

# Draft Environmental Impact Statement for Eagle Take Permits for the Chokecherry and Sierra Madre Phase I Wind Energy Project

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U.S. Fish and Wildlife Service  
Mountain-Prairie Region



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## Executive Summary

### ES.1 Purpose and Need

We, the U.S. Fish and Wildlife Service (USFWS), have prepared this Draft Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (NEPA). This EIS evaluates the effects of issuing both a standard and a programmatic Eagle Take Permit (ETP) for non-purposeful take of eagles that is incidental to otherwise lawful activities under the Bald and Golden Eagle Protection Act (BGEPA) for construction and operational activities associated with the Chokecherry and Sierra Madre (CCSM) Phase I Wind Energy Project.

On June 16, 2015, the Power Company of Wyoming LLC (PCW or the Applicant) applied for two ETPs: a standard ETP for construction of the wind turbine development and infrastructure components for the CCSM Phase I Project, and a programmatic ETP for operation of the CCSM Phase I Project. PCW's Eagle Conservation Plan (ECP), provided in Attachment A, is the foundation of PCW's ETP applications.

We are obligated to review the application package, complete the associated NEPA process, and decide whether or not to issue ETPs under BGEPA for the CCSM Phase I Project. To issue ETPs, we must determine that the CCSM Phase I Project is consistent with the BGEPA regulatory standards, currently defined as maintaining stable or increasing breeding populations of bald and golden eagles. In making this determination, we will endeavor to follow Secretarial Order 3285, which encourages development of renewable energy generation projects in the United States.

#### ES.1.1 General Project Overview

PCW proposes to construct, operate, and maintain the CCSM Phase I Project in Carbon County, Wyoming, south of the city of Rawlins, as shown in Chapter 1.0, Figure 1-1. The CCSM Phase I Project would consist of approximately 500 wind turbines and a variety of supporting infrastructure. PCW has applied for ETPs for the CCSM Phase I Project as a viable stand-alone project, independent of Phase II. The CCSM Phase II Project, which could be developed at a later date, would consist of up to an additional 500 wind turbines; this reasonably foreseeable project is analyzed in the Cumulative Impacts section of this EIS. The northern portion of the proposed project is termed Chokecherry, and the southern portion is termed Sierra Madre. The CCSM Phase I Project would occur in the western portions of both the Chokecherry and Sierra Madre Wind Development Areas (WDAs).

#### ES.1.2 Previous and Ongoing Environmental Review

About half of the CCSM Project would be located on federal lands and would require a right-of-way (ROW) grant from the Bureau of Land Management (BLM). The BLM NEPA review for the ROW grant is a tiered review. In 2012, the BLM completed two Final EISs and a Record of Decision for the CCSM Project. Starting in late 2013, the BLM began conducting

detailed NEPA review of PCW's site-specific plans of development for the CCSM Phase I Project in the form of two Environmental Assessments (EAs).

The first EA, called EA1 and titled "Environmental Assessment for Infrastructure Components: Phase I Haul Road and Facilities, West Sinclair Rail Facility, and Road Rock Quarry," was finalized in December 2014 (BLM 2014). The second EA, called EA2 and titled "Environmental Assessment for Phase I Wind Turbine Development," is for the 500 wind turbines and pads, access roads, and associated components for the CCSM Phase I Project (BLM 2016a).

We have an independent obligation to comply with NEPA. The analysis in our EIS incorporates by reference many portions of BLM's documents in accordance with 40 Code of Federal Regulations (CFR) 1502.21. New analysis provided in this EIS focuses primarily on eagles and related resources (such as habitat and prey), as well as migratory birds and other wildlife, that would potentially be affected by ETPs for the CCSM Phase I Project and other alternatives. Although we are preparing separate NEPA documents for the CCSM Phase I Project, we are closely coordinating with the BLM.

### **ES.1.3 Policy, Authority, and Legal Overview**

#### **ES.1.3.1 National Environmental Policy Act**

We have determined that several factors pertaining to the context and intensity of potential impacts of the CCSM Phase I Project are "significant" (as defined in 40 CFR 1508.27) and warrant the preparation of an EIS for ETPs for the CCSM Phase I Project. These factors include, but are not limited to, the context of impacts on the local and regional eagle populations, the intensity in terms of the degree to which the effects are likely to be highly controversial, the degree to which effects may establish a precedent and represent a decision in principle for future consideration, and whether the action may contribute cumulatively to significant impacts on environmental resources.

#### **ES.1.3.2 Bald and Golden Eagle Protection Act**

We oversee the administration, implementation, and enforcement of BGEPA. Under the Eagle Permit Rule issued in 2009, we can issue two types of permits for eagle take: standard permits and programmatic permits. Both types of permits can authorize take of bald and golden eagles or their nests when the take is associated with, but not the purpose of, an otherwise lawful activity and cannot practicably be avoided.

Standard ETPs authorize individual instances of take (including nest disturbance during construction activities) where the location, timing, and amount of take are all known. Programmatic ETPs authorize take that may recur through the life of a project and are applicable where the location, timing, and amount of take are all unknown. The maximum duration for ETPs is 5 years.

To be authorized under a permit, any non-purposeful (that is, incidental) take must result in no net loss (currently defined as maintaining stable or increasing breeding populations) to bald and golden eagle populations. Under the regulations, any take must be unavoidable even

after the implementation of advanced conservation practices (ACPs). ACPs are defined as “scientifically supportable measures that are approved by the [USFWS] and represent the best available techniques to reduce eagle disturbance and ongoing mortalities to a level where remaining take is unavoidable” (50 CFR 22.3). We have not currently approved any ACPs for wind energy projects; therefore, ACPs are implemented at wind energy facilities on an experimental basis and are referred to as EACPs. The EACPs for the CCSM Phase I Project are described in the ECP.

### **ES.1.3.3 Other Federal Environmental Acts and Related Requirements**

We administer the Migratory Bird Treaty Act (MBTA), which protects migratory birds and prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when authorized by our agency under a permit. Most of the bird species that occur in the vicinity of the CCSM Phase I Project are protected under the MBTA. We also administer the Endangered Species Act (ESA) together with the Department of Commerce National Marine Fisheries Service, and we have primary responsibility for terrestrial and freshwater organisms.

Other major federal policies, plans, and programs potentially relevant to the CCSM Phase I Project are presented in Chapter 1.0, Table 1-1. The EIS and subsequent ETPs, if ETPs are issued, would not conflict with or supersede those requirements.

