

# **EAGLE CONSERVATION PLAN FOR THE SEVEN MILE HILL I AND II WIND ENERGY PROJECTS**

**PacifiCorp**

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## INTRODUCTION

On January 14, 2020, the United States Fish and Wildlife Service (USFWS) Region 6 Migratory Bird Office released a new guidance document for development of Eagle Conservation Plans (ECPs) 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 2020a). 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 Seven Mile Hill I and II 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. Because the Project has been an operational wind facility for over 10 years, PacifiCorp has conducted a variety of studies and applied lessons learned to support eagle conservation. 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 10 years of operation the Project was repowered with larger blades in 2019.

### 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 and to avoid and minimize golden eagle and other avian mortalities at the Project. 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
- Implementation of experimental advanced conservation practices
- Develop and submit an ECP to support an application for an EITP
- Conduct compensatory mitigation measure for eagle mortalities
- Develop a project-specific Bird and Bat Conservation Strategy

The implemented actions are discussed in more detail throughout this ECP. It is understood 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 Energy (PacifiCorp) developed and constructed the Seven Mile Hill I and II Wind Energy Project (Project). The Project has been in operation since December 2008. 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 Carbon County, Wyoming, approximately 10 miles (mi; 16 kilometers [km]) west of Medicine Bow, 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.***

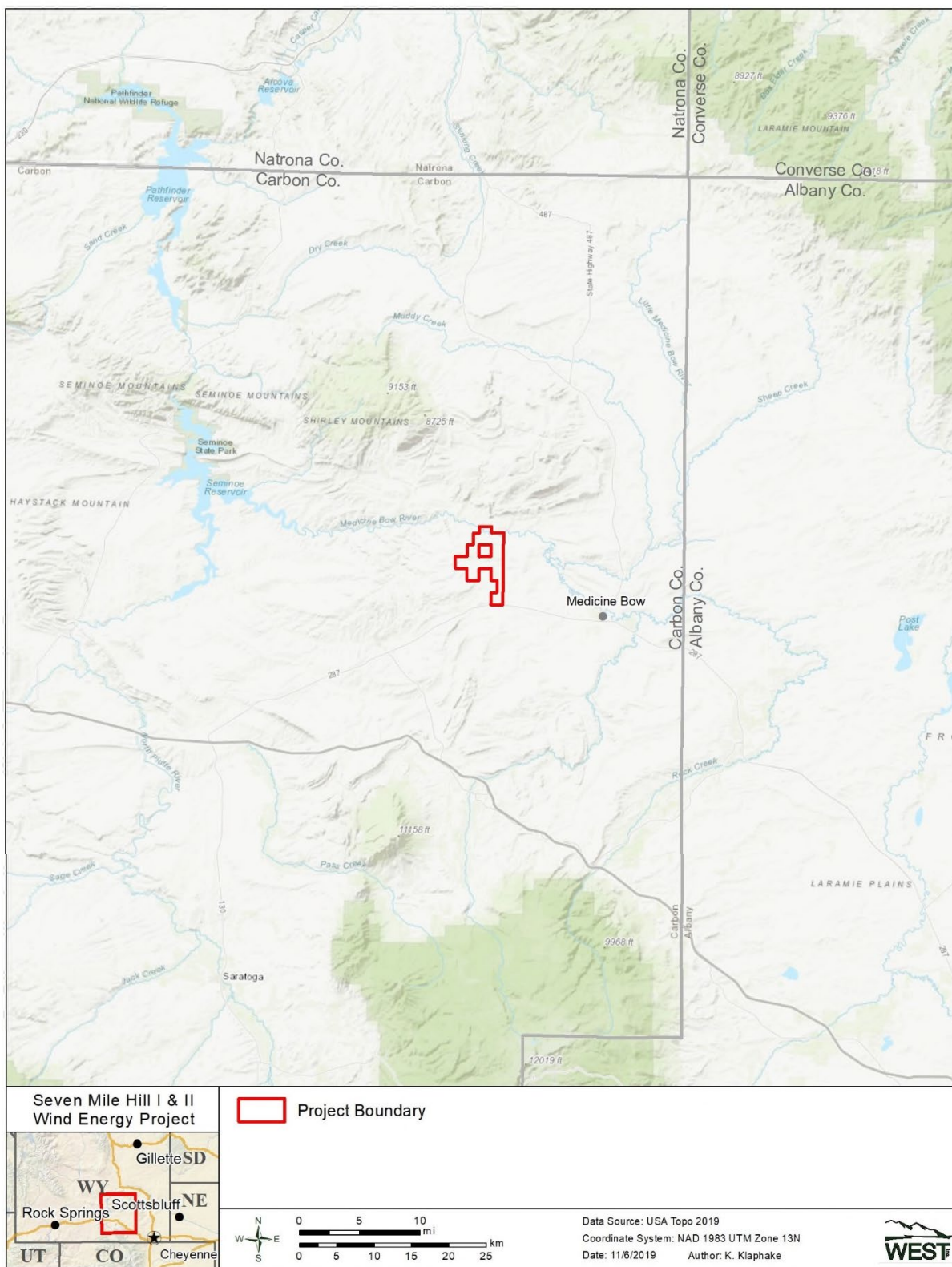
The Project is requesting take coverage for bald and golden eagles under a permit for the operating life of the Project or up to 30 years as allowed under the USFWS 2016 Revised Eagle Rule.

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 threatened or endangered bird species with the potential for occurring in the Project area (USFWS 2019). These species are least tern (*Sternula 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 and no depletions have/will occur as part of the Project operations. IPaC lists two threatened plant species, Ute ladies'-tresses (*Sprianthese 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, based on a desktop review and habitat mapping, suitable habitat does not exist in the Project area. The Project area does not contain known populations of federally threatened

or endangered species and does not contain designated critical habitat for federally listed species. The list of federally listed species potentially impacted by the Project has not changed from 2009 to present.

The access road for the Project crosses a section of Bureau of Land Management (BLM) administered lands, and as such a right-of-way grant was requested and obtained (Serial Number WYW-167129). It is assumed that a Section 7 consultation occurred as part of the process and that the BLM determined impacts were allowable.



**Figure 1. Location of the Seven Mile Hill Wind Energy Project, Carbon 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. The Project does not occur in proximity to a DoD installation or airport.

## **6. Project Description**

The Project is located in Carbon County, Wyoming, approximately 10 mi west of Medicine Bow, Wyoming (Figure 1). The Project is located on leased private-fee owned lands with some inclusion of leased State lands and an access road section that crosses BLM administered land. The sites encompass approximately 14,000 acres of land that extends approximately 6.5 mi (10.5 km) from north to south and is approximately 4.0 mi (6.4 km) wide. This land ranges in elevation from 5,800 to 8,000 feet (ft; 1,768 to 2,438 meters [m]) above mean sea level. Initial Project development consisted of 79 GE 1.5 megawatt (MW) wind turbine generators (WTG) rated at 118.5 MW (Figure 2). These WTG had 77 m rotor diameters, 80 m hub height, and 119 m total height. The Project construction was initiated March 10, 2008 and began operation in December 2008. The Project was repowered in 2019 and all 79 WTG were upgraded with new nacelles and rotors. The repowered WTG have 91 m rotor diameters, 80 m hub height, 126 m total height, and are rated at 1.85 MW. Five meteorological towers were constructed for the Project, and the three guyed towers were removed in 2010. The two remaining towers are lattice structures approximately 300 ft (91 m) in height. Output from the Project is delivered to the onsite Seven Mile Hill collector substation (approximately 2.5 acres [ac; 1.0 hectare (ha)]) where it is stepped up to 230 kilovolts (kV) and interconnected to the PacifiCorp Miners to Dave Johnston 230-kV transmission line via the Freeze Out transmission substation. Approximately 26 mi (41.8 km) of underground collection lines and 3.5 mi (5.6 km) of overhead distribution lines were installed for the Project. The 3.5 mi (5.6 km) is specifically to support the operation and maintenance building. All above ground power lines currently meet the Avian Power Line Interaction Committee (APLIC) 2006 standards. Approximately 18 mi (29 km) of roads were constructed for the Project. Five meteorological towers were constructed for the Project. Three of meteorological towers (guyed) were removed in the first year after construction. The remaining two are lattice structure approximately 125-ft tall (Figure 2). An Operations & Maintenance (O&M) building was constructed for the Project on an approximately 1.0 ac (0.4 ha) plot. An observation tower was constructed and became operation December 2015. Temporary impacts included a 650-ft long x 10-ft wide underground line installation. Permanent impacts included a 900-ft long x 15-ft wide access road and approximately 0.4 acre tower pad.

Wyoming big sagebrush (*Artemisia tridentata wyomingensis*) is the predominant landcover in the Project. Other habitat types present include greasewood (*Sarcobatus vermiculatus*) flats, grasslands, riparian areas, playas, and areas dominated by buckwheat (*Eriogonum* sp.). Cattle ranching activities occur seasonally across the Project.

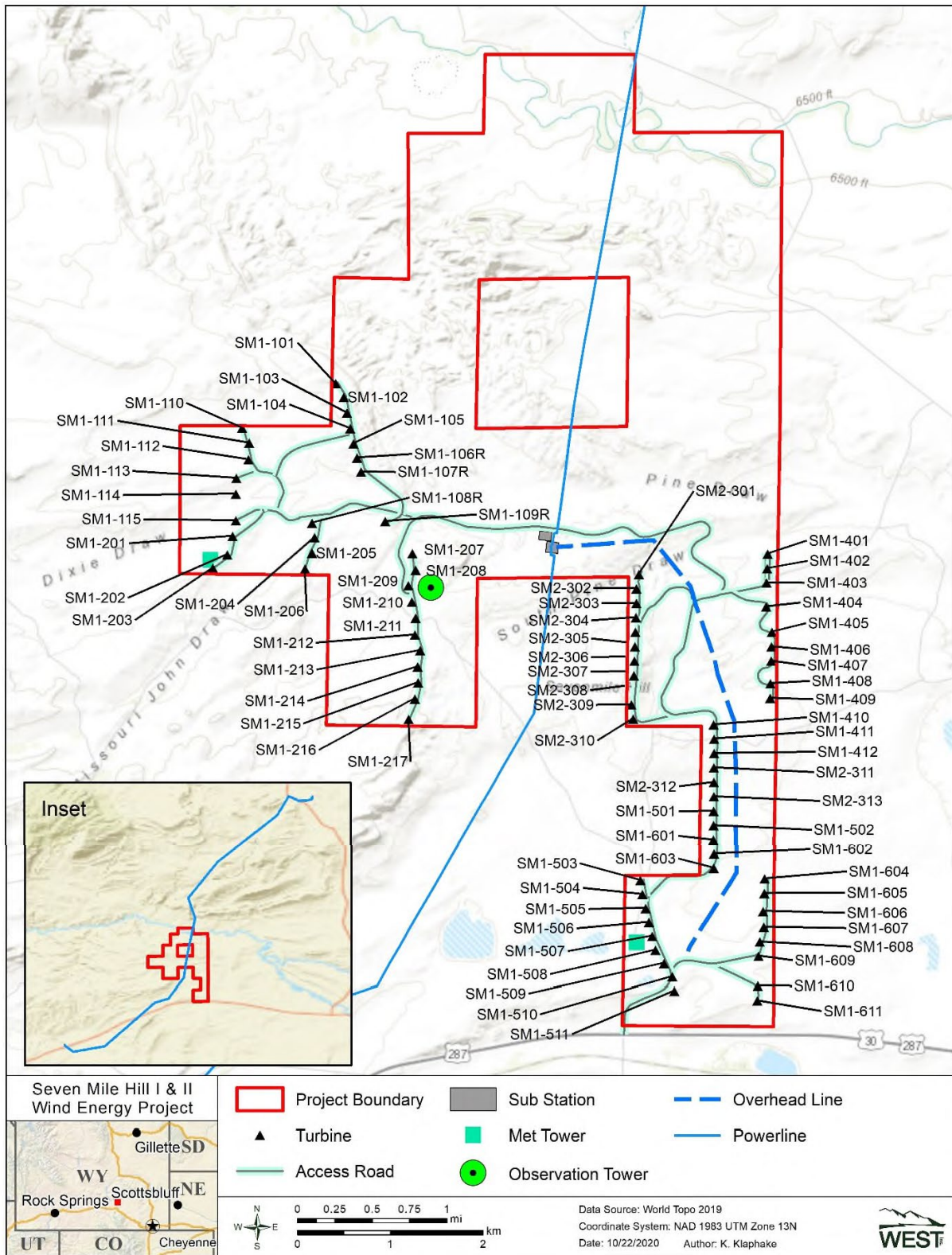


Figure 2. Seven Mile Hill turbine locations and other infrastructure, Carbon County, Wyoming.

## **7 Eagle Data for the Project**

PacifiCorp has conducted a variety of pre- and post-construction surveys for the Project. 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 USFWS, Region 6 ECP guidance memo), 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 provided as appendices. For studies without technical reports, general methods and results are provided. In all cases, GIS shapefiles and requested excel files have been provided to the USFWS.

### **Standardized Avian Use Surveys – Pre (2007) and Post (2010)**

Avian use surveys were conducted in the spring and fall of 2007 as part of the pre-construction baseline surveys (Johnson et al 2008 [Appendix A]). Standard avian use surveys were also conducted post-construction at the request of the USFWS, with an objective to assess the impact of the Project on abundance, composition, habitat use, and behavior compared to pre-construction data (Enercon 2011 [Appendix D]). Summaries for each are provided below and in technical reports (Johnson et al 2008, Enercon 2011 [Appendix A and D]).

Additional eagle use surveys have been conducted for the Project as part of the eagle monitoring plan and curtailment program, however due to the non-standard methods, these surveys are discussed in a separate section.

