APPENDIX E

Northern Long-eared Bat Habitat Assessment Report

Northern Long-eared Bat Habitat Assessment

Philip Wind Project

Haakon County, South Dakota

Final Report

May – October 2022

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WEST

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1 INTRODUCTION

Philip Wind Partners, LLC (Philip Wind) is considering development of the Philip Wind Project (Project) in Haakon County, South Dakota (Figure 1.1). Philip Wind contracted Western EcoSystems Technology, Inc. (WEST) to assess the presence of potentially suitable summer roosting and foraging habitat for northern long-eared bat (*Myotis septentrionalis*; NLEB) using the Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines (Guidelines; USFWS 2022b). The NLEB is listed under the Endangered Species Act (1973) as a federally endangered species throughout its range (U.S. Fish and Wildlife Service [USFWS] 2022a). The objective of this assessment was to identify potentially suitable summer roosting and foraging habitat within the March 2022 Project Area and the Study Area, a separate 2.5-mile (mi) buffer from the Project Area (Figure 1.1). This combined Project Area and Study Area encompasses the most recent Project Area (dated August 2022).

2 PROJECT AREA

The March 2022 Project Area encompasses approximately 68,569 acres (ac) in Haakon County, South Dakota (Figure 1.1). The Project is located approximately 14 mi north of the city of Philip, South Dakota. The Project is within two level IV ecoregions: the Sub-humid Pierre Shale Plains and the Rivers Breaks of the Level III Northwestern Great Plains (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.

The landscape within the Project Area is gently rolling to flat topography. The primary land cover/use within the Project Area is grassland/herbaceous and cultivated crops. There are numerous named creeks within the Project Area (U.S. Geological Survey [USGS] National Hydrography Dataset 2020).

