Campbell Hill Wind Project

Three Buttes Windpower, LLC

Eagle Conservation Plan

Prepared:

January 2022

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Acronyms and Abbreviations

AGL	above ground level
APLIC	Avian Power Line Interaction Committee
APP	Avian Protection Plan
BBCS	Bird and Bat Conservation Strategy
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
CHW	Campbell Hill Wind Power
CRM	Collision Risk Model
DER	Duke Energy Renewables
DOJ	Department of Justice
ECP	Eagle Conservation Plan
ECPG	USFWS Eagle Conservation Plan Guidance
ECM	Eagle Conservation Measure
EFMP	Eagle Fatality Monitoring Plan
EITP	eagle incidental take permit
EA	Environmental Assessment
Eagle ILF	Bald Eagle and Golden Eagle Electrocution Prevention In-Lieu Fee
EMU	Eagle Management Unit
EOA	Evidence of Absence
ESA	Endangered Species Act
FAA	Federal Aviation Administration
GIS	Geographic Information System
IDF	IdentiFlight®
IEC	informed eagle curtailment
MBCP	Migratory Bird Compliance Plan
MBTA	Migratory Bird Treaty Act
NEPA	National Environmental Policy Act
NLCD	National Land Cover Database
OLE	Office of Law Enforcement
Project	Campbell Hill Wind Energy Project
Project Area	Land contained within the Project boundary
REA	Resource Equivalency Analysis
SPUT	Special Purpose - Utility Permit
TBD	to be determined
TOTW	Top of the World Wind Energy Project
USFWS	U.S. Fish and Wildlife Service
WEGs	USFWS Land-based Wind Energy Guidelines
WGFD	Wyoming Game and Fish Department
WIMRS	Wildlife Incident Monitoring and Reporting System

1.0 INTRODUCTION AND PURPOSE

Three Buttes Windpower, LLC, a wholly owned subsidiary of Duke Energy Renewables, Inc. (DER) and commonly known and referred to here-in-after as Campbell Hill Wind Power (CHW), developed the Campbell Hill Wind Energy Project (Project) Eagle Conservation Plan (ECP) to follow the recommended process of preparing an eagle incidental take permit (EITP) application to the U.S. Fish and Wildlife Service (USFWS) under the Bald and Golden Eagle Protection Act (BGEPA; 50 CFR 22.26 & 22.27) and the associated National Environmental Policy Act (NEPA) process. The ECP was developed as a requirement of a Plea Agreement between DER and the federal government on November 22, 2013 (Plea Agreement 2013), for violations of the Migratory Bird Treaty Act (MBTA) resulting from incidental take of migratory birds, including golden eagles due to Project operations.[1] The Plea Agreement requirements included the payment of fines and restitution, five years of probation, and compliance with a Migratory Bird Compliance Plan (MBCP; MBCP 2013). Primary components of the MBCP include revising the Project's Bird and Bat Conservation Strategy (BBCS; DER 2020), preparation of this ECP, and application for an EITP. The MBCP was developed with the assistance of the USFWS and the Department of Justice (DOJ) and was approved by the Chief of Migratory Birds for USFWS Region 6 and the DOJ on November 13, 2013. DER has met all its obligations and conditions of probation under the Plea Agreement and was released from probation in December 2018. All compliance elements included in the MBCP have been met by DER at the time of submittal of this ECP and permit application.

The ECP provides information on the development, construction, and operation of the Project; identifies potential risks to bald and golden eagles from the Project; reduces those risks through implementation of conservation measures and avoidance and minimization measures such that the remaining take is unavoidable; and describes compensatory mitigation that meets the regulatory preservation standard for bald and golden eagles. CHW is submitting this ECP to support the application for a EITP for an 8-year term and the format of this ECP is consistent with U.S. Fish and Wildlife Service, Region 6, Migratory Bird Management Office, Recommended Approach for Development and Submission of Eagle Conservation Plans in support of an Eagle Incidental Take Permit Application for Wind Energy Project (USFWS, 2021). For purposes of this ECP, and per discussions with USFWS, eagle fatality data presented herein are representative of all data collected through December 31, 2020. Fatalities occurring after this date, if any, have not been included in any analysis for this ECP. The NEPA analysis associated with the take permitting process will use the information in this ECP to evaluate the federal action of issuing the EITP by the USFWS.

[1] Throughout this ECP, there are references to actions that have been or will be taken by DER and by CHW. In general, actions taken by DER were required by or in accordance with the plea agreement, which pertains to both this Project and the Top of the World Wind Energy Project, while actions taken by CHW are specific to this Project.

This ECP summarizes eagle studies and evaluates eagle use at the Project (Section 3), provides avoidance and minimization measures designed to reduce risk to eagles (Sections 6.1 and 6.2), identifies additional avoidance and minimization measures intended to address on-going risk to eagles at the Project (Section 6.5), describes a plan for providing compensatory mitigation for unavoidable take of eagles at the Project (Section 6.3), and summarizes future monitoring and reporting commitments (Sections 7 and 8, respectively). The fact that the Project was constructed and placed into operation prior to USFWS's issuance of its final Eagle Conservation Plan Guidance (ECPG; USFWS 2013) causes several components of this ECP to differ from an ECP that would be developed for a wind facility prior to construction. However, when possible, information is presented according to the recommendations of the ECPG and specific Region 6 guidance. Results of ongoing studies relevant to eagles are provided up through December 31, 2020.

In addition to this ECP, CHW developed and is implementing a Project BBCS. The BBCS outlines processes employed by CHW to avoid and minimize impacts to all avian and bat species at the Project. The BBCS provides a framework for compliance with state and federal wildlife conservation and protection laws and regulations, adherence with the final USFWS Land-based Wind Energy Guidelines (WEGs; USFWS 2012), scientifically credible approaches to understanding impacts to avian resources, and the implementation of conservation, avoidance, minimization, and mitigation measures that address impacts that result from the operation of the Project. This ECP builds upon the BBCS and incorporates provisions applicable to eagles.

This ECP has been developed in coordination with USFWS. An initial kickoff meeting was held on July 15, 2014, and periodic meetings and conference calls between CHW, USFWS, and CHW's consultants have occurred throughout the development of this ECP.

At the time of Project development, CHW consulted with the USFWS Wyoming Ecological Services Field Office and, based on that consultation, it was determined that the Project is not anticipated to result in take of listed wildlife, fish, or plants, or adversely modify critical habitat pursuant to the Endangered Species Act (ESA). No additional ESA consultation with the USFWS is needed for the Project. Pre-construction correspondence with the USFWS regarding potential impacts to threatened or endangered species is contained in Appendix A.

All Federal Aviation Administration (FAA) approvals, including from the Department of Defense, required at the time of construction were obtained by the original developer of the Project. All FAA approvals required at the time of construction were obtained. At the time of development, DOD approvals were part of the FAA approval process.

2.0 PROJECT DESCRIPTION

2.1 Project Site

The Project is located in west-central Converse County, Wyoming, approximately 12 miles northwest of the town of Glenrock (Figure 1). Construction of the Project began on March 2, 2009, and the Project went into commercial operations on December 11, 2009. The Project Area consists of 12,749 acres of private lands contained within the Project boundary (Figure 1).

According to the National Land Cover Database (NLCD), approximately 85 percent of the Project Area is composed of grassland herbaceous cover (Table 1, Figure 2). The next most common land cover type is shrub/scrub, which composes about 11.5 percent of the Project Area. Barren areas compose approximately 2.6 percent, while other land cover types (i.e. woody wetlands, open water, evergreen forest, and emergent herbaceous wetlands) collectively compose less than 1 percent of the Project Area (Table 1). Further details on habitat and land uses relevant to eagle use are provided in Section 3.

Table 1: Land Cover Types, Coverage, and Percent Composition within the Project Area

Habitat	Acres	Percent Composition
Grassland/Herbaceous	10,905	85.5
Shrub/scrub	1,459	11.5
Barren	332	2.6
Woody Wetlands	27	0.2
Open Water	18	0.1
Evergreen Forest	2	<0.1
Emergent Herbaceous Wetlands	5	<0.1
Total	**12,749**	**100**

Topography in the Project Area varies from relatively large areas of little topographic relief in the southern portion of the Project Area to areas of greater topographical variation in the north, including numerous ridges and hills (Figure 3). North-south-oriented ridges and valleys occur throughout the Project Area, rising to a high point at the Three Buttes Summit, which is in the center of the Project. Elevations within the Project Area range from approximately 5,200 to 5,900 feet above sea level.

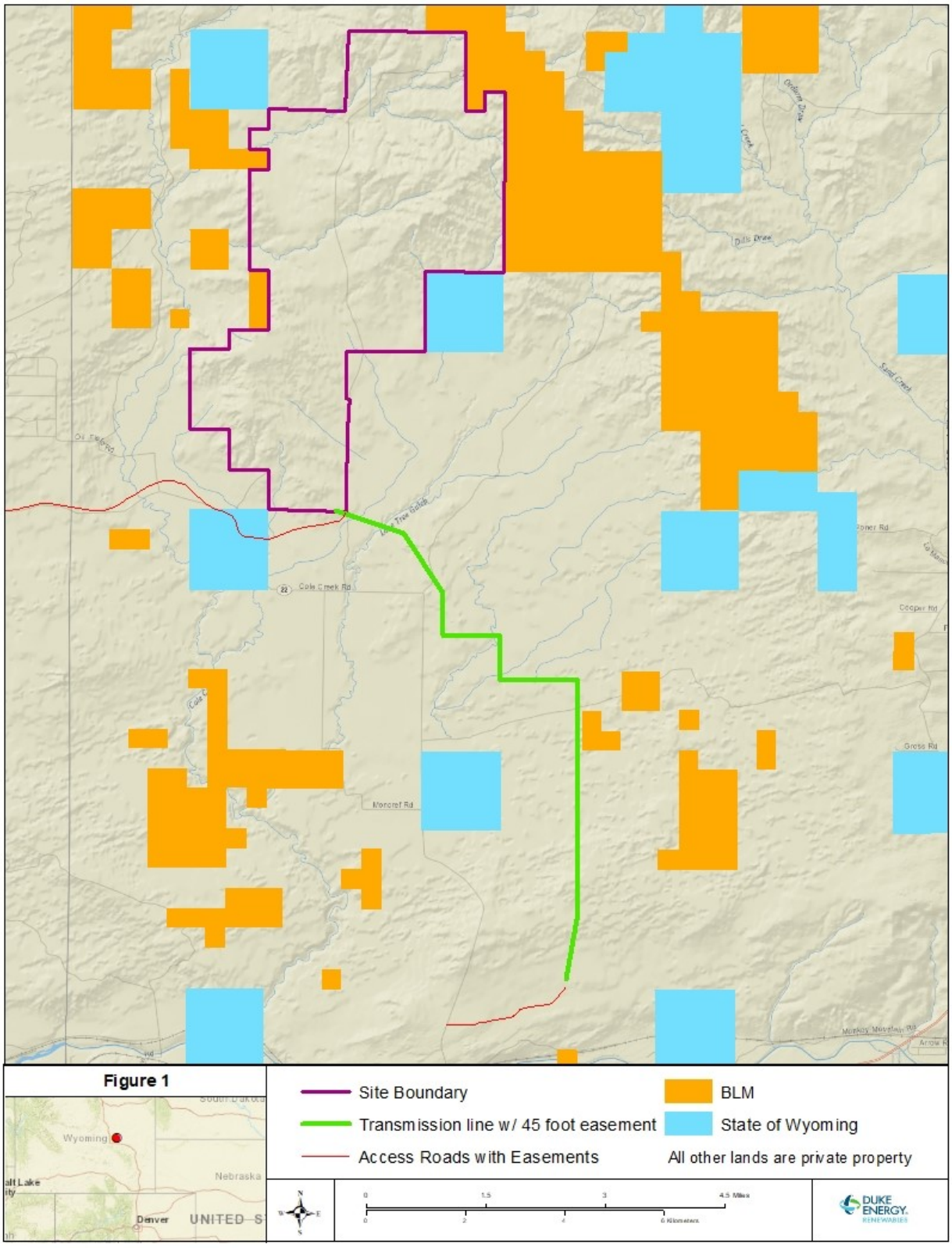

Figure 1: Location of Project and Land Ownership/Management in Project Vicinity

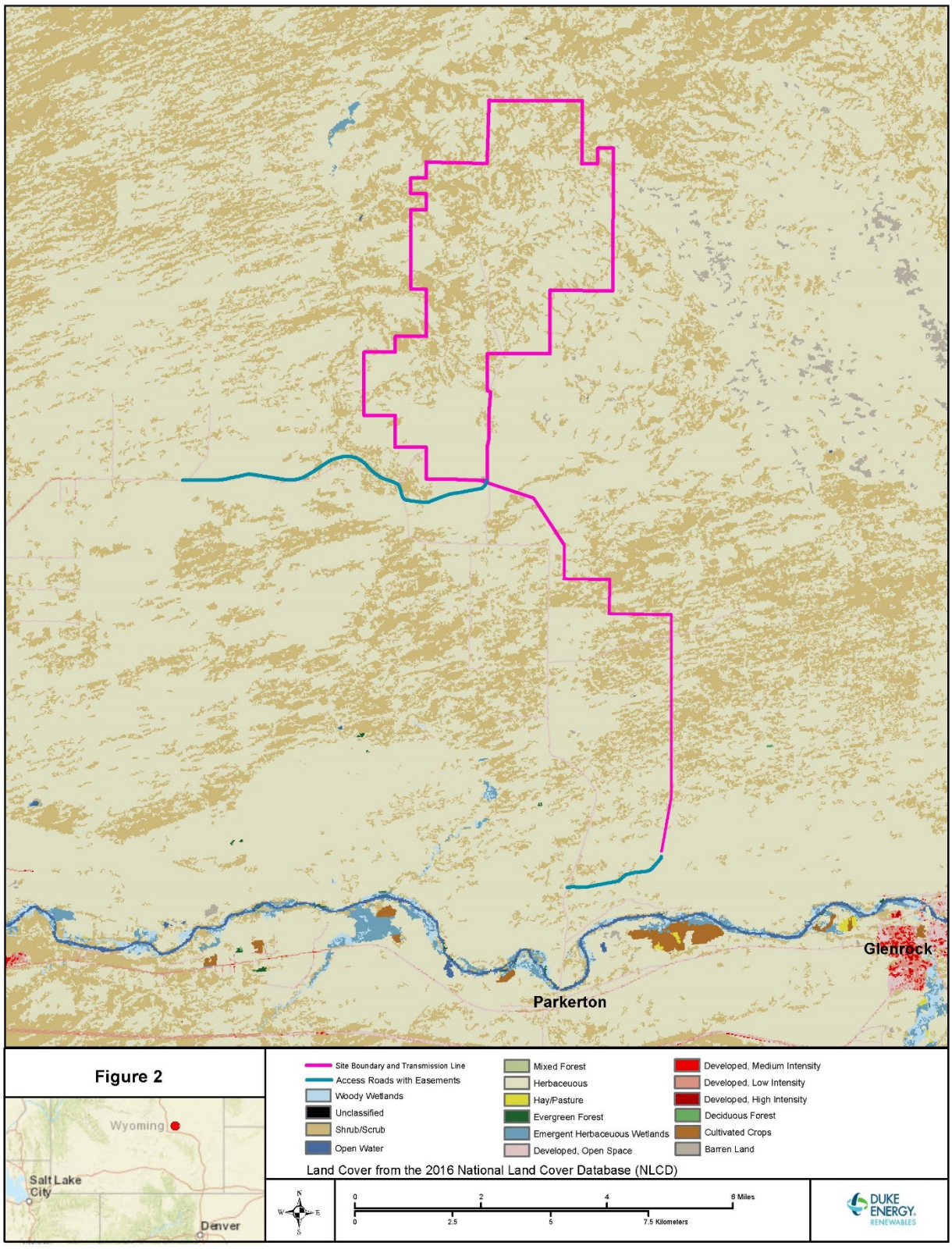

Figure 2: Land Cover in the Vicinity of the Project

2.2 Project Infrastructure

The Project originally consisted of 66 General Electric 1.5-megawatt wind turbines with a rotor diameter of 77 meters. Total turbine height is 118.5 meters (388.8 feet). However, one turbine (Turbine 23) at the Project failed in August 2020 and will be replaced. At the time of this ECP, the exact wind turbine model to be used to replace Turbine 23 has not yet been determined. All existing turbine nacelles are situated on 80-meter-tall steel tubular towers secured to a concrete foundation. Turbines are situated on turbine pads that are each 15 meters in diameter. In accordance with FAA guidelines (FAA 2007), 16 of the turbines are lighted with medium-intensity, red, synchronously flashing, nighttime lights. This lighting arrangement is also consistent with recommendations from the USFWS for aviation-hazard lighting on wind turbine towers to reduce bird collision risk. In addition, exterior lights at substations and the operations and maintenance building are only used when needed when work is being conducted at night or in low light conditions and are downshielded.