### **ES.1.4 Public, Agency, and Tribal Participation**

We held a 60-day scoping period for the EIS, from December 4, 2013, to February 3, 2014. Background information and documents regarding our consideration of whether or not to issue ETPs for the CCSM Phase I Project is found on our Mountain-Prairie Region website. We held two public scoping meetings for our EIS, on December 16, 2013, in Rawlins, Wyoming and on December 17, 2013, in Saratoga, Wyoming. On January 21, 2014, we mailed letters regarding the EIS to 115 federal, state, and local agencies and other potentially interested parties. During the scoping period, we received 48 comment letters from project stakeholders (that is, members of the public, non-governmental agencies, and elected officials) and agencies. We are considering the information and input contained in these letters in the EIS process, as described in Chapter 1.0.

Five agencies requested to be, and have been accepted as, cooperating agencies on the EIS: the BLM; Carbon County Board of County Commissioners; Saratoga-Encampment-Rawlins Conservation District; Wyoming Game and Fish Department; and Wyoming Department of Environmental Quality, Industrial Siting Council. A cooperating agency has jurisdiction by law or special expertise with respect to environmental impacts involved with the proposal, and is involved in the NEPA analysis. These agencies have cooperated in the preparation of this EIS by reviewing it and providing us with their comments.

We have engaged in tribal consultation specific to the issue of eagle take. We invited 71 tribes to participate in government-to-government consultation regarding this action, of which 8 have engaged in ongoing consultation. These tribes are the Cheyenne River Sioux Tribe of the Cheyenne River Reservation, Chippewa Cree Indians of the Rocky Boy's

Reservation, Comanche Nation, Eastern Shoshone Tribe/Eastern Shoshone Business Council, Northern Arapaho Tribe/Northern Arapaho Business Council, Northern Cheyenne Nation, Santa Clara Pueblo, and Shoshone-Bannock Tribes of the Fort Hall Reservation.

## **ES.2 Description of Alternatives**

We considered input received from the public, agencies, and tribes regarding the range of alternatives to be considered in this EIS. While developing alternatives, we considered the potential direct and indirect effects on eagles of the proposed project activities that would be covered by the ETPs. This approach is consistent with 40 CFR 1500.1, the purpose of NEPA, which states that “NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail.”

The four reasonable alternatives evaluated in the Draft EIS are described below. Chapter 2.0 includes more detailed descriptions of each alternative.

### **ES.2.1 Alternative 1 – Proposed Action: Issue ETPs for Phase I Wind Turbine Development and Infrastructure Components**

Alternative 1 (Proposed Action) is for the USFWS to issue two ETPs for the CCSM Phase I Project based on the ETP applications. The standard ETP would cover the activities that would result in the unavoidable disturbance of eagles (including nest disturbance) during the construction of the infrastructure components and Phase I wind turbine development. The programmatic ETP would cover the ongoing take of eagles that is likely to occur during the operation of the CCSM Phase I Project. We have analyzed the construction and operation of the infrastructure components as part of the CCSM Phase I Project because these components would have no independent utility without the wind turbine development.

#### **ES.2.1.1 Description of the CCSM Phase I Project**

The activities covered under the standard ETP for Alternative 1 would include the construction activities for the Phase I wind turbine development and the infrastructure components for the CCSM Phase I Project that may result in disturbance take of eagles. The programmatic ETP would cover the operation of the CCSM Phase I Project that is anticipated to result in eagle fatalities and other types of take, as described in Section 1.7.2.

The CCSM Phase I Project would include 500 wind turbines in the western portions of the Chokecherry and Sierra Madre WDAs. As shown in Chapter 2.0, Figure 2-3, 202 turbines would be constructed within the Chokecherry WDA and 298 turbines in the Sierra Madre WDA. In addition to the turbines, as shown in Chapter 2.0, Figures 2-4 and 2-5, the Phase I wind turbine development would include roads, laydown yards (including a temporary construction camp and parking areas), electrical systems, water facilities, buildings, meteorological towers, utilities, and other temporary features. PCW would also construct infrastructure components that would be covered by the ETPs:

- **Phase I Haul Road (Haul Road) and Facilities:** The Haul Road would begin at the Northern Entrance to the CCSM Project area, off of I-80, connect to the West Sinclair Rail Facility, and continue south through the center of the Chokecherry and Sierra Madre WDAs. Associated facilities would include access roads, water stations, a water extraction facility (including pump stations and buried water pipeline), and laydown yards.
- **West Sinclair Rail Facility:** The West Sinclair Rail Facility would consist of about 14 miles of track to connect to the Union Pacific Railroad, a laydown yard, and unloading areas.
- **Road Rock Quarry:** The Road Rock Quarry would be situated within the Chokecherry WDA and would include the excavation area, material processing area, material storage piles, and a 5-mile-long quarry access road.

Construction of the infrastructure components, beginning with Phase I Haul Road and Facilities and the West Sinclair Rail Facility, is expected to begin in 2016 and continue through 2019. PCW would install turbines, beginning with Phase I of the Sierra Madre WDA, in 2019 to 2020. The peak construction workforce is anticipated to be 761 workers in July and August 2017. The construction schedule would comply with the requirements of the BLM NEPA process and with applicable wildlife timing stipulations.

Surface modifications for Alternative 1 would include 4,464 acres of initial clearing and grading areas, 849 acres of long-term modification areas, and 440 acres of activity areas (where grasses may be mowed and shrubs may be cut or partially cut for a short period during construction but no clearing or grading would occur).

The combination of the Phase I turbine layout, the proposed conservation measures, best management practices (BMPs), EACPs, and monitoring and adaptive management measures have been developed and proposed with the intent that they would avoid and minimize impacts on bald and golden eagles such that remaining take is unavoidable.

**Avoidance and Minimization Measures:** Between 2007 and 2014, PCW, the BLM, and the USFWS cooperated to develop measures to avoid and minimize potential impacts on eagles and other wildlife species. PCW removed several areas of high wind potential as wind turbine sites, reconfigured the layout of turbines and other components to avoid eagle nests and areas of high eagle and raptor use, and agreed to construction timing windows. PCW agreed to curtail operation of wind turbines within 1 mile of unoccupied golden eagle nests during daylight hours between February 1 and April 30. The avoidance and minimization measures are described in detail in Section 2.2.1.3.2.

**Eagle Fatality Predictions:** We developed a peer-reviewed Bayesian model that has been used to predict the annual fatality rate for bald and golden eagles for the CCSM Phase I Project, incorporating site-specific values such as eagle observation data collected during pre-construction monitoring efforts, turbine rotor radius, and the number of hours in a year that turbines could be spinning when eagles may be active. Our model also incorporates exposure rates and collision probability for eagles based on data collected at existing wind energy facilities.

We used our eagle fatality model to estimate programmatic eagle take for bald and golden eagles separately, as described in Section 2.2.1.3.3 and Attachment C. Because the wind turbine blade diameter has not been finalized, the fatality modeling for the CCSM Phase I Project used rotor diameters of 338 feet (103 meters) and 394 feet (120 meters). If the programmatic ETP is granted, PCW would provide us with the exact turbine blade diameter, and the predicted annual eagle take would be recalculated. The estimated annual take for the 120-meter-diameter turbine would be 2 bald eagles and 14 golden eagles. The estimated annual take for the 103-meter-diameter turbine would be 1 bald eagle and 10 golden eagles.

