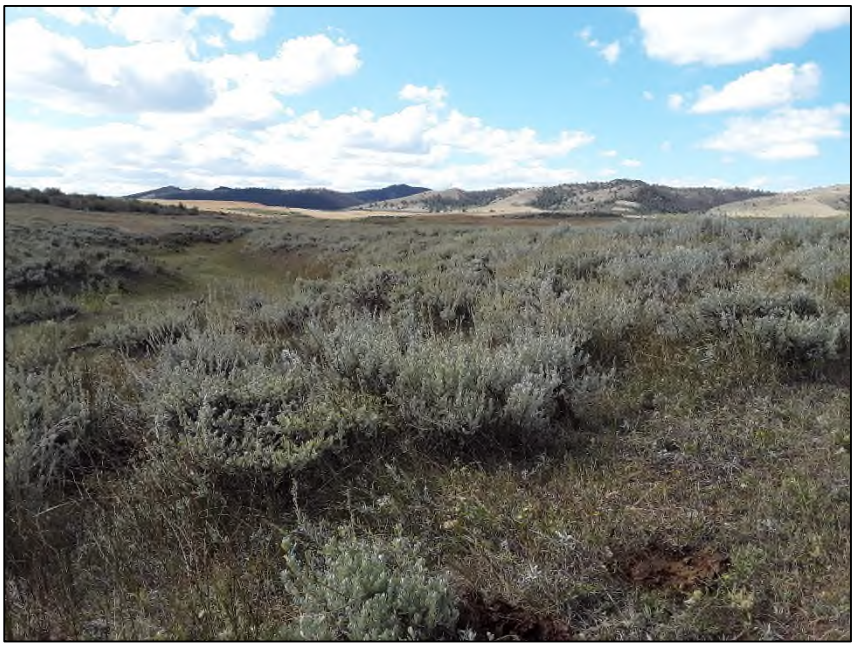
Biological Resources Evaluation

Rail Tie Wind Project
Albany County, Wyoming



Prepared for:

ConnectGen Albany County LLC

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TETRA TECH

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1 INTRODUCTION

At the request of ConnectGen Albany County LLC (ConnectGen), Tetra Tech, Inc. (Tetra Tech) has prepared this Biological Resources Evaluation for the Rail Tie Wind Project (Project). This document is intended to provide reviewing regulatory agencies with information on the biological resources and potential development constraints for the Project and to describe the application of Tiers 1 and 2 of the U.S. Fish and Wildlife Service (USFWS) Land-based Wind Energy Guidelines (WEGs; USFWS 2012) and Stage 1 of the Eagle Conservation Plan Guidance (ECPG; USFWS 2013a). A broader geographic area was evaluated as part of ConnectGen's internal screening process to obtain the general ecological context of the Project and to assist in the Project planning process, which coincides with Tier 1 of the of the USFWS WEGs. The areas reviewed as part of Tiers 1 and 2 of the WEGS are outlined in Section 1.2.

This Biological Resources Evaluation provides the results of the review of publicly available information as well as field-based habitat assessment of the Project Area for potentially occurring special-status plant and wildlife species and other species of concern. In addition, the Biological Resources Evaluation provides a review of potential effects to plant and wildlife resources from development of the Project as well as proposed Environmental Protection Measures (EPMs) to avoid and minimize potential Project effects to plants, wildlife, and habitat.

1.1 Project Background

The Project is located in southeastern Albany County, Wyoming, and encompasses approximately 26,000 acres of ranchland on private and state lands near Tie Siding, Wyoming (Project Area; Figure 1). The Project would include up to 149 wind turbine generators, each ranging between 3.0 to 6.0 MW in size, with a combined maximum generating capacity rating of 504 MW. The Project proposes to interconnect to the existing transmission system of the Western Area Power Administration (WAPA) via the Ault-Craig 345-kilovolt (kV) transmission line, which runs through the Project Area.

For construction planning and site optimization, the Project consists of two separate phases, each approximately 252 MW. Construction of the Project is expected to begin in 2021, and both phases could be fully operational by the end of 2022. As is common with large wind projects, the Project may require 2 years to fully construct. If additional time is required to facilitate construction, it is anticipated that the first 252 MW phase would be completed and fully operational by the end of 2022, and second phase operational in 2023.

1.2 Analysis Area

The Tier 1 Evaluation Area focuses on the proposed Project Area and a 10-mile buffer in order to address the Tier 1/Tier 2 recommendations outlined in the USFWS WEGs (USFWS 2012) and Stage 1 of the ECPG (USFWS 2013a). Specifically, a 10-mile buffer was used to determine the potential presence of bald and golden eagles within the vicinity of the Project Area. (It should be

noted that the ECPG recommendation of a 10-mile eagle survey buffer, on which this analysis is based on, was subsequently revised on April 21, 2020 to two miles [USFWS 2020a]).

The Tier 2 Study Area includes all lands within the Project Area in order to provide the finer site characterization detail requested in the WEGs. As outlined in Section 3.2, a habitat assessment was conducted to provide detailed habitat mapping for the Project Area. This information was used to assist in determining the potential for occurrence for special-status plant and wildlife species within the Project Area.

To determine potential impacts of Project development to special-status species and their associated habitats, ConnectGen developed a Project Siting Corridor, as described below, to capture all areas where potential Project ground disturbance may occur (Figure 2).

To quantify the potential impacts, ConnectGen identified a representative Project Layout as described below that provides the basis for determining the estimated permanent and temporary habitat ground disturbance for the Project (Figure 2).

1.2.1 Project Siting Corridor

ConnectGen has identified a series of 1,000-foot-wide turbine siting corridors as well as a detailed network of access road, collection system, and crane walk design as part of the site plan development for both the 3.0 MW and 6.0 MW turbine layouts. This area, herein referred to as the Project Siting Corridor, encompasses all potential Project features (regardless of the selected turbine model) along with an appropriate buffer to capture areas where potential ground disturbance may occur.

The Project Siting Corridor consists of the 1,000-foot-wide turbine siting corridors, 100-foot-wide access road and crane path corridors, 50-foot-wide collection line corridors, 150-foot-wide transmission line corridor, proposed operation and maintenance facility, temporary laydown yards, permanent meteorological (met) tower locations, Project substations, and interconnection switchyard location.

1.2.2 Representative Project Layout

To quantify the potential ground disturbance impacts of the Project, ConnectGen provided a representative physical footprint of all Project facilities and appurtenances that may be necessary for the Project, referred to as the Representative Project Layout. The Representative Project Layout is meant to reflect the largest proposed Project footprint (i.e., most conservative for estimate of impacts), and includes 151 turbine locations within the twenty 1,000-foot-wide turbine siting corridors, approximately 60 miles of access roads, approximately 15 miles of crane paths, approximately 80 miles of collection lines, approximately four miles of 345 kV transmission line, three proposed permanent met tower locations, two Project substations, an interconnection switchyard, operation and maintenance building, and two temporary laydown yards. The representative Project Layout and anticipated area required for construction and operation of each

Project feature provide the basis for determining the estimated permanent and temporary disturbance for the Project.

2 REGULATORY FRAMEWORK

2.1 Federal Regulations

2.1.1 National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires the disclosure of potential environmental impacts for projects with a federal action, through either a Categorical Exclusion, Environmental Assessment, or Environmental Impact Statement (EIS), as well as a process of public and agency review and comment.

WAPA's action on the interconnection request is considered a major federal action subject to NEPA, in accordance with Council on Environmental Quality (CEQ) regulations for implementing NEPA, and DOE NEPA Implementing Procedures (40 CFR Parts 1500−1508, 10 CFR Part 1021). This technical report provides information to assist WAPA in analysis of the potential effects to the natural and human environments associated with approving or denying the interconnection request.

2.1.2 Endangered Species Act

The Endangered Species Act (ESA) and its implementing regulations in Title 50 of the CFR Section 17 prohibit the take of any fish or wildlife species that is federally listed as threatened or endangered without prior approval pursuant to either Section 7 or Section 10 of the ESA.

Section 3 of the ESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct" (16 USC § 1532 (19)). Harm, in this case, means an act that actually kills or injures a federally listed wildlife species, and "may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering" (50 CFR § 17.3). To harass means to perform "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include but are not limited to, breeding, feeding or sheltering" (50 CFR § 17.3). In addition, Section 9 of the ESA details generally prohibited acts and Section 11 provides for both civil and criminal penalties for violators regarding species federally listed as threatened or endangered.

2.1.2.1 Section 7 of the ESA

ESA Section 7(a)(2) requires each federal agency to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat (16 USC § 1536 (a)(2)). If the actions of a federal agency are not likely to jeopardize

the continued existence of any endangered or threatened species, but could adversely affect the species, or result in a take, the action must be addressed under Section 7 of the ESA (16 USC § 1536 (a)(2)).

The Project Area is located within the Platte River Basin, which is the major hydrologic basin from which water would be appropriated for use for Project construction and operation. Consumption of groundwater or surface water that could result in depletions to flows in the Platte River System are a concern under the Endangered Species Act (ESA) due to potential downstream impacts to federally listed threatened and endangered species habitat associated with the Platte River in Nebraska.

In 1997, Colorado, Wyoming, Nebraska, and the Department of Interior partnered together to develop the Platte River Recovery Implementation Program (PRRIP). Under the program, projects that include water-related activities in the Platte River Basin that have a federal nexus may be subject to consultation under Section 7 of the ESA. These activities include new or expanded wells, reservoirs, or diversions whose water supply is solely derived from sources that are considered "hydrologically connected" to the Platte River and that meet or exceed the de minimis threshold of 0.1 acre-foot per year of depletions in flow to the nearest surface water tributary to the Platte River System. Activities subject to consultation are required to conduct a depletions analysis and seek streamlined ESA consultation through the PRRIP or conduct independent Section 7 consultation with the U.S. Fish and Wildlife Service (USFWS). In Wyoming, the PRRIP is implemented through the Wyoming Depletions Plan and administered by the Wyoming State Engineer's Office.

2.1.2.2 Section 10 of the ESA

Section 10 of the ESA allows a non-federal applicant, under certain terms and conditions, to incidentally take an ESA-listed species that would otherwise be prohibited under Section 9 of the ESA. When a non-federal applicant wishes to proceed with an activity that is legal in all other respects, but that may result in the incidental taking of a listed species, an Incidental Take Permit (ITP), as defined under Section 10 of the ESA, is required. Incidental take is defined as take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity" (50 CFR § 17.3). Under Section 10, a USFWS-approved Habitat Conservation Plan is required to accompany an application for an ITP to demonstrate that all reasonable and prudent efforts have been made to avoid, minimize, and mitigate for the effects of the potential incidental take. As the granting of an ITP would be considered a federal action, NEPA compliance would also be required.

2.1.3 Bald and Golden Eagle Protection Act

Under authority of the Bald and Golden Eagle Protection Act (BGEPA; 16 USC 668–668d), bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are afforded legal protection. The BGEPA prohibits the take, sale, purchase, offer of sale, purchase, or barter, transport, export or import, at any time or in any manner of any bald or golden eagle, alive or

dead, or any part, nest, or egg thereof (16 USC 668). The BGEPA defines take to include "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb," and includes criminal and civil penalties for violating the statute (16 USC 668c). The term "disturb" is defined as agitating or bothering an eagle to a degree that causes, or is likely to cause, injury to an eagle, or either a decrease in productivity or nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior (50 CFR 22.3).

Under 50 CFR § 22.26 eagle incidental take permits (EITPs) are available for incidental take associated with otherwise lawful activities (USFWS 2016a). Although EITPs are not required to operate a wind facility, an operator is liable if an eagle is taken without an EITP. EITPs are available for take of both bald and golden eagles and their nests and can be issued for up to 30 years contingent on 5-year reviews. The USFWS released the ECPG in April 2013 (USFWS 2013a), with a technical update related to eagle survey guidelines released on April 21, 2020 (USFWS 2020a). This guidance outlines the recommended steps for permit applicants. USFWS published an update to the regulations regarding EITPs in the Federal Register in December 2016 that took effect January 15, 2017 (USFWS 2016a).

Within USFWS Region 6, issuance of an EITP typically involves consultation with USFWS and development of an Eagle Conservation Plan (ECP) or similar guidance that follows the ECPG (USFWS 2013a) and updated survey guidance (USFWS 2020a), the Eagle Rule Revision (USFWS 2016a), as well as specific ECP component recommendations for Region 6 (USFWS 2020b). As the granting of an EITP would be considered a federal action, NEPA compliance would also be required.

2.1.4 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements the Unites States' obligations under four treaties for the protection of migratory birds. The MBTA is administered by the USFWS, which maintains a list of all species protected by the MBTA (50 CFR 10.13). This list includes over 1,000 species of migratory birds, including eagles and other raptors, waterfowl, shorebirds, seabirds, wading birds, and passerines.

The MBTA makes it unlawful "by any means or in any manner, to pursue, hunt, take, capture, kill … possess, offer for sale, sell … purchase … ship, export, import …transport or cause to be transported… any migratory bird, any part, nest, or eggs of any such bird …" except as otherwise permitted under the regulations (16 USC 703). The word "take" is defined by regulation as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect" (50 CFR 10.12). The definition of "take" does not include the broader terms of "harass" or "harm" that have been found to prohibit incidental takes under the ESA. A December 22, 2017 memorandum from the U.S. Department of the Interior's Office of the Solicitor clarified that the prohibitions of take under the MBTA apply only to "affirmative actions that have as their purpose the taking or killing of migratory birds, their nests, or their eggs." An April 11, 2018 memorandum from the USFWS provided guidance to "clarify what constitutes prohibited take." The USFWS memo stated that the "take of birds, eggs or nests" was prohibited only when

the purpose of the activity was to conduct take but was not prohibited when the purpose of the activity was not to conduct take (USFWS 2018a).

2.1.5 Clean Water Act Section 404 Permit

A Clean Water Act (CWA) Section 404 permit will be required by the U.S. Army Corps of Engineers (USACE) if the Project will permanently impact wetlands or other jurisdictional waters of the United States (WOTUS). Section 404 of the CWA requires approval prior to discharge of dredged or fill materials into WOTUS, including wetlands. Impacts to WOTUS from construction of the Project will require either a nationwide permit (NWP) or an individual permit (IP).

Impacts under the 0.5-acre limit for IPs may be permitted under the NWP program. The NWPs are issued by the USACE under CWA Section 404(e) for projects expected to have minimal individual or cumulative effects and are pre-certified under CWA Section 401.

If the Project impacts are larger than 0.5 acre of wetlands or 300 linear feet of stream bank, USACE will require an IP, which requires development of a formal mitigation plan. Issuance of an IP would be a federal action that would trigger compliance with NEPA discussed above. IPs also require state water quality certification under CWA Section 401.

2.2 State Regulations

2.2.1 Wyoming Industrial Development Information and Siting Act

The Wyoming Department of Environmental Quality (WDEQ) Industrial Siting Division (ISD) administers the Wyoming Industrial Development Information and Siting Act (Act; Wyoming Statute § 35-12-101:119) and the Rules and Regulations of the Industrial Siting Council (ISC), Chapters 1 and 2. The Act is designed to protect Wyoming's environmental, social, and economic fabric of communities from unregulated large-scale industrial development. By consolidating the review of 19 independent state agencies into one comprehensive permitting process, the Act offers a thorough analysis of the development's impacts to the public and affected agencies.

Pursuant to the Act, all wind energy projects consisting of 30 or more turbines (in all planned phases of the installation) and/or exceeding the statutory threshold construction cost amount of $222.8 million are subject to review and approval by the ISC. For facilities permitted under Wyoming Statute (W.S.) § 35-12- 102(a)(vii)(E) and (F), a site reclamation and decommissioning plan and a financial assurance plan are required pursuant to W.S. § 35-12-105(d) and (e).

As part of the review and approval process, the ISC requires submittal of an application outlining the evaluation of potential project impacts and mitigation measures related to environmental, social, and economic resources.

2.2.2 Wyoming Game and Fish Department Nongame Bird and Mammal Program

Wyoming does not list species as threatened or endangered but implements the Wyoming Game and Fish Department's (WGFD) Nongame Bird and Mammal Program for wildlife species. This program is responsible for managing species that are legally designated as Nongame, which includes Species of Greatest Conservation Need (SGCN) with a designated Native Species Status (NSS) and Neotropical Migratory Birds. WGFD developed the State Wildlife Action Plan (SWAP) to address SGCN (WGFD 2017). The SGCN designation is intended to identify species whose conservation status warrants increased management attention and funding, as well as consideration in conservation, land use, and development planning in Wyoming (WGFD 2017).

While WGFD does not directly issue permits related to wind energy development projects, WGFD is a cooperating agency for NEPA EIS review, participates in the ISC review and approval process, as well as the Albany County permit approval process (see Section 2.3.1 below). In November 2010, WGFD approved the "Wind Protection Recommendations for Wind Energy Development in Wyoming" (WGFD Wind Energy Recommendations; WGFD 2010), which is used as the basis for the agency's consultative obligation to the ISC.

2.3 Local Regulations

2.3.1 Wind Energy Conversion System Permit

The Albany County Wind Energy Siting Regulations require all facilities with an aggregate generating capacity greater than 25 kW to apply for a Wind Energy Conversion System (WECS) Use Permit (Albany County 2017). The application process involves the review and recommendation of the Planning and Zoning Commission and the approval of the Board of County Commissioners, as well as community input during a defined and requisite public hearing and comment period (§§18-5-502(a)). The WECS permit applicants must certify that the Project would comply with all applicable state and county zoning and land use regulations. As part of the application, potential impacts to resources such as economic, air quality, water quality, general nuisances, soil disturbance, wildlife, and cultural resources must be addressed.

3 METHODOLOGY

3.1 Desktop Review

Tetra Tech reviewed publicly available information contained on websites, databases, maps, and scientific literature to identify plant, wildlife, and habitat resources within the Project Area, including:

- U.S. EPA Ecoregions
- National/State Parks, Forests, and Recreation Areas
- The Nature Conservancy (TNC) Priority Conservation Areas (PCAs) and conservation easements

- USFWS National Wildlife Refuges (NWRS) and Wildlife and Waterfowl Management Areas
- WGFD Wildlife Habitat Management Areas, Crucial and Enhancement Habitat Priority Areas, and Hunter Management Areas
- Colorado Parks and Wildlife (CPW) State Wildlife Areas
- National Audubon Society (Audubon) Important Bird Areas (IBAs)
- National Land Cover Database (NLCD)
- U.S. Geological Survey (USGS) National Hydrography Dataset (NHD)
- USFWS National Wetlands Inventory (NWI)
- Wyoming Natural Resource and Energy Explorer (NREX)
- WGFD State Wildlife Action Plan (SWAP)
- NatureServe Ecological Systems
- USFWS Information for Planning and Consultation (IPaC) online tool
- Wyoming Natural Diversity Database (WYNDD)
- Wildlife baseline studies conducted as part of the Hermosa West Wind Energy Project

In addition to publicly available information, Tetra Tech also incorporated agency feedback received by ConnectGen on potential plant, wildlife, and habitat resources within the Project Area based on the following:

- WGFD project response letter to ConnectGen received April 12, 2019
- USFWS Project introduction meeting held May 13, 2019
- WGFD Project Introduction meeting held July 31, 2019
- WYNDD Species Overlay and Observation Data Request received September 10, 2019
- WGFD scoping response letter to WAPA received January 29, 2020

3.2 Field-Based Habitat Assessment

Two Tetra Tech biologists conducted a field-based habitat assessment of the Project Area from September 18 to 23, 2019. The goal of the field-based habitat assessment was to ground-truth the NLCD and to identify potential habitat for federally listed species and other special-status species with the potential to occur within the Project Area, and more specifically the Siting Corridor, based on desktop review and agency consultation. In order to identify potential species habitat, land cover types were classified based on the habitat classification system provided in the WGFD SWAP (WGFD 2017). Each SWAP habitat type identified within the Project Area was then assigned to a NatureServe ecological system (NatureServe 2019) within one of the 11 terrestrial habitat types identified in the WGFD SWAP (WGFD 2017). Representative photos of these habitat types and general landscape features are provided as Photos 1-20 in Appendix A.

The biologists surveyed the Project Area by vehicle and by foot, utilizing electronic tablets to collect representative data points, photographs, and habitat boundaries. Areas that were not accessible were scanned using binoculars to identify and delineate potential habitat via aerial imagery. Dominant vegetation was identified within each habitat type, and all incidental plant and

wildlife species observations were noted (Appendix B), with GPS locations recorded for observation of any federally listed species or other special-status species.

Within the Siting Corridor, the conservative boundaries of potential wetland and other waterbodies were identified and mapped based on the presence of hydrophytic vegetation and Ordinary High Water Mark (OHWM), and are incorporated into the habitat assessment results. A detailed assessment of these wetland and other waterbody features is provided in the Surface Water and Groundwater Technical Report (in preparation). No formal delineations were completed as part of this effort.

4 BIOLOGICAL RESOURCES EVALUATION

4.1 Ecoregion

The Project Area is located within the Laramie Basin and Crystalline Mid-Elevation Forests Level IV EPA Ecoregions (Chapman *et al*. 2004; Figure 1). The Laramie Basin Ecoregion, which encompasses the majority of the western portion of the Project Area, is an intermontane valley containing primarily mixed-grass prairie. The topography of this ecoregion is nearly flat with elevations ranging from 7,100 to 7,900 feet above sea level. Average annual precipitation ranges from ten to 16 inches and the mean high temperature ranges from 32°F in January to 80°F in July. Vegetation includes mixed-grass prairie species such as blue grama (*Bouteloua gracilis)*, Indian ricegrass (*Oryzopsis hymenoides*), western wheatgrass (*Pascopyrum smithii)*, rabbitbrush (*Ericameria* and *Chrysothamnus* spp.), and fringed sage (*Artemisia frigida*). The Crystalline Mid-Elevation Forests Ecoregion, which encompasses the central and eastern portions of the Project Area, consists of low mountain slopes and outwash fans between 7,500 and 9,000 feet above sea level. Average annual precipitation ranges from 18 to 26 inches and the mean high temperature ranges from 32°F in January to 80°F in July. Dominant vegetation includes lodgepole pine (*Pinus contorta*) and Douglas fir (*Pseudotsuga menziesii*) forests with areas containing limber pine (*Pinus flexilis*) and quaking aspen (*Populus tremuloide*s).

4.2 Management Areas and Other Conservation Lands of Interest

4.2.1 Federal and State Parks, Forests, and National Wildlife Refuges

The Project Area does not contain any federal or state parks, forests, or NWRs. The closest national forests include Medicine Bow-Routt National Forest, approximately one mile northeast of the Project Area, and the Arapaho-Roosevelt National Forest, approximately 0.3 mile from the southern boundary of the Project Area (Figure 3). The closest NWR is Hutton Lake NWR, located approximately eight miles northwest of the Project Area. The closest state park is Curt Gowdy State Park, located approximately eight miles northeast of the Project Area (Figure 3).

4.2.2 State Wildlife Management Areas and Conservation Easements

State-managed lands within the Project Area include the Cherokee Creek Hunter Management Area (HMA), located within the southern portion of the Project Area (Figure 3). The Cherokee

Park HMA is managed by WGFD and primarily supports elk hunting across 3,166 acres of both private and state lands (WGFD 2019a). The closest state wildlife management area is the Cherokee State Wildlife Area (SWA) located in Colorado, approximately five miles south of the Project Area (Figure 3).

No conservation easements are located within the Project Area. The closest conservation easement is The Nature Conservancy's (TNC's) Laramie Foothills Easement, which is located approximately 1.3 miles southeast of the Project Area (Figure 3).

4.2.3 Other Conservation Lands of Interest

Other conservation lands of interest reviewed as part of this report include WGFD Habitat Priority Areas (HPAs), TNC Priority Conservation Areas (PCAs), and Audubon Important Bird Areas (IBAs).

WGFD has identified Crucial HPAs and Enhancement HPAs throughout the state in their Strategic Habitat Plan (WGFD 2015c). Crucial HPAs have significant biological or ecological values and are protected and managed with the goal of maintaining wildlife populations (WGFD 2015a). Enhancement HPAs are identified based on habitat issues, such as habitat fragmentation, degraded habitat, and water quality effects. Management efforts are directed towards improving and enhancing these areas to restore wildlife habitats (WGFD 2015a). The central and eastern portions of the Project Area lie within a Crucial HPA identified by WGFD as crucial for land protection, moose, and big game range (WGFD 2015a, b; Figure 3). The northeastern portion of the Project Area lies within an Enhancement HPA identified by WGFD for enhancement of mixed mountain shrub habitat (WGFD 2015a, b; Figure 3).

No TNC PCAs are located within the Project Area; however, TNC has identified two tracts of land adjacent to the Project Area as PCAs. The Laramie Foothills PCA is located approximately 0.1 mile southeast of the Project Area, and the Turtle Rock PCA is located adjacent to the northeastern portion of the Project Area (Figure 3). These areas are not owned or managed by TNC but are areas that have biodiversity significance for conservation priorities (TNC 2019). PCAs often provide habitat for threatened and endangered species, sensitive wildlife and plants, and rare plant communities.

The Audubon Society identifies, monitors, and protects IBAs, locations recognized as being globally important for the conservation of bird populations. No IBAs are located within the Project Area. The closest IBA is the Laramie Plains Lake Complex (associated with the Hutton NWR), located approximately eight miles northeast of the Project Area (NAS 2019a; Figure 3).

4.3 Land Cover and Land Use

According to the National Land Cover Dataset (NLCD) for Wyoming (Yang *et al*. 2018), land cover for the Project Area consists primarily of scrub/shrub vegetation (64.14 percent; Figure 4) and grassland/herbaceous cover (30.57 percent; Figure 4). Within the Siting Corridor, similar land

cover percentages are present, with a dominant land cover of scrub/shrub vegetation (66.16 percent) and grassland/herbaceous vegetation (31.4 percent; Table 1; Figure 3). Other land cover types present within the Siting Corridor include emergent herbaceous wetland (0.92 percent), primarily mapped along the major stream features associated with the Project Area, and evergreen forest (1.04 percent), primarily located within the southernmost portion of the Project Area (Figure 4). This NLCD data were utilized for ground-truthing during the September 2019 habitat assessment to determine habitat types within the Project Area and Siting Corridor as outlined in Section 4.5.

Table 1: NLCD Land Cover Within the Siting Corridor

NLCD Description[1]	Acres within Siting Corridor	Percentage of Siting Corridor
Shrub/Scrub	4,121.77	66.16%
Grassland/Herbaceous	1,955.89	31.40%
Evergreen Forest	64.79	1.04%
Herbaceous Wetland	57.47	0.92%
Woody Wetland	15.36	0.25%
Developed, Open Space	10.49	0.17%
Barren Land	1.65	0.03%
Deciduous Forest	1.99	0.03%
Developed, Low Intensity	0.22	<0.01%
Total	6,230	100%

1 Source: National Land Cover Database (Yang *et al*. 2018)

Land use within the Laramie Basin Ecoregion generally consists of seasonal grazing of livestock. Land use within the Crystalline Mid-Elevation Forests Ecoregion is comprised of livestock grazing, logging, recreation, and mineral extraction (Chapman *et al*. 2004). Within the Project Area, land use is primarily ranchland, with scattered residential properties that are generally associated with ranching activities.

Two parallel transmission lines owned and operated by WAPA traverse the center of the Project Area. The Ault-Craig 345 kV transmission line is the southern line, which traverses the Project Area in an east-west direction to just east of U.S. Highway 287, where it then travels southeast to connect the Craig and Ault Substations (Figure 1). The northern line is the North Park to Terry Ranch 230 kV transmission line, which traverses the Project Area east to west to connect the Archer and Hayden Substations. The Union Pacific Railroad's Central Corridor comes in from the north just east of Tie Siding, where it then runs through the center of the eastern portion of the Project Area before splitting into two lines running northeast and southeast near the eastern border of the Project Area (Figure 1).

4.4 Wetlands and Other Waters

Wetlands and riparian areas are ecologically important because they provide habitat to both resident and migratory wildlife. In addition, they play an important role in regional hydrology and serve as ecotones between terrestrial and aquatic systems (Mitsch and Gosselink 1993). Figure

5 displays the locations of surface waters and wetlands mapped by the NHD (USGS 2018a) and NWI (USFWS 2018b) within the Project Area and Siting Corridor. Based on review of these data, eight named streams are located within the Project Area, each of which intersects at least a portion of the Siting Corridor. These named stream features include Government Creek, Forest Creek, Boulder Creek, Willow Creek, Fish Creek, Dale Creek, Pump Creek, and Johnson Creek. Intermittent and ephemeral tributaries associated with these features are also present throughout the Project Area and Siting Corridor (Figure 5). The majority of drainages within the northwestern portion of the Project Area drain into Willow Creek, a perennial stream that drains northwest into the Laramie River. The majority of drainages within the northeastern and southern portions of the Project Area drain into Dale Creek, a perennial stream that drains south into the North Fork Cache la Poudre River. Both the Laramie River and North Fork Cache La Poudre River are drainages within the Platte River Watershed.