Power from each wind turbine is transported to a central substation (Figure 3) via collector lines. All electrical collector lines have been buried.

From the on-site substation, the electricity is transported via a 10-mile 230-kilovolt overhead transmission line south to PacifiCorp's existing Latigo substation (Figure 3). The transmission line was constructed in accordance with the recommendations of the Avian Power Line Interaction Committee (APLIC; APLIC 2006).

Two meteorological towers were constructed as part of the Project. However, the meteorological towers at the Project were removed in June 2012 to reduce potential avian impacts.

Additional Project features include approximately 14 miles of access roads and an operations and maintenance building (Figure 3). Activities associated with the Project include traffic along existing private ranch roads used by both ranchers and site personnel and access roads to and from the Project and operation and maintenance activities within the Project Area. The Project, as part of this ECP, has also proposed four IdentiFlight® eagle detection units. Proposed locations for these four units are shown on Figure 3 below and on Figure 9 in Section 6.2.2.1. These units are expected be installed in Fall 2021.

Currently, the above-ground acreage occupied by Project facilities is approximately 152 acres.

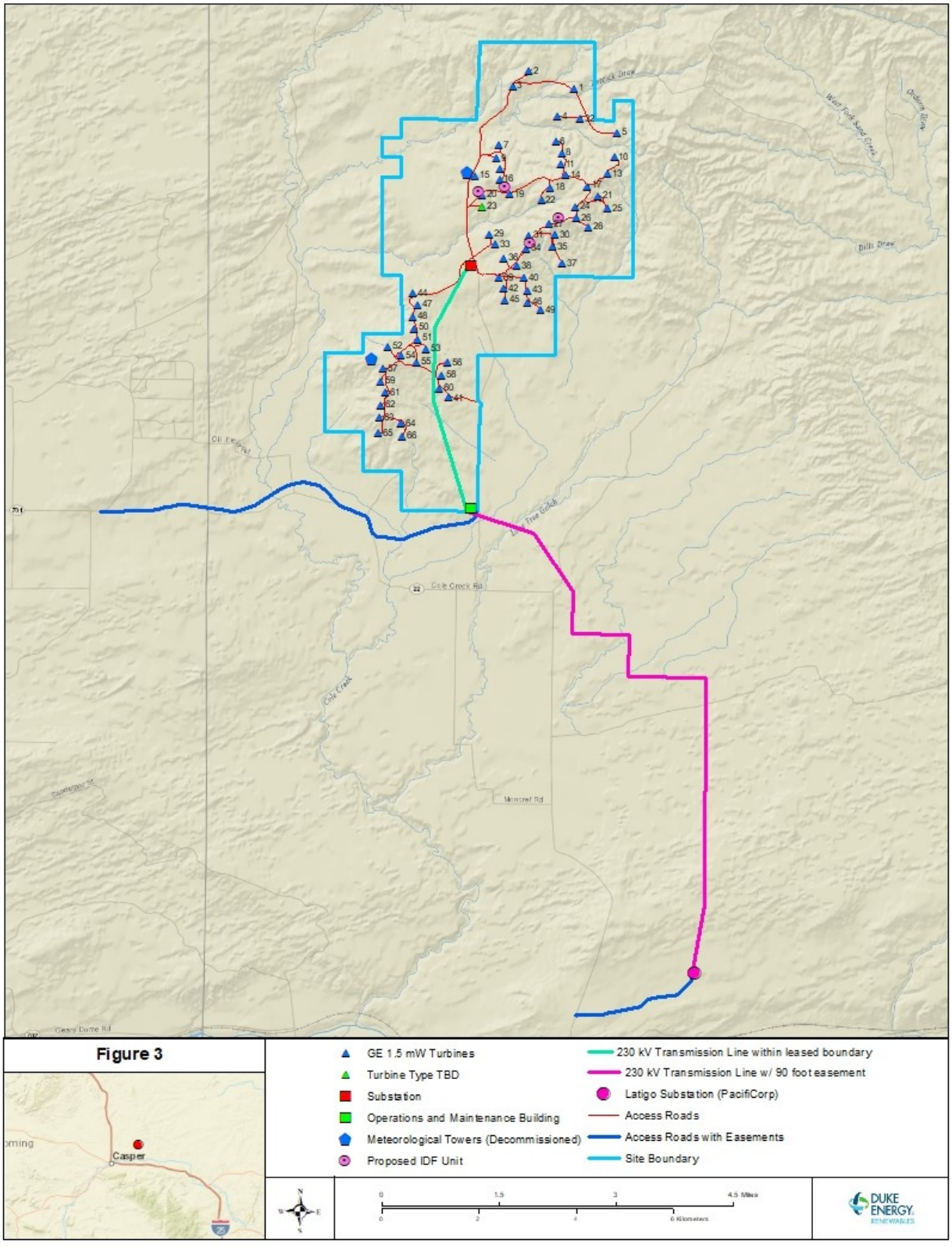

Figure 3: As-built Locations of Project Features

2.3 Other Land Uses in the Vicinity of the Project

In addition to Project-related structures and activities, there are several pre-existing and ongoing anthropogenic activities on or near the Project that may affect bald and golden eagles. These activities include big game and prairie dog hunting, livestock grazing operations (i.e., cattle and sheep), oil and gas operations, and various linear infrastructure developments. This last category includes several federal and state highways that pass south of the Project Area, private rural roads and ranch roads that occur in the vicinity of the Project Area, and a railroad that passes within 1 mile of the southern Project boundary (Figures 1 and 3). Of note, since the Project became operational, oil and gas development has occurred within and near the Project area.

The ranching community of Parkerton is located approximately 1 mile south of the Project, just south of the North Platte River, and the town of Glenrock is located approximately 3 miles southeast of the Project (Figure 1). The North Platte River passes within 1 mile of the southern Project boundary; however, the river is approximately eight miles from the closest wind turbine. The North Platte River runs through mostly private lands, however some tracts of federal and state landholdings exist that allow for recreational use of the river.

2.4 Project Operations and Repowering

Currently, CHW is made of 66 turbines as described in Section 2.2. DER is considering the repowering of the CHW Project. Repowering would consist of replacing some of the wind turbine components to increase the efficiency and possible generation output of the Project. The turbine foundations, towers, and nacelle would likely remain the same as the existing turbines, but the blades and some equipment within the nacelle (i.e. generator and gear box) would likely be changed out. If the site is repowered, it is expected that the repowering would be completed no later than December 31, 2024. The baseline case presented in this ECP is for the site to continue to operate with the existing turbines, except for Turbine 23 which will be replaced as noted above. If a decision is made to repower the entire CHW Project, CHW will notify USFWS in writing. Following this notification, USFWS and CHW will discuss and determine what, if any specific changes to this ECP are warranted and determine if amendments to the EITP, assuming one is issued, are needed.

3.0 SITE-SPECIFIC SURVEYS AND ASSESSMENT (ECPG STAGE 2)

The Project was sited, developed, constructed, and achieved commercial operation status at approximately the same time frame as issuance of the 2009 Eagle Permit Rule and prior to the release of the WEGs (USFWS 2012) and the draft and final ECPG (USFWS 2011, 2013). Thus, this ECP focuses primarily on the operational phase of the Project and risk to eagles and does not provide a detailed review and analysis of landscape-scale assessments and siting decisions. However, some site-specific surveys and assessments specific to eagles were conducted. These were consistent with common/typical industry practices at the time and some align with ECPG Stage 2 recommendations. These are presented in the remainder of this section.

3.1 Eagle Use

The Project was developed prior to the development of the ECPG and the WEGs, however eagle use was documented at the Project through multiple surveys, and objectives varied by survey type, as described below. Surveys were conducted during different, and sometimes overlapping, phases of Project development, construction, and operation. General avian point-count and specific golden eagle observation surveys were conducted both prior to and during construction (Sections 3.1.1 and 3.1.2), and information from these surveys was augmented with data from eagle observations that were conducted after the Project began commercial operations (Section 3.1.3). Methods and results from all surveys relevant to eagle use are presented chronologically in the sections below and summarized in Table 2 at the end of Section 3.1.4.3. Other anecdotal or general use information relevant to the assessment of potential Project impacts on eagles is summarized in Section 3.1.4.

3.1.1 Avian Point-Count Surveys 2008 – 2009

Avian point-count surveys were conducted from September 9, 2008, through May 27, 2009. The principal objective of these avian point-count surveys was to estimate the relative abundance and the use of the Project Area by all birds, with a focus on raptors. The information that follows summarizes the methods and results of these surveys as they relate to eagle use and as described in Taylor et al. (2010) (Appendix D).

Avian point-count surveys were conducted approximately every 2 weeks in fall (defined as September 1 – December 14), weekly to bi-weekly (i.e., every 2 weeks) during winter (defined as December 15 – March 15), and weekly during spring (defined as March 16 – May 31; Table 2; Figure 4). Individual avian point-count surveys were 20 minutes in duration and each survey plot was an 800-meter-radius circle centered on each of the survey point locations (Figure 4). Points were established to achieve spatial coverage of the area within the Project boundary where turbines were planned and to sample representative habitats and topography. Twelve

point-count locations were selected in fall 2008. During winter 2008/2009, one of the original twelve survey points was removed from surveys to help reduce spatial overlap among survey plots, and an additional seven points were added to increase the spatial coverage of the Project Area. As a result, a total of 18 points were surveyed beginning in winter 2008/2009 (Figure 4). Construction began on February 9, 2009; therefore, the surveys conducted during fall and more than half of the winter season surveys occurred pre-construction. Surveys conducted after February 9, 2009, occurred during construction.

All birds detected during avian point-count surveys were recorded. Data collected included species, number of individuals, sex and age class (when possible), behavior, flight height above ground, and distance from the observer. Locations of raptors seen during avian point-count surveys were recorded on field maps by observation number. Flight paths and locations of perched eagles were digitized using a Geographic Information System (GIS). Because these surveys were conducted prior to the ECPG recommending the collection of minutes of eagle flight, the minutes of eagle flight observed during the surveys were not recorded.

During the 409 20-minute surveys conducted between 2008 and 2009, there were 183 observations of golden eagles and no observations of bald eagles (Table 2). There were an additional five eagle observations that could not be assigned to species (Table 2).

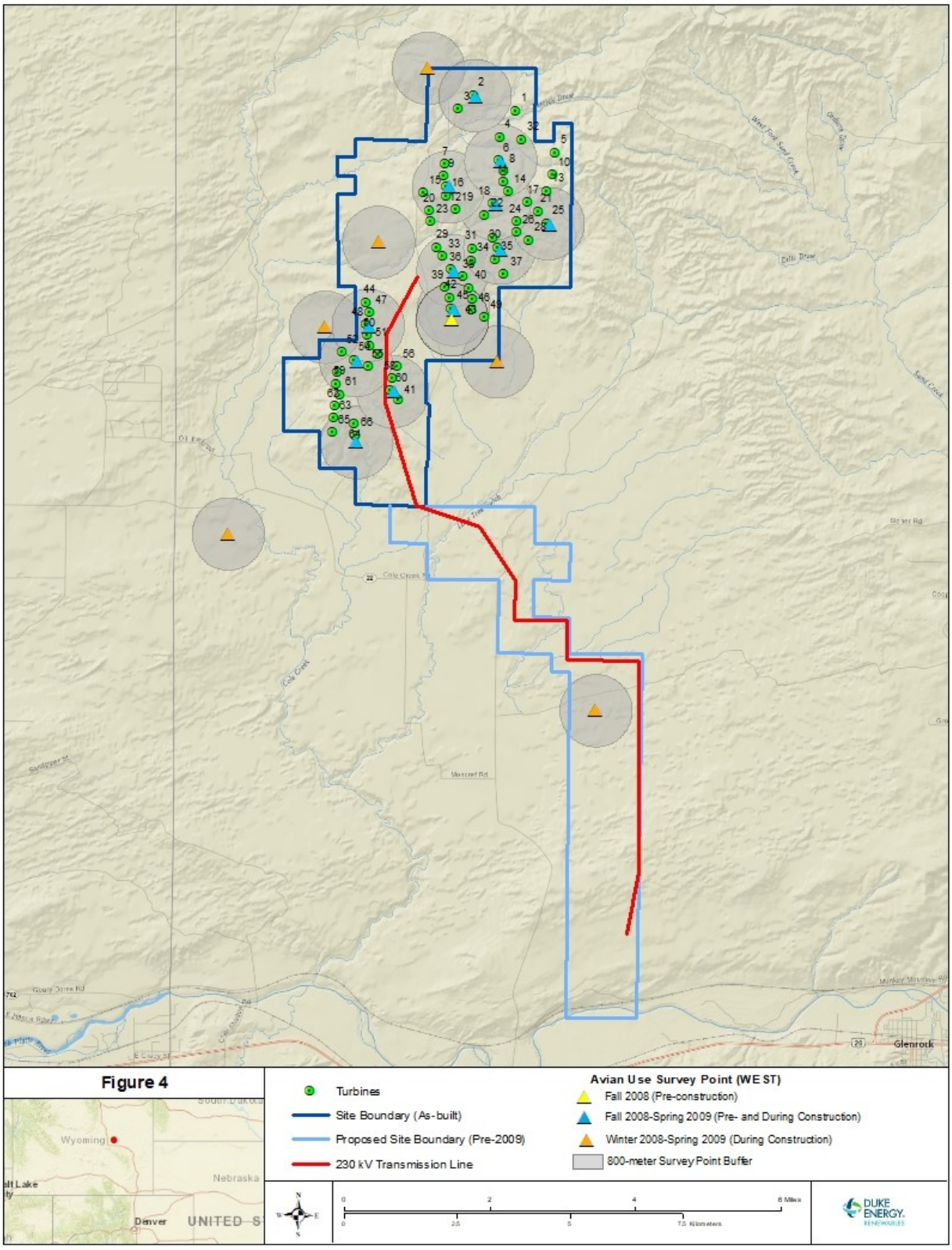

Figure 4: Avian Use Survey Locations from 2008-2009 at Campbell Hill Wind Project