### **Methods**

Avian use surveys conducted at the Project pre-dated the current USFWS standards and included all birds. The pre-construction and post-construction surveys used similar methods to allow comparisons. One notable difference was the pre-construction surveys only included spring (April 30 – June 8, 2007) and fall (September 18 – November 15, 2007) periods, while the post-construction survey included one full year (March 20, 2010 – March 19, 2011). Additionally, the pre-construction period surveyed a combination of 12 points depending on the survey period, while the post-construction period used 12 points for the entire survey period (Figure 3). The points used for the pre-construction surveys covered approximately 33% or 40% of the area within 0.6 mi (1.0 km) of turbines depending on the survey period. Post-construction surveys maintained 40% coverage. Full survey methods are provided in respective reports (Johnson et al 2008 and Enercon 2011 [Appendix A and D]).

Table 1. Studies conducted at the Seven Mile Hill Wind Energy Project

| Study Description  | Pre or Post | Study Dates   | Study Topic |            |                 | Prey Resources | Report Citation                         | Appendix Location |
|--|-------------|---|-------------|------------|-----------------|----------------|---|-------------------|
|  |             |   | Eagle Use   | Eagle Nest | Eagle Mortality |                |   |                   |
| Baseline Wildlife Study  | Pre         | 4/30/2007-11/15/2007  | x           | x          |                 | x              | Johnson et al 2008                      | Appendix A        |
| Pronghorn Pellet Count Study                                       | Pre         | 9/6&7/2007, 6/9&10/2008, 10/29&30/2008 and 11/3&4/2008  |             |            |                 | x              | Johnson and Martinson 2009a             | Appendix A        |
| Sage Grouse Study  | Pre         | Leks – 4/1/2008-5/15/2008<br>Pellets - 9/6&7/2007, 6/9&10/2008, 10/29&30/2008 and 11/3&4/2008 |             |            |                 | x              | Johnson and Martinson 2009b             | Appendix A        |
| Post-construction Monitoring – Year 1                              | Post        | 5/18/2009-5/13/2010   |             | x          | x               | x              | Johnson et al 2010                      | Appendix B        |
| Post-construction Monitoring – Year 2                              | Post        | 5/19/2010-5/18/2011   |             | x          | x               | x              | Johnson et al 2011                      | Appendix B        |
| Post-construction Monitoring – Year 3                              | Post        | 5/23/2011-5/11/2012   |             | x          | x               | x              | Johnson et al 2012                      | Appendix B        |
| Avian Usage Report: Comparison to Baseline                         | Post        | 3/20/2010-3/19/2011   | x           |            |                 |                | Enercon Services, Inc 2011              | Appendix D        |
| Golden Eagle Monitoring Study                                      | Post        | 4/26/2010 – 5/3/2011  | x           |            | x               | x              | Johnson and Rintz 2011                  | Appendix C        |
| Post-construction Monitoring June 2012-May 2013                    | Post        | June 2012-May 2013  |             |            | x               |                | No report available                     | NA                |
| Post-construction Monitoring July 2013-December 2015               | Post        | July 2013-December 2015   |             |            | x               |                | No report available                     | NA                |
| Post-construction Monitoring January 2016-present [September 2020] | Post        | January 2016 – present [August 2019]  |             |            | x               |                | No report available; monitoring ongoing | NA                |

|  |      |                             |   |   |  |   |  |            |
|--|------|-----------------------------|---|---|--|---|--|------------|
| Raptor Nest Survey Reports (2013 – 2020) | Post | January – August*           |   | x |  |   | WEST Inc. 2013-2019 (7 total technical memos)  | Appendix E |
| Sage Grouse Lek Surveys                  | Post | March – May*                |   |   |  | x | WEST Inc. 2017-2019b (3 total technical memos) | Appendix F |
| Curtailment Analysis                     | Post | November 2012-December 2014 | x |   |  |   | WEST Inc. 2015c                                | Appendix H |

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

## Results

Thirty-four golden eagles were observed during the pre-construction surveys (spring 4/30/2007-6/8/2007 and fall 9/18/2007-11/15/2007) and 40 were observed during the post-construction survey (3/20/2010-3/19/2011; only spring and fall are reported for consistency). Golden eagle flight paths from the pre-construction survey are presented in Figure 4 (these are not available for post-construction period). Golden eagle use in spring and fall was slightly lower during the post-construction period (0.17 golden eagles/20-survey) compared to the pre-construction period (0.24). Both studies demonstrated eagle use across the study area, with higher use in the north. See Johnson et al 2008 and Enercon 2011 for full results.

### **Golden Eagle Monitoring Study (2010-2011) – Post-construction**

The Golden Eagle Monitoring Study was conducted from April 26, 2010 – April 3, 2011. The study was developed and implemented at the request of USFWS, due to an increase in eagle mortality early in the Project's operational period. Full methods and results are provided in the (Johnson and Rintz 2011 [Appendix C]) technical report.

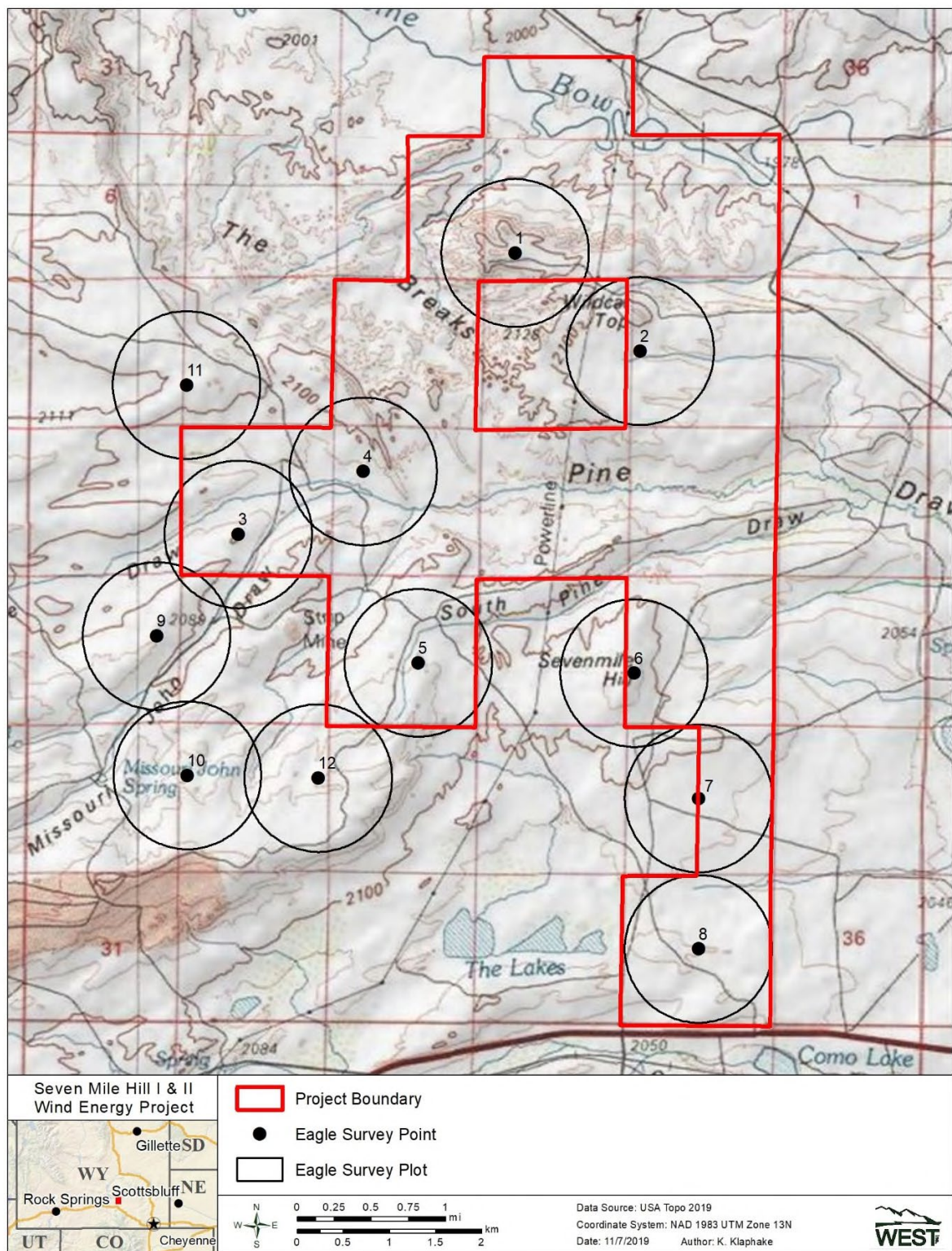
#### **Methods**

A protocol for the eagle monitoring program was developed in consultation with the USFWS and was implemented in April 2010 after being approved by the USFWS. The program consisted of golden eagle use surveys, habitat/topography mapping, prey-base mapping, and additional fatality surveys. Only eagle use surveys are summarized in this section. Surveys were conducted two hours per week for 52 weeks at locations near turbine strings where eagle mortalities were documented. A standard survey time/duration and survey view shed was not established. Surveyors were allowed to move between observation locations in an effort to maximize eagle observations and subsequent data collection. A standard point-location method was not used. The objective of surveys was to understand eagle use near high risk turbines and identify other factors (e.g., prey or season) that may influence golden eagle mortalities. Full survey methods are provided in the technical report (Johnson and Rintz 2011 [Appendix C]).

#### **Results**

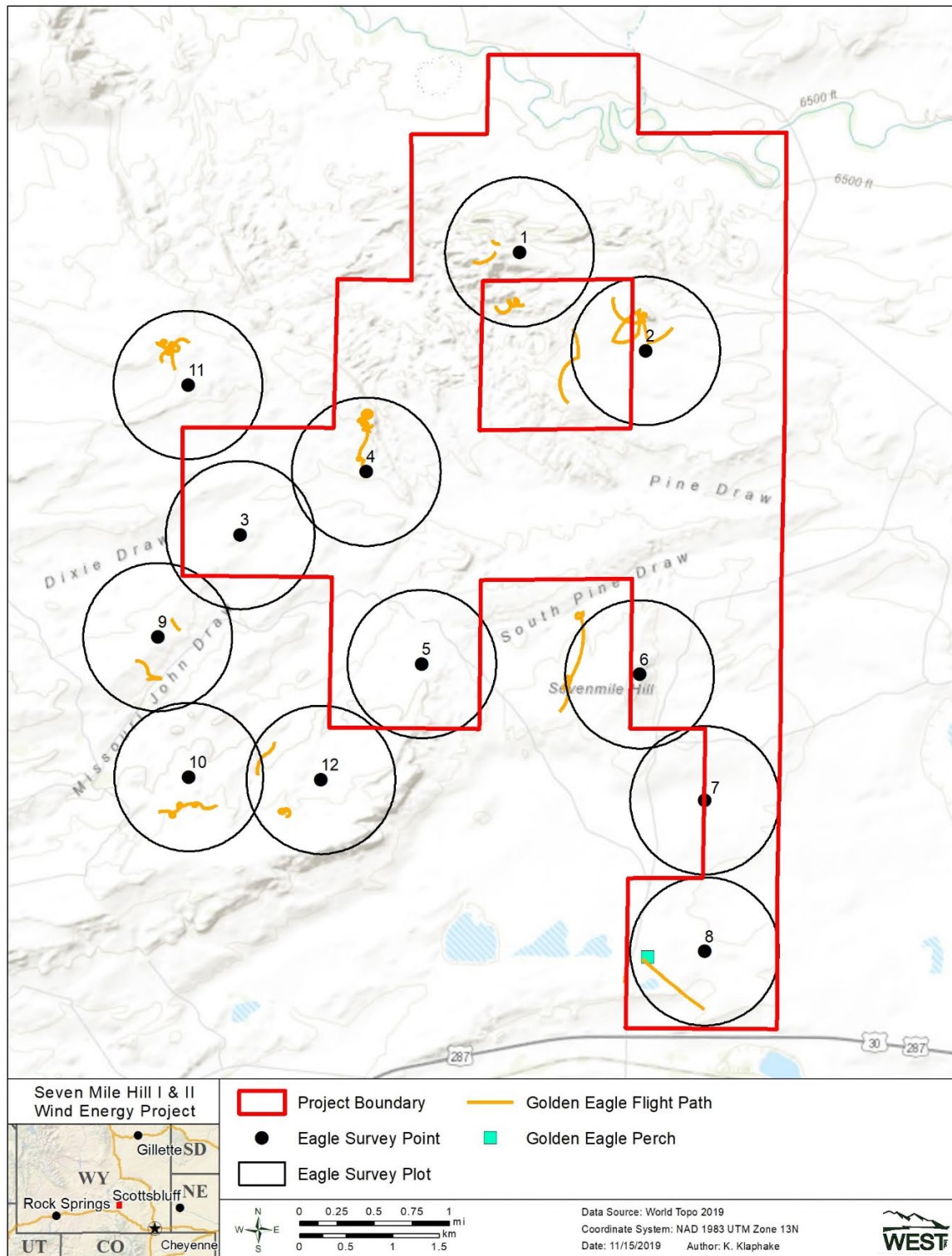
One-hundred and one individual golden eagle observations were recorded during the 52 surveys conducted from April 26, 2010 to April 3, 2011 (Figure 5). The highest use was recorded during winter, followed by summer. Use was most commonly recorded along the SM1-100 string near a prominent ridge. While numerous eagle flights were recorded through turbine strings, no clear use pattern was identified beyond flights to and from the ridge. Results did not identify concentrated use near prairie dog towns or sage grouse leks. See technical report (Johnson and Rintz 2011 [Appendix C]) for full results.