Wetlands mapped by the NWI within the Project Area and Siting Corridor primarily include freshwater emergent wetland and riverine wetlands, with smaller areas of freshwater forested/shrub and freshwater pond wetlands (Figure 5). These are primarily associated with the stream features and associated tributaries located throughout the Project Area and Siting Corridor.

Based on the September 2019 wetland and waterbody resource mapping effort within the Siting Corridor, mapped NWI and NHD features generally appear to reflect existing conditions within the Project Area and Siting Corridor. A total of 53 stream features were mapped within the Siting Corridor. The majority of the mapped stream features were identified as ephemeral and are reflective of the numerous ephemeral tributaries associated with the major drainages present throughout the Siting Corridor. Intermittent and perennial stream features within the Siting Corridor were generally reflective of the name stream features present within the Siting Corridor. Four stock ponds associated were also mapped within the Siting Corridor. In general, waterbody features identified during the field reconnaissance were typical of the mountainous high plains of Wyoming and its low base flow and rainfall-driven streamflow.

A total of 58 potential wetland features were mapped within the Siting Corridor. Herbaceous emergent wetlands made up the majority of the wetland features, with five of these features identified as having potential fen characteristics. The majority of the mapped wetland features are associated with the major named streams and associated tributaries present throughout the Siting Corridor, and were focused predominantly within the southern and northeastern portions of the Siting Corridor. No forested wetlands were identified during the site reconnaissance.

The features identified during the wetland and other waterbody mapping effort were incorporated into the habitat assessment results to reflect their respective habitat types and ecological systems, as outlined in Section 4.5 below.

4.5 Habitat Communities Assessment

As noted above in Section 3.2, Tetra Tech biologists completed a field-based habitat assessment for the Project Area in September 2019. The habitat assessment methodology focused on ground-truthing of land cover types identified by the NLCD (Yang *et al* 2018). The results of that effort indicate that the Project Area contains a much higher cover of scrub/shrub vegetation (94.01 percent; Figure 6) than what is mapped by the NLCD data (66.06 percent; Figure 4), accounting for nearly all of the grassland cover mapped by the NLCD.

Within the Siting Corridor, similar land cover percentages were observed, with a dominant land cover of scrub/shrub vegetation (96.31 percent; Table 2; Figure 6). Other land cover types present within the Siting Corridor are generally similar to NLCD cover, and include emergent herbaceous wetland (0.81 percent), primarily mapped along the major stream features associated with the Project Area, evergreen forest (0.83 percent), primarily located within the southernmost portion of the Project Area, as well as barren land (1.49 percent), located primarily within the northern portions of the Project Area (Figure 6).

Table 2: Field-Verified NLCD Land Cover Within the Siting Corridor

NLCD Description[1]	Acres within Siting Corridor	Percentage of Siting Corridor
Shrub/Scrub	5,998.63	96.31%
Barren Land	92.89	1.49%
Evergreen Forest	51.83	0.83%
Herbaceous Wetland	50.64	0.81%
Woody Wetland	26.93	0.43%
Pasture/Hay	4.7	0.08%
Open Water	2.05	0.03%
Deciduous Forest	0.77	0.01%
Total	6,230	100%

1 Source: National Land Cover Database (Yang *et al*. 2018)

Using the field-verified NLCD data, along with documentation of dominant species, habitat types were then categorized within each land cover type using the habitats identified within the WGFD SWAP (WGFD 2017). The SWAP also outlines sub-classifications of these habitat types using NatureServe ecological system classifications (NatureServe 2019), which allow for a more refined assessment of habitat for SGCN and other sensitive species. Consequently, the SWAP habitat types categorized from the field-verified NLCD data were further sub-divided into their respective NatureServe ecological systems (NatureServe 2019).

The results of the habitat assessment for the Project Area and Siting Corridor indicate the presence of twelve ecological systems within seven SWAP habitat types (Figure 7). These ecological systems, along within their respective acreages within the Siting Corridor, are provided in Table 3. The most common habitat type identified within the Project Area and Siting Corridor is sagebrush shrublands, specifically the Wyoming Basins Dwarf Sagebrush Shrubland and Steppe ecological system (93.43 percent; Figure 7).

This ecological system is common in the windswept high-elevation basins within central and southern Wyoming and is associated with shallow, rocky soils (NatureServe 2019). The distinguishing feature of this system is a short-shrub stratum in which dwarf-shrubs (<30 centimeters [cm] tall) contribute at least two-thirds of the woody canopy. The dominant sagebrush species within the Project Area representative of this system is Wyoming threetip sagebrush (*Artemisia tripartita* ssp. *rupicola*). As reflected within the Project Area, where graminoids are common and tall, the vegetation within this system often has the appearance of grassland without shrubs when viewed from a distance (Photo 6, Appendix A). Where graminoids contribute less cover, the vegetation is a compact shrubland. The herbaceous component of the vegetation includes both rhizomatous and bunch-form graminoids, cushion plants, and other low-growing forbs (Nature Serve 2019). Due to its low-stature shrubs and grass composition, this system is used by many grassland wildlife species (WGFD 2017). Within the western portion of the Project Area, this habitat has been heavily grazed by cattle.

Table 3 provides a description of all habitat types and associated ecological systems identified within the Project Area and Siting Corridor along within their respective acreages within the Siting Corridor. Representative photos of each ecological system are provided as Photos 1-12 in Appendix A. Overall, habitat within the Project Area and Siting Corridor is representative of the land cover types mapped by the NLCD (Yang *et al* 2018), with the NLCD grassland cover accounted for within the Wyoming Basins Dwarf Sagebrush Shrubland and Steppe ecological system. A number of bedrock outcrops dominated by cushion plant communities were also mapped within this ecological system, primarily within the northwestern portion of the Project Area (Figure 7). Wetland and riparian habitat was mapped primarily along the major stream features associated with the Project Area (Figure 6). A small area of aspen/deciduous forest was mapped along the westernmost portion of the Project Area, while cliffs and rock outcrops were mapped within the northeastern portion of the Project Area (Figure 6). Foothill shrublands were mapped within the southern and western portions of the Project Area, while xeric and lower montane forest was mapped primarily within the southernmost portion of the Project Area, and a few small segments are located within the eastern portion (Figure 6).

Table 3: Habitat Types and Ecological Systems Present within the Siting Corridor

WGFD SWAP Habitat Type[1]	NatureServe Ecological System[1]	Description[2]	Acres within Siting Corridor	Percentage of Siting Corridor
Aspen/Deciduous Forest	Rocky Mountain Aspen Forest and Woodland	Upland forests and woodlands dominated by quaking aspen (*Populus tremuloides*) without a significant conifer component.	0.78	0.01%
Cliffs, Canyons, Caves, and Rock Outcrops	Inter-mountain Basins Cliff and Canyon	Granite rock outcrops with sparse vegetation (generally <10% plant cover).	30.99	0.50%

WGFD SWAP Habitat Type[1]	NatureServe Ecological System[1]	Description[2]	Acres within Siting Corridor	Percentage of Siting Corridor
Foothill Shrublands	Inter-mountain Basins Montane Sagebrush Steppe	Mesic shrub-steppe stands comprised of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and other sagebrush species intermixed with grasses such as bluebunch wheatgrass (*Pseudoroegneria spicata*) and western wheatgrass (*Pascopyrum smithii*).	163.10	2.62%
	Inter-mountain Basins Mountain-Mahogany Woodland and Shrubland	Dense thickets of 1.5-2 m tall shrubland or woodlands dominated by curl-leaf mountain mahogany (*Cercocarpus ledifolius*) located generally along ridges and steep rimrock slopes.	14.27	0.23%
Riparian Areas	Rocky Mountain Lower Montane-Foothill Riparian Woodland and Shrubland	Mosaic of multiple communities along streams that are tree-dominated with a diverse shrub component. Dominant species include Bebb willow (*Salix bebbiana*), mountain willow (*S. monticola*), and strapleaf willow (*S. eriocephala*).	26.93	0.43%
Sagebrush Shrublands	Wyoming Basins Dwarf Sagebrush Shrubland and Steppe	Matrix of dwarf sagebrush and shrub-steppe in which dwarf-shrubs (<30 cm tall) contribute at least two-thirds of the woody canopy. Vegetation cover is dominated by Wyoming threetip sagebrush, growing no taller than a few inches, intermixed with grassland species such as blue grama (*Bouteloua gracilis*), Sandberg's bluegrass (*Poa secunda*), and bluebunch wheatgrass (*Pseudoroegneria spicata*).	5,821.16	93.46%
	Wyoming Basins Dwarf Sagebrush Shrubland and Steppe- Bedrock Outcrops	Predominantly barren, wind-scoured bedrock outcrop inclusions of shale characterized by soft soil, low vegetation cover, and a dominance of cushion plants such as Hood's phlox (*Phlox hoodii*) and Hooker's desert sandwort (*Eremogone hookeri*). Fringed sagebrush (*Artemisia frigida*) also common around the perimeters of these areas. May support rare plant species.	61.89	0.99%
Wetlands	Pasture/Hay	Meadows comprised of moist soils supporting grass and forb species used for hayfields and grazing. Dominant species include Timothy (*Phleum pratense*) and smooth brome (*Bromus inermis*).	4.70	0.08%
	Open Water	Open water areas with little to no vegetative cover.	2.05	0.03%

WGFD SWAP Habitat Type[1]	NatureServe Ecological System[1]	Description[2]	Acres within Siting Corridor	Percentage of Siting Corridor
	Rocky Mountain Subalpine-Montane Fen (Suspected)	Wetlands characterized by a high groundwater level and peat accumulation. Further soil and groundwater analyses would be required for confirmation. Dominant species include sedges (*Carex* spp.) and spikerushes (*Eleocharis* spp.).	12.06	0.19%
	Western Great Plains Open Freshwater Depression Wetland	Depressional wetlands and stream margins characterized by herbaceous emergent species such as sedges (e.g., *Carex aquatilis* and *C. nebrascensis*), rushes (e.g., *Juncus balticus*), and spikerushes (e.g., *Eleocharis palustris*).	38.56	0.62%
Xeric and Lower Montane Forest	Rocky Mountain Foothill Limber Pine-Juniper Woodland	Rocky, patchy forests dominated by limber pine (*Pinus flexis*) and Ponderosa pine (*Pinus ponderosa*) interspersed with sagebrush species and montane grasses.	51.83	0.83%
TOTAL			6,230	100%

1 WGFD 2017
2 NatureServe 2019

4.6 Special-Status Plants and Other Plant Species of Concern

The field-based habitat assessment in September 2019 tentatively identified 119 plant species within the Project Area (Appendix B). The field survey was conducted later in the growing season after the flowering or inflorescence period for some species; therefore, plant identification may not reflect a comprehensive list for the site. The taxonomic reference for the vegetation assessment was *Vascular Plants of Wyoming* (Dorn 2001).

4.6.1 Federally Listed Plant Species

Section 7 of the ESA directs federal agencies to ensure that no actions they authorize, fund, or carry out are likely to jeopardize the continued existence of an endangered or threatened species. This includes federal actions on private lands that may impact federally-listed plant species. One federally listed plant species, the federally threatened Western prairie-fringed orchid (*Platanthera praeclara*), is identified as potentially being affected by Project development based on the USFWS IPaC resource list (USFWS 2019a; Appendix C). This plant occurs most often in mesic to wet unplowed tallgrass prairies and meadows, but has been found in old fields and roadside ditches (USFWS 2004). While no occurrences of the species have been documented within Wyoming, Western prairie-fringed orchid is listed for Albany County because water depletions in the Platte River System may have an effect on downstream populations in Nebraska. If the Project may lead to consumptive use of water or have the potential to adversely affect water quality in the Platte River System (i.e., result in an effect that is not discountable, insignificant, or beneficial), there may be impacts to threatened and endangered species inhabiting the downstream reaches of this

river system (USFWS 2019a). Under Section 7 of the ESA, consultation must occur for projects in Wyoming with a federal nexus that may lead to water depletions that potentially impact water quality in the Platte River System.

Water used for Project construction would likely be obtained from either temporary groundwater wells or from an offsite water purveyor. During Project operations, it is anticipated that either an existing landowner well or a new domestic well will be utilized to support onsite staff at the O&M building. As estimated water use for the Project is minimal, it is anticipated that any water-related activities associated with the Project will be covered under the Wyoming Depletions Plan and will be subject to streamlined ESA consultation with USFWS for review of impacts to the Platte River System.

In addition, according to the Wyoming SEO "Green Area" maps, groundwater resources associated with the Harney Creek-Laramie River sub-basin, which covers the northwestern portion of the Project Area are considered "not hydrologically connected" to the North Platte River Basin (WSGS 2013). Therefore, development of new water supply wells or use of existing water sources within this portion of the Project would be unlikely to require coverage under the PRRIP.

In addition to the Western prairie fringed orchid, previous coordination for listed plant species as part of the Hermosa West Wind Energy Project (WAPA 2012) identified two other federally listed plant species of potential concern to USFWS not identified by the 2019 IPaC review: the threatened Ute ladies'-tresses orchid (*Spiranthes diluvialis*) and the endangered blowout penstemon (*Penstemon haydenii*). As noted in the Hermosa West Wind Energy Project DEIS, informal discussion with USFWS in the Cheyenne field office (Covington 2010) verified that Ute ladies'-tresses orchid is not likely to be found at the site based on site elevation, as the orchid is not typically found above 7,000 feet. Elevation of the Project Area ranges from approximately 7,560 feet to 8,290 feet; therefore, Ute ladies'-tresses orchid is not anticipated to be present within the Project Area. The blowout penstemon is only found on sand blowouts or sand dunes, neither of which occurs in the Project Area. Therefore, neither species is anticipated to be impacted by Project development.

If it is determined that the Project may affect an ESA-listed species, a Biological Assessment (BA) would be prepared that will review potential effects to federally listed species from development of the Project as part of consultation with USFWS under Section 7 of the ESA.

4.6.2 Wyoming Plant Species of Concern

The WYNDD maintains a list of plant Species of Concern (SOC) that names 423 vascular plants that are of greatest conservation concern in the state (Heidel 2018). While WYNDD SOC have no regulatory protections, the SOC lists are intended to provide decision makers and the public with sufficient background information to determine which species are the highest priority for conservation attention.

Fifty-eight SOC plants are known to occur or may occur in Albany County (Appendix D). Of these 58 SOC plant species, 11 were determined to have the potential to occur within the Project Area and Siting Corridor based on prediction modeling of the Project Area by WYNDD (WYNDD 2019). Table 4 provides a description of these species, including two additional SOC plant species not listed for Albany County but included in the prediction modeling of the Project Area by WYNDD.

Another SOC plant species, the Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradoensis*), is listed by WYNDD as potentially occurring within Albany County (Table 4; WYNDD 2019). This species was previously listed as federally threatened under the ESA, but was recently delisted by USFWS as of November 5, 2019. Although no documented occurrences of the species have been made in Albany County, it has been documented to the south in Larimer County, Colorado, and to the east in Laramie County, Wyoming, where former critical habitat was listed approximately 24 miles east of the Project Area (USFWS 2019b). The species typically occurs in wetland habitats along the meandering stream channels on the high plains, preferring open habitat that is not substantially overgrown by other vegetation (USFWS 2019c).

Although the species has not been documented within Albany County, there is potential habitat within the Project Area and Siting Corridor for the species, and known occurrences have been documented in adjacent counties. Therefore, the species has a moderate potential to occur within the Project Area.

Table 4: Wyoming Plant Species of Concern with Potential to Occur in the Project Area and Siting Corridor

Common Name	Scientific Name	State Rank	Global Rank	Habitat Description[1]
Colorado butterfly plant	*Gaura neomexicana* ssp. *coloradoensis*	S2	G3T2	Found on sub-irrigated soils on level or slightly sloping floodplains and drainage bottoms at elevations from 5,000 to 6,400 feet in Wyoming. Colonies are found on the bends in wide, meandering streams or in low depressions adjacent to the channel.
Dainty rockcress	*Boechera gracilenta*	S1	G4?Q	Typically found on rocky slopes and in dry, sandy soils. It may be found in pine-juniper plant communities, at elevations from 4,700 to 8,500 feet.
Dropleaf buckwheat	*Eriogonum exilifolium*	S2	G3	Tentative identification during September 2019 habitat assessment (no flowers present during survey). Barren/windswept area with cushion plant community dominating on rocky soils and shale outcrops.

Common Name	Scientific Name	State Rank	Global Rank	Habitat Description[1]
Grassyslope sedge	*Carex oreocharis*	S2	G3	Occurs on dry, gravelly, rolling plains of Sherman granite in plant communities dominated by three-tip sagebrush and slimstem muhly.
Howard's evening primrose	*Oenothera howardii*	S1	G3G4	Chalky banks, dry hillsides, sandy soils, and grassland.
Laramie chickensage	*Sphaeromeria simplex*	S2	G2	This species is a mat-forming perennial herb or subshrub, typically less than 10cm tall. Found on gentle slopes or wind-scoured openings dominated by cushion plants.
Leechleaf blazingstar	*Mentzelia sinuata*	S2	G3	Disturbed plains and hills.
Marsh felwort	*Lomatogonium rotatum*	S2	G5	Occurs along the margins of salt marshes, lakeshores, flooded meadows, and moist hummocks in willow thickets and sedge wetlands (7,300-8,900 ft)
Rocky Mountain phacelia	*Phacelia denticulata*	S2	G3	Gravelly, sandy or clay soils, prairie draws and flats, or rocky slopes in the mountains from 6,000 to 7,900 feet.
Rusby's blazingstar	*Mentzelia rusbyi*	S1	G4?	Open parks, moist meadows, and gravelly roadcuts at elevations from 6,600 to 7,800 feet.
Smooth white aster	*Symphytotrichum porteri*	S1	G3G4	Typically found in aspen/lodgepole pine stands, limber pine/Douglas-fir stands, grassy meadows, and shrublands on sandy, gravelly, or granite talus slopes (from 7,000 to 9,050 feet).
Watson's goosefoot	*Chenopodium watsonii*	S1	G5	Plains, hills and disturbed areas.
White River coraldrops	*Besseya plantaginea*	S1	GNR	Moist wooded slopes, aspen groves, and edge of moist meadows or willow thickets from 7,800 to 8,200 feet.

1 Source: Dorn (2001)

4.6.3 Noxious Weeds

Noxious weed invasions can have an adverse impact on rare plant species and native plant communities. The State of Wyoming enacted the Wyoming Weed and Pest Control Act that states: "The district board shall: Implement and pursue an effective program for the control of designated weeds and pests" (W.S. 11-5-105(a)(i). Thirty noxious weed species on the 2018 list of State Designated Weeds and Pests are considered to be detrimental to the state (W.S. 11-5-102 (a)(xi) (Wyoming Weed and Pest Council 2018). In addition, Declared Weeds or Pests may

be considered a detriment to a specific district. Three Declared Weeds in Albany County: locoweed (*Oxytropis nana*), larkspur (*Delphinium* sp.), and cheatgrass (*Bromus tectorum*; Albany County Weed and Pest Control District 2019).

Cheatgrass was observed throughout the overall Project Area in relatively low concentrations during the September 2019 habitat assessment. Other Wyoming state-listed noxious weed species noted during the habitat assessment include Canada thistle (*Cirsium arvense*), houndstongue (*Cynoglossum officinale*), and common mullein (*Verbascum thapsus*). Previous field efforts for the Hermosa West Wind Energy Project also noted the presence of leafy spurge (*Euphorbia esula*), field bindweed (*Convolvulus arvensis*) and quackgrass (*Elymus repens*; WAPA 2012).

4.7 Special-Status Wildlife and Other Sensitive Wildlife

The following sections identify and discuss wildlife species of concern potentially occurring within the Project Area using data from WYNDD, WGFD, and USFWS. It is important to note that these sources of species' distribution information are often based on documented occurrences from indiscriminate surveys that have taken place rather than on systematic surveys; therefore, a lack of records does not necessarily indicate that a species is absent from a particular area.

4.7.1 Federally Listed Animal Species

All federally listed wildlife species are protected under the ESA. The USFWS IPaC resource list identified five federally listed wildlife species as having the potential to occur within the Project Area and Siting Corridor or to be affected by Project development (USFWS 2019a; Table 5; Appendix C): Preble's meadow jumping mouse (Preble's mouse; *Zapus hudsonius preblei*), interior least tern (*Sterna antillarum athalassos*), piping plover (*Charadrius melodus),* whooping crane (*Grus americana),* and pallid sturgeon (*Scaphirhynchus albus)*. In addition, WGFD identified potential habitat within the Project Area for one other federally listed wildlife species not listed on the IPaC, the Wyoming toad (*Anaxyrus baxteri*; WGFD 2019b; Table 5; Appendix E).

Table 5 lists the likelihood of occurrence for federally listed wildlife species identified as having the potential to occur within the Project Area (USDWS 2019a, WGFD 2019b). Likelihood determinations are based upon review of known species' ranges, habitat requirements, and presence of habitat within the Project Area, as determined by the field-based habitat assessment. While interior least tern, piping plover, whooping crane, and pallid sturgeon are not expected to occur within Albany County, these species are listed for Albany County because water depletions in the Platte River System may have an effect on downstream populations in Nebraska. As stated above, under Section 7 of the ESA, consultation must occur for projects in Wyoming with a federal nexus that may lead to water depletions that potentially impact water quality in the Platte River System, as adverse impacts to water quality may affect threatened and endangered species inhabiting the downstream reaches of these river systems (USFWS 2019a).

As noted above, it is anticipated that any water-related activities associated with the Project will be covered under the Wyoming Depletions Plan and will be subject to streamlined ESA consultation with USFWS for review of impacts to the Platte River System. In addition, according to the Wyoming SEO "Green Area" maps, groundwater resources associated with the Harney Creek-Laramie River sub-basin, which covers the northwestern portion of the Project Area are considered "not hydrologically connected" to the North Platte River Basin (WSGS 2013). Therefore, development of new water supply wells or use of existing water sources within this portion of the Project would be unlikely to require coverage under the PRRIP.

The Preble's mouse has a moderate likelihood of occurrence within the Project Area and Siting Corridor based on the presence of potentially suitable habitat and the location of portions of the Project Area within a recovery population hydrologic unit identified for the species. More detailed species information is provided below.

If it is determined that the Project may affect an ESA-listed species, a BA would be prepared that will review potential effects to federally listed species from development of the Project and support consultation with USFWS under Section 7 of the ESA.

Table 5. Federally Listed Wildlife Species with Potential to Occur in the Project Area and Siting Corridor

Common Name	Scientific Name	Listing Status[1]	Species-Habitat Association[3]	Likelihood of Occurrence[2]	Habitat Notes
Mammals					
Preble's meadow jumping mouse	*Zapus hudsonius preblei*	FT	Prairie and foothill riparian habitats in areas with dense shrub, grass, and woody debris cover, with relatively undisturbed adjacent upland grasslands, and a nearby water source. Portions of Project Area located within Cache la Poudre recovery population hydrologic unit.	Moderate	Numerous riparian areas with flowing streams, wetland fringes, and multi-storied canopies of shrubs and trees were identified during the field-based habitat assessment. These riparian areas are bordered by grassland and short-stature shrublands with cattle grazing as the main disturbance stressor in the ecosystem. No capture records within the Project Area.
Birds					
Least tern (interior pop.) ▲	*Sterna antillarum athalassos*	FE	Primary habitat includes the Platte River System, specifically flat, sandy, or gravelly shoreline. Summer breeding resident, migrant. Does not regularly occur in Wyoming.	Unlikely	No rivers with sandbars, lakes, or reservoirs capable of supporting breeding identified within Project Area during field-based habitat assessment. No anticipated adverse downstream water depletions of the Platte River System from Project development.

Common Name	Scientific Name	Listing Status[1]	Species-Habitat Association[3]	Likelihood of Occurrence[2]	Habitat Notes
Piping plover ▲	*Charadrius melodus*	FT	Shorelines around small lakes, reservoir beaches, river islands, alkali flats, sand pits, and beaches on large lakes for breeding. Summer breeding resident, migrant.	Unlikely	No alkali flats, reservoirs, or rivers capable of supporting breeding identified within Project Area during field-based habitat assessment. No anticipated adverse downstream water depletions of the Platte River System from Project development.
Whooping crane ▲	*Grus americana*	FE	Wetland habitat including marshes, lakes, ponds, wet meadows and rivers, and agricultural fields. Project Area is outside of the migration corridor in which 95 percent of observations occur. Does not regularly occur in Wyoming.	Unlikely	Wetland and wet meadow habitat and hayfields that could be used as a stopover during migration were identified within the Project Area during the field-based habitat assessment. No anticipated adverse downstream water depletions of the Platte River System from Project development.
Fishes					
Pallid sturgeon ▲	*Scaphirhynchus albus*	FE	Occurs in the Platte River watershed downstream in Nebraska. Not known to occur in Wyoming or Colorado.	Unlikely	No large, silty rivers identified within the Project Area during the field-based habitat assessment. No anticipated adverse downstream water depletions of the Platte River System from Project development.
Amphibians					
Wyoming toad	*Anaxyrus baxteri*	FE	Glacial relic known only from Albany County, Wyoming. Formerly inhabited floodplains, ponds, and small seepage lakes in the shortgrass communities of the Laramie Basin. Listed as extinct in the wild since 1991, currently exists only in captivity and within Mortenson Lake National Wildlife Refuge.	Unlikely	Potential habitat present within Project Area; however, only extant population located approximately 13 miles northwest of the Project Area in Mortensen NWR.

Common Name	Scientific Name	Listing Status[1]	Species-Habitat Association[3]	Likelihood of Occurrence[2]	Habitat Notes

▲ If the Project may lead to consumptive use of water or have the potential to affect water quality in the Platte River System, there may be impacts to threatened and endangered species inhabiting the downstream reaches of this river system (USFWS 2019a).

1 FE= Federally Endangered, FT= Federally Threatened (USFWS 2019a).

2 Potential for Occurrence: Unlikely—species' range does not overlap with Project and/or no suitable habitat in Project, and/or no downstream Platte River impacts; Low—species' range overlaps with Project and marginally suitable habitat in Project; Moderate—species' range overlaps with Project and suitable habitat present in Project; High—species' range overlaps with Project and highly suitable habitat in Project, and/or known populations/observations within Project.

3 Sources: USFWS 2019a,b; Elliott-Smith and Haig 2004; Thompson *et al*. 1997; Urbanek and Lewis 2015; USFWS 2013b

4.7.1.1 Preble's Meadow Jumping Mouse

Preble's mouse, a subspecies of the meadow jumping mouse, was federally listed as a threatened species in 1998 and is also listed as a SGCN for Wyoming (WGFD 2017). A draft recovery plan was prepared in 2003 by the USFWS and a final recovery plan (Recovery Plan) was prepared in August 2018 (USFWS 2018c). In 2008, the species was removed from protection under the ESA in Wyoming, but was reinstated in 2011 (USFWS 2011). Preble's mouse is only found in southeastern Wyoming and the Colorado Front Range, typically at elevations between 6,650 and 8,100 feet (USFWS 2018c). The mouse inhabits well-developed riparian areas adjacent to undisturbed grasslands. Riparian vegetation typically includes a dense combination of grasses, forbs, and shrubs in open wet meadows and riparian corridors or where shrubs and low trees provide adequate cover. The Recovery Plan designates hydrologic units that have known or potential populations of the Preble's mouse that are targeted for Preble's mouse recovery (USFWS 2018c), one of which overlaps the southern and eastern portions of the Project Area and Siting Corridor, the Cache la Poudre Hydrologic Unit Code (HUC; Figure 8). The closest critical habitat for the Preble's mouse is within the Cache la Poudre HUC, located approximately 10.8 miles south of the Project Area along the North Fork Cache la Poudre (USFWS 2019b).

Based on trapping efforts conducted between 1989 to 2014, there are no capture records of Preble's mouse within the Project Area. Two trapping locations were noted within the Project Area along Johnson Creek and Willow Creek, and three trapping locations were noted just north of the northeastern Project boundary along a tributary of Dale Creek. No Preble's mouse were found at any of those locations (USFWS 2019d). The closest capture record is from 1998 and is located approximately 1.2 miles southeast of the Project Area along a tributary to Fish Creek (USFWS 2019d).

