Final Environmental Assessment

for

the Issuance of an Eagle Take Permit

for Apple Blossom Wind Project

Prepared by

U.S. Fish and Wildlife Service

Division of Migratory Birds, Interior Region 3

U.S. Department of the Interior

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LIST OF ACRONYMS AND ABBREVIATIONS

AMM	avoidance and minimization measure
Apple Blossom Wind	Apple Blossom Wind, LLC
Apple Blossom Wind Project	the existing Apple Blossom Wind Project
Applicant	Apple Blossom Wind, LLC
Audubon	National Audubon Society
BBCS	Bird and Bat Conservation Strategy
CET	Cumulative Effects Tool
CRM	Collision Risk Model
CFR	Code of Federal Regulations
EA	Environmental Assessment
Eagle Act	Bald and Golden Eagle Protection Act
ECP	Eagle Conservation Plan
ECPG	Eagle Conservation Plan Guidance
EIS	Environmental Impact Statement
EMU	Eagle Management Unit
ESA	Endangered Species Act
GHG	greenhouse gas
ITP	Incidental Take Permit
LAP	local area population
EGLE	Michigan Department of Environmental Great Lakes, and Energy
MDNR	Michigan Department of Natural Resources
NEPA	National Environmental Policy Act
O&M	Operations and Maintenance
OLE	Office of Law Enforcement
PEIS	Programmatic Environmental Impact Statement
Project	Apple Blossom Wind Project
Service	United States Fish and Wildlife Service
SOL	Office of the Solicitor
U.S.	United States
USC	United States Code
WEG	Land-Based Wind Energy Guidelines

1 Introduction

This Environmental Assessment (EA) has been prepared to analyze the environmental consequences of the U.S. Fish and Wildlife Service (Service) issuing an incidental take permit (ITP) for the take of bald eagles (*Haliaeetus leucocephalus*) associated with the operation of the existing Apple Blossom Wind Project (Project), pursuant to the National Environmental Policy Act (NEPA) (42 United States Code [USC] 4321–4347). Issuance of a bald eagle ITP by the Service for take that is incidental to otherwise lawful activities under the Bald and Golden Eagle Protection Act (Eagle Act) (16 USC 668–668d and 50 Code of Federal Regulations [CFR] 22.26) constitutes a discretionary Federal action that is subject to NEPA. This EA assists the Service in ensuring compliance with the NEPA, and in making a determination as to whether any "significant" impacts could result from the analyzed actions that would require preparation of an Environmental Impact Statement (EIS). This EA evaluates the effects of alternatives for our decision whether to issue a bald eagle ITP.

The Eagle Act authorizes the Service to issue eagle take permits only when the take is compatible with the preservation of each eagle species, defined (in Service 2016a) as "consistent with the goals of maintaining stable or increasing breeding populations in all eagle management units (EMUs) and the persistence of local populations throughout the geographic range of each species."

The applicant, Apple Blossom Wind, LLC (Apple Blossom Wind or the Applicant), is requesting Eagle Act take coverage for operational activities associated with the Project. This company is a wholly owned subsidiary of AEP Renewables, LLC. The Applicant has requested a 30-year bald eagle ITP for non-purposeful take of bald eagles for the Project. The Applicant's Eagle Conservation Plan (ECP) (Attachment A; also available online: Eagle Conservation Plan) is the foundation of the permit application for the Project.

Based on an estimated annual take rate of 5.01 bald eagles per year, the Applicant is requesting a permit for the incidental take of up to 151 bald eagles over the anticipated 30-year duration of the permit. To ensure that authorized take is not exceeded over the life of the permit, we would establish 5-year check-in periods. Based on the estimated annual take for the Project, the 5-year check-in benchmark would be 26 bald eagles (5.01 bald eagles per year over 5 years, rounded up to the next whole number). As discussed in additional detail in Section 4.1.1, we anticipate that the predicted level of take would be refined in precision as data from Project-specific monitoring is incorporated into the prediction as part of each 5-year check-in.

This EA evaluates whether issuance of the bald eagle ITP would have significant impacts to the existing human environment. "Significance" under NEPA is defined by regulation at 40 CFR 1508.27, and requires short- and long-term consideration of both the context of a proposal and its intensity.

This proposal conforms with, and carries out, the management approach analyzed in, and adopted subsequent to, the Service's *Programmatic Environmental Impact Statement for the Eagle Rule Revision*, December 2016 (PEIS; Service 2016d). Accordingly, this EA tiers from the 2016 PEIS.

The PEIS (Service 2016d) analyzed the bald eagle take at a national level; Project-specific information has been considered in this EA as described below. Based on this Project-specific analysis, and our confirmation that the Project meets the tiering criteria provided in the PEIS (see Section 8.5 in Attachment A), we have determined that an EA is the appropriate level of review.

1.1 Purpose and Need

The need for this action is a decision on a 30-year bald eagle ITP application from the Applicant. The decision must comply with all applicable regulatory requirements and be compatible with the preservation of bald eagles.

1.2 Authorities

Service authorities are codified under multiple statutes that address management and conservation of natural resources from many perspectives, including, but not limited to the effects of land, water, and energy development on fish, wildlife, plants, and their habitats. This analysis is based on the Eagle Act (16 USC 668–668d) and its regulations (50 CFR Part 22). The PEIS (Service 2016d) has a full list of authorities that apply to this action (PEIS Section 1.6, pages 7–12), which are incorporated by reference here.

1.3 Background

The Applicant is currently operating and maintaining the Project, a wind generation facility owned and operated by Apple Blossom Wind located in Huron County, Michigan near the town of Pigeon, approximately three miles from the Lake Huron shoreline (Figure 1). The Project is permitted for operation by the state of Michigan as an up to 100-megawatt wind energy facility, with 29 Vestas V126 3.45-megawatt wind turbines with a rotor diameter of 126 meters (Figure 2). The Project also includes two meteorological towers, an underground electrical collection system, a substation, access roads, an operations and maintenance facility, and 120-kilovolt overhead transmission line. For the purposes of our analysis, we consider the Project area to include the minimum convex polygon that encompasses the wind project facilities (e.g., the area around turbines and any associated infrastructure, including utility lines, out-buildings, roads; Service 2013). Additional facility details for the Project are provided in Attachment A (see Section 2.0 of the Applicant's ECP).

