will include observations of wildlife species, their numbers, location, activity, and other pertinent data as applicable and identified on the General Wildlife Observation Data Sheet (**Table I-2a**). Where Operators are uncertain of the United States Geological Survey (USGS) coordinates for an observation, a general description of the location may be provided and in instances where species or sex information is questionable, Operators will identify the observation as such.

Additional inventory and monitoring measures may be applied for other species as specified in annual reports (**Table I-1**). Surveys will be conducted in adherence with protocol to be established by the BLM, other agencies and Operators, and Operators may provide financial assistance for these inventory and monitoring investigations (**Table I-2a**).

2.3 Determine and Implement Protection Measures, Effects Analysis, and Apply Adaptive Management

Long-term studies and monitoring programs identified above, along with implementing protection measures, should be established to evaluate and compare the effectiveness of various mitigation techniques. Efforts should be made to continually integrate monitoring data into adaptive management strategies, including making individual and compiled results available to industry and agencies to improve energy-development and mitigation techniques. Opportunities to enable agencies, conservation organizations, and energy companies to collaboratively interact and contribute data should be identified (WGFD 2010). Evaluations of the biological response of focal species are integral to assessing success in delivering conservation programs (Naugle 2011).

During project development, the BLM is responsible to manage or restore habitat to conserve, recover, and maintain species populations consistent with the CD-C EIS and Rawlins RMP (BLM 2008a) plans. The Rawlins RMP states that a full range of mitigation options will be considered when developing mitigation for project-level activities, including those located within the CD-C project area. The wildlife protection measures proposed herein have been developed from past measures identified for oil and gas developments in Wyoming and are basically tools to implement while exercising adaptive management. Additional measures may be included and/or existing measures may be modified in any given year as allowable and as deemed appropriate by BLM in consultation with other agencies, Operators, and interested parties. These measures will be specified in annual reports (**Table I-1**). Protection measures will be implemented by Operators with assistance from and/or in consultation with the BLM. In addition, these measures may be modified on a site-specific basis as deemed appropriate by the BLM after completion of the APD and right-of-way application field reviews.

The principal protection measure for most wildlife will be species- and project-specific measures as well as general wildlife and associated habitat protection measures. The implementation of these measures may also benefit other wildlife species found on and adjacent to the project area. Sensitive and crucial habitats should be avoided where possible. Protection measures (e.g., BMPs identified in the Rawlins RMP and CD-C EIS, **Appendix C**) will be applied based on the analysis of information gathered through inventory and monitoring. These BMPs are included in the Rawlins RMP and CD-C EIS and include, but are not limited to, measures such as timing restrictions to protect species and habitat from disruptive activities during critical periods, modifications of BLM fences to allow big game species greater freedom

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of movement to avoid disruptive activities, and vegetation treatments, such as herbicide treatments, seeding, prescribed burning, cutting/chopping for regeneration, planting shrubs or trees, or fertilization. The process of adaptive management will be used to determine the effectiveness of BMPs and necessary changes in conservation management will be made if identified. This process allows ineffective management actions to be modified, or new actions implemented, to reduce impacts to wildlife from development.

The Nature Conservancy's (TNC) *Energy by Design – Cooperative Mitigation Planning for the CD-C Gas Field* (**Appendix G**) is a science-based approach designed to reduce conflicts and steer development away from conservation priorities, increase the cost-effectiveness of mitigation, and direct funding to higher-value conservation. The project blends landscape-level conservation with the mitigation hierarchy including: (1) avoid; (2) minimize/restore; and (3) offset to improve mitigation efforts. This is accomplished in a four step process which includes the following;

- a. Develop a landscape conservation plan (or use an existing landscape plan);
- b. Blend landscape conservation planning with mitigation hierarchy to evaluate conservation and development conflicts;
- c. Determine the residual impacts associated with development and select an optimal offset portfolio; and then
- d. Estimate the offset contribution to conservation goals.

TNC's final report for the CD-C project area was completed on August 1, 2009. Protection measures and adaptive management for the CD-C project area could be identified from this plan.

The *Wyoming Landscape Conservation Initiative* (WLCI) was created in 2007 as a multi-agency and stakeholders' initiative designed to maintain and enhance wildlife habitat and other resource values within energy development and other changes. Partners are conducting science-based research and monitoring, completing habitat enhancements and restoration, encouraging effective reclamation and mitigation practices, identifying and prioritizing landscape-scale conservation work, and promoting grazing practices which benefit wildlife, ranchers, and open-space conservation. Initial funding for this program has come through federal appropriations and projects to date have included fence modifications and enclosure fencing, prescribed burns, riparian enhancements, invasive species treatments, river restoration, and conservation easements (WGFD 2010). Protection measures and adaptive management for the CD-C project area could be identified from this plan.

2.3.1 Special Status Species and Associated Habitats: Protection Measures (Adaptive Management)

The level of protection required for Special Status Species is obligatory under the ESA. If crucial features for any Special Status Species are found during on-site surveys of the proposed project, avoidance of these features will be required first. In the event this is not feasible, the BLM will conference and/or consult and coordinate with the USFWS to determine and implement the most effective protection measures required to protect Special Status Species and their habitats. Habitat and species conservation measures for Special Status Species are identified in the Rawlins RMP (BLM 2008a) biological assessment and the biological opinion. Both documents will be adhered to for compliance with the ESA and conservation measures will be applied to all surface-disturbing and disruptive activities, as appropriate. In the event that a Special Status Species is observed, especially during construction activities, work at the project site will be curtailed until there is concurrence between BLM and the USFWS on what activities can be authorized. Activities will, in most cases, be delayed until such time that no adverse effects will occur.

The Rawlins RMP requires the BLM maintain, restore, or enhance Special Status Species, as well as Sensitive Species habitat to prevent listing under the ESA, in coordination with other local, state and

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federal agencies. It is assumed that the protocol specified for general wildlife will likely benefit Special Status Species as well. If any management agency identifies a potential for impacts to any Special Status Species, additional measures may be implemented as specified in annual reports.

Black-footed Ferret. Habitat and species conservation measures for the black-footed ferret are identified in the Rawlins RMP (BLM 2008a) biological assessment and the biological opinion. Both documents will be adhered to for compliance with the ESA and conservation measures will be applied to all surface-disturbing and disruptive activities, as appropriate. These protection measures are identified to reduce impacts to the black-footed ferret within the CD-C project area (Rawlins RMP, page 2-54). If black-footed ferrets are found on the project area, the USFWS will be notified immediately and formal consultations will be initiated to develop strategies that ensure no adverse effects to the species. Before ground-disturbing activities are initiated in black-footed ferret habitat, authorizations to proceed must be received from the BLM, in consultation with the USFWS.

Ute Ladies'-Tresses Plant. Habitat and species conservation measures for the Ute ladies'-tresses plant are identified in the Rawlins RMP (BLM 2008a) biological assessment and the biological opinion. Both documents will be adhered to for compliance with the ESA and conservation measures will be applied to all surface-disturbing and disruptive activities, as appropriate. These protection measures are identified to reduce impacts to the Ute ladies'-tresses plant within the CD-C project area (Rawlins RMP, page 2-54).

Colorado River Fish Species. Habitat and species conservation measures for Colorado River fish species are identified in the Rawlins RMP (BLM 2008a) biological assessment and the biological opinion. Both documents will be adhered to for compliance with the ESA and conservation measures will be applied to all surface-disturbing and disruptive activities, as appropriate. These protection measures are identified in the Rawlins RMP, page 2-54.