3.1.2 Golden Eagle Observation Surveys 2008 – 2009

Golden eagle observation surveys were conducted prior to and during construction. The objective of the golden eagle observation surveys was to understand the general spatial extent and use by eagles of the area surrounding a known golden eagle nest detected in 2008 (Nest 35; Section 3.2). Additionally, because the observation surveys continued once construction had begun, they also served to document any evidence of disturbance. The information that follows summarizes the methods and results of these observation surveys as described in Taylor et al. (2010) (Appendix D). Two-hour observations were conducted from December 18, 2008, through May 27, 2009 approximately weekly to bi-weekly during winter and weekly during spring (Table 2). Observation surveys conducted prior to February 9, 2009, occurred prior to construction, whereas observation surveys conducted on or after that date occurred during construction. Observation surveys were conducted from four vantage points that allowed maximum visibility of the nest and the surrounding property to the north and south (Figure 5). The spatial extent of the observation survey plot was determined solely by the viewshed, which varied throughout the observation survey period based on vegetation and weather conditions. Flight paths and perch locations recorded on topographic maps in the field were later digitized using GIS and incorporated into a spatial analysis of use. Because these observation surveys were conducted prior to the ECPG recommending the collection of minutes of eagle flight, the minutes of eagle flight were not recorded. A total of 18 2-hour observations were conducted from December 18, 2008, through May 27, 2009. Use was analyzed spatially instead of through tabulations of individual eagle detections; the results of the analysis indicated that the area around Nest 35 was regularly used by golden eagles during the observation period (Table 2; Section 5.2).

3.1.3 Golden Eagle Observation Surveys 2010 – 2013

Golden eagle observation surveys were conducted during the first three calendar years of Project operation. The objective of these post-construction golden eagle observation surveys was to understand the spatial extent and use by golden eagles of the area surrounding occupied golden eagle nest locations in the vicinity of the Project, as well as golden eagle use of the areas near Project turbines, to inform avoidance strategies to prevent eagle fatalities. The information that follows summarizes the methods and results of these observation surveys as described in Taylor et al. (2011, 2012, 2013) (Appendices E, F, G). Two-hour observation surveys were conducted approximately weekly during spring (defined as March 16 – May 15) and fall (defined as August 1 – October 31) and monthly during summer (defined as May 16 – July 31) and winter (defined as November 1 – March 15; Table 2). Observation surveys were conducted from two to five vantage points that allowed maximum visibility of golden eagle nests that were occupied during the monitoring year and the surrounding property to the north and south (Table 2; Figure 5). The spatial extent of the survey plot was determined solely by the viewshed, which varied throughout the observation survey period based on vegetation and weather conditions. In 2013, the observation survey length was reduced to 1-hour periods during some

observation surveys. Data collection protocols were similar to pre-construction surveys. Flight paths and locations of perched eagles were recorded on topographic maps in the field. Later, these data were digitized using GIS and incorporated into a spatial analysis of use. Because these observation surveys were conducted prior to the ECPG recommending the collection of minutes of eagle flight, the minutes of eagle flight were not recorded. During the 73, 2-hour observation surveys and 112, 1-hour observation surveys conducted between 2010 and 2013, there were 83 detections of golden eagles, one detection of bald eagle, and eight detections of unidentified eagle species (Table 2).

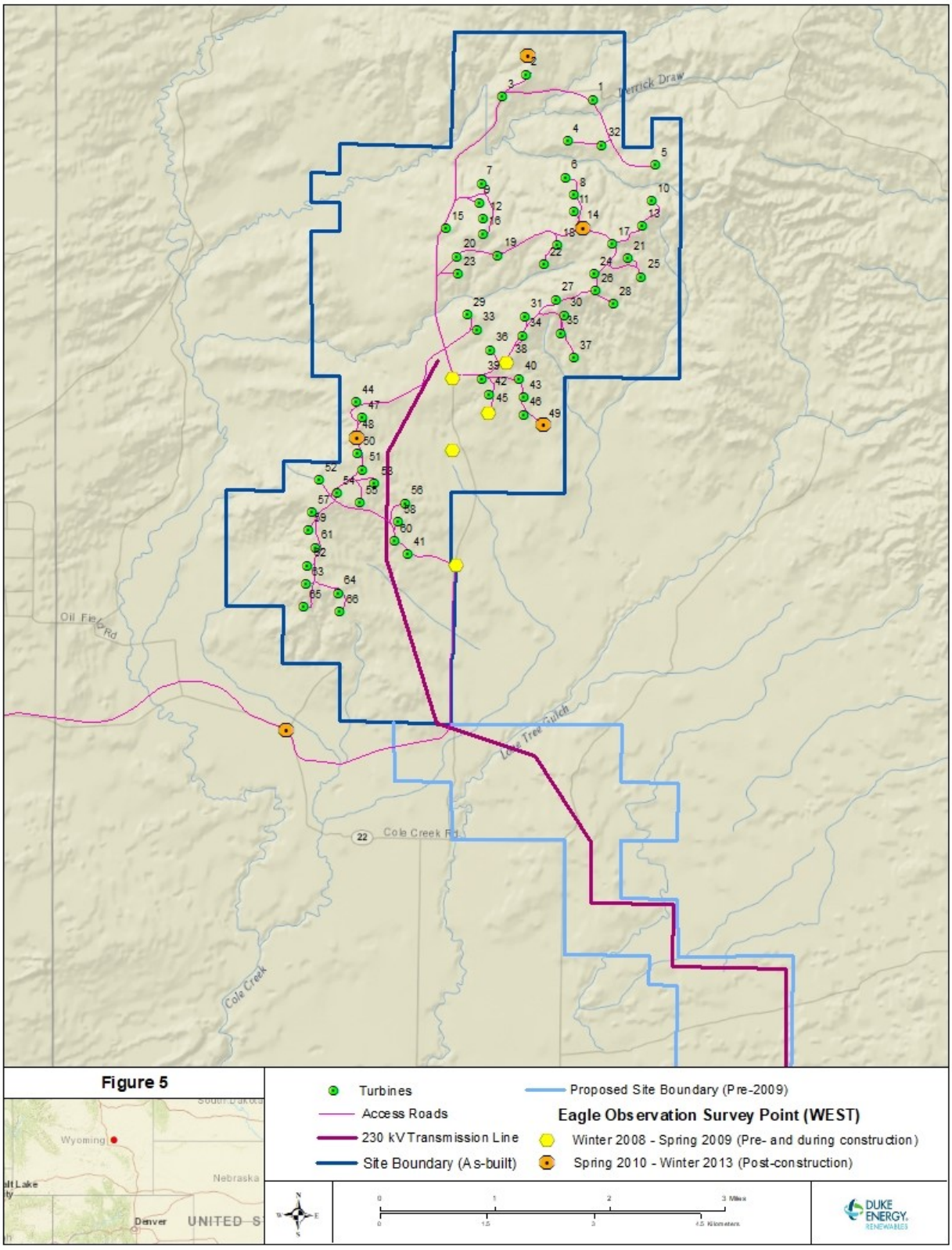

Figure 5: Golden Eagle Observation Points 2008-2013

3.1.4 Other Information on Eagle Use

This section summarizes the available information relevant to the presence and use by eagles of roost sites, foraging areas, migration corridors, and wintering areas.

3.1.4.1 Roosts

In June 2009, CHW requested data from the USFWS Wyoming Field Office and the Bureau of Land Management Casper Field Office on historical bald and golden eagle communal winter roosts and used these data to preliminarily evaluate the Project for the presence of winter eagle roosts. The data received from the agencies later that month indicated that the nearest roost is the Boxelder Bald Eagle Roost located 11.3 miles southeast of the Project. Subsequent site assessments and wildlife surveys found no indication of bald eagle communal roosts in the vicinity of the Project. The Project's environmental siting and fatal flaw report (E&E 2008) noted that the lack of trees on the property greatly reduces the potential for roosting on site by bald and golden eagles. Golden eagles typically do not form communal roosts like bald eagles, but are known to roost communally in unique circumstances such as extremely cold weather and abundant prey (Kochert et al. 2002).

3.1.4.2 Foraging Areas

Observational studies of golden eagle use performed at the Project from 2008–2013 indicated that the entire Project Area is used for foraging by golden eagles and that golden eagle use was not concentrated in any particular area or prey resource. This pattern may occur because there are several types of golden eagle prey that have been recorded within the Project (Section 3.3; Figure 6). However, inferences from these studies relative to foraging areas are limited because nesting areas and turbine locations were the target of the studies.

3.1.4.3 Migration Corridors and Wintering Areas

There is no information available that indicates the presence of migration corridors or wintering concentrations of bald or golden eagles within the Project. The nearest known migratory concentration of raptors to the Project is along Commissary Ridge, an approximately north-south ridge in western Wyoming approximately 250 miles southwest of the Project (Goodrich and Smith 2008).

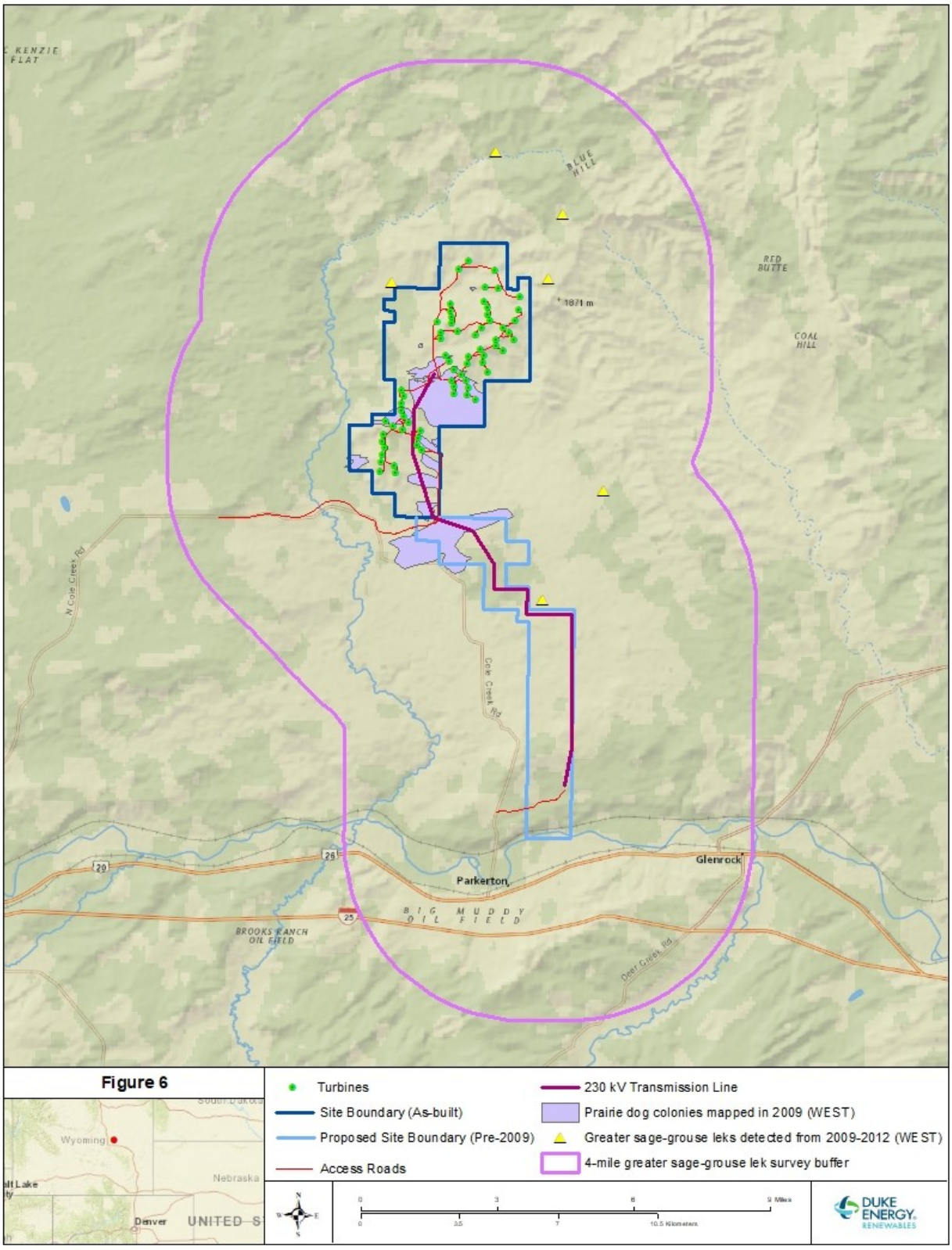

Figure 6: Golden Eagle Prey Resources Mapped from 2009 - 2012

Table 2. Avian Use Studies Conducted and Eagles Observed at the Project from September 2008 – February 2013

Timing [1]	Dates Conducted [2, 3]	No. of Survey Points	Count Duration	Survey Frequency	Total No. of Surveys	Size of Survey Point	No. of Golden Eagle Detections (Mean Detections per Hour)	No. of Bald Eagle Detections (Mean Detections per Hour)	Reference
Pre-construction and during construction	September 9, 2008 – May 27, 2009	12 in fall, 18 in winter and spring	20 min	Weekly in spring, every two weeks in fall, every one to two weeks in winter[2]	409	800-meter	183 [4] (1.34)	0 [4] (0)	Taylor et al. 2008a (Appendix B), Taylor et al. 2010 (Appendix D)
Pre-construction and during construction	December 18, 2008 – May 27, 2009	4	2 hours	Weekly in spring, every one to two weeks in winter[2]	18	Viewshed	Not reported, spatial analysis only	Not reported, spatial analysis only	Taylor et al. 2010 (Appendix D)
Post-construction	April 10, 2010 – January 5, 2011	2	2 hours	Weekly in spring and fall, monthly in summer and winter[3]	19	Viewshed	7 (0.18)	0 (0)	Taylor et al. 2011 (Appendix E)
Post-construction	April 6, 2011 – May 12, 2011	2	2 hours	Weekly[3]	11	Viewshed	18 [5] (0.19)	0 [5] (0)	Taylor et al. 2012 (Appendix F)
Post-construction	July 14, 2011 – January 12, 2012	2	2 hours	Weekly in fall, monthly in summer and winter[3]	35	Viewshed			
Post-construction	February 20, 2012 – April 12, 2012	2	2 hours	Weekly in spring, monthly in winter[3]	8	Viewshed	58 [6] (0.45)	1 [6] (0.01)	Taylor et al. 2013 (Appendix G)
Post-construction	April 18, 2012 – February 15, 2013	5	1 hour	Weekly in spring and fall, monthly in summer and winter[3]	112	Viewshed			

1. Project construction began February 9, 2009.
2. Pre-construction and during construction seasons defined as follows: Spring = March 16 – May 31, Summer = June 1 – August 31, Fall = September 1 – December 14, Winter = December 15 – March 15.
3. Post-construction seasons defined as follows: Spring = March 16 – May 15; Summer = May 16 – July 31, Fall = August 1 – October 31, Winter = November 1 – March 15.
4. An additional five unidentified eagles were observed during this period.
5. An additional seven unidentified eagles were observed during this period.
6. An additional unidentified eagle was observed during this period.

