

**EAGLE CONSERVATION PLAN for the
HIGH PLAINS and MCFADDEN RIDGE I WIND ENERGY
PROJECTS**

PacifiCorp

January 2020

TABLE OF CONTENTS

INTRODUCTION 1

 Migratory Bird Compliance Plan..... 1

REQUESTED ITEMS/INFORMATION 2

 Standardized Eagle Use Surveys – Preconstruction (2007 – 2009) 7

 Methods 7

 Results 7

 Eagle Nest Surveys..... 7

 Methods 7

 Results 10

 Mean Inter-nest Distance 10

 Prey Base Observations..... 14

 Greater sage-grouse 14

 Big Game 14

 Other Prey Resources 15

 Post-Construction Mortality Monitoring..... 15

 Methods 15

 Results 19

 During Development 23

 During Construction 24

 During Operations 24

REFERENCES 28

LIST OF TABLES

Table 1. Studies conducted at the High Plains and McFadden Ridge I Wind Energy Project 6

Table 2. Eagle nest survey summary for the High Plains and McFadden Ridge I Wind Energy Project from 2007 and 2011 through 2019..... 11

Table 3. Complete Eagle Fatality List for High Plains and McFadden Ridge I, Albany County, Wyoming 21

Table 4. Summary of Adaptive Management Plan using a step-wise approach..... 27

LIST OF FIGURES

Figure 1. Location of the High Plains and McFadden Ridge I Wind Energy Project, Albany County, Wyoming. 3

Figure 2. High Plains and McFadden Ridge I turbine locations and other infrastructure, Albany County, Wyoming. 5

Figure 3. Location of fixed-point eagle use survey plots at the High Plains and McFadden Ridge I Wind Energy Project, Albany County, Wyoming. 8

Figure 4. Location of mapped golden eagle flight paths and perch locations recorded during 2007 – 2009 eagle use survey plots at the High Plains and McFadden Ridge I Wind Energy Project, Albany County, Wyoming. 9

Figure 5. High Plains and McFadden Ridge I Wind Energy Project eagle nest locations from 2007 and 2011 – 2019, Albany County, Wyoming. The survey area (2.5-mile [4.0-kilometer] buffer) was the largest survey area used.....12

Figure 6. Approximate bald eagle territories for the bald eagle nests identified near the High Plains and McFadden Ridge I Wind Energy Project, Albany County, Wyoming. A buffer distance of 1.25 miles (2.01 kilometers) was used based on half the mean inter-nest distance between the three identified occupied bald eagle nests.13

Figure 7. Location of known greater sage-grouse leks and big game crucial range identified near High Plains and McFadden Ridge I Wind Energy Project, Albany County, Wyoming.16

Figure 8. Locations of the 29 turbines selected for post-construction carcass searches at the High Plains and McFadden Ridge I Wind Energy Project, Albany County, Wyoming. The same turbines were searched during all study periods, however the search interval was modified depending on survey period.....18

Figure 9. Location and date for the six identified eagle carcasses within the High Plains and McFadden Ridge I Wind Energy Project, Albany County, Wyoming.20

LIST OF APPENDICES

- Appendix A. US Fish and Wildlife Service Information for Planning and Consultation Report (Informal)
- Appendix B. Pre-construction Monitoring Studies
- Appendix C. Post-Construction Mortality Monitoring Studies
- Appendix D. Raptor Nest Studies
- Appendix E. Wildlife Incident Report and Handling System

INTRODUCTION

On July 23, 2019, the US Fish and Wildlife Service (USFWS) Region 6 Migratory Bird Office recently released a new guidance document for development of Eagle Conservation Plans (ECP) titled *U.S. Fish and Wildlife Service, Region 6, Recommended Approach for Development and Submission of Eagle Conservation Plans submitted to Region 6, Migratory Management Office in support of an Eagle Incidental Take Permit [EITP] Application for Wind Energy Project* (Guidance; USFWS 2019b). The following document has been prepared to address the items identified in the regional Guidance and is intended to serve as an ECP in support of an EITP application for the High Plains and McFadden Ridge I Wind Energy Project (Project).

Per the Guidance, the text in this ECP is limited primarily to summaries with reference to technical reports provided as appendices. This document does not elaborate on every study, but rather emphasizes data that support the document objective: eagle conservation. Lastly, readers should be cognizant that after nearly 10 years of operation, the Project will undergo a repower fitting turbines with larger blades. The repower will occur in 2020.

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 (MBTA) and Bald and Golden Eagle Protection Act (BGEPA) 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 (PCM) and conduct USFWS approved mortality monitoring
- Develop protocols for eagle nest surveys and conduct USFWS approved nest surveys
- Apply for a Special Purpose 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 EITP has been issued or termination of the non-prosecution period set forth in the plea agreement.

REQUESTED ITEMS/INFORMATION

1. ***Provide a statement that the ECP was prepared to support an application for an EITP for a wind energy facility, the name of the facility, and relevant company/subsidiary names of the applicant/owner/operator.***

PacifiCorp developed and constructed the Project. The Project has been in operation since 2009. This ECP has been prepared to support an application for an EITP for the Project.

2. ***Provide a map showing the location of the wind energy facility that USFWS can use for the NEPA [National Environmental Policy Act] document.***

A map of the location of the Project is included in Figure 1. The Project is located in Albany County, Wyoming, approximately 2.0 miles (mi; 3.2 kilometers [km]) east of McFadden, Wyoming.

3. ***Provide a statement indicating how many years the applicant is requesting eagle take for. Note that per the USFWS 2016 Revised Eagle Rule (FRN Vol 81, 91494) all applications for EITPs submitted after July 14, 2017 will be processed under the 2016 BGEPA regulations.***

The Project is requesting eagle take coverage under a permit for the operating life of the Project or up to 30 years as allowed under the USFWS 2016 Revised Eagle Rule.

4. ***Provide documentation which demonstrates that compliance with the Endangered Species Act (ESA), for federally listed species and critical habitat (designated or proposed), has already been completed for the wind energy project.***

The USFWS Information for Planning and Consultation (IPaC) tool lists three federally listed threatened or endangered bird species with the potential for occurring Project area (USFWS 2019a; Appendix A). These species are least tern (*Sterna antillarum*), piping plover (*Charadrius melodus*), and whooping crane (*Grus americana*). The pallid sturgeon (*Scaphirhynchus albus*) is the only listed (endangered) fish species triggered by the IPaC review. The bird and fish species are typically associated with the Platte River and suitable habitat is lacking in the Project area. IPaC lists two threatened plant species, Ute ladies'-tresses (*Spiranthes diluvialis*) and western prairie fringed orchid (*Platanthera praeclara*). The western prairie fringed orchid is also associated with the Platte River and, therefore, will not be affected by the Project. The Project occurs within the Ute ladies'-tresses range; however, the Project footprint is sited outside of potential suitable habitat. The Project area does not contain known populations of federally listed threatened or endangered species and does not contain designated critical habitat for federally listed species.

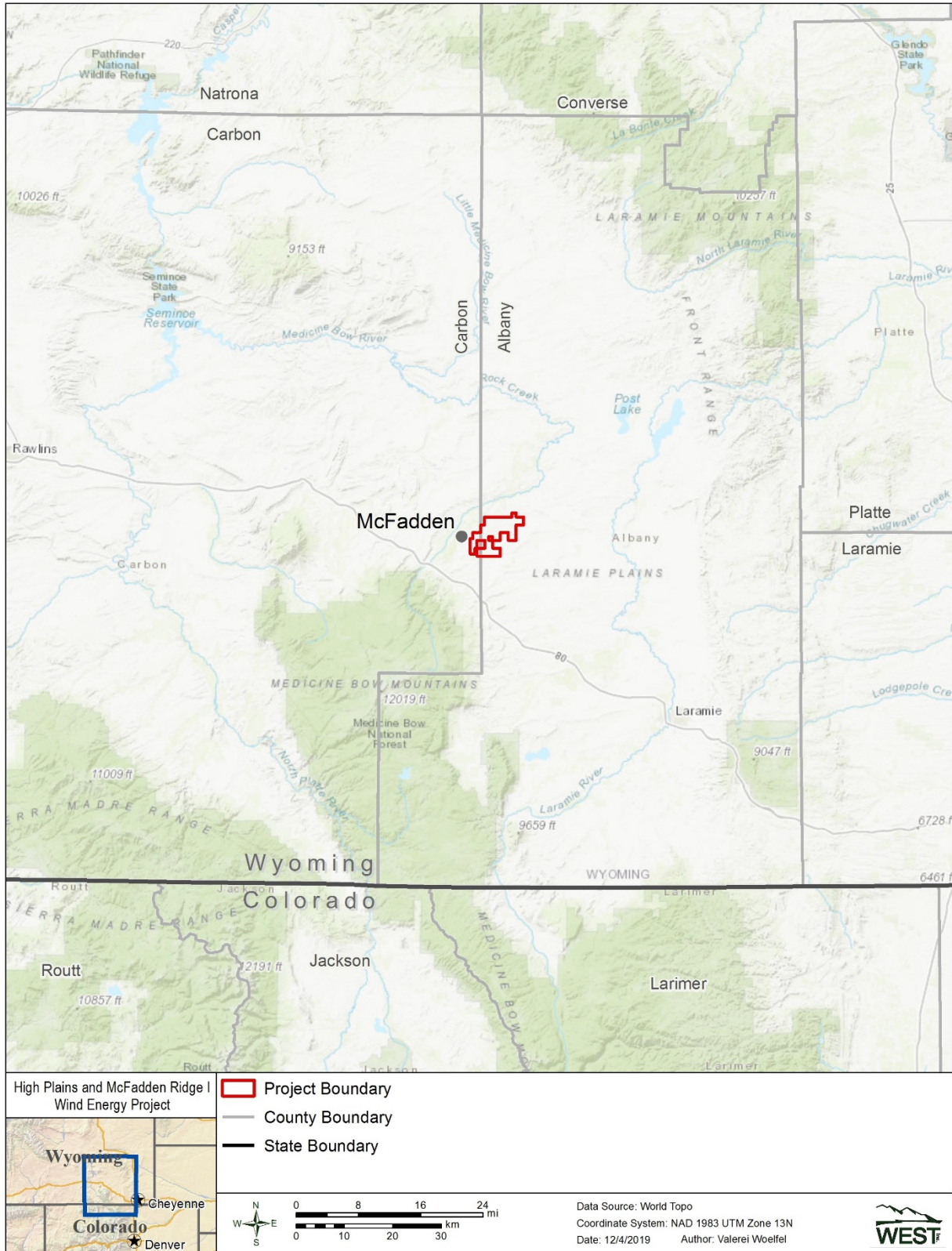


Figure 1. Location of the High Plains and McFadden Ridge I Wind Energy Project, Albany County, Wyoming.