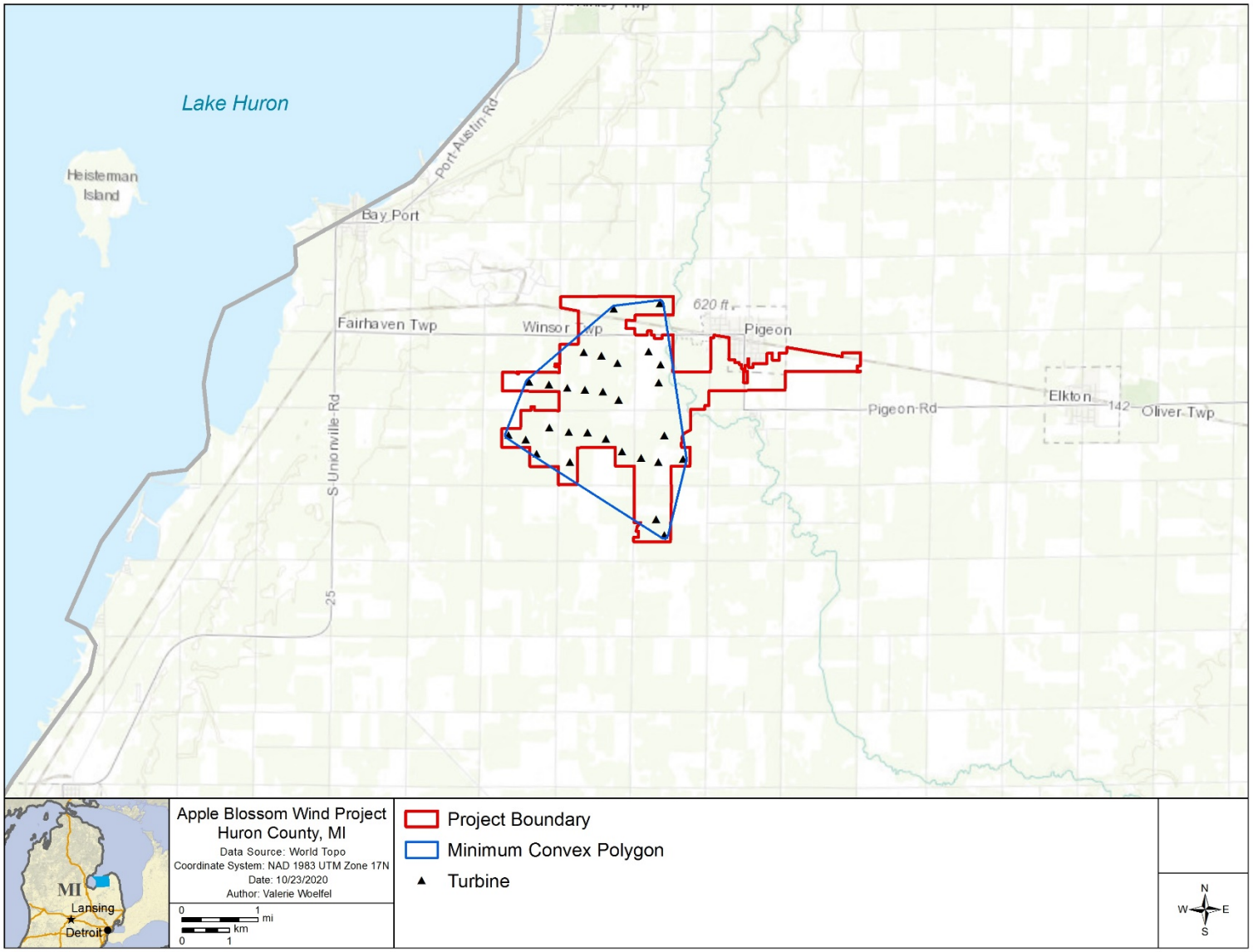

Figure 1. Location of the Apple Blossom Wind Project

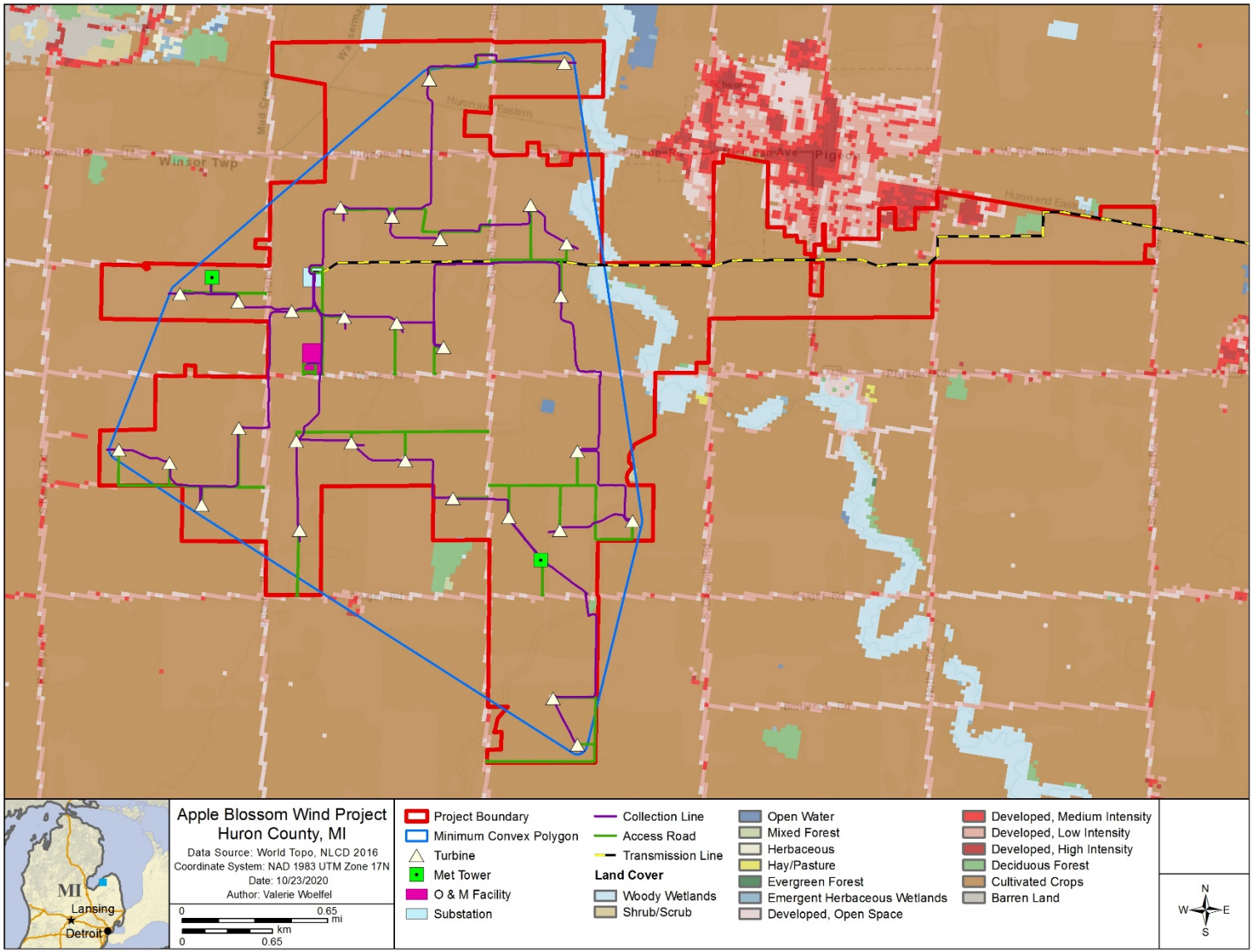

Figure 2. Turbine Layout, Associated Infrastructure, and Land Cover within the Apple Blossom Wind Project, Huron County, Michigan

The Applicant received all federal, state, and county permits necessary to construct the Project (e.g., Section 404 of the Clean Water Act, Michigan Public Service Commission review associated with the Electric Transmission Line Certification Act, Huron County Wind Energy Facility Site Permit). Construction of the Project began in late 2016 and it became operational in 2017.