During the September 2019 field-based habitat assessment, the field biologists identified a number of locations with potentially suitable Preble's mouse habitat within the Project Area and Siting Corridor. These habitat areas were restricted to portions of the perennial stream features within the Project Area (Willow Creek, Fish Creek and associated tributaries, Dale Creek and associated tributaries, Johnson Creek, and Pump Creek) where flowing stream systems with well-developed wetland fringes, a shrub/tree canopy, and adjacent grasslands were present. These areas were associated with ecological systems composing the Wetlands SWAP habitat type

(Figures 4 and 5; Photos 5, 9, 13, Appendix A). Due to heavy grazing within the western portion of the Project Area, the riparian shrub/tree canopy along features such as Willow Creek and Fish Creek and its associated tributaries is smaller and more discontiguous than those features present within the eastern portion of the Project Area and therefore more marginally suitable habitat for Preble's mouse may be present in these locations.

Although the Project Area is over one mile from the nearest capture record, due to the location of the Project Area within a Preble's mouse recovery hydrologic unit and the presence of potentially suitable habitat, the likelihood of occurrence for Preble's mouse within the Project Area and Siting Corridor is moderate. A focused habitat assessment will be conducted in 2020 at proposed crossing locations with the potentially suitable habitat currently identified in order to further refine habitat suitability within the Project. ConnectGen will use this information to microsite Project features to avoid impacts to potentially suitable Preble's mouse habitat to the extent possible. Based on the results of this siting effort, ConnectGen will then coordinate with USFWS to determine whether any focused presence/absence survey efforts, including trapping, may be suggested to assess the potential for the Project to affect Preble' mouse.

As stated above, if it is determined that the Project may affect an ESA-listed species, a BA would be prepared that will review potential effects to federally listed species from development of the Project as part of consultation with USFWS under Section 7 of the ESA.

4.7.2 Other Special-Status Wildlife Species

4.7.2.1 Bald and Golden Eagles

Bald and golden eagles are protected species under both the BGEPA and the MBTA, and are also listed as SGCN for Wyoming (WGFD 2017) and Birds of Conservation Concern (BCC; USFWS 2008).

In consideration of the Tier 1/Tier 2 recommendations outlined in the USFWS WEGs (USFWS 2012) and Stage 1 of the ECPG (USFWS 2013a), a 10-mile buffer was used to determine the potential presence of bald and golden eagles within the vicinity of the Project Area. As stated above, while this evaluation utilizes a 10-mile buffer, it should be noted that the ECPG recommendation of a 10-mile eagle survey buffer, on which this analysis is based on, was subsequently revised on April 21, 2020 to two miles (USFWS 2020a).

4.7.2.1.1 Bald Eagle

Bald eagles are considered year-round residents, winter residents, or spring and fall migrants in Wyoming (WGFD 2017). Bald eagles are opportunistic foragers that prey primarily on fish but also prey on waterfowl and other birds, on small mammals such as prairie dogs, on other aquatic and terrestrial vertebrates, and on carrion (WGFD 2017; Buehler 2000). In Wyoming, bald eagles typically nest in forested areas adjacent to rivers and large bodies of water. Trees selected for nesting are typically mature, old-growth trees close to water and foraging opportunities (Buehler 2000). Both riparian deciduous trees, such as cottonwoods, and evergreen trees, such as

ponderosa pine, can be used as nest trees (WGFD 2017). Most wintering populations are present within the contiguous United States, Alaska, and coastal Canada. Wintering locations are associated with aquatic areas that contain some open water for foraging on fish. Wintering bald eagles roost anywhere between 6 miles and 20 miles from foraging sites depending on abundance of prey. The wintering or non-nesting period is from September through mid-January (USFWS 2013a).

No large water bodies (e.g., lakes, rivers) are located within the Project Area or immediate vicinity that would regularly attract bald eagles. Sources of carrion within the Project Area include livestock, offal from hunting, and roadkill. Livestock carcasses from cattle ranching activities and roadkill along roads within the Project Area were both noted during the September 2019 field-based habitat assessment. Previous surveys completed for the Hermosa West Wind Energy Project in 2010, as well as a WYNDD species observation from 1991, noted the presence of white-tailed prairie dog colonies (*Cynomys leucurus)* within the Project Area (Taylor and Bay 2011; WYNDD 2019). However, no prairie dog colonies were observed within the Siting Corridor during the September 2019 field-based habitat assessment or during any other field-based surveys for the Project to date, indicating the these colonies are no longer extant within the Project Area.

Bald eagles regularly occur at Hutton Lake NWR, approximately 7.5 miles to the northwest of the Project Area along the Laramie River and are year-round residents there (Figure 3). Previous avian surveys completed for the Hermosa West Wind Energy Project in 2010 noted four bald eagle observations (Taylor and Bay 2011), and one bald eagle observation was reported within the Project Area based on the WYNND species observation data (WYNDD 2019). During the September 2019 field-based habitat assessment, one juvenile bald eagle was observed perched on a rock in the center of the Project Area.

Avian surveys are being conducted for the Project in accordance with the ECPG (USFWS 2013a), the Eagle Rule Revision (USFWS 2016a), the WEGs (USFWS 2012), and the WGFD Wind Energy Recommendations (WGFD 2010). Aerial surveys for eagle and raptor nests were conducted by Western Ecosystems Technology, Inc. (WEST) in spring 2019 within the Project Area and surrounding 10-mile buffer. One occupied-active bald eagle nest was documented during surveys in a tree along the very western edge of the 10-mile buffer (WEST 2019). In addition, the species was observed during large bird surveys conducted within the Project Area from January to December 2019 by WEST (Kosciuch *et al*. 2020), which included documentation of eagle flight paths, height, and perch locations. An additional year of large bird surveys and aerial nests surveys are underway.

Based on recent observations, the proximity of potential habitat, and potential prey sources, bald eagles are likely to occur in the Project Area; however, due to the lack of large mature nest trees and associated large waterbodies, the likelihood that bald eagles will nest within the Project Area and Siting Corridor is low.

4.7.2.1.2 Golden Eagle

Golden eagles occur year-round throughout Wyoming within a wide variety of habitats including sagebrush steppe, desert shrubland, prairie grassland, juniper woodland edges, lower elevation riparian areas, and mountainous cliffs in high elevation areas (WGFD 2017). Golden eagles nest on cliff faces and rock outcrops in open habitats, but also nest on trees (WGFD 2017). Golden eagles feed upon a wide variety of prey species in Wyoming including, but not limited to, jackrabbits (*Lepus* sp.), cottontail rabbits (*Sylvilagus* sp.), ground squirrels (*Urocitellus* sp.), prairie dogs (*Cynomys* sp.), and pronghorn fawns (WGFD 2017).

Suitable foraging habitat was identified throughout the Project Area. Golden eagle prey such as pronghorn (*Antilocapra americana*) and white-tailed jackrabbit (*Lepus townsendii*) were observed during the September 2019 field-based habitat assessment (Appendix B). Sources of carrion within the Project Area include livestock, offal from hunting, and roadkill. As noted above, livestock carcasses from cattle ranching activities and roadkill along roads within the Project Area were both noted during the September 2019 field-based habitat assessment. In addition, suitable nesting habitat was identified within the cliffs and rock outcrops that make up the Inter-mountain Basins Cliff and Canyon ecological system within the Project Area (NatureServe 2019; Figure 7; Photos 2 and 9, Appendix A).

One adult golden eagle was observed during the September 2019 field-based habitat assessment in the very northeastern portion of the Project Area. Previous avian surveys completed for the Hermosa West Wind Energy Project in 2009 and 2010 noted one active golden eagle nest within a 1-mile buffer of the project during ground-based raptor nest surveys, 34 golden eagle observations during fixed-point avian surveys, as well as the presence of white-tailed prairie dog colonies (Taylor and Bay 2011). During a site reconnaissance field visit in February 2019 by Tetra Tech of the Project Area and 2-mile buffer, four golden eagles were observed, as were five large unoccupied stick nests that could be used by golden eagles. In addition, eight golden eagle observations have been reported within the Project Area based on the WYNND species observation data (WYNDD 2019). No white-tailed prairie dog colonies were observed.

As stated above, WEST is conducting avian surveys for the Project in accordance with the ECPG (USFWS 2013a), the Eagle Rule Revision (USFWS 2016a), the WEGs (USFWS 2012), and the WGFD Wind Energy Recommendations (WGFD 2010). The results of aerial nest surveys in spring 2019 documented 12 golden eagle nests within the 10-mile Project buffer, including one occupied nest within the Project Area (WEST 2019). Seven nests were considered occupied-active and five as occupied-inactive.

In addition, the species was observed during large bird surveys conducted within the Project Area from January to December 2019 by WEST (Kosciuch *et al*. 2020). An additional year of large bird surveys and aerial nests surveys are underway.

Based on previous observations, the proximity of potential habitat, and potential prey sources, the likelihood that golden eagles will occur within the Project Area and Siting Corridor is high.

Specifically, due to the presence of suitable nesting habitat and active nests observed within the Project Area, the likelihood that golden eagles will nest within the Project Area near the Siting Corridor is also high.

ConnectGen is currently coordinating with USFWS with regards to survey data collection for bald and golden eagles use within the Project Area and nests within a 10-mile buffer. Further consultation will be required to determine the potential impacts to eagles and associated regulatory compliance requirements for development of the Project, including any avoidance and minimization measures.

4.7.2.2 USFWS Species of Concern

The USFWS identifies Species of Concern as those species which might be in need of concentrated conservation actions. The following Species of Concern may occur in the Project Area: white-tailed prairie dog, bald eagle, mountain plover (*Charadrius montanus*), raptors, and USFWS Birds of Conservation Concern (USFWS 2018d). As stated above, bald eagles have been observed within the Project Area during field-based surveys for the Project. Other USFWS Species of Concern are addressed further in this section, as applicable, and noted in the wildlife observation list from the September 2019 field-based habitat assessment (Appendix B). While USFWS Species of Concern have no regulatory protections, the lists are intended to support effective planning to help ensure the long-term conservation of these species and remove threats that may contribute to the future need for listing under the ESA.

4.7.2.3 Wyoming Species of Greatest Conservation Need

Wyoming does not list species as threatened or endangered but implements the Nongame Bird and Mammal Program for wildlife species. This program is responsible for managing species that are legally designated as Nongame, which includes SGCN with a designated Native Species Status and Neotropical Migratory Birds (Section 4.7.2.4). The SGCN designation is intended to identify species whose conservation status warrants increased management attention and funding, as well as consideration in conservation, land use, and development planning in Wyoming. The purpose of the SWAP is to develop conservation strategies for these species (WGFD 2017).

WGFD has identified 219 wildlife SGCN that occur throughout the state of Wyoming, including nine amphibians, 80 birds, eight crustaceans, 28 fishes, 51 mammals, 19 mollusks, and 24 reptiles (WGFD 2017). SGCN are placed in tiers: Tier I—highest priority, Tier II—moderate priority, and Tier III—lowest priority. Appendix E lists the SGCN identified as potentially occurring within the Project Area. This list of SGCN was determined based on prediction modeling and observation data provided by WYNDD (WYNDD 2019), which was cross checked with the current list of SGCN (WGFD 2017).

Eighty-five SGCN have the potential to occur within the Project Area based on WYNDD prediction modeling (WYNDD 2019). Of these species, 25 have been observed within or near the Project

Area (Photo 16, Appendix A; Appendix E). This included field observations from Christmas Bird Counts (NAS 2010), Breeding Bird Surveys (Pardieck *et al*. 2019), or field surveys of the Project Area, including the February 2019 Tetra Tech site reconnaissance, the September 2019 Tetra Tech field-based habitat assessment, WEST avian and bat surveys for 2019 (WEST 2019; Kosciuch *et al*. 2020; Bishop-Boros and Kosciuch 2020), and wildlife baseline studies conducted as part of the Hermosa West Wind Energy Project (Taylor and Bay 2011).

In the scoping response letter provided by WGFD (WGFD 2019b), preconstruction monitoring was recommended for the following SGCN based on the presence of potential habitat within the Project Area: burrowing owl (*Athene cunicularia*), long-billed curlew (*Numenius americanus*), mountain plover, swift fox (*Vulpes velox*), plains spadefoot toad (*Spea bombifrons*), and Wyoming toad (described in Section 4.7.1). More detailed information for these species is provided below.

In addition, WGFD also noted that a portion of the Project occurs within the Harney Creek-Laramie River 5th level HUC watershed, which contain the following SGCN: brassy minnow (*Hybognathus hankinsoni*; Tier 3) and common shiner (*Luxilus cornutus*; Tier 3). Based on the recommendations of WGFD, the Project will complete a Reconnaissance Level Assessment (RLA) for the portion of the Project that occurs within the Harney Creek-Laramie River 5th level HUC to determine the potential for any Project impacts to aquatic resources within this watershed.

4.7.2.3.1 Burrowing Owl

Burrowing owls (Tier 1 SGCN; BCC) are generally found in open terrain such as grasslands, prairies, shrub-steppe, and deserts, and prefer well-draining or gently sloping areas with low vegetation and a high percentage of bare ground (WGFD 2017). Burrowing owls require burrows for nesting, escape cover, prey caching, and vigilance and must nest in burrows previously excavated by mammals. In Wyoming, burrowing owls are primarily found in prairie dog colonies, both active and inactive. Although the species is patchily distributed across western and central Wyoming, burrowing owls are most abundant in grasslands in eastern Wyoming (WGFD 2017).

Habitat for burrowing owl is present throughout the Project Area and Siting Corridor and is primarily associated with Wyoming Basins Dwarf Sagebrush Shrubland and Steppe, although the owls may be associated with portions of Inter-mountain Basins Montane Sagebrush Steppe and Inter-mountain Basins Mountain-Mahogany Woodland and Shrubland (Figure 7; Photos 3, 4, and 6, Appendix A). Although no observations of burrowing owls have been made to date within the Project Area (Appendix E), WYNDD modeling predicts the species may be present within or near (i.e., within approximately one mile of) the Project Area (WYNDD 2019).

4.7.2.3.2 Long-billed Curlew

In Wyoming, long-billed curlews (Tier II SGCN; BCC) nest in sparsely-vegetated shortgrass or mixed-grass prairie environments, often dominated by Baltic rush (*Juncus balticus*) and mountain timothy (*Phleum alpinum*), with low vegetation (≤ 10–30 cm) and topography that is flat or gently sloping (WGFD 2017). This species typically avoids habitats with high densities of tall grass, forbs,

shrubs, and/or trees but will nest in some agricultural landscapes including hay fields and grazed pasture. Long-billed curlew is a ground nesting species. Long-billed curlews spend the non-breeding season in coastal estuaries, mudflats, salt marshes, wetlands, flooded fields, agricultural fields and pastures, and a variety of manmade waterbodies. Central and western Wyoming lie within the current core breeding distribution of the species, although breeding has also been documented in eastern Wyoming. The species migrates through the state in the spring and fall and is a summer resident (WGFD 2017).

Within the Project Area and Siting Corridor, habitat for long-billed curlew is present within the wetlands and wet meadow habitats associated with ecological systems comprising the Wetlands SWAP habitat type (Figure 7; Photos 8, 10, and 11, Appendix A). While the species may occur within the Project Area as an occasional migrant or summer resident, WYNDD modeling does not predict the species to be present within or near (i.e., within approximately 1-2 miles of) the Project Area (WYNDD 2019), and it is unlikely the species nests within the Project Area. In addition, no observations of the species have been made to date within the Project Area (Appendix F).

4.7.2.3.3 Mountain Plover

Mountain plovers (Tier I, BCC) prefer sparsely vegetated desert habitat, but can also be found in sparsely-vegetated short-grass prairie as well (WGDF 2017). In Wyoming and elsewhere in its range, it utilizes areas grazed by herbivores, including prairie dogs, bison (*Bison bison*), pronghorn, and domestic livestock. It also uses active agricultural fields and recently burned grasslands. In the western periphery of its range, it uses xeric shrubland communities dominated by bare ground with saltbush (*Atriplex* spp.) and sagebrush (*Artemisia* spp.). In particular, the species prefers vegetation cover generally less than 5 cm tall with a bare ground component typically over 30 percent. The species also prefers habitat with flat topography, generally with less than 5 percent slope. Wyoming forms a significant portion of the breeding range of mountain plovers, but does not include overwintering range. Concentrated areas of breeding in Wyoming include the Powder River, Shirley, Laramie, Big Horn, Great Divide, and Washakie basins (WGFD 2017).

Potential habitat for mountain plover is present primarily within Wyoming Basins Dwarf Sagebrush Shrubland and Steppe within the heavily grazed, generally flat portions of the western half of the Project Area and Siting Corridor (Figure 7; Photo 6 Appendix A). According to WYNDD observation data, two observations of mountain plover have been made to date within or near the Project Area (Appendix E), and WYNDD modeling predicts the species maybe present within or near (i.e., within approximately one mile of) the Project Area (WYNDD 2019).

A mountain plover habitat assessment was conducted by WEST in 2010 for the Hermosa West Wind Energy Project (Taylor and Bay 2011). They determined that, while the potential for mountain plover use could not be ruled out within the Hermosa West Wind Resource Area, the actual suitability of the habitat within the project was considered low, with small isolated patches of potentially suitable habitat present. In addition, no mountain plovers had been observed during two years of baseline work conducted at the project (Taylor and Bay 2011).

4.7.2.3.4 Swift Fox

Swift fox (Tier II) habitat typically consists of short-grass and mid-grass prairies with flat or gently sloping topography (WGFD 2017). However, swift fox also utilize a mixture of non-native and atypical habitat throughout portions of their range, including agricultural croplands. Habitat in Wyoming includes grasslands with a higher shrub component, including sagebrush, greasewood (*Sarcobatus vermiculatus*), and saltbush (*Atriplex gardneri*). Within these sagebrush shrub communities, areas of lower-growing shrubs (≤ 30 cm) are used more often than those with taller shrubs. Swift fox depend greatly on burrows (dens), which are used year-round for pup-rearing as well as refuge. Swift fox may excavate their own dens or enlarge old burrows from ground squirrels or badgers (*Taxidea taxus*). Den sites are typically characterized by well-drained, loamy soils and flat terrain, sloping plains, and hill tops. Prairie dog colonies may also provide important habitat for swift fox, although this may vary throughout the range of the species. Wyoming is located on the western edge of swift fox continental range. The species is widely distributed across suitable habitat in the state (WGFD 2017).

Potential habitat for swift fox within the Project Area and Siting Corridor is present primarily within Wyoming Basins Dwarf Sagebrush Shrubland and Steppe, although they may be associated with portions of Inter-mountain Basins Montane Sagebrush Steppe and Inter-mountain Basins Mountain-Mahogany Woodland and Shrubland (Figure 7; Photos 3, 4, and 6, Appendix A). Two observations of swift fox have been made to date within or near the Project Area (Appendix E), and WYNDD modeling predicts the species may be present within or near (i.e., within approximately one mile of) the Project Area (WYNDD 2019). An observation of a potential swift fox active den site (i.e., littered with bones and scat) was made within the northwest portion of the Project Area within the Siting Corridor during the February 2019 field-based habitat assessment (Photo 14, Appendix A; Figure 8); however, no individual was observed.

4.7.2.3.5 Plains Spadefoot Toad

The plains spadefoot toad (Tier II) prefers plains grasslands and sagebrush communities below 6,000 feet in elevation (WGFD 2017). It prefers loose and well drained soils that can be found in floodplains, prairies, and loess hills. As an adaptation to arid habitats, plains spadefoot toads spend most of their lives in underground burrows. Because of this habit, they are commonly found in loose well drained soils. The plains spadefoot toad usually waits for heavy rains or irrigation runoff to fill roadside ponds, stock tanks, and other ephemeral pools before breeding. Although permanent bodies of water may be utilized for breeding, this species prefers ephemeral water. Within Wyoming, the range of the plains spadefoot toad includes all eastern and central counties, as well as the Big Horn Basin (WGFD 2017).

Within the Project Area and Siting Corridor, habitat for plains spadefoot toad is present within the wetlands and wet meadow habitats associated with ecological systems comprising the Wetlands SWAP habitat type (Figure 7; Photos 10 and 11, Appendix A), as well as upland depressional areas within Wyoming Basins Dwarf Sagebrush Shrubland and Steppe that may be subject to ponding during heavy rain events. However, WYNDD modeling does not predict the species to

be present within or near (i.e., approximately 1-2 miles of) the Project Area (WYNDD 2019), and no observations of the species have been made to date within the Project Area (Appendix F). In addition, the elevation of the Project Area ranges from approximately 7,560 feet to 8,290 feet, well above the 6,000-foot upper elevation range of the species. Therefore, the presence of plains spadefoot toad is unlikely within the Project Area.

4.7.2.4 Neotropical Migratory Birds

Neotropical migrant birds are species that breed in the United States and winter in Central and South America and the Caribbean. These species are managed under WGFD's Nongame Bird and Mammal Program. Approximately 155 neotropical migrants spend part of their life cycle in Wyoming (Wyoming Partners in Flight 2002). During the September 2019 field-based habitat assessment, 28 neotropical migrants (USFWS 2019f) were observed, as noted in Appendix B. In addition, neotropical migrant birds that are listed as SGCN or BCC species with the potential to occur within the Project Area are noted in Appendices E and F, respectively.

4.7.2.5 Birds of Conservation Concern

BCC are species of non-game migratory birds designated by the USFWS as being of one their highest conservation priorities (USFWS 2008). This is a non-regulatory status. The Project Area occurs within Bird Conservation Region (BCR) 10—Northern Rockies and BCR 16—Southern Rockies/Colorado Plateau. Tetra Tech reviewed the BCC in each BCR and determined that there were 28 potentially occurring BCC species in the Project Area based on habitat, range, and known occurrences (Faulkner 2010; Appendix F). The Project Area may provide wintering, migration, or breeding habitat for these BCC species; however, many of the species listed for BCR 16 are not expected to occur within the Project Area as the Project is within the northern extent of this BCR and outside of the known range of many species that occur farther south. Seven BCC species were detected during the September 2019 field-based habitat assessment (Appendix B).

4.7.2.6 Prairie and Sage Grouse

The WEGs recommend evaluating prairie and sage grouse during project planning (USFWS 2012). No prairie grouse species are expected to occur within the Project Area based on species' range and habitat (WGFD 2007; WGFD 2017).

The greater sage-grouse (*Centrocercus urophasianus*) is a Tier II SGCN that requires large contiguous areas of sagebrush habitat that include a variety of semiarid shrub-grassland (shrub steppe) habitats, particularly big sagebrush (*Artemisia tridentata*; WGFD 2017). The nearest designated Core Population Area is approximately 22 miles north of the Project Area, and the closest sage-grouse distribution area is located approximately four miles west of the Project Area (WGFD 2019c; Figure 8). No greater sage-grouse or leks were observed during surveys conducted for the Hermosa West Wind Energy Project (Taylor and Bay 2011) or during avian point count surveys and other field surveys conducted in 2019 for the Project. In addition, no observations of greater sage-grouse or leks have been made to date within the Project Area

(Appendix E), although WYNDD modeling predicts the species may be present within or near (i.e., within approximately one mile of) of the Project Area (WYNDD 2019). The southern portion of the Project Area contains areas of Inter-mountain Basins Montane Sagebrush Steppe (Figure 7; Photo 3, Appendix A) which could provide potential habitat for the species; however, these areas are likely not extensive enough to support greater sage-grouse.

4.7.2.7 Big Game

The WGFD is responsible for protecting and maintaining big game migration routes and stopover areas as well as other important areas of wildlife movement. WGFD's directive is to maintain wildlife migration corridors through avoidance and mitigation measures. The Project Area contains WGFD-designated Mule Deer Crucial Range (winter/yearlong) and Elk Migration Routes (WGFD 2019d; Figure 8). WGFD is currently in the process of designating Ungulate Migration Corridors with the goal to attain no significant declines in species distribution or abundance or loss of habitat (WGFD 2019e). Based on feedback provided by WGFD during initial agency outreach, the Project Area is located outside these proposed Ungulate Migration Corridors.

Habitat is present throughout the Project Area for elk (*Cervus canadensis*), mule deer (*Odocoileus hemionus*), and pronghorn, and they are commonly observed foraging. During the September 2019 field-based habitat assessment, one herd of approximately 50 elk was observed in the northeast corner of the Project Area (Figure 8; Photo 15, Appendix A). Aspen and montane forest habitat types present with the Project Area (Figure 7) provide suitable habitat for elk throughout the year, and shrubland habitats (Figure 7) provide suitable habitat for elk in the winter. One herd of approximately ten mule deer was observed in the southern portion of the Project Area (Figure 8). Aspen, montane forests, and shrubland habitats provide suitable mule deer habitat throughout the year. Pronghorn were observed in multiple locations throughout the Project Area, predominantly within the Wyoming Basins Dwarf Sagebrush Shrubland and Steppe (Figure 6).

4.7.3 Other Sensitive Wildlife

4.7.3.1 Avian Species

Birds have been identified as having the potential to be affected by wind energy development. Impacts include direct mortality as a result of collisions with wind turbines and power lines, and displacement due to the presence of associated structures (Erickson *et al*. 2005, Arnett *et al*. 2007, Loss *et al*. 2013, Marques *et al*. 2014, AWWI 2019, Dohm *et al*. 2019). Wyoming has 444 documented bird species (WGFD 2016). The Project Area lies within the Central Flyway, a migratory corridor for bird species during their spring and fall migrations between breeding grounds as far away as Alaska and Canada and wintering grounds as far away as South America (USFWS 2019e). Resident and migratory birds use the proposed Project Area for breeding, nesting, foraging, hunting, roosting, and shelter. To assess the bird community in the Project Area, two datasets were queried: the Audubon Christmas Bird Count (CBC) and USGS's Breeding Bird Survey (BBS). Observations recorded during these surveys can provide a general understanding of bird species that could occur in the Project Area.

As stated above, WEST is conducting avian use surveys for the Project in accordance with the WEGs (USFWS 2012) and WGFD Wind Energy Recommendations (WGFD 2010). Fixed avian point count surveys were conducted from January to December 2019 by WEST (Kosciuch *et al*. 2020). Overall, 18 species of large bird and 24 species of small bird were recorded, totaling 42 species of birds observed or heard over the study period. Large bird mean use was highest during spring, followed by winter, summer, and fall. Diurnal raptors accounted for the majority of large bird use during summer and fall while large corvids accounted for the majority of use during winter and spring. Small bird mean use was highest during summer, followed by spring, fall, and winter. Passerines accounted for 100 percent of small bird use during winter, spring, and fall and nearly 100 percent of use during summer (Kosciuch *et al*. 2020). No state or federally listed species were documented.

4.7.3.1.1 Audubon Christmas Bird Counts

The Audubon CBC is an annual bird census conducted by citizen scientists within established 15-mile diameter circular plots on a day falling between December 14 and January 5 (NAS 2019b). The closest CBC location to the Project Area is Albany County (WYAC), approximately five miles north-northwest of the Project Area (NAS 2019c; Figure 8). A desktop review of aerial imagery shows that some of the landcover of the WYAC CBC differs from the Project Area in that it contains an urban area (Laramie, WY) and a large riparian corridor along the Laramie River. However, the Project Area and WYAC CBC both contain shrub/scrub, evergreen and deciduous forests, and barren land NLCD cover types, and avian species observed during the CBC that prefer these land cover types are anticipated to occur within the Project Area.

From 2009 to 2018, 76 species have been detected during the WYAC CBC (Appendix G). Songbirds (passerines) were the most common species group detected from 2009 to 2018, and contained three of the five most common species detected during this 10-year period. The five most common species were house sparrow (*Passer domesticus*), rock pigeon (*Columba livia*), European starling (*Sturnus vulgaris*), American crow (*Corvus brachyrhynchos*), and mallard (*Anas platyrhynchos*; Appendix G). House sparrow, rock pigeon, European starling, and American crow are typically found in urban areas, and mallard is typically found in riparian areas. Since the Project Area contains no large urban areas and few riparian areas, it is unlikely that these species would be found in the same abundance within the Project Area.

Within the raptor species group, there have been 12 confirmed species detected during the WYAC CBC from 2009 to 2018 (Table 6). The three most commonly detected raptor species from 2009 to 2018 were rough-legged hawk (*Buteo lagopus*), bald eagle, and golden eagle, each of which were observed each year during the 10-year period, and in most years more than one individual of each species was detected. All three species are expected to occur within the Project Area.

No federally listed threatened or endangered species have been observed during the WYAC CBC from 2009 to 2018. Six BCC and nine SGCN have been observed during the WYAC CBC within the last ten years (Appendix E, Appendix F).