3.2 Eagle Nests

Bald and golden eagle nests were identified and monitored during and after Project construction for potential impacts associated with Project construction and operations and to identify approaches to minimize those impacts. No pre-construction raptor nest surveys were conducted during the breeding season; however, a post-breeding season raptor nest survey was conducted in the year prior to Project construction to identify nests potentially at risk due to Project construction. Various aerial and ground-based eagle nest surveys were performed during construction and post construction from 2009 to 2013 and are described in Table 3 below. In summary, six golden eagle breeding territories with eight nests and one bald eagle nest/territory were identified and monitored during the 2009 to 2013 surveys, see Figure 7 below for the nest locations. Nest distances to the nearest turbine ranged from 0.3 miles to 10.7 miles. Nest success and productivity during the 2009 to 2013 surveys varied year to year and are presented in the above referenced reports and Table 4.

Post construction nest observations/surveys by DER biologists and CHW site staff at select nests also occurred from 2015-2020. A summary of nest success and productivity based on these observations is provided in Table 5. Since 2016, other anthropogenic activities, not related to wind energy, including oil and gas development, have occurred in proximity to known eagle nests.

Table 3. Raptor Nest Surveys Conducted at the Project from November 2008 – May 2013

Timing	Survey Method	Survey Dates[1]	Reference
Pre-construction	Ground-based nest surveys within approximately 1 mile of Project infrastructure. One aerial nest survey within approximately 1 mile of Project transmission line and proposed access road.	Ground: week of November 2, 2008 and on December 18, 2008 Aerial: November 2008	Taylor et al. 2008a (Appendix B), Taylor et al. 2008b (Appendix C)
During construction	Ground-based nest visits at known nests[2] within approximately 1 mile of proposed construction activities Two aerial raptor nest surveys within 2 miles of Project Area Ground-based follow-up visits to aerial surveys	Ground-based visits to known nests February – June 2009 [2]. Aerial surveys: April 22 – 23 and May 28 – 29, 2009 Ground-based follow-up visits, where access possible: June 19, 21, 22 and July 6 – 7, 2009	Taylor et al. 2010 (Appendix D)
Post-construction	Two aerial raptor nest surveys within 2 miles of Project Area Ground-based follow-up visits to aerial surveys	Aerial surveys: Late March and late April 2010 Ground-based follow-up visits, where possible: June	Taylor et al. 2011 (Appendix E)
Post-construction	Two aerial raptor nest surveys within 2 miles of Project Area Ground-based follow-up visits to aerial surveys	Aerial surveys: Late March and mid-May 2011 Ground-based follow-up visits, where possible: June and early July	Taylor et al. 2012 (Appendix F)
Post-construction	Two aerial raptor nest surveys within 2 miles of Project Area Ground-based follow-up visits to aerial surveys	Aerial surveys: April 6 and April 30, 2012 Ground-based follow-up visits, where possible: June and early July	Taylor et al. 2013 (Appendix G)
Post-construction	Two aerial raptor nest surveys within 2 miles of Project Area Ground-based follow-up visits to aerial surveys	Aerial surveys: March 28 and May 8, 2013 Ground-based follow-up visits, where possible: early July	WEST 2014 (Appendix H)

1. The precision of the dates that surveys were conducted varied by survey type and source report. The values presented here reflect those in the source reports.
2. Limited to nest sites identified in Mitigation and Monitoring Plan (Taylor et al. 2008b).

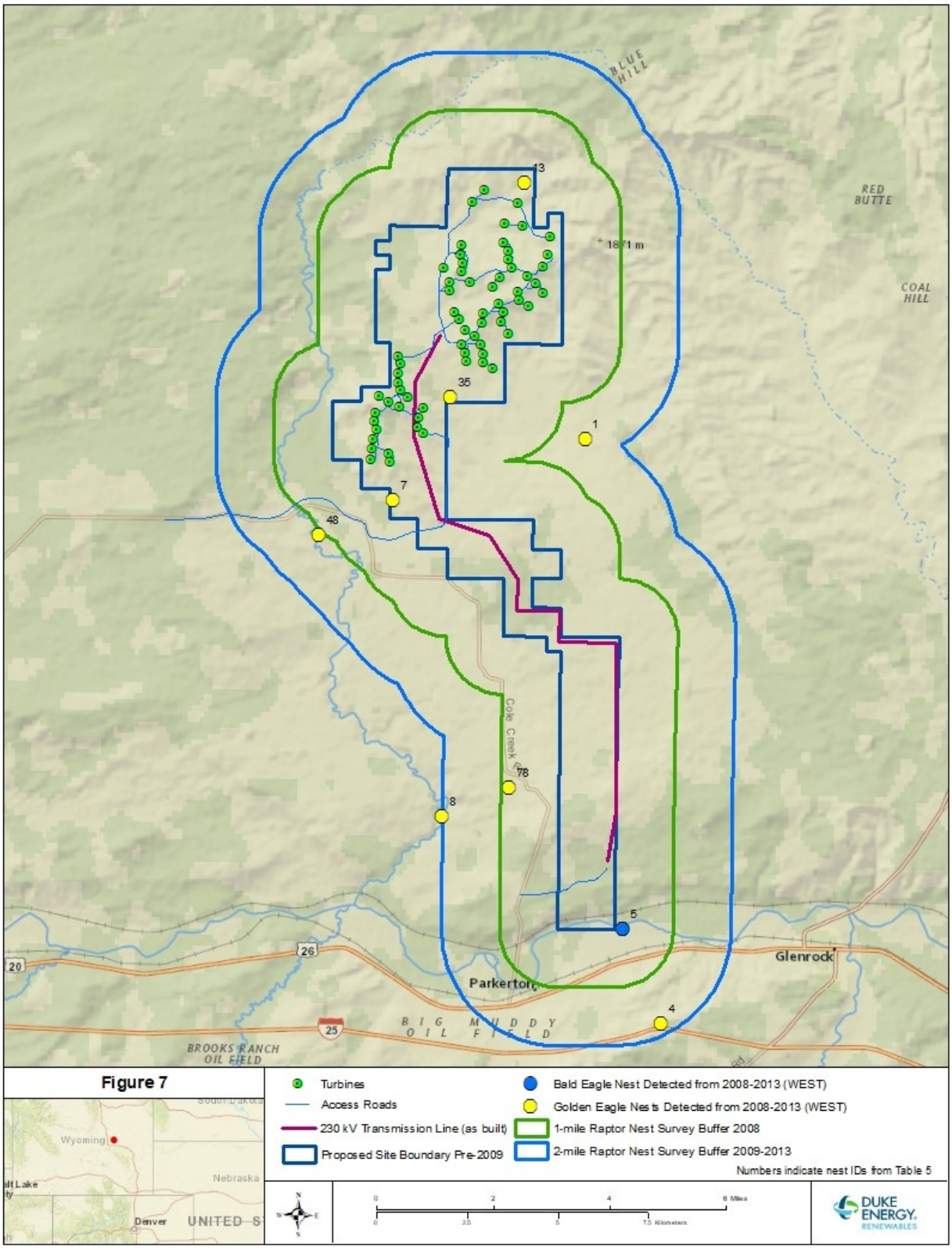

Figure 7: Bald and Golden Eagle Nests Detected from 2008-2013

Table 4: Eagle Nest Success and Productivity Based on Raptor Nest Surveys Conducted at the Project from 2009 - 2013

Nest ID		Species	Results by Survey Year[1,2,3]												
			2009	2010			2011			2012			2013		
			Productivity Survey	Productivity Survey	Nest Success	Productivity	Productivity Survey	Nest Success	Productivity	Productivity Survey	Nest Success	Productivity	Productivity Survey	Nest Success	Productivity
Lone Tree Gulch	1	Golden eagle	No, nest unoccupied	No, nest unoccupied	Nest unoccupied	–	No, nest unoccupied	Nest unoccupied	–	No, no ground access	UND	UND	Yes	Successful	1
West Glenrock	4	Golden eagle	No, nest unoccupied	No, nest unoccupied	Nest unoccupied	–	No, no ground access	UND (chicks observed[4])	UND	No, no ground access	UND	UND	No, no ground access	UND (1–2 chicks observed[4])	UND
North Platte River	5	Bald eagle	No, nest unoccupied	No, no ground access	UND (chicks observed[4])	UND	No, no ground access	UND (chicks observed[4])	UND	No, no ground access	UND (2–3 chicks observed[4])	UND	No, no ground access	UND (2 chicks observed[4])	UND
North Cole Creek	7	Golden eagle	No, nest unoccupied	No, nest unoccupied	Nest unoccupied	–	No, nest unoccupied	Nest unoccupied	–	No, nest unoccupied	Nest unoccupied	–	Yes	Failed (1 egg observed[4])	0
	48		No, nest unoccupied	No, nest unoccupied	Nest unoccupied	–	Yes	Failed (1 dead egg[4])	0	Yes	Successful	1	No, no breeding attempt	No breeding attempt	–
South Cole Creek	8	Golden eagle	No, nest unoccupied	No, nest unoccupied	Nest unoccupied	–	No, nest unoccupied	Nest unoccupied	–	No, nest unoccupied	Nest unoccupied	–	No, no ground access	UND	UND
	78		No, nest not detected	No, nest unoccupied	Nest unoccupied	–	No, no ground access	UND (chicks observed[4])	UND	No, no ground access	UND	UND	No, nest unoccupied	Nest unoccupied	–
Derrick Draw	13	Golden eagle	No, nest unoccupied	Yes	Successful	1	Yes	Failed (1 dead egg[4])	0	Yes	Successful	1	No, no breeding attempt	No breeding attempt	–
Valentine Draw	35	Golden eagle	No, nest unoccupied	No, nest gone[5]	Nest gone[5]	–	No, nest gone[5]	Nest gone[5]	–	No, nest gone[5]	Nest gone[5]	–	No, nest gone[5]	Nest gone[5]	–

1. **Productivity Survey:** Productivity surveys were conducted only at those nests that were occupied and had a breeding attempt, and for which ground access permission was obtained.
2. **Nest Success:** Successful = fledged at least one young, Failed = fledged no young, Nest unoccupied = no breeding attempt therefore no further monitoring for nest success or productivity; Nest not detected = nest unknown at time of survey and therefore not surveyed for nest success or productivity; UND (Undetermined) = nest success and productivity surveys not performed; therefore, unable to determine nest success; No breeding attempt = eagles did not lay eggs.
3. **Productivity**: "–" = nest was unoccupied or gone and production of young not possible; Undetermined = nest success and productivity surveys not performed; therefore, unable to determine productivity.
4. Comments from aerial raptor nest surveys performed in 2009–2013.
5. Nest structure fell out of tree prior to the 2010 breeding season, nest location not monitored after 2013

Table 5: Eagle Nest Success and Productivity Based Nest Observations Conducted at the Project from 2015-2020

Nest ID		Species	Results by Year											
			2015		2016		2017		2018		2019		2020	
			Productivity Observations/Survey	Nest Success	Productivity Observations/Survey	Nest Success	Productivity Observations/Survey	Nest Success	Productivity Observations/Survey	Nest Success	Productivity Observations/Survey	Nest Success	Productivity Observations/Survey	Nest Success
Lone Tree Gulch	1	Golden eagle	Occupied	Unknown	Occupied	Failed	Unoccupied, No eagle activity	-	No[1]	-	No[1]	-	No[1]	-
North Cole Creek	7	Golden eagle	Occupied	Successful, 1 eaglet confirmed	Occupied	Successful, 2 fledglings	Occupied	UND, chicks not confirmed	Occupied	UND, Presumed Failed	No signs of eagle activity	-	No activity observed	-
	48		Occupied	Successful, 1 eaglet confirmed	Occupied	Successful, 2 fledglings	Occupied	Successful, 1 chick	Occupied	UND, Presumed Failed	No signs of eagle activity	-	Yes, nest occupied	Successful, 1 fledgling
Derrick Draw	North[2]	Golden eagle	Occupied	Failed nesting attempt	Unoccupied, nest falling apart	-	Unoccupied, No eagle activity	-	Unoccupied, no signs of nest activity	-	No signs of eagle activity	-	No activity observed	-
	South (13)	Golden eagle	Unoccupied	-	Unoccupied, No eagle activity	-	Occupied	Successful, 1 chick observed	Unoccupied, no signs of nest activity	-	Yes, Occupied, 1 egg in nest	Failed, due to mud washing from above into nest	No activity observed	-

1. Lone Tree Gulch not monitored in 2018 or beyond due to nest's distance from Project site, lack of permission to access the nest, and increased oil and gas activity in the area.
2. North nest found in 2015 by DER and was not given a Nest ID number.

3.3 Eagle Prey Base Assessment

Golden eagle prey resources include prairie dogs, upland bird species, young individuals of big game species, livestock, carrion, and lagomorphs (Kochert et al. 2002), all of which have been recorded within the Project Area (Figure 6). Although a prey base assessment was not performed at the Project, a summary of other survey efforts as well as incidental observations that provide information on these potential prey resources at the Project are provided below.

Detailed, ground-truthed landcover mapping was conducted in 2009 to provide information about where sensitive species and vegetative communities may occur within the Project. Limited mapping occurred in areas outside the Project Area due to access limitations. This effort included identifying prairie dog towns that could be directly impacted by development of the Project. Prairie dog burrows that were detected by observers were delineated in the field on printouts of aerial photographs. A total of ten black-tailed prairie dog towns were mapped within the Project Area and vicinity in 2009 (Figure 6). Four prairie dog towns totaling 2,326 acres were determined to be active towns, and six prairie dog towns totaling 331 acres were determined to be inactive towns in 2009 (Taylor et al. 2010; Appendix D).