5. ***If the wind energy project that an EITP is being submitted for occurs in proximity to a Department of Defense (DoD) installation, or a civil or commercial airport, or both, include a statement that the permit applicant is coordinating with these entities regarding the wind project. Also in such cases, the EITP applicant must provide documentation that DoD, Federal Aviation Administration (FAA), or both, have reviewed the wind project and that they do not have any issues with the project design and layout relative to their radar systems and other infrastructure.***

PacifiCorp coordinated with the FAA as part of the repower process. The FAA approved the turbine locations and heights and DoD reviewed as part of the FAA process through the DoD clearing house. No FAA hazards or DoD impacts were identified.

6. ***Project Description***

The Project is located in Albany County, Wyoming, approximately two mi east of McFadden, Wyoming (Figure 1). The Project is located on a combination of leased private-fee and State of Wyoming owned lands. The sites encompass approximately 7,500 acres (3,035 hectares) of land that extends approximately 3.4 mi (5.5 km) from north to south and is approximately 5-mi (8-km) wide. This land ranges in elevation from approximately 7,000 to 7,200 feet (ft; 2,133 to 2,195 meters [m]) above mean sea level. The Project currently consists of 85 GE 1.5 megawatt (MW) wind turbine generators (WTG) rated at 127.5 MW (Figure 2). These WTG have 269-ft (82-m) rotor diameters, 262-ft (80-m) hub height, and 397 ft (121 m) total height. The Project will be repowered in 2020 and all 85 WTG will be upgraded with new nacelles and rotors. The repowered WTG will have 299-ft (91-m) rotor diameters, 80-m hub height, 413 ft (126 m) total height, and will be rated at 1.85 MW. Two substations transform energy delivered by the 29.3 mi (47.2 km) of underground collection lines from 34.5 kilovolt (kV) to 230 kV. An approximately 10-mi (16-km) overhead transmission line, which was built across private fee lands, interconnects the Project with the existing Foote Creek Substation. All above ground lines currently meet the Avian Power Line Interaction Committee (APLIC) 2006 standards. One Operations and Maintenance (O&M) building was constructed for the Project.

Originally, the McFadden Ridge II Project in Albany County was proposed as part of the Project, but, after evaluations, was not constructed. Some descriptions in this document and supporting technical reports include the McFadden Ridge II Project area as part of the assessment area.

Most of the uplands in the Project area are mapped as mixed-grass prairie vegetative community cover-type (a mixture of graminoids, forbs, and shrubs, with less than 25% of the canopy cover contributed by shrubs). Additional vegetative community cover types include Wyoming big sagebrush (*Artemisia tridentate wyomingensis*; similar to the mixed-grass prairie, but with more than 25% of the plant cover contributed by shrubs), irrigated cropland, dry-land crop, greasewood (*Sarcobatus vermiculatus*), and basin rock soil. Riparian areas are a mosaic of riparian shrubland on Dutton Creek and small inclusions of riparian forest along Rock Creek. A small area of saltbush

community (dominated by Gardner saltbush [*Atriplex gardneri*]) occurs along the southern boundary. Livestock ranching operations occur throughout the Project area.

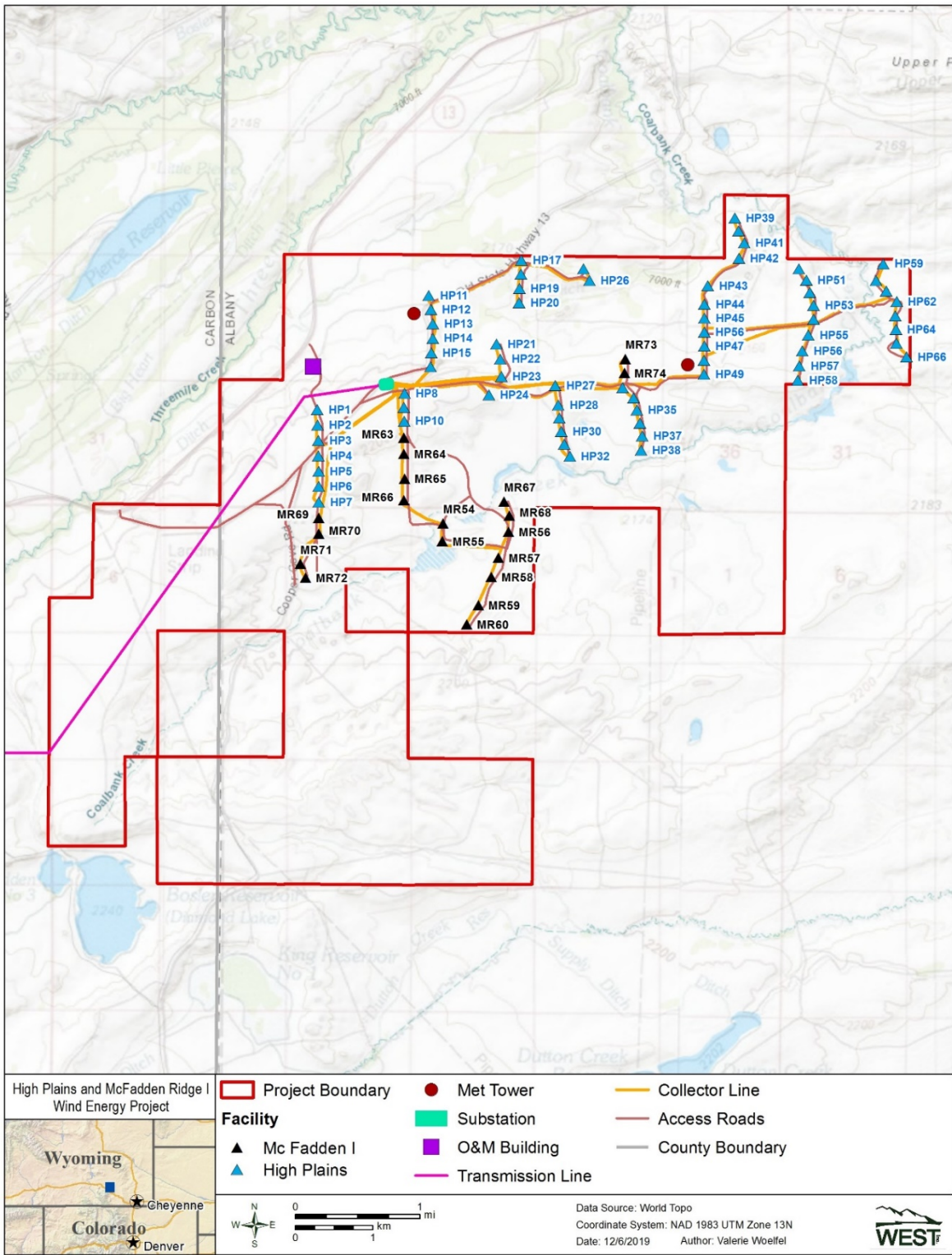


Figure 2. High Plains and McFadden Ridge I turbine locations and other infrastructure, Albany County, Wyoming.

7 Eagle Data for the Project

PacifiCorp has conducted a variety of pre- and post-construction surveys for the Project (Appendix B – Pre-construction Monitoring Studies; Appendix C – Post-construction Mortality Monitoring Studies; Appendix D – Raptor Nest Studies). Baseline avian studies and early post-construction studies were conducted prior to the establishment of the USFWS *Land-based Wind Energy Guidelines* (USFWS 2012), *Eagle Conservation Plan Guidance* (USFWS 2013), or Eagle Rule (USFWS 2016). Therefore, survey methods did not meet current standards and were typically focused on all birds, not specifically eagles. Table 1 lists all studies completed, dates, study focus (based on Guidance recommendation bullets), and identifies if technical reports are available. Brief descriptions are provided below for each study. For studies with technical reports, limited information is presented and the reader is directed to the technical report. For studies without technical reports, general methods and results are provided. Where available, Geographic Information System shapefiles and requested excel files have been or will be provided to the USFWS.

Table 1. Studies conducted at the High Plains and McFadden Ridge I Wind Energy Project

Study Description	Pre or Post	Study Dates	Study Topic			Prey Resources	Report Citation
			Eagle Use	Eagle Nest	Eagle Mortality		
Baseline Wildlife Study	Pre	4/6/2007-3/14/2009	X	X		X	Johnson et al 2009
Pellet Count Study	Pre	June 2009 and October/November 2008				x	Johnson and Martinson 2009
Post-construction Monitoring – Year 1	Post	10/14/2009-10/31/2010			X	X	McCreight and Lehnen 2010
Post-construction Monitoring – Year 2	Post	11/1/2010-10/31/2011			X	X	McCreight and Lehnen 2012a
Post-construction Monitoring – Year 3	Post	11/1/2011-10/31/2012			X	X	McCreight and Lehnen 2012b
Post-construction Monitoring Eagle Specific	Post	May 2014 – present			X		No report available
Raptor Nest Reports (2011 – 2019)	Post	January – August*		X			Johnson and Eddy 2011; WEST Inc. 2012-2019 (eight total technical memos)

*dates include total survey duration, but actual events varied by year (see respective reports for details)

Standardized Eagle Use Surveys – Preconstruction (2007 – 2009)

Eagle use surveys were conducted from 2007 - 2009 as part of the pre-construction baseline surveys (Johnson et al 2009). A summary is provided below and the technical report is included in Appendix B.

Methods

Eagle use surveys conducted at the Project pre-dated the current USFWS standards and included all birds. The surveys were conducted year round and split up by season (spring: March 15 – May 31, 2007; fall: September 1 – November 15, 2007; summer: June 1 – August 31, 2008; and winter: November 16, 2008 – March 14, 2009). The surveys were conducted at 11 points that covered approximately 30% of the area within 0.6 mi (1.0 km) of turbines (Figure 3). Full survey methods are provided in the technical report (Johnson et al 2009; Appendix B).

Results

Twenty golden eagles (*Aquila chrysaetos*) were observed during the survey period. Golden eagle flight paths from the survey are presented in Figure 4. Golden eagle use was consistently low throughout the survey year (0.07 golden eagles/800-m [2,625-ft] plot/20-minute [min] survey in spring and winter, 0.05 in summer and 0.03 in fall). Golden eagle use was only documented from the central portion of the Project and eastward. See Johnson et al 2009 for full results.