4.7.3.1.2 USGS Breeding Bird Survey

The USGS BBS is a long-term avian monitoring program conducted annually during the breeding season at established 24.5-mile roadside routes across the United States and Canada (USGS 2018b). The nearest USGS BBS is the Buford BBS Route (#92027), which runs directly through the Project Area along Hermosa Road (County Road 222) for approximately 7.9 miles of the 24.5-mile route (Figure 8). Because approximately 32 percent of the Buford BBS Route runs through the Project Area and the portion of the BBS route outside of the Project Area shares similar shrub/scrub and evergreen forest habitat, species detected during the BBS are anticipated to breed within the Project Area. The Buford BBS Route has not been surveyed consistently. Within the last ten years of available data (2009-2018), the Buford BBS Route has been surveyed five times (Pardieck *et al*. 2019). During that time, 73 species have been documented as potentially breeding in the area (Appendix H). Most of these species prefer grassland or woodland habitats. The most common species observed on the Buford BBS Route are horned lark (*Eremophila alpestris*), western meadowlark (*Sturnella neglecta*), and Brewer's blackbird (*Euphagus cyanocephalus*; Pardieck *et al*. 2019; Appendix H). These species are common to this region of Wyoming (WGFD 2016). No federally listed species or bald or golden eagles have been observed on the Buford BBS Route. Ten SGCN and eight BCC have been observed during the Buford BBS Route within the last 10 years (Appendix E, Appendix F).

4.7.3.1.3 Raptors

The Project Area contains suitable foraging and nesting habitat for raptors. Utility-line towers, communications towers, large trees, and rock outcrops present within the Project Area could provide hunting perches and nesting structures for raptors.

Based on the CBC, BBS, field observations, and range maps (Faulkner 2010), there are 26 raptors species with potential to occur within the Project Area, including bald and golden eagles (Table 6). None are federally listed under the ESA; however, bald and golden eagles are federally protected under BGEPA and all raptor species are USFWS SOC (USFWS 2018d, Section 4.7.2.2). The results of aerial nest surveys conducted by WEST in spring 2019 documented three ferruginous hawk, five red-tailed hawk, one Swainson's hawk, one prairie falcon, and five great horned owl occupied-active nests within a 10-mile buffer of the Project Area.

Table 6: Raptors with Potential to Occur in the Project Area

Common Name	Scientific Name	Season of Occurrence[1]				
		Spring	Summer	Fall	Winter	Survey[2]
Vultures						
Turkey vulture	*Cathartes aura*	X	X	X	—	BBS, Field surveys
Hawks						
Bald eagle	*Haliaeetus leucocephalus*	X	X	X	X	CBC, Field surveys
Broad-winged hawk	*Buteo platypterus*	X	—	X	—	None

Common Name	Scientific Name	Season of Occurrence[1]				
		Spring	Summer	Fall	Winter	Survey[2]
Cooper's hawk	*Accipiter cooperii*	X	X	X	X	CBC, Field surveys
Ferruginous hawk	*Buteo regalis*	X	X	X	X	CBC, BBS, Field surveys
Golden eagle	*Aquila chrysaetos*	X	X	X	X	CBC, Field surveys
Northern goshawk	*Accipiter gentilis*	X	X	X	X	BBS, Field surveys
Northern harrier	*Circus hudsonius*	X	X	X	X	CBC, Field surveys
Osprey	*Pandion haliaetus*	X	—	X	—	None
Red-tailed hawk	*Buteo jamaicensis*	X	X	X	X	CBC, BBS, Field surveys
Rough-legged hawk	*Buteo lagopus*	X	—	X	X	CBC, Field surveys
Sharp-shinned hawk	*Accipiter striatus*	X	X	X	X	CBC, Field surveys
Swainson's hawk	*Buteo swainsoni*	X	X	X	—	BBS, Field surveys
Falcons						
American kestrel	*Falco sparverius*	X	X	X	X	CBC, BBS, Field surveys
Merlin	*Falco columbarius*	X	X	X	X	CBC, Field surveys
Peregrine falcon	*Falco peregrinus*	X	X	X	—	None
Prairie falcon	*Falco mexicanus*	X	X	X	X	CBC, BBS, Field surveys
Owls						
Barn owl	*Tyto alba*	—	—	—	—	None
Burrowing owl	*Athene cunicularia*	X	X	X	—	None
Eastern screech-owl	*Otus asio*	—	—	—	—	None
Great horned owl	*Bubo virginianus*	X	X	X	X	CBC, BBS
Northern pygmy-owl	*Glaucidium gnoma*	X	X	X	X	None
Northern saw-whet owl	*Aegolius acadicus*	X	X	X	X	None
Long-eared owl	*Asio otus*	X	X	X	X	Field surveys
Short-eared owl	*Asio flammeus*	X	X	X	X	None
Snowy owl	*Bubo scandiacus*	—	—	—	X	None

1 Cornell Lab of Ornithology 2019; Pardieck *et al*. 2019

2 CBC = Christmas Bird Count (NAS 2010); BBS = Breeding Bird Survey (Pardieck *et al*. 2019); Field surveys = species observed during field surveys conducted within the Project Area (includes February 2019 Tetra Tech site reconnaissance, September 2019 Tetra Tech field-based habitat assessment, WEST avian and bat surveys for 2019 [WEST 2019, Kosciuch

Common Name	Scientific Name	Season of Occurrence[1]				
		Spring	Summer	Fall	Winter	Survey[2]

et al. 2020], and wildlife baseline studies conducted as part of the Hermosa West Wind Energy Project [Taylor and Bay 2011])

4.7.3.2 Bat Species

Bat casualties have been reported from most wind-power facilities where post-construction fatality monitoring data are available. In total, 18 bat species are known to occur in Wyoming (Orabona *et al*. 2016). These species are attracted to a variety of landscape features and habitats including, but not limited to natural caves, abandoned mines, other man-made structures, rock shelters, deciduous and evergreen forests, and surface water.

Natural caves and sinks provide some of the most important hibernating and maternity sites for bats (Racey and Entwistle 2003), and the lack of suitable roosts in these environments may be the most limiting factor for cave-dwelling bats (Kunz 1982). Several bat species that are associated with caves have the potential to occur in the Project Area (Hester and Grenier 2005, Table 7). In addition, many of Wyoming's abandoned mines surveyed by WGFD have been confirmed to be occupied by bats or contain significant habitat potential for bats (Hester and Grenier 2005).

Natural caves in Wyoming are primarily composed of karst (readily dissolved soluble rocks) and pseudokarst (non-soluble rocks similar in topography to karst) features (Hester and Grenier 2005). No karst features or other natural caves have been identified within the Project Area. The nearest natural cave to the Project Area is the Grand Vedauwoo Caverns, a small granite cave on the south edge of the Vedauwoo Recreation Area located approximately three miles northeast (Hill *et al*. 1976; Figure 9). In addition, karst features are mapped in the western portion of the Project Area and in the southwestern and northwestern vicinity of the Project Area that could support future development of caves and sinks (Figure 9; USGS 2014). Abandoned mines share many of the same characteristics as natural caves, which makes them important sites for bats (Hinman and Snow 2003). Five mines were identified within the Project Area within an additional six mines identified within one mile of the Project Area (Figure 9; Horton *et al*. 2019). These include borrow pits, gravel pits, mine shafts, open pit mines, and prospect pits.

The Project Area is not located near any large, known bat colonies likely to attract large numbers of bats. The historic mine location within the Hermosa West Wind Resource Area was sampled in 2010 and the bat activity rate in the vicinity of the mine was within the range of activity rates at other sampling stations (WAPA 2012).

Man-made structures such as buildings, bridges, and culverts with suitable conditions can provide additional important habitat for bats (Hester and Grenier 2005). Structures within the Project Area that may provide suitable roosting habitat for bats include scattered old and abandoned buildings associated with ranching activities as well as a railroad tunnel associated with the Union Pacific Railroad.

Rock shelters are important for many species of bats (Kurta 2000) as they provide protection from predators and suitable roosting habitat for smaller colonies and individual bats (Vaughan and O'Shea 1976). Rock shelters are any shallow crevice or small cave in a cliff, rock outcrop, or talus slope (Hester and Grenier 2005). Several granite rock outcrop structures are present within the eastern portion of the Project Area that may provide suitable rock shelters for bats (Photos 2 and 9, Appendix A). Within the Project Area, these areas comprise the Inter-mountain Basins Cliff and Canyon ecological system, as illustrated in Figure 7.

Many bats also depend on surface water, forests, and woodlands for survival. Surface water is not only important to bats for drinking, it also provides foraging habitat (Hinman and Snow 2003). This habitat is reflected in the Wetlands and Riparian SWAP habitat types illustrated in Figure 7 (Photos 5 and 9, Appendix A), and may also be present in scattered stock tanks present within the Project Area. Species such as the hoary bat, silver-haired bat, and eastern red bat are generally obligate tree-roosting species (Hester and Grenier 2005), but can also be found roosting in sagebrush scrub along migration routes when no trees are available. Tree-roosting bat species found in Wyoming primarily occur in conifer forests, juniper woodlands, and aspen forests, all of which are reflected in the forest SWAP habitat types illustrated in Figure 7 (Photos 1 and 12, Appendix A).

Of the 18 bat species known to occur in Wyoming, the northern long-eared bat (*Myotis septentrionalis*), listed as threatened under the ESA, and the tri-colored bat (*Perimyotis subflavus*), proposed to be listed under the ESA, are not likely to occur within the Project Area as there are no records for Albany County (Orabona *et al*. 2016, WYNDD 2019). Of the 16 remaining species, 12 have the potential to occur within the Project Area based on documented detections, range maps, and the presence of suitable habitat (Orabona *et al*. 2016, WYNDD 2019). Table 7 outlines the likelihood of occurrence of these 12 species within the Project Area. Of the 12 species with potential to occur in the Project Area, ten have a high likelihood of occurrence, one has a moderate likelihood of occurrence, and one has a low likelihood of occurrence. Six of these species are SGCN.

Bat acoustic monitoring for the Project was conducted in accordance with the WEGs (USFWS 2012 and WGFD Wind Energy Recommendations (WGFD 2010). Bat acoustic monitoring was conducted from April to October 2019 by WEST (Bishop-Boros and Kosciuch 2020). The results indicate that bat activity varied substantially between seasons with low activity in the spring and higher activity in summer and fall. Nearly 69 percent of bat passes were classified as low frequency (e.g., mostly hoary bat ([*Lasiurus cinereus*] and silver-haired bat [*Lasionycteris noctivagans*], and 31 percent of bat passes were classified as high frequency (mostly little brown myotis [*Myotis lucifugus*] and eastern red bat [*Lasiurus borealis*]). No state or federally listed species were documented (Bishop-Boros and Kosciuch 2020).

Table 7: Bat Species Potentially Occurring in the Project Area

Name	Migratory Status	Roosting Habits	Preferred Habitat Associations and Known Occurrences[1]	Survey Notes/ Documentation	Likelihood of Occurrence[2]
Big brown bat *Eptesicus fuscus*	Non-migratory	Roosts and hibernates in buildings, occasionally in rock crevices, caves, hollow trees, and crevices in bark.	Coniferous and deciduous forests, basin-prairie and mountain-foothills shrublands, grasslands, and urban areas. Known occurrences in Albany County.	Coniferous and deciduous forests present in western, southern, and eastern portions of Project Area, Shrublands present throughout.	High[3]
California myotis *Myotis californicus*	Non-migratory	Roosts in any type of shelter including mines and caves.	Pine-juniper, woodland-chaparral, basin-prairie shrublands, grasslands, cliffs, and rock outcrops. Acoustic record from Albany County.	Although preferred habitat is present throughout Project area, this species does not regularly occur in Wyoming.	Low
Eastern red bat *Lasiurus borealis*	Migratory	Roosts in foliage of trees and shrubs.	Deciduous trees or leafy shrubs in sagebrush grasslands, eastern great plains grasslands, croplands, and riparian areas. Known to occur in Albany County. Documented within Project Area.	Deciduous trees and shrubs present in western and southern portions of Project Area and within riparian areas through Project.	High[3]
Fringed myotis[4] *Myotis thysanodes*	Non-migratory	Roosts and hibernates in caves, mines, rock crevices, and buildings.	Coniferous forests, woodland-chaparral, and basin-prairie shrublands. Known occurrence within Project Area.	Habitat present throughout Project Area. WYNDD reports one occurrence within vicinity of Project Area	High[3]
Hoary bat *Lasiurus cinereus*	Migratory	Roosts in foliage of deciduous trees.	Coniferous and deciduous forests, aspen, basin-prairie shrublands, eastern great plains grasslands, sagebrush-grasslands, mountain foothills shrublands, riparian shrub, and urban areas. Known occurrence within Project Area.	Habitat present throughout Project Area.	High[3]
Little brown myotis[4] *Myotis lucifugus*	Non-migratory	Day roosts in humid caves and buildings. Night roosts in buildings. Hibernates in caves and mines.	Coniferous and deciduous forests, sagebrush-grasslands, riparian shrub, and urban areas. Usually close to water. Known to breed in Albany County.	Habitat present throughout Project Area. WYNDD reports two occurrences within vicinity of Project Area.	High[3]
Western long-eared myotis[4] *Myotis evotis*	Non-migratory	Roosts in caves, buildings, and mines.	Coniferous forests—especially ponderosa pine and juniper, riparian areas, basin-prairie shrublands, and sagebrush-grasslands. Known occurrence within Project Area.	Habitat present throughout Project Area. WYNDD reports two occurrences within vicinity of Project Area.	High[3]

Name	Migratory Status	Roosting Habits	Preferred Habitat Associations and Known Occurrences[1]	Survey Notes/ Documentation	Likelihood of Occurrence[2]
Long-legged myotis[4] *Myotis volans*	Non-migratory	Roosts in tree crevices, snags, buildings, rock crevices, mines, and caves.	Coniferous and deciduous forests, basin-prairie and mountain foothills, shrublands, and riparian areas. Known occurrence within Project Area.	Habitat present throughout Project Area. WYNDD reports an occurrence within vicinity of Project Area.	High[3]
Pallid bat *Antrozous pallidus*	Migratory	Day roosts in small rock crevices. Night roosts in open buildings, rock overhangs, and porches.	Sagebrush-grasslands, cliffs, rock outcrops, riparian areas, and great plains grasslands. Known occurrence within Project Area.	Habitat present throughout Project Area. Although this species is rare in this area of Wyoming, WYNDD reports an occurrence within vicinity of Project Area.	High[3]
Silver-haired bat *Lasionycteris noctivagans*	Migratory	Roosts in tree foliage, hollow trees, mines, caves, houses, and under loose bark.	Coniferous and deciduous forests, often near water. Known occurrence within Project Area.	Coniferous and deciduous trees and shrubs present in southern, and western portions of Project Area	High[3]
Townsend's big-eared bat[4] *Corynorhinus townsendii*	Non-migratory	Day roosts in caves, mines, and rock outcrops. Night roosts in buildings.	Deciduous forests, dry coniferous forests, basin-prairie and mountain-foothills shrublands, desert grasslands, and juniper. Known breeding records for Albany County.	Habitat present throughout Project Area; however, there are no known occurrences in the Project vicinity.	Moderate
Western small-footed myotis[4] *Myotis ciliolabrum*	Non-migratory	Roosts and hibernates in caves, mines, and buildings.	Pine-juniper woodlands, basin-prairie shrublands, sagebrush-grasslands, eastern great plains grasslands, great-basin foothills, mountain-foothills grasslands, cliffs, and rock outcrops. Known occurrence within Project Area.	Habitat present throughout Project Area. WYNDD reports two occurrences within vicinity of Project Area.	High[3]

1 Orabona *et al*. (2016), WYNDD (2019)

2 Likelihood of Occurrence:
High = Suitable habitat present, and/or known occurrence or high likelihood of occurrences within the Project Area; Moderate = Habitat or other factors only marginally suitable or occur sparsely within Project Area, and no known occurrences in the Project Area; Low = Low quality or no habitat in the Project Area and no known occurrences within and/or near the Project Area.

3 Identified during WEST bat surveys for 2019 (Bishop-Boros and Kosciuch 2020) or during wildlife baseline studies conducted as part of the Hermosa West Wind Energy Project (Taylor *et al*. 2011).

4 SGCN = Species of Greatest Conservation Need (WGFD 2017)

5 POTENTIAL EFFECTS ANALYSIS

This section discusses the potential direct and indirect effects to habitat, plant, and wildlife resources associated with the Project.

5.1 Management Areas and Other Conservation Lands of Interest

Potential impacts associated with wildlife management areas would occur if the following were experienced from construction or operation of the Project:

- Conflict with applicable land use plans, policies, goals, or regulations.
- Conflict with federal or state or established, designated, or reasonably foreseeable planned special use areas.
- Conflict with any applicable habitat conservation plan or natural community conservation plans.

Development of the Project would be in conformance with existing Albany County Comprehensive Plan and zoning designations for the site, and would not represent a conflict with applicable land use plans, policies, goals, or regulations. There are no special use areas identified within the Project Area.

In addition, there are no known conflicts with applicable habitat conservation plans or natural community conservation plans in the Analysis Area, and there are no known conflicts with nearby federal or state established, designated, or reasonably foreseeable planned special use areas, including the Laramie Plains NWR system Comprehensive Conservation Plan (USFWS 2007), which outlines management considerations for the Hutton NWR.

The Project would not preclude hunting within the Project Area. Maintaining hunter access to lands developed for wind energy is vital to enable the WGFD to successfully manage game populations and the habitats upon which they depend, to maintain the quality of the hunting experience in Wyoming, and to reduce subsequent overcrowding of remaining public areas used by hunters. Public access for hunting is anticipated to continue on the 3,611 acres of private and State land within the Cherokee Park HMA once the Project has been constructed. Similarly, Project activities would not prohibit hunting on private lands within the Project Area; landowners would determine access to their property for hunting just as they currently do. It is possible that temporary closure of some hunting areas on the State lands parcel along Cherokee Park Road or on private lands in the Project Area would be required during construction of the Project and for brief periods during operations and maintenance to protect public safety.

Observational information from existing wind facilities suggest that big game species do not abandon habitats within or adjacent to wind energy facilities. For example, numerous observations of mule deer and elk in the vicinity of turbines were documented during post-construction monitoring at the Elkhorn Valley Wind Farm in Oregon (Jeffery *et al*. 2009). At the Foote Creek Rim facility in Wyoming, pronghorn antelope observed during raptor use surveys were recorded year-round (Johnson *et al*. 2000). A study of interactions of elk with operating wind-energy facilities (Walter *et al*. 2004) reported no evidence that operating wind turbines have a measurable impact on elk use of the surrounding area.

While it is likely that both big game and small game would avoid some areas within the Project Area during construction, based on the observational data outlined above, it is anticipated that game populations would return upon completion of construction, resulting in few long-term impacts to hunting opportunities.

5.2 Habitat

Potential impacts to aquatic and terrestrial habitat would occur if there were substantial local loss of habitat (as compared to total available resources within the area) or habitat productivity from Project construction or operation.

Permanent direct effects to habitat would be anticipated from the construction of access roads, turbine pads, the operations and maintenance building, the meteorological towers, the Project substations and interconnection switchyard, and the gen-tie transmission line. Direct, short-term habitat loss would be expected within areas temporarily disturbed during construction of these Project features as well as construction of crane paths, electrical collection lines, construction parking and office area, and laydown areas.

As discussed in Section 1.2.2, in order to quantify the potential ground disturbance impacts of the Project, ConnectGen developed a Representative Project Layout (Figure 2) meant to reflect the largest proposed Project footprint (i.e., most conservative for estimate of impacts). Based on the Representative Project Layout, a total of approximately 1,469.98 acres of temporary impacts and approximately 181.73 acres of permanent impacts to habitat are predicted within the Siting Corridor. Temporary effects to Wyoming Basins Dwarf Sagebrush Shrubland and Steppe habitat would be approximately 96 percent of the total temporary impacts to habitat. Permanent effects to this habitat would be approximately 97 percent of the total permanent impact to habitat.

Tables 8 and 9 provide a breakdown of temporary and permanent representative impacts by habitat type, as defined by the NatureServe ecological systems mapped within the Project Area (NatureServe 2019).

Table 8: Representative Temporary Habitat Impacts from the Rail Tie Wind Project

SWAP Habitat Type[1]	NatureServe Ecological System[2]	Temporary Impact (Acres)[3]	% of Total Disturbed Area
Aspen/Deciduous Forest	Rocky Mountain Aspen Forest and Woodland	0.00	0.00%
Cliffs, Canyons, Caves, and Rock Outcrops	Inter-mountain Basins Cliff and Canyon	1.25	0.09%
Foothill Shrublands	Inter-mountain Basins Montane Sagebrush Steppe	25.27	1.72%
	Inter-mountain Basins Mountain-Mahogany Woodland and Shrubland	2.44	0.17%
Riparian Areas	Rocky Mountain Lower Montane-Foothill Riparian Woodland and Shrubland	3.11	0.21%
Sagebrush Shrublands	Wyoming Basins Dwarf Sagebrush Shrubland and Steppe	1,407.35	95.74%
	Wyoming Basins Dwarf Sagebrush Shrubland and Steppe- Bedrock Outcrops	12.72	0.87%
Wetlands	Pasture/Hay	1.91	0.13%
	Open Water	0.54	0.04%

SWAP Habitat Type[1]	NatureServe Ecological System[2]	Temporary Impact (Acres)[3]	% of Total Disturbed Area
	Rocky Mountain Subalpine-Montane Fen (Suspected)	1.82	0.12%
	Western Great Plains Open Freshwater Depression Wetland	5.18	0.35%
Xeric and Lower Montane Forest	Rocky Mountain Foothill Limber Pine-Juniper Woodland	8.40	0.57%
	Total	**1,469.98**	**100%**

1 Source: WGFD 2017
2 NatureServe 2019
3 Acreage impacts calculated based on Representative Project Layout

Table 9: Representative Permanent Habitat Impacts from the Rail Tie Wind Project

SWAP Habitat Type[1]	NatureServe Ecological System[2]	Permanent Impact (Acres)[3]	% of Total Disturbed Area
Aspen/Deciduous Forest	Rocky Mountain Aspen Forest and Woodland	0.00	0.00%
Cliffs, Canyons, Caves, and Rock Outcrops	Inter-mountain Basins Cliff and Canyon	0.00	0.00%
Foothill Shrublands	Inter-mountain Basins Montane Sagebrush Steppe	2.37	1.30%
	Inter-mountain Basins Mountain-Mahogany Woodland and Shrubland	0.34	0.19%
Riparian Areas	Rocky Mountain Lower Montane-Foothill Riparian Woodland and Shrubland	0.12	0.06%
Sagebrush Shrublands	Wyoming Basins Dwarf Sagebrush Shrubland and Steppe	176.24	96.98%
	Wyoming Basins Dwarf Sagebrush Shrubland and Steppe- Bedrock Outcrops	0.89	0.49%
Wetlands	Pasture/Hay	0.03	0.01%
	Open Water	<0.01	<0.01%
	Rocky Mountain Subalpine-Montane Fen (Suspected)	0.22	0.12%
	Western Great Plains Open Freshwater Depression Wetland	0.59	0.32%
Xeric and Lower Montane Forest	Rocky Mountain Foothill Limber Pine-Juniper Woodland	0.93	0.51%
	Total	**181.73**	**100%**

1 Source: WGFD (2017)
2 NatureServe (2019)
3 Acreage impacts calculated based on Representative Project Layout

The Project will avoid and minimize siting infrastructure in sensitive aquatic habitats such as surface water, wetlands (including fens), and riparian areas, as well as more specialized terrestrial

habitats like granite rock outcrops and shale outcrop inclusions, to the greatest extent practicable in order to minimize habitat loss from development of the Project.

As outlined in Table 10 below, ConnectGen plans to develop a Reclamation Plan prior to the onset of construction that will guide the revegetation of disturbed areas during and following the construction process. In addition, revegetation will be implemented for all areas temporarily disturbed by construction or decommissioning of the facility in conformance with landowner agreements and in compliance with state and/or federal permitting requirements. Temporarily disturbed areas will be revegetated as soon as practicable, either through natural revegetation practices or through the use of reseeding. Plant species native to the affected ecosystems will be utilized whenever practicable.

Approximately 60 miles of new, 20-foot wide, permanent access roads would be created. Habitat fragmentation associated with road development can occur from Project development, potentially causing physical separation of wildlife and plant individuals within a given population and limiting reproductive effectiveness and gene flow within and between populations. This indirect effect varies by species, with some species affected more than others. In addition, both temporary and permanent stream crossings can cause potential downstream impacts to aquatic habitat from sedimentation and impacts to stream morphology.

New permanent roads developed as part of the Project will be relatively narrow (20 feet) and infrequently travelled upon completion of construction, which should facilitate passage of wildlife and seed dispersal across these features. In addition, the Project will implement speed limits on construction and permanent access roads to minimize potential impacts to wildlife.

As outlined in Table 10 below, access roads will also be designed and constructed to minimize disruption of aquatic habitats associated with natural drainage patterns including perennial, intermittent, and ephemeral streams. Waterbody crossings would incorporate WGFD design specifications and professional engineering standards, as applicable. Open-bottom culverts will be used where appropriate to avoid changing stream morphology or removing suitable fish habitat. In addition, such waterbody crossings and culverts would be constructed in a manner that prevents sediment erosion, deposition of sediment, and minimizes impacts to any environmentally sensitive areas. Water quality best management practices would be implemented at waterbody crossings to minimize any unforeseen impacts to the Platte River System's watershed and associated vegetation communities.

5.3 Plants

Potential impacts to plants would result if the following were to occur from construction or operation of the Project:

- Impact to a rare plant population identified by a Federal or State resource agency
- Loss to any population of plants that would result in a species being listed or proposed for listing as threatened or endangered
- Establishment or increase of a noxious weed population
- Noxious weed infestations that replace native plant communities and impact sensitive plants and/or plants protected under State law

5.3.1 Special-Status Plants

There are no federally-listed plant species present within the Project Area. The USFWS IPaC resource list identified one federally listed plant species, the Western prairie fringed orchid, as a species that could potentially be affected by water depletions in the Platte River System (Appendix C). As noted in Section 4.6.1, it is anticipated that any water-related activities associated with the Project will either be located within a non-hydrologically-connected portion of the Platte River Basin (and therefore have no potential downstream impacts to Platte River species), or be covered under the Wyoming Depletions Plan and will be subject to streamlined ESA consultation with USFWS. Therefore, water use associated with the Project is not anticipated to have any adverse downstream effects on the Platte River System and its associated habitat.

A BA would be prepared that will review potential effects to federally listed species from development of the Project as part of consultation with USFWS under Section 7 of the ESA.

There are sensitive habitat types within the Project Area that may support rare plant populations and WYNDD Species of Concern. These habitats include surface water, wetlands (including fens), and riparian areas, as well as more specialized terrestrial habitats like granite rock outcrops and shale outcrop inclusions.

As noted above, the Project plans to avoid these habitats to the greatest extent practicable in order to minimize potential impacts to special-status plant species from development of the Project. In addition, as outlined in Table 10 below, a Reclamation Plan will be prepared prior to the onset of construction that will guide the revegetation of disturbed areas during and following the construction process in order to support restoration of sensitive habitats that may support special-status plant species. In addition, access roads will be designed and constructed to minimize disruption of aquatic habitats associated with natural drainage patterns including perennial, intermittent, and ephemeral streams.

5.3.2 Noxious Weeds

There are 30 noxious weed species on the 2018 list of State Designated Weeds and Pests that are considered to be detrimental to the state of Wyoming (W.S. 11-5-102 (a)(xi) (Wyoming Weed and Pest Council 2018). Of these, there are three Declared Weeds in Albany County: locoweed, larkspur, and cheatgrass (Albany County Weed and Pest Control District 2019).

Cheatgrass was observed throughout the overall Project Area in relatively low concentrations during the September 2019 habitat assessment. Other Wyoming state-listed noxious weed species that have been observed within the Project Area include Canada thistle, houndstongue, common mullein, leafy spurge, field bindweed, and quackgrass.

Soil disturbance as part of construction may provide an opportunity for potential colonization of disturbed areas by State listed noxious weeds, which could lead to impacts to existing habitat quality for plant and wildlife species. As outlined in Table 10 below, in order to prevent the expansion of noxious weeds within the Project Area as a result of construction, a Reclamation Plan will be prepared prior to the onset of construction that will guide the revegetation of disturbed areas during and following the construction process. The Reclamation Plan will identify locally-

approved, weed free seed mixtures that prioritize plant species native to the ecosystems affected by site construction.

In addition, the Project will develop and implement an Integrated Weed Management Plan that identifies appropriate controls to avoid, minimize, or treat the spread of noxious weeds directly resulting from construction, operations, and decommissioning. This will include performance of a preconstruction survey of the Project footprint to identify existing locations of noxious weeds. Any locations delineated will be identified and appropriate controls will be applied to Project activities in these areas. Upon completion of construction, a post-construction weed inventory survey will be performed to validate the effectiveness of the weed management program and ensure that invasive weed levels have not exceeded preconstruction levels.