Greater sage-grouse (*Centrocercus urophasianus*) lek surveys were conducted in spring from 2009 to 2012 within a 4-mile buffer of the Project Area (Figure 6). The survey methods followed protocols established by the Wyoming Game and Fish Department (WGFD), and locations of known leks were provided by WGFD. In each survey year, between four and six leks were confirmed active within the 4-mile survey buffer; however, none of these leks occurred within the Project Area (Figure 6). The status of individual leks detected in a given year can be found in the source reports (Taylor et al. 2008a, 2010, 2011, 2012, 2013; Appendices B, D, E, F, G).

Incidental observations were recorded during wildlife studies conducted prior to, during, and after construction of the Project. Potential prey species observed included greater sage-grouse, wild turkey (*Meleagris gallopavo*), pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), badger (*Taxidea taxus*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), swift fox (*Vulpes velox*), black-tailed prairie dog (*Cynomys ludovicianus*), and domestic sheep.

Big game hunting of pronghorn and deer occurs on private lands within or near the Project Area. Animals shot and not retrieved as well as offal (gut piles) could be exploited by eagles as a food source. No data are available on the rates of occurrence of these food sources. However, CHW works with the local landowners and has a carcass-removal program to minimize the occurrence of such food sources in the Project Area (Section 6.2.2.1).

Lagomorphs such as white-tailed jackrabbits (*Lepus townsendii*) and eastern cottontails (*Sylvilagus floridanus*) are common in the Project vicinity, but a detailed prey assessment has not been conducted for either species. An assessment of whether manmade structures at the Project

provide habitat for lagomorphs and fossorial mammals (e.g., prairie dogs) was completed in 2014 (DER 2014). No evidence of lagomorph or fossorial mammal use of manmade structures was found during the habitat surveys at the Project, and CHW concluded that the manmade structures at the Project did not serve as habitat features for these species at the time of the survey.

Bald eagles use some of the same prey resources as golden eagles; however, fish generally make up a larger majority of their diet (Buehler 2000). Fish-bearing water bodies are limited within the Project Area with the nearest such waterbody approximately 9 miles from the nearest turbine, suggesting that this source of prey is limited near the Project. Eagle Fatalities and Fatality Monitoring

3.4 Eagle Fatalities and Fatality Monitoring

Fatality monitoring at the Project has been conducted under a variety of protocols since the initiation of commercial operations in December 2009. Three years of fatality monitoring studies were conducted at the Project following construction from February 2010 to February 2013 (Section 3.4.1). A Wildlife Incident Monitoring and Reporting System (WIMRS) was instituted by CHW in February 2013 and will continue for the life of the Project (Section 3.4.2). An enhanced version of the WIMRS protocol was implemented in draft form following the Plea Agreement (Section 3.4.3), until a USFWS-approved monitoring plan using a third party was implemented in 2014 (Section 3.4.4). The sections below summarize chronologically the methods and results from monitoring efforts for each of the protocols. Section 3.4.5 provides a summary of detected golden eagle fatalities at the Project from the time of Project construction through December 31, 2020 (Section 3.4.5). Eagle fatalities detected during searches as well as those detected incidentally are described. Because incidental detections of fatalities may occur under a number of scenarios (i.e., during a scheduled search but outside of the delineated search plot, in a search plot but outside of a scheduled search, or outside of both scheduled search period and search plot) and this level of detail is not typically recorded, incidental detections are not broken down further.

3.4.1 Post-construction Fatality Monitoring Studies (2010 – 2013)

Standardized fatality monitoring was conducted for the first 3 years after the Project became operational from February 2010 through February 2013 (Table 7; Taylor et al. 2011, 2012, 2013; Appendices E, F, G). The primary objective of the fatality monitoring studies was to estimate the annual number of bird and bat fatalities attributable to collisions with Project facilities. The study protocol was the same for all 3 years. Square search plots of 160 meters on each side were established at 22 turbines and were centered on the turbine. Standardized carcass searches were generally conducted weekly during the spring (March 16–May 31) and fall (August 1–October 31), and monthly during the summer (June 1–July 31) and winter (November 1–March 15) at each of the search plots (Table 7).

Turbines were selected for sampling using a systematic design with a random start. In addition, the two met towers were systematically searched for bird and bat carcasses; met tower search plots were 120 meters on each side and centered on the tower. The same turbines and met towers were searched during all 3 study years; however, the removal of met towers in June 2012, annual study start and stop dates, seasonal cut-off dates, and weather conditions resulted in inter-annual variations in the number of fatality searches conducted (Table 7). Searchers systematically walked transects spaced approximately 6 to 8 meters apart to allow 100 percent coverage of each search plot. For each carcass detected, the species, date and time collected, location, carcass condition, and cause of death (if apparent) were recorded. Photographs were taken of carcasses as found in the field. Fatalities found outside of search plots, or observed within search areas but outside of a formal search, were coded as incidental discoveries and documented in the same manner. Fatalities found by facilities operation and maintenance personnel were similarly documented.

Searcher-efficiency and carcass-persistence trials were conducted to determine the probability of a searcher detecting a carcass and to estimate the average length of time carcasses remain in the search area. Trials were performed to estimate bias due to searcher efficiency and carcass persistence for small birds, bats, and large birds. However, large birds were removed from bias trials on March 14, 2011, due to concerns over increased carrion availability within the Project and the potential for increased scavenging by eagles and other raptors (Taylor et al. 2012; Appendix F). Overall searcher efficiency for 2010–2011 year of study was 68.0 percent for large birds (range: 33.3 – 100; Table 7). Fifty-five percent of large bird carcasses remained after day 10 and 50 percent of large bird carcasses remained after day 30 of carcass-persistence trials (Table 7).

No golden eagles were detected from 2010–2013 during scheduled searches of search plots at the Project (Table 7). As a result, a fatality rate was not calculated for golden eagles at the Project. A total of three golden eagle fatalities were detected incidentally over the same period at turbines that were not among the sample being searched (Table 7; Figure 8).

Table 6: Post-construction Eagle Fatalities During Fatality Monitoring at the Project from 2010 – 2013

Study Year	Date Range	Search Frequency	No. Fatality Surveys[1]	Percent Turbines Surveyed	No. Eagle Fatalities		Searcher Efficiency Large Bird[2]	Mean Carcass Removal for Large Bird[2]	References
					Detected During Scheduled Searches of Search Plots	Detected Incidentally			
2010–2011	February 23, 2010 – January 20, 2011	Weekly in spring and fall, monthly in summer and winter	713	33 (n=22)	0 golden eagle 0 bald eagle	1 golden eagle 0 bald eagle	68 percent (range: 33 – 100 percent)	55 percent remaining to day 10 50 percent remaining to day 30	Taylor et al. 2011 Appendix E
2011–2012	February 17, 2011 – January 12, 2012	Weekly in spring and fall, monthly in summer and winter	571	33 (n=22)	0 golden eagle 0 bald eagle	1 golden eagle 0 bald eagle	Not performed	Not performed	Taylor et al. 2012 Appendix F
2012–2013	February 20, 2012 – February 15, 2013	Weekly in spring and fall, monthly in summer and winter	623	33 (n=22)	0 golden eagle 0 bald eagle	1 golden eagle 0 bald eagle	Not performed	Not performed	Taylor et al. 2013 Appendix G

1. Includes searches at met towers. The removal of met towers in June 2012, annual study start/stop dates, seasonal cut-off dates, and weather conditions resulted in inter-annual variations in the number of fatality searches conducted.
2. In order to reduce attracting eagles and other scavengers, large birds were removed from bias trials on March 14, 2011.

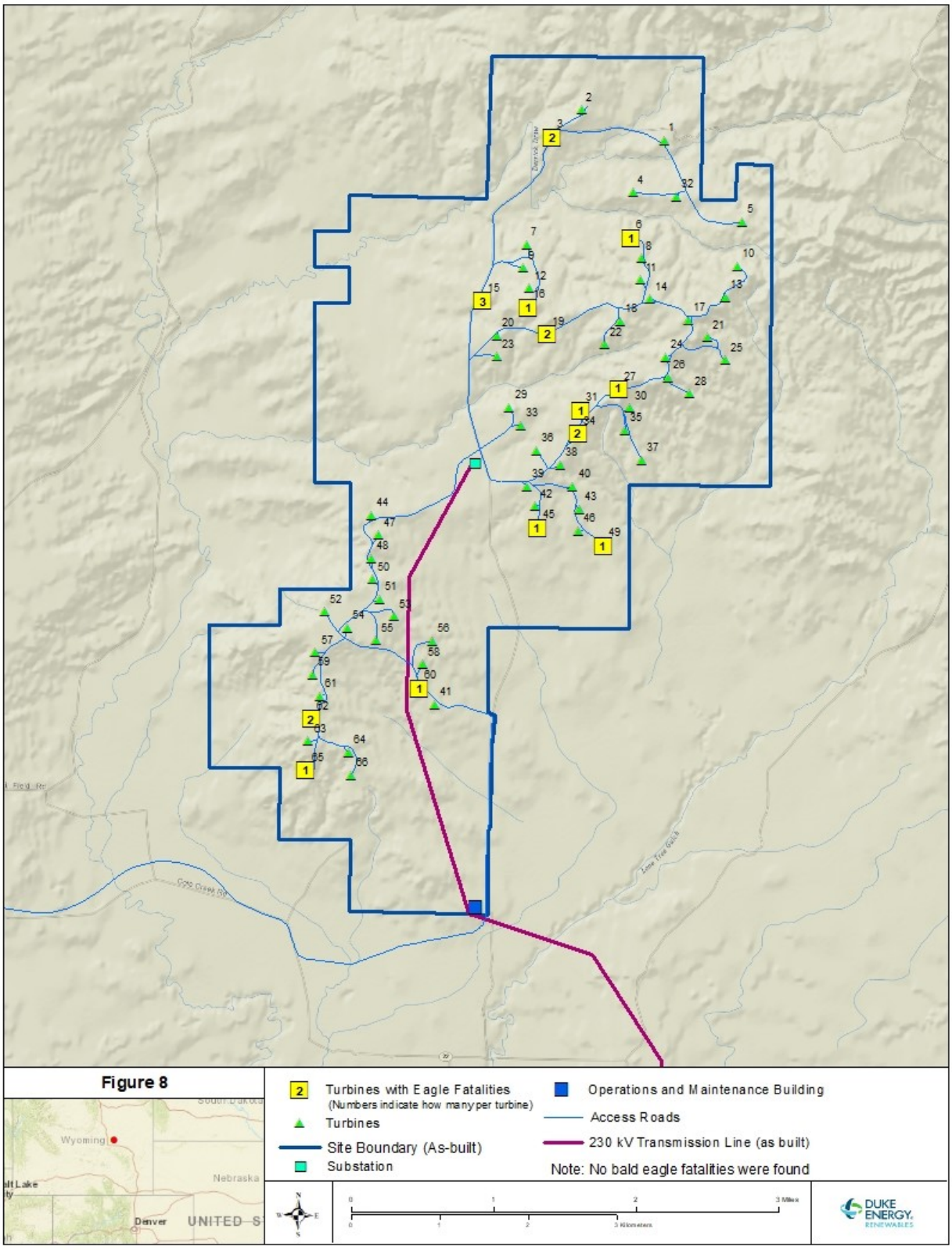

Figure 8: Golden Eagle Fatalities Detected during Searches and Incidentally from 2010-2020

3.4.2 Wildlife Incident Monitoring and Reporting System (2013 – Present)

Beginning in March 2013 after the standardized fatality monitoring had concluded, CHW instituted the WIMRS with the objective of complying with state and federal wildlife laws and helping ensure that impacts on all wildlife resources are identified, documented, managed, and reduced. The WIMRS updated the previous Duke Energy Generation Services avian and bat reporting system. The WIMRS is detailed in DER (2012) and will continue to be implemented for the life of the Project. In summary, monitoring and reporting under the WIMRS is performed by CHW staff and includes: wildlife incidentally observed during work within the Project Area; monthly searches for dead or injured wildlife at the turbine pad, transformer, and along access roads as part of routine turbine maintenance visits; and Environmental Services inspections and audits as needed.

3.4.3 Enhanced Fatality Monitoring and Reporting System (2014)

In addition to the WIMRS, CHW implemented an enhanced eagle fatality monitoring and reporting system after the finalization of the Plea Agreement. The enhanced monitoring and reporting system was initiated on February 17, 2014 and operated for approximately five months. The objectives of the enhanced fatality monitoring effort were to: (1) quantify all eagle fatalities/injuries at the Project to ensure appropriate interim compensatory mitigation; (2) help inform eagle take predictions under Stage 3 of ECP development; (3) inform the development of the monitoring plan of the ECP; and (4) help demonstrate the efficacy of Advanced Conservation Practices (referred to hereafter as Eagle Conservation Measures) and adaptive management implemented at the Project (See Section 6.2.2).

In summary, the enhanced fatality monitoring effort included:

- Surveys of all wind turbines at the Project;
- Search frequency of 28 days;
- Search plot size of 160 meters x 160 meters centered on the turbine tower;
- Reporting requirements.

Although formal reports were not prepared to summarize details on the level of effort and results of bias-correction trials under this protocol, no eagle fatalities were found at the Project during the time period when this protocol was being used (Table 8). The enhanced monitoring and reporting system continued until it was replaced by a revised and USFWS-approved protocol (2014 Mortality Monitoring Plan), which was first implemented on August 11, 2014 (Section 3.4.4).

3.4.4 2014 Eagle Fatality Monitoring Plan (2014 – 2020)

The Eagle Fatality Monitoring Plan (EFMP) was developed by DER in coordination with USFWS, approved for implementation by USFWS, and initiated on August 11, 2014 (2014 EFMP; WEST 2020; Appendix I). The 2014 EFMP was developed based on DER's and USFWS's current understanding of the most effective way to achieve the plan objectives to: (1) find eagle and other large raptor fatalities attributable to collisions with Project facilities; (2) quantify the number of fatalities occurring at the Project; and (3) develop a better understanding of the risk of eagle fatality or injury at the Project. The 2014 EFMP protocol is currently being implemented at the Project.

The 2014 EFMP uses the methods described under the enhanced fatality monitoring and reporting system (Section 7) but specifies that bias-correction trials (both searcher efficiency and carcass persistence) would be conducted and it includes: the details on trial methods; the mapping and use of visibility classes; a description of analysis procedures; and potential adaptive management approaches to the protocol.

Fifteen golden eagle fatalities were found during the implementation of this protocol between August 11, 2014 and December 31, 2020 (Table 8). Of these 15 golden eagle fatalities, 7 (47%) were detected incidentally and 8 (53%) were detected during schedule searches.

3.4.5 Summary of Golden Eagle Fatalities from February 2010 – 2021

A total of 19 golden eagle fatalities have been detected as of December 31, 2021 at the Project (Table 8). No bald eagle fatalities or injuries have been detected during this same time period. Over half (58%) of golden eagle fatalities (11 of the 19) golden eagle were detected incidentally. No golden eagle fatalities were detected in 2013 or 2021.