2.3.2 BLM Wyoming State Sensitive Species (Plants/Animals) and Associated Habitats: Protection Measures (Adaptive Management)

Surface-disturbing and disruptive activities that would potentially affect the habitat of Special Status Species will be intensively managed on a case-by-case basis. In addition, surface-disturbing and disruptive activities will be intensively managed to minimize impacts on identified crucial habitat for sensitive species for the purpose of protecting these species and their associated habitats. Coordination with the WGFD will allow the *Recommendations for Development of Oil and Gas Resources Within Important Wildlife Habitats* management actions to be implemented to reduce impacts to BLM sensitive species (Table I-2b).

2.3.2.1 BLM Sensitive Small Mammals and Associated Habitats

Bat Species (long-eared myotis, fringed myotis, spotted bat, Townsend's big-eared bat). Habitat and species protection measures for BLM sensitive bat species are identified in the Rawlins RMP (BLM 2008a). These protection measures are identified to reduce impacts to bat species within the CD-C project area (Rawlins RMP, page 2-54). In addition, all open vent stack equipment shall be designed and constructed to prevent bat use and potential mortalities.

Pygmy Rabbit. Habitat and species protection measures for the pygmy rabbit are identified in the Rawlins RMP (BLM 2008a). These protection measures are identified to reduce impacts to the pygmy rabbits within the CD-C project area (Rawlins RMP, page 2-54). The BLM has identified additional protection measures to reduce impacts to this species.

Wyoming Pocket Gopher. Habitat and species protection measures for the Wyoming pocket gopher are identified in the Rawlins RMP (BLM 2008a). These protection measures are identified to reduce impacts to the Wyoming pocket gopher within the CD-C project area (Rawlins RMP, page 2-54). To protect the identified Wyoming pocket gopher and associated habitat, the BLM has identified additional protection

measures to reduce impacts to this species. The survey protocol is available from the BLM Rawlins Field Office upon request.

White-tailed Prairie Dog. Habitat and species protection measures for the white-tailed prairie dog are identified in the Rawlins RMP (BLM 2008a). These protection measures are identified to reduce impacts to the white-tailed prairie dog within the CD-C project area (Rawlins RMP, page 2-54 to 2-55).

2.3.2.2 BLM Sensitive Upland Game Birds, Migratory Raptors, Songbirds, Shorebirds, Waterfowl and Habitats

Habitat and species protection measures for the BLM Sensitive raptors, songbirds, shorebirds and waterfowl are identified in the Rawlins RMP (BLM 2008a). These protection measures are identified to reduce impacts to upland game birds, migratory raptors, songbirds, shorebirds, and waterfowl within the CD-C project area (Rawlins RMP, page 2-52 to 2-55). These are required to comply with both the Rawlins RMP and the MBTA.

Songbirds (loggerhead shrike, sage thrasher, Brewer's sparrow, sage sparrow). All open vent stack equipment shall be designed and constructed to prevent avian mortalities due to bird use and perching. In addition, nesting habitats could be treated with nitrogen fertilizers (BLM 2008c).

Shorebirds (white-faced ibis, long-billed curlew). Protection measures that could reduce impacts to nesting shorebirds would be implemented on surface-disturbing and disruptive activities located near water habitats such as mudflats, salt ponds, marshes, rocky shores and agricultural fields (USFWS 2011).

Waterfowl (trumpeter swan). Protection measures that could reduce impacts to waterfowl would be implemented on surface-disturbing and disruptive activities located near water habitats such as wetland, and marshes (Wetlands Regional Monitoring Program Plan 2002). In addition, not permitting the use of open pits (Naugle 2011) in the natural gas field would reduce impacts to waterfowl species.

Bald Eagle and Ferruginous Hawk. Habitat and species protection measures for the bald eagle and ferruginous hawk are identified in the Rawlins RMP (BLM 2008a), pages 2-53 to 2-55. These protection measures are identified to reduce impacts to the bald eagle and ferruginous hawk within the CD-C project area. Protection protocol will be as described for raptors (See **Section 2.3.1**). Additional measures will be applied on a species- or site-specific basis, as deemed appropriate by the BLM and/or USFWS, and specified in annual reports.

Greater Sage-Grouse. Habitat and species protection management actions for greater sage-grouse are identified in ARMPA. The ARMPA provides consistent habitat management across the range of the Greater Sage-Grouse using management tools that would assure a net conservation gain to the Sage-Grouse within PHMAs (Core areas) and within General Habitat Management Areas (GHMAs). Those tools will be applied to oil and gas development in the CD-C project area under the Proposed Action and all alternatives, including the No Action Alternative. **Section 2.2.7.9** of the Final EIS, **Management of Greater Sage Grouse**, provides a summary of the principal management tools from the ARMPA that will be at work in the CD-C project area. A complete description of the tools can be found in the ARMPA, available at: https://eplanning.blm.gov/epl-front-office/projects/lup/9153/63189/68431/002_Wyoming_ARMPA_Main-Body.pdf

Mountain Plover. Habitat and species protection measures for the mountain plover are identified in the Rawlins RMP (BLM 2008a). These protection measures are identified to reduce impacts to the mountain plover within the CD-C project area (Rawlins RMP, page 2-52 to 2-55). Mountain plover habitat will be avoided where practical due to the presence of alternative well and road development sites. Where these habitats will be disturbed, reclamation will utilize procedures designed to reestablish suitable plover habitat. The primary protection measure for mountain plover on the project area will be avoidance plover habitat during the breeding season.

Burrowing Owl. Habitat and species protection measures for the burrowing owl are identified in the Rawlins RMP (BLM 2008a). These protection measures are identified to reduce impacts to the burrowing owl within the CD-C project area (Rawlins RMP, page 2-53 to 2-55).

2.3.2.3 BLM Sensitive Amphibians, Reptiles, and Fish Species and Associated Habitats

Habitat and species protection measures for the BLM sensitive amphibian, reptile and fish species are identified in the Rawlins RMP (BLM 2008a), page 2-54. In addition, a portion of the Upper Muddy Creek/Grizzly Wildlife Habitat Management Area occurs within the CD-C project area (Rawlins RMP, page 2-41) which affords additional protection measures for Colorado River fish species unique to the Muddy Creek watershed.

2.3.2.4 BLM Sensitive Plant Species and Associated Habitats

Habitat and species protection measures for the BLM sensitive plant species are identified in the Rawlins RMP (BLM 2008a). These protection measures are identified to reduce impacts to sensitive plant species within the CD-C project area (Rawlins RMP, page 2-54 to 2-55).

Operators will finance site-specific surveys for BLM Sensitive Plant Species prior to any surface disturbance in areas determined by the BLM to contain potential habitat for such species (BLM 2008b). These surveys will be completed by a qualified botanist as authorized by the BLM and this botanist will be subject to the BLM's 6840 policy requirements. Data from these surveys will be provided to the BLM, and if any sensitive plants or habitats are found, BLM recommendations for avoidance of the proposed project location will be implemented (BLM 2008c).

Meadow Milkvetch, Cedar Rim Thistle, Gibbens' Beardtongue and Persistent Sepal Yellowcress Plants. In extreme cases when the proposed project cannot be relocated, then seed-banking of these plants from the disturbance location would be recommended to attempt off-site propagation, since most of the common techniques such as off-site compensation or habitat restoration have proven largely unsuccessful (BLM 1997).