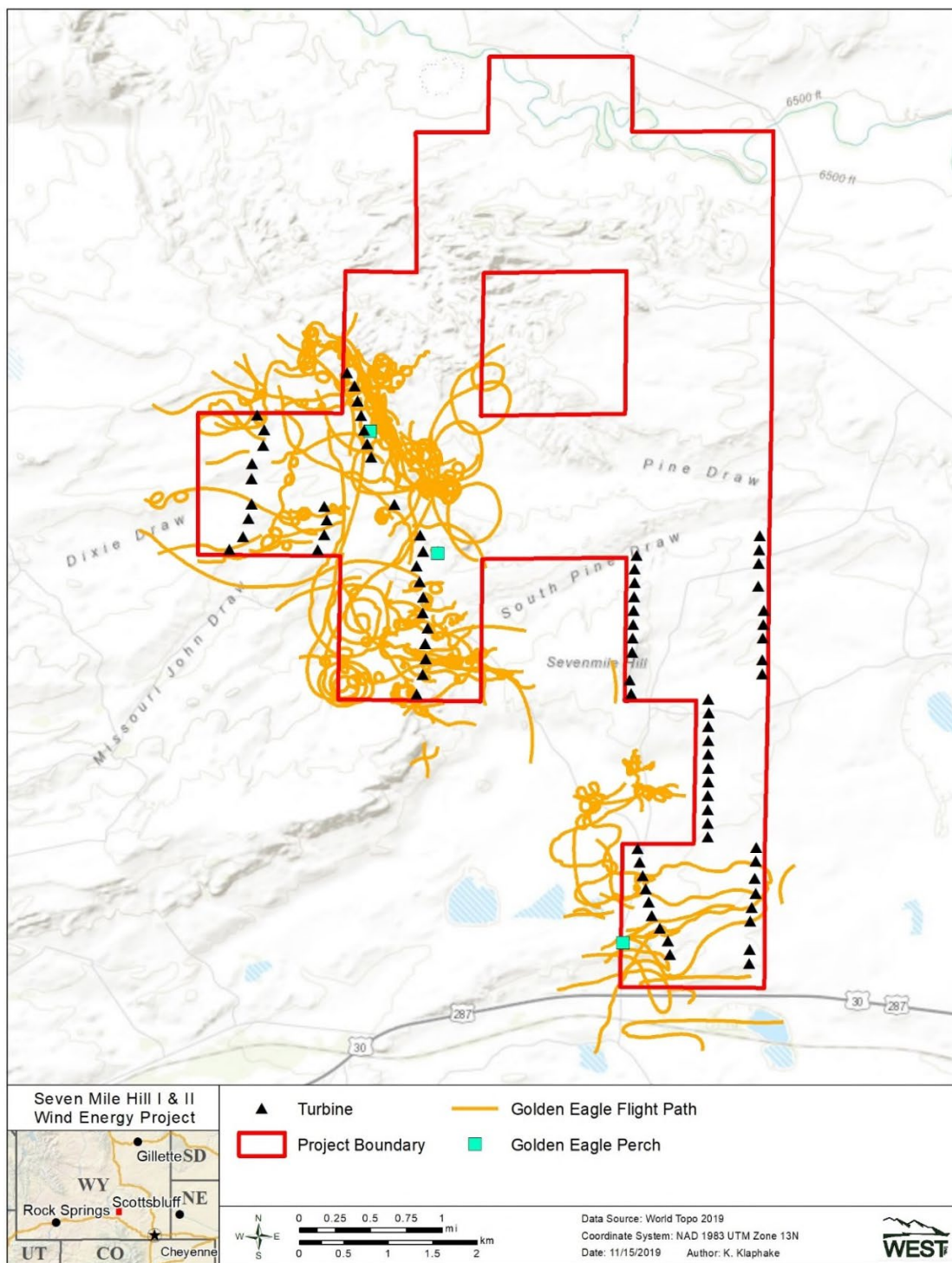


**Figure 3. Location of pre-construction (4/30/2007-11/15/2007) and post-construction (3/20/2010-3/19/2011) fixed-point avian use survey plots at the Seven Mile Hill Wind Energy Project, Carbon County, Wyoming. Note, points 1-8 were surveyed in the pre-construction spring period (4/30/2007 – 6/8/2007) and points 3-12 were surveyed in the fall period (9/18/2007 – 11/15/2007).**





**Figure 4. Location of mapped golden eagle and bald eagle flight paths and perch locations recorded during pre-construction (spring 4/30/2007-6/8/2007 and fall 9/18/2007-11/15/2007) avian use survey plots at the Seven Mile Hill Wind Energy Project, Carbon County, Wyoming. Survey duration was 20 minutes per point totaling 40 survey hours and a total of 34 eagle observations were recorded.**



**Figure 5. Location of mapped golden eagle flight paths and perch locations recorded during April 26, 2010 – May 3, 2011 golden eagle monitoring study at the Seven Mile Hill Wind Energy Project, Carbon County, Wyoming. Study included weekly two hour surveys (104 total hours) and 101 golden eagle observations were recorded.**

## Eagle Nest Surveys

Eagle nest surveys were conducted in spring of 2007 as part of the baseline monitoring study (Johnson et al 2008 [Appendix A]). This was the only pre-construction nest survey conducted for the Project and included one round of ground-based survey. Ten additional years (2010 – 2019) of nest surveys have been conducted post-construction (Johnson et al 2010, 2011, 2012 [Appendix B], and WEST Inc. 2013, 2014, 2015b, 2016b, 2017b, 2018a, 2019a, 2020 [Appendix E]). Detailed methods for each survey year are included in the respective reports.

### Methods

Various survey methods have been employed over the 11 survey years. The survey area, number of visits, ground vs 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 B and E). For the purpose of this document the following terms are defined:

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

Four golden eagle nests were identified within the study area during the pre-construction (2007) surveys (Figure 6, Table 2). Six golden eagle nests were identified across all other surveys years (Table 2). No bald eagle nests were identified within the study area during pre- or post-construction surveys. All of the nests are located greater than 1 mi from Project turbines. The most occupied nests identified in any one year was five (2013); however, one nest was likely an alternative, so four golden eagle territories have been identified in the Project study area. Additional discussion on territories and mean inter-nest distances 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 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 (Appendix B and D).

Table 2. Eagle nest survey summary for golden eagles at the Seven Mile Hill Wind Energy Project from 2007 and 2010 through 2020.

| Nest ID  | 2007           |                  | 2010           |                  | 2011           |                  | 2012           |                  |
|----------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|
|          | Occupied (Y/N) | Successful (Y/N) | Occupied (Y/N) | Successful (Y/N) | Occupied (Y/N) | Successful (Y/N) | Occupied (Y/N) | Successful (Y/N) |
| 23800302 | Y              | N                | N              | N                | N              | N                | N              | N                |
| 23800201 | Y              | N                | N              | N                | N              | N                | N              | N                |
| 23791901 | Y              | N                | N              | N                | Y              | N                | Y              | N                |
| 23801001 | N              | N                | N              | N                | N              | N                | N              | N                |
| 23800401 | NA             | NA               | NA             | NA               | NA             | NA               | NA             | NA               |
| 23802901 | NA             | NA               | NA             | NA               | NA             | NA               | NA             | NA               |
| Nest ID  | 2013           |                  | 2014           |                  | 2015           |                  | 2016           |                  |
|          | Occupied (Y/N) | Successful (Y/N) | Occupied (Y/N) | Successful (Y/N) | Occupied (Y/N) | Successful (Y/N) | Occupied (Y/N) | Successful (Y/N) |
| 23800302 | Y              | N                | N              | N                | Y              | N                | Y              | N                |
| 23800201 | Y              | N                | Y              | N                | Y              | N                | Y              | N                |
| 23791901 | Y              | N                | Y              | N                | Y              | Y                | Y              | Y                |
| 23801001 | NA             | NA               | NA             | NA               | NA             | NA               | NA             | NA               |
| 23800401 | Y              | N                | Y              | N                | NA             | NA               | NA             | NA               |
| 23802901 | Y              | N                | N              | N                | Y              | N                | N              | N                |
| Nest ID  | 2017           |                  | 2018           |                  | 2019           |                  | 2020           |                  |
|          | Occupied (Y/N) | Successful (Y/N) | Occupied (Y/N) | Successful (Y/N) | Occupied (Y/N) | Successful (Y/N) | Occupied (Y/N) | Successful (Y/N) |
| 23800302 | Y              | N                | Y              | N                | Y              | Y                | N              | N                |
| 23800201 | Y              | N                | N              | N                | N              | N                | N              | N                |
| 23791901 | Y              | Y                | Y              | Y                | Y              | N                | Y              | Y                |
| 23801001 | NA             | NA               | NA             | NA               | NA             | NA               | NA             | NA               |
| 23800401 | NA             | NA               | NA             | NA               | NA             | NA               | NA             | NA               |
| 23802901 | N              | N                | N              | N                | N              | N                | N              | N                |

NA = Not applicable because nest was not present or data were not available.