Table 7: Summary of Detected Golden Eagle Fatalities from February 2010 - December 2021 at Campbell Hill Wind Project [1, 2]

Date Found	Search or Incidental[3]
9/15/2010	Incidental
3/10/2011	Incidental
5/31/2012	Incidental
7/9/2014	Incidental
3/5/2015	Incidental
3/26/2015	Incidental
5/20/2015	Incidental
9/6/2016	Search
5/4/2017	Incidental
1/29/2018	Search
2/13/2018	Incidental
5/30/2018	Search
9/24/2018	Incidental
11/9/2018	Search
11/8/2019	Search
11/19/2019	Search
3/30/2020	Search
5/15/2020	Search
5/28/2020	Incidental

1. No Bald Eagle Fatalities have occurred at the Project.
2. No Eagle Injuries have occurred at the Project.
3. Search = Eagle was found during scheduled eagle mortality search with search plots; Incidental -= Eagle was found outside of scheduled search or search plot.

4.0 AVOIDANCE AND MINIMIZATION OF RISKS IN PROJECT SITING (ECPG STAGE 4)

This section summarizes impact avoidance and minimization measures relevant to eagles that were incorporated by CHW into the siting of the Project. Further details of CHW's landscape-scale, site-specific, and micro-siting efforts, both related and unrelated to eagle conservation, are addressed in the Project's BBCS (DER 2020) as well as in the Industrial Siting Permit application (CH2MHill 2009). Although CHW's siting measures predated release of the ECPC and WEGs, the measures outlined below are generally consistent with several recommendations therein.

1. Sage-grouse: CHW coordinated with WGFD to develop and implement measures to avoid and minimize impacts to greater sage-grouse, a golden eagle prey species (Kochert et al. 2002). This included siting the Project outside of areas known to WGFD to be important to greater sage-grouse and locating all infrastructure outside of a minimum 0.25-mile no-surface-disturbance buffer from occupied greater sage-grouse leks (Figure 6). These measures reduced potential Project impacts to eagles by increasing the distance of the Project from greater sage-grouse leks and other areas of known importance to sage-grouse, which may potentially attract foraging bald and golden eagles.

2. Big Game: The Project was sited a minimum of 5 miles outside of big game crucial winter range; young big game animals and carrion of big game species provide a food resource for eagles (Buehler 2000, Kochert et al. 2002). This measure reduced potential Project impacts to eagles by increasing the distance of the Project from concentrations of big game, which may potentially attract foraging bald and golden eagles.

3. Eagle Nest Setbacks: The locations of several turbine arrays, individual turbines, and other infrastructure were adjusted as a result of micro-siting in an effort to ensure Project infrastructure was sited greater than 0.5 miles from known eagle nests that were occupied at the time of final turbine siting in 2009 (Figure 7). For example, the Project access road and transmission line were rerouted around golden eagle Nest 35. The micro-siting efforts were conducted continually throughout the late stages of development, and even into the early construction phase, as CHW obtained new information about eagle nests through field surveys and incidental observations. Maintaining a setback distance of 0.5 miles from known eagle nests minimized disturbance impacts to eagles from construction and was consistent with recommendations by WGFD (2009) and other written standards available at the time of construction (e.g., Call 1979, Craig 1995).

4. Turbine Layout: Turbines were not located on multiple sides of any golden eagle nest

known at that time, such that travel by the eagle would be "boxed-in" (Figure 7).

5. Electric Lines: The overhead transmission line was sited greater than 0.25 miles from all raptor nests identified during the pre-construction nest inventory and construction of the line followed general recommendations from APLIC to reduce the risk of avian collisions and electrocutions (APLIC 1994, 2006, 2012). Electric collector lines were buried. These measures minimized disturbance of known eagle nests and reduced the potential for collisions and electrocutions by eagles in the area and eagles using nests near the transmission corridor (Figure 7). In addition, on the transmission line, conical perch discouragers were affixed to the top of the transmission line poles to discourage use of these poles as perches by eagles.

5.0 PREDICTING EAGLE FATALITIES (ECPG STAGE 3)

This section discusses predicted eagle take due to collision with Project turbines and potential impacts associated with disturbance of eagles at important eagle-use areas. The analyses performed were conducted in the context of the conditions at the operational Project, which are described in detail in Section 3. Because the Project is operational, not all aspects of the ECPG are relevant, and only analyses applicable to operational projects have been included in this section.

5.1 Predicting Eagle Fatalities

Per direction from USFWS Region 6, CHW is not responsible for developing an eagle take estimate for the Project as part of the ECP. Instead, USFWS will complete the fatality prediction for the Project. CHW has provided USFWS with post-construction eagle mortality and project operations data for the Project. Using the data provided by CHW USFWS will generate a prediction of eagle take (bald eagle and golden eagle) for the Project using the USFWS Bayesian Collision Risk Model (CRM) and Evidence of Absence (EOA) tool. USFWS will conduct this analysis as part of the Environmental Assessment (EA) that is completed pursuant to the NEPA requirements related to the federal action for consideration of issuance of an EITP. Results of the USFWS analyses, including the eagle take estimates for bald and golden eagles, will be presented in the Draft Environmental Assessment to be prepared by USFWS as part of the USFWS process associated with consideration of whether to issue an EITP for the Project.

5.2 Disturbance Risk Assessment

For purposes of this ECP and the Project's application for an EITP, potential future disturbance is assessed relative to the current baseline condition of the fully operating Project. With respect to disturbance only, it is CHW's position that, unless there are significant changes in operations at the Project that are materially different from the baseline operational conditions at the time of potential EITP issuance, CHW does not expect there will be disturbance impacts attributable to Project operations. Because CHW does not anticipate any significant operational changes, there should be no material difference in Project operations during the EITP term that would result in a net increase in disturbance to nesting, roosting, or foraging eagles. CHW's analysis of disturbance risk going forward is summarized below. However, the Project may be repowered in the future. As stated in Section 2.4 above, if a decision to repower the project is made, CHW will consult the USFWS to determine if disturbance risk may occur during this repowering effort.

Based upon multiple years of occupancy, nest success, and productivity data collected during Project operations, through 2020 it appears that nests near the Project continued to be occupied by breeding golden eagles, some of which successfully produced young (Section 3.2). Therefore, future disturbance to nesting eagles as a result of CHW Project operations is considered unlikely. Similarly, the available data suggest that there are no bald or golden eagle communal roosts in the vicinity of the Project (Section 3.1.4.1); therefore, future disturbance of communally roosting eagles as a result of CHW Project operations is considered unlikely. Lastly, the Project Area does experience widespread use by eagles, but it does not appear that there are concentrated foraging areas within the Project Area (Section 3.1.4.2), therefore, future disturbance to foraging eagles as a result of CHW Project operations is considered unlikely as is disturbance to migrating or foraging eagles. To address potential future disturbance, CHW will employ passive best management practices to minimize risk of disturbance to nesting, roosting, migrating, and foraging eagles caused by the operation of the wind site (Section 6.2.1).

6.0 ADDITIONAL AVOIDANCE AND MINIMIZATION OF RISKS, ECMS, AND COMPENSATORY MITIGATION (ECPG STAGE 4)

This section summarizes measures that CHW has implemented or considered for future implementation to reduce eagle take to the point where it is unavoidable and to mitigate for unavoidable take. Best management practices (BMPs) relevant to eagles that were incorporated by CHW during the construction of the Project are summarized below (Section 6.1). Measures that have been or continue to be incorporated by CHW during Project operations are summarized in Section 6.2, including BMPs relevant to eagles (Section 6.2.1) and other conservation measures that CHW has investigated (Section 6.2.2.1), is currently investigating (Section 6.2.2), or has implemented. Compensatory mitigation options that CHW is considering for offsetting unavoidable take are summarized in Section 6.3, with the associated effectiveness monitoring for CHW's mitigation option summarized in Section 6.4. The adaptive management strategy that CHW will use to manage any future take in exceedance of the permitted take is presented in Section 6.5.

6.1 Construction Phase Best Management Practices

This section summarizes avoidance and minimization measures relevant to eagles that were implemented by CHW during construction of the Project. Although CHW is an existing and operating wind farm, this section is included for purposes of detailing measures employed during the construction of CHW. Even though the measures predated release of the WEGs, they were generally consistent with WEG recommendations.

1. Sage-grouse: Construction activities were avoided within 2 miles of greater sage-grouse nesting and brood-rearing habitat between March 15 and June 30, 2009 (Figure 6).

2. Seasonal Raptor Nest Buffers: CHW enforced seasonal limits of construction activities within nest buffers at the Project to minimize potential disturbance impacts to raptors. The disturbance-free dates and buffers for occupied golden eagle nests were February 15 – August 15 within 0.5 miles of construction activity. Since construction activity had commenced before the 2009 raptor nesting season, biologists performed raptor nest surveys during construction. These surveys revealed that golden eagles occupied the Valentine Draw territory during the 2009 breeding season (Figure 7). CHW monitored the nest weekly for activity (December 18, 2008 – May 27, 2009) and for signs of potential disturbance during construction (February 9, 2009 – May 27, 2009. The nest was confirmed to be unoccupied during weekly monitoring, and the nest was observed to

have fallen out of the nest tree as of May 29, 2009. This was the only occupied eagle territory within 1 mile of Project infrastructure during the construction of the Project (February 9, 2009 – December 11, 2009).

3. Electric Lines: Electrical collector lines were buried. This measure is consistent with APLIC recommendations to reduce the risk of collision and electrocution to eagles and other raptors (APLIC 1994, 2006, 2012).

4. Met Tower Guy Marking: BIRD-FLIGHT™ Diverters (Preformed Line Products, Cleveland, Ohio) were installed on the guy wires supporting the permanent meteorological towers to reduce potential collision risk to eagles.

5. Speed Limits: Speed limit signs were posted and enforced along construction roads to minimize the risk of wildlife/vehicle collisions. The speed limit during construction was 20 miles per hour. This measure reduced potential Project impacts to eagles by removing a source of carrion that could attract eagles to the Project and by reducing the potential for eagle/vehicle collisions should eagles forage on roadside carcasses.

6. Alternate Nest Structures: CHW installed a platform southeast of occupied golden eagle Nest 35 to provide an alternate long-term nest site farther from the Project wind turbines and within line-of-sight of Nest 35.

7. On Site Environmental Management: CHW had an environmental manager on site throughout the construction phase of the Project. The environmental manager was responsible for ensuring that CHW and its contractors complied with environmental (including wildlife) laws, regulations, and corporate policies during construction of the Project. The manager's compliance responsibilities included posting signs around the unoccupied golden eagle nest (Nest 35; Figure 7) and ensuring that workers respected the no-disturbance buffer.

8. Biological Monitoring: Throughout the construction period, CHW biologists and contracted biologist performed periodic informal nest surveys of the Project to monitor nesting activity of eagles and other raptors. These nest surveys did not use specific monitoring methodology or follow a prescriptive schedule but were generally consistent with industry standards of the time.

6.2 Operational Phase

6.2.1 Best Management Practices

This section summarizes impact avoidance and minimization measures relevant to eagles that were or are currently being implemented by CHW during Project operations. These measures include applicable with common/typical industry practices BMPs that are outlined in Chapter 7 of the WEGs (e.g., speed limits), as well as actions that CHW implements to address potential

eagle risk factors at the Project associated with land uses and Project activities. Additionally, DER and USFWS established in the MBCP (MBCP 2013) that CHW should conduct a survey and assessment of manmade features that may provide habitat for raptor prey species. Further details related and unrelated to eagle conservation are addressed in the Project's BBCS (DER 2020) and in DER's Summary Report: Manmade Habitat Survey and Assessment (DER 2014). These BMPs below will be ongoing following issuance of the permit.

- Maintain speed limit of 25 miles per hour on Project roads for site personnel.
- Site personnel stay on Project roads, ranch roads, or Project rights-of-way as much as possible to minimize nesting, roosting, or foraging disturbance. Notable exceptions will include eagle or wildlife related monitoring, or carrion removal.
- Site personnel maintain a 0.5-mile non-disturbance buffer around occupied eagle nests to minimize nesting disturbance. Notable exceptions include eagle nest monitoring activities or accompanying USFWS in the retrieval and handling of eagle chicks.
- Site personnel minimize dusk, dawn, and nighttime activity on the Project Area as much as practicable to minimize roosting disturbance. However, during shorter daylight winter days, it may not be possible to completely avoid activity in the Project Area during dusk and dawn periods.
- Work with cooperating landowners/farm managers in communicating recommendations for hunting practices and livestock operations to avoid occurrence and persistence of carrion on-site (Section 6.2.2.2).
- Implement a program to remove carrion detected within the Project Area (Section 6.2.2.2).
- Remove two guyed met towers (completed in June 2012). These were the only two such towers that CHW owned on the site.

The following BMP was implemented as part of the MBCP, but has been completed:

- Survey Project Area from August 20 to October 03, 2014 to identify manmade features including culverts and cattle guards that would serve as habitat features for lagomorphs or fossorial mammals; no evidence of use was noted at the time of the survey.

6.2.2 Eagle Conservation Measures

As part of the MBCP (MBCP 2013), DER investigated the use of several Eagle Conservation Measures (ECMs) to avoid and minimize eagle fatalities at the nearby Top of the World Wind Energy Project (TOTW) or other offsite locations for potential future implementation at the Project. These ECMs were formerly known as Advanced Conservation Practices prior to the 2016 revised eagle rule.

DER performed pilot studies at off-site locations to investigate the effectiveness of four ECMs that were identified in the MBCP for minimizing eagle fatalities: a radar detection system, an audible deterrent system, a visual deterrent system, and an informed curtailment program. In

coordination with the USFWS, DER evaluated each ECM in terms of likely effectiveness at minimizing eagle fatalities and feasibility of implementation and did not carry forward three that were unlikely to be effective, were not ready for full deployment, and/or were cost prohibitive to implement in an effective manner. Additional discussion about the ECMs not carried forward was addressed in the Top of the World ECP (DER 2021). The fourth ECM, informed eagle curtailment (IEC), will be implemented at the Project in addition to one ECM that is currently being implemented at the Project as part of the MBCP: on-site carrion removal. These ECMs will be carried forward and are summarized in Section 6.2.2.1 below.

6.2.2.1 Ongoing ECMs

This section describes the ECMs that were identified by DER, in coordination with the USFWS, that are expected to be effective which will continue to be implemented at the Project (MBCP 2013). On-site carrion removal is ongoing at the Project and a targeted IEC program utilizing the IdentiFlight® technology will be implemented at the Project as described below. Currently IdentiFlight® is a technology that has been shown to substantially reduce eagle collisions (McClure 2021). It is possible that competing IEC technologies may be developed and may prove more effective than IdentiFlight®. In such a case, Duke is not under any requirement to replace any IdentiFlight® units installed at the Project with the same technology. In the future Duke can consider other technology vendors in considering such needs for the Project. Future technology deployment at the Project will be coordinated with USFWS.