1.4 Scoping, Consultation, and Coordination

Scoping: This EA incorporates by reference the scoping performed for the PEIS (Chapter 6, page 175).

Public Comment: The draft EA, including the ECP and other application materials, was made public for 30 days to solicit public comments. These materials were made available on the Service's Midwest Eagle Webpage on September 22, 2021. The Service sent out emails to 22 individuals within 10 entities to apprise them of the availability of the draft EA for review, and asked these individuals to pass the information along to any of their contacts who may be interested. The Service did not receive any comments on the draft EA during the public comment period. However, the Service added additional information on golden eagle take to Table 5: Comparison of the No-Action Alternative and the Proposed Action, and added language in Section 3.1.4.1 stating that a waiver would be granted to the Applicant regarding strict conformance to the pre-construction survey requirements outlined in the ECPG (see Section 3.1.4.1).

Coordination: The Applicant worked closely with the Service and other agencies, including the Michigan Department of Natural Resources (state-listed species review and coordination), Michigan Department of Environment, Great Lakes, and Energy (previously, the Michigan Department of Environmental Quality; wetland and waterbody permitting), and Huron County (Wind Energy Facility Site Permit). These meetings helped to inform development of the ECP in support of its application to avoid, minimize, and mitigate adverse effects on bald eagles.

Development of the Project, including consultation, coordination, and review, was initiated in 2005. The Project was originally proposed developed, and constructed by other entities; the operating Project (including the entity Apple Blossom Wind, LLC) was purchased by AEP Renewables in 2019. For the purposes of this final EA, "the Applicant" will be used to refer to the party through which all coordination and communication activities have occurred with the Service. A summary of coordination with agencies from 2011 to 2020 is provided in Section 5.3 of the ECP (Attachment A).

1.5 Tribal Coordination

In accordance with Executive Order 13175 and the Service's American Indian Policy, the Service consults with American Indian tribal governments whenever actions taken under

authority of the Eagle Act may affect tribal lands, resources, or the ability to self-govern. This coordination process is also intended to ensure compliance with the National Historic Preservation Act (54 USC 300101 et seq., 1966), the American Indian Religious Freedom Act (42 USC 1996, 1978), and Executive Order 13175 (Consultation and Coordination with Indian Tribal Governments, 2000).

The Service contacted nine potentially interested tribes who have an interest or a historic land connection within a 100-mile radius of the Project footprint. This notification was sent to tribal leaders and biologists via email and hard copy prior to posting the draft EA for public comment with an invitation to provide comments.

This outreach to potentially impacted tribes and tribal interests is in addition to the tribal consultation and information on impacts to cultural resources already conducted for the PEIS and is incorporated by reference.

The Service did not receive any comments or letters from tribal entities on the draft EA, and no substantive changes have been made to the final EA based on tribal coordination.

1.6 Endangered Species Act Consultation

The Service conducted an Intra-Service Section 7 consultation under the Endangered Species Act (ESA) during the internal review process and as part of the evaluation of the bald eagle ITP application (Attachment C). The candidate monarch butterfly (*Danaus plexippus*), threatened northern long-eared bat (*Myotis septentrionalis*), threatened rufa red knot (*Calidris canutus rufa*), endangered piping plover (*Charadrius melodus*), threatened eastern massasauga rattlesnake (*Sistrurus catenatus*), threatened eastern prairie fringed orchid (*Platanthera leucophaea*), and threatened Pitcher's thistle (*Cirsium pitcheri*) have the potential to occur in Huron county, Michigan. The issuance of a long-term bald eagle ITP would not have significant or negative impacts to federally listed or candidate species. The Service's Intra-Service Section 7 Biological Evaluation (Attachment C) documents if and how issuance of the permit (and associated implementation of the ECP and permit conditions) would affect federally listed or candidate species. The Service determined that the Project would have no effect on eastern massasauga rattlesnake, eastern prairie fringed orchid, and Pitcher's thistle; would not likely adversely affect northern long-eared bat, rufa red knot, and piping plover; and would not jeopardize the continued existence of the monarch butterfly. Additional information on federally and candidate listed species is described in Sections 3.4, 4.1.4, 4.1.5, 4.2.4, and 4.2.5.

If an eagle ITP is issued and future modifications to turbine operation or adaptive management are proposed, the Service may retain discretionary involvement with the Project. As a result, reinitiation of consultation would be required (50 CFR 402.16(a)) under certain conditions: (1) if new information reveals effects of the project that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) if the project is subsequently modified in a

manner that causes an effect to the listed species or critical habitat that was not considered in the written concurrence; or (3) if a new species is listed or critical habitat designated that may be affected by the project.

1.7 Scope of Environmental Assessment

This EA considers the Proposed Action and the No-Action Alternative related to Apple Blossom Wind's application for a bald eagle ITP to authorize the incidental take of bald eagles resulting from operation of the Project. The proposed federal action includes the issuance of a bald eagle ITP, and as such, it is not within the EA's scope to evaluate impacts associated with the siting and construction of the Project. It analyzes the effects of Service's proposed issuance of a bald eagle ITP on the human environment and evaluates impacts over the 30-year permit term. In addition, the EA discusses the environmental impacts that will occur whether or not the Service issues a bald eagle ITP.

2 Proposed Action and Alternatives

2.1 Proposed Action

Issuance: We propose to issue a 30-year permit to take up to 151 bald eagles (derived from our Collision Risk Model (CRM) output of 5.01 bald eagles per year, or up to 26 bald eagles between each 5-year check-in), with associated conditions, as allowed by regulation. This take estimate is based on results of our CRM that utilizes Eagle Conservation Plan Guidance (ECPG) model priors only.

Conditions: The Applicant would implement all measures required by other agencies and jurisdictions to conduct the activity at this site. In addition, the Applicant has committed to implementing a Bird and Bat Conservation Strategy (BBCS; Attachment B), adaptive management (see Section 8.4 in Attachment A), eagle mortality monitoring (see Section 9 in Attachment A), and the conservation commitments described in the Applicant's ECP (see Section 4.1, below; see also Sections 8.1 and 8.2 in Attachment A).

Avoidance and Minimization Measures: A complete description of the avoidance and minimization measures (AMMs) can be found in the Applicant's ECP, Section 8.2 (Identification of Avoidance, Minimization and Conservation Measures during Project Operations) and Section 8.4 (Adaptive Management). A summary of these measures can be found in Section 4.1, below.

Mitigation: Because the Project would not be permitted for a take limit above the Mississippi Flyway EMU threshold or greater than 5 percent of the local area population (LAP), compensatory (off-setting) mitigation would not be required by permit regulations.

Monitoring: Proposed eagle mortality monitoring to ensure permit compliance are summarized below (see Section 5.2) and in Section 9.2 of the Applicant's ECP (Attachment A), and are described in detail in the *Post-Construction Eagle Fatality Monitoring Study Plan for the Apple Blossom Wind Farm* (included as Appendix 3 of the Applicant's ECP [Attachment A]).

