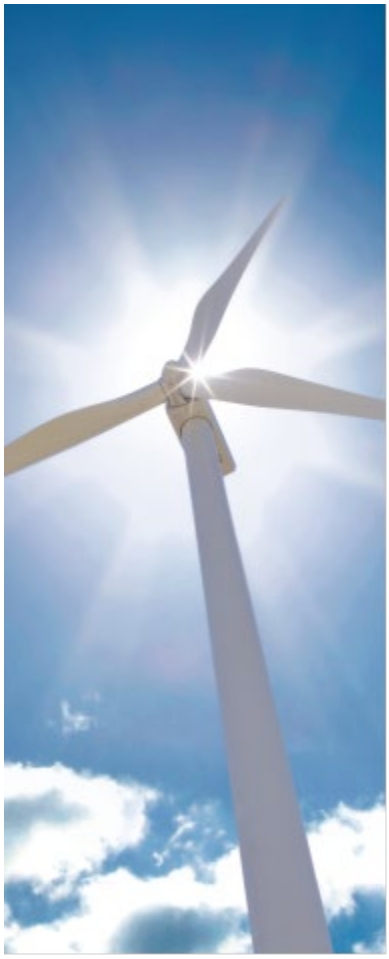
PACIFICORP

A BERKSHIRE HATHAWAY ENERGY COMPANY

Dunlap Wind Energy Facility

Eagle Conservation Plan

PacifiCorp



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1.0 Introduction

PacifiCorp applies the principles in its RESPECT policy to guide the company's corporate commitment to the environment (Appendix A). That commitment is reflected in this Eagle Conservation Plan (ECP) for the Dunlap Wind Energy Project (the "Project" or "Site") located in Carbon County, Wyoming.

Wind energy is one of the fastest growing sources of renewable energy in the United States, and is generally viewed as an environmentally friendly alternative to nuclear and fossil fuel power plants (American Wind Energy Association [AWEA] 2008, National Research Council [NRC] 2007). Development of wind energy is strongly endorsed by the Secretary of the Interior and is one of the Department of Interior's highest priorities (US Fish and Wildlife Service [USFWS] 2003b, Bureau of Land Management [BLM] 2013). Energy from wind-powered generation resources serves an important role in meeting PacifiCorp's loads, which includes Wyoming consumers. In addition, wind energy enables PacifiCorp to meet its renewable portfolio standards, and applicable federal Green House Gas goals and objectives.

PacifiCorp has developed this ECP to meet the recommendations from the USFWS to obtain an incidental take permit for bald and golden eagles and to support the National Environmental Protection Act (NEPA) process at the Project. Additionally, PacifiCorp is required to apply for an eagle take permit under the Project's Migratory Bird Compliance Plan (see section 1.1). The ECP provides detailed information on siting, configuration, construction, and operation for the Project. Actions taken that promote minimization of eagle take are highlighted with the goal of minimizing eagle take to the maximum extent practicable. The ECP supports an application for an incidental take permit for bald and golden eagles and commits to mitigation that meets the statutory preservation standard for golden and bald eagles.

The 2013 USFWS Eagle Conservation Plan Guidance, Version 2 (ECPG, 2013b) provides guidance for conserving bald and golden eagles during siting, construction, and operations of wind energy facilities through a staged approach similar to the tiered approach in the 2012 USFWS Land-based Wind Energy Guidelines (WEG, 2012). Additionally, in 2013 the USFWS Region 6 released a regional guidance memo "Final Outline and Components of an Eagle Conservation Plan (ECP) for Wind Development Recommendations from USFWS Region 6" (Reg. 6 ECPG). Both the USFWS ECPG and the Reg. 6 ECP Guidance were followed in developing the Project ECP. The ECPG emphasizes the importance of implementing avoidance and minimization measures throughout all phases of wind energy development and operations. The ECPG has been developed to assist project developers and operators in complying with regulatory requirements and avoiding incidental take of eagles at wind energy facilities, while also providing guidance to inform the collection of biological data needed to support permit applications for facilities that may pose a risk to eagles.

The Dunlap Project is an operational facility; therefore, the ECP format and information varies slightly from standard guidance provided by U.S. Fish and Wildlife Service (USFWS) and

specifically USFWS – Region 6. In an effort to follow the Reg. 6 ECP Guidance, this ECP presents only pre-construction information in Section 4 – Initial site assessment (ECPG Stage 1), Section 5 – Site-specific survey and assessments (ECPG Stage 2), Section 6 – Avoidance and minimization of risk in project siting, and Section 7 – Predicting eagle fatalities (ECPG Stage 3). Post-construction information is presented in Section 9 – Calibration and updating of the fatality predictions and continued risk assessment. Additionally, the compensatory mitigation and adaptive management sections have been removed from Section 8 (as directed in the Reg. 6 ECP Guidance) and moved to Section 9 after the calibration and updating fatality predictions information is presented. We believe this outline presents information to the reader in a more clear approach, with discussion on mitigation and adaptive management occurring after all current Project information is presented.

1.1 Migratory Bird Compliance Plan

PacifiCorp entered into a plea agreement with the Department of Justice and USFWS in December 2014. As part of the plea agreement, a Migratory Bird Compliance Plan (MBCP) was developed to provide a collaborative framework for PacifiCorp's implementation of measures that will ensure compliance with the requirements of the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act during the term of the MBCP. A brief summary of the actions required under the MBCP that relate specifically to eagles are provided below:

- Develop protocols for post-construction monitoring and conduct USFWS approved mortality monitoring
- Develop protocols for eagle nest surveys and conduct USFWS approved nest surveys
- Apply for a Special Use – Utility (SPUT) permit and adhere to required reporting standards
- Implement a carrion removal program
- Develop and submit an ECP
- Conduct compensatory mitigation measure for eagle mortalities

The implemented actions are discussed in more detail throughout this ECP. It is understood that the MBCP requirements will remain in effect until an eagle take permit has been issued or termination of the non-prosecution period set forth in the plea agreement.

1.2 Project Background

PacifiCorp's initial evaluation for the Project included a Dunlap Phase 1 and Dunlap Phase 2 (Figure 1 and 2). Only Phase 1 was constructed and is requested for coverage under an eagle take permit. PacifiCorp does not currently have a schedule for the development and construction of Dunlap Phase 2. Due to the 2-phased baseline evaluation, many of the defined survey areas, reported results, maps, turbine layouts, and subsequent evaluations occurred and are presented in this ECP at the 2-phased scale. Efforts have been made in this ECP to clearly identify what data are associated specifically with Dunlap Phase 1. All post-construction information is presented only for Dunlap Phase 1. It should be assumed by the reader that any reference to "Project" or "Dunlap" only refers to Dunlap Phase 1, unless specifically noted.

Evaluation of the Project (Dunlap Phase 1 and 2) for potential wind energy projects began in early 2008 and pre-construction wildlife surveys began on June 4, 2008, and continued to May 27, 2009

(Johnson et al. 2009). These data were used to inform the prediction of eagle fatalities and risk. Three years of standardized post-construction monitoring were completed from 2011 – 2014 (Martinson et al. 2012, 2013 and 2014). Ongoing monitoring occurred from 2014 through the present. Other studies (described below) completed after the Project became operational include eagle nest surveys, prey habitat mapping, eagle attractant, and use assessments. These data were used to update the fatality predictions and continue the risk assessment.

This ECP identifies and describes conservation measures and actions that will be implemented to minimize current and future impacts to eagles at the Project. Technical reports are provided in the Appendices to this ECP for all studies completed and data collected to date.

1.3 Purpose of the ECP

In accordance with the ECPG (USFWS 2013b) this ECP provides information in support of an application for an eagle take permit for the Project. The ECP will assess the risk of the Project to eagles; document eagle specific survey and monitoring work and results, both pre- and post-construction; document avoidance and minimization measures implemented pre- and post-construction; and discuss the Project's adaptive management plan.

The ECP is written to reflect the Project's development history and operations. The ECP is organized to follow the Reg. 6 ECP Guidance as closely as possible, however, the organization is influenced by the availability of data to inform the decision making process. The Project's design phase did pre-date the issuance of the *Eagle Conservation Plan Guidance* (ECPG) and the *U.S. Fish and Wildlife Service Land-based Wind Energy Guidelines* (WEG; USFWS 2012, 2013b; *see* Sections 2.1.3 and 2.1.4 *for more details*). This document reflects recommendations and comments from the Project's Technical Advisory Committee (TAC; Appendix B) and the USFWS. The TAC first met in May 2011, 6 months after the project had become operational. The TAC membership included PacifiCorp, Western EcoSystems Technology, Inc. (WEST), Wyoming Game and Fish Department (WGFD), and USFWS. In addition, this ECP reflects PacifiCorp's commitment to implement an adaptive management program that includes minimization measures, monitoring, experimental advanced conservation practices, and compensatory mitigation. The adaptive management program is designed to support the objective of "no net loss" of golden eagles within the Eagle Management Units (EMU) associated with the Project, so that it is consistent with USFWS's goal of maintaining stable or increasing breeding populations of eagles.

1.4 ECP Term

The ECP will cover the term of any potential eagle take permit PacifiCorp receives. PacifiCorp has and will continue to update this ECP in coordination with the USFWS through an adaptive management program (*see* Sections 8.0). Should operation continue beyond the expected life of the Project, this ECP will be reviewed, updated, and remain in effect until Project decommission.

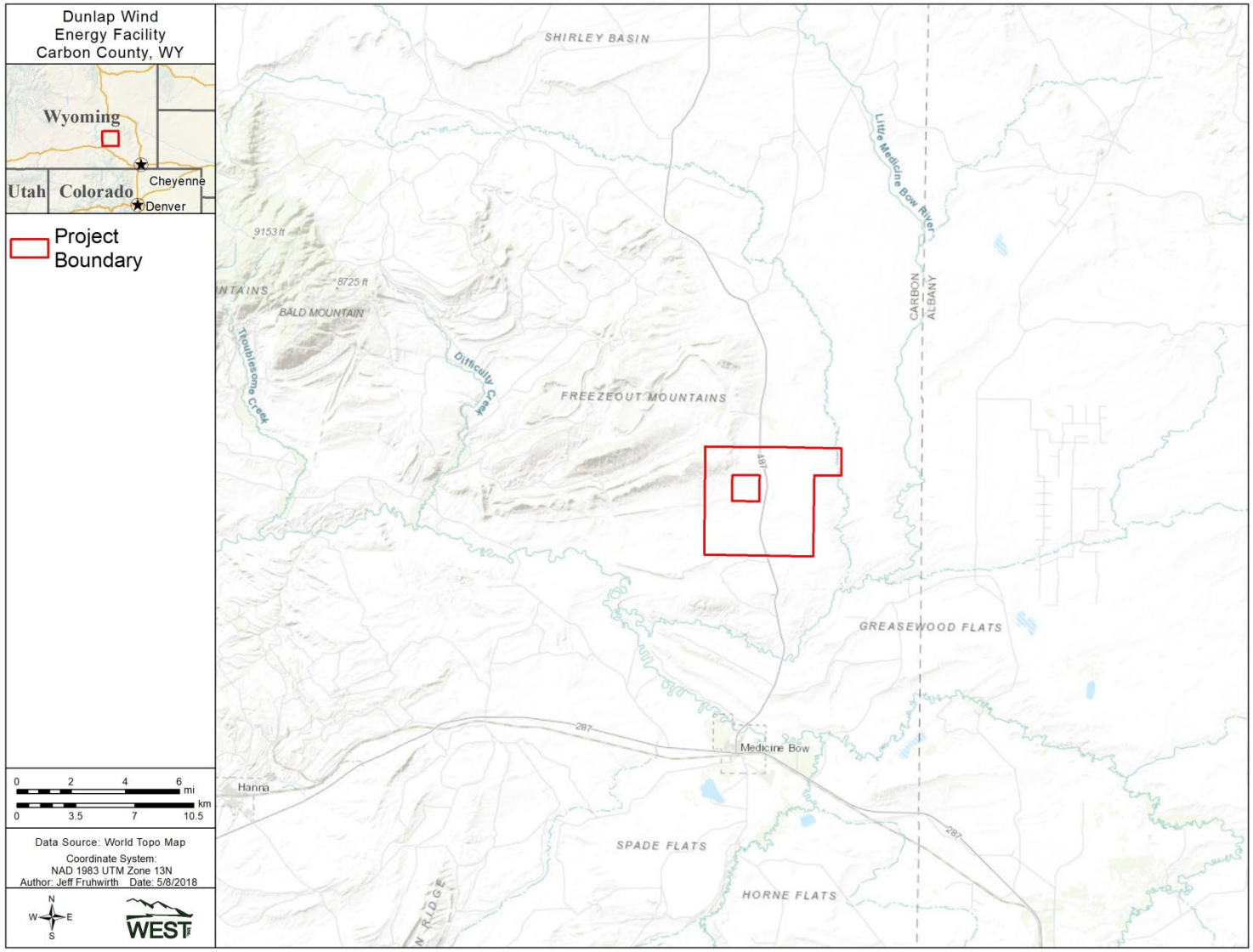

Figure 1. Location of the Dunlap Wind Energy Facility, Carbon County, Wyoming. The Project boundary shown is representative of the constructed wind project.

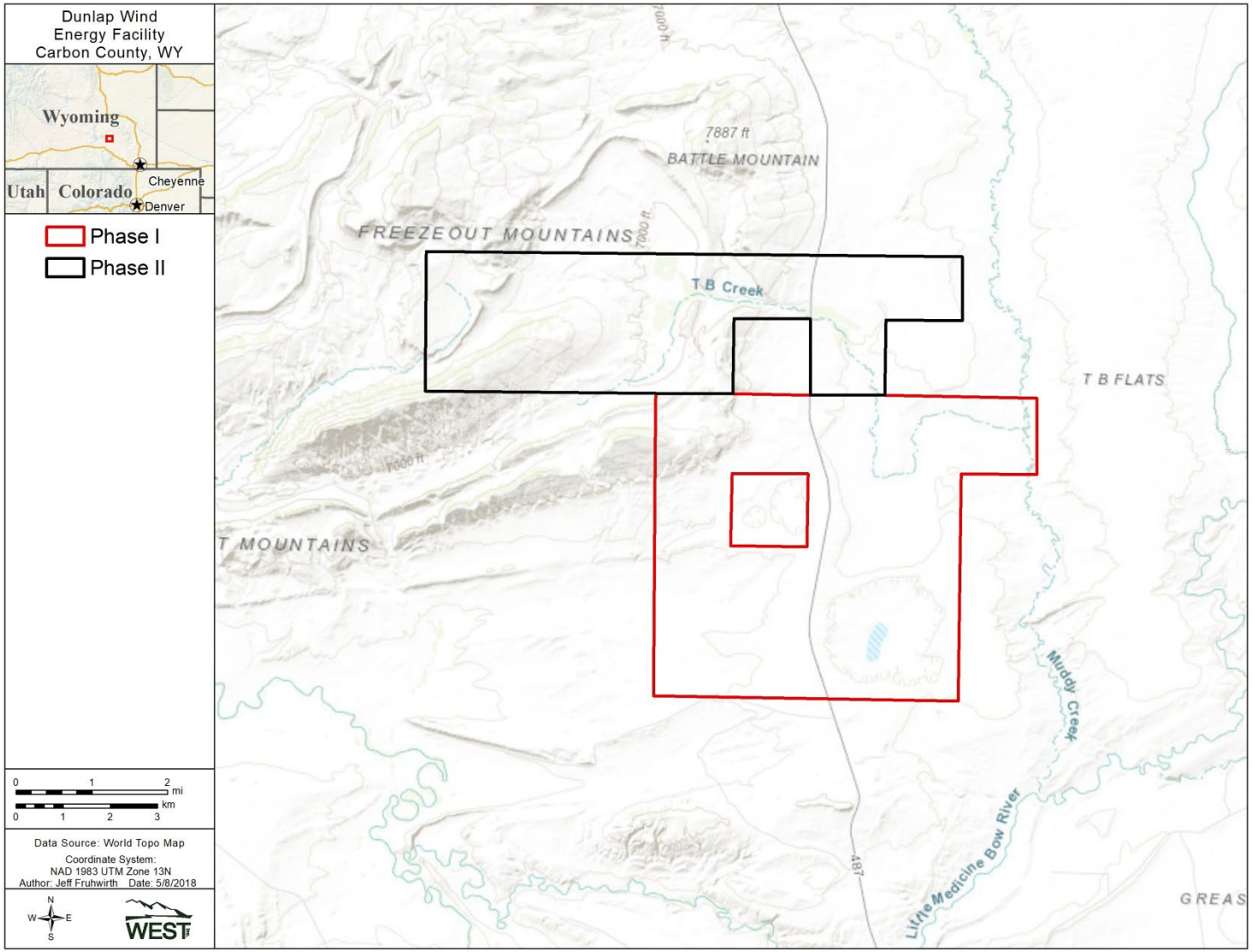

Figure 2. Location of the Dunlap Phase 1 and Phase 2 boundaries, Carbon County, Wyoming. Phase 2 was evaluated as part of the baseline survey effort. Phase 1 is representative of the constructed project.

2.0 Regulatory Framework

This section describes the regulations and guidelines relevant to this ECP.

2.1 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA; 1918) is the cornerstone of migratory bird conservation and protection in the United States. The MBTA implements four treaties that provide for international protection of migratory birds. The MBTA states, "Unless and except as permitted by regulations… it shall be unlawful at any time, 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 ….[The Act] prohibits the taking, killing, possession, transportation, import and export of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior."16 U.S.C. 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 Service maintains a list of all species protected by the MBTA at 50 CFR 10.13. This list includes over one thousand species of migratory birds, including eagles and other raptors, waterfowl, shorebirds, seabirds, wading birds, and passerines.

2.2 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA; 1940) (16 USC §§ 668-668d) prohibits the take of bald (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*), unless authorized by federal regulation. The BGEPA defines "take" of an eagle to include a broad range of actions, including to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb. The term "disturb" in regulations found at 50 CFR § 22.3 means "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: (1) injury to an eagle; (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

In 2009, the Service promulgated a final rule on two new permit regulations that specifically authorize under BGEPA the non-purposeful (i.e., incidental) take of eagles and eagle nests in certain situations. See 50 CFR 22.26 & 22.27. The permits authorize limited take of bald and golden eagles; authorizing individuals, companies, government agencies and other organizations to disturb or otherwise take eagles in the course of conducting lawful activities. To facilitate issuance of eagle take permits for wind energy facilities the Service finalized the ECPG. If eagles are identified as a potential risk at a project site, developers are strongly encouraged to follow the ECPG. The ECPG describes specific actions that are recommended to achieve compliance with the regulatory requirements in BGEPA for an eagle take permit, as described in 50 CFR 22.26 and 22.27. The ECPG provides a national framework for assessing and mitigating risk specific to eagles through development of ECPs. In December 2016, the USFWS published notice of a final rule revising its eagle permitting regulations and extended the maximum permit duration to 30

years. In communication with USFWS, PacifiCorp intends to develop this ECP to avoid and minimize to the maximum extent practicable and to support an incidental take permit application.

2.3 USFWS Land-Based Wind Energy Guidelines

In 2003, the USFWS published the *Interim Voluntary Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines* (2003a Guidelines).[1] The 2003 guidelines encouraged the "wind energy industry to follow these guidelines and, in cooperation with the Service, to conduct scientific research to provide additional information on the impacts of wind energy development on wildlife." In 2004, USFWS issued *Instructions for Implementation of Service Voluntary Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines* (2004 Instructions).

In 2012 USFWS issued the WEG (USFWS 2012). The WEG replaced the 2003 Guidelines.[2] The WEG set out a voluntary and collaborative approach to implement a structured, scientific process for addressing wildlife conservation concerns at all stages of land-based wind energy development. Further the WEG provided a "tiered approach" to assess the "potential adverse effects to species of concern and their habitats." The tiered approach is an iterative decision-making process for collecting information in increasing detail; quantifying the possible risks of proposed wind energy projects to species of concern and their habitats; and evaluating those risks to make siting, construction, and operation decisions. The WEG also provide Best Management Practices (BMPs) for site development, construction, retrofitting, repowering, and decommissioning.

To avoid, minimize, and mitigate impacts to eagles under the MBTA and BGEPA, PacifiCorp is implementing measures described in this ECP document. The specific measures to minimize impacts to eagles are discussed in greater detail in Sections 6.0 and 8.0, additional experimental advanced conservation practices and compensatory mitigation measures are discussed in greater detail in Section 8.0.

2.4 Eagle Conservation Plan Guidance

Originally issued in draft form in January 2011, the ECPG provides a roadmap to wind energy developers and operators for obtaining programmatic eagle take permits in accordance with the Eagle Permit Rule.[3] The ECPG also supplements the WEG.[4] Whereas the WEG provided a broad overview of wildlife considerations at wind energy facilities, the ECPG provides guidance specifically related to bald and golden eagles.

[1] 68 Fed. Reg. 41175 (July 10, 2003).
[2] *See* 77 Fed. Reg. 17496 (March 26, 2012).
[3] 50 CFR. § 22.26.
[4] 77 Fed. Reg. 17496 (March 26, 2012).

The ECPG clarifies the relationship between the tiers of the WEG and the stages of the ECPG process. Because the ECPG stages do not align precisely with the WEG tiers, the new guidance details which ECPG stages occur within each tier.[5] This alignment is illustrated in the table[6] below:

Table 1. Comparison between the USFWS WEG and ECPG step-wise approaches.

Land-based Wind Energy Guideline Tiers		Eagle Conservation Plan Guidance Stages	
Tier 1	Preliminary evaluation or screening of potential sites	Stage 1	Site assessment
Tier 2	Site characterization	Stage 2	Site-specific surveys and assessments
Tier 3	Site characterization	Stage 3	Predicting eagle fatalities
Tier 4	Post-construction surveys to estimate impacts	Stage 4	Avoidance and minimization of risk using ACP's and compensatory mitigation
Tier 5	Other post-construction studies and research	Stage 5	Calibration and updating of the fatality prediction and continued risk-assessment

The conservation practices outlined in the ECPG are intended to offset the short- and long-term negative effects of wind energy facilities on eagle populations.[7] Those practices will also benefit other avian species, and in particular, raptor species. The USFWS recommends "an adaptive management framework predicated, in part, on the precautionary approach for consideration and issuance of programmatic eagle take permits."[8]

Adaptive management techniques "consist of case-specific considerations applied within a national framework" that may include "operational adjustments at individual projects at regular intervals where deemed necessary and appropriate."[9] Ultimately, "[i]mplementation of the final ECP must reduce predicted eagle take, and the population level effect of that take, to a degree compatible with regulatory standards to justify issuance of a programmatic take permit . . . ."[10] Compatibility with regulatory standards means maintaining a stable or an increasing breeding eagle population.

Although the ECPG applies generally to all wind energy facilities with risk of eagle take, the guidance primarily addresses developers and operators in the initial stages of facility siting and development. For wind facilities already operating, the guidance may apply somewhat differently. The ECPG states that "[f]or projects already in the development or operational phase, implementation of all stages of the recommended approach in the ECPG may not be applicable or possible."[11]

[5] ECPG at vii.
[6] ECPG at 18.
[7] ECPG at 4-5.
[8] *Id.* at 9.
[9] *Id*.
[10] *Id*. (emphasis added).
[11] *Id*. at iii.

This ECP was developed in accordance with the ECPG. This ECP also relies on the Reg. 6 ECP Guidance, which provides recommendations about the content and organization of an ECP, and requests supplemental information related to avoidance and minimization measures.

2.5 National Environmental Protection Act

The National Environmental Policy Act (NEPA) [42 U.S.C. 4321 et seq.] establishes national environmental policy and goals for the protection, maintenance, and enhancement of the environment and provides a process for implementing these goals within the federal agencies. The Act requires federal agencies to incorporate environmental considerations in their planning and decision-making through a systematic interdisciplinary approach. All federal agencies are required to prepare detailed statements assessing the environmental impact of and alternatives to major federal actions significantly affecting the environment. Issuance of an eagle take permit by the USFWS constitutes a federal action and thus requires an assessment of the potential environmental impacts associated with the action and alternatives under NEPA. As a result, the USFWS must complete a NEPA analysis before it makes a decision about whether or not to issue an eagle permit.

2.6 Endangered Species Act

The ESA directs the USFWS to identify and protect endangered and threatened species and their critical habitat, and to provide a means to conserve their ecosystems. Among its other provisions, the ESA requires the USFWS to assess civil and criminal penalties for violations of the Act or its regulations. Section 9 of the ESA prohibits take of federally-listed species. Take is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct" 16 U.S.C. 1532. The term "harm" includes significant habitat alteration which kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering, 50 CFR 17.3. Projects involving Federal lands, funding or authorizations will require consultation between the Federal agency and the USFWS, pursuant to section 7 of the ESA. Projects without a Federal nexus should work directly with USFWS to avoid adversely impacting listed species and their critical habitats.

2.7 State and Federal Permit Requirements

A Section 109 Permit application was submitted to the Wyoming Industrial Siting Council (WISC) in June 2009. The Industrial Siting Application (ISA), which is part of the state permitting process, addressed a variety of environmental aspects of the Project, including air quality, noise, soil resources/geologic hazards, cultural resources, vegetation resources, surface and groundwater resources, land use/recreation, recreational resources, wetlands/waters of the US, visual/scenic resources, and wildlife resources, including avian resources, bats, and federally listed wildlife species.