The standard ETP would cover disturbance take of 2 bald eagles at one nest and 8 golden eagles at four nests on an annual basis until project construction is completed. Disturbance take would include injury to eagles at these nests, any reduction of productivity at these nests, or abandonment of these nests. The term of the standard ETP would be 4 years (2016 through 2019, or until the first turbine is operating).

**Conservation Measures and Best Management Practices:** Section 2.2.1.3.4 and Attachment A describe the conservation measures and BMPs that PCW would implement to reduce risk to eagles and decrease eagle fatalities.

**Permit Stipulations:** If granted, we would attach stipulations to the standard and programmatic ETPs. These stipulations would include the permit duration; EACPs and additional BMPs; monitoring; adaptive management; and compensatory mitigation requirements, as described in Section 2.2.1.4.

**Compensatory Mitigation:** PCW would retrofit high-risk power poles within the four Bird Conservation Regions (BCRs) contiguous with the CCSM Phase I Project to compensate for predicted golden eagle fatalities during operation. The four BCRs are the Eagle Management Unit (EMU) for golden eagles potentially impacted by the Proposed Action. Eagles in each of these BCRs may migrate to or from the Phase I development and infrastructure areas.

The cooperating agencies and scoping comments have expressed a preference for retrofitting power poles near the CCSM Phase I Project area, in particular within Carbon County. Retrofitting power poles with a high risk of avian electrocution in accordance with Avian Power Line Interaction Committee (APLIC) guidelines is the only form of compensatory mitigation for eagle take that has been approved by USFWS at this time, though other mitigation approaches are considered under Alternative 2. The number of power pole retrofits that would be needed to offset the take of golden eagles from the CCSM Phase I Project would be between 1,492 and 3,778, depending on the turbine blade diameter and the number of years for which the retrofit would prevent loss of eagles. PCW would work with us and with utilities to identify power poles with high risk to eagles and then develop a power pole retrofit plan for our approval as part of the ETP review process.

## **ES.2.2 Alternative 2 – Proposed Action with Different Mitigation**

Under Alternative 2, we would issue to PCW a standard ETP for disturbance during construction of the Phase I wind turbine development and infrastructure components for the CCSM Phase I Project, and a programmatic ETP for operation of the CCSM Phase I Project,

as described under Alternative 1 (Proposed Action). However, under Alternative 2, we would require PCW to implement a different form of compensatory mitigation within the four BCRs contiguous with the CCSM Phase I Project than proposed in its ETP applications. Compensatory mitigation can address pre-existing causes of eagle mortality, such as eagle electrocutions from power poles, or it can address increasing the carrying capacity of the eagle population in the affected EMU. PCW has indicated in its ETP applications that it would perform power pole retrofits, which would reduce the risk of mortality from existing transmission lines. We are considering the following forms of different mitigation and evaluating their applicability and effectiveness in providing for compensatory mitigation for predicted golden eagle take:

- Mitigation of older wind facilities
- Lead abatement
- Carcass removal
- Carcass avoidance
- Wind conservation easement
- Habitat enhancement, with prey enhancement as an essential component
- Rehabilitation of injured eagles

One or more of the mitigation options could be selected. However, for us to accept a potential compensatory mitigation option when issuing an ETP, we would need scientifically supportable evidence as a foundation for the conclusion that implementing the alternative compensatory mitigation action would achieve the desired beneficial offset in mortality or carrying capacity.

### **ES.2.3 Alternative 3 – Issue ETPs for Only the Sierra Madre Portion of the CCSM Phase I Project**

We received numerous comments during the EIS scoping process requesting that we examine a different development scenario from the one proposed by PCW as part of Alternative 1 (Proposed Action). We must analyze a project with specific wind turbines and layout rather than issuing a permit allowing a level of take and then devising a project layout to meet that permit. When we have completed the ETP application review and the associated NEPA processes, it is possible that we would determine that the applications would meet the criteria for issuing ETPs, but not at the scale of the proposed project, and the applicant would need to present an alternative project scenario. Therefore, we are considering Alternative 3 (Issue ETPs for Only the Sierra Madre Portion of the CCSM Phase I Project) as an example of a different development scenario. If our review determines that PCW's applications for ETPs for Alternative 1 (Proposed Action) meet the ETP criteria, Alternative 3 would not be selected.

Activities covered under the ETPs for Alternative 3 would include the Phase I activities related to only the Sierra Madre WDA and all infrastructure components of the CCSM Phase I Project. Phase I of the Sierra Madre WDA would include 298 turbines, roads, electrical systems, operation and maintenance buildings, meteorological towers, utilities, and temporary features within the Sierra Madre portion of the Phase I boundary. Alternative 3 would include 3,237 acres of initial clearing and grading areas (27 percent less than under

Alternative 1), 658 acres of long-term modification areas (22 percent less than under Alternative 1), and 288 acres of activity areas (35 percent less than under Alternative 1).

**Eagle Fatality Predictions:** Using our eagle fatality model, we estimated programmatic eagle take for bald and golden eagles for Alternative 3. The estimated annual take for the 120-meter-diameter turbine would be 1 bald eagle and 10 golden eagles. The estimated annual take for the 103-meter-diameter turbine would be 1 bald eagle and 7 golden eagles.

The standard ETP for Alternative 3 would cover the same disturbance take as Alternative 1, which would be 2 bald eagles at one nest and 8 golden eagles at four nests on an annual basis until project construction is completed.

**Compensatory Mitigation:** The number of power pole retrofits that would be needed to offset the take of golden eagles from the CCSM Phase I Project would be between 1,015 and 2,556, depending on the turbine blade diameter and the number of years for which the retrofit would prevent loss of eagles.

#### **ES.2.4 Alternative 4 – No Action: Denial of ETPs**

Under Alternative 4, we would deny PCW standard and programmatic ETPs for construction and operation of the CCSM Phase I Project. We could deny the ETPs because the permit applications failed to meet criteria under 50 CFR 22.26 or because we have determined that the risk to eagles is so low that ETPs are unnecessary. ETPs are not required in order for PCW to construct and operate a wind energy facility. However, any unpermitted eagle take, if it occurs, would constitute a violation of BGEPA.

If we deny or do not issue ETPs to PCW for the proposed project, PCW may take one of two actions: PCW may decide not to construct the proposed project, which we refer to as the No Build scenario, or PCW may construct the proposed project, as approved by the BLM and other permitting agencies, without ETPs and without adhering to an ECP, which we refer to as the Build Without ETPs scenario.