Adaptive Management: Adaptive management to ensure permit compliance is described in Section 8.4 of the Applicant's ECP (Attachment A).

2.2 Alternative 1: No-Action

Under the No-Action Alternative, the Service would take no further action on the Applicant's permit application. In reality, the Service must take action on the permit application, determining whether to deny or issue the permit. We consider this alternative because Service policy requires evaluation of a No-Action Alternative and it provides a clear comparison of any potential effects to the human environment from the Proposed Action.

The No-Action Alternative in this context analyzes predictable outcomes of the Service not issuing a permit. Under the No-Action Alternative, the Project would likely continue to operate without a bald eagle ITP being issued. Thus, for purposes of analyzing the No-Action Alternative, we assume that the Applicant would implement all measures required by other agencies and jurisdictions to conduct the activity at this site, but the conservation measures proposed in the bald eagle ITP application package would not be required. The Applicant may choose to implement some, none, or all of those conservation measures. Under this alternative, we assume that the Applicant would take some reasonable steps to avoid taking bald eagles, but the Applicant would not be protected from enforcement for violating the Eagle Act should take of a bald eagle occur.

2.3 Other Alternatives Considered but Not Evaluated in this Environmental Assessment

The Service considered one additional alternative, but concluded that the alternative was not consistent with the Eagle Act and its regulations. Therefore, the Service did not assess the potential environmental impacts of the alternative. Below is a summary of the alternative considered but eliminated from further review.

2.3.1 Alternative 2: Deny Permit

Under this alternative, the Service would deny the permit application because the Applicant falls under one of the disqualifying factors and circumstances denoted in 50 CFR 13.21, the application fails to meet all regulatory permit issuance criteria and required determinations listed in 50 CFR 22.26, or because we have determined that the risk to bald eagles is so low that a take permit is unnecessary.

Our permit issuance regulations at 50 CFR 13.21(b) set forth a variety of circumstances that disqualify an applicant from obtaining a permit. None of the disqualifying factors or circumstances denoted in 50 CFR 13.21 apply to Apple Blossom Wind. We next considered whether the Applicant meets all issuance criteria for the type of permit being issued. For bald eagle ITPs, those issuance criteria are found in § 22.26(f). Apple Blossom Wind's application (including the ECP) meets all the regulatory issuance criteria and required determinations (50 CFR 22.26) for bald eagle ITPs.

When an applicant for a bald eagle ITP is not disqualified under 50 CFR 13.21 and meets all the issuance criteria of 50 CFR 22.26, denial of the permit is not a reasonable option. Therefore, this alternative—denial of the permit—was eliminated from further consideration.

3 Affected Environment

This section describes the current status of the environmental resources and values that are affected by the Proposed Action and the No-Action Alternative.

3.1 Bald Eagle

3.1.1 General Habitat Requirements

General information on the taxonomy, ecology, distribution, and population trends of bald eagles are provided in Section 3.2.1 of the PEIS (Service 2016d). In general, bald eagles are frequently found relatively (but not exclusively) near water or other sources of food such as carrion. Particularly in winter, bald eagles can be found near open water for foraging. During the breeding season (February through August in the Project area), adult bald eagles with nesting territories are not social and will defend their territory from other bald eagles.

3.1.2 Bald Eagle Populations in Michigan

Bald eagles can be found throughout the state of Michigan year-round. Bald eagle populations in Michigan have been steadily increasing over the past 30 years. The estimated number of occupied breeding territories has increased from 102 in 1981 to 8,349 in 2019 (Grier et al. 1983; unpublished Service/Michigan Department of Environmental Great Lakes, and Energy [EGLE] data 2019).

The LAP (the number of bald eagles within an 86-mile-radius of the Project) is estimated to be 771 bald eagles (see Table 11 in the ECP; Attachment A). Bald eagle observations are numerous throughout Huron County, but are concentrated along the shoreline of Lake Huron, including Saginaw Bay (eBird 2018a).

3.1.3 Bald Eagle Distribution in the Project Vicinity

Raptor nest surveys conducted by the Applicant, as well as data collected by the Service and EGLE during nest surveys indicate that eight bald eagle territories are present within 10 miles of the Project (Chapman et al. 2014, unpublished Service/EGLE data 2020; Figure 3). Each of the nests identified during aerial surveys was within one mile of Lake Huron (unpublished Service/EGLE data 2020). Between 2016 and 2019, all eight territories were in-use by bald eagles. Further, with the exception of two territories in 2019, all bald eagle territories were productive between 2016 and 2019, with one to three bald eaglets hatched in each of the eight active territories (see Table 1). None of the bald eagle nests were within two miles of Project turbines. The closest bald eagle nest is the Bay Port Nest (Table 1), located just over 3.5 miles from the nearest Project turbine.

Table 1: Characteristics of Bald Eagle Nests within 10 Miles of the Apple Blossom Wind Project

Territory Name	Nest Location* (latitude/longitude)	Status in 2019	Fledgling Success in 2019
Bay Port	43.853590/-83.384450	In-Use	2 Fledglings
Caseville	43.949680/-83.249170	In-Use	2 Fledglings
Heisterman Island	43.860750/-83.441020	Alternate	-
Heisterman Island	43.861790/-83.436190	In-Use	1 Fledgling
Maisou Island North	43.834750/-83.450250	In-Use	2 Fledglings
Maisou/Katechay/North Island	43.877720/-83.425060	Alternate	-
Maisou/Katechay/North Island	43.875640/-83.415050	In-Use	1 Fledgling
Sand Point	43.903233/-83.334217	Alternate	-
Sand Point	43.911183/-83.335400	Alternate	-
Sand Point	43.909690/-83.352390	In-Use	None
Sebewaing	43.738240/-83.460980	Alternate	-
Sebewaing	43.740400/-83.460220	In-Use	3 Fledglings
Wildfowl Bay	43.812400/-83.444633	In-Use	None

* No bald eagle nests are located within 2 miles of Project turbines.

3.1.4 Project-specific Use and Distribution

3.1.4.1 Pre-construction

The Applicant conducted site-specific studies in and near the Project area to assess use and distribution of eagles and other bird species at the Project site, to further define potential eagle risks, and to inform siting and impact avoidance measures. Surveys were conducted at the original Project site (within 0.5 mile of the shoreline of Wildfowl Bay) from March 2011 through February 2012, and at a modified project site (set back at least two miles from the Lake Huron shoreline) between August 2013 and April 2014. Results of pre-construction surveys are summarized in Table 2 and described in detail in Section 6.1 of the ECP (Attachment A).

