APPENDIX N

Eagle Utilization Distribution Monitoring Report

Bald Eagle Utilization Distribution Monitoring

Philip Wind Project

Haakon County, South Dakota

Final Report

May – June 2022

Prepared for:

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1 INTRODUCTION

Philip Wind Partners, LLC (Philip Wind) is considering development of the Philip Wind Project (Project) in Haakon Country, South Dakota. Philip Wind contracted Western EcoSystems Technology, Inc. (WEST) to conduct bald eagle (*Haliaeetus leucocephalus*) utilization distribution (UD) surveys to monitor one nest within the August 2022 Project Area (Figure 1.1). This bald eagle nest was identified as occupied active on April 8, 2022. The objective of eagle UD monitoring was to gain information on how bald eagles utilize the area around the active nest spatially by mapping flight paths to and from the nest. Eagle nest flight path mapping was carried out in accordance with the U.S. Fish and Wildlife Service's (USFWS) *Land-Based Wind Energy Guidelines* (2012) and *Eagle Conservation Plan Guidance* (2013), and in compliance with the USFWS *Revisions to Regulations for Eagle Incidental Take and Take of Eagle Nests* (USFWS 2016). A historical golden eagle nest (*Aquila chrysaetos*) in the August 2022 Project Area was documented to be occupied active by a ferruginous hawk (*Buteo regalis*) then later in the season was occupied by a golden eagle (Piorkowski and Arellano 2023). This nest was not monitored for UD surveys as the nest was not documented occupied active by golden eagles in 2022.

2 PROJECT AREA

The Project is located approximately 14 mi north of the city of Philip in Haakon County, South Dakota (Figure 1.1). The Project Area encompasses approximately 68,318 acres (ac) within two level IV ecoregions: the Sub-humid Pierre Shale Plains and the Rivers Breaks (U.S. Environmental Protection Agency [USEPA] 2012). These ecoregions, historically dominated by grasslands have been extensively converted for agricultural use (e.g., row crops and livestock grazing; USEPA 2012), and contain semi-permanent and seasonal wetlands, often referred to as prairie potholes. Topography within the Project Area is gently rolling to flat.

A review of the 2019 National Land Cover Database (2019) for the Project Area identified herbaceous (52%) as the major land cover type within the Project Area, intermixed with patches of cultivated crops (42%) (Table 2.1, Figure 2.1). All other land cover types together accounted for approximately 6% of the Project Area (Table 2.1, Figure 2.1).

Table 2.1. Land cover types based on the National Land Cover Database within the Project Area of the Philip Wind Project, Haakon County, South Dakota, May – June 2022.

Cover Type	Acres	Percent (%)
Herbaceous	35,478	52
Cultivated Crops	28,679	42
Hay/Pasture	2,046	3
Developed, Open Space	708	1
Open Water	617	1
Emergent Herbaceous Wetlands	474	1
Developed, Low Intensity	148	<1
Woody Wetlands	69	<1
Deciduous Forest	54	<1
Developed, Medium Intensity	23	<1

Table 2.1. Land cover types based on the National Land Cover Database within the Project Area of the Philip Wind Project, Haakon County, South Dakota, May – June 2022.

Cover Type	Acres	Percent (%)
Shrub/Scrub	14	<1
Barren Land	4	<1
Developed, High Intensity	1	<1
Mixed Forest	<1	<1
Total[1]	**68,318**	**100**

[1] Sums of values may not add to total value shown, due to rounding.