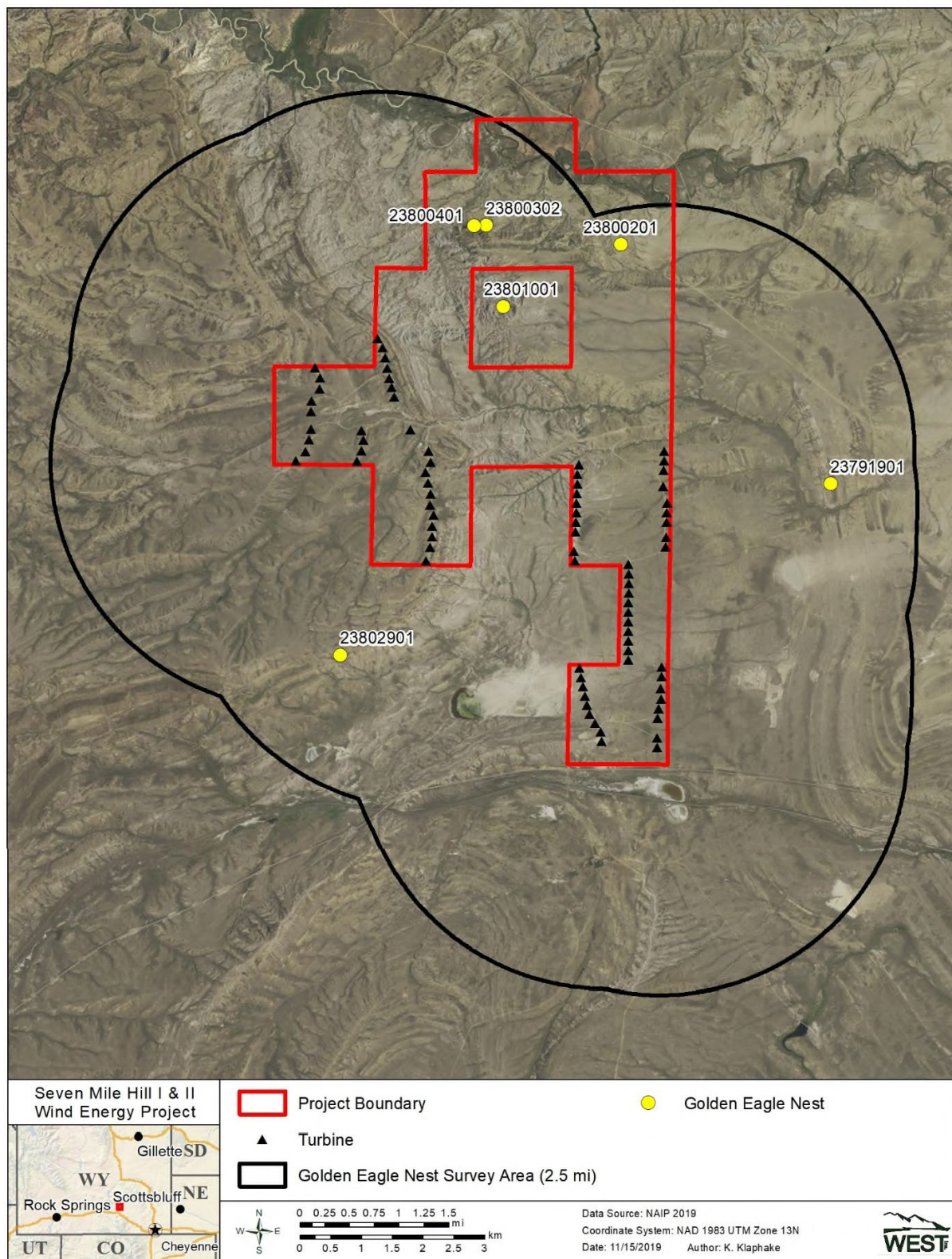


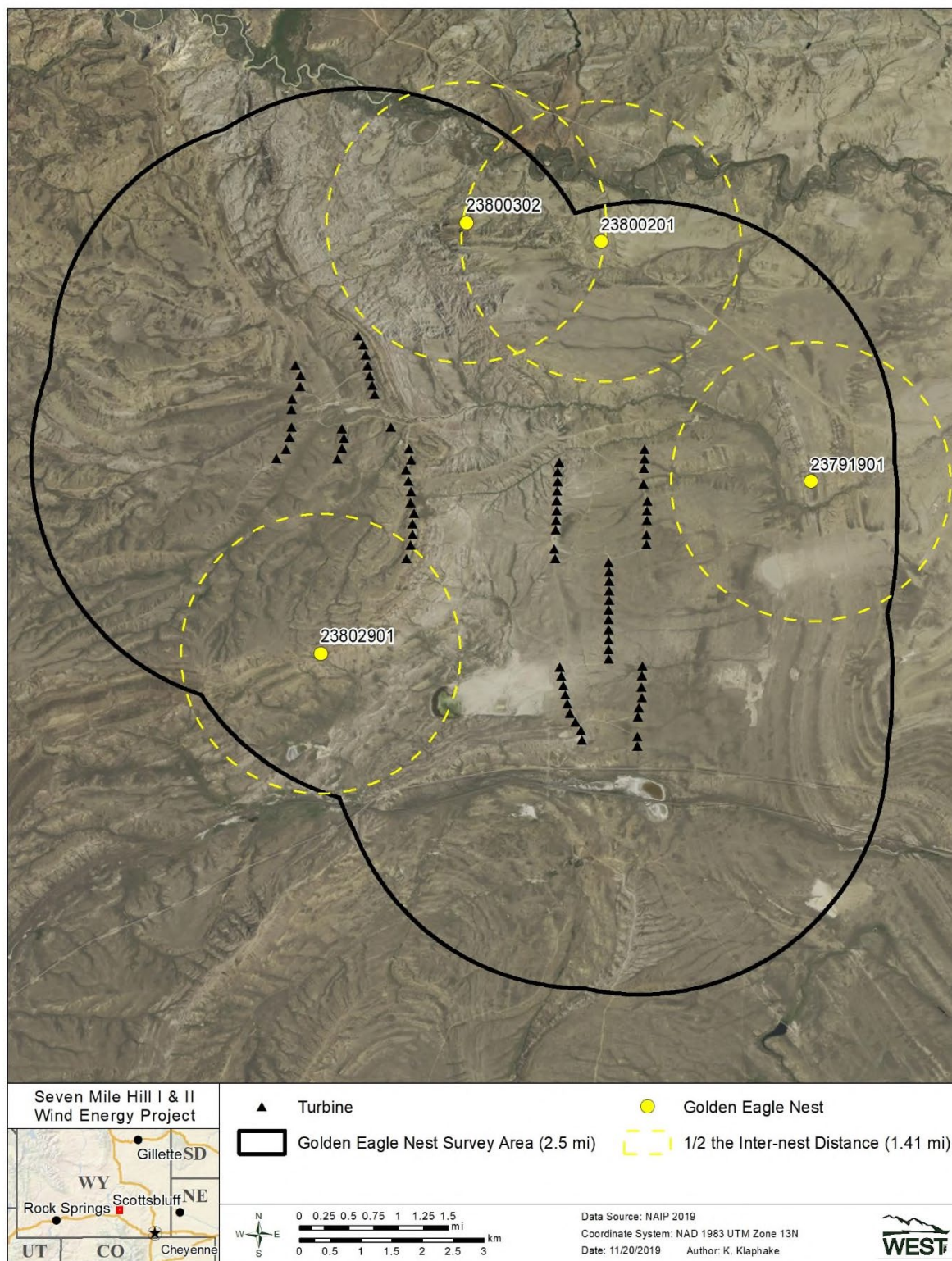
Figure 6. Seven Mile Hill Wind Energy Project golden eagle nest locations from 2007 and 2010 - 2019, nest surveys in Carbon County, Wyoming.

*Mean Inter-nest Distance*

Based on the eagle nest surveys conducted for the Project and surrounding 1-mile buffer (1.6-km) in 2007, 2-mile buffer (3.2-km) in 2010, 2011, 2012, and 2013, and 2.5-mile buffer (4.0-km) in 2014, 2015, 2016, 2017, 2018, and 2019 there have been as many as six golden eagle nests located within 2.5 miles (4.0 km) of Project turbines. In 2013 five nest were classified as occupied, but two of the nest are considered within the same territory. Therefore, four occupied nest territories are considered for mean inter-nest distance. This is the highest number of occupied golden eagle nest territories identified in any one year based on the data available (2013 and 2015).

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 that a 10-mile survey area be used to inform this calculation and only an approximately 2.5-mile buffer (4.0-km) was used for the Project. This may result in a higher or lower MIND when compared with 10-mi survey areas. Using the four occupied golden eagle nests located in the vicinity of the Project in 2013 and 2015, the mean inter-nest distance (MIND) is 2.8 miles (4.5 km) and  $\frac{1}{2}$  the MIND or approximate territory radius is 1.4 miles (2.3 km; Figure 7).





**Figure 7. Approximate golden eagle territories for the golden eagle nests that have been identified in the vicinity of the Seven Mile Hill Wind Energy Project, Carbon County, Wyoming. A buffer distance of 1.4 miles was used based on half the mean inter-nest distance between the four identified occupied golden eagle nests.**

## Prey Base Observations

Prey base surveys conducted pre-construction included white-tailed prairie dog (*Cynomys leucurus*) mapping, greater sage-grouse (*Centrocercus urophasianus*) lek and pellet count surveys, and pronghorn (*Antilocapra americana*) pellet count surveys (Johnson et al 2008, Johnson and Martinson 2009a, and Johnson and Martinson 2009b [Appendix A]). Sage-grouse and pronghorn pellet count surveys were conducted for one year after construction (Johnson et al 2010 [Appendix B]). Sage grouse lek surveys were conducted in 2010, 2011, 2012, 2017, 2018, and 2019 (Johnson et al 2010, 2011, and 2012 [Appendix B] and WEST Inc. 2017b, 2018b, and 2019b [Appendix F]). Prey base studies were also conducted as part of the 2010-2011 Golden Eagle Monitoring Study (Johnson and Rintz 2011 [Appendix C]) including updated prairie dog mapping and an evaluation of sage-grouse lek data. Brief methods and results are presented below for each target species with detailed information available in the respective technical reports.

### *White-tailed prairie dog mapping*

#### Methods

Two white-tailed prairie dog mapping efforts were conducted at the Project. The first mapping effort occurred in 2007 as part of the baseline studies. The second mapping effort occurred in 2010 as part of the Golden Eagle Monitoring Study. In both instances, a biologist traveled around the Project area mapping visible towns on hard copy maps. These maps were then digitized in ArcGIS.

#### Results

Prairie dog towns were mapped in both the 2007 and 2010 survey efforts (Figure 8). In 2007 fairly limited concentrations were identified, while in 2010 large portions of the survey area were mapped as prairie dog towns. Most turbines are outside of the prairie dog concentrations; however, a number of strings are aligned along the delineated edges. Additional information can be found in technical reports (Johnson et al 2008 and Johnson and Rintz 2011 [Appendix A and C]).

### *Greater sage-grouse*

#### Methods

Greater sage grouse leks (2008, 2010, 2011, 2012, 2017, 2018, 2019) and pellet count (2007, 2008, 2009, and 2010) surveys were conducted pre- and post-construction. Leks survey methods have varied from data gathering from the Wyoming Game and Fish Department (WGFD) to multiple ground-based surveys in the March – May leking season. Details for each survey year can be found in technical reports (Johnson et al 2008, Johnson and Martinson 2009b, Johnson et al 2010, 2011, 2012, and WEST Inc. 2017b, 2018b, 2019b [Appendix A, B, and F]). Pellet count studies were conducted over five seasons that included pre-construction, during construction, and post-construction periods. Treatment sites established within the Project and reference sites established away from the Project were surveyed each season. Details for each survey year can be found in technical reports (Johnson et al 2008, Johnson and Martinson 2009b and Johnson et al 2010 [Appendix A and B]).



### Results

Six active leks were identified within two miles (3.2 km) of the Project during pre-construction surveys (Figure 9). However, it is believed that lek #4 was simply random strutting males, not an actual lek (was not observed in subsequent years). The closest lek (Pine Draw) was approximately 0.3 miles (0.5 km) east of the Project. All other leks were approximately one mile (1.6 km) or greater from Project turbines. Lek counts have varied from year to year, trending down immediately after Project construction and then rebounding in recent years. Additional results can be found in technical reports (Johnson et al 2010, 2011, 2012 [Appendix B] and WEST Inc. 2017a, 2018b, 2019b [Appendix F]).

Pellet counts documented grouse use in the Project area across all Project phases. More pellets were documented pre-construction when compared to post-construction. While this was consistent for both treatment and reference plots, a greater reduction was observed in the treatment plots. Additional results can be found in technical reports (Johnson et al 2008, Johnson and Martinson 2009a and Johnson et al 2010 [Appendix A and B]).

### *Big game*

#### Methods

Standardized big game surveys focused on pronghorn (2007, 2008, 2009, and 2010). Pellet count studies were conducted over six seasons that included pre-construction, during construction, and post-construction periods. Treatment sites established within the Project and reference sites established away from the Project were surveyed each season. Details for each survey year can be found in technical reports (Johnson et al 2008, Johnson and Martinson 2009b and Johnson et al 2010 [Appendix A and B]).

### Results

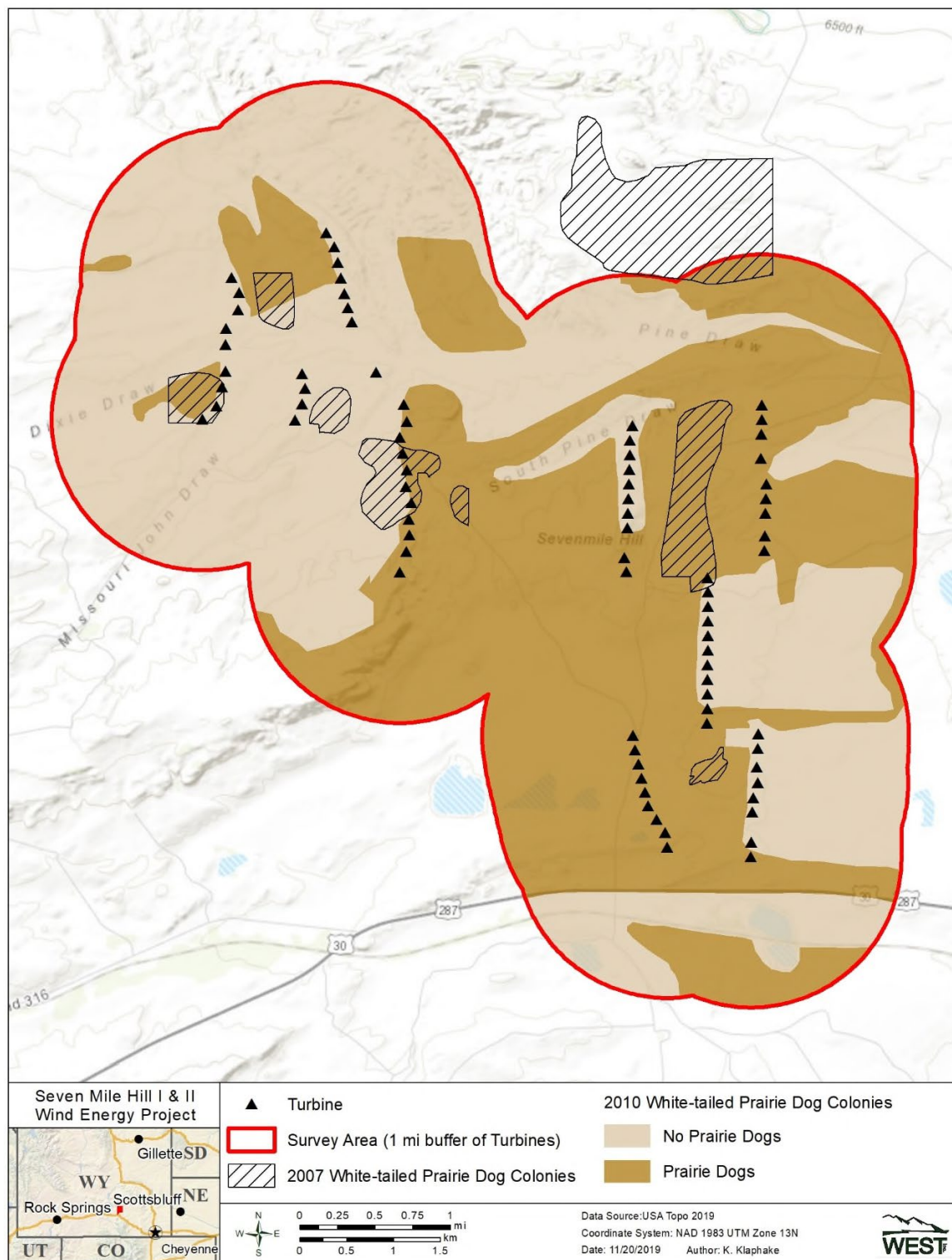
Pellet counts documented pronghorn use in the Project area across all Project phases. More pellets were documented post-construction when compared to pre-construction. This pattern was observed for both treatment and reference plots. Additional results can be found in technical reports (Johnson et al 2008, Johnson and Martinson 2009b and Johnson et al 2010 [Appendix A, and B]).

No big game parturition or birthing areas exist in or near the Project. Crucial range for mule deer and elk are greater than two miles (3.2 km) north of the Project. Pronghorn crucial range is immediately north of the Project, with two turbines in the northeast Project area inside the delineated boundary (Figure 9).