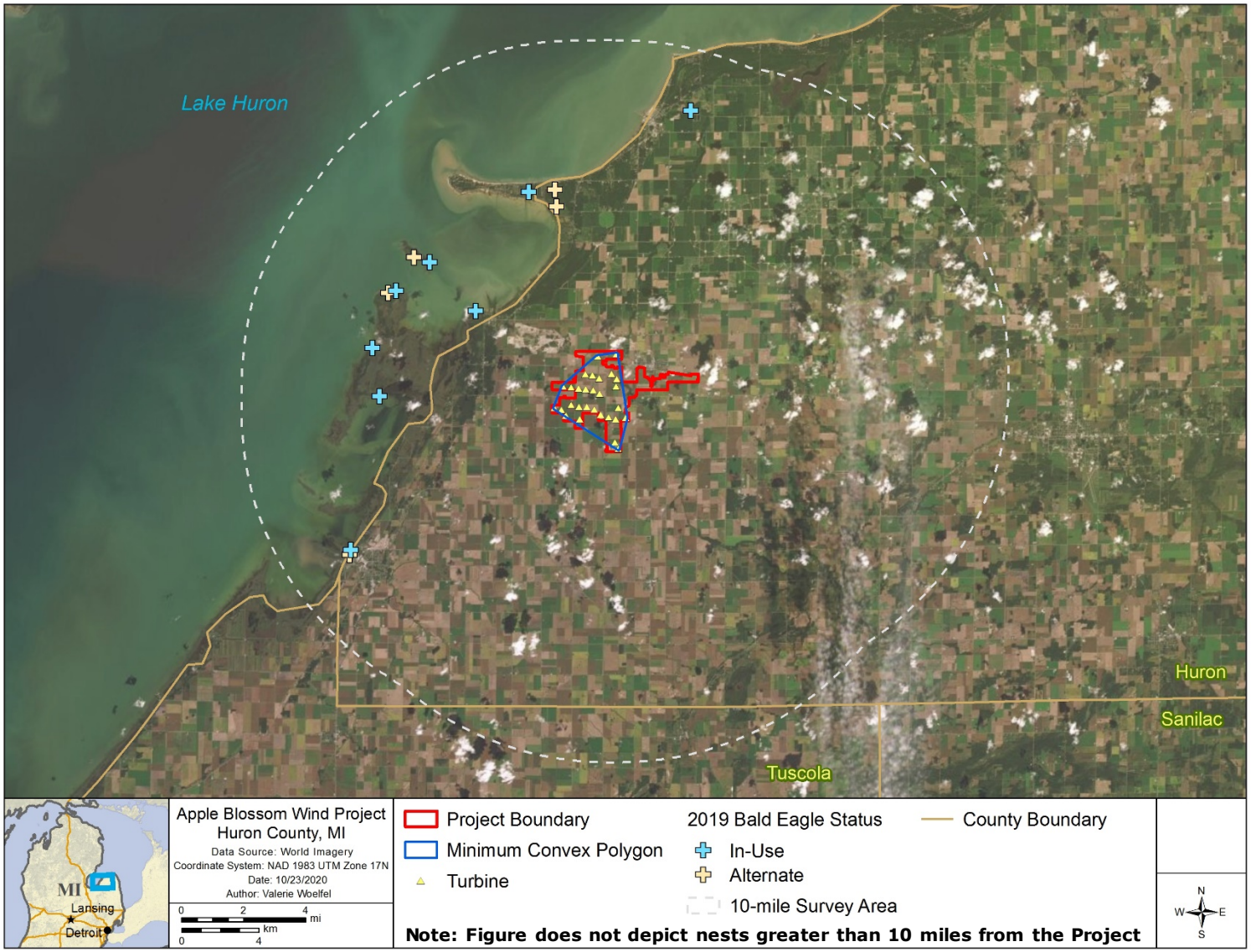

Figure 3. Bald Eagle Nests Identified within 10 Miles of the Apple Blossom Wind Project.

Table 2: Summary of Avian Surveys in and near the Project Area

Survey Type	Season *	Date	Duration	Survey Area
Spring and fall raptor & waterfowl/waterbird survey	Breeding, Fall	March 21 – May 5 & September 12-15, 2011	92.8 survey hours	3 points located 1.2 – 2.3 miles from shore along the western half of the original Project boundary
Passerine survey	Breeding, Fall	May 2 – 5, June 13 – 16, & September 12 – 15, 2011	30 survey hours	30 points within the original Project boundary and several points between the Project and the shore of Wildfowl Bay
Late fall raptor & waterfowl/waterbird survey	Winter	November 1 – 5 & 21 – 22, 2011	34 survey hours	20 points (subset of 10 surveyed during second round) within the original Project boundary as well as points located adjacent to the shore 7 points overlap a 0.6-mile buffer of final turbine layout
Eagle survey	Breeding	May 24–26, June 14-16, June 24-25, July 6-7, 2011	13.75 survey hours (coastal) 52 survey hours (inland)	2 coastal points and 2 inland points
Eagle survey	Winter	February 7 – 9, 2012	18 survey hours	18 points within the original Project boundary as well as points located adjacent to the shore 7 points overlap a 0.6-mile buffer of final turbine layout
Quantitative eagle point count survey	Breeding, Fall, Winter	August 7, 2013 – July 22, 2014	120 survey hours	10 points in modified Project boundary 7 points overlap a 0.6-mile buffer of final turbine layout
Aerial stick nest survey	Breeding	April 15, 2014	N/A	Modified project boundary plus a 10-mile buffer

* Eagle use seasons: winter (November 1 – February 28), breeding (March 1 – July 31), and fall (August 1 – October 31).

Surveys conducted in 2011 and 2012 were designed to investigate the degree to which the Project area was utilized by eagles, and to assess the potential risk to eagles from development of the Project. Bald eagle-specific surveys during the breeding period in 2011 resulted in an observation rate of 0.19 bald eagle per hour at the inland points (1.2 and 1.6 miles from the shoreline) and 1.75 bald eagles per hour at the two sites near the shoreline. Surveys in 2011–2012 that occurred outside of the breeding period resulted in bald eagles being observed within the original project boundary four times.

Point count surveys were conducted at 10 points in the modified Project boundary, totaling 120 hours, from August of 2013 through July of 2014. Four bald eagles were observed in the modified Project area during the 2013–2014 surveys, each of which was observed during the summer of 2014 (see Section 6.2 of the ECP in Attachment A).

The Project began development prior to issuance of the *Land-Based Wind Energy Guidelines* (WEG; Service 2012) and ECPG (Service 2013); therefore, some of the data may not be representative of the eagle use within the Project. The point count surveys were only conducted for one year and were conducted for 20 minutes at a time (concurrent with songbird surveys) rather than the currently recommended eagle-only survey length of 60 minutes. Furthermore, the survey effort was not consistent across seasons, with the time of higher eagle observations occurring during the lowest level of survey effort. In 2016, after the completion of the 2013–2014 surveys, the Project boundary and layout were further modified, increasing the set-back from Lake Huron to at least three miles. Through coordination with the Service, the Applicant requested a waiver from strict conformance with the ECPG survey protocols, as surveys began two years prior to publishing the final ECPG and five years before the 2016 Eagle Rule (a review of the Project's conformance with the ECPG survey protocols and request for a waiver are included in Appendix 4 of the ECP [Attachment A]). Based on review of the waiver request from the Applicant, the Service is granting a waiver for strict conformance to the pre-construction survey requirements outlined in the ECPG. Table 2 describes the number of survey points within the current Project boundary, in addition to the total number of points where surveys occurred.