Eagle Nest Surveys

Eagle nest surveys were conducted in spring of 2007 as part of the baseline monitoring study (Johnson et al 2009; Appendix B). This was the only pre-construction nest survey conducted for the Project and included one round of ground-based survey. Nine additional years (2011 – 2019) of nest surveys have been conducted post-construction (Johnson and Eddy 2011, and WEST Inc. 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019). Detailed methods for each survey year are included in the respective reports (Appendix D).

Methods

Various survey methods have been employed over the 10 survey years. The survey area, number of visits, ground versus aerial, survey objectives, and nest status terms have been modified as USFWS recommendations and industry practices have evolved. Surveys through 2013 used methods that are not consistent with the current USFWS recommendations. Surveys from 2014 through 2019 have followed a rigorous survey methodology developed in coordination with the USFWS. See technical reports for detailed methods (Appendix D). For the purpose of this document the following terms are defined:

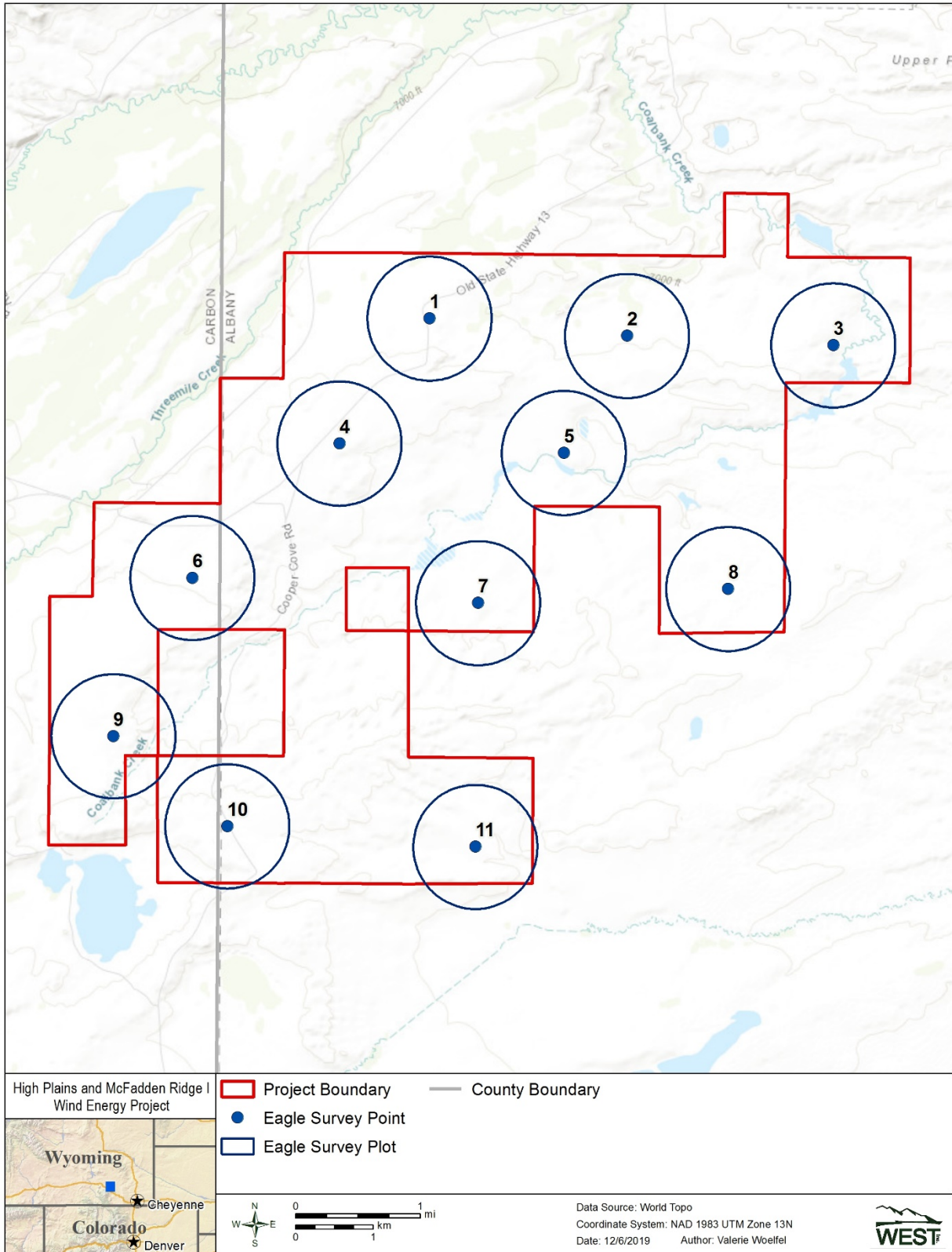


Figure 3. Location of fixed-point eagle use survey plots at the High Plains and McFadden Ridge I Wind Energy Project, Albany County, Wyoming.

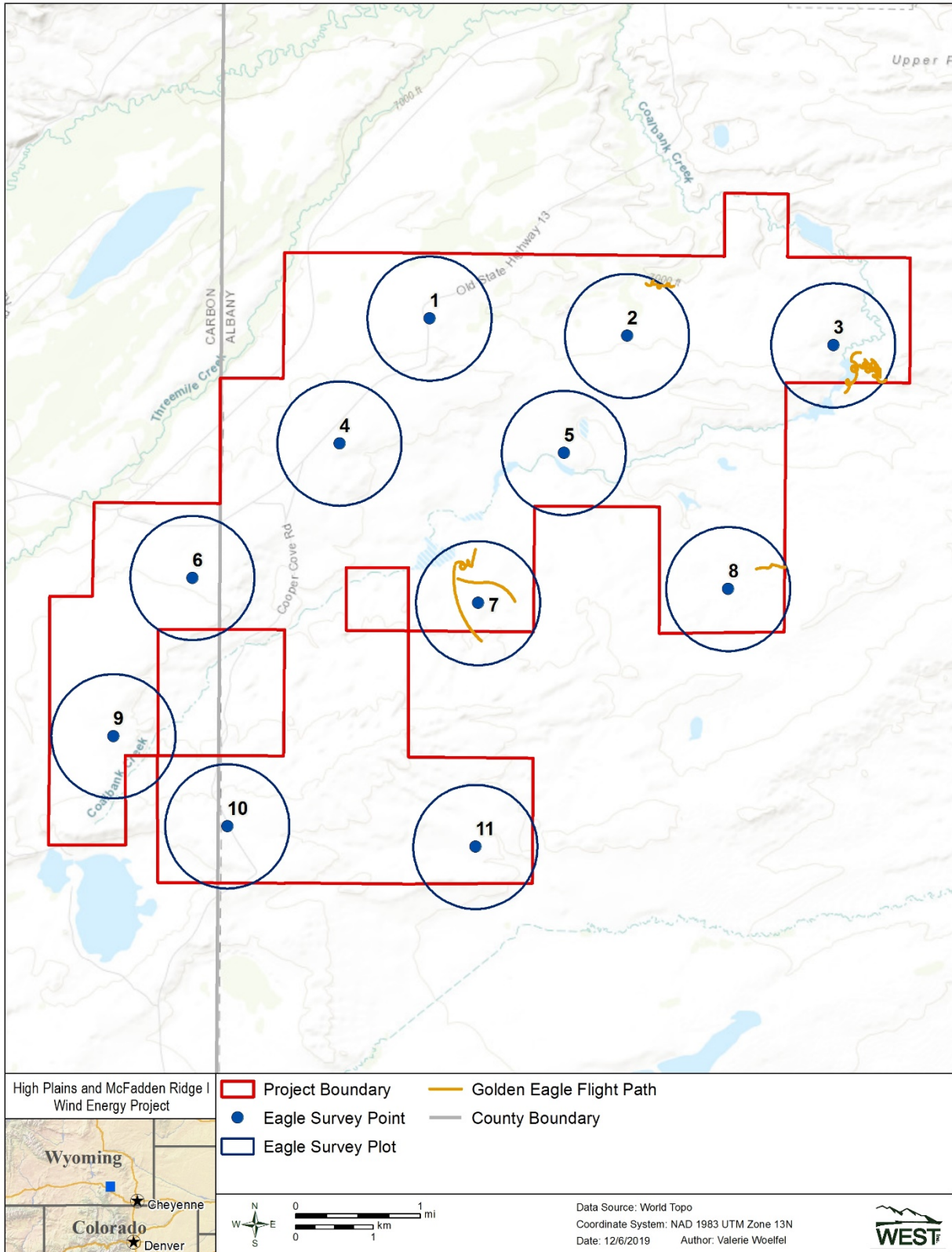


Figure 4. Location of mapped golden eagle flight paths and perch locations recorded during 2007 – 2009 eagle use survey plots at the High Plains and McFadden Ridge I Wind Energy Project, Albany County, Wyoming.

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.

Successful – Nests that fledged at least one juvenile.

Results

Two golden eagle nests and five bald eagle (*Haliaeetus leucocephalus*) nests have been located during all Projects surveys (Table 2, Figure 5). One golden eagle and one bald eagle nest were identified within the study area during the pre-construction (2007) surveys. An additional one golden eagle nest and four bald eagle nests were identified across all other surveys years. All of the nests are located greater than 1.0 mi (1.6 km) from Project turbines. There was never more than one golden eagle nest identified in any one year, therefore, mean inter-nest distances (MIND) and subsequent territory range for golden eagles could not be calculated. The most occupied bald eagle nests identified in any one year was three (2019); therefore, up to three bald eagle territories have been identified in the Project study area. Additional discussion on territories and MIND is provided below.

While the survey methods and reported results were not consistent across each survey year, an effort was made to standardize each year's data based on best available data to allow for comparison. Based on the terms defined above, each nest was identified as Occupied (Yes or No) and Successful (Yes or No) across all survey years (Table 2). Detailed results for each survey year are included in the respective reports

Mean Inter-nest Distance

Based on the eagle nest surveys conducted for the Project and surrounding 1-mi buffer in 2007, 2-mi buffer in 2011, 2012, and 2013, and 2.5-mi (4.0-km) buffer in 2014, 2015, 2016, 2017, 2018, and 2019, there have been as many as two golden eagle and five bald eagle nests located within 2.5 mi of Project turbines. No more than one golden eagle nest was occupied in a single year, so no territory ranges were defined. In 2019, three bald eagle nest were classified as occupied. Therefore, three occupied bald eagle nest territories are considered for the MIND. This is the highest number of occupied bald eagle nest territories identified in any one year based on the data available.