5.4 Wildlife

5.4.1 Special Status Wildlife

5.4.1.1 Federally Listed Species

The USFWS IPaC resource list identified five federally listed wildlife species as having the potential to occur within the Project Area and Siting Corridor or to be affected by Project development (Appendix C): Preble's meadow jumping mouse, least tern, piping plover, whooping crane, and pallid sturgeon. In addition, WGFD identified potential habitat within the Project Area for one other federally listed wildlife species not listed on the IPaC, the Wyoming toad.

The least tern, piping plover, whooping crane, and pallid sturgeon are all listed by USFWS as species that could potentially be affected by water depletions in the Platte River System (Appendix C). As noted in Section 4.6.1, it is anticipated that any water-related activities associated with the Project will either be located within a non-hydrologically-connected portion of the Platte River Basin (and therefore have no potential downstream impacts to Platte River species), or be covered under the Wyoming Depletions Plan and will be subject to streamlined ESA consultation with USFWS. Therefore, water use associated with the Project is not anticipated to have any adverse downstream effects on the Platte River System and its associated habitat.

The Wyoming toad, a federally endangered species, is a glacial relic known only from Albany County, Wyoming. It has been listed as extinct in the wild since 1991, and formerly inhabited floodplains, ponds, and small seepage lakes in the shortgrass communities of the Laramie Basin, which includes the Project Area. While there is potential habitat present within Project Area for the Wyoming toad, the only extant population is located approximately 13 miles northwest of the Project Area in the Mortensen NWR. Therefore, there are no anticipated impacts to this species from development of the Project.

The Preble's mouse, a federally threatened species and WGFD SGCN, inhabits well-developed riparian areas adjacent to undisturbed grasslands. Riparian vegetation typically includes a dense combination of grasses, forbs, and shrubs in open wet meadows and riparian corridors or where shrubs and low trees provide adequate cover. The Project Area is located within portions of the Cache la Poudre HUC recovery hydrologic unit for the species. No Preble's mouse were found within any of the trapping locations identified by USFWS within the Project Area; the closest

capture record is from 1998 and is located approximately 1.2 miles southeast of the Project Area along a tributary to Fish Creek (USFWS 2019d).

Potentially suitable Preble's mouse habitat is located within the Project Area and Siting Corridor along portions of the larger perennial stream features within the Project Area (Willow Creek, Fish Creek and associated tributaries, Dale Creek, Johnson Creek, and Pump Creek) where flowing streams systems with well-developed wetland fringes, a shrub/tree canopy, and adjacent grasslands were present. These areas were associated with ecological systems composing the Wetlands SWAP habitat type.

Although the Project Area is over one mile from the nearest capture record, due to the location of the Project Area within a Preble's mouse recovery hydrologic unit and the presence of potentially suitable habitat, the likelihood of occurrence for Preble's mouse within the Project Area and Siting Corridor is moderate.

A focused habitat assessment will be conducted in 2020 at proposed crossing locations with the potentially suitable habitat currently identified in order to further refine habitat suitability within the Project. ConnectGen will use this information to microsite Project features to avoid impacts to potentially suitable Preble's mouse habitat to the extent possible.

As stated above, a BA would be prepared that will review potential effects to federally listed species from development of the Project as part of consultation with USFWS under Section 7 of the ESA.

5.4.1.2 Bald and Golden Eagles

Both bald and golden eagles have been observed within the Project Area. Avian surveys are being conducted for the Project in accordance with the ECPG (USFWS 2013a), the Eagle Rule Revision (USFWS 2016a), the WEGs (USFWS 2012), and the WGFD Wind Energy Recommendations (WGFD 2010). Aerial surveys for eagle nests were conducted by WEST in spring 2019 within the Project Area and surrounding 10-mile buffer. One occupied-active bald eagle nest was documented during surveys in a tree along the very western edge of the 10-mile buffer, and 12 golden eagle nests (seven occupied-active and five occupied-inactive) were documented throughout the 10-mile Project buffer (WEST 2019). In addition, both species were observed during large bird surveys conducted within the Project Area from January to December 2019 by WEST (Kosciuch *et al*. 2020). An additional year of large bird surveys and aerial nests surveys are planned for 2020. Based on the results of these surveys and the presence of suitable foraging and nesting habitat, bald eagles are likely to occur in the Project Area and Siting Corridor; however the likelihood of occurrence for nesting bald eagles is low. The likelihood of occurrence for golden eagles, including nesting golden eagles, within the Project Area and Siting Corridor is high.

Impacts to nesting eagles could occur from Project construction activities in the vicinity of an active nest. As outlined in Table 10, ConnectGen established a one-mile spatial buffer around known, occupied eagle nests identified during the nest surveys conducted in spring 2019 and has excluded this area from the Siting Corridor to ensure that all potential turbine locations are set back a minimum one-mile from the active eagle nests. If future nest surveys identify additional

occupied eagle nests, ConnectGen will coordinate with the USFWS and WGFD to identify appropriate nest-specific avoidance or minimization measures.

Potential impacts to eagles during operation of the Project would be primarily limited to collision with turbines or transmission lines. As outlined in Table 10, to address potential take of eagles from operational activities, ConnectGen will coordinate with USFWS in development and implementation of eagle conservation practices as part of its Bird and Bat Conservation Strategy to comply with regulatory requirements and seek to avoid the unintentional take of eagles. This will include performance of post-construction mortality surveys to calculate the fatality rate of birds. In addition, all overhead electric lines planned as part of the Project will be designed to incorporate appropriate spacing of energized parts and bird flight diverters to avoid or reduce the potential for electrocution risk to eagles.

5.4.1.3 Species of Greatest Conservation Need

Eighty-five SGCN have the potential to occur within the Project Area based on WYNDD prediction modeling. Of these species, 25 have been observed within or near the Project Area (Appendix E).

The greater sage-grouse is a SGCN that requires large contiguous areas of sagebrush habitat that include a variety of semiarid shrub-grassland (shrub steppe) habitats, particularly big sagebrush. The nearest designated Core Population Area is approximately 22 miles north of the Project Area, and the closest sage-grouse distribution area is located approximately four miles west of the Project Area. In addition, no current or historic observations of greater sage-grouse or leks have occurred within the Project Area, and suitable sagebrush cover within the Project Area is very limited. Therefore, no impact is anticipated to greater sage-grouse from Project development.

Based on feedback provided by WGFD, preconstruction monitoring was recommended for the following SGCN based on the presence of potential habitat within the Project Area: burrowing owl, long-billed curlew, mountain plover, swift fox, plains spadefoot toad, and Wyoming toad.

No adverse Project impacts are expected for long-billed curlew, plains spadefoot toad, or Wyoming toad. WYNDD prediction modeling did not predict occurrence of either long-billed curlew or plains spadefoot toad within one mile of the Project Area. In addition, suitable nesting habitat for long-billed curlew is very limited within the Project Area, and the Project Area lies well above the preferred elevation range of plains spadefoot toad. As stated above, Wyoming toad is also not anticipated to be present within the Project Area.

Suitable habitat exists within large portions of shrublands within the Project Area and Siting Corridor for burrowing owl and swift fox, and one tentative identification of a swift fox burrow was made during the September 2019 field-based habitat assessment. Suitable habitat for mountain plover is also present within the Project Area, however a 2010 habitat assessment for the Hermosa West Wind Energy Project indicated that the actual suitability of the habitat was considered low and restricted to small isolated patches (Taylor and Bay 2011). Potential impacts to these species might result from habitat loss associated with construction of the Project primarily

within the Wyoming Basins Dwarf Sagebrush Shrubland and Steppe ecological system that comprise the majority of the Siting Corridor and Project Area.

ConnectGen will coordinate with WGFD on recommended preconstruction surveys and monitoring for SGCN based on the results of the field-based habitat assessment. This information will be used during Project siting to avoid and minimize impacts to SGCN and their habitat to the extent practicable.

In addition, WGFD also noted that a portion of the Project occurs within the Harney Creek-Laramie River 5th level HUC watershed, which contain the following SGCN: brassy minnow and common shiner. Based on the recommendations of WGFD, ConnectGen plans to conduct a Reconnaissance Level Assessment (RLA) for the portion of the Project that occurs within the Harney Creek-Laramie River 5th level HUC to determine the potential for any Project impacts to aquatic resources within this watershed.

5.4.2 Other Sensitive Wildlife

5.4.2.1 Avian Species

Potential impacts to avian species from Project development include direct mortality as a result of collisions with wind turbines and electric lines, destruction of nesting habitat during construction, and displacement due to the presence of Project structures. The Project Area lies within the Central Flyway, a migratory corridor for bird species during their spring and fall migrations, and resident and migratory birds use the proposed Project Area for breeding, nesting, foraging, hunting, roosting, and shelter.

Collision impacts are of particular concern for large birds, specifically raptors. The Project Area contains suitable foraging and nesting habitat, and utility-line towers, communications towers, large trees, and rock outcrops present within the Project Area could provide hunting perches and nesting structures for raptors. There are 26 raptor species with potential to occur within the Project Area, including bald and golden eagles (discussed above in Section 5.4.1.2).

As stated above, WEST is conducting avian use surveys and aerial raptor nest surveys for the Project in accordance with the WEGs (USFWS 2012) and WGFD Wind Energy Recommendations (WGFD 2010). Fixed avian point count surveys were conducted from January to December 2019 by WEST (Kosciuch *et al*. 2020). Overall, 18 species of large bird and 24 species of small bird were recorded, totaling 42 species of birds observed or heard over the study period.

As outlined in Table 10, to minimize potential impacts to avian species from construction activities, initial vegetation clearing will be performed during the non-breeding season for birds (September 1 through April 15) if feasible. If vegetation clearing cannot occur during the non-breeding season, surveys will be performed in breeding bird habitat to identify avian nesting activity within the Project Area. Nest sites would be avoided until determined to be inactive.

In consideration of potential avian impacts during operation of the Project, ConnectGen will develop and implement a Bird and Bat Conservation Strategy to avoid and reduce potential

impacts to non-listed bird species that may result from the operation of the Project. This will include performance of post-construction mortality surveys to calculate the fatality rate of birds. In addition, all overhead electric lines planned as part of the Project will be designed to incorporate appropriate spacing of energized parts and bird flight diverters to avoid or reduce the potential for electrocution risk.

5.4.2.2 Bat Species

Potential impacts to bat species from Project development include direct mortality as a result of collisions with wind turbines. Twelve bat species have the potential to occur within the Project Area. These species are attracted to a variety of landscape features and habitats including, but not limited to natural caves, abandoned mines, other man-made structures, rock shelters, deciduous and evergreen forests, and surface water.

The Project Area is not located near any large, known bat colonies likely to attract large numbers of bats. No karst features or other natural caves have been identified within the Project Area. Five mines were identified within the Project Area within an additional six mines identified within one mile of the Project Area. Sampling within one of the historic mine locations in 2010 indicated the bat activity rate in the vicinity of the mine was within the range of activity rates at other sampling stations and did not appear to be an important roosting area (WAPA 2012).

Other features within the Project Area that may provide suitable roosting habitat for bats include scattered old and abandoned buildings associated with ranching activities, a railroad tunnel associated with the Union Pacific Railroad, rock outcrop shelters, and forested areas.

Bat acoustic monitoring for the Project was conducted in accordance with the WEGs (USFWS 2012) and WGFD Wind Energy Recommendations (WGFD 2010). Bat acoustic monitoring was conducted from April to October 2019 by WEST (Bishop-Boros and Kosciuch 2020). The results indicate that bat activity varied substantially between seasons with low activity in the spring and higher activity in summer and fall. Nearly 69 percent of bat passes were classified as low frequency and 31 percent of bat passes were classified as high frequency, signifying greater use by species such as hoary bat and silver-haired bat over species such as little brown bat and eastern red bat. No state or federally listed species were documented.

As outlined in Table 10, in consideration of potential impacts to bats during operation of the Project, ConnectGen will develop and implement a Bird and Bat Conservation Strategy to avoid and reduce potential impacts to bat species that may result from the operation of the Project. This will include performance of post-construction mortality surveys to calculate the fatality rate of bats.

5.4.2.3 Big Game

Potential direct effects to big game include direct mortality as a result of collisions with construction or maintenance vehicles. Potential temporary indirect effects include displacement of individuals and populations within the Project Area as a result of increased human disturbance and habitat loss and fragmentation from Project infrastructure.

The Project Area contains WGFD-designated Mule Deer Crucial Range (winter/yearlong) and Elk Migration Routes. WGFD is currently in the process of designating Ungulate Migration Corridors with the goal to attain no significant declines in species distribution or abundance or loss of habitat (WGFD 2019e). Based on feedback provided by WGFD during initial agency outreach, the Project Area is located outside these proposed Ungulate Migration Corridors.

Habitat is present throughout the Project Area for elk, mule deer, and pronghorn, and they are commonly observed foraging. In addition, as stated above, the Cherokee Park HMA, managed by WGFD, is located within the southern portion of the Project Area and primarily supports elk hunting across 3,166 acres of both private and state lands.

As noted above in Section 5.1, observational information from existing wind facilities suggest that big game species do not abandon habitats within or adjacent to wind energy facilities. While it is likely that big game would avoid some areas within the Project Area during construction, it is anticipated that game populations would return upon completion of construction, resulting in few long-term impacts to big game resources within the Project Area. Within the portions of the Project Area designated as crucial winter range, WGFD recommends that construction activities occur outside November 15-April 30. ConnectGen will continue to coordinate with WGFD on any additional data collection that may be requested in order to better understand utilization of the Project Area by big game.

As outlined in Table 10, ConnectGen will implement speed limits on construction and permanent access roads to minimize potential impacts to wildlife. In addition, no new fencing, outside of that required for the O&M facility and Project substations, will be installed as part of Project development. Hunting may be restricted periodically during construction for safety purposes; however, following construction hunting activities will continue in conformance with the property lease agreements and/or land use regulations, including Cherokee Park HMA.

5.5 Applicant-Proposed Environmental Protection Measures

ConnectGen has developed EPMs that when implemented would avoid or minimize adverse effects to environmental resources from construction, operations and maintenance, and decommissioning of the Project. The EPMs listed in Table 10 below would both directly and indirectly avoid or reduce potential impacts to plants, wildlife, and habitat resources from development of the Project.

Table 10: Proposed Environmental Protection Measures Related to Plants, Wildlife, and Habitat Resources for the Rail Tie Wind Project

Resource Category	Measure	Implementation			
		Preconstruction	Construction	Operations	Decommissioning
General					
GEN-1	The Project will be designed, constructed, and operated in compliance with Albany County Zoning Regulations (as amended) and Albany County Wind Energy Siting Regulations. Construction and operations activities will comply with all federal, state, and county environmental regulations, as applicable.	X	X	X	X
GEN-2	The Project will delineate environmentally sensitive areas (e.g., wetlands, waters, habitats) located within or adjacent to the Project Area and will identify those locations in construction planning documents. Construction and operations personnel will be informed of the appropriate practices that may be applicable to avoid or minimize impacts to these areas.	X	X	X	X
GEN-3	Construction travel will be restricted to existing roads and permanent or temporary access roads identified in the final Project Site Plan.		X		
GEN-4	The Project will implement speed limits on construction and permanent access roads to minimize potential for fugitive dust, impacts to wildlife, and for safety purposes. Speed limit signs will be posted as appropriate.		X	X	X
GEN-6	Fences, gates and other access controls (e.g., cattle guards) will be maintained in good working order during construction and operation activities. Damaged access controls will be repaired or replaced as soon as possible. Security guards or access attendants may be employed during the construction phase if needed.		X	X	X
GEN-8	Temporary sanitary facilities will be located in convenient locations throughout the site. Facilities will be located greater than 100 feet from any waterbody or wetland and will be regularly serviced and maintained.		X		X

Resource Category	Measure	Implementation			
		Preconstruction	Construction	Operations	Decommissioning
Public Health and Safety					
PHS-10	During construction, temporary plastic mesh fencing will be installed to protect public and worker safety near excavated wind turbine foundations, electrical collection system trenches, material laydown areas, or any other areas deemed hazardous. Open holes and trenches without fencing will be covered or fenced to deter wildlife and livestock from becoming trapped or injured.		X		
PHS-14	Wildfire Mitigation Measures will be developed in coordination with the Laramie Fire Department and Tie Siding Volunteer Fire Department and will be incorporated in the Project's Emergency Response Plan.	X			
Noise					
NOISE-1	Construction vehicles and equipment will be maintained in proper operating condition and will be equipped with manufacturers' standard noise control devices or better (e.g., mufflers, engine enclosures).		X		X
NOISE-2	Construction and hauling equipment will be maintained adequately and equipped with appropriate mufflers.		X		X
NOISE-3	Blasting or hydraulic hammering will be limited to daylight hours.		X		X
Geology and Soils					
GEO-1	Temporary ground disturbance activities will be limited to the minimum amount necessary in order to safely construct project facilities.		X		
GEO-2	Ground disturbance activities in areas of highly erodible soils and steep slopes will be avoided to the extent practicable.		X		
GEO-3	Roads will be designed to follow existing contours and to avoid steep slopes that would require extensive cut-and-fill construction.	X			
GEO-4	Soils excavated from the turbine pads will be segregated into separate stockpiles for topsoil and subsoil. Subsoil will be used primarily as backfill while topsoil will be spread as the topmost layer of soil to support revegetation. Any unused soils or excavated rock will be removed from the site or disposed of in coordination with the landowner.		X		

Resource Category	Measure	Implementation			
		Preconstruction	Construction	Operations	Decommissioning
GEO-5	An Erosion Control Plan will be developed to identify areas of potentially higher erodibility due to excavation, grading, or ground disturbance. The plan will define appropriate erosion control measures that may be implemented during and after construction.		X		
GEO-6	Erosion control measures will be periodically inspected, and as required after precipitation events. Erosion control measures will be repaired or replaced as necessary.		X		
GEO-7	As soon as practicable following completion of ground disturbance activities, areas of temporary ground disturbance will be regraded and recontoured to blend with the natural terrain while maintaining existing drainage patterns.		X	X	X
GEO-8	All private landowner's existing drainage and erosion control structures such as diversions, irrigation ditches and tile lines shall be avoided by the Project, or in the alternative, appropriate measures are to be taken to maintain the design and effectiveness of the existing structures. Any structures disturbed during construction shall be repaired to as close to original condition as possible, as soon as possible.		X		
Recreation					
REC-2	Recreational activities, such as hunting, may be restricted periodically during construction for the safety of workers and recreationist; however, following construction recreational activities may continue in conformance with the property lease agreements and/or land use regulations.		X	X	X
REC-3	To the extent practicable, construction and maintenance traffic will be limited to minimize disruption of normal land use and recreation activities.		X	X	X
Transportation					
TRANS-1	Rail Tie will coordinate with Wyoming Department of Transportation and Albany County to implement a Transportation and Traffic Management Plan that minimizes risks and inconvenience to the public, while ensuring safe and efficient construction of the Project. The plan will focus on turbine component deliveries, traffic and circulation primarily within and in the vicinity of the Project area. It will be designed to minimize potential hazards from increased truck traffic and worker traffic and to minimize impacts to traffic flow in the vicinity of the Project.	X	X		

Resource Category	Measure	Implementation			
		Preconstruction	Construction	Operations	Decommissioning
Vegetation					
VEG-1	A Reclamation Plan will be prepared prior to the onset of construction that will guide the revegetation of disturbed areas during and following the construction process.	X	X		
VEG-2	Revegetation will be implemented for all areas temporarily disturbed by construction or decommissioning of the facility in conformance with landowner agreements and in compliance with state and/or federal permitting requirements. Temporarily disturbed areas will be revegetated as soon as practicable, either through natural revegetation practices or through the use of reseeding. Plant species native to the affected ecosystems will be utilized whenever practicable.		X		X
VEG-3	The Reclamation Plan will identify locally-approved, weed free, seed mixtures that prioritize plant species native to the ecosystems affected by site construction.	X	X		
VEG-4	The Project will develop and implement an Integrated Weed Management Plan that identifies appropriate controls to avoid, minimize, or treat the spread of noxious weeds directly resulting from construction, operations, and decommissioning.	X	X	X	X
VEG-5	The Project will perform a preconstruction survey of the project footprint to identify existing locations of noxious weeds. Any locations delineated will be identified in the Weed Management Plan, and appropriate controls will be applied to Project activities in these areas.	X			
VEG-6	Upon completion of construction, a post-construction weed inventory survey will be performed to validate the effectiveness of the weed management program and ensure that invasive weed levels have not exceeded preconstruction levels.		X	X	
VEG-7	The Project will coordinate with the weed management contractor and host landowners regarding specific treatment methods on their respective properties.	X			
VEG-8	Any herbicide use as part of vegetation management activities will follow label instructions and relevant federal, state, and local laws.		X	X	X

Resource Category	Measure	Implementation			
		Preconstruction	Construction	Operations	Decommissioning
Water Quality					
WQ-1	The Project will identify, avoid, and/or minimize adverse effects to wetlands and waterbodies.	X	X	X	X
WQ-2	Woody vegetation in potentially disturbed wetlands will be cut at ground level to leave the root systems intact and encourage sprouting of the existing species following construction.		X		
WQ-3	Equipment operation in wetlands will be kept to the minimum necessary to safely perform the work. Prefabricated equipment matting will be used to avoid rutting, soil compaction, and other ground disturbance where temporary work areas occur in wetlands.		X		X
WQ-4	Wetland and aquatic resource boundaries will be clearly identified on all construction plans and will be posted with signs and flagging in the field.		X		X
WQ-5	Appropriate permits will be secured prior to any fill or dredge activities in wetlands or other waters of the United States (WOTUS).	X	X	X	X
WQ-5	No parking or servicing of construction-related vehicles will occur within any wetland boundary.		X	X	X
WQ-6	Erosion control barriers and other measures, such as silt fencing, fiber logs, and/or hay bales will be placed immediately upgradient of wetlands and waterbodies to minimize sediment transport and deposition.		X		X
WQ-7	Access roads will be designed and constructed to minimize disruption of natural drainage patterns including perennial, intermittent, and ephemeral streams.	X	X		
WQ-8	A Stormwater Pollution Prevention Plan (SWPPP) outlining specific erosion control measures will be prepared, and its requirements will be implemented onsite for the proposed Project. The SWPPP will be based on U.S. Environmental Protection Agency and Wyoming Department of Environmental Quality requirements.	X	X		
WQ-9	Construction activities shall be performed using methods that prevent entrance or accidental spillage of solid matter, contaminant debris, and other objectionable pollutants and wastes into flowing streams or dry watercourses, lakes, and underground water sources.		X		

Resource Category	Measure	Implementation			
		Preconstruction	Construction	Operations	Decommissioning
WQ-10	Borrow pits, if required, shall be excavated so that the water will not collect and stand therein. Upon completion of construction, the sides of borrow pits will be brought to stable slopes, with slope intersections shaped to carry the natural contour of adjacent, undisturbed terrain into the pit or borrow area, giving a natural appearance.		X		
WQ-11	Waterbody crossings would incorporate WGFD design specifications and professional engineering standards, as applicable. Open-bottom culverts will be used where appropriate to avoid changing stream morphology or removing suitable fish habitat. In addition, such waterbody crossings and culverts would be constructed in a manner that prevents sediment erosion, deposition of sediment, and minimizes impacts to any environmentally sensitive areas.	X	X	X	
WQ-12	Excavated material or other construction materials will not be stockpiled or deposited on or near stream banks, pond shorelines, or other watercourse perimeters where they can be washed away by storm runoff or can, in any way, encroach upon the actual water body itself.		X		
WQ-13	Water quality best management practices would be implemented at waterbody crossings to minimize any unforeseen impacts to the Platte River System's watershed and associated vegetation communities.		X		X
Wildlife					
WL-1	Initial vegetation clearing would be performed during the non-breeding season for birds (September 1 through April 15) if feasible. If vegetation clearing cannot occur during the non-breeding season, surveys will be performed in breeding bird habitat to identify avian nesting activity within the Project Area. Nest sites would be avoided until determined to be inactive.	X	X		
WL-2	The Project will develop and implement a Bird and Bat Conservation Strategy to avoid and reduce potential impacts to non-listed bird and bat species that may result from the operations of the Project.	X	X	X	
WL-3	The Project will develop and implement eagle conservation practices as part of its Bird and Bat Conservation Strategy to comply with regulatory requirements and seek to avoid the unintentional take of eagles at wind energy facilities.	X	X	X	

Resource Category	Measure	Implementation			
		Preconstruction	Construction	Operations	Decommissioning
WL-4	In consideration of the USFWS' Land Based Wind Energy Guidelines (2012), the Project will perform post-construction mortality surveys to calculate the fatality rate of birds and bats.			X	
WL-5	All trash and refuse will be disposed of in designated, covered waste receptacles and regularly removed from the site in order to avoid attracting scavengers.		X	X	X
WL-6	The overhead power to ground wire (OPGW) wires associated with the 345 kV transmission line will be marked with bird flight diverters consistent with methods suggested in the Avian Power Line Interaction Committee's Reducing Avian Collisions with Power Lines (2012).		X		
WL-7	If overhead collection lines are included in the Project's final design, the electric lines will be designed to incorporate appropriate spacing of energized parts to avoid or reduce the potential for electrocution risk to large birds, specifically raptors. The Project's design would consider the Avian Power Line Interaction Committee's Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006.	X			
WL-8	The Project will notify the USFWS within 24 hours of federally listed species or eagle mortality documented on the Project site.		X	X	
WL-9	The Project established a 1-mile spatial buffer around known, occupied eagle nests identified during the 2019 raptor nest surveys. The area within the 1-mile buffers was excluded from the Project Siting Corridor; therefore, wind turbine generators would be setback a minimum 1-mile from the identified eagle nests. If future nest surveys identify additional occupied eagle nests, the Project will coordinate with the USFWS to identify appropriate nest-specific avoidance or minimization measures.	X			
WL-10	To the extent practicable, herptile habitats for Species of Greatest Conservation Need, such as fallen trees, prairie dog colonies, and potential basking rocks, will be left intact.		X	X	X

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FIGURES

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Rail Tie Wind Project

Figure 1
Project Area

Albany County, WY

Crystalline Mid-Elevation Forests Ecoregion

Laramie Basin Ecoregion

Tie Siding

Albany County, Wyoming

Larimer County, Colorado

- Project Area
- State/County Boundary
- Highways
- County Roads
- Railroad
- Transmission Line
- Bureau of Land Management (BLM)
- US Forest Service (USFS)
- State Land
- Level 4 Ecoregion Boundary

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Miles

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MT SD ID WY NE UT CO

TETRA TECH

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Rail Tie Wind Project

Figure 2
Representative Project Layout and Siting Corridor

Albany County, WY

- Project Area
- Siting Corridor

Representative Project Layout

- Turbine
- Met Tower
- Access Road
- Collection Line
- Crane Path
- Transmission Line
- Project Substation
- Interconnection Switchyard
- Laydown Yard
- O&M Site
- State/County Boundary
- Highways
- County Roads
- Railroads

NOTE: WTG locations shown in the figure are representative and may change based on final engineering, environmental review and WTG model selection.