Under the No Build scenario, no wind turbines or infrastructure components would be constructed, and the ECP would not be implemented. PCW's purpose of generating 1,500 megawatts (MW) of electricity from wind to serve 790,000 households in California, Nevada, and Arizona to help meet the renewable energy mandates of these states would not be met. If not constructed, the CCSM Phase I Project would not help meet the goal of Secretarial Order 3285, which encourages development of renewable energy generation projects in the United States.

Under the Build Without ETPs scenario, PCW would build the CCSM Phase I Project as described in the BLM-approved site-specific plans of development for the project, but we assume that our permit stipulations would not be implemented, including monitoring, adaptive management, compensatory mitigation, and EACPs. PCW would still be required to comply with BGEPA, and we could make a referral to the U.S. Department of Justice that PCW be prosecuted for any bald and golden eagles taken without a permit.

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## ES.3 Affected Environment and Environmental Consequences

### ES.3.1 Introduction

Emphasis in our EIS is on biological resources, with other resources described and evaluated in detail with regard to their potential for being affected by the take of bald and golden eagles and other special status species. This focused analysis will provide the basis for our decision to issue or not issue standard and programmatic ETPs. Section 3.2 includes resources commonly described and assessed for potential impacts in many EISs but that are not evaluated in detail in this EIS.

The resources evaluated in full in this EIS are water resources (Section 3.3); vegetation and wetlands (Section 3.4); fish, amphibians, and reptiles (Section 3.5); mammals (Section 3.6); birds (other than eagles) (Section 3.7); eagles (Section 3.8); and cultural resources (Section 3.9). Each of these topics was evaluated in the BLM FEIS and ROD, EA1, and EA2, and we have addressed each of these resources in greater detail in our EIS for one or more of the following reasons:

- The resource is the subject of our decision to be made regarding potentially issuing standard and programmatic ETPs (that is, eagles).
- The resource falls under our trust as a result of another federal regulation (for example, the MBTA or ESA).
- The topic requires discussion to provide background for resources under our jurisdiction (for example, resources that serve as habitat or prey for eagles).

We defined the impact criteria for each resource to evaluate the level of impact of the Proposed Action and alternatives. Impacts were categorized by magnitude, duration, potential to occur, and geographic extent. Within these categories, impact types were defined for each resource, as shown in the impact criteria tables in Chapter 3.0.

### ES.3.2 Water Resources

Water resources influence habitat for eagle prey species, special status species, and migratory birds. Under Alternative 1, construction would result in possible to probable, minor, temporary to long-term impacts on water resources over a limited area due to increased surface runoff, increased erosion, and stream channel instability. Potential hazardous materials spills and use of magnesium chloride for dust control could result in possible, minor, temporary impacts on surface water quality over a limited area during construction and operation. Operation under Alternative 1 would result in probable, minor, long-term impacts on water resources over a limited area due to localized increases in erosion and channel instability.

Under Alternative 2, construction impacts on water resources would be the same as those described under Alternative 1. Operation under Alternative 2 would also have similar impacts on water resources except that decommissioning of older wind facilities, if chosen as an alternative mitigation measure, could be beneficial to water resources depending on whether roads and water crossing structures are removed and rehabilitated. Habitat

enhancement would result in probable, minor to moderate, long-term, limited to regional beneficial effects on water resources. Under Alternative 3, construction and operation would result in impacts similar to those under Alternative 1, except impacts would not occur in the Chokecherry WDA. Under the No Build scenario under Alternative 4, neither direct nor indirect impacts on water resources would occur. If PCW decides to build without ETPs, impacts on water resources during construction and operation would be expected to be consistent with those described under Alternative 1.

### **ES.3.3 Vegetation and Wetlands**

Vegetation and wetlands provide habitat for eagles, eagle prey species, special status species, and migratory birds. Construction under all alternatives (except the No Build scenario under Alternative 4) would affect vegetation communities through clearing, grading, cutting, partial cutting, or long-term modification of vegetated areas. The magnitude and duration of impacts would be highest in riparian/mesic lowlands, riparian woodlands, and wetlands. The potential spread of noxious weeds and invasive plants during construction would be limited by weed control measures and site-specific reclamation techniques to minor, medium-term impacts at and immediately adjacent to surface modification areas. During operation under each alternative, with implementation of BMPs such as dust control, erosion control, weed management, and reclamation, impacts on vegetation, wetlands, and riparian zones would be negligible. Habitat improvement and reclamation, as proposed in the sage grouse conservation plan, would have probable moderate to major, long-term, regionally beneficial effects on vegetation and wetlands.

The potential to occur, magnitude, duration, and extent of potential impacts on water resources from construction and operation would be less under Alternative 3, because impacts would not occur in the Chokecherry WDA, and under the No Build scenario under Alternative 4. Under the Build Without ETPs scenario, impacts would be the same as under Alternative 1 (Proposed Action). Impacts on water resources under Alternative 2 (Proposed Action with Different Mitigation) would be similar to those under Alternative 1, but may differ depending on the compensatory mitigation option selected.

### **ES.3.4 Fish, Amphibians, and Reptiles**

Most of the fish, amphibian, and reptile species present in the CCSM Phase I development and infrastructure areas are prey for eagles and migratory birds. Construction would result in temporary to long-term impacts on amphibian and reptile habitat, and the crossing of streams could directly impact fish, amphibians, and reptiles. Construction-caused disruption, displacement, and fatality would likely result in probable, minor, temporary to medium-term impacts on amphibians and reptiles in a limited area. Surface water use would have a probable, minor, temporary impact over an extensive area on the pallid sturgeon and on fish habitat in the North Platte River. Operation under each alternative would result in fewer direct and indirect impacts on amphibians and reptiles and aquatic habitat. BMPs would minimize habitat alteration and degradation.

The potential to occur, magnitude, duration, and extent of potential impacts on fish, amphibians, and reptiles from construction and operation would be less under Alternative 3,

because impacts would not occur in the Chokecherry WDA, and under the No Build scenario under Alternative 4. Impacts on fish, amphibians, and reptiles under Alternative 2 (Proposed Action with Different Mitigation) would be similar to those under Alternative 1 (Proposed Action), but may differ depending on the compensatory mitigation option selected. If PCW decides to build without ETPs, impacts on fish, amphibians, and reptiles during construction and operation would be expected to be consistent with those described under Alternative 1.

### ES.3.5 Mammals

Many mammals found in the Phase I infrastructure and development areas provide prey resources for eagles, particularly small mammals and big game. Both direct and indirect effects on mammals could occur from construction and operation under Alternative 1 (Proposed Action), including habitat loss, modification, and fragmentation associated with construction clearing and grading; sedimentation, erosion, and runoff during construction and operation; behavioral modification such as avoidance of, and disruption and displacement from, habitats; disruption of suspected migratory routes; and mortality and fatality associated with construction clearing and grading, collisions with construction and maintenance vehicles, and collisions with turbines.