3.1.4.2 Post-construction

Post-construction mortality monitoring was conducted to estimate bird and bat mortality at the Project, with attention to eagles, as per the approach and objectives in Tier 4 of the WEG (Service 2012). The monitoring also adhered to the objectives outlined in the ECPG (Service 2013). The monitoring plan was designed in coordination with the Service, and occurred from June 2018 through May 2019. Five turbines were selected for mortality monitoring, which were searched as cleared plots (120 meters x 120 meters), and the remaining 24 turbines searched on the road and pads on a weekly basis, as described further in the BBCS (Attachment B). In addition to the cleared plot and road and pad searches, visual scans (using binoculars to scan the

area around each turbine contained within a 300 meter x 300 meter square) were conducted at every turbine twice per month.

Two bald eagle fatalities have occurred that may be associated with operation of the Project. As described in additional detail in Section 3.1.7, the first fatality was documented in July 2018 and the second fatality was documented in May 2020.

3.1.4.3 Summary of Data Incorporated into the Service's Final Take Estimate

The Service has determined that bald eagle use data collected for the Project may underestimate the risk of bald eagle fatality at the site. We reached this determination due to several factors, including the relatively limited amount of pre-construction eagle use data collected within the Project, the potential for bald eagle use of an area to vary between years, the number of documented bald eagle territories in the vicinity of the Project, and that recent bald eagle fatalities have been documented at the site (discussed further in Section 3.1.7, below). Therefore, the Service concluded that a priors-only CRM analysis was reasonable for this Project. The priors-only CRM analysis accounts for the Project size and turbine configuration but does not include any site-specific bald eagle use or fatality monitoring data; instead, the priors-only CRM analysis utilizes existing knowledge regarding eagle use near a wind facility (exposure) and the probability of an eagle colliding with an operating turbine (New et al. 2015). The Service uses the 80th quantile of the CRM fatality probability distribution to determine the take limit to bolster against underestimation of risk, which is the basis for the take estimation presented under the Proposed Action.

3.1.5 Bald Eagle Mortality Associated with Human Development

General threats to bald eagles are described in detail in the PEIS (Service 2016d). The four leading anthropogenic causes of injury and mortality for bald eagles likely include poisoning (25.6%), trauma (22.9%), electrocution (12.5%), and shooting (10.2%; Russell and Franson 2014). Lead poisoning is a major stressor of bald eagles in this region and contributes to eagle-vehicle collisions as well (Russell and Franson 2014). In Michigan, bald eagle injuries and fatalities from vehicle collisions have become more frequent as populations have increased, likely due to their habit of feeding on carcasses along roadways (Simon et al. 2020, Journal of Wildlife Management). Based on the Service's Cumulative Effects Tool (CET), which calculates the LAP of eagles for an activity or project under consideration for a permit and summarizes existing and ongoing take that may affect said LAP, anthropogenic take accounts for 93.8% of bald eagle fatalities within the LAP. The leading causes of bald eagle injury and mortality between 2011 and 2020 were classified as vehicle collision (32.1%), unknown/other (21.4%), and lead poisoning (13.8%). More detailed information on the stressors to local area populations of bald eagles are discussed in the Cumulative Effects Analysis in Section 4.1.5. The Service's CET was run on June 17, 2021, and pulls information from the Service's Injury and Mortality

Reporting System database. The CET follows methods outlined in Appendix F of the ECPG (Service 2013).

3.1.6 Bald Eagle Mortality Associated with Wind Energy Development

Pagel et al. (2013) published a report of six substantiated bald eagle fatalities or injuries at wind energy facilities within the U.S. The Service is aware of more bald eagle deaths at wind farms than this and other cited reports, but details of these fatalities are not yet publicly available due to ongoing investigations. The Service intends to undertake a comprehensive review of bald eagle deaths at windfarms and will provide the findings when available.

3.1.7 Project-specific Fatalities

Two bald eagle fatalities have occurred that may be associated with operation of the Project; the first fatality was documented in July 2018 and the second fatality was documented in May 2020. The Service was promptly notified of both bald eagle fatalities and engaged in subsequent coordination with the Applicant.

On July 17, 2018, a landowner informed Apple Blossom Wind that the remains of a bald eagle had been found in his field approximately 262 feet from a turbine. The bald eagle was discovered within a designated search area in a recently harvested wheat field on the western side of the Project (see Section 6.3 of the ECP in Attachment A). The bald eagle was subsequently determined to be an adult male, and the cause of the mortality was determined to be possible collision with a wind turbine.

On May 4, 2020, a landowner informed Apple Blossom Wind that the remains of a bald eagle had been found incidentally approximately 400 feet from a turbine in the west-central portion of the Project (see Section 6.3 of the ECP in Attachment A). This turbine is located approximately one mile southeast of the turbine associated with the 2018 bald eagle fatality.

No additional bald eagle mortalities have been identified during post-construction mortality monitoring or incidentally since commencing Project operations.

3.2 Golden Eagle

The Service does consider the potential impacts to golden eagles (*Aquila chrysaetos*) as part of the EA, and as described below, finds that the Project is located in an area where golden eagles would not be expected to occur in high numbers and would generally be rare migrants. The Applicant assessed regional and site-specific records of golden eagles and coordinated with the Service on potential risk to golden eagles. While actual risk to golden eagles from the Project remains unknown due to minimal Project-specific data, the Applicant is not seeking take coverage for golden eagles at this time.

The Service did not use eagle survey data to inform the CRM model due to several factors, including the relatively limited amount of pre-construction eagle use data collected within the Project and the potential for eagle use of an area to vary between years; therefore, they may not be representative of golden eagle use (see Section 3.1.4.3). For these reasons, the Service estimated golden eagle take using the priors-only CRM model. We note, however, that no golden eagles were observed during any of the 2013–2014 eagle use surveys at points inside or outside the modified Project boundary (see Section 6.2 of the ECP in Attachment A). We, therefore, anticipate that the golden eagle take estimate should be considered conservative and actual take may be lower.

The Service would continue to assess the need for future golden eagle monitoring, studies, and take permitting over the life of the Project. Conservation measures, including post-construction fatality monitoring, implemented for bald eagles would also benefit golden eagles; however, the Applicant would not be protected from enforcement for violating the Eagle Act should take of a golden eagle occur. The Service would assist in updating the golden eagle risk assessment based on additional Project-specific fatality monitoring data throughout the life of the permit. The Applicant would coordinate with the Service to ensure Project-specific impacts to golden eagles are sufficiently avoided, minimized, and mitigated.

3.2.1 General Habitat Requirements

Golden eagles occur frequently in eastern North America, primarily as winter migrants from breeding areas in Canada (Morneau et al. 2015). The estimated population of golden eagles in eastern North America, including eastern Canada and U.S., is 5,000 (Dennhardt et al. 2015). Additional information on the taxonomy, ecology, distribution, and population trends (including stressors and sources of mortality) of golden eagles are provided Section 3.3.1 of the PEIS (Service 2016d).