2.3.3 Big Game Species and Associated Habitats: Protection Measures (Adaptive Management)

Big Game Crucial Winter Range. The Rawlins RMP (BLM 2008a) requires the BLM to maintain, restore, or enhance habitat function in crucial winter range, including those areas located within the CD-C project area. Habitat and species protection measures for the big game species and their habitats are identified in the Rawlins RMP. These protection measures are identified to reduce impacts to big game species within the CD-C project area (Rawlins RMP, page 2-53 to 2-54). In addition, a portion of the Upper Muddy Creek/Grizzly Wildlife Habitat Management Area occurs within the CD-C project area (Rawlins RMP, page 2-41) which affords additional protection measures for elk and mule deer crucial winter range. Coordination with the WGFD will allow the *Recommendations for Development of Oil and Gas Resources Within Important Wildlife Habitats* management actions to be implemented to reduce impacts to big game species (**Table I-2b**).

Snow fences, if used, will be limited to segments of $\frac{1}{4}$ mile or less. Project personnel will also be advised to minimize stopping and exiting their vehicles in big game winter habitat during crucial winter periods. In addition, escape openings will be provided along roads in big game crucial winter ranges, as designated by the BLM, to facilitate exit of big game animals from snowplowed roads. The use of gates on roads within development areas would also preclude or limit motorized public access in sensitive wildlife areas. Additional habitat protection and/or improvement measures may also be applied in any given year as directed by the BLM, in consultation with Operators and other agencies, and specified in annual reports.

There are several projects that can be implemented to improve habitat and use for big game species which include, but are not limited to: (1) fertilization projects which help offset direct and indirect habitat losses by increasing sagebrush production, enhancing available winter forage and potentially increasing

palatability and nutrient quality for wintering big game (specifically mule deer) (BLM 2012, BLM 2008c); (2) closing roads from January 1-April 30 each year to protect big game from disruptive human activity which, during difficult winter months, can increase the mortality rate for these animals and patrolling the areas is required to allow the BLM to educate the public, distribute maps, answer questions, deter violators, encourage the public to report violations, and issue citations when needed; (3) implement chemical thinning treatments (tebuthiuron, or Spike™) to increase forage variety, quantity and quality and improve the big sagebrush and mountain shrub age-class structure; (4) establish conservation easements; (5) implement fence modification projects; (6) implement prescribed fire treatments for big game species (e.g., spring and fall ranges should focus on herbaceous component to help does with fawning and winter ranges should focus more on shrubs and shrub productivity); (7) seeding after fires; (8) mechanical treatments such as crushing with an aerator and including seeding in the treatment; (9) chaining, disking and imprinting pipe harrowing and aerating; (10) mowing; (11) other vegetation treatments such as planting of shrubs and aspen; and (12) control of invasive weeds (BLM 2012).

Big Game Migration Corridors. Big game migration corridor habitat protection measures are identified in the Rawlins RMP (BLM 2008a). These protection measures are identified to reduce impacts to big game species within the CD-C project area (Rawlins RMP, page 2-54). Surface-disturbing and disruptive activities will be managed, on a case-by-case basis, in identified big game migration and transitional ranges to maintain their integrity and function for big game species in these areas. Although fences are not a direct result of natural gas development, fences that are identified to be a problem to big game migration, as a result of development, will be modified to meet BLM fence standards. New fences are allowed in big game migration corridors, provided they meet BLM fence standards.

2.3.4 Raptors and Associated Habitats Protection Measures (Adaptive Management)

The primary protection measure for raptor species on the project area will be avoidance of nest locations during the breeding season. Habitat and species protection measures for raptor species are identified in the Rawlins RMP (BLM 2008a). These protection measures are identified to reduce impacts to raptor species within the CD-C project area (Rawlins RMP, page 2-53). Coordination with the WGFD will allow the *Recommendations for Development of Oil and Gas Resources Within Important Wildlife Habitats* management actions to be implemented to reduce impacts to raptor species (**Table I-2b**)

The goshawk, osprey, and screech owl raptor species are located within the RFO area; however, they require different habitat types than those located within the CD-C project area and are highly unlikely to nest within the project area. In the rare event that one of these species is found, their breeding and nesting habitat will be protected by the protection measures found in the Rawlins RMP.

2.3.5 Songbirds, Waterfowl, and Shorebirds and Associated Habitats Protection Measures (Adaptive Management)

Habitat and species protection measures for songbirds, waterfowl, and shorebirds species are identified in the Rawlins RMP (BLM 2008a). These protection measures are identified to reduce impacts to songbirds, waterfowl, and shorebirds within the CD-C project area (Rawlins RMP, page 2-52 to 2-54). All open vent stack equipment shall be designed and constructed to prevent use birds and to discourage perching. Surface-disturbing and disruptive activities will be intensively managed. BMPs will be applied to surface-disturbing and disruptive activities to maintain or enhance habitat for these species ((BLM 2008a). Coordination with the WGFD will allow the *Recommendations for Development of Oil and Gas Resources Within Important Wildlife Habitats* management actions to be implemented to reduce impacts to songbirds, waterfowl, and shorebird species (**Table I-2b**).

2.3.6 Amphibians, Reptiles, and Fish and Associated Habitats Protection Measures (Adaptive Management)

Habitat and species protection measures for amphibian, reptile and fish species are identified in the Rawlins RMP (BLM 2008a). These protection measures are identified to reduce impacts to the amphibians, reptiles, and fish within the CD-C project area (Rawlins RMP, page 2-54). Coordination with the WGFD will allow the *Recommendations for Development of Oil and Gas Resources Within Important Wildlife Habitats* management actions to be implemented to reduce impacts to amphibian, reptile, and fish species (**Table I-2b**)

2.3.7 General Wildlife Species Protection Measures (Adaptive Management)

The Rawlins RMP (BLM 2008a) requires the BLM manage projects through facility placement and minimization of construction disturbance to maintain connectivity between large contiguous blocks of undisturbed habitat. Reclamation activities associated with proposed projects within the CD-C project area must include wildlife habitat objectives in the plans.

Unless otherwise indicated, the following protection measures will be applied for all wildlife species. Additional measures primarily designed to minimize impacts to other resources (e.g., vegetation and surface water resources, including wetlands, steep slopes, etc.) are identified in the EIS in **Chapter 4**, and these measures may provide additional protection for wildlife. Additional actions may be applied in any given year to further minimize potential impacts to wildlife. These actions will be specified in annual reports.

All roads on and adjacent to the project area that are required for the proposed project will be appropriately constructed, improved, maintained, and signed to minimize potential wildlife and vehicle collisions and facilitate wildlife (most notably big game) movement through the project area. Appropriate speed limits will be adhered to on all project roads, and Operators will advise employees and contractors regarding these speed limits. Some existing roads on the project area and surrounding transportation planning area may be reclaimed if they become redundant, and/or closed (gated and locked, year-round or seasonally) to deny unnecessary access.

To protect important habitat in portions of the project area (i.e., ephemeral draws dominated by basin big sagebrush), areas with sagebrush greater than three feet tall will be avoided where possible.