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 2013). It should be noted that the ECP recommends a 10-mi (16-km) survey area be used to inform this calculation and only an approximately 2.5-mi buffer was used for the Project. Using the three occupied bald eagle nests located near the Project in 2019, the MIND is 2.5 mi and ½ the MIND or approximate territory radius is 1.25 mi (2.01 km; Figure 6).

Table 2. Eagle nest survey summary for the High Plains and McFadden Ridge I Wind Energy Project from 2007 and 2011 through 2019.

Nest ID	Species	2007		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)
20771501	Golden Eagle	Y	unknown	Y	N	NA	NA	NA	NA
20771801	Golden Eagle	NA	NA	NA	NA	Y	N	NA	NA
20772101	Bald Eagle	Y	N	Y	Y	N	N	Y	Y
20771101	Bald Eagle	NA	NA	N	N	N	N	N	N
20773001	Bald Eagle	NA	NA	NA	NA	NA	NA	NA	NA
20771203	Bald Eagle	NA	NA	NA	NA	NA	NA	NA	NA
20771104	Bald Eagle	NA	NA	NA	NA	NA	NA	NA	NA
Nest ID	Species	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)
20771501	Golden Eagle	NA	NA	NA	NA	NA	NA	NA	NA
20771801	Golden Eagle	NA	NA	NA	NA	NA	NA	NA	NA
20772101	Bald Eagle	Y	Y	Y	Y	Y	Y	Y	Y
20771101	Bald Eagle	Y	Y	N	N	Y	Y	Y	Unknown
20773001	Bald Eagle	NA	NA	NA	NA	NA	NA	NA	NA
20771203	Bald Eagle	NA	NA	NA	NA	NA	NA	NA	NA
20771104	Bald Eagle	NA	NA	NA	NA	NA	NA	NA	NA
Nest ID	Species	2018		2019					
		Occupied (Y/N)	Successful (Y/N)	Occupied (Y/N)	Successful (Y/N)				
20771501	Golden Eagle	NA	NA	NA	NA				
20771801	Golden Eagle	NA	NA	NA	NA				
20772101	Bald Eagle	NA	NA	NA	NA				
20771101	Bald Eagle	N	N	N	N				
20773001	Bald Eagle	Y	Unknown	Y	Y				
20771203	Bald Eagle	Y	Unknown	Y	N				
20771104	Bald Eagle	NA	NA	Y	Y				

NA = Not applicable because nest was not present, was no longer an eagle nest, or was not surveyed.

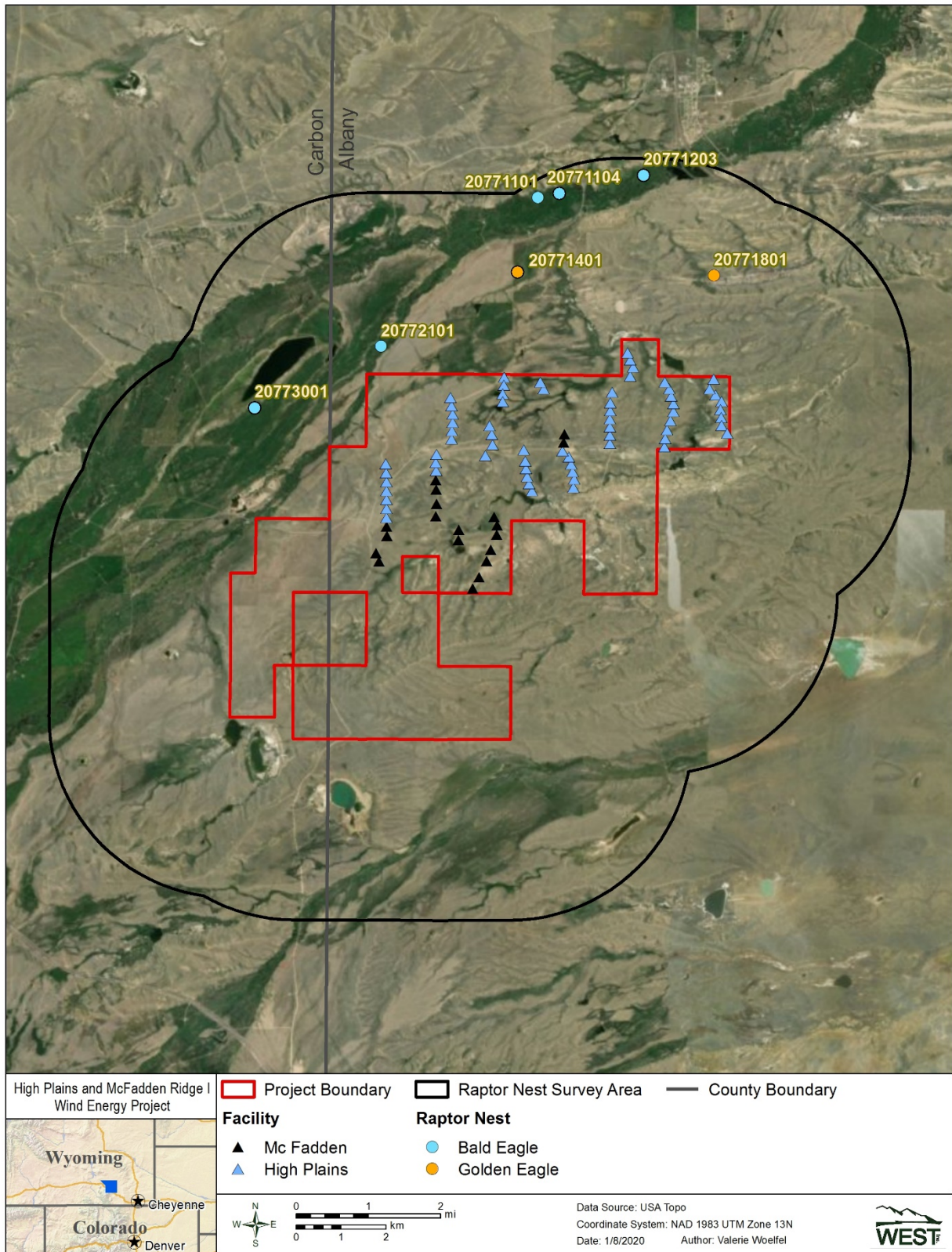


Figure 5. High Plains and McFadden Ridge I Wind Energy Project eagle nest locations from 2007 and 2011 – 2019, Albany County, Wyoming. The survey area (2.5-mile [4.0-kilometer] buffer) was the largest survey area used.

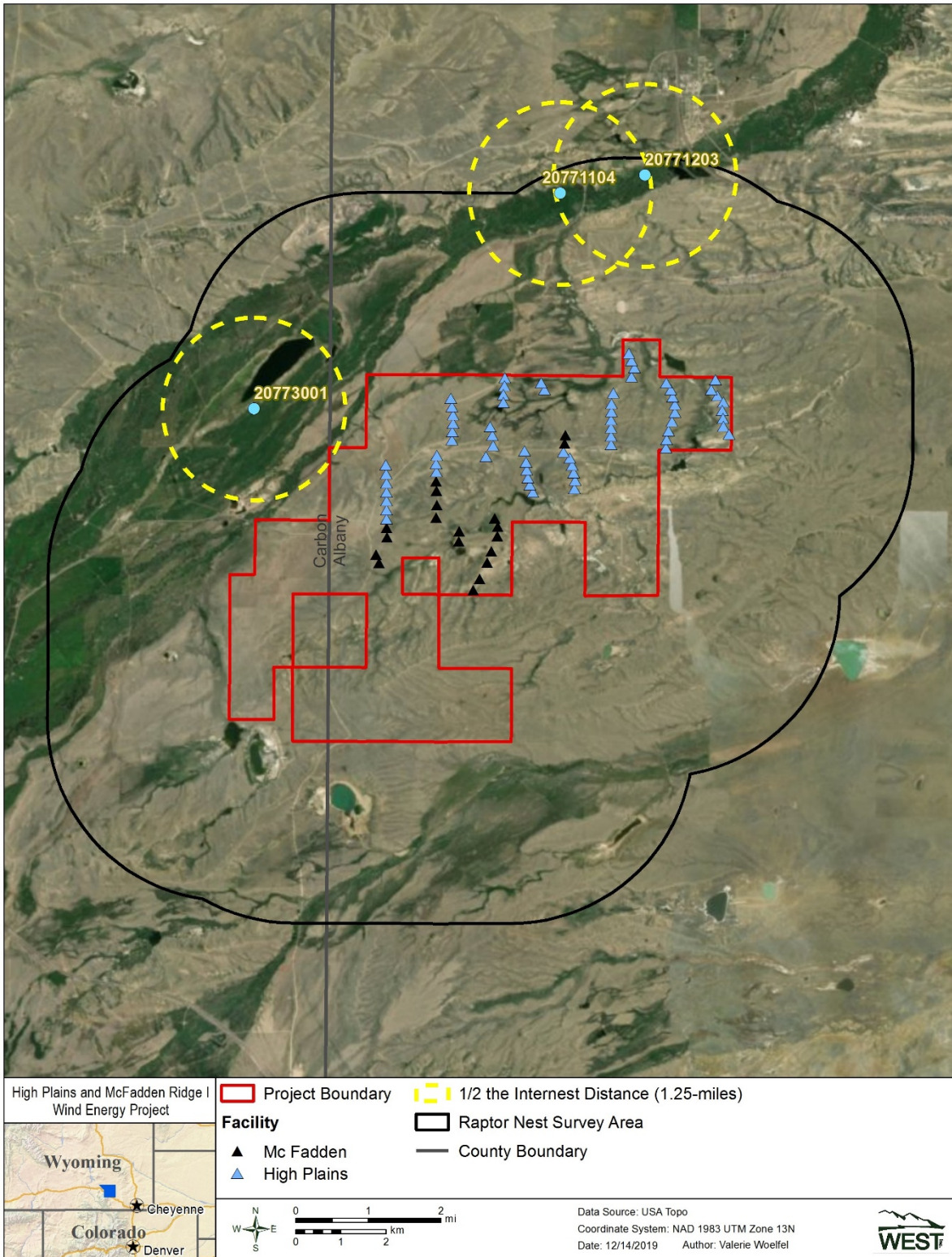


Figure 6. Approximate bald eagle territories for the bald eagle nests identified near the High Plains and McFadden Ridge I Wind Energy Project, Albany County, Wyoming. A buffer distance of 1.25 miles (2.01 kilometers) was used based on half the mean inter-nest distance between the three identified occupied bald eagle nests.