Golden eagles in Midwestern states, including Michigan, are typically observed in dense forests within the blufflands of the major rivers, often foraging in the open, upland prairies (National Eagle Center 2017). Golden eagles prey mostly on squirrels, other rodents, and rabbits, but will eat other mammals, birds, reptiles, and some carrion. This species needs open terrain for hunting such as grasslands, savannahs, and early successional stages of forest and shrub habitats (Zeiner et al. 1990).

3.2.2 Golden Eagle Population in Michigan

Michigan falls within the winter range of North America's eastern golden eagle population (Katzner et al. 2012). While there are no breeding records of golden eagles in Michigan, observations during the winter and both the spring and fall migration are widely distributed across the state (Katzner et al. 2012). Recent telemetry data shows that while Michigan does not

fall within the major eastern migratory route for golden eagles, there is still likely a substantial number of golden eagles migrating through the state each year (Brown et al. 2017, Miller 2019).

Golden eagles are typically observed along the shoreline of Lake Huron every spring, with the highest number of observations being reported at the Mackinaw Straights and Port Crescent Hawk Watch sites (eBird 2018b). From 2008 – 2018, a total of 13 observations of golden eagles were reported within inland portions of Huron County in the last 10 years (eBird 2018b), and no golden eagles have been recorded during Christmas Bird Counts in the two closest Christmas Bird Count Circles (Huron and Tuscola U.F.A.; National Audubon Society [Audubon] 2020).

3.2.3 Golden Eagle Distribution in Project Vicinity

Wintering golden eagles could occur within the Project area; however, no golden eagles have been observed within the Project footprint during surveys or incidentally. Based on data from eBird, although golden eagles have not been observed within the Project boundary, golden eagle observations have been reported in Huron County within the last 10 years, the closest of which was a November 2017 report of a golden eagle south of Wildfowl Bay, approximately 2.6 miles west of the Project (eBird 2018b).

Golden eagles are known migrants in the Project vicinity but data on actual numbers are sparse. The Project area provides limited foraging habitat and no suitable nesting sites. Agricultural areas and grasslands in and near the Project could provide some foraging opportunities for those golden eagles passing through the area.

3.3 Migratory Birds

The Project is located in the Mississippi Flyway, where almost half the birds that pass through contiguous North American states/provinces and up to 40 percent of waterfowl migrate each year (Audubon 2018b). More than 325 avian species have been documented within the Mississippi Flyway (Audubon 2018b). Avian species that migrate through these flyways are diverse, utilize variable habitats, and will use wetlands (seasonal and permanent) for stopover habitat, along with grasslands, forested patches, and riparian corridors. Birds that breed in Michigan also use these habitats during the nesting season.

3.3.1 Project-specific Use and Composition

Pre-construction avian use surveys were conducted at the Project from 2011 through 2014 (Table 2). Detailed descriptions of survey methodologies and results can be found in the Applicant's BBCS (Attachment B). A total of 107 passerine (songbird) species were observed during these surveys, and the most individuals were observed during the fall migration. Red-winged blackbird (*Agelaius phoeniceus*), common grackle (*Quiscalus quiscula*), European starling (*Sturnus vulgaris*), tree swallow (*Tachycineta bicolor*), and American robin (*Turdus*

migratorius) were the most abundant passerine species observed. Turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus hudsonius*), and bald eagle were the most common of the eight identifiable raptor species observed. Canada goose (*Branta canadensis*), tundra swan (*Cygnus columbianus*), and ring-billed gull (*Larus delawarensis*) were the most abundant waterfowl/waterbird species observed. Both raptor and waterfowl/waterbird activity was highest during the spring migration period.

No federally listed bird species were observed during pre-construction avian use surveys completed at the Project. Sensitive species (i.e., state-listed threatened or endangered species, birds of conservation concern, and species of greatest conservation need) were observed in relatively low numbers, and were primarily limited to species of greatest conservation need (see Sections 4.3.2.2 and 4.3.3.2 of the BBCS; Attachment B). One state-listed species, the common loon (*Gavia immer*; state threatened), was observed during avian surveys at the Project.

3.4 Species Listed under the Endangered Species Act

In accordance with Section 7 of the ESA of 1973 (16 USC 1531–1599), actions that have a Federal nexus such as involvement of Federal land, Federal funding, or a Federal action (e.g., the decision on whether to issue a permit under the Eagle Act) necessitate consultation with the Service if the action may affect a listed endangered or threatened species. Because the Service is the lead agency in the review of the permit application for the Project, an Intra-Service Section 7 consultation was conducted; the Service's Intra-Service Section 7 Biological Evaluation documents if and how issuance of the permit (and associated implementation of the ECP and permit conditions) or denial of the permit would affect federally endangered or threatened species with the potential to occur in the Project area (Attachment C).

There are six species listed under the ESA with the potential to occur in the general Project area, including the threatened northern long-eared bat (*Myotis septentrionalis*), endangered piping plover (*Charadrius melodus*), threatened rufa red knot (*Calidris canutus rufa*), threatened eastern massasauga rattlesnake (*Sistrurus catenatus*), threatened eastern prairie fringed orchid (*Platanthera leucophaea*), and threatened Pitcher's thistle (*Cirsium pitcheri*). Additionally, the candidate monarch butterfly (*Danaus plexippus*), also has the potential to occur in the Project area. The following sections discuss the potential for each species to occur in the Project area (including known records) and summarize how permit issuance would impact the species.

3.4.1 Northern Long-eared Bat

The northern long-eared bat roosts and forages in upland forests during spring and summer, hibernates in caves and mines in the winter, and migrates between foraging areas and hibernacula during the fall. There are no documented northern long-eared bat hibernacula or roost trees in Huron County (Service 2016c). The closest known hibernacula is over 80 miles away in Alpena County, and the closest known roost trees are in Livingston County, over 150

miles away (Service 2016c). Potential roosting and foraging habitat for this species in the Project area is limited due to the lack of forested habitat (0.7% of the total Project area). Critical habitat has not been designated for this species.

Surveys were conducted within the Project area during 2011 and 2014; northern long-eared bats were not documented during surveys in either year. Acoustic surveys were conducted for the Project at a total of nine sites in 2011, during which a total of 10,943 bat calls were recorded on 900 detector nights. In addition, mist-netting was conducted in eight locations (four forested and four cropland) between July 14 and July 19, 2011. In 2014, acoustic surveys were conducted in eight locations within the Project area in accordance with the *2014 Revised Range-Wide Indiana Bat Summer Survey Guidelines* (Service 2014a), which were approved to be used for northern long-eared bat surveys per the *2014 Northern Long-eared Bat Interim Conference and Planning Guidance* (Service 2014b). Based on the results of these site-specific bat surveys, it appears that northern long-eared bats likely do not occur in the Project area during the summer months; however, this species could potentially occur at the Project during migration.

3.4.2 Piping Plover

In the Great Lakes area, the piping plover on sand and gravel shores, islands of lakes, ponds, rivers, and impoundments, and sometimes among cobble or sparsely vegetated areas on islands (Powell and Cuthbert 1992, NatureServe 2020). The nearest designated critical habitat (unit MI-23) is approximately 30 miles north-northwest of the Project.