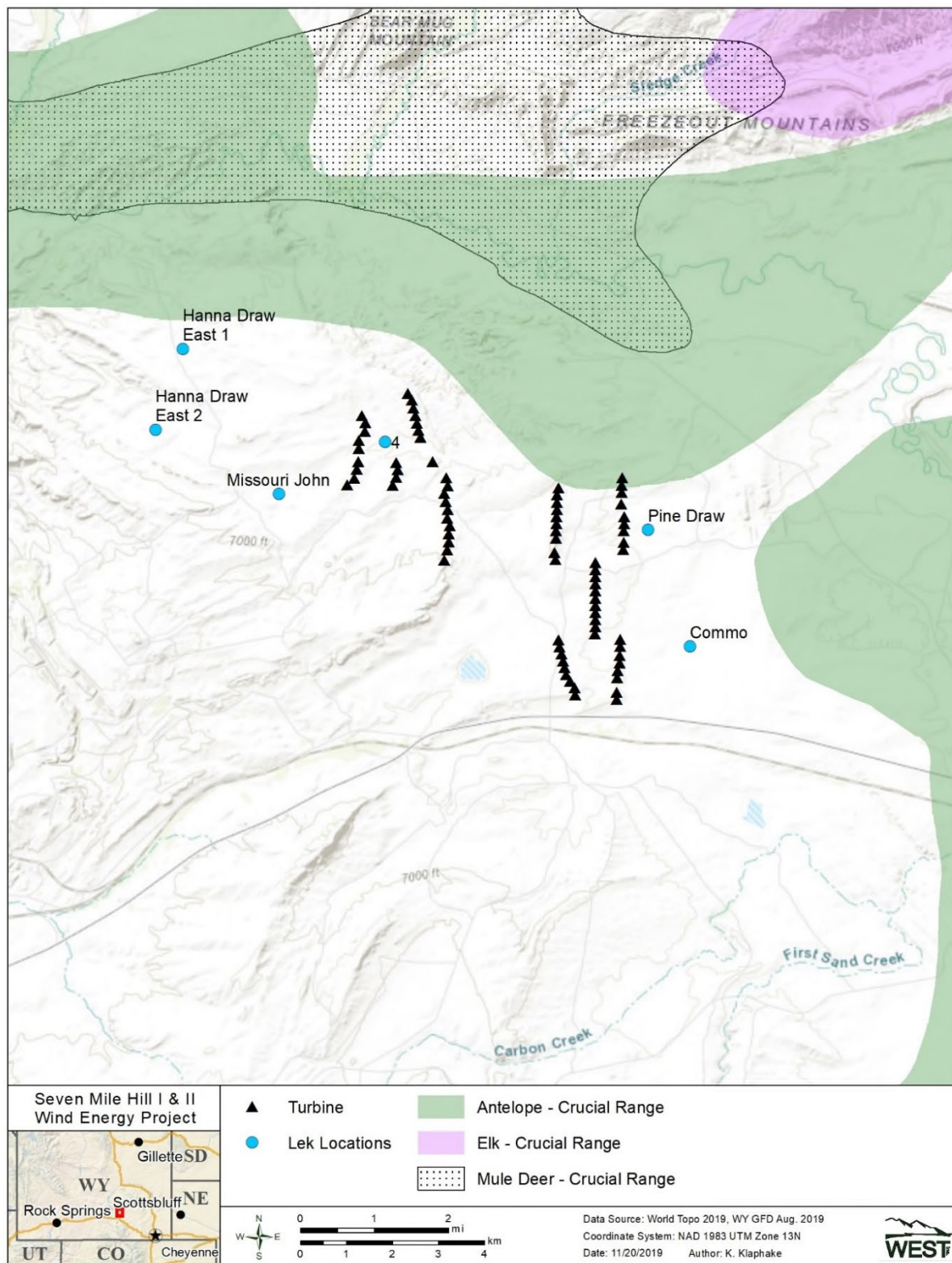
### *Other Prey Resources*

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. No calving historic or current calving areas are known to occur in the Project. 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.



**Figure 8. Location of white-tailed prairie dog towns mapped in 2007 and 2010 at the Seven Mile Hill Wind Energy Project, Carbon County, Wyoming.**



**Figure 9. Location of greater sage-grouse leks and big game crucial ranges identified within the vicinity of the Seven Mile Hill Wind Energy Project, Carbon County, Wyoming. All leks were present in 2007; however, lek 4 was not observed in subsequent surveys.**

## Post-Construction Mortality Monitoring

PacifiCorp placed the Project in operation in January 2009. Multiple post-construction monitoring studies have been conducted since the Project went operational including: 1) a standard 3-year PCM study (May 2009 – May 2012) which included two eagle-specific monitoring segments at the request of USFWS (Eagle Monitoring Study: May 2010 – April 2011 and Video Monitoring Study: March 2012 – June 2012); 2) an informal monitoring effort (June 2012 – May 2013); 3) eagle specific bi-monthly searches at original PCM turbines (July 2013 – December 2015); and 4) eagle specific monthly searches at all Project turbines (January 2016 – present). The information below provides detailed summaries for each survey period and presents data through August 2019.

### Methods

The first standard 3-year PCM study period (May 2009 – May 2012) included an initial 1-year post-construction monitoring and reporting program (May 2009 – May 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 of the Project turbines (Figure 10). Post-construction monitoring efforts included standardized carcass searches, searcher efficiency bias trials, and carcass persistence bias trials. Large game birds (e.g., mallards) were used for trials. After the one year monitoring study, in coordination with the TAC, two additional years of monitoring were implemented (May 2010 – May 2012). Detailed methods for the three monitoring years are provided in the technical reports (Johnson et al 2010, Johnson et al 2011 and Johnson et al 2012 [Appendix B]).

Additionally, at the request of the USFWS, a Golden Eagle Monitoring Study was conducted for a one-year period (April 2010 – April 2011) and included additional searches at 17 turbines where eagle mortalities had been identified (Figure 11). Detailed methods for the golden eagle monitoring study (turbine plot searches) are provided in the technical report (Johnson et al 2010 and Johnson et al 2011 [Appendix B and C]).

A Video Monitoring Study was also conducted where cameras were mounted along high risk strings and mortality monitoring was conducted to identify potential eagle strikes. Video monitoring occurred on a subset of turbine plots from March 2012 to June 2012. Six cameras were installed and 19 turbines were identified as within the cameras' field of view (Figure 12). Search method for each turbine followed the standard protocol described in Johnson et al 2010, 2011, and 2012 (Appendix B). Trials were not completed for this study as the goal was not to produce a fatality estimate, but rather to observe potential eagle behavior near turbines. A report was not prepared for this study.

The second informal monitoring period (June 2012 – May 2013) was a monitoring study initiated after the standardized 3-year PCM study was complete (Figure 12). The monitoring objective was not to conduct a rigorous research study, but rather to continue a reduced monitoring program after the formal three-year period. These surveys included monthly and bi-monthly searches at turbine strings where previous eagle mortalities had been discovered (Figure 13). Biologists

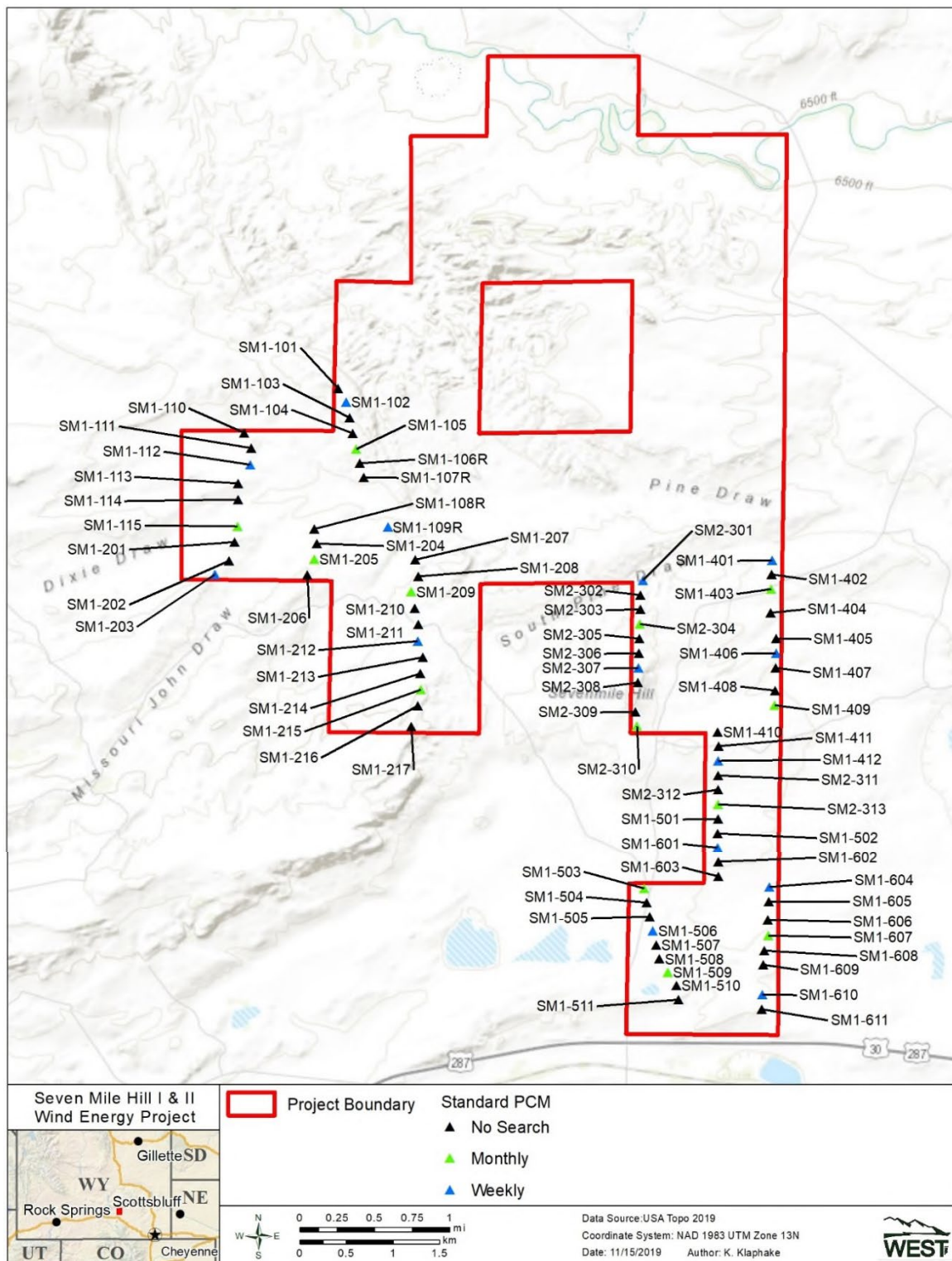
conducted meandering transect searches at designated turbines. The circular transects were rapid surveys approximately 30 m from the turbine base. Monitoring was conducted once a month in February, March, July, August, September, October and November, and twice a month in January, April, May, and December. These months were selected for two surveys based on the dates of previous golden eagle discoveries. All turbines not searched had drive by and/or checks from the pad for eagle carcasses. No bias trials were conducted as part of this effort and no technical reports were developed, although all eagle fatalities found were reported to the USFWS within 24-48 hours as required.

The third eagle specific bi-monthly period (July 2013 – 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. From July 2013 to December 2015 eagle-specific mortality monitoring was conducted twice per month at the original one-third of turbines (Figure 10). Search plots were 525 x 525 ft (160 x 160 m) with 66 ft (20 m) transect spacing. Eagle scans occurred from the pads for all turbines not searched by transects. Searcher efficiency trials (turkey skin wrapped around foam decoys) occurred to verify adequate detection rates at searched turbines and to determine detection potential at non-searched turbines. In total, 38 trials were placed and available during the survey period including 24 at search plots and 15 at non-search plots. No carcass persistence trials were conducted during the period and a formal report was not prepared beyond required SPUT reporting.

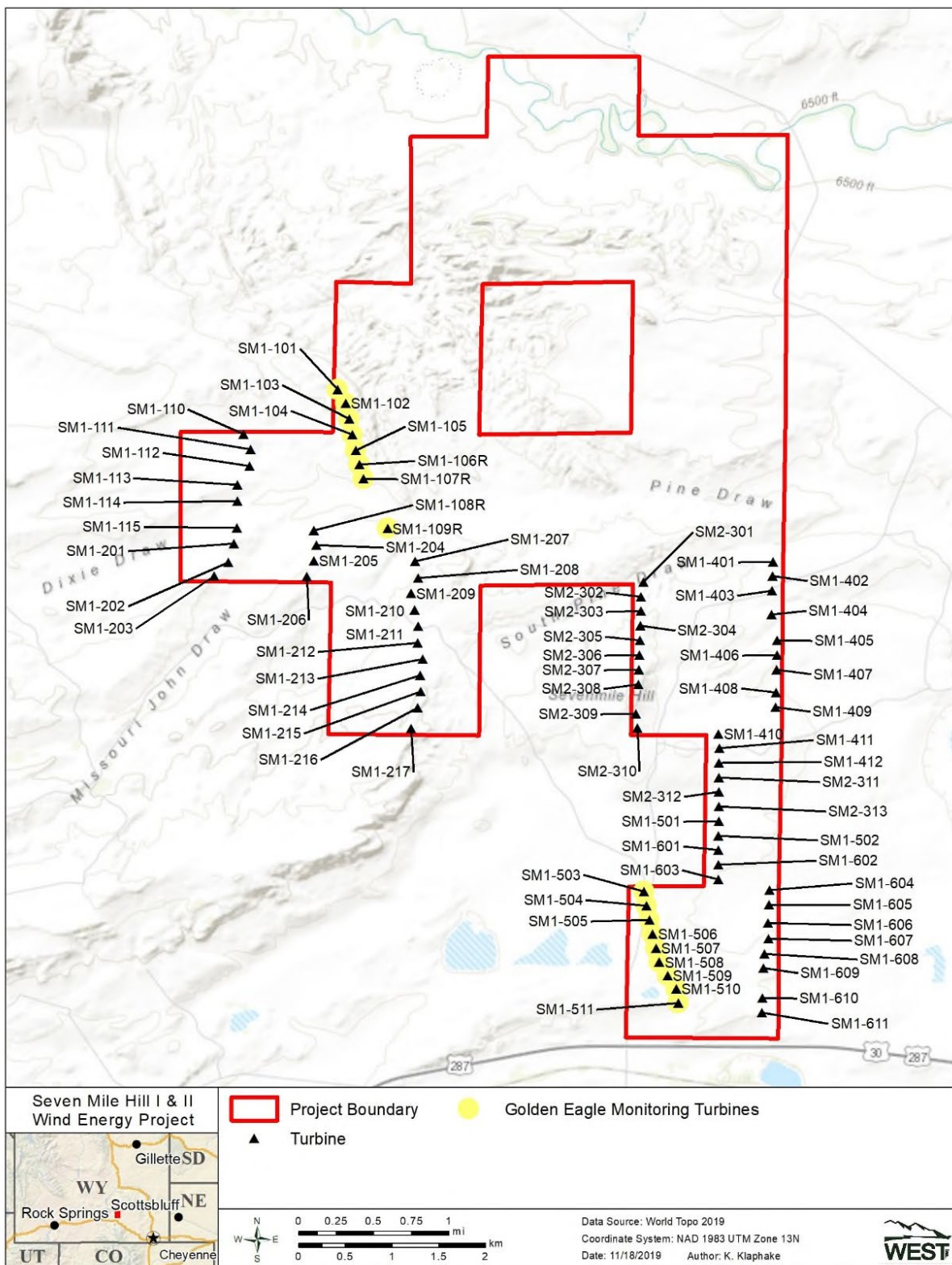
The fourth eagle specific monthly period (January 2016 – present) was a standardized monitoring study focused on eagle fatality detections. This effort is ongoing. The general survey methods followed those used during the three year standardized study (2009 – 2012). From January 2016 – present (data through August 2019) eagle-specific mortality monitoring was conducted once per month at 100% of the turbines. Search plots were 525 x 525 ft (160 x 160 m) with 66 ft (20 m) transect spacing. This protocol was developed in coordination with the USFWS. Searcher efficiency trials (turkey skin wrapped around foam decoys) were conducted throughout the monitoring period. Forty-eight trials were placed in 2016, 72 in 2017, 97 in 2018, and 55 through August 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 G). Eagle mortality reporting changed over time with initial reporting to the USFWS – Wyoming Ecological Services Field Office. USFWS staff retrieved dead eagles or PacifiCorp was authorized by USFWS Office of Law Enforcement (OLE) to collect mortalities until retrieval by USFWS. Under the current protocol, PacifiCorp reports all eagle mortalities to USFWS – OLE and obtains permission to deliver eagle remains to the USFWS National Eagle Repository. If USFWS issues an eagle incidental take permit for the Project, reporting to USFWS of eagle mortalities discovered will continue based on the permit conditions.