Sources: National Land Cover Database 2019

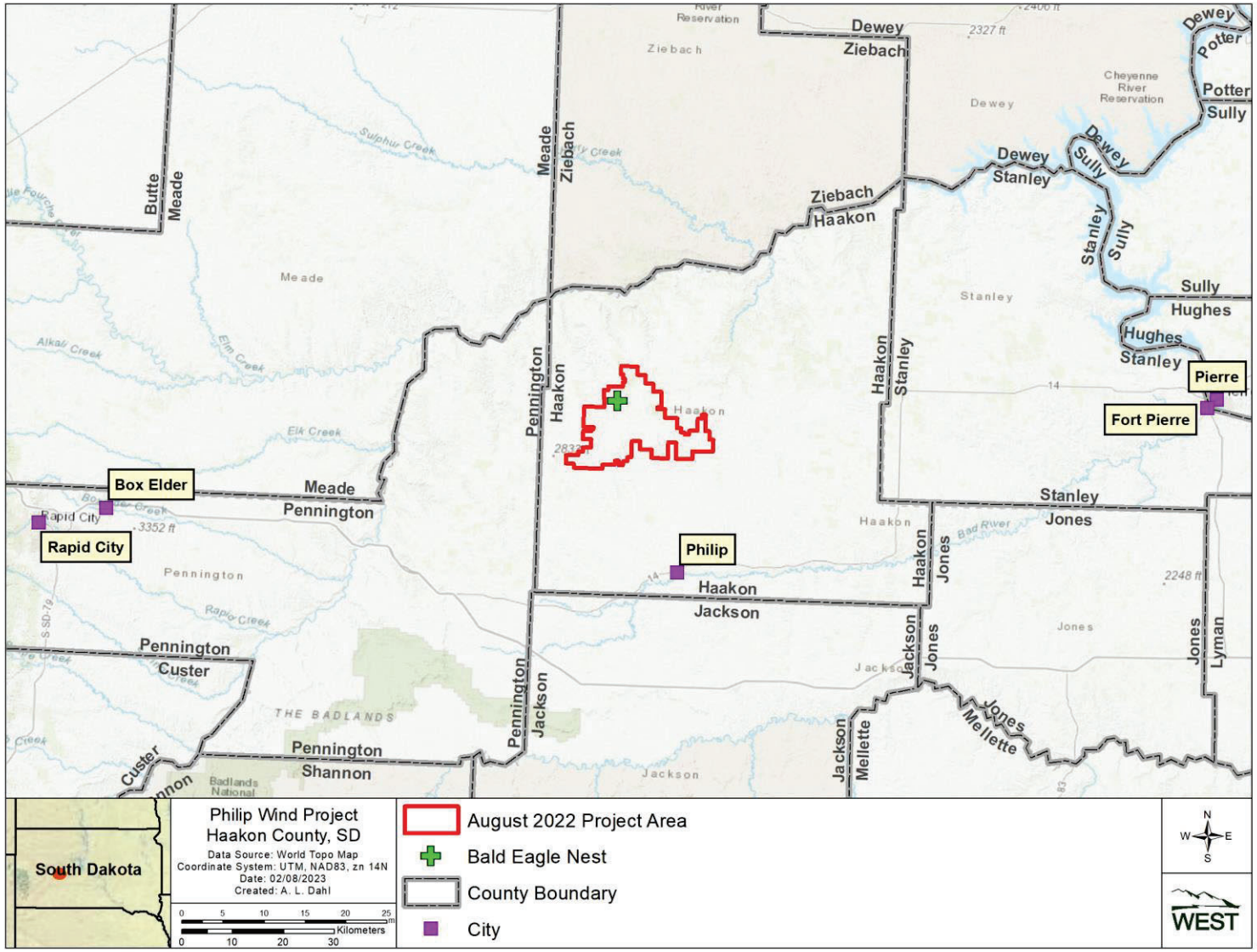

Figure 1.1 Location of the Philip Wind Project in Haakon County, South Dakota, 2022.