<u>On-site Carrion Removal</u>

Remains of livestock, such as cattle or sheep, and wildlife carcasses are a potential attractant to eagles and other avian scavengers. To reduce the potential for attracting eagles to the Project, CHW refined, further developed, and implemented a program beginning in January 2014, in coordination with USFWS, to remove any carrion detected onsite. If livestock carcasses are found at the Project, the Site Manager notifies the landowner or farm manager immediately for removal from the Project Area. If the livestock carcass is not removed within 24 hours, the Site Manager removes the carcass from the Project Area or otherwise makes the carcass unavailable for raptors (e.g., covering with sand, soil, or a tarp). Carcasses of big game and other wildlife (except birds and bats or any federally protected species) that would likely be an attractant to eagles are removed when detected on site, typically within 24 hours of discovery. If weather conditions (e.g., deep snow) prevent the immediate removal of a carcass, the remains are covered with a tarp to make them unavailable to raptors. All appropriate safety precautions are employed when removing carcasses. All removed carcasses are disposed of in a local landfill. Because CHW staff and contract biologists have frequently observed eagles feeding on carrion on or near the site (CHW, 2015, unpublished data), this ECM is believed by CHW to be an effective measure at removing an eagle food source and potential attractant from the Project Area and may help to reduce the exposure of eagles to collision with Project turbines.

Turbine Curtailment with IdentiFlight®

IdentiFlight® (IdentiFlight International LLC, Louisville, Colorado) is an autonomous aerial monitoring and detection system that supports the minimization of protected avian species collisions with rotating wind turbines. High-precision optical technology installed atop an IdentiFlight® tower detects, identifies, and tracks birds flying within a one-kilometer hemisphere around the tower. IdentiFlight® uses a blend of proprietary software and artificial intelligence to analyze images of detected birds ("targets") in real time to determine target size, 3D position, velocity, and trajectory. The system then identifies detected targets using a confidence score as an "eagle" or "non-eagle" (or other targeted species). By detecting and identifying birds as far away as one kilometer, the IdentiFlight® system provides wind facility operators with visual and quantitative data to inform strategies to minimize protected avian species collisions with wind turbines, including turbine curtailment. The net effect with implementation of the IdentiFlight technology is that when eagles are detected and determined to be at risk of collision with turbines and when turbine curtailment strategies are implemented (based on curtailment criteria integrated into the system) the system actively curtails wind turbines so that the likelihood of eagle collision with the turbine is reduced.

During development of the ECP, CHW has conferred with the USFWS regarding ECMs to be implemented at the Project. Based on an analysis of golden eagle fatalities at CHW from February 2010 through September 2020, USFWS has recommended that CHW implement actions to minimize future eagle fatalities in a localized area that includes six wind turbines (turbines 15, 16, 19, 27, 31, and 24) that have resulted in 53 percent of the reported golden eagle fatalities at the Project. In response to this recommendation, CHW plans to install four IdentiFlight® units to provide coverage to these six turbines. Proposed locations are shown in Figure 9. These locations will be microsited in the field and the units will be installed and operational prior to the issuance of the EITP. Though the placement of the IdentiFlight® units was based on providing coverage for the six turbines which have resulted in 53 percent of reported golden eagle fatalities at the Project, the IdentiFlight® locations chosen also provide full or partial coverage for additional turbines in the IdentiFlight® coverage area.

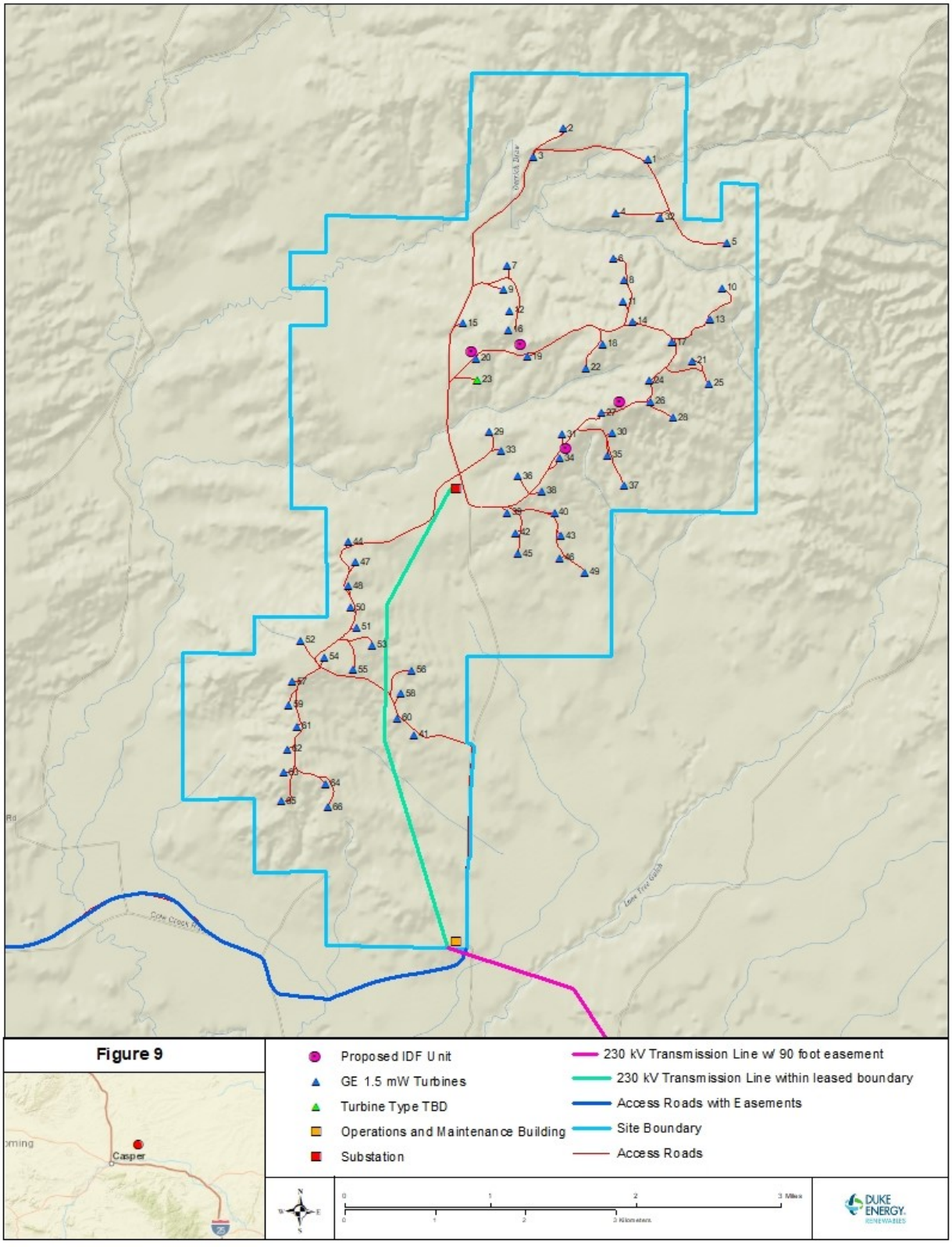

Figure 9: Location of Proposed IdentiFlight® Units

6.3 Compensatory Mitigation for Bald and Golden Eagles

Even after the implementation of the avoidance and minimization measures, including the implementation of on-site carcass removal and an IEC program, some unavoidable golden eagle and bald eagle take will likely occur at the Project. At this time, compensatory mitigation to offset take of bald eagles is not expected but could potentially be required under a future EITP. DER commits to offset authorized take of golden eagles under the permit through compensatory mitigation, as required by regulation (Code of Federal Regulations, Title 50 Fisheries and Wildlife, Part 22). Compensatory mitigation will occur at a 1.2 to 1 mitigation ratio based on the final take numbers for the EITP determined by USFWS. As established in the MBCP (MBCP 2013), power pole retrofitting will be the default compensatory mitigation option for this ECP and is described in Section 6.3.2 and 6.3.2.1 below. In addition to power pole retrofits, as part of the MBCP (MBCP 2013), DER and USFWS were required to identify two other compensatory mitigation options and explore them. As part of this effort, DER identified and analyzed three other options. These three options included: roadside carcass removal, habitat preservation/enhancement, and lead abatement. Brief summaries of each option, including power pole retrofits are provided below in Sections 6.3.2-6.3.5. As stated above, power pole retrofitting either through a direct retrofit arrangement with an electric utility or through purchasing credits through the in-lieu fee program will be the default compensatory mitigation option unless or until other compensatory mitigation options are determined by USFWS and DER to be practicable, equally cost-effective, quantifiable and approved by the USFWS for use at the Project.

6.3.1 Compensatory Mitigation Credit

The USFWS will provide predicted bald and golden eagle take at the Project in the EA that is completed pursuant to the NEPA requirements and based on the USFWS collision risk model informed by on-site turbine characteristics, operational time and eagle fatality data collected as part of CHWs eagle fatality monitoring program. Based on preliminary numbers provided to CHW it is expected that the baseline take prediction for the Project will be 2.9 golden eagles and 0.6 bald eagles per year. This baseline prediction assumes no informed eagle curtailment. As stated above, CHW plans to purchase and install the IdentiFlight® eagle detection and curtailment system to cover a portion of Project's wind turbines that have been shown to have a higher risk of eagle collisions. Based on CHW's experience with IdentiFlight®'s performance at the nearby TOTW wind project to date, we expect a reduction of eagle take due to the deployment of the IdentiFlight® technology from baseline conditions. Specifically, CHW commits to offset authorized take of golden eagles under the EITP (if issued) and proposes to provide initial compensatory mitigation as described in Section 6.3.2 below for 5.8 potential golden eagle takes during the first two years following permit issuance. This compensates for the predicted eagle take that USFWS derived as part of the NEPA compliance process over the

first two years of the permit (golden eagle takes annually). At a 1.2 to 1 mitigation ratio, this equates to 6.96 golden eagles mitigated for during the first two years of the permit; assuming one is issued by USFWS for the Project

In summary, at a 1.2 to 1 mitigation ratio, the initial 6.96 golden eagles mitigated for equates to golden eagle takes over years one and two of the permit (golden eagles mitigated for equating to 3.48 golden eagle takes per year). If, during the first two years under the permit, the Project exceeds golden eagle takes, the Project will "true up" its mitigation obligation accordingly at the end of the two-year period and provide additional mitigation for the remainder of the permit term. If the Project does not exceed golden eagle takes during the first two years, per input from USFWS all excess mitigation calculated at a 1.2 to 1 ratio will be carried forward and be credited towards the remaining term of the permit.

If, at the end of the first permit term, there is excess mitigation of golden eagles, those "credits" will be rolled into the next permit term, assuming there is a next permit and that the USFWS issues a new permit (with a new take prediction and take authorization) for CHW.

Bald Eagle Compensatory Mitigation: Based on a review of the Programmatic Environmental Impact Statement for the Eagle Rule Revision 2016, the Project is not expected to be required to provide compensatory mitigation for bald eagles. However, the compensatory mitigation performed for golden eagles as outlined in this ECP will provide conservation co-benefits to local and regional bald eagle populations.

CHW has proposed power pole retrofitting, either through direct agreement or through the in-lieu fee program, as the default mitigation option. As such, a greater level of detail has been provided for power pole retrofitting compared to the other three options described here (Sections 6.3.2 through 6.3.5). If any of the other mitigation options outlined in Sections 6.3.3, 6.3.4, and 6.3.5 or any other newly identified mitigation options are determined by USFWS, in consultation with TOTW, to be practicable, equally cost-effective, quantifiable, and if implementation is approved by the USFWS; then compensatory requirements may be fulfilled with one or more of these options after which a detailed mitigation plan will be developed and implemented.

6.3.2 Power-pole Retrofitting

At the time of the preparation of this ECP, the USFWS's only approved compensatory mitigation option is retrofitting electric power poles that are a high risk to eagles. Power pole retrofits address a known anthropogenic source of eagle mortality — electrocution (Tetra Tech 2011, USFWS 2013). CHW uses recommendations by APLIC (2014) in evaluating the suitability of candidate utilities to develop and execute power-pole retrofits suitable for CHW's mitigation. Suitable utility candidates need to have: (1) ownership of candidate power poles

located within the same Eagle Management Unit (EMU) as the Project; (2) availability of poles that currently pose a mortality risk to bald and golden eagles but are not known to have caused an eagle fatality; and (3) an implemented Avian Protection Plan (APP). Neither DER nor its parent company or any affiliates are currently retrofitting power poles in this EMU, so these power pole retrofits would be an addition to the baseline of retrofitted poles. The USFWS Office of Law Enforcement (OLE) will ultimately determine the acceptability of the proposed retrofit work. To offset incidental take at the local-area population level, CHW would also prioritize pole retrofits within a 109-mile radius of the Project. CHW will enter into a contract with a utility or utilities meeting the above criteria to perform power-pole retrofits in the form of reframing existing power poles as compensatory mitigation for golden eagle fatalities predicted to occur at the Project during the first two-year operating period. CHW will ensure that these required power pole retrofits are completed. These retrofits would be in addition to such utility's routine operations and maintenance activities as well as in addition to any retrofits necessary to meet such utility's commitments under its APP and its own mitigation obligations. The retrofits will involve the reframing of existing power poles (i.e., changing the pole configuration to meet avian-safe distances; APLIC 2014). As such, the expected effectiveness of the retrofits is a minimum of 30 years based on information from 30 years of APLIC utility members' experiences. Unlike shorter-term fixes to make power poles safe for eagles and raptors (i.e. line covers), because these retrofits are reframing, no follow-up effectiveness monitoring is needed beyond the confirmation that they were reframed. CHW will work with USFWS separately, along with input from the utility providing the poles to be retrofitted, to develop a detailed plan for power-pole retrofits.

CHW will use the Resource Equivalency Analysis (REA) developed by USFWS and published in the ECPG (USFWS 2013) to estimate the number of power-pole retrofits needed per eagle. However, the final REA that determines the number of required power pole retrofits under the eagle incidental take permit will be completed by the USFWS.

6.3.2.1 In-Lieu Fee Program

CHW may opt to use the Bald Eagle and Golden Eagle Electrocution Prevention In-Lieu Fee (Eagle ILF) Program developed by Eagle Electrical Solutions LLC (Fort Collins, CO) to implement compensatory mitigation via power-pole retrofitting. The Program is structured to sell advanced credits to users (i.e., permittees) authorized by the USFWS to participate in a compensatory mitigation program for bald eagles or golden eagles associated with EITPs to offset anticipated incidental take of eagles.

If this option is used, CHW will estimate the necessary number of credits using the REA with a 30-year effectiveness duration. However, the final REA that determines the number of credits required for the incidental take permit will be completed by the USFWS. The Eagle ILF Program offsets estimated eagle take by retrofitting eagle-risk power poles in the same EMU as the permitted take. The Eagle ILF Program pools mitigation funds to implement retrofitting

projects with local electric utilities to conduct a risk assessment and prescribe a retrofitting plan. Eagle risk power poles are identified, incorporating both electrical infrastructure and biological factors. The pole retrofit credits are defined as one mitigation credit = one retrofitted power pole. Once the in-lieu fee is paid, a transaction receipt will be provided to USFWS to document the mitigation credit.

