Energy Gateway South Transmission Project

Biological Assessment

Prepared for

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LIST OF ACRONYMS AND ABBREVIATIONS

AC	Alternating current
AOU	American Ornithologists' Union
APLIC	Avian Power Line Interaction Committee
AZGFD	Arizona Game and Fish Department
BA	Biological Assessment
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BRTG	Biological Resources Task Group
CHU	Critical habitat unit
CIC	Compliance Inspection Contractor
CFR	Code of Federal Regulations
COT	Conservation Objectives Team
CWA	Clean Water Act
dB	Decibels
dBA	Decibels (A-weighted)
DNA	Deoxribonucleic acid
DPS	Distinct Population Segment
EIS	Environmental Impact Statement
EPG	Environmental Planning Group
ESA	Endangered Species Act of 1973
ESCA	Endangered Species Conservation Act
ESPA	Endangered Species Preservation Act
ExPA	Experimental Population Area
FLPMA	Federal Land Policy and Management Act of 1976
FR	Federal Register
FWS	U.S. Fish and Wildlife Service
GIS	Geographic Information System
HEA	Habitat Equivalency Analysis
IM	Instruction Memorandum
IPaC	Information Planning and Conservation Database
kV	Kilovolt
NEP	Nonessential Experimental Population
NEPA	National Environmental Policy Act
NTST	National Transmission Support Team

PAC	Priority Areas for Conservation
PCE	Primary constituent element
POD	Plan of Development
Project	Energy Gateway South Transmission Project
Proponent	PacifiCorp, doing business as Rocky Mountain Power (Applicant for right-of-way grant)
UDWR	Utah Division of Wildlife Resources
UNHP	Utah Natural Heritage Program
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
WO	Washington Office

1.0 INTRODUCTION

In December 2008, PacifiCorp (doing business as Rocky Mountain Power, the Proponent) submitted an Application for Transportation and Utility Systems and Facilities on Federal Lands (Standard Form 299) to the Bureau of Land Management (BLM) and the U.S. Forest Service (USFS) for constructing, operating, and maintaining the Energy Gateway South Transmission Line Project (the Project). As described in the Proponent's Project description, the Project will be constructed as a single-circuit, alternating-current (AC), 500-kilovolt (kV) transmission line and also will include the rebuilding of two existing 345kV transmission lines in existing rights-of-way. The BLM, as the lead federal agency in coordination with 28 federal, state, and county cooperating agencies (refer to Chapter 6 in the Environmental Impact Statement [EIS] for a list of agencies), is preparing an EIS to evaluate and disclose the potential Project-related environmental impacts that could result from implementation of the action proposed by the Proponent (Proposed Action) and alternatives of the Proposed Action.

The BLM and cooperating agencies, analyzed through the EIS, the Proponent's plan for and the potential environmental impacts of constructing, operating, and maintaining the Project and amending BLM and USFS land-use plans to accommodate the proposed transmission line. Based on the analysis presented in the EIS, the decisions to be made by federal land-management agencies for the agency-preferred route include the following: (1) the BLM will issue a Record of Decision on whether or not to grant the Proponent a right-of-way for the Proposed Action on land administered by the BLM; (2) the USFS will issues a Record of Decision on whether or not to issue a special-use authorization to cross land administered by the USFS; and (3) the Ute Indian Tribe and/or Indian landowners will decide whether or not land within the boundaries of the Uintah and Ouray Indian Reservation and allotted lands may be crossed and, if such lands are crossed, the Bureau of Indian Affairs (BIA) will issue encroachment permits and grants of easement for the Proposed Action. The Proponent's interests and objectives; the purpose of the federal action; a description of the Project; and potential major federal, tribal, state, and local permits or licenses required are provided in more detail in Chapters 1 and 2 and Appendices A and B of the EIS.

Section 7 of the Endangered Species Act (ESA) of 1973, as amended, requires federal agencies, in consultation with the U.S. Fish and Wildlife Service (FWS), to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. Federal agencies may initiate formal consultation with the FWS by submitting a Biological Assessment (BA) to the FWS and requesting initiation of consultation. This BA was prepared for the Project by Environmental Planning Group, LLC (EPG), on behalf of the BLM and federal cooperating agencies with jurisdiction over potentially affected resources (FWS, USFS, BLM, U.S. Army Corps of Engineers [USACE], and BIA) to fulfil agency obligations under Section 7(a)(2) of the ESA for the agency-preferred route as identified by the BLM in coordination with cooperating agencies. This BA addresses the potential for the Project to affect species listed by the FWS as threatened or endangered under the ESA or those that are proposed or candidate species for such listing across all jurisdictions and land ownership. Candidate species or species undergoing status review prior to any listing determinations are discussed in an advisory context in this document as their listing status may change over the timeline of Project development. No consultation or impact avoidance actions pertaining to Section 7 of the ESA are required for those species while under review, although they may have special conservation status with other agencies.

Section 7(d) of the ESA prohibits federal agencies and permit applicants from making any "irreversible or irretrievable commitment of resources" prior to completion of Section 7 consultation that would have the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative measures. Irreversible commitments of resources are those that would be committed to the Project

throughout the life of the Project. Irretrievable commitments of resources are uses of resources that are neither renewable nor recoverable for use during or beyond the life of the Project. As required under the ESA, the BLM will reinitiate Section 7 consultation with the FWS in the event the results of resource surveys, environmental monitoring, or ongoing coordination among the BLM, Proponent, and other relevant parties indicate the effects of the Project may exceed the effects identified through the Section 7 consultation process. Section 7 consultation will also be reinitiated if the status of a species or its critical habitat changes after the consultation is concluded or if the Project is modified to include effects that were not considered in this consultation.

1.1 Consultation History

Informal consultation for the Project began with the submittal of written correspondence to the FWS from the BLM on July 23, 27, and 30, 2009. At the direction of the FWS, the BLM obtained lists of ESA-listed threatened, endangered, proposed, and candidate species with the potential to exist in the Project area from the FWS. The species lists have been updated as new lists become available to reflect the current listing status of all ESA-listed and candidate species found in counties potentially crossed by the Project.

Informal consultation between the BLM (including cooperating agencies) and FWS has continued throughout the development of the EIS and has included meetings, conference calls, letters, and other correspondence. In early 2010, the BLM established the Biological Resources Task Group (BRTG) composed of the biologists from the BLM, USFS, FWS, and the state wildlife agencies. The group meets via conference call once a month to discuss the status of the Project, issues, and approach to addressing key biological resource issues.

In early 2011 the FWS, BLM, USFS, BIA, and USACE (federal agencies with the authority and responsibility to perform certain actions associated with the Project) entered into a Consultation Agreement. Additional federal agencies signed the Agreement in 2013 (i.e., Utah Reclamation Mitigation and Conservation Commission, National Park Service). The Agreement addresses interagency coordination for the affirmative conservation and recovery of listed species under Section 7(a)(1) of the ESA. Section 7(a)(1) directs all federal agencies to use their authorities in furtherance of the purposes of the ESA by "carrying out programs for the conservation and recovery of listed species." Pursuant to Section 7(a)(1), the Agreement clarifies agency roles during consultation under Section 7(a)(2) for the direct, indirect, and cumulative effects of the Proposed Action on listed species, species proposed for listing, and their associated designated or proposed critical habitat. In coordination with appropriate state natural-resource management agencies that have trust authority for nonlisted species, the Agreement also speaks to interagency coordination for the conservation of, and assessment of effects on, candidate species that may be affected by the Proposed Action.

The BLM, in cooperation with the appropriate cooperating agencies, prepared a BA to initiate formal consultation with the FWS and fulfill agency obligations under Section 7(a)(2) of the ESA for the agency-preferred route. A draft BA was prepared in coordination with the BRTG and provided to the FWS and cooperating agencies for a courtesy review in early January 2015.

1.2 Project Location

Multiple alternative routes were analyzed and addressed in the EIS prepared by the BLM in collaboration with cooperating agencies. Through a systematic environmental review process, the number of alternative routes was narrowed to the route preferred by the agencies (refer to EIS Chapter 2, Section 2.5 for a description of the process). The BA addresses only the alternative route preferred by the agencies (refer to Map 1, Appendix A). In the EIS, this agency-preferred route is described as a combination of a route segment in the northern portion of the Project area (Links W15, W21, W30, W32, W35, W36, W101,

W108, W113, W116, W125, W302, W411, C31, C61, C71, C91, C94, C95, and C175 [referred to in the EIS as Alternative WYCO-B]) and a route segment in the southern portion of the Project area (Links C186, C188, U242, U280, U285, U300, U400, U401, U404, U406, U408, U411, U413, U417, U418, U445, U460, U504, U508, U514, U516, U530, U533, U539, U560, U621, U625, U638, U639, and U650 [referred to in the EIS as Alternative COUT-C]). The agency-preferred route crosses Carbon and Sweetwater counties in Wyoming, Moffat and Rio Blanco counties in Colorado, and Duchesne, Sanpete, Uintah, Utah, Wasatch, and Juab counties in Utah.

The agency-preferred route begins in Wyoming at the planned Aeolus Substation (a separate planned action that is not a part of the Project) and crosses Interstate 80 approximately 10 miles east of Sinclair, Wyoming. The route continues west on the southern side of Interstate 80 (approximately 3 to 5 miles south) for approximately 57 miles at which point it parallels Wamsutter Road (on the east side of the road) south for approximately 15 miles. At that point, the route continues southwest crossing Flat Top Mountain, continuing toward the Wyoming and Colorado border, approximately 22 miles west of Baggs, Wyoming.

In Colorado, the route continues south/southwest through the Sevenmile Ridge area where it crosses the Little Snake River, the western edge of the Godiva Rim, and Colorado State Highway 318 in an area approximately 10 miles northwest of Maybell, Colorado. The route continues south crossing the Yampa River 5 miles northeast of Cross Mountain Gorge, and then U.S. Highway 40 at a point approximately 12 miles southwest of Maybell. The route continues southwest for approximately 22 miles paralleling the existing Bonanza to Bears Ears 345kV and the Hayden to Artesia 138kV transmission lines to a point south of U.S. Highway 40, approximately 20 miles east of Dinosaur, Colorado. From this point, the route continues west toward the Colorado/Utah border.

In Utah, the route continues southwest paralleling the existing Bonanza to Bears Ears 345kV transmission line to approach the town of Bonanza, Utah. The route continues to the west and crosses the Green River approximately 8 miles north of Sand Wash boat launch, continuing west towards the western end of the Tavaputs Plateau. Within the plateau, it traverses through Argyle Ridge for approximately 12 miles in a southwest direction toward U.S. Highway 191, following U.S. Highway 191 through Indian Canyon for approximately 2 miles; it then crosses the highway heading west/northwest toward Solder Summit for a distance of approximately 21 miles. The route continues west toward U.S. Highway 6 and parallels the Spanish Fork to Carbon 138kV transmission line northwest for approximately 25 miles. It continues paralleling the Bonanza to Mona 345kV transmission line toward Thistle, Utah, turning south and crosses U.S. Highway 89 near Birdseye, Utah, continuing south/southwest to a point approximately 5 miles north of Fountain Green, Utah. The route continues to parallel the Bonanza to Mona 345kV transmission line west through Salt Creek Canyon, south of Mount Nebo, toward Nephi, Utah, and the 500kV transmission line segment's terminus at the Clover Substation. The two existing 345kV transmission lines proposed for rebuilding cross between the Clover and Mona substations, which are approximately 3 miles apart.

1.3 Preparation of Plan of Development

The BLM requires preparation of a Plan of Development (POD) to guide implementation and maintenance of the Project as a condition of any federal land-use authorization. The POD will be incorporated by reference into federal right-of-way grants, special-use permits, license agreements, and other technical documents as needed. Thereby, the Proponent agrees to be bound by all terms and conditions, stipulations, and mitigation prescribed in such documents. Any change to the POD after issuance of the notice to proceed would require National Environmental Policy Act (NEPA) review through a variance of or amendment to the POD.

The POD provides direction to the Proponent's construction personnel, construction contractor(s) and crews, compliance inspection contractor, environmental monitors, and agency personnel regarding specifications of construction, operation, and maintenance such as exact approved locations of transmission-line structures and other facilities and measures that must be implemented as a condition of BLM's right-of-way grant to reduce the environmental impacts of the Project.

A draft POD, referred to as the NEPA POD, is being prepared and will be reviewed by the agencies prior to the BLM and other federal agencies issuing a Record of Decision for the Project. The POD will be refined when resource pedestrian surveys (e.g., biological, cultural, and paleontological resources) have been completed and the resulting reports have been approved by the agency (or agencies) responsible for overseeing the surveys. Refinements to the locations where environmental protection measures would be applied in the POD will be incorporated based on the results of the surveys and the agencies will be asked to review the refined POD, referred to as the Construction POD. The locations of structures, access roads, and other facilities may be altered as required by selective mitigation measures required by the BLM or other agencies' Records of Decision based on the results of resource surveys. The POD also will contain all conservation measures identified though the Section 7 consultation process.

The POD also will provide direction to the agencies' and Proponent's personnel for operation and maintenance of the Project. The content of the POD, which is carried forward from and/or refined from the information and data disclosed in the EIS, will consist of (1) background information, direction, and implementation plans and (2) detailed mapping to facilitate execution of environmental protection and selective mitigation measures. Background information and direction includes the Project description, including an explanation of the Proponent's and agencies' roles and responsibilities; description of construction, operation, and maintenance activities; specification of land use and access; and description of design features and other measures for environmental protection to avoid sensitive environmental resources.

ESA-listed threatened or endangered species or species that are proposed or candidates for listing will be considered in accordance with management policies set forth by appropriate land-management or wildlife-management agencies. Conservation measures developed through the NEPA process and Section 7 consultation to address direct and indirect effects on species will be incorporated into the Biological Resources Conservation Measures Plan to be developed for the POD. The purpose of this plan will be to assist the BLM, USFS, and Proponent personnel in meeting their obligations to protect biological resources during construction, operation, and maintenance of the Project. All relevant BLM and FWS requirements (including monitoring) will be included in this plan and the Project will be required to be constructed and operated in compliance with stipulations in this plan.

The supporting implementation plans of relevance to biological resources that will be included in the POD are listed and described in Table 1-1.

TABLE 1-1 IMPLEMENTATION PLANS FOR THE PLAN OF DEVELOPMENT OF RELEVANCE TO BIOLOGICAL RESOURCES		
Plan	**Description**	**Regulatory Compliance**
Stormwater Pollution Prevention Plan Framework	Describes how erosion and sediment transport would be minimized to adjacent water	Title 40 Code of Federal Regulations (CFR) Parts 122 and 123
Biological Resource Conservation Plan	Assists the affected federal land-management agencies, and Project personnel in meeting their obligations to protect biological resources during the planning, design, and implementation of the Project. Conservation measures developed during the National Environmental Policy Act process and Section 7 consultation to address direct and indirect effects on individual Endangered Species Act (ESA)-listed wildlife species will be incorporated in these plans. All relevant cooperating agency requirements will be included in this plan, and compliance of the Project with stipulations in this plan will be a condition of Bureau of Land Management's (BLM) right-of-way grant.	ESA of 1973, Bald and Golden Eagle Protection Act (16 United States Code [U.S.C.] 668), Migratory Bird Treaty Act (16 U.S.C. 703), BLM Manual 6840, BLM Executive Order 13112, BLM Executive Order 11990, Executive Order 13186; Sections 401, 402, and 404 of the Clean Water Act (CWA); Federal Land Policy Management Act (FLPMA), National Forest Management Act of 1976 (36 CFR 219), BLM Instruction Memorandums, U.S. Forest Service Manual 2670, Washington Office Memorandum of Understanding WO-230-2010-04 and #08-MU-1113-2400-264
Erosion, Dust Control, and Air Quality Plan	Addresses regulatory compliance, environmental concerns, mitigation recommendations, and monitoring to ensure impacts associated with construction activities are minimized as they relate to soil conservation and air quality	FLPMA (Public Law 94-579), U.S.C 1761-1771, 43 CFR 2800, 36 CFR 251.50, 36 CFR 220, National Pollutant Discharge Elimination System CWA (33 U.S.C. 1342), CWA Section 401: CWA (33 U.S.C. 1344)
Noxious Weed Management Plan	Provides the plan purpose and goals and objectives of the noxious weed inventory, management practices, monitoring, and the use of pesticides/herbicides	U.S. Forest Service Manual 2080, BLM Manual 9015, Federal Noxious Weed Act of 1974 (as amended 1990)
Fire Protection Plan	Provides detailed measures that will be implemented to (1) reduce the risk of starting a fire and (2) to suppress a fire in the event one does occur in the construction area during Project construction, operation, and maintenance	Subject to state, county, and federally enforced laws, ordinances, rules, and regulations
Stream, Wetland, Well, and Spring Protection Plan	Provides measures to protect these resources from potential impacts during construction, operation, and maintenance activities	Sections 401, 402, and 404 of the CWA

TABLE 1-1 IMPLEMENTATION PLANS FOR THE PLAN OF DEVELOPMENT OF RELEVANCE TO BIOLOGICAL RESOURCES		
Plan	**Description**	**Regulatory Compliance**
Reclamation, Revegetation, and Monitoring Framework Plan	Provides a framework for reclamation treatments to be applied to the Project on identification of construction-related disturbance, prevent unnecessary degradation of the environment during construction, rehabilitate temporary-use areas, and reclaim disturbed areas such that these areas are ecologically functional and visually compatible with the surrounding environment to the greatest extent practicable.	BLM Terms and Conditions of Right-of-way Grants and Temporary Use Permits, 43 CFR 2881.2, BLM National Sage-Grouse Habitat Conservation Strategy 2004, Section 1.4.1, FLPMA, Section 101(a)(8), ESA, as amended, Section 7(a)(2)

1.4 Project Description

The federal action for consultation is the BLM's approval of the right-of-way grant for the construction and operation of the Project and USFS's issuance of a special-use authorization for construction and operation of the Project on land administered by each agency for the agency-preferred route. The Project includes the following:

- Constructing, operating, and maintaining a 500kV single-circuit AC transmission line from the Aeolus Substation near Medicine Bow in Carbon County, Wyoming, to the Clover Substation near Mona in Juab County, Utah, a distance of 429 miles
- Constructing two series compensation stations, at points between the Aeolus and Clover substations, to improve the transport capacity and efficiency of the transmission line
- Constructing communication regeneration stations (approximately every 55 miles)
- Rebuilding two existing 345kV transmission lines between the Clover and Mona Substations (in the existing right-of-way), a total distance of approximately 9 miles of transmission lines between substations approximately 3 miles apart
- Rerouting of the Mona to Huntington 345kV transmission line through the Clover Substation
- Relocating a 2-mile section of the Bears Ears to Bonanza Flats 345kV transmission line

Construction of the Project will initially require resource surveys (biological, cultural, and paleontological), a geotechnical investigation, vegetation clearing, and construction of access roads. Following these activities, construction of structures, series compensation stations, and communication regeneration stations will occur. Stringing of transmission line will follow construction of structures. Reclamation of temporarily disturbed sites will occur after completion of construction activities in accordance with the Reclamation, Revegetation, and Monitoring Plan developed for the POD. Maintenance and operation activities will occur over the life of the Project.

A summary of Project components most relevant to biological resources is presented in the following subsections. A detailed Project description is provided in Chapter 2 and Appendix B of the Project EIS.

1.4.1 Biological Resource Surveys

Biological resource surveys would be conducted for the identification, flagging, and avoidance of sensitive resources. Surveys will be conducted for plants and wildlife that could be affected by the Project and are designated as threatened, endangered, or candidates for listing under the ESA as well as species listed as sensitive by the USFS, BLM, or states crossed by the route. Surveys to identify potential wetlands and waters of the United States are required to facilitate avoidance measures, and if necessary, obtain permits from the USACE. Survey results and information gathered will inform application of mitigation measures (e.g., seasonal restrictions, design considerations, and spatial avoidance).

Due to the temporal separation and different spatial requirements of the geotechnical investigation and the transmission-line construction, it is anticipated that different approaches will be used for collecting required biological resource information. The geotechnical investigation requires that biological data be collected around the borehole locations and overland travel areas (geotechnical site). Transmission-line construction will require biological data to be collected along the entire right-of-way, new and improved access routes, and ancillary facilities. The survey requirements for species listed under the ESA are being developed through the Section 7 consultation process and are outlined in species-specific conservation measures. Detailed information regarding biological surveys will be outlined in a Biological Resources Survey Plan developed for the Project. The results of all survey efforts pertaining to federally listed species would be provided to the FWS and applicable agencies.

Additional surveys required for the Project may include noxious weed surveys, cultural resource surveys, and paleontological resource surveys.

1.4.2 Geotechnical Investigation

Geotechnical investigations will be conducted at various locations along the transmission-line right-of-way to collect information regarding subsurface stability, which will be used in the final design of each transmission-line structure and foundation. The geotechnical investigations will consist of the drilling and sampling of soils to a typical depth of 50 to 60 feet below the ground's surface; however, borehole depth may exceed 60 feet depending on soil conditions. The boreholes will have a diameter of approximately 8 inches and typically will be backfilled with auger cuttings and onsite soils. Existing roads and overland access routes will be used exclusively and will be identified in the POD. Vehicles to be used for the geotechnical investigations may include road-legal, two-wheel-drive and four-wheel-drive trucks, tracked vehicles, oversized-tire all-terrain vehicles, platform rigs, water trucks and/or support vehicles, large air compressors, and the geologist's pickup truck or utility vehicle. As described in the Proponent's Project description, multiple drilling methods are likely to be employed.

1.4.3 Construction or Upgrade of Access Roads

Access roads will be required for Project construction, operation, and maintenance. All roads needing improvement will be upgraded or new roads will be constructed in accordance with the Proponent's published standards for road construction or according to BLM (2011a), USFS, state, and/or local requirements for road construction, or private landowner agreements, to be outlined in the POD. Where required to meet the access needs of the Project, roads may be built as either temporary or permanent access. All access roads will be built with a travel-surface width of at least 14 feet with final size depending on site-specific conditions. The road travel surface typically will be an unpaved, native surface. Curves will require a wider surface (e.g., 16 to 22 feet wide). Specific plans for the construction, rehabilitation, and/or maintenance of roads, including the locations of access roads, will be documented in the POD.

1.4.4 Vegetation Management

Clearing of natural vegetation will be required for construction purposes (to include but not limited to access, spur roads, and structure sites), electrical safety, long-term maintenance, and reliability of the transmission line. In the right-of-way, mature vegetation will be removed under or near the conductors to provide adequate electrical clearance as required by the National Electrical Safety Code and Department of Energy. Clearing activities will be in compliance with *PacifiCorp Transmission and Distribution Vegetation Management Program Specification Manual* (PacifiCorp 2014; refer to Appendix B) as a requirement of the North American Electric Reliability Council Vegetation Management Standard FAC-003-1 Transmission Vegetation Management Program or as negotiated with the agencies in specific locations. At each structure site, work areas are required to facilitate the safe operation of equipment and construction operations. In typical work areas in flat terrain, an area of temporary disturbance 250 by 250 feet for 500kV and 150 by 200 feet for 345kV will be required for equipment and construction tasks. In that work area, the permanent disturbance associated with the structure footings will be up to 60 by 60 feet for the 500kV line and 5 by 40 feet for the 345kV line. Clearing individual structure sites will be done using a bulldozer to blade the required area.

The Proponent will keep necessary work areas around structures clear of vegetation and will limit the height of vegetation along the right-of-way in accordance with the PacifiCorp clearing specifications and vegetation management plans (PacifiCorp 2014, Appendix B). The method for vegetation management is called the wire-border zone method. This method results in two zones of clearing and revegetation. The wire zone is the linear area along the right-of-way under the wires and extending 10 feet outside of the outermost phase conductor. After initial clearing, vegetation in the wire zone will be maintained using chemical and/or mechanical means for vegetation that remain under 5 feet tall at maturity. The border zone is the linear area along each side of the right-of-way extending from the wire zone to the edge of the right-of-way. Vegetation in the border zone will be maintained using chemical and/or mechanical means for tall shrubs or short trees (up to 25 feet high at maturity), grasses, and forbs.

The type of vegetation management control method used for both initial clearing and long-term vegetation management will vary depending on site conditions. In areas with steep terrain, manual control methods (i.e., workers using hand tools) may be used in place of mechanical control methods (i.e., use of machinery). Much of the agency-preferred route traverses areas characterized by low-growing vegetation. In these areas, long-term vegetation management will be minimal compared to areas at higher elevations that receive more precipitation and exhibit taller vegetation.

Project-related vegetation management activities will include noxious weed control in addition to vegetation clearing activities. A Noxious Weed Management Plan will be developed for the POD based on the principles and procedures outlined in the BLM Integrated Weed Management Manual 9015 and USFS Noxious Weed Management Manual 2080.

The Proponent is responsible for ensuring that noxious weeds are identified and controlled during construction, operation, and maintenance of Project facilities and that all federal, state, county, and other local requirements are satisfied. The management of noxious weeds will be considered throughout all stages of the Project. Construction personnel will be educated regarding identified problem areas, the importance of preventive measures, and treatment methods. Specific preventive measures will be implemented to counteract the spread of noxious weeds during construction, operation, and maintenance activities. Preconstruction and post-construction treatment methods will be applied to areas where noxious weeds are present. In areas where federally listed species are present, noxious weed control methods and buffers will be consistent with applicable species-specific conservation measures.

The Proponent will be responsible for ongoing weed monitoring and control inside of the right-of-way for the life of the BLM right-of-way grant and USFS special-use authorization.

1.4.5 Construction of 500-kilovolt Transmission Line

The majority of the transmission line will require construction, operation, and maintenance of a 500kV single-circuit AC transmission line. The average distance between 500kV structures (span) will be 1,000 to 1,800 feet, or approximately 3 to 5 structures per mile. Structures will vary in height from 140 to 200 feet depending on terrain and the requirement to maintain minimum conductor clearances from the ground. The length of the 500kV transmission line over the entire agency-preferred route is approximately 421 miles, or approximately 98 percent of the approximately 429-mile length of the agency-preferred route.

The primary structure type for the 500kV transmission line would be guyed single-circuit tangent structures in portions of the Project area in Wyoming, Colorado, and the eastern portion of Utah. In rough terrain throughout the Project area; and in the western portion of Utah, self-supporting steel-lattice single-circuit 500kV tangent structures typically would be used as the primary structure type. Self-supporting lattice steel towers would be used in all areas of the Project where angles in the line would be greater than 1 degree. Tubular steel H-frame single-circuit 500kV tangent structures are an alternate structure for both the tangent guyed and self-supporting structures. The various 500kV structure types would be used in response to specific design and resource needs where conditions or agency requirements warrant. Installation of structure foundations will require excavation (which may include blasting), and installation of foundations (typically drilled concrete piers). The 500kV structures will be assembled on site where possible and lifted into place using a large crane.

1.4.6 Rebuilding 345-kilovolt Transmission Line

Two existing 345kV transmission lines will be rebuilt in existing rights-of-way to electrically connect the Clover and Mona substations, and the existing Mona to Huntington 345kV transmission line will be rerouted through the Clover Substation. Additionally, a 2-mile section of the Bears Ears to Bonanza 345kV transmission line will be relocated north of the Raven Ridge Area of Critical Environmental Concern to colocate with the agency-preferred route. The 345kV structures would be steel H-frame, steel monopole single-circuit or steel monopole double-circuit structures depending on final design requirements. Engineering details regarding structure types will be completed upon approval of a final route in the ROD and right-of-way grant.

The 345kV foundations would be either drilled-pier or directly embedded. Specific foundation diameters and depths would be determined during final design and are dependent on the type of soil or rock present at each specific foundation site. The average distance between 345kV H-frame tangent structures will be 800 to 1,200 feet, or approximately 4 to 6 structures per mile. H-frame structures will vary in height from 80 to 140 feet depending on terrain and the requirement to maintain minimum conductor clearances from the ground. H-frame type structures are directly embedded and do not require concrete foundations. Embedment depth is typically 10 percent of the pole length plus 5 feet. Diameter of the hole excavated for embedment is typically the pole diameter plus 18 inches. When a pole is placed in a hole, native or select backfill would be used to fill the voids around the perimeter of the hole. The average distance between 345kV single- and double-circuit monopole structures will be 700 to 800 feet. Single-circuit monopole structures will vary in height from 85 to 130 feet, and double-circuit monopole structures will vary in height from 95 to 150 feet. Monopole 345kV single- and double-circuit structures use a drilled-pier foundation. The 345kV H-frame, single-circuit (and double-circuit) monopole structures will be framed on site and either assembled on the ground and lifted into place by a crane or assembled aerially. The length of the 345kV transmission line is 9 miles, or approximately 2 percent of the 429-mile length of the agency-preferred route.

Any structures remaining after the relocation of the 345kV transmission lines will be removed, and all disturbed areas will be reclaimed in accordance with the Proponent's Reclamation, Revegetation, and Monitoring Framework Plan.

1.4.7 Stringing of Transmission Line

Conductors, insulators, hardware, and stringing sheaves will be delivered to each tower site and installed on site. A pilot line will be pulled (strung) from structure to structure (or pole to pole) by helicopter, truck, or four-wheel-drive vehicle and threaded through the stringing sheaves at each structure. A stronger line that is larger in diameter (pulling line) then will be attached to the pilot line and strung. This process is repeated until the shield wire and conductor are pulled through all sheaves. Shield wire and conductor will be strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end. Sites for pulling-and-tensioning equipment measure approximately 250 by 400 feet, two will occur every 3 to 5 miles and 100- by 100-foot splicing sites will occur approximately every 9,000 feet, which is the length of a standard reel of conductor.

1.4.8 Series Compensation Station Construction and Substation Reconfiguration

Two series compensation stations are planned as part of the Project and will be located at approximately one-third (Series Compensation Substation No. 1) and at approximately two-thirds (Series Compensation Substation No. 2) the distance from the Aeolus Substation to the Clover Substation. These series compensation substations are required to improve the transport capacity and efficiency of the transmission line.

Construction of the series compensation stations would generally follow the listed steps:

- A site is chosen and graded using large earth moving equipment. The site would include a drainage slope and possible additional drainage features or retention ponds, depending on local land characteristics.
- Construction of a security fence.
- Control building foundations are excavated and equipment footings and piers are poured. Control buildings, either constructed onsite of masonry block or assembled with pre-engineered steel, are added to the foundations.
- Cable trenches are cut and conduit and grounding conductors are added. Each cable trench is backfilled with native material and sand, as needed.
- Station equipment, including transformers, circuit breakers, switches, etc., is added using cranes or man-lifts as needed.
- High-voltage conductors are installed and supported on insulators.
- Control and protection panels are installed in control buildings and connected to equipment in the yard using cables previously installed in trenches.
- The entire site is completed with a crushed-rock surfacing material, spread and compacted as needed.
- All equipment is tested and then the station is energized.

Alterations and/or reconfigurations of three substations will be needed for the Project. Substations were constructed as part of existing projects and no additional surface disturbance will be required for reconfiguration.

1.4.9 Right-of-way Reclamation

The right-of-way will be reclaimed through methods described in the reclamation plan, which will be developed and included in the POD. All practical means will be made to reclaim the land to its original contour and natural drainage patterns. Revegetation activities along the right-of-way will conform to the Proponent's vegetation management standards as approved by the agencies. Reclamation seed mixture will conform to land-management-agency requirements and approval. Specific seed mixes and reclamation techniques will be outlined in the POD.

1.4.10 Operation and Maintenance

Operation and maintenance activities will include transmission-line patrols, climbing inspections, structure and conductor inspection and maintenance, insulator washing in selected areas as needed, and access-road repairs. Inspection of the entire transmission-line system will be conducted three times annually. Aerial inspection will be conducted by helicopter on an annual basis and will require two or three crew members, including the pilot. Detailed ground inspections will take place on a semi-annual basis using existing access roads to each structure. Ground inspection will use four-wheel-drive trucks or four-wheel-drive all-terrain vehicles. Periodic inspection and maintenance of each of the substations and communications facilities also is a key part of operating and maintaining the electrical system. System operation and maintenance activities will be conducted as specified in the POD to meet system safety and reliability requirements.

The Proponent will coordinate with the respective federal land-management agencies' Authorized Officers or their designated representatives prior to initiating scheduled inspection, maintenance (including vegetation management), and/or repair activities unless emergency maintenance activities are required. In the event of an emergency, the Proponent will contact the BLM Wyoming State Office (the authorizing agency and primary point of contact) and the BLM state office and field office where the action occurred within 24 hours of the action occurring. The Proponent will adhere to the same conservation measures outlined through the Section 7 consultation process and the POD during emergency maintenance activities to the extent feasible; however, adherence to some conservation measures, particularly those specific to seasonal timing restrictions, may not be possible in order to complete the necessary emergency maintenance activities.

The BLM Wyoming State Office will notify the FWS Wyoming Ecological Services Field Office within 48 hours of the action occurring. As soon as practicable, the BLM Wyoming State Office will initiate formal Section 7 consultation if ESA-listed species and/or designated critical habitats have been adversely affected. Emergency consultation for natural disasters or other calamities may require expedited consultation under 50 Code of Federal Regulations (CFR) 402.5.

1.4.11 Environmental Design Features

Design features of the Project for environmental protection are measures the Proponent will implement as standard practice of construction, operation, and/or maintenance, as applicable. These measures were developed from a review of land-use plans relevant to the Project to identify best-management practices and other measures to mitigate potential Project impacts. Table C-1 in Appendix C lists the environmental design features; and for each feature, the table indicates the phase of the Project the design feature would apply to and indicates the applicable environmental resource. These environmental design features are

applied to all lands, regardless of jurisdiction or ownership, where appropriate. Environmental protection measures also were developed specifically for the species analyzed in this document. These measures are referred to as conservation measures, and are described in Section 4 for each species. The Proponent has committed to adhere to conservation measures on all lands, regardless of jurisdiction or ownership.

1.4.12 Decommissioning

At the end of the useful life of the transmission line (projected to be at least 50 years, most likely longer), if the facilities no longer will be required, the transmission lines and associated facilities will be decommissioned. At such time, a plan for dismantling and removing conductors, insulators, and hardware from the right-of-way will be developed and approved by the permitting agencies. Tower and pole structures will be removed and foundations demolished below ground surface and buried. All permanent disturbances will be restored in accordance with a Termination and Reclamation Plan approved by the federal land-management agency Authorized Officer, as appropriate. Since it is not possible to know which facilities will be needed and will remain and/or facilities that will be removed, and it is difficult to predict the status of land use and policy regarding decommissioning and reclamation at a point that far in the future, the effects of decommissioning of the Project are not analyzed in the EIS or this BA. Requirements for decommissioning and reclamation (including environmental protection) will have to be addressed in a comprehensive Termination and Reclamation Plan (or equivalent) when decommissioning is proposed. Decommissioning will likely require further consultation with the FWS, as will reissuance of a future right-of-way grant.

1.5 Deconstructing the Action

Based on guidance provided by the FWS during early coordination, the BLM has deconstructed the action proposed by the Proponent to assist with understanding and assessing potential effects on species analyzed in this BA. Table 1-2 presents a summary of the preconstruction, construction, operation, and maintenance activities of the Project, and the components of each of those activities are listed. Potential stressors that may result from these activities that are likely to have the greatest relevance to ESA-listed plant and wildlife species are listed. This assessment of potential stressors forms the basis for effects analyses presented later in this document.

The timing and duration of activities at any single location may vary, based on seasonal restrictions to avoid sensitive wildlife, weather conditions, site-specific construction methods, and the overall construction schedule. This information will be fully developed in the POD.

TABLE 1-2 PROJECT ACTIVITIES AND POTENTIAL RESULTING STRESSORS ON ESA-LISTED OR CANDIDATE PLANT AND WILDLIFE SPECIES.				
Activity	**Location of activity**	**Activity Components**	**Stressors**	**Frequency, Duration, and Intensity of Activity[1]**
Preconstruction Activities				
Resource surveys	Substation and series compensation locations and along the transmission-line right-of-way (all activities within construction footprint); access roads; spur roads; temporary work areas	Site access via existing roads and approved overland travel by road-legal two-wheel-drive and four-wheel-drive vehicles; verify and stake wetland and other sensitive resource boundaries	Dust production; weed introduction; crushing of vegetation; soil disturbance; human presence; equipment and vehicle traffic; soil compaction	Frequency: Multiple occurrences, depending on survey type. Duration: Each survey typically 1 to 2 days per site Intensity: Low
Geotechnical investigation	Substation and series compensation locations and along the transmission-line right-of-way (all activities within subsequent construction footprint)	Site access via existing roads and approved overland travel by road-legal two-wheel-drive and four-wheel-drive trucks, tracked vehicles, oversized-tire all-terrain vehicles or on platform rigs, water truck and/or support vehicle, large air compressor, the geologist's pickup truck or utility vehicle; drilling and sampling of soils; may involve mud rotary drilling; existing roads will not be improved for the geotechnical investigation	Dust production; weed introduction; crushing of vegetation; soil compaction; soil disturbance; vegetation clearing in the immediate vicinity of bore holes; human presence; equipment and vehicle traffic; drilling noise; hazardous materials; water use for mud rotary drilling	Frequency: Single occurrence; estimated total of 332 boreholes across entire transmission line, including 12 bore holes per substation or series compensation station Duration: Typically 1 to 2 days per site Intensity: Low
Staking and surveying of Project features	Centerline; structure center hubs; right-of-way boundaries; access roads; spur roads; temporary work areas	Verifying and staking of boundaries of Project features; resource surveys; overland vehicle travel	Dust production; weed introduction; crushing of vegetation; soil compaction; soil disturbance; human presence; equipment and vehicle traffic	Frequency: Varies; single occurrence and multiple occurrences, depending on survey Duration: Each survey typically 1 to 2 days per site Intensity: Low
Construction Activities				
Multi-purpose construction yard establishment	One 30-acre site approximately every 20 miles along the route; specific work areas would be identified during engineering design of the Project; each site would be approved by the agencies and identified in the Plan of Development (POD)	Vegetation clearing; minimal grading. Once established, sites will be used for material laydown and storage, structure fabrication and staging, helicopter landing, storage, refueling, construction trailers, and vehicle parking, field offices, reporting locations for workers, parking space for vehicles and equipment, concrete batch plants (when existing batch plants are out of range), and stations for equipment maintenance; site access would be accomplished using access roads improved or constructed in other steps of construction	Dust production; weed introduction; soil compaction; soil disturbance and loss of vegetative cover; human presence; equipment and vehicle traffic; construction noise; hazardous materials	Frequency: Single occurrence; sites would be in use throughout construction phase of Project (up to 3 years) Duration: Typical construction crews and equipment for all construction activities discussed in Tables 2-5 and 2-6 of the Environmental Impact Statement Intensity: Moderate
Existing access road improvement	As determined necessary on all existing access roads to be used to access Project facilities; specific areas would be identified during engineering design of the Project	Roads graded and/or graveled to provide a smooth all-weather travel surface; water used for dust control	Dust production; weed introduction; human presence; equipment and vehicle traffic; construction noise; hazardous materials; water depletion; soil compaction	Frequency: Single occurrence; specific plans for the rehabilitation of roads would be documented in the POD Duration: Access establishment through cleanup and reclamation typically takes 2 to 4 months at each site Intensity: High
		Roads widened as needed to provide a minimum of a 14-foot-wide travel way; vegetation clearing; grading; water used for dust control	Dust production; weed introduction; soil disturbance; loss of vegetative cover; change in runoff patterns; human presence; equipment and vehicle traffic; construction noise; hazardous materials; water depletion; soil compaction	
Right-of-way vegetation preparation	In the transmission-line right-of-way	Vegetation removal to height standards with heavy equipment and hand tools (e.g., chainsaws); travel on access roads; overland travel	Dust production; weed introduction; soil disturbance; loss of vegetative cover; human presence; equipment and vehicle traffic; equipment noise; hazardous materials; water depletion; fragmentation of forested areas; soil compaction	Frequency: Single occurrence for initial vegetation height and/or site clearing standards. Duration: Access establishment through cleanup and reclamation typically takes 2 to 4 months at each site Intensity: High

TABLE 1-2 PROJECT ACTIVITIES AND POTENTIAL RESULTING STRESSORS ON ESA-LISTED OR CANDIDATE PLANT AND WILDLIFE SPECIES.				
Activity	**Location of activity**	**Activity Components**	**Stressors**	**Frequency, Duration, and Intensity of Activity[1]**
New access road construction	As determined necessary for Project access; specific locations would be identified during engineering design of the Project	Vegetation clearing and removal to height standards; grading; road construction; heavy equipment use in area; water used for dust control	Dust production; weed introduction; soil disturbance; loss of vegetative cover; change in runoff patterns; Increased public access to sensitive sites; human presence; equipment and vehicle traffic; construction noise; hazardous materials; water depletion; soil compaction	Frequency: Single occurrence; specific plans for the construction of roads would be documented in the POD; new access roads would be used during construction; roads not needed for maintenance and operation would be reclaimed Duration: Access establishment through cleanup and reclamation typically takes 2 to 4 months at each site Intensity: High
Expansion of substations	Aeolus Substation to have equipment added within the existing substation fence as proposed by Gateway West; Clover substation to be completed (requiring additional earth work and equipment installation within an area previously permitted and assessed); Mona substation to be reconfigured within the existing substation footprint and fenced yard	Various construction activities, including grading, equipment installation, and graveling; heavy equipment use, including dump trucks, water trucks, graders, back hoes, and dozers; water used for dust control	Dust production; weed introduction; soil disturbance and vegetation clearing; change in runoff patterns; human presence; equipment and vehicle traffic; construction noise; hazardous materials; water depletion; soil compaction	Frequency: Single occurrence; sites would be in use throughout the life of the Project Duration: Access establishment through cleanup and reclamation typically takes 2 to 4 months at each site Intensity: High
Construction of series compensation stations	Two 160-acre series compensation stations to be built, at approximately one-third and at approximately two-thirds the distance from the Aeolus Substation to the Clover Substation; specific locations would be identified during engineering design of the Project in identified siting areas; access to the series compensation stations would be accomplished with access roads improved or constructed in other construction steps	Various construction activities, including grading of site and access roads, building of perimeter fence, construction of building, and graveling; heavy equipment use for grading and structure foundation installation, including dump trucks, water trucks, graders, back hoes, and dozers; water used for concrete and dust control	Dust production; weed introduction; soil disturbance and vegetation clearing; change in runoff patterns; human presence; equipment and vehicle traffic; construction noise; hazardous materials; water depletion; soil compaction	Frequency: Single occurrence; sites would be in use throughout the life of the Project Duration: Access establishment through cleanup and reclamation typically takes 2 to 4 months at each site Intensity: High
Installation of structure foundations	Specific structure sites and work areas would be identified during engineering design of the Project; each site would be approved by the agencies and identified in the POD; temporary work area disturbance: would be 250 by 250 feet for 500kV structures and 150 by 200 feet for 345kV structures; permanent disturbance (the area occupied by the structure) would be up to 60 by 60 feet for the 500kV line and 5 by 40 feet for the 345kV line; structure foundations would be located approximately every 1,000 to 1,500 feet	Access and spur road travel; overland vehicle travel within approved work areas; heavy equipment use for structure foundation installation; excavation and potential blasting; drilling of concrete piers; water used for concrete foundations and dust control	Dust production; weed introduction; crushing of vegetation; soil disturbance; loss of vegetative cover; change in runoff patterns; human presence; equipment and vehicle traffic; construction noise; hazardous materials; soil compaction; water depletion	Frequency: Single occurrence; structure foundations would be in use throughout the life of the Project Duration: Access establishment through cleanup and reclamation typically takes 2 to 4 months at each site Intensity: High
Erecting of support structures; ground rod installation as needed	Same locations used for installation of structure foundations	Overland vehicle access, where approved, by crane, flatbed truck, and other heavy machinery; potential helicopter use	Dust production; weed introduction; crushing of vegetation; soil disturbance; human presence; equipment and vehicle traffic; construction and helicopter noise; hazardous materials; soil compaction	Frequency: Single occurrence; structures would be in use throughout the life of the Project Duration: Access establishment through cleanup and reclamation typically takes 2 to 4 months at each site Intensity: High
Stringing of wires, including temporary pulling-and-tensioning sites and splicing sites	Sites for pulling-and-tensioning equipment measure approximately 250 by 400 feet with two every 3 to 5 miles and 100- by 100-foot splicing sites approximately every 9,000 feet	Overland vehicle access, where approved, by crane, four-wheel drive truck, and other heavy machinery; vegetation disturbance at pulling-and-tensioning sites and splicing sites; helicopter use	Dust production; weed introduction; crushing of vegetation; soil disturbance; human presence; equipment and vehicle traffic; construction and helicopter noise; hazardous materials; soil compaction	Frequency: Single occurrence; lines would be in use throughout the life of the Project Duration: Access establishment through cleanup and reclamation typically takes 2 to 4 months at each site Intensity: High

TABLE 1-2 PROJECT ACTIVITIES AND POTENTIAL RESULTING STRESSORS ON ESA-LISTED OR CANDIDATE PLANT AND WILDLIFE SPECIES.				
Activity	**Location of activity**	**Activity Components**	**Stressors**	**Frequency, Duration, and Intensity of Activity[1]**
Cleanup and site reclamation	Areas of disturbance, as dictated in the Reclamation, Revegetation, and Monitoring Framework Plan	Recontouring and re-establishment of drainage patterns; seeding	Dust production; weed introduction; soil disturbance; herbicide application; human presence; equipment and vehicle traffic; construction noise; hazardous materials; soil compaction	Frequency: Single occurrence; some reclamation sites may be monitored for multiple years as directed in the Reclamation, Revegetation, and Monitoring Framework Plan Duration: Access establishment through cleanup and reclamation typically takes 2 to 4 months at each site Intensity: Moderate
Maintenance Activities				
Maintenance access	Entire length of right-of-way	Travel on approved access roads and overland routes	Dust production; weed introduction; crushing of vegetation; soil disturbance; soil compaction	Frequency: Conducted on an as-needed basis as specified in the POD Duration: Inspection of the entire transmission-line system would be conducted three times annually Intensity: Low
Transmission-line patrols, climbing inspections, structure and conductor inspection and maintenance, insulator washing in selected areas as needed	Entire length of right-of-way	Travel on approved access roads and overland routes; helicopter use; water spraying	Dust production; weed introduction; crushing of vegetation; soil disturbance; soil erosion; human presence; equipment and vehicle traffic; construction noise; hazardous materials; soil compaction	Frequency: Conducted on an as-needed basis, as specified in the POD Duration: Typically 1 to 2 days per site Intensity: Low
Vegetation management (i.e., noxious weed control; removal of tall vegetation)	In transmission-line right-of-way; wire and border zones as needed	Travel on approved access roads and overland routes; mechanical vegetation removal; chemical vegetation treatment; noxious weed control	Dust production; weed introduction; crushing of vegetation; soil disturbance; herbicide application; human presence; equipment and vehicle traffic; machinery/chainsaw noise; hazardous materials; soil compaction	Frequency: Conducted on an as-needed basis, typically once every 5 to 10 years for the life of the Project. Duration: Typically 2 to 3 days per site Intensity: Low
Emergency maintenance	Entire length of right-of-way	Travel on approved access roads and overland routes; overland access	Dust production; weed introduction; crushing of vegetation; soil disturbance; human presence; equipment and vehicle traffic; construction noise; hazardous materials; water depletion; soil compaction	Frequency: Conducted on an as-needed basis and coordinated with the land-management agency and landowners Duration: Duration of activities similar to relevant construction activities Intensity: Low
Operations access and access road repairs	Entire length of right-of-way; repairs as needed	Travel on access roads; overland travel; access road re-grading, re-surfacing	Dust production; weed introduction; crushing of vegetation; soil disturbance; human presence; equipment and vehicle traffic; construction noise; hazardous materials; soil compaction	Frequency: Conducted on an as-needed basis, as specified in the POD Duration: Duration of activities similar to relevant construction activities Intensity: Moderate
NOTE: Intensity of activity refers to the relative effect of the activity on species analyzed in this Biological Assessment compared to other Project activities.				