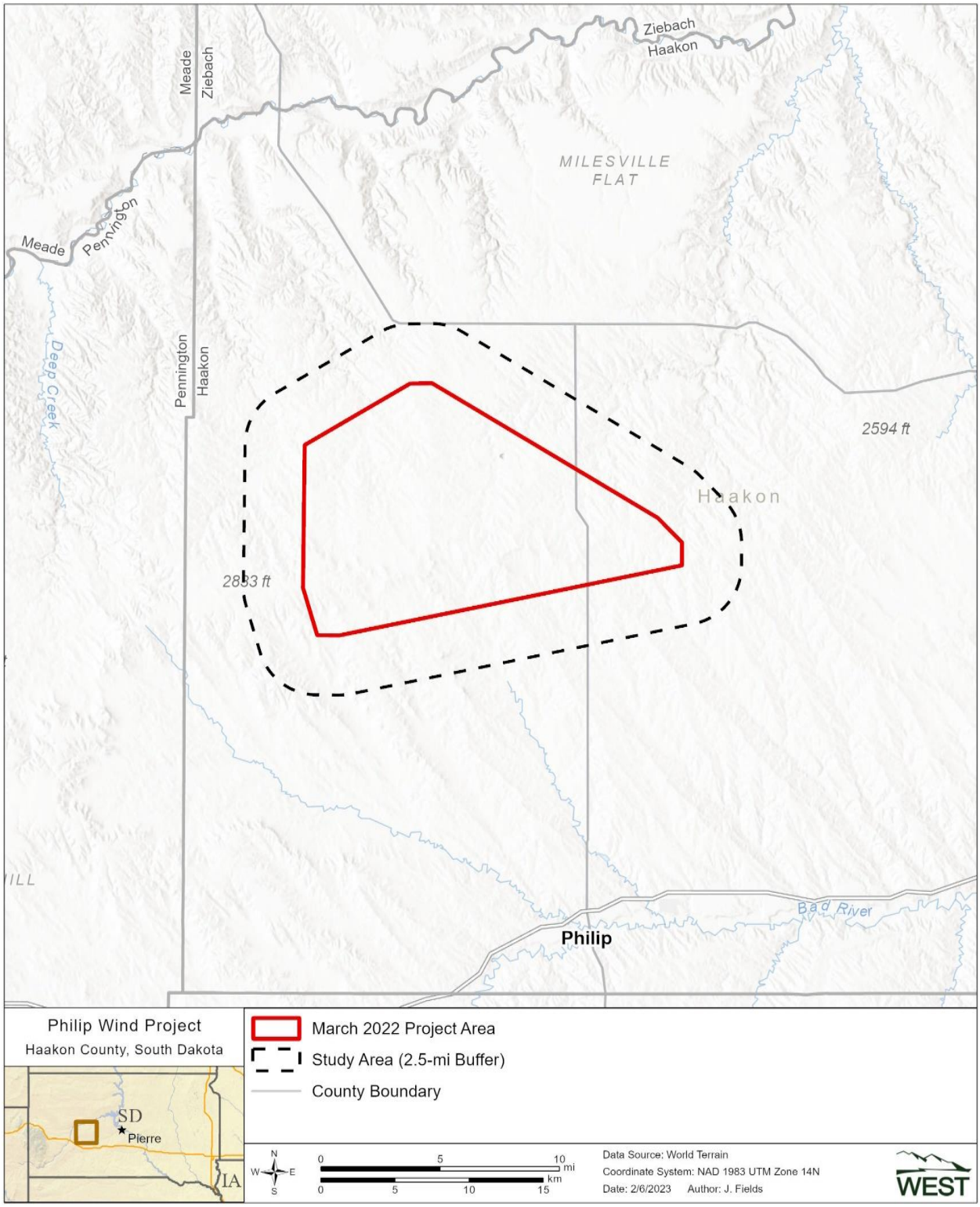

Figure 1.1 Location of the Philip Wind Project in Haakon County, South Dakota, 2022.

2.1 Northern Long-eared Bat Summer Habitat Description

NLEB favor roosting habitat located in intact, interior forests with late successional characteristics (Carter and Feldhamer 2005, Timpone et al. 2010). Although the NLEB tends to favor intact forests, this species can also use relatively small forest patches connected by shelterbelts (Henderson and Broders 2008). NLEB is a roost generalist using a much broader array of roost types than specialists such as Indiana bats (e.g., cavities, crevices, exfoliating bark, stumps, artificial structures) and smaller roost trees (as small as two inches in diameter at breast height (DBH; Lacki et al. 2009). NLEB generally use roosts with a higher percentage of canopy cover and typically greater clutter than other, similar bat species (e.g., other Myotis. spp.), usually requiring 56−84% canopy cover around roosts (Sasse and Perkins 1996, Foster and Kurta 1999, Lacki and Schwierjohann 2001, Carter and Feldhamer 2005, Timpone et al. 2010). NLEB also tend to stay relatively close to forest features while foraging (Henderson and Broders 2008), generally preferring to forage in upland, mature forest above or below the canopy, but also using forest clearings, riparian forest, forested ponds, and forested flyways (Foster and Kurta 1999, Amelon and Burhans 2006). Based on a synthesis of ecological studies, the USFWS defines suitable NLEB roost trees as trees with a DBH ≥ 3 inches, and with exfoliating bark, cracks, crevices, or cavities (USFWS 2022b). Connected habitat include “individual trees [that] may be considered suitable habitat when they exhibit characteristics of suitable roost trees and are within 1,000 ft of other forested or wooded habitat” (USFWS 2022b).

3 METHODS

The NLEB summer habitat assessment was completed in accordance with the Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines (Guidelines; USFWS 2022b). NLEB roosting habitat was defined as deciduous forest, mixed forest, and woody wetlands 10 ac or larger in size with potential roost trees and any forested areas within 1,000 ft of these patches. Anthropogenic structures were not included in this assessment. Linear forest features, isolated trees, and isolated small forest stands (less than 10 ac in size) located more than 1,000 ft away from suitable forested habitat were considered unsuitable habitat for NLEB as per supporting research and USFWS guidelines (Foster and Kurta 1999, Henderson and Broders 2008, USFWS 2022b). The habitat assessment consisted of an initial desktop review, followed by a field reconnaissance visit to ground-truth the desktop results.