During construction under Alternative 1, the removal and degradation of mammal habitat would result in minor, long-term impacts on habitat for small mammals, big game, bats, and special status mammal species. Small mammals could be displaced due to construction activities, and their abundance could temporarily decrease in the project footprint due to loss of habitat and crushing by construction equipment. Moderate behavioral disruption and displacement of big game from suspected migration routes and crucial winter habitat is probable. Injury and fatality of bats are unlikely during construction. Minor impacts on aquatic insects that are prey for bats could occur. Minor impacts on special status mammals are probable, including behavioral disruption, displacement, injury, and fatality.

During operation under Alternative 1, major impacts on bats are probable due to fatalities resulting from collision with wind turbines. Injury to or fatality of small mammals and big game would be possible due to collision with vehicles. Moderate impacts are probable from surface modification in mule deer crucial winter range and from disruption of suspected migration routes for mule deer, elk, and pronghorn. Continued impacts due to the loss, alteration, and fragmentation of habitat are probable, including changes in foraging areas or emigration to adjacent habitats that may be less suitable. Displacement or disruption of mammals is probable due to operation of turbines or human activity, which could result in increased stress levels or reduced fitness.

The potential to occur, magnitude, duration, and extent of potential impacts from construction and operation would be similar under each alternative, except they would be greater under the Build Without ETPs scenario under Alternative 4, and they would be less under the No Build scenario under Alternative 4. Impacts on mammals under Alternative 2 (Proposed Action with Different Mitigation) would be similar to those under Alternative 1 (Proposed Action), but may differ depending on the compensatory mitigation option selected.

### ES.3.6 Birds (Other than Eagles)

Construction under Alternative 1 (Proposed Action) could result in the following impacts on birds (other than eagles): (1) habitat loss, degradation, and fragmentation from construction of roads, power lines, wind turbines, turbine pads, and other facilities; (2) disruption, displacement, and avoidance due to construction activities and equipment; and (3) injury and fatality due to collisions with construction vehicles or equipment. Injuries and fatalities of birds (other than eagles) are unlikely during construction; however, ground-clearing activities could impact ground- and shrub-nesting birds, such as some passerine species. Habitat loss, degradation, and fragmentation would result in direct and indirect impacts on bird habitat. The loss of foraging and nesting habitat would range in magnitude from minor to moderate depending on the range and sensitivity of the species, but would persist for the long-term. The fragmentation of the landscape and associated displacement and disruption would create a gradient of impacts that could extend large distances beyond the construction footprint. Human development also increases the prevalence of nest predators and parasites such as coyotes and ravens, which could result in moderate, long-term impacts on nesting birds. Additionally, construction would include the use of surface water and potential for increased erosion or chemical spills, which could result in minor impacts on waterbirds, waterfowl, and shorebirds.

No threatened or endangered bird species occur in the Phase I infrastructure and development areas, but other special status species, including USFWS Birds of Conservation Concern and those designated by the Wyoming Game and Fish Department as Species of Greatest Conservation Need could occur. In general, impacts on these species would be similar as to other waterbirds, waterfowl, shorebirds, passerines, and raptors. It is probable that displacement and disruption due to construction could result in major impacts on greater sage-grouse, and associated habitat loss and increases in nest predation could have moderate impacts on this species. The potential to occur, magnitude, duration, and extent of potential impacts from construction would be similar under each alternative, except they would be greater under the Build Without ETPs scenario under Alternative 4, and they would be less under the No Build scenario under Alternative 4.

Operation under Alternative 1 (Proposed Action) could result in the following impacts on birds (other than eagles): (1) continued indirect effects from habitat loss, alteration, and fragmentation; (2) continued disruption, displacement, and avoidance due to operation and maintenance; and (3) injury and fatality due to collisions with wind turbines, power lines, meteorological towers, communication towers, operation and maintenance buildings, or maintenance vehicles. We anticipate moderate to major impacts on birds (other than eagles) due to fatalities as a result of collisions with wind turbines and other project infrastructure. Passerines are expected to experience the highest fatality rates, but raptors, waterbirds, and waterfowl may also experience high rates of collision fatalities. The continuation of impacts from habitat loss, alteration, and fragmentation from construction would persist for the long-term. Raptors, passerines, and some shorebirds are particularly susceptible to the indirect and habitat-based impacts of habitat loss, fragmentation, displacement, and disruption. Special status bird species would experience impacts similar to those on more common species, but these impacts could be amplified due to smaller populations, stringent habitat requirements, and restricted ranges. The potential to occur, magnitude, duration, and extent of potential

impacts from operation of the CCSM Phase I Project would be similar under each alternative, except they would be greater under the Build Without ETPs scenario under Alternative 4, and they would be less under the No Build scenario under Alternative 4.

The compensatory mitigation of power pole retrofits proposed under Alternative 1 (Proposed Action) would primarily benefit large birds, such as raptors, and would provide lesser benefits to other bird species. The alternative compensatory mitigation options under Alternative 2 are also focused on maximizing benefits to golden eagles, and as such, the benefits to other birds would vary depending on the species. Some mitigation options could be highly beneficial to certain species, while others could have no impact, and still others may result in minor, localized, adverse impacts, such as increased predation. In general, a wind conservation easement could provide the greatest benefit to the most bird species by preventing future injuries or fatalities caused by a wind facility. Habitat enhancements and the mitigation of existing wind facilities would provide minor or moderate benefits to all birds. Mitigation options that would remove carcasses, avoid carcasses, or reduce the use of lead during hunting would benefit primarily carcass-feeding birds, but would have little effect on other birds. Increased funding for rehabilitation of injured eagles would benefit only eagles, unless funds were also distributed for the rehabilitation of other birds.

### ES.3.7 Eagles

Bald and golden eagles would be affected by construction and operation under Alternative 1 (Proposed Action). Potential construction-related impacts on eagles would include (1) injury or fatality due to collision with construction vehicles or equipment; (2) habitat loss, degradation, and fragmentation from construction of roads, power lines, turbine pads, and other surface use facilities; and (3) disturbance and displacement due to construction activities and equipment. Injuries and fatalities of eagles are unlikely during construction under Alternative 1, but would range from minor to moderate in magnitude and limited to the area of the project were they to occur. Construction could also result in impacts on eagle prey base, including deterrence from foraging areas and degradation of habitat for key prey species. While the deterrence of bald eagles from riparian habitat is unlikely, it is possible that construction could result in minor impacts on aquatic habitats in the region. It is also possible that construction could result in minor impacts on golden eagle prey, such as small mammals and ungulates, or deterrence of golden eagles from foraging habitat. Moderate disturbance to one bald eagle nesting pair and four golden eagle nesting pairs due to construction is probable within the Phase I infrastructure and development areas. The standard ETP, if issued, would allow for this level of disturbance take to one bald eagle nest and four golden eagle nests, but would not permit injury or fatality due to construction. Construction-related impacts would be temporary in duration. The potential to occur, magnitude, duration, and extent of potential impacts from construction would be similar under each alternative, except they would be greater under the Build Without ETPs scenario under Alternative 4, and they would be less under the No Build scenario under Alternative 4.