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2.0 METHODS

2.1 Species Considered in Analysis

A list of species listed as threatened or endangered under the ESA, species proposed or candidates for listing, and designated or proposed critical habitat that is found in counties crossed by the agency-preferred route was obtained through the FWS Information Planning and Conservation database most recently on May 18, 2015 (FWS 2015). The agency-preferred route crosses Carbon and Sweetwater counties in Wyoming, Moffat and Rio Blanco counties in Colorado, and Duchesne, Sanpete, Uintah, Utah, Wasatch, and Juab counties in Utah.

The Information Planning and Conservation Database (IPaC) search results also included species and critical habitat in downstream Colorado River, Platte River, Spanish Fork River, and Currant Creek (tributary to the Jordan River) watersheds that could be affected by Project activities. One additional species, the gray wolf, was not included in the IPaC search results but is addressed in this BA based on guidance provided by the BRTG. During preliminary review of this list, a determination was made that the Project will have no effect on several species due to a lack of suitable habitat or lack of proximity of known populations to the agency-preferred route, and a revised list was presented to personnel from the FWS, BLM, and USFS for review. The FWS provided comments and recommendations for refinements to this list. This species list was refined and submitted to the FWS for concurrence on December 1, 2014. The FWS issued formal concurrence with this list on December 9, 2014. All species recommended by the FWS for inclusion in the BA have been carried forward for analysis in this document (Table 2-1). Included in Table 2-1 are candidate species, although in this document candidate species are discussed in an advisory context only. The BLM does not wish to conference on candidate species as consultation pertaining to Section 7 of the ESA is not required for candidate species.

Species considered but eliminated from analysis are listed in Table 2-2. Each of these species is not present in the Project action area, and the Project would have no effect on any of these species.

TABLE 2-1
ENDANGERED, THREATENED, CANDIDATE, AND PROPOSED SPECIES LISTED UNDER THE ENDANGERED SPECIES ACT CARRIED FORWARD FOR ANALYSIS

Common Name *Latin Name*	Status	Critical Habitat Designated?	Rationale for Inclusion in Analysis
Fish			
Bonytail *Gila elegans*	E	Yes	This species is found in the Colorado River watershed, including the Green River. Designated critical habitat is found in the Green River downstream from the Project. This species and its critical habitat may be affected by water use in the Colorado River watershed.
Colorado pikeminnow *Ptychocheilus lucius*	E	Yes	This species is found in the Colorado River watershed, including the White, Yampa, and Green rivers. Designated critical habitat is found in the White, Yampa, and Green rivers in areas crossed by or downstream from the Project. This species and its critical habitat may be affected by water use in the Colorado River watershed, and by construction activities in the floodplain of the Yampa River.

TABLE 2-1 ENDANGERED, THREATENED, CANDIDATE, AND PROPOSED SPECIES LISTED UNDER THE ENDANGERED SPECIES ACT CARRIED FORWARD FOR ANALYSIS			
Common Name ***Latin Name***	**Status**	**Critical Habitat Designated?**	**Rationale for Inclusion in Analysis**
Humpback chub *Gila cypha*	E	Yes	This species is found in the Colorado River watershed, including the Green River and Yampa River. Designated critical habitat is found downstream from the Project in the Yampa River and Green River. This species and its critical habitat may be affected by water use in the Colorado River watershed.
June sucker *Chasmistes liorus*	E	Yes	June sucker is found in Utah Lake and spawns in several tributaries. Designated critical habitat is outside the Project action area. This species may be affected by ground-disturbing activities in watersheds that drain into Utah Lake.
Pallid sturgeon *Scaphirhynchus albus*	E	No	This species is found along the Platte River system in Nebraska and may be affected by water use in the Platte River watershed.
Razorback sucker *Xyrauchen texanus*	E	Yes	This species is found in the Colorado River watershed, including the White, Yampa, and Green rivers. Designated critical habitat is found in the White, Yampa, and Green rivers in areas crossed by or downstream from the Project. This species and its critical habitat may be affected by water use in the Colorado River watershed.
Birds			
Greater sage-grouse *Centrocercus urophasianus*	C	NA	Habitat and locations are crossed by the agency-preferred route. The Bureau of Land Management is including information on greater sage-grouse for informational purposes only. The Bureau of Land Management does not wish to conference on greater sage-grouse.
Least tern (interior population) *Sternula antillarum*	E	No	This species is found along the Platte River system in Nebraska and may be affected by water use in the Platte River watershed.
Mexican spotted owl *Strix occidentalis lucida*	T	Yes	Potential habitat is crossed by the agency-preferred route in Utah. Designated critical habitat is outside the Project action area.
Piping plover *Charadrius melodus circumcinctus*	T	Yes	This species is found along the Platte River system in Nebraska and may be affected by water use in the Platte River watershed.
Whooping crane *Grus americana*	E	Yes	This species is found along the Platte River system in Nebraska. Critical habitat for this species is designated on a portion of the Platte River. This species and its designated critical habitat may be affected by water use in the Platte River watershed.
Yellow-billed cuckoo (Western Distinct Population Segment) *Coccyzus americanus*	T	Proposed	Potential habitat is crossed by the agency-preferred route in Utah and Colorado. Proposed critical habitat is outside the Project action area and not crossed by the agency-preferred route.

TABLE 2-1 ENDANGERED, THREATENED, CANDIDATE, AND PROPOSED SPECIES LISTED UNDER THE ENDANGERED SPECIES ACT CARRIED FORWARD FOR ANALYSIS			
Common Name ***Latin Name***	**Status**	**Critical Habitat Designated?**	**Rationale for Inclusion in Analysis**
Mammals			
Black-footed ferret *Mustela nigripes*	E (NEP)	NA	Reintroduction management areas for this species are crossed by the agency-preferred route in Wyoming (Shirley Basin NEP), Colorado (Wolf Creek NEP), and Utah (Coyote Basin NEP).
Canada lynx *Lynx canadensis*	T	Yes	This species is present at high elevations in Colorado, Wyoming, and potentially Utah. Although suitable habitat is not present, reintroduced individuals may disperse through the Project area. Designated critical habitat is outside the Project action area.
Gray wolf *Canis lupus*	E	No	This species may disperse through the Project area in Wyoming, Colorado, or Utah. No packs are known to be resident near the Project action area.
Plants			
Clay phacelia *Phacelia argillacea*	E	No	Individuals, reintroduction sites, and modeled habitat are known in proximity to the agency-preferred route.
Clay reed-mustard *Schoenocrambe argillacea*	T	No	Individuals and habitat are known in proximity to the agency-preferred route.
Deseret milkvetch *Astragalus desereticus*	T	No	Individuals and habitat are known in proximity to the agency-preferred route.
Shrubby reed-mustard *Schoenocrambe suffrutescens*	E	No	Habitat is known in proximity to the agency-preferred route.
Uinta Basin hookless cactus *Sclerocactus wetlandicus*	T	No	Individuals, habitat, and core areas are known in proximity to the agency-preferred route.
Ute ladies'-tresses *Spiranthes diluvialis*	T	No	Habitat is known in proximity to the agency-preferred route.
Western prairie fringed orchid *Platanthera praeclara*	T	No	This species is found along the Platte River system in Nebraska and may be affected by water use in the Platte River watershed.
NOTES: C: Candidate E: Endangered NEP = Nonessential Experimental Population T: Threatened			

TABLE 2-2 ENDANGERED, THREATENED, CANDIDATE, AND PROPOSED SPECIES LISTED UNDER THE ENDANGERED SPECIES ACT NOT CARRIED FORWARD FOR ANALYSIS			
Common Name Latin Name	**Status**	**Critical Habitat Designated?**	**Rationale for Not Carrying Forward for Analysis**
Mammals			
Utah prairie dog *Cynomys parvidens*	T	No	Established range for the species is outside the Project action area, and no occurrences are known in or near the Project action area.
Plants			
Barneby ridge-cress *Lepidium barnebyanum*	E	No	The species is not known to occur in the Project action area. The Project is located outside identified range for the species.
Blowout penstemon *Penstemon haydenii*	E	No	The species is not known to occur in the Project action area. The Project is located outside the range of the species.
Dudley Bluffs bladderpod *Physaria congensta*	T	No	The species is not known in proximity to the agency-preferred route.
Dudley Bluffs twinpod *Physaria obcordata*	T	No	The species is not known in proximity to the agency-preferred route.
Heliotrope milkvetch *Astragalus montii*	T	Yes	Neither occurrences nor designated critical habitat are known in proximity to the agency-preferred route.
Pariette cactus *Sclerocactus brevispinus*	T	No	The Project is located outside the range of the species.
NOTES: E: Endangered T: Threatened			

2.2 Species Information

Information on life history, distribution, and threats for each species was gathered from peer-reviewed literature, agency publications, regional reference books, museum collection databases, and other sources as appropriate. Location data used in analysis of impacts on these species was acquired from the BLM, FWS, state natural heritage programs, and published literature.

Habitat modeling was conducted by EPG for the Mexican spotted owl, yellow-billed cuckoo, and Ute ladies'-tresses at the direction of the BRTG to provide additional information for use in the analysis and comparison of alternatives conducted for the EIS. The habitat models allow for an informative, relative comparison between alternative routes in the Project EIS and are used in this document to provide consistency with the EIS, for informational purposes, and as a general reference. The habitat models comprehensively do not identify areas where the species may occur, identify areas where species surveys should be conducted, or identify areas that should be avoided by the Project to avoid impacts on the species. Conservation measures developed for individual species included in this BA identify the need for field-based habitat assessments and species surveys to identify where impacts could occur and where conservation measures would be applied.

Habitat modeling was conducted for clay phacelia by the USFS (USFS 2013). More detail on habitat mapping for each of these species is presented in Section 4.0.

2.3 Project Action Area and Analysis Areas for Species

An action area is the geographic extent of changes to the physical, chemical, and biotic environment that would occur directly (i.e., immediately) or indirectly (i.e., later in time, but still reasonably certain to occur) as a result of a federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area for the Project would include the right-of-way, new and existing access roads, substations, laydown yards, other Project features, and an area around these features. At the time of this analysis, the final engineering design for the Project is not available and the exact locations of these Project features are unknown. Therefore, the reference centerline of the agency-preferred route identified in the Final EIS is used to identify the general area of potential environmental impacts. For the purposes of this analysis, the action area extends 1 mile on each side of the centerline of the agency-preferred route, equating to a 2-mile-wide corridor. This action area is assumed to sufficiently encompass all impacts of the Project on the local environment; however, this action area is likely to be a large overestimation of the actual extent of impacts of the Project. Nearly all direct effects are assumed to be restricted to the immediate area of any construction or maintenance activities, though some effects such as noise or dust deposition may affect ESA-listed species over relatively long distances and thus require an action area of this scale to be considered.

Although action areas are used to identify the extent of an action's effects on the local environment, action areas do not necessarily extend outward to the larger range of a species that may be affected if action-related changes to the local environment are not reasonably expected to occur to this extent. Impacts on a species may originate within the action area (e.g., reduced foraging area due to vegetation clearing), and become apparent on a species outside the action area (e.g., eventual reduced fecundity occurring in distant breeding areas). The geographic range in which direct and indirect impacts on a species may occur, referred to in this BA as a species' analysis area, was defined for each species individually, irrespective of the Project action area. Analysis areas encompass all potential direct and indirect impacts on a species to be analyzed and used to inform determination of effects for that species. The analysis area for a species is generally based on its distribution, whether known or modeled, in proximity to Project activities and in relation to the geographic extent of the potential effects of those activities. The analysis area for each species is listed in Table 2-3.

TABLE 2-3
ANALYSIS AREAS FOR ENDANGERED, THREATENED, CANDIDATE, AND PROPOSED SPECIES LISTED UNDER THE ENDANGERED SPECIES ACT CARRIED FORWARD FOR ANALYSIS

Common Name (*Latin Name*)	Analysis Area and Rationale
Fish	
Bonytail (*Gila elegans*) Colorado pikeminnow (*Ptychocheilus lucius*) Humpback chub (*Gila cypha*) Razorback sucker (*Xyrauchen texanus*)	Potential impacts on water quality (e.g., erosion and sedimentation, spills) analyzed within the 100-year floodplain of occupied bodies of water and other tributaries with temporary or permanent surface flow into occupied habitat Impacts of water depletions analyzed in the Colorado River basin in accordance with the existing programmatic Biological Opinion
June sucker (*Chasmistes liorus*)	Potential impacts on water quality (e.g., erosion and sedimentation, spills) analyzed within the 100-year floodplain of the Utah Lake watershed portion of the Jordan River basin Impacts of water depletions analyzed in the Jordan River basin

TABLE 2-3 ANALYSIS AREAS FOR ENDANGERED, THREATENED, CANDIDATE, AND PROPOSED SPECIES LISTED UNDER THE ENDANGERED SPECIES ACT CARRIED FORWARD FOR ANALYSIS	
Common Name (*Latin Name*)	**Analysis Area and Rationale**
Pallid sturgeon (*Scaphirhynchus albus*)	Potential impacts on water quality (e.g., erosion and sedimentation, spills) analyzed within the 100-year floodplain of occupied bodies of water and other tributaries with temporary or permanent surface flow into occupied habitat Impacts of water depletions analyzed in the Platte River basin in accordance with the existing programmatic Biological Opinion
Birds	
Least tern (interior population) (*Sternula antillarum*) Piping plover (*Charadrius melodus circumcinctus*) Whooping crane (*Grus americana*)	Impacts of water depletions analyzed in the Platte River basin in accordance with existing programmatic Biological Opinion
Greater sage-grouse (*Centrocercus urophasianus*)	11 miles on each side of the Project centerline to capture indirect effects on seasonal habitats (Connelly et al. 2000)
Mexican spotted owl (*Strix occidentalis lucida*) Yellow-billed cuckoo (Western Distinct Population Segment) (*Coccyzus americanus*)	1 mile on each side of the Project centerline to capture the potential effects of construction noise on nest success
Mammals	
Black-footed ferret, non-essential experimental population (*Mustela nigripes*)	1.3 miles on either side of the Project centerline to represent the minimal area needed to sustain a black-footed ferret in white-tailed prairie dog habitat (Stromberg et al. 1983)
Canada lynx (*Lynx canadensis*) Gray wolf (*Canis lupus*)	Northern Rocky Mountains in Wyoming, Colorado, and Utah to capture the potential effects of construction disturbance on dispersal through intermountain valleys
Plants	
Clay phacelia (*Phacelia argillacea*) Clay reed-mustard (*Schoenocrambe argillacea*) Deseret milkvetch (*Astragalus desereticus*) Shrubby reed-mustard (*Schoenocrambe suffrutescens*) Uinta Basin hookless cactus (*Sclerocactus wetlandicus*) Ute ladies'-tresses (*Spiranthes diluvialis*)	Boundaries of the sixth-level (12-digit) hydrologic unit code (subbasin) drainage areas crossed by the Project in which habitat is located
Western prairie fringed orchid (*Platanthera praeclara*)	Impacts of water depletions analyzed in the Platte River basin in accordance with the existing programmatic Biological Opinion

2.4 Direct Effects Analysis

Direct effects (those that take place at the same time or in the same location as the proposed action) analyzed in this BA included mortality during construction or operation of the Project, loss of habitat resulting from ground-disturbing activities, habitat fragmentation, and disturbance from human presence or construction noise. Effects such as mortality were considered to be limited to areas where ground disturbance would be proposed or where existing access roads would be used by Project vehicles. Noise

and associated disturbance was analyzed based on available information on noise transmission and the response of individual species.

For some of the species considered in this analysis, the types of potential effects will vary depending on the type of transmission-line structure selected. For birds, the risk of mortality and injury from in-flight collision may be greater in locations where guyed transmission-line structures are used. These effects are described in detail for each bird species analyzed in Section 4. For mammals, fish, and plant species, the types of potential effects are assumed to be the same regardless of the structure type selected. The amount of surface disturbance required to construct all of the transmission-line structures described in Section 1.4.4 is assumed to be identical. The extent of habitat loss for species analyzed in the BA that may occur as a result of construction, operation, and maintenance of the Project was estimated using the best available information from the Proponent to provide an estimate of the extent of potential impacts on these species. Prior to final engineering design of the Project, the location of Project features such as new access roads, upgrades to existing roads, drive- and-crush areas, transmission-line structures, and other Project facilities have not been identified. The analysis was completed by estimating the total disturbance due to construction of features such as the Project access network (construction of new roads, upgrades to existing roads, drive-and-crush travel), transmission-line structures, and other Project facilities over the entire length of the agency-preferred route. The analysis assumes a constant rate of disturbance per mile of transmission line, which was calculated using the estimated total disturbance and the total length of the transmission line. The rate was then used to estimate the extent of loss of habitat (in acres) that will occur with each specific length of habitat crossed by the agency-preferred route.

2.5 Indirect Effects Analysis

Indirect effects (those that take place at later in time or in a different location than the proposed action) analyzed in this BA included the effects of water depletion, vegetation changes such as altered fire regimes or facilitation of invasive plants, dust deposition, increased recreational access, altered predator or prey populations, and disturbance that may alter wildlife dispersal and distribution patterns. Where possible, these indirect effects were discussed quantitatively based on the best available information (e.g., known distances for the potential effects of raptor predation near transmission lines). In other cases, the spatial extent or intensity of indirect effects cannot be quantified at this time (e.g., the degree to which recreational traffic may increase in any location), and the potential for these effects to occur was discussed qualitatively.

2.6 Water Depletion Analysis

Construction of the Project will require the use of surface water or groundwater for dust control, transmission-line structure and facility foundations, and geotechnical exploration. Impacts of potential water depletions on downstream ESA-listed species were analyzed using best available water-use estimates from the Proponent. Specific methods are described in the effects analysis section for species that may be affected by water depletions in downstream water systems (Section 4.1).

2.7 Cumulative Effects Analysis

Cumulative effects, in regard to the BA analysis, include those effects of future state, private, or tribal activities not involving federal activities or permits that are reasonably certain to occur in the action area of the federal action subject to consultation (50 CFR 402.02). Cumulative effects are only assessed where the analysis of impacts determines that the Project may affect, and is likely to adversely affect, a listed species or critical habitat. For this BA analysis, cumulative effects were analyzed beyond the extent of the Project action area and into the specific analysis area for each species (defined in Section 2.3).

Cumulative impacts on critical habitat were considered for the entire critical habitat unit (CHU) that may be affected by Project actions.

All nonfederal projects that are reasonably certain to occur in a species' analysis area were assessed, as defined for use in cumulative effects analysis in the Project EIS (Pontarolo 2014). Reasonably foreseeable future projects are those that have either applied for a permit from local or state authorities or which are publicly known.

3.0 ENVIRONMENTAL BASELINE AND CURRENT STATUS

This section provides background information on the ecology, regulatory status, and threats for each listed, proposed, and candidate species that may be affected by the proposed Project. The discussion focuses on aspects of each species' ecology and life history that has relevance to potential effects of the Project.

3.1 Fish

3.1.1 Bonytail (*Gila elegans*) – Endangered

3.1.1.1 Regulatory Status

The bonytail was first proposed for listing as endangered under the ESA on April 24, 1978, (43 *Federal Register* [FR] 17375), and the final listing rule was released in 1980 (45 FR 27710). The bonytail also is included in the Lower Colorado River Multi-Species Conservation Program (2004).

3.1.1.2 Designated Critical Habitat

Critical habitat for the bonytail and other listed Colorado River fish was proposed in 1993 (58 FR 6578-6589), and designated in 1994 (59 FR 13374-13400). The designation included seven reaches of the Colorado River system, including portions of the Colorado, Green, and Yampa rivers in the Upper Basin and the Colorado River in the Lower Basin, totaling 312 river miles. Designated critical habitat for the bonytail in the Project area includes portions of the upper Colorado River (northeast of Wayne County, Utah), portions of the Green River (north of Wayne County, Utah), and the Yampa River.

3.1.1.3 Taxonomy and Life History

The bonytail, also referred to as the bonytail chub in the 1980 listing rule and other documents (FWS 2002a), originally was collected and described from the Zuni River, New Mexico, in 1853 by Baird and Girard of the Sitgreaves Expedition (Minckley and Marsh 2009). The bonytail is a member of a unique assemblage of 35 fish species native to the Colorado River Basin. Identification of juvenile bonytail versus the similar, closely related roundtail chub (*Gila robusta*) can be particularly difficult, and some historical distribution records are questionable as a result (FWS 2002a).

The bonytail is a relatively large minnow (family *Cyprinidae*) endemic to the Colorado River Basin. The bonytail and several related species have unique morphological adaptations to the flow regimes of the historic Colorado River mainstem and tributaries. Adult bonytails are characterized by a small head and an elongated, laterally compressed body with a long, thin caudal peduncle and a slightly humped back (Nevada Department of Wildlife 2007). Adult bonytails can reach a maximum size of 22 inches (Bozek et al. 1984). The scales are small, reduced in number over part of the fish, and may be embedded and the eyes are relatively small—all thought to be adaptations to high-suspended sediment loads and turbidity

that characterized the Colorado River system prior to the construction of dams (Arizona Game and Fish Department [AZGFD] 2001). The narrow tail terminates in a V-shaped caudal fin (FWS 2002a).

Natural reproduction of the bonytail was last documented in the Green River in Dinosaur National Monument in the early 1960s (Vanicek and Kramer 1969). The species is a broadcast spawner; in the wild females released an estimated 10,000 adhesive eggs while hatchery females yield an average of 25,000 eggs (Hamman 1982). In Lake Mohave and the lower basin, spawning occurs in May, whereas spawning occurs in June and July in the upper basin. By 2002, more than 83,000 hatchery-reared bonytails had been released into Lake Mohave (Valdez and Clemmer 1982). In rivers, adults eat primarily terrestrial insects, plant debris, and algae, and the young eat aquatic insects. In lakes, the bonytail has been observed feeding on algae and plankton (AZGFD 2001).

3.1.1.4 Distribution and Habitat Requirements

Formerly abundant throughout the Colorado River and its larger tributaries, the bonytail has been found from the Green River in Wyoming and Utah; the Yampa and Gunnison rivers in Colorado; the Colorado River in Arizona, Colorado, Nevada, and California; San Juan River in New Mexico; and the Gila and Salt rivers in Arizona (FWS 2002a). Extirpated or declining across most of its range, the bonytail is now one of the most critically imperiled North American freshwater fishes. The only known wild bonytails are an unknown number of large, old adults in Lake Mohave on the lower Colorado River and scattered individuals in the upper Colorado River basin (AZGFD 2001). Known locations include the Yampa River in Dinosaur National Monument, the Green River in Gray and Desolation canyons, the Colorado River near Black Rocks (Kaeding et al. 1986) and Cataract Canyon (59 FR 13374), Lake Mohave near the Arizona-Nevada border, and Lake Havasu in Arizona and California (FWS 2002a). Bonytails have also dispersed into the San Rafael River from release sites in the Colorado or Green rivers (Bottcher et al. 2013). The Project will cross the Green and Yampa rivers, which could be occupied by the bonytail.

The bonytail was historically common in warm-water reaches of larger rivers from Mexico to Wyoming. Little is known, however, about the specific habitat requirements of bonytails because the species was extirpated from most of its historic range prior to extensive fishery surveys (FWS 2002a). However, most recent records indicate the species prefers mid-sized to large rivers, usually near deep swift water, in flowing pools and backwaters, over mud or rocks (Valdez et al. 1990). Flooded bottomland habitats are likely to be important growth and conditioning areas for bonytails, particularly as nursery habitats for young (FWS 2002a).

3.1.1.5 Primary Threats to Survival

Threats to the species include streamflow regulation, habitat modification or destruction, and competition with and predation by non-native fish species. Historically, the species inhabited the large, turbid mainstream rivers of the Colorado River Basin that alternated between swift water canyons characterized by torrential rapids and slow, meandering, sand-bottomed stretches. The Colorado River and its major tributaries have been greatly altered by dams and diversions, eliminating much of the bonytail's original habitat. The lower Colorado River basin is now an alternating series of reservoirs and cold tailwaters that do not provide the warm-water temperature needed for bonytails to spawn. Predation by introduced species such as bass, sunfish, catfish, red shiner, and redside shiner reduce survival of juvenile bonytails and further contribute to the species' low recruitment (45 FR 27710). Stocking efforts have been adjusted to release larger size classes of bonytails in an attempt to reduce the risk of predation on juveniles, but even the largest individuals regularly stocked (approximately 10 inches) appear to be susceptible to predation by striped bass (*Morone saxatilis*) in reservoirs (Karam and Marsh 2010).

3.1.1.6 Species Recovery

Recovery goals for the bonytail were published on August 1, 2002. The recovery of the bonytail is managed as two recovery units, the Upper Basin and Lower Basin, separated by Glenn Canyon Dam and Lake Mead. The Upper Basin Recovery Unit is composed of the Green River and Upper Colorado Basin, and the Lower Basin Recovery Unit includes the mainstem and tributaries of the Colorado River from Glenn Canyon Dam downstream to the United States/Mexico border.

The bonytail may be downlisted from endangered to threatened, if during a 5-year period: (1) one (Upper Basin Recovery Subunit) and two (Lower Basin Recovery Subunit) genetically and demographically viable, self-sustaining populations of more than 4,400 adults are maintained; (2) a genetic refuge is maintained in a suitable location in the Lower Basin Recovery Unit such as Lake Mohave or Havasu; and (3) site-specific management tasks to minimize or remove threats have been identified, developed, and implemented. Delisting can occur if all three goals listed above are maintained for an additional 3 years past downlisting and a necessary level of protection is attained (FWS 2002a). A 5-year review of the status of the bonytail was completed in 2012, and no change in listing status was recommended (FWS 2012a).

3.1.2 Colorado Pikeminnow (*Ptychocheilus lucius*) – Endangered

3.1.2.1 Regulatory Status

Colorado pikeminnow was listed as endangered (as the Colorado River squawfish) under the Endangered Species Preservation Act (ESPA) on March 11, 1957 (32 FR 4001) and as endangered under the ESA on its passage in 1973 (United States Code (U.S.C.), Title 16, Sections 1531-1544). Two reintroduced Colorado pikeminnow populations have been designated as Nonessential Experimental Populations (NEP) under Section 10(j) of the ESA (50 FR 30188). An additional reintroduced population has been proposed for designation as an NEP (52 FR 32143), but the ruling has never been finalized. A 5-year review was initiated on April 18, 2007 (72 FR 19549) and completed in 2011 (FWS 2011a).

3.1.2.2 Designated Critical Habitat

On March 21, 1994 the FWS designated 1,148 river miles as critical habitat in six reaches of the Colorado River system, including portions of the Colorado, Green, Yampa, White, and San Juan rivers (59 FR 13374).

3.1.2.3 Taxonomy and Life History

The Colorado pikeminnow is the largest North American member of the minnow family (*Cyprinidae*). The estimated maximum total size is 6 feet and 80 pounds, although averages are believed to be less than 3 feet and between 4 to 9 pounds (Miller 1961). It is one of three large cyprinids of the genus *Ptychocheilus* native to western North America. The species has a flattened head and elongated body and is adapted to life in rivers with seasonally variable flow and high silt loads. The mouth is large and nearly horizontal with slender teeth adapted for grasping and holding prey. The Colorado pikeminnow is the top native aquatic carnivore of the Colorado River system. Small individuals feed primarily on waterfleas, copepods, and chironomids. Large adults prey mainly on other fish (FWS 2002b).

The Colorado pikeminnow spawns under decreasing flow regimen with increasing temperatures in summer when the water temperature is at least 68 to 72 degrees Fahrenheit, generally after June. The pikeminnow makes an extensive spawning migration, with one individual recorded traveling 127 miles. They are broadcast spawners that deposit their eggs on cobble substrates in riffles and runs. Eggs hatch in less than 1 week, and larvae then enter stream drift and are transported downstream for about 6 days.

Larvae travel an average distance of 99 miles to mature in low-gradient reaches and backwaters of the river. The Colorado pikeminnow matures in 5 to 7 years, and may live 30 years or more. Natural reproduction has been recently observed in the Green, Yampa, upper Colorado, Gunnison, and San Juan rivers (FWS 2002b).

3.1.2.4 Distribution and Habitat Requirements

The Colorado pikeminnow was once widespread in the large rivers of the Colorado River and major tributaries, but its historical distribution was much greater than at present. The last capture of a wild Colorado pikeminnow in the lower Colorado River was in 1975 (Minckley et al. 2003). The three remaining wild populations are found in the Green, upper Colorado, and San Juan River subbasins.

In the Green River Subbasin, the Colorado pikeminnow is present in the following rivers:

- Green River (from Lodore Canyon to the Colorado River confluence)
- Yampa River (from Craig, Colorado, to the Green River confluence) (FWS 2002b)
- Little Snake River (Wyoming to the Yampa River confluence) (Marsh et al. 1991)
- White River (Taylor Draw Dam to the Green River confluence)
- Price River (lower 89 miles above Green River confluence)
- Duchesne River (lower 6 miles above the Green River confluence)
- San Rafael River (2.8 miles downstream from the Hatt Ranch diversion to the Green River confluence) (Bottcher et al. 2013)

In the Upper Colorado River Subbasin, the Colorado pikeminnow is present in the following rivers:

- Upper Colorado River (from Palisade, Colorado, to Lake Powell inflow)
- Gunnison River (lower 33 miles above Colorado River confluence)
- Dolores River (lower 1 mile above Green River confluence)

The Project will cross the Green, Yampa, and White rivers.

In the San Juan River Subbasin, the species is found only in the San Juan River (from Shiprock, New Mexico, to the Lake Powell inflow) (FWS 2002b).

A refuge population was successfully established at the Dexter National Fish Hatchery in Dexter, New Mexico. From 1981 to 1990, as many as 623,000 Colorado pikeminnow from the refuge population were reintroduced to two designated NEPs in tributaries of the Gila River in Arizona (50 FR 30188):

- Salt River (Gila County) – from Roosevelt Dam upstream to U.S. Highway 60 Bridge
- Verde River (Gila and Yavapai counties) – from Horseshoe Dam upstream to Perkinsville

Initial introductions into the Salt and Verde rivers met with low success. In 1992, the reintroduction program was modified to only release fish into the Verde River, as well as increase the age of the released fish (FWS 2009a).

A rule was proposed in 1987 to designate an additional NEP in the Colorado River Basin, but has never been finalized:

- Lower Colorado River (Yuma and La Paz counties, Arizona; and Imperial, Riverside, and San Bernardino counties, California) – between Imperial and Parker Dams (52 FR 32143)

The Colorado pikeminnow is found in warm-water reaches of the mainstem Colorado River and larger tributaries. Adults have been found in various habitats including deep, turbid, strongly flowing water;

eddies; runs; flooded bottoms; and backwaters. Lowlands inundated during high spring flows appear to be important habitats for health and reproductive conditioning, as the fish use these habitats to offset winter stress and replenish energy stores needed for long migrations and spawning. In winter, adults are most commonly found in shallow, ice-covered shoreline areas (FWS 2002b).

Adults migrate long distances (Tyus and McAda 1984) and seek whitewater canyons for spawning. They appear to select river canyons receiving groundwater discharge from sandstone and limestone seeps, and return to the same spawning site every year. Only two principal spawning sites have been identified, both in the Green River Subbasin. One site is near Three Fords Canyon in Gray Canyon of the Lower Green River and the other is in the lower 20 miles of the Yampa River (FWS 2002b). After hatching, the larvae drift downstream, and then move to shoreline areas and backwaters. Juvenile pikeminnow temporarily occupy shallow, ephemeral backwaters formed in late summer by receding water levels (Utah Division of Wildlife Resources [UDWR] 1997).

3.1.2.5 Primary Threats to Survival

Threats to the Colorado River Basin endangered fishes include streamflow regulation, habitat modification or destruction, and competition/predation from non-native fish species. Historically, the species inhabited the large turbid mainstream rivers of the Colorado River Basin that alternated between swift water canyons characterized by torrential rapids and slow, meandering, sand-bottomed stretches. The Colorado River has been greatly altered by dams and diversions eliminating much of the Colorado pikeminnow original habitat. Currently, the lower Colorado River Basin is an alternating series of reservoirs and cold tailwaters that do not provide the warm water temperature needed for the Colorado pikeminnow to spawn. Predation by introduced species also likely contributed to the decline of the species. Species such as bass, sunfish, catfish, red shiner, and redside shiner prey on the eggs and young of a number of native fish species (45 FR 27710).

3.1.2.6 Species Recovery

The Colorado pikeminnow recovery plan was approved in 1991, and updated with recovery goals on August 28, 2002 (FWS 2002b). To address unique threats and site-specific management actions, the entire population of the Colorado pikeminnow is managed in three recovery subunits of the Upper Colorado River Basin: the Green River, the Upper Colorado River, and the San Juan River subbasins.

The Colorado pikeminnow may be downlisted from endangered to threatened, if during a 5-year period: (1) one genetically and demographically viable, self-sustaining population of more than 2,600 adults is maintained in the Green River Subbasin Recovery Unit; (2) a self-sustaining population of at least 700 adults is maintained in the upper Colorado River Subbasin Recovery Unit; (3) a target number of 1,000 age-5-plus fish is established in the San Juan River Subbasin Recovery Unit; and (4) site-specific management tasks to minimize or remove threats have been identified, developed, and implemented. Delisting can occur if the three goals listed above are maintained for an additional 7 years beyond downlisting and a necessary level of protection is attained (FWS 2002b).

3.1.3 Humpback Chub (*Gila cypha*) – Endangered

3.1.3.1 Regulatory Status

The humpback chub was listed as endangered under the ESPA on March 11, 1967 (32 FR 4001). With the 1973 passage of the ESA, which superseded the ESPA, the species retained its endangered status. On April 18, 2007, the FWS initiated a 5-year species status review (72 FR 19549), which was completed in 2011 (FWS 2011b). The humpback chub also is included in the Lower Colorado River Multi-Species Conservation Program (2004).

3.1.3.2 Designated Critical Habitat

On March 21, 1994, the FWS designated seven reaches of the Colorado River system including portions of the Colorado, Green, and Yampa rivers in the Upper Basin and portions of the Colorado and Little Colorado rivers in the Lower Basin, totaling 379 river miles of critical habitat for the species (59 FR 13374).

3.1.3.3 Taxonomy and Life History

The humpback chub was first described in 1946. Prior to that time, the humpback chub was considered part of the *Gila robusta* (roundtail chub) complex.

The humpback chub is a medium-sized, unusually shaped fish of the minnow family (*Cyprinidae*). The head is narrow, flattened, and generally dorsally concave with a long fleshy snout and small eyes. The mouth is inferior-subterminal. There is a pronounced dorsal hump that begins at the dorsal origin of the gill covers, protrudes anteriorly, and then ends at the origin of the dorsal fin. It is believed the odd shape of the fish aids in fast water by pushing the fish to the bottom where the current would be slower and where the fish would expend less energy to hold its position. The grooves in the hump also may aid in directing water to the fish's gills (FWS 2002c).

The humpback chub evolved in seasonally warm and turbid waters and is highly adapted to unpredictable hydrologic conditions that occurred in the Colorado River system prior to extensive damming. Spawning of the humpback chub occurs in spring shortly after peak flow (Gorman and Stone 1999). In the Little Colorado River of Arizona, individuals moved upriver in early spring and slowly back downstream post-reproduction. Humpback chubs are opportunistic omnivores that are known to eat insects, crustaceans, plants, and seeds and will opportunistically feed on small fish, reptiles, and amphibians (FWS 2002c).

3.1.3.4 Distribution and Habitat Requirements

Historically, the humpback chub was found throughout the Colorado River Basin from western Colorado and Wyoming to northern Arizona in the Colorado, Green, Lower Yampa, and White rivers. Currently, there are six known self-sustaining populations consisting of 7,300 to 13,800 wild adults. Five populations exist in the Upper Colorado River basin and one in the Lower Colorado River basin. The Upper Colorado River basin populations are present in the Colorado River (Black Rocks, Westwater, and Cataract canyons in Utah) the Yampa River (Yampa Canyon in Colorado) and the Green River (Desolation/Gray Canyons in Utah). The Project crosses populations present in the Yampa and Green rivers. The only population in the Lower Colorado River basin is found on the mainstem Colorado River in Marble and Grand Canyons and the Little Colorado River. A small number of humpback chub have been captured in the Green River in Dinosaur National Monument but are not considered to be a self-sustaining population (FWS 2002c).

Humpback chubs are found in large rivers in a variety of habitats. Adults have been found in deep turbulent currents, shaded canyon pools, and areas under shaded ledges in moderate current, riffles, and eddies (59 FR 13374-13400). Young and spawning adults generally are found in sandy runs and backwaters (FWS 1990a) in the Colorado, Green, Lower Yampa, and White rivers.

3.1.3.5 Primary Threats to Survival

The current primary threats to the humpback chub are loss, fragmentation, and modification of habitat due to construction and operation of the Hoover Dam. The dam has led to impoundment of streams causing stream inundation, reduced water temperatures, reduced spring flow, sediment capture, and increased daily fluctuation in flow. Decreased temperatures and flow reduction may impede successful spawning

and increase competition with other species. As with the other Colorado River Basin endangered fishes, predation by introduced species also likely contributed to the decline of the species. Species such as bass, sunfish, catfish, red shiner, and redside shiner prey on the eggs and young of a number of native fish species (45 FR 27710).

Other threats include hybridization with *G. elegans* (bonytail) and *G. robusta* (roundtail chub), introduced parasites, and effects of a small population size. In addition to possible genetic effects and higher vulnerability to catastrophic events, small population size in fish can contribute to low reproductive success during spawning. Increased hybridization among the native Gila species is thought to be symptomatic of changes in habitat and movement patterns leading to the genetic introgression (Utah Natural Heritage Program [UNHP] 2003). The introduced Asian tapeworm also may be a serious threat to the survival of the humpback chub.

3.1.3.6 Species Recovery

The current recovery plan for the humpback chub was published in 1990 and amended in 2002. The species may be downlisted from endangered to threatened if during a 5-year period: (1) the numbers of adults in the six extant populations do not decline significantly; (2) the recruitment of age-3 naturally produced fish equals or exceeds mean annual adult mortality for each of the six extant populations; (3) two genetically and demographically viable, self-sustaining populations of more than 2,100 adults are maintained; and (4) site-specific management tasks to minimize or remove threats have been identified, developed, and implemented. Delisting can occur if the four goals listed above are maintained for an additional 3 years beyond downlisting and a necessary level of protection is attained (FWS 2002c). A 5-year review of the status of the humpback chub was completed in 2011, and no change in listing status was recommended (FWS 2011b).

3.1.4 June Sucker (*Chasmistes liorus*) – Endangered

3.1.4.1 Regulatory Status

The June sucker was proposed for listing as endangered under the ESA in 1984, with critical habitat proposed in the lower Provo and Spanish Fork rivers (49 FR 27183-27188). The listing was finalized in 1986, although the Spanish Fork River was removed from the final critical habitat designation (51 FR 10851-10857).

3.1.4.2 Designated Critical Habitat

The lower 3 miles of the Provo River was designated as critical habitat at the time the June sucker was listed, in recognition of the presence of the last remaining natural spawning run for the species (51 FR 10851-10857). No designated critical habitat is present in the Project area.

3.1.4.3 Taxonomy and Life History

The June sucker is one of four or five species in the genus *Chasmistes*, although one is presumed extinct (FishBase 2014). Two of the five species are endemic to Utah Lake and its tributaries, and form a species complex where anatomical similarity and apparent hybridization events have made identification difficult since each species was described. The Webug sucker (*C. fecundus*) has been variously separated from or combined with other species in descriptions on the basis of anatomical features that often overlap, and the current status of the species is unclear although it may persist in Utah Lake (Cook 2001). The closely related Utah sucker (*Catostomus ardens*) and June sucker may have hybridized during a drought event in the 1930s that reduced water levels in Utah Lake and affected spawning behavior. This event may have resulted in the loss of a pure June sucker population, although the resulting population, sometimes named

Chasmistes liorus mictus, appears to be reproductively isolated and distinct from the Utah sucker at this time.

June suckers spawn in gravel beds in low-velocity rivers and streams that flow into Utah Lake. Spawning peaks in early June, after flows peak from snowmelt runoff (Modde and Muirhead 1994), although spawning may be shifting to earlier dates in response to changed flow patterns in managed rivers (Andersen et al. 2006). After hatching in riverine gravel beds, larval June suckers may remain in low-flow areas, then drift downstream and enter Utah Lake. There, juveniles would take refuge and mature in extensive areas of emergent aquatic vegetation that formerly surrounded the lake. June suckers mature between 5 and 10 years of age, and individuals as old as 42 have been captured (Belk 1998).

3.1.4.4 Distribution and Habitat Requirements

The June sucker is restricted to Utah Lake and the Provo River, although it may occasionally spawn in other historically occupied tributaries of Utah Lake as well, including the Spanish Fork and Hobble Creek (FWS 1999, Abate 2015). Several populations are maintained in fish hatcheries, and several populations exist in natural and man-made lakes and reservoirs, where the species was introduced to provide insurance against events that could affect the native population in Utah Lake (Andersen et al. 2006). The agency-preferred route crosses into the Utah lake watershed and the Spanish Fork River subbasin of the Jordan River basin.

Adult June suckers require open-water lake habitat, and feed primarily on zooplankton. June suckers have been observed feeding in large schools in open water, presumably following concentrations of zooplankton as well as potentially lowering individual predation risk (Billman 2008). Juveniles prefer the structure and shelter of emergent aquatic vegetation in shallow water, such as existed previously in marshes where spawning streams join Utah Lake.

3.1.4.5 Primary Threats to Survival

Many of the threats to the June sucker interact and are related to the physical and biological characteristics of Utah Lake. Manipulation of water levels in Utah Lake, together with the introduction of non-native herbivorous fish such as common carp (*Cyprinus carpio*) resulted in the loss of much of the emergent vegetation around the lake. Increased nutrient loading from land use practices such as agriculture adjacent to the lake and its tributaries supports extensive algal blooms. These blooms, together with higher turbidity resulting from the loss of emergent vegetation that previously buffered wave action and sediment-disturbing foraging activities of common carp, has allowed turbidity to increase and further reduced the ability of emergent vegetation to recover. The loss of shelter and foraging habitat for juvenile June suckers allowed high rates of predation from introduced game fish, and functionally prevented recruitment in the species prior to implementation of the hatchery program.

Alteration of flows in rivers used for spawning may have, as noted previously, shifted the spawning season earlier in the year. A change in spawning season can expose larval and juvenile June suckers to river and lake conditions to which they may not be adapted. Physical manipulation (e.g., damming, channelization) of many of the former spawning streams has eliminated natural spawning runs, with only the Provo River now supporting natural reproduction for the species.

3.1.4.6 Species Recovery

The recovery plan for the June sucker was published in 1999 (FWS 1999) and identifies goals needed to downlist and delist the species. Recovery goals were primarily based on reducing or eliminating threats, and do not include quantitative population objectives. The June Sucker Recovery Implementation Program was formed in 2002, as a coalition of agencies and other stakeholders and oversees recovery

efforts, including water management for in-stream flows, methods to address lake water quality, and the hatchery program to raise and release June suckers.

3.1.5 Pallid Sturgeon (*Scaphirhynchus albus*) – Endangered

3.1.5.1 Regulatory Status

The pallid sturgeon originally was submitted as a category 2 candidate species on December 30, 1982 (47 FR 58454-58460). The species was listed as endangered on September 6, 1990 (55 FR 36641-36647).

3.1.5.2 Designated Critical Habitat

No critical habitat has been designated for the pallid sturgeon.

3.1.5.3 Taxonomy and Life History

The pallid sturgeon is a member of an ancient group of bony fishes (subclass *Paleopterygii*) that thrived from the Paleozoic Era through to the early Mesozoic Era. Most species in this subclass went extinct, but eight species of sturgeon (family *Acipenseridae*) and the paddlefish (family *Polyodontidae*) continue to inhabit portions of North America (FWS 2014a).

The pallid sturgeon was described in 1905 from nine specimens collected out of the Mississippi River near Grafton, Illinois. It originally was classified as its own genus (*Parascaphirhynchus*), but was found to be part of the genus *Scaphirhynchus* in 1954 (FWS 2014a).

The pallid sturgeon is long and slender with a completely armored caudal peduncle. It has a flattened, shovel-shaped snout with a toothless mouth located on the ventral side of the snout. The species is the largest fish species found in the Missouri-Mississippi River drainage, with some individuals as large as 86 pounds. Individuals found in the northern portions of the species' ranges tend to be significantly larger than those in the southern portions of the range (FWS 2014a).

Spawning occurs between June and August. It is unclear at what size and age sexual maturity is reached; but for most sturgeon species, sexual maturity is not reached until 7 years of age, and several years pass between spawnings to allow eggs to mature. One study estimates that male pallid sturgeons reach sexual maturity at 7 to 9 years with intervals of 2 to 3 years between spawning years. Females were estimated to reach sexual maturity at 15 to 20 years with 3- to 10-year intervals between spawning years (FWS 2014a).

Pallid sturgeons primarily consume fish but also will consume aquatic invertebrates (FWS 2014a).

3.1.5.4 Distribution and Habitat Requirements

Pallid sturgeons inhabit the Missouri and Mississippi River systems from Montana to southern Louisiana in addition to tributaries of those rivers. The pallid sturgeon evolved with the rivers and relied on the annual floods that would occur as a result of snowmelt. These flood events would occur in April and June stimulating spawning migrations (FWS 2014a).

Specific habitat preference data are extremely limited due to the rarity of the species. Using capture occurrences may or may not provide a true representation of the micro-habitat characteristics of the pallid sturgeon. Pallid sturgeons are often captured over a sand bottom, which is the predominant bottom substrate within the species' range. The species has been captured over gravel and rock in the Yellowstone River and is most often captured in areas with a velocity of 1.3 to 2.9 feet per second or in slower currents near to shore (FWS 2014a).

3.1.5.5 Primary Threats to Survival

The primary threat to the survival of the pallid sturgeon is habitat loss. Destruction and alteration of the river system by humans through dams and channelization has greatly altered the water flow and ecosystems of these rivers. Channelization results in changes in water velocity, reduces the width of the river, and prevents water flow into backwaters. Dams have resulted in the control of annual flooding as well as fragmenting habitat. Larval pallid sturgeons require long, uninterrupted river segments after hatching as reservoirs can support predatory fish and unsustainable predation rates on larval and juvenile pallid sturgeons. Impoundments also capture sediment, potentially affecting downstream habitat use by pallid sturgeons. Pallid sturgeons evolved to live in a nearly sightless world, and water clarity has increased predation by sight-feeding predators as well as making capture of prey by pallid sturgeons more difficult (FWS 2014a).

3.1.5.6 Species Recovery

On November 7, 1993, a recovery plan for the pallid sturgeon was published (FWS 2014a). The objective of this plan was to delist the species by 2040. The first revision of the recovery plan was released in 2014 (FWS 2014a), where a downlisting goal of 2030 and delisting goal of 2047 were noted. Delisting may be considered when each management unit supports diverse population of 5,000 adult pallid sturgeons for two generations, and there are sufficient population numbers in the wild to maintain stability. Specific population objectives to meet the goal of sufficient population numbers has yet to be determined (FWS 2014a; FWS 2007).

3.1.6 Razorback Sucker (*Xyrauchen texanus*) – Endangered

3.1.6.1 Regulatory Status

The razorback sucker was first proposed for listing as a threatened species under the ESA of 1973 on April 24, 1978 (43 FR 17375). On May 27, 1980, the FWS withdrew the proposal, because it was not finalized within the 2-year time limit from the initial publication in the *Federal Register* (45 FR 35410). In 1989, the FWS received a petition from the Sierra Club, National Audubon Society, The Wilderness Society, Colorado Environmental Coalition, Southern Utah Wilderness Alliance, and the Northwest Rivers Alliance requesting the razorback sucker be listed as an endangered species. A positive finding was made and subsequently published by the FWS on October 23, 1991 (56 FR 54957).

On February 14, 2007, the FWS and Nevada Department of Wildlife entered into a Safe Harbor Agreement, encouraging the conservation, enhancement of survival, and recovery of the species through development of facilities for the rearing of juveniles and providing refuge habitats for adult razorback suckers (71 FR 57558). A 5-year review was initiated on April 18, 2007 (72 FR 19549).