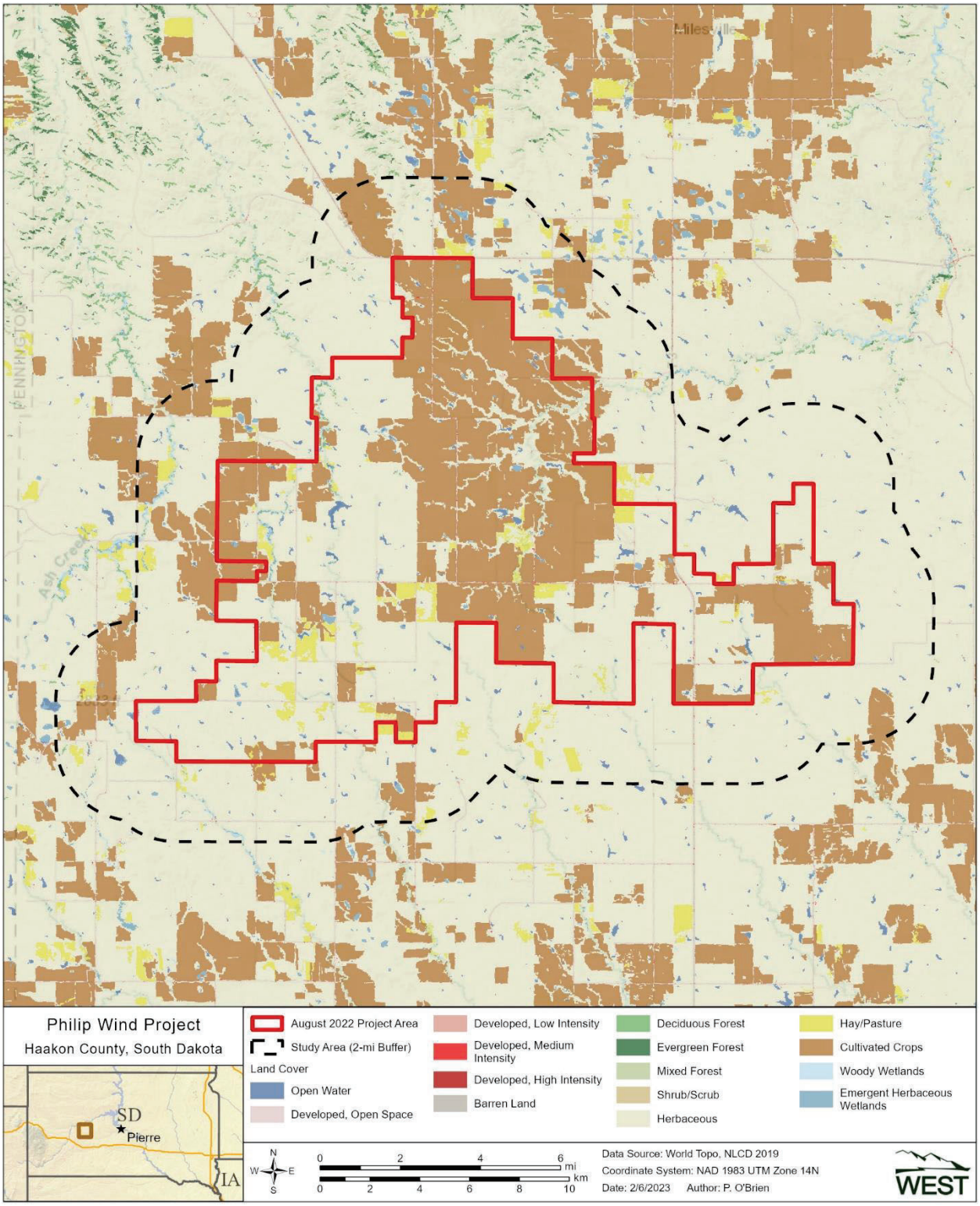

Figure 2.1. Land cover types within the Philip Wind Project and Study areas, Haakon County, South Dakota, 2022.

3 METHODS

Bald eagle UD surveys were conducted during the 2022 breeding season at one known occupied active bald eagle nest (i.e., nest had eggs, nestlings, and/or an adult in incubating/brooding position at the time of the survey; Piorkowski and Arellano 2023) located within the Project Area (Figure 1.1). The complete breeding season for bald eagles in South Dakota January 1 to August 30 (USFWS 2007, USFWS 2021). Surveys were conducted from observation points that maximized the observers' ability to note activity at the nest and surrounding landscape without disturbing the eagles. When possible, different bearings from the survey point to the nest were chosen to provide a comprehensive view of the nest and its surroundings. Survey points were generally located within 1,200 meters (m) of the nests.

The nest was observed during weekly, 4-hour observation periods beginning in the second week of May 2022 and continuing until the nest was confirmed to have either succeeded (at least one young fledged (able to fly) or reached an age of 67 days within the nest; Steenhof and Newton 2007, USFWS 2013) or failed (no documented use by adults for at least two consecutive surveys). Survey timing alternated between early morning and late afternoon. WEST biologist (Observer), nest ID number, distance and bearing to the nest, temperature, wind speed and direction, cloud cover, and precipitation were recorded at the start of each survey.

For each eagle observed during a survey, the following were recorded: starting detection time, surrounding habitat, flight height, estimated distance from the observer to the bird, flight direction, behavioral activities, and age and sex, if possible. Flight paths for each eagle observed in flight and type of flight (e.g., flapping or soaring) were recorded by hand on topographical imagery and digitized for analysis of movement patterns.