Operation-related impacts on eagles under Alternative 1 (Proposed Action) would include (1) injury and fatality of eagles due to collision with wind turbines, and could include collision with overhead power lines, meteorological or communication towers, buildings, and operation vehicles or electrocution from overhead power lines; (2) continued effects from

habitat loss, degradation, and fragmentation; and (3) continued disturbance and displacement due to operation and maintenance of the facility. Our eagle fatality model predicts that operation under Alternative 1 would result in 10 or 14 golden eagle and 1 or 2 bald eagle fatalities each year due to collision with wind turbines, depending on wind turbine blade diameter. Issuance of a programmatic ETP would permit this level of mortality, with a number of mitigation and minimization measures intended to moderate the impacts of fatality on the local bald and golden eagle populations. Continued disturbance at nest sites due to operation activities is possible and would be moderate in magnitude. It is also probable that operation under Alternative 1 could result in minor impacts on golden eagle foraging areas, disturbance to small mammal prey, and an increase in raven abundance at a regional extent. Impacts on big game prey due to operation under Alternative 1 are unlikely. Operation-related impacts would be long-term in duration. The potential to occur, magnitude, duration, and extent of potential impacts from operation of the CCSM Phase I Project would be similar under each alternative, except they would be greater under the Build Without ETPs scenario under Alternative 4, and they would be less under the No Build scenario under Alternative 4.

Under Alternative 1 (Proposed Action), PCW would retrofit existing power poles to compensate for predicted golden eagle fatalities due to operation of the CCSM Phase I Project. Power pole retrofits are a credible, quantifiable, and USFWS-approved form of compensatory mitigation. However, we would consider other forms of mitigation if their benefits to golden eagles were proven credible and quantifiable, and could achieve no-net-loss of golden eagles. Under Alternative 2 (Proposed Action with Different Mitigation), one or more of the following mitigation measures would be selected: mitigation of existing wind facilities, lead abatement, carcass removal, carcass avoidance, wind conservation easement, habitat enhancements, or the rehabilitation of injured eagles. The benefits to bald eagles would vary slightly depending on the mitigation option chosen, but the benefits to golden eagles would not differ because each option would be required to achieve no-net-loss of golden eagles.

Under Alternative 3 (Issue ETPs for Only the Sierra Madre Portion of the CCSM Phase I Project), our eagle fatality model predicts 7 or 10 golden eagle fatalities and 1 bald eagle fatality per year; however, as a result of mitigation and minimization measures that would be required in the programmatic ETP, the intensity of impacts would remain the same as under the other alternatives.

### **ES.3.8 Cultural Resources**

Bald and golden eagles are important symbolic and traditional religious resources for American and Native American cultures. Environmental justice is also considered because potential impacts may disproportionately affect Native American tribes for whom eagles, particularly golden eagles, have a central role in their beliefs, traditions, and worldview.

Construction of the alternatives would not be expected to adversely affect eagles as a cultural resource.

Operation under Alternative 1 is not expected to adversely affect the cultural relationship between eagles and the broader American public; however, golden eagle take would

probably result in minor to moderate, long-term, regional to extensive, adverse impacts on Native American tribes and their cultural relationship with eagles. In addition, operation under Alternative 1 would have no effect on Native American access to eagles, feathers, or parts for religious use or access to religious use permits. Operation under Alternative 1 would not raise environmental justice concerns.

Operation under Alternative 2 would result in impacts similar to those under Alternative 1, except that funding for eagle rehabilitation as an alternative mitigation measure could have possible, minor, long-term, regional to extensive beneficial impacts on tribes' cultural relationships with eagles and access to eagles, feathers, and parts. Operation under Alternative 3 would result in impacts similar to those under Alternative 1. Although lower numbers of eagle fatalities would reduce impacts on Native American tribes, the impacts would still be minor to moderate in magnitude. Under the No Build scenario under Alternative 4, cultural resource impacts would not occur. If PCW decides to build without ETPs under Alternative 4, operation would not impact the cultural relationship between eagles and the broader American public. However, unmitigated golden eagle take would probably result in major, long-term, regional to extensive, adverse impacts on Native American tribes and their cultural relationship with eagles. Unmitigated golden eagle take could also have a minor to major impact on Native American access to eagles, feathers, or parts for religious use. These operational impacts could result in disproportionately high and adverse impacts on Native American communities, raising environmental justice concerns.

## ES.4 Cumulative Impacts

### ES.4.1 Introduction

A cumulative impact, as defined in 40 CFR 1508.7, is “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” by federal, state, or local agencies or by individuals. Reasonably foreseeable future actions consist of activities that are generally in the planning stage and can be evaluated with respect to their impacts.

Our approach to evaluating cumulative impacts on eagles considers the effects of programmatic take on eagle populations at three scales: (1) EMU; (2) local area population (LAP), and (3) project area. This approach is consistent with our ECP guidance. These three scales are defined as follows:

- EMU: For the CCSM Phase I Project, the EMUs for bald eagles are the Northern Rocky Mountains EMU and the Rocky Mountains and Plains EMU, as shown in Chapter 2.0, Figure 2-1. The EMUs for golden eagles are the four BCRs described in Section 2.1.2.1 and shown in Chapter 4.0, Figure 4-1. These four BCRs are the Northern Rockies (BCR 10), Southern Rockies/Colorado Plateau (BCR 16), Badlands and Prairies (BCR 17), and Shortgrass Prairie (BCR 18).

- **LAP:** The LAP for bald eagles is a 43-mile radius and the LAP for golden eagles is a 140-mile radius around the CCSM Phase I Project. The size of the LAP is based on the median distance to which eagles are thought to disperse from the nest where they are hatched to where they settle to breed.
- **Project area:** The project area is defined as the CCSM Phase I Project and the infrastructure boundaries, as shown in Chapter 2.0, Figures 2-4 and 2-5.

The goal of the cumulative impacts analysis is to qualitatively assess cumulative eagle take within the EMUs, quantitatively assess take of bald and golden eagles within the LAP, and assess cumulative impacts on other resources.

Reasonably foreseeable future actions within the local area scale for eagles include electric transmission lines, other wind energy development (including the CCSM Phase II Project), mineral and energy development, new transportation infrastructure, and hunting.

#### **ES.4.2 Water Resources**

Water resources in the local and regional area are affected by continued expansion of human development that strains water supplies and results in reduced surface water, hydrologic modifications, degradation of floodplain functions, groundwater depletions, and impacts on water quality. If climate change results in reduced annual precipitation, these impacts would be magnified. The CCSM Phase I Project includes avoidance and minimization measures and BMPs to reduce anticipated project-related impacts on surface waters, and conservation measures that would benefit water resources. With implementation of these measures, the cumulative effects of past, present, and reasonably foreseeable future actions on surface water resources and surface water quality within and immediately near the CCSM Phase I Project would have probable, moderate, temporary to long-term, regional, adverse effects.