3.1.6.2 Designated Critical Habitat

On March 21, 1994, the FWS designated 15 reaches of the Colorado River system, including portions of the Green, Yampa, Duchesne, Colorado, White, Gunnison, and San Juan rivers in the Upper Basin and portions of the Colorado, Gila, Salt, and Verde rivers in the Lower Basin, totaling 1,724 river miles of critical habitat for the species (59 FR 13374).

3.1.6.3 Taxonomy and Life History

The razorback sucker, also known as the humpback sucker, is a member of the family *Catostomidae*. The razorback sucker was first described by Charles Conrad Abbott as *Catostomus texanus* because it was mistakenly thought the species had come from the Colorado River in Texas. In 1889, it was reorganized

into the *Xyrauchen* genus, which translates to razornape. LaRivers redescribed the species, correctly identifying the place of origin to the Colorado and New rivers in Arizona (FWS 2002d).

Adult razorback suckers can grow up to 3 feet long and weigh up to 13 pounds. However, most specimens are smaller. The largest razorback suckers currently inhabit the warmer climates of the lower Colorado River. It is easily distinguished from other catostomids by a pronounced bony keel that grows from the dorsal surface of its back and gill rakers, an adaptation for feeding on zooplankton. Razorback suckers consume insects, zooplankton, phytoplankton, algae, and detritus, depending on age and habitat. Larvae begin feeding on plankton, and as the mouth migrates to a sub-terminal position, larvae begin feeding on benthos as well (FWS 2002d).

Razorback suckers spawn as early as 3 to 4 years of age. Depending on water temperature, spawning may begin in mid-April and last as late as June. In Lake Mohave, spawning has been observed as early as November, but no earlier than February in Lake Mead. They migrate long distances, congregating in large numbers at spawning sites. Razorback suckers are broadcast spawners that deposit adhesive eggs over a cobble substrate that are quickly covered by silt. Adults do not guard nests (FWS 2002d).

3.1.6.4 Distribution and Habitat Requirements

Historically, the razorback sucker was widely distributed and abundant in the Colorado River and major tributaries from Northern Mexico through Arizona and Utah into Wyoming, Colorado, and New Mexico. Now it is much reduced in range and abundance. In the Lower Colorado Basin, numbers of razorback sucker began to decline with the impoundment of Lake Mead.

In the Upper Colorado River Basin, razorback suckers are considered extant in four locations: Westwater and Cataract Canyons and the Utah/Colorado border on the Colorado River, Desolation and Gray canyons of the Green River, and a population in northwestern Colorado on the Yampa River. The Green and Yampa river populations are in or downstream of the Project area. Razorback suckers have also dispersed into the San Rafael River from release sites in the Green River (Bottcher et al. 2013). Recruitment of razorback sucker was observed in Lake Powell in 2014 from Good Hope Bay to Hite (Hanson 2015). The razorback sucker is more widely distributed in the Lower Basin. The total population is estimated at approximately 10,500 individuals in three areas. The Lake Mohave population is the largest, estimated at 9,000 individuals. There is no observed recruitment in the population, though, so as the population ages it becomes smaller. In Lake Mead, the population is estimated at about 400 individuals with an average age of 20 to 25 years of age, indicating recent recruitment. Approximately 1,000 individuals are believed to inhabit a 60-mile reach between Davis Dam and Lake Havasu and have demonstrated reproduction (FWS 2002d).

Razorback sucker habitat includes slow areas, backwaters, and medium to large eddies of medium to large rivers and their impoundments. Three of the four remaining populations of more than 100 individuals are found in reservoirs. Flooded lowlands and lower portions of tributary streams serve as resting and feeding areas during breeding season in the Green River Basin. The razorback sucker is commonly associated with sandy, muddy, and rocky substrates in areas with little aquatic vegetation. In Lake Mohave, individuals were associated with inshore habitats except during the hotter months when they moved offshore, possibly to avoid warmer water temperatures (FWS 2002d).

In streams, spawning occurs most commonly near shores in streams over silty sand, gravel, or rock substrate. In reservoirs, spawning occurs on gravel bars swept clean by wave action or along shorelines over mixed substrates. Larvae appear to remain in gravel initially, swim up in the shallow littoral zone for a few weeks after hatching, and then disperse to deeper waters. Seasonally inundated flood plains provide favorable feeding areas for young (FWS 2002d).

3.1.6.5 Primary Threats to Survival

Primary threats to the razorback sucker are non-native fishes and invertebrates and human alteration of riparian habitat. Predation on larvae and juveniles by introduced fishes results in low and sometimes absent recruitment despite confirmed spawning and hatched larvae. Competition with and predation by exotic crayfish also may have been documented in some areas. Hybridization with other suckers is a potential problem in some locations. The loss, fragmentation, and modification of habitat due to construction and operation of dams greatly restrict the amount of suitable habitat. Dams lead to impoundment of streams causing changes in winter and spring flows, altered river temperatures, and reduced flooding (FWS 2002d).

3.1.6.6 Species Recovery

The current recovery plan for the razorback sucker was published in 1998 and amended in 2002. To address unique threats and site-specific management actions, the entire population of the razorback sucker has been reduced to Upper and Lower Basin recovery units. The Upper Basin Recovery Subunit is composed of the Green, Upper Colorado, and San Juan river subbasins and the Lower Basin Recovery Subunit includes the mainstem and tributaries of the Colorado River from Lake Mead downstream to the southerly International Boundary with Mexico. The species may be downlisted from endangered to threatened, if during a 5-year period: (1) two subbasins (one Green River Subbasin and one in either the Colorado River or San Juan River subbasins) and two subunits (Lower Basin Recovery Subunit) demonstrate that genetically and demographically viable, self-sustaining populations of more than 5,800 adults are maintained; (2) a genetic refuge is maintained in a suitable location in the Lower Basin Recovery Unit such as Lake Mohave; and (3) site-specific management tasks to minimize or remove threats have been identified, developed, and implemented. Delisting can occur if the three goals listed above are maintained for an additional 3 years past downlisting and a necessary level of protection is attained (FWS 2002d).

3.2 Birds

3.2.1 Greater Sage-grouse (*Centrocercus urophasianus*) – Candidate

3.2.1.1 Regulatory Status

The greater sage-grouse is regulated by a complex and evolving array of federal and state regulations. This section presents laws and policies most relevant to issues to be addressed in this BA. Additional information on greater sage-grouse presence in the Project area, potential effects of the Project, and the mitigation planning process are presented in Appendix K to the EIS.

Status under the Endangered Species Act

On March 4, 2010, the greater sage-grouse became a candidate species for listing as threatened or endangered under the ESA of 1973 (75 FR 13909). Prior to this rule, the FWS had listed the Washington state population of sage-grouse as a candidate for listing under the ESA in 2001 (66 FR 22984). In both rules, the FWS stated that formal listing for the species is warranted but is precluded by other higher priority listing actions. As a condition of a court-approved settlement, the FWS must make a listing determination by the end of fiscal year 2015.

In advance of the 2015 listing determination, the FWS convened a Conservation Objectives Team (COT) of state experts and FWS representatives to develop conservation objectives to address greater sage-grouse habitat threats identified in the 2010 12-month finding. The final COT report identified key areas

for conservation efforts (Priority Areas for Conservation, or PACs), identified key threats, and identified the extent to which the threats need to be reduced so that the species would not require the protections provided by the ESA (FWS 2013a). The FWS also developed a Range-Wide Energy Project Checklist for Consistency with the COT report and a Greater Sage-grouse Range-Wide Mitigation Framework (FWS 2014b), both designed to guide the development of greater sage-grouse mitigation that reduce threats and the need to list the species under the ESA.

The Bi-state Distinct Population Segment (DPS) of the greater sage-grouse, which is located in western Nevada and eastern California, was proposed for listing as a threatened species under the ESA in 2013 (79 FR 45420-45421) with critical habitat (78 FR 64328-64355).

Bureau of Land Management Regulations and Policies

The greater sage-grouse is listed as a sensitive species by the BLM state offices in all three states crossed by the Project. Current BLM sage-grouse management is guided by the documents listed below.

- BLM sensitive species are managed according to guidance provided by *BLM Manual 6840*. BLM's policies do not require consultation or conference on candidate species, but these species may be addressed in a BA as appropriate for the BLM's management objectives and the conservation of the species.
- The BLM has issued national-level and state-level Instructional Memorandums (IM) that provide additional guidance for the management of sage-grouse. The BLM is currently revising applicable land-use plans to incorporate sage-grouse conservation measures.
- In November 2004, the BLM Washington Office (WO) released its *National Sage-Grouse Habitat Conservation Strategy* (BLM 2004), which provides a framework for future conservation efforts by setting out broad goals and specific actions to meet those goals.
- In March 2010, the BLM Washington Office issued WO-IM 2010-071 *Gunnison and Greater Sage-grouse Management Considerations for Energy Development* (BLM 2010). These management considerations supplement the *National Sage-Grouse Habitat Conservation Strategy*. This IM identifies management actions necessary at some sites to ensure environmentally responsible exploration, authorization, leasing, and development of renewable and nonrenewable energy resources, including transmission projects, within the ranges of the Gunnison sage-grouse and greater sage-grouse.
- In December 2011, the BLM Washington Office issued WO IM 2012-043 *Greater Sage-Grouse Interim Management Policies and Procedures* (BLM 2011b), which provides interim conservation measures applied to sage-grouse and sage-grouse habitats while BLM land-use plan revisions are occurring, and WO IM 2012-044 *BLM National Greater Sage-Grouse Land Use Planning Strategy* (BLM 2011c), which directs the BLM to consider all applicable conservation measures when revising or amending its resource management plans in greater sage-grouse habitat.
- In February 2012, the BLM Wyoming State Office issued WY IM 2012-019 *Greater Sage-Grouse Habitat Management Policy on Wyoming Bureau of Land Management Administered Public Lands including the Federal Mineral Estate* (BLM 2012). This IM provides guidance to BLM Wyoming Field Offices on sage-grouse habitat management for proposed activities and resource management planning.

U.S. Forest Service Regulations and Policies

USFS Manual 2670 contains legal authorities, objectives, policies, responsibilities, instructions, and guidance that direct the USFS when planning and executing assigned programs and activities. In October 2012, the USFS published *Interim Conservation Recommendations for Greater Sage-grouse and Greater Sage-grouse Habitat for Regions 1, 2, and 4*. These recommendations supplement the recommendations for sage-grouse contained in the *Chief's Letter to Regional Foresters in Regions 1, 2, 4, 5 and 6 for Sage-grouse and Sagebrush Conservation* (July 2010). These recommendations also promote consistency in management of activities on USFS land with BLM IM 2012-043. Additionally, the USFS is currently revising applicable land and resource management plans to incorporate sage-grouse conservation measures.

3.2.1.2 Designated Critical Habitat

Critical habitat is not designated for candidate species.

3.2.1.3 Taxonomy and Life History

Greater sage-grouse are the largest grouse found in North America and are uniquely adapted to and dependent on sagebrush (*Artemisia* spp.) for survival. In the 1990s, researchers documented morphological, behavioral and genetic evidence suggesting that sage-grouse in southwestern Colorado and southeastern Utah were distinct from sage-grouse elsewhere across their range (Hupp and Braun 1991; Kahn et al. 1999; Oyler-McCance et al. 1999; Young et al. 1994). In 2000, the Gunnison sage-grouse (*C. minimus*) was recognized formally by the American Ornithologists' Union (AOU) as a distinct species, with sage-grouse across the remainder of the range being renamed greater sage-grouse (*C. urophasianus*).

Although as far back as the 1940s researchers have argued for subspecies classification between sage-grouse in eastern (*C. u. urophasianus*) and western (*C. u. phaios*) portions of the species' range (Aldrich 1946; Aldrich 1963; Aldrich and Duvall 1955) Morphological, behavioral, and genetic differences among some populations have been documented (Aldridge et al. 2008; Oyler-McCance et al. 2005; Taylor and Young 2006), though individuals are not differentiated at a distinct geographic boundary. The Bi-state DPS in eastern California and western Nevada, proposed for ESA listing, initially was petitioned for listing as a DPS of the subspecies *C. u. phaios* (Institute for Wildlife Protection 2002), although the proposal to list the DPS found that *C. u. phaios* was not a valid subspecies (75 FR 13910-14014).

Sage-grouse are polygamous and exhibit consistent breeding behavior on ancestral strutting grounds (leks) annually (Patterson 1952). During the breeding season, males display in early morning and evening hours, traveling up to 1.3 miles (Ellis et al. 1987) from the lek to day-use feeding and resting areas. Sage-grouse females retire into the vicinity of their nest location within a few days of being bred and remain relatively sedentary until they nest (Patterson 1952). A majority of sage-grouse females nest within 4 miles of the lek where bred (Colorado Greater Sage-grouse Steering Committee 2008). No concealment strategies are attempted at the nest except that afforded by natural cover and the female's cryptic plumage coloration pattern (Rassmussen and Griner 1938).

Egg laying takes 7 to 10 days, incubation lasts 25 to 29 days, and average clutch sizes are between 6.5 and 9.1 eggs (Patterson 1952; Schroeder et al. 1999). Reproductive effort (nesting propensity) estimates in sage-grouse range from 63 to 100 percent (Connelly et al. 2011); however, research on follicular development indicates that between 91 and 98 percent of females breed annually (Braun 1979). Nesting success in sage-grouse ranges from 15 to 86 percent and is typically around 50 percent (Connelly et al. 2011). Re-nesting rates less than 40 percent are typically reported (Connelly et al. 2011); however, Schroeder (1997) reported re-nesting rates greater than 80 percent in Washington. Sage-grouse are

relatively long-lived compared to other grouse, thus renesting may not be beneficial after weighing the benefits and costs of the increased parental investment in a second clutch (Bergerud 1988).

Sage-grouse chicks are precocial and move immediately following hatching to search for food (Patterson 1952); females generally rear their broods for the first 2 to 3 weeks in the immediate vicinity of their nest (Berry and Eng 1985; Connelly 1982). Most chick mortality occurs prior to the flight stage (2 to 3 weeks) when decreased mobility increases vulnerability to predation and starvation (Autrienth 1981; Patterson 1952). Sage-grouse broods remain in sagebrush habitats until range desiccation induces them to move to habitats still supporting succulent vegetation (Fischer et al. 1993; Neel 1980; Peterson 1970; Wallestad 1971). Brooding females may remain in upland habitats if suitable microsite conditions (e.g., swales, ditches, and springs) are found (Fischer et al. 1996; Hausleitner 2003; Wallestad 1971) or if weather conditions result in forbs remaining succulent in these habitats throughout the summer (Holloran 1999).

The beginning of late brood-rearing coincides with forb desiccation but also with changes in chick diets from predominantly insects to forbs (Drut et al. 1994; Klebenow and Gray 1968; Patterson 1952; Peterson 1970). Late brood-rearing habitats generally are used from July to early September (Connelly et al. 1988; Dalke et al. 1963; Gill and Glover 1965; Patterson 1952; Savage 1969; Wallestad 1971). Fall is a transitional period for sage-grouse (Wambolt et al. 2002), during which sage-grouse diets change from a variety of forbs, insects, and sagebrush to predominantly sagebrush (Gill 1965; Leach and Hensley 1954; Patterson 1952; Rassmussen and Griner 1938; Wallestad et al. 1975).

Sage-grouse populations can exhibit either sedentary or migratory behavior. Sedentary populations increase flock size and move from meadows into nearby sagebrush habitats during winter (Autrienth 1981). Migratory populations often travel 50 to 99 miles to winter ranges (Patterson 1952), but some only travel short distances during fall migrations (Eng and Schladweiler 1972). A precipitation event (usually snow) or a drop in the temperature initiates migration, which begins in late August (in advance of snow accumulation) and may continue into December (Berry and Eng 1985; Connelly et al. 1988; Dalke et al. 1960). During periods of early, severe winter snowstorms sage-grouse may begin migrations to winter habitats; but at the onset of milder weather later in the fall, they may return to sites adjoining late brood-rearing habitat (Patterson 1952).

3.2.1.4 Distribution and Habitat Requirements

Sage-grouse were historically distributed throughout the Intermountain and northwestern United States and southern regions of three Canadian provinces (Schroeder et al. 2004). Pre-settlement distributions included western Nebraska and the Dakotas; all of Montana, Idaho, Wyoming, Nevada and Utah; northwestern New Mexico; northern Arizona; western Colorado; portions of eastern California, Oregon and Washington; and southern British Columbia, Alberta, and Saskatchewan. Sage-grouse currently occupy 56 percent of the historical distribution, and are no longer found in Arizona, New Mexico, Nebraska, or British Columbia (Schroeder et al. 2004). The agency-preferred route crosses sage-grouse habitats in Wyoming, Colorado, and Utah.

The Western Association of Fish and Wildlife Agencies recently defined seven sage-grouse management zones that reflect ecological similarities and population linkages instead of political boundaries (Knick and Connelly 2011; Stiver et al. 2006).

- Management Zone I (Great Plains) includes sage-grouse populations in eastern Montana, northeastern Wyoming, North and South Dakota, Saskatchewan, and Alberta
- Management Zone II (Wyoming Basin) consists of populations mostly in Wyoming and northwestern Colorado but also including south-central Montana, and far southeastern Idaho and northeastern Utah

- Management Zone III (Southern Great Basin) includes populations primarily in southern Nevada and Utah but includes parts of California
- Management Zone IV (Snake River Plains) includes sage-grouse populations primarily in Idaho, northern Nevada, and eastern Oregon but also includes northwestern Utah and southwestern Montana
- Management Zone V (Northern Great Basin) includes populations in Oregon, California, and Nevada
- Management Zone VI (Columbia Basin) includes populations in Washington
- Management Zone VII (Colorado Plateau) includes populations in Utah and Colorado

The highest densities of sage-grouse occur in Management Zones I, II, IV and V (Connelly et al. 2004).

Sage-grouse population persistence has been linked to the availability of sagebrush habitat; the dependence of the species on sagebrush through all seasonal periods has been well documented (Connelly et al. 2004). Sage-grouse are considered a landscape-scale species as populations generally inhabit and rely on large, interconnected expanses of sagebrush (Connelly et al. 2004). Connelly et al. (2011) report that sage-grouse populations typically occupy habitats with a diversity of species and subspecies of sagebrush interspersed with a variety of other habitats (e.g., riparian meadows, agricultural lands, grasslands, sagebrush habitats with some conifer or deciduous trees); these habitats usually are intermixed in a sagebrush-dominated landscape and are used often by sage-grouse during certain times of the year (e.g., summer) or during certain years (e.g., above-normal snow pack).

Populations generally exhibit one of three potential migratory patterns (Connelly et al. 2000): (1) nonmigratory, where sage-grouse do not make long-distance movements between or among distinct seasonal ranges; (2) one-stage migratory, where sage-grouse move between two distinct seasonal ranges (e.g., distinct winter areas and integrated breeding and summer areas); or (3) two-stage migratory, where sage-grouse move among three distinct seasonal ranges (e.g., distinct winter, breeding and summer areas). Although migratory populations may use a large area, there are specific seasonal habitats used by the population that may be spatially isolated; corridors of sagebrush-dominated habitats are used by individuals to move among these seasonal ranges (Connelly et al. 2003). For nonmigratory populations, Connelly et al. (2003) suggest that seasonal habitats generally are well interspersed with no major anthropogenic barriers (e.g., reservoirs) between habitats.

Leks are situated in areas with minimal shrub cover adjacent to relatively dense sagebrush stands where strutting male exposure is maximized but escape, thermal, and feeding cover is readily available (Gill 1965; Patterson 1952). An important characteristic for leks may be their proximity and configuration with nesting habitat (per theories of lek evolution and mating behavior) (Gibson 1996). In nonmigratory populations, leks generally are found in nesting habitat, and may be situated near the center of seasonal ranges (Eng and Schladweiler 1972; Wallestad and Pyrah 1974; Wallestad and Schladweiller 1974). In migratory populations, female dispersal routes between wintering and nesting areas may influence the locations of leks (Bradbury et al. 1989; Dalke et al. 1963; Gibson 1996; Wakkinen et al. 1992).

Selection of specific habitat features in a landscape by nesting sage-grouse has been extensively documented. Across the range of the species, nesting sage-grouse consistently select areas with more sagebrush canopy cover and taller grasses compared to available habitats and tall, dense herbaceous cover—including residual (e.g., standing dead) herbage—in selected dense sagebrush stands generally tends to increase the probability of a successful hatch (Hagen et al. 2007; Holloran 2005). Recent research suggests sage-grouse select nesting habitat at multiple spatial scales: selection is for sagebrush-canopy cover at the site scale; for high-density sagebrush and flat topography at the patch scale; and against conifer, grassland, and riparian cover at larger scales (Doherty 2008).

Females show strong fidelity to nesting areas, generally selecting nest locations within 0.3 to 0.6 mile from previous years' nests (Fischer et al. 1993; Holloran et al. 2005). Additionally, fidelity of female offspring to their natal home ranges has been observed (e.g., yearling females nesting close to their natal nest), suggesting that family groups of females may inhabit relatively distinct areas (Thompson 2012). Thermal and predator protection of young chicks (e.g., dense sagebrush stands) (Thompson et al. 2006) and food availability (e.g., insects and succulent forbs) (Drut et al. 1994; Johnson and Boyce 1990) are important for chick survival during the early brood-rearing period (hatch through 2-weeks post-hatch). Protein-rich foods are additionally required for optimal development 10 to 45 days post-hatch (Johnson and Boyce 1990).

Stand structure and food availability are characteristics most frequently associated with habitat selection by sage-grouse during the summer (Aldridge and Brigham 2002; Autrienth 1981; Klebenow 1969). Sage-grouse may use a variety of sagebrush habitats and other habitats (e.g., riparian, wet meadows and irrigated agricultural fields adjacent to sagebrush habitats) during summer, but tend to select feeding habitat near edges of sagebrush-dominated security cover types (Dunn and Braun 1986). Hagen et al. (2007) suggested sage-grouse select areas with increased forb and grass cover during late brood-rearing periods (greater than 6 weeks post-hatch).

Selection of wintering habitats by sage-grouse is influenced by snow depth and hardness, topography (i.e., elevation, slope, and aspect), and vegetation height and density (Batterson and Morse 1948; Gill 1965; Greer 1990; Schroeder et al. 1999). During the winter, sage-grouse rely almost exclusively on sagebrush exposed above the snow for forage and shelter (Connelly et al. 2000; Crawford et al. 2004; Patterson 1952; Rassmussen and Griner 1938; Remington and Braun 1985; Robertson 1991; Schroeder et al. 1999). In certain areas and during certain winters when snow depths are sufficient to cover most sagebrush plants, suitable winter habitat (e.g., areas where plant exposure above the snow is maintained) may be the most limiting seasonal habitat (Beck 1977; Patterson 1952) with sage-grouse over a broad summering area congregating on smaller, traditional wintering grounds (Beck 1977; Berry and Eng 1985).

3.2.1.5 Primary Threats to Survival

Current sage-grouse breeding populations throughout western North America are approximately 17 to 47 percent lower than those during the late 1960s, and populations declined on average 2 percent annually from 1965 to 2003 (Connelly and Braun 1997). Connelly et al. (2004) reported that long-term population declines prior to 1994 in states historically supporting the largest sage-grouse populations (Colorado, Idaho, Montana, Oregon, Wyoming) averaged 30 percent; in states and Canadian provinces historically supporting smaller populations, breeding populations declined by an average of 37 percent. Lek sizes and average rates of change in male numbers declined between 1965 and 2007 for 6 of the 7 Management Zones, and 2 Management Zones—Columbia Basin (VI) and Colorado Plateau (VII)—are projected to decline below an effective population size of 500 individual males in the next 30 years if current population trends continue (Garton et al. 2011). For the majority of management zones (86 percent), population change was best described by declining carrying capacity through time (Connelly et al. 2011), supporting conclusions that habitat quantity and quality are continuing to decline across the sagebrush biome (Connelly et al. 2004).

Potential factors contributing to sage-grouse declines range-wide include many human-caused impacts on the species and its habitats. The changes to the sagebrush biome that have occurred since pre-settlement conditions can be grouped into three categories: habitat loss, habitat degradation, and habitat fragmentation (Braun 1998). More specifically, the total area dominated by sagebrush habitats has been reduced; the composition and structure of (i.e., the vegetation and soils) sagebrush communities has been negatively altered, including increased abundance and performance of invasive species and decreased abundance and performance of native species; and roads, power lines, fences, energy developments,

urbanization, and other anthropogenic features have transformed large expanses of habitat into smaller pieces (Connelly et al. 2004; Fahrig 2003). Other factors such as hunting, predation, and drought also have been implicated (Braun 1998). The relative importance of these individual factors most likely has varied over the range of the sage-grouse as well as through time.

The primary contributors to permanent habitat loss in the sagebrush biome include agricultural conversion and urbanization, although one could convincingly argue that the ultimate result of the domination of a site by invasive annual grasses constitutes permanent habitat loss. As an example, cultivated agriculture (primarily cropland) covers more than 88,800 square miles(56.8 million acres; 11 percent) of the total land area in the estimated historic distribution of sage-grouse (Knick et al. 2011). Areas converted to croplands generally are those with deeper loamy soils able to be irrigated, while sagebrush remains in arid areas where soils and topography are limiting to crops; agriculture has replaced 75 percent of the shrub steppe in deep soils, suggesting a majority of the most productive sage-grouse habitats no longer exist (Connelly et al. 2004). Agricultural development also can indirectly influence sage-grouse by providing access to sagebrush habitats for predators such as domestic cats, red fox (*Vulpes vulpes*) and corvids (Connelly et al. 2004).

Habitat degradation is exemplified by the long-term consequences of overgrazing by livestock at the turn of the nineteenth century as well as the proliferation of invasive annual grasses (e.g., cheatgrass [*Bromus tectorum*]), especially in the Great Basin. Miller et al. (2011) estimate that approximately 65 percent of the Great Basin ecoregion has conditions that put it at moderate to high risk of cheatgrass invasion. Dominance of a site by cheatgrass shortens fire-return intervals, which, as most species of sagebrush are killed by fire, ultimately results in the conversion of a sagebrush-dominated site to a cheatgrass monoculture providing little to no habitat value for sage-grouse (Epanchin-Niell et al. 2009; Knapp 1996; Rowland et al. 2010). The major influence of livestock grazing on sage-grouse habitat is the potential to cause a transition from an ecological state dominated by sagebrush and cool season bunchgrasses to a site dominated by sagebrush and rhizomatous grasses, invasive annual grasslands or woodlands—all providing sage-grouse with either lower-quality or no habitat value (Pyke 2011).

Unmanaged overuse of sage-grouse habitats by wild horses and ungulates (e.g., elk, deer, and pronghorn) can have negative effects similar to livestock grazing. The transition to a lower-quality condition can occur in 10 to 15 years at any given site under heavy uncontrolled grazing; and once a site has transitioned to a grazing-tolerant state, it will not revert without active restoration, even if the mechanism causing the conversion is eliminated (Connelly et al. 2004).

Habitat fragmentation is generally the result of the addition of anthropogenic infrastructure and human activity in sagebrush habitats (e.g., roads, transmission lines, energy developments). Within a 7-square-mile area, the mean sagebrush patch size was more than nine times as large in occupied sage-grouse range as compared to areas where sage-grouse had been extirpated (Wisdom et al. 2011). Paved roads exist in most sagebrush regions in densities up to or greater than 3 miles per square mile; less than 5 percent of the sage-grouse range is greater than 1.6 miles from a paved road, and almost no area of sagebrush is greater than 4.3 miles from a paved road (Knick et al. 2011). Disturbance to sage-grouse from energy development has been linked to human activity levels (Dzialak et al. 2012). Noise associcated with human activity may result in habitat avoidance and thus functional habitat loss and fragmentation (Blickley et al. 2012). Of 14 studies investigating the response of sage-grouse populations to energy development, none indicated a positive influence (Naugle et al. 2011). The indirect effects of energy development on sage-grouse populations have been documented at distances up to 6.8 miles (Johnson et al. 2011).

3.2.1.6 Species Recovery

Recovery plans are not developed for candidate species.

3.2.2 Least Tern, Interior Population (*Sternula antillarum*) – Endangered

3.2.2.1 Regulatory Status

The least tern was proposed for listing under the ESA in 1984 (49 FR 2485-2488), and was listed as endangered on May 28, 1985 (50 FR 21784-21792). A 5-year review of the status of the least tern was initiated in March of 2008 (73 FR 21643), and the completed 5-year review was released in 2013 (FWS 2013b).

3.2.2.2 Designated Critical Habitat

No critical habitat has been designated for the least tern (Interior population).

3.2.2.3 Taxonomy and Life History

Interior populations of North American least terns were initially described as *Sterna antillarum athalassos*, but the species was moved to the genus *Sternula* in 2006 following deoxyribonucleic acid (DNA) analysis (FWS 2013b).The AOU recognized three subspecies of the least tern in North America: the interior least tern (*Sterna antillarum athalassos*), the eastern or coastal least tern (*Sterna antillarum antillarum*), and the California least tern (*Sterna antillarum browni*) (AOU 1998), but genetic analysis found no evidence of differentiation warranting subspecies recognition by the FWS (2013b).

The least tern is the smallest of the North American terns. Interior populations are the inland reproductive population of least tern that nests on or adjacent to the major rivers of the Great Plains and the Lower Mississippi Valley (FWS 2013b). Breeding time periods vary geographically, but breeding generally occurs between early April and early June. Least terns are colonial nesters with colony sizes ranging from a few breeding birds to more than 1,200 (FWS 2013b). Typically clutches are two or three eggs with an incubation period generally between 19 and 25 days (Thompson et al. 1997). Chicks leave their nests within a few days of hatching, but remain near the nests and are fed by their parents until fledging (Thompson et al. 1997). Nesting success is highly dependent on nesting site conditions, including habitat suitability, flooding, prey fish availability, and predation pressure, resulting in wide fluctuations in population numbers (FWS 2013b).

The least tern is primarily an opportunistic piscivore, feeding primarily on small fish (Wilson et al. 1993), but also will feed on aquatic or marine invertebrates (Thompson et al. 1997).

3.2.2.4 Distribution and Habitat Requirements

The least tern is a widely distributed breeder in North America. The species typically nests in open sandy beaches, sandbars, unvegetated islands, and a variety of material deposits along the coasts of oceans, bays, inland rivers, large lakes, and reservoirs as well as Great Plains wetlands. Interior populations nest from the lower Ohio River in Indiana and Kentucky west to the Upper Missouri River in Montana, from Montana to southern Texas, and along river channels across the Great Plains and the Lower Mississippi Valley (FWS 2013b).

The least tern usually forms colonies on bare or sparsely vegetated sand or dried mudflats along coasts or rivers, and sandy islands as well as gravel and sand pits (Smith and Renken 1991). Colonies are typically

near lagoons, estuaries, rivers, or coasts. Least tern colony habitats can be ephemeral, which makes continued use difficult, but the species shows high colony site tenacity and fidelity that are both influenced by changes in vegetative cover, predators, human activity, flood, and colony size (Atwood and Massey 1988). The presence and number of suitable nest sites, as well as human activity, limit colony sites. Least terns nest on the ground in open areas near feeding habitat. Sand or gravel islands free of vegetation are preferred for nesting, although other open areas including mudflats, graveled rooftops and parking lots, and dredged-material deposits also are used (FWS 2013b).

Fall migrating least terns generally follow major river basins to their confluence with the Mississippi River and then fly south to the Gulf of Mexico, although there is evidence that some birds migrate cross-country (Thompson et al. 1997). Limited information specific to interior populations of least tern migration and winter habitat inclusive of other populations is available. Once they reach the Gulf Coast, they cannot be distinguished from other least tern populations en route to or in their winter habitats in the Gulf of Mexico, Caribbean islands, and Central and South America (Thompson et al. 1997). Little is known of least tern winter habitats, other than the birds are primarily observed along marine coasts, in bays and estuaries, and at the mouths of rivers (Thompson et al. 1997).

3.2.2.5 Primary Threats to Survival

The primary threats identified for interior populations of least tern in the listing rule and recovery plan were the destruction of habitat and curtailment of range due to channel engineering practices on large rivers of the Interior Basin (i.e., damming, channelization, and channel stabilization), and low numbers of surviving birds throughout the range (50 FR 21784-21792; FWS 1990b). Channelization of streams, irrigation practices, and the construction of reservoirs contributed to the elimination of much of the least tern's sandbar and nesting habitat in the Missouri, Arkansas, and Red River systems (FWS 1990b). Habitat with sandbars often experience dam discharges, causing problems for the least terns nesting in remaining habitats. Hydropower, irrigation, and public recreation demands on river flow can conflict with historic flood regimes, often decreasing the quality and quantity of least tern nesting sites (FWS 1990b). Recent changes in river channel engineering management practices, such as new dike designs that allow flow to isolated nesting bars during the nesting season, have provided opportunities for least tern range expansion and reduced threats to the species (FWS 2013b).

3.2.2.6 Species Recovery

On September 19, 1990, a recovery plan was published with the objective of delisting the least tern in 2005 if the recovery criteria were met. Recovery criteria includes increasing or maintaining adult populations in the Missouri River system, Lower Mississippi River, Arkansas River system, Red River system, and Rio Grande River system; and maintaining those stable population sizes for 10 years (FWS 1990b).

The completed 5-year review noted that the interior population of the least tern has increased by approximately an order of magnitude since the time of listing (FWS 2013b), and that there is a consistent but variable trend towards population increases. Although delisting the interior least tern was recommended based on the current population status, the FWS first will conduct population viability modeling in response to potential future scenarios (e.g., various management regimes, climate change, and metapopulation dynamics) before proposing any change in listing status.

3.2.3 Mexican Spotted Owl (*Strix occidentalis lucida*) – Threatened

3.2.3.1 Regulatory Status

The Mexican spotted owl was listed as threatened under the ESA on March 16, 1993 (58 FR 14248).

3.2.3.2 Designated Critical Habitat

Critical habitat originally was designated on March 16, 1993 (58 FR 14248), and subsequently revoked on March 25, 1998 (63 FR 14378). Critical habitat was designated again on February 1, 2001 (66 FR 8530) and further revised to its current extent on August 31, 2004 (69 FR 53181). Designated critical habitat is located in Utah, Colorado, Arizona, and New Mexico, outside of the Project area.

3.2.3.3 Taxonomy and Life History

The Mexican spotted owl is one of three recognized subspecies of the spotted owl in North America. *S. o. lucida* is the only subspecies that is found in the Project area. The other subspecies, the California spotted owl (*S. o. occidentalis*) and the northern spotted owl (*S. o. caurina*), are found along the west coast from south-central California north to southwestern British Columbia (Gutierrez et al. 1995).

Spotted owls are usually found in steep canyons with mature or old-growth forest, but they also may be found in canyons with steep cliffs and relatively little forest habitat, associated with a perennial water source nearby. In Utah, Mexican spotted owls primarily utilize deep, steep-walled canyons and hanging canyons (FWS 2012b). They have been reported at elevations ranging from 3,700 feet to the subalpine transition (Ganey 1998; Gutierrez et al. 1995; Johnsgard 1988).

Spotted owls are nocturnal ambush hunters that feed mainly on small mammals, primarily rodent species, with woodrats (*Neotoma* spp.) often the dominant dietary component. Invertebrates make up a small portion of their prey, and they may supplement their diet with birds, bats, or lagomorphs (Ehrlich et al. 1988; Ganey 1998; Gutierrez et al. 1995). In Arizona, Mexican spotted owls feed on woodrats, white-footed mice (*Peromyscus leucopus*), voles (*Microtus* spp.), rabbits, and pocket gophers (*Thomomys* spp.) (Ganey 1998).

Spotted owls may construct nests in tree cavities (usually in live trees) or on constructed platforms on tree limbs. In Utah, they nest almost exclusively in caves formed on cliffs and canyon walls (Gorell et al. 2005). They may use abandoned raptor or corvid platform nests (Ehrlich et al. 1988; Terres 1980). They produce from two to four eggs, with the typical number being two (Ehrlich et al. 1988; Gutierrez et al. 1995; Terres 1980).

3.2.3.4 Distribution and Habitat Requirements

The Mexican spotted owl is a permanent resident in the interior mountain ranges of western North America, from southern Utah and central Colorado south through the mountains of Arizona, New Mexico, and extreme west Texas. Its range in Mexico includes mountainous regions from Sonora, Chihuahua, Coahuila, and Nuevo Leon south to Jalisco, Michoacan, and Guanajuato (AOU 1998). The Project is located near the northern edge of the range of the Mexican spotted owl in Colorado and Utah (FWS 2012b).

The Mexican spotted owl normally occupies old-growth forest in mixed conifer, pine-oak woodland, deciduous riparian, or a combination of these habitats that will support a home range of 1,400 to 4,500 acres (Ehrlich et al. 1988; Gutierrez et al. 1995). Habitat also typically has a structured canopy, a

perennial water source, and a rodent dominated prey base of adequate size (Gutierrez et al. 1995). In Utah, however, breeding owls primarily inhabit deep steep-walled canyons and hanging canyons. These canyons typically are surrounded by terrain that does not appear to provide nest/roost habitat but may provide foraging habitat for owls (FWS 2012b). Mexican spotted owl home ranges include activity centers that represent concentrated use areas for nesting, roosting, and foraging. Protected Activity Centers designated by the FWS (2012b) require a minimum of 600 acres centered on known or potential nest sites where disturbance should be avoided to conserve core use areas.

3.2.3.5 Primary Threats to Survival

The primary threat to Mexican spotted owls in the U.S. is the risk of stand-replacing wildfire (FWS 2012b). Fire can create patches of preferred foraging habitat for Mexican spotted owls, but stand-replacing fires can remove nesting habitat over large areas (Bond et al. 2002; Jenness 2000). However, fire is not a landscape-scale threat to Mexican spotted owl habitat on the Colorado Plateau, as the cliff and canyon habitat experiences a very low incidence and extent of stand-replacing fire (FWS 2012b).

At the time of listing, habitat loss and fragmentation related to old-growth timber harvest and other forest-management practices (Ehrlich et al. 1988; Gutierrez et al. 1995) were considered the primary threat to Mexican spotted owl survival, but current forest-management practices are more compatible with maintenance of spotted owl habitat conditions (FWS 2012b). Secondary human-caused habitat impacts include losses associated with developments for urban or suburban expansion, and development for agriculture, reservoirs, mining, and fuel-wood harvesting (Gutierrez et al. 1995).

3.2.3.6 Species Recovery

The recovery plan for the Mexican spotted owl was released in 1995 (FWS 1995a), and a revised recovery plan was published in 2012 (FWS 2012b). The 2012 recovery plan subdivided the Mexican spotted owl range into 11 Ecological Management Units, which are geographical subdivisions of the species' range used to organize recovery efforts. Mexican spotted owl populations in Utah are managed under the Colorado Plateau Ecological Management Unit (FWS 2012b). The recovery objective of the plan is to delist the species, which can occur when the population in the three most populated recovery units are stable or increasing, habitat monitoring protocols are designed and implemented, and a long-term management plan is in place to ensure appropriate management.

3.2.4 Piping Plover (*Charadrius melodus circumcinctus*) – Threatened

3.2.4.1 Regulatory Status

On December 30, 1982, the FWS designated the piping plover as a category 2 candidate for listing (47 FR 58458). On December 11, 1984, the Great Lakes breeding population was designated as endangered and all other piping plover populations were designated as threatened (50 FR 50726-50734). The Great Lakes breeding population includes the states of Illinois, Indiana, Mississippi, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin and the province of Ontario.

3.2.4.2 Designated Critical Habitat

Critical habitat for the Great Lakes breeding population was designated on May 7, 2001 (66 FR 22938-22969). Critical habitat for wintering piping plovers was designated on July 10, 2001 (66 FR 36038-36143). Critical habitat was designated for the Northern Great Plains breeding population on September 11, 2002, including a portion of the Platte River in Nebraska (67 FR 57638-57717).

3.2.4.3 Taxonomy and Life History

Two subspecies of piping plover (*Charadrius melodus circumcinctus* and *C.m. melodus*) have been recognized since 1957. The subspecies *melodus* is considered the Atlantic coast subspecies and *circumcinctus* is the inland subspecies. There has been debate over the recognition of these subspecies; however, recent genetic analysis has come to suggest that subspecific differentiation is valid and that Great Lakes birds align more closely with the inland birds than the Atlantic birds (Elliott-Smith and Haig 2005; FWS 2009b). Even though the Great Lakes and Northern Great Plains populations are a single subspecies, behavioral and ecological factors provide enough separation to continue managing these two populations separately (FWS 2009b).

Piping plovers are small shorebirds with a brown dorsal side and white underbelly. They have a ring around their neck that may be complete or incomplete. Plovers have stubby bills with an orange base and black tip (Elliott-Smith and Haig 2005).

Piping plovers tend to lay four eggs per clutch and have one brood per year. Females may lay multiple clutches if nests are destroyed but will only raise a single brood. Nests are dug in sandy substrate. In the northern reaches of the breeding range, the species will begin laying eggs during the first 2 weeks of May and incubate for 25 to 28 days. Chicks fledge between 21 and 35 days of age (Elliott-Smith and Haig 2005).

Piping plovers forage along freshwater and marine shorelines. They feed on freshwater, marine, terrestrial, and benthic invertebrates (Elliott-Smith and Haig 2005).

3.2.4.4 Distribution and Habitat Requirements

There are three breeding populations of piping plover. The Atlantic Coast population inhabits the Atlantic Coast between Newfoundland and North Carolina. The northern Great Plains breeding populations ranges from northern Saskatchewan and south to portions of Kansas and Oklahoma and from Montana east to Minnesota. The Great Lakes population was found throughout much of north-central United States and south-central Canada but is currently limited to northern Michigan and northern Wisconsin. Piping plovers winter along the Atlantic and Gulf Coasts from North Carolina to Mexico and portions of the West Indies and Bahamas (66 FR 22939). There are no piping plovers or habitat in the Project area. However, the Northern Great Plains population nests along the Platte River in Nebraska, and critical habitat for the species is designated on the Platte River as well.

Breeding habitat consists of open sandy beaches. These beaches may be found on shorelines of oceans or Great Lakes, but also may be found along alkali lakes, reservoirs, rivers, freshwater lakes, dry alkali lakes, sandpits, industrial ponds, and gravel mines. The species tends to prefer wide, sparsely vegetated sand or gravel beaches adjacent to vast waters. Along rivers, piping plovers will use beaches, sand flats, dredge islands, and drained floodplains where vegetative cover is less than 20 percent. Winter habitat is similar to breeding habitat, but is located almost entirely along oceanic coasts and bays (Elliott-Smith and Haig 2005).

3.2.4.5 Primary Threats to Survival

The primary threat to piping plovers is loss of habitat. Shoreline development along the Gulf and Atlantic coasts and along the Great Lakes has greatly reduced the amount of available habitat. Additional efforts to stabilize beaches in the wake of large storms have altered the natural tidal flows in many areas. In the northern Great Plains population area, development of reservoirs, channelization of rivers, and modification of river flows have greatly altered the vegetation growth in areas that were previously scoured of vegetation by spring flooding events (FWS 2009b)

In addition to these threats, other human-related impacts are threatening the survival of piping plovers. Recreation along coasts and shorelines disturb roosting and/or nesting plovers. Pets often destroy nests. Wind and oil development throughout much of the species' range may affect further survival (FWS 2009b).

3.2.4.6 Species Recovery

Recovery plans have been developed for each of the three separate breeding populations: Atlantic Coast, Great Lakes, and Northern Great Plains. These plans call for recovery criteria specific to each population (FWS 2009b). Recovery criteria for the Northern Great Plains populations include: (1) increase the number of birds to 1,300 pairs; (2) protect essential breeding and winter habitat; (3) attain the Canadian Recovery objective of 2,500 birds for the prairie region; and (4) the 1,300 pairs will be maintained in the following distribution for 15 years (FWS 1988a):

- Montana: 60 pairs
- North Dakota: 650 pairs (Missouri River, 100 pairs; Missouri Coteau, 550 pairs)
- South Dakota: 350 pairs (Missouri River below Gavins Point, 250 pairs [shared with Nebraska]; other Missouri River sites, 75 pairs; other sites, 25 pairs)
- Nebraska: 465 pairs (Platte River, 140 pairs; Niobrara River, 50 pairs; Missouri River, 250 pairs; Loup River system, 25 pairs)
- Minnesota: 25 pairs (Lake of the Woods)

3.2.5 Whooping Crane (*Grus americana*) – Endangered

3.2.5.1 Regulatory Status

The whooping crane was listed as endangered on March 11, 1967, under the ESPA, and carried forward under the ESA on its passage in 1973 (32 FR 4001). Whooping crane populations consist of one self-sustaining wild population, several reintroduced NEPs, and a captive breeding population. The Aransas-Wood Buffalo population, listed as endangered, is the only self-sustaining wild population, and uses the Platte River as an important migration stopover point. NEPs were designated in several regions: the Rocky Mountains population, the Florida nonmigratory population, the eastern United States migratory population, and the southwestern Louisiana nonmigratory population (66 FR 33903-33917, 62 FR 38932-38939, 58 FR 5647-5658). The reintroduced Rocky Mountains NEP migrated through the Project area, although the reintroduction was not successful and no whooping cranes remained after 2002 (Canadian Wildlife Service and FWS 2007).

3.2.5.2 Designated Critical Habitat

Critical habitat was designated in the United States in 1978 for key wintering and migration areas, including a portion of the Platte River in Nebraska (43 FR 20938-20942).

3.2.5.3 Taxonomy and Life History

The whooping crane is a member of the family *Gruidae;* its closest relatives in continental North America being five races of sandhill cranes (*Grus canadensis*). The whooping crane is North America's tallest bird, with males approaching 5 feet in height. The sexes appear the same, although their guard call vocalizations are sexually distinct. The plumage is snowy white, with black primaries, a carmine crown and malar region, and a dark wedge-shaped patch on the nape. Juvenile birds have reddish-cinnamon plumage until the end of their second summer.

Eggs are normally laid from late April to mid-May and are incubated for approximately 1 month. Whooping cranes generally nest annually, unless nesting habitat conditions are unsuitable or the birds are nutritionally stressed. The diet varies seasonally and by habitat, but includes insects, frogs, rodents, fish, plant tubers, berries, crabs, crayfish, clams, and agricultural grains (Canadian Wildlife Service and FWS 2007).

3.2.5.4 Distribution and Habitat Requirements

Historically, whooping cranes ranged from the Arctic coast south to central Mexico and from Utah east to New Jersey, South Carolina, Georgia, and Florida (Canadian Wildlife Service and FWS 2007). Currently, only three wild populations exist, with another nine in captivity at various facilities. As of 2011, the total wild population, including NEPs, consisted of 279 individuals, and the total captive population was 158 individuals (77 FR 55530-55604).

The Aransas-Wood Buffalo population nests in and around Wood Buffalo National Park in Alberta and the Northwest Territories and winters in and adjacent to Aransas National Wildlife Refuge on the Texas coast. Departure from the wintering grounds generally begins between March 25 and April 15, with the autumn migration commencing around mid-September. Most birds arrive on the wintering grounds between late October and mid-November (Canadian Wildlife Service and FWS 2007). The Aransas-Wood Buffalo population uses wetlands along the Platte River in Nebraska as important migration stopover sites. No whooping cranes are expected to be found in the Project area.

Reintroduction attempts in the Rocky Mountains took place from 1975 to 1989 and again in 1997. One male from that population remains in captivity; the last remaining wild bird died in 2002 (Canadian Wildlife Service and FWS 2007). A nonmigratory flock was introduced in the Kissimmee Prairie and surrounding area in central Florida in 1993. Efforts have been ongoing since 2001 to establish a migratory flock between Wisconsin and the central Florida Gulf Coast.

Breeding habitat in Wood Buffalo National Park (Canada) consists of numerous shallow, poorly drained wetlands, separated by narrow, slightly elevated ridges with an overstory of white and black spruce (*Picea glauca* and *P. mariana*), tamarack (*Larix laricina*), and willows (*Salix* spp.), with a shrub understory. Habitat on the wintering grounds includes tidal flats, estuarine marshes, and other shallow coastal wetland communities (Lewis 1995).