4 RESULTS

The bald eagle nest (BAEA-1) was surveyed between May 14 and June 22, 2022. One bald eagle observation was recorded during 28 hours (seven, 4-hour surveys) of nest monitoring (Figure 4.1). The observation on June 8, 2022, was of an adult soaring and approaching from the north then circling towards the nest tree. The eagle did not perch on the nest. The eagle was recorded in the air for two minutes before landing in the nest tree where it remained perched until the conclusion of the survey (121 minutes). The eagle's flight height ranged from 800 m to 25 m prior to perching on the tree above the nest (nest height approximately 20 m off the ground). No spatial or temporal patterns could be made with a single observation. Nest failure was confirmed on June 22, 2022, because no eagle observations were made during two consecutive surveys (June 15, 2022 and June 22, 2022).

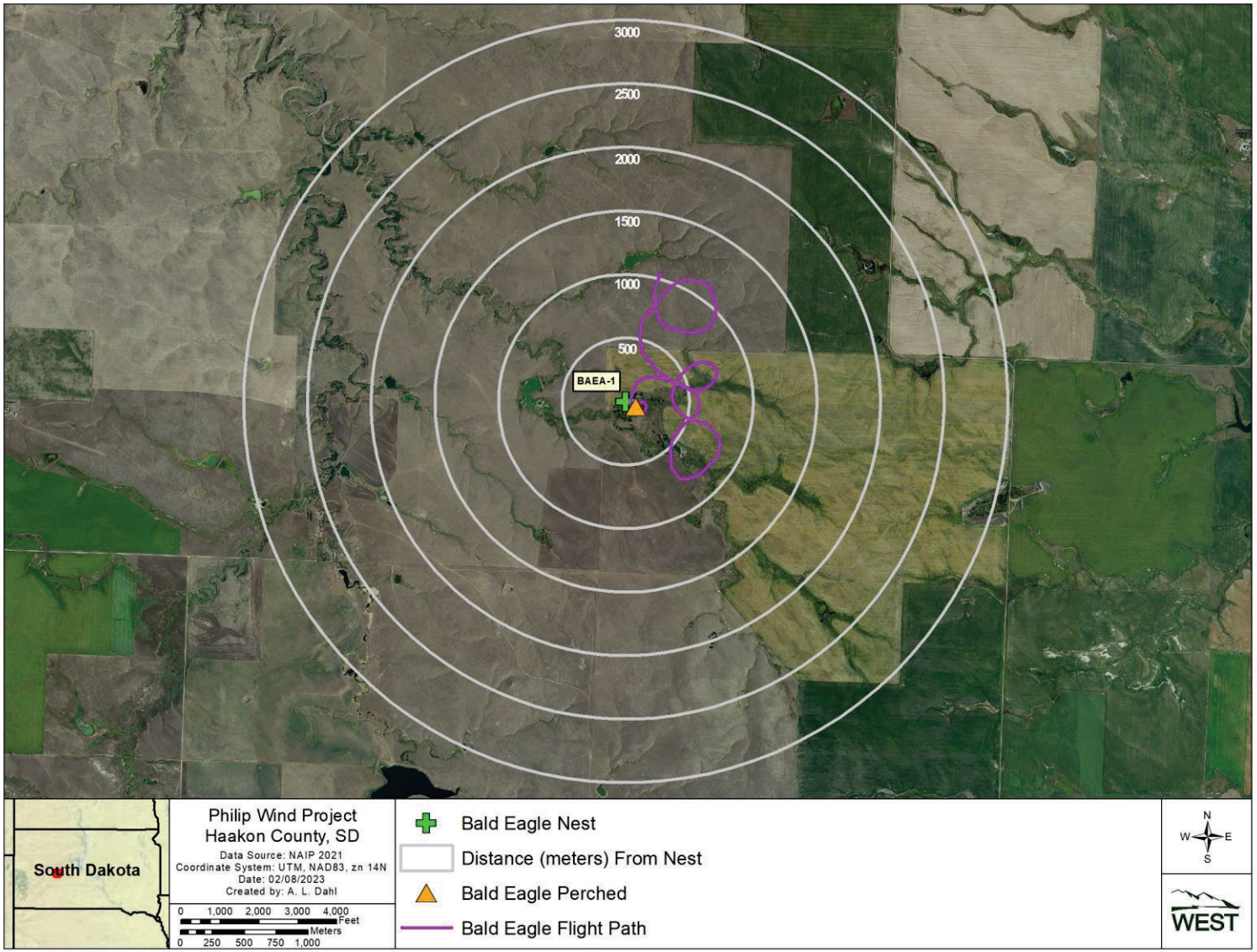

Figure 4.1. Bald eagle flight paths and perch locations at the Philip Wind Project in Haakon County, South Dakota, May – June 2022.

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