#### **ES.4.3 Vegetation and Wetlands**

Human development in the local and regional area has extensively impacted vegetation and wetlands by dramatically altering native vegetation communities, entirely removing them in some places, and substantially reducing the amount and condition of wetlands and riparian zones. Climate change would further reduce wetlands and riparian zones if it results in reduced annual precipitation. The CCSM Phase I Project includes avoidance and minimization measures and BMPs that would reduce anticipated project-related impacts on vegetation and wetlands, and conservation measures that would provide probable benefits to vegetation and wetlands. With implementation of these measures, the cumulative effects of past, present, and reasonably foreseeable future actions within the Phase I development and infrastructure areas would have probable moderate, long-term, regional, adverse effects on vegetation and wetlands.

#### **ES.4.4 Fish, Amphibians, and Reptiles**

Fish, amphibians, and reptiles in the local and regional area have been notably impacted by human development that has resulted in direct habitat loss, alteration, and fragmentation across aquatic and terrestrial habitats. Climate change could exacerbate habitat degradation.

Human development has also caused disturbance and direct mortality to fish, amphibians, and reptiles, including the creation of movement barriers that prevent these species from completing life-cycle requirements. The CCSM Phase I Project includes avoidance and minimization measures and BMPs to reduce anticipated project-related impacts on fish, amphibians, and reptiles, and conservation measures that would provide probable benefits. With implementation of these measures, the cumulative effects of past, present, and reasonably foreseeable future actions within and immediately near the CCSM Phase I Project would have probable minor, long-term, limited, adverse effects on fish, amphibians, and reptiles.

#### **ES.4.5 Mammals**

Cumulative impacts of past, present, and reasonably foreseeable future actions on mammals within the Phase I development and infrastructure areas could result in disturbance and displacement from development; habitat loss, degradation, and fragmentation from energy development and agriculture; water diversion leading to changes in hydrology, wetland loss, and habitat suitability; and global climate change resulting in shifting geographic ranges, seasonal activities, migration patterns, and abundances.

Cumulative impacts on mammals from past and present development include habitat loss, fragmentation, disturbance, and displacement. These impacts are considered cumulatively significant to all mammals, but in particular to big game species that migrate long distances and use habitat over a broad range. Cumulative impacts have the potential to affect multiple seasonal ranges as well as result in barriers to movement. The Wyoming Game and Fish Department has determined that crucial winter range is a determining factor for meeting or maintaining big game population objectives. Big game require high-quality forage during the winter to meet their energy needs and gain sufficient energy surplus to support reproduction. The cumulative impacts on bats due to injuries and fatalities would be significant. Overall, the cumulative impacts on mammals would be adverse and significant. The CCSM Phase I Project would contribute minor to moderate impacts on cumulative impacts on mammals in the local area.

#### **ES.4.6 Birds (Other than Eagles)**

Impacts on birds (other than eagles) could include injury or fatality from collision with wind turbines, overhead power lines, meteorological or communication towers, buildings, or vehicles, as well as electrocution by power lines. Habitat loss, degradation, fragmentation, disturbance, and displacement could also occur as a result of construction and operation of wind facilities, which could result in various detrimental impacts on the bird community. Many of the impacts could be compounded by the cumulative impacts from past, present, and reasonably foreseeable future development in addition to other land uses and regional- or global-scale environmental changes. Many of the cumulative impacts on birds (other than eagles) are expected to occur within and immediately adjacent to the CCSM Phase I Project. Reasonably foreseeable future wind energy development may include the CCSM Phase II Project, which would compound impacts in the area and contribute to population-level impacts throughout the region and local area. The CCSM Phase I Project would include

multiple avoidance and minimization measures to reduce the anticipated impacts at and near the site.

The cumulative effects of past, present, and reasonably foreseeable future impacts on birds (other than eagles) could result in large-scale, population-level impacts for some bird species. It is probable that the combined impacts on birds (other than eagles) would result in impacts ranging from minor to moderate that are long-term and regional. The cumulative effects of past, present, and reasonably foreseeable future impacts on birds (other than eagles) within and immediately near the CCSM Phase I Project would have moderate, long-term, regional, adverse effects on some bird species.

The impacts under Alternative 2 (Proposed Action with Different Mitigation) would be comparable to those under Alternative 1 (Proposed Action), but slightly less because more mitigation (especially habitat enhancement and wind conservation easements) would occur in the local and regional areas. Mitigation to remove or avoid carcasses would also benefit other scavenger species. Alternative 3 (Issue ETPs for Only the Sierra Madre Portion of the CCSM Phase I Project) would cause slightly less impacts than Alternative 1 (Proposed Action) because it would affect a smaller area. The No Build scenario under Alternative 4 (No Action: Denial of ETPs) would not contribute to cumulative impacts, and the Build Without ETPs scenario under Alternative 4 would likely cause impacts similar to those under Alternative 1.

#### **ES.4.7 Eagles**

The cumulative effect of past, present, and reasonably foreseeable future impacts on bald and golden eagles in combination with the CCSM Phase I Project were evaluated in detail within the LAP. Reasonably foreseeable future actions that could affect eagles include conversion of habitat to agriculture, fire suppression, water diversion, mineral and energy development projects (including other wind development and transmission line projects), and climate change. The LAP for bald eagles is delimited by a circle with a radius of 43 miles around the Phase I infrastructure and development areas. This area includes the Northern Rocky Mountains and Rocky Mountains and Plains EMUs. The current LAP for bald eagles is approximately 117 eagles, which results in 1 percent and 5 percent benchmarks of 1 and 6 bald eagles, respectively. Within the LAP, there were 11 reported bald eagle fatalities between 2005 and 2014, which when combined with predicted take due to the CCSM Phase I Project, results in approximately 4 or 5 bald eagle fatalities annually, depending on wind turbine blade diameter. When combined with predicted bald eagle fatalities due to the CCSM Phase II Project, we estimate 5 to 7 bald eagle fatalities per year in the LAP, which would exceed the 5 percent benchmark, depending on turbine blade diameter. Based on our Final EA for the eagle take permit rule (USFWS 2009), the combined take threshold for the Rocky Mountain and Rocky Mountains and Plains EMUs is 44 bald eagles. The estimated take of 4 or 5 bald eagles per year (estimated from the CCSM Phase I Project plus other ongoing eagle take) leaves 40 or 39 bald eagles per year that could still be taken from the combined EMUs in Region 6. It is probable that the CCSM Phase I Project combined with past, present, and reasonably foreseeable future actions within the LAP would result in minor to moderate, long-term, extensive impacts on bald eagles.