3.2.5.5 Primary Threats to Survival

A variety of factors threaten the survival of the whooping crane. As with many other endangered species, destruction of habitat, loss of migration stopover habitat, and displacement due to human activities are threats. Additionally, loss of individuals by human shooting remains a threat. In November 2009, a reproductive female whooping crane from the eastern United States migratory population was shot and killed in Indiana (FWS 2009c), and shooting deaths due to vandalism or misidentification continue (Canadian Wildlife Service and FWS 2007). An estimated 60 to 80 percent of crane losses occur during migration, with the primary cause of loss being collisions with utility lines. Additional threats are posed by disease, inclement weather, predation, and the species' delayed reproductive maturity, low reproductive rates, and drastically reduced gene pool (Canadian Wildlife Service and FWS 2007; Lewis 1995).

3.2.5.6 Species Recovery

The first recovery plan for the whooping crane was prepared in 1980, revised in 1986, 1994, and most recently in 2007 (Canadian Wildlife Service and FWS 2007). The recovery plan does not identify delisting goals but anticipates the whooping crane can be downlisted to threatened when a single self-sustaining population of at least 1,000 individuals is reached, or when multiple smaller self-sustaining populations have been maintained in the wild for at least 10 years. Additionally, a captive breeding population must maintain the current genetic diversity of the species.

3.2.6 Yellow-billed cuckoo (*Coccyzus americanus*) – Threatened

3.2.6.1 Regulatory Status

The western yellow-billed cuckoo was petitioned for ESA listing as a subspecies in 1998 (Center for Biological Diversity 1998). In 2001, the FWS determined that listing the yellow-billed cuckoo in the western United States as a DPS was warranted but was precluded by higher listing priorities (66 FR 38611-38626). The FWS proposed listing the western United States DPS of the yellow-billed cuckoo as threatened under the ESA in 2013 (78 FR 61621-61666), and published a final rule listing the DPS in 2014 (79 FR 59992-60038).

3.2.6.2 Designated Critical Habitat

Following the proposed listing of the DPS, the FWS proposed critical habitat for the yellow-billed cuckoo in 2014 (79 FR 48547-48652). Critical habitat was proposed in nine states, including Wyoming, Colorado, and Utah. No proposed critical habitat is crossed by the agency-preferred route.

3.2.6.3 Taxonomy and Life History

The yellow-billed cuckoo is one of six species of the family *Cuculidae* that breed in the United States (National Geographic Society 2002). The yellow-billed cuckoo was first described in 1758 as *Cuculus americanus*, with the western yellow-billed cuckoo being described in 1887 as *Coccyzus americanus occidentalis*. However, since the late 1800s, debate has centered on whether the species should be split into eastern (*C. a. americanus*) and western (*C. a. occidentalis*) subspecies (66 FR 38611-38626). Those in favor of recognizing subspecies cited differences in morphology between eastern and western birds. Review and study of yellow-billed cuckoo taxonomy occurred in response to a petition in 1986 to list the yellow-billed cuckoo as endangered in California, Washington, Oregon, Idaho, and Nevada. In their response to a second petition in 1998, the FWS determined there was not enough evidence to consider the western population as a distinct subspecies, but the population did warrant listing as a DPS. The range of the western yellow-billed cuckoo was determined to be the area west of the continental divide in the Rocky Mountains, and west of the Pecos River in New Mexico and Texas (66 FR 38611-38626).

Most western yellow-billed cuckoos arrive on their breeding grounds in June (Laymon 1998). They construct an unkempt stick nest on a horizontal limb, often in shrubby vegetation (Ehrlich et al. 1988; Terres 1980). Nest heights range from 4.3 feet and rarely to 98 feet with an average below 20 feet (Laymon 1998).

Yellow-billed cuckoos lay one to five large eggs, which hatch after 9 to 11 days of incubation (Ehrlich et al. 1988). Nestlings fledge at 5 to 8 days of age, giving the species the shortest combined incubation and nestling period known for any bird (Corman and Wise-Gervais 2005; Hughes 1999). They occasionally are brood parasites of other species (Hughes 1999). This behavior may be stimulated by high egg production resulting from abundant food supplies (Ehrlich et al. 1988).

Yellow-billed cuckoos forage primarily by gleaning insects from vegetation, but they also may capture flying insects (Ehrlich et al. 1988; Hughes 1999; Laymon 1998). They specialize on relatively large prey, including caterpillars, katydids, cicadas, grasshoppers, and tree frogs (Laymon 1998; Terres 1980). Their breeding season may be timed to coincide with outbreaks of insect species, particularly tent caterpillars (Hughes 1999; Ehrlich et al. 1988; 66 FR 38611-38626). They also consume some wild berries and take small lizards and frogs and occasionally bird eggs and young as prey (Hughes 1999; Terres 1980).

3.2.6.4 Distribution and Habitat Requirements

The western yellow-billed cuckoo was formerly widespread and locally common in California and Arizona; locally common in New Mexico, Oregon, and Washington; and local and uncommon along drainages in western Colorado, western Wyoming, Idaho, Nevada, and Utah (66 FR 38611-38626). Populations of yellow-billed cuckoos in the western United States have declined over the past century and their breeding range has contracted. The species may be extirpated from British Columbia, Washington, and Oregon (Hughes 1999). The western yellow-billed cuckoo may be found in riparian habitats associated with major river systems in the Project area.

The yellow-billed cuckoo breeds from interior California, southern Idaho, the Dakotas, and southern New Brunswick south to Baja California, southern Arizona, Chihuahua, the Gulf Coast and the Greater Antilles. The breeding range formerly extended north to western Washington (AOU 1998). Although an uncommon summer resident in Wyoming, it has not been confirmed to nest in the state (Cerovski et al. 2004). Breeding records are very rare and the species only are found in scattered drainages in western Colorado, Idaho, Nevada, and Utah (NatureServe 2008a). Breeding records in Utah are rare in lowland riparian habitats. Records exist in the northern Salt Lake Valley (Weber and Salt Lake counties), Utah Lake near the mouth of the Provo River (Utah County), Cedar City, and Beaver Dam Wash (Washington County). Extensive riparian habitat is located at the confluence of the Duchesne, White, and Green rivers on the Uintah and Ouray Indian Reservation (Grand and Uintah counties) (Bosworth 2003; Parrish et al. 2002), and sustains the largest breeding population of yellow-billed cuckoo in Utah (BLM 2008a). Recently, nesting has been documented at Ouray National Wildlife Refuge on the Green River and the Matheson Wetland Preserve near Moab (78 FR 61636). Additionally, there are reports from at least five other areas in Utah where breeding has been suspected (Owens 1998, as cited in FWS 2011c).

The western yellow-billed cuckoo prefers large stands of dense riparian woodlands for nesting that are primarily composed of cottonwood (*Populus fremontii*), willow (*Salix* spp.), and mesquite (*Prosopis* spp.) along riparian corridors in otherwise arid areas (Hughes 1999). While yellow-billed cuckoos typically avoid monocultures of tamarisk for nesting, tamarisk may be a component of nesting habitat (79 FR 48548). Several studies have reported western yellow-billed cuckoos preferring to nest in tracts greater than 25 acres in size. Dense undergrowth may be an important factor in selection of nest sites (Ehrlich et al. 1988), as multi-storied canopy and dense shrubby vegetation provide invertebrate prey and cover for foraging juveniles (Corman and Wise-Gervais 2005). Water is required near the nesting site (Corman and Wise-Gervais 2005; Floyd et al. 2007), which along with dense vegetation, maintain the humidity required in the nesting area for hatching eggs and rearing chicks (Corman and Wise-Gervais 2005, Laymon 1998). Migration, stopover, and dispersal habitat is apparently similar to nesting habitat, but patch size may be smaller than required for nesting and vegetation structure may differ in structure (e.g., percent canopy cover, presence and composition of understory) (79 FR 48547-48652).

3.2.6.5 Primary Threats to Survival

The primary threat to western yellow-billed cuckoos is the loss of high-quality riparian habitat suitable for nesting (Corman and Wise-Gervais 2005; Floyd et al. 2007). Riparian habitat throughout the western United States has been modified or destroyed by dams, water diversions, riverflow management, stream

channelization and stabilization, conversion to agricultural uses (e.g., livestock grazing), construction of urban and transportation infrastructure, and an increased incidence of wildfire. Habitat fragmentation and invasion of native habitats by non-native plant species (especially tamarisk) result from the aforementioned habitat-modifying factors (78 FR 61622-61665).

Other natural and manmade factors threatening the continued existence of yellow-billed cuckoo include a small overall population size, isolation of populations, lack of immigration, chance weather events, fluctuating availability of prey populations, pesticides, collisions with tall vertical structures during migration, spread of the introduced tamarisk leaf beetle as a biocontrol agent in the Southwest that results in defoliation of non-native habitats occasionally used for nesting, and climate change (78 FR 61622-61665).

3.2.6.6 Species Recovery

Recovery planning has been initiated with the listing of the species in 2014, but no time frame for the publication of a recovery plan has been released (79 FR 59992-60038).

3.3 Mammals

3.3.1 Black-footed Ferret (*Mustela nigripes*) – Endangered

3.3.1.1 Regulatory Status

The black-footed ferret was listed as endangered by the Bureau of Sport Fisheries and Wildlife in 1966. The species was subsequently listed as threatened with extinction under the ESPA on March 11, 1967 (32 FR 4001). The ESPA was amended to be named the Endangered Species Conservation Act (ESCA) in 1969, and the black-footed ferret was listed as endangered under the ESCA on June 2, 1970 (35 FR 8491-8498). The species was carried forward under the ESA on its passage in 1973. Eight black-footed ferret populations reintroduced between 1991 and 2003 have been designated as NEPs under Section 10(j) of the ESA, and several other populations have been reintroduced in the United States and Mexico without being designated as NEPs (FWS 2008). The FWS proposed a rule in 2015 that would designate a statewide NEP in Wyoming, clarifying that all black-footed ferrets are the results of releases and that all further reintroductions would take place under the statewide NEP (80 FR 19263-19275).

The FWS initiated a 5-year review for the black-footed ferret on July 7, 2005 (70 FR 39326-39327), and completed the review in 2008 (FWS 2008). The FWS recommended no change in status and maintained the Recovery Priority Number of 2C (a species with a high degree of threat, high recovery potential, and potential management conflicts).

3.3.1.2 Designated Critical Habitat

No critical habitat has been designated for the black-footed ferret.

3.3.1.3 Taxonomy and Life History

The black-footed ferret was described first formally by John Audubon and James Bachman in 1851 (Clark 1986). The species is 1 of 14 members of the genus *Mustela* and 1 of 3 species in the subgenus *Putorius*, which also includes the Siberian polecat (*M. eversmanni*) and the European polecat (*M. putorius*) (Hillman and Clark 1980). The black-footed ferret is endemic to North America and is the only ferret species native to the Americas (FWS 2008). There are no recognized subspecies.

The black-footed ferret co-evolved with prairie dogs (*Cynomys* spp.) in North America and is considered to be a prairie dog obligate. The ferret is dependent entirely on prairie dog colonies, utilizing prairie dog burrows for shelter and den sites and preying almost exclusively on prairie dogs (Biggins 2006). Female black-footed ferrets become sexually mature at 9 months with prime breeding age occurring from 1 to 3 years old (Clark 1989). Ferrets breed between March and May and females can have multiple estrus cycles. Gestation lasts 42 to 45 days and kits are born between April and June (Hillman and Clark 1980). Average litter size is three kits (Forrest et al. 1988). Kits generally disperse in late September and early October with males typically dispersing to different prairie dog towns and females remaining near their mother's home range (Clark 1989).

Black-footed ferrets are territorial (Eads et al. 2014), and are solitary except during the breeding season and when mothers are caring for kits. Ferrets are strongly nocturnal and spend much of the day below ground among several burrows (Clark 1989). The average lifespan of wild black-footed ferrets is 3 to 4 years.

3.3.1.4 Distribution and Habitat Requirements

As a prairie dog-obligate, the black-footed ferret is associated exclusively with prairie dog colonies in the grasslands and semi-desert shrublands of North America. The historical distribution of the black-footed ferret was closely associated with the ranges of the black-tailed prairie dog (*Cynomys ludovicianus*), the white-tailed prairie dog (*C. leucurus*), and the Gunnison's prairie dog (*C. gunnisoni*). The species historical range has been estimated at nearly 250 million acres across Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, and Wyoming as well as Alberta and Saskatchewan (Clark 1989).

The significant reduction in the distribution and abundance of prairie dogs throughout North America during the 20th century resulted in the near extirpation of the black-footed ferret (Esch et al. 2005). The species was thought to be extinct until the discovery of a small population near Meeteetse, Wyoming, in 1981. After the Meeteetse population declined to 18 individuals, all black-footed ferrets were captured and placed in a captive breeding program in 1987 (FWS 1988b). Since 1991, 18 black-footed ferret reintroduction projects have been conducted in eight states and Mexico (FWS 2008):

- Shirley Basin, Wyoming NEP: 1991 (56 FR 41473)
- Badlands National Park, South Dakota NEP: 1994 (59 FR 42682)
- Charles M. Russell National Wildlife Refuge, Montana NEP: 1994 (59 FR 42696)
- Conata Basin, South Dakota: 1996
- Aubrey Valley, Arizona NEP: 1996 (61 FR 11320)
- Fort Belknap Indian Reservation, Montana: 1997
- Coyote Basin, Colorado/Utah NEP: 1999 (63 FR 52823)
- Cheyenne River Sioux Reservation, South Dakota NEP: 2000 (65 FR 60879)
- Wolf Creek, Colorado NEP: 2001
- BLM "40 Complex," Montana: 2001
- Janos, Chihuahua, Mexico: 2001
- Rosebud Sioux Reservation, South Dakota NEP: 2003 (68 FR 26498)
- Lower Brule Indian Reservation, South Dakota: 2006
- Wind Cave National Park, South Dakota: 2007
- Espee Ranch, Arizona: 2007
- Logan County, Kansas: 2007
- Northern Cheyenne Indian Reservation, Montana: 2008
- Vermejo Ranch, New Mexico: 2008

Four reintroduction sites (Aubrey Valley, Cheyenne River Indian Reservation, Conata Basin, and Shirley Basin) currently meet the population objectives for reintroduced populations outlined in the 1988 recovery plan and are considered successful and potentially self-sustaining by the FWS (FWS 2008). The Shirley Basin reintroduction site is crossed by the Project. Two populations (Badlands and Rosebud Sioux Reservation in South Dakota) are improving; four (Charles M. Russell National Wildlife Refuge, Coyote Basin, Wolf Creek, and Janos, Mexico) are marginal; and the remaining populations are either unsuccessful or too recent to categorize. Both the Coyote Basin and Wolf Creek reintroduction sites are crossed by the Project. The FWS currently estimates there are 418 breeding adult black-footed ferrets across all reintroduced populations (78 FR 77485-77486).

3.3.1.5 Primary Threats to Survival

The historical decline in the black-footed ferret occurred concurrently with the reduction in the distribution and abundance of prairie dogs in North America. The primary causes of the species' decline included conversion of native grassland habitats to agriculture, large-scale eradication of prairie dogs, and disease (Esch et al. 2005). Despite several successful reintroductions, the black-footed ferret remains one of the most endangered mammals in North America.

The current threats to recovery of the species include habitat loss and modification, disease, and the lack of adequate regulatory mechanisms (FWS 2008). The FWS estimates that approximately 97 percent of suitable habitat from pre-European times has been lost, and the fragmentation or loss of large prairie-dog colonies currently limits the ability of the remaining habitat to support ferrets. Sylvatic plague, caused by a non-native bacterium, affects both ferrets and prairie dogs, and the disease continues to be a primary threat to the black-footed ferret. Plague has caused the suspension of reintroduction efforts at three sites and limited recovery at two other sites (FWS 2008). In 2008, plague was documented in prairie dogs at Conata Basin, which supported the most successful reintroduced ferret population. This population subsequently suffered a substantial and rapid decline (78 FR 77485-77486). Finally, the lack of regulatory mechanisms to protect prairie-dog colonies from control and eradication efforts as well as recreational shooting currently represents a significant threat to the recovery of the black-footed ferret.

3.3.1.6 Species Recovery

On December 17, 2012, the FWS announced the availability of the Draft Black-footed Ferret Programmatic Safe Harbor Agreement and Environmental Assessment for comment by the public and federal, state, tribal, and local agencies. The final Black-footed Ferret Programmatic Safe Harbor Agreement was released in 2013 (FWS 2013c). The safe harbor agreement, covering activities in the 12 states where the species historically was found, is part of a larger new multi-agency partnership to expand black-footed ferret recovery efforts.

The Black-footed Ferret Recovery Plan was released in 1978 when no extant, wild black-footed ferrets were thought to exist (Linder et al. 1978), and a revision was approved in 1988 (FWS 1988b). The 1988 recovery plan did not include any delisting criteria for the species (FWS 1988b). FWS published the Black Footed Ferret Spotlight Species Action Plan on August 19, 2009. The action plan provided some interim guidance for the recovery of the species. A second revision of the Recovery Plan with downlisting and delisting criteria was approved in 2013 (78 FR 23948-23949).

3.3.2 Canada Lynx (*Lynx canadensis*) – Threatened

3.3.2.1 Regulatory Status

The North Cascades population of the Canada lynx in Washington State was petitioned (as the North American lynx) for ESA listing in 1991, but the petition was not found to present substantial information

that listing was warranted (57 FR 46007-46012). The species was petitioned again, for the entire population in the 48 contiguous states, in 1994 (Biodiversity Legal Foundation 1994). The petition additionally requested the Canada lynx population in the southern Rocky Mountains receive an emergency listing. The FWS found the petition presented substantial information that listing may be warranted, but that an emergency listing was not warranted, and noted that a 12-month review was ongoing as required by a court settlement (59 FR 44123-44124). That review found that listing the Canada lynx was not warranted (59 FR 66507-66509).

In 1997, the FWS again reviewed the status of the Canada lynx, determined that the population in the 48 contiguous states qualified as a DPS, determined that listing was warranted but precluded by higher listing priorities, and added the Canada lynx to the list of candidate species (62 FR 49398-49397). The species was proposed for listing in 1998 (63 FR 36994-37013), and was listed as threatened in 2000 (65 FR 16053-16086). At that time, the DPS boundary was listed as including 14 states currently or historically occupied by the species.

Critical habitat for the Canada lynx was proposed in 2005 in Maine, Minnesota, Montana, and Washington (70 FR 68294-68328) and designated in 2006 in Minnesota, Montana, and Washington (71 FR 66008-66061). The proposed critical habitat in Maine was removed in the final rule. A revision to the critical habitat rule was proposed in 2008 (73 FR 10860-10896), and a final rule revising the designated critical habitat was issued in 2009 (74 FR 8616-8702). The revision increased the area of all previously designated CHUs, created a CHU in Maine, and created an additional CHU in southern Montana and western Wyoming in the Greater Yellowstone Ecosystem. A second revision was proposed in 2013 (78 FR 59429-59474) that increased the area in previously designated CHUs and defined the Contiguous United States DPS as including all Canada Lynx in the 48 contiguous states, wherever found. A final rule revising the DPS boundary and designated critical habitat was issued in 2014 (79 FR 54781-54846).

3.3.2.2 Designated Critical Habitat

No designated critical habitat is present in the Project area (79 FR 54781-54846). The nearest CHU (Greater Yellowstone Area) is in northwestern Wyoming.

3.3.2.3 Taxonomy and Life History

The Canada lynx is one of two North American members of the genus *Lynx*, the other being the bobcat (*L. rufus*), a much more widespread, generalist species. Two additional species are present in Europe and northern Asia (Wilson and Reeder 2005). Several subspecies of the Canada lynx may be described, ranging from three (Wilson and Reeder 2005) to eight (Tumlison 1987). However, the ESA listing for the species does not address subspecies, as all individuals in the 48 contiguous states (the ESA-listed DPS) are accepted to be a single subspecies.

Canada lynx are predators, specializing in other mammals and especially snowshoe hares (*Lepus americanus*). Other prey may be taken opportunistically. However, Canada lynx population size closely follows increases and declines of snowshoe hare populations in a regular cycle that, absent external causes of Canada lynx population declines, appears to be the major factor controlling Canada lynx population size (Stenseth et al. 1997). As such, their habitat preferences also overlap strongly with snowshoe hares, and both typically are found in boreal forests with a dense understory, and with deep snow in winter. Snowshoe hares are important prey rangewide, but Canada lynx may take alternate prey more often in the southern part of their range in the ESA-listed DPS (Roth et al. 2007; Murray et al. 2008).

Canada lynx in the southern portion of their range require larger home ranges than northern populations, likely due in part to the patchiness of high-elevation habitat in the Rocky Mountains. Canada lynx home

ranges measured in Wyoming and Montana ranged from 40 to 85 square miles, based on total annual use. However, that area is divided approximately in half by winter and summer use (Squires and Laurion 1999). Reintroduced Canada lynx in Colorado used home ranges averaging 106 to 181 square miles, while individuals in Maine used home ranges averaging between 12 and 26 square miles (79 FR 54781-54846).

Canada lynx den in dense cover, such as downed trees, and give birth in mid-summer to litters averaging 2.8 kittens (79 FR 54781-54846; Tumlison 1987). Although they mature within approximately 1 year, most do not reproduce until their second year, and reproduction is higher in years of high snowshoe hare abundance.

3.3.2.4 Distribution and Habitat Requirements

Canada lynx are widespread across northern North America, largely following the distribution of boreal forests across Canada and Alaska, extending into mixed hardwood forests in New England and the Great Lakes region, and extending south into the Rocky Mountains and Pacific Northwest in montane coniferous woodlands (Agee 2000).

The ESA-listed DPS, which includes all Canada lynx in the 48 contiguous states wherever they are found, is primarily restricted to four regions, each with some measure of connectivity to the core range of the species in Canada. The New England population is strongest in parts of Maine, but individuals occasionally are reported from Vermont and New Hampshire, and trapping records indicate the species has been found rarely as far southwest as New York and Pennsylvania. The Great Lakes population is located primarily in northern and eastern Minnesota with additional records throughout Wisconsin and Michigan. The Rocky Mountains population extends from Idaho and Montana into Wyoming and Utah and now includes the reintroduced population in Colorado. A population also is present in the northern Cascades in Washington (79 FR 54781-54846). For the Rocky Mountains population in particular, connectivity to Canada is somewhat constrained (Squires et al. 2013), and maintaining that connectivity may be critical to the survival of the population (Schwartz et al. 2004). The agency-preferred route does not cross any areas known or likely to be occupied by resident Canada lynx.

3.3.2.5 Primary Threats to Survival

Canada lynx at the southern edge of their range are found in patchy blocks of suitable habitat at relatively high elevations, which are separated by low-elevation valleys without suitable habitat. Canada lynx in Wyoming, Montana, and Idaho typically are found at elevations above 4,100 feet, while those in Colorado typically are found above 9,500 feet (79 FR 54781-54846). This avoidance of low-elevation valleys contributes to metapopulation structure, where dispersal among populations can be critical to avoiding genetic effects of small population size and stochastic events in populations. Highways, agriculture, and other types of development can reduce dispersal rates across the landscape.

When determining that listing the Canada lynx was warranted, the primary factor identified was a lack of existing regulatory mechanisms to guide maintenance of suitable habitat for the species (65 FR 16053-16086). Logging, fire management, other forestry practices, recreation, and travel management can all contribute to declines in populations that are inherently sensitive due to their small size. For example, Canada lynx appeared to strongly avoid forests subject to thinning treatments (Squires et al. 2013).

Hybrids between Canada lynx and bobcats have been recorded in Minnesota, although it is unclear whether the resulting hybrids were fertile and could cause genetic pollution of Canada lynx populations, or sterile and lost reproductive opportunities or potential competitors (Schwartz et al. 2004).

3.3.2.6 Species Recovery

No recovery plan has been prepared for the Canada lynx. However, a recovery outline was released in 2005 (FWS 2005a). The recovery outline identified core, secondary, and peripheral habitat areas, and provided a recovery strategy focused on habitat management and monitoring Canada lynx populations. The Lynx Conservation Assessment and Strategy was developed to assist with Section 7 consultation on federal lands in the contiguous United States and includes conservation measures compatible with the concepts and potential recovery actions included in the recovery outline (Interagency Lynx Biology Team 2013).

3.3.3 Gray Wolf (*Canis lupus*) – Endangered

3.3.3.1 Regulatory Status

The gray wolf has undergone a lengthy, complex history regarding its listing status under the ESA. Although this section does not present a full history of all listing actions and related court decisions, a summary is provided of the original listing history of the species and recent determinations that affect the listing status of the species in the Project area.

The timber wolf, considered at the time an eastern subspecies of the gray wolf (*C. l. lycaon*), was listed under the ESPA in 1967 (32 FR 4001). The northern Rocky Mountain wolf (*C. l. irremotus*) was listed under the ESCA in 1973 (U.S.C. Title 16, Sections 1531-1544), and the species was listed under the ESA in 1978 throughout the contiguous United States, acknowledging that previous subspecies names and boundaries were likely inaccurate (43 FR 9607-9615).

An NEP was designated in 1994 to allow for the reintroduction of the gray wolf into the northern Rocky Mountains, including the Greater Yellowstone Area (59 FR 60266-60281). The NEP boundary encompassed all of Wyoming, as well as southern Montana and southeastern Idaho.

The FWS designated the Northern Rocky Mountains population of gray wolves as a DPS in 2008, and delisted the DPS after determining recovery objectives had been met (73 FR 10514-10560). The gray wolf listing, including the NEP designation in Wyoming, was reinstated in response to a court order in 2008 (73 FR 75356-75371). In 2009, the FWS published a rule delisting gray wolves in the Northern Rocky Mountains DPS, except for the state of Wyoming where the species remained listed as an NEP (74 FR 15123-15188). The delisted portion of the Northern Rocky Mountains DPS was listed again in response to a court order in 2010 (75 FR 65574-65579). In 2011, the Northern Rocky Mountains DPS was delisted by legislation, although gray wolves in Wyoming remained listed as an NEP (76 FR 25590-25592) until they were delisted in 2012 (77 FR 55530-55604). The listing of the gray wolf in Wyoming was reinstated in 2014, in response to a court order[1].

The gray wolf is not known to be present in Colorado or Utah, but sightings are reported anecdotally on occasion. These states were not a part of the Northern Rocky Mountains DPS, so the species remained listed as endangered. The FWS proposed to delist the gray wolf rangewide in 2013, but this rule has not been finalized to date (78 FR 60813-60815).

3.3.3.2 Designated Critical Habitat

No critical habitat has been designated for the gray wolf.

[1] 13-698 – Defenders of Wildlife et al v. Jewell et al. United States 6th Circuit District Court, Eastern District of Tennessee.

3.3.3.3 Taxonomy and Life History

Taxonomy of North American wolves has been subject to frequent revision and contradiction, as indicated above in the history of the species' listing under the ESA, and uncertainty continues to this day. Although up to 24 New World and 8 Old World subspecies have been described by some authors (Mech 1974, Wilson and Reeder 2005), many of these were considered invalid by later authors, and some have become extinct. As few as three or four subspecies may now be recognized in North America (78 FR 60813-60815). One former subspecies is now recognized as the eastern (or timber) wolf (*C. lycaon*). The red wolf (*C. rufus*) of the southeastern United States, listed as endangered under the ESA, is closely related to the eastern wolf, and both species appear to be more closely related to coyotes (*C. latrans*) than to the gray wolf (Wilson et al. 2000). One possible evolutionary and biogeographical explanation is that the common ancestor of the coyote, eastern wolf, and red wolf dispersed to and diverged in North America from the Eurasian gray wolf. These species later came into contact when gray wolves reached North America during a more recent interglacial period.

All North American wolf species are social and form packs of mostly related individuals led by a dominant male-female pair. Litter size averages six pups, which are raised in sheltered dens by the female. Gray wolves are mature at approximately 1 year, but may not reproduce until their second year. Gray wolves are almost exclusively carnivorous, cooperating to take large grazing mammals but also opportunistically capturing small mammals and birds (78 FR 60813-60815), and even fish in some populations (Darimont and Reimchen 2002). Gray wolves will prey on livestock directly and also will scavenge on livestock carcasses (Morehouse and Boyce 2011).

3.3.3.4 Distribution and Habitat Requirements

The gray wolf is currently found south of Canada only in northern Mexico, a few areas in the Rocky Mountains (reintroduction sites in Montana, Wyoming, and Idaho), northwestern Great Lakes region, and Cascade Mountains of northern Washington. Formerly, gray wolves were much more numerous in the Rocky Mountain states than in the southwestern United States. The agency-preferred route does not cross any areas known or likely to be occupied by resident gray wolves.

The gray wolf is a habitat generalist, with large stable home ranges and exclusive pack territories. Wolf packs generally consist of a breeding pair and offspring. Travel patterns across home ranges are influenced by elevation, topography, prey distribution, and climatic conditions; travel routes along roads, trails, and survey lines for efficiency are common (Paquet and Carbyn 2003). In addition to avoiding roads and human activity, the gray wolf selects den sites (natal and secondary) according to proximity of stable food and water resources; selecting for proximity to ungulate prey species and often denning along ungulate migration routes. Den sites also are located relative to adjacent wolf pack proximity. However, territory overlap with other predators occurs. Limiting factors include climate, prey density, human-induced mortality and disease (Paquet and Carbyn 2003).

3.3.3.5 Primary Threats to Survival

Human conflicts drive the primary threats to the ESA-listed population of the gray wolf, and human-caused deaths can be the majority of mortality for dispersing or resident wolves (Boyd and Pletscher 1999). Although wolves are generalists in their habitat and prey preferences to a degree, and tolerant of some human presence, the degree of disturbance, dispersal barriers, habitat modification, and conflicts with residents and livestock producers has rendered most of the lower and middle elevations within the range of the gray wolf unsuitable for their recovery. High road densities have been shown to increase gray wolf deaths from road mortality and shooting and decrease the probability of an area being occupied by

gray wolves (Wydeven et al. 2001; Kaartinen et al. 2005). However, gray wolves also will travel opportunistically on low-use roads and trails that cross their home ranges (Whittington et al. 2005).

Management for the recovery of gray wolves in montane habitat in the Rocky Mountains often is seen as being in conflict with cattle and sheep grazing, as well as with hunting interests that are dependent on robust elk and deer populations (78 FR 60813-60815). In most recent cases where gray wolves have been delisted in a portion of their range, a hunting program or policy allowing lethal removal of gray wolves taking livestock has been implemented by the states.

3.3.3.6 Species Recovery

Recovery planning to date has only been implemented for the Mexican gray wolf (*C. l. baileyi*). Recovery throughout the remainder of the species' range has been guided by the implementation of policies related to the reintroduction efforts and management of hunting as well addressing agricultural and social conflicts.

3.4 Plants

3.4.1 Clay Phacelia (*Phacelia argillacea*) – Endangered

3.4.1.1 Regulatory Status

Clay phacelia was first proposed for listing on June 16, 1976, along with 1,700 other vascular plant species (41 FR 24523). On June 28, 1978, the FWS published a final rule listing clay phacelia as an endangered species (43 FR 44810).

The FWS initiated a 5-year review on June 20, 2011 (76 FR 35906). The FWS concluded the 5-year review and published the summary and evaluation for the species on August 19, 2013. The FWS concluded that clay phacelia should retain its classification as an endangered species throughout its range, primarily due to threats associated with grazing and infrastructure development.

3.4.1.2 Designated Critical Habitat

No critical habitat has been designated for clay phacelia.

3.4.1.3 Taxonomy and Life History

Clay phacelia is a member of the waterleaf family (*Hydrophyllaceae*) (UDWR 2005a). It was first collected in 1883 by Marcus E. Jones at Pleasant Valley Junction in Wasatch County, Utah, and again in 1894 at Clear Creek near Soldier Summit in Utah County in 1894. However, Jones failed to recognize it as a new species. It was rediscovered in 1971 by N.D. Atwood who identified it as the closely related glandular phacelia (*Phacelia glandulosa*). However, on further examination, substantial differences were seen in the Utah populations so they were given unique species status (FWS 1982).

Clay phacelia is a biennial that reaches heights of 12 inches. The stems are finely pubescent with pinnate leaves. The inflorescence is a compound cyme with blue to violet flowers. It germinates in the fall if there is significant moisture, but can germinate in the spring if conditions in fall are not wet enough. Flowering takes place in late May to early June and fruits are produced from mid-June to September and persist up to 2 weeks. Each fruit can contain up to four seeds. Pollen is primarily spread by wind and possibly bees (FWS 1982).

Dispersed seeds lodge in cracks or crevices on the shale-covered slopes where they germinate when conditions are suitable. Basal rosettes are formed by early to mid-October. Basal rosettes over-winter under the snow pack. Where they are found, extant populations of clay phacelia cover only 3 to 5 percent of the surface of the slope in scattered patches (FWS 1982). Overall vegetative cover is generally around 10 percent in habitat for the species (NatureServe 2013).

3.4.1.4 Distribution and Habitat Requirements

Historically, clay phacelia was known only from the two locations recorded by Jones in Pleasant Valley and Clear Creek. However, later searches were only able to locate the remaining population at Clear Creek near Soldier Summit in Utah County. The Pleasant Valley population remains to be rediscovered or has been extirpated since its initial discovery (UDWR 2005a). Only nine plants were known to exist in 1977. This may have been a result of construction of a railroad line directly through the population. By 1980, only four plants were left at the site due to trampling by sheep. In 1989, a search turned up two subpopulations on open slopes near Water Hollow Canyon approximately 5 miles west to northwest of the Clear Creek site. Being a biennial species, populations vary and require yearly surveys to accurately represent the total number of individuals. To date, continuous monitoring does not occur, but past population counts range from 100 to 400 individuals (FWS 2013d).

Twelve reintroduction sites for clay phacelia have been designated on USFS-administered lands in Spanish Fork Canyon. The U.S. Geological Survey (USGS) has collected and cultivated clay phacelia seeds in a greenhouse for use in reintroduction of the species at five of these sites. The USFS has documented emergence of plants at three of the five reintroduction sites; however, only one individual has been observed as having completed the biennial life cycle and successfully producing seeds. All known clay phacelia populations occur in the Project area.

Clay phacelia grows on steep slopes in sparsely populated juniper-pinyon and mountain brush communities (Welsh et al. 1975). The slopes are very steep; the largest population is located on a slope with a 70 percent grade.

The substrate of habitat for clay phacelia is shaley clay colluviums of the Green River Formation (Atwood 1975). As a result, the loose shale on the surface is continually sloughing down the face of the slopes. The majority of the plants grow on slopes facing west or southeast, at elevations between 6,000 and 7,000 feet. Populations are not likely to exist at elevations greater than 8,000 feet (Utah Native Plant Society 1989). Habitat areas are free of snow at least once during the winter and are typically dry in early spring. Associated vegetation includes Skunkbush sumac (*Rhus trilobata*) and serviceberry (*Amelanchier alnifolia*) with a degraded sagebrush steppe at the base of the slope (FWS 1982).

3.4.1.5 Primary Threats to Survival

In their 5-year review, the FWS identified three primary threats to clay phacelia survival: grazing, road construction, and transmission-line development (FWS 2013d).

Historic livestock grazing drastically reduced populations and contributed to the 1978 listing decision. Currently, livestock grazing does not occur at the Nature Conservancy owned Clear Creek site or any of the reintroduction sites on public land (FWS, 2013d). However, grazing still occurs on the privately owned lands surrounding the Water Hollow populations and remains a threat to the species. An exclosure fence to prevent wild ungulate herbivory encircles the core of the Clear Creek population, but herbivory significantly contributes to plant mortality and hampers reintroduction and recovery efforts.

Road expansions and transmission-line development, both ongoing and proposed, also pose a threat to clay phacelia survival through associated habitat loss, dust deposition, and erosion (FWS 2013d). These impacts are magnified by clay phacelia's drastically small population size and restricted range. In populations with less than 1,000 individuals, demographic uncertainties can play a significant role in extinction probability, and any direct loss of individuals or impacts on fecundity could disproportionally reduce clay phacelia survival.

3.4.1.6 Species Recovery

The recovery plan for clay phacelia was published in 1982 (FWS 1982). The objective of the plan is to establish a self-sustaining population of 2,000 to 3,000 individuals on 120 acres of protected habitat and possibly establish at least one new population. Clay phacelia can possibly be downlisted once the objective is achieved, depending on the nature of existing threats to the species. The FWS is currently re-evaluating recovery goals for clay phacelia to create more meaningful, measurable, and achievable recovery criteria (FWS et al. 2013). Twelve suitable, but unoccupied, areas were identified in Water Hollow and nearby Tie Fork as potential reintroduction sites. Currently, reintroduction via seeding has been attempted at five of the sites. These efforts have resulted in successful germination and seed production, but are not considered to have produced self-sustaining populations (FWS 2013d).

3.4.2 Clay Reed-mustard (*Schoenocrambe argillacea*) – Threatened

3.4.2.1 Regulatory Status

Clay reed-mustard was first listed as a candidate to add to the list of endangered species on December 15, 1980 (45 FR 82480). Beginning on October 13, 1983, and each successive year, the FWS made 1-year findings that the petition to list the species was warranted but precluded by other listing actions of higher priority. On April 12, 1991, the FWS published a proposed rule proposing to list clay reed-mustard as an endangered species (56 FR 14910). Surveys for the species conducted after the proposal date revealed significant additional populations of the species, possibly twice as large as previously thought. Taking the new survey results into account, the FWS found it more appropriate to list clay reed-mustard as a threatened species (57 FR 1398).

The FWS initiated a 5-year review on October 6, 2008 (73 FR 58261). The FWS concluded the 5-year review and published the summary and evaluation for the species on July 11, 2011. The FWS concluded that clay reed-mustard should retain its classification as a threatened species throughout its range, primarily due to threats associated with oil and gas development.

3.4.2.2 Designated Critical Habitat

No critical habitat has been designated for clay reed-mustard.

3.4.2.3 Taxonomy and Life History

Clay reed-mustard, also known as clay *Schoenocrambe* and the Uinta Basin plainsmustard (UDWR 2005a), was discovered by Duane Atwood in 1976 on a site in the southern portion of the Uinta Basin in Uintah County, Utah, approximately 1 mile from the discovery site of the shrubby reed-mustard (*Schoenocrambe suffrutescens*). It originally was described as *Thelypodiopsis argillacea*. In 1982, the genus was changed to *Schoenocrambe* after evaluating the cruciferous genera that also includes the endangered shrubby reed-mustard and Barneby reed-mustard (*Schoenocrambe barnebyi*) (FWS 1994).

Clay reed-mustard is a perennial, herbaceous plant that reaches 1 foot in height. It has a wood root crown with alternate leaves arranged on the stem and connected without a petiole. The flowers are pale lavender to white with prominent purple veins and grow to half an inch in length in a raceme of 3 to 20 flowers at the end of the plant's leafy stem (FWS 1994).

All three species of reed-mustards present in the Uinta Basin flower from April to May with fruit appearing May to June. Reproduction is sexual and pollination is aided by insects. Little is known about the long-term population dynamics, population viability, or the effects of disease, parasitism, grazing, or competition on any of the species (FWS 1994).

3.4.2.4 Distribution and Habitat Requirements

Six populations of clay reed-mustard are known within a 19-mile range from the west side of the Green River to the east side of Willow Creek in southwestern Uintah County, Utah. One population is known from the eastern slopes of Big Pack Mountain; one in Broome Canyon to the east; a third is located along the west slopes of Wild Horse Bench; a fourth is immediately north in Long Bottom; a fifth is immediately north of Long Bottom called King's Bottom; and the sixth population is along the slopes of the canyons about Ray's Bottom, on the west side of the Green River. The total population is estimated from approximately 5,300 to 7,450 plants (FWS 2011d). The Ray's Bottom and King's Bottom populations occur in the Project area.

Clay reed-mustard grows in mixed salt desert shrub communities, generally on north-facing slopes composed of clay soils rich with gypsum overlain with sandstone talus. The sandstone talus of the clay reed-mustard is derived from a mixture of shales and sandstones from the zone of contact between the Uinta and Green River geologic formations. Populations grown on protected sites generally are more robust than those that grow on exposed surfaces (FWS 1994). Associated vegetation includes crispleaf buckwheat (*Eriogonum corymbosum*), Torrey's jointfir (*Ephedra torreyana*), shadscale (*Atriplex confertifolia*), valley saltbush (*Atriplex cuneata* ssp. *cuneata*), and saline wildrye (*Leymus salinus*) (UDWR 2005a).

3.4.2.5 Primary Threats to Survival

Primary threats to clay reed-mustard include habitat disruption associated with energy development and off-road vehicle use. Most known populations are on federal lands that are leased for oil and gas energy reserves and petroleum deposits that are being developed in adjacent habitats. In addition, the entire range of the species is underlain by oil shale (FWS 1994). Most sites of clay reed-mustard contain less than 200 individuals, which increases the chance that populations may be lost as a result of natural variation in population numbers and less genetic diversity thus making the populations more susceptible to natural disasters (57 FR 1398-1403).

3.4.2.6 Species Recovery

The recovery plan for the three Utah reed-mustards was published in 1994. The goal of the plan is to delist clay reed-mustard. Delisting criteria described in the plan includes: (1) discovering or establishing a minimum of 10 separate populations with 2,000 or more individuals per population; and (2) documenting or establishing formal land management designations that would provide for long-term protection on undisturbed habitat for the 10 separate populations (FWS 1994).

3.4.3 Deseret Milkvetch (*Astragalus desereticus*) – Threatened

3.4.3.1 Regulatory Status

On June 16, 1976, the FWS published a proposed rule to designate 1,700 plants, including Deseret milkvetch, as endangered species (41 FR 24523). On December 10, 1979, the FWS withdrew the proposal as it was not finalized within the 2-year time limit from initial publication in the *Federal Register* (44 FR 70796). In the December 15, 1980, notice of review, Deseret milkvetch was listed as a category 1 species, indicating that sufficient information on biological vulnerability and threats to support preparation of listing proposals was available. It also was noted that Deseret milkvetch may have recently become extinct. In 1981, a population was discovered that led to a relisting of Deseret milkvetch as a Category 2 candidate, for which data were not sufficient to support issuance of a listing proposal (48 FR 53640). Surveys in 1990 and 1991 resulted in additional information that reinstated the Category 1 candidate assignment in 1993 (58 FR 51144). The species eventually was listed as a threatened species on October 20, 1999 (64 FR 56590).

On January 25, 2007, an advanced notice of proposed rulemaking was released announcing the intent to remove Deseret milkvetch from the federal list of endangered and threatened plants. Delisting was proposed because threats to the species believed to exist at the time of listing were not thought to be as significant as earlier believed (72 FR 3379). A 5-year review was initiated on April 18, 2007 (72 FR 19549); the FWS did not find any threats to the species during the 5-year review process and, therefore, recommended delisting the species. However, the FWS also noted that a single project, such as a major transmission-line project, in or affecting occupied habitat could elevate the threats to the species to the point that it will not be able to be delisted (FWS 2011e).

3.4.3.2 Designated Critical Habitat

No critical habitat has been designated for Deseret milkvetch.

3.4.3.3 Taxonomy and Life History

Deseret milkvetch is a member of the legume family (*Leguminosae, Fabaceae*). It was first collected near Indianola, Utah, in 1893 and 1909 by Marcus E. Jones and Ivar Tidestrom, respectively. It was not described as a separate species until 1964 by Rupert Barneby using specimens from various herbaria. At that time, unsuccessful effort was made to find the original populations from which Jones and Tidestrom collected specimens. The species was believed to be extinct until found near Birdseye, Utah, in 1981. The Birdseye population is the only current known occurrence (64 FR 56590).

Deseret milkvetch is a perennial, herbaceous species that is nearly stemless and can reach a height of 6 inches. The flowers are typical of the bean family and are white with a purple tip on the keel. The seed pods are just under an inch long, hairy, and contain 14 to 16 seeds (64 FR 56590). Because the milkvetch is a short-lived perennial, it has no means of vegetative propagation. The survival of the species depends on successful reproduction and germination of seeds annually. Growth and reproduction begin after the annual snow melt, usually by mid-April (NatureServe 2008a). Flowering and seed-setting occurs in May and June. Like most species in the pea family, the flower of Deseret milkvetch is designed primarily to be pollinated by bees. The seeds lay dormant over the winter and germinate in the spring when favorable conditions return (64 FR 56590).

3.4.3.4 Distribution and Habitat Requirements

Deseret milkvetch is endemic to central Utah and known from only one location on the east side of the Thistle Creek Valley near the town of Birdseye in Utah County (UDWR 2005a). The population consists

of an estimated 86,775 to 98,818 individuals growing on 146 acres on both state and privately owned land (FWS 2011e). A majority of the known population lies less than 1 mile from the agency-preferred route. The known location of Deseret milkvetch is in an open-to-sparse juniper-sagebrush community on open, steep, naturally disturbed south and west (rarely north) facing slopes of sandy-gravelly soils of the Moroni Formation (UDWR 2005a). On west-facing road cuts, the individuals tend to grow larger. The vegetation is dominated by pinyon pine and Utah juniper. Other associated vegetation includes sagebrush, scrub oak, Indian ricegrass, antelope bitterbrush, and plateau beardtongue (*Penstemon scariosus*) (64 FR 56590).

3.4.3.5 Primary Threats to Survival

The primary threats to the survival of Deseret milkvetch are residential development, highway widening, and livestock grazing and trampling. Although distribution of the species is still small and restricted, evidence shows there has been little to no habitat disturbance in recent years, and there are no foreseeable potential threats to the state-owned portion of the species' range. Only one house has been built on private property within the species' range, affecting less than 1 percent of occupied habitat. As of 2006, there were no plans for highway widening to occur within the range of the species. Livestock grazing is being managed by the UDWR, reducing the threat of trampling of vital habitat (72 FR 3379).

3.4.3.6 Species Recovery

No recovery plan has been created for Deseret milkvetch.

3.4.4 Shrubby Reed-mustard (*Schoenocrambe suffrutescens*) – Endangered

3.4.4.1 Regulatory Status

On July 1, 1975, the FWS published a notice that included shrubby reed-mustard as a candidate for listing (41 FR 24523). Amendments to the ESA in 1978 required that all petitions more than 2 years old be withdrawn, but that petitions already more than 2 years old were subject to a 1-year grace period. On December 10, 1979, the FWS withdrew the petition to list the shrubby reed-mustard because it was not finalized within the 1-year grace period (44 FR 70796). The species was once again listed as a candidate species in the December 15, 1980, notice of review. Amendments to the ESA in 1982 required that a finding must be made as to whether a requested action is warranted, not warranted, or warranted but precluded by other activity within 2 years of the intent to list. All petitions pending as of October 12, 1982, were treated as having been received on that date. Each successive year after the 1982 amendments, the FWS released notices that an endangered determination for the shrubby reed-mustard was warranted but precluded by other listing activity. The final rule to list the species as endangered was published on October 6, 1987 (52 FR 37416).

3.4.4.2 Designated Critical Habitat

In September 1985, approximately 7,360 acres of critical habitat was proposed in the vicinity of Hill Creek in Uintah County (50 FR 36118-36112). However, the proposal was withdrawn when the species was listed (52 FR 37416).

3.4.4.3 Taxonomy and Life History

Shrubby reed-mustard, also known as toad-flax cress, Graham's schoenocrambe, shrubby glaucocarpum, and the Uinta Basin waxfruit, is a member of the mustard (*Brassicaceae*) family (UDWR 2005a). It was first discovered in the Uinta Basin of Uintah County, Utah, in 1935 and described by Reed C. Rollins as *Thelypodium suffrutescens*. Following further taxonomic research, in 1938 Rollins described it to the

monotypic genus *Glaucocarpum*. By 1992, the name was changed to shrubby reed-mustard (S*choenocrambe suffrutescens*) to complete a morphologically discrete phylogenetic unit of five species that also includes the threatened clay reed-mustard (*S. argillacea*) and endangered Barneby reed-mustard (57 FR 1398). The genus is under some review and is commonly placed in either *Glaucocarpum* or *Schoenocrambe* (UDWR 2005a).