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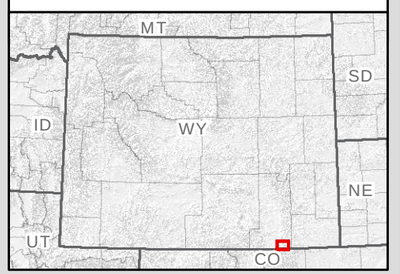

TETRA TECH

Albany County, Wyoming

Larimer County, Colorado

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Rail Tie Wind Project

Figure 3
Management Areas and
Other Conservation
Lands of Interest

Albany County, WY

- Project Area
- State Boundary
- County Boundary
- Important Bird Area
- National Wildlife Refuge
- Wyoming Hunter Management Area
- Colorado State Wildlife Area (SWA)
- State Parks
- Bureau of Land Management (BLM)
- US Forest Service (USFS)
- US Fish and Wildlife (USFW)
- State Land
- WGFD Crucial Habitat Priority Area
- WGFD Enhancement Habitat Priority Area
- The Nature Conservancy Priority Conservation Area
- Conservation Easement (The Nature Conservancy)

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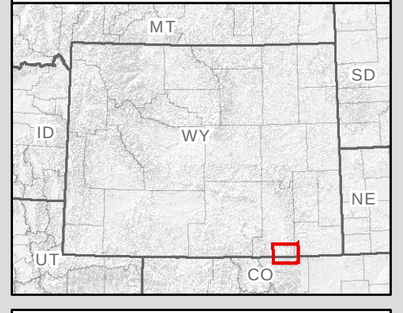

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Mortenson Lake NWR
Laramie Plains Lakes Complex IBA
Laramie Plains Lakes PCA
Hutton Lake NWR
Monolith Ranch HMA
Spiegelberg HMA
Albany County
Red Buttes PCA
Turtle Rock/Red Buttes (PCA) Easement
Medicine Bow National Forest
Turtle Rock PCA
North Crow HMA
Curt Gowdy State Park
Tie Siding
Laramie County
Laramie Foothills (Aka Mountains To Plains) Easement
Shell Creek PCA
Cherokee Park HMA
Lone Tree Creek HMA
Laramie Foothills Easement
Wyoming
Colorado
Laramie River PCA
Dead Tree SWA
Roosevelt National Forest
Cherokee SWA - Upper Unit
Cherokee SWA - Middle Unit
Cap Rock Preserve
Laramie Foothills PCA
Larimer County
Mountains to Plains PCA
230
210
80
287

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Rail Tie Wind Project

Figure 4
National Land Cover Database

Albany County, WY

- Project Area
- Siting Corridor
- State/County Boundary
- Highways
- County Roads

NLCD Land Cover

- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Scrub/Shrub
- Grassland/Herbaceous
- Woody Wetlands
- Emergent Herbaceous Wetlands

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Source: National Land Cover Database 2016

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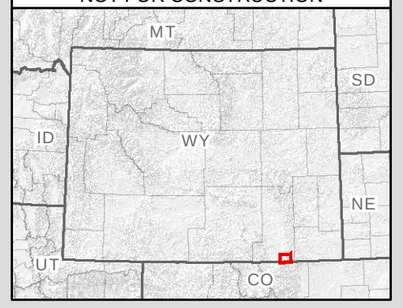

TETRA TECH

Albany County, Wyoming

Larimer County, Colorado

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Rail Tie Wind Project

Figure 5
Wetlands and Other Waters

Albany County, WY

Project Area
Siting Corridor
State/County Boundary
Highways
County Roads

NHD Stream Type
Perennial Stream
Intermittent Stream
Ephemeral Stream

NWI Wetland Type
Freshwater Emergent Wetland
Freshwater Forested/ Shrub Wetland
Freshwater Pond
Lake
Riverine

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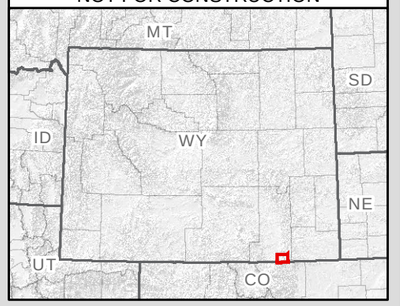

TETRA TECH

Albany County, Wyoming
Larimer County, Colorado

Tie Siding

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Rail Tie Wind Project

Figure 6
Field-Verified Land Cover

Albany County, WY

- Project Area
- Siting Corridor
- State/County Boundary
- Highways
- County Roads

Field-Verified Land Cover

- Open Water
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Shrub/Scrub
- Pasture/Hay
- Herbaceous Wetland
- Woody Wetland

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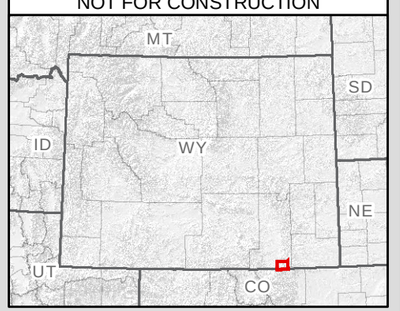

TETRA TECH

Albany County, Wyoming

Larimer County, Colorado

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WGFD SWAP Habitat Type	NatureServe Ecological Systems
Aspen/Deciduous Forest	Rocky Mountain Aspen Forest and Woodland
Cliffs, Canyons, Caves, and Rock Outcrops	Inter-mountain Basins Cliff and Canyon
Foothill Shrublands	Inter-mountain Basins Montane Sagebrush Steppe
	Inter-mountain Basins Mountain-Mahogany Woodland and Shrubland
Riparian Areas	Rocky Mountain Lower Montane- Foothill Riparian Woodland and Shrubland
Sagebrush Shrublands	Wyoming Basins Dwarf Sagebrush Shrubland and Steppe
	Wyoming Basins Dwarf Sagebrush Shrubland and Steppe- Bedrock Outcrops
Wetlands	Pasture/hay
	Open water
	Rocky Mountain Subalpine-Montane Fen (Suspected)
	Western Great Plains Open Freshwater Depression Wetland
Xeric and Lower Montane Forest	Rocky Mountain Foothill Limber Pine-Juniper Woodland

Tie Siding
Sportsman Lake Rd
Robinson Rd
Cherokee Park Rd
Hermosa Rd
Iron Horse Rd
Klondike Rd
Davis Pkwy
Rams Horn Rd
Poudre Rd
Dale Creek Rd
Monument Rd
Pumpkin Vine Rd
Boulder Ridge Rd
Bobcat Ridge Rd
Elk Crossing Rd
Deer Crossing Rd
Weaver Ranch Rd
222
231
241
234
319
31
59
287
Albany County, Wyoming
Larimer County, Colorado

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Rail Tie Wind Project

Figure 7
Field-Based Habitat Assessment Results

Albany County, WY

- Project Area
- Siting Corridor
- State/County Boundary
- Highways
- County Roads

Habitat classification based on the NatureServe Ecological Systems (2019) within the Wyoming Game and Fish Department State Wildlife Action Plan Habitat Types (2017).

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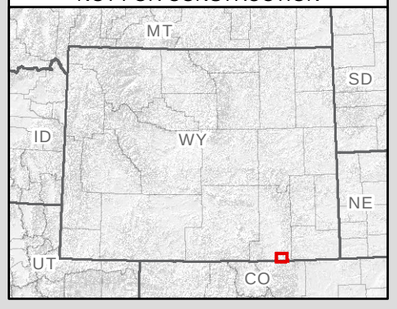

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Rail Tie Wind Project

Figure 8
Biological Resouces

Albany County, WY

- Project Area
- Siting Corridor
- Highway
- State Boundary
- County Boundary
- Breeding Bird Survey Route
- Christmas Bird Count

Site Observations (September 2019)

- Elk Herd
- Mule Deer Herd
- Potential Swift Fox Den

Wyoming Game and Fish Dept.

- Antelope Migration Route
- Antelope Crucial Range
- Elk Migration Route
- Elk Crucial Range
- Elk Parturition Area
- Mule Deer Migration Route
- Mule Deer Crucial Range
- Current Sage-Grouse Distribution (2015)
- Preble's Meadow Jumping Mouse Potential Recovery HUC

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Rail Tie Wind Project

Figure 9
Geology

Albany County, WY

Project Area
Siting Corridor
State/County Boundary
Highway
County Rds
Cave (Hill et al. 1976)
Mine

Karst Features

Fissures, tubes, and caves over 1,000 ft (300 m) long; 50 ft (15 m) to over 250 ft (75 m) vertical extent; in moderately to steeply dipping beds of carbonate rock

Carbonate rocks at or near the land surface in a dry climate

Carbonate rocks at or near the land surface in a humid climate

Evaporite rocks at or near the land surface in a dry climate

Gypsum extent

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Source: USGS Karst Map

NOT FOR CONSTRUCTION

TETRA TECH

Albany County, Wyoming

Larimer County, Colorado

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APPENDIX A:
Field-Based Habitat Assessment Photographs

ConnectGEN

Rail Tie Wind Project

Photo Locations

Albany County, WY

- 1 Photo Locations
- Project Area
- State/County Boundary
- Highways
- County Roads

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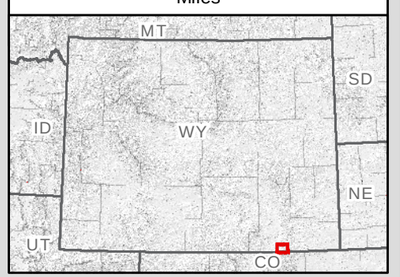

Albany County, Wyoming

Larimer County, Colorado

Tie Siding

Stevenson Rd
Hermosa Rd
Iron Horse Rd
Klondike Rd
Dale Rd
Davis Pkwy
Poudre Rd
Rams Horn Rd
Dale Creek Rd
Monument Rd
Pumpkin Vine Rd
Sportsman Lake Rd
Robinson Rd
Boulder Ridge Rd
Bobcat Ridge Rd
Deer Crossing Rd
Elk Crossing Rd
Cherokee Park Rd

287 222 80 234 231 241 31 319 59

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Photo 1. Representative habitat photo of Rocky Mountain Aspen Forest.

Photo 2. Representative habitat photo of Inter-mountain Basins Cliff and Canyon.

Photo 3. Representative habitat photo of Inter-mountain Basins Montane Sagebrush Steppe.

Photo 4. Representative habitat photo of Inter-mountain Basins Mountain-Mahogany Woodland and Shrubland.

Photo 5. Representative habitat photo of Rocky Mountain Lower Montane-Foothill Riparian Woodland and Shrubland.

Photo 6. Representative habitat photo of Wyoming Basins Dwarf Sagebrush Shrubland and Steppe.

Photo 7. Representative habitat photo of Wyoming Basins Dwarf Sagebrush Shrubland and Steppe-Bedrock Outcrops.

Photo 8. Representative habitat photo of Pasture/Hay.

Photo 9. Representative habitat photo of Open Water.

Photo 10. Representative habitat photo of Rocky Mountain Subalpine-Montane Fen (Suspected).

Photo 11. Representative habitat photo of Western Great Plains Open Freshwater Depression Wetland.

Photo 12. Representative habitat photo of Rocky Mountain Foothill Limber Pine-Juniper Woodland.

Photo 13. Potentially suitable Preble's jumping mouse (*Zapus hudsonius preblei*) habitat.

Photo 14. Potential kit fox (*Vulpes velox*) den in northwest portion of Project Area.

Photo 15. Elk (*Cervus canadensis*) herd in northeast portion of Project.

Photo 16. Ephemeral pool with SGCN western tiger salamander (*Ambystoma mavortium*).

Photo 17. Landscape overview of western portion of Project Area showing dwarf sagebrush habitat

Photo 18. Landscape overview of the northwest portion of the Project Area showing patch of mountain mahogany in dwarf sagebrush habitat.

Photo 19. Landscape overview of the eastern portion of the Project Area showing erosional swale through dwarf sagebrush habitat.

Photo 20. Landscape overview of the eastern portion of the Project Area showing wet meadow and rock outcrops.

APPENDIX B:
Species Observed During the Field-Based Habitat Assessment

APPENDIX B:
Species Observed During the Field-Based Habitat Assessment

Species	Scientific Name
Wildlife	
Birds	
Waterfowl	
Blue-winged teal[3]	*Spatula discors*
Canada goose[3]	*Branta canadensis*
Gadwall[3]	*Mareca strepera*
Pigeons/dove	
Rock pigeon	*Columba livia*
Waterbirds	
Wilson's snipe[3]	*Gallinago delicata*
Raptors	
American kestrel[1,3]	*Falco sparverius*
Bald eagle[2]	*Haliaeetus leucocephalus*
Cooper's hawk[3]	*Accipiter cooperii*
Ferruginous hawk[2,3]	*Buteo regalis*
Golden eagle[2,3]	*Aquila chrysaetos*
Long-eared owl[3]	*Asio otus*
Northern harrier[3]	*Circus hudsonius*
Prairie falcon[2,3]	*Falco mexicanus*
Red-tailed hawk[3]	*Buteo jamaicensis*
Sharp-shinned hawk[3]	*Accipiter striatus*
Swainson's hawk[1,2,3]	*Buteo swainsoni*
Turkey vulture[3]	*Cathartes aura*
Woodpeckers	
Northern flicker[3]	*Colaptes auratus*
Songbirds	
American crow	*Corvus brachyrhynchos*
American robin	*Turdus migratorius*
Black-billed magpie	*Pica hudsonia*
Black-capped chickadee	*Poecile atricapillus*
Blue-gray gnatcatcher[3]	*Polioptila caerulea*
Brewer's blackbird[3]	*Euphagus cyanocephalus*
Clark's nutcracker	*Nucifraga columbiana*
Common raven	*Corvus corax*
European starling	*Sturnus vulgaris*
Horned lark	*Eremophila alpestris*
Lark bunting[3]	*alamospiza melanocorys*
Loggerhead shrike[1,2,3]	*Lanius ludovicianus*
McCown's longspur[1,2,3]	*Rhynchophanes mccownii*
Mountain bluebird[3]	*Sialia currucoides*
Mountain chickadee	*Poecile gambeli*
Orange-crowned warbler[3]	*Leiothlypis celata*
Red crossbill	*Loxia curvirostra*
Red-winged blackbird[3]	*Agelaius phoeniceus*
Rock wren	*Salpinctes obsoletus*

APPENDIX B:
Species Observed During the Field-Based Habitat Assessment

Species	Scientific Name
Western bluebird[3]	*Sialia mexicana*
Western meadowlark[3]	*Sturnella neglecta*
Yellow warbler[3]	*Setophaga petechia*
Yellow-rumped warbler[3]	*Setophaga coronata*
Mammals	
Coyote	*Canis latrans*
Elk	*Cervus canadensis*
Least chipmunk	*Tamias minimus*
Mule deer	*Odocoileus hemionus*
Pronghorn	*Antilocapra americana*
Swift fox (potential den only)[1]	*Vulpes velox*
Thirteen-lined ground squirrel	*Ictidomys tridecemlineatus*
White-tailed jackrabbit	*Lepus townsendii*
Amphibians	
Western tiger salamander[1]	*Ambystoma mavortium*
Reptiles	
Terrestrial gartersnake	*Thamnophis elegans*
Plants	
Trees	
Aspen	*Populus tremuloides*
Limber pine	*Pinus flexilis*
Narrowleaf cottonwood	*Populus angustifolia*
Ponderosa pine	*Pinus ponderosa*
Rocky Mountain maple	*Acer glabrum*
Thinleaf alder	*Alnus incana*
Shrubs	
Antelope bitterbrush	*Purshia tridentata*
Bebb willow	*Salix bebbiana*
Bluestem willow	*Salix irrorata*
Chokecherry	*Padus virginiana*
Common juniper	*Juniperus communis var. depressa*
Coyote willow	*Salix exigua*
Fendler's ceanothus, buckbrush	*Ceanothus fendleri*
Fringed sage	*Artemisia frigida*
Kinnikinnick	*Arctostaphylos uva-ursi*
Mountain mahogany	*Cercocarpus montanus*
Oregon grape	*Mahonia repens*
Plains silver sagebrush	*Artemisia cana* spp. *cana*
Plane-leaf willow	*Salix planifolia*
Prickly-pear	*Opuntia polyacantha*
Rabbitbrush	*Chrysothamnus viscidiflorus*
Red osier dogwood	*Cornus sericea*
Shrubby cinquefoil	*Potentilla fruiticosa*
Soapweed yucca	*Yucca glauca*

APPENDIX B:
Species Observed During the Field-Based Habitat Assessment

Species	Scientific Name
Strapleaf willow	*Salix eriocephala* spp. *ligulifolia*
Twinberry honeysuckle	*Lonicera involucrata*
Waxcurrant	*Ribes cereum*
Western serviceberry	*Amelanchier alnifolia*
Western snowberry	*Symphoricarpos occidentalis*
Whitestem gooseberry	*Ribes inerme*
Woods' rose	*Rosa woodsii*
Wyoming big sagebrush	*Artemisia tridentata* spp. *wyomingensis*
Wyoming three-tip sagebrush	*Artemisia tripartita* spp. *rupicola*
Grasses	
American mannagrass	*Glyceria grandis*
Baltic rush	*Juncus balticus*
Beaked sedge	*Carex utriculata*
Blue grama	*Bouteloua gracilis*
Bluebunch wheatgrass	*Pseudoregneria spicata*
Bluejoint reedgrass	*Calamagrostis canadensis*
Brookgrass	*Catabrosa aquatica*
Canada bluegrass	*Poa compressa*
Cheatgrass[5]	*Bromus tectorum*
Clustered field sedge	*Carex praegracilis*
Creeping bentgrass	*Agrostis stolinifera*
Creeping spikerush	*Eleocharis palustris*
Daggerleaf rush	*Juncus ensilfolius*
Fowl mannagrass	*Glyceria striata*
Foxtail barley	*Hordeum jubatum*
Indian ricegrass	*Acnatherum hymenoides*
Jointleaf rush	*Juncus articulatus*
Kentucky bluegrass	*Poa pratensis*
Longstyle rush	*Juncus longistylis*
Merten's rush	*Juncus mertensianus*
Mountain muhly	*Muhlenbergia montana*
Nebraska sedge	*Carex nebrascensis*
Needle and thread	*Hesperostipa comata*
Panicled bulrush	*Scirpus microcarpus*
Prairie junegrass	*Koeleria macrantha*
Reed canarygrass	*Phalaris arundinacea*
Sandberg bluegrass	*Poa secunda*
Six-weeks fescue	*Vulpia octaflora*
Sloughgrass	*Beckmannia syzigachne*
Smooth brome	*Bromus inermis*
Spike trisetum	*Trisetum spicatum*
Timothy	*Phleum pratense*
Toad rush	*Juncus bufonius*
Tufted hairgrass	*Deschampsia cespitosa*

APPENDIX B:
Species Observed During the Field-Based Habitat Assessment

Species	Scientific Name
Water sedge	*Carex aquatilis*
Western wheatgrass	*Pascopyrum smithii*
Forbs	
American brooklime	*Veronica americana*
Broadfruit bur-reed	*Sparganium eurycarpum*
Dropleaf buckwheat[4] (tentative identification due to lack of flowers at the time of the field-based habitat assessment)	*Eriogonum exilifolium*
Few-flower buckwheat	*Eriogonum pauciflorum*
Bull thistle	*Cirsium vulgare*
Canada thistle[5]	*Cirsium arvense*
Colorado aletes	*Aletes humilis (tentative ID)*
Common mullein[5]	*Verbascum thapsus*
Common plantain	*Plantago major*
Coontail	*Ceratophyllum demersum*
Creeping nailwort	*Paronychia sessiliflora*
Dock species	*Rumex* sp.
Elk thistle	*Cirsium scariosum*
Fendler's meadowrue	*Thalictrum fendleri*
Field mint	*Mentha arvensis*
Flixweed	*Descurainia sophia*
Forked spleenwort	*Asplenium setentrionale*
Fringed grass-of-Parnassus	*Parnassia fimbriata*
Giant angelica	*Angelica ampla*
Green gentian, monument plant	*Frasera speciosa*
Harebell	*Campanula rotundifolia*
Hawkweed	*Agoseris glauca*
Hood's phlox	*Phlox hoodii*
Hooker's sandwort	*Eremogone hookeri*
Houndstongue[5]	*Cynoglossum officinale*
Largeleaf avens	*Geum macrophyllum*
Marsh violet	*Viola palustris*
Milkvetch species	*Astragalus* sp.
Missouri iris	*Iris missouriensis*
Musk thistle	*Carduus nutans*
Nylon hedgehog cactus	*Echinocereus viridiflorus*
Pale madwort	*Alyssum alyssoides*
Pineappleweed	*Matricaria discoidea*
Prairie goldenbanner	*Thermopsis rhombifolia*
Prairie sage, white sage	*Artemisia lucoviciana*
Prairie sunflower	*Helianthus petiolaris*
Prostrate vervain	*Verbena bracteata*
Pussytoes	*Antennaria parviflora*
Rayless groundsel	*Packera debilis or pauciflora*
Salsify	*Tragapogon dubius*

APPENDIX B:
Species Observed During the Field-Based Habitat Assessment

Species	Scientific Name
Silverleaf potentilla	*Potentilla anserina*
Simpon's ball cactus	*Pediocactus simpsonii*
Sticky purple geranium	*Geranium viscosissimum*
Stinging nettle	*Urtica dioica*
Stonecrop	*Sedum lanceolatum*
Sulfur buckwheat	*Eriogonum umbellatum*
Thrift mock goldenweed	Stenotus armerioides
Water cress	*Nasturium officinale*
Wavyleaf thistle	*Cirsium undulatum*
Wild licorice	*Glycyrrhiza lepidota*
Willowherb	*Epilobium* sp.
Yarrow	*Achillea millefolium*

1 SGCN (WGFD 2017)
2 BCC (USFWS 2008)
3 Neotropical Migrant (USFWS 2019f)
4 SOC Plant Species (Heidel 2018)
5 State Designated Noxious Weed (Wyoming Weed and Pest Council 2018)

APPENDIX C:
USFWS Information for Planning and Consultation Resources List for the Rail Tie Wind Project

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Wyoming Ecological Services Field Office
5353 Yellowstone Road, Suite 308a
Cheyenne, WY 82009-4178
Phone: (307) 772-2374 Fax: (307) 772-2358
http://www.fws.gov/wyominges/

In Reply Refer To:
Consultation Code: 06E13000-2019-SLI-0409
Event Code: 06E13000-2019-E-01188
Project Name: Rail Tie Wind Project

September 10, 2019

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ES) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

Please feel free to contact us if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. We also encourage you to visit the Wyoming Ecological Services website at https://www.fws.gov/wyominges/species_endangered.php.

The purpose of the ESA is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the ESA and its implementing regulations (50 CFR 402 *et seq.*), federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF.

We also recommend you consider the following information when assessing impacts to federally listed species, as well as migratory birds, and other trust resources:

Colorado River and Platte River Systems: Federal agencies must consult with the Service under section 7 of the ESA for projects in Wyoming that may lead to water depletions or have the potential to impact water quality in the Colorado River system or the Platte River system, because these actions my affect threatened and endangered species inhabiting the downstream reaches of these river systems. In general, depletions include evaporative losses and/or consumptive use of surface or groundwater within the affected basin, often characterized as diversions minus return flows. Project elements that could be associated with depletions include, but are not limited to: ponds, lakes, and reservoirs (e.g., for detention, recreating, irrigation, storage, stock watering, municipal storage, and power generation); hydrostatic testing of pipelines; wells; dust abatement; diversion structures; and water treatment facilities. For more information on consultation requirements for the Platte River species, please visit https://www.fws.gov/platteriver/.

Migratory Birds: The Migratory Bird Treaty Act (16 U.S.C. 703-712; MBTA) prohibits the taking of any migratory birds, their parts, nests, or eggs except as permitted by regulations. Except for introduced species and some upland game birds, almost all birds occurring in the wild in the United States are protected (50 CFR 10.13). On December 22, 2017, the Department of the Interior Solicitor's Office issued an opinion that the MBTA's prohibitions on pursuing, hunting, taking, capturing, killing, or attempting to do the same apply only to affirmative actions that have as their purpose the taking or killing of migratory birds, their nests, or their eggs.

While the opinion (M-37050) states that the MBTA prohibition on the taking or killing of migratory birds applies only to deliberate acts, project activities should avoid, to the extent possible, sensitive periods and habitats to conserve healthy populations of migratory birds. See our website for more information and example conservation measures at https://www.fws.gov/wyominges/species_migratory.php. Guidance for minimizing impacts to migratory birds for projects that include communication towers can be found at https://www.fws.gov/birds/management/project-assessment-tools-and-guidance/guidance-documents/communication-towers.php.

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d; Eagle Act) prohibits knowingly taking, or taking with wanton disregard for the consequences of an activity, any bald or golden eagles or their body parts, nests, or eggs, which includes collection, molestation, disturbance, destruction, or killing. Eagle nests are protected whether they are active or inactive. Removal or destruction of nests, or causing abandonment of a nest could constitute a violation of the Eagle Act. Projects affecting eagles may require development of an eagle conservation plan (https://www.fws.gov/ecological-service/es-library/pdfs/Eagle_Conservation_Guidance-Module%201.pdf). Additionally, wind energy projects should follow the wind energy guidelines (https://www.fws.gov/ecological-service/energy-develpment/wind.html) for minimizing impacts to migratory birds and bats.

In addition to MBTA and the Eagle Act, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Wyoming Ecological Services Field Office
5353 Yellowstone Road, Suite 308a
Cheyenne, WY 82009-4178
(307) 772-2374

Project Summary

Consultation Code: 06E13000-2019-SLI-0409

Event Code: 06E13000-2019-E-01188

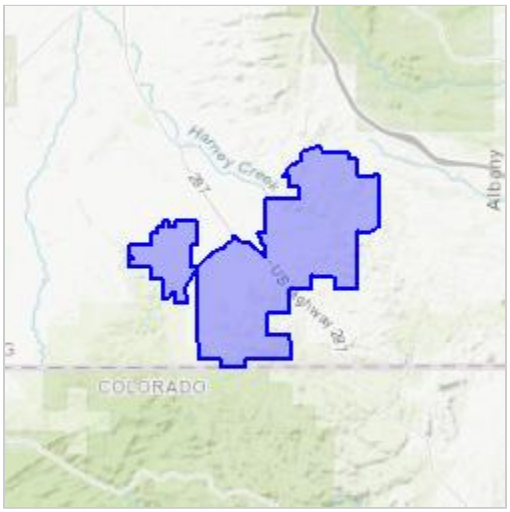
Project Name: Rail Tie Wind Project

Project Type: POWER GENERATION

Project Description: The proposed Project is a commercial wind energy facility encompassing approximately 29,430-acres of ranchland on private and state lands located in southeastern Albany County, Wyoming, approximately 15 miles south of the town of Laramie. The development and ultimate construction of the Project may occur in multiple phases, with the collective Project including up to 500 megawatts in generation capacity. The Project proposes to interconnect to the existing transmission system of the Western Area Power Administration (WAPA) via the Craig-to-Ault 345-kilovolt (kV) transmission line, which runs through the Project Area. The Project is currently studying multiple wind turbine generator types and Project design options. Therefore, layout and location of wind turbines and associated Project facilities such as access roads, electric collector lines, substation, operations and maintenance facility, and laydown areas, have not been identified at this time. ConnectGen intends to begin construction in 2021, and complete construction of the first phase by the end of 2022. ConnectGen expects to complete construction on the second phase in 2023.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/41.06695826686005N105.44248452869424W



Counties: Albany, WY

Endangered Species Act Species

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Preble's Meadow Jumping Mouse *Zapus hudsonius preblei* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4090	Threatened

Birds

NAME	STATUS
Least Tern *Sterna antillarum* Population: interior pop. No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8505	Endangered
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Whooping Crane *Grus americana* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/758	Endangered

Fishes

NAME	STATUS
Pallid Sturgeon *Scaphirhynchus albus*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/7162

Flowering Plants

NAME	STATUS
Western Prairie Fringed Orchid *Platanthera praeclara*	Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/1669

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Brewer's Sparrow *Spizella breweri* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9291	Breeds May 15 to Aug 10
Cassin's Finch *Carpodacus cassinii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9462	Breeds May 15 to Jul 15

NAME	BREEDING SEASON
Chestnut-collared Longspur *Calcarius ornatus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Golden Eagle *Aquila chrysaetos* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Olive-sided Flycatcher *Contopus cooperi* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Rufous Hummingbird *selasphorus rufus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8002	Breeds Apr 15 to Jul 15
Veery *Catharus fuscescens salicicola* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds May 15 to Jul 15

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

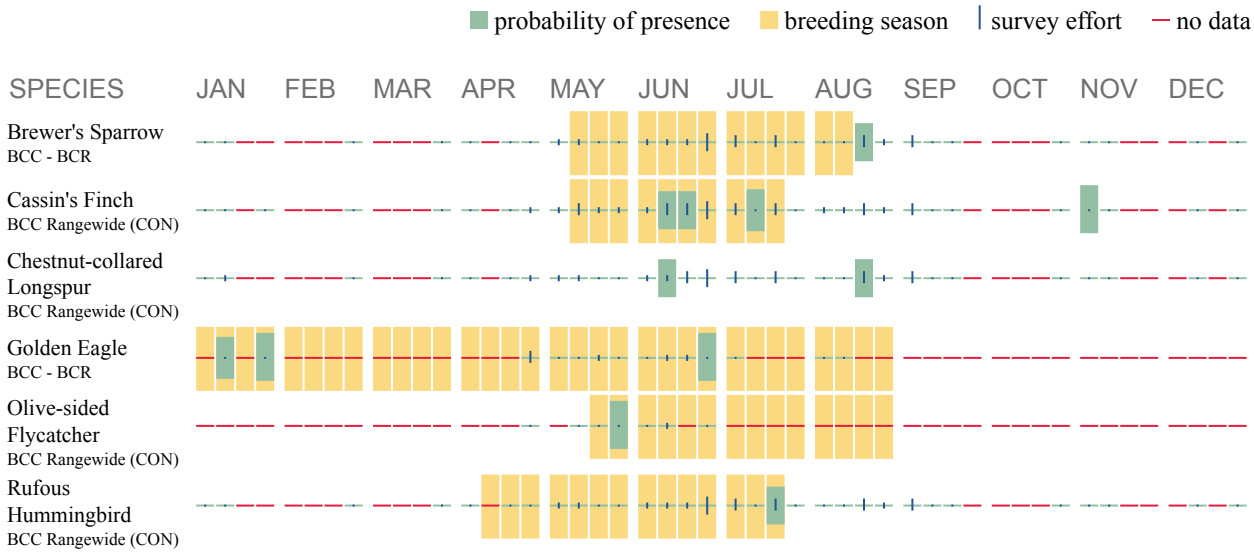
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