As part of the preparation for the WISC permit process, PacifiCorp met with several state, federal, and local agencies, including the Wyoming Department of Environmental Quality (WDEQ) on April

29 and May 15, 2009; the WGFD on April 24 and May 8, 2008, as well as March 13, April 30, and May 22, 2009; and the USFWS office on May 8, 2008, and June 12, 2009. The purpose of these meetings was to provide an overview of the Project and the ISA process, discuss baseline data collected, address any issues and concerns (including pre- and post-construction monitoring), and answer questions. To provide the local public an opportunity to comment on the Project, a public open house was held in Medicine Bow on June 8, 2009. A number of town council meetings also were held in June 2009 in Rock River, Rawlins, Laramie, and Sinclair. Other state and county agency meetings were held in May and June 2009 in the City of Cheyenne and in Carbon and Albany Counties. The public was invited to all state and local agency meetings as well. The Section 109 Permit was approved in September 2009 after a public hearing on August 28, 2009.

In addition to the Section 109 permit, PacifiCorp completed an application for a Certificate of Public Convenience and Necessity to construct the Project. This application was submitted to the Wyoming Public Service Commission on July 24, 2009 and approved.

No other federal, state, or local permits were require or applied for as part of the Project development.

3.0 Project Description

The Project is located on a combination of privately owned fee and State of Wyoming Lands in Township 23 and Ranges 78 and 79 West. PacifiCorp is the landowner of 14,024 acres of private fee lands within the Phase 1 and 2 boundaries (Figures 1 and 2). The Phase 1 boundary encompasses approximately 10,347 acres. A private entity owns 640 acres of private fee land within the Project area. The Project also includes 640 acres of State of Wyoming lands. PacifiCorp has completed the Special Use Lease process with the Wyoming Office of State Lands and Investments and holds a 35-year lease agreement for those State lands.

Project construction began in September 2009 and all Project turbines were completed and commissioned by October 1, 2010. The Project became commercially operational in October 2010 and is currently in operation. The Project will be repowered in 2020 (proposed completion date is October 31, 2020) and continue standard operation.

3.1 Environmental Setting

The Project is located on 10,374 acres of land in Carbon County, Wyoming, approximately eight miles north of Medicine Bow, Wyoming (Figure 1). Wyoming State Highway 487 bisects the Project area. The northwestern boundary of the Project area abuts the Freezeout Mountains and the northeast boundary transitions to the area commonly known as Shirley Basin. At a local-scale, the Project area falls within the drainage system of Muddy Creek and its tributaries, which are tributaries to the Medicine Bow River. Muddy Creek flows along the eastern border of the Project area and TB Creek snakes in and out of the northeast Project area.

The Project occurs in the US Army Corps of Engineers (USACE) designated Arid West Region within the sub-region characterized as Interior Deserts (LRR D; USACE 2008) with elevations

ranging from 2,034-2,293 meters (m; 6,673 – 7,523 feet [ft]; Figure 3). This sub-region is broken into two distinct parts: the “hot desert” and the “cold desert.” The Project area lies within the “cold desert” portion. The area is characterized by arid grasslands and shrublands supporting bunchgrasses and sagebrush, interrupted by high hills and low mountains. The annual average precipitation in the area is less than 12 inches (in). Winter Pacific frontal storms associated with low-pressure systems are an increasingly important source of moisture for this region as storms move from south to north (USACE 2008).

During the initial Project evaluation (Phase 1 and 2) in 2009, the land use/land cover (LULC) was defined and mapped as presented in Johnson et. al 2009. The LULC data was updated for the ECP based on the final Project layout (Figure 4; Table 2). Scrub/shrub (big sagebrush) and herbaceous (grasslands) communities are the most common land cover types in the Project area (Table 2). Most of the infrastructure is sited in grassland, sagebrush, or greasewood communities.

Table 2. The land cover types, coverage, and composition within the Dunlap Project Area, Carbon County, Wyoming.

Habitat	Acres	% Composition
Developed, Open Space	100.5	1.0
Developed, Low Intensity	6.7	0.1
Barren Land	21.6	0.2
Shrub/Scrub	6,979.6	67.5
Herbaceous	3,233.6	31.3
Emergent Herbaceous Wetlands	5.3	0.1
Total	**10,347.3**	**100**

Data from the US Geological Survey National Landcover Database (2011).

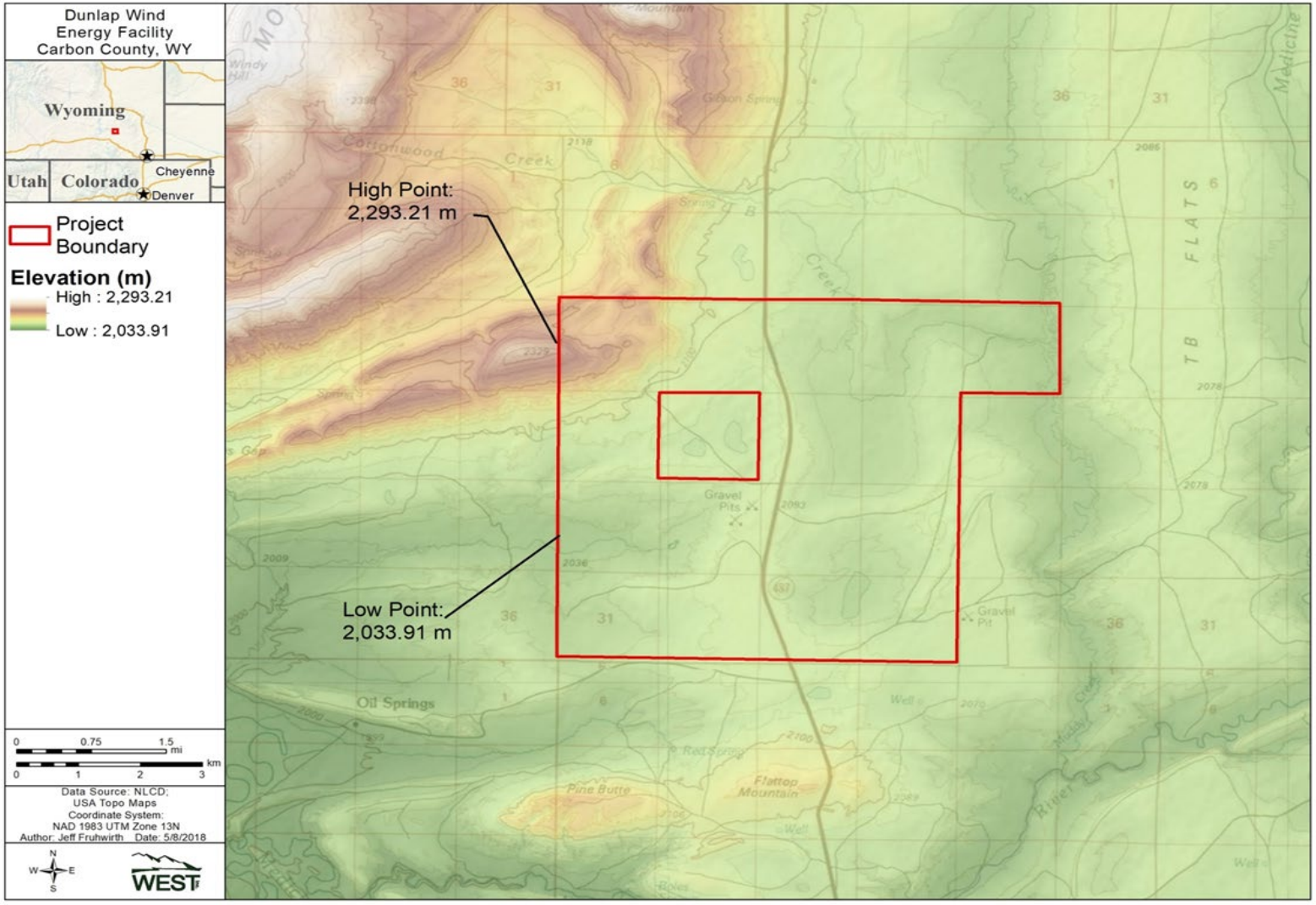

Figure 3. Dunlap Wind Energy Facility, Carbon County, Wyoming – Elevation across the constructed Project. High and low points within the Project boundary are identified.

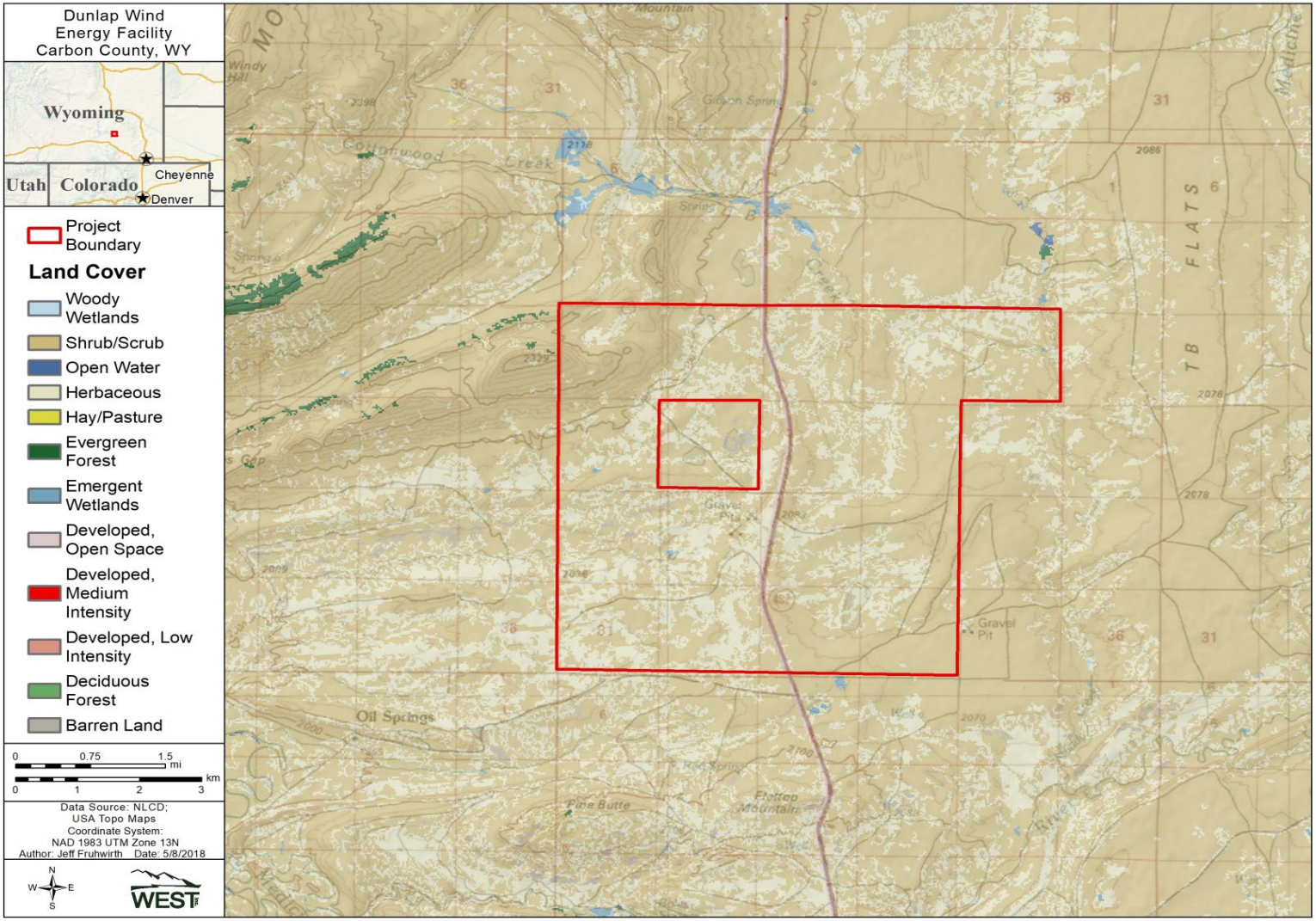

Figure 4. Dunlap Wind Energy Facility, Carbon County, Wyoming – Land Use Land Cover for the constructed Project boundary.

3.2 Project Infrastructure

The Project consists of 74 turbines with a capacity of 111 MW (Figure 5). The GE 1.5-MW turbines have a rotor diameter of 253 ft and the wind turbines are situated on 262-ft tall steel tubular towers secured to concrete foundations. An 11-mile transmission line interconnects the Project with PacifiCorp's Miners to Difficulty transmission line. These lines were built along PacifiCorp- and State of Wyoming-owned property. In addition to the turbines and interconnection line, the Project includes a variety of access roads, crane pads, a laydown area, batch plant, communication/collection systems, substation, operation and maintenance building, transmission lines, and metrological towers. Full descriptions for Project infrastructure are provided below and temporary and permanent impacts are quantified in Table 3.

The Project will be repowered in 2020 and will upgrade the turbine rotors, blades, and nacelles. No towers, foundations, maintenance pads, on-site substations, collector lines, or operation and maintenance buildings will be modified. Each repowered turbine will have a 298.6 ft rotor diameter and 413.4 ft turbine height. Repowered turbines will have a 1.85 MW capacity for total Project nameplate capacity at 136.9 MW.

Table 3. Estimated temporary and permanent acres of impact associated with the Dunlap Wind Energy Project, Carbon County, Wyoming.

Project Feature	Temporary Habitat Acres Impacted	Permanent Habitat Acres Impacted
Wind Turbine Generators and Crane Pads	56.6	17.4
Access Roads (onsite and transmission line associated)	131.8	49.5
Transmission Line	-	<1
Collection Lines	163.6	-
Laydown Area and Batch Plant	10.0	-
O&M Building	2.0	1.0
Substations and Interconnection station	5.0	3.0
Metrological towers	<1	<1
TOTAL	**369.2**	**71.0**

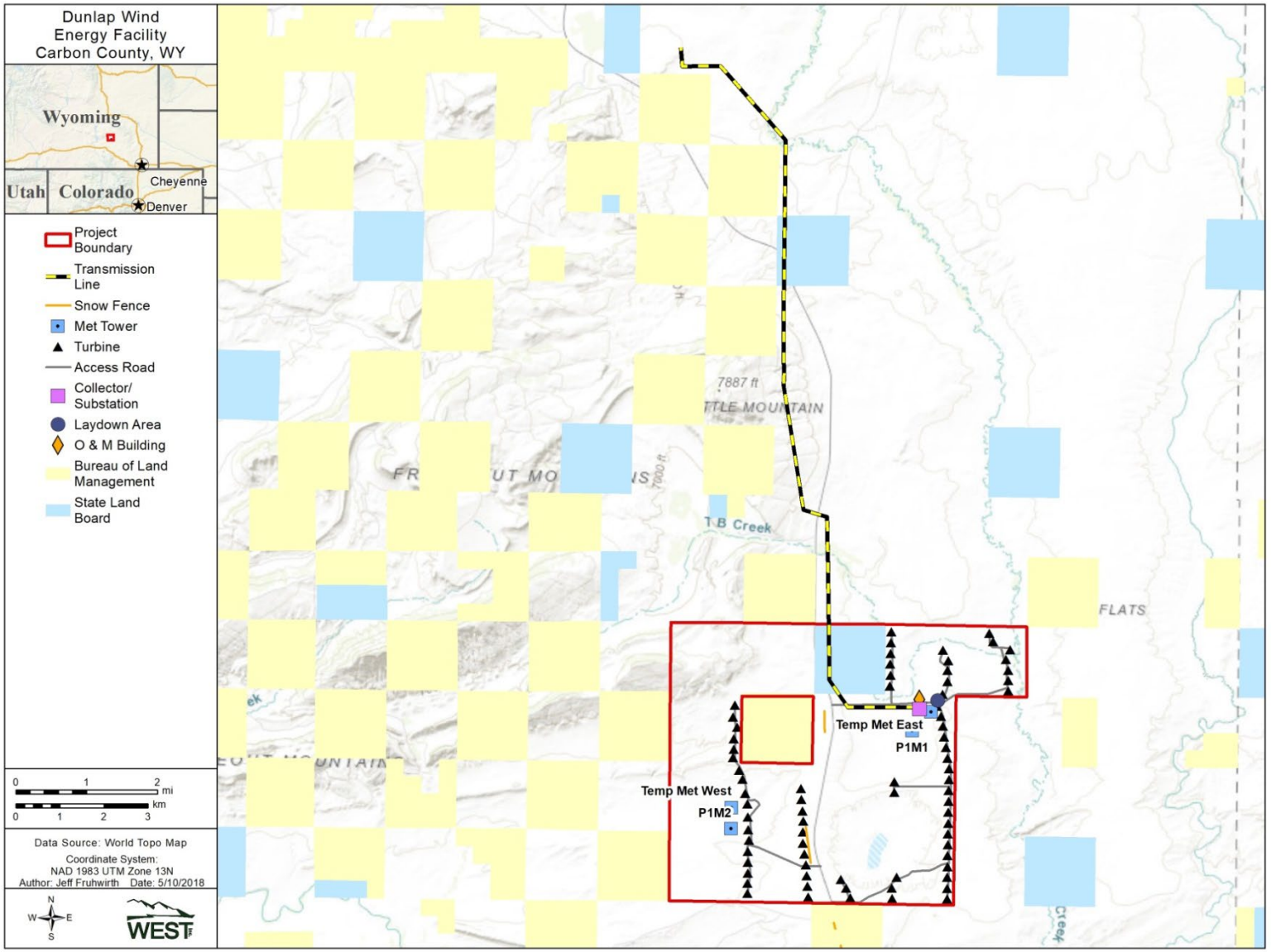

Figure 5. Dunlap Wind Energy Facility, Carbon County, Wyoming – Infrastructure layout.

3.2.1 *Access Roads and Crane Pads*

Access roads were designed to turbine vendor standards and specifications (i.e., 24 foot wide construction roads and six inch minimum gravel depth standards and sited to minimize disturbances, maximize transportation efficiency, and avoid sensitive resources and unsuitable topography to the extent practicable. Existing roads were used whenever possible, though some existing roads were temporarily widened up to a total width of 32 ft to accommodate delivery of wind turbine generator (WTG) equipment. After construction, these private roads were narrowed to 8 to 12 ft wide for operations. Approximately 5.5 miles of existing roads were improved.

Approximately 17 miles of new gravel roads were constructed in areas where existing roads did not provide access to WTG locations and along the length of turbine strings. New roads were typically up to 24 ft wide, and an additional shoulder (up to 32-ft width) was temporarily disturbed during construction. Roads were designed under the direction of a licensed engineer and compacted to meet equipment loading and hauling requirements. In addition, a temporary 11-mile road connecting the collector and interconnect substations was built for access during the construction process.

In conjunction with the access road construction, crane pads were established at each WTG location to provide enough space for a large crane to install the tower sections, nacelle, blades, and other components. The crane pad also provides access to the area for maintenance, if necessary. An approximate 40-ft-by-60-ft crane pad was maintained after construction, in addition to a 100-ft diameter access pad for maintenance procedures.

3.2.2 *Laydown Area and Batch Plant*

An approximately 10-acre laydown area was used during Project construction, which included a 2-acre batch plant within the laydown area. The laydown area was used to stage construction components and store construction supplies and equipment. The laydown area experienced temporary surface disturbance that entailed stripping and stockpiling of both topsoil and subsoil. The area of temporary disturbance was restored and reseeded to pre-construction conditions upon completion of construction.

3.2.3 *Communications and Collection System*

Generated electricity moves through an underground collection system to the Project collector substations. Both power and communication cables were buried in trenches approximately 3-4 ft below the ground surface.

An estimated 27 miles of underground collection system wiring was installed for the 74-turbine Project. The linear disturbance area was approximately 50-ft wide and resulted in approximately 164 acres of temporary ground disturbance through burying lines. No above ground collection lines were constructed for the Project. Only areas that required clearing to construct the lines were impacted and cleared areas were revegetated.

3.2.4 *Substations and O&M Facility*

The Project collector substation is owned by PacifiCorp and operated in accordance with prudent industry practices, such as maintaining a secured facility, installation of avian guarding equipment, and requiring appropriate Personal Protection Equipment at all times. The substation is similar to those used in the region in design (i.e., minimizing snow collection and utilizing avian guarding equipment) and maintenance frequencies. The substation occupies an area of approximately 1.5 acres, and the substation site is surrounded by a graveled, fenced area with transformer and switching equipment and space to park vehicles. The total cleared area associated with construction of the substation site was approximately five acres.

The 5,500-square foot O&M facility, which contains all necessary plumbing and electrical connections needed for typical operation of offices and a maintenance shop, is also located at the Project. The O&M facility, including the facility and parking area, encompasses approximately one acre. Approximately two acres were temporarily impacted during the construction phase. Utilities such as electric service, water service, telephone service, as well as access to a septic system, are required at the Project.

3.2.5 *Transmission Line*

An 11-mile overhead 230-kV transmission line associated with the Project was constructed between December 2009 and March 2010. The line interconnects the Project with PacifiCorp's Miners to Difficulty transmission line at the Shirley Basin switching station. The transmission line was constructed across private fee lands and State of Wyoming lands, and did not cross BLM-managed federal lands. The line traverses approximately nine miles north of the Project and parallel to WYO 487.

The line incorporates features suggested by the Avian Power Line Interaction Committee (APLIC 2006 and APLIC 2012) to minimize collision and electrocution-related avian mortalities.

3.2.6 *Meteorological Towers*

Four guyed meteorological (MET) towers were constructed for the Project. However, two of these structures were temporary and were removed at the end of October 2011, during the first year of post-construction mortality monitoring. The Project currently has two permanent lattice, guyed MET towers that are marked with bird flight diverters. Each MET tower resulted in approximately 0.02 acres of ground disturbance.

3.2.7 *Post-Construction Grading, Erosion Control, and Project Clean-up*

Once construction of the Project was completed, all disturbed areas were graded to their approximate original contour, and areas disturbed during construction were stabilized and reclaimed using erosion control measures, including site-specific contouring, reseeding, or other measures (i.e., hydro-seeding, rock check-dams, straw waddles). Areas were reseeded with native vegetation mixes supplied by construction contractor and included Kentucky bluegrass, spike wheatgrass, and slender wheatgrass. The erosion control measures were implemented in compliance with the Project's construction Storm Water Pollution Prevention Plan (SWPPP).

Areas that were disturbed around each turbine during construction were reverted to the original land use after construction except for a 100 ft diameter maintenance access pad and associated 40 ft by 60 ft crane pad.

3.2.8 *Operations, Maintenance, Decommissioning, and Restoration*

PacifiCorp will perform project O&M for the life of the Project, which is anticipated to be 30 years from the commission date. PacifiCorp and its O&M contractor will control, monitor, operate, and maintain the Project by means of the Supervisory Control and Data Acquisitions (SCADA) system, and regularly scheduled on-site inspections will be conducted.

Maintenance activities typically occur within areas previously disturbed by construction. Abnormal activities may include the need to disturb areas to facilitate crane access. Turbine maintenance is typically performed up-tower, and O&M personnel perform maintenance within the tower or nacelle and access the towers using pick-up trucks.

Each turbine has an associated maintenance pad for activity requiring a heavy operating crane. However, as each turbine has an associated maintenance pad for activity requiring a heavy operating crane, the need for additional disturbance to facilitate crane access is unlikely. No significant construction is required to utilize the crane pads and disturbance is kept to a minimum during maintenance activities.

PacifiCorp will meet or exceed current APLIC standards in the event that any utility poles or power lines are built or retrofitted at the Site for ownership by PacifiCorp. However, third parties provide some electrical service to some PacifiCorp sites, including Dunlap, and as such, own and operate their own utility poles. High Plains Power provides power to the Dunlap Project and PacifiCorp does not own or maintain the lines required to provide power to the Project.

Large scale noxious weed management is performed by a licensed herbicide and pesticide applicator on all turbine pads, roads, substations, and O&M facility infrastructure during the spring and fall, or on an as needed basis. Application amounts and products vary by season, weather conditions, site properties, and target vegetation type and density. Products used at the site may include Krovar, Method 240 SL, Piper, Ranger Pro, Perspective and Esplanade.

Throughout the Project's life, PacifiCorp expects to explore alternatives for decommissioning and/or repowering the Project. At the present time, PacifiCorp is in the process of repowering the Project, and this effort is scheduled to be completed by October 31, 2020. The repower includes upgrading the turbine's nacelles and rotors with new nacelles and rotors that will have a rotor diameter of up to 298.6 ft and an overall height of up to 413.4 ft. Only the turbine rotors, blade, and nacelle (with associated gearbox/generator components) would be upgraded. PacifiCorp is not evaluating modifications to existing ancillary facilities and support structures, such as turbine tower sections, tower foundations, maintenance pads, on-site substations, collector lines, and operations and maintenance buildings. PacifiCorp will continue to engage the USFWS throughout the repower process.

If the Project terminates operations in the future, PacifiCorp would obtain the necessary authorization from the appropriate regulatory agencies to decommission the facilities. Generally, wind energy projects that are decommissioned contain a high "scrap value" due to the materials and equipment contained in the infrastructure (steel infrastructure, electric generators, and copper).

In general, the decommissioning of the Project may result in burial of foundations below an allowed depth, and any unsalvageable material would be disposed of at authorized sites. The soil surface would be restored as close as reasonably possible to its original contour. The Project substations may remain in place post-decommissioning, if required to be utilized for other purposes. If the buried/overhead power lines could not be used by PacifiCorp for other utility purposes, all structures, conductors, and cables would be removed unless otherwise allowed to remain in place.