Shrubby reed-mustard is a perennial, herbaceous plant with multiple, clumped stems that reach 1 foot in height. The leaves are alternately arranged and attached to the stem by a short petiole. The flowers are light yellow or greenish yellow that grow to half an inch, displayed in a raceme of 5 to 20 flowers at the plant's leafy stems (FWS 1994).

All three species of reed-mustards flower from April to May with fruit appearing May to June. Reproduction is sexual and pollination is aided by insects, primarily several species of bees. Within the raceme, flowers mature closest to the stem first and spread upward. The flowers are most fragrant in the morning and decline as the day progresses. Little is known about the long-term population dynamics, disease, parasitism, effect of grazing, competition, and viability of any of the species (FWS 1994).

3.4.4.4 Distribution and Habitat Requirements

Shrubby reed-mustard is confined to localized geological formations of buff-colored calcareous shale of the Green River Formation in the Uinta Basin of eastern Utah (Duchesne and Uintah counties). In 1985, eight parcels of this habitat totaling 7,360 acres were proposed as critical habitat, but the rule was never finalized (50 FR 36118-36112). This area supports the majority of the known populations and appears to be necessary to the continued survival of the species (FWS 1994).

There are currently seven known populations of shrubby reed-mustard. Four populations lie between Hill Creek and Willow Creek (Big Pack Mountain, Thorn Ranch, Johnson Draw, and Agency Draw) totaling approximately 2,440 individuals). Two populations are located on the west side of Hill Creek (Gray Knolls and Dog Knoll) and comprise approximately 320 individuals. A single population exists in Duchesne County approximately 15 miles from the other populations. It is located approximately 1.5 miles north of the junction of Nine Mile Creek and Daddy Canyon. This population (Badlands Cliff/Wrinkles Road) has a population of approximately 170 individuals (FWS 2010). The Badlands Cliff population occurs within 1 mile of the agency-preferred route.

Shrubby reed-mustard is found in desert-shrub communities with sparse juniper and pinyon pine trees. It grows on clay soils with white shale. In contrast to the other listed *Schoenocrambe* species, the shrubby reed-mustard generally grows on level to moderately sloping round surfaces. The soil is derived from the Evacuation Creek Member of the Green River geological formation at an elevation of 5,400 to 6,000 feet (FWS 1994).

3.4.4.5 Primary Threats to Survival

Primary threats to shrubby reed-mustard include threats associated with the oil and gas industry, off-road vehicle use, and small population. All known populations are on federal lands leased for oil and gas energy reserves and petroleum deposits being developed in adjacent habitats with the exception of a small portion on the Uintah and Ouray Indian Reservation. In addition, the entire range of the species is underlain by oil shale. The species also is vulnerable to ground-disturbing activities associated with energy development (FWS 1994).

Another particular threat to shrubby reed-mustard is association of habitat with commercially valuable native building stone composed of volcanic ash deposited during the prehistoric Uinta Lake during the Eocene epic. Previous commercial stone excavation is believed to have caused the extirpation of a portion

of the population near the Big and Little Pack Mountains (50 FR 36118). In addition, there are risks associated with the species having only three small populations that could be devastated by an unpredictable catastrophe such as an extreme weather event (Beacham et al. 2005).

3.4.4.6 Species Recovery

The recovery plan for three Utah reed-mustards was published in 1994. The goal of the plan is to delist or downlist the shrubby reed-mustard. Due to a small total population, vulnerability of the habitat to ongoing and potential oil and gas activity, and unrestricted off-road vehicle use, downlisting and delisting of the shrubby reed-mustard appears unlikely in the near future. However, criteria for downlisting include (1) discovering or establishing a minimum of 5 separate populations with 2,000 or more individuals per population and (2) document or establish formal land management designations that would provide for long-term protection on undisturbed habitat for the above 5 populations. The species may be considered for delisting when the above criteria are expanded to 10 populations (FWS 1994). The FWS initiated a 5-year review on October 6, 2008 (73 FR 58261). The 5-year review determined that the species should retain its current listing status (FWS 2010).

3.4.5 Uinta Basin Hookless Cactus (*Sclerocactus wetlandicus*) – Threatened

3.4.5.1 Regulatory Status

Uinta Basin hookless cactus was listed as threatened under the ESA of 1973 on October 11, 1979, based primarily on threats of over-collection and habitat destruction (44 FR 58868). At that time, it was listed as part of the *Sclerocactus* complex of three species: Pariette cactus (*S.brevispinus*), Colorado hookless cactus (*S.glaucus*), and Uinta Basin hookless cactus (*S.wetlandicus*). In 2006, a petition was filed to remove the *Sclerocactus* complex from the list of threatened plants, but the petition was denied after a 90-day review and the status of these species remained unchanged (71 FR 75215). On September 18, 2007, the FWS initiated a 12-month petition to change the taxonomy of the threatened *Sclerocactus* complex to three distinct species to reflect the taxonomy generally accepted in scientific literature. Because all three species were once considered part of the *Sclerocactus* complex when the species was listed as threatened, all remained listed as threatened under the new taxonomic status. The FWS officially recognized the taxonomic revision in September 2009 and listed each species as threatened independent of the other species (74 FR 47112-47117).

Core conservation areas also have been established by the FWS to provide management guidance for habitat for both Uinta Basin hookless cactus and Pariette cactus (heretofore referred to as *Sclerocactus* core habitat), as no clear geographic delineation between the ranges and habitat requirements of these species exists (FWS n.d.).

3.4.5.2 Designated Critical Habitat

No critical habitat for Uinta Basin hookless cactus has been designated (72 FR 75215).

3.4.5.3 Taxonomy and Life History

Uinta Basin hookless cactus has had an involved taxonomic history. It was first collected by Schumann in 1898 and initially described as *Echinocactus glaucus.* In 1917, considering the Schumann publication to be illegitimate, Rydberg redescribed the species as *E. subglaucus*. In 1925, Purpus treated the species as a variety of Whipple's fishhook cactus *E. whipplei* var. *glaucus*. By 1939, the species was first placed in the genus *Sclerocactus* as *S.s franklinii* by Evans. In 1966, Benson assigned six species to the *Sclerocactus* genus and noted that *S. glaucus* was distinguished from others in the genus by a large unhooked central

spine and noticeably smaller seeds (Benson 1966). In 1972, Arp changed the genus to *Pediocactus*, leading to an assignment of *Pediocactus glaucus* (Arp 1972). Finally, in 1981, the species was restored to Benson's concept of *Sclerocactus* (Heil et al. 1981)and reestablished *Sclerocactus glaucus* in the taxonomic literature (FWS 1990c).

Sclerocactus glaucus remained the accepted name until revisions to the taxonomy of the Uinta Basin hookless cactus in 1989 resulted in three distinct species, once part of the *Sclerocactus* complex. This reclassification was based on genetic studies, common garden experiments (Welsh et al. 2003), distribution, and a reevaluation of the morphological characteristics. The recently published Flora of North America now recognizes *S.glaucus*, *S. wetlandicus*, and *S. brevispinus*, which collectively were recognized as *S.glaucus* at the time of listing (72 FR 53211). The FWS officially recognized the taxonomic revision in September 2009 (74 FR 47112-47117).

Uinta Basin and Colorado hookless cacti (*S. wetlandicus* and *S.glaucus)* are morphologically similar. They are low growing, leafless succulent plants that are oval to globular in shape. The stems generally are solitary, but sometime grow in clusters of two or three. Individuals can reach heights of 1.5 to 7.0 inches and 1.0 to 4.5 inches in diameter. Stems are covered with protuberances arising from the 12 ribs. The cacti have numerous 1- to 2-inch pinkish flowers that have pronounced ultra-violet reflectance, unique to the genus (FWS 1990c). Flowers bloom in late April to May and produce green, thin-walled fruits that turn red at maturity. The seeds are small, black, and asymmetrical. It appears that small bees (families *Halictidae and Anthophoridae*), ants, and gravity are the primary dispersal mechanisms that may be a limiting factor to the distribution (NatureServe 2008b).

Although no long-term demographic data are available, it is believed the species may live for 10 to 20 years in good conditions. Populations range from 1 to more than 1,000 individuals with a wide range of ages. Known predators include the cactus borer beetle and rodents (FWS 1990c).

3.4.5.4 Distribution and Habitat Requirements

The known distribution of the *Sclerocactus* complex includes federal, state, tribal, and private lands in Utah (Uintah, Duchesne, and Carbon counties) and Colorado (Mesa, Delta, Garfield, and Montrose counties). At the time of listing, eight populations of the *Sclerocactus* complex were known to exist in five counties in western Colorado and eastern Utah. Since that time, two small outlier populations near Gateway, Colorado, and Bonanza, Utah have been identified. Ninety percent of the total population of the three species is found on BLM-managed lands (FWS 1990c).

Uinta Basin hookless cactus is endemic to northeast Utah (Duchesne and Uintah counties) where it is located entirely in the BLM Vernal Field Office planning area. Current population estimates are at about 30,000 individuals over a range that is approximately 60 miles long and 25 miles wide. Individuals are patchily to densely distributed near the confluence of the Green, White, and Duchesne rivers near Ouray National Wildlife Refuge and the town of Ouray, Utah, south along the Green River to the vicinity of Sand Wash including concentrations near the mouth of the Pariette Draw (FWS 1990c). The Project crosses known populations of Uinta Basin hookless cactus in both Duchesne and Uintah counties.

Uinta Basin hookless cactus is found in salt desert shrub communities and pinyon-juniper woodlands on river benches, valley slopes, and rolling hills. It is found on Quaternary and Tertiary alluvial soils weathered from the Uinta and Green River formations that are fine textured, dry, and overlain with cobble and pebble (BLM 2008b). Most of the range is in existing oil and gas fields or in undeveloped oil and gas lease areas. The cactus is more abundant on south facing slopes with up to a 30 percent grade at an elevation of 4,500 to 5,900 feet. Associated vegetation includes shadscale, galleta, black sage, and Indian rice grass (FWS 1990c).

3.4.5.5 Primary Threats to Survival

The primary threats to the survival of Uinta Basin hookless cactus stem from mineral and energy development, water development, and collection. Most of the range of the species is in existing oil and gas fields or undeveloped oil and gas lease areas (BLM 2008b). This activity has the potential to devastate local populations. The cactus also is sought out by professional and amateur cactus growers for its beautiful flowers. Because of its natural scarcity, it is a prized species for collectors and, therefore, could be highly threatened by the unregulated commercial trade of those plants collected from the wild (FWS 1990c).

3.4.5.6 Species Recovery

A recovery outline for Uinta Basin hookless cactus was published in April 2010. This recovery outline recognized Uinta Basin hookless cactus as a distinct species and recommended an increase in its recovery priority. Recovery needs for this species include surveying to accurately document populations and suitable habitat, protecting and restoring habitat (including pollinator habitat and corridors to provide connectivity), and protecting individual plants and populations from direct and indirect threats. The recognition of *Sclerocactus* core areas by the FWS was an effort to address some of these recovery needs.

3.4.6 Ute Ladies'-tresses (*Spiranthes diluvialis*) – Threatened

3.4.6.1 Regulatory Status

On September 27, 1985, the FWS published a notice that included Ute ladies'-tresses as a category 2 species candidate for listing (50 FR 39526). Category 2 comprised taxa for which the FWS had information indicating the appropriateness of a proposal to list as endangered or threatened but for which more substantial data was needed on biological vulnerability and threats. After a review of status information acquired after the 1985 notice, the FWS upgraded Ute ladies'-tresses to a category 1 species in the February 21, 1990, Notice of Review (55 FR 6184), which meant the FWS had in possession enough data to support listing. The final decision to list the species as threatened was published on January 17, 1992 (57 FR 2048). On May 10, 1996, the FWS received a petition from the Central Utah Water Conservancy District to delist Ute ladies'-tresses. Due to the low priority assigned to delisting petitions, the FWS postponed immediate action. On October 12, 2004, the FWS initiated a 5-year review that would be used to determine the outcome of the petition to delist (69 FR 60605).

3.4.6.2 Designated Critical Habitat

No critical habitat for Ute ladies'-tresses has been designated.

3.4.6.3 Taxonomy and Life History

The Ute ladies'-tresses, also known as flood ladies'-tresses, is a member of the orchid family (*Orchidaceae*) (UDWR 2005a). Prior to 1984, only three species of white-flowered ladies'-tresses were known to exist – *S. cernua*, *S. romanzoffiana*, and *S. porrifolia*. In 1980, a specimen was collected near Golden, Colorado that was first thought to be *S. cernua* and sent to Dr. Charles Sheviak who was conducting studies on the genus *Spiranthes*. In 1984, after visiting sites in both Colorado and Utah, Sheviak described the new species *S. diluvialis*. In the description, *S. diluvialis* is believed to have resulted from the hybridization of *S. magnicamporum* and *S. romanzoffiana* during a Pleistocene pluvial period, at a time when the two species would have been located sympatricly (FWS 1995b).

Ute ladies'-tresses is a long-lived perennial orchid with a flowering stalk arising from clusters of basal leaves and short thickened roots. It reproduces only by seeds and can produce as many as 7,300 seeds per

fruit that can persist for up to 8 years as subterranean saprophytes dependent on mycorrhizal fungi. Leaf rosettes may emerge at the end of the growing season and overwinter. In any given year, mature plants can be found in stages—flowering, nonflowering (vegetative), and seasonally dormant stages. Under adverse conditions, individual plants may not flower and can persist underground for an unknown period of time until conditions are amenable to survival above ground. This can make locating the plant difficult, and the species can only reliably be identified when flowering (FWS 1995b).

3.4.6.4 Distribution and Habitat Requirements

Ute ladies'-tresses is known to exist in three general areas: on the eastern slope of the Rocky Mountains, the Uinta Basin, and near the western base of the Wasatch Mountains. Near the Rocky Mountains, the species is found in north-central and central Colorado (Clear Creek, Jefferson, Boulder, Larimer, and possibly Moffat counties), east-central Idaho (Bonneville and Jefferson counties), southwestern Montana (Beaverhead, Broadwater, Gallatin, Jefferson, and Madison counties) and east-central and southeastern corner of Wyoming (Converse, Goshen, Laramie, and Niobrara counties), and downstream in western Nebraska (Sioux, Washington, and Okanogan counties). In the Uinta Basin, the species is associated with streams and rivers of the Upper Colorado River drainage. Near the Wasatch Mountains, the species is generally found in the eastern Great Basin (Utah, Salt Lake, Weber, and Tooele counties), in the Wyoming Basin (Daggett County), and in the Colorado Plateau (Garfield and Wayne counties) (FWS 1995b). Potential Ute ladies'-tresses habitat occurs within 1 mile of the agency-preferred route at several locations in the Project area.

Ute ladies'-tresses is endemic to moist or very wet meadows near springs, lakes, or perennial streams. It also is found in abandoned stream meanders that retain ample groundwater. It is found at elevations ranging from 4,300 to 7,000 feet. The species is generally found in areas with relatively open vegetation, although some individuals have been observed in the riparian woodlands of eastern Utah and Colorado. Populations generally are small and located in scattered groups occupying small areas in the riparian system (FWS 1995b).

3.4.6.5 Primary Threats to Survival

Riparian habitat and the nomadic grazing typical of native ungulates are vital to Ute ladies'-tresses to create and maintain habitat, both of which have been altered since settlement of the west. Orchid habitat is now grazed by cows, sheep, or horses, all of whose grazing habits differ from native ungulates in timing and intensity. Season-long grazing where the plants are destroyed after flower stem formation can be detrimental to the already low reproductive success of the species. Water developments, urbanization, and dams interrupt flooding cycles causing fragmentation and destruction of vital habitat (57 FR 2048). Reservoirs, dams, and diversions have drastically altered some stream systems by completely dewatering some reaches and changing their magnitude and timing of flow. In addition, invasion by noxious weeds such as the leafy spurge (*Euphorbia esula*), spotted knapweed (*Centaurea maculosa*), and Russian knapweed (*Centaurea repens*) can outcompete the species in already limited habitat (FWS 1995b). Degradation of habitat for pollinator species in the surrounding area also has been proposed as a threat to the species (Sipes and Tepedino 1995).

3.4.6.6 Species Recovery

The recovery plan for Ute ladies'-tresses was published in 1995 (FWS 1995b). The objective of the plan is the continued existence of Ute ladies'-tresses, but no specific delisting criteria are given. The species will be considered for delisting when sites that include occupied habitat harboring 90 percent of the plants in each ecoregion are protected at public ownership or higher levels of protection and managed in accordance with a FWS-approved management plan. The plan must assure implementation of

management practices that provide the range and spatial distribution of successional and hydrologic regimes required to maintain the species and its pollinators in self-sustaining, naturally occurring populations that will remain in effect after delisting occurs.

3.4.7 Western Prairie Fringed Orchid (*Platanthera praeclara*) – Threatened

3.4.7.1 Regulatory Status

On October 11, 1988, the FWS published a proposal to list western prairie fringed orchid as threatened (53 FR 39621-39626). This rule was finalized on September 28, 1989 (54 FR 39857-39863).

3.4.7.2 Designated Critical Habitat

Critical habitat has not been designated for western prairie fringed orchid.

3.4.7.3 Taxonomy and Life History

The western prairie fringed orchid, also known as Great Plains white fringed orchid, is a member of the orchid family (*Orchidaceae*). The species was previously included as a single species with the eastern prairie fringed orchid (*Platanthera leucophaea*) but was described separately in 1986 by Dr. Bowles on the Sheyenne National Grassland in Ransom County, North Dakota (FWS 1996).

The western prairie fringed orchid is a smooth, erect perennial herb with two to five fairly thick elongated hairless leaves. Flowers are wide and white in color with the lower petal deeply three-lobed and fringed. Plants typically grow to approximately 4 feet in height (FWS 1996). Like many orchids, western prairie fringed orchid may experience periods of dormancy. Research estimates 4 to 12 percent of plants may be dormant each year and dormancy may be as short as 1 year but could last as long as 8 years (FWS 2009d). This can inhibit the ability of surveyors to detect the species presence.

3.4.7.4 Distribution and Habitat Requirements

The species is historically known to exist throughout the Great Plains of North America. In 1996, populations of western prairie fringed orchid were known in 41 counties across six states (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota) and Manitoba, Canada (FWS 1996). Populations in Nebraska are located in the Platte River watershed. There is no habitat or populations of this species in the Project area.

The species inhabits tallgrass prairies and is found most often on unplowed, calcareous prairies and sedge meadows. It also has been known to exist at disturbed sites in successional communities such as borrow pits, old fields, and roadside ditches. Most locations are similar in that they are subirrigated by near-surface groundwater that provides a reliable source of water. Species likely to also exist in these areas are big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), and Indiangrass (*Sorghastrum nutans*) in tallgrass prairies and sedge and spikerush (*Eleocharis* spp.) species in sedge meadows (FWS 1996).

3.4.7.5 Primary Threats to Survival

Historically, the major cause for decline of the species was conversion of habitat to cropland. Hydrologic changes that draw down or contaminate the water table also may adversely affect the species. Additional practices also may affect the species depending on their timing, frequency, and intensity. These include

burning, grazing, and mowing (FWS 1996). However, the species is dependent on periodic disturbance, but these management practices must be implemented carefully (FWS 2009d).

In addition to these threats, non-native species may out-compete western prairie fringed orchid. Inter-seeding of non-native species to increase livestock forage is promoted in some states inhabited by western prairie fringed orchid, such as Nebraska (FWS 2009d).

3.4.7.6 Species Recovery

The recovery plan for western prairie fringed orchid was published in 1996 (FWS 1996). The objective of the plan is to delist the species. The species will be considered for delisting when sites that include occupied habitat harboring 90 percent of the plants in each ecoregion are protected at public ownership or higher levels of protection and managed in accordance with a FWS-approved management plan. The plan must assure implementation of management practices that provide the range and spatial distribution of successional and hydrologic regimes required to maintain the species and its pollinators in self-sustaining, naturally occurring populations that will remain in effect after delisting occurs.

4.0 EFFECTS OF THE PROJECT

This section presents the potential effects of the proposed Project on any ESA-listed, proposed, or candidate species and designated critical habitat that may be found in the Project area.

Table 4-1 provides a summary of the listing status of each species discussed in Section 4.0 and the determination for whether the proposed Project will affect each species.

TABLE 4-1
DETERMINATIONS FOR SPECIES AND CRITICAL HABITAT THAT MAY BE PRESENT IN THE PROJECT AREA.

Species	Listing Status	Determination
Fish		
Bonytail	Endangered	May affect, likely to adversely affect
Bonytail	Designated critical habitat	May affect, likely to adversely affect
Colorado pikeminnow	Endangered	May affect, likely to adversely affect
Colorado pikeminnow	Designated critical habitat	May affect, likely to adversely affect
Humpback chub	Endangered	May affect, likely to adversely affect
Humpback chub	Designated critical habitat	May affect, likely to adversely affect
June sucker[1]	Endangered	May affect, not likely to adversely affect
Pallid sturgeon	Endangered	May affect, likely to adversely affect
Razorback sucker	Endangered	May affect, likely to adversely affect
Razorback sucker	Designated critical habitat	May affect, likely to adversely affect
Birds		
Greater sage-grouse	Candidate	No determination is required
Least tern, Interior population	Endangered	May affect, likely to adversely affect
Mexican spotted owl[1]	Threatened	May affect, not likely to adversely affect
Piping plover, Northern Great Plains population	Threatened	May affect, likely to adversely affect
Piping plover, Northern Great Plains population	Designated critical habitat	May affect, likely to adversely affect
Whooping crane	Endangered	May affect, likely to adversely affect
Whooping crane	Designated critical habitat	May affect, likely to adversely affect

TABLE 4-1 DETERMINATIONS FOR SPECIES AND CRITICAL HABITAT THAT MAY BE PRESENT IN THE PROJECT AREA.		
Species	**Listing Status**	**Determination**
Yellow-billed cuckoo, Western United States Distinct Population Segment[1]	Threatened	May affect, likely to adversely affect
Mammals		
Black-footed ferret	Endangered, NEP	Not likely to jeopardize
Canada lynx[1]	Threatened	May affect, not likely to adversely affect
Gray wolf	Endangered, Nonessential Experimental Popluation (Wyoming)	Not likely to jeopardize
Gray wolf	Endangered (Colorado and Utah)	May affect, not likely to adversely affect
Plants		
Clay phacelia	Endangered	May affect, not likely to adversely affect
Clay reed-mustard	Threatened	May affect, not likely to adversely affect
Deseret milkvetch	Threatened	May affect, not likely to adversely affect
Shrubby reed-mustard	Endangered	May affect, not likely to adversely affect
Uinta Basin hookless cactus	Threatened	May affect, likely to adversely affect
Ute ladies'-tresses	Threatened	May affect, not likely to adversely affect
Western prairie fringed orchid	Threatened	May affect, likely to adversely affect
NOTE: [1]Critical habitat has been designated or proposed for these species, but they are outside the Project area.		

4.1 Multi-species River Basin Analyses

ESA-listed aquatic or water-dependent species are present in river basins that will be crossed by the agency-preferred route. Decreases in the availability of surface water, due in part to consumptive water use, have been identified as a threat to many of these species. Availability of surface water can be affected by direct withdrawal from river and reservoir systems or by pumping groundwater from aquifers that support surface-water flows. For the purpose of Section 7 consultation, including estimating depletion fees (if any), surface water and groundwater are treated similarly. This section presents the framework for the analysis of potential effects of the Project on surface-water availability, through surface-water withdrawals and groundwater pumping that may result from consumptive water use, required primarily during the construction phase of the Project.

As identified in Table 1-2 and the EIS, several components of Project preconstruction and construction activities will require water use:

- Mud rotary drilling, one of several proposed methods for geotechnical investigations prior to Project construction
- Dust control on right-of-way and access roads during Project construction
- Concrete foundations for substations, series compensation stations, and other ancillary facilities during Project construction
- Concrete foundations for transmission-line support structures during Project construction

The Proponent provided estimates of water use for each of those components (summarized below). These estimates were derived based on previous experience constructing high-voltage transmission lines in the region. Where water use was provided on a per-unit (e.g., structure, borehole, transmission-line segment), the water use was extrapolated to the Project as a whole. This Project-wide estimate was then converted to an acre-feet-per-mile estimate, which was used to calculate water use in each river basin where effects on ESA-listed species were analyzed based on the length of the transmission line in each basin. Water-use estimates for ancillary facilities were provided separately, and the potential effects of those depletions were assigned to the river basin where each facility will be located.

Water use for geotechnical investigations was estimated on a per-borehole basis. The Proponent provided an estimate that 332 boreholes will be required for the Project and approximately 15 percent of those will be developed using mud-rotary drilling. Each mud-rotary borehole will typically require 55 gallons of water. Thus, approximately 2,739 gallons or 0.008 acre-feet of water will be required for geotechnical investigations across the entire Project area. This amount will not change the determinations, estimated depletion fees, or any other component of the analysis in Section 7 consultation and is not addressed further with regards to water depletion.

Ancillary facilities analyzed for water use include series compensation stations and regeneration sites. Two series compensation stations are planned, as noted in Section 1.4.8. Separate water use estimates were provided by the Proponent for each series compensation station. Four regeneration sites are planned, and the Proponent estimates that each one will require 6,500 gallons or 0.02 acre-feet of water use. Similar to the geotechnical investigation, the amount of water use for regeneration sites is not addressed further.

The Proponent anticipates that all water use will come from municipal sources or temporary acquisition of existing water rights subject to previous Section 7 consultation. However, specific sources cannot be identified until near the time of construction. The commitment to use existing water sources or temporary water-use agreements for construction is included as a species-specific conservation measure where appropriate, is identified in the EIS, and will be identified in the POD. While acquisition of water required for construction-related activities would be the responsibility of the construction contractor, use of water from sources and in amounts subject to Section 7 consultation for the Project would be a condition in appropriate construction contracts. If water sources subject to Section 7 consultation for the Project are unavailable for the Project's needs, consultation would be reinitiated.

No municipal or groundwater sources are identified that fall in the Great Divide Closed Basin, approximately 9.3 percent of the Project area. The Great Divide Closed Basin is located between the North Platte Basin and Muddy River (Colorado River) Basin. For the purpose of this analysis, the water use estimated to be required for construction in the Great Divide Closed Basin has been allocated as 50 percent being acquired from sources in the North Platte Basin (such as Rawlins, Wyoming), and 50 percent from sources in the Colorado River Basin (such as Baggs, Wyoming).

Table 4-2 provides the estimated acre-feet of depletions that may occur in each basin. Potential effects of these depletions are addressed for Platte River species in Section 4.1.1 and Colorado River species in Section 4.1.2.

TABLE 4-2 ESTIMATED WATER USE FOR CONSTRUCTION OF THE PROJECT					
Basin	**Miles Crossed**	**Water Use for Foundations (acre-feet)**	**Water Use for Dust Control (acre-feet)**	**Water Use for Ancillary Facilities (acre-feet)**	**Total (acre-feet)**
North Platte River	60	2.2	28.5		30.7
Great Divide Closed Basin (east)	20	0.7	9.3		10.0
Total depletions to be addressed through the Platte River Recovery Implementation Program					**40.7**
Great Divide Closed Basin (west)	20	0.7	9.3		10.0
Muddy Creek	20	0.8	9.6		10.3
Little Snake River	56	2.0	26.5	17.0	45.6
Lower Yampa River	19	0.7	9.3		10.0
Lower White River	72	2.6	33.9	25.5	62.0
Lower Green River	87	3.2	41.2		44.4
Total depletions to be addressed through the Upper Colorado River Endangered Fish Recovery Program					**181.7**
Jordan River[1]	61	2.3	29.0		31.3

NOTES:
[1]No mechanism to address depletions for June sucker recovery exists in the Jordan River Basin.
Due to rounding, the water use for foundations and water use for dust control columns may not add to the total acre-feet.

4.1.1 Platte River Species – Pallid Sturgeon, Least Tern, Piping Plover, Whooping Crane, Western Prairie Fringed Orchid

4.1.1.1 Status of the Species and Critical Habitat in the Study Area

The pallid sturgeon, least tern, piping plover, whooping crane, and western prairie fringed orchid are not known to exist in the Project area. However, populations of these species are found in Nebraska in the Platte River watershed downstream from the Project. The FWS addresses the effects of water depletions for Platte River species during Section 7 consultation through a programmatic Biological Opinion (FWS 2006). Potential effects of the Project are entirely related to water depletions and are identical for all species; thus, all species are addressed together here.

Pallid Sturgeon

The pallid sturgeon is not found in or near the Project area. However, the species is present in the lower Platte River, from the Loup River downstream to the confluence with the Missouri River (FWS 2007).

Least Tern – Interior Population

No least tern nesting records have been noted in or near the Project area, and the species has not been recorded nesting west of Routt National Forest. The least tern is present along parts of the Platte River.

Piping Plover

There are no piping plovers or habitat in the Project area. However, the Northern Great Plains population nests along the Platte River in Nebraska, and critical habitat for the species is designated on the Platte River as well.

Whooping Crane

The Aransas-Wood Buffalo population of whooping cranes migrates across the Great Plains twice a year, between the Texas Gulf Coast and northern Alberta/southern Northwest territories in Canada. The majority of whooping crane sightings for this migration route fall within a corridor approximately 200 miles wide, largely crossing Texas, Oklahoma, Kansas, Nebraska, South Dakota, North Dakota, Saskatchewan, Alberta, and the Northwest Territories (FWS 2009e). This population uses wetlands along the Platte River in Nebraska as important migration stopover sites. Critical habitat for the species is designated on the Platte River.

The reintroduced Rocky Mountain population migrated from central New Mexico across the Project area to nesting grounds in eastern Idaho and western Wyoming. However, no individuals of that population remain in the wild (Canadian Wildlife Service and FWS 2007); therefore, no whooping cranes are expected to be found in the Project area.

Western Prairie Fringed Orchid

Western prairie fringed orchid is found in Iowa, Kansas, Minnesota, Nebraska, and North Dakota. There is no habitat or populations of this species in the Project area; however, it is found along the Platte River in Nebraska, downstream from the Project.

4.1.1.2 Potential Effects of the Project

No direct effects on Platte River ESA-listed species are anticipated. Water use in the Platte River basin, regardless of location and whether from surface-water or groundwater pumping, is assumed to affect the availability of surface-water flows downstream in the Platte River. Each of the ESA-listed Platte River species is dependent on some aspect of surface-water availability; thus, water depletions are assumed to affect each species (FWS 2006).

Guidance received from the FWS in 2014 indicates that depletions should be analyzed as being fully realized in the year that the depletion occurs, rather than being averaged over the life of the Project (FWS 2014c). All identified depletions for the Project are associated with the construction phase of the Project (refer to Table 1-2 for detailed information regarding anticipated Project activities). The Project likely will involve multiple construction contracts over a probable 3-year period. Multiple segments will be under construction at the same time. The majority of construction activity will occur in the first 2 years, followed by revegetation and reclamation activities. Details are provided in Section 3.6.5 of Appendix B of the EIS. For the purpose of this analysis, construction activities requiring water use are assumed to take place in and are averaged over a 3-year period in the Platte River basin.

Effects on Designated Critical Habitat

Critical habitat for the piping plover and whooping crane has been designated on the Platte River in Nebraska. Depletions caused by the Project may contribute to lowered peak and base flows in the Platte River, which can affect the formation of sandbars, a primary constituent element (PCE) of critical habitat for the piping plover. PCEs were not described in the critical habitat rule for the whooping crane, although reduction in water levels was noted as a potential negative effect (40 FR 58308-58312) and the programmatic Biological Opinion for the Platte River notes that sufficient water likely serves as a barrier against predation (FWS 2006).

4.1.1.3 Conservation Measures

Design features of the Project (Table C-1, Appendix C) are intended to minimize impacts on resources, will reduce the amount of ground disturbance, and thus reduce the amount of water used for dust control.

The Proponent has committed to acquire water to use for construction of the Project from existing sources already subject to Section 7 consultation and covered under the Platte River Recovery Implementation Program. The Wyoming State Engineer is responsible for reviewing planned water sources to ensure they meet the terms of the programmatic Biological Opinion for the Platte River and the Platte River Recovery Implementation Program. The BLM provided the Wyoming State Engineer with information detailing the Proponent's commitment to use water from sources subject to previous consultation, and the State Engineer provided concurrence that this commitment would meet the terms of the programmatic Biological Opinion, provided that water use at the time of construction is in accordance with the provided description. The Wyoming State Engineer's review is provided in Appendix D.

The Platte River Recovery Implementation Program receives fees to offset the effects of depletions through conservation actions, and the applicant would be responsible for these fees as a part of the acquisition of water from municipal sources or through temporary-use agreements. The following conservation measures are provided to specify the effects of depletions on Platte River species would be minimized.

- ***Platte River Multi-species Conservation Measure 1:*** All water used in construction of the Project would be acquired from previously allocated sources already subject to Section 7 consultation.
- ***Platte River Multi-species Conservation Measure 2:*** All required depletion fees would be paid by the Proponent at the time of water acquisition.

4.1.1.4 Residual Effects

No direct effects on Platte River ESA-listed species or designated critical habitat for Platte River ESA-listed species are anticipated; however, water use during construction of the Project will result in an estimated 41 acre-feet of depletions from the North Platte River basin, which may contribute to lower peak and base flows. While the fees collected by the Platte River Recovery Implementation Program would be used to offset the negative effects of water depletions through mitigation actions, some of these actions may not directly restore flows to the river; rather, mitigation may focus on habitat improvements and other actions to maintain the highest recovery value from remaining river flows.

4.1.1.5 Determination

Effect on Species

The Project may affect, and is likely to adversely affect, the pallid sturgeon, least tern (Interior population), piping plover (Northern Great Plains population), whooping crane, and western prairie fringed orchid.

Effect on Designated Critical Habitat

The Project may affect, and is likely to adversely affect, designated critical habitat for the piping plover (Northern Great Plains population) and whooping crane.

4.1.1.6 Cumulative Effects

The Platte River Recovery Implementation Program and Programmatic Biological Opinion are intended to cover all water-related activities, including state and private activities that may affect surface-water availability above the Loup River confluence (FWS 2006). Thus, no additional cumulative impacts are identified in the Project area.

4.1.2 Colorado River Species – Bonytail, Colorado Pikeminnow, Humpback Chub, Razorback Sucker

4.1.2.1 Status of the Species and Critical Habitat in the Study Area

The bonytail, Colorado pikeminnow, humpback chub, and razorback sucker are all present in the Project area (Map 2, Appendix A), although their distributions differ as described below. All of these species and their designated critical habitat are present in the Colorado River watershed downstream from the Project and designated critical habitat for some species is crossed by agency-preferred route. The FWS addresses the effects of water depletions for Colorado River species during Section 7 consultation through the Upper Colorado River Endangered Fish Recovery Program and a programmatic Biological Opinion for the Yampa River Basin (FWS 2005b). Potential effects of the Project are identical for all species; thus, all species are addressed together here.

Bonytail

The bonytail is endemic to the Colorado River Basin, but no reproducing populations are thought to persist in the wild (FWS 2012a). Hatchery-raised fish are released into several rivers in the basin, including the Green, Yampa, Gunnison, and Lower Colorado, but recruitment appears to be low and a self-sustaining population does not exist.

Colorado Pikeminnow

The Colorado pikeminnow is endemic to the Colorado River Basin. In the Project area, populations of the Colorado pikeminnow are found in the Green River and the Yampa and White rivers in the Upper Colorado River basin. The only two known spawning sites of the species are also in the Project area, near Three Fords Canyon in the Gray Canyon area of the Green River (Carbon and Uintah counties) and the lower 20 miles of the Yampa River (Moffat County, Colorado).

Humpback Chub

The humpback chub is endemic to the Colorado River basin and is primarily found in Utah. In the Project area, there are two known populations of humpback chub: Yampa, and Desolation/Gray Canyons. Some individuals also have been seen in the Green River through Dinosaur National Monument. Designated critical habitat for the species in the Project area includes portions of the Green and Yampa rivers.

Razorback Sucker

The razorback sucker is endemic to the Colorado River Basin, found primarily in Utah. In the Project area, the razorback sucker is found in Desolation/Gray Canyons on the Green River in Carbon, Emery, and Grand counties; and in the Yampa River in Moffat County, Colorado. Portions of the designated critical habitat are also in the Project area in the Green, Yampa, Duchesne, and Whiterivers.

4.1.2.2 Potential Effects of the Project

As described in Section 2.6, construction of the Project will require the use of surface water or groundwater for dust control, transmission-line structure and facility foundations, and geotechnical exploration (refer to Table 1-2 for detailed information regarding anticipated Project activities). Water use in the Colorado River Basin, regardless of location and whether from surface-water or groundwater pumping, is assumed to affect the availability of surface-water flows downstream in the Colorado River and its tributaries. Each of the ESA-listed Colorado River species is dependent on the dynamic, seasonal flow regime historically present in the Colorado River Basin; thus, water depletions are assumed to affect each species (FWS 2005b).

Guidance received in 2014 indicates that project-specific depletions that change substantially from year to year should be analyzed as being fully realized in the year that the depletion occurs, rather than being averaged over the life of the activity (FWS 2014c). All identified depletions for the Project are associated with the construction phase of the Project. The construction phase may take place over multiple years, although the duration in any one location may be somewhat shorter. For the purpose of this analysis, construction activities requiring water use are assumed to take place in and are averaged over a 3-year period in the Colorado River basin. The Utah State Engineer reviewed the Proponent's proposed water use for consistency with the Programmatic Biological Opinions for Colorado River fish and in regards to existing water availability in Utah. The Utah State Engineer's review is provided in Appendix D.

In addition to effects from water use, ground disturbance from vehicles and heavy equipment during preconstruction, construction, operation, and maintenance activities for the Project near rivers could contribute sediment and degrade water quality in rivers supporting ESA-listed Colorado River fish. Preconstruction activities will include geotechnical surveys, which will involve overland vehicle access (restricted to routes designated in the POD). Construction activities will consist of access road improvement and construction, access and spur road travel and overland vehicle travel by heavy machinery, construction site preparation, excavation and potential blasting, drilling of concrete piers, heavy equipment use, and cleanup and site reclamation. These activities will require vegetation clearing, land-forming activities (grading, recontouring, and cut-and-fill landform manipulations), drive-and-crush of existing vegetation during temporary site access, piling of soil material, and recontouring and seeding during reclamation. Project operation activities will consist of routine inspections and operation of the transmission line, substations, and series compensation stations. These activities will require access-road use by inspection vehicles. Potential maintenance activities will consist of access-road maintenance and right-of-way vegetation maintenance. These activities will require overland travel and access-road use by operation vehicles.

While suspended sediments are often present in high concentrations during flood events in the Colorado River system, sediment deposition outside the natural regime can degrade spawning habitat (FWS 2002d). Other potential effects on water quality could occur as a result of any spills that allow hazardous chemicals to reach ESA-listed Colorado River fish habitat.

Effects on Designated Critical Habitat

The agency-preferred route crosses designated critical habitat for one or more of the Colorado River ESA-listed fish species in three locations (Map 2, Appendix A):

- Yampa River, Moffat County, Colorado (Colorado pikeminnow)
- White River, Uintah County, Utah (Colorado pikeminnow)
- Green River, Uintah County, Utah (Colorado pikeminnow, razorback sucker)

Critical habitat for the bonytail and humpback chub also is designated in Desolation Canyon, approximately 8 miles south (or 22 river-miles downstream) of the location where the agency-preferred route will cross the Green River. PCEs identified in the rule designating critical habitat were described in three categories: (1) water of adequate quality and quantity; (2) physical environmental features, including appropriate stream substrates and access to seasonally flooded areas; and (3) a biological environment with appropriate levels of prey and levels of predation from introduced species that do not exceed sustainable thresholds (59 FR 13374-13400).

In the final rule designating critical habitat, the boundaries of each designated river segment were defined by upstream and downstream landmarks. The lateral extent was not explicitly defined, but was defined as areas within the 100-year floodplain that contain PCEs. Thus, a precise extent of critical habitat crossed

by the agency-preferred route cannot be provided until detailed engineering is available, but effects would be reduced by spanning the 100-year floodplain to avoid impacting PCEs at each location.

Although complete, detailed engineering will not be available until after the completion of the geotechnical investigation, a preliminary review of information provided by the Proponent indicates that designated critical habitat would be spanned and ground disturbance would be avoided in all locations, with the exception of the north bank of the Yampa River. In this location, the width of the floodplain precludes complete spanning, and a single transmission-line structure would be required in designated critical habitat for the Colorado pikeminnow. Each structure requires a temporary work area of 1.4 acres and a permanent foundation of approximately 0.1 acre. This structure would be reached by overland travel of up to 1,300 feet in the floodplain, and no permanent ground disturbance would be required for an access road. Given that this proposed structure location is in an undeveloped portion of the floodplain, the following PCEs are assumed to be present and would potentially be affected by the Project as described:

- Water (in sufficient quality and seasonally appropriate quantity)
  - Depletions affecting water quantity are addressed separately in this BA.
  - Erosion in areas of ground disturbance may contribute sediment to the Yampa river.
- Physical habitat (including seasonally flooded portions of the floodplain)
  - The Project is not located in a part of the floodplain subject to annual seasonal flooding.
- Biological environment (including food sources and balanced levels of predation)
  - Permanent ground disturbance may affect the presence of insect prey to an insignificant degree.

4.1.2.3 Conservation Measures

Colorado River Multi-species Conservation Measure 9 references the depletion fee assessed by the Upper Colorado River Endangered Fish Recovery Program for water-related activities that cause more than 100 acre-feet of depletions. In Fiscal Year 2014, this fee was $20.24 per acre-foot. This fee is adjusted annually for inflation, and the Proponent would pay the appropriate fee for the year the depletion occurs. These funds are used to mitigate the effects of depletions by furthering the conservation and recovery of ESA-listed Colorado River fish in several ways, including habitat restoration, invasive fish management, stocking and rearing programs, and educational programs.

The following conservation measures will minimize the effects of the Project on Colorado River fish and designated critical habitat:

- ***Colorado River Multi-species Conservation Measure 1:*** No construction equipment will operate in or cross the actively flowing channel of the Green, White, or Yampa rivers.
- ***Colorado River Multi-species Conservation Measure 2:*** Materials will not be stockpiled in the 100-year floodplain of the Green, White, or Yampa rivers or any wetlands connected to those rivers.
- ***Colorado River Multi-species Conservation Measure 3:*** To avoid entrainment of ESA-listed fish species, surface water will not be taken from the Green, White, or Yampa rivers.
- ***Colorado River Multi-species Conservation Measure 4:*** No surface disturbance, staging areas, or permanent structures will be located in the 100-year floodplain of the Green and White rivers.
- ***Colorado River Multi-species Conservation Measure 5:*** For any activities within the 100-year floodplain of the Yampa River, the following conservation measures will apply:
  - Construction and maintenance in the floodplain of the Yampa River will take place during seasonal low flows.

- Ground disturbance and vegetation clearing will be located in areas that avoid or minimize impacts on PCEs.
- Ground disturbance and vegetation clearing will be minimized in the Yampa River floodplain. Drive-and-crush access and construction techniques will be used to the extent feasible. In areas where vegetation drive-and-crush access and construction techniques are not feasible, the least impactful technique will be used. In areas where vegetation clearing is necessary, vegetation will be trimmed with the root balls left intact and in place wherever practical.
- No permanent access roads will be constructed in the 100 year floodplain. Any grading activities will be conducted in a way that avoids altering seasonal flow regimes.
- All temporary disturbance in the floodplain will be promptly stabilized and reclaimed to minimize the potential for erosion.
- Soil stabilization and erosion control measures will be implemented during construction and through completion of reclamation activities. Specific measures erosion control measures will be developed in coordination with the FWS and will be identified in the Stormwater Pollution Prevention Plan, which is a component of the POD.

- ***Colorado River Multi-species Conservation Measure* 6:** Prior to any vegetation removal in critical habitat for Colorado River fish, a preconstruction site will be attended by the BLM, FWS, Proponent, and construction representatives to discuss implementation of measures designed to protect riparian function and critical habitat for Colorado River fish.
- ***Colorado River Multi-species Conservation Measure 7:*** Refueling and storing potentially hazardous materials will not occur within a 328-foot radius of the White, Green, and Yampa rivers and their perennial tributaries. Spill preventive practices and containment measures will be incorporated in the Water Resources Protection Plan, which will be developed as a part of the POD.
- ***Colorado River Multi-species Conservation Measure 8:*** No aerial or broadcast herbicide treatments will be applied for vegetation management within 2,500 feet of bonytail, Colorado pikeminnow, humpback chub, or razorback sucker designated critical habitat.

  For noxious weed control within 2,500 feet of bonytail, Colorado pikeminnow, humpback chub, or razorback sucker designated critical habitat, the following restrictions apply:

  - Herbicides will not be applied over surface water. Only agency-approved herbicides registered for use near water will be used within 328 feet of surface water or in areas with a high leaching potential. Minimum pesticide spray distances (buffers) from surface water are as follows:
    - Backpack spraying operations – 20 feet
    - Other mechanized applications (e.g., truck or all-terrain vehicle mounted equipment) – 50 feet
- ***Colorado River Multi-species Conservation Measure 9:*** All required depletion fees would be paid by the Proponent at the time of water acquisition.
- ***Colorado River Multi-species Conservation Measure 10:*** The Proponent will develop and implement, as a part of the construction compliance management system committed to in the POD, a tracking tool to record water use during construction. The tracking tool will ensure that all depletions are properly recorded and any required fees for depletions in the Colorado River basin are assessed and paid to the Upper Colorado River Endangered Fish Recovery Program.

4.1.2.4 Residual Effects

No direct effects on Colorado River ESA-listed fish or designated critical habitat for Colorado River ESA-listed fish are anticipated. The potential effect of sedimentation is assumed to be discountable, as Colorado River Multi-species Conservation Measures will minimize ground disturbance and effects on water quality, and will ensure compliance with all applicable laws and policies. The BLM anticipates that spanning locations where PCEs are present will be sufficient to avoid direct impacts on designated critical habitat for Colorado River ESA-listed fish.

Water use during construction of the Project will result in an estimated 182 acre-feet of depletions from the Colorado River basin, which may contribute to alterations of peak and base flows in affected waterways. While the fees collected by the Upper Colorado River Endangered Fish Recovery Program would be used to offset the negative effects of water depletions through mitigation actions, some of these actions may not directly restore flows to the river; rather, mitigation may focus on habitat improvements, hatchery programs, and other actions to maintain the highest recovery value from remaining river flows.

The draft consultation guidance for Colorado River species notes that reinitiation will be required if the actual depletion is greater than the estimate presented during Section 7 consultation by 10 percent or more.

4.1.2.5 Determination

Effect on Species

The Project may affect, and is likely to adversely affect, the bonytail, Colorado pikeminnow, humpback chub, and razorback sucker.

Effect on Designated Critical Habitat

The Project may affect, and is likely to adversely affect, designated critical habitat for the bonytail, Colorado pikeminnow, humpback chub, and razorback sucker.

Rationale

No direct effects on bonytail, Colorado pikeminnow, humpback chub, and razorback sucker are anticipated. No direct effects on designated critical habitat for the bonytail, humpback chub, and razorback sucker are anticipated. Critical habitat for the Colorado pikeminnow would be directly affected by the placement of a structure in the floodplain of the Yampa River, but ground disturbance and effects on water quality will be minimized to the extent feasible. All other potential effects of the Project are entirely related to water depletions. Water use during construction of the Project will result in an estimated 182 acre-feet of depletions from the Colorado River basin. The draft consultation guidance for Colorado River species notes that reinitiation would be required if the actual depletion is greater than the estimate presented during Section 7 consultation by 10 percent or more.

4.1.2.6 Cumulative Effects

The Programmatic Biological Opinion for the Management Plan for Endangered Fishes in the Yampa River Basin indicates no future private, state, or tribal actions are identified in the area that will not be covered under the Biological Opinion related to water depletions. Similarly, the Upper Colorado River Endangered Fish Recovery Program is understood to address all depletions in the Upper Colorado River Basin, including all private, state, or tribal depletions. The federal Clean Water Act (CWA) regulates deposition of fill, including sedimentation resulting from ground disturbance, in its Section 404

Nationwide and Individual Permit programs, which are subject to Section 7 consultation. Thus, no additional cumulative impacts are identified in the Project area.