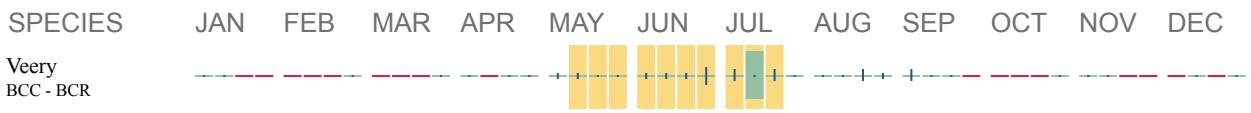
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.
Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird

model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER EMERGENT WETLAND

- PEM1C
- PEM1A
- PEM1B
- PEM1Ah
- PEM1Ch
- PEM1Cb
- PEM1F
- PEM1Fh

FRESHWATER FORESTED/SHRUB WETLAND

- PSSA
- PSSAx
- PSSC
- PSSCb
- PSSB
- PFOA

FRESHWATER POND

- PABFh
- PABGb
- PUSCh

RIVERINE

- R4SBC
- R5UBH
- R3UBF

APPENDIX D:
Plant Species of Concern Potentially Occurring in Albany County

Species Scientific Common Name	Heritage Rank	Federal Status	County	Managed Area	Range Context	# Pops.	Abund.	Vulnerab.	Recent Trends	Wyoming Contrib.
Besseya plantaginea White River coraldrops	GNR/S1	MBNF-SOLC	ALB	Medicine Bow NF	Regional Endemic/ Edge	Very Low	Uncommon	Moderate	Stable	Medium
Salix serissima Autumn willow	G5/S1	USFS R2 Sensitive	ALB	Medicine Bow NF	Disjunct	Very Low	Rare	Moderate	Stable	Medium
Asclepias hallii Hall's milkweed	G3/SH		ALB	Rawlins BLM?	Widespread/ Edge	Very Low	Unknown	Unknown	Unknown	Unknown
Potentilla ambigens Silkyleaf cinquefoil	G3/SH		ALB	Rawlins BLM?	Widespread/ Edge	Very Low	Unknown	Moderate	Unknown	Unknown
Cymopterus alpinus [*Oreoxis alpina*] Alpine oreoxis	G4G5/S1		ALB	Medicine Bow NF Rawlins BLM?	Widespread/ Edge	Very Low	Rare	Moderate	Unknown	Low
Elymus triticoides [*Leymus triticoides*] Creeping wildrye	G4G5/SH		ALB	Hutton Lake NWR	Widespread/ Edge	Very Low	Unknown	Unknown	Unknown	Unknown
Carex bella Southwestern showy sedge	G5/SH		ALB	Medicine Bow NF	Widespread/Edge	Very Low	Unknown	Moderate	Unknown	Low
Eriogonum exilifolium Dropleaf buckwheat	G3/S2	USFS R2 Sensitive	ALB, CAR	Medicine Bow NF Rawlins BLM	Regional Endemic/ Core	Low	Uncommon	Moderate	Unknown	High
Xanthisma coloradense [*Machaeranthera coloradoensis; Haplopappus coloradoensis*] Colorado tansyaster	G3/S2	USFS R2 Sensitive	ALB, CAR	Medicine Bow NF Rawlins BLM	Regional Endemic/ Core	Low	Rare	Moderate	Unknown	High
Luzula subcapitata Colorado woodrush	G3/S1		ALB, CAR	Medicine Bow NF	Regional Endemic/ Edge	Very Low	Rare	Unknown	Unknown	Medium
Paronychia pulvinata Rocky Mountain nailwort	G3?/S1		ALB, CAR	Medicine Bow NF Rawlins BLM	Regional Endemic/ Edge	Very Low	Rare	Moderate	Stable?	Medium
Carex egglestonii Eggleston's sedge	G4/S1		ALB, CAR	Medicine Bow NF	Regional Endemic/ Edge	Very Low	Unknown	Moderate	Unknown	Medium
Heterotheca pumila [Incl. in *Chrysopsis villosa* by Cronquist] Alpine false goldenaster	G4/S1		ALB, CAR	Medicine Bow NF	Regional Endemic/ Edge	Very Low	Rare?	Moderate	Unknown	Medium
Tonestus pygmaeus [*Haplopappus pygmaeus*] Pygmy goldenweed	G4/S1		ALB, CAR	Medicine Bow NF	Widespread/ Edge	Very Low	Rare	Moderate	Stable?	Low
Erigeron elatior Tall fleabane	G4/S2		ALB, CAR	Medicine Bow NF Rawlins BLM?	Regional Endemic/ Edge	Low	Uncommon	Moderate	Unknown	Medium
Erigeron pinnatisectus Featherleaf fleabane	G4/S2		ALB, CAR	Medicine Bow NF	Regional Endemic/ Edge	Low	Uncommon	Moderate	Stable?	Medium
Chionophila jamesii Rocky Mountain snowlover	G4?/S1		ALB, CAR	Medicine Bow NF	Regional Endemic/ Edge	Very Low	Uncommon	Moderate	Stable?	Medium

Species Scientific Common Name	Heritage Rank	Federal Status	County	Managed Area	Range Context	# Pops.	Abund.	Vulnerab.	Recent Trends	Wyoming Contrib.
Carex occidentalis Western sedge	G4/S1		ALB, CAR, PAR	Cody BLM Medicine Bow NF Rawlins BLM? Shoshone NF	Widespread/ Edge	Very Low	Unknown	Moderate	Unknown	Low
Polypodium saximontanum [*P. vulgare* var. *columbianum*] Rocky Mountain polypody	G3?/S1		ALB, CAR, CON	Medicine Bow NF	Regional Endemic/ Edge	Very Low	Rare	Unknown	Stable?	Medium
Saxifraga chrysantha [*S. serpyllifolia* var. *chrysantha, Hirculus serpyllifolius* ssp. *chrysanthus*] Goldenbloom saxifrage	G4/S2		ALB, CAR, FRE, PAR, SUB	Bridger-Teton NF Medicine Bow NF Shoshone NF	Widespread/ Edge	Low	Uncommon	Moderate	Unknown	Low
Lomatogonium rotatum Marsh felwort	G5/S2	MBNF-SOLC	ALB, CAR, LAR	Medicine Bow NF Mortenson Lake NWR	Disjunct	Low	Rare	Moderate	Unknown	Medium
Carex hallii [*C. parryana* var. *unica; C. parryana* ssp. *hallii*] Deer sedge	G4?Q/S2		ALB, CAR, LAR, PLA, TET	Medicine Bow NF Rawlins BLM Yellowstone NP?	Widespread/ Edge	Very Low	Uncommon	Moderate	Unknown	Low
Ipomopsis tenuituba ssp. *tenuituba* [*I. aggregata* var. *tenuituba, Gilia aggregata* var. *macrosiphon*] Slendertube ipomopsis	G4G5TNR /S1		ALB, CAR, LIN, SUB	Medicine Bow NF	Widespread/ Edge	Very Low	Rare	Moderate	Unknown	Low
Carex diandra Lesser panicled sedge	G5/S2	USFS R2 Sensitive	ALB, CAR, PAR, SHE, TET	Bighorn NF Grand Teton NP Medicine Bow NF Shoshone NF Yellowstone NP	Disjunct	Low	Rare	Moderate	Stable	Medium
Asplenium trichomanes- ramosum [*A. viride*] Brightgreen spleenwort	G4/S2S3		ALB, CAR, SHE, TET, WAS	Bighorn NF Bridger-Teton NF Grand Teton NP Medicine Bow NF Targhee NF	Disjunct	Low	Rare	Moderate	Stable?	Medium
Vaccinium myrtillus [*V. myrtillus* var. *oreophilum]* Whortleberry	G5T4T5/ S1		ALB, CAR, TET	Medicine Bow NF Yellowstone NP?	Widespread/ Edge	Very Low	Rare	Moderate	Unknown	Low

Species Scientific Common Name	Heritage Rank	Federal Status	County	Managed Area	Range Context	# Pops.	Abund.	Vulnerab.	Recent Trends	Wyoming Contrib.
Artemisia simplex [*Sphaeromeria simplex*] Laramie chickensage	G2/S2	WY BLM Sensitive	ALB, CAR, CON, NAT	Casper BLM Rawlins BLM	Local Endemic/ Core	Low	Uncommon	Moderate	Stable	Very High
Mentzelia rusbyi [*Nuttallia rusbyi*] Rusby's blazingstar	G4?/S1		ALB, CAR, SWE	Medicine Bow NF? Rawlins BLM? GET	Widespread/ Edge	Very Low	Unknown	Moderate	Unknown	Low
Aquilegia laramiensis Laramie columbine	G3/S3	USFS R2 Sensitive WY BLM Sensitive	ALB, CON	Casper BLM Medicine Bow NF Rawlins BLM	Local Endemic/ Core	Moderate	Rare	Moderate	Stable?	Very High
Listera convallarioides Broad-leaved twayblade	G5/S1S2	Bghrn NF-SOLC, BlHll NF-SOLC, MBNF-SOLC	ALB, CON, LIN, SHE, TET	Bighorn NF Bridger-Teton NFGrand Teton NPMedicine Bow NFTarghee NF Yellowstone NP	Widespread/ Edge	Low	Rare	High	Unknown	Low
Dieteria bigelovii var. bigelovii [*Machaeranthera bigelovii var. bigelovii*] Bigelow's tansyaster	G4G5T3T4/S2		ALB, CRO	Bamforth NWR? Black Hills NF Medicine Bow NF Mortenson Lake NWR?	Regional Endemic/ Edge	Low	Rare	Moderate	Unknown	Medium
Dichanthelium linearifolium [*Panicum linearifolium*] Slimleaf panicgrass	G5/S1	MBTB-SOLC	ALB, CRO, WES	Black Hills NF Medicine Bow NF	Disjunct	Very Low	Unknown	Moderate	Unknown	Medium
Juncus triglumis var. albescens [*J. albescens*] Northern white rush	G5T5/S2	MBNF-SOLC	ALB, FRE, PAR, SUB	Bridger-Teton NF Medicine Bow NF Shoshone NF	Disjunct	Low	Rare	Moderate	Stable?	Medium
Salix candida Sageleaf willow	G5/S2S3	USFS R2 Sensitive	ALB, FRE, PAR, SUB, TET	Bridger-Teton NF Medicine Bow NF Natl Elk Refuge Pinedale BLM Shoshone NF Yellowstone NP	Widespread/ Edge	Low	Rare	Moderate	Stable?	Low
Juncus vaseyi Vasey's rush	G5/S1	MBNF-SOLC	ALB, FRE, SUB, TET	Bridger-Teton NF Medicine Bow NF Yellowstone NP	Widespread/ Edge	Very Low	Rare	Moderate	Unknown	Low
Paronychia jamesii James' nailwort	G4/S1		ALB, GOS		Widespread/ Edge	Very Low	Unknown	Moderate	Unknown	Low

Species Scientific Common Name	Heritage Rank	Federal Status	County	Managed Area	Range Context	# Pops.	Abund.	Vulnerab.	Recent Trends	Wyoming Contrib.
Lipocarpha aristulata [*L. drummondii; Hemicarpha drummondii*] Awned halfchaff sedge	G4G5/S1		ALB, GOS, PLA	Fort Laramie NHS	Widespread/ Edge	Very Low	Rare	Moderate	Unknown	Low
Festuca hallii [*F. altaica* ssp. *hallii;* incl. in *F. scabrella* by some authors] Plains rough fescue	G4/S2	USFS R2 Sensitive	ALB, JOH?, PAR	Bighorn NF? Cody BLM Medicine Bow NF Shoshone NF	Widespread/ Edge	Low	Uncommon	Moderate	Unknown	Low
Symphyotrichum porteri [*Aster porteri*] Smooth white aster	G3G4/S1	MBNF-SOLC	ALB, LAR	Medicine Bow NF	Regional Endemic/ Edge	Very Low	Rare	Moderate	Stable?	Medium
Phacelia alba [*P. neomexicana* var. *alba*] White phacelia	G4G5/S1	MBNF-SOLC	ALB, LAR	Medicine Bow NF Rawlins BLM	Widespread/ Edge	Very Low	Rare	Moderate	Unknown	Low
Phacelia denticulata Rocky Mountain phacelia	G3?/S2	MBNF-SOLC	ALB, LAR	Medicine Bow NF Rawlins BLM	Regional Endemic/ Edge	Low	Rare	Moderate	Moderate Decline?	Medium
Gentiana bigelovii [*G. affinis* var. *bigelovii*] Bigelow's prairie gentian	G5/S1	MBTB-SOLC	ALB, LAR	Medicine Bow NF	Widespread/ Edge	Very Low	Rare	Moderate	Unknown	Low
Carex oreocharis Grassyslope sedge	G3/S1		ALB, LAR	Medicine Bow NF Rawlins BLM	Regional Endemic/ Edge	Very Low	Uncommon	Moderate	Stable?	Medium
Mentzelia sinuata Leechleaf blazingstar	G3/S2		ALB, LAR	Rawlins BLM?	Regional Endemic/ Edge	Low	Unknown	Moderate	Unknown	High
Boechera gracilenta [*B. selbyi ; Arabis selbyi; B. perennans* and *Arabis perennans;* misappl.] Dainty rockcress	G4?Q/S1		ALB, LIN, NIO, SWE	Ashley NF [FGNRA] Rawlins BLM Rock Springs BLM	Widespread/ Edge	Low	Unknown	Moderate	Unknown	Low
Asplenium trichomanes ssp. *trichomanes* Maidenhair spleenwort	G5T5/S1		ALB, NAT	Medicine Bow NF	Widespread/ Edge	Very Low	Rare	Moderate	Stable?	Low
Potamogeton illinoensis Illinois pondweed	G5/S1		ALB, NAT, PAR, SUB	Bridger-Teton NFLander BLM? Shoshone NF Yellowstone NP	Widespread/ Edge	Very Low	Rare	Moderate	Unknown	Low
Trichophorum pumilum [*Scirpus rollandii, S. pumilus*] Rolland's bulrush	G5/S1	MBTB-SOLC	ALB, PAR, SUB, TET	Bridger-Teton NF Medicine Bow NF Natl Elk Refuge Pinedale BLM Shoshone NF	Disjunct	Very Low	Rare	High	Stable?	Medium

Species Scientific Common Name	Heritage Rank	Federal Status	County	Managed Area	Range Context	# Pops.	Abund.	Vulnerab.	Recent Trends	Wyoming Contrib.
Potamogeton strictifolius Narrowleaf pondweed	G5/S1		ALB, PAR, SUB, TET	Bridger-Teton NF Rawlins BLM Yellowstone NP	Disjunct	Very Low	Unknown	Unknown	Moderate Decline?	Medium
Euthamia graminifolia [*E. g.* var. *major; E. g.* var. *graminia, Solidago graminifolia* var. *major*] Flat-top goldentop	G5T5/S1	MBNF-SOLC	ALB, PLA	Camp Guernsey TA? Casper BLM Medicine Bow NF?	Widespread/ Edge	Very Low	Unknown	Moderate	Unknown	Low
Lysimachia thyrsiflora Tufted loosestrife	G5/S1		ALB, TET	Yellowstone NP	Widespread/ Edge	Very Low	Rare	Moderate	Unknown	Low
Besseya alpina Alpine kittentails	G4/S1	MBNF-SOLC	ALB, CAR,	Medicine Bow NF	Regional Endemic/ Edge	Very Low	Uncommon	Moderate	Stable?	Medium
Packera crocata [*Senecio crocatus*] Saffron ragwort	G4/S1?	MBNF-SOLC	ALB, CAR, SWE	Medicine Bow NF Rock Springs BLM	Regional Endemic/ Edge	Very Low	Rare	Moderate	Unknown	Medium
Downingia laeta Great Basin calicoflower	G5/S1		ALB, CAR, UIN	Kemmerer BLM? Rawlins BLM	Widespread/ Edge	Very Low	Rare	Moderate	Unknown	Low
Aletes humilis Larimer aletes	G2G3/SH?	MBNF-SOLC	ALB?		Regional Endemic/ Edge	Very Low	Unknown	Unknown	Unknown	Unknown
Cypripedium parviflorum var. *pubescens* [*C. calceolus* var. *pubescens;C. pubescens*] Greater yellow lady's slipper	G5T5/S2	USFS R2 Sensitive	ALB?, BIG, CRO, FRE, JOH, SHE, WAS Wind River IR	Bighorn NF Black Hills NF Medicine Bow NF?	Disjunct	Low	Rare	Moderate	Moderate Decline	Medium
Rubus arcticus ssp. *acaulis* [*R. acaulis*] Dwarf raspberry	G5/S2	USFS R2 Sensitive	ALB?, CAR, JOH, PAR, TET	Bighorn NF Medicine Bow NF? Yellowstone NP	Disjunct	Low	Rare	Moderate	Stable?	Medium
Triteleia grandiflora [*Brodiaea douglasii*] Largeflower triteleia	G4G5/S2	USFS R2 Sensitive	ALB?, LIN, TET	Bridger-Teton NF? Caribou- Targhee NF Grand Teton NP Medicine Bow NF? Yellowstone NP	Widespread/ Edge	Low	Rare	Moderate	Moderate Decline?	Low

APPENDIX E:
Species of Greatest Conservation Need Potentially Occurring in the Project Area

APPENDIX E:
Species of Greatest Conservation Need Potentially Occurring in the Project Area

Common Name	Scientific Name	SGCN Tier[1]	Habitat Description[2]	WYNDD Occurrences Within or Near the Project Area[3]	Observed during CBC, BBS, or Field Surveys[4]
Mammals					
American pygmy shrew	*Sorex hoyi*	III	This species is associated with a broad array of habitat types, with an apparent preference for moist environments such as fens, bogs, and riparian zones. In Wyoming the species has generally been found in moist, mature stands of Engelmann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*).	None	—
Abert's squirrel	*Sciurus aberti*	III	This species mainly inhabits ponderosa pine forests at elevations of 5,900-9,843 feet. May also extend into mixed conifer and upper pinyon-juniper woodland. Nests high in pines.	None	—
Eastern red bat	*Lasiurus borealis*	III	This species has been documented in a variety of habitats but is typically associated with forested areas. The species prefers large tracts of mature deciduous forests but has also been documented in shelterbelts and riparian and urban areas with large trees. The species forages in riparian areas, above the forest canopy, near forest edges, and in open areas near forest habitats. In summer, the species roosts in the canopy of deciduous trees and shrubs.	None	Field surveys
Eastern spotted skunk	*Spilogale putorius*	II	This species prefers forested areas or habitats with substantial cover, but can also be found in several habitats, including open areas, and in rocky canyons and outcrops in woodlands and prairies.	None	—
Fringed myotis	*Myotis thysanodes*	II	This species inhabits conifer forests, woodland-chaparral, caves and mine; Habitat occurs within caves, mines, snags, rock outcrops, and human structures as roost sites, with foraging habitat often occurring within riparian areas. Open water habitats provide foraging habitat and these can include streams, reservoirs, stock tanks, and other water catchments.	One observation 8/22/2011	Field surveys
Little brown myotis	*Myotis lucifugus*	II	This species is generally associated with woodland habitats but is considered a generalist species. Roosts are varied and include buildings, abandoned mines, caves, railroad tunnels, trees, rock piles, and wood piles.	Two observations 8/22/2011	Field surveys

APPENDIX E:
Species of Greatest Conservation Need Potentially Occurring in the Project Area

Common Name	Scientific Name	SGCN Tier[1]	Habitat Description[2]	WYNDD Occurrences Within or Near the Project Area[3]	Observed during CBC, BBS, or Field Surveys[4]
Long-eared myotis	*Myotis evotis*	III	This species inhabits coniferous forest and woodland, including juniper, Ponderosa pine, and spruce-fir. It typically forages over rivers, streams, and ponds within the forest-woodland environment. During summer, it roosts in a wide variety of structures, including cavities in snags, under loose bark, stumps, buildings, rock crevices, caves, and abandoned mines. During winter, it probably hibernates primarily in caves and abandoned mines.	Two observations 8/22/2011	Field surveys
Long-legged myotis	*Myotis volans*	III	This species is primarily associated with forested habitats, especially coniferous forests. The species may also be found in other forest types such as riparian forests, juniper scrub, and mixed deciduous forests. In Wyoming, the species have been found inhabiting sagebrush-steppe and grassland habitats with few or no trees, indicating that the species may utilize a broader range.	One observation 8/22/2011	Field surveys
Moose	*Alces americanus*	II	In Wyoming, moose occupy lacustrine and palustrine forest habitats associated with Engelmann spruce, Douglas and subalpine fir, and lodgepole pine. During winter, moose generally select riparian/deciduous shrub vegetation dominated by willow (*Salix* spp.). In areas where riparian habitats are limited or during more severe winters, moose can be found in mature conifer forests that provide abundant cover and forage.	None	—
Olive-backed pocket mouse	*Perognathus fasciatus*	III	This species is found in a variety of arid and semiarid upland habitats, generally with a large grass component, sparse vegetation, and loose sandy to clayey soils that accommodate tunnel construction. Although commonly associated with relatively open grasslands, it can also occupy farmland, grassy rock outcroppings, arid shrublands, and semi- wooded habitat.	None	—
Plains harvest mouse	*Reithrodontomys montanus*	II	This species is found in well-developed grasslands, hay fields, highway medians, cultivated fields, grazed riparian woodland. They may nest above or below ground in logs or beneath rocks or other objects.	None	—
Plains pocket mouse	*Perognathus flavescens*	III	This species prefers sandy areas with shortgrass prairie but can also be found in rocky, brushy ravine slopes. Nests underground in burrows.	None	—

APPENDIX E:
Species of Greatest Conservation Need Potentially Occurring in the Project Area

Common Name	Scientific Name	SGCN Tier[1]	Habitat Description[2]	WYNDD Occurrences Within or Near the Project Area[3]	Observed during CBC, BBS, or Field Surveys[4]
Sagebrush vole	*Lemmiscus curtatus*	II	This species almost always occupies areas with significant coverage of big sagebrush species. Occupation of sites without sagebrush (e.g., arid grasslands, rabbitbrush, greasewood) is known but considered atypical. The species constructs and uses underground burrows and nests. Burrows can be extensive enough to describe as tunnel systems and sometimes incorporate tunnels of pocket gophers (*Thomomys* spp.).	None	—
Swift fox	*Vulpes velox*	II	This species inhabits grasslands. Swift foxes tend to be associated with short and mixed grass prairie. They form their dens in sandy soil on open prairies, in plowed fields, or along fences.	Two observations 2004-2016	Potentially active den observed during September 2019 field survey
Townsend's big-eared bat	*Corynorhinus townsendii*	II	This species inhabits forests and basin-prairie shrub. Roosting habitat includes: caves, mines, snags, rock outcrops, and human structures. Similar habitat as the fringed myotis, but more closely associated with caves and mines for day roosts and hibernation sites. It is common in shrub-steppe, juniper woodlands and dry coniferous forests.	None	—
Uinta chipmunk	*Tamias umbrinus*	III	Occupied habitat often includes coniferous forests at moderate to high elevations (to upper tree line). In Wyoming, they are reported occupying spruce-fir forest, lodgepole pine-Douglas-fir forest, and ponderosa pine forest. In more southern regions of the global range, they are most often associated with ponderosa pine habitats, but also are found in drier pinyon pine-juniper woodlands.	None	—
Western small-footed myotis	*Myotis ciliolabrum*	II	This species is generally associated with arid landscapes, usually in the vicinity of cliffs, canyons, rock-outcrops, or badlands. It also occurs near riparian areas in a variety of other habitat types including montane forests, juniper woodlands, various shrublands, and grasslands.	Two observations 8/22/2011	Field surveys

APPENDIX E:
Species of Greatest Conservation Need Potentially Occurring in the Project Area

Common Name	Scientific Name	SGCN Tier[1]	Habitat Description[2]	WYNDD Occurrences Within or Near the Project Area[3]	Observed during CBC, BBS, or Field Surveys[4]
Western spotted skunk	*Spilogale gracilis*	III	This species is most commonly associated with relatively open wooded and shrub habitats with brushy and herbaceous components that promote a diversity of edge habitat, often along streams, and often in association with rock outcroppings. Western spotted skunks use dens, which are typically burrows excavated by the skunk, modifications of other burrows (e.g., ground squirrel burrows), natural cavities (e.g., hallows in rock piles or the roots and trunks of trees), or man-made structures (e.g., gaps under buildings or road cuts).	None	—
White-tailed prairie dog	*Cynomys leucurus*	II	This species inhabits Basin-prairie shrub, grasslands: Habitat includes arid grassland and shrub/grassland communities, usually with slopes less than 12 to 15 percent; typically higher elevations than the black tailed prairie dog, in intermountain valleys, benches, and plateaus with diverse grass and forb cover. Where it occurs east of the Continental Divide in Wyoming, it probably occupies areas that are too dry for the black-tailed prairie dog.	One observation 7/10/1991	Field surveys (Hermosa West)
Amphibians					
Northern leopard frog	*Lithobates pipiens*	II	This species inhabits beaver ponds, and permanent water in plains and foothills. Springs, slow streams, marshes, bogs, ponds, canals, flood plains, reservoirs, and lakes; usually permanent water with rooted aquatic vegetation. In summer, commonly inhabits wet meadows and fields. Takes cover underwater, in damp niches, or in caves when inactive. Overwinters usually underwater.	None	—
Western tiger salamander	*Ambystoma mavortium*	III	In Wyoming, this species can be found in rodent burrows, cellars, window wells, and manure heaps, where they can escape desiccation. A fairly moist environment is required even for adult forms which are primarily terrestrial. Larvae may be found in intermittent streams, ponds, lakes, and stock troughs.	None	Field surveys
Wyoming toad	*Anaxyrus baxteri*	I	This species can be found in flood plains, ponds, and small seepage lakes in the shortgrass communities of the Laramie Basin.	None	—

APPENDIX E:
Species of Greatest Conservation Need Potentially Occurring in the Project Area

Common Name	Scientific Name	SGCN Tier[1]	Habitat Description[2]	WYNDD Occurrences Within or Near the Project Area[3]	Observed during CBC, BBS, or Field Surveys[4]
Birds					
American kestrel[5]	*Falco sparverius*	III	This species breeds in a variety of open and semi-open habitats that also contain trees, cliffs, or other man-made structures that provide nesting cavities. This species can be found in a variety of semi-open habitats including meadows, grasslands, deserts, agricultural fields, cottonwood riparian, open parkland, and urban areas. Habitat is characterized by short ground vegetation, either in small or large patches, with suitable trees or other structures to provide perches and nest cavities	Seven observations 1995-2017	BBS, CBC, Field surveys
American white pelican[5]	*Pelecanus erythrorhynchos*	II	Habitat occurs on a variety of aquatic and wetland habitats, including rivers, lakes, reservoirs (both large and small), estuaries, bays, marshes, and sometimes in inshore marine habitats. These habitats are used variously for nesting, loafing, and feeding. Nesting colonies usually are situated on islands or peninsulas in brackish or freshwater lakes, where they are isolated from mammalian predators.	None	Field surveys
American pipit[5]	*Anthus rubescens*	III	This species breeds in alpine meadows and fell fields. During migration this species will utilize black-tailed prairie dog colonies, dry vernal pools. Plowed fields, stubble fields, mud flats, and river courses.	None	Field surveys
Bald eagle	*Haliaeetus leucocephalus*	II	This species typically occurs close to fish bearing open water, including major rivers, lakes, and reservoirs. Generally occupy riparian or lacustrine habitat as breeders but occasionally exploit upland areas for food. On rivers, they concentrate on runs and pools, riffles are important seasonally as prey fishes are spawning; lakes and reservoirs are used in shallow areas with gentle sloped shorelines and wetlands. Winter foraging habitat can include upland areas where they feed on carrion, and small mammals.	One observation 2/18/1999	CBC, Field surveys
Black-billed cuckoo[5]	*Coccyzus erythropthalmus*	II	This species is not found above 2,134 meters in elevation, and during the breeding season prefers habitats composed of trees, forest edges, and thickets, typically near water. During migration it uses thickets, groves, meadow and forest edges, and wooded areas, especially near streams and ponds. In Wyoming, it is most often found in riparian corridors composed of mature cottonwood with dense understories.	None	—

APPENDIX E:
Species of Greatest Conservation Need Potentially Occurring in the Project Area