Demolition or removal of equipment and facilities will meet applicable environmental and health regulations. Additionally, PacifiCorp may salvage economically recoverable materials or recycle Project materials for future uses.

4.0 Initial Site Assessment (ECPG Stage 1)

The Project was designed and developed prior to the issuance of the 2009 Eagle Permit Rule. The Project was constructed and became operational during and immediately after this rule was issued and prior to the release of the WEG (USFWS 2012), ECPG (USFW 2013b), and Final Eagle Rule (USFWS 2016). Due to this timing, this ECP document focuses primarily on the operational phase of the Project.

To support the initial site assessment, PacifiCorp initiated communication with the USFWS in 2008 (Appendix C). As referenced in a May 15, 2008 letter from USFWS, a meeting with PacifiCorp and the USFWS occurred on May 7, 2008 to discuss the Project and potential environmental concerns. The letter identified concern for bald and golden eagles and recommended continued communication with state and federal agencies during the Project development process. All available agency correspondences are provided in Appendix C.

Based on identified environmental concerns, PacifiCorp coordinated site-specific surveys to further assess the Project. Surveys included gathering publically available data on habitat and species presence (specifically greater sage grouse, big game, and eagles), conducting eagle use surveys, and nest surveys.

5.0 Site-specific Surveys and Assessments (ECPG Stage 2)

Information in this section addresses recommendations under Stage 2 of the ECPG (baseline surveys). Site-specific surveys were conducted based on communication with state and federal agencies. The ECPG (USFWS 2013b) was not published prior to initiating site-specific surveys; therefore, the survey methods described below did not meet the survey standards recommended

in the ECPG (USFWS 2013b) and Final Eagle Rule (USFWS 2016). This includes eagle use surveys and nest surveys.

The differences between the actual surveys conducted for the Project and the current USFWS data standards are as follows:

- All point count surveys conducted were all bird surveys (i.e., Avian use) not eagle specific surveys,
- Avian use surveys did not meet the 30% coverage of the minimum convex polygon,
- Survey points were selected using systematic random sample instead of a randomized method,
- Surveys were conducted for 20 min in duration as opposed to 60-min duration,
- Eagle flight data was not collected on a per minute basis,
- Surveys were not conducted for at least once a month for two full years,
- Surveys recorded all birds including both small and large birds instead of only recording eagle and large birds,
- Eagle nest surveys did not include a 10-mile Project buffer
- Data were not collected to specifically assess nest occupation and productivity,
- Surveys were not conducted via helicopters and/or did not included extended four hour ground observations at nests, and
- The number of seasonal nest surveys did not meet current USFWS recommendations in Region 6 which includes up to six nest surveys.

The eagle use standards recommended by the USFWS are required to inform the USFWS Collision Risk Model. As such, application of the baseline eagle data from the Project to the USFWS Collision Risk Model should be cognizant of potential biases (Section 7.0). The methods and results presented below represent the eagle use data collected during avian use surveys at the Project (Phase 1 and 2) and are provided to inform baseline conditions and risk assessments.

Because this is an operational Project, the baseline data are presented in this section to illustrate the available information that was used to inform the risk assessment during Project development, consistent with the ECPG; however, Section 9.0 below includes data from multiple years of post-construction monitoring, and these data are used to inform discussions on actual Project risk and future take predictions.

5.1 Pre-Construction Avian Use Surveys

During the spring, summer, fall, and winter of 2008 and 2009, pre-construction avian studies were conducted that included fixed-point avian use surveys, nest surveys, and prey base surveys (Johnson et al. 2009) to assess potential Project impacts. A summary is provided below to describe the eagle use data collected during the avian use-surveys conducted from June 4, 2008 through May 27, 2009 and the nest surveys conducted in spring 2009. The full technical report is provided in Appendix D.

5.1.1 *Avian Use Surveys*

5.1.1.1 Methods

Fixed point surveys were conducted using methods described by Reynolds et al. (1980). Ten 800-m radius points were selected to survey representative habitats and topography of the study area (Figure 6). The study area included both the Phase 1 and Phase 2 Project areas. The 10 800-m plots provided coverage of 22.9% of the area within one km of constructed turbines. All species of birds observed during surveys were recorded, and large bird flight paths were mapped. Surveys were conducted approximately weekly during the spring migration and early breeding season (March 16 to May 31, 2009; 103 surveys) and fall migration (September 1 to November 15, 2008; 110 surveys), and every two weeks during summer (June 1 to August 31, 2008; 69 surveys) and winter (November 16, 2008, to March 15, 2009; 58 surveys). Point count duration was 20 minutes (e.g., Hoover and Morrison 2005, Smallwood et al. 2009, Strickland et al. 2011). This resulted in approximately 34.33 total hours of survey effort in the spring, 36.67 in the fall, 23 in summer, and 19.33 total hours of survey in winter for a total of 113.33 total hours of survey effort. Surveys were conducted during daylight hours and survey periods were varied to approximately cover all daylight hours during a season. To the extent practical, each point was surveyed about the same number of times; however, the schedule varied in response to adverse weather conditions (e.g., fog and/or rain), which caused delays and/or missed surveys.

Locations of eagles were recorded on field maps by observation number. Flight paths and perched locations were digitized using ArcGIS. Approximate flight height and direction were recorded.

5.1.1.2 Results

A total of 340 20-min fixed point surveys were conducted. There were a total of 179 golden eagle observations in 145 groups and two observations of individual bald eagles (Figure 7). Golden eagles comprised approximately 8.8% of all observations. Golden eagles had the highest overall use of all raptor species observed in all seasons: summer 0.31, fall 0.25, winter 0.33, and spring 0.21 birds/800-m plot/20-min survey. At a spatial scale, Point 2 had the highest recorded eagle use (0.66 eagles/800- plot/20-min survey), followed by Points 6, 8, and 9 (0.36, 0.36, and 0.44, respectively). Point 2 is outside of the Phase 1 boundary. Detailed descriptions of all golden eagle observations are available in Table 4 and flight paths and perch locations are provided in Figure 7.

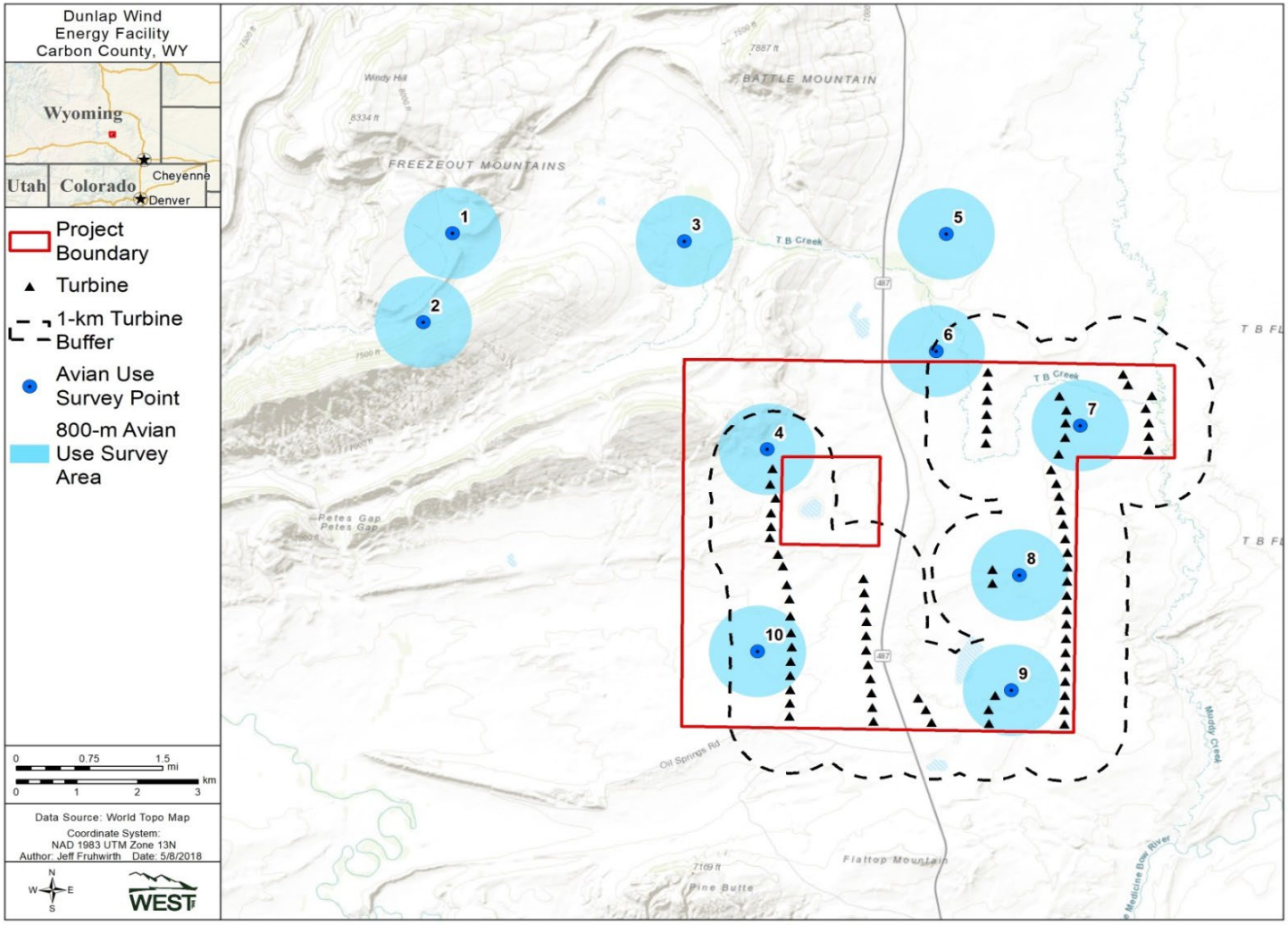

Figure 6. Fixed-point avian-use survey points at the Dunlap Project surveyed during Phase 1 and 2 evaluations. Figure includes a 1-km buffer from constructed turbines, the Project boundary (Phase 1 only), and turbine locations. These features are provided to illustrate the areas surveyed in comparisons to the final Project layout.

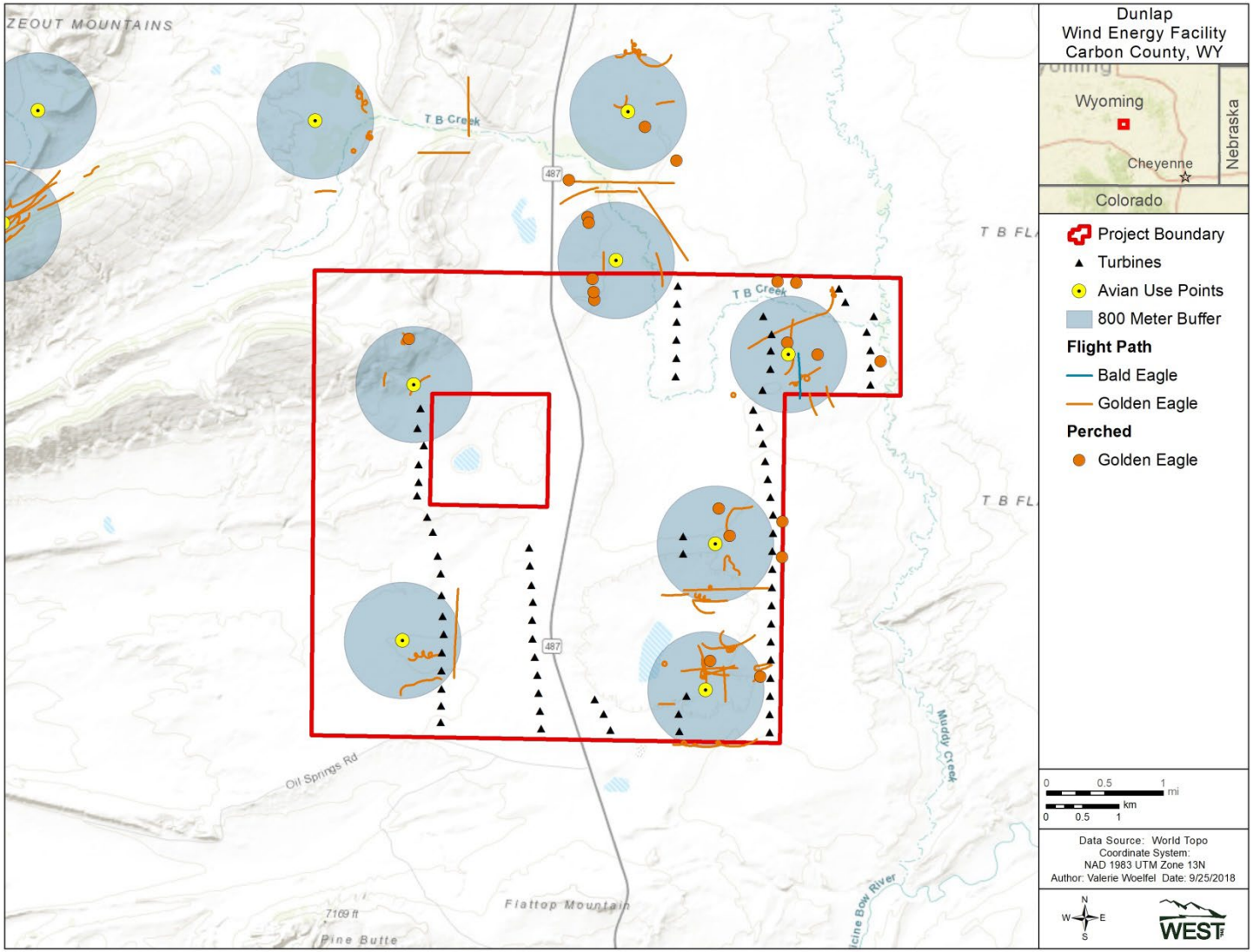

Figure 7. Bald and golden eagle flight paths and perch locations collected during the avian use surveys at the Dunlap Project. Only flight paths associated with survey points in the Project area were included in the CRM (Points 4, 6, 7, 8, 9, 10). Other flight paths/perch points are provided to illustrate the use area in comparisons to the final Project layout.

Table 4. Details of bald and golden eagle observations collected during the 2008/2009 avian use surveys at the Dunlap Phase 1 and 2 Project area, Carbon County, Wyoming. Note: Stations 1, 2, 3, and 5 are beyond the current Project boundary and as such were not included in the CRM discussed in Section 7.

Date	Station	# of Individuals	Age	First Activity*	Initial Flight Height (meters)	Initial Distance from Observer (meters)	Closest Distance from Observer (meters)
Bald Eagle							
4/18/2009	7	1	ADULT	FL	1	200	
5/3/2009	2	1	ADULT	GL	80	350	
Golden Eagle							
6/4/2008	3	1		SO	75	600	
6/4/2008	3	1		SO	75	700	
6/4/2008	8	3		OT		800	
6/30/2008	6	2		PE		600	
7/16/2008	8	1		FL	1	200	
7/16/2008	6	1		PE		450	
7/16/2008	1	1		SO	30	1000	
7/16/2008	3	1		GL	20	1000	
7/28/2008	8	1		SO	60	50	
7/28/2008	6	2		PE		700	
8/13/2008	5	1	MIXED	PE		175	
8/13/2008	2	5	MIXED	GL		400	300
8/13/2008	4	1		FL	20	1000	
8/13/2008	1	2		SO	20	1000	
8/13/2008	6	1		GL	60	1000	
8/13/2008	9	1		FL	5	1500	
8/27/2008	2	1	SUBAD ULT	GL	80	400	100
8/27/2008	2	2		SO	30	1000	800
9/3/2008	8	1		PE		900	
9/3/2008	1	1		PE		1000	
9/3/2008	2	1		FL	10	1000	800
9/3/2008	2	2		SO	20	1000	
9/3/2008	9	1		SO	20	3000	
9/7/2008	9	1		GL	125	0	
9/7/2008	2	1		GL	20	800	
9/7/2008	5	1		PE		900	
9/7/2008	5	1		SO	50	1000	
9/7/2008	7	2		PE		1000	
9/7/2008	8	1		SO	40	1000	
9/7/2008	9	1	SUBAD ULT	SO	20	1000	800

Table 4 (*continued*). Details of bald and golden eagle observations during the 2008/2009 eagle use surveys at the Dunlap Phase 1 and 2 Project area, Carbon County, Wyoming. Note: Stations 1, 2, 3, and 5 are beyond the current Project boundary.

Date	Station	# of Individuals	Age	First Activity*	Initial Flight Height (meters)	Initial Distance from Observer (meters)	Closest Distance from Observer (meters)
9/7/2008	9	2		SO	125	1000	
9/7/2008	1	7		FL		6000	2000
9/17/2008	7	1		GL	100	700	
9/17/2008	9	1	ADULT	FL	12	750	
9/17/2008	5	1		FL	10	1000	
9/17/2008	7	1		FL	12	1000	
9/24/2008	7	1		PE		100	
9/24/2008	6	1		PE		500	
9/24/2008	2	1		GL	20	500	
9/24/2008	6	1		PE		800	
9/24/2008	5	1		PE		900	
9/24/2008	6	2		PE		1000	
9/24/2008	7	1		SO	80	1000	
9/24/2008	9	1	ADULT	SO	12	1000	800
9/24/2008	9	1		SO	40	1000	
9/24/2008	9	1		SO		2000	
9/30/2008	10	1	ADULT	FL	10	300	
9/30/2008	6	2		PE		700	
9/30/2008	2	3		GL		800	100
9/30/2008	7	1		FL	3	1000	
9/30/2008	3	4		SO		1000	
9/30/2008	3	1		FL	10	1000	
9/30/2008	3	1		FL		1000	
9/30/2008	2	1		SO	60	1000	
9/30/2008	10	1		FL	15	1000	
9/30/2008	10	1		SO	150	1000	
9/30/2008	10	1		SO	75	1000	
9/30/2008	1	1		PE		2000	
10/7/2008	9	1		FL	2	700	
10/7/2008	8	1		HO	10	1000	
10/7/2008	7	1		PE		1000	
10/15/2008	7	1		PE		0	
10/15/2008	2	1		FL	90	400	150
10/15/2008	5	2	MIXED	FL		800	
10/15/2008	9	1		SO	50	1200	
10/15/2008	9	1		SO	30	2000	
10/21/2008	2	1		GL	10	350	
10/21/2008	9	1		FL	1	500	
10/21/2008	7	1		FL	1	850	

Table 4 (*continued*). Details of bald and golden eagle observations during the 2008/2009 eagle use surveys at the Dunlap Phase 1 and 2 Project area, Carbon County, Wyoming. Note: Stations 1, 2, 3, and 5 are beyond the current Project boundary.

Date	Station	# of Individuals	Age	First Activity*	Initial Flight Height (meters)	Initial Distance from Observer (meters)	Closest Distance from Observer (meters)
10/21/2008	8	1		FL	6	900	
10/30/2008	8	1		PE		250	
10/30/2008	4	1		PE		700	
11/10/2008	9	1		PE		300	
11/10/2008	6	1		PE		600	
11/10/2008	8	1		PE		900	
12/9/2008	4	1	ADULT	FL	10	400	400
12/9/2008	4	1	ADULT	FL	6	600	600
12/13/2008	8	1	ADULT	FL	3	200	
12/13/2008	7	1	JUVENILE	FL	5	400	400
12/13/2008	3	2		FL	100	700	
12/13/2008	5	1	ADULT	SO	200	800	800
12/13/2008	3	2		FL	75	800	800
12/13/2008	10	2	ADULT	FL	6	800	600
1/16/2009	9	1		PE		400	400
1/16/2009	9	1		FL		500	250
1/16/2009	9	1		FL	10	800	600
2/7/2009	7	1	ADULT	FL		300	50
2/24/2009	9	1		FL	8	400	300
3/3/2009	9	1	ADULT	FL	15	200	200
3/3/2009	8	1		FL	12	500	250
3/3/2009	9	2		FL	15	700	700
3/19/2009	5	1		FL	5	200	150
3/19/2009	5	1		FL	10	700	650
3/19/2009	4	1		SO	40	1500	
3/19/2009	2	1		FL	20	1500	
3/19/2009	4	1		SO	35	2000	
3/19/2009	6	2	ADULT	FL	15	2500	
3/19/2009	6	1		FL	30	2500	
3/19/2009	1	1		FL	15	2500	
3/19/2009	1	1		SO	100	2500	
3/19/2009	7	1		FL	15	3000	
3/19/2009	3	1		FL	2	3000	
3/19/2009	4	1		SO	75	5000	
3/24/2009	4	1		FL	10	125	50
3/24/2009	6	1		FL	1	900	
3/24/2009	4	1		FL	20	1000	
3/24/2009	7	1		GL	3	1500	
3/24/2009	4	1		SO	75	1500	
3/24/2009	10	1	ADULT	FL	1	2000	

Table 4 (*continued*). Details of bald and golden eagle observations during the 2008/2009 eagle use surveys at the Dunlap Phase 1 and 2 Project area, Carbon County, Wyoming. Note: Stations 1, 2, 3, and 5 are beyond the current Project boundary.

Date	Station	# of Individuals	Age	First Activity*	Initial Flight Height (meters)	Initial Distance from Observer (meters)	Closest Distance from Observer (meters)
3/24/2009	8	1		GL	5	2000	
3/29/2009	6	1		FL	2	500	
3/29/2009	8	1		PE		550	
3/29/2009	9	1		GL	5	1000	
3/29/2009	9	1		SO	5	1000	
3/29/2009	9	1		PE		1250	
4/11/2009	9	1		FL	10	300	
4/11/2009	7	1		FL	100	700	
4/11/2009	8	1		GL	75	800	600
4/11/2009	5	1		PE		1000	
4/11/2009	8	1		SO	60	2000	
4/18/2009	2	1		GL	80	100	0
4/18/2009	7	1		PE		400	
4/18/2009	9	1		HO	10	700	
4/18/2009	10	1	ADULT	GL	75	1000	750
4/21/2009	2	1	ADULT	GL	150	0	
4/21/2009	3	1		SO	125	700	
4/21/2009	7	1		SO	40	1000	
4/21/2009	8	1		FL	15	1000	800
4/21/2009	1	1		GL	5	1500	
4/26/2009	5	2		FL		400	
4/26/2009	6	1		FL	5	1000	
4/26/2009	2	2		GL	10	1000	
4/26/2009	9	1		HO	5	2500	
5/3/2009	8	1		PE		1250	
5/10/2009	8	1	SUBADULT	PE		80	
5/10/2009	3	1		SO	10	1000	
5/10/2009	7	1		PE		1250	
5/10/2009	7	1		FL	15	1250	
5/10/2009	6	1		FL	25	1500	800
5/18/2009	8	1		SO	125	0	
5/27/2009	6	1		FL	50	300	200
5/27/2009	5	1		SO	20	1500	
5/27/2009	1	1		GL	15	2000	
5/27/2009	3	1	ADULT	FL	5	2500	
5/27/2009	5	1		SO	125	3500	

*Activities include perched (PE), soaring (SO), gliding (GL), flapping (FL), hovering (HO), and other (OT).

5.1.2 *Eagle Nest Surveys*

5.1.2.1 Methods

Aerial nest surveys were completed in the spring of 2009 throughout the proposed Project area (Phase 1 and 2) and a surrounding one-mile buffer as well as within a one-mile buffer of the proposed transmission line. To supplement the fixed-wing aerial surveys, comprehensive ground surveys were completed by visually inspecting areas of suitable habitat (e.g., trees, cliffs, rocky outcrops and other potential nest structures). Universal Transverse Mercator (UTM) coordinates, as well as nesting substrate and current status (i.e., inactive, active, incubating, young in nest), were recorded for each nest located.

5.1.2.2 Results

One active golden eagle nest was found during the 2009 raptor nest surveys (Figure 8). The nest had an incubating adult. No follow up surveys were completed to determine nest success or productivity. No other eagle nests were identified during pre-construction surveys.

For additional information on eagles nest surveys and results for the Project please see section 9.4 Nest Surveys.