4.2 Fish

4.2.1 June Sucker

4.2.1.1 Status of the Species in the Study Area

The June sucker is found in Utah Lake in the Jordan River basin and historically spawned in several rivers that flow into the lake, including the Spanish Fork and Provo River. However, natural spawning is currently restricted to a small portion of the Provo River, lower Spanish Fork, and occasionally other tributaries of Utah Lake (Andersen et al. 2006, Abate 2015). The lower 3 miles of the Provo River is designated critical habitat (51 FR 10851-10857). The agency-preferred route does not cross the Provo River and is not in the Provo River watershed. Immediately after entering Utah County, the agency-preferred route crosses into the Utah Lake watershed, and remains in it until reaching the Clover Substation. The agency-preferred route crosses through the Spanish Fork River subbasin of the Jordan River basin for 38 miles. The agency-preferred route then crosses 23 miles of the West Creek subbasin of the Jordan River basin, where the Clover Substation is located. The West Creek subbasin did not historically contain June suckers and is separated by Mona Reservoir from any habitat naturally occupied by the species. However, Mona Reservoir has been considered as a potential site for a refuge population of June suckers (June Sucker Recovery Implementation Program 2010), and the species has been introduced experimentally there in the past (Andersen et al. 2006). June suckers are not present in any location that will be directly crossed by the agency-preferred route, although the species may spawn in the lower reaches of Spanish Fork below a diversion structure that prevents upstream movement (Abate 2015). No designated critical habitat is present in or downstream from the Project area.

4.2.1.2 Potential Effects of the Project

The agency-preferred route does not cross or is not located adjacent to any waters currently occupied by the June sucker. However, the agency-preferred route crosses approximately 61 miles of the Utah Lake watershed. Construction of the Project will require the use of water for dust control, concrete for structure foundations and substation facilities and other minor uses (refer to Table 1-2 for detailed information regarding anticipated Project activities). Approximately 31 acre-feet of water from the Jordan River basin (Table 4-2) may be required during the construction phase of the Project. Although fluctuating water levels in Utah Lake have substantially affected the June sucker in the past by preventing the long-term persistence of emergent vegetation (51 FR 10851-10857) and are noted as an ongoing management concern (June Sucker Recovery Implementation Program 2010), the use of 31 acre-feet of water over a multi-year period will constitute a negligible, immeasurable effect to Utah Lake and to the June sucker.

Increased turbidity is a contributing factor to the loss of marsh vegetation in Utah Lake (FWS 1999), and the Project will result in ground disturbance in the watershed of the Spanish Fork River, which flows directly into Utah Lake and can be used by June suckers as a spawning stream in the lowest reaches. Ground disturbance from vehicles and heavy machinery during preconstruction, construction, operation, and maintenance activities for the Project near the Spanish Fork River would have the potential to contribute sediment and degrade water quality in the Spanish Fork River and Utah Lake. Preconstruction activities will include geotechnical surveys and species presence surveys, which will involve overland vehicle access (restricted to routes designated in the POD). Construction activities will consist of access road improvement and construction, access and spur road travel and overland vehicle travel by heavy machinery, construction site preparation, excavation and potential blasting, drilling of concrete piers, heavy equipment use, and cleanup and site reclamation. These activities will require vegetation clearing, land-forming activities (grading, recontouring, and cut-and-fill landform manipulations), drive-and-crush

of existing vegetation during temporary site access, piling of soil material, and recontouring and seeding during reclamation. Project operation activities will consist of routine inspections and operation of the transmission line, substations, and series compensation stations. These activities will require access-road use by inspection vehicles. Potential maintenance activities will consist of access road maintenance and right-of-way vegetation maintenance. These activities will require overland travel and access-road use by operation vehicles.

Although the Project could contribute short-term increases in turbidity in tributaries of Utah Lake, the primary causes of high turbidity in Utah Lake are driven by nutrient loading from surrounding agriculture and urban areas, as well as sediment disturbance by introduced carp. Short-term increases in suspended sediments from tributaries to the lake during high-flow events have not been noted as a threat to the June sucker, as these events were a part of the naturally dynamic response of streams to spring thaw and heavy precipitation events.

4.2.1.3 Conservation Measures

Conservation measures for June sucker minimize potential impacts on water quality of any tributaries of Utah Lake known to support June sucker spawning.

- ***June Sucker Conservation Measure 1:*** Refueling and storing potentially hazardous materials in the Jordan River basin will not occur within a 328-foot radius of any tributaries of Utah Lake known to support June sucker spawning. Spill preventive practices and containment measures will be incorporated in the Water Resources Protection Plan, which will be developed as a part of the POD.
- ***June Sucker Conservation Measure 2:*** No aerial or broadcast herbicide treatments will be applied for vegetation management within 2,500 feet of June sucker designated critical habitat. For noxious weed control within 2,500 feet of June sucker designated critical habitat, the following restrictions apply:
  - Herbicides will not be applied over surface water. Only agency-approved herbicides registered for use near water will be used within 328 feet of surface water or in areas with a high leaching potential. Minimum pesticide spray distances (buffers) from surface water are as follows:
    - Backpack spraying operations – 20 feet
    - Other mechanized applications (e.g., truck or all-terrain vehicle mounted equipment) – 50 feet
- ***June Sucker Conservation Measure 3:*** Ground clearing will be minimized in the floodplain of any tributaries of Utah Lake known to support June sucker spawning, and vegetation will be trimmed with the root balls left intact and in place wherever practical. All temporary disturbances in the floodplain will be promptly stabilized and reclaimed to minimize the potential for erosion. Soil stabilization and erosion control measures will be stipulated in the Stormwater Pollution Prevention Plan, which is a component of the POD.

4.2.1.4 Residual Effects

No direct effects on June sucker are anticipated. The potential effect of sedimentation is assumed to be discountable, as June sucker conservation measures will be applied during all Project activities to minimize ground disturbance and effects on water quality and to ensure compliance with all applicable laws and policies. The potential effect of water depletion is assumed to be insignificant, as the volume of water estimated to be required from the Utah Lake watershed in the Jordan River basin (31 acre-feet) is small and is likely to be spread over multiple years and locations.

4.2.1.5 Determination

Effect on Species

The Project may affect, but is not likely to adversely affect, the June sucker.

Effect on Designated Critical Habitat

The Project will not affect designated critical habitat for the June sucker. No designated critical habitat is present in the Project area or downstream from potential Project activities.

Rationale

Effects on June sucker may occur from water use from the Utah Lake basin during construction of the Project, but the potential effect of water depletion is assumed to be insignificant as the volume of water estimated to be required (31 acre-feet) is small and is likely to be spread over multiple years and locations. The Project may contribute sediment to Utah Lake through ground disturbance in the watershed of Spanish Fork, but the potential effect of sedimentation is assumed to be discountable as June sucker conservation measures would be applied during all Project activities to minimize ground disturbance and effects on water quality and to ensure compliance with all applicable laws and policies.

4.2.1.6 Cumulative Effects

Cumulative effects are not required to be assessed for species that are not likely to be adversely affected by the Project.

4.3 Birds

4.3.1 Greater Sage-Grouse

4.3.1.1 Status of the Species in the Project Area

The agency-preferred route crosses sage-grouse core areas or priority habitat, habitats within 4 miles of known active leks both inside and outside core areas, and designated PACs in all three states (Maps 3 to 5, Appendix A). Information regarding the greater sage-grouse in the Project area is provided for informational purposes only, as the BLM does not request conference on the greater sage-grouse.

In Wyoming, the entire length of the agency-preferred route traverses occupied sage-grouse habitat; but where crossing core areas and priority habitats, the Project will be located in a transmission-line corridor designed by Wyoming Executive Order 2011-5. Sage-grouse PACs crossed in Wyoming are part of the Wyoming portion of the Wyoming Basin population. Primary threats to this portion of the population include energy development and transfer, long-term drought, and brush eradication programs (FWS 2013a). The population is considered at low risk of extinction, as the population is still robust, occupies large and contiguous habitats, and regulatory measures provide habitat protection (FWS 2013a).

In Colorado, almost the entire length of the agency-preferred route traverses occupied sage-grouse habitat. Sage-grouse PACs crossed in Colorado are part of the Northwest Colorado portion of the Wyoming Basin population. Limiting factors for this portion of the population are not well understood, although long-term population trends appear stable (FWS 2013a).

In Utah, the agency-preferred route crosses three distinct population areas: Anthro Mountain, Deadman's Bench, and Emma Park. The only sage-grouse PAC crossed in Utah is the Carbon Sage-grouse Management Area, which includes the Emma Park population. Primary threats to the population in the

management area include habitat loss and fragmentation due to energy development, wildlife, invasive species, and predation. The management area is considered at-risk (FWS 2013a). The Anthro Mountain and Deadman's Bench populations have been affected by past and ongoing livestock grazing and energy development. Long-term reliable lek counts for the Anthro Mountain are not available, preventing accurate estimates about long-term population trends. Trends for the Deadman's Bench population also are difficult to evaluate, as evidence suggests that these sage-grouse move into habitat that extends into Colorado (BLM 2013).

The number of leks within 2, 4, and 11 miles of the Project centerline and average lek counts within 4 miles of the agency-preferred route centerline are shown in Tables 4-3 through 4-5. Population-specific data are provided for Utah because the Project crosses three geographically separated sage-grouse populations in Utah. Sage-grouse habitat crossed in Colorado and Wyoming is contiguous, and distinct population boundaries are not recognized by the BLM or state wildlife agencies. Therefore, additional individual population-level analyses beyond the statewide analyses were not warranted in Colorado and Wyoming.

TABLE 4-3
SUMMARY OF GREATER SAGE-GROUSE LEK DISTANCES TO AGENCY-PREFERRED ROUTE CENTERLINE

State	Number of Sage-grouse Leks		
	Within 2 Miles	Within 4 Miles	Within 11 Miles
Wyoming	17	41	147
Colorado	8	11	47
Utah	0	0	5

NOTE: Lek analysis includes only leks in contiguous sage-grouse habitat crossed by the agency-preferred route.

TABLE 4-4
SUMMARY OF 5-YEAR AVERAGE GREATER SAGE-GROUSE LEK COUNTS AT LEKS WITHIN 4 MILES OF THE AGENCY-PREFERRED ROUTE CENTERLINE

State	5-Year Average Sage-grouse Lek Counts		
	Statewide Sum	Sum Within 4 miles	Percent of Sage-grouse That Attend Leks Within 4 miles
Wyoming	23,299	288	1
Colorado	3,392	102	3
Utah	3,427	0	0

NOTE: Not all leks have been counted each year during the past 5 years and lek counts may have been conducted using different methodologies in different states. For leks without data for the past 5 consecutive years, an average of the number of counts available during the period was used.

TABLE 4-5 SUMMARY OF THE NUMBER OF LEKS AND 5-YEAR AVERAGE GREATER SAGE-GROUSE LEK COUNTS AT LEKS IN UTAH POPULATIONS CROSSED WITHIN 2, 4, AND 11 MILES OF THE AGENCY-PREFERRED ROUTE CENTERLINE											
	Sage-grouse Population Total Leks		Sage-grouse Leks within 2 Miles of the Agency-Preferred Route			Sage-grouse Leks Within 4 Miles of the Agency-Preferred Route			Sage-grouse Leks Within 11 Miles of the Agency-Preferred Route		
Population	Number of Leks	Sum of 5-Year Average Lek Counts	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count
Anthro Mountain	5	19	0	0	0	0	0	0	0	0	0
Deadman's Bench	1	2	0	0	0	0	0	0	1	2	100
Emma Park	14	150	0	0	0	0	0	0	4	56	37
NOTE: Lek analysis incudes only leks in contiguous sage-grouse habitat crossed by the agency-preferred route.											

4.3.1.2 Potential Effects of the Project

Construction, operations, and maintenance of the Project could have direct and indirect impacts on greater sage-grouse, including direct mortality, increased susceptibility to predation, increased disturbance due to human presence and noise, loss or modification of habitat, and habitat fragmentation and displacement (refer to Table 1-2 for detailed information regarding anticipated Project activities). The extent of each habitat type that will be disturbed by the Project and habitats disturbed by the Project in each Utah population is shown in Tables 4-6 and 4-7.

TABLE 4-6 MILES OF GREATER SAGE-GROUSE HABITAT CROSSED AND ACRES OF ESTIMATED HABITAT DISTURBANCE				
State	Core Areas or Priority Habitat[1]	General Habitat and Transmission-line Corridors Designated in Wyoming Executive Order 2011-5	Habitat Within 4 Miles of Leks Located in Core Areas or Priority Habitat[2]	Habitat Within 4 Miles of Leks Located Outside Core Areas or Priority Habitat[3]
Miles				
Wyoming	0	141	18	52
Colorado	29	55	34	0
Utah	23	0	3	0
Acres				
Wyoming	0	2,223	279	816
Colorado	453	924	537	0
Utah	416	0	56	0

NOTES:
[1]For the purpose of this analysis, greater sage-grouse occupied habitat in Utah (Utah Division of Wildlife Resources 2011) was considered to be synonymous with priority habitat.
[2]Refers to sage-grouse habitat crossed that is within 4 miles of leks that are located in designated core areas or priority habitat.
[3]Refers to sage-grouse habitat crossed that is within 4 miles of leks that are not located in designated core areas or priority habitat.

TABLE 4-7 GREATER SAGE-GROUSE HABITAT INVENTORY BY UTAH POPULATIONS CROSSED BY THE AGENCY-PREFERRED ROUTE				
	Miles		Acres	
Population	Core Areas or Priority Habitat[1]	Habitat Within 4 Miles of Leks Located In Core Areas or Priority Habitat[2]	Core Areas or Priority Habitat[1]	Habitat Within 4 Miles of Leks Located In Core Areas or Priority Habitat[2]
Anthro Mountain	4	0	79	0
Deadman's Bench	16	3	287	56
Emma Park	3	0	50	0

NOTES:
[1]For the purpose of this analysis, greater sage-grouse occupied habitat in Utah (Utah Division of Wildlife Resources 2011) was considered to be synonymous with priority habitat.
[2]Refers to sage-grouse habitat crossed that is within 4 miles of leks that are located in designated core areas or priority habitat.

Direct Mortality

Vegetation clearing, land-forming activities, and road construction during construction and vehicle access during preconstruction, construction, operation, and maintenance phases of the Project could contribute to the direct mortality of sage-grouse due to collisions with vehicles traveling on roads and destruction of active nests. The potential for direct mortality is likely greater in areas within 4 miles of leks. Results of research projects in Colorado, Idaho, and Wyoming have indicated that approximately 80 percent of sage-grouse nests are found within 4 miles of the active lek where female grouse were captured and assumed to have bred (Colorado Greater Sage-grouse Steering Committee 2008), suggesting that 20 percent of the nests are farther than 4 miles from a lek.

The BLM will require seasonal restrictions on construction activities in mapped sage-grouse habitats within 4 miles of leks. The Proponent has indicated their intention to apply seasonal restrictions that apply to all lands, regardless of ownership. Therefore, the BLM has prepared the analysis as if restrictions would be followed on all lands. However, the BLM only has authority to enforce stipulations on BLM-administered lands. Sage-grouse that nest more than 4 miles away from known leks would not be protected by seasonal restrictions for nests within 4 miles of leks. Construction activities occurring during the sage-grouse nesting season would coincide with the migratory bird nesting season. Surveys for ground-nesting migratory birds would be required within 7 days of ground-disturbing activities during appropriate seasons, as provided in the POD. While sage-grouse are not protected under the Migratory Bird Treaty Act, if active sage-grouse nests are located during surveys for migratory ground-nesting birds, the BLM and the appropriate state wildlife agency would be notified before construction can proceed and appropriate spatial and temporal buffers will be implemented to avoid disturbing nesting activities.

After construction, the presence of transmission-line conductors, groundwires, and structures in sage-grouse habitat could increase the potential for sage-grouse mortality due to collision. Avian collision risk is largely a function of species-specific behavior, but is also influenced by structure visibility, design, and placement (Avian Power Line Interaction Committee [APLIC] 2012). The tendency of sage-grouse to fly relatively low, and in low light or when harried, may put them at a risk of collision and mortality as a result of in-flight collisions with transmission lines, towers, or fences, although the risk is generally low. Areas where the transmission line will be located near habitats where grouse concentrate (e.g., leks, wintering areas, and brood-rearing areas) may represent localized areas where the risk of collision would be increased.

Guyed transmission-line structures are proposed for the majority of sage-grouse habitat in the Project area (refer to Section 1.4.4 for a description of proposed transmission-line structures and siting locations), which may pose a greater risk of mortality and injury from in-flight collision than other transmission-line structures. While there are no studies demonstrating an increased risk of sage-grouse collision with guyed structures compared to other transmission-line structure types, the tendency for sage-grouse to typically fly at low heights potentially puts them at the height of guy wires during flight and may increase their risk of collision. The probability of collision is greater for sage-grouse and other upland game birds than for some other bird species due to their larger size and low flight maneuverability (APLIC 2012). As mentioned above for collision risk with general transmission-line infrastructure, collision risk for guy wires may be increased in areas where the Project is located near habitats where sage-grouse concentrate (e.g., leks, wintering areas, brood-rearing areas), or where lines are located between two habitat types that birds frequently fly between at low heights (i.e., foraging and roosting sites) (APLIC 2012).

The degree of increased sage-grouse collision risk posed by guyed transmission-line structures compared to other transmission-line structures cannot be quantified due to a lack of available data; therefore the effectiveness of mitigation measures that include using alternative structure types in sage-grouse habitat is unknown. Marking fences has been demonstrated to reduce sage-grouse fence collision risk and could be an effective tool for minimizing guy-wire collision risk.

Fences also represent potential movement barriers, although the construction of fences associated with the Project in sage-grouse habitat will be limited to communication regeneration stations, ground rod installation sites, and substation perimeters in the form of chain link security fences (typically 8 feet in height), unlike the woven-wire livestock and big game fences (Braun 1998) more typically representing a collision threat to sage-grouse.

The electrocution of sage-grouse due to contact with power lines has been identified as a potential effect on sage-grouse associated with power line development (76 FR 66370-66439), but this effect is not anticipated to occur as a result of implementation of the Project as the distance between conductors or an energized conductor and a grounded element of the transmission-line infrastructure will be much greater than the wingspan or head-to-foot measurement of a greater sage-grouse.

Increased Susceptibility to Predation

Transmission-line structures have been shown to influence raptor and corvid distributions and hunting efficiency (Connelly et al. 2004; Steenhof et al. 1993), which may result in increased predation on sage-grouse. Knick and Connelly (2011) report estimated foraging distances of avian sage-grouse predators at 4.3 miles, suggesting that the extent of habitat indirectly affected as a result of existing and planned transmission-line infrastructure could be substantial (Connelly et al. 2004; Cresswell et al. 2010). Studies in Wyoming found leks in proximity to transmission lines have lower annual recruitment of individual birds when compared to leks farther from these lines. The difference was presumed to be a result of raptor predation (Braun et al. 2002).

Sage-grouse also may experience increased predation by mammalian predators due to the lack of escape cover along the transmission-line corridor and increased visibility of sage-grouse to mammalian predators when utilizing these corridors.

Increased Disturbance Due to Human Presence and Noise

Increased human presence and noise associated with Project preconstruction, construction, operations, and maintenance could increase the potential for disturbance to sage-grouse. Preconstruction activities will include geotechnical surveys, which will involve overland vehicle access (restricted to routes designated in the POD). Construction activities will consist of access road improvement and construction,

access and spur road travel and overland vehicle travel by heavy machinery, construction site preparation, excavation and potential blasting, drilling of concrete piers, heavy equipment use, and cleanup and site reclamation. These activities will require vegetation clearing, land-forming activities (grading, recontouring, and cut-and-fill landform manipulations), drive-and-crush of existing vegetation during temporary site access, piling of soil material, human foot-traffic, and recontouring and seeding during reclamation. Project operation activities will consist of routine inspections and operation of the transmission line, substations, and series compensation stations. These activities will require access-road use by inspection vehicles. Potential maintenance activities will consist of access road maintenance and right-of-way vegetation maintenance. These activities will require overland travel and access-road use by operation vehicles.

Impacts of anthropogenic activity have been documented at leks at a distance of up to 3.7 miles (Naugle et al. 2011). Roads near sage-grouse leks may influence female habitat selection (Lyon and Anderson 2003) and male sage-grouse lek attendance, likely as a result of increased noise produced by traffic (Holloran 2005). Traffic disturbance (1 to 12 vehicles per day) within 1.9 miles of leks during the breeding season reduced nest-initiation rates of female sage-grouse in southwestern Wyoming (Lyon and Anderson 2003). Disturbance to wintering sage-grouse from energy development also have been linked to human activity levels (Dzialak et al. 2012).

Sage-grouse susceptibility to disease and predation could increase from physiological stress induced by noise and human presence. Impacts of infrastructure on female survival were the largest contributor to reduced population growth in sage-grouse populations influenced by energy development in southwestern Wyoming (Holloran 2005). Declines in body condition caused by elevated blood corticosteroid levels—the physiological response of avian species to stress (Siegel 1980) during the period of time the females were influenced by energy development—may have resulted in altered foraging or vigilance behaviors, increasing the probability of predation later in the summer and early fall (Holloran 2005). In an experimental noise playback study, industrial activities increased sage-grouse stress levels, suggesting that chronic noise pollution can cause sage-grouse to avoid otherwise suitable habitat (Blickley et al. 2012). Implementation of seasonal restrictions within 4 miles of active leks is expected to minimize disturbance associated with noise and human presence.

Loss or Modification of Habitat

Removal of vegetation in sage-grouse habitat during Project preconstruction and construction activities will result in the direct loss and degradation of currently occupied sage-grouse habitat. These activities will require vegetation clearing, land-forming activities (grading, recontouring, and cut-and-fill landform manipulations) and drive-and-crush of existing vegetation during temporary site access. Vehicles and equipment used during construction or by subsequent public use of access roads constructed for the Project could indirectly result in the degradation of sage-grouse habitats by increasing the potential for introduction and spread of non-native plants and noxious weeds. Invasive plants such as cheatgrass and medusahead displace desirable native plant species and degrade rangeland health. In many cases, the displaced species are critical to sage-grouse survival (Natural Resources Conservation Service 2010). Degradation of sage-grouse habitat due to invasion of non-native plants and noxious weeds could lead to decreased survival of individual birds in affected populations and a reduction in the carrying capacity of sagebrush habitats. In addition to cheatgrass displacing native understory species, infestation leads to an increased risk of wildfires that eliminate the sagebrush overstory because cheatgrass germinates early and thus dries early in the growing season (Klemmedson and Smith 1964). Sagebrush plant communities important for sage-grouse survival could be destroyed by fire and habitats require decades to recover. More frequent wildfires in sage-grouse habitats could result in reduced local sage-grouse population size and reduction of suitable habitat available for sage-grouse in the Project area.

Construction of the Project in sage-grouse habitat could increase the application of herbicides to control noxious weeds in sage-grouse habitat. Herbicide applications can kill sagebrush and forbs that are important food sources for sage-grouse (Call and Maser 1985) and may affect insect populations dependent on these plants. The use of herbicides to control noxious weeds has been shown to reduce the abundance and diversity of forbs in sage-grouse brood habitat (Crawford et al. 2004; Klebenow 1970). Reduction of understory vegetation in sagebrush habitats can reduce the amount of forbs and insects available, which comprise the bulk of sage-grouse chick diets until they are approximately 12 weeks of age (Klebenow and Gray 1968; Peterson 1970) and provide protein sources essential for successful egg production and chick nutrition (Gregg et al. 2008; Johnson and Boyce 1991; Schroeder et al. 1999).

Increased predation pressure around the transmission line (Connelly et al. 2004) could result in functional habitat loss if sage-grouse respond by avoiding areas where predators are concentrated and predation pressure is highest (Dinkins et al. 2012). If raptors and ravens are concentrated around the transmission line, sage-grouse may abandon or reduce their utilization of habitats near the transmission line, effectively reducing the amount of habitat available to individuals and populations and potentially displacing birds into suboptimal habitats (Connelly et al. 2004). Sage-grouse also may respond to increased predation pressure by increasing sheltering behavior to avoid predation and reducing or shifting temporally other essential behaviors (e.g., foraging) (Hagen 2011). These behavioral shifts may reduce the fitness of individual sage-grouse that occupy habitats near the transmission line, which ultimately may influence survival (Holloran 2005).

Habitat Fragmentation and Displacement

Transmission-line structures in sage-grouse habitat could increase the potential for fragmentation of sage-grouse habitats and the displacement of sage-grouse from occupied habitats due to the tendency of sage-grouse to avoid areas that contain tall structures, including transmission-line structures (Braun 1998; Braun et al. 2002; Pruett et al. 2009) and areas adjacent to transmission lines due to the presence of electromagnetic fields near the line (Fernie and Reynolds 2005). A USGS review of factors influencing sage-grouse conservation concluded that sage-grouse may avoid habitats within 0.4 to 2.9 miles of transmission lines, that erection of a transmission line close to a lek may negatively influence sage-grouse lek attendance and breeding-season behavior, and that higher densities of power lines within 4 miles of a lek may negatively influence lek persistence (Manier et al. 2013). Based on a separate literature review on the impacts of infrastructure on sage-grouse, the USGS proposed sage-grouse conservation buffers for tall structures, including transmission lines, that ranged from 2 to 5 miles (Manier et al. 2014). These distances are an attempt to balance the extent of protected areas with multiple land-use requirements using estimates of the distribution of sage-grouse habitat. The authors stated that there is no single distance that is an appropriate buffer for all sage-grouse populations and habitats because of variations in populations, habitats, development patterns, and other factors. They also acknowledge that scientifically justifiable departures may be warranted based on local data and other factors when implementing buffer protections or density limits (Manier et al. 2014).

Across the western range of the species, habitat suitability as measured by the presence of active leks was highest in areas with transmission-line densities less than 0.037 mile (of overhead transmission line) per square mile and leks were absent from areas where power line densities exceeded 0.0124 mile (of overhead transmission line) per square mile (Knick et al. 2013). Braun (1998) reported that sage-grouse use of areas near transmission lines in Colorado increased as distance from transmission lines increased up to approximately 2,000 feet. Similarly, in a comparison of sage-grouse radiotelemetry locations in Idaho to locations of anthropogenic features, Gillian et al. (2013) found that sage-grouse avoided areas within 1,968.5 feet of power transmission lines and 492 feet of buildings; and Hanser et al. (2011a) found a negative association between modeled sage-grouse occurrence within 1,640.4 feet of energy development, power lines, and major roads in Wyoming using pellet count data.

Construction of a transmission line altered dispersal patterns of breeding sage-grouse in northeastern Utah (Ellis 1985), suggesting a transmission line could be a potential barrier to movements and thus result in habitat fragmentation. In northeastern Wyoming, the probability of lek persistence decreased with proximity to power lines and the increasing proportion of power lines in a 4-mile area around leks (Walker et al. 2007). Sage-grouse avoided brood-rearing habitats within 2.9 miles of transmission lines in south-central Wyoming (LeBeau 2012). Avoidance of areas near the transmission line and/or reduction of movements across the transmission-line right-of-way may fragment and reduce the connectivity of sage-grouse habitats in the Project area. These effects could result in alteration of seasonal sage-grouse migrations or movements among populations if habitats affected represent important seasonal habitat or habitat important for providing connectivity between populations.

4.3.1.3 Conservation Measures

Cooperating agencies and the Proponent have committed to implement onsite conservation measures for greater sage-grouse. Additionally, the Proponent has agreed to develop a Sage-grouse Compensatory Mitigation Plan, including conducting a Habitat Equivalency Analysis (HEA), to mitigate for the unavoidable effects of the Project on sage-grouse and sage-grouse habitat. The intention of the Sage-grouse Compensatory Mitigation Plan is to compensate for the unavoidable effects of the Project on sage-grouse and sage-grouse habitat such that the Project can be developed in compliance with applicable state, BLM (e.g., state- and Washington-level IMs), and FWS (e.g., COT report, COT consistency checklist) policies regarding sage-grouse management. The BLM will require as a condition of a right-of-way grant that the Sage-grouse Compensatory Mitigation Plan be completed to the satisfaction of the BLM prior to initiation of construction activities. The Proponent has convened a HEA Technical Working Group, consisting of biologists from the BLM, FWS, other cooperating agencies, and state wildlife agencies to provide input and guidance in development of the Sage-grouse Compensatory Mitigation Plan and HEA. The FWS has been providing technical guidance to the development of the onsite mitigation measures and the Proponent's Sage-grouse Compensatory Mitigation Plan through participation on the HEA Technical Working Group and through participation in the BRTG convened by the BLM during preparation of the EIS. The BLM anticipates the FWS will continue to provide technical guidance in these areas through completion of the Proponent's Sage-grouse Compensatory Mitigation Plan.

Design features of the Project (Table C-1, Appendix C) will be employed to minimize ground disturbance and other effects on sage-grouse habitat. Additional onsite conservation measures applicable to greater sage-grouse habitats crossed by the agency-preferred route are listed in Table 4-8 and described in the text below.

TABLE 4-8
ONSITE SAGE-GROUSE CONSERVATION MEASURES

Conservation Measure	Core Areas and Priority Habitats	General Habitats	Habitat Within 4 miles of Leks
Measure 1	✓	✓	✓
Measure 2	✓	✓	✓
Measure 3	✓	✓	✓
Measure 4	✓	✓	✓
Measure 5	✓	✓	✓
Measure 6	✓		✓
Measure 7	✓	✓	✓
Measure 8			✓

- ***Greater Sage-Grouse Conservation Measure 1***: For any activities associated with the geotechnical investigation, the following restrictions will apply:
  - Seasonal and spatial restrictions identified in the POD and ongoing land-use plan amendments will be adhered to.
  - All work in designated sage-grouse habitat will be monitored by a biological monitor to ensure compliance with all applicable conservation measures.
  - Existing access roads in designated sage-grouse habitat may be used, but not improved.
- ***Greater Sage-Grouse Conservation Measure 2***: Special status species will be considered in accordance with management policies set forth by management agencies. Surveys for special status wildlife potentially affected by the Project will be conducted in suitable habitat along the selected route using protocols approved by the BLM, USFS, or other cooperating agencies. Construction techniques that avoid and minimize impacts on special status wildlife populations and habitat would be implemented , which may include altering the placement of roads or transmission-line structures, use of existing roads, and minimization of vegetation clearing. Additional techniques to minimize impacts on sage-grouse in select locations may include structure design modification and the use of perch deterrents to reduce the effects of predation, and flight diverters and marking devices to reduce the risk of collision. The locations where these types of measures would be implemented would be determined by the BLM in coordination with the cooperating agencies. Monitoring of identified special status wildlife populations and habitat also may be required.
- ***Greater Sage-Grouse Conservation Measure 3***: All construction vehicle movement will be restricted to designated access roads based on avoidance of known noxious weed locations.
- ***Greater Sage-Grouse Conservation Measure 4***: To minimize vehicle collisions with special status wildlife, a speed limit of 15 miles per hour will be employed on overland access routes.
- ***Greater Sage-Grouse Conservation Measure 5***: All new or improved access not required for maintenance will be closed or rehabilitated following Project construction in accordance with prior agency approval and using the most effective and least environmentally damaging methods.
- ***Greater Sage-Grouse Conservation Measure 6***: Construction and maintenance activities will be restricted in designated areas and during critical periods, (e.g., wintering habitats and specific breeding or nesting seasons). The timing of restrictions will be based on measures developed for the EIS and ongoing Land Use Plan Amendments.
- ***Greater Sage-Grouse Conservation Measure 7***: Drive-and-crush (vehicular travel to access a site without significantly modifying the landscape) and/or clear-and-cut travel (removal of vegetation to provide suitable access for equipment) will occur in areas where no grading will be needed to access work areas (i.e., areas with low-growing sagebrush and other low-growing vegetation). This will reduce the amount of ground-disturbing activities (e.g., surface soil removal, vegetation cropping/cutting) landscape modification, risk of introduction of invasive weeds, and special status wildlife habitat fragmentation. Modification of sagebrush vegetation communities, which provide necessary cover and forage for habitat suitability, resulting from vegetation clearing, will be limited in habitats occupied by sagebrush obligate special status wildlife species like greater sage-grouse.
- ***Greater Sage-Grouse Conservation Measure 8***: To minimize disturbance to greater sage-grouse habitats, the transmission-line right-of-way would be sited to avoid locally important habitats identified in consultation with the Proponent, BLM, FWS, and state wildlife agencies. Where seasonally important habitats (i.e., within 4 miles of leks, nesting, wintering) cannot be avoided, then transmission-line right-of-way would be further sited as follows:

- In areas to maximize colocation with other above-ground utilities
- In existing designated corridors
- In nonhabitat (i.e., within 4 miles of leks but outside of preliminary priority habitat, occupied habitat, woodland vegetation communities)
- In areas where placement of structures and access roads maximizes the use of topographic features to visually screen impacts from seasonally important habitats
- In areas that minimize fragmentation (i.e., use existing roads, no new permanent roads, drive and crush).

4.3.1.4 Residual Effects

Implementation of Greater Sage-Grouse Conservation Measures 1 through 8 and the implementation of the Sage-grouse Compensatory Mitigation Plan will minimize the potential effects of direct mortality, increased disturbance, and loss or modification of habitat on sage-grouse. Despite efforts to avoid or minimize potential effects on sage-grouse, loss of sage-grouse habitats will occur. The presence of transmission lines and structures in sage-grouse habitat may increase susceptibility to predation, and habitat fragmentation and displacement are likely to occur due to the tendency of sage-grouse to avoid areas that contain tall structures. These residual effects will be addressed through compensatory mitigation that will be provided by the Proponent and outlined in the Proponent's Sage-grouse Compensatory Mitigation Plan.

4.3.1.5 Determination

Effect on Species

The greater sage-grouse is a candidate for ESA listing and a determination is not required.

Effect on Designated Critical Habitat

Critical habitat is not designated for candidate species.

4.3.1.6 Cumulative Effects

Cumulative effects are not required to be assessed for species not listed as threatened or endangered under the ESA.

4.3.2 Mexican Spotted Owl

4.3.2.1 Status of the Species in the Project Area

The Project is located near the northern edge of the range of the Mexican spotted owl in Colorado and Utah, and the species is relatively uncommon when compared to the core of its range (FWS 2012b). One unit of critical habitat (CP-15, West Tavaputs Plateau) has been designated west of the Green River, 7.5 miles south of the Project area at its nearest point (69 FR 53182-53298). This unit includes the Protected Activity Center nearest the Project area, in the Desolation Canyon area of the Green River.

The BLM in Utah has surveyed for the Mexican spotted owl in select areas in the Argyle Canyon area in Duchesne County, and the Coal Creek area near the Roan Cliffs in Carbon County. No owls have been located during these surveys and BLM has recently downgraded the agency's assessment of potential Mexican spotted owl habitat in many of these areas (McDonald and Emmett 2012; Wright 2012). These surveys are anticipated to continue in the future, and will continue to provide current information on the status of the species near the Project area.

To provide additional information on potential Mexican spotted owl habitat use near the Project, a BLM habitat suitability assessment and a habitat model was used to identified potential Mexican spotted owl habitat within 1 mile of the agency-preferred route. A habitat suitability assessment created for the BLM Vernal Field Office to determine the location of potentially suitable Mexican spotted owl nesting and steep-slope mixed conifer forest habitat was used for BLM Vernal Field Office lands (BLM 2011d). The habitat suitability assessment included habitat ratings developed by the BLM and FWS to identify specific areas that would require presence-absence surveys for Mexican spotted owl.

In areas not encompassed by the BLM Vernal Field Office model, the habitat model created by EPG for the analysis in the EIS was used (EPG 2013). The EIS model used the FWS 2 by 2 rule (i.e., canyons less than 2 kilometers [approximately 1.24 miles] wide and at least 2 kilometers long provide suitable Mexican spotted owl habitat) to identify where canyons crossed by the agency-preferred route may provide suitable habitat for Mexican spotted owls. Consultation with agency experts, previous BLM Field Office habitat assessments (e.g., BLM Vernal Field Office), and the Willey-Spotskey Mexican Spotted Owl habitat model (Willey and Spotskey 2000) provided additional guidance in identification of general areas of potentially suitable habitat. Additional details of the model creation and supporting field surveys are available in the Administrative Record for the Project (EPG 2013).

The habitat suitability assessment and the habitat model results indicated that 11.3 miles of potential Mexican spotted owl habitat will be crossed by the agency-preferred route (Table 4-9). All potential habitat is located between the Green River and the Argyle Canyon area in Uintah and Duchesne counties, Utah (Maps 6, 6a, and 6b, Appendix A). Habitat suitability of potential habitat modeled on BLM Vernal Field Office lands crossed by the agency-preferred route was primarily rated as poor (Table 4-9). The model used for other lands in the analysis area did not rate habitat suitability, but it was field-verified in a number of locations and was determined to have potentially overestimated the extent of suitable habitat for the species (EPG 2013). Prior to final design of the transmission line and initiation of construction activities, additional potentially suitable habitat assessments, including field verification, will be completed using BLM- and FWS-approved methods to verify the results of the habitat assessment. Field surveys will be conducted in suitable habitat as identified during the habitat assessment for 2 years prior to construction activities, including areas identified in the BLM Vernal Field Office habitat suitability assessment as having a habitat suitability ranking of fair, to verify the presence of nesting Mexican spotted owls.

The Mexican spotted owl is not anticipated to be found near the Project area in Colorado or Wyoming. The agency-preferred route will not cross designated critical habitat for the species.

TABLE 4-9
SUMMARY OF MODELED MEXICAN SPOTTED OWL HABITAT CROSSED BY THE AGENCY-PREFERRED ROUTE

Area assessed	Habitat suitability ranking	Miles Crossed
Bureau of Land Management (BLM) Vernal Field Office lands[1]	Poor	2.7
BLM Vernal Field Office lands[1]	Fair	0.6
Other lands[2]	–	8.0

NOTES
[1]The BLM Vernal Field Office Mexican spotted owl habitat suitability assessment was used for BLM Vernal Field Office lands (BLM 2011c)
[2]The EPG Mexican spotted owl habitat model was used for other lands in the analysis area (EPG 2013)

4.3.2.2 Potential Effects of the Project

Increased human presence and noise associated with Project preconstruction, construction, operations, and maintenance activities could increase the potential for disturbance to Mexican spotted owl (refer to Table 1-2 for detailed information regarding anticipated Project activities). Preconstruction activities will include geotechnical surveys, which will involve overland vehicle access (restricted to routes designated in the POD). Construction activities will consist of access road improvement and construction, access and spur road travel and overland vehicle travel by heavy machinery, construction site preparation, excavation and potential blasting, drilling of concrete piers, heavy equipment use, and cleanup and site reclamation. These activities will require vegetation clearing, land-forming activities (grading, recontouring, and cut-and-fill landform manipulations), drive-and-crush of existing vegetation during temporary site access, piling of soil material, human foot-traffic, and recontouring and seeding during reclamation. Project operation activities will consist of routine inspections and operation of the transmission line, substations, and series compensation stations. These activities will require access-road use by inspection vehicles. Potential maintenance activities will consist of access road maintenance and right-of-way vegetation maintenance. These activities will require overland travel and access-road use by operation vehicles.

Mexican spotted owls can respond negatively to the presence of humans and may respond by flushing from nests or roosting sites. In addition to human presence, Mexican spotted owls may flush in response to loud noises from sources such as helicopters or other machinery, primarily when the noise source is within 300 feet (Delaney et al. 1999). Flushing from resting sites or nests can expose Mexican spotted owls, as well as eggs or young, to high temperatures, lower humidity, and an increased predation risk. If human activities generate noise when Mexican spotted owls are foraging, an elevated noise floor may affect foraging success regardless of proximity (FWS 2012b).

Removal of vegetation in potential Mexican spotted owl habitat during Project construction activities could result in the degradation of Mexican spotted owl habitat. These activities will require vegetation clearing, land-forming activities (grading, recontouring, and cut-and-fill landform manipulations) and drive-and-crush of existing vegetation during temporary site access. Although Mexican spotted owls primarily nest and roost in canyon habitat in the Project area, they also use trees as roosting and foraging perches in canyon habitat (FWS 2012b). Thus, the removal of trees in suitable habitat for the species may alter how that habitat is used. Clearing of shrubs and lower vegetation can reduce forage available for small mammal prey, but also can increase foraging success for birds of prey. As noted in Section 3.2.3.5, stand-replacing wildfire is considered the primary threat to Mexican spotted owl range-wide, but fire is not typically a threat to Mexican spotted owls in the Project area and the risk of wildfire is not anticipated to increase as a result of Project activities.

Guyed transmission-line structures are not proposed for the majority of potentially suitable Mexican spotted owl habitat crossed by the Project due to terrain constraints (refer to Section 1.4.5 for a description of proposed transmission-line structure types). Guyed structures are limited to use in areas where the transmission line does not turn and where terrain is relatively level. In the event that guyed transmission-line structures are used in potentially suitable Mexican spotted owl habitat, the risk of mortality and injury to Mexican spotted owls from in-flight collision may be greater than in areas where alternative structure types are used. The risk of collision with transmission-line infrastructure, guyed or otherwise, is very low given that Mexican spotted owls have not been detected in the Project area. In the event that Mexican spotted owls are confirmed to be present, transmission-line structures will not be placed within 0.5 mile of occupied habitat, further reducing the potential effect of collision.

4.3.2.3 Conservation Measures

The following conservation measures are provided to specify how surveys and seasonal avoidance would be implemented to minimize potential effects on the Mexican spotted owl.

- ***Mexican Spotted Owl Conservation Measure 1:*** Potentially suitable habitat assessments, including field verification, will be completed using BLM- and FWS-approved methods prior to final design of the transmission line and initiation of construction activities.
- ***Mexican Spotted Owl Conservation Measure 2:*** For any activities associated with the geotechnical investigation, the following restrictions will apply:
  - Geotechnical drilling activities will be avoided within 0.5 mile of potentially suitable habitat identified during the habitat assessment between March 1 and August 31
  - Existing access roads located in potentially suitable habitat identified during the habitat assessment and within 0.5 mile of potentially suitable habitat identified during the habitat assessment may be used, but not improved.
- ***Mexican Spotted Owl Conservation Measure 3:*** Surveys will be conducted for 2 years prior to construction activities within 0.5 mile of construction activities in potentially suitable habitat identified during the habitat assessment. Surveys will be conducted according to FWS-approved methods. All identified Mexican spotted owl nests will be avoided by construction activities by at least 0.5 mile until the end of the nesting season (March 1 to August 31).
- ***Mexican Spotted Owl Conservation Measure 4:*** The placement of permanent structures within 0.5 mile of suitable habitat identified during the habitat assessment will be avoided unless Mexican spotted owl suitable habitat is surveyed and determined to be unoccupied.

4.3.2.4 Residual Effects

Through implementation of Mexican Spotted Owl Conservation Measures 1 and 2, the potential effects of noise and disturbance on the Mexican spotted owl are assumed to be discountable, as no Mexican spotted owls have been detected in the Project area or adjacent surveyed habitat. Surveys will be conducted to detect any previously unknown owls nesting in the area. Conservation measures will require the seasonal avoidance of Mexican spotted owls by appropriate buffer distances to prevent impacts resulting from noise and human presence if the species is confirmed to be present in the Project area. The Project could require the removal of trees and other vegetation in suitable habitat for the Mexican spotted owl, but permanent structures will not be placed within 0.5 miles of occupied habitat.

4.3.2.5 Determination

Effect on Species

The Project may affect, but is not likely to adversely affect, the Mexican spotted owl.

Effect on Designated Critical Habitat

The Project will not affect designated critical habitat for the Mexican spotted owl. No designated critical habitat for this species is present in the Project area.

Rationale

Construction of the Project could disturb Mexican spotted owls through noise and human presence, and could require the removal of trees and other vegetation in suitable habitat for the Mexican spotted owl. The potential effects of noise, disturbance, and vegetation removal on the Mexican spotted owl are assumed to be discountable as no Mexican spotted owls have been detected in the Project area or adjacent surveyed habitat. Habitat assessments and surveys for the species would be conducted and conservation measures would require the avoidance of Mexican spotted owls by appropriate buffer distances if the species is confirmed to be present in the Project area.

4.3.2.6 Cumulative Effects

Cumulative effects are not required to be assessed for species that are not likely to be adversely affected by the Project.

4.3.3 Yellow-billed Cuckoo

4.3.3.1 Status of the Species in the Project Area

The western yellow-billed cuckoo may be found in riparian habitats associated with major river systems in the Project area. The critical habitat proposal focused on identifying large blocks of relatively intact riparian woodlands that would be critical to the survival and recovery of the species, but acknowledged that many other smaller habitat blocks would be used by smaller numbers of nesting yellow-billed cuckoos (79 FR 48547-48652). Characteristics of riparian woodlands identified as a PCE of proposed designated critical habitat for yellow-billed cuckoo included mixed willow-cottonwood vegetation and mesquite-thorn-forest vegetation; habitat for nesting and foraging in patches greater than 325 feet in width and 200 acres in extent; average canopy closure greater than 70 percent; and cooler, more humid environment than surrounding habitats. No proposed critical habitat is crossed by the agency-preferred route.

To support the analysis in the EIS, a habitat model was created to identify riparian woodlands around all alternative routes. The model allowed for an informative, relative comparison between alternative routes in the Project EIS and is used in this document for informational purposes and as a general reference. However, the habitat model comprehensively does not identify areas where the species may occur, identify areas where surveys for yellow-billed cuckoo should be conducted, or identify areas that should be avoided by the Project to avoid impacts on the species. Details of the model creation and supporting field surveys are available as an unpublished report (EPG 2013) in the Administrative Record of the Project. In brief, the model selected areas from remote-sensing data identified as having riparian tree cover, and then identified blocks of contiguous tree cover at least 5 acres in size, or smaller blocks immediately adjacent to blocks larger than 5 acres. This relatively coarse model was field-verified in a number of locations as identifying, but potentially overestimating, suitable habitat for the species (EPG 2013).

Table 4-10 provides a list and notes regarding preliminary identification of potential yellow-billed cuckoo habitat by the habitat model that will be crossed by or is within a 0.5-mile buffer around the agency-preferred route (refer to Maps 7 and 7a through 7o, Appendix A). As indicated in Table 4-10, modeled habitat for the yellow-billed cuckoo is crossed in seven locations, but only the Green River appeared to be potentially suitable for the species based on a review of aerial imagery and photographs. Additional patches of habitat adjacent to but not crossed by the Project also may be suitable. Table 4-10 is intended to provide context regarding the overall extent and condition of potential yellow-billed cuckoo habitat in the analysis area, and is not intended to be a substitute for the habitat assessments and surveys committed to as conservation measures for the species.

TABLE 4-10
SUMMARY OF MODELED YELLOW-BILLED CUCKOO HABITAT NEAR THE AGENCY-PREFERRED ROUTE

River Name	State	Miles of Modeled Habitat Crossed	Map	Notes[1]
Little Snake River	Colorado	0.00	Map 7a	Modeled habitat near the agency-preferred route is not likely to be suitable: small patch size, open canopy.
Yampa River	Colorado	0.00	Map 7b	Modeled habitat near the agency-preferred route may be suitable.