Prey Base Observations

Prey base surveys conducted pre-construction included greater sage-grouse (*Centrocercus urophasianus*) lek and pellet count surveys and pronghorn (*Antilocapra americana*) pellet count surveys (Johnson and Martinson 2009, Johnson et al. 2009, McCreight and Lehnen 2010, 2012a, 2012b). Brief methods and results are presented below for each target species with detailed information available in the respective technical reports.

Greater sage-grouse

Methods

The Project is not located within a CORE greater sage-grouse area and no records of leks were within two mi of the Project (Figure 7). To obtain additional information on greater sage-grouse leks all areas within two mi of the Project were searched by vehicle and foot in 2007. Details for the survey year can be found in technical reports (Johnson et al. 2009). Pellet count studies were conducted over two seasons pre-construction and over seven seasons post-construction. Surveys were conducted twice per year during May/June and October/November, starting in June 2008 and ending in October 2012. Only May/June 2009 (construction period) was not surveyed. Treatment sites were established within the Project at turbines with suitable habitat and reference sites established away from the Project with suitable habitat were surveyed each season. Details for each survey year can be found in technical reports (Johnson and Martinson 2009, Johnson et al. 2009, McCreight and Lehnen 2010, 2012a, 2012b).

Results

No greater sage-grouse leks were located within 2 mi of the Project (Figure 7).

No pellets were identified during pre-construction surveys and pellets occurred in very low density at both the turbine and reference sites during post-construction surveys. More pellets were documented at reference sites than turbine sites, but was not statistically significant. Additional results can be found in technical reports (Appendix B and C).

Big Game

Methods

Pellet count studies were conducted over nine seasons during pre- and post-construction periods (see details for greater sage-grouse above). Treatment sites were established within the Project at turbines within the crucial range and reference sites established away from the Project within the crucial range were surveyed each season. Details for each survey year can be found in technical reports (Johnson and Martinson 2009, McCreight and Lehnen 2010, 2012a, 2012b).

Results

Low pellet counts were recorded during pre-construction surveys at both turbine and reference plots, though more were recorded at reference plots. During post-construction surveys, more pellets were documented at reference sites than turbine sites, but was only statistically significant in the first two of the seven seasons. Additional results can be found in technical reports.

The northeastern portion of the Project overlaps pronghorn crucial range. Crucial range for mule deer (*Odocoileus hemionus*) and elk (*Cervus canadensis*) are greater than two mi northwest and south of the Project. (Figure 7).

Other Prey Resources

The Project is located on leased-private land that has historically been used for ranching operations. As such, livestock activities occur as required by the landowner. Livestock use across the Project has primarily been cattle and no clear seasonal patterns have been noted. Additional prey resources in the Project area include various small mammals including lagomorphs and fossorial mammals. No formal studies have been conducted for these prey resources.

Post-Construction Mortality Monitoring

PacifiCorp placed the Project in operation in September 2009. Multiple PCM studies have been conducted since the Project went operational including a standard 3-year PCM study (October 2009 – October 2012) and eagle specific bimonthly/monthly searches (May 2014 – present). The information below provides detailed summaries for each survey period and presents data through June 2019.

Methods

The first period (October 2009 – October 2012) included an initial 1-year PCM and reporting program (October 2009 – October 2010) to estimate and evaluate Project impacts, as required by the Industrial Siting Council permit. This program was designed for all birds and bats, not eagles specifically, and searched plots at one-third (29) of the Project turbines (Figure 8). PCM efforts included standardized carcass searches, searcher efficiency bias trials, and carcass persistence bias trials. Large game birds (e.g., hen pheasants [*Phasianus colchicus*]) were used for large bird trials. After the 1-year monitoring study, in coordination with the TAC, two additional years of monitoring were implemented (November 2010 – October 2012). Detailed methods for the three monitoring years are provided in the McCreight and Lehnen 2010, 2012a, and 2012b technical reports (Appendix A).

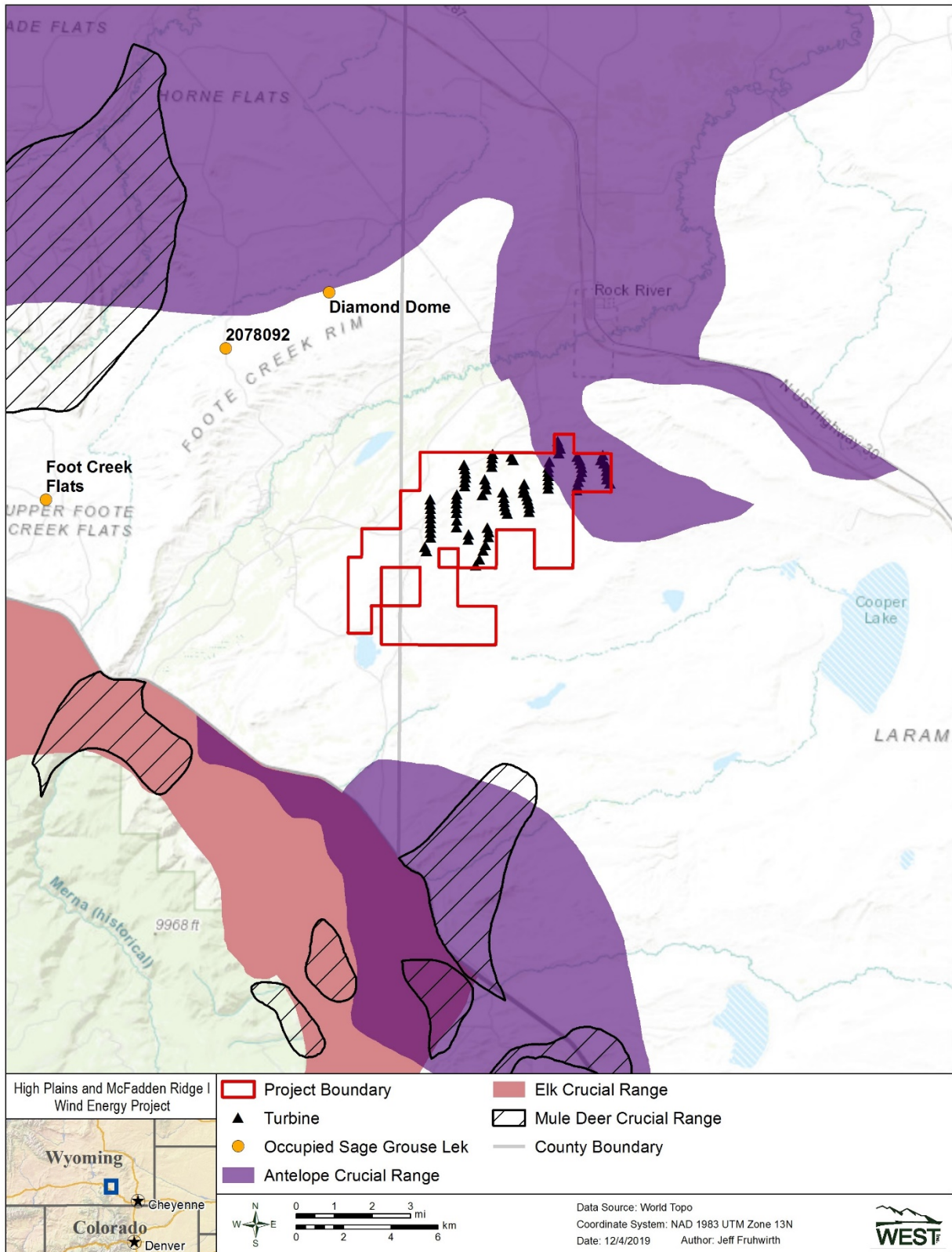


Figure 7. Location of known greater sage-grouse leks and big game crucial range identified near High Plains and McFadden Ridge I Wind Energy Project, Albany County, Wyoming.

The second period (May 2014 – December 2015) was a standardized monitoring study focused on eagle fatality detections. The general survey methods followed those used during the three year standardized study. Search plots were 525 x 525-ft (160 x 160-m) squares centered on turbines. A 66-ft (20-m) transect spacing was used for all pedestrian searches. All non-searched turbines were visually inspected from turbine pads during each search round. From May 2014 – December 2015 eagle-specific mortality monitoring was conducted twice per month at the same one-third of the turbines searched during standardized monitoring (Figure 8). Searcher efficiency trials (turkey skin wrapped around foam decoys) were conducted at searched and non-searched turbines. The goal of detection trials was not to provide a statistically robust data set, but rather to verify that a 20-m spacing was appropriate for eagle detection. As such, 10 trials were placed in 2014 and 16 in 2015. At the direction of the USFWS, the search interval was reduced to once per month starting in January 2016 and the number of detection trials was increased. This change in methods has continued into the present (data presented through June 2019). Thirty-six trials were placed in 2016, 39 in 2017, 53 in 2018, and 30 through June 2019. No carcass persistence trials were conducted. A formal report was not prepared for this monitoring period. SPUT reporting was completed as required.

As part of the overall monitoring effort, avian carcasses discovered at the Project were handled under the Wildlife Incident Reporting and Handling System (WIRHS) manual and will continue to be for the life of the Project (Appendix E). Eagle carcass reporting changed over time with initial reporting to the USFWS – Wyoming Ecological Services Field Office. Carcasses were retrieved by USFWS staff or PacifiCorp was authorized by USFWS Office of Law Enforcement (OLE) to collect carcasses until retrieval by USFWS. Under the current protocol, PacifiCorp reports all eagle carcasses to USFWS – OLE and obtains permission to deliver carcasses to the repository. If USFWS issues an EITP for the Project, reporting to USFWS of eagle carcasses discovered will continue based on the permit conditions.