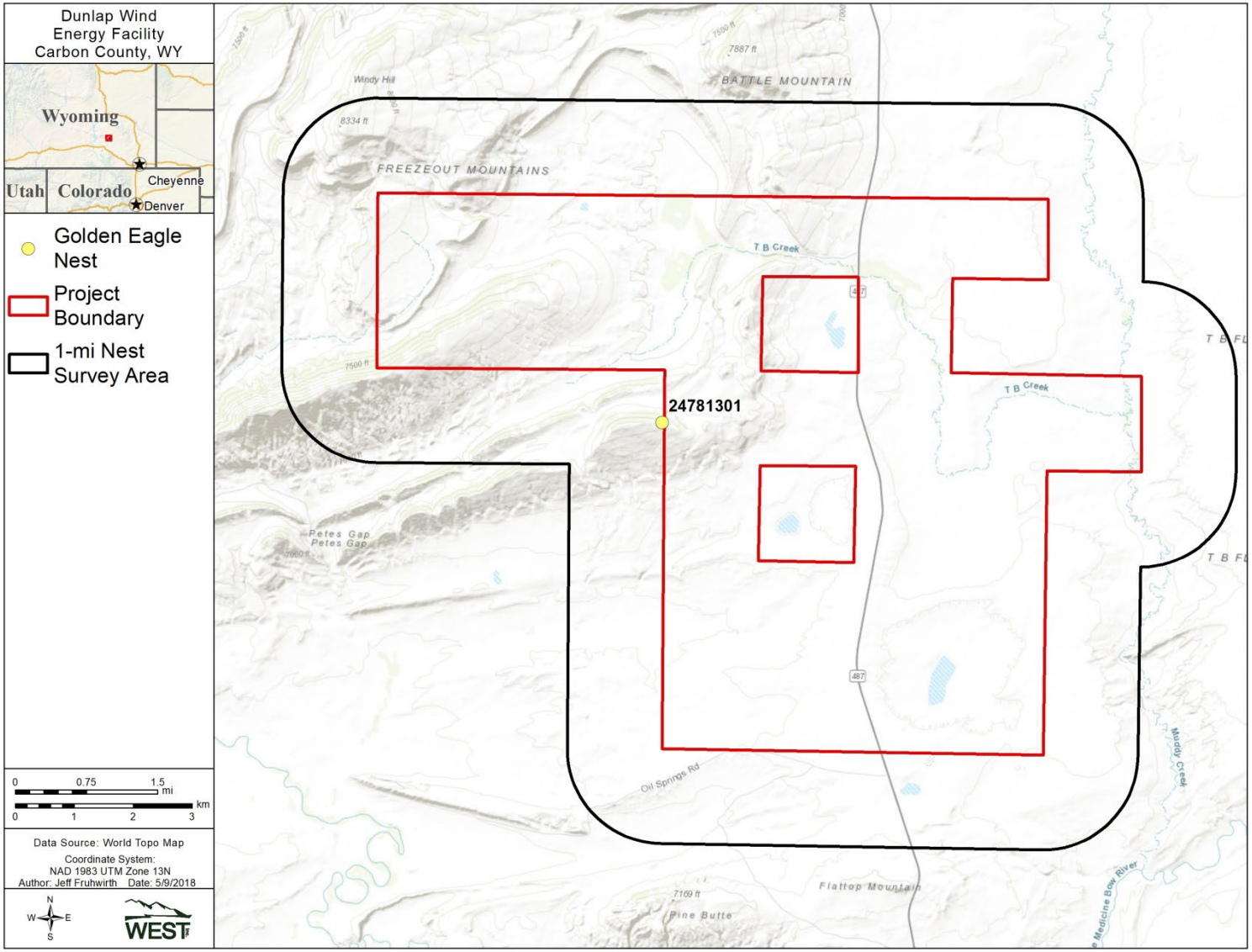

Figure 8. Location of eagle nest found in 2009 at the Dunlap Project and 1-mile buffer from the Phase 1 and Phase 2 boundaries, Carbon County, Wyoming. Nest was identified as active (incubating adult) in 2009.

5.1.3 *Prey Base Assessments*

5.1.3.1 Sage Grouse

Since greater sage-grouse provide a source of prey for eagles, the results of greater sage-grouse surveys are summarized in this section. Sage-grouse lek surveys were competed with an objective of locating leks in the Project area and a 4-mile (6.4-km) buffer of the proposed Project area. This area included the proposed Phase 1 and Phase 2 boundaries (Figure 8). The locations of known historic and existing greater-sage grouse leks in the Project and the 4-mile buffer were obtained from the WGFD. To search for undocumented or new leks, five surveys were conducted for greater sage-grouse in spring 2009, according to the present time WGFD protocols: four ground counts and one aerial survey. The aerial survey was conducted on April 24, 2009, from a fixed-wing aircraft and the four ground counts were conducted at the Project between April 21 and May 10.

Three historic WGFD leks were located within four miles of the survey area, one occupied and two unoccupied (Figure 8). However, no sage-grouse were observed on these three leks during any of the field surveys performed in 2009.

The Wyoming Executive Order (WGFD 2014) did not exist during the initial site assessment stage; however, the Project area is approximately six miles north of the nearest greater sage-grouse core population area (Figure 9). The core areas identify the most important sage grouse habitat in the state and are afforded additional protection under the Executive Order (WGFD 2014).

5.1.3.2 Big Game

Pronghorn may also be considered prey for golden eagles. Range maps for pronghorn were developed as part of the baseline assessments (Johnson et. al 2009). The WGFD data showed crucial winter range across most of the Project area. The far western portion of the Project boundary was not classified as pronghorn range. These data were used to support additional big game evaluations, but were not specifically used to assess eagle risk at the Project. During the pre-construction surveys 4,006 pronghorn and 1,748 elk were observed incidentally (Johnson et al. 2009).

5.1.3.3 Other Prey

Avian point count surveys did document waterfowl and waterbird use in the Project area. Waterfowl are known prey for bald eagles. Waterbird use was limited and did not compose species likely to be predated by eagles (e.g. American white pelicans [*Pelecanus erythrorhyncos*]). Waterfowl use did not appear to be associated with any water features located in the Project area, as most of the waterfowl use occurred in spring in the northeast Project area (Johnson et al. 2009).

No additional prey surveys were conducted prior to construction to specifically evaluate eagle use and associated risk at the Project. In a July 10, 2009 letter from the USFWS Wyoming Field Office, USFWS provided PacifiCorp with the recommendation that wind turbines not be located in or near

prairie dog towns; however, prairie dog surveys were not conducted prior to Project construction. Prairie dog surveys did occur after the Project was constructed (Section 9.0) and mapped active prairie dog colonies scattered across the Project area (Figure 17). Additionally, livestock activities have occurred at the Project during pre-construction and operational periods. These activities included seasonal cattle grazing.

5.2 Bald and Golden Eagles

Both bald and golden eagles are known to occur within the Project area; in particular, golden eagles are present year round and bald eagles are present less frequently. Discussion of habitat and observations about bald and golden eagles in the vicinity of the Project are provided below.

5.2.1 *Bald Eagle*

Three bald eagles were observed on the Project during the 2008-2009 pre-construction avian surveys: two were observed during fixed-point avian use surveys in spring and one was observed incidentally in August (Johnson et al. 2009). Bald eagle nesting habitat (e.g., trees in proximity to large waterbodies) is not present in the Project and foraging habitat is minimal. No communal bald eagle roosts or habitat for such roosts exist in the Project area.

5.2.2 *Golden Eagle*

Golden eagles occur in the Project area, and had the highest use of any raptor species during the pre-construction avian use surveys. One golden eagle nest was identified as active within one mile of the Project boundary during the pre-construction nest survey (Figure 8). The turbine layout was not finalized at the time of the survey; however, based on the final construction locations, the nest was just over one mile from the closest turbine. Suitable golden eagle foraging habitat is available in and surrounding the Project. The Project lies on the edge of the Shirley Basin, where colonial prey species (i.e., prairie dogs) are very abundant and wide spread. Additionally, lagomorphs have been observed in the Project area. No trees exist in the Project, but some artificial perch locations (i.e., power poles, fence posts, etc.) do occur. Other potential nesting habitat exists outside of the Project in the form of cliffs, trees, and man-made structures. No known communal roosts have been identified within the Project area.

5.3 Eagle Risk Categorization

Risk to eagles at the Project was identified based on pre-construction avian use data collection. The avian use survey documented eagle use, specifically golden eagles, in the Project area. Nest surveys documented a golden eagle nest one-mile from the Project. Additional data evaluation identified prey sources in the Project area and perch opportunities. Based on the site-specific surveys, minimization measures were established to reduce the risk to eagles.

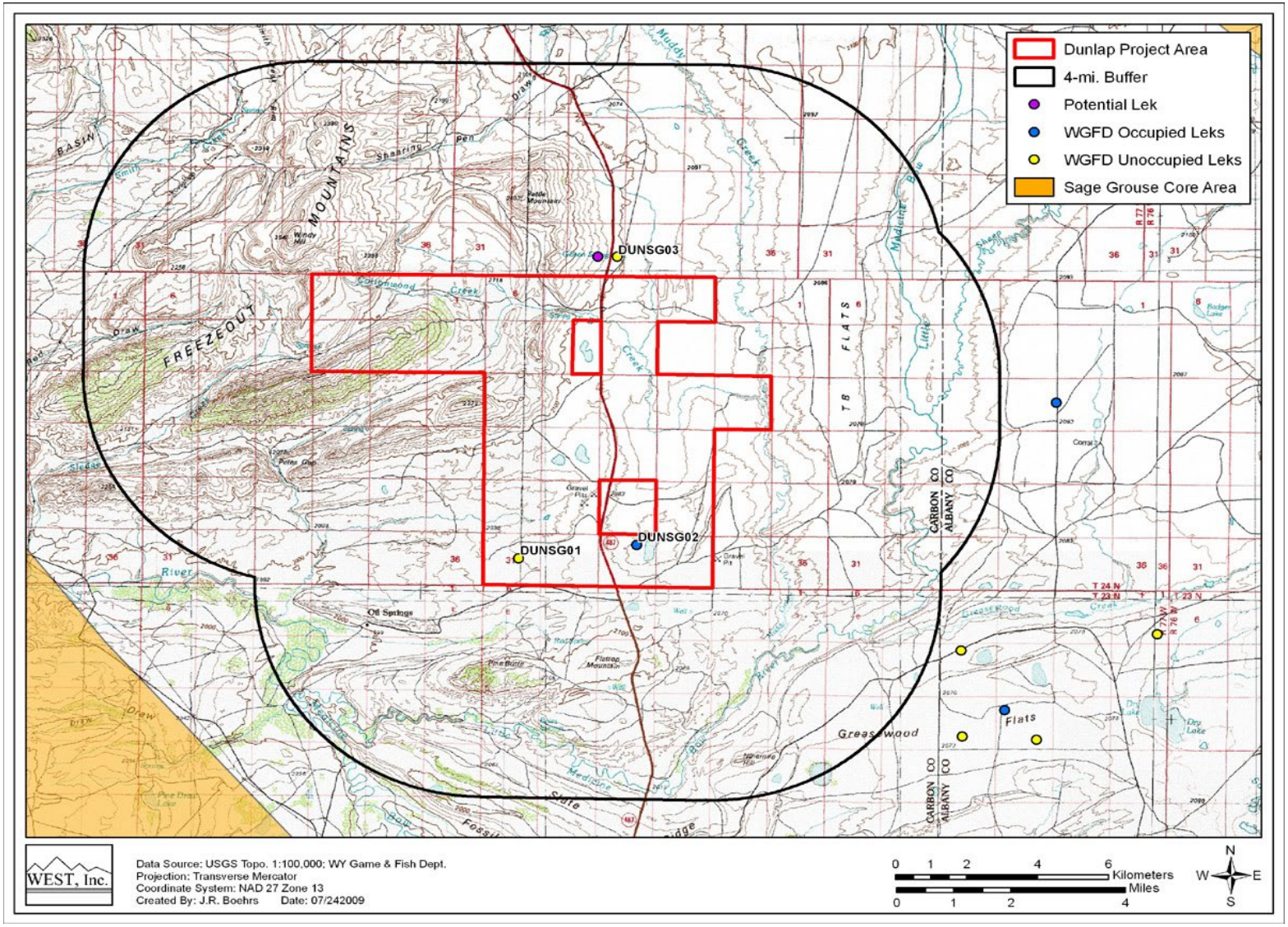

Figure 9. Greater sage-grouse core use habitats and location of greater sage-grouse leks in relation to the Dunlap Project Area (Phase 1 and 2), Carbon County, Wyoming.

6.0 Avoidance and Minimization of Risks in Project Siting (ECPG Stage 4)

In accordance with the Reg. 6 ECP Guidance, this section includes information on avoidance and minimization of risks during project siting and design. Information in this section also addresses recommendations under Stage 4 of the ECPG.

Throughout Project development, PacifiCorp evaluated and adopted conservation measures to avoid and minimize impacts to eagles. These conservation measures were and will be incorporated into the infrastructure layout and design, construction/clean-up, operations, and decommissioning/restoration plans for the Project. This section provides a summary of the conservation measures developed during site selection and Project design. Conservation measures that were implemented during construction, are being implemented during operations, and will be implemented during decommissioning/restoration are included in Section 8.0 below.

6.1 Site Selection and Project Design

- Project siting and design plans were shared and discussed with USFWS and WGFD in meetings on May 7, 2008 and June 12, 2009. These communications were documented in USFWS response letters dated May 15, 2008 and July 10, 2009 (Appendix C).
- Multiple turbine and associated infrastructure alignments were evaluated during the Project siting and design process. Part of the siting and design evaluation included removing turbines in an effort to avoid and minimize Project impacts to eagles. Turbines were also removed from initial layouts due to roadway setbacks, engineering input, and other siting considerations. While these modifications did not specifically target minimization of risk to eagles, the reduction of constructed turbines did result in a risk reduction.
    - An initial *maximum capacity turbine layout* was prepared for the Dunlap 1 and 2 projects that included 243 turbines (Figure 10). Of these, 142 of the turbines were initially sited in Phase 1. This initial layout did not consider wind resources, roadway setbacks, or environmental resources. The Project was ultimately scaled back to 74 turbines (Figure 5) based on a number of factors, including avoidance and minimization to eagles.
- After discussions with USFWS and WGFD, turbine locations were removed and PacifiCorp determined disturbance-free buffers be maintained for the known eagle nest.
    - Figure 11 demonstrates a preliminary Project design that did not include a disturbance-free buffer for an eagle nest. Figure 12 demonstrates the modified turbine layout design that removed 14 turbines from the preliminary Phase 1 Project design to create a disturbance-free eagle nest buffer. PacifiCorp established a one-mile nest buffer to minimize nest disturbance. USFWS acknowledged that PacifiCorp's buffers and turbine siting was in accordance with the general recommendations from USFWS to avoid disturbing raptor nests; however, USFWS also recommended additional evaluations to better understand

eagle movement throughout the site to further inform nest buffers beyond the standard (USFWS letter dated July 10, 2009; Appendix C). PacifiCorp did not conduct the additional pre-construction evaluations beyond what has been presented in this document.

- Turbine siting also evaluated greater sage-grouse habitat and lek locations that represent a concentrated eagle prey source, by buffering active leks and identifying and avoiding areas mapped as containing sagebrush communities.
    - No turbines were constructed in a 0.25-mile disturbance free buffer and a 2-mile buffer was identified as a controlled surface area (Figure 13). Because leks are attractive to eagles, establishing a buffer around leks was intended to reduce potential impacts to eagles in a known concentration area.
    - Twelve turbines identified as Phase 1 - Alternative (Figure 14) were removed from the final Project design (Figure 5). This turbine string was aligned through a moderate density sagebrush community and would likely have resulted in greater risk to eagles.
- In addition, the location of the transmission line was modified to concentrate impacts within an existing transmission line corridor. Figure 12 demonstrates the original transmission line alignment (solid blue line), while Figure 5 shows the final alignment. The transmission line alignment modification was supported by the USFWS in a letter dated July 10, 2009 (Appendix C).
- The Project incorporates state-of-the-art turbine technology, including unguyed, tubular towers and slow-rotating, upwind rotors.
- The Project implemented APLIC (2006) recommendations (e.g. a minimum of 150 centimeters [cm; 60 in] of horizontal separation between energized and/or grounded parts and 100 cm [40 in] of vertical separation and insulation or covering of exposed energized or grounded parts into overhead lines constructed for the Project to minimize electrocution risks to eagles).

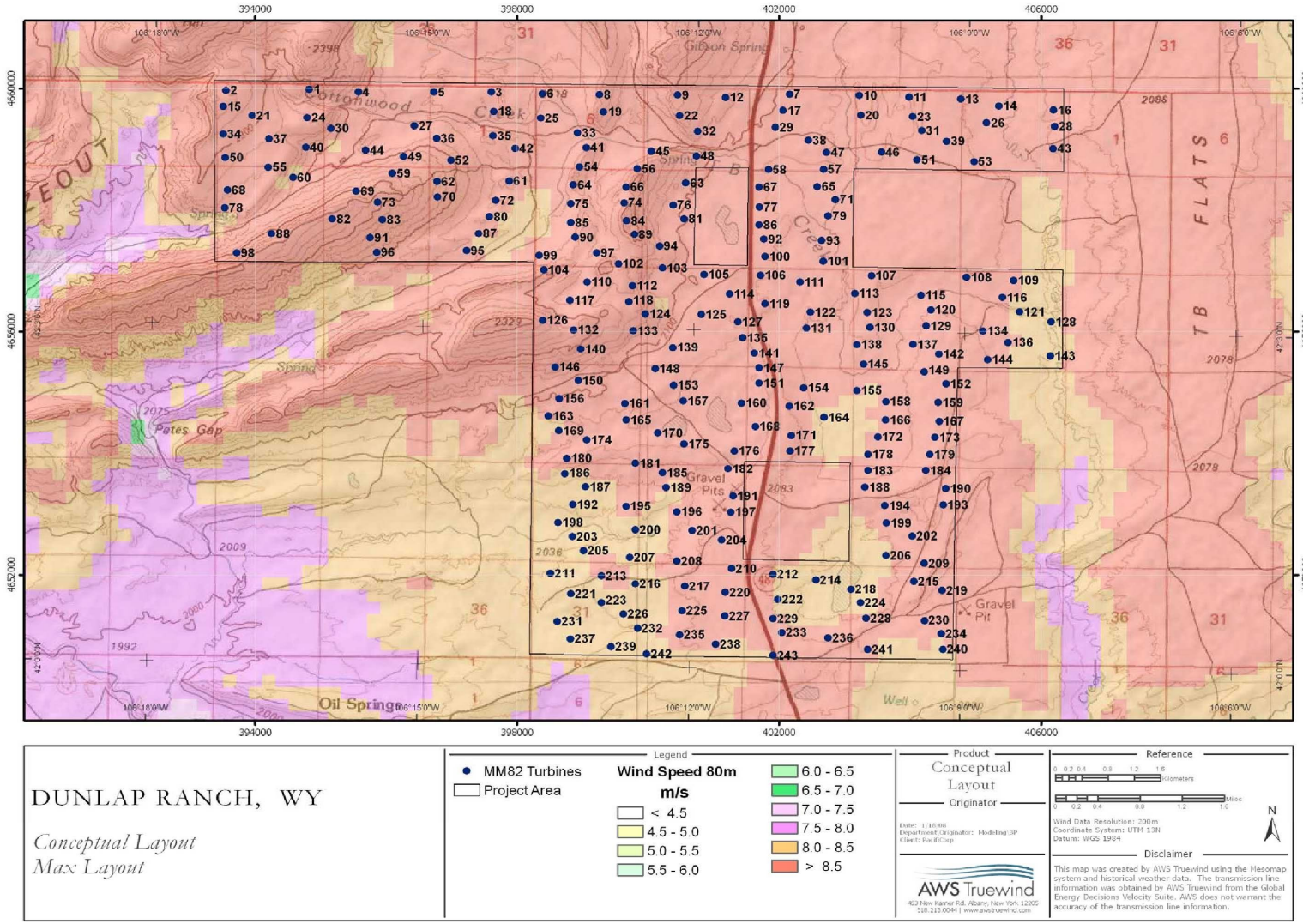

Figure 10. Maximum layout Project design for the Dunlap 1 and 2 Projects, Carbon County, Wyoming.

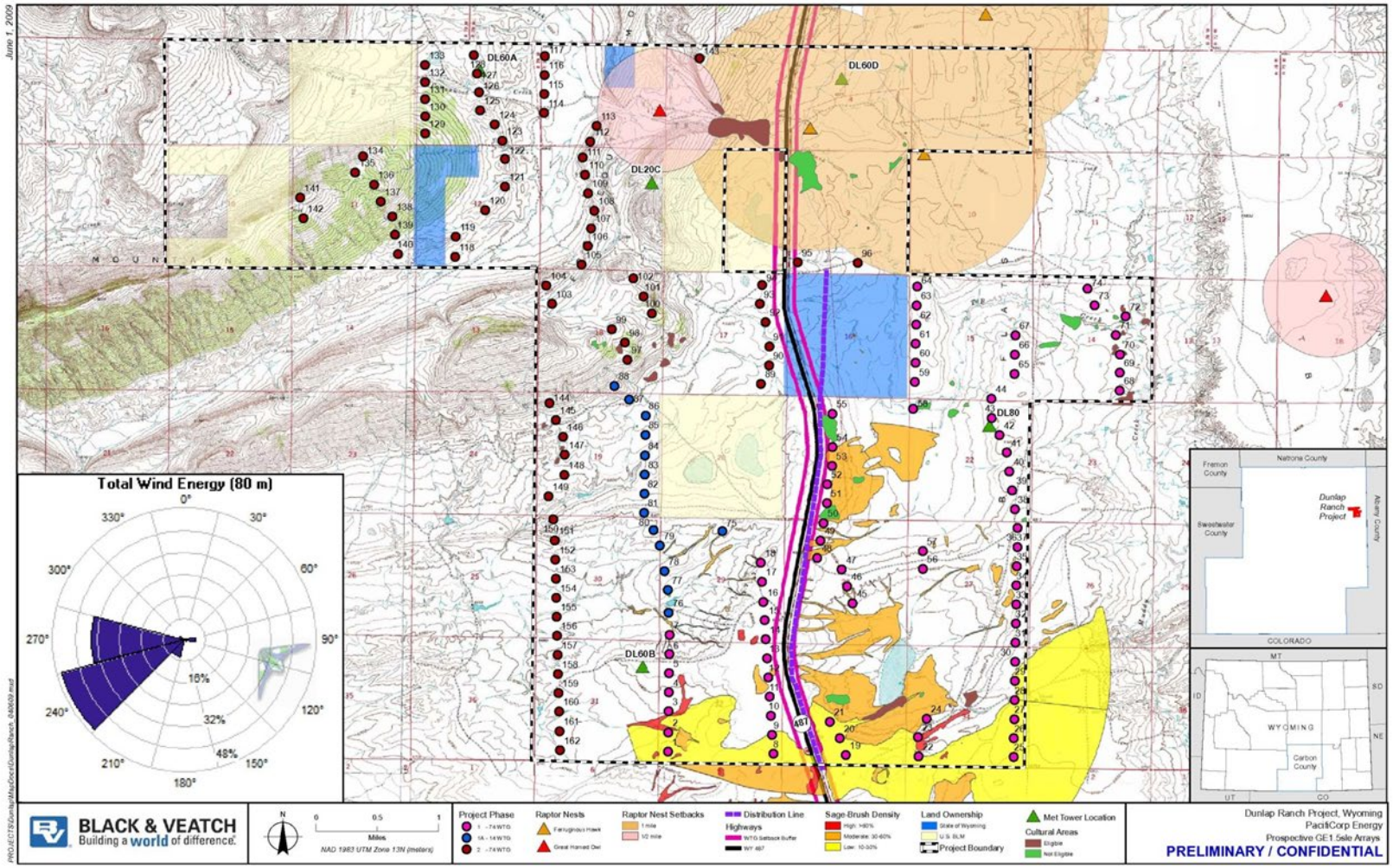

Figure 11. Preliminary Project design for the Dunlap 1 and 2 Projects, Carbon County, Wyoming.

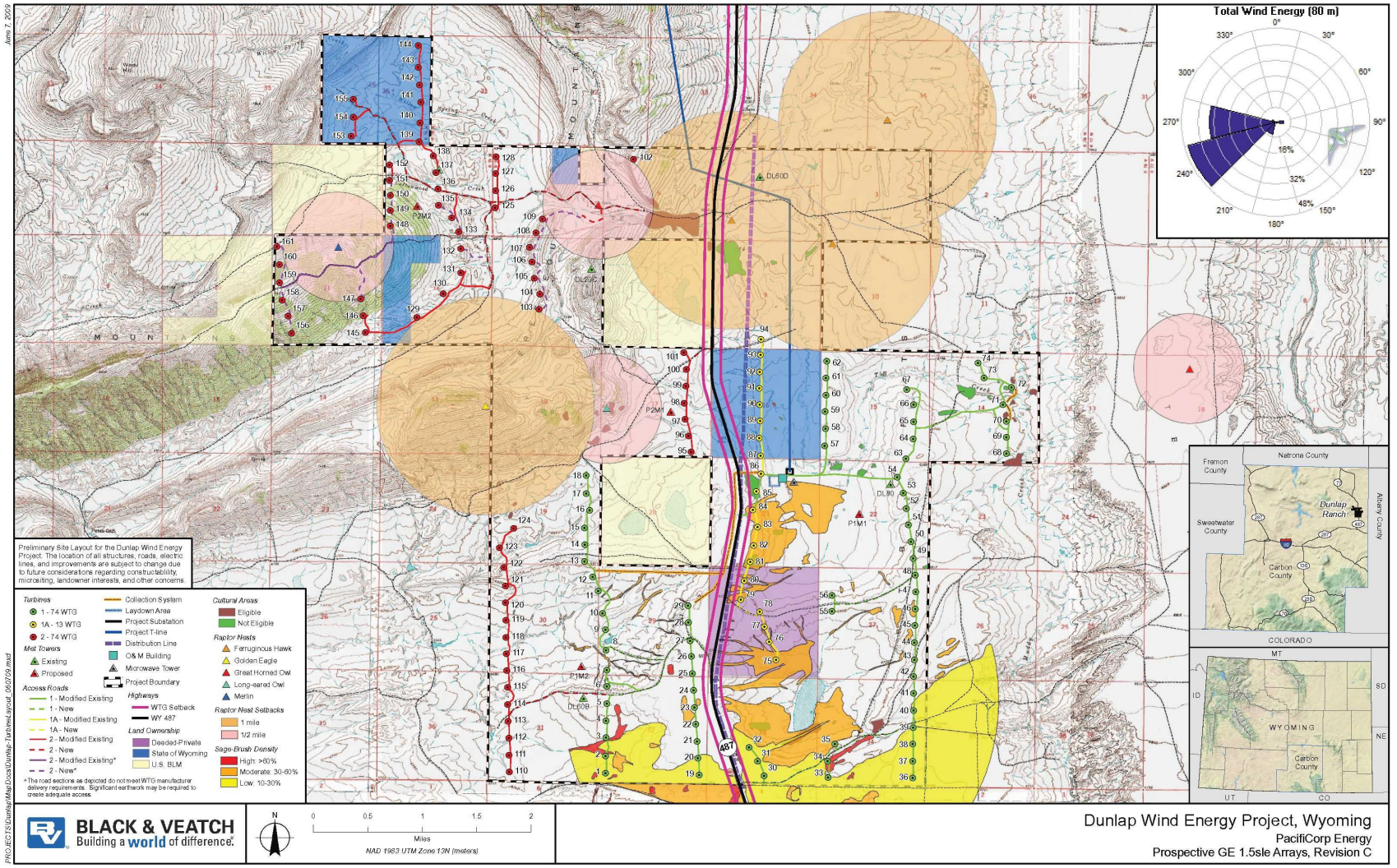

Figure 12. Modified Project design that implemented measures to avoid and minimize potential impacts to eagles at the Dunlap 1 and 2 Projects, Carbon County, Wyoming. Note the removal of 14 Phase 1 turbines within the eagle nest buffer.