TABLE 4-10 SUMMARY OF MODELED YELLOW-BILLED CUCKOO HABITAT NEAR THE AGENCY-PREFERRED ROUTE				
River Name	**State**	**Miles of Modeled Habitat Crossed**	**Map**	**Notes[1]**
Coyote Wash (Tributary of White River)	Utah	0.00	Map 7c	Modeled habitat near the agency-preferred route is not likely to be suitable: small patch size, open canopy.
White River	Utah	0.02	Map 7d	Modeled habitat crossed by or near the agency-preferred route is not likely to be suitable: preferred tree species not dominant, open canopy.
Cottonwood Wash	Utah	0.02	Map 7e	Modeled habitat crossed by or near the agency-preferred route is not likely to be suitable: preferred tree species not dominant, open canopy.
Willow Creek	Utah	0.00	Map 7f	Modeled habitat downstream from the agency-preferred route may be suitable.
Green River	Utah	0.17	Map 7g	Modeled habitat crossed by the agency-preferred route may be suitable.
White River (tributary of Price River)	Utah	0.00	Map 7h	Modeled habitat near the agency-preferred route is not likely to be suitable: preferred tree species not present or dominant, small patch size.
Soldier Creek	Utah	0.00	Map 7i	Modeled habitat near the agency-preferred route is not likely to be suitable: preferred tree species not present or dominant, small patch size.
Soldier Creek	Utah	0.17	Map 7j	Modeled habitat crossed by or near the agency-preferred route is not likely to be suitable: preferred tree species not dominant.
Soldier Creek	Utah	0.00	Map 7k	Modeled habitat near the agency-preferred route may be suitable.
Soldier Creek, Lake Fork	Utah	0.00	Map 7l	Modeled habitat near the agency-preferred route along Lake Fork Canyon may be suitable.
Thistle Creek	Utah	0.00	Map 7m	Modeled habitat near the agency-preferred route may be suitable.
Nebo Creek	Utah	0.00	Map 7n	Modeled habitat near the agency-preferred route may be suitable.
Hop Creek	Utah	0.08	Map 7o	Modeled habitat crossed by or near the agency-preferred route is not likely to be suitable: small patch size, open canopy.
Salt Creek	Utah	0.01		
Bradley Canyon	Utah	0.05		
Salt Creek	Utah	0.00		
NOTE:[1]Through an assessment of aerial imagery, an area was considered not likely to be suitable as nesting habitat if it was unlikely to support riparian woodland dominated by willows or cottonwoods, in the minimum contiguous patch size suitable for yellow-billed cuckoo occupancy (approximately 10 acres).				

4.3.3.2 Potential Effects of the Project

The Project will have the potential to affect yellow-billed cuckoos through the removal or alteration of suitable nesting, foraging, or migration stopover habitat, mortality or injury from in-flight collision, or through disturbance, including noise that could affect nesting success outside the right-of-way.

Loss of riparian habitat suitable for nesting is considered the primary threat to yellow-billed cuckoo (79 FR 59992-60038). Removal of vegetation in suitable habitat for the yellow-billed cuckoo during Project preconstruction, construction, and maintenance activities could reduce the extent or quality of available habitat (refer to Table 1-2 for detailed information regarding anticipated Project activities). Preconstruction and construction activities normally require vegetation clearing and drive-and-crush of existing vegetation during temporary site access; but in suitable yellow-billed cuckoo habitat, vegetation clearing and disturbance is expected to be minimal as river crossings will be spanned. Some removal of trees will be required for safe conductor clearance, and minimum clearances between conductors and vegetation will be maintained for the life of the Project in compliance with the Proponent's vegetation management plans (PacifiCorp 2014; refer to Appendix B).

The proposed crossing at the Green River is anticipated to require a nonstandard span, due to the width of the river and disparity in the elevations on each side of the river. The structure on the eastern bank will be located approximately 500 feet higher than the river elevation, while the western shore is within approximately 50 feet of the river elevation. However, the design in this location is anticipated to minimize or eliminate the need for vegetation management in the right-of-way, based on the elevated structure siting and resulting height of the conductors over any riparian vegetation that is present. If vegetation management is required, it will have the effect of shortening a linear patch of riparian woodland by approximately 200 feet, and will result in the loss of approximately 1 acre of riparian vegetation from a patch of approximately 21 acres. However, the patch will not be bisected or fragmented by vegetation management, as the crossing location is at the southern edge of the patch.

In addition to direct effects on habitat, the presence of transmission-line infrastructure could increase the risk of mortality and injury to yellow-billed cuckoos from in-flight collision. In-flight collision risk may be greater in locations where guyed transmission-line structures are used (refer to Section 1.4.5 for a description of proposed transmission-line structure types). Guyed structures and self-supporting lattice structures are both structure types that may be used near potential habitat for the yellow-billed cuckoo. However, guyed structures are limited to use in areas where the transmission line does not turn and where terrain is relatively level. Self-supporting lattice structures would be selected as turning structures, where uneven terrain is present, and where more robust structures are needed to accomplish larger span distances, including many major river and stream crossings. The risk of collision with guy wires is generally low as the structures will be located outside of typical yellow-billed cuckoo habitat, and the species does not typically fly at the low altitudes that would put them at the height of guy wires, particularly during nocturnal migration. This analysis acknowledges the potential collision risk from guyed structures, but also notes that this risk would be partially minimized as a result of structure type selection as detailed engineering is completed.

Increased noise associated with preconstruction, construction, operations, and maintenance activities could increase the potential for disturbance to yellow-billed cuckoo. Heavy machinery will be used during preconstruction and construction phases for access road improvement and construction, construction site preparation, excavation and potential blasting, drilling of concrete piers, and cleanup and site reclamation. All phases of the Project will involve vehicle use, periodically increasing noise levels. Project operation activities will consist of routine inspections and will require access-road use by inspection vehicles. Potential maintenance activities will consist of access-road maintenance and right-of-way vegetation maintenance.

Noise has been demonstrated in many studies to have a negative effect on nesting birds. In addition to the Green River crossing, the other locations identified in Table 4-10 as potentially suitable habitat near but not crossed by the Project could be affected by noise or other disturbance during construction. An increased noise floor during periods when a bird is engaging in territory maintenance requires a greater energetic expense to change song pitch or increase song volume (Rheindt 2003; Brumm 2004),

potentially decreasing energy available for foraging and feeding young. This can reduce occupancy, or reduce productivity on occupied territories (Parris and Schneider 2009; Bayne et al. 2008; Halfwerk et al. 2011). These effects are strongest near the noise source, and additional effects such as behavioral change or hearing loss can occur at very close distances or at the highest noise intensities.

Although detailed noise modeling has not been conducted for this Project, an assumed noise level of 85 dBA (decibels, A-weighted) from construction activities requiring heavy equipment was used to support a noise analysis in a similar example (BLM and Western Area Power Authority 2014). Sound attenuates logarithmically with distance, at a rate of approximately 3 dB (decibels) (linear sources such as roads) to 6 dB (point sources such as equipment working in a small area) for each doubling of distance (Federal Transit Administration 2006). Thus, over open ground, attenuation would reduce construction equipment noise levels by approximately 20 to 40 dB at 0.5 mile from the Project, depending on the type of activity. Additionally, barriers can strongly reduce the intensity of noise when compared to line-of-sight (Slabbekoorn and Ripmeester 2007). Note that dB is used as a measure of sound energy, while dBA is adjusted to reflect increased hearing sensitivity for certain frequencies and is used as a measure of sound intensity as perceived by a listener.

Table 4-10 and Maps 7a through 7o show modeled yellow-billed cuckoo habitat within 0.5 mile of the agency-preferred route. Some of the patches of modeled habitat identified as potentially suitable are screened by topography or vegetation, which will reduce the level of noise from construction activities. Potential effects of noise could occur in any locations where suitable yellow-billed cuckoo habitat is occupied at the time of construction activities, within 0.5 mile of the transmission-line route if topography or vegetation does not form an adequate barrier to noise.

4.3.3.3 Conservation Measures

The following conservation measures are provided to specify how surveys and seasonal avoidance will be implemented for the yellow-billed cuckoo:

- ***Yellow-billed Cuckoo Conservation Measure 1:*** Habitat assessments, including field verification, will be completed within 0.5 mile of construction activities using BLM- and FWS-approved methods prior to final design of the transmission line and initiation of construction activities to identify suitable nesting habitat. Results will be provided to the FWS for review and concurrence.
- ***Yellow-billed Cuckoo Conservation Measure 2:*** Protocol breeding season surveys will be conducted in suitable nesting habitat within 0.5 mile of construction activities prior to any disturbance unless species occupancy and distribution information is complete, available, and supports a conclusion that the species is not present; or unless otherwise agreed to by the FWS and BLM in response to mitigating factors such as existing disturbance, screening, or site-specific habitat conditions. All surveys must be conducted according to protocol by surveyors who have attended an FWS-approved yellow-billed cuckoo survey training and are operating under a recovery permit.
- ***Yellow-billed Cuckoo Conservation Measure 3:*** For any activities associated with the geotechnical investigation, the following restrictions will apply:
    - Geotechnical drilling activities will be avoided within 0.25 mile of potentially suitable nesting habitat, as determined by the habitat assessments, between June 1 and August 31.
    - Existing access roads within 0.5 mile of potentially suitable nesting habitat as determined by the habitat assessments may be used during any time of year, but not improved.

- Any geotechnical drilling activity will be moved or abandoned that would result in modification of suitable yellow-billed cuckoo nesting habitat as determined by the habitat assessments.

- ***Yellow-billed Cuckoo Conservation Measure 4:*** Transmission-line structures will not be sited in field-verified suitable nesting habitat. Waterways will be spanned in field-verified suitable nesting habitat.
- ***Yellow-billed Cuckoo Conservation Measure 5:*** Project activities (e.g., road construction or improvement, geotechnical activities, vegetation management, transmission-line construction, right-of-way reclamation, and maintenance activities), will not be conducted within a 0.5-mile buffer of occupied nesting habitat between June 1 and August 31.
- ***Yellow-billed Cuckoo Conservation Measure 6:*** A biological monitor will be on-site during construction and vegetation management or otherwise disruptive activities during operation and maintenance within 0.5 mile of occupied and field-verified suitable habitat between June 1 and August 31. The biological monitor will monitor the application and effectiveness of avoidance and minimization measures during construction or maintenance activities. An annual summary of the application of avoidance and minimization measures and the effectiveness of the measures will be provided to the BLM and FWS within 1 month of the completion of activities subject to seasonal restrictions.
- ***Yellow-billed Cuckoo Conservation Measure 7:*** Prior to any vegetation removal in potentially suitable nesting habitat as determined by the habitat assessments, preconstruction site visits to three to four representative stream crossings will be attended by the BLM, FWS, Proponent, and construction representatives to discuss implementation of measures designed to protect riparian function and yellow-billed cuckoo nesting habitat.
- ***Yellow-billed Cuckoo Conservation Measure 8:*** All transmission lines that cross field-verified suitable habitat will be marked to minimize the potential for collisions in coordination with the FWS. Marking will occur from one outer edge of suitable habitat to the outer edge of suitable habitat on the opposite side of the river.
- ***Yellow-billed Cuckoo Conservation Measure 9:*** New biological information regarding the yellow-billed cuckoo and potential effects of the Project would be addressed as follows:
    - Habitat assessment and survey methods, survey areas, and avoidance buffers would be modified to be consistent with updates and revisions to the current 2015 draft survey protocol and habitat assessment guidance issued by the FWS.
    - Site-specific adjustments to survey and avoidance buffers may be implemented on agreement between the BLM and FWS on a case-by-case basis (e.g., in response to terrain that facilitates or limits noise transmission, or the conditions of the habitat at a specific location), following the interagency preconstruction site visits.
- ***Yellow-billed Cuckoo Conservation Measure 10:*** Avoid broad-scale herbicide application for vegetation management within 0.5 mile of field-verified suitable nesting habitat.

4.3.3.4 Residual Effects

Implementation of Yellow-billed Cuckoo Conservation Measures will reduce the potential effects of noise on yellow-billed cuckoo breeding and nesting activities and will minimize other threats to this species (i.e., destruction of active nests, reproductive failure, in-flight collision, and habitat loss) posed by the Project. However, some loss of potentially suitable habitat may be unavoidable due to vegetation clearing at major river crossings.

4.3.3.5 Determination

Effect on Species

The Project may affect, and is likely to adversely affect, the yellow-billed cuckoo (Western United States DPS).

Effect on Proposed Critical Habitat

The Project will not affect proposed critical habitat for the yellow-billed cuckoo. Critical habitat is proposed for this species in Wyoming, Colorado, and Utah, but none is present in the Project area.

Rationale

Construction of the Project could disturb yellow-billed cuckoos through noise generated during construction activities, could result in mortality or injury from in-flight collision, and could require the removal of trees in suitable nesting habitat for the yellow-billed cuckoo. Yellow-billed Cuckoo Conservation Measure 5 will reduce the effects of noise by appropriate buffer distances if nesting yellow-billed cuckoos are confirmed to be present in the Project area. The potential effect of in-flight collision would be reduced by Yellow-billed Cuckoo Conservation Measure 8. The potential effects of in-flight collision are greatest in locations where guyed transmission-line structures are used, but this risk is assumed to be insignificant, as the structures will be located outside of typical yellow-billed cuckoo habitat and the species does not typically fly at the low altitudes that would put them at the height of guy wires. The potential effect of vegetation removal would be reduced by Yellow-billed Cuckoo Conservation Measure 7, but some removal of trees will be required for safe conductor clearance where the transmission line would span suitable habitat.

4.3.3.6 Cumulative Effects

Much of the modeled yellow-billed cuckoo habitat within 0.5 mile of the agency-preferred route is located on federal lands. Many actions on state, tribal, and private lands that could affect yellow-billed cuckoo habitat may require permitting under the federal CWA, or otherwise have a federal nexus. Current land uses such as agriculture and grazing may affect riparian vegetation, and are anticipated to continue in the future, and noise-generating activities on private lands would not have a federal nexus; however, no other specific additional cumulative actions that may affect the yellow-billed cuckoo are identified at this time.

4.4 Mammals

4.4.1 Black-footed Ferret

4.4.1.1 Status of the Species in the Study Area

All known black-footed ferret populations are descended from reintroduced, captive-bred animals. There are two management areas that contain reintroduction sites in the Project area: the Shirley Basin/Medicine Bow Management Area (Shirley Basin) and the Northwestern Colorado/Northeastern Utah Black-footed Ferret Experimental Population Area (ExPA) (Map 8, Appendix A).

The Shirley Basin site was the location of the first release of captive-raised black-footed ferrets in 1991. The Shirley Basin site encompasses approximately 2,068 square miles in Carbon, Albany, and Natrona counties in Wyoming. This area is located approximately 20 miles northeast of Rawlins, Wyoming. Since 1991, 534 individuals have been released at this site. The site was estimated to support approximately 203 individuals in 2011 and represents the second largest black-footed ferret population in North America (78

FR 23948-23949). Although the Shirley Basin supports the only known extant population of wild black-footed ferrets in Wyoming, there are numerous white-tailed prairie dog complexes in the planning areas for both the BLM Rawlins and Rock Springs Field Offices that could represent suitable habitat for the black-footed ferret. However, the number of prairie dog complexes that are large and dense enough to support a population of black-footed ferrets is low.

The ExPA encompasses portions of Rio Blanco and Moffat counties in Colorado, Sweetwater County in Wyoming, and Uintah and Duchesne counties in Utah. The ExPA has been separated into the Northwestern Colorado Experimental Population Sub-Area and the Northeastern Utah Experimental Population Sub-Area. In the Northwestern Colorado Sub-Area, the Little Snake Black-footed Ferret Management Area and the Wolf Creek Management Area were established as specific reintroduction sites. The Little Snake area is located in northwest Moffat County, Colorado, along the Colorado/Wyoming border. However, ferrets have not been released into this area due to observed decline in white-tailed prairie dog populations. The Wolf Creek area is located in Moffat and Rio Blanco counties in northwest Colorado. Ferret releases in the Wolf Creek NEP northeast of Rangely, Colorado, were initiated in 2001, and 254 individuals have been released at this site. The Wolf Creek population reached at least 16 individuals (FWS 2008), but no recent counts are available. The population had, to some degree, merged with the Coyote Basin population in Utah (78 FR 23948-23949). Further reintroductions are not currently being implemented due to a recent plague epidemic in white-tailed prairie dog populations.

In the Northeastern Utah Sub-Area, the Coyote Basin Black-footed Ferret Management Area was established as the specific reintroduction site. The Coyote Basin area is located in Uintah County, Utah, along the Utah/Colorado border and includes the Snake John Reef Subcomplex and the Coyote Basin Subcomplex. Since 1999, 424 black-footed ferrets have been released into the Coyote Basin NEP. Reproduction was confirmed in Coyote Basin in 2000, and the population was estimated to have reached 25 individuals (FWS 2008). However, the population rapidly declined to possibly a single individual shortly thereafter (78 FR 23948-23949).

The agency-preferred route crosses three black-footed ferret release sites: the Shirley Basin/Medicine Bow Management Area, the Wolf Creek Management Area, and the Coyote Basin Subcomplex (Table 4-11).

TABLE 4-11
SUMMARY OF BLACK-FOOTED FERRET RELEASE SITES CROSSED BY THE AGENCY-PREFERRED ROUTE

Black-Footed Ferret Release Site	State	Miles Crossed
Shirley Basin/Medicine Bow	Wyoming	8.1
Wolf Creek	Colorado	12.6
Snake John Reef Subcomplex	Utah	0.0
Coyote Basin Subcomplex	Utah	4.6

4.4.1.2 Potential Effects of the Project

Vehicle and heavy equipment use associated with Project preconstruction, construction, operations, and maintenance could increase the potential for black-footed ferret vehicle mortality (refer to Table 1-2 for detailed information regarding anticipated Project activities). Preconstruction activities will include geotechnical surveys, which will involve road and overland vehicle access (restricted to routes designated in the POD). Construction activities will require vehicle and heavy equipment use for access road improvement and construction, construction site preparation, excavation and potential blasting, drilling of concrete piers, and cleanup and site reclamation. Project operation activities will require access-road use by inspection vehicles for routine inspections and operation of the transmission line, substations, and

series compensation stations. Potential maintenance activities will require overland travel and access-road use by operation vehicles for access road maintenance and right-of-way vegetation maintenance. Black-footed ferrets are nocturnal, but vehicle mortality could occur if construction activities or travel take place at night in occupied black-footed ferret habitat. Mortality also could occur if occupied burrows are destroyed during construction activities.

Black-footed ferrets and prairie dogs are both susceptible to raptor predation. Construction of transmission lines can increase raptor density locally when constructed in areas previously lacking elevated perches or suitable nest sites. Engineering solutions such as structure design, or additional measures such as raptor perch deterrents, can reduce but not completely eliminate raptor use of transmission lines. In the Wolf Creek Management Area and Coyote Basin Subcomplex, the agency-preferred route would parallel existing transmission lines. In these areas, black-footed ferrets have likely already incurred the adverse effects of increased predation from raptors that use the transmission-line structures as hunting perches. The effects of increased predation may be greater for ferrets in the Shirley Basin/Medicine Bow Management Area, where the agency-preferred route would not parallel existing transmission lines.

4.4.1.3 Conservation Measures

All populations of black-footed ferrets crossed by the Project are reintroduced NEPs. The following conservation measures apply only to these NEPs as no black-footed ferret populations are known to occur outside these reintroduction areas.

- ***Black-footed Ferret Conservation Measure 1:*** For any activities associated with the geotechnical investigation, the following restrictions will apply:
  - All geotechnical activities located within 0.5 mile of prairie dog colonies in active black-footed ferret reintroduction management areas during the breeding season (March 1 through July 15) will be avoided.
  - All geotechnical activities in prairie dog colonies in active black-footed ferret reintroduction management areas would be located to avoid damaging prairie dog burrows.
  - All work in prairie dog colonies in active black-footed ferret reintroduction management areas will be monitored by a biological monitor to ensure compliance with all applicable conservation measures.
  - Existing access roads in prairie dog colonies in active black-footed ferret reintroduction management areas may be used, but not improved.
- ***Black-footed Ferret Conservation Measure 2***: In active black-footed ferret reintroduction management areas, the transmission line will be located as close as possible to existing and other planned high-voltage transmission lines.
- ***Black-footed Ferret Conservation Measure 3***: The local BLM field office will be notified 10 to 20 days prior to the initiation of construction activities in active black-footed ferret reintroduction management areas.
- ***Black-footed Ferret Conservation Measure 4:*** Vehicle activities will be restricted to daylight hours in occupied black-footed ferret habitat, to minimize the risk of vehicle collision.
- ***Black-footed Ferret Conservation Measure 5:*** Disruptive activities within 0.5 mile of prairie dog colonies in active black-footed ferret reintroduction management areas will be conducted outside the reproductive period (March 1 through July 15), with special emphasis on avoiding the period between birthing and the emergence of young (May 1 through July 15).

4.4.1.4 Residual Effects

Implementation of Black-footed Ferret Conservation Measures 1, 4, and 5 will minimize the greatest threats to this species posed by the Project. However, vehicles and machinery may create a threat to individual black-footed ferrets during construction and maintenance activities. Implementation of Black-footed Ferret Conservation Measure 2 will reduce the effect of increased perching sites for raptors in areas where the Project can be colocated with existing and planned transmission lines. Where the proposed agency-preferred route is not parallel to existing transmission lines, construction of the Project may reduce both black-footed ferret survival and prairie dog density by facilitating raptor predation.

4.4.1.5 Determination

Effect on Species

The Project is not likely to jeopardize the survival or recovery of the black-footed ferret. However, the Project may affect the black-footed ferret.

Effect on Designated Critical Habitat

No critical habitat has been designated for the black-footed ferret.

Rationale

Vehicles and machinery may create a threat to individual black-footed ferrets during construction and maintenance activities. Construction of the Project may reduce black-footed ferret survival and prairie dog density by facilitating raptor predation, especially where the Project is not parallel to existing transmission lines. Implementation of black-footed ferret conservation measures will minimize the threats of vehicles, machinery, and increased predation posed by the Project.

4.4.1.6 Cumulative Effects

Black-footed ferret habitat in the Northwestern Colorado/Northeastern Utah Black-footed Ferret ExPA in the vicinity of the Project area is located almost entirely on federal lands. Black-footed ferret habitat in the Shirley Basin/Medicine Bow Management Area is located on checkerboard lands, alternating between BLM and private lands. The black-footed ferret reintroduction effort in the Shirley Basin/Medicine Bow Management Area has been ongoing with federal and private cooperation since 1991 (56 FR 41473-41490). Although there is no specific information on planned actions near the Project area that could affect black-footed ferrets on private lands, activities such as oil and gas development or prairie dog control may take place in the future.

4.4.2 Canada Lynx

4.4.2.1 Status of the Species in the Study Area

Colorado Parks and Wildlife reintroduced lynx in Colorado from 1999 to 2006. A predictive map of lynx habitat use in Colorado indicates lynx could occupy habitats east of the Project area in the Routt and White River National Forests (Colorado Parks and Wildlife 2012; Map 9, Appendix A). Both national forests are located in the Project area but are not directly crossed by the agency-preferred route. Additionally, some individual lynx dispersed for long distances, sometimes away from suitable habitat, following their release in Colorado. However, these individuals do not represent typical habitat use or the current range of the species.

The natural Canada lynx population in Utah has likely been extirpated. Released Canada lynx have been tracked dispersing across northern Utah in the high Uinta Mountains, but none are known to have remained permanently in Utah (UDWR 2005b). Lynx habitat blocks in Utah are considered peripheral areas, which are defined as areas that contain few verified historical or recent records of lynx. The quality and quantity of habitat to support adequate snowshoe hare or lynx populations are questionable, but the areas may sustain short-term survival during lynx dispersal (FWS 2005a).The Uinta-Wasatch-Cache National Forest contains designated Canada lynx analysis units and linkage areas, though no Canada lynx are known to be found there (Jorgensen 2013). The USFS announced that Canada lynx hair was found in the Manti-La Sal National Forest in 2002 south of the Project area (UDWR 2005b); though no Canada lynx have been reported since.

4.4.2.2 Potential Effects of the Project

The agency-preferred route does not cross any areas known or likely to be occupied by resident Canada lynx. However, the agency-preferred route crosses intermountain valleys that may be used by dispersing Canada lynx. If Canada lynx disperse through the Project area, human presence, noise, and vehicle use associated with Project preconstruction, construction, operations, and maintenance activities could increase the potential for disturbance and vehicle mortality to Canada lynx (refer to Table 1-2 for detailed information regarding anticipated Project activities). Canada lynx typically avoid areas with high levels of human activity (Bates and Jones 2007), and are susceptible to vehicle mortality when dispersing (Devineau et al. 2010). Effects on dispersing Canada lynx would be greatest during the construction phases of the Project, when human presence, noise, and vehicle use would be substantially greater than other phases of the Project. Effects from construction activities may persist for up to 3 years, the anticipated duration of Project construction. Following construction, effects would be limited to periodic disturbance and noise associated with vehicle use and human presence during maintenance and operation activities, including inspections, repairs, and vegetation management.

Dispersal through the Project area from the existing population in the Greater Yellowstone area or the reintroduced population in Colorado would be anticipated to follow pathways that minimize human interaction and remain at high elevations, such as by following the Wind River Range, Ferris Mountains, and the Snowy Range in Wyoming, or traveling through the Wasatch and Uinta Mountains in Utah. While habitat selection during dispersal is not understood in detail, Canada lynx appear to avoid open areas when possible (Squires et al. 2013).

Although Canada lynx reintroduced into Colorado displayed unpredictable, exploratory movements and often disperse away from suitable habitat, movement was still often centered on high-elevation corridors (Devineau et al. 2010). The Lynx Conservation Assessment and Strategy recommends preserving riparian corridors and contiguous forested habitat on ridgelines to maintain connectivity between occupied habitat patches (Interagency Lynx Biology Team 2013). Construction and safe operation of the Project will require vegetation clearing in the right-of-way. Although open areas may be avoided by Canada lynx, no information is available to quantify or predict locations where or whether the Project may measurably alter Canada lynx behavior during dispersal.

4.4.2.3 Conservation Measures

No conservation measures are proposed specifically for the Canada lynx. Conservation measures were developed for core areas and secondary/peripheral areas in the Lynx Conservation Assessment and Strategy (Interagency Lynx Biology Team 2013), but these areas are located outside of the Project area. The unpredictable potential for Canada lynx existence in the Project area precludes the application of conservation measures in any specific location for the species.

4.4.2.4 Residual Effects

The effect of disturbance on Canada lynx individuals from human presence and heavy equipment operation is assumed to be discountable. The likelihood of dispersing Canada lynx encountering construction or maintenance activities is likely to be extremely low given the low rates of dispersal through the Project area. The effect of habitat alteration on dispersal is assumed to be insignificant. Successful dispersal between mountain ranges in the Project area typically requires Canada lynx to travel across many miles of open vegetation, such as sagebrush or grasslands. The low-growing vegetation maintained in the 250-foot width of the right-of-way is not anticipated to be a measureable barrier to Canada lynx movement.

4.4.2.5 Determination

Effect on Species

The Project may affect, but is not likely to adversely affect, the Canada lynx.

Effect on Designated Critical Habitat

The Project will not affect designated critical habitat for the Canada lynx. No designated critical habitat for this species is present in the Project area.

4.4.2.6 Cumulative Effects

Cumulative effects are not required to be assessed for species that are not likely to be adversely affected by the Project.

4.4.3 Gray Wolf

4.4.3.1 Status of the Species in the Study Area

There are currently no known resident gray wolves in Utah or Colorado, although sightings are reported anecdotally on occasion. In the summer of 2014, a single male gray wolf originating in northern Idaho dispersed through the Uinta Mountains in Utah, although its tracking collar failed and its current location is unknown (Prettyman 2014a). A single female gray wolf dispersed from Wyoming to the Grand Canyon in 2014 and was subsequently shot by a hunter near Beaver, Utah (Prettyman 2014b). Near the Project area in 2003, a single gray wolf was reported near Baggs, Wyoming. This wolf was a confirmed identification by Wyoming Game and Fish Department biologists; however, an exact location is not known.

4.4.3.2 Potential Effects of the Project

The agency-preferred route does not cross any areas known or likely to be occupied by resident gray wolves. However, the agency-preferred route crosses intermountain valleys that may be used by dispersing gray wolves. Although climate and vegetation can constrain gray wolf dispersal at some scales (Geffen et al. 2004), and management to reduce human-wolf conflicts also may limit their use of intermountain valleys, individuals from a recovering gray wolf population may cross the Project area during long-distance movements.

Gray wolves crossing through the Project area may be exposed to three primary potential effects: (1) the direct effect of construction and maintenance activities may cause dispersing gray wolves to avoid the vicinity of active work; (2) direct mortality to dispersing gray wolf from increased vehicle use associated with construction and maintenance activities; and (3) the indirect effect of the presence of new access

roads created for Project construction could affect gray wolf behavior during dispersal for the life of the Project through road use by recreational and other non-Project traffic.

Direct effects on dispersing gray wolves would be greatest during the construction phases of the Project, when human presence, noise, and vehicle use would be substantially greater than other phases of the Project (refer to Table 1-2 for detailed information regarding anticipated Project activities). Effects from construction activities may persist for up to 3 years, the anticipated duration of Project construction. Following construction, effects would be limited to periodic disturbance and noise associated with vehicle use and human presence during maintenance and operation activities including inspections, repairs, and vegetation management, and the indirect effects of avoidance of new access roads created for the Project.

Gray wolves have recently been demonstrated to cross through the Project area while dispersing, but specific areas cannot be identified where dispersal is most likely. However, dispersal south towards the Project area from the existing population in the Greater Yellowstone area would be anticipated to follow pathways that minimize human interaction, by either following the Wind River Range and Ferris Mountains towards the Snowy Range, or traveling through the Wasatch and Uinta Mountains. Longer dispersals crossing low-elevation habitat also may occur, although prey availability would be lower and human presence would be higher in most areas. All dispersal routes that may cross through the Project area would require crossing multiple State or Interstate highways.

4.4.3.3 Conservation Measures

No conservation measures are proposed specifically for the gray wolf. However, general conservation measures that minimize ground disturbance and vegetation clearing in the right-of-way also may minimize avoidance of the right-of-way by dispersing gray wolves.

4.4.3.4 Residual Effects

The effect of disturbance from human presence, heavy equipment operation, recreational activities, vehicle travel, and hunting is assumed to be discountable due to the low rates of dispersal of gray wolves through the Project area.

4.4.3.5 Determination

Effect on Species

The Project may affect, but is not likely to adversely affect, the gray wolf.

Effect on Designated Critical Habitat

No critical habitat has been designated for the gray wolf.

4.4.3.6 Cumulative Effects

Cumulative effects are not required to be assessed for species that are not likely to be adversely affected by the Project.

4.5 Plants

4.5.1 Clay Phacelia

4.5.1.1 Status of the Species in the Project Area

All known clay phacelia locations and reintroduction sites are found from between 0.5 to 1.2 miles from the centerline of the agency-preferred route in Spanish Fork Canyon in Utah County, Utah (UNHP 2012). Two of the know locations (the Water Hollow and Clear Creek sites), as well as some reintroduction sites, occur within a 7-mile stretch on colluvial hill slopes to the northeast of U.S. Highway 6 and the Denver and Rio Grand railroad and southwest of the centerline of the agency-preferred route. The Tie Fork reintroduction sites are located to the northeast of U.S. Highway 6 and the agency-preferred route.

Clay phacelia is a biennial species and populations vary and require yearly surveys to accurately represent the total number of individuals. In general, population counts range from 100 to 400 individuals (FWS, 2013d). Clay phacelia's rarity, narrow endemism, and restriction to erodible slopes make it particularly sensitive to disturbance.

Approximately 1,348 acres of clay phacelia potential habitat was modeled by the USFS in the area of known locations in Spanish Fork Canyon in Utah using habitat requirements in published literature (USFS 2013). The model has been desktop reviewed for coherency (containing known occupied habitat; focused, intuitive review of inputs; etc.) but has not been subjected to ground-truthing. Approximately 1 mile of USFS-modeled habitat for clay phacelia is crossed by the agency-preferred route and a large portion of the modeled habitat (1,068 acres) is located within 1 mile of the agency-preferred route (Maps 10 and 10b, Appendix A). In addition, 34.5 acres of modeled habitat is present in the proposed right-of-way.

4.5.1.2 Potential Effects of the Project

Based on estimates of disturbance per mile of transmission-line construction, approximately 20 acres (1.5 percent) of clay phacelia modeled potential habitat will be affected by the construction of the transmission-line structures, access roads inside and outside of the right-of-way, and other potential Project facilities. A more detailed description of the methods used to calculate acreages of disturbances can be found in Section 2.4.

All known occupied habitat and existing sites, reintroduced or otherwise, would be avoided and would not be directly affected by the Project as these areas are separated from the agency-preferred route by a distance of between 0.5 and 1.2 miles and by varied topography. Indirect impacts from dust production as a result of Project activities could affect clay phacelia individuals if dust production occurs in proximity of plants, as dust deposition inhibits photosynthetic ability, reproductive ability, and various metabolic processes of individuals.

Preconstruction, construction, operation, and maintenance activities for the Project will be required in areas of modeled potential clay phacelia habitat (refer to Table 1-2 for detailed information regarding anticipated Project activities). Preconstruction activities will include geotechnical surveys and species presence surveys, which will involve overland vehicle access (restricted to routes designated in the POD) or foot traffic. Construction activities in modeled potential clay phacelia habitat will consist of access road improvement and construction, access and spur road travel and overland vehicle travel by heavy machinery, construction site preparation, excavation and potential blasting, drilling of concrete piers, heavy equipment use, and cleanup and site reclamation. These activities will require vegetation clearing, land-forming activities (grading, recontouring, and cut-and-fill landform manipulations), drive-and-crush of existing vegetation during temporary site access, piling of soil material, human foot-traffic, and

recontouring and seeding during reclamation. Project operation activities will consist of routine inspections and operation of transmission line, substations, and series compensation stations. These activities will require access-road use by inspection vehicles. Potential maintenance activities in modeled potential clay phacelia habitat will consist of access road maintenance and right-of-way vegetation maintenance. These activities will require overland travel, access-road use by operation vehicles, and potential herbicide use.

Clay phacelia modeled potential habitat may be affected as a result of these activities. Vegetation clearing and land-forming activities will result in a direct loss of modeled potential habitat and fragmentation and reduction in connectivity between areas of modeled potential habitat. Overland vehicle traffic, foot traffic, crushing of existing vegetation, and soil disturbance due to temporary site access could result in habitat degradation through changes in vegetation composition, possible introduction of noxious weeds, and the creation of soil conditions that facilitate the colonization and spread of noxious weeds. If noxious weeds are introduced into active sites, competition with weeds could limit water, nutrient, and space resource availabilities leading to reduced plant vigor and germination success rates.

4.5.1.3 Conservation Measures

The BLM will require collection of site-specific information along the agency-preferred route as to the species actual occurrence (presence/absence), and for implementation of conservation measures for specific sites where plants or populations are found. The BLM believes this approach will allow complete avoidance of occupied clay phacelia habitat and direct and indirect disturbance to clay phacelia populations (active and inactive). The following Project-related conservation measures will minimize effects on clay phacelia due to potential impacts of the Project as identified in Section 4.6.1.2:

- ***Clay Phacelia Conservation Measure 1:*** A field habitat assessment would be conducted prior to final engineering and design to ground-truth the August 2013 USFS-suitable habitat model and determine presence of suitable habitat within a 650-buffer surrounding modeled habitat where this area is traversed by the proposed right-of-way or has potential to be affected by other project-related disturbance (i.e., geotechnical investigations, access roads, fly yards). Habitat assessments may occur any time as long as there is no snow cover. Suitable habitat parameters developed by the FWS (Appendix E) will be used to assess habitat suitability.
- ***Clay Phacelia Conservation Measure 2:*** Following habitat assessments, all suitable habitat (including field-verified suitable habitat identified in both modeled habitat and areas of suitable habitat outside of the modeled habitat) within 650 feet of either side of the right-of-way and other areas where Project impacts will occur will be 100 percent surveyed by BLM-approved individual(s) prior to final design of the transmission line. Surveys will be conducted in accordance with agency-approved methods and protocols.
- ***Clay Phacelia Conservation Measure 3:*** All occupied sites, including occupied habitat identified during field surveys, will be avoided by Project activities inside and outside the right-of-way (including structures, facilities, new roads, upgrades to existing roads, and overland vehicle traffic) by at least 650 feet.
- ***Clay Phacelia Conservation Measure 4:*** For any activities associated with the geotechnical investigation the following requirements apply:
    - All work within 650 feet of occupied clay phacelia habitat will be moved or abandoned.
    - All work within 650 feet of suitable habitat will be monitored by a biological monitor to ensure compliance with all applicable conservation measures.
    - Existing access roads within 650 feet of suitable clay phacelia habitat may be used, but not improved.

- ***Clay Phacelia Conservation Measure 5:*** Appropriate erosion control measures (e.g., silt fence, straw wattles) will be constructed where disturbance occurs within 650 feet of suitable habitat or if such measures are needed to prevent sedimentation or dust deposition in suitable or occupied habitat.
- ***Clay Phacelia Conservation Measure 6:*** A qualified, BLM-approved botanist will be onsite to monitor surface-disturbing activities when clay phacelia suitable habitat is within 650 feet of any surface-disturbing activities. In addition to ensuring compliance with all applicable conservation measures, the botanist also will:
  - Make areas for avoidance visually identifiable in the field (e.g., flagging, temporary fencing, rebar, etc.) before and during construction
  - Provide the FWS and BLM with a post-construction report of compliance, impacts, and extent of impacts on clay phacelia
- ***Clay Phacelia Conservation Measure 7:*** Only water (no chemicals, reclaimed production water or other) will be used for dust abatement measures in occupied clay phacelia habitat.
- ***Clay Phacelia Conservation Measure 8:*** Dust abatement will be employed during maintenance activities in modeled suitable clay phacelia habitat over the life of the Project during the time of the year when the plant is most vulnerable to dust-related impacts (March through August).
- ***Clay Phacelia Conservation Measure 9:*** The following restrictions apply to herbicide use in suitable or occupied clay phacelia habitat:
  - No aerial or broadcast herbicide treatments will be applied for vegetation management within 2,500 feet of suitable or occupied clay phacelia habitat.
  - For noxious weed control within 2,500 feet of suitable or occupied clay phacelia habitat, manual spot treatments (i.e. backpack sprayers) shall be used.
  - All those involved in the herbicide application shall be accompanied by a qualified botanist/ecologist familiar with clay phacelia to help herbicide applicators identify clay phacelia and avoid impacts on individual plants.
  - Treatments would not be done when wind speeds exceed 6 miles per hour.
  - Drift reducing agents shall be used when practical.
  - A reduced application rate would be used.
  - Pump pressure would be reduced, per label instructions.
  - Droplet size would be increased to the largest size possible while still effectively covering the target vegetation. This could be accomplished using larger nozzles or reduced pressure.
  - Herbicides shall be stored in spill proof containers away from special status plant habitats.
- ***Clay Phacelia Conservation Measure 10:*** Upgrades to existing access roads in suitable habitat will be limited such that it has minimal impact on clay phacelia habitat, eliminates the need to construct a new road, or is necessary for safety.
- ***Clay Phacelia Conservation Measure 11***: Surface reclamation will occur for any Project-related ground-disturbing activity. The method of reclamation will normally consist of, but is not limited to, salvaging, segregating and restoring topsoil, returning disturbed areas back to their natural contour, reseeding using seed mixes developed in coordination with the BLM, USFS, and FWS botanists, installing cross drains for erosion control, placing water bars in the road, and filling ditches.

4.5.1.4 Residual Effects

Through implementation of Clay Phacelia Conservation Measures 1 through 11, the BLM anticipates that all occupied sites for clay phacelia can be avoided by the 650-foot buffer. These conservation measures will minimize the greatest threats to clay phacelia (i.e., direct loss of individuals and occupied habitat) posed by the Project.

Due to the amount of modeled suitable habitat in areas crossed by the transmission line, complete avoidance of modeled suitable habitat is not feasible and an estimated 20 acres (1.5 percent) of modeled clay phacelia habitat would be subject to disturbance due to Project activities. The agency-preferred route is parallel to several existing high-voltage transmission lines in the area where modeled clay phacelia habitat would be crossed. Existing access roads provide operation and maintenance access to these existing transmission lines. The use of existing access roads to construct the new transmission line to the extent feasible should minimize the amount of new disturbance required to construct the new transmission line in modeled clay phacelia potential habitat.

Dust from construction activities and vehicle travel in modeled habitat is unlikely to affect clay phacelia individuals as all known individuals and reintroduction sites are between 0.5 to 1.2 miles from the centerline of the agency-preferred route, and Clay Phacelia Conservation Measure 8 will require dust abatement during the time of the year when the plant is most vulnerable to dust-related impacts.

4.5.1.5 Determination

Effect on Species

The Project may affect, but is not likely to adversely affect, clay phacelia.

Effect on Designated Critical Habitat

No critical habitat has been designated for clay phacelia.

Rationale

Direct effects on clay phacelia are anticipated to be discountable as the Project would be required to avoid all occupied habitat by at least 650 feet. Furthermore, Clay Phacelia Conservation Measures 3, 7, 8, and 9 should limit indirect impacts on clay phacelia from erosion, sediment deposition, noxious weed invasion, or herbicide drift from noxious weed control to insignificant levels. Modeled potentially suitable habitat will be unavoidable and disturbance in modeled habitat would occur. However, the amount of modeled habitat that would be affected is minor in relation to the amount of habitat that has been modeled (1.5 percent), and any activities in field-verified habitat would be undertaken with FWS coordination. Based on the minor amounts of modeled habitat affected and FWS involvement, indirect and direct effects on clay phacelia resulting from Project activities in modeled habitat are expected to be insignificant. Clay Phacelia Conservation Measures 6, 10, and 11 would minimize any potential impacts on field-verified habitat and maintain the FWS's abilities to recover clay phacelia.

4.5.1.6 Cumulative Effects

Cumulative effects are not required to be assessed for species that are not likely to be adversely affected by the Project.

4.5.2 Clay Reed-mustard

4.5.2.1 Status of the Species in the Project Area

The centerline of the agency-preferred route (Link U400) crosses in the mapped boundary of the King's Bottom population of clay reed-mustard in the area east of the crossing of the Green River (FWS 2011d) (Maps 10 and 10a, Appendix A). Several known locations of clay reed-mustard are located on steep slopes less than 0.2 miles from the agency-preferred route centerline in this area. Moon Bottom Road, parts of which may be used for Project access during construction, operation, and maintenance phases, is found partially in the boundaries of the King's Bottom population (Map 10a, Appendix A) and crosses approximately 0.3 mile upslope of known clay reed-mustard locations. The boundary of the Ray's Bottom population of clay reed-mustard is approximately 0.1 mile south of the centerline of the agency-preferred route (Link U400) (Map10a), with known locations being approximately 0.4 mile south of the centerline (FWS 2011d). The centerline also crosses approximately 4 miles of potential habitat for this species outside the extent of these populations (Map 10a).

4.5.2.2 Potential Effects of the Project

Based on estimates of disturbance per mile of Project construction, 75 acres of clay reed-mustard potential habitat will be affected by the construction of the transmission-line structures, access roads inside and outside of the right-of-way, and other potential Project facilities. A more detailed description of the methods used to calculate acreages of disturbances can be found in Section 2.4. Project preconstruction, construction, operation, and maintenance activities will be required in the boundaries of the King's Bottom population and approximately 0.2 mile from plants of this population (refer to Table 1-2 for detailed information regarding anticipated Project activities). Individuals are located on highly erodible, extremely steep slopes above the Green River. These slopes generally are avoided as siting locations for transmission-line structures and access roads due to their slope angle; however, plants could be susceptible to impacts from upslope activities. Preconstruction activities will include geotechnical surveys and species presence surveys, which will involve overland vehicle access (restricted to routes designated in the POD) or foot traffic. Construction activities upslope of these locations could consist of access road improvement (Moon Bottom Road) and construction, access and spur road travel and overland vehicle travel by heavy machinery, construction site preparation, excavation and potential blasting, drilling of concrete piers, heavy equipment use, and cleanup and site reclamation. These activities could require vegetation clearing, land-forming activities (grading, recontouring, and cut-and-fill landform manipulations), drive-and-crush of existing vegetation during temporary site access, and recontouring and seeding during reclamation. Project operation activities will consist of routine inspections and operation of the transmission line, substations, and series compensation stations. These activities will require access-road use by inspection vehicles. Potential maintenance activities will consist of access road maintenance and right-of-way vegetation maintenance, which will require overland travel, access-road use by operation vehicles, and herbicide use.

Clay reed-mustard individuals and habitat may be affected as a result of these activities. Vegetation clearing and land-forming activities could result in a direct loss of suitable habitat and fragmentation and reduction in connectivity between areas of suitable habitat. Overland vehicle traffic, foot traffic, crushing of existing vegetation, and soil disturbance due to temporary site access could result in habitat degradation through vegetation composition changes, possible introduction of noxious weeds, and the creation of soil conditions that facilitate the colonization and spread of noxious weeds. Upslope activities could result in erosion that directly buries clay reed-mustard individuals or negatively affects habitat. Any activities that alter topography or disturb soils could affect existing plants if located downslope of activities. Alterations to runoff patterns and increased erosion potential increase the likelihood of burial or loss of plants during extreme precipitation events. Dust production as a result of Project activities also may affect clay reed-mustard individuals at existing sites, as dust deposition inhibits photosynthetic

ability, reproductive ability, and various metabolic processes of individual plants. The use of herbicide during Project maintenance activities could result in impacts on clay reed-mustard individuals due to herbicide drift. Degradation of habitat in areas near existing clay reed-mustard sites may decrease the attractiveness of these areas to pollinator species, which could result in reduction of pollinator visits to clay reed-mustard individuals and reduced fecundity.

4.5.2.3 Conservation Measures

The following conservation measures detailing avoidance and minimization methods have been developed by the BLM and FWS for actions in and adjacent to clay reed-mustard habitat and populations.

- ***Clay Reed-mustard Conservation Measure 1*:** Pre-project habitat assessments will be completed across 100 percent of the disturbance area in FWS-mapped potential habitat prior to any ground-disturbing activities to determine if suitable clay reed-mustard habitat is present.
- ***Clay Reed-mustard Conservation Measure 2*:** Site inventories will be conducted in suitable habitat (defined as areas which contain or exhibit the specific components or constituents necessary for plant persistence; determined by field inspection and/or surveys; may or may not contain clay reed-mustard) to determine occupancy. Where standard surveys are technically infeasible and otherwise hazardous due to topography, slope, etc., suitable habitat will be assessed and mapped for avoidance (hereafter, avoidance areas); in such cases, 300-foot buffers will be maintained between surface disturbance and avoidance areas. However, site-specific distances will need to be approved by the FWS and BLM whenever disturbance will occur upslope of habitat. Where conditions allow, inventories:
  - Must be conducted by qualified, BLM-approved individual(s) and according to BLM- and FWS-accepted survey protocols.
  - Will be conducted in suitable and occupied habitat for all areas proposed for surface disturbance prior to initiation of Project activities and in the same growing season at a time when the plant can be detected (usually May 1 to June 5, in the Uinta Basin; however, surveyors will verify that the plant is flowering by contacting a BLM or FWS botanist or demonstrating that the nearest known population is in flower).
  - Will occur within 300 feet of Project-related disturbance.
  - Will include, but not be limited to, plant species lists and habitat characteristics.
  - Will be valid until May 1 of the following year.
- ***Clay Reed-mustard Conservation Measure 3:*** For any activities associated with the geotechnical investigation the following requirements apply:
  - All work within 300 feet of occupied clay reed-mustard habitat will be moved or abandoned
  - All work within 300 feet of suitable habitat will be monitored by a biological monitor to ensure compliance with all applicable conservation measures
  - Existing access roads within 300 feet of suitable clay reed-mustard habitat may be used, but not improved
- ***Clay Reed-mustard Conservation Measure 4:*** Project infrastructure will be designed to minimize impacts in suitable habitat. This will include the following considerations:
  - Where standard surveys are technically infeasible, infrastructure and activities will avoid all suitable habitat by 300 feet. However, site-specific distances will need to be approved by the FWS and BLM when disturbance will occur upslope of habitat.
  - New access route creation will be limited.

- Roads and utilities will share common right-of-ways where possible.
- The width of roads will be reduced and the depth of excavation needed for the road bed will be minimized; where feasible, the natural ground surface will be used for roads in suitable habitat.
- Signing will be placed to limit off-road travel in sensitive areas.
- Activities will be constrained to designated routes and other cleared/approved areas.