Additional non-species-specific wildlife mitigations that may reduce and/or eliminate potential impacts to species and associated habitats include the following:

- a. Reserve, work-over, and flare pits and other locations potentially hazardous to wildlife will be adequately protected by netting and/or fencing as directed by the BLM to prohibit wildlife access.
- b. If dead or injured raptors, big game, migratory birds, or unusual wildlife are observed on the project area, Operator personnel will contact the appropriate BLM and WGFD offices. Under no circumstances will dead or injured wildlife be approached or handled by Operator personnel.
- c. Employee and contractor education will be conducted regarding wildlife laws. If violations are discovered on the project area, Operators will immediately notify the appropriate agency. If the violation is committed by an employee or contractor, said employee or contractor will be disciplined and may be dismissed by the Operator and/or prosecuted by the WGFD and/or USFWS.
- d. Operators will implement policies designed to control off-site activities of operation personnel and littering, and will notify all employees (contract and company) that conviction of a violation can result in disciplinary action, including dismissal.
- e. Use of smaller rigs, directional drilling, oak mats, and purpose-built rigs.
- f. When studies become available that indicate the need for changes, modifications of timing or other stipulations would be implemented or deleted based on the findings.

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Additional project- and site-specific mitigation measures may be added in future years, as specified in annual reports.

Table I-1: Summary of general wildlife meeting and reporting requirements

Action	Dates	Responsible Entity
Annual tentative plan of development	By November 15, annually	Operator using format identified in Table I-2a
Annual inventory, monitoring, protection measures, and effects analysis data will be completed	By November 15, annually	Operator using format identified by the BLM for the annual report
Annual reports	Annually: Final—early February	BLM will review and determine if requirements are being met
Annual meeting	December and as necessary	BLM with participation by other agencies and Operators

APPENDIX I—WILDLIFE MITIGATION, MONITORING, AND PROTECTION PLAN

Table I-2a: Summary of references for wildlife inventory and monitoring requirements

Special Status Species; BLM Sensitive Species; Big Game Crucial Winter Range and Migration Corridors; Raptors; Songbirds, Waterfowl, and Shorebirds; Amphibians, Reptiles, and Fish; and General Wildlife Species and Associated Habitats located within and adjacent to the CD-C project area (Operators will be required to use the inventory and monitoring protocols identified below for each species in this table. Changes to the protocols will be based on decisions made by the BLM and will be discussed at the Monitoring without Borders Meetings held each year and at other meetings as deemed appropriate)	
Species / Associated Habitat	Inventory and Monitoring Requirements
Threatened, Endangered, Candidate, and Proposed Species (Special Status Species)	
Black-footed Ferret (E) <i>(Mustela nigripes)</i>	(CD/WII EIS [BLM 2000] and BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36) Habitat, Species: WGFD: WY Wyoming State Wildlife Action Plan- 2010 (WY SWAP 2010) Species Accounts p. IV-2-20 to 2-11; Habitat Section-Sagebrush Shrublands p. III-9-12 to 9-15, Desert Shrublands p. III-3-8 to 3-10 <i>USFWS 1989. Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act. Denver, Colorado, and Albuquerque, New Mexico: U.S. Fish and Wildlife Service. April 1989. 10 pp. + appendices.</i>
Ute Ladies'-Tresses Plant (T) <i>(Spiranthes diluvialis)</i>	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36; Vegetation p. 2-46 to 2-48. Habitat, Species: WGFD: WY SWAP 2010 Aquatic Basins p. III-13-17 to 13-19, Habitat Section-Riparian p. III-8-14 to 8-18, Wetlands p. III-10-11 to 10-13 Rare Plant Mapping: <i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development. Page13.</i> <i>BLM Buffalo Field Office Wildlife Surveys;</i> http://www.blm.gov/wy/st/en/field_offices/Bufalo/wildlife.html
Colorado River Fish Species: bonytail (<i>Gila elegans</i>), Colorado pikeminnow <i>(Ptychocheilus lucius)</i> , humpback chub (<i>Gila cypha</i>), razorback sucker (<i>Xyrauchen texanus</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36 Habitat, Species: WGFD: WY SWAP 2010 Aquatic Basins p. III-13-17 to 13-19, Habitat Section-Riparian p. III-8-14 to 8-18, Wetlands p. III-10-11 to 10-13 Protection Measures: <i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development. Appendix H.</i>
BLM Sensitive Species	
Bat species: long-eared myotis <i>(Myotis evotis)</i> , fringed myotis <i>(Myotis thysanodes)</i> , spotted bat <i>(Euderma maculatum)</i> , Townsend's big-eared bat <i>(Corynorhinus townsendii)</i>	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36 Habitat, Species: WGFD: WY SWAP Species Accounts p. IV-2-41, p. IV-2-27, p. IV-2-77 and p. IV-2-84; spotted bat- Habitat Section-Sagebrush Shrublands p. III-9-12 to 9-15, Aspen/Deciduous Forest p. III-1-11 to 1-13, Cliffs-Canyons-Caves and Rock Outcrops p. III-2-8 to 2-10, Habitat Section-Riparian p. III-8-14 to 8-18, Wetlands p. III-10-11 to 10-13 Bat Carcass Survey, Bat Protection Plan: <i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development. Page 3 and Appendix A.</i> Goodbar, J. R. 1999. Oil and Gas Drilling in Cave and Karst Areas: A Process of Mitigating Impacts. Proceedings of the 1997 Karst and Cave Management Symposium, 13 th National Cave Management Symposium, Bellingham, Washington and Chilliwack and Vancouver Island, BC, Canada, October 7-10, 1997. pp. 195-197. Bat Conservation International. Media and Information Literature Database. Literature Library. www.batcon.org

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Table I-2a: Summary of references for wildlife inventory and monitoring requirements, *continued*

Species / Associated Habitat	Inventory and Monitoring Requirements
Pygmy rabbit (<i>Sylvilagus idahoensis</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-2-70; Habitat Section-Sagebrush Shrublands p. III-9-12 to 9-15, Aspen/Deciduous Forest p. III-1-11 to 1-13
	Survey Protocol: <i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development</i> . Appendix F.
	BLM JIO-PAPO 2012. Pinedale Anticline Project Office, Bureau of Land Management, Pinedale Field Office. < http://www.wy.blm.gov/jio-papo/papo/index.htm >
Wyoming pocket gopher (<i>Thomomys clusius</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-2-97, Desert Shrublands p. III-3-8 to 3-10
	Survey Protocol, Sampling Techniques: <i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development</i> . Appendix I.
White-tailed prairie dog (<i>Cynomys gunnisoni</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	BLM JIO-PAPO 2012. Pinedale Anticline Project Office, Bureau of Land Management, Pinedale Field Office. < http://www.wy.blm.gov/jio-papo/papo/index.htm >
Swift Fox (<i>Vulpes velox</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts, p. IV-2-81; Habitat Section- Sagebrush Shrublands p. III-9-12 to 9-15
Songbirds: loggerhead shrike (<i>Lanius ludovicianus</i>), sage thrasher (<i>Oreoscoptes montanus</i>), Brewer’s sparrow (<i>Spizella breweri</i>), sage sparrow (<i>Amphispiza belli</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-1-29, p. IV-1-112 and p. IV-1-114; Habitat Section-Sagebrush Shrublands p. III-9-12 to 9-15, Foothill Shrublands p. III-4-10 to 4-12
	Fixed Point Count Surveys and Marine Surveillance Radar Surveys: <i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development</i> . pp 3–11.
Shorebirds: white-faced ibis (<i>Plegadis chihi</i>), long-billed curlew (<i>Numenius americanus</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-1-85 and p. IV-1-136, Habitat Section-Riparian p. III-8-14 to 8-18, Wetlands p. III-10-11 to 10-13
	Develop water sources for wildlife in coordination with the WGFD and the BLM water Development Handbook {I-1741-0} (Casper FO RMP)
	Species Survey, Monitoring: U.S. Shorebird Conservation Plan: A Comprehensive Monitoring Program for North American Shorebirds. 2000. Pages 80–81
	Wetlands Regional Monitoring Program Plan 2002, Part 2: Data Collection Protocols Shorebirds, Gary W. Page, Point Reyes Bird Observatory, Stinson Beach CA and Nils Warnock, Point Reyes Bird Observatory, Stinson Beach CA