**Figure 10. Locations of the 27 turbines selected for the Years 1, 2, 3 standard post-construction carcass searches (May 2009 – May 2012) and the July 2013 to December 2015 post-construction carcass searches at the Seven Mile Hill Wind Energy Project, Carbon County, Wyoming.**



**Figure 11. Locations of the turbines searched for the Golden Eagle Monitoring Study (April 2010 – April 2011) at the Seven Mile Hill Wind Energy Project, Carbon County, Wyoming.**



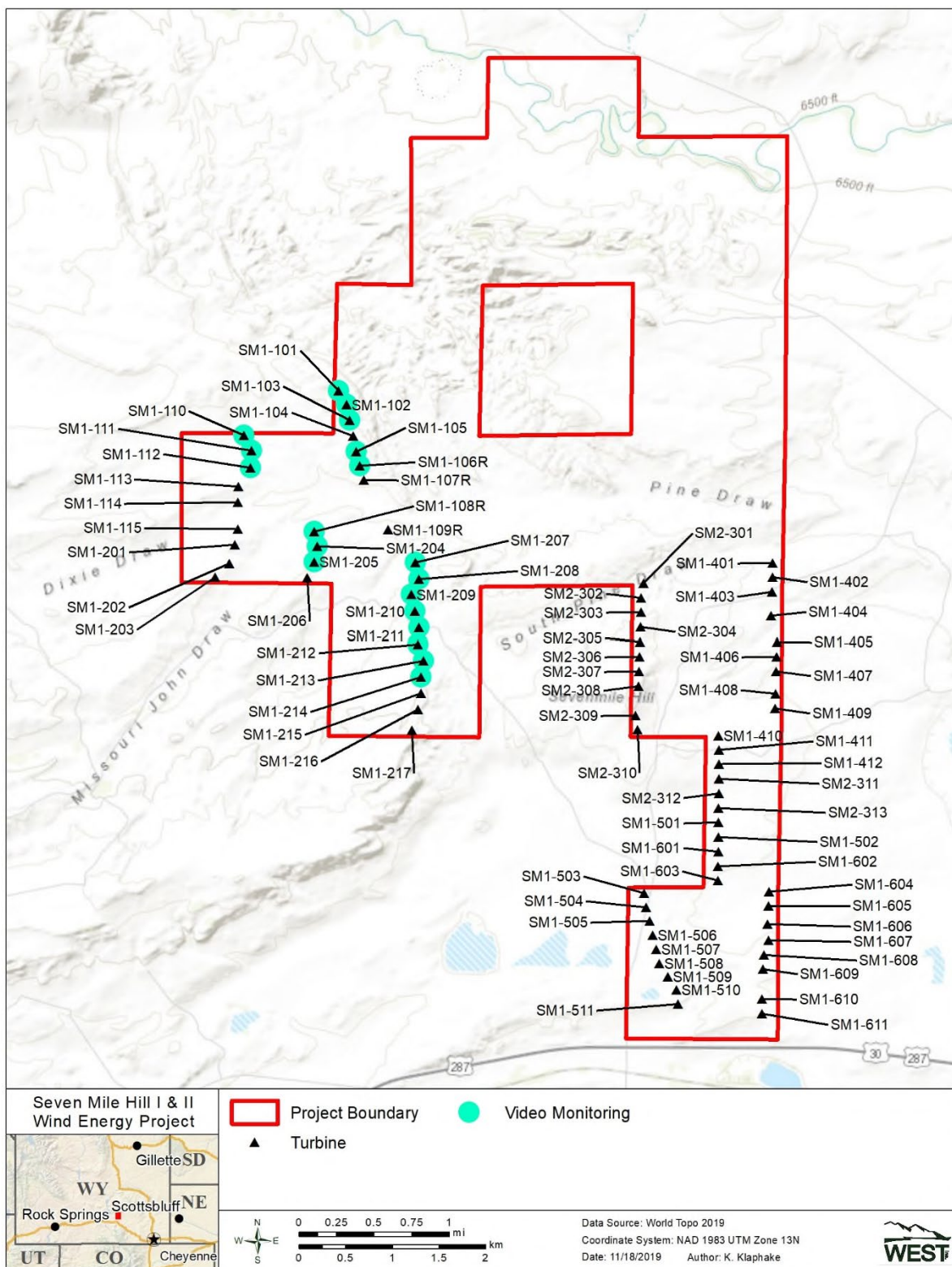
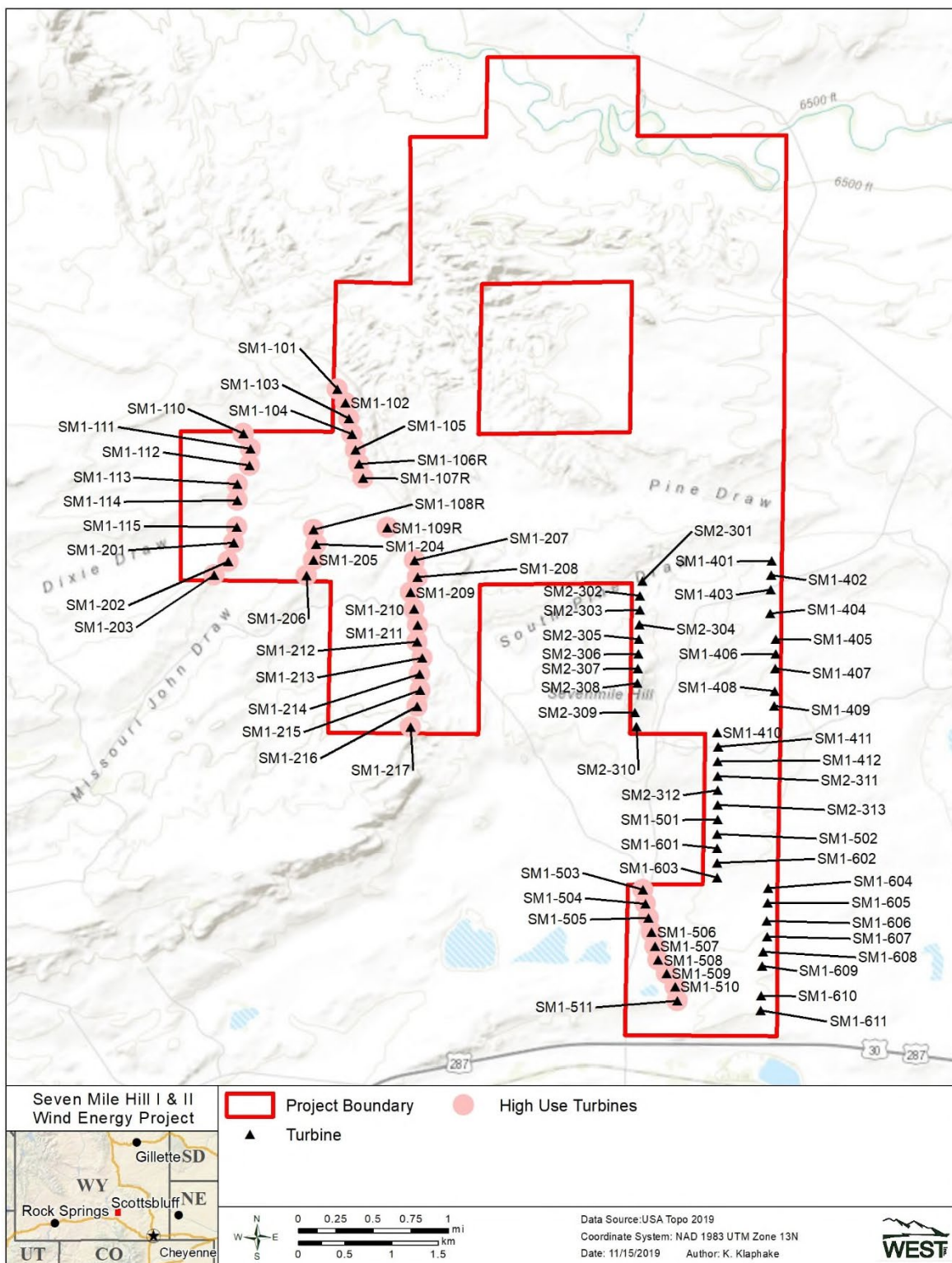


Figure 12. Locations of the turbines searched as part of the Video Monitoring Study (March 2012 - June 2012) at the Seven Mile Hill Wind Energy Project, Carbon County, Wyoming.



**Figure 13. Locations of the turbines searched as part of the informal carcass searches (monthly/bi-monthly) from July 2012 through May 2013 at the Seven Mile Hill Wind Energy Project, Carbon County, Wyoming. This monitoring occurred after the standard 3-year PCM at turbine strings where eagle mortalities had been discovered.**

## Results

### Year 1 (May 18, 2009 – May 13, 2010)

A total of 640 turbine plot searches were conducted and six golden eagles were found (including one found during clearing searches and one found as part of the golden eagle monitoring program; Figure 14, Table 3). One eagle was found on June 16, 2009 near turbine SMH-113. The USFWS Agent Dominic Domenici determined the mortality was not the result of turbine operation, and had likely been tampered with and dropped at the site. Based on this determination, the mortality is acknowledged, but not included in any subsequent tables, figures, or analysis. The detection rate for large birds in Year 1 was 76.5% across all seasons. The mean removal time for large birds was 21.4 days across all seasons. The average probability that a large bird carcass was available and detected was 78.0% for weekly surveys and approximately 45.0% for monthly searches. Full results can be found in the technical report (Johnson et al 2010 [Appendix B]).

### Year 2 (May 19, 2010 – May 18, 2011)

A total of 656 turbine plot searches were conducted as part of the standardized PCM and 525 turbine plot searches were completed as part of the golden eagle monitoring study. Two golden eagles were detected during scheduled searches during the study period (Figure 14, Table 3). No eagles were found at golden eagle monitoring study turbines. The detection rate for large birds in Year 2 was 67.3%. The mean removal time for large birds was 32.3 days across all seasons. The average probability that a large bird carcass was available and detected was 82.0% for weekly surveys and 47.0% for monthly surveys. Full results can be found in the technical report (Johnson et al 2011 [Appendix B]).

### Year 3 (May 23, 2011 – May 11, 2012)

A total of 551 turbine plot searches were conducted and no golden eagles were found. The detection rate for large birds in Year 3 was 68.9%. The mean removal time for large birds was 18.3 days. The average probability that a large bird carcass was available and detected was 72.0% for weekly surveys and 33.0% monthly surveys. Full results can be found in the technical report (Johnson et al 2012 [Appendix B]).

### Video Monitoring (March 2012 – June 2012)

A total of 285 turbine plot searches were conducted and two golden eagles were found (Figure 14, Table 3). Primary behavior observed on video review was circle soaring.

### Informal Monitoring (July 2012 - June 2013)

A total of 610 turbine plot searches were conducted and two golden eagles were found, one during a scheduled search and the other incidentally by an onsite observer (Figure 14, Table 3).