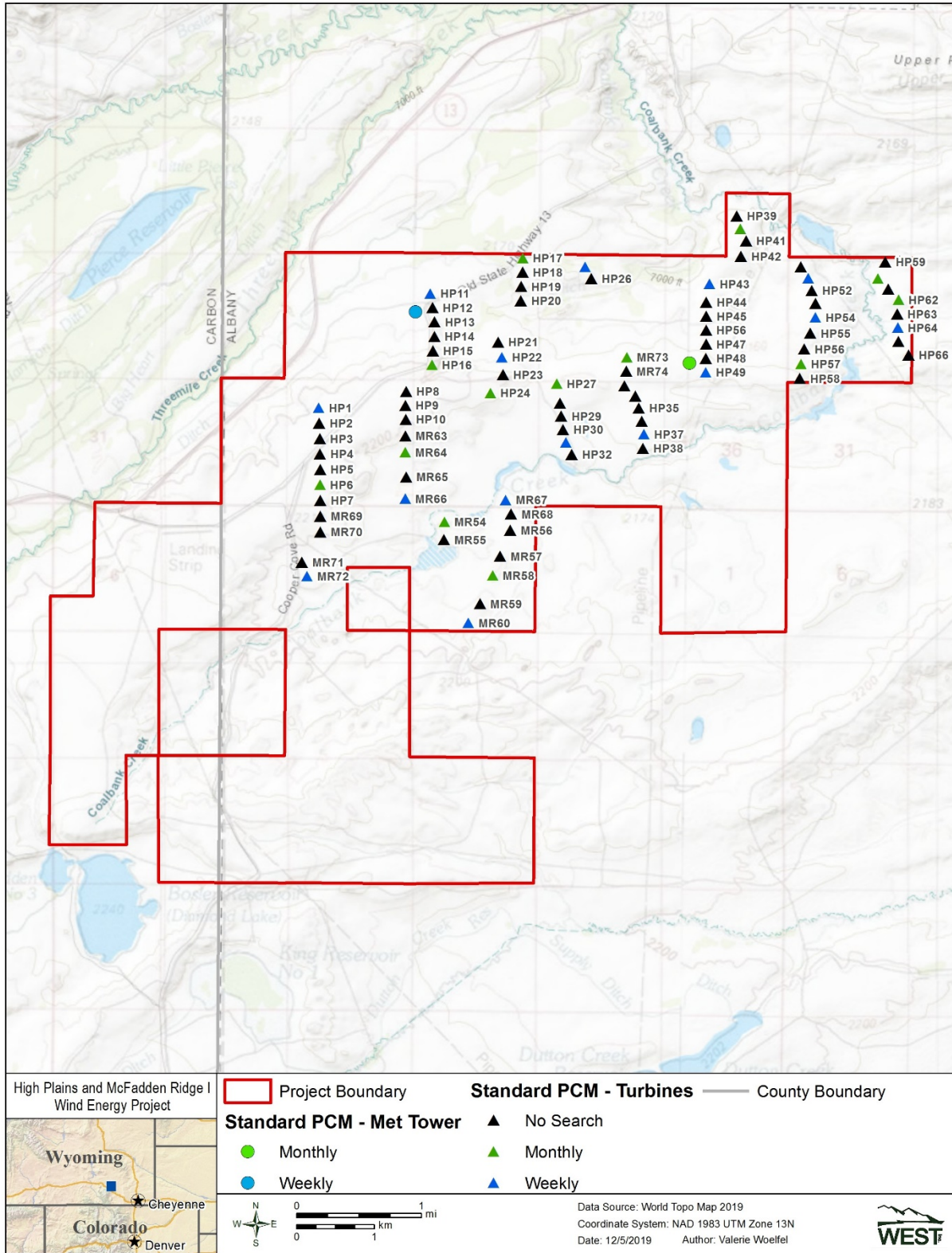


Figure 8. Locations of the 29 turbines selected for post-construction carcass searches at the High Plains and McFadden Ridge I Wind Energy Project, Albany County, Wyoming. The same turbines were searched during all study periods, however the search interval was modified depending on survey period.

Results

Year 1 (October 14, 2009 – October 31, 2010)

Seven hundred twenty-three turbine plot searches were conducted and one bald eagle and one golden eagle carcass were found. Both of these finds were incidental and the bald eagle was found by operations staff (Figure 9, Table 3). The detection rate for large birds in Year 1 was 81.0% across all seasons. The mean removal time for large birds was 25.2 days across all seasons. Full results can be found in the McCreight and Lehnen 2010 technical report.

Year 2 (November 1, 2010 – October 2011)

Three hundred forty-four turbine plot searches were conducted and one golden eagle carcass was detected incidentally (Figure 9, Table 3). The detection rate for large birds in Year 2 was 82.0%. The mean removal time for large birds was 20.3 days across all seasons. Full results can be found in the McCreight and Lehnen 2012a technical report.

Year 3 (November 1, 2011 – October 31, 2012)

Five hundred eighty turbine plot searches were conducted and one golden eagle was found during a scheduled search (Figure 9, Table 3). The detection rate for large birds in Year 3 was 83.9%. The mean removal time for large birds was 19.8 days. Full results can be found in the McCreight and Lehnen 2012b technical report.

Standardized Eagle Monitoring (May 2014 – December 2015)

In 2014, 448 turbine plot searches were conducted and one bald eagle carcass was found (Figure 9, Table 3). The detection rate for turkey skin decoys during 2014 was 100% for on plot trials and 25.0% for off plot trials. In 2015, 714 turbine plot searches were conducted and no eagle carcasses were found. The detection rate for turkey skin decoys during 2015 was 83.3% for on plot trials and 30.0% for off plot trials.

Standardized Eagle Monitoring (January 2016 – Present)

In 2016, 353 turbine plot searches were conducted and no eagle carcasses were found. The detection rate for turkey skin decoys during 2016 was 77.8%. In 2017, 320 turbine plot searches were conducted and no eagle carcasses were found. The detection rate for turkey skin decoys during 2017 was 94.9%. In 2018, 357 turbine plot searches were conducted and no eagle carcasses were found. The detection rate for turkey skin decoys during 2018 was 96.2%. Through June 2019, 186 turbine plot searches were conducted and one golden eagle carcass was found (Figure 9, Table 3). The detection rate for turkey skins through June 2019 was 96.7%.

Four golden eagle and two bald eagle carcasses have been found during the Project's 10-year operational period (Figure 9, Table 3). Three golden eagle carcasses and one bald eagle carcass were found during the 3-year PCM study. One golden eagle and one bald eagle were found during additional monitoring from 2014 – 2019.

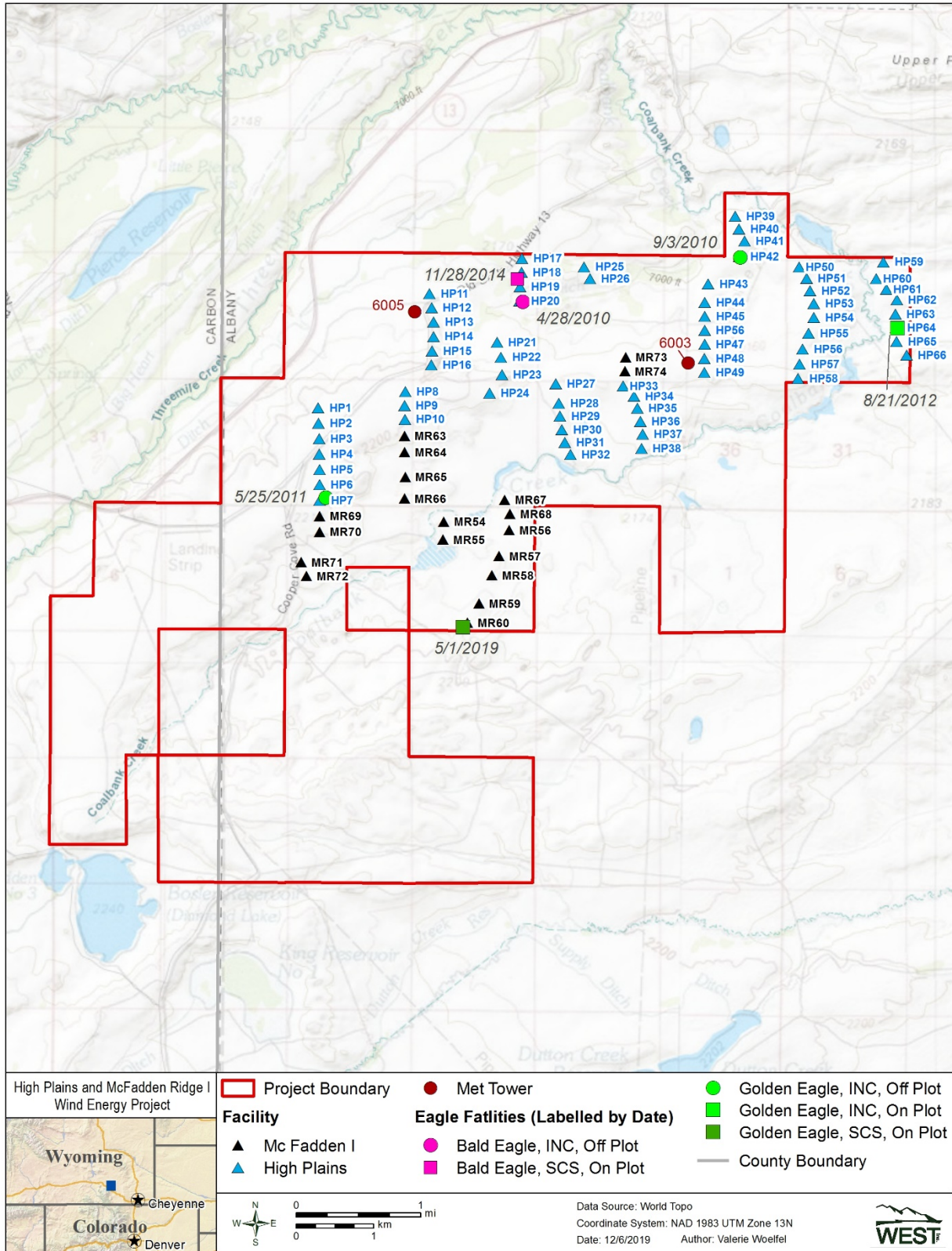


Figure 9. Location and date for the six identified eagle carcasses within the High Plains and McFadden Ridge I Wind Energy Project, Albany County, Wyoming.

Table 3. Complete Eagle Fatality List for High Plains and McFadden Ridge I, Albany County, Wyoming

Date	Species	Age	Sex	Ob.	Search Type	On/Off Plot	Turbine	Distance (m)	Bearing (degrees)	Longitude	Latitude	Habitat	Condition	Est. Time Since Death	Dis.
4/28/2010	bald eagle	A	U	OS	INC	Off	HP-20	45	107	41.68054	-106.02591	Scrubland	Dismembered	14 days	Left in Place
9/3/2010	golden eagle	U	U	Enercon	INC	Off	HP-42	27	135	41.68600	-105.99226	Barren Land	Intact	NA	Left in Place
5/25/2011	golden eagle	U	U	Enercon	INC	Off	HP-7	83	64	41.65756	106.05611	Scrubland	Dismembered	2 days	Left in Place
8/21/2012	golden eagle	U	U	Enercon	SCS	On	HP-64	21	108	41.67800	-105.96781	CRP	Intact	>7 days	Left in Place
11/28/2014	bald eagle	J	U	WEST	SCS	On	HP-18	87	209	41.6832	-106.02680	Scrubland	Dismembered	<1 month	Left in place
5/1/2019	golden eagle	J	U	WEST	SCS	On	MR-60	71	226	41.6427	-106.03461	Scrubland	Dismembered	15 – 30 days	Left in place

Search type = Carcass was found during Scheduled Carcass Search (SCS); Inc = Incidental find.