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Table I-2a: Summary of references for wildlife inventory and monitoring requirements, *continued*

Species / Associated Habitat	Inventory and Monitoring Requirements
Waterfowl: trumpeter swan (<i>Cygnus buccinator</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-1-125, Habitat Section-Riparian p. III-8-14 to 8-18, Wetlands p. III-10-11 to 10-13
	Trumpeter Swan Survey of the Rocky Mountain Population Winter 2011, U.S. Fish and Wildlife Service Migratory Birds and State Programs Mountain-Prairie Region Lakewood, Colorado, April 12, 2011 < http://www.fws.gov/mountain-prairie/species/birds/trumpeterswan/trumpeter_swan_survey_winter_2011.pdf >
	USFWS Red Rock Lakes National Wildlife Refuge. Mountain-Prairie Region. April 1, 2011 < http://www.fws.gov/redrocks/Refuge-Management-Trumpeter-Swan.htm >
Bald eagle (<i>Haliaeetus leucocephalus</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-1-8, Habitat Section-Riparian p. III-8-14 to 8-18, Wetlands p. III-10-11 to 10-13
	<i>Field Protocol for Spatially-Balanced Sampling of Landbird Populations.</i> Hanni, D.J., C.M. White, R.A. Sparks, J.A. Blakesley, G.J. Levandoski, and J.J. Birek. 2010. Unpublished report. Rocky Mountain Bird Observatory, Brighton, CO. 34pp.
	Survey Protocol, Raptor Nesting/Habitat Surveys: <i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development.</i> pp3 – 11 and Appendix G
Ferruginous hawk (<i>Buteo regalis</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-1-55; Habitat Section-Sagebrush Shrublands p. III-9-12 to 9-15
	<i>Field Protocol for Spatially-Balanced Sampling of Landbird Populations.</i> Hanni, D.J., C.M. White, R.A. Sparks, J.A. Blakesley, G.J. Levandoski, and J.J. Birek. 2010. Unpublished report. Rocky Mountain Bird Observatory, Brighton, CO. 34pp.
	Fixed Point Count Surveys and Marine Surveillance Radar Surveys: <i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development.</i> pp3 – 11
	Raptor Nesting/Habitat Surveys: <i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development.</i> Appendix G.
Greater Sage-Grouse (C) (<i>Centrocercus urophasianus</i>)	Annually from April to mid-May to determine lek activity. BLM or BLM-approved Operator-financed biologist. WGFD standard protocols/form required for grouse lek monitoring (CD/WII EIS [BLM 2000] BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36)
	At least every five years. BLM or BLM-approved Operator-financed biologist with Operator-provided financial assistance for aircraft rental will inventory for new leks. RFO (CD/WII EIS [BLM 2000] and BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36)
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-1-69 to 1-70; Habitat Section-Sagebrush Shrublands p. III-9-12 to 9-15, Desert Shrublands p. III-3-8 to 3-10
	<i>Greater Sage-Grouse Habitat Management Policy on Wyoming Bureau of Land Management (BLM) Administered Public Lands including the Federal Mineral Estate.</i> Instruction Memorandum No. WY-2010-012. December 29, 2009. EMS Transmission: January 4, 2010.
	<i>Wyoming Game and Fish Department Greater Sage-Grouse Lek Monitoring Techniques.</i>

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Table I-2a: Summary of references for wildlife inventory and monitoring requirements, *continued*

Species / Associated Habitat	Inventory and Monitoring Requirements
Greater Sage-Grouse (C) <i>continued</i>	Monitoring Techniques, Survey Types: <i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development</i> . Pages 11-12 and Appendix C.
	BLM JIO-PAPO 2012. Pinedale Anticline Project Office, Bureau of Land Management, Pinedale Field Office. < http://www.wy.blm.gov/jio-papo/papo/index.htm >
	In order to resolve conflicts with vegetation treatments adjacent to and within the CD-C project area, refer to the nine (9) steps in the <i>Wyoming Guidelines for Managing Sagebrush Communities with an Emphasis on Fire Management</i> (Wyoming Interagency Vegetation Committee 2002:12)
	Establish a monitoring framework for Sage-Grouse populations and habitat within PHMAs. The monitoring framework will be incorporated into individual project approvals as appropriate and necessary (ARMPA MD SSS 1) using HAF or the best available assessment tool when assessing Sage-Grouse habitats at multiple scales (ARMPA MD GMD 15).
Mountain plover (<i>Charadrius montanus</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-1-92, Habitat Section-Desert Shrublands p. III-3-8 to 3-10
	<i>Mountain Plover Survey Guidelines</i> . U.S. Fish and Wildlife Service. April 2002.
	Annually from May to July. BLM or BLM-approved Operator-financed biologist. Standard form required for mountain plover monitoring.
	Survey Protocol, Survey Guidelines: <i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development</i> . Page 12 and Appendix D.
	Species Survey, Monitoring: <i>U. S. Shorebird Conservation Plan: A Comprehensive Monitoring Program for North American Shorebirds</i> . 2000. Pages 60-61
Burrowing owl (<i>Athene cucularia</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-1-33; Habitat Section-Sagebrush Shrublands p. III-9-12 to 9-15, Desert Shrublands p. III-3-8 to 3-10
	Survey Protocol: <i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development</i> . Page 8 and Appendix B.
Amphibians: northern leopard frog (<i>Rana pipiens</i>), Great Basin spadefoot toad (<i>Spea intermontana</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-4-9, Habitat Section-Riparian p. III-8-14 to 8-18, Foothill Shrublands p. III-4-10 to 4-12, Wetlands p. III-10-11 to 10-13
	Habitat, Acoustic and Visual Survey Protocol: <i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development</i> . Page 7.
Fish: Colorado River cutthroat trout (<i>Oncorhynchus clarkii pleuriticus</i>), roundtail chub (<i>Gila robusta</i>), flannelmouth sucker (<i>Catostomus latipinnis</i>), and bluehead sucker (<i>Catostomus discobolus</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-3-19, p. IV-3-68, p. IV-3-28 and p. IV-3-3; III-13-17 thru 13-19; Aquatic Basins p. III-13-17 to 13-19, Habitat Section-Riparian p. III-8-14 to 8-18, Wetlands p. III-10-11 to 10-13
	AZ Game and Fish Department Fish Survey Techniques 2009. < http://www.azgfd.gov/w_c/Fish_Survey_Techniques.shtml >
	Hydroacoustics: Lakes and Reservoirs. J. Christopher Taylor, Suzanne L. Maxwell. < http://www.stateofthesalmon.org/fieldprotocols/downloads/SFPH_p5-.pdf >

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Table I-2a: Summary of references for wildlife inventory and monitoring requirements, *continued*