### Standardized Eagle Monitoring One-third of Turbines (July 2013 – December 2015)

A total of 1,536 turbines plot searches were conducted and two golden eagles were found, one during a pad check and the other incidentally at a non-searched turbine (Figure 14, Table 3). The detection rate for turkey skin decoys at searched turbines was 87.5% and 60.0% for non-searched

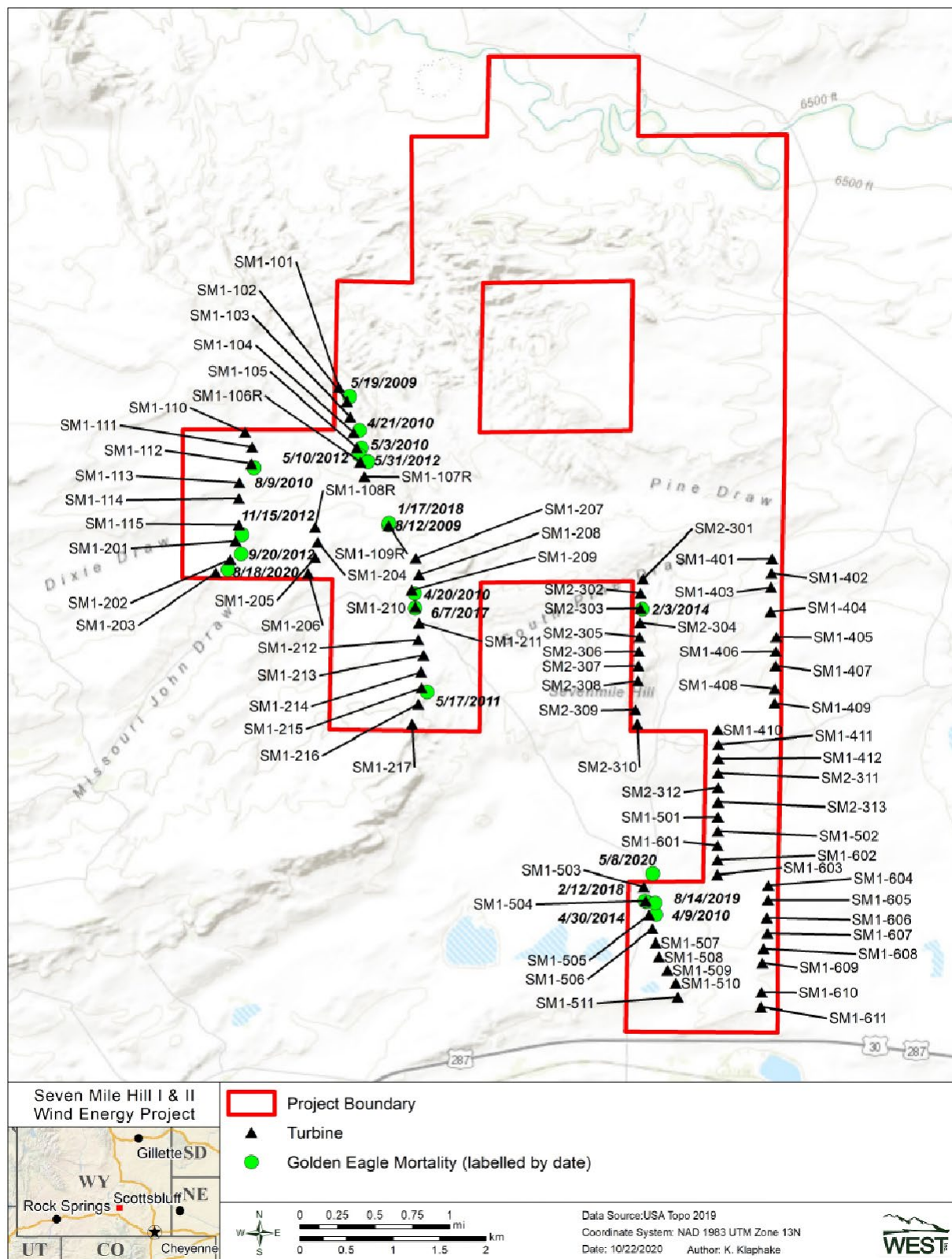
turbines. Experimental curtailment was initiated during this period (November 2012 – December 2015; see Chapter 8 for more details).

Standardized Eagle Monitoring 100% of Turbines (January 2016 – current [August 2020])

In 2016, 897 turbine plot searches were completed and no golden eagle carcasses were found. The detection rate for turkey skin decoys during 2016 was 68.8%. In 2017, 889 turbine plot searches were completed and site personnel incidentally found one dead golden eagle (Figure 14, Table 3). The detection rate for turkey skin decoys during 2017 was 81.9%. In 2018, 926 turbine plot searches were completed and two golden eagles were found; one during a scheduled search and a curtailment observer incidentally found the other (Figure 14, Table 3). The detection rate for turkey skin decoys during 2018 was 69.0%. In 2019, 922 turbine plot searches were completed and one golden eagle was found, incidentally by PacifiCorp (Figure 14, Table 3). The detection rate for turkey skins in 2019 was 82.0%. Through August 2020, 610 turbine plot searches were completed and two golden eagles were found, both during scheduled searches. The detection rate for turkey skins through August 2020 was 89.8%. Informed curtailment occurred throughout the duration of this monitoring period (see Chapter 8 for more details).

Twenty golden eagle mortalities have been found during the Project's operational period (Figure 14, Table 3). Seven golden eagles were found during the 3-year PCM study. One golden eagle was found during the golden eagle monitoring study searches. Two golden eagles were found during the video study. An additional 10 golden eagles have been found during additional monitoring from 2013 – 2020.





**Figure 14. Location and date for the 20 identified golden eagle mortalities documented within the Seven Mile Hill Wind Energy Project, Carbon County, Wyoming from May 2009 – August 2020.**

**Table 3. Eagle Fatalities Documented at the Seven Mile Hill Wind Facility in Carbon County, Wyoming from May 2009 – August 2020.**

| Date       | Species      | Mortality or Injury | On/Off Plot | Search Type         |
|------------|--------------|---------------------|-------------|---------------------|
| 5/19/2009  | golden eagle | Mortality           | On          | Scheduled Search    |
| 8/12/2009  | golden eagle | Mortality           | On          | Scheduled Search    |
| 4/9/2010   | golden eagle | Mortality           | Off         | Incidental*         |
| 4/20/2010  | golden eagle | Mortality           | On          | Incidental*         |
| 4/21/2010  | golden eagle | Mortality           | On          | Scheduled Search    |
| 5/3/2010   | golden eagle | Mortality           | On          | Incidental*         |
| 8/9/2010   | golden eagle | Mortality           | On          | Scheduled Search    |
| 5/17/2011  | golden eagle | Mortality           | On          | Scheduled Search    |
| 5/10/2012  | golden eagle | Mortality           | On          | Incidental**        |
| 5/31/2012  | golden eagle | Mortality           | On          | Incidental*         |
| 9/20/2012  | golden eagle | Mortality           | Off         | Incidental*         |
| 11/15/2012 | golden eagle | Mortality           | On          | Incidental          |
| 2/3/2014   | golden eagle | Mortality           | On          | Scheduled Search*** |
| 4/30/2014  | golden eagle | Mortality           | Off         | Incidental          |
| 6/7/2017   | golden eagle | Mortality           | On          | Incidental*         |
| 1/17/2018  | golden eagle | Mortality           | On          | Incidental*         |
| 2/12/2018  | golden eagle | Mortality           | On          | Incidental*         |
| 8/14/2019  | golden eagle | Mortality           | Off         | Incidental          |
| 5/8/2020   | golden eagle | Mortality           | On          | Scheduled Search    |
| 8/18/2020  | golden eagle | Mortality           | Off         | Scheduled Search    |

\*Designates fatality found on search plot by non-search staff

\*\*Found during video monitoring study

\*\*\*Found during eagle scan

## **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, decommissioning, and restoration plans for the Project. This section provides a summary of the conservation measures developed during site selection and Project design, as well as measures implemented over the operational period. Conservation measures considered Best Management Practices that were implemented during construction, are being implemented during operations, and will be implemented during decommissioning/restoration are discussed in Section 9 below.

During the Project development and operational periods, PacifiCorp engaged the USFWS and received feedback on the Project.

Additionally, during the site design stage of the Project, spring and fall pre-construction avian surveys were conducted and results indicated that the Project had higher golden eagle use in the northern Project area. Additionally, nest surveys identified multiple nests in the area. As a result, 22 turbines were eliminated from high use and known golden eagle nesting areas (Figure 15). By elimination of the 22 turbines, the nearest known golden eagle nest based on the 2007 nest survey effort was located greater than 1.0 mi (1.6 km) from the nearest turbine.

In 2020, the USFWS published revised Region 6, Recommendations for Avoidance and Minimization of Impacts to Golden Eagles at Wind Energy Facilities (USFWS 2020b). This document recommends a 2-mi buffer for all occupied golden eagle nests. Only golden eagle nest 23800201 is more than two miles from Project turbines.

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 electrocution risks to avian species. The APLIC (2012) guidance was not available during the development period.
- The Project was cited outside of big game crucial range, with the exception of two turbines within pronghorn crucial range. All other crucial ranges are approximately two miles or greater from the nearest turbine.
- A number of avoidance and minimization measures have been implemented during the Project's operational period and are discussed below.

### **Golden Eagle Monitoring Study**

At the request of USFWS, PacifiCorp contracted WEST to develop and implement a study to further evaluate eagle risk at the Project. Based on specific requests from the USFWS, WEST developed a protocol to be implemented. The study plan was implemented over a one-year period (April 2010 – May 2011) and included habitat mapping, topography mapping, prey-based surveys, eagle use surveys, mortality searches at turbines identified as high risk, and a detailed

assessment of eagle mortalities to date. The study was not developed as a statistically rigorous research project, but rather to provide greater insight into the early operational-stage eagle mortalities. Full study details are provided in the technical report (Johnson and Rintz 2011 report [Appendix C]).

In total, approximately 100 eagle observation survey hours, over 300 turbine plot searches, multiple field survey days to map habitat and prey resources, and a robust data gathering effort were performed. The study concluded that the northern Project area had higher risk features including greater topography and prey sources. The 100-string made up of seven turbines located on the prevailing windward side of a ridgeline appeared to pose the greatest risk. This information was carried through to other adaptive management strategies developed in the future, with the goal of reducing mortalities along the 100 string.



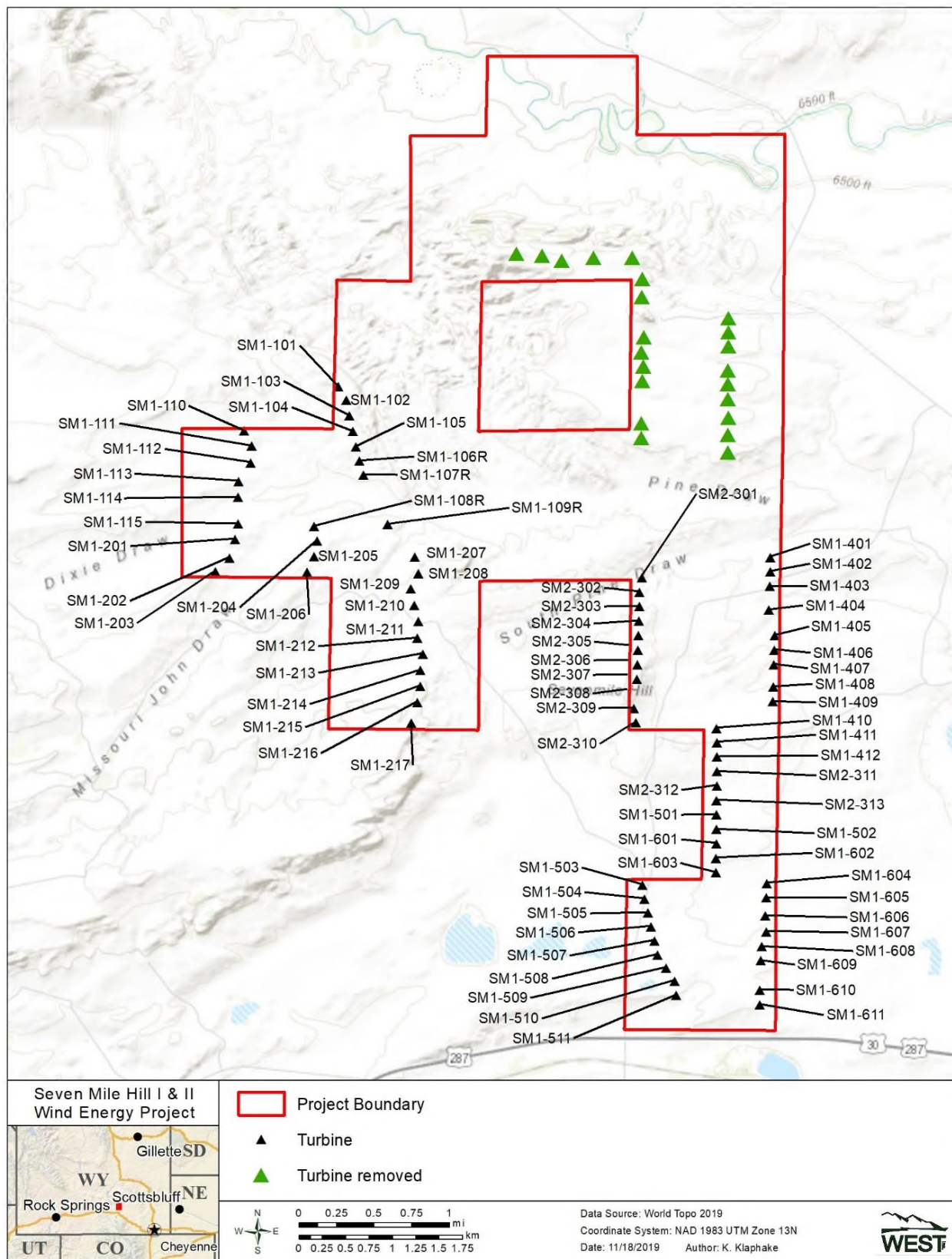


Figure 15. Existing wind turbines and 22 turbines removed during design phase at the Seven Mile Hill Wind Energy Project, Carbon County, Wyoming.

## Experimental and Informed Curtailment

One of the larger adaptive management strategies PacifiCorp has implemented to date is curtailment of wind turbines. During curtailment monitoring periods, a biomonitor actively surveys for eagles and curtails (either manually or through radio call-in to operations staff) turbines when an eagle is deemed at risk. Two curtailment phases have occurred (or are ongoing) at the Project; experimental and informed.

The first curtailment phase was an experiment curtailment period initiated in November 2012 and continued through March 2015. PacifiCorp worked with WEST to develop and implement a curtailment plan with the goal of reducing risk to eagles at the Project (Appendix H). Curtailment surveys were conducted five days a week in November and December 2012, then seven days a week starting in late December 2012 and continuing throughout 2013 and 2014. During curtailment surveys, one biomonitor documented turbine curtailment events and eagle observations. The biomonitor was stationed in a vehicle and radioed to the O&M building where Project personnel were monitoring radio traffic and manually curtailing turbines as requests for turbine curtailments came in.

Data collected during the experimental curtailment phase were analyzed and a report was developed (WEST Inc. 2015a; Appendix H). The results of the analysis were used to identify trends in eagle use and risk observed during the experimental curtailment phase. The analysis specifically evaluated eagle use and curtailment trends throughout a day, throughout the year, spatially across the Project, relative to Project slopes, wind conditions, and distance to turbines. These metrics were discussed and used to move the curtailment program into the informed curtailment phase.