Common Name	Scientific Name	SGCN Tier[1]	Habitat Description[2]	WYNDD Occurrences Within or Near the Project Area[3]	Observed during CBC, BBS, or Field Surveys[4]
Black-crowned night-heron[5]	*Nycticorax*	II	This species is associated with a wide range of aquatic, wetland, and riparian habitats, but breeding colonies are typically associated with larger marshes and lakes that support stands of bulrushes and cattails. This species will use numerous substrates for nesting (e.g., living and dead trees, willows, shrubs, vines, reeds, anthropogenic structures, rocks, the ground), but most nests in Wyoming are in emergent aquatic reeds, island trees and shrubs, or on the ground of islands.	None	BBS
Black rosy-finch	*Leucosticte atrata*	II	The species nests on cliff and rock faces, and forages on tundra, fellfields, rock slides, snowfields, and glaciers within 4 kilometers of the nest site. In the winter, black rosy-finches use alpine tundra and open slopes just below tree line. The species often descends into intermountain valleys when snow covers higher slopes, and can also be found in human landscapes, especially where bird feeders provide food.	None	Field surveys
Black tern[5]	*Chlidonias niger*	II	Preferred summer habitats for this species occurs in inland marshes and sloughs, typically with fairly dense cattail or other marsh vegetation and pockets of open water. These wetlands are often shallow in nature. Winter habitat is on the coasts of South America.	None	—
Black-throated gray warbler[5]	*Setophaga nigrescens*	II	During the breeding season in southwestern Wyoming, this species prefers north- and east-facing slopes, woodland with Pinyon Pine, and breast-height understory vegetation.	None	—
Bobolink[5]	*Dolichonyx oryzivorus*	II	This species is associated with tall grass and mixed-grass prairie ecosystems, and the species will also utilize hayfields and irrigated and non-irrigated meadows. In Wyoming, this species breeds in mixed prairie shrublands, grasslands, and irrigated meadows and prefers dense horizontal cover for nesting.	None	—
Brewer's sparrow[5]	*Spizella breweri*	II	This species is closely associated with sagebrush, preferring dense stands broken up with grassy areas. In the northern part of their range, they can be found in habitats such as sub-alpine fir or dwarf birch, or montane pinon-juniper woodlands.	Three observations 1978-1998	Field surveys

APPENDIX E:
Species of Greatest Conservation Need Potentially Occurring in the Project Area

Common Name	Scientific Name	SGCN Tier[1]	Habitat Description[2]	WYNDD Occurrences Within or Near the Project Area[3]	Observed during CBC, BBS, or Field Surveys[4]
Burrowing owl[5]	*Athene cunicularia*	I	This species inhabits grasslands and basin-prairie shrub: owls use vacant rodent burrows, mainly associated with prairie dog habitat. In Wyoming, the highest concentrations of burrowing owls are in the south and east, although they occur and breed throughout the state (WGFD. ND).	None	—
Black tern[5]	*Chlidonias niger*	II	Preferred summer habitats for this species occurs in inland marshes and sloughs, typically with fairly dense cattail or other marsh vegetation and pockets of open water. These wetlands are often shallow in nature. Winter habitat is on the coasts of South America.	None	—
Brown-capped rosy-finch	*Leucosticte australis*	II	Breeds exclusively above tree-line in alpine tundra, almost exclusively in the Snowy Range. In winter, this species moves to lower elevations and can be found in open areas. This species regularly visits bird feeders.	None	CBC
Calliope hummingbird[5]	*Selasphorus calliope*	II	This species is a summer resident within the region. Summer habitat is mostly montane communities. Species occupies habitats ranging from riparian forests to shrub-sapling secondary growth to open montane forests.	None	--
Canyon wren	*Catherpes mexicanus*	II	This species is typically found in arid, rocky habitats, including cliffs, canyons, rock outcrops, and boulder piles between 300 and 1,850 meters in elevation. It is often found near water, which may be a byproduct of its canyon habitat as opposed to a limiting factor. This species does not seem to display a preference in vegetative communities, as long as rocky habitat is available; and it may be found in grasslands, chaparral, deserts, or forests dominated by piñon-juniper, oak, and conifers.	None	—
Chestnut-collared longspur[5]	*Calcarius ornatus*	II	This species is a native prairie obligate and prefers level to rolling native mixed-grass and shortgrass uplands. In drier areas it can be found in moist lowlands.	One observation 5/31/2008	
Clark's grebe[5]	*Aechmophorus clarkii*	II	This species breeds primarily on large, freshwater lakes and marshes with several square kilometers of open water and areas of flooded emergent vegetation. In Wyoming, colonies are found on large, deep, open-water lakes and reservoirs with emergent vegetation for nesting.	None	-

APPENDIX E:
Species of Greatest Conservation Need Potentially Occurring in the Project Area

Common Name	Scientific Name	SGCN Tier[1]	Habitat Description[2]	WYNDD Occurrences Within or Near the Project Area[3]	Observed during CBC, BBS, or Field Surveys[4]
Clark's nutcracker	*Nucifraga columbiana*	II	This species breeds in a variety of forest habitats from the lower montane to the subalpine zone, including pinon-juniper woodlands, Ponderosa pine, Douglas-fir, Jeffrey Pine, and mixed coniferous subalpine communities which include whitebark or limber pine, growing on steep, rocky hillsides or on ridges interspersed with moist meadows, small lakes, and creeks with birds migrating to lower elevation areas in winter and spring.	Three observations 2001-2016	BBS, CBC, Field surveys
Common loon[5]	*Gavia immer*	I	This species generally inhabits clear, oligotrophic lakes, surrounded by forest, with rocky shorelines, deeply indented bays, numerous islands, and floating bogs. Forest types are characteristic of boreal and mixed forests.	None	—
Common nighthawk[5]	*Chordeiles minor*	III	This species uses a variety of nesting habitats, including logged, slash-burned, and open forests and clearings; grasslands and prairies; sagebrush; and rock outcrops. They breed in prairies and open Ponderosa Pine forests on ridges and mesas throughout the state of Wyoming.	One observation 8/1/1986	BBS
Common yellowthroat[5]	*Geothlypis trichas*	III	This species is found in a variety of habitats, although it typically occurs in dense vegetation associated with marshes, thickets, and shrubby areas. In Wyoming, the species breeds below 2,438 meters in dense willow and other shrubby habitats along the edges of ponds, lakes, and riparian areas, and in emergent bulrush and cattail vegetation along the edges of marshes.	None	—
Ferruginous hawk[5]	*Buteo regalis*	II	This species occupies lower-elevation grassland, shrub steppe, and desert habitats.	10 observations 1978-2017	BBS, CBC, Field surveys
Forster's tern[5]	*Sterna forsteri*	II	This species prefers fresh, brackish and saltwater marsh and wetland habitats. Although it is most commonly found in large, open-water marshes with islands of standing emergent or floating vegetation, it will also use peripheral marsh habitat at the edges of lakes, streams, islands, estuaries and coastal beaches.	None	—

APPENDIX E:
Species of Greatest Conservation Need Potentially Occurring in the Project Area

Common Name	Scientific Name	SGCN Tier[1]	Habitat Description[2]	WYNDD Occurrences Within or Near the Project Area[3]	Observed during CBC, BBS, or Field Surveys[4]
Golden eagle[5]	*Aquila chrysaetos*	II	This species occurs throughout the state of Wyoming in a wide variety of habitats including sagebrush steppe, desert shrubland, prairie grassland, juniper woodland edges, lower elevation riparian areas, and mountainous cliff habitat in high elevation areas.	Eight observations 1983-2017	CBC, Field surveys
Grasshopper sparrow[5]	*Ammodramus savannarum*	II	This species uses a broad array of open grassland habitats.	None	BBS
Great blue heron[5]	*Ardea herodias*	II	During the breeding season, this species prefers shallow coastal marine waters, coastal mangrove swamps, sea beaches, pasture and cultivated fields, prairie, aquaculture ponds, and human-created foraging sites. In Wyoming, the highest concentration of breeding great blue herons occurs along the major river drainages in the state (i.e., Bighorn, Green, North Platte, Powder, and Snake).	None	BBS, CBC
Greater sage-grouse	*Centrocercus urophasianus*	II	This species is a sagebrush obligate species that depends on large areas of contiguous sagebrush that include a variety of semiarid shrub-grassland (shrub-steppe) habitats, especially Big Sagebrush. Leks are typically located in openings of relatively low shrub and herbaceous cover within nesting habitat, which are characterized by sagebrush with an understory of native grasses and forbs. Greater sage-grouse move to mesic areas, such as wet meadows, riparian areas, or alfalfa fields in response to summer desiccation of herbaceous vegetation in the uplands.	None	—
Lewis's woodpecker	*Melanerpes lewis*	II	This species prefers open ponderosa pine forest, open riparian woodland dominated by cottonwood, and logged or burned pine forest. May prefer ponderosa pine forest at medium to high elevations and open riparian forests at low elevations. Often classified as a specialist in burned pine forest habitat although suitability of burned areas may vary with post-fire age, size, and intensity of burn.	None	—

APPENDIX E:
Species of Greatest Conservation Need Potentially Occurring in the Project Area

Common Name	Scientific Name	SGCN Tier[1]	Habitat Description[2]	WYNDD Occurrences Within or Near the Project Area[3]	Observed during CBC, BBS, or Field Surveys[4]
Loggerhead shrike[5]	*Lanius ludovicianus*	II	This species habitat occurs in basin-prairie shrub and mountain-foothill shrub. Species prefers open habitat including shrub-steppe, deserts and grasslands with access to elevated perches and impaling stations. Feeds mostly on large insects such as grasshoppers and beetles but some small birds and rodents are also taken.	Two observations 1997-2009	Field surveys
MacGillivray's warbler[5]	*Geothlypis tolmiei*	II	This species is known to utilize a great variety of coniferous and deciduous forest habitats, as well as shrub-dominated areas without a canopy layer. The species tends to be highly dependent on riparian habitats with thick understories and is also known to use areas that have been logged, burned, and affected by windfall events.	None	—
McCown's longspur[5]	*Rhynchophanes mccownii*	II	This species inhabits shortgrass prairies which contain sparse vegetation coverage. They can utilize agricultural areas (predominantly within their northern range).	23 observations 1978-2017	BBS, Field surveys
Merlin[5]	*Falco columbarius*	III	This species uses a variety of habitats, including conifer, deciduous, and mixed-wood forests and woodlands with forest openings, riparian woodlands, shrub-steppe, prairie, and urban/suburban areas with trees. During migration and the non-breeding season, this species will use grasslands, semi-open forests, and coastal areas.	None	CBC, Field surveys
Mountain plover[5]	*Charadrius montanus*	I	This species inhabits low, open habitats such as arid shortgrass and mixed grass prairies dominated by blue grama and buffalo grass with scattered clumps of cacti and forbs, and saltbush habitats of the shrub-steppe of central and western Wyoming. It prefers to nest in large, flat grassland expanses with sparse, short vegetation (10 cm or less), and bare ground. It is adapted to areas that have been disturbed by prairie dogs, heavy grazing, or fire.	Two observations 1977-1979	—
Northern goshawk	*Accipiter gentilis*	I	This species inhabits mature conifer and deciduous forests. It is a forest habitat generalist and requires abundant prey base, possibly related to understory shrub development in forested habitat. Generally considered to prefer mature coniferous forests but will also inhabit deciduous and mixed forests from sea level to subalpine areas.	None	BBS, Field Surveys

APPENDIX E:
Species of Greatest Conservation Need Potentially Occurring in the Project Area

Common Name	Scientific Name	SGCN Tier[1]	Habitat Description[2]	WYNDD Occurrences Within or Near the Project Area[3]	Observed during CBC, BBS, or Field Surveys[4]
Pygmy nuthatch	*Sitta pygmaea*	II	In Wyoming, this species is strongly associated with forests dominated by old-growth or mature Ponderosa Pine, preferably with a number of large snags.	None	—
Red crossbill	*Loxia curvirostra*	II	This species creates nests in cavities that are typically located in dead snags or dead sections of trees.	None	BBS, CBC, Field surveys
Red-eyed vireo[5]	*Vireo olivaceus*	II	This species prefers mature conifer forests. The exact conifer species and microhabitat are determined by call type and morphological bill specialization. Within Wyoming, call types 2 and 5 specialize on ponderosa pine and lodgepole pine. Call type 3 specializes on western hemlock and call type 4 specializes on Douglas fir. However, both call type 3 and 4 have additionally been observed in association with Engelmann spruce in the state. Call type 1 does not appear to specialize on a single species of conifer and has been documented feeding from a variety of conifer species.	None	—
Sage thrasher[5]	*Oreoscoptes montanus*	II	This species inhabits basin-prairie shrub, mountain-foothill shrub: It is a sagebrush obligate as they are common inhabitants of shrub-steppe communities that are dominated by big sagebrush. Nest-site selection is specific as most nests are located within or beneath sagebrush plants with high foliage and branch density. Dense patches of large sagebrush plants and low densities of exotic plants also seem to be an important habitat characteristic for sage thrashers	Seven observations 1978-2017	BBS, Field surveys
Snowy egret[5]	*Egretta thula*	II	This species is associated with a wide range of coastal and inland aquatic habitats, including shallow salt-marsh ponds, tidal channels, shallow bays, mangroves, swamps, marshes, reservoirs, lakes, rivers, flooded fields, wet meadows, and irrigation channels. In Wyoming, this species is found in low-elevation wetlands, flooded pastures, and along the shores of ponds, lakes, reservoirs, and rivers.	None	—
Swainson's hawk[5]	*Buteo swainsoni*	II	This species inhabits open pine-oak woodlands with an abundant shrub-grass component, grasslands, and cultivated farmlands. Nests in trees or bushes.	25 observations 1977-2017	BBS, Field surveys

APPENDIX E:
Species of Greatest Conservation Need Potentially Occurring in the Project Area

Common Name	Scientific Name	SGCN Tier[1]	Habitat Description[2]	WYNDD Occurrences Within or Near the Project Area[3]	Observed during CBC, BBS, or Field Surveys[4]
Virginia rail[5]	*Rallus limicola*	III	This species is found in natural, freshwater wetland and marsh habitats, as well as brackish or saltwater marshes, and seasonal or semi-permanent ponds and lakes. In Wyoming and across its distribution, this species primarily breeds in early-stage, invertebrate-rich, freshwater marshes with thick stands of emergent vegetation, shallow to intermediate water depths, and muddy substrate. The structure of emergent vegetation is likely a more important habitat characteristic than dominant plant species.	None	—
White-faced ibis[5]	*Plegadis chihi*	II	This species inhabits marshes and wet meadows: Frequently feeds in shallowly flooded wetlands of short, emergent plants, such as sedges, spikerushes, glassworts, inland saltgrass, and black greasewood. Nearby irrigated crops, particularly alfalfa, barley, and native hay meadows are important feeding sites. Water appears to be a requirement for a suitable feeding site. Usually nests in emergent vegetation or low trees and shrubs over shallow water, use hardstem bulrush, alkali bulrush, cattails, or build a stick nest in small willows.	None	—
Williamson's sapsucker[5]	*Sphyrapicus thyroideus*	II	Breeds in mid to high-elevation forests composed of western larch, Douglas fir, ponderosa pine, pine-fir, and mix-deciduous forests. Non-breeding habitat is lower-elevation oak-juniper and pine-oak forests.	None	—
Willow flycatcher[5]	*Empidonax traillii*	III	Breeding habitat for this species consists of deciduous thickets, especially willows and often near water. Winters in shrubby clearings and early successional growth.	Two observations 1974-1979	BBS
Reptiles					
Plains gartersnake	*Thamnophis radix*	III	This species is found near ponds, sloughs, marshes, lakes, or slow creeks or rivers within prairie, farmland and pinyon-juniper habitat and often disperses to adjacent residential areas and vacant lots. Hibernates in burrows of other rodents, revies, anthill, and other similar sites.	None	—

APPENDIX E:
Species of Greatest Conservation Need Potentially Occurring in the Project Area

Common Name	Scientific Name	SGCN Tier[1]	Habitat Description[2]	WYNDD Occurrences Within or Near the Project Area[3]	Observed during CBC, BBS, or Field Surveys[4]
Prairie rattlesnake	*Crotalus viridis*	III	This species is often found near rocky outcrops, talus slopes, rocky stream courses, and ledges, but can also be found in the plains, foothills, scarp woodlands, and near granite or limestone outcrops. They were formerly abundant in shortgrass plains, where they favor black-tailed prairie dog towns, though populations in these areas have declined.	None	—
Red-sided gartersnake	*Thamnophis sirtalis parietalis*	III	This subspecies of the common garter snake is found in a variety of habitats such as grassland, woodland, scrub, and forest, and occurs farther north than any other subspecies of common gartersnake. It overwinters underground and in large numbers.	None	—
Fishes					
Brassy minnow	*Hybognathus hankinsoni*	III	This species prefers clear water and weedy ponds and streams. They are typically found in slow runs or pools with mud bottoms and often are associated with the fathead minnow and other shiner species.	None	—
Common shiner	*Luxilus cornutus*	III		None	—
Iowa darter	*Etheostoma exile*	II	This species prefer cool, slow moving vegetated waters with little to no turbidity and sand or gravel substrates, but will use a variety of available habitats. In Wyoming, they were found at sites with slow moving water, with light to heavy vegetation and cobble to silt substrates.	None	—
Crustaceans					
Calico/papershell crayfish	*Orconectes immunis*	III	This species will inhabit ditches, floodplains, pools, and intermittent streams. It will also inhabit the floodplains of medium to large rivers and intermittent prairie headwater streams. Aquatic habitats with mud bottoms and lacking strong current are places the calico crayfish may live. Aquatic vegetation, flooded terrestrial vegetation, or high turbidity often provides cover for this species.	None	—
Constricted fairy shrimp	*Branchinecta constricta*	II	Most fairy shrimps live in temporary rain pools, and usually swim in open water and prefer habitats that are free of fish and other predators.	None	—

APPENDIX E:
Species of Greatest Conservation Need Potentially Occurring in the Project Area

Common Name	Scientific Name	SGCN Tier[1]	Habitat Description[2]	WYNDD Occurrences Within or Near the Project Area[3]	Observed during CBC, BBS, or Field Surveys[4]
Couse tadpole shrimp	*Lepidurus couesii*	III	Tadpole shrimps live only on the bottom of temporary rain pools, avoiding predation by fish entirely.	None	—
Longtail tadpole shrimp	*Triops longicaudatus*	III	Tadpole shrimps live only on the bottom of temporary rain pools, avoiding predation by fish entirely.	None	—
Mollusks					
Ash gyro	*Gyraulus parvus*	III	This snail is found in a variety of freshwater habitats including pools, ponds, and lakes with small plants.	None	—
Forest disc	*Discus whitneyi*	III	This terrestrial snail is found in mesic to dry forested habitats under woody debris and rocks, in downed rotten wood, and leaf litter.	None	—
Marsh rams-horn	*Planorbella trivolvis*	III	This freshwater snail is found in a variety of habitats such as river drainages and tributaries, lakes, and permanent artificial waterbodies.	None	—
Prairie fossaria	*Fossaria bulimoides*	III	This snail species is found in intermittent waters including temporary ponds and streams in prairies.	None	—
Quick gloss snail	*Zonitoides arboreus*	III	This terrestrial snail is found on or under exfoliating bark of rotting trees and is typically found in small colonies.	None	—
Umbilicate sprite	*Promenetus umbilicatellus*	III	This freshwater snail is found in vernal ponds and marshes as well as flooded margins of intermittent streams with dense vegetation and mud.	None	—

1 Tier I—highest priority, Tier II—moderate priority, and Tier III—lowest priority

2 NatureServe (2019), Hendricks (2012), Montana Field Guide (2019), Faulkner (2010), Stebbins (2003)

3 Source: WYNDD 2019

4 CBC = Christmas Bird Count (NAS 2010); BBS = Breeding Bird Survey (Pardieck *et al*. 2019); Field surveys = species observed during field surveys conducted within the Project Area (includes February 2019 Tetra Tech site reconnaissance, September 2019 Tetra Tech field-based habitat assessment, WEST avian and bat surveys for 2019 (WEST 2019, Kosciuch *et al*. 2020, Bishop-Boros and Kosciuch 2020), and wildlife baseline studies conducted as part of the Hermosa West Wind Energy Project [Taylor and Bay 2011])

5 Neotropical migrant (USFWS 2019)

Note: Focused surveys have not been conducted for these species within the Project Area. This list may not include rare species, migrants, or species for which there are limited data on occurrences.

APPENDIX F:
USFWS Birds of Conservation Concern Potentially Occurring Within the Project Area

APPENDIX F:
USFWS Birds of Conservation Concern Potentially Occurring Within the Project Area

Species	Scientific Name	Observations Within or Near the Project Area[1]
American bittern[2]	*Botaurus lentiginosus*	—
Bald eagle[3]	*Haliaeetus leucocephalus*	CBC,WYNDD, September 2019
Black rosy-finch	*Leucosticte atrata*	—
Brewer's sparrow[2,3]	*Spizella breweri*	WYNDD
Brown-capped rosy-finch[3]	*Leucosticte australis*	CBC
Burrowing owl[2,3]	*Athene cunicularia*	—
Calliope hummingbird[2,3]	*Selasphorus calliope*	—
Cassin's finch[2]	*Haemorhous cassinii*	BBS, CBC
Chestnut-collared longspur[2,3]	*Calcarius ornatus*	WYNDD
Ferruginous hawk[2,3]	*Buteo regalis*	BBS, CBC, WYNDD, September 2019
Golden eagle	*Aquila chrysaetos*	CBC, WYNDD, September 2019
Grasshopper sparrow[2,3]	*Ammodramus savannarum*	BBS
Lewis's woodpecker[3]	*Melanerpes lewis*	—
Loggerhead shrike[2,3]	*Lanius ludovicianus*	WYNDD, September 2019
Long-billed curlew[2,3]	*Numenius americanus*	—
McCown's longspur[2,3]	*Rhynchophanes mccownii*	BBS, WYNDD, September 2019
Mountain plover[2,3]	*Charadrius montanus*	WYNDD
Olive-sided flycatcher[2]	*Contopus cooperi*	—
Peregrine falcon[2,3]	*Falco peregrinus*	—
Pinyon jay	*Gymnorhinus cyanocephalus*	—
Prairie falcon[2]	*Falco mexicanus*	BBS, CBC, September 2019
Sage thrasher[2,3]	*Oreoscoptes montanus*	BBS, WYNDD
Sagebrush sparrow[2]	*Artemisiospiza nevadensis*	—
Swainson's hawk[2,3]	*Buteo swainsoni*	BBS, WYNDD, September 2019
Upland sandpiper[2,3]	*Bartramia longicauda*	—
Virginia rail[2,3]	*Rallus limicola*	—
Williamson's sapsucker[2,3]	*Sphyrapicus thyroideus*	—
Willow flycatcher[2,3]	*Empidonax traillii*	BBS, WYNDD

1 CBC = Christmas Bird Count (NAS 2010), BBS = Breeding Bird Survey (Pardieck *et al*. 2019), WYNDD = WYNDD Observation Data (WYNDD 2019), September 2019 = September 2019 Field-Based Habitat Assessment

2 Neotropical Migrant (USFWS 2019f)

3 SGCN (WGFD 2017)

APPENDIX G:
Species and Average Counts for the Albany County Christmas Bird Count: 2009–2018

APPENDIX G:
Species and Average Counts for the Albany County Christmas Bird Count: 2009–2018

Species	Average Count/Year[1]
Songbirds	
House sparrow	1,041
European starling	442.9
American crow	338.2
Common raven	177.9
House finch	139.0
Horned lark	93.7
Mountain chickadee	68.5
Gray-crowned rosy-finch	59.5
Red-breasted nuthatch	20.5
Black-billed magpie	17.6
American tree sparrow	15.9
Red crossbill	12.0
Sparrow sp.	8.4
Dark-eyed junco	8.3
Black-capped chickadee	8.2
Cassin's finch	7.5
American robin	7.3
Brown creeper	4.2
Crossbill sp.	4.2
Townsend's solitaire	3.8
Clark's nutcracker	2.9
Common grackle	2.5
Pine siskin	2.3
Northern shrike	2.1
Pine grosbeak	2.1
White-breasted nuthatch	1.3
Blackbird sp.	0.9
Red-winged blackbird	0.8
Snow bunting	0.7
Song sparrow	0.5
Golden-crowned kinglet	0.4
Lapland longspur	0.4
White-crowned sparrow	0.4
American goldfinch	0.4
Steller's jay	0.3
Brewer's blackbird	0.3
Great-tailed grackle	0.3
Brown-capped rosy-finch	0.2
Common redpoll	0.2
Blue jay	0.1
American dipper	0.1
Ruby-crowned kinglet	0.1
Cedar waxwing	0.1

APPENDIX G:
Species and Average Counts for the Albany County Christmas Bird Count: 2009–2018

Species	Average Count/Year[1]
Harris's sparrow	0.1
White-winged crossbill	0.1
Lesser goldfinch	0.1
Doves/pigeons	
Rock pigeon	697.3
Eurasian collared-dove	123.5
Mourning dove	3.1
Waterfowl	
Mallard	336.2
Green-winged teal	44.5
Canada goose	5.1
American wigeon	1.1
Common goldeneye	0.4
Gadwall	0.3
Raptors	
Rough-legged hawk	11.7
Bald eagle	5.0
Golden eagle	3.7
Northern harrier	2.6
Merlin	1.4
Red-tailed hawk	1.3
Ferruginous hawk	1.0
American kestrel	0.9
Sharp-shinned hawk	0.7
Great horned owl	0.6
Cooper's hawk	0.3
Prairie falcon	0.3
Falcon sp.	0.2
Hawk sp.	0.1
Woodpeckers	
Northern flicker	8.8
Downy woodpecker	2.6
Hairy woodpecker	1.1
Waterbirds	
Wilson's snipe	9.4
Great blue heron	0.1
Rails/cranes	
American coot	0.5
Other	
Belted kingfisher	1.7

Source: NAS (2010)

1 Average number of individuals counted per year from 2009 to 2018.

APPENDIX H:
Species Encountered and their Abundance on the Buford USGS Breeding Bird Survey Route

APPENDIX H:
Species Encountered and their Abundance on the Buford USGS Breeding Bird Survey Route

Species	Average Number of Individuals/Route[1]
Horned lark	66.6
Western meadowlark	61.2
Brewer's blackbird	38.8
American robin	19.2
Red-winged blackbird	18.8
Vesper sparrow	17.6
Cliff swallow	12.6
Mountain bluebird	11.0
American crow	10.0
McCown's longspur	8.0
Savannah sparrow	7.2
Barn swallow	5.6
Chipping sparrow	5.0
Song sparrow	4.8
Red crossbill	4.4
Warbling vireo	4.4
Common raven	3.6
Black-billed magpie	3.6
Rock wren	3.6
House wren	3.4
Green-tailed towhee	3.4
Mountain chickadee	2.8
Sage thrasher	2.6
Tree swallow	2.4
Black-headed grosbeak	2.4
European starling	2.2
Common grackle	2.0
Yellow warbler	2.0
Clark's nutcracker	1.6
Cassin's finch	1.6
Evening grosbeak	1.6
Brown-headed cowbird	1.4
Western wood-pewee	1.4
Dark-eyed Junco	1.4
Dusky flycatcher	1.2
Violet-green swallow	1.0
Lark sparrow	1.0
Ruby-crowned kinglet	0.8
Red-breasted nuthatch	0.8
American goldfinch	0.8
Spotted towhee	0.8
Yellow-rumped warbler	0.8
Lincoln's sparrow	0.8
Veery	0.6

APPENDIX H:
Species Encountered and their Abundance on the Buford USGS Breeding Bird Survey Route

Species	Average Number of Individuals/Route[1]
House sparrow	0.6
Townsend's solitaire	0.4
Hermit thrush	0.4
Pine siskin	0.2
Steller's jay	0.2
Willow flycatcher	0.2
Grasshopper sparrow	0.2
Lark bunting	0.2
Swainson's thrush	0.2
Wilson's snipe	9.2
Killdeer	3.8
Great blue heron	0.2
Black-crowned night-heron	0.2
Turkey vulture	2.4
Red-tailed Hawk	2.0
Swainson's hawk	1.6
American kestrel	1.2
Prairie falcon	0.8
Great horned owl	0.6
Northern goshawk	0.2
Ferruginous hawk	0.2
Northern flicker	3.6
Broad-tailed hummingbird	2.4
White-throated swift	0.2
Mourning dove	1.4
Mallard	1.2
Common nighthawk	1.0
Common poorwill	0.2
Sora	0.4

Source: Pardieck *et al*. (2019)

1 These numbers reflect the abundance of the species near the survey route. They are averages of the total counts along the route for the five surveys that occurred between 2009 and 2018. Because each survey route is 24.5 miles long and consists of fifty 3-minute counts along the length of the route, the abundance estimate represents the number of birds that a surveyor would encounter in approximately 2.5 hours of roadside birding in the area near the BBS route.