Species / Associated Habitat	Inventory and Monitoring Requirements
Meadow milkvetch plant (<i>Astragalus diversifolius</i> var. <i>diversifolius</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Aquatic Basins p. III-13-17 to 13-19, Habitat Section-Riparian p. III-8-14 to 8-18, Wetlands p. III-10-11 to 10-13
Cedar Rim thistle plant (<i>Cirsium aridum</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Habitat Section-Desert Shrublands p. III-3-8 to 3-10, Cliffs-Canyons-Caves and Rock Outcrops p. III-2-8 to 2-10
Gibbens' beardtongue plant (<i>Penstemon gibbensii</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Habitat Section-Desert Shrublands p. III-3-8 to 3-10, Cliffs-Canyons-Caves and Rock Outcrops p. III-2-8 to 2-10
Persistent sepal yellowcress plant (<i>Rorippa calycina</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Aquatic Basins p. III-13-17 to 13-19, Habitat Section-Riparian p. III-8-14 to 8-18, Wetlands p. III-10-11 to 10-13
Big Game Crucial Winter Range, Migration Corridors, and Associated Habitats	
Big Game Crucial Winter Range	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	WGFD: BLM will request data from WGFD
	Habitat, Species: WGFD: Habitat Section Sagebrush Shrublands p. III-9-12 to 9-15, Foothill Shrublands p. III-4-10 to 4-12, Desert Shrublands p. III-3-8 to 3-10
	Radio or satellite telemetry to determine big game movement
	Pellet Count Surveys
	BLM JIO-PAPO 2012. Pinedale Anticline Project Office, Bureau of Land Management, Pinedale Field Office. < http://www.wy.blm.gov/jio-papo/papo/index.htm >
Big Game Migration Corridors	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: Habitat Section Sagebrush Shrublands p. III-9-12 to 9-15, Foothill Shrublands p. III-4-10 to 4-12, Desert Shrublands p. III-3-8 to 3-10
	BLM JIO-PAPO 2012. Pinedale Anticline Project Office, Bureau of Land Management, Pinedale Field Office. < http://www.wy.blm.gov/jio-papo/papo/index.htm >

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Table I-2a: Summary of references for wildlife inventory and monitoring requirements, *continued*

Species / Associated Habitat	Inventory and Monitoring Requirements
Raptors and Associated Habitats	
Raptors (Non-Special Status Species and BLM Sensitive Species)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts, Species of Greatest Conservation Need-other bird species
	Annually from April to July to determine nest activity. BLM or BLM-approved Operator-financed biologist. Standard form required for raptor nest monitoring
	At least every five years. BLM or BLM-approved Operator-financed biologist with Operator-provided financial assistance for aircraft rental.
	<i>Field Protocol for Spatially-Balanced Sampling of Landbird Populations.</i> Hanni, D.J., C.M. White, R.A. Sparks, J.A. Blakesley, G.J. Levandoski, and J.J. Birek. 2010. Unpublished report. Rocky Mountain Bird Observatory, Brighton, CO. 34pp.
	Survey Protocol, Avian Protection Plan: <i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development.</i> p. 3–11 for Fixed Point Count Surveys and Marine Surveillance Radar Surveys.
	<i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development.</i> Appendix G.
Songbirds, Waterfowl, and Shorebirds and Associated Habitats	
Songbirds, waterfowl, and shorebirds and associated habitats (Non-Special Status Species and BLM Sensitive Species)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts, Species of Greatest Conservation Need-other bird species, Habitat Section-Riparian p. III-8-14 to 8-18 – other species
	<i>Field Protocol for Spatially-Balanced Sampling of Landbird Populations.</i> Hanni, D.J., C.M. White, R.A. Sparks, J.A. Blakesley, G.J. Levandoski, and J.J. Birek. 2010. Unpublished report. Rocky Mountain Bird Observatory, Brighton, CO. 34pp.
	Survey Protocol: <i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development.</i> pp3 – 11 for Fixed Point Count Surveys and Marine Surveillance Radar Surveys.
	Species Survey, Monitoring: <i>U. S. Shorebird Conservation Plan: A Comprehensive Monitoring Program for North American Shorebirds.</i> 2000. Pages 60-61, 80-81
Amphibians, Reptiles, and Fish and Associated Habitats	
Amphibians, reptiles, and fish and associated habitats (Non-Special Status Species and BLM Sensitive Species)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts, Species of Greatest Conservation Need-other amphibian, reptile and fish species; WY SWAP 2010 Aquatic Basins p. III-13-17 to 13-19 – other fish species, Habitat Section-Riparian p. III-8-14 to 8-18 – other species
	Habitat Mapping, Acoustic Breeding Surveys, Visual Surveys Amphibians/Reptiles: <i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development,</i> p 7.
	AZ Game and Fish Department Fish Survey Techniques. 2009. < http://www.azgfd.gov/w_c/Fish_Survey_Techniques.shtml >
	Hydroacoustics: Lakes and Reservoirs (Taylor and Maxwell 2007) < http://www.stateofthesalmon.org/fieldprotocols/downloads/SFPH_p5.pdf >

APPENDIX I—WILDLIFE MITIGATION, MONITORING, AND PROTECTION PLAN

Table I-2a: Summary of references for wildlife inventory and monitoring requirements, *continued*

Species / Associated Habitat	Inventory and Monitoring Requirements
General Wildlife Species and Associated Habitats	
General Wildlife Species	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts, Species of Greatest Conservation Need-crustacean and mollusk species
	General Wildlife Observation Data Sheet. Surveys will be conducted in adherence with protocol to be established by the BLM, other agencies and Operators and Operators may provide financial assistance for these investigations
	Additional inventory and monitoring measures may be applied for other species as specified in annual reports. BLM with participation by other agencies and Operators.

APPENDIX I—WILDLIFE MITIGATION, MONITORING, AND PROTECTION PLAN

Table I-2b. Summary of references for wildlife protection measures, cause and effect studies, and adaptive management requirements: wildlife and associated habitats