3.1 Desktop Review

3.1.1 Desktop GIS assessment to Identify Potentially Suitable Summer Habitat

WEST digitized the boundaries of forested areas greater than or equal to 10 ac within the Project and Study areas based on U.S. Department of Agriculture’s (USDA) National Agricultural Imagery Program (NAIP) imagery (USDA NAIP 2021) and considered it potentially suitable summer habitat. WEST defined “patch” as a distinct, contiguous area of trees with a DBH ≥ 3 inches separated from other distinct, contiguous areas of trees.

3.1.2 Finalize Potentially Suitable Summer Habitat

A USFWS-permitted WEST bat biologist reviewed all resulting desktop habitat assessment files. The bat biologist evaluated the suitability of each digitized patch of potentially suitable summer habitat to ensure they were biologically valid.

3.1.3 Create Connected Habitat Buffer

A connected habitat buffer (1,000-ft) was placed around forested patches (greater than or equal to 10 ac) and includes all land cover types within the 1,000 ft buffer that could be used for foraging and commuting (USFWS 2023). Forested patches within these connected habitat buffers were deemed potentially suitable summer habitat.

3.1.4 Calculate Potentially Suitable Summer Habitat

Individual trees and small tree stands (<10 ac) within or intersecting the connected habitat buffer were included in calculating the total acreage of potentially suitable summer habitat. The total calculation included forested patches greater than 10 ac and the linear forest features, individual trees within 1,000 ft of a 10 ac forest patch, and small forest stands (< 10 ac) within 1,000 ft of a 10 ac forest patch.

3.2 Site Visit

Following the desktop review, a permitted WEST bat biologist completed a reconnaissance site visit on October 13–14, 2022, to assess potential summer habitat within the Project and Study areas from publically accessible roads. During the site visit, forest characteristics were evaluated and confirmed against the desktop evaluation, when possible, using factors including vegetation type, tree size composition (≥ 3 in DBH), and snags. Areas mapped during the desktop review as potential summer habitat were visited and Global Positioning System points were recorded in the GAIA GPS mobile application to identify habitat assessment points and reference photo locations (Appendix A). If additional potential summer habitat was identified during the site visit, those forest patches were mapped and added to the dataset.

3.3 Results

The Project Area contains 1,507.7 ac of connected habitat, and the Study Area contains 8,030.8 ac of additional connected habitat (black outline; Figure 3.1; Table 3.1; area calculations may differ slightly due to rounding), both of which include the 1,000 ft connected habitat buffer. The Project Area contains 64.8 ac of potentially suitable summer habitat, and the Study Area contains 345.1 ac of potentially suitable summer habitat (green area; Figure 3.1; Table 3.1). During the site visit, it was confirmed that the desktop evaluation of potentially suitable summer habitat was accurate and that the forest patches were of at least three inches DBH interspersed with snags.

Table 3.1. Potentially suitable northern long-eared bat summer habitat at the Philip Wind Project, Haakon County, South Dakota, October 2022.

	Connected Habitat Buffer (acres)	Potentially Suitable Summer Habitat (acres)
Site 1	2906.4	103.6
Site 2	583.2	31.4
Site 3	1946.5	107.4
Site 4	1974.2	91.7
Site 5	1216.1	45.9
Site 6	912.8	30.1
Total	**9539.1**	**410.0**