The current LAP for golden eagles is approximately 1,932 eagles, which results in 1 percent and 5 percent benchmarks of 19 and 97 golden eagles, respectively. Within the LAP, there were 430 reported golden eagle fatalities between 2005 and 2014, which when combined with predicted take due to the CCSM Phase I Project, results in approximately 55 to 59 golden eagle fatalities annually, depending on wind turbine blade diameter. When combined with predicted golden eagle fatalities due to the CCSM Phase II Project, there would be an estimated 84 to 91 golden eagle fatalities per year in the LAP, which is below the current 5 percent benchmark level. Based on our Final EA for the eagle take permit rule (USFWS 2009), the combined take threshold for golden eagles is zero; therefore, any predicted golden eagle take would need to be mitigated. It is probable that the CCSM Phase I Project combined with past, present, and reasonably foreseeable future actions within the LAP would result in moderate to major, long-term, extensive, adverse impacts on golden eagles.

Under Alternative 2 (Proposed Action with Different Mitigation) impacts would be comparable to those under Alternative 1 (Proposed Action), but with slightly less impact if more occurred in the local and regional areas. Under Alternative 3 (Issue ETPs for Only the Sierra Madre Portion of the CCSM Phase I Project), there would be slightly less impact because of the smaller number of eagle fatalities and smaller area of disturbance. The No Build scenario under Alternative 4 would not contribute to cumulative impacts. However, under the Build Without ETPs scenario under Alternative 4, the impacts would be greater than the impacts under Alternative 1 because many of the provisions of the ECP would not be implemented and compensatory mitigation for golden eagle take would not occur.

#### **ES.4.8 Cultural Resources**

Cumulative impacts on the cultural value of eagles were assessed across the BCR and EMU areas, and we considered broader national implications for Native American tribes. Cumulative impacts on eagles as a cultural resource are caused by eagle mortality, the resulting impact on the stability of eagle populations, and the cultural impacts of the administration of religious-use permits under BGEPA. BGEPA and its implementing regulations have historically reduced tribes' access to eagles and have precipitated changes in traditional cultural practices. These regulatory impacts may make Native American cultural practices and beliefs regarding eagles more vulnerable to the effects of eagle take and population-level decline. The CCSM Phase I Project would contribute to probable, moderate, long-term, extensive cumulative impacts on the cultural value of eagles to tribes by contributing to the moderate impacts on bald and golden eagle populations in the LAP. The cumulative effects of past, present, and reasonably foreseeable future impacts combined with the CCSM Phase I Project would result in possible, minor, long-term, extensive impacts on the value of bald eagles as a national and environmental symbol.

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## **Attachments**

- Attachment A Eagle Take Permit Applications and Eagle Conservation Plan
- Attachment B Phase I Bird and Bat Conservation Strategy
- Attachment C USFWS Eagle Fatality Modeling
- Attachment D Bird Species Known or Likely to Occur in the CCSM Phase I Project Area

## List of Abbreviations, Acronyms, and Short Forms

Abbreviation	Definition
ACM	applicant-committed measure
ACP	advanced conservation practice
APLIC	Avian Power Line Interaction Committee
APP	Avian Protection Plan
AWWI	American Wind Wildlife Institute
BBCS	Bird and Bat Conservation Strategy
BCC	Bird of Conservation Concern
BCR	Bird Conservation Region
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BLM FEIS	BLM's Final Environmental Impact Statement, consisting of the VRM Plan Amendment FEIS as Volume I and the CCSM Project FEIS as Volume II, published in July 2012
BLM ROD	BLM's Record of Decision for the Chokecherry and Sierra Madre Wind Energy Project and Approved Visual Resource Management Plan Amendment on Public Lands Administered by the Bureau of Land Management Rawlins Field Office, Carbon County, Wyoming, signed in October 2012
BMP	best management practice
CCSM	Chokecherry and Sierra Madre
CCSM Phase I Project	Chokecherry and Sierra Madre Phase I Wind Energy Project, consisting of the Phase I wind turbine development and infrastructure components
CCSM Phase II Project	Chokecherry and Sierra Madre Phase II Wind Energy Project
CCSM Project	Chokecherry and Sierra Madre Wind Energy Project, including both the Phase I and Phase II projects
CDNST	Continental Divide National Scenic Trail
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CI	credible interval
CR	County Road
CY	cubic yard
DEIS or Draft EIS	Draft Environmental Impact Statement

Abbreviation	Definition
DOI	U.S. Department of the Interior
DPS	distinct population segment
EA	Environmental Assessment
EA1	BLM's Environmental Assessment for Infrastructure Components: Phase I Haul Road and Facilities, West Sinclair Rail Facility, and Road Rock Quarry, Chokecherry and Sierra Madre Wind Energy Project, final EA published in December 2014
EA2	BLM's Environmental Assessment for Phase I Wind Turbine Development, Chokecherry and Sierra Madre Wind Energy Project, draft EA dated November 2014
EACP	experimental advanced conservation practice
ECP	Eagle Conservation Plan
EIA	U.S. Energy Information Administration
EIS	Environmental Impact Statement
EMU	eagle management unit
EO	Executive Order
ESA	Endangered Species Act of 1973, as amended
ETP	Eagle Take Permit
FAA	Federal Aviation Administration
FEIS or Final EIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FR	Federal Register
I-80	Interstate 80
IPCC	Intergovernmental Panel on Climate Change
IWJV	Intermountain West Joint Venture
kHz	kilohertz
kMWh	thousand megawatt hours
kV	kilovolt
LAP	local area population
MBPM-2	USFWS' Migratory Bird Permit Memorandum
MBTA	Migratory Bird Treaty Act
MIND	mean inter-nest distance
mph	miles per hour
MSL	mean sea level
MW	megawatt

Abbreviation	Definition
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NER	National Eagle Repository
NGO	non-governmental organization
NRCS	Natural Resources Conservation Service
NREL	National Renewable Energy Laboratory
PCW	Power Company of Wyoming LLC
PLJV	Playa Lakes Joint Venture
REA	Resource Equivalency Analysis
RMP	Resource Management Plan
ROD	Record of Decision
ROW	right-of-way
SCADA	Supervisory Control and Data Acquisition
SGCN	Species of Greatest Conservation Need
SPOD	site-specific plan of development
SRMA	Special Recreation Management Area
TCP	traditional cultural property
TMP	transportation management plan
TOTCO	The Overland Trail Cattle Company LLC
UPRR	Union Pacific Railroad
U.S.C.	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VRM	Visual Resource Management
WDA	Wind Development Area
WDEQ	Wyoming Department of Environmental Quality
WGFD	Wyoming Game and Fish Department
WHMA	Wildlife Habitat Management Area
WNS	white-nose syndrome
WYO	Wyoming State Highway