Under this option, the funding to retrofit power poles would be provided upfront by CHW in the form of mitigation credits purchased under the Eagle ILF Program, and proof of purchased mitigation credits shall constitute compliance with the eagle take compensatory mitigation.

6.3.3 Roadside Carcass Removal

Eagle-vehicle collisions are a known anthropogenic source of eagle mortality (Phillips 1986, Hunt 2002), and the ECPG notes that, as a compensatory mitigation strategy, the removal of roadkill along roads where vehicle strikes cause eagle fatalities may be suitable given sufficient quantification (USFWS 2013). The underlying assumption of this compensatory mitigation option is that removal of medium and large animal carcasses from roadsides will decrease the vehicle collision rate of eagles foraging on roadside carrion. Based on anecdotal observations from CHW staff, eagle-vehicle collisions are common in the local population area. At least one bald eagle and one golden eagle have been incidentally detected as roadkill off-site (B. Halstead, DER, pers. comm.), and both bald and golden eagles have been observed feeding on roadside carrion numerous times in this area of Wyoming by DER biologists, DER site personnel, and contract biologists. To further explore this mitigation option, CHW contracted with HawkWatch International (HWI) to collect roadside carcass and eagle use data within the EMU located within 109 miles of the Project. In addition, HWI will develop a detailed carcass removal program for CHW and potentially other wind projects in the area. These data, the analysis, and removal program details, will be provided to USFWS for review and approval upon completion.

If this mitigation option is approved as an accepted form of compensatory mitigation by USFWS, CHW would have the option to switch to this compensatory mitigation program.

6.3.4 Habitat Protection and Enhancement

Habitat-based compensatory mitigation has long been used to compensate for unavoidable impacts to wildlife; notably in Habitat Conservation Plans under the ESA. The general concept behind habitat-based compensatory mitigation for golden eagles is that eagle take is mitigated for by "creating" more eagles on the landscape, i.e., creating conditions that lead to increased survival or reproduction. Habitat-based compensatory mitigation when applied with a holistic ecosystem focus also creates benefits to other wildlife species and provides other environmental benefits. By addressing and removing sources of anthropogenic eagle mortality and other existing threats on the protected habitat, this mitigation would also "save" eagles.

If this mitigation option is approved as an accepted form of compensatory mitigation by

USFWS, CHW would have the option to switch to this compensatory mitigation program.

6.3.5 Lead Abatement

Voluntary lead abatement is another possible mitigation option to offset the Project's unavoidable take because bald and golden eagles are known to be susceptible to lead poisoning, primarily from the ingestion of lead shot or lead fragments in offal (i.e., gut piles) of harvested big game, wounded prey, or carcasses (Kelly et al. 2011). Lead abatement could be accomplished through a variety of programs, including those that remove existing sources of lead from the environment (e.g., gut pile removal), as well as those that prevent the introduction of additional lead into the environment (e.g., hunter education, non-lead for lead ammunition exchange). The American Wind and Wildlife Institute has recently developed a research framework for quantifying the numbers of eagles saved from a given lead-abatement effort in Wyoming (Cochrane et al. 2015).

If this mitigation option is approved as an accepted form of compensatory mitigation by USFWS, wind project, including CHW would have the option to switch to this compensatory mitigation program.

6.4 Implementation Monitoring of Required Compensatory Mitigation

The implementation monitoring of CHW's default method of mitigation, power pole retrofits, would be included in the contract between CHW and the utility providing the retrofits, whereby CHW would pay the utility to complete the retrofits by an agreed upon date using permanent retrofits such as pole reframing to the utility's avian-safe standards (consistent with APLIC 2006 recommendations). Through contract language, the utility providing the retrofits would be required to provide to CHW and USFWS a report on the number, location of the power poles retrofitted and the date they were retrofitted. In the contract, CHW or its contractors would be authorized to inspect the retrofitted power poles to confirm the retrofits have been completed. If the utility fails to perform the retrofits as outlined in the contract, CHW would seek the remedy outlined in the contract. If the utility fails to retrofit the agreed upon required number of poles by the completion date, CHW will notify USFWS and coordinate a plan accordingly. Permanent retrofits such as pole reframing to avian-safe standards are expected to last the life of the pole and would not require additional monitoring efforts. If CHW elects to use the Eagle ILF program, the implementation monitoring will be conducted by Eagle Electrical Solutions LLC as outlined in the agreement between the Eagle ILF program and USFWS.

If other mitigation options are approved in the future, as an accepted form of compensatory

mitigation by USFWS, CHW would have the option to switch to an alternative type of compensatory mitigation to meet mitigation requirements. If such change in mitigation options occur an effectiveness monitoring plan will be developed in coordination and approval by USFWS.

The effectiveness monitoring requirements will be included in the overall program USFWS approval process.

6.5 Adaptive Management

Adaptive management is a decision-making process that promotes flexible cooperative decision-making and adjustment of management decisions and actions based on evolving operational experience. In this ECP, adaptive management considers eagle-specific avoidance, minimization, and compensatory mitigation measures and ECMs as needed to prevent permitted take exceedance.

If eagle fatalities are on a trajectory to exceed the authorized take, DER will examine various factors associated with these fatalities including spatial and temporal patterns of fatalities; potential attraction sources (e.g. carrion) and other factors.

The development and commercial deployment of minimization measures using technology-based ECMs such as eagle detection and deterrent systems is still in the early stages; however, based on recent research results, some technology-based ECMs have proven to be effective. (McClure 2021) and commercially available. DER has tested several ECMs as part of the commitments in their MBCP (Section 6.2.2). Based on the information gained from those efforts CHW believes that the IdentiFlight® technology will be effective at reducing eagle collision and take risk at the Project. If the Project is on a trajectory to exceed authorized take, and if no other root cause for fatalities can be determined and addressed through other ECMs, then changes to the existing operation of IdentiFlight® or the installation of additional IdentiFlight® units will be used in an adaptive management framework. Adaptive Management actions utilizing IdentiFlight® could include programming IdentiFlight® to implement more conservative curtailment prescriptions than the baseline curtailment prescription for IdentiFlight® units that are already in place or could include installation of additional IdentiFlight® units at the Project. If changes in curtailment prescriptions are warranted, such changes may include but are not limited to, one or more of the following programming adjustments:

- Increasing the time to collision value to provide more time for the turbine to stop;
- Increasing the flight trajectory potential angle of flight direction change; and
- Increasing the above ground level (AGL) cap for curtailment.

Due to still being in the early stages of IdentiFlight®, tiers of thresholds and triggers for adaptive management actions are not specified. If estimated take as determined through the fatality monitoring program is on a trajectory to exceed the permitted limit, CHW will confer

with the USFWS and will implement one or more of the adaptive management actions outlined above. In addition, other currently unknown minimization techniques or measures may be developed in the future. If such developments occur and become commercially viable, CHW and USFWS will confer and consider implementation of such future technologies as part of this adaptive management approach.

In addition to the adaptive management measures listed above, CHW may consider the need for other measures not related to IdentiFlight® provided they are proven to be more effective than IdentiFlight® and are practicable to implement.

7.0 EAGLE FATALITY MONITORING, EAGLE INJURIES AND REPORTING

7.1 Eagle Fatality Monitoring

For the first two years after EITP issuance, assuming an EITP is issued, the eagle fatality monitoring implemented at the Project will be completed per the monitoring requirements of the EITP. The EITP monitoring requirements will generally follow the CHW portion of the 2014 EFMP (WEST 2020; Appendix I) which was updated in 2018 and 2020. The EFMP includes a section that addresses incidental discoveries of eagle fatalities. In summary, the monitoring will include routine plot-based searches for eagle fatalities centered on each turbine. It will include searcher efficiency and carcass persistence trials each monitoring season over the course of each year for which details are provided in the EFMP. A protocol identical to the one outlined in the EFMP will be used for incidental finds. Some slight adjustments to plot shape (circular vs. square plots) will likely occur and will be developed and agreed to between CHW and USFWS.

Protocols and procedures will be implemented as part of the fatality monitoring program with the following exceptions:

- Only bald or golden eagles will be monitored for;
- A federal Special Purpose - Utility Permit (SPUT) will be a requirement of the EITP for the purpose of possession and use of raptor carcasses for carcass-persistence trials or searcher-efficiency trials whether the carcasses are found at the Project or provided by USFWS. Standard reporting requirements under the SPUT will be implemented;
- A Wyoming Chapter 33 permit is not a requirement except as needed for the possession and use of raptor carcasses for carcass-persistence trials or searcher-efficiency trials whether the carcasses are found at the Project or provided by USFWS; and

- The quarterly report requirements from 2014 EFMP do not apply.

After two-years post permit issuance, the protocol for eagle fatality monitoring will be reevaluated. It may be adjusted based on the results of the first two years of monitoring under the first two years of the permit term. Any future adjustments to the monitoring protocol will be determined by USFWS after review and discussion of post-construction mortality monitoring data and results with the Project.

7.1.1 Eagle Injuries

The injury of a bald or golden eagle may occur at the Project during the permit term. If an injured eagle is discovered by CHW incidentally or as part of eagle fatality monitoring, regardless of the cause, CHW will make every effort to get the eagle to a rehabilitator as soon as practicable. This could be through notification and coordination with a USFWS OLE Agent or WGFD game warden; or by a CHW representative transporting the eagle to the rehabilitator directly. A copy of the EITP will be carried with the CHW representative when in possession of an injured eagle.

7.1.2 Injury or Fatality Documentation

All eagle injuries or fatalities detected at the Project will be recorded. Documentation will include the species, date, time, condition, location, and any comments that may indicate cause of death or injury; the eagle will also be photographed. Data will be managed using either software that is currently being used by CHW to report eagle fatalities or a similar data management system. All data will be stored on a secure database server.

If an eagle injury or fatality detected at the Project is suspected to not be the result of a turbine collision, CHW will confer with USFWS. Such circumstances may include, but are not limited to, an eagle found on the Project area but not near a turbine or Project infrastructure; an eagle injury or fatality whose injuries do not appear consistent with turbine collision (i.e. gunshot wound); an emaciated eagle with no other apparent injuries; an eagle discovered on a public or private road not near a turbine; or evidence of injuries consistent with eagle on eagle interactions (i.e. talon injuries). For any eagle fatality, if, after conferring with USFWS, it is determined that a necropsy is warranted to determine the cause of death, CHW will coordinate with USFWS. USFWS will direct CHW where the eagle mortality should be shipped so that a necropsy can be performed.

7.1.3 Compliance Reporting

The specific elements of the compliance reporting will be outlined in the conditions of the permit.

7.1.4 Adaptive Management of Eagle Fatality Monitoring

As stated above, two years post permit issuance, the eagle fatality monitoring protocol may be modified or adjusted based on knowledge gained during these first two years. Any possible modification or adjustment in the eagle fatality monitoring requirements will be determined by USFWS after review of data and reports from eagle fatality monitoring and discussion between the parties.

In addition, technologies for fatality monitoring are in the research and development phase, but progress is being made. These advancements are being driven by the increased growth of offshore wind where human based searches under wind turbines are not an option. For land-based wind, human searches as outlined in the EFMP are costly, present operational challenges, and pose safety risks to the searchers. Either through the IdentiFlight® system outlined in Section 6.2.2.2 or other non-related technology development, CHW will continue to track and investigate such technologies. If such technologies are developed and proven to be equally or more effective than human searchers, are cost effective, practicable, and become commercially available, they will be considered for implementation at the Project. Upon review and concurrence by the USFWS, CHW may opt to shift to a technology-based fatality monitoring program.

8.0 PERMITS AND REPORTING

8.1 USFWS Eagle IncidentalTake Permit

If an EITP is issued to Three Buttes Windpower, LLC (CHW) it will authorize the incidental, non-purposeful take of bald and golden eagles. To demonstrate compliance with the permit and its conditions, annual reports will be submitted to USFWS per the conditions of the EITP. The EITP will also allow the collection and temporary possession of dead or injured eagles until they can be taken to a rehabilitator in the case of an injury or turned over to USFWS in the case of eagle fatalities.

8.1 USFWS Special Purpose – Utility Permit

CHW currently possesses a USFWS SPUT permit that authorizes CHW or its authorized agent to possess non-eagle raptor carcasses found on the site or provided by USFWS for use in searcher efficiency trials and carcass persistence trials. CHW will apply for permit renewals as necessary for the duration of the EITP.

8.2 Wyoming State Permits

On an annual basis since 2011, except for 2014, CHW has applied for and received a WGFD Chapter 10 Permit to Import, Possess, Confine, Transport, Sell, and/or Dispose of Live Wildlife. Under the conditions of CHW's permit (Permit number 10-1760), an annual report summarizing transport/rehabilitation activities will be submitted to the Cheyenne office of WGFD no later than January 31 of the following year for which this permit is valid. In 2015 the chapter 10 permit number changed to 10-1758.

Similarly, on an annual basis since 2011, except for 2014, CHW has applied to WGFD for and received a WGFD Chapter 33 Permit for Scientific Resource, Educational/Display, or Special Purposes. Disposal of dead birds will occur as directed by WGFD and in accordance with federal permit guidelines (Section 6.2). Disposal of dead bats will occur as directed by WGFD. Under the conditions of CHW's permit (Permit number 33-755), an annual report summarizing salvage and rehabilitation activities is to be submitted to the Cheyenne office of WGFD no later than January 31 of the following year for which this permit is valid.

9.0 CONTRIBUTORS

This CHW ECP has been prepared by Duke Energy Renewables, Inc. with technical assistance from the following:

- Clear Current, LLC
- IdentiFlight International LLC
- Tetra Tech, Inc.
- Western EcoSystems Technology, Inc.

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11.0APPENDICIES

Appendix A. USFWS Correspondence: January 16, 2009 Letter

Appendix B. Wildlife Studies for the Campbell Hill Wind Resource Area Converse County, Wyoming Fall Summary Report September 9 – November 5, 2008Appendix C. Wildlife Mitigation/Monitoring Plan Campbell Hill Windpower Project Converse County

Appendix D. Biological Surveys and Monitoring for the Campbell Hill Wind Resource Area Converse County, Wyoming 2008 and 2009 Final Report September 9, 2008 – November 5, 2009

Appendix E. Year 1 Post-construction Monitoring for the Campbell Hill Windpower Project Converse County, Wyoming Final Report February 2010 – February 2011

Appendix F. Year 2 Post-construction Monitoring for the Campbell Hill Windpower Project Converse County, Wyoming Final Report February 2011 – February 2012.

Appendix G. Year 3 Post-construction Monitoring for the Campbell Hill Windpower Project Converse County, Wyoming Final Report February 2012 – February 2013.

Appendix H. 2013 Raptor Nest Survey Report for the Campbell Hill Windpower Project Converse County, Wyoming. Final Report March 2013 – July 2013.

Appendix I. Eagle Fatality Monitoring Plan for the Campbell Hill, Happy Jack, Silver Sage, and Top of the World Wind Energy Facilities Laramie and Converse Counties, Wyoming