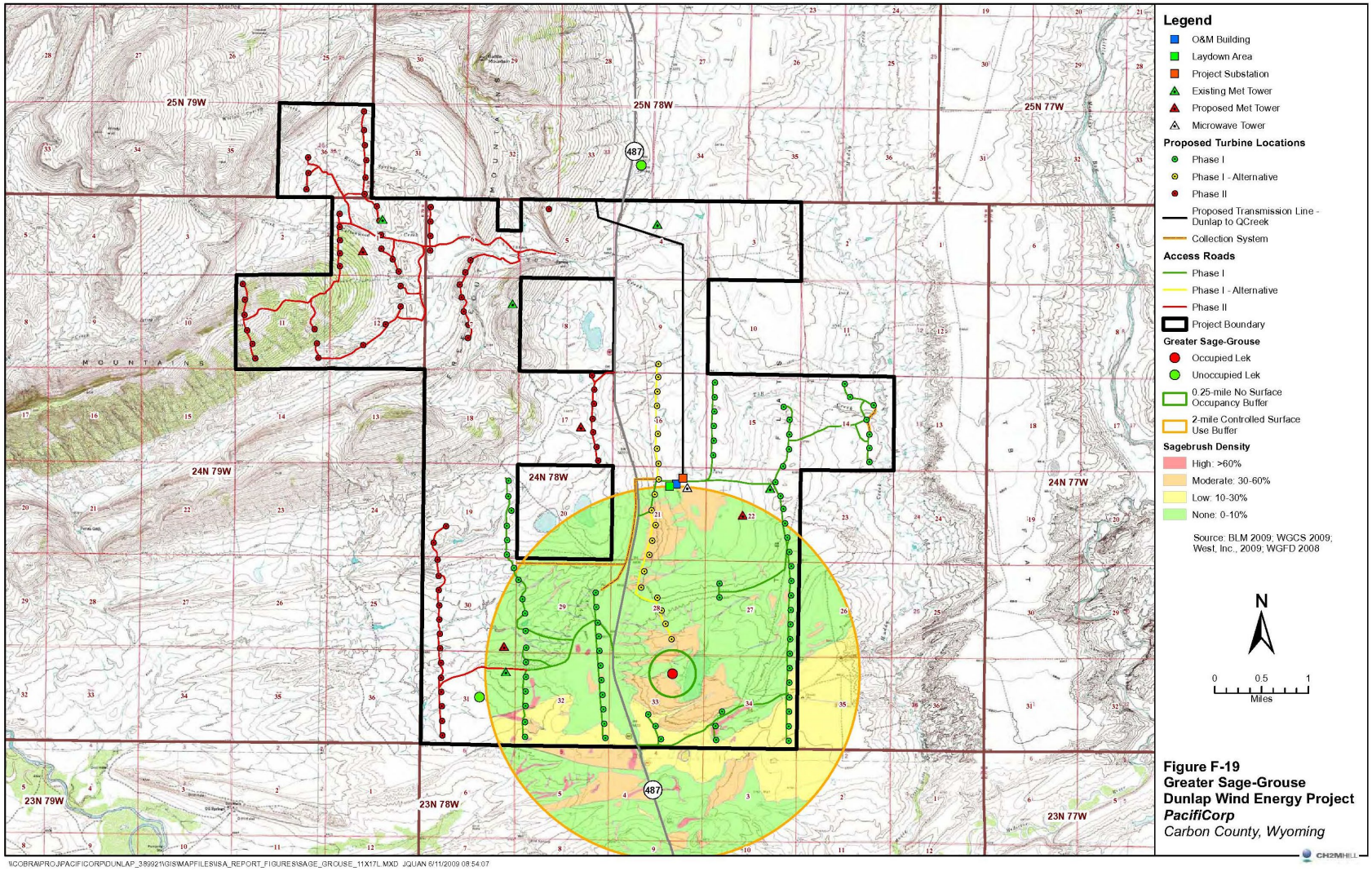

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Figure 13. Project design for the Dunlap 1 and 2 Projects, Carbon County, Wyoming that shows the no surface occupancy sage-grouse lek buffer (0.25 miles), the controlled surface use or seasonal use restriction buffer (2 miles), and sagebrush density.

7.0 Predicting Eagle Fatalities (ECPG Stage 3)

This section includes a risk assessment for the Project based on the pre-construction eagle use data that was collected at the Project during avian use surveys. Information in this section addresses recommendations under Stage 3 of the ECPG. As stated above, the data used to inform the USFWS Collision Risk Model were not collected under the ECPG (USFWS 2013b) or Final Eagle Rule (USFWS 2016) data standards. Readers should be cognizant of the potential limitation of the results provided below. An updated risk assessment and associated fatality prediction that incorporates the post-construction mortality monitoring data from the Project is included in Section 9.0 , and therefore may be more representative of the Project's risk to eagles.

7.1 USFWS Mortality Modeling

Pre-construction eagle data for the Project that was collected during avian use surveys has been used to provide golden eagle and bald eagle mortality predictions under the current USFWS Collision Risk Model (USFWS 2013b). The 2016 USFWS eagle rule allows project proponents to use any credible, scientifically peer-reviewed model. In addition to the USFWS prior collision correction factor, this ECP uses the Bay et al. 2016 prior collision correction factor within the USFWS Collision Risk Model to allow comparisons between a range of potential eagle risk predictions. The results of the modeling efforts based on pre-construction data are provided to allow for calibration and updating of the modeled eagle mortality through the use of the post-construction and ongoing monitoring efforts (see Section 9.0 below). It is understood that the USFWS will independently determine the appropriate level of take for this Project.

The pre-construction avian-use data collection effort for the Project pre-dates the USFWS ECPG and 2016 eagle permit rule data standards and data inputs for this analysis vary from standard inputs in the following ways:

Table 5. Comparison between USFWS data standards and baseline surveys conducted for the Project.

USFWS Collision Risk Model Assumptions	Dunlap Wind Project Use Survey Methods
≥ 1-hr surveys	20-minute surveys
Number of eagle minutes recorded	Number of eagles observed recorded
Two years of eagle-use surveys	One year of all bird use surveys
Minimum 30% of project footprint surveyed	~23% of the area within 1-km of constructed turbines surveyed
All points sampled each month	Sample points surveyed weekly in spring/fall; every other week in summer/winter
Survey points randomly selected	Points established to provide coverages across the Project in representative habitats and topography

Acknowledging that the avian use survey data were not collected per standards in the ECPG and Final Eagle Rule, it was considered informative to run the fatality model with the eagle use data collected in 2008-2009 and then to compare that information to the analyses of fatality estimates

derived from the mortality monitoring data (see Section 9.0 below). To obtain an estimate of bald and golden eagle mortalities at the Project using the USFWS methodology, the following information was used for each eagle species: 1) the number of eagle observations within 800 m of observers and below 200 m AGL at points within a 1-km buffer of constructed turbines (see Figure 6, all eagle data from points 4, 6, 7, 8, 9, 10 were included in analysis) ; 2) estimated daylight hours of facility operation within a year; 3) the number of turbines and rotor radius of the turbines at the Project; and 4) the prior Bayesian collision correction factor as recommended by the USFWS (2013b) as well as an alternative collision correction factor as presented in Bay et al. 2016 that is based on pre- and post-construction golden eagle surveys conducted at 26 modern wind energy facilities. A total of 70.67 hours of pre-construction avian use surveys were completed at the Project. There were a total of 27 individual golden eagle observations recorded during the studies at or below 200 m within 800 m of observers at survey points within a 1-km buffer of Project turbines. Zero individual bald eagles were recorded during the studies at or below 200 m and within 800 m of observers at survey points within a 1-km buffer of Project turbines.

Exposure rate (λ), as defined by the USFWS (2013b), is the expected number of flight minutes below 200 m per daylight hour across the surveyed area (km^2). Avian use surveys at the Project were conducted prior to release of the ECPG and, as a result, eagle observations were not conducted on a per-minute basis and the total minutes eagles were observed in flight were not recorded. In this modeling approach, we assumed one minute of eagle flight time per eagle observation. Based on this, a total of 27 golden eagle flight minutes and zero bald eagle flight minutes were recorded within fixed-point plots that covered the sampled portion of the Project during 70.67 survey hours (Table 6). The exposure rate and subsequent collision prediction will increase if more than one minute per eagle observation is assumed or if all of the survey points are included in the analysis. Additionally, there is bias using eagle risk minutes resulting from general avian surveys methods versus large bird only methods to inform the CRM and as such, results should be interpreted with caution. PacifiCorp understands the USFWS – Region 6 may choose to apply a different approach to informing the model based on the methods and data collected.

A $Gamma(\alpha = 0.97, \beta = 2.76)$ prior distribution with mean (0.35) and standard deviation (0.357) has been recommended by the USFWS for the exposure prior. Posterior exposure distributions of eagle use at the Project were estimated as $Gamma$ distributions with the α parameters equal to the sum of the prior α and total flight minutes below 200 m, and the β parameters equal to the sum of the prior β and effort (hours of surveys x km^2 of area surveyed). This resulted in a posterior distribution for the golden eagle exposure rate at the Project of *Gamma* (27.97, 144.84) with mean 0.193 golden eagle flight minutes observed per hour of survey per km^2 (Table 6). The posterior distribution for the bald eagle exposure rate at the Project of *Gamma* (0.97, 144.84), with a mean 0.007 bald eagle flight minutes observed per hour of survey per km^2 (Table 6).

Table 6. Estimated exposure rate (λ) from golden eagle and bald eagle observations made during pre-construction avian use surveys at the Dunlap I Project, Carbon County, Wyoming.

Variable		Golden Eagle	Bald Eagle
1	Number of Surveys	213	213
2	Average Length of Surveys (hours)	0.33	0.33
3	Survey Hours	70.67	70.67
4	Survey Radius (meters)	800	800
5	Recorded Flight Minutes below 200 m at points	27	0
6	Eagle Flight Minutes (α : Line 5 + 0.97)	27.97	0.97
7	Effort (β ; survey hours x sq km of area surveyed+2.76)	144.844	144.844
8	Mean Exposure Rate (Line 6 / Line 7)	0.1931	0.0067

A facility-specific expansion factor is included to account for the hazardous area within the Project and this expansion factor is multiplied by the eagle exposure rate

$$\left(\frac{\textbf{eagle flight minutes}}{\textbf{hour} \cdot \textbf{km}^2}\right)$$

to estimate the potential annual eagle-wind turbine interactions (minutes of flight within the turbine hazardous area). The expansion factor also scales the exposure rate to daylight and/or operational daylight hours (τ) within a year across the total hazardous areas (δ_i) surrounding all proposed turbines (n_t; USFWS 2013b). For this modeling effort, an annual estimate of operational turbine hours during daylight was used. To calculate operational hours, Project specific turbine operational data were compiled from January 1, 2015 through April 14, 2017 and script was run to identify when turbine sensors were engaged (i.e., operational). These data were correlated with sunrise and sunset times for the latitude/longitude location associated with the Dunlap Operational and Maintenance building.

$$\varepsilon = \tau \sum_{i=1}^{n_t} \delta_i$$

The USFWS has defined the turbine hazardous area (δ_i) as the rotor-swept area around each turbine or proposed turbine location ($\textbf{km}^2$; USFWS 2013b). Expansion factors (ε) were calculated using annual daylight hours and the originally proposed turbine scenarios (Table 7). The repowered turbine specifications were not evaluated for this exercise.

Table 7. Expansion factors (ε) for the turbine layout at the Dunlap I Project, Carbon County, Wyoming. Turbine hazardous area = pi * turbine radius expressed in km^2. Expansion factor = Line 9 x Line 11 x Line 12.

Variable		GE 1.5 MW Turbine
9	Operating Time During Annual Daylight Hours	3586.55
10	Rotor Radius (meters)	38.5
11	Turbine Hazardous Area	0.005
12	Number of Turbines	74
13	Overall Expansion Factor	1235.89

The collision correction factor (collision probability; C) was defined as the probability of an eagle colliding with a turbine given each minute of eagle flight in the turbine hazardous area. The prior distribution for collision probability was developed by the USFWS using the four previous golden eagle mortality studies (Foote Creek Rim, Wyoming; San Gorgonio, California; Tehachapi, California; and Altamont, California) reported in Whitfield (2009). A mean of the estimated golden eagle flight minutes within the turbine hazardous area to recorded golden eagle collision events at those facilities was used to determine a $\mathrm{Beta}(2.31, 396.69)$ prior distribution for collision probability with mean of 0.00579 eagle fatalities per minute of flight in the turbine hazardous area, respectively (Table 8). WEST has also applied the model using an alternative collision correction factor developed from pre- and post-construction studies at 26 modern facilities (Bay et al. 2016). The Bay et al. (2016) collision prior is $\mathrm{Beta}(9.28, 3{,}224.51)$ for collision probability with mean of 0.00287 eagle fatalities per minute of flight in the turbine hazardous area (Table 8). The modeling efforts presented in this section do not incorporate site specific information into the collision probability; however, the modeling efforts in section 9.0 include information from the post-construction mortality monitoring to inform the modeling efforts.

Table 8 Collision correction factor (*C*) calculated as Line 14/(Line 14 + Line 15).

Variable		USFWS GOEA	Bay et al. 2016 Prior GOEA	USFW BAEA	Bay et al 2016. Prior BAEA
14	Prior Mortalities	2.31	9.28	2.31	9.28
15	Prior exposure events not resulting in mortality	396.69	3224.51	369.69	3224.51
16	Prior mean collision correction factor	0.00579	0.00287	0.00579	0.00287

Bay et al. 2016
USFWS=US Fish and Wildlife Service; GOEA=golden eagles

The USFWS collision risk model assumes that higher site-specific eagle flight activity will correspond to higher annual eagle mortality, once the wind energy facility is operational. Under this assumption, predictions of annual eagle mortality (F) were modeled as the pre-construction measure of eagle exposure (λ) within areas of potential eagle-wind turbine interactions (ε) multiplied by a collision correction factor (C):

$$F = \varepsilon \lambda C$$

Credible intervals (i.e., Bayesian confidence intervals) were calculated using a simulation of 10,000 Monte Carlo draws from the posterior distribution of eagle exposure (λ) and the collision probability distribution $(C;$ Manly 1991). The product of each of these draws, with the exposure area corresponding to turbine type was used to estimate the distribution of possible mortality at the Project. The upper 80th percentile of this distribution has been recommended by the USWFS as a conservative estimate of take for a proposed wind energy Project (USFWS 2013b).

Predicted golden eagle mortalities per year using the USFWS Bayesian Collision prior are 1.38 golden eagles/year (point estimate) and 2.04 golden eagles/year (upper 80th credible interval; Table 9). The predicted number of golden eagle mortalities per year using the Bay et al. 2016 collision prior is 0.68 (upper 80th = 0.89; Table 9).

Predicted bald eagle mortalities per year using the USFWS Bayesian Collision prior are 0.48 bald eagles/year (point estimate) and 0.07 bald eagles/year (upper 80th credible interval; Table 9). The predicted number of bald eagle mortalities per year using the Bay et al. 2016 collision prior is 0.02 (upper 80th = 0.04; Table 9).

Table 9. Eagle fatalities per year (F).

	Golden Eagle		Bald Eagle	
Variable	**USFWS**	**Bay et al. 2016 Collision Prior**	**USFWS**	**Bay et al. 2016 Collision Prior**
Estimated annual eagle fatalities	1.3817	0.6849	0.0479	0.0238
Upper 80th Credible Interval	2.0365	0.8850	0.0733	0.0376

Bay et al 2016

7.2 Other Impacts

7.2.1 *Habitat Loss, Degradation, and Fragmentation*

Construction of wind energy facilities also impact eagles and their prey, through habitat loss, degradation, or fragmentation. The removal of habitat and conversion of interior habitat to edge habitat during construction of turbines and associated facilities likely results in certain species being displaced from at least portions of habitat within the Project footprint. Construction of the 74-turbine Project resulted in the removal of approximately 72.2 acres of habitat for the substation, interconnection substation, O&M building turbine, crane pads, new access roads, and transmission line access roads (Table 3). The primary habitat lost was sagebrush steppe dominated by a mix of grassland and shrub communities. Temporary land disturbances resulting from the construction of the turbines and associated infrastructure include appropriately 205 acres. Temporary impacts included a laydown area and batch plant, widened new and existing roads, and ground disturbance associated with the underground collector system and temporary MET towers (Table 3). Temporary land disturbances have been reclaimed and re-vegetated so that natural succession could occur.

In addition to the direct ground-level impacts associated with this Project, the construction of the Project created a hazardous area (zone of risk) to eagles the can result in collisions with turbine

(as assessed in Section 7.1 above) or other vertical structures, electrocutions associated with above ground line, or impacts associated with the increased presence of vehicles and other equipment. Our current understanding of these additional impacts associated with Project features makes quantification of these impacts difficult; however, the potential for these impacts are recognized in this ECP.

7.2.2 *Disturbance/Displacement*

In addition to removing and degrading habitat, Project wind turbines may displace eagles and their prey from an area due to creation of edge habitat, the introduction of vertical structures, and disturbances directly associated with turbine operation (e.g., noise and shadow flicker) (USFWS 2012, NRC 2007). Impacts are concentrated near turbine locations and along access roads, although available data indicate that avoidance of wind turbines by birds generally extends 245 to 2,625 ft from a turbine, depending on the environment and the bird species affected (Strickland 2004). Eagle specific information was not located for inclusion in this document. Literature is not currently available to define the magnitude of these impacts.

Although construction and operation of the wind energy facility likely resulted in displacement of some groups of birds and prey species, the Project was sited to minimize disturbance to native habitat, and undisturbed native habitats are abundant in the region. Therefore, it is unlikely that this Project alone would cause displacement of eagles or prey species that would result in any population level impacts to eagles.

7.3 Eagle Risk Factors

In addition to abundance, the two main risk factors identified in the ECPG are: (1) the interaction of topographic features, season, and wind currents that create conditions for high-risk flight behavior near turbines; and (2) behavior that distracts eagles and presumably makes them less vigilant (e.g., active foraging or inter- and intra-specific interactions such as territorial defense).

The ECPG also provides table of general risk factors that can be used to guide risk assessments for a Project. These factors are listed in Table 10 with additional site specific information regarding each factor and a qualitative risk assignment based on available information. It should be noted, this information is only provided to identify general factors at the Project that may result in more or less risk and is not used to specifically identify each risk factor and magnitude at the Project. Further risk evaluations based on post-construction monitoring data are provided in Section 9.0.

Table 10. Risk factors listed in the US Fish and Wildlife Service Eagle Conservation Plan Guidance and a discussion of these factors for the Dunlap Project, Carbon County, Wyoming.

Risk Factor	Scientific Evidence/Support	Citations	Project Situation	Qualitative Assessment
Eagle Density	Mixed findings; likely some relationship but other factors have overriding influence across a range of species	Barrios and Rodríguez (2004), de Lucas et al. (2007), Hunt (2002), Smallwood et al. (2009), Ferrer et al. (2011)	Raptor use estimated during pre-construction surveys was moderate relative to other studies; however, eagles made up about 55% of all raptors and were the most abundant large bird species.	Moderate to High
Eagle Age	Mixed findings. Higher number of fatalities among subadult and adult golden eagles in one area. Higher fatalities among adult white-tailed eagles in another	Hunt (2002), Nygård et al. (2010)	Data collected to date suggest more adult eagle use at the Project although subadults and juveniles were observed as well.	Moderate
Proximity to Nests	White-tailed eagle nesting areas close to turbines have been observed to have low nest success and be abandoned over time.	Nygård et al. (2010)	The nearest golden eagle nest was originally located approx. 1.04 miles from nearest turbine.	Moderate
Eagle Residency Status	Mixed findings. Higher risk to resident adults in Egyptian vultures (*Neophron percnopterus*). Higher number of mortalities among subadults and floating adults in golden eagles in one other study.	Barrios and Rodríguez (2004), Hunt (2002)	One golden eagle nest was identified pre-construction. Various golden and bald eagle activity was documented during pre-construction surveys.	Moderate

Table 10 (*continued*). Risk factors listed in the US Fish and Wildlife Service Eagle Conservation Plan Guidance and a discussion of these factors for the Dunlap Project, Carbon County, Wyoming.

Risk Factor	Scientific Evidence/Support	Citations	Project Situation	Qualitative Assessment
Season	Mixed findings. In some cases for some species, risk appears higher in seasons with greater propensity to use slope soaring (fewer thermals) or kiting flight (windy weather) while hunting.	Barrios and Rodríguez (2004), de Lucas et al. (2007), Hoover and Morrison (2005), Smallwood et al. (2009)	Eagle use was similar among seasons.	Unknown
Flight Style	Species most at risk perform more frequent flights that can be described as kiting, hovering, and diving for prey.	Smallwood et al. (2009)	Potential for these flight behaviors within the Project.	Moderate to High
Interaction with Other Birds	Higher risk when interactive behavior is occurring.	Smallwood et al. (2009)	Potential exists based on location of golden eagle and other raptor nests.	Unknown, needs further study to determine actual influence to risk
Active Hunting/Prey Availability	High risk when hunting close to turbines, across a range of species	Barrios and Rodríguez (2004), de Lucas et al. (2007), Hoover and Morrison (2005),Hunt (2002), Smallwood et al. (2009)	Presence of sage grouse, prairie-dogs, lagomorph species and other small mammals, variety of avian species, livestock grazing, and big-game.	High

Table 10 (*continued*). Risk factors listed in the US Fish and Wildlife Service Eagle Conservation Plan Guidance and a discussion of these factors for the Dunlap Project, Carbon County, Wyoming.

Risk Factor	Scientific Evidence/Support	Citations	Project Situation	Qualitative Assessment
Turbine Height	Mixed, contradictory findings across a range of species	Barclay et al. (2007), de Lucas et al. (2008)	34.5% of flying eagle observations were initially recorded within the RSH during pre-construction surveys	Moderate
Rotor Speed	Higher risk associated with higher blade-tip speed for golden eagles in one study, but this finding may not be generally applicable.	Chamberlain et al. (2006)	State of the art technology, low RPM's, more space between rotor sweeps, however tip speeds generally the same	Low or Unknown
Rotor-swept Area	Meta-analysis found no effect, but variation among studies clouds interpretation	Barclay et al. (2007)	34.5% flying eagle observations were initially recorded within the RSH during pre-construction surveys. However, larger rotors generally have more space and time between sweeps	Moderate
Topography	Several studies show higher risk of collisions with turbines on ridgelines and on slopes. Also a higher risk in saddles that present low-energy ridge crossing points.	Barrios and Rodríguez (2004), de Lucas et al. (2007), Hoover and Morrison (2005), Smallwood and Thelander (2004)	Based on the prevailing wind direction in relation to topography including slope, aspect, and elevation.	Low to Moderate
Wind Speed	Mixed findings, probably locality dependent.	Barrios and Rodríguez (2004), Hoover and Morrison (2005), Smallwood et al. (2009)	Based on the prevailing wind direction in relation to topography including slope, aspect, and elevation.	Low to Moderate

7.3.1 *Topography and Wind*

The Project area is relatively flat with limited topographic relief (Figure 3). The eastern half of the Project has a shallow basin in the southern portion of the Project. The western half of the Project was constructed on a soft windward slope (western aspect). The slope is gradual, not forming an obvious ridgeline that is often associated with higher use by eagles, but is the most notable feature

in the Project area. All turbines at the Project are located on an area of generally flat topography, with increased topography immediately to the west-northwest and south of the Project. The Freezeout Mountains abut the northwest boundary and the Pine Butte and Flattop Mountain are located slightly more than a mile south the Project. To the east of the Project lie the TB flats and Greasewood flats. The prominent wind direction at the Project is oriented in a westerly direction (wind blows out of the west). The orientation of the overall topography in the vicinity of the Project at a landscape-scale and the prominent wind direction in relation to the Project suggest that turbines sited on steep slopes with a west facing aspect may be more risky to eagles because these areas could support strong updrafts of wind. The Project area lacks steep slopes that may result in increased impacts.