WEST = Western EcoSystems Technology, Inc.; OS = Operation Staff.

A = Adult; J = Juvenile; U = Unknown.

Est. = Estimated; Dis = Disposition.

8. **Avoidance and Minimization Measures Implemented for the Project:**

Throughout Project development, PacifiCorp evaluated and adopted conservation measures to aid in the protection of eagles. These conservation measures have been 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 implemented during construction are being implemented during operations and will be implemented during decommissioning/restoration (included in Section below).

No major avoidance and minimization measure specific to eagles were implemented as part of the Project design and planning phase, primarily because early biological studies showed limited evidence of eagle risk. The Project location avoided and minimized eagle risk due to proper siting. Topography across the site was relatively flat, lacking prominent ridgelines, draws, and saddles commonly associated with eagle use. Natural perch structures were not identified in the Project area and only man-made structures (i.e., power lines) were available post-construction. While some prey resources were identified during the planning phase, significant attractants such as prairie dog (*Cynomys* spp.) colonies, greater sage-grouse, or carrion sources were not present. No prairie dog towns were identified in the Project pre- or post-construction. The Project is beyond CORE sage grouse habitat and no known leks occur within five mi of the Project. The eastern limits of the Project is mapped as crucial range for pronghorn; however, no major migration pathways or partition areas occur in the Project area. No other big game crucial ranges occur in the Project area. The Project is owned and managed as a cattle ranch.

Baseline studies for the Project did identify one bald eagle nest and one golden eagle nest in the survey area. Based on the information provided, the USFWS requested a one-mile buffer for eagle nests. Neither nest was in the Project footprint and all turbines were cited to provide at least a one-mile buffer as requested by the USFWS.

Other Project design conservation measures include:

- Existing ranch roads were utilized where possible to minimize additional disturbance.
- The Project implemented APLIC (2006) recommendations into the transmission and distribution line design to minimize collision and electrocution risks to avian species. The APLIC (2012) guidance was not available during the development period.
- The Region 6 Golden Eagle Avoidance and Minimization Measures Guidance was not available at the time the Project was sited and developed. However, this ECP points out areas where Project selection and development were generally in line with the Region's recommendations: nest surveys and turbine placement, concentrated prey resources, and other Project-specific eagle activity areas.

A number of avoidance and minimization measures have been implemented during the Project's operational period and are discussed below.

9. Eagle Conservation Measures for the Project

This section includes Best Management Practices (BMPs) and conservation measures for eagles that have been and will continue to be implemented at the Project during development, construction, operations, and repower. Based on the new Region 6 ECP guidance, additional general wildlife/biological resource BMPs and conservation measures that have been or will be implemented for the Project have not been included below, but are presented in the Project's Bird and Bat Conservation Strategy.

During Development

The Project implemented a variety of BMPs and conservation measures to reduce potential impacts to wildlife and biological resources. The following measures were implemented during Project siting to avoid/minimize impacts to eagles.

- Turbine locations were sited or relocated to ensure adherence to disturbance-free buffers from eagle nests (including a 1-mi buffer from the identified bald eagle and golden eagle nests).
- The Project was sited outside of areas identified as present-day CORE habitat for greater-sage grouse; the closest known lek is greater than five miles away from turbines.
- By utilizing existing roads where possible, siting of Project infrastructure minimized habitat loss and fragmentation. Although the Land-Based Wind Energy Guidelines (USFWS 2012) and the Wildlife Protection Recommendations for Wind Energy Development in Wyoming (WGFD 2010) were not available at the time the Project infrastructure was sited, the Project was generally consistent with these guidelines.
- WTGs feature tubular support towers, rather than lattice supports, to minimize bird perching and nesting opportunities.
- To the extent possible, electrical collection lines were buried underground. The Project APLIC 2006 recommendations into the transmission and distribution line design to minimize electrocution risks to avian species for any lines constructed above ground.
- Any guy wires on meteorological towers (MET) were marked with recommended bird deterrent devices or removed shortly after construction.
- Turbine placement avoided documented locations of any species of wildlife, fish, or plant protected under the federal Endangered Species Act.
- Existing roads and transmission corridors have been incorporated into the site plans to the extent possible.
- Site plans minimize the extent of the road network needed within the Project.
- With the exception of the eastern Project limits, which is in crucial pronghorn range, the Project was sited outside of crucial big game winter range, parturition areas, and migration corridors that can provide a prey resource for eagles.

During Construction

The following BMPs and Conservation Measures were implemented during construction of the Project to avoid and minimize impacts to eagles:

- Construction activities occurred outside of seasonal buffer restrictions for occupied eagle nests known to occur in the Project area.
 - 0.5 mi (0.8 km) for occupied bald eagle nests from February 1 – August 15.
 - 0.5 mi for occupied golden eagle nests from January 15 – July 31.
- Gravel was placed at least 5.0 ft (1.5 m) around each turbine foundation to discourage small mammals and reptiles from burrowing under or near turbine bases, which could act as a prey source for eagles.
- During Project construction, travel was restricted to designated roads, and Project personnel were advised regarding speed limits (25 mi per hour [mph; 40 km per hour]) to minimize wildlife mortality due to vehicle collisions and potential for eagle attraction to carrion.
- Reclaimed areas were contoured, graded, and seeded as needed to promote successful re-vegetation, thereby reestablishing habitat that could be used by wildlife.
- Collection and communication lines were buried to minimize and avoid collision and electrocution risks to eagles and other avian species. All lines were either constructed in accordance with the most current APLIC Guidelines (APLIC 2006) to protect birds, including eagles, from electrocution and collision or lines not built to these recommendations were updated during the operational period.

During Operations

- Carrion and carcass removal: PacifiCorp will continue to remove potential source(s) of eagle attractions in the Project area (e.g., carrion, prey and/or prey habitat) in accordance with applicable state and federal laws. PacifiCorp has carrion removal contracts in place with vendors at all Wyoming wind energy 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). All PacifiCorp employees and contractors are actively engaged in the location and reporting process.
- The Project is located on leased private property. Hunting is limited to the landowner and accompanying guest; however, hunting is not allowed near the Project turbines. A benefit of this practice is safety and a reduction in attraction as gut piles and other carcass remnants are reduced.
- Project personnel are advised regarding speed limits on roads (25 mph) to minimize wildlife mortality due to vehicle collisions. This reduces potential eagle attraction associated with carrion.

- Potential increases in poaching are reduced through employee and contractor education regarding wildlife laws. If violations are discovered, the offense will be reported to the WGFD and/or USFWS, depending upon the species.
- Several temporary guyed MET towers at the Project were removed during the first year of PCM. The two remaining towers have bird-flight diverters installed.
- PacifiCorp will meet or exceed current APLIC recommendations in the event any utility poles or power lines are built or retrofitted at the site. As described above, all overhead lines constructed for the Project were required to incorporate APLIC 2006 guidelines. However, a contractor had originally designed and constructed some of the lines and had not used an avian-safe design. Upon PacifiCorp inspection of the line after construction, it was documented the construction did not meet PacifiCorp's avian-safe standards and was subsequently re-insulated to achieve PacifiCorp's standards.
- PacifiCorp employees and on-site O&M contractors receive annual training in WIRHS protocols to ensure they understand the procedures (Appendix E).
- PacifiCorp will continue to monitor for the presence of eagle carcasses at the Project as described in Section 7 to verify the effectiveness of the avoidance, minimization, and mitigation strategies incorporated in the Project's operation and management and to support future evaluations under adaptive management. If an EITP is issued, continued monitoring would follow the detailed permit requirements.
- The use of real carcasses (e.g., mallards [*Anas platyrhynchos*]) stopped after the standard 3-year PCM study and PacifiCorp has transitioned to artificial surrogates to reduce potential attraction and better evaluate detection rates for eagles.
- 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.
- Annual nest surveys are performed (as described in Section 7) 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 October of 2012, including mortality surveys and nest surveys, were recorded in formal annual reports since monitoring was initiated in October 2009 (McCreight and Lehnen 2010, 2012a, 2012b). Results from monitoring surveys from 2014 – 2019 have been documented in annual SPUT reports and reported in this ECP. 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.

- If/when an eagle carcass is located at the Project, PacifiCorp initiates an eagle mortality assessment. The assessment gathers information to help understand if there is an identifiable cause of the mortality (e.g., carrion source) and if any adaptive management is required.
- An adaptive management program has and will be implemented as described in Section 11.
- While no specific advanced conservation practices (ACP) have been implemented at the Project, PacifiCorp has evaluated the effectiveness of multiple ACP at other nearby facilities. These ACP include research/development associated with an automated detection and deterrent systems; experimental and informed curtailment program, habitat modification to reduce prey resources, power line retrofit, undergrounding lines, removal of old infrastructure (specifically with the goal of reducing perch opportunities), and covering culverts to reduce prey shelter. Lessons learned from these ACP activities can be used when/if needed at the Project to further reduce eagle attraction and mortalities at the site. Having previously studied, these ACP will allow PacifiCorp to transition directly into the implementation phase and avoid prolonged a research and development phase.

10. *Compensatory Mitigation*

With the implementation of the AMMs described above, some unavoidable eagle mortalities have occurred and are expected to still occur in the future. PacifiCorp has been mitigating for eagle mortalities at the site since 2015 as part of the MBCP. Additional compensatory mitigation may be necessary to ensure the standard of no net loss to the population is achieved whenever golden eagles are taken at the Project. PacifiCorp will prepare a Project-specific power pole plan using a template provided by the USFWS, Mountain Prairie Region Office and would be applied as needed to cover additional compensatory mitigation based on discussions with the USFWS.

11. *Adaptive Management*

As stated in the Guidance document (USFWS 2019b), “adaptive management is a component of every EITP issued by USFWS, Region 6 to companies for wind energy facilities”. Further, the USFWS recommends operators work with the USFWS to develop an adaptive management plan. PacifiCorp has communicated with the USFWS over the past decade to identify potential adaptive management actions recommended to support eagle risk reduction. While these communications have not developed a formal step-wise table agreed upon by both parties, actions have been taken. It is assumed PacifiCorp will work with the USFWS to formalize a table or written plan either prior to or during the permit period. The information below is presented to recognize the current adaptive management plan used by PacifiCorp.