- ***Clay Reed-mustard Conservation Measure 5:*** Project-related surface disturbance will avoid all occupied habitat by 300 feet. Project infrastructure will be designed to avoid direct disturbance and minimize indirect impacts on populations and to individual plants. This will include the following considerations:
  - To avoid water flow and/or sedimentation into occupied habitat and avoidance areas, silt fences, hay bales, and similar structures or practices will be incorporated into Project design; appropriate placement of fill is encouraged.
- ***Clay Reed-mustard Conservation Measure 6:*** A qualified, BLM-approved biologist or botanist must be onsite preconstruction to clearly mark or flag avoidance areas so they are visible during construction. Qualified personnel also will be present during construction to monitor avoidance of these areas. A post-construction report documenting compliance and noncompliance with these measures will be prepared by the qualified personnel and submitted to the FWS.
- ***Clay Reed-mustard Conservation Measure 7:*** Dust abatement will occur during the peak flowering season (April through May) and only water will be used within 300 feet of suitable habitat.
- ***Clay Reed-mustard Conservation Measure 8:*** The following restrictions apply to herbicide use in suitable or occupied clay reed-mustard habitat:
  - No aerial or broadcast herbicide treatments will be applied for vegetation management within 2,500 feet of suitable or occupied clay reed-mustard habitat.
  - For noxious weed control within 2,500 feet of suitable or occupied clay reed-mustard habitat, manual spot treatments (i.e. backpack sprayers) shall be used.
  - All those involved in the herbicide application shall be accompanied by a qualified botanist/ecologist familiar with clay reed-mustard to help herbicide applicators identify reed-mustard and avoid impacts on individual plants.
  - Treatments would not be done when wind speeds exceed 6 miles per hour.
  - Drift reducing agents shall be used when practical.
  - A reduced application rate would be used.
  - Pump pressure would be reduced, per label instructions.
  - Droplet size would be increased to the largest size possible while still effectively covering the target vegetation. This could be accomplished using larger nozzles or reduced pressure.
  - Herbicides shall be stored in spill proof containers away from special status plant habitats.

4.5.2.4 Residual Effects

Through implementation of Clay Reed-Mustard Conservation Measures 1 through 6, the BLM anticipates that all clay reed-mustard individuals and occupied sites can be avoided by at least 300 feet. These conservation measures will minimize potential direct impacts on clay reed-mustard (i.e., direct loss of

individuals and occupied habitat). Clay Reed-Mustard Conservation Measures 4 through 8 would minimize the indirect effects of dust, erosion, and herbicide drift on this species to insignificant levels.

4.5.2.5 Determination

Effect on Species

The Project may affect, but is not likely to adversely affect, clay reed-mustard.

Effect on Designated Critical Habitat

No critical habitat has been designated for clay reed-mustard.

Rationale

No direct effects on clay reed-mustard are anticipated as the Project is expected to avoid all occupied habitat. Any potential indirect effects from dust deposition or erosion should be minimized to insignificant levels through Clay Reed-Mustard Conservation Measures 4 through 8.

4.5.2.6 Cumulative Effects

Cumulative effects are not required to be assessed for species that are not likely to be adversely affected by the Project.

4.5.3 Deseret Milkvetch

4.5.3.1 Status of the Species in the Project Area

Occupied habitat and locations of Deseret milkvetch are found from between approximately 0.3 to 1.3 miles east of the centerline of the agency-preferred route (Link U621) in Thistle Creek Valley near the town of Birdseye (UDWR 2005a) (Map 10 and 10c, Appendix A). These locations and occupied habitat comprise the only known population of Deseret milkvetch. The proposed route in this area is higher in elevation than habitat and locations of this species but is not immediately upslope of these areas. Occupied habitat for Deseret milkvetch is not directly crossed by the transmission-line centerline; however, occupied habitat is located immediately adjacent to an existing road on UDWR property (Blind Canyon Road) (Map 10c).

4.5.3.2 Potential Effects of the Project

The agency-preferred route does not cross populations or occupied habitat for Deseret milkvetch and, therefore, direct impacts on this species from construction are not expected (refer to Table 1-2 for detailed information regarding anticipated Project activities). Blind Canyon Road, which is located immediately adjacent to occupied Deseret milkvetch habitat, will not be used for access during the construction, maintenance, and monitoring phases of the Project. Project access routes will be determined during final engineering design of the transmission line and preparation of the POD.

Though the closest habitats and populations of Deseret milkvetch are approximately 0.3 mile from the centerline of the agency-preferred route in this area, Project activities in higher elevation areas in proximity to occupied Deseret milkvetch habitat could affect this species if appropriate measures are not implemented. Preconstruction activities in proximity to these areas will include geotechnical surveys and species presence surveys, which will involve overland vehicle access (restricted to routes designated in

the POD) or foot traffic. Construction activities will consist of access road improvement and construction, access and spur road travel and overland vehicle travel by heavy machinery, construction site preparation, excavation and potential blasting, drilling of concrete piers, heavy equipment use, and cleanup and site reclamation. These activities will require vegetation clearing, land-forming activities (grading, recontouring, and cut-and-fill landform manipulations), drive-and-crush of existing vegetation during temporary site access, piling of soil material, human foot-traffic, and seeding for reclamation. Project operation activities will consist of routine inspections and operation of transmission line, substations, and series compensation stations. These activities will require overland travel and access-road use by inspection vehicles. Potential maintenance activities will consist of access road maintenance and right-of-way vegetation maintenance. These activities will require overland travel, access-road use by operation vehicles, and herbicide use.

Loss of vegetation cover and soil disturbance in adjacent areas could result in alterations to runoff patterns, which may cause soil or other material to be washed downhill during extreme precipitation events and the subsequent burial of individual plants or suitable habitat. Dust production as a result of Project activities also may affect Deseret milkvetch individuals at existing sites, as dust deposition inhibits photosynthetic ability, reproductive ability, and various metabolic processes of individual plants. The use of herbicide during Project maintenance activities could result in impacts on Deseret milkvetch individuals due to herbicide drift. Degradation of habitat in areas near Deseret milkvetch occupied habitat may decrease the attractiveness of these areas to pollinator species, which could result in reduction of pollinator visits and reduced fecundity.

4.5.3.3 Conservation Measures

The following conservation measures detailing avoidance and minimization methods have been developed by the BLM and FWS for actions in and adjacent to Deseret milkvetch habitat and populations.

- ***Deseret Milkvetch Conservation Measure 1:*** Focused-intuitive surveys will be conducted along the proposed right-of-way to identify and survey any previously unidentified areas of potentially suitable Deseret milkvetch habitat. Surveys will occur in all areas of potentially suitable habitat. Potentially suitable habitat will be identified based on a geographic information system (GIS) exercise to identify survey areas prepared by the BLM and Proponent coordination with the FWS Utah Field Office. The GIS exercise will help identify habitats that may be suitable for the species on west through south aspects of the Moroni formation. The identification of suitable habitat will be refined by review of aerial imagery and bounded by the Section 7 consultation boundary provided by the FWS. Suitable habitat parameters developed by the FWS (Appendix E) will be used to identify appropriate survey areas.
- ***Deseret Milkvetch Conservation Measure 2:*** If the Project can avoid all suitable habitat (as documented during the focused-intuitive surveys) and occupied habitat (as documented) within a 300-foot buffer, no surveys are necessary. If avoidance of suitable habitat is not possible, surveys will be performed within 300 feet of the Project area to determine occupancy prior to construction or 400 feet if upslope of suitable or occupied habitat. If surveys are necessary, they must be performed by qualified, BLM-approved individual(s) and according to FWS-accepted survey protocols. Surveys will be conducted during the flowering and/or fruiting period when the plant can be detected and correctly identified. Surveys will be valid for one calendar year.
- ***Deseret Milkvetch Conservation Measure 3:*** For any activities associated with the geotechnical investigation the following requirements apply:
    - All work within 300 feet (400 feet if upslope) of occupied Deseret milkvetch habitat will be moved or abandoned

- All work within 300 feet of suitable habitat will be monitored by a biological monitor to ensure compliance with all applicable conservation measures
- Existing access roads within 300 feet of suitable Deseret milkvetch habitat may be used, but not improved

- ***Deseret Milkvetch Conservation Measure 4:*** No new development or permanent ground disturbance, including but not limited to poles, pads, towers, etc., will occur within a 300-foot buffer of occupied Deseret milkvetch habitat. If construction activities occur upslope of occupied habitat, the buffer may be increased to 400 feet to prevent additional erosion in the habitat.
- ***Deseret Milkvetch Conservation Measure 5:*** Wire will be strung between towers aerially with no ground disturbance in field-verified habitat or within 300 feet of occupied Deseret milkvetch habitat.
- ***Deseret Milkvetch Conservation Measure 6:*** No new roads will be established within a 300-foot buffer of occupied Deseret milkvetch habitat. If construction activities occur upslope of occupied habitat, the buffer may be increased to 400 feet to prevent additional erosion in the habitat. Existing access roads will be used to the extent practicable to limit additional fragmentation in the species' habitat from new road development that avoid occupied habitat.
- ***Deseret Milkvetch Conservation Measure 7:*** The existing access road to the north of Birdseye that connects to Blind Canyon Road contains plants alongside the road and within 300 feet of the road edge. This road will not be used for any Project-related activities.
- ***Deseret Milkvetch Conservation Measure 8:*** A qualified, BLM-approved biologist or botanist must be onsite preconstruction to clearly mark or flag avoidance areas so they are visible during construction. Qualified personnel also will be present during construction to monitor avoidance of these areas. A post-construction report documenting compliance and noncompliance with these measures will be prepared by the qualified personnel and submitted to the FWS no later than 1 month after construction.
- ***Deseret Milkvetch Conservation Measure 9:*** After construction, the Project will provide a GIS shapefile or documentation of new and upgraded access routes to the appropriate emergency fire operations personnel with the State of Utah, BLM, USFS, and FWS, as well as notification statement that there is an ESA-listed plant species in the area of Birdseye, Utah. This information will be provided no later than 1 year after construction of this specific transmission-line segment.
- ***Deseret Milkvetch Conservation Measure 10:*** No vegetation treatments will be performed within a 300-foot buffer of occupied Deseret milkvetch habitat.
- ***Deseret Milkvetch Conservation Measure 11:*** The following restrictions apply to herbicide use in suitable or occupied Deseret milkvetch habitat:
  - No aerial or broadcast herbicide treatments will be applied for vegetation management within 2,500 feet of suitable or occupied Deseret milkvetch habitat.
  - For noxious weed control within 2,500 feet of suitable or occupied Deseret milkvetch habitat, manual spot treatments (i.e. backpack sprayers) shall be used.
  - All those involved in the herbicide application shall be accompanied by a qualified botanist/ecologist familiar with Deseret milkvetch to help herbicide applicators identify Deseret milkvetch and avoid impacts on individual plants.
  - Treatments would not be done when wind speeds exceed 6 miles per hour.
  - Drift reducing agents shall be used when practical.
  - A reduced application rate would be used.

- Pump pressure would be reduced, per label instructions.
- Droplet size would be increased to the largest size possible while still effectively covering the target vegetation. This could be accomplished using larger nozzles or reduced pressure.
- Herbicides shall be stored in spill proof containers away from special status plant habitats.

4.5.3.4 Residual Effects

Through implementation of Deseret Milkvetch Conservation Measures 1 through 8, the BLM anticipates that new disturbance within 300 feet (or 400 feet if disturbance is upslope) of all Deseret milkvetch individuals and occupied habitat can be avoided. These conservation measures will minimize the greatest threats to Deseret milkvetch (i.e., direct loss of individuals and occupied habitat) posed by the Project to a discountable level. Deseret Milkvetch Conservation Measures 4 through 8, 10, and 11 will minimize indirect effects from dust, erosion, noxious weeds, and herbicide drift to an insignificant level.

4.5.3.5 Determination

Effect on Species

The Project may affect, but is not likely to adversely affect, Deseret milkvetch.

Effect on Designated Critical Habitat

No critical habitat has been designated for Deseret milkvetch.

Rationale

Any direct effects on Deseret milkvetch would be discountable as the Project would be required to avoid all occupied habitat by at least 300 feet. Indirect effects on the species from dust deposition, erosion, noxious weeds, or herbicide applications should be minimized to insignificant levels through Deseret Milkvetch Conservation Measures 4 through 11.

4.5.3.6 Cumulative Effects

Cumulative effects are not required to be assessed for species that are not likely to be adversely affected by the Project.

4.5.4 Shrubby Reed-mustard

4.5.4.1 Status of the Species in the Project Area

Shrubby reed-mustard potential habitat and occupied habitat has been mapped by the BLM in the area south of Link U400 in the Uinta Basin (Maps 10 and 10a, Appendix A). Portions of mapped shrubby reed-mustard potential habitat are located approximately 0.4 miles from the centerline of the agency-preferred route, but no mapped potential habitat is directly crossed by the agency-preferred route centerline. The boundary of the Badlands Cliff population of shrubby reed-mustard is located approximately 0.7 mile southeast of the centerline of the agency-preferred route (Link U400) on moderately steep slopes in the area of the West Tavaputs Plateau, with mapped locations approximately 1.5 miles southeast of the centerline. Wrinkles Road crosses mapped shrubby reed-mustard potential habitat and also crosses within 0.1 mile downslope of the Badlands Cliff population, but this road will not be used for Project access during construction, operation, and maintenance phases.

4.5.4.2 Potential Effects of the Project

The agency-preferred route does not cross known occupied or suitable habitat for shrubby reed-mustard and, therefore, direct impacts on this species are not expected (refer to Table 1-2 for detailed information regarding anticipated Project activities). Wrinkles Road, which is located within 300 feet of the Badlands Cliff population, will not be used for Project access during construction, maintenance, and monitoring of the Project.

Although the center line of the agency-preferred route is at least 0.4 mile from suitable shrubby reed-mustard habitat, Project activities occurring upslope of suitable habitat may affect shrubby reed-mustard, if appropriate measures are not taken. Preconstruction activities in proximity to shrubby reed-mustard habitat will include geotechnical surveys and species presence surveys, which will involve overland vehicle access (restricted to routes designated in the POD) or foot traffic. Construction activities will consist of access road improvement and construction, access and spur road travel and overland vehicle travel by heavy machinery, construction site preparation, excavation and potential blasting, drilling of concrete piers, heavy equipment use, and cleanup and site reclamation. These activities will require vegetation clearing, land-forming activities (grading, recontouring, and cut-and-fill landform manipulations), drive-and-crush of existing vegetation during temporary site access, piling of soil material, human foot-traffic, and seeding for reclamation. Project operation activities will consist of routine inspections and operation of the transmission line, substations, and series compensation stations. These activities will require overland travel and access-road use by inspection vehicles. Potential maintenance activities will consist of access road maintenance and right-of-way vegetation maintenance. These activities will require overland travel, access-road use by operation vehicles, and herbicide use.

Loss of vegetation cover and soil disturbance in adjacent areas could result in alterations to runoff patterns, which may cause soil or other material to be washed downhill during extreme precipitation events and the subsequent burial of individual plants or suitable habitat. Dust production as a result of Project activities also may affect shrubby reed-mustard individuals at existing sites, as dust deposition inhibits photosynthetic ability, reproductive ability, and various metabolic processes of individual plants. The use of herbicide during Project maintenance activities could result in impacts on shrubby reed-mustard individuals due to herbicide drift. Degradation of habitat in areas near shrubby reed-mustard habitat may decrease the attractiveness of these areas to pollinator species, which could result in reduction of pollinator visits and reduced fecundity.

4.5.4.3 Conservation Measures

The following conservation measures will minimize effects on the Badlands Cliff population of shrubby reed-mustard due to potential impacts of the Project as identified in Section 4.5.5.2:

- ***Shrubby Reed-mustard Conservation Measure 1:*** Prior to construction, FWS-mapped potentially suitable habitat within 300 feet of any Project-related activity will be 100 percent surveyed by BLM-approved botanists following appropriate FWS guidelines.
- ***Shrubby Reed-mustard Conservation Measure 2:*** For any activities associated with the geotechnical investigation the following requirements apply:
    - All work within 300 feet of occupied shrubby reed-mustard habitat will be moved or abandoned.
    - All work within 300 feet of suitable habitat will be monitored by a biological monitor to ensure compliance with all applicable conservation measures.
    - Existing access roads within 300 feet of suitable shrubby reed-mustard habitat may be used, but not improved.

- ***Shrubby Reed-mustard Conservation Measure 3:*** New surface disturbance is prohibited within 300 feet of occupied shrubby reed-mustard habitat.
- ***Shrubby Reed-mustard Conservation Measure 4:*** In proximity to suitable habitat, all construction activities will be overseen by a biological monitor to ensure compliance with all applicable conservation measures. The biological monitor will also:
  - Before and during construction, make areas for avoidance visually identifiable in the field (e.g., flagging, temporary fencing, rebar, etc.).
  - Provide the FWS and BLM with a post-construction report of compliance, impacts, and extent of impacts on shrubby reed-mustard.
- ***Shrubby Reed-mustard Conservation Measure 5:*** Wrinkles Road will not be used for any Project-related activities.
- ***Shrubby Reed-mustard Conservation Measure 6:*** Appropriate erosion control measures (silt fencing, hay bales, or other methods) will be taken where Project activities occur within 300 feet upslope of suitable habitat.
- ***Shrubby Reed-mustard Conservation Measure 7:*** The following restrictions apply to herbicide use in suitable or occupied shrubby reed-mustard habitat:
  - No aerial or broadcast herbicide treatments will be applied for vegetation management within 2,500 feet of suitable or occupied shrubby reed-mustard habitat.
  - For noxious weed control within 2,500 feet of suitable or occupied shrubby reed-mustard habitat, manual spot treatments (i.e. backpack sprayers) shall be used.
  - All those involved in the herbicide application shall be accompanied by a qualified botanist/ecologist familiar with shrubby reed-mustard to help herbicide applicators identify shrubby reed-mustard and avoid impacts on individual plants.
  - Treatments would not be done when wind speeds exceed 6 miles per hour.
  - Drift reducing agents shall be used when practical.
  - A reduced application rate would be used.
  - Pump pressure would be reduced, per label instructions.
  - Droplet size would be increased to the largest size possible while still effectively covering the target vegetation. This could be accomplished using larger nozzles or reduced pressure.
  - Herbicides shall be stored in spill proof containers away from special status plant habitats.

4.5.4.4 Residual Effects

Through implementation of Shrubby Reed-Mustard Conservation Measure 1 through 7, the BLM anticipates that new disturbance within 300 feet of all shrubby reed-mustard individuals and occupied habitat can be avoided. These conservation measures will minimize the greatest threats to shrubby reed-mustard (i.e., direct loss of individuals and occupied habitat) posed by the Project and will minimize the effects of dust and other indirect effects on this species to an insignificant level.

4.5.4.5 Determination

Effect on Species

The Project may affect, but is not likely to adversely affect, shrubby reed-mustard.

Effect on Designated Critical Habitat

No critical habitat has been designated for shrubby reed-mustard.

Rationale

No direct effects on shrubby reed-mustard are anticipated as the Project is expected to avoid all occupied habitat. Conservation measures controlling water run-off, requiring dust abatement, and detailing weed control methods should limit any potential effects of the Project from erosion, dust deposition, and herbicide drift on shrubby reed-mustard to an insignificant level.

4.5.4.6 Cumulative Effects

Cumulative effects are not required to be assessed for species that are not likely to be adversely affected by the Project.

4.5.5 Uinta Basin Hookless Cactus

4.5.5.1 Status of the Species in the Project Area

Uinta Basin hookless cactus is found in the central portions of the Project area in Utah (Uintah, Duchesne, and Carbon counties). Most populations and occupied habitat for this species are located on BLM-administered lands, but some also are found on the Ouray National Wildlife Refuge, the Uintah and Ouray Indian Reservation, and private lands. Uinta Basin hookless cactus grows on alluvial river terraces near the confluence of the Green, White, and Duchesne rivers south along the Green River to the vicinity of Sand Wash and the mouth of the Pariette Draw, the Badland Cliffs, and the clay badlands of the Pariette Draw drainage south of Myton, Utah (FWS 1990c).

Uinta Basin hookless cactus potential habitat is defined for the purposes of this analysis as areas in which the FWS requires surveys for this species to be conducted in advance of any Project construction. Level 1 *Sclerocactus* core habitat includes high-density occupied habitat and a 1,312-foot buffer around plants. Level 2 *Sclerocactus* core habitat includes less-densely occupied habitat and a 3,281-foot buffer around plants (FWS n.d.). Both buffer distances allow for pollinator travel between cactus locations (FWS n.d.). Polygons for these core habitat areas will be regarded as *Sclerocactus* occupied habitat for the purpose of this analysis.

The centerline of the agency-preferred route crosses 33.6 miles of potential habitat and 8.5 miles of core areas for Uinta Basin hookless cactus. Core areas crossed by the centerline of the agency-preferred route includes 2.3 miles of the White River and Middle Green Level 1 *Sclerocactus* core areas, and 6.2 miles of the Level 2 *Sclerocactus* core areas identified by FWS (Maps 11 and 11a to 11i, Appendix A).

Several known Uinta Basin hookless cactus populations are located within 1 mile of Links U280, U285, U300, and U400 along Pariette Draw, Nine Mile Canyon, and the Green River, with some locations being immediately adjacent to or within 0.1 mile of the route in these areas. Many roads that could be used for Project access cross through potential habitat, *Sclerocactus* core areas, and within less than 1 mile of known plant locations. Known locations of the species have been identified through surveys largely associated with oil and gas and pipeline development in these areas. Surveys for the Project have not been conducted, though given the amount of habitat crossed and known plant density in core areas, it is likely that cactus will be located in and adjacent to the right-of-way. Additionally, several Uinta Basin hookless cactus individuals that were transplanted as mitigation for previous pipeline projects are known to be located between 0.1 and 0.5 mile of the centerline of the agency-preferred route.

4.5.5.2 Potential Effects of the Project

Based on estimates of disturbance per mile of Project construction, approximately 614 acres of potential habitat, 41 acres of Level 1 *Sclerocactus* core areas, and 111 acres of Level 2 *Sclerocactus* core areas will be affected by construction of the transmission-line structures, access roads inside and outside of the right-of-way, and other potential Project facilities. A more detailed description of the methods used to calculate acreages of disturbances can be found in Section 2.4.

Project construction, operation, and maintenance activities will be required in potential habitat, *Sclerocactus* core areas and in proximity to or overlapping known Uinta Basin hookless cactus locations, including transplant locations (refer to Table 1-2 for detailed information regarding anticipated Project activities). Preconstruction activities in proximity to these areas will include geotechnical investigations and species presence surveys, which will involve overland vehicle access (restricted to routes designated in the POD) or foot traffic. Construction activities in these areas could consist of access road improvement and construction, construction site preparation, construction of Project facilities, and cleanup and site reclamation. These activities could require vegetation clearing, land-forming activities (grading, recontouring, and cut-and-fill landform manipulations), drive-and-crush of existing vegetation during temporary site access, and recontouring and seeding during reclamation. Project operation activities will consist of routine inspections and operation of transmission line, substations, and series compensation stations. These activities will require overland travel and access-road use by inspection vehicles. Potential maintenance activities will consist of access road maintenance and right-of-way vegetation maintenance, which will require overland travel, access-road use by operation vehicles, and herbicide use.

Uinta Basin hookless cactus individuals and habitat will be affected as a result of preconstruction, construction, operation, and maintenance activities. Overland vehicle traffic, foot traffic, crushing of existing vegetation, and soil disturbance due to temporary site access could result in habitat degradation through vegetation composition changes, possible introduction of noxious weeds, and the creation of soil conditions that facilitate the colonization and spread of noxious weeds. Vegetation clearing and land-forming activities will result in a direct loss of suitable habitat and fragmentation and reduction in connectivity between areas of suitable habitat. Construction activities may require the removal and relocation of cactus individuals where located in the construction footprint. Any activities that alter topography or disturb soils could affect existing plants if located downslope of activities. Alterations to runoff patterns and increased erosion potential increase the likelihood of burial or loss of plants during extreme precipitation events. Dust production as a result of Project activities will affect Uinta Basin hookless cactus individuals at existing sites, as dust deposition inhibits photosynthetic ability, reproductive ability, and various metabolic processes of individual plants. The use of herbicide during Project maintenance activities could result in impacts on Uinta Basin hookless cactus individuals due to herbicide drift. Degradation of habitat in areas near existing Uinta Basin hookless cactus sites may decrease the attractiveness of these areas to pollinator species, which could result in reduction of pollinator visits to individuals and reduced fecundity.

4.5.5.3 Conservation Measures

Due to the known density of Uinta Basin hookless cactus individuals in core areas and the length of core areas crossed by the agency-preferred route, it is recognized that it will not be possible to avoid all Uinta Basin hookless cactus individuals through modification of engineering design. The approach presented below demonstrates the Proponent's intent to avoid and minimize impacts on Uinta Basin hookless cactus to the extent feasible and compensate for impacts that are unavoidable. The following Project-related conservation measures will minimize effects on Uinta Basin hookless cactus due to potential impacts of the Project as identified in Section 4.5.6.2:

- ***Uinta Basin Hookless Cactus Conservation Measure 1:*** Surveys for Uinta Basin hookless cactus will be conducted prior to final design of the Project using survey protocols developed for the Project through coordination with the BLM and FWS (Appendix F).
- ***Uinta Basin Hookless Cactus Conservation Measure 2:*** All Uinta Basin hookless cactus transplant sites and study plots will be avoided to the extent possible.
- ***Uinta Basin Hookless Cactus Conservation Measure 3:*** Right-of-way placement within 300 feet of occupied Uinta Basin hookless cactus habitat will be avoided to the extent possible.
- ***Uinta Basin Hookless Cactus Conservation Measure 4:*** For any activities associated with the geotechnical investigation, the following requirements apply:
  - All work requiring Uinta Basin hookless cactus to be transplanted will be moved or abandoned.
  - All work within 300 feet of suitable or occupied habitat will be monitored by a biological monitor to ensure compliance with all applicable conservation measures.
  - Alternative, low-impact geotechnical investigation methods will be used within 300 feet of occupied habitat. These methods could include walk-in or helicopter-assisted drilling and will be subject to BLM and FWS approval.
  - Existing access roads within 300 feet of suitable Uinta Basin hookless cactus habitat may be used, but not improved.
- ***Uinta Basin Hookless Cactus Conservation Measure 5:*** Permanent disturbance will be sited to: (1) maximize the distance from adjacent Uinta Basin hookless cactus, (2) minimize impacts on the maximum number of cacti technically feasible, and (3) minimize the overall surface-disturbance area without compromising safety.
- ***Uinta Basin Hookless Cactus Conservation Measure 6:*** Construction will occur down slope of plants and populations where feasible and avoid concentrating water flows or sediments to plants. Appropriate erosion/sedimentation control measures (i.e., silt fencing, straw wattles) will be used to protect Uinta Basin hookless cactus within 300 feet and downslope or downwind of surface disturbance. Fencing is intended to prevent sedimentation or dust deposition and will be evaluated for effectiveness by a qualified, BLM-approved botanist.
- ***Uinta Basin Hookless Cactus Conservation Measure 7:*** A qualified, BLM-approved botanist will be on-site to flag cacti or avoidance areas, train construction crews on how to avoid cacti, and ensure that construction and activities avoid or minimize damage to habitat when Uinta Basin hookless cactus is within 300 feet of any surface-disturbing activities.
- ***Uinta Basin Hookless Cactus Conservation Measure 8:*** Dust abatement (consisting of water only) will occur during construction where plants are closer than 300 feet to a proposed surface disturbance and during maintenance activities in suitable Uinta Basin hookless cactus habitat over the life of the Project during the time of the year when cactus is most vulnerable to dust-related impacts (March through August).
- ***Uinta Basin Hookless Cactus Conservation Measure 9:*** Ground-disturbing activities will occur outside of the flowering season, typically March 15 to June 30, in Level 1 *Sclerocactus* core habitat as defined by the FWS. This will avoid adverse impacts on *Sclerocactus* reproductive success in high-density occupied habitat related to fugitive dust and pollinator disturbance.
- ***Uinta Basin Hookless Cactus Conservation Measure 10:*** A 15-mile-per-hour speed limit for all construction personnel will be implemented within 300 feet of occupied habitat.

- ***Uinta Basin Hookless Cactus Conservation Measure 11:*** The FWS will be contacted within 24 hours in the event of any emergency or unforeseen situation in which cacti or habitat in Level 1 and Level 2 *Sclerocactus* core conservation areas will be damaged or lost.
- ***Uinta Basin Hookless Cactus Conservation Measure 12:*** All disturbed areas in the *Sclerocactus* potential habitat polygon will be reclaimed using seed mixes developed in coordination with the BLM botanist and the FWS and final approval will be provided by the BLM.
- ***Uinta Basin Hookless Cactus Conservation Measure 13:*** Post-construction monitoring for invasive species will be required. Noxious weeds in *Sclerocactus* habitat will follow mitigation measures identified in the BLM's 2007 Programmatic EIS for Vegetation Treatments using Herbicides. Coordination would occur with the BLM Vernal Field Office prior to noxious weed management in *Sclerocactus* habitat.
- ***Uinta Basin Hookless Cactus Conservation Measure 14:*** Where complete avoidance of individual cacti is not feasible, all cacti located in the areas required to be disturbed by the Project will be transplanted by a qualified botanist. Only cacti that were not previously transplanted or used as control plants for Uinta Basin hookless cactus monitoring studies would be allowed to be affected during this Project and potentially transplanted. The number of cacti to be transplanted would be calculated after the surveys are completed. All transplanted cacti will be monitored as agreed upon by the BLM and FWS.
    - Cacti shall be transplanted into high-quality unoccupied suitable habitat or habitat with a few scattered individuals within the range of the species to prevent disruption and competition with occupied sites. Recipient sites should be coordinated with botanists from the BLM and FWS. Up to 30 of the cacti to be transplanted can instead be donated to up to three Center for Plant Conservation-designated botanical gardens for education or formation of an ex-situ collection as determined by the BLM and FWS botanists in coordination with the recipient garden.
- ***Uinta Basin Hookless Cactus Conservation Measure 15:*** Mitigation will be required in occupied suitable habitat based on the results of surveys and residual impacts. A monetary amount will be contributed to the *Sclerocactus* Mitigation Fund to aid in the recovery of *Sclerocactus* species affected by the Project. The payment will be calculated using the *Sclerocactus* compensatory mitigation calculation table provided by the FWS upon completion of surveys and final engineering design. The primary purpose of the mitigation fund is to implement conservation and restoration activities for *Sclerocactus* and its habitat or to acquire suitable or occupied habitat.
- ***Uinta Basin Hookless Cactus Conservation Measure 16:*** Additional measures to avoid or minimize effects on the species may be developed and implemented in consultation with the FWS to ensure continued compliance with the ESA.

4.5.5.4 Residual Effects

Through implementation of Uinta Basin hookless cactus Conservation Measures 1 through 5, 7, 10, 15, and 16, the BLM anticipates the risk of destruction of individual cacti and the number of cacti requiring transplantation can be minimized. These conservation measures will minimize the greatest threats to Uinta Basin hookless cactus (i.e., direct loss of individuals) posed by the Project. Other conservation measures implemented will reduce impacts on cacti located outside of the Project footprint.

Due to the amount of potential habitat as well as Level 1 and Level 2 core areas crossed by the transmission-line route, avoidance of additional surface disturbance in core areas is not feasible. Approximately 614 acres of potential habitat, 41 acres of Level 1 *Sclerocactus* core areas, and 111 acres of Level 2 *Sclerocactus* core areas will be disturbed by the Project. Due to the known density of cactus in some of the core areas crossed, complete avoidance of individuals is not anticipated to be feasible.

Additionally, some core areas crossed already exceed FWS's recommended disturbance caps. Though the Project will result in impacts on the species, contributions to the monetary fund required under Uinta Basin Hookless Cactus Conservation Measure 15 could be used to further the recovery of the species.

4.5.5.5 Determination

Effect on Species

The Project may affect, and is likely to adversely affect, Uinta Basin hookless cactus due to the effects of loss or degradation of suitable habitat, effects on individuals during relocation, and the impacts of dust, noxious weed invasion, and soil disturbance on existing populations. The number of individuals requiring relocation will be determined from field survey results.

Effect on Designated Critical Habitat

No critical habitat has been designated for Uinta Basin hookless cactus.

Rationale

Direct effects of individual loss or habitat degradation are anticipated as the Project will be unable to avoid occupied Uinta Basin hookless cactus habitat. Uinta Basin Conservation Measures 1 through 5, 7, 10, 15, and 16 should minimize individual loss or cacti to be transplanted. Additional Uinta Basin hookless cactus conservation measures should limit potential indirect effects from erosion, dust deposition, noxious weed invasion, or herbicide drift.

4.5.5.6 Cumulative Effects

The BLM is not aware of any future nonfederal actions in Uinta Basin hookless cactus potential habitat, Level 1 *Sclerocactus* core areas, or Level 2 *Sclerocactus* core areas in the cumulative effects analysis area for this species on private, state, or tribal lands.

4.5.6 Ute Ladies'-tresses

4.5.6.1 Status of the Species in the Project Area

To assist in the analysis conducted for the Project EIS, potentially suitable habitat for Ute ladies'-tresses in sixth-level (12-digit) hydrologic unit code subwatersheds crossed by the Project was modeled using GIS desktop analysis (EPG 2013).

Modeled potentially suitable habitat was visually refined for an area within a 1-mile buffer around all reference centerlines as defined in April 2012, October 2012, April 2013, and September 2014 based on revised centerlines in Wyoming, Colorado, and Utah. Field inspections of selected modeled habitat areas conducted in July 2013 indicated the habitat model overestimated the extent of Ute ladies'-tresses habitat in many areas by including marginally suitable areas, but also underestimated suitable habitat in other areas including irrigated pastures, hayfields, and on the periphery of tilled agricultural fields (EPG 2013).

The model allows for an informative, relative comparison between alternative routes in the Project EIS and is used in this document for informational purposes and as a general reference. However, the habitat model comprehensively does not identify areas where the species may occur, identify areas where surveys for Ute ladies'-tresses should be conducted, or identify areas that should be avoided by the Project to avoid impacts on the species.

The centerline of the agency-preferred route crosses Ute ladies'-tresses modeled potential habitat in several areas (Maps 11 and 11a through 11i, Appendix A).

In Wyoming, the route centerline crosses Ute ladies'-tresses modeled potential habitat in four areas in Carbon County:

- Floodplain of Medicine Bow River
- Wetlands in Hanna Draw
- Floodplain of North Platte River
- Wetlands in Hay Gulch

Modeled habitat in the floodplain of the Big Ditch also occurs within 1 mile of the centerline. The closest known population of Ute ladies'-tresses in Wyoming is 21 miles from the agency-preferred route.

No areas of modeled potential habitat for Ute ladies'-tresses are crossed by the centerline of the agency-preferred route in Colorado; however, modeled potential habitat is located within 1 mile of the centerline in the Seller's Hole area of the Nine Mile Basin, on the floodplain of the Yampa River, and along the many creeks running south from Moose Head Mountain near the town of Dinosaur. No populations or individuals are known within 1 mile of the Project in Colorado (the extent of available habitat information for special status plants in Colorado).

In Utah, the centerline crosses Ute ladies'-tresses modeled potential habitat in the following areas:

- Floodplain of Willow Creek in Uintah County
- Floodplain of the Green River in Uintah County
- Floodplain and tributaries of Soldier Creek in Spanish Fork Canyon in Utah County
- Lake Fork Creek in Utah County
- Floodplain of Thistle Creek in Utah County
- Wetlands, floodplains, and riparian areas the canyon between Nephi and Fountain Green in Juab County
- Wetlands in the Juab Valley in Juab County

A population of Ute ladies'-tresses is located approximately 3.5 miles from the centerline of the agency-preferred route in the area of Diamond Fork near the town of Thistle. Additional populations are known to occur along Soldier Creek and on the Green River floodplain upstream of the agency-preferred route.

In total, the agency-preferred route will cross approximately 1 mile of modeled potential habitat for Ute ladies'-tresses. However, this is only an estimate of actual length of suitable habitat crossed due to the limitations of desktop habitat modeling.

4.5.6.2 Potential Effects of the Project

Based on estimates of disturbance per mile of Project construction, 22 acres of disturbance will occur in modeled Ute ladies'-tresses habitat through construction of the transmission-line structures, access roads inside and outside of the right-of-way, and other potential Project facilities. A more detailed description of the methods used to calculate acreages of disturbances can be found in Section 2.4. However, it is likely this is an overestimation of actual impacts on suitable habitat as areas that represent suitable Ute ladies'-tresses habitat do not represent preferred locations for siting of transmission-line structures, access roads, and other facilities and these areas are typically avoided during engineering design process. Furthermore, the extent of suitable habitat crossed by the Project is likely overestimated due to the limitations of desktop habitat modeling.

It is likely Project construction, operation, and maintenance activities will be required in proximity to potentially suitable habitat for Ute ladies'-tresses, which could contain previously undetected populations (refer to Table 1-2 for detailed information regarding anticipated Project activities). Habitat for this species is moist or very wet meadows near springs, lakes, or perennial streams, areas not likely to be favored siting locations for transmission lines. Regulations regarding Section 404 of the CWA will apply to construction activities in these areas and in adjacent wetlands or streams, and USACE requires compliance with the ESA prior to issuance of a permit to fill or dredge waters of the United States. Additionally, surveys will be conducted to detect habitat and populations of this species in all areas of modeled potentially suitable habitat, and the transmission line (and associated facilities) will span or avoid populations and habitat where feasible. However, individuals of this species are not always conspicuous and it is possible that populations could be missed during surveys.

Preconstruction, construction, operation, and maintenance activities could affect Ute ladies'-tresses potentially suitable habitat or previously undetected populations. Though construction in wetland and floodplain areas is not likely to be required, construction in areas upslope of habitat or populations could consist of access road improvement and construction, construction site preparation, construction of Project facilities, and cleanup and site reclamation. These activities could require vegetation clearing, land-forming activities (grading, recontouring, and cut-and-fill landform manipulations), drive-and-crush of existing vegetation during temporary site access, and recontouring and seeding during reclamation. Construction activities in wetlands, waterways, and riparian areas, if unavoidable, could alter the hydrology and water quality of downstream systems, thereby potentially negatively affecting this species. Project operation activities in upslope areas could consist of routine inspections and operation of transmission line, substations, and series compensation stations, which will require overland travel and access-road use by inspection vehicles. Potential maintenance activities could consist of access road maintenance and right-of-way vegetation maintenance, which will require overland travel, access-road use by operation vehicles, and herbicide use.

Any activities that alter topography, remove vegetation, or disturb soils could affect existing plants if located downslope of activities. Alterations to runoff patterns and increased erosion potential increase the likelihood of sedimentation and subsequent burial or loss of plants during extreme precipitation events. Crushing of existing vegetation and soil disturbance due to temporary site access could result in possible introduction of noxious weeds, and the creation of soil conditions that facilitate the colonization and spread of noxious weeds. Dust production as a result of Project activities could affect photosynthetic ability, reproductive ability, and metabolic processes of Ute ladies'-tresses individuals. The use of herbicide during Project maintenance activities could result in impacts on individuals due to herbicide drift. Degradation of habitat in adjacent areas may decrease the attractiveness of these areas to pollinator species, which could result in reduction of pollinator visits to individuals and reduced fecundity.

4.5.6.3 Conservation Measures

The following conservation measures were developed in coordination with the BLM and FWS to minimize effects of the Project on Ute ladies'-tresses.

- ***Ute Ladies'-Tresses Conservation Measure 1***: Field habitat assessments will be conducted to identify areas of potentially suitable Ute ladies tresses habitat in the Project area where surveys will be conducted. Field habitat assessments:
    - Must be conducted by qualified individual(s) approved by the BLM and FWS.
    - Will occur during the growing season.
    - Will occur within 300 feet of any planned disturbance or areas likely to experience hydrology changes resulting from Project activities.

- Will identify habitat meeting the criteria described in 1992 Interim Survey Requirements for Ute ladies'-tresses Orchid (FWS 1992) and Rangewide Status Review of Ute Ladies'-Tresses (Spiranthes diluvialis) (Fertig et. al 2005).
- Will exclude habitats meeting the following criteria:
  - Appropriate hydrology not present, typically indicated by:
    - area comprised of mostly upland vegetation
    - area that dries up by mid-July with a water table lower than 12 to 18 inches below the soil surface
  - Heavy clay soils present
  - Soils strongly alkaline
  - Site heavily disturbed, such as, for example:
    - stream banks channelized and stabilized by heavy rip-rap
    - highway rights-of-way built on filled or compacted soil or rock material
    - construction sites where construction has either stripped the topsoil or where construction has been completed within the last 5 years but the area has not been revegetated (Ute ladies'-tresses orchid has been found in some heavily disturbed sites where hydrology is appropriate, such as revegetated gravel pits, heavily grazed riparian edges and pastures, and along well-traveled trails developed on old berms)
    - Stream banks steep, transition from stream margin to upland areas abrupt
    - Site characterized by standing water with cattails, bulrushes, and other emergent aquatic vegetation- note margins may be suitable habitat
    - Riparian areas, stream banks, or wetlands vegetated with dense rhizomatous species such as reed canary grass (*Phalaris arundinacea*), tamarisk or salt cedar (*Tamarix ramosissima*), teasel (*Dipsacus sylvestris*), common reed (*Phragmites australis*), or saltgrass (*Distichlis spicata*)
    - Riparian areas overgrazed or otherwise managed such that the vegetation community is comprised of upland native or weedy species or is unvegetated. (the orchid can tolerate rather extreme overgrazing as long as it has not resulted in a drop in the water table as indicated by conversion of the riparian or wet meadow pasture vegetation community to mostly upland species)
    - Potential habitat is no longer in a natural condition, for example, has been converted to agricultural uses and is now plowed and cropped, or has been converted to lawns or golf courses (wet meadow pastures with a mix of native and non-native pasture grasses, including pastures that are regularly hayed, are suitable potential habitat)
    - Wetland is a brackish playa or pothole not fed by springs or not in the floodplain of or hydrologically connected with a riparian system or other source of fresh water (fens and wetlands associated fresh water springs are suitable potential habitat).

- ***Ute Ladies'-Tresses Conservation Measure 2***: Surveys to determine Ute ladies'-tresses habitat occupancy will be conducted in suitable habitat. The following requirements for inventories apply:
  - Must be conducted by qualified individual(s) and according to *1992 Interim Survey Requirements for Ute ladies'-tresses Orchid* (FWS 1992)
  - Will not occur in areas where existing roads would be used without improvement
  - Will be conducted at a time when the plant can be detected and during appropriate flowering periods

- Will be conducted for at least 1 year prior to any temporary disturbance in suitable habitat (e.g., overland travel to access geotechnical boring location). Two additional years of surveys would be conducted after the temporary disturbance for a total of 3 years of surveys.
- Three consecutive years of surveys will be required prior to any permanent disturbance (e.g., road widening, new road construction, placement of other infrastructure)

- ***Ute Ladies'-Tresses Conservation Measure 3***: For any activities associated with the geotechnical investigation the following requirements apply:
  - All work within 300 feet of occupied Ute ladies' tresses habitat will be moved or abandoned.
  - All work within 300 feet of suitable habitat will be monitored by a biological monitor to ensure compliance with all applicable conservation measures.
  - Existing access roads within 300 feet of suitable Ute ladies'-tresses habitat may be used, but not improved.
- ***Ute Ladies'-tresses Conservation Measure 4:*** Design Project infrastructure to minimize direct or indirect impacts on suitable habitat both in and downstream of the Project area:
  - Alteration and disturbance of hydrology will not be permitted.
  - Disturbance footprint size should be reduced to the minimum needed, without compromising safety.
  - New access routes for the Project should be limited.
  - Roads and utilities should share common right-of-ways where possible.
  - Rights-of-way widths should be reduced and the depth of excavation needed for the road bed should be minimized.
  - Construction and right-of-way management measures should avoid soil compaction that would impact Ute ladies' tresses habitat.
  - Offsite impacts or indirect impacts should be avoided or minimized (i.e., install berms or catchment ditches to prevent spilled materials from reaching occupied or suitable habitat through either surface or groundwater).
  - Signing should be placed to limit off-road travel in sensitive areas.
  - Vehicles and equipment should be made to stay on designated routes and other cleared/approved areas.
  - All disturbed areas will be revegetated with species approved by FWS and BLM botanists.
- ***Ute Ladies'-tresses Conservation Measure 5:*** Project-related construction activities will avoid individual plants by a minimum of 300 feet. In proximity to occupied habitat, Project infrastructure will be designed to avoid direct disturbance and minimize indirect impacts on populations and to individual plants:
  - Follow recommendations for Project design in suitable habitats.
  - Create designs that will avoid altering site hydrology and concentrating water flows or sediments into occupied habitat.
  - Minimize the disturbed area through interim and final reclamation. Reclaim disturbance following construction to the smallest area possible.
- ***Ute Ladies'-tresses Conservation Measure 6:*** In proximity to occupied habitat, all construction activities will be overseen by a biological monitor to ensure compliance with all applicable conservation measures. The biological monitor will also:

- Make areas for avoidance visually identifiable in the field (e.g., flagging, temporary fencing, rebar, etc.) before and during construction.
- Provide the FWS and BLM with a post-construction report of compliance, impacts, and extent of impacts on Ute ladies'-tresses no later than 4 months upon Project completion.

- ***Ute Ladies'-tresses Conservation Measure 7:*** The following restrictions apply to herbicide use in suitable or occupied Ute ladies'-tresses habitat:
  - No aerial or broadcast herbicide treatments will be applied for vegetation management within 2,500 feet of suitable or occupied Ute ladies'-tresses habitat.
  - For noxious weed control within 2,500 feet of suitable or occupied Ute ladies'-tresses habitat, manual spot treatments (i.e. backpack sprayers) shall be used.
  - All those involved in the herbicide application shall be accompanied by a qualified botanist/ecologist familiar with Ute ladies'-tresses to help herbicide applicators identify Ute ladies'-tresses and avoid impacts on individual plants.
  - Treatments would not be done when wind speeds exceed 6 miles per hour.
  - Drift reducing agents shall be used when practical.
  - A reduced application rate would be used.
  - Pump pressure would be reduced, per label instructions.
  - Droplet size would be increased to the largest size possible while still effectively covering the target vegetation. This could be accomplished using larger nozzles or reduced pressure.
  - Herbicides shall be stored in spill proof containers away from special status plant habitats.
- ***Ute Ladies'-tresses Conservation Measure 8:*** Notify the FWS immediately if any Ute Ladies' tresses are located during surveys or monitoring. In the event that Ute Ladies tresses are located, additional discussions between the BLM and FWS will be conducted to review site plans and ensure that the appropriate avoidance measures are implemented.

4.5.6.4 Residual Effects

Through implementation of Ute ladies-tresses Conservation Measures 1 through 7, the BLM anticipates that all Ute ladies' tresses individuals and occupied habitat can be avoided by new surface disturbance, and indirect effects on this species can be minimized to an insignificant level. Other conservation measures will reduce impacts on suitable habitat resulting from stormwater pollution, dust, or other effects on an insignificant level.

4.5.6.5 Determination

Effect on Species

The Project may affect, but is not likely to adversely affect, Ute ladies'-tresses.

Effect on Designated Critical Habitat

No critical habitat has been designated for Ute ladies'-tresses.

Rationale

No direct effects on Ute ladies'-tresses are anticipated as the Project is expected to avoid all occupied habitat. Additionally, Ute Ladies'-tresses Conservation Measures 4 through 7 should eliminate any potential indirect impacts from alteration of hydrology, erosion and sediment deposition, or herbicide drift.

4.5.6.6 Cumulative Effects

Cumulative effects are not required to be assessed for species that are not likely to be adversely affected by the Project.

5.0 PREPARERS AND CONTRIBUTORS

Preparers, contributors, and consultants involved throughout the Project (including BLM and USFS staff), are listed in Tables 5-1, 5-2, and 5-3.

TABLE 5-1
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TABLE 5-2 U.S. FOREST SERVICE PREPARERS AND CONTRIBUTORS		
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