Baseline surveys (Johnson et al. 2009) did not record higher use along the slope when compared with points in the eastern portion of the Project; however, the two survey points near the slope (point 4 and 10) were at the bottom of the feature. Although scientific support is limited, some research suggests turbines in saddles or canyons or on the upwind side of ridges may pose more risk to golden eagles (Barrios and Rodríguez 2004, de Lucas et al. 2008, Hoover and Morrison 2005, Smallwood and Thelander 2004). While some gaps and saddles and other areas that could provide orographic lift are located within the Project area, the Project does not contain significant topographic features (e.g., ridgelines) that would combine with prevailing winds to provide substantial orographic lift for eagles. The results of the landscape-scale assessment of topography and wind suggest that topography and wind conditions at the Project might be a low risk to eagles overall in relation to facility and individual turbine siting, with the greatest risk associated with turbine sited at the top of the western slope feature.

7.3.2 *Inter- and Intra-Specific Interactions and Foraging Behavior*

Inter specific interaction is the competition among different species; and intra-specific interaction is competition within the same species (e.g., ECPG; *see also* Eagle Risk Factors *above*). Assuming that intra- and inter-specific competition and territorial defense increases collision risk, these behaviors likely occur within the Project based on the location of known eagle and other raptor nests in the vicinity of the Project. While this potential risk factor is identified in the ECPG, studies that clearly quantify the magnitude of risk associated with this behavior are not currently available.

Eagles are known to forage within the Project and foraging behavior near prairie dog towns is believed to result in higher risk to eagles if turbines are present. Prairie dog towns are scattered throughout the Project area, but may be more risky in areas at the top of slopes or areas where turbines area sited between prey locations and perch or nest structures (see Section 9.5 for further discussion). Additionally, the Project area is designated winter range for pronghorn and migration routes occur in the Project region. Seasonal ranges, specifically winter ranges, are more likely to result in pronghorn mortality, and carcasses are known attractants to eagles. The increase in pronghorn may increase risk to eagle foraging in the area. As indicated in Section 8.0 below, PacifiCorp is implementing a carcass removal program that should also help to reduce risk to foraging eagles. Common perch structures are located along the highway in the form of transmission poles. Turbines located parallel and relatively close to the highway may result in

greater risk as eagles may fly through the turbines when traveling from perch sites or nest locations to forage.

7.4 Eagle Risk Site Categorization

The ECPG recommends that Project developers or operators use a standardized approach to categorize the likelihood that a project will meet the standards for issuance of a programmatic eagle take permit. Those categories are listed below.

- Category 1—High risk to eagles/potential to avoid or mitigate impacts is low.
- Category 2—High to moderate risk to eagles/opportunity to mitigate impacts.
- Category 3—Minimal risk to eagles.

The ECPG (USFWS 2013b) applies primarily to wind energy facilities that have not yet been constructed or are operational. Dunlap was constructed and operational prior to the publication of the ECPG; therefore, the USFWS has determined that risk categorization does not apply to Dunlap and it should not be assigned a risk category.

8.0 Additional Avoidance and Minimization of Risks, and ACP's (Stage 4)

In accordance with the Region 6 ECP Guidance, this section covers additional information on avoidance and minimization of risks to eagles during construction and operations at the Project (*see* Section 6.0 *above for avoidance and minimization during Siting and Design*). Information in this section also addresses recommendations under Stage 4 of the ECPG. The compensatory mitigation and adaptive management sections have been moved to section 9.0 based on the current state of the Project and decision making process.

8.1 Construction Phase Best Management Practices

The following avoidance and minimization measures were implemented to reduce impacts to eagles during the construction phase. These measures included both direct and indirect measure to reduce impacts to eagles and their prey. The measures listed below include all measures implemented to address the impacts discussed in Section 7 including habitat fragmentation, degradation, disturbance, and displacement. For detailed explanation of best management practices please see the project-specific BBCS or ISC permit application.

- The Project complied with all federal, state, and county environmental laws, orders, and regulations related to construction.
- During Project construction, travel was restricted to designated roads, and Project personnel were advised regarding speed limits (25 miles per hour [mph]) to minimize wildlife mortality due to vehicle collisions and to reduce disturbance and displacement.
- Where applicable, efforts were made to minimize impacts to vegetation and soils. These efforts help minimize degradation and fragmentation of habitat for eagles and their prey. A brief list of measures to support vegetation and soils includes:

  - Minimized damage to the land surface and property, to only areas necessary for the safe and efficient construction;
  - Used existing roads and minimized disturbed area where possible;
  - Soil and vegetation restoration for areas impacted by construction (filling ruts and scars);
  - Roads, portions of roads, crane paths, and staging areas not required for operation and maintenance were restored to the original contour. Reclaimed areas were contoured, graded, and seeded as needed to promote successful re-vegetation, provide for proper drainage, and prevent erosion;
  - Proper soil handling techniques (top soil removal, minimizing excavation, protecting exposed soils, minimizing work on wet soils) were implemented to help restore habitat and reduce potential fragmentation and degradation;
  - Equipment was inspected for potential noxious weed sources prior to entering the facility. This measure helped to reduce habitat degradation; and
  - All erosion reduction material (straw waddles) were certified weed free to minimize habitat degradations.
- Where applicable, efforts were made to minimize impacts to water resources and wetlands. These efforts supported reduced water impairment issues and degradation of habitat and resources that are used by eagles and their prey. A brief list is provided below:
  - Wind turbines and most ancillary facilities were built on uplands to avoid surface water features and designated floodplains;
  - Refueling and staging occurred at least 300 ft from the edge of a channel bank at all stream channels. Sediment control measures were utilized to minimize impacts to aquatic and riparian habitats;
  - Restoration near drainages included matching contours to allow natural flows; and
- During Project construction, riparian areas were avoided, where feasible. If avoidance was not feasible, activities within riparian areas were conducted in conformance with SWPPP requirements.
- Effective exhaust mufflers were installed and properly maintained on all construction equipment to minimize additional noise and potential disturbance to eagles and their prey.
- PacifiCorp required construction contractors to comply with federal limits on truck noise. Construction activities took place mostly during daylights hours. Nighttime construction work was minimized. These measures reduced potential disturbance and displacement to roosting eagles and their prey.
- Gates were installed on private roads to restrict public access to turbine locations. These restrictions reduce traffic on the Project which likely resulted in fewer opportunities for collision, less disturbance and displacement to eagles and prey, and generally reduced

sound, minimized air quality impairments, or other disturbances to the land that supports eagles.

- All applicable hazardous material laws and regulations existing or hereafter enacted or promulgated regarding regulated chemicals were complied with, and a Spill Prevention, Control, and Countermeasure Plan (SPCC) were implemented. The only hazardous chemicals anticipated to be on-site are the chemicals contained in batteries, diesel fuel, gasoline, coolant (ethylene glycol), and lubricants in machinery. These restrictions minimize the potential for direct eagle poisoning or poising to their prey.
- No burning or burying of waste materials occurred or will occur at the Project. Post construction waste materials were removed from the construction area. All contaminated soil and construction debris was disposed of in approved landfills in accordance with appropriate environmental regulations to minimize habitat degradation.

8.2 Operational Phase Best Management Practices

As discussed above (see Section 6.0), Project siting was developed in coordination with WGFD and USFWS to avoid or minimize impacts to eagles. The measures implemented during the operational phase included both direct and indirect measures to reduce impacts to eagles and their prey. The measures listed below include all measures implemented to address the impacts discussed in Section 7 including habitat fragmentation, degradation, disturbance, and displacement. Specific measures taken include:

8.2.1 *Site Management*

- To avoid attracting eagles and other raptors, the availability of carrion is reduced by removing carcasses discovered on-site during regular maintenance and monitoring activities. O&M personnel, or PacifiCorp contractors, will either pick up the carrion and dispose of it at an appropriate off-site facility or immediately call the WGFD to collect the wildlife carcass in an effort to remove potential eagle attractants from turbines areas. Appropriate owners are called to remove livestock carcasses. The removal notification occurs immediately with the target carcass removed as quickly as possible.
- The Project is located on private property. Hunting is not allowed near the Project turbines. A benefit of this practice is safety and a reduction in eagle attraction as gut piles and other carcass remnants are reduced. This also reduces potential lead poisoning incidents.
- Project personnel are advised regarding speed limits on roads (25 mph) to minimize wildlife mortality due to vehicle collisions and to minimize potential disturbance and displacement.
- Typical travel is restricted to designated roads; and no off-road travel is allowed except to perform operational activities such as turbine maintenance and repair and in emergencies. This measure reduces habitat degradation, disturbance, and displacement.
- PacifiCorp performs regular maintenance on Project components to ensure they are functioning properly and do not pose additional risk to eagles.

- Rodent control is performed utilizing non-poison bait traps to avoid release of the dead carcasses into the environment. The traps are self-contained and do not result in the release of toxins to the environment. PacifiCorp contracts with a rodent management company that performs monthly inspections and trap collection/replacement.
- Heavy equipment utilized for road maintenance and snow plowing is inspected for fluid leaks and noxious weeds by site supervisors prior to work commencement. These steps ensure potential hazardous materials will not directly or indirectly impact eagles and that vegetation in the project area remains intact.
- Large scale maintenance cranes typically utilize existing crane access pads, thus minimizing ground disturbance in the event a crane is utilized. Ground disturbing activities may include the occasional need to access underground cable or communications lines.

8.2.2 *Collision Risk*

- Wind turbines are unguyed, tubular towers and have slow-rotating, upwind rotors.
- Practices suggested by APLIC (2006) were used to ensure that overhead lines constructed for the Project, for ownership by PacifiCorp, are consistent with recommendations provided in APLIC guidance documents (e.g., a minimum of 150 cm (60 inches) of horizontal separation between energized and/or grounded parts and 100 cm (40 inches) of vertical separation, insulation or covering of exposed energized or grounded parts, and application of perch management techniques (APLIC 2006)).
- Collection and communication lines were buried to minimize and avoid collision and electrocution risks to eagles and other avian species. This included over 26 miles of buried lines.
- The two permanent MET towers erected at the Project have bird diverters installed on the guy wires to reduce the potential for avian collision.
- Turbine lighting has been minimized to that which is required by the Federal Aviation Administration (FAA) and red pulsating lights are being utilized, consistent with the 2012 Guidelines. Kerlinger et al. (2010) summarized several studies which showed that FAA lighting on wind turbines does not increase bird mortality.
- In accordance with the 2012 Guidelines (USFWS 2012), each turbine also has a low voltage, shielded light (white incandescent).

8.2.3 *General Operation and Continued Monitoring*

- PacifiCorp employees and on-site O&M contractors receive annual training in Wildlife Incident Reporting and Handling System (WIRHS) protocols to ensure they understand the procedures (Appendix E).
- PacifiCorp will continue to monitor for the presence of eagle mortalities at the Project in accordance with Chapter 9 of this ECP (or the Eagle Take Permit upon issuance) to verify the effectiveness of the avoidance, minimization, and mitigation strategies incorporated in

the project operation and management and to support future evaluations under adaptive management.

- Ongoing operational monitoring needs will be evaluated in coordination with the USFWS, based on the results of previous operational monitoring, and will be implemented if warranted.
- An adaptive management program will be implemented as described below.
- Annual nest surveys are performed to identify eagle nesting activity and success. These surveys allow PacifiCorp and agency representatives to understand current eagle use and use over time and to support discussions on adaptive management.
- Results of all monitoring activities through February of 2014, including mortality surveys and nest surveys, were recorded in formal annual reports since monitoring was initiated in May 2011 (Martinson et al. 2012, 2013, 2014). Results from monitoring surveys from 2014 – 2017 have been documented in annual Special Purpose Utility Permits (SPUT). Monitoring activities and eagle nest surveys are ongoing. The continued monitoring and evaluation of collected data has and will continue to support the need for potential adaptive management or additional study needs. These results also provide actual mortality data that can be used to determine the Project's impacts on eagles.
- PacifiCorp will meet or exceed current APLIC recommendations in the event that any utility poles or power lines are built or retrofitted at the Site for ownership by PacifiCorp.

8.2.4 *Decommissioning and Restoration*

- In the event that the Project is decommissioned, infrastructure will be removed, and the site will be graded and restored to as near its original condition as reasonably possible.
- Native habitat that was removed as a result of Project development will be allowed to re-establish through natural succession, thereby restoring habitat over time for eagle species.

8.2.5 *Conservation Measures for Bald and Golden Eagles and Other Raptors*

In addition to the above actions, PacifiCorp has and/or will implement the following monitoring efforts and conservation measures. These measures are designed to identify impacts and provide ongoing conservation and benefits to eagles and other raptors, with the goal of enhancing eagle populations, but also have the potential to benefit other avian species.

8.2.5.1 Carrion and Carcass Removal

PacifiCorp will continue to remove the potential source(s) of eagle attraction in the Project area (e.g., carrion, prey and/or prey habitat) in accordance with applicable state and federal law. PacifiCorp has carrion removal contracts in place with vendors at all Wyoming wind facilities to collect and remove observed carrion which could create an attraction for foraging eagles, raptors, and other scavengers. Depending upon the carcass(es) observed, PacifiCorp will contact applicable carcass owners to request permission before relocating or disposing of the carcass(es). Disposal of carcasses varies and may include onsite burial or transfer to a local landfill. If illegal activity is assumed, the WGFD is notified and disposal occurs are directed.

9.0 Calibration and Updating of the Fatality Prediction and Continued Risk Assessment (ECPG Stage 5) and Compensatory Mitigation (ECPG Stage 4)

9.1 Post-Construction Monitoring and Analysis Summary

PacifiCorp placed the Project in operation on October 1, 2010. Two post-construction monitoring periods have been conducted since the Project went operational including: 1) a standard three year post-construction monitoring study (2011 – 2014; Martinson et al. 2012, Martinson et al. 2013, Martinson et al. 2014), and 2) post-settlement monitoring reviewed by the settlement team (2014 – present [currently April 2020]).

The first period (March 2011 – February 2014) included a one year post-construction monitoring and reporting program to estimate and evaluate Project impacts, as required by the ISC permit. The monitoring study followed the protocol presented in the "Wildlife Monitoring Studies at Dunlap Wind Energy Facility" document (Appendix F), which outlined the protocols to monitor wildlife impacts. Post-construction avian monitoring efforts included standardized carcass searches, bias trials, and nest surveys. After the one year monitoring study, in coordination with the TAC, two additional years of monitoring were implemented. Summaries of the post-construction surveys along with comparisons to pre-construction risk assessments are included below. The full post-construction monitoring reports are included in Appendix F.

The second period (March 2014 – present) included multiple monitoring methodologies and is described in detail below (Section 9.3). Carcass searches occurred throughout the study period with bias trials varying based on the survey period. These methods were reviewed and adapted through coordination with the USFWS.

As part of the overall monitoring effort, avian mortalities discovered at the Project were handled under the WIRHS manual and will continue to be for the life of the Project (Appendix E). Eagle mortality reporting changed over time with initial reporting to USFWS – Ecological Services. Carcasses were retrieved by USFWS staff or PacifiCorp was authorized by USFWS to collect carcasses until retrieval. Under the current protocol, PacifiCorp reports all eagle mortalities to USFWS – Office of Law Enforcement and obtains permission to deliver carcasses to the repository. Future reporting will likely change with the issuance of an eagle take permit and subsequent stipulations will be followed based on the stated permit conditions.

9.1.1 *Standardized Avian Carcass Searches - March 11, 2011 to February 28, 2013*

Three years (March 11, 2011 – February 28, 2014) of post-construction monitoring was completed at the Project to assess avian mortalities discovered at the Project and raptor nesting activity. These surveys included monitoring for eagle mortalities and nest surveys that were focused on eagle species.

9.1.1.1 Methods

The methods for the carcass search studies were broken into four primary components: 1) standardized carcass surveys of selected turbines and MET towers; 2) searcher efficiency trials

to estimate the percentage of carcasses found by searchers; 3) carcass removal trials to estimate the length of time that a carcass remained in the field for possible detection; and 4) adjusted mortality estimates for bird species calculated using the results from searcher efficiency trials and carcass removal trials to estimate the total number of bird mortalities within the Project area.

Eagle mortalities found within search plots were included in the mortality estimate calculations, including mortalities found outside scheduled search times, under the assumption that the mortalities found incidentally on search plots would have been found during subsequent standardized searches. Mortalities found outside of the defined search plots were not included in the estimate as areas outside of the search plots were not part of the standardized monitoring. Searcher efficiency trials were conducted to estimate how detectable birds were (i.e, the percentage of carcasses that searchers found); however, these trials did not focus specifically on eagles, rather large birds in general. Twenty-six of the 74 turbines were selected for surveying using a systematic design with a random start (Figure 14). The 26 turbines were searched each year during the three year post-construction monitoring study. Search plots at turbines were 160 m (525 ft) x 160 m centered on the turbine. Standardized carcass surveys occurred at all 26 turbines once every 4-week (28-day) period throughout the year, with standardized surveys at half of these turbines (13 turbines) conducted once every week (seven days) during the spring (March 16 – May 15) and fall (August 1 – October 31) migration periods. A total of 38 large bird trial carcasses were placed for searcher efficiency trials in Year 1, 33 large birds were placed in Year 2, and 26 large birds were placed in Year 3. A total of 27 large bird trial carcasses were placed for Year 1 carcass removal trials; 28 large bird trial carcasses were placed in Year 2; and 27 large bird trial carcasses were placed Year 3. Carcasses used for large bird trials included hen mallards (*Anas platyrhynchos*).

For each study year, the average probability that a large bird carcass was available and detected was calculated using the bias trial results. Season was tested to determine if removal rates was affected by season. Then, due to the different search intervals for half of the searched turbines, a probability of persistence was calculated for migration season (weekly and monthly) searches and non-migration season (monthly) searches in all three study years based on the appropriate removal rate.

9.1.1.2 Results

Year 1 (March 11, 2011 – February 10, 2012)

A total of 541 turbine searches were completed and two eagle mortalities (one golden eagle and one bald eagle) were found. The golden eagle was an incidental detection on a non-search plot, while the bald eagle was detected during searches on a search plot. The detection rate for large birds in Year 1 was 82.4% across all seasons. Individual search efficiency rates were not calculated for each individual searcher, but efforts were made to evenly distribute trials across all searchers. The mean removal time for large birds was 16.7 days across all seasons. The average probability that a large bird carcass was available and detected was 76.0% for weekly surveys and approximately 42% for monthly searches.

Year 2 (March 1, 2012 – February 28, 2013)

A total of 504 turbine searches were completed and no bald or golden eagle mortalities were found. The detection rate for large birds in Year 2 was 90.6%. The mean removal time for large birds was 8.23 days across all seasons. The average probability that a large bird carcass was available and detected was 64.0% for weekly surveys and approximately 24.0% for monthly searches.

Year 3 (March 1, 2013 – February 28, 2014)

A total of 498 turbine searches were completed and one golden eagle mortality was found incidentally on a non-search plot. The detection rate for large birds in Year 3 was 96.0%. The mean removal time for large birds was 26.6 days during migration season and 10.4 days during non-migration season. The average probability that a large bird carcass was available and detected was 84.0% during weekly migration season surveys, 56.0% during monthly migration season surveys, and 31.0% during monthly non-migration season surveys.

9.1.1.3 Conclusions

A total of two golden eagle mortalities and one bald eagle mortality (including incidentals) were found during the carcass search studies, from March 11, 2011 to February 20, 2014 (Appendix F). Only the bald eagle mortality was found on a search plot. Golden and bald eagle mortalities detected during the three year post-construction monitoring are shown by location and date in Figure 15.

In addition to the eagles found during the study, one golden eagle mortality was found on November 4, 2010 at Turbine 6 after the Project had begun operation, but prior to the commencement of the post-construction mortality monitoring. An additional golden eagle mortality was found in April 2010 during Project construction (prior to operation and monitoring). These detections were not included in the fatality analyses.

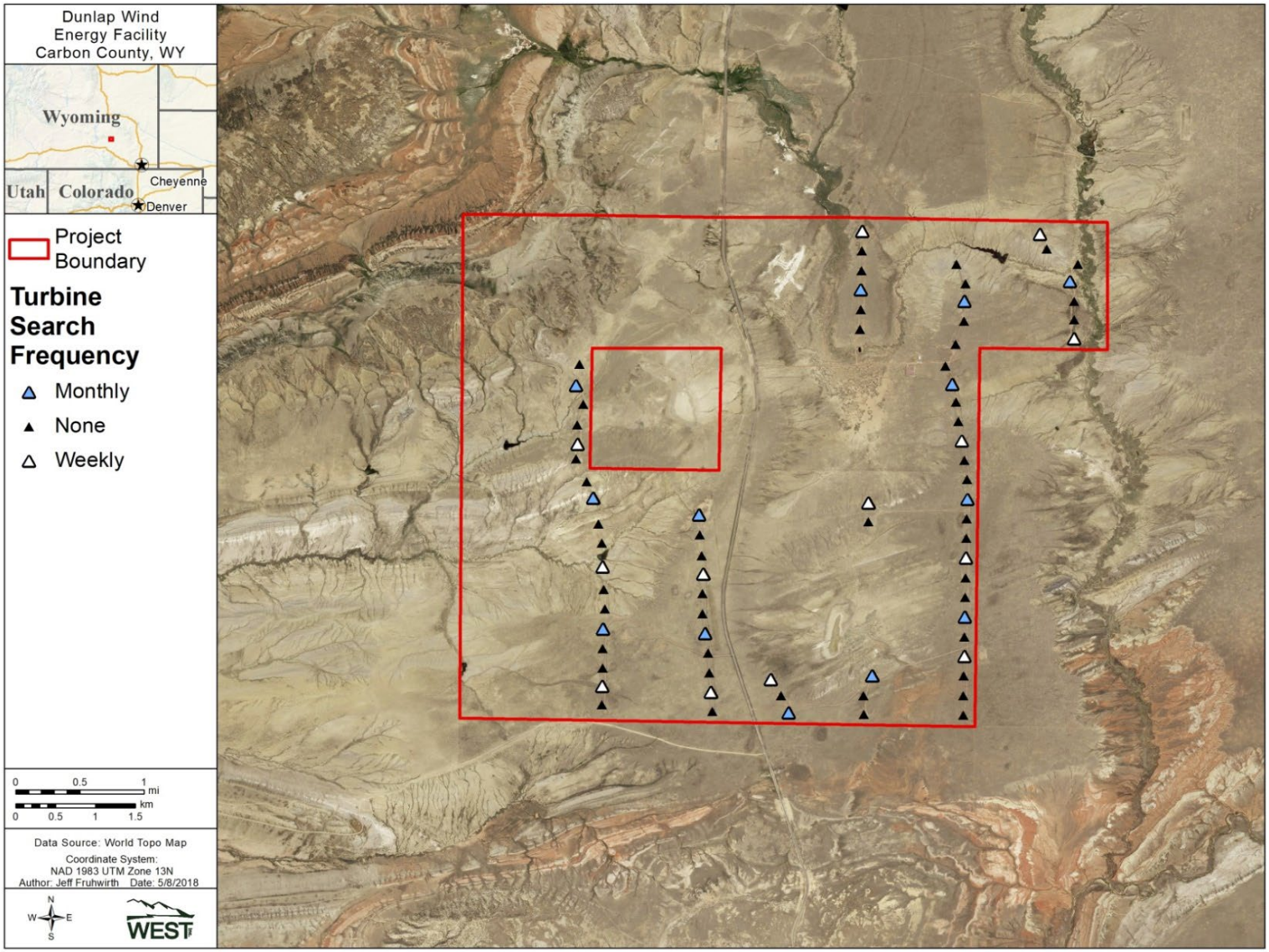

Figure 14. Location of carcass search plots at the Dunlap Wind Energy Facility, Carbon County, Wyoming (March 2011 – February 2014).