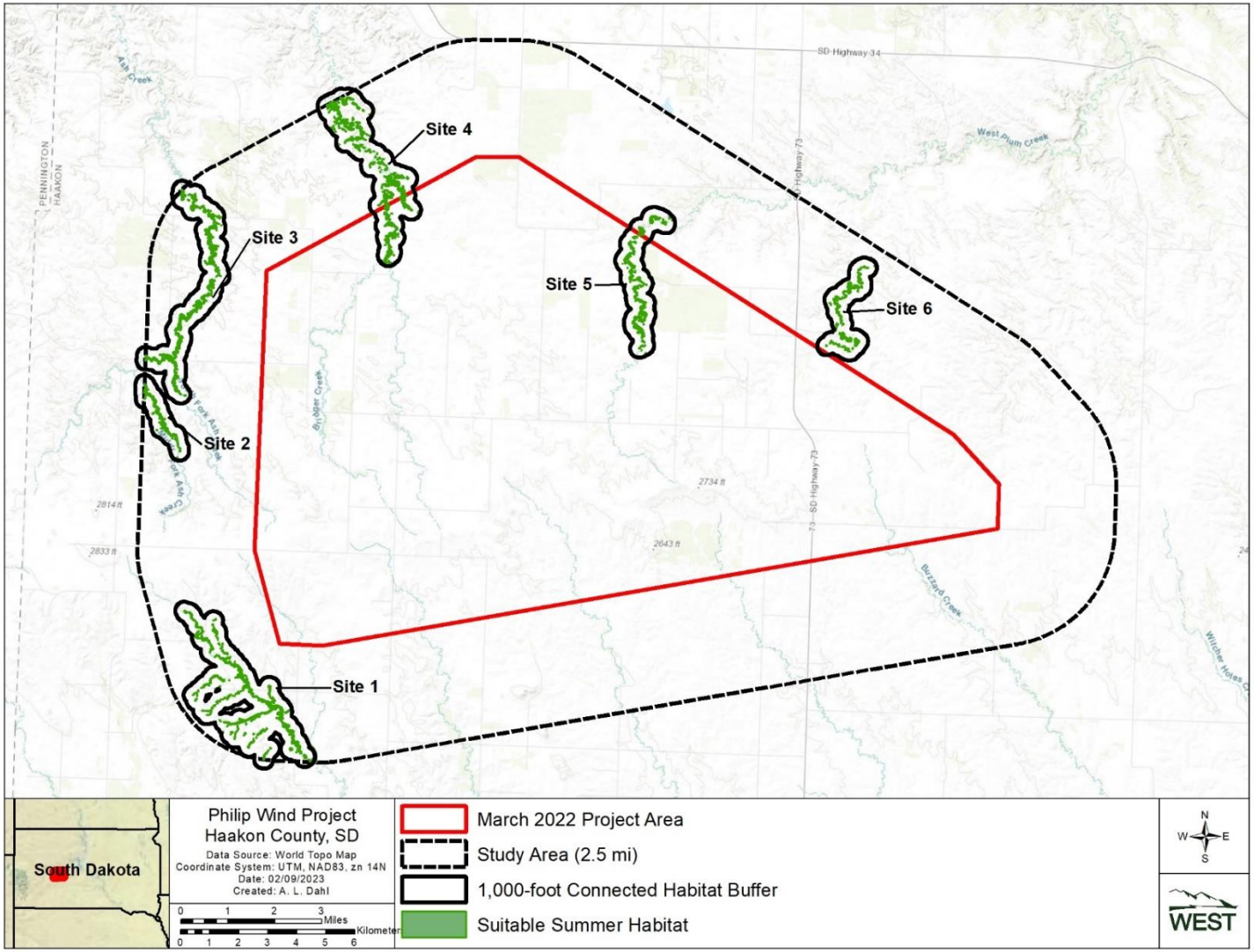

Figure 3.1. Potentially suitable summer habitat for the northern long-eared bat at the Philip Wind Project in Haakon County, South Dakota, 2022.

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Appendix A. Representative Site Photographs of Potentially Suitable Summer Habitat at the Philip Wind Project, Haakon County, South Dakota

Representative photograph of northern long-eared bat potentially suitable summer habitat at Site

Representative photograph of northern long-eared bat potentially suitable summer habitat and

Representative photograph of northern long-eared bat potentially suitable summer habitat and

Representative photograph of trees and snags with exfoliating bark at Site 3.