The informed curtailment phase officially kicked off in December 2015. The informed curtailment plan includes the use of one biomonitor, five hours per day (0900 – 1400) for a four-month period (December – March) each year (Appendix H). PacifiCorp conducted additional evaluations to target one location within the Project area where an observation tower would be constructed and biomonitors would be stationed during curtailment surveys. This included a view shed analysis for two potential locations (Figure 16). The location was selected to maximize the biomonitors viewshed across the Project area and was placed near the location with the highest eagle use. The tower also allowed biomonitors to have access to the SCADA systems and the ability to manually curtail turbines without the need to radio to the O&M staff. The informed curtailment phase has continued from December 2015 to the present. The curtailment program is discussed further in the Curtailment Protocol Report (Appendix H).

In line with PacifiCorp's adaptive management plan, changes to the informed curtailment program occur on an as needed basis based on the best available data. As eagle activity changes at the Project, PacifiCorp will evaluate the need to add additional biomonitors or start curtailment activities earlier than December or extending the surveys beyond the defined March end date.

This adaptive management occurred during spring 2014, when PacifiCorp extended curtailment surveys through May. Additionally, a second biomonitor was added to increase the Project area coverage. This change was made due to an increase in eagle activity, resulting in eagle mortalities.

PacifiCorp received recommendations from the USFWS regarding minimization of potential future eagle mortalities at wind turbines SMH-504 and SMH-505. PacifiCorp continues to assess and implement actions to minimize eagle collision risk near these turbines. As a result of such assessment, PacifiCorp is in the process of stationing high resolution cameras near turbines SMH-504 and 505 to increase the ability of curtailment staff to see eagles in the area. This measure will be evaluated for its efficacy and PacifiCorp will consider extending the duration of informed curtailment if warranted by eagle presence near these turbines. Additional minimization measures that PacifiCorp will continue to evaluate and implement include the following: blade painting technology, subject to appropriate authorizations and approvals; alerting device technologies; prey base management; perch/habitat management; and/or other actions yet to be identified through research, observations, and discussions with wildlife specialist. Seasonal curtailment will be reviewed and considered as part of the actions taken to minimize eagle risk and will be considered as a last approach effort due to the potentially significant energy generation impacts, which affects PacifiCorp and its customers.

PacifiCorp has developed a robust informed curtailment program at the Project which it has implemented over the past nine years. Installing high resolution cameras at turbines SMH-504 and 505 will further enhance this program, and provide observers with additional visual information that can be used to minimize eagle collisions. PacifiCorp has also identified a suite of experimental avoidance and minimization measures that the company will continue to evaluate during the term of the permit to further reduce collisions. Monitoring associated with project operations will enable the company to implement effective minimization measures while retaining the generation benefits provided by the Project to PacifiCorp customers.



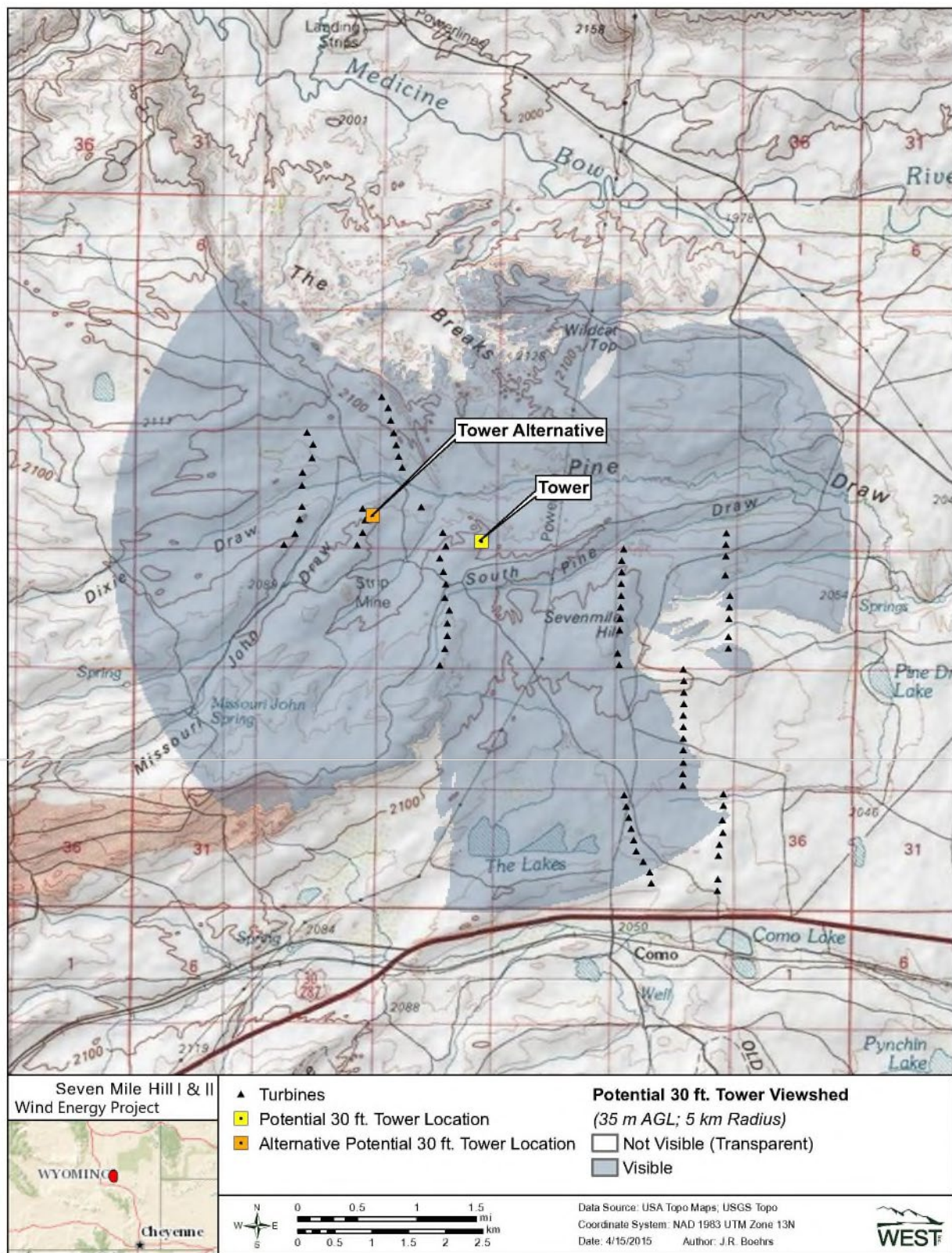


Figure 16. Observation tower location and view shed analysis for the Seven Mile Hill Wind Energy Project, Carbon County, Wyoming.

### **Technology Investigation (Detection and Deterrent)**

As part of the adaptive management plan and in discussion with the USFWS, PacifiCorp evaluated technology that could potentially reduce eagle impacts at the Project. PacifiCorp contracted WEST to evaluate an experimental detection and deterrence system at the Project. The WindSafeFlight™ system developed by BirdsVision Ltd. was the focus of this study. The WindSafeFlight™ system consists of various monitoring and detection sensors including cameras and radars, as well as acoustic and visual deterrents. Three systems (or nodes) were deployed at the Project. All three systems were mounted on turbine SM1-104 on October 25 and 26, 2013. A study plan was developed to test the system that included pre-installation and operational phase surveys; however, due to system issues, the study period was designated a beta test and a study plan was not actually implemented. As such, a report that included detailed methods and results could not be prepared. The system was deployed for an approximately 3-month period, and a number of advancements and lessons learned were taken from the study in both deployment, system operations, data evaluation, among other areas. Data were collected during the period and BirdsVision continued to work on the system to support a later study at the Glenrock and Rolling Hills Wind Energy Project.

## **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, presented in the Project's Bird and Bat Conservation Strategy.

### **During Development**

The Project implemented a variety of Best Management Practice's (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:

- As described above, 22 turbines were eliminated from high eagle use and known eagle nesting areas; the nearest known golden eagle nest (based on results from the 2007 nest survey effort) was located greater than 1.0 mile (1.6 km) from the nearest turbine.
- 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 incorporated APLIC 2006 recommendations into the transmission and distribution line design to minimize electrocution risks to avian species for any lines constructed above ground.
- Project development avoided using guy wires for turbines, and any existing guy wires on meteorological (MET) towers 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.
- The Project was sited away from known greater sage-grouse leks which can serve as a concentrated prey resource for eagles. One known lek exists approximately 0.3 mi (0.5 km) from the nearest turbine, all other leks are approximately one mile (1.6 km) or greater.
- The Project was sited outside of crucial big game winter range, parturition areas, and migration corridors which 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 15 - August 15
  - 0.5 mi (0.8 km) for occupied golden eagle nests from January 15 to July 31
- Gravel was placed at least five 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 mph) 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. A native seed



mix was determined by consultation with the Medicine Bow Conservation District and landowner.

- 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 Avian Power Line Interaction Committee (APLIC) Guidelines (APLIC 2006) to protect birds including eagles from electrocution or lines that were not built to these recommendations were later 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.
- PacifiCorp worked with landowners to stop the use of lethal predator control that may also impact eagles. This practice included either exploding devices or poisons used in association with carrion bait.
- 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.
- The two temporary guyed meteorological towers at the Project were removed during the first year of post-construction monitoring.
- 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. As described above, all overhead lines constructed for the Project were required to incorporate APLIC 2006. However, some of the lines had originally been designed and constructed by a contractor who had not used an avian-safe design. Upon PacifiCorp inspection of the line after construction, it was documented that 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 G).
- PacifiCorp has continued to monitor for the presence of eagle mortalities 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 Eagle Incidental Take Permit is issued, future eagle mortality monitoring would follow the detailed permit requirements for monitoring.
- The use of real carcasses (e.g., mallards) stopped after the standard 3-yr PCM study and PacifiCorp has transitioned to artificial surrogates to reduce potential attraction and better evaluate detection rates for eagles.
- Annual nest surveys are performed (as described in Section 7) to identify eagle nesting occupation 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 May of 2012, including mortality surveys and nest surveys, were recorded in formal annual reports since monitoring was initiated in May 2009 (Johnson et al. 2010, 2011, 2012 [Appendix B]). 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.
- PacifiCorp has evaluated and implemented a number of advanced conservation practices as part of the ongoing adaptive management. These items were discussed in more detail in Section 8 and include:
  - If/when a dead eagle 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.
  - Experimental and informed curtailment: PacifiCorp worked with WEST Inc. to develop and implement an experiment curtailment program starting in 2012. The curtailment program occurred during all daylight hours 365 days a year from November 2012 – March 2015. Data collected during this period were analyzed and a plan for long-term informed curtailment was developed. The informed curtailment identified a 4-month period and 5-hour curtailment survey day to be conducted in perpetuity or until deemed no longer required. The informed curtailment has been conducted from December 2015 – present (December 2019 report date).
  - Technology (detect and deter) research: PacifiCorp evaluated a number of experimental detect and deter systems and then funded a study to test the

effectiveness of a system. The BirdsVision system was installed at the Project, monitored, and then evaluated for potential use at the Project. This information was shared with the USFWS to further industry and agency knowledge on potential eagle risk reduction solutions.

- Many of the conservation actions implemented were focused on the 100 turbine string. Through PCM, this area was identified as a high eagle use and subsequently high risk string. Since implementing the deterrent study and curtailment program, no mortalities have occurred along this string (five eagle mortalities prior to 2012, and zero since 2012).
- An adaptive management program has been implemented as described in Chapter 11.

## **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 will be necessary to ensure that the standard of no net loss to the population is achieved whenever golden eagles are taken at the Project. The Project was operational as of January 2009 and hence it is part of the environmental baseline in the USFWS FEA of April, 2009. As such, compensatory mitigation will not be required for take predicted for the original Project, but will be required for the additional take resulting from the repower (i.e., the difference between original Project take prediction and repowered Project take prediction). PacifiCorp will prepare a separate Project-specific power pole retrofit plan using a template provided by the USFWS, Mountain Prairie Region Office.

Based on recommendations under the ECPG, utility pole retrofits are currently the mitigation approach preferred by USFWS. 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 the golden eagle take that would require mitigation (i.e., difference between pre- and post-repower predicted take) as identified in a USFWS authorized EITP; if this permit is issued for the Project. The number of utility pole retrofits per eagle carcass discovery beyond the baseline 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.

## **11. Adaptive Management**

As stated in the USFWS Region 6 ECP recommendations (USFWS 2019), “*adaptive management is a component of every EITP issued by USFWS, Region 6 to companies for wind energy facilities*”. Further, the USFWS recommends that operators work with the USFWS to

develop and apply appropriate adaptive management measures in the development and operation of wind energy facilities. PacifiCorp has communicated with the USFWS over the past decade to identify potential adaptive management actions to support eagle risk reduction for the Project. It is assumed that PacifiCorp will work with the USFWS to address adaptive management measures for the Project as appropriate. If an eagle incidental take permit is issued by USFWS for the Project, it will incorporate specific actions that PacifiCorp will implement if eagle take authorization under the permit approaches or reaches the amount of take authorized. The information below is present to recognize the current adaptive management plan being implemented by PacifiCorp (with USFWS coordination) and actions taken to date.

PacifiCorp has evaluated and implemented a number of adaptive management techniques during the Project's operation beyond the WIRHS system and will continue to evaluate the need for adaptive management following the plan described below. The current adaptive management plan includes past and ongoing strategies to avoid and minimize impacts to eagles.

PacifiCorp's adaptive management plan (1) evaluates the mortality rates reported based on post-construction monitoring; (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.

## **12. Other USFWS Permits**

PacifiCorp has obtained a MBTA 21.27 SPUT permit (Permit number: MB00469B-0) in accordance with their Migratory Bird Compliance Plan 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.

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## **Appendix A. Pre-construction Monitoring Studies**

## **Appendix B. Post-construction Mortality Monitoring Studies**

## **Appendix C. Golden Eagle Monitoring Study**



## **Appendix D. Post-construction Avian Usage Study**

## **Appendix E. Raptor Nest Studies**

## **Appendix F. Greater Sage Grouse Lek Studies**

## **Appendix G: Wildlife Incident Reporting and Handling Systems**

## **Appendix H. Curtailment Documents**