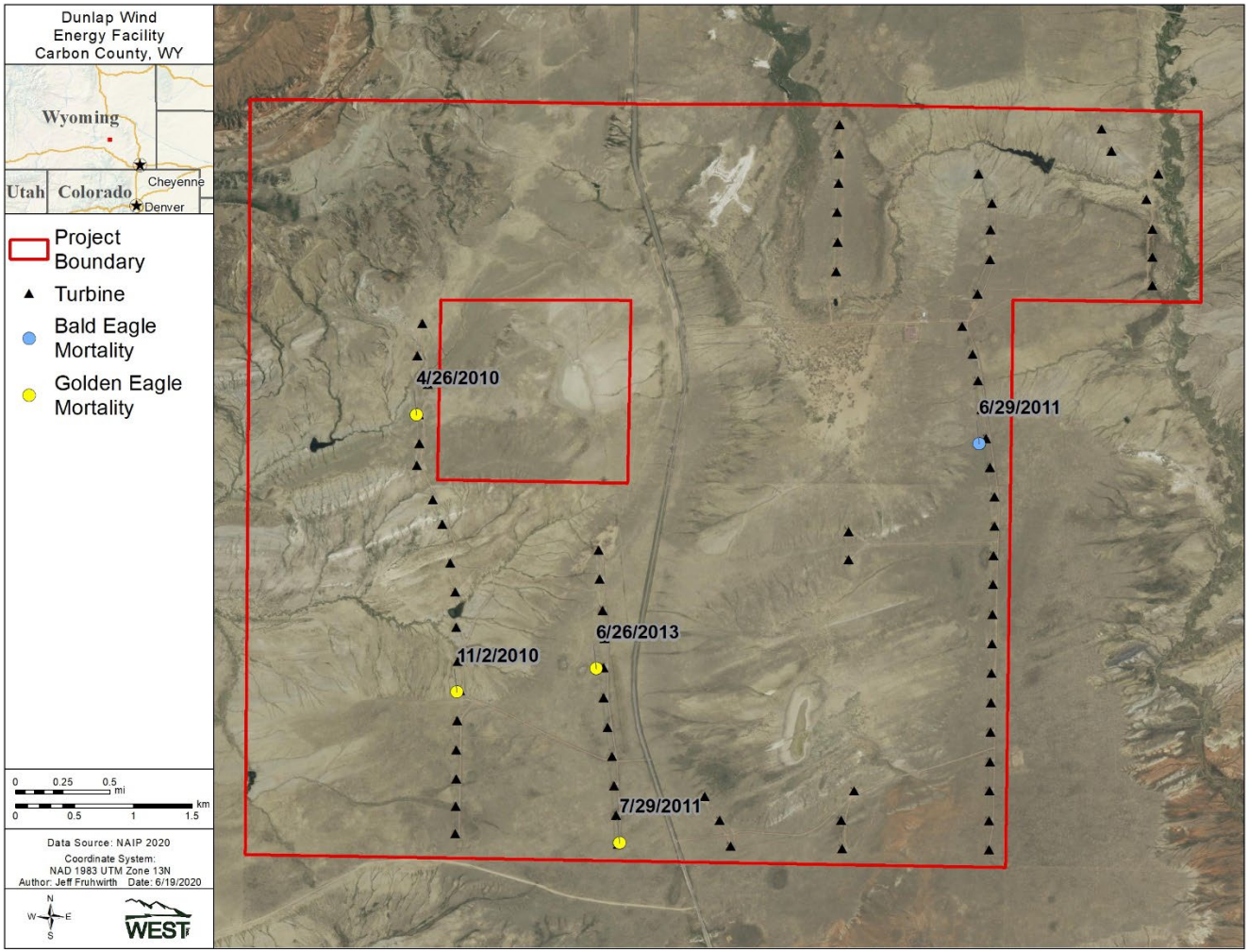

Figure 15. Location of eagle mortalities found at the Dunlap Wind Energy Facility, Carbon County, Wyoming, between March 11, 2011, and February 28, 2014 (three year post-construction monitoring period). The golden eagle mortality found on April 26, 2010 was discovered during construction before turbine 16 was erected. The golden eagle mortality found on November 2, 2010 was discovered during Project operation, but prior to the monitoring study. As such, these two mortalities have not been included in any fatality analyses.

9.2 Ongoing Monitoring

Ongoing mortality monitoring was initiated in March 2014 after the three year study was completed and continues in the present [currently April 2020]. PacifiCorp collaborated with the USFWS on mortality monitoring methods from March 2014 through the present [currently April 2020]. Only data through April 2018 are presented in this document.

PacifiCorp has implemented a number of monitoring methods after the completion of the 3-yr post-construction monitoring study and will continue to evaluate the need to conduct and/or modify monitoring efforts. In all cases, PacifiCorp has and will utilize qualified individuals to perform carcass searches at selected turbines.

From the period of March 2014 – December 2015, PacifiCorp contracted qualified biologists to search turbines two times a month (approximately every two weeks) at 20 m transects. Starting in January 2016, the search interval was reduced to one search round per month. Discussions and letter correspondence with USFWS representatives determined modifying the search methods was appropriate. No changes were made to transect search width or turbines to be searched. The once a month search interval has been conducted from January 2016 – present [currently April 2020]. For comparison to the three years of standardized monitoring (previously conducted from March 2011 through February 2014), PacifiCorp monitored the 26 turbines originally selected for standardized monitoring (*see* Section 9.1 above). PacifiCorp, in discussions with the USFWS, believed this monitoring method was sufficient to detect golden and bald eagles. The USFWS did recommend bias trials continue to be conducted to verify the methods remain appropriate.

Square plots (160 m [525 ft] on a side) were searched at each of the selected turbines. Since emphasis was placed on detecting eagle mortalities, transects were spaced approximately 20 m (33 ft to 50 ft) apart. In addition, since the possibility exists for eagle mortalities to occur in all areas of the Project, surveyors also inspected all non-searched turbines in the Project; this inspection included conducting a rapid visual inspection from the turbine pad as well as examination on foot of any areas hidden from view of the turbine pad. The rapid method varied by turbine and was based on the surveyor's discretion. The surveyor evaluated the visibility across the landscape and glassed the area around the turbine out to the edge of the plot (approximately 80 m). In most cases, the surveyor did not leave the pad. If areas were unseen (e.g., back of slope), the surveyor would investigate the non-visible areas on foot. Searches were not performed when weather conditions made turbines inaccessible or unsafe to access in a standard road vehicle. Any detection located at a rapid turbine search was classified as an incidental detection and was not included in the fatality estimates.

Searcher efficiency trials of similar size and coloration to golden eagles were used to calculate detection rates. The trials were real feather skins (Turkey Skinz) wrapped around a foam decoy (Figure 15). Initially trials were placed on search and non-search turbines to evaluate the probability of detection; however, starting in 2017 a decision was made to only target searched turbines. Trials placed on non-search turbines were not used to inform fatality estimates. The goal

of the trials was to evaluate the effectiveness of the monitoring for detecting eagles during the monitoring period at searched turbines. Incidental detection of trials was not an objective of the monitoring study, but was tracked as detections were reported. Trials were conducted throughout each search year, with approximately 100 trials conducted to date. No additional carcass persistence trials (beyond those conducted during the 2011 – 2014 studies) have been completed for the Project to date.

Data collected during the search efforts (i.e., eagle discoveries) have been compared against previous annual values. The eagle mortality discoveries have remained consistent throughout the continued monitoring period (2014 – 2018), with one golden eagle found in 2014 (8/15/14), one golden eagle found in 2015 (10/23/15), one golden eagle found in 2016 (10/13/2016), no golden eagles detected in 2017, and one golden eagle found to date in 2018 (3/14/2018). Searcher efficiency trial rates have been approximately 87% for searched turbines and 79% for non-searched turbines during the study period. The non-searched turbine detection rates were based on a limited number of trials (n = 24).

PacifiCorp will continue to monitor the search efforts and discuss potential protocol modifications with the USFWS. The results of continuing detection trials may inform changes to the protocols used for the ongoing monitoring program. Additionally, year-round for the life of the project, PacifiCorp contractors and staff will report, using the WIRHS protocols, any eagle mortalities found.

Figure 16. Photo of a representative Turkey Skinz decoy used for searcher efficiency trials at Dunlap from March 2014 – present.

9.3 Nest Surveys

9.3.1 *Methods*

The methods implemented to survey raptor nests have been modified throughout the Project's duration. Modifications have been made to increase nest survey proficiency and follow protocols and naming conventions recommended by the USFWS.

The Project as well as a surrounding 2-mile buffer was searched for active and non-active raptor nests during the three years of post-construction monitoring (Summer 2011, Spring 2012, and Spring 2013; Appendix G). The objective of the raptor nest surveys was to determine the occupancy of eagle nests in and near the study area to compare to pre-construction data on nesting eagles obtained during the 2009 baseline study. Similar to searches in 2009, ground based searches were conducted in 2011. One round of nest surveys was completed in July 2011. Nest surveys specifically targeted previously identified nests; however, efforts were made to locate additional nests in suitable habitat (e.g., rocky out crops/cliffs, trees, etc.). The property southeast of the Project was not accessible for ground checks during any survey year due to private landownership. Aerial and ground-based nest surveys were completed in 2012 and 2013 to determine occupancy and nest success. In 2012, a 2-mile buffer was surveyed including one early season ground check and one aerial flight in April. Follow up checks were not required at eagle nests, as no activity was observed in April. In 2013, a 2.5-mile buffer was surveyed including one early season ground check and one aerial flight in May. Follow up checks were not required at eagle nests, as no activity was observed in May.

Survey methods for 2014, 2015, 2016, and 2017 were designed to identify potentially occupied eagle nests and track eagle nest activities throughout the nesting season, with a goal of determining nest productivity (i.e., number of chicks) and success (i.e. did chicks fledge). This included the identification of unoccupied eagle nests. In 2015, a formal raptor nest survey protocol was developed in conjunction with the USFWS. The methods detailed in this plan were agreed upon by PacifiCorp and USFWS. The text of the plan is provided below.

PacifiCorp will conduct annual eagle nest surveys within 2.5 miles of the Project (subject to weather conditions, safety, and landowner access to nests). The primary objectives of the raptor nest surveys are to: 1) identify all eagle and ferruginous hawk nests present in the defined survey area that were identified in previous years; 2) locate potentially new eagle and ferruginous hawk nests during the current nesting season; 3) monitor the occupied eagle and ferruginous hawk nests status throughout the nesting season (January 1 – August 31); and 4) determine the productivity and nest success for all occupied nests.

Modifications to this protocol may be warranted over time as new information becomes available.

Occupancy determinations will follow the guidance as outlined in the USFWS Eagle Conservation Plan document:

"Occupied nest – a nest used for breeding in the current year by a pair. Presence of an adult, eggs, or young, freshly molted feathers or plucked down, or current years' mutes (whitewash) suggest site occupancy. In years when food resources are scarce, it is not uncommon for a pair of eagles to occupy a nest yet never lay eggs; such nests are considered occupied."

Nest survey schedules may be modified based on weather and logistic issues. Ground checks will only be completed at nests where property access has been granted and these will be clearly identified. Aerial surveys will check all known (historic) and potentially new nests during each nesting season. Ground surveys will only check known nests or nests determined to be occupied during the current year's surveys. These methods will apply to eagle and ferruginous hawk nests. Nests that are determined to not be occupied in the current year will not be checked during subsequent checks. However, even for these nests at least two nest checks will still be made prior to April 1 of each nesting season. If a nest is determined, through the nest checks, to not be occupied as of April 1, then there will be no further monitoring of this nest during the current nesting season. Similarly, if a nest is determined to be occupied early in the season (e.g. March), but an incubating adult is not documented prior to April 1, this nest will not be included in the check for chicks or fledge success.

Survey Methods
The eagle nest surveys will follow the guidelines provided below:

January 1 – mid-February: Informal ground checks will be completed to verify potential occupation at known nest locations. A nest will be considered potentially occupied if it meets the definition provided above. These checks will be completed in coordination with other site activities.

Mid-February – late-March: The first round of aerial surveys will be conducted from a helicopter. The goal of this survey will be to document all eagle nests (potentially new and historic) and determine if the nests are occupied. One qualified WEST biologist and the helicopter pilot will fly the survey area (2.5-mile turbine buffer). Known nest data will include previous WEST survey data and BLM nest data. Features within the survey area where nests are likely to occur (e.g., rocky outcrops, trees, man-made structures) will be investigated for potential new nests.

Late-March – April: Ground checks will be completed at all occupied eagle nests (based on the results of the previous surveys). The goal of this survey will be to identify occupied eagle nests with incubating adults. The timing of surveys will be triggered by the presence of an incubating adult at a highly visible nest (e.g., eagle nest visible from public road). It is assumed one check will be completed at each occupied nest.

May: The second round of aerial surveys will be conducted from a helicopter. The goal of this survey will be to identify chicks at eagle nests that had incubating adults (based on previous surveys). This survey will be conducted at least 60-days after the first aerial survey. Only eagle nests where an incubating adult was observed (unless property access did not allow a March-April check) will be checked.

June – August: Ground checks will be completed at eagle and ferruginous hawk nests that have continued to be occupied and eggs or chicks were observed or assumed to be present) during previous surveys. The goal of this survey will be to identify eagle fledge success. It is assumed one check will be completed at each nest where chicks were present. Timing of surveys will be triggered by the fledge success confirmation at a highly visible nest (e.g. eagle or ferruginous hawk nest visible from a public road).

9.3.2 *Results*

As discussed in Section 5.1, in 2009, one active golden eagle nest (24781301) was located outside the Project boundary, but within the one-mile buffer surrounding the Project (Figure 8, Table 12). In 2011, no golden eagle nests were identified. The nest located in 2009 was not located in 2011 (or during the remainder of the nest surveys). No evidence of the nest was observed in the tree or on the ground below the tree during the ground check. In 2012, two golden eagle nests were located and one was classified as an occupied unsuccessful nest (24792501) and one was classified as unoccupied (23780101). The occupied nest had tending adults early in the season, but no further nesting activity was observed. No evidence of occupation was observed at the unoccupied nest. In 2013, two occupied unsuccessful golden eagle nests (24792501 and 23780101) were identified during survey efforts. Both nests had adult eagles near the nest, fresh greenery, and mutes observed during early season checks, but did not have incubating adults or chicks observed later in the nesting season.

In 2014, two occupied – active golden eagle nests (24792501 and 23780101) were identified during the first round of aerial nest surveys. A golden eagle was observed on each nest, in an incubating posture. As of May 2 (date of the second aerial survey) chicks were not present; however, an adult was still observed incubating at both nest sites. Land access was not granted to the golden eagle nest (23780101) southeast of the Project area; therefore, follow up surveys were not conducted and success could not be determined. The golden eagle nest (24792501) west of the Project was monitored on foot on June 19, 2014. No adults were present at or near the nest site and no chicks were observed. Based on these observations, the nest was believed to be unsuccessful.

In 2015, three golden eagle nests (23780101, 24792501, and 24780401) were located and monitored. No evidence of occupancy was observed at two nests (23780101 and 24792501) and these were determined to be unoccupied. A new golden eagle nest (24780401) was occupied and successfully fledged one young in 2015 (Figure 17; Table 12). This nest was historically an occupied and successful ferruginous hawk nest.

In 2016 and 2017, two golden eagle nests (23780101 and 24792501) were located and designated as unoccupied. No evidence of nesting was observed. The successful golden eagle nest in 2015 (24780401), reverted back to a ferruginous hawk nest in 2016 and 2017.

9.3.3 *Conclusions*

Only one successful nest was identified during the 2011 – 2017 nest surveys (Table 12). This occurred in 2015 at a nest that has been occupied by a ferruginous hawk in all other years. Beyond the nest located in 2009, two golden eagle nests were identified from 2011 – 2017. These nests have not been occupied since 2014. Survey methods varied among the survey years; therefore, results may not be directly comparable between years. Readers are encouraged to review the annual raptor nest memos for detailed descriptions on methods and results (Appendix F).

Annual eagle nest monitoring is planned until a permit is obtained. At that time, nest surveys will meet the permit requirements. Results from the monitoring efforts will be evaluated on an annual basis to determine if any additional measures are warranted. The annual results will be shared with USFWS.

Table 12. Eagle nest survey summary for the Dunlap Wind Energy Facility from 2009 through 2017.

NEST ID	2009		2011		2012		2013	
	Occupied (Y/N)	*Successful (Y/N)*	*Occupied (Y/N)*	*Successful (Y/N)*	*Occupied (Y/N)*	*Successful (Y/N)*	*Occupied (Y/N)*	*Successful (Y/N)*
24781301	Y	Unknown	Not Located	-	Not Located	-	Not Located	-
23780101	NS	-	NS	-	N	N	Y	N
24792501	NS	-	NS	-	Y	N	Y	N
24780401	NA	-	NA	-	NA	-	NA	-
NEST ID	**2014**		**2015**		**2016**		**2017**	
	Occupied (Y/N)	*Successful (Y/N)*	*Occupied (Y/N)*	*Successful (Y/N)*	*Occupied (Y/N)*	*Successful (Y/N)*	*Occupied (Y/N)*	*Successful (Y/N)*
24781301	Not Located	-	Not Located	-	Not Located	-	Not Located	-
23780101	Y	Unknown	N	-	N	-	N	-
24792501	Y	N	N	-	N	-	N	-
24780401	NA	-	Y	Y	NA	-	NA	-

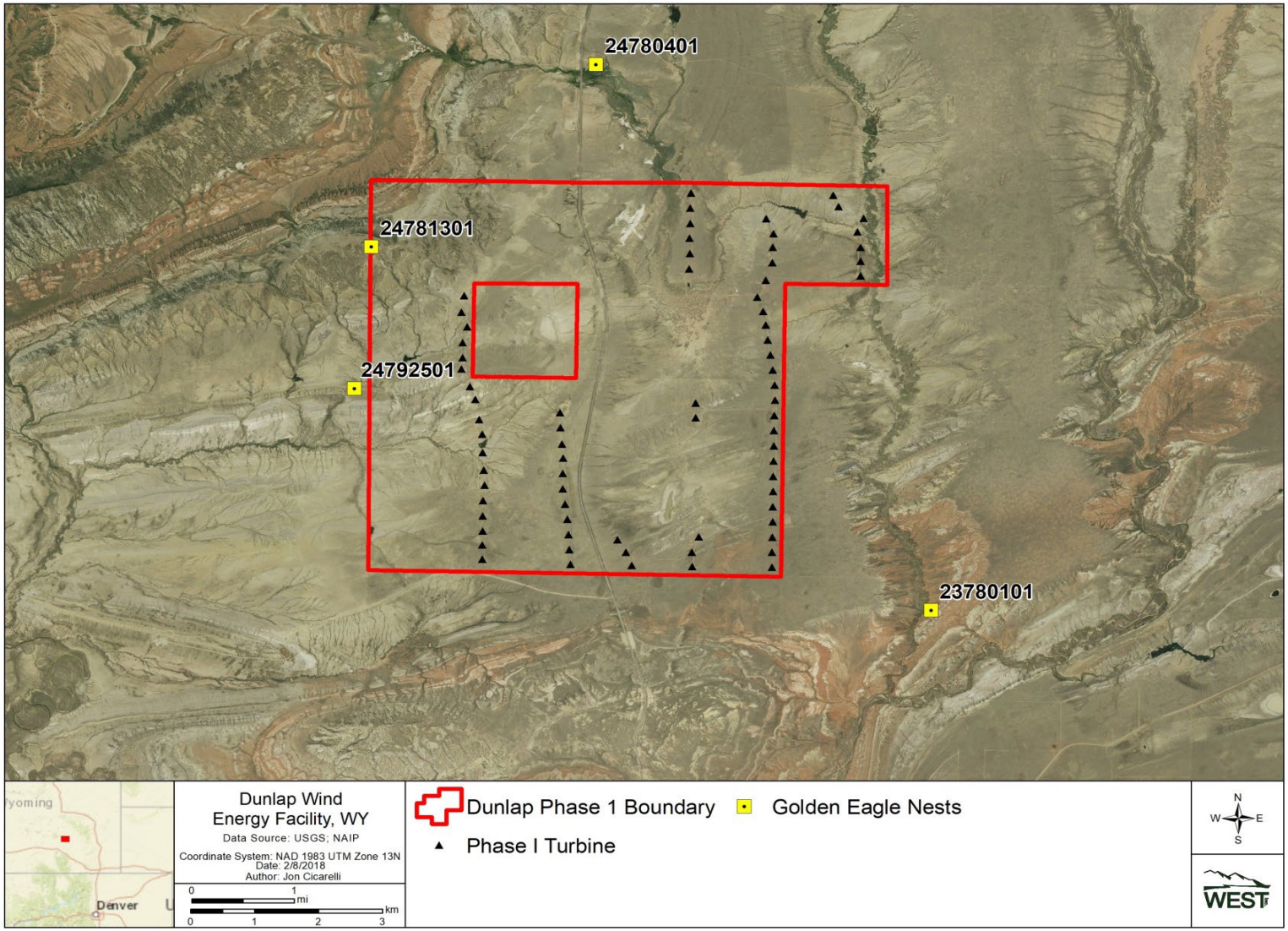

Figure 17. Dunlap Wind Energy Facility eagle nest locations from 2009 through 2017, Carbon County, Wyoming.

9.3.4 *Inter-Nest Distance*

Based on the eagle nest surveys conducted for the Project and surrounding 1-mile buffer in 2009, 2-mile buffer in 2011, 2012, and 2013, and 2.5-mile buffer in 2014, 2015, 2016, and 2017 there have been four golden eagle nests located within 2.5 miles of Project turbines. Only two nests have been occupied in any one year within the defined survey areas (2013 and 2014; Table 12).

The approach used in the ECPG for approximating eagle territories and evaluating the distance for monitoring potential disturbance/displacement impacts calls for measuring nearest neighbor distances from occupied nests in a single nesting year (USFWS 2013b). Using the two occupied golden eagle nests located in the vicinity of the Project in 2013 and 2014, the mean inter-nest distance is 9.74 miles and ½ the mean inter-nest distance or approximate territory radius is 4.87 miles (Figure 18). The two occupied golden eagle nests used for this calculation have not been occupied since 2014, and the nest that successfully fledged a young in 2015 was historically a ferruginous hawk nest, and returned to a ferruginous hawk nest in the 2016 and 2017 nesting seasons. The occupied golden eagle nest located during pre-construction surveys (Johnson et al. 2009), has not been identified during subsequent surveys. No other eagle nests have been located in the survey area. The mean inter-nest distance information for the Project should be interpreted with caution since the survey area has only extended out 2.5 miles from Project turbines, not the 10-mile buffer recommended in the ECPG (USFWS 2013).

9.4 Post-construction Risk Evaluations

In an effort to better understand potential risk to eagles at the Project, PacifiCorp coordinated efforts with WEST to map prairie dog populations at Dunlap and reviewed potential perch structures in the Project. This information was compared against eagle mortality locations.

The survey area was defined as a 1-mile buffer from Project turbines (PacifiCorp property only). Over 3,000 acres of concentrated white-tailed prairie dog (*Cynomy leucurus*) colonies (greater than 10 burrows per acre) were mapped during the survey at Dunlap. Less concentrated populations were present throughout the remainder of the site.

These concentration areas were compared with eagle mortality locations (Figure 19). Based on this comparison, prairie dog concentration areas were located near many of the golden eagle mortality discovery locations. The prairie dog concentration areas and mortalities were located in the west and southwest portions of the Project area. Extensive prairie dog populations were also mapped in the northeast Project area; however, only one golden eagle mortality has been discovered in this section of the Project.

Potential prairie dog control options were evaluated to minimize future risk to eagles; however, concerns were raised due to risk of harming eagles and potential impacts to other endangered species, specifically the black footed ferret.

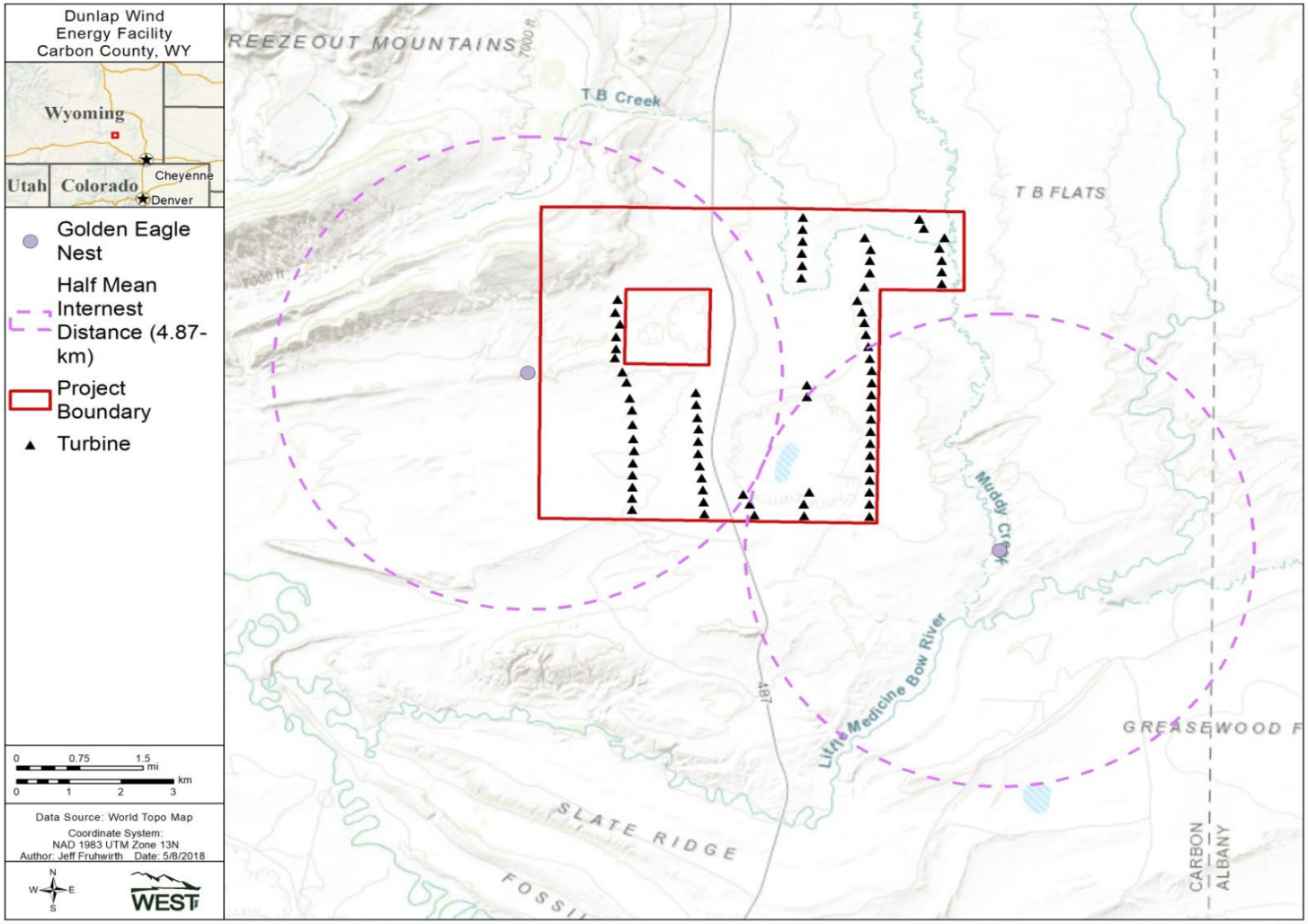

Figure 18. Approximate golden eagle territories occupied in 2013 and 2014 based on golden eagle nest surveys in the vicinity of the Dunlap Wind Energy Facility, Carbon County, Wyoming. A buffer distance of 4.87 miles was used based on half the mean inter-nest distance between the two occupied golden eagle nests identified in 2013 and 2014.