PacifiCorp’s adaptive management plan 1) evaluates the mortality rates reported based on PCM, 2) evaluates the need 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 or their environmental consultant related to resource avoidance, minimization, and mitigation measures designed to reduce Project impacts on eagles. This ECP provides a framework for assessing if the adaptive management triggers as defined below have been reached. Table 4 outlines a step-wise approach to mitigation, thresholds, and the implementation of conservation measures. PacifiCorp understands this table may change after formal coordination with the USFWS has taken place.

Table 4. Summary of Adaptive Management Plan using a step-wise approach.

Step	Conservation Measures	Threshold or Trigger
Step I	Inform the US Fish and Wildlife Service (USFWS) of the discovery and collect the carcass (if authorized). Meet all reporting requirements. Conduct internal assessment on eagle fatality to determine and/or understand potential cause. Evaluate fatality with previous take to determine if common factors are evident. As appropriate, communicate with the USFWS to keep them informed on any next steps or questions concerning avoidance and minimization strategies. Evaluate take levels relative to permitted value.	One golden or bald eagle is taken
Step 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 Best Management Practices, habitat management, advanced conservation practices, or other activities deemed appropriate. Consult with USFWS to determine potential course of action.	<i>To be determined based on authorized take levels.</i> 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
Step III	PacifiCorp will consult with the USFWS to review and discuss information known about previous takes, in an attempt to identify factors that 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: <ul style="list-style-type: none"> • Employ onsite biological monitor(s) during daylight hours at locations and/or times of suspected risk to further refine the understanding of risk factors. If this is during the current informed curtailment period, an additional biomonitor may be added to increase coverage. • Implement habitat management or modification plan to minimize attraction to the Project, limit perching within the Project, and generally minimize risky behaviors. • Implement a limited curtailment program specific to the area(s) and/or period(s) of highest collision risk. • Consider developing and evaluating a detection and deterrent system for eagles approaching area(s) of risk. • Other measures agreed upon in consultation with USFWS. 	<i>To be determined based on authorized take levels.</i> Take is within the authorized limit. An additional take would meet the authorized amount under the permit.

12. Other US Fish and Wildlife Service Permits

PacifiCorp has obtained a MBTA 21.27 SPUT permit (Permit number: MB00469B-0) in accordance with their MBCP to legally collect migratory birds and hold them at the Project for use in PCM studies as well as to remove carcasses that could be potential attractants to raptors including eagles. The permit will be updated as required.

REFERENCES

- Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Public Interest Energy Research Program (PIER) Final Project Report CEC-500-2006-022. Edison Electric Institute, APLIC, and the California Energy Commission. Washington D. C. and Sacramento, California.
- Avian Power Line Interaction Committee (APLIC). 2012. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Edison Electric Institute and APLIC, Washington, D. C.
- ESRI. 2019. World Imagery and Aerial Photos. (World Topo). ArcGIS Resource Center. Environmental Systems Research Institute (ESRI), producers of ArcGIS software. Redlands, California. Information online: <http://www.arcgis.com/home/webmap/viewer.html?useExisting=1>
- Johnson, G. and L. Martinson. 2009. Pronghorn and Greater Sage-Grouse Pellet Count Study. High Plains Wind Energy Project, Carbon and Albany County, Wyoming. Prepared for CHSM Hill, Englewood, Colorado. Prepared by Western EcoSystems Technology, Inc. Cheyenne, Wyoming. February 9, 2009.
- Johnson, G. D., K. Bay, and J. Eddy. 2009. Wildlife Baseline Studies for the High Plains Wind Resource Area, Carbon and Albany Counties, Wyoming. Prepared for CH2M HILL. Prepared by Western EcoSystems Technology, Inc. (WEST), Cheyenne, Wyoming.
- Johnson, G. D. and J. Eddy. 2011. Raptor Nest Survey for the High Plains Wind Energy Facility, Laramie and Carbon Counties, Wyoming. Prepared for PacifiCorp Energy, Salt Lake City, Utah. Prepared by Western EcoSystems Technology, Inc. (WEST), Cheyenne, Wyoming. December 23, 2011.
- McCreight, J. and S. Lehnen. 2010. First Annual Report: High Plains and Mcfadden Ridge I Wind Energy Facility Avian and Bat Fatality Survey and Pronghorn Antelope and Greater Sage Grouse Displacement Assessment. Prepared for PacifiCorp Energy, Salt Lake City, Utah. Prepared by Enercon Services, Inc., Oklahoma City, Oklahoma. December 6, 2010.
- McCreight, J. and S. Lehnen. 2012a. Second Annual Report: High Plains and Mcfadden Ridge I Wind Energy Facility Avian and Bat Fatality Survey and Pronghorn Antelope and Greater Sage Grouse Displacement Assessment. Prepared for PacifiCorp Energy, Salt Lake City, Utah. Prepared by Enercon Services, Inc., Oklahoma City, Oklahoma. January 11, 2012.
- McCreight, J. and S. Lehnen. 2012b. Final Report: High Plains and Mcfadden Ridge I Wind Energy Facility Avian and Bat Fatality Survey and Pronghorn Antelope and Greater Sage Grouse Displacement Assessment. Prepared for PacifiCorp Energy, Salt Lake City, Utah. Prepared by Enercon Services, Inc., Oklahoma City, Oklahoma. November 16, 2012.
- North American Datum (NAD). 1983. NAD83 Geodetic Datum.
- US Fish and Wildlife Service (USFWS). 2012. Land-Based Wind Energy Guidelines. March 23, 2012. 82 pp. Available online: http://www.fws.gov/cno/pdf/Energy/2012_Wind_Energy_Guidelines_final.pdf

- US Fish and Wildlife Service (USFWS). 2013. Eagle Conservation Plan Guidance: Module 1 - Land-Based Wind Energy, Version 2. US Department of the Interior, Fish and Wildlife Service, Division of Migratory Bird Management. April 2013. 103 pp. + frontmatter. Available online: <https://www.fws.gov/migratorybirds/pdf/management/eagleconservationplanguidance.pdf>
- US Fish and Wildlife Service (USFWS). 2016. Eagle Permits; Revisions to Regulations for Eagle Incidental Take and Take of Eagle Nests; Final Rule. 50 CFR 13 and 22. Department of the Interior Fish and Wildlife Service. 81 Federal Register (FR) 242: 91494-91554. December 16, 2016.
- US Fish and Wildlife Service (USFWS). 2019a. Information, Planning and Consultation (IPaC). USFWS Environmental Conservation Online System (ECOS). Accessed September 2019. Information online: <http://ecos.fws.gov/ipac/>
- US Fish and Wildlife Service (USFWS). 2019b. Region 6, Recommended Approach for Development and Submission of Eagle Conservation Plans Submitted to Region 6, Migratory Management Office in Support of an Eagle Incidental Take Permit Application for Wind Energy Projects. USFWS, Region 6, Migratory Bird Management Office. 23 July, 2019.
- USA Topo. 2019. USA Topo Maps. US Geological Survey (USGS) topographical maps for the United States. ArcGIS. Environmental Systems Research Institute (ESRI), producers of ArcGIS software. Redlands, California.
- Western EcoSystems Technology, Inc. (WEST). 2012. Technical Memorandum: High Plains & McFadden - Raptor Nest Memo 2012. Prepared for PacifiCorp. Prepared by Western EcoSystems Technology, Inc., Cheyenne, Wyoming. September 19, 2012.
- Western EcoSystems Technology, Inc. (WEST). 2013. Technical Memorandum: High Plains & McFadden - Raptor Nest Memo 2013. Prepared for PacifiCorp. Prepared by Western EcoSystems Technology, Inc., Cheyenne, Wyoming. November 1, 2013.
- Western EcoSystems Technology, Inc. (WEST). 2014. Technical Memorandum: High Plains/McFadden Ridge - Raptor Nest Memo 2014. Prepared for PacifiCorp. Prepared by Western EcoSystems Technology, Inc., Cheyenne, Wyoming. December 11, 2014.
- Western EcoSystems Technology, Inc. (WEST). 2015. Technical Memorandum: High Plains/McFadden Ridge - Raptor Nest Memo 2015. Prepared for PacifiCorp. Prepared by Western EcoSystems Technology, Inc., Cheyenne, Wyoming. October 23, 2015.
- Western EcoSystems Technology, Inc. (WEST). 2016. Technical Memorandum: High Plains/McFadden Ridge - Raptor Nest Memo 2016. Prepared for PacifiCorp. Prepared by Western EcoSystems Technology, Inc., Cheyenne, Wyoming. November 18, 2016.
- Western EcoSystems Technology, Inc. (WEST). 2017. Technical Memorandum: High Plains/McFadden Ridge I - 2017 Raptor Nest Survey. Prepared for PacifiCorp. Prepared by Western EcoSystems Technology, Inc., Cheyenne, Wyoming. December 5, 2017.
- Western EcoSystems Technology, Inc. (WEST). 2018. Technical Memorandum: High Plains/McFadden Ridge I - 2018 Raptor Nest Survey. Prepared for PacifiCorp. Prepared by Western EcoSystems Technology, Inc., Cheyenne, Wyoming. December 21, 2018.
- Western EcoSystems Technology, Inc. (WEST). 2019. Technical Memorandum: High Plains/McFadden Ridge I - 2019 Raptor Nest Survey. Prepared for PacifiCorp. Prepared by Western EcoSystems Technology, Inc., Cheyenne, Wyoming. November 4, 2019.

Wyoming Game and Fish Department (WGFD). 2010. Wildlife Protection Recommendations for Wind Energy Development in Wyoming. WGFD, Cheyenne, Wyoming. Approved by Wyoming Game and Fish Commission November 17, 2010. Available online: <https://wgfd.wyo.gov/WGFD/media/content/PDF/Habitat/Habitat%20Information/Wind%20Energy%20Development/Wildlife-Protection-Recommendations-for-Wind-Energy-Development.pdf>

**Appendix A. US Fish and Wildlife Service Information for Planning and Consultation
Report (Informal)**

Appendix B. Pre-construction Monitoring Studies

Appendix C. Post-Construction Mortality Monitoring Studies

Appendix D. Raptor Nest Studies

Appendix E. Wildlife Incident Report and Handling System