Special Status Species; BLM Sensitive Species; Big Game Crucial Winter Range and Migration Corridors; Raptors; Songbirds, Waterfowl, and Shorebirds; Amphibians, Reptiles, and Fish; and General Wildlife Species and associated habitats located within and adjacent to the CD-C project area (Operators will be required to use the inventory and monitoring protocols identified below for each species in this table. Changes to the protocols will be based on decisions made by the BLM and will be discussed at the Monitoring without Borders Meetings held each year and other meetings as deemed appropriate)	
Species / Habitat	Protection Measures, Cause and Effect Studies and Adaptive Management Requirements
Threatened, Endangered, Candidate, and Proposed Species (Special Status Species) and Associated Habitats	
Black-footed Ferret (E) <i>(Mustela nigripes)</i>	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36 Habitat, Species: WGFD: WY Wyoming State Wildlife Action Plan- 2010 (WY SWAP 2010) Species Accounts p. IV-2-20 to 2-11; Habitat Section-Sagebrush Shrublands p. III-9-12 to 9-15, Desert Shrublands p. III-3-8 to 3-10
Ute Ladies'-Tresses Plant (T) <i>(Spiranthes diluvialis)</i>	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36 Habitat, Species: WGFD: WY SWAP 2010 Aquatic Basins p. III-13-17 to 13-19, Habitat Section-Riparian p. III-8-14 to 8-18, Wetlands p. III-10-11 to 10-13
Colorado River Fish Species: bonytail (<i>Gila elegans</i>), Colorado pikeminnow (<i>Ptychocheilus lucius</i>), humpback chub (<i>Gila cypha</i>), razorback sucker (<i>Xyrauchen texanus</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36 Habitat, Species: WGFD: WY SWAP 2010 Aquatic Basins p. III-13-17 to 13-19, Habitat Section-Riparian p. III-8-14 to 8-18, Wetlands p. III-10-11 to 10-13
BLM Sensitive Species (Plants/Animals) and Associated Habitats	
Bat species: long-eared myotis (<i>Myotis evotis</i>), fringed myotis (<i>Myotis thysanodes</i>), spotted bat (<i>Euderma maculatum</i>), Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36 Habitat, Species: WGFD: WY SWAP Species Accounts p. IV-2-41, p. IV-2-27, p. IV-2-77 and p. IV-2-84; spotted bat- Habitat Section-Sagebrush Shrublands p. III-9-12 to 9-15, Aspen/Deciduous Forest p. III-1-11 to 1-13, Cliffs-Canyons-Caves and Rock Outcrops p. III-2-8 to 2-10, Habitat Section-Riparian p. III-8-14 to 8-18, Wetlands p. III-10-11 to 10-13
	Bat Carcass Survey Protocol, Bat Protection Plan: <i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development</i> . Page 3 and Appendix A. <u>Bat Carcass Survey</u>
	Goodbar, J. R. 1999. Oil and Gas Drilling in Cave and Karst Areas: A Process of Mitigating Impacts. Proceedings of the 1997 Karst and Cave Management Symposium, 13 th National Cave Management Symposium, Bellingham, Washington and Chilliwack and Vancouver Island, BC, Canada, October 7-10, 1997. pp. 195-197.
	Acoustic, Carcass, Mortality Surveys: SWCA Environmental Consultants. <i>Avian and Bat Protection Plan for the Spring Valley Wind Energy Facility</i> . 2010. Prepared for Spring Valley Wind LLC, 1600 Smith Street, Suite 4025, Houston, Texas 77002. Prepared by SWCA Environmental Consultants, 7373 Peak Drive, Suite 170, Las Vegas, Nevada 89128.
	Bat Conservation International. Media and Information Literature Database. Literature Library. www.batcon.org

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Table I-2b. Summary of references for wildlife protection measures, cause and effect studies, and adaptive management requirements: wildlife and associated habitats, *continued*

Species / Habitat	Protection Measures, Cause and Effect Studies and Adaptive Management Requirements
Bat species, <i>continued</i>	Develop water sources for wildlife in coordination with the WGFD and the BLM water Development Handbook {I-1741-0} (Casper FO RMP) WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> . Version 6.0.
Pygmy rabbit (<i>Sylvilagus idahoensis</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36; RFO Wildlife Attachment Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-2-70; Habitat Section-Sagebrush Shrublands p. III-9-12 to 9-15, Aspen/Deciduous Forest p. III-1-11 to 1-13 BLM JIO-PAPO 2012. Pinedale Anticline Project Office, Bureau of Land Management, Pinedale Field Office. < http://www.wy.blm.gov/jio-papo/papo/index.htm > WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> . Version 6.0.
Wyoming pocket gopher (<i>Thomomys clusius</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36; RFO Wildlife Attachment Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-2-97, Desert Shrublands p. III-3-8 to 3-10 Surveys, Sampling Approach: <i>Bureau of Land Management High Desert District Wildlife and Plant Survey Protocols for Wind Energy Development</i> . Appendix I. WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> . Version 6.0.
White-tailed prairie dog (<i>Cynomys gunnisoni</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36 BLM JIO-PAPO 2012. Pinedale Anticline Project Office, Bureau of Land Management, Pinedale Field Office. < http://www.wy.blm.gov/jio-papo/papo/index.htm > WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> . Version 6.0.
Swift Fox (<i>Vulpes velox</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36 WGFD: WY SWAP 2010 Species Accounts, p. IV-2-81; Habitat Section-Sagebrush Shrublands p. III-9-12 to 9-15 WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> . Version 6.0.
Songbird: loggerhead shrike (<i>Lanius ludovicianus</i>), sage thrasher (<i>Oreoscoptes montanus</i>), Brewer's sparrow (<i>Spizella breweri</i>), sage sparrow (<i>Amphispiza belli</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36 Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-1-29, p. IV-1-112 and p. IV-1-114; Habitat Section-Sagebrush Shrublands p. III-9-12 to 9-15, Foothill Shrublands p. III-4-10 to 4-12 WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> . Version 6.0.

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Table I-2b. Summary of references for wildlife protection measures, cause and effect studies, and adaptive management requirements: wildlife and associated habitats, *continued*

Species / Habitat	Protection Measures, Cause and Effect Studies and Adaptive Management Requirements
Shorebirds: white-faced ibis (<i>Plegadis chihi</i>), long-billed curlew (<i>Numenius americanus</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-1-85 and p. IV-1-136, Habitat Section-Riparian p. III-8-14 to 8-18, Wetlands p. III-10-11 to 10-13
	Develop water sources for wildlife in coordination with the WGFD and the BLM water Development Handbook {I-1741-0} (Casper FO RMP)
	WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> . Version 6.0.
Waterfowl: trumpeter swan (<i>Cygnus buccinator</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-1-125, Habitat Section-Riparian p. III-8-14 to 8-18, Wetlands p. III-10-11 to 10-13
	Develop water sources for wildlife in coordination with the WGFD and the BLM water Development Handbook {I-1741-0} (Casper FO RMP)
	Energy Development and Wildlife Conservation in Western North America, David E Naugle 2011.
	Wetlands Regional Monitoring Program Plan 2002, Part 2: Data Collection Protocols Wetland Birds, Wetland Bird Monitoring, Developed by the Bird Focus Group Wetland Regional Monitoring Program
	WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> . Version 6.0.
Bald eagle (<i>Haliaeetus leucocephalus</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36; RFO Wildlife Attachment
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-1-8, Habitat Section-Riparian p. III-8-14 to 8-18, Wetlands p. III-10-11 to 10-13
	<i>Field Protocol for Spatially-Balanced Sampling of Landbird Populations</i> . Hanni, D.J., C.M. White, R.A. Sparks, J.A. Blakesley, G.J. Levandoski, and J.J. Birek. 2010. Unpublished report. Rocky Mountain Bird Observatory, Brighton, CO. 34pp.
	WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> . Version 6.0.
Ferruginous hawk (<i>Buteo regalis</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-1-55; Habitat Section-Sagebrush Shrublands p. III-9-12 to 9-15
	WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> . Version 6.0.
Greater Sage-Grouse (C) (<i>Centrocercus urophasianus</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-1-69 to 1-70; Habitat Section-Sagebrush Shrublands p. III-9-12 to 9-15, Desert Shrublands p. III-3-8 to 3-10
	Approved Resource Management Plan Amendment for Greater Sage-Grouse (ARMPA)/Record of Decision (BLM 2015b)
	BLM JIO-PAPO 2012. Pinedale Anticline Project Office, Bureau of Land Management, Pinedale Field Office. < http://www.wy.blm.gov/jio-papo/papo/index.htm >

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Table I-2b. Summary of references for wildlife protection measures, cause and effect studies, and adaptive management requirements: wildlife and associated habitats, *continued*