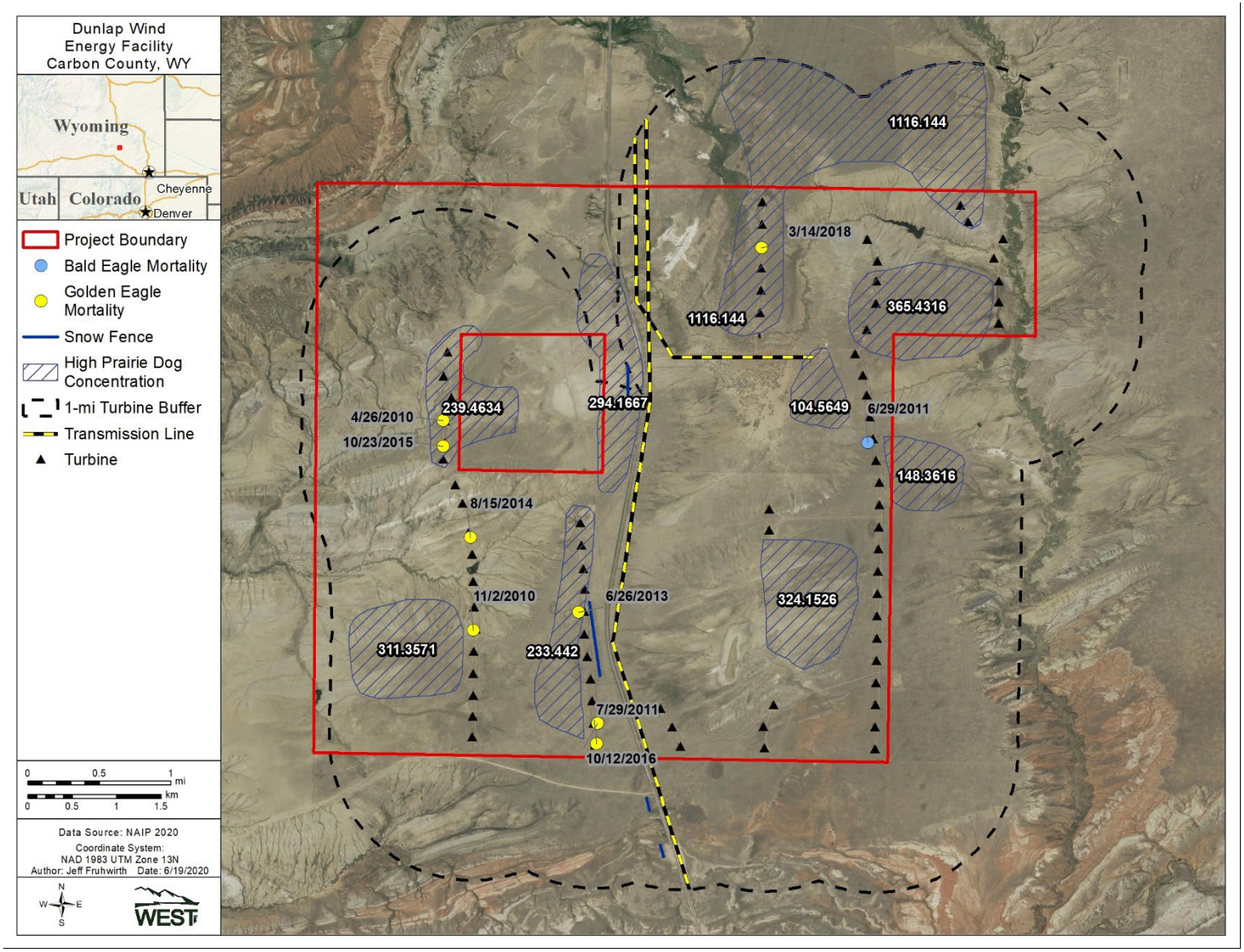

Figure 19. Dunlap Wind Energy Facility prairie dog populations, eagle perch opportunites, and eagle mortalities. Note: The April 2010 detection occurred prior to construction of turbines.

9.5 Eagle Mortality Discoveries to Date

To date, a total of eight eagle mortalities have been discovered at the Project during project operation through April 2018 (Figure 20; Table 13). One eagle mortality was found prior to the start of the mortality monitoring study, but after the Project began operations. This eagle was found in November 2010 at D6 by PacifiCorp personnel. This detection was not included in fatality estimates as it was located outside of the study period. An additional golden eagle was found during construction (April 2010; prior to operation) near the future turbine D15 location, and as such, this discovery has not been included in any fatality predictions or analyses. Two golden eagle mortalities were found during the initial 3-yr post-construction monitoring studies (Figure 9), both of which were incidental finds. The first golden eagle was found in July 2011 near turbine D19, and the second was found in June 2013 near turbine D25. Both detections occurred at non-searched turbines and were not included in fatality estimates. A bald eagle was found in June 2011 near turbine D50 at a searched turbine and during a scheduled search.

Four golden eagle discoveries have occurred during the ongoing monitoring surveys. One golden eagle was found in August 2014 near turbine D10. This detection was located during a rapid check at a non-searched turbine and as such was classified as an incidental detection. One golden eagle was found in October 2015 near turbine D14 during a transect search at a searched turbine. One golden eagle was found in October 2016 near D21 by PacifiCorp personnel. The detection was an incidental find at a non-searched turbine. One golden eagle was found in March 2018 near turbine D60 by PacifiCorp personnel. The detection was an incidental find at a non-searched turbine.

Table 13. Eagle mortality summary for the Dunlap Project; Carbon County, Wyoming (April 2010 – April 2018).

Date	Species	Mortality or Injury	Incidental or Scheduled Search
4/26/2010*	golden eagle	Mortality	Incidental
11/2/2010*	golden eagle	Mortality	Incidental**
6/29/2011	bald eagle	Mortality	Scheduled Search
7/29/2011	golden eagle	Mortality	Incidental**
6/26/2013	golden eagle	Mortality	Incidental
8/15/2014	golden eagle	Mortality	Incidental***
10/23/2015	golden eagle	Mortality	Scheduled Search
10/12/2016	golden eagle	Mortality	Incidental**
3/14/2018	golden eagle	Mortality	Incidental**

*Mortalities found prior to the start of mortality monitoring study
**Designates mortality found by operations personnel
***Found during a non-standard survey (rapid check)

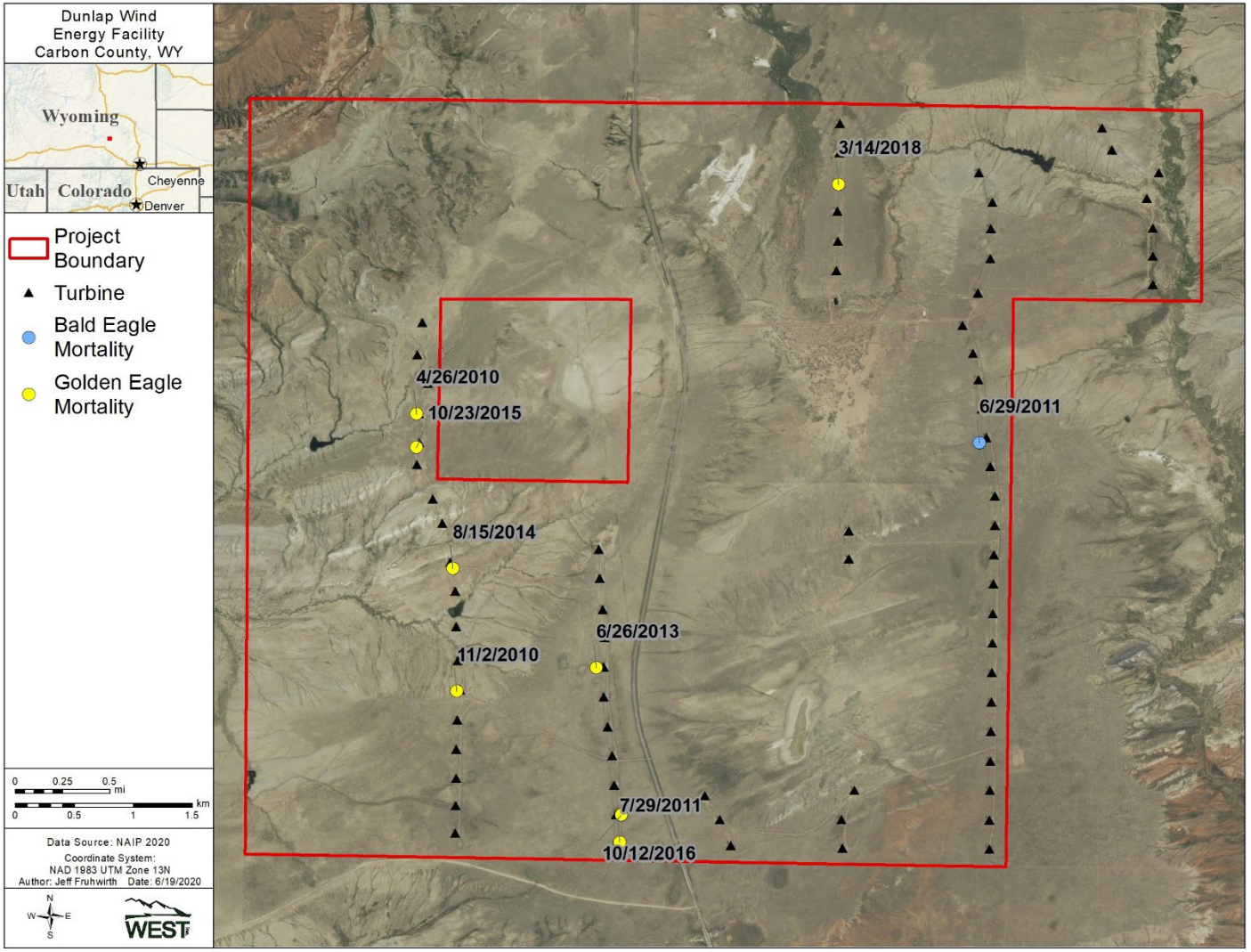

Figure 20. Location of eagle mortalities found to date at the Dunlap Wind Energy Facility, Carbon County, Wyoming (April 2010 through April 2018). The golden eagle mortality found on April 26, 2010 occurred during construction before turbine 16 was erected. The golden eagle mortality found on November 2, 2010 occurred during project operation, but prior to the monitoring study. As such, these two mortalities have not been included in any fatality analyses.

9.5.1 *Mortality Modeling – Informed (Post-construction)*

Pre-construction eagle data collected during avian use surveys for the Project were used to predict golden and bald eagle mortalities (see Section 7.3.1). The ECP Guidance recommends post-construction monitoring data are used to inform take predictions for an operational wind facility. As part of this ECP, additional take prediction modeling has also been completed that includes only post-construction mortality monitoring data. Due to the concerns raised by the USFWS related to the pre-construction eagle use data collected during avian use surveys and the fact that these data were collected before the Final Eagle Rule (USFWS 2016) data standards of the were available, the mortality predictions presented in this section of the ECP are based solely on the results of the post-construction mortality monitoring and Evidence of Absence (EoA) analysis. The EoA analysis was not used in conjunction with the USFWS Collision Risk Model (and associated pre-construction data) to predict eagle take.

The EoA framework utilizes a statistical hierarchical model to estimate the actual number of fatalities from the number found and probability of discovery. The EoA estimator assumes the number of fatalities found during searches follows a binomial distribution,

$$X \sim \text{binomial}(M,g)$$

where X is the count of fatalities found during standardized carcass searches, M is the (unknown) number of eagle fatalities, and g is the site-wide probability that a carcass is available to be found and detected by searchers. The site-wide probability that a carcass is available to be found and detected by searchers is based on the following Dunlap specific data (see Sections 9.1 – 9.3 above and Appendix F for additional details):

- Searcher efficiency expressed as the proportion of placed carcasses found by searchers during searcher efficiency trials. The searcher efficiency trials only include the Turkey Skinz trials that occurred during the ongoing monitoring period; large birds trials (mallards) conducted during the first three years of mortality monitoring were not used.
- Non-removal rates expressed as the estimated average probability a carcass was expected to remain in the study area and be available for detection by the searchers during removal trials. The persistence trials only occurred during the first three years of mortality monitoring and used mallards. No carcass persistence trials have been conducted during the ongoing monitoring periods; therefore, the non-removal rate from the three years of post-construction monitoring were used to inform subsequent years.
- Search area adjustment based on the relative carcass density within search areas and outside of search areas. The Hull and Muir distribution model was used to correct for potential search area bias.

- Search area correction also adjusted the estimate based on the number of turbines searched (26) relative to the total number of turbines at the Project (74).

The statistical hierarchy of models inherent in EoA assumes the total number of eagle fatalities (M) follows a Poisson distribution,

$$M \sim Poisson(\lambda),$$

where λ is the rate that eagle fatalities occur at the Project. A further step in the model hierarchy assumes λ is a Jeffreys prior, and g follows a beta distribution,

$$g \sim beta(\alpha,\beta).$$

The parameter of interest, λ, is estimated using Bayesian methods. Under these methods, the posterior distribution for λ is estimated using a direct calculation. The reported prediction is the mean of the posterior for λ, while 80th credible interval for λ is the upper 80% quantile from the posterior.

Post-construction fatality monitoring studies were conducted for nearly seven years, March 2010 - December 31, 2017, at the Project (Section 9.2 and 9.3). During the study, one bald eagle and six golden eagles mortalities were found. Of these, the one bald eagle detection in 2011 and one golden eagle detection in 2015 were found during scheduled searches of the 160 m x 160 m search area and located inside these search plots. EoA 50% credible interval and 80% credible interval are provided for each study year and the combined seven year period (Table 14) as well as the annual average for a single year (Table 15). Additionally, the adjustment factor (g-value) is also provided in both tables. As described in Section 9.2 and 9.3 above, data from two monitoring periods were used in this analysis. Results should be interpreted with caution as these data may not be directly comparable.

Individual year's take predictions for bald and golden eagles show a lot of variability with bald eagles ranging from one to 17 fatalities (50% credible interval) and golden eagles ranging from one to nine fatalities (50% credible interval). The annual average for bald and golden eagles was 1.8 fatalities per year at the 50% credible interval and 3.5 fatalities per year at the 80% credible interval (Table 15).

Comparisons between the USFWS Collision Risk Model (CRM) assessment (Section 7.0) and the EoA assessment show similar predicted take for golden eagles. The CRM predicted an annual average take at 1.38 golden eagles and an 80th percentile at 2.04 golden eagles, while the EoA predicted annual take at 1.8 golden eagles and 3.5 golden eagles, respectively. The bald eagle predictions showed greater disparity with the CRM predicting well under one bald eagle per year, while the EoA predicted 1.8 and 3.5 bald eagles per year at the average and 80th credible interval.

The take predictions provided in this chapter were developed using the model/process outlined above and may vary from the methodology and take predictions developed by USFWS. However, it is understood the USFWS will ultimately decide the number of eagle takes to evaluate in the NEPA process and include in associated permit conditions.

Table 14 Evidence of absence results for estimated yearly take based on data gathered during the seven years of post-construction mortality monitoring conducted from March 2011 – December 2017, at the Dunlap Wind Energy Project, Carbon County, Wyoming.

Study Year	Eagle Mortalities Included in the Estimate	g-value	Average Annual Take (λ)	Annual take (λ) - 80th credible bound
Bald eagles				
Year 1	1	0.069	17	33
Year 2	0	0.045	4	17
Year 3	0	0.089	2	8
Year 4	0	0.124	1	6
Year 5	0	0.129	1	5
Year 6	0	0.102	2	7
Year 7	0	0.115	1	6
Golden eagles				
Year 1	0	0.069	3	11
Year 2	0	0.045	4	17
Year 3	0	0.089	2	8
Year 4	0	0.124	1	6
Year 5	1	0.129	9	17
Year 6	0	0.102	2	7
Year 7	0	0.115	1	6

λ = lambda, annual take

Table 15. Evidence of Absence results for estimated annual take based on data gathered during the seven years of post-construction mortality monitoring conducted from March 2011 – December 2017, at the Dunlap Wind Energy Project, Carbon County, Wyoming.

Species	g-value	Average Annual Take (λ)	Annual take (λ) - 80th credible bound
bald eagles	0.096	1.8	3.5
golden eagles	0.096	1.8	3.5

λ = lambda, annual take

9.5.1.1 Local Area Population and Cumulative Impacts

USFWS Region 6 will complete the local area population (LAP) analysis for the Project using their cumulative effects tool and proprietary data on known eagle mortality within the LAP area for each eagle species. This is not an analysis that Project proponents are expected to complete.

The USFWS analysis will provide a cumulative impacts assessment for both golden and bald eagles at the LAP scale within the 109 mile and 86 mile species-specific buffers. This review will consider eagle mortality records from other existing wind energy facilities as well as all other sources of known mortality such as electrocution, collisions, shootings, poisonings, etc. This information, and the accompanying analysis, will be fully presented in the Environmental Assessment (EA) that USFWS will complete for the Project. The information about known eagle

mortality will be used by USFWS Region 6 in the decision making process about whether or not to issue an programmatic eagle take permit for the Project and the level of take for golden and bald eagles that could potentially be authorized.

9.6 Compensatory Mitigation

With the implementation of the AMMs described above, some unavoidable eagle mortalities may still occur. Additional compensatory mitigation will be necessary to ensure that the standard of no net loss to the population is achieved whenever golden eagles are taken. PacifiCorp will prepare a Project-specific power pole retrofit plan using a template provided by USFWS, Mountain Prairie Region Office.

Based on recommendations under the ECPG, utility pole retrofits are currently the preferred mitigation approach accepted by USFWS as compensatory mitigation. The requirements for *bird-safe* utility poles are well known and are being implemented by PacifiCorp and other utilities. The reduction of electrocutions will benefit eagle productivity directly by reducing this source of mortality.

PacifiCorp will retrofit, to meet or exceed current APLIC guidance (APLIC 2006), enough electric utility poles to provide full compensatory mitigation for all golden eagle take that would be authorized by USFWS under a EITP; if this permit is issued for the Project. The number of utility pole retrofits per eagle mortality discovery will be based on a resource equivalency analysis (REA) conducted by USFWS (USFWS 2013a). All power pole retrofits will be monitored in accordance with the protocols established in the Rocky Mountain Power APP. If additional monitoring is necessary it will be developed in accordance with permit requirements.

9.7 Adaptive Management

The ECPG recommends that a project developer or operator collect information to determine potential conservation measures that can be employed to avoid and/or minimize the predicted risks at a given site (Stage 4). PacifiCorp will continue to evaluate impacts to determine if additional ongoing operational monitoring beyond the WIRHS system is warranted. The adaptive management plan includes ongoing and future strategies (i.e., mitigation and conservation measures) to avoid and minimize impacts to avian resources.

9.8 Adaptive Management Plan

PacifiCorp has developed this ECP including the following adaptive management plan based on the Project specifics and data available to monitor for impacts and avoid, minimize and mitigate impacts to eagles and other avian species.

PacifiCorp's adaptive management plan (1) evaluates the mortality rates reported based on post-construction monitoring; (2) evaluates triggers to monitor the potential effects of various avoidance, minimization, and mitigation measures that may be implemented; and (3) reviews and

implements, as appropriate, recommendations from the USFWS related to resource avoidance, minimization, and mitigation measures designed to reduce Project impacts on eagles.

Actions described below include an investigation of the probable causes of discovered eagle mortalities that could trigger the need for adaptive management (e.g., weather events or other considerations correlating with mortality discoveries). This ECP provides a framework for assessing if the adaptive management triggers as defined below have been reached.

A summary table of the avoidance and minimization measures for golden eagles is provided below. Table 16 outlines a step-wise approach to mitigation, thresholds, and the implementation of conservation measures. This table will be updated once additional discussions with the USFWS have occurred and/or after the USFWS has conducted their take analysis to support potential permit issuance.

Table 16. Summary of Adaptive Management Plan using a step-wise approach.

Step	Conservation	Threshold or Trigger
I	Assess eagle fatality to determine and/or understand potential cause. Evaluate fatality with previous take to determine if common factors are evident. Initiate consultation with USFWS to review appropriate measures to minimize likelihood of future take. Evaluate take levels relative to permitted value.	One golden or bald eagle taken
II	Evaluate the need to conduct additional studies to inform take occurrences. Identify actions that can be taken to avoid or minimize future take. This may include operation BMP, habitat management, ACP, or other activities deemed appropriate. Consult with USFWS to determine potential course of action.	To be determined based on authorized take levels. Take is within the authorized limit. Trigger will be determined based on a rate of take that could exceed the authorized take over a 5 year period if take continues at the rate identified.
III	PacifiCorp will consult with the USFWS to review and discuss information known about previous takes, in an attempt to identify factors which might be targeted. PacifiCorp's overall mitigation program for the subsequent 5-year permit period would be re-evaluated, based on actual results as compared with permitted levels of take, and this stepwise approach will start over with Step I. Examples of measures that may be implemented include: • Employ onsite biological monitor(s) during daylight hours at locations and/or times of suspected risk, to further refine the understanding of risk factors. • Implement habitat management or modification plan to minimize attraction to the Project, limit perching within the Project, and generally minimize risky behaviors	To be determined based on authorized take levels. Take is within the authorized limit. An additional take would meet the authorized amount under the permit.

Table 16. Summary of Adaptive Management Plan using a step-wise approach.

Step	Conservation	Threshold or Trigger
	• Implement a limited curtailment program specific to the area(s) and/or period(s) of highest collision risk. • Develop and evaluate detection and deterrent system for eagles approaching area(s) of risk. • Other measures agreed upon in consultation with USFWS	

9.8.1 *Mitigation for Bald and Golden Eagles*

Upon discovery of a bald or golden eagle mortality at the Project, the following actions will be taken:

- PacifiCorp will tarp the mortality and fill out the appropriate WIRHS reporting form.
- PacifiCorp will notify the designated USFWS office consistent with permit requirements.
- PacifiCorp will, if requested by USFWS, meet and confer with the USFWS to help determine the circumstances under which the mortality was discovered.
- PacifiCorp will work with the USFWS to evaluate available mortality discovery data and, as appropriate, implement additional monitoring measures, or implement measures to help reduce potential risks to eagles.

10.0 Permits and Reporting

10.1 USFWS Eagle Incidental Take Permit

If PacifiCorp obtains an eagle incidental take permit, they will follow all stipulations required by the permit. It is assumed that a Project-specific monitoring plan will be developed and required by the permit. PacifiCorp is committed to meeting the permit stipulations. Incidental reporting will continue as described in the PacifiCorp WIRHS. Additionally, for the life of the Project quarterly checks at all turbines will be completed.

10.2 USFWS Special Purpose Utility Permit (SPUT)

PacifiCorp applied for and received a Special Purpose Utility Permit (SPUT) renewal from the USFWS on April 03, 2020 (MB00466B-0). This permit is valid through March 31, 2023. The SPUT authorizes PacifiCorp to collect, transport, and temporarily possess migratory birds found dead or injured at the Project. Sub-permittees and employees directly reporting to the sub-permittees are also authorized under the permit. The permit does not allow eagles and federally listed threatened and endangered species to be collected. PacifiCorp will apply for a permit renewal as necessary throughout the duration of the Project. Under the conditions of this SPUT, PacifiCorp will report to USFWS all birds found dead or injured at the Project.

10.3 Wyoming State Permits

PacifiCorp has applied for and received a Chapter 10 (No. 1545) and Chapter 33 (No. 696) Permit from the Wyoming Game and Fish Department (WGFD). Permits have been authorized for the present calendar year and will be updated as warranted for the life of the Project. The Chapter 10 permit authorizes PacifiCorp to import, possess, confine, transport, sell and/or dispose of live wildlife. The Chapter 33 permit is a scientific resource, education/display or special purposes permit that allows PacifiCorp to possess and remove bird and mammals on and within one mile of the Project area. As a stipulation of the permit, PacifiCorp will provide annual reports to the WGFD. PacifiCorp will renew permits as necessary to complete the Project activities.

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Appendix A. PacifiCorp's RESPECT Corporate Policy

Appendix B. Dunlap Technical Advisory Committee Meeting Notes

Appendix C. Agency Communication

Appendix D. Pre-Construction Technical Report

Appendix E. Wildlife Incident Report and Handling System

Appendix F. Post-Construction Monitoring Reports

Appendix G. Post-Construction Nest Memorandums