Species / Habitat	Protection Measures, Cause and Effect Studies and Adaptive Management Requirements
Greater Sage-Grouse (C), <i>continued</i>	In order to resolve conflicts with vegetation treatments adjacent to and within the CD-C project area, refer to the nine (9) steps in the <i>Wyoming Guidelines for Managing Sagebrush Communities with an Emphasis on Fire Management</i> (Wyoming Interagency Vegetation Committee 2002:12) WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> . Version 6.0.
Mountain plover (<i>Charadrius montanus</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36; RFO Wildlife Attachment Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-1-92, Habitat Section-Desert Shrublands p. III-3-8 to 3-10 WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> . Version 6.0.
Burrowing owl (<i>Athene cunicularia</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36; RFO Wildlife Attachment Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-1-33; Habitat Section-Sagebrush Shrublands p. III-9-12 to 9-15, Desert Shrublands p. III-3-8 to 3-10 WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> . Version 6.0.
Amphibians: northern leopard frog (<i>Rana pipiens</i>), Great Basin spadefoot toad (<i>Spea intermontana</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36 Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-4-9, Habitat Section-Riparian p. III-8-14 to 8-18, Foothill Shrublands p. III-4-10 to 4-12, Wetlands p. III-10-11 to 10-13 Develop water sources for wildlife in coordination with the WGFD and the BLM water Development Handbook {I-1741-0} (Casper FO RMP) Place water development s and salt and mineral supplements for livestock at least 500 feet from known or potential locations of this plant species (Casper FO RMP 2007) Improve floodplain connectivity and function of stream miles (Casper FO RMP 2007). WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> . Version 6.0.
Fish: Colorado River cutthroat trout (<i>Oncorhynchus clarkii pleuriticus</i>), roundtail chub (<i>Gila robusta</i>), flannelmouth sucker (<i>Catostomus latipinnis</i>), and bluehead sucker (<i>Catostomus discobolus</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36 Habitat, Species: WGFD: WY SWAP 2010 Species Accounts p. IV-3-19, p. IV-3-68, p. IV-3-28 and p. IV-3-3; III-13-17 thru 13-19; Aquatic Basins p. III-13-17 to 13-19, Habitat Section-Riparian p. III-8-14 to 8-18, Wetlands p. III-10-11 to 10-13 WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> . Version 6.0.
Meadow milkvetch plant (<i>Astragalus diversifolius</i> var. <i>diversifolius</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36 Habitat, Species: WGFD: WY SWAP 2010 Aquatic Basins p. III-13-17 to 13-19, Habitat Section-Riparian p. III-8-14 to 8-18, Wetlands p. III-10-11 to 10-13 Place water development s and salt and mineral supplements for livestock at least 500 feet from known or potential locations of this plant species (Casper FO RMP 2007)

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Table I-2b. Summary of references for wildlife protection measures, cause and effect studies, and adaptive management requirements: wildlife and associated habitats, *continued*

Species / Habitat	Protection Measures, Cause and Effect Studies and Adaptive Management Requirements
Cedar Rim thistle plant (<i>Cirsium aridum</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Habitat Section-Desert Shrublands p. III-3-8 to 3-10, Cliffs-Canyons-Caves and Rock Outcrops p. III-2-8 to 2-10
Gibbens' beardtongue plant (<i>Penstemon gibbensii</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Habitat Section-Desert Shrublands p. III-3-8 to 3-10, Cliffs-Canyons-Caves and Rock Outcrops p. III-2-8 to 2-10
Persistent sepal yellowcress plant (<i>Rorippa calycina</i>)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Aquatic Basins p. III-13-17 to 13-19, Habitat Section-Riparian p. III-8-14 to 8-18, Wetlands p. III-10-11 to 10-13
	Place water development s and salt and mineral supplements for livestock at least 500 feet from known or potential locations of this plant species (Casper FO RMP 2007)
Big Game Crucial Winter Range, Migration Corridors, and Associated Habitats	
Big Game Crucial Winter Range	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	WGFD: BLM will request data from WGFD
	Habitat, Species: WGFD: Habitat Section Sagebrush Shrublands p. III-9-12 to 9-15, Foothill Shrublands p. III-4-10 to 4-12, Desert Shrublands p. III-3-8 to 3-10
	BLM JIO-PAPO 2012. Pinedale Anticline Project Office, Bureau of Land Management, Pinedale Field Office. < http://www.wy.blm.gov/jio-papo/papo/index.htm >
	WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> . Version 6.0.
Big Game Migration Corridors	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36; RFO Wildlife Attachment
	Habitat, Species: WGFD: Habitat Section Sagebrush Shrublands p. III-9-12 to 9-15, Foothill Shrublands p. III-4-10 to 4-12, Desert Shrublands p. III-3-8 to 3-10
	BLM JIO-PAPO 2012. Pinedale Anticline Project Office, Bureau of Land Management, Pinedale Field Office. < http://www.wy.blm.gov/jio-papo/papo/index.htm >
	WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> . Version 6.0.
Raptors and Associated Habitats	
Raptors (Non-Special Status Species and BLM Sensitive Species)	BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36
	Habitat, Species: WGFD: WY SWAP 2010 Species Accounts, Species of Greatest Conservation Need-other bird species
	WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> . Version 6.0.

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Table I-2b. Summary of references for wildlife protection measures, cause and effect studies, and adaptive management requirements: wildlife and associated habitats, *continued*

Species / Habitat	Protection Measures, Cause and Effect Studies and Adaptive Management Requirements
Songbirds, Waterfowl, and Shorebirds and Associated Habitats	
Songbirds, waterfowl, and shorebirds and associated habitats (Non-Special Status Species and BLM Sensitive Species)	<p>BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36</p> <p>Habitat, Species: WGFD: WY SWAP 2010 Species Accounts, Species of Greatest Conservation Need-other bird species, Habitat Section-Riparian p. III-8-14 to 8-18 – other species</p> <p>Develop water sources for wildlife in coordination with the WGFD and the BLM water Development Handbook {I-1741-0} (Casper FO RMP)</p> <p>Place water development s and salt and mineral supplements for livestock at least 500 feet from known or potential locations of this plant species (Casper FO RMP 2007)</p> <p>WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i>. Version 6.0.</p>
Amphibians, Reptiles, and Fish and Associated Habitats	
Amphibians, reptiles, and fish and associated habitats (Non-Special Status Species and BLM Sensitive Species)	<p>BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36; RFO Wildlife Attachment</p> <p>Habitat, Species: WGFD: WY SWAP 2010 Species Accounts, Species of Greatest Conservation Need-other amphibian, reptile and fish species; WY SWAP 2010 Aquatic Basins p. III-13-17 to 13-19 – other fish species, Habitat Section-Riparian p. III-8-14 to 8-18 – other species</p> <p><i>Develop water sources for wildlife in coordination with the WGFD and the BLM water Development Handbook {I-1741-0} (Casper FO RMP)</i></p> <p><i>Place water development s and salt and mineral supplements for livestock at least 500 feet from known or potential locations of this plant species (Casper FO RMP 2007)</i></p> <p>Improve floodplain connectivity and function of stream miles (Casper FO RMP 2007).</p> <p>WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i>. Version 6.0.</p>
General Wildlife Species and Associated Habitats	
General Wildlife Species	<p>BLM 2008a – Wildlife and Fisheries p. 2-51 to 2-55; Appendices 8, 10, 14, 15, 17, 26, and 36</p> <p>Habitat, Species: WGFD: WY SWAP 2010 Species Accounts, Species of Greatest Conservation Need-crustacean and mollusk species</p> <p>Develop water sources for wildlife in coordination with the WGFD and the BLM water Development Handbook {I-1741-0} (Casper FO RMP)</p> <p>WGFD. Revised April 2010. <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i>. Version 6.0.</p>

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