No piping plovers were observed during baseline studies at the Project. The piping plover relies on wetlands/open water for breeding and stopover habitat, and these habitats only make up 2.9% of the Project area (Section 4.1 of the BBCS; Attachment B). Based on minimal suitable habitat in the Project area and the lack of piping plover observations during surveys, piping plover has minimal potential to occur within the Project area. However, there is the possibility for rare occurrences, likely during migration.

3.4.3 Rufa Red Knot

The rufa red knot is typically found along coastal beaches and riparian areas during migration, and has low potential to occur in the Project area as discussed in Section 4.2 of the BBCS (Attachment B). Critical habitat has not been designated for this species.

The rufa red knot is only known to occur in coastal areas of Huron County between May 1 and September 30, during the rufa red knot migratory period. The rufa red knot relies on wetlands/open water with abundant food sources for stopover habitat during migration, and these habitats only make up 2.9% of the Project area (Section 4.1 of the BBCS; Attachment B). No rufa red knots were observed during baseline studies at the Project. Based on known occurrences in Huron County, minimal suitable habitat in the Project area, and the lack of rufa red knot

observations during site-specific surveys, rufa red knot has minimal potential to occur within the Project area. However, there is the possibility for rare occurrences during the migration season.

3.4.4 Eastern Massasauga

In Michigan, eastern massasauga can be found in woods, bogs, fens, and marshes during winter; during summer, eastern massasauga live in dry, grassy areas with small shrubs adjacent to high quality wetlands. The eastern massasauga hibernates in burrows of other animals, rock crevices, and sometimes tree root systems (Johnson and Menzies 1993). Critical habitat has not been designated for this species.

The majority of the Project area consists of cultivated agricultural land (83.8%), with only 2.6% of the Project area comprising wetlands.(Section 4.1 of the BBCS, Attachment B). Suitable habitat (such as high quality wetland and adjacent undisturbed upland herbaceous habitat) required by the species does not occur within the Project area (see Section 4.2 of the BBCS; Attachment B).

3.4.5 Eastern Prairie Fringed Orchid

The eastern prairie fringed orchid occurs in mesic to wet prairies and wet sedge meadows, wet ditches, bogs, and rights-of-way near railroads (NatureServe 2020).The eastern prairie fringed orchid requires open grassy areas with little to no woody vegetation (NatureServe 2020). Critical habitat has not been designated for this species.

The majority of the Project area consists of cultivated agricultural land (83.8%), followed by a smaller portion of hay/pasture (6.7%) (Section 4.1 of the BBCS, Attachment B). Suitable habitat for this species (emergent herbaceous wetlands and herbaceous habitats) is limited to 26.6 acres (less than 0.5%) within the Project area (see Section 4.1 of the BBCS; Attachment B).

3.4.6 Pitcher's Thistle

Pitcher's thistle is one of the few species endemic to the Great Lakes (NatureServe 2020). It typically occurs on open sand dunes and beach ridges along the shoreline of Lake Michigan, Lake Huron, and Lake Superior, and it is unable to disperse seeds widely across large areas (NatureServe 2020, Service 2019). Critical habitat has not been designated for this species.

The majority of the Project area consists of cultivated agricultural land (83.8%), followed by a smaller portion of hay/pasture (6.7%; Section 4.1 of the BBCS, Attachment B). Suitable habitat for the species (open sand dunes) does not occur within the Project area (see Section 4.1 of the BBCS; Attachment B).

3.4.7 Monarch Butterfly

The monarch butterfly is currently a candidate species for listing under the ESA, after a 2020 finding that a listing of this species is warranted but precluded by work on higher-priority listing actions. This status will be reviewed each year until it is no longer a candidate. Internal Service policy directs the Service to consider their action's effect on candidate species as though proposed for listing to ensure actions undertaken by the Service do not jeopardize the species.

Monarch butterflies lay their eggs exclusively on milkweeds (primarily *Asclepias* spp.) and larvae feed on milkweed leaves until pupation. Adult monarchs have a wide diet breadth and feed on nectar from a variety of flowers (Monarch Joint Venture 2021). The Service has identified threats to monarch as loss and degradation of habitat, continued exposure to insecticides, and effects of climate change (Service 2020). The eastern population of the monarch butterfly has potential to occur within the Project area. While the majority of the Project consists of cultivated agricultural lands, there is the possibility for patchy areas of milkweed and nectar resources within the Project area that could support monarchs (e.g., roadsides, ditches, agricultural field margins). However, there are no proposed Project actions that would result in any habitat alteration that may impact potential existing monarch resources. We do not anticipate the issuance of a bald eagle ITP (and associated conditions) to appreciably change the existing habitat available to monarch butterflies, and therefore is not likely to jeopardize their continued existence as a species.

3.5 Federally Listed Species Not Addressed

The Service has addressed impacts of the Proposed Action on all federally listed and candidate species known to, or having potential to occur within the Project area. Should new information become available that shows the likelihood of additional listed species in the Project area, or the status of a species changes, the Service would assess whether these changes warrant additional Section 7 analysis.

3.6 Cultural and Socioeconomic Interests

Cultural: Impacts to cultural values were addressed in Section 1.5, above. No additional cultural concerns were raised during the analysis for this EA.

Socioeconomic: Agricultural use provides an economic value, as crops and livestock produced on these lands are sold. Operation of the Project would continue under both the Proposed Action and the No-Action, making economic impacts the same between both alternatives. Neither of the alternatives under consideration would affect these social values or the economic base of the area. Therefore, social and economic values will not be further analyzed in this EA.

3.7 Climate Change

Climate change was considered in the PEIS (Service 2016d; Section 3.9, page 144) and is incorporated by reference here. Issuance of a permit may incrementally increase vehicle emissions, which include greenhouse gas (GHG) emissions, during onsite eagle monitoring operations. However, GHGs generated from eagle monitoring operations would be minor, temporary, and are not anticipated to affect climate change on a local, regional, or global level. Therefore, climate change will not be further analyzed in this EA.

4 Environmental Consequences

This section summarizes the effects on the environment of implementing the Proposed Action and the No-Action Alternative.

The discussion of overall effects of the bald eagle ITP program is provided in the PEIS (Service 2016d) and is incorporated by reference here. This section of this EA analyzes only the effects that were not analyzed in the PEIS and that may result from the issuance of a bald eagle ITP for this specific project.

4.1 Proposed Action

In determining the significance of effects of the Project on bald eagles, we screened the Proposed Action against the analysis provided in the PEIS (Service 2016d) and *Bald and Golden Eagles: Population demographics and estimation of sustainable take in the United States, 2016 update* (Service 2016a). We also used our eagle-risk analysis (Appendix D in the ECPG (Service 2013), and Cumulative Effects Analysis (Appendix F in the ECPG (Service 2013) to quantify bald eagle fatality risk and cumulative local population level effects.

4.1.1 Bald Eagle

Permitted Take: Under the Proposed Action, we estimate that up to 151 bald eagles may be taken over the life of the 30-year permit. As described in additional detail in Section 3.1.4, this take estimate is based on the results of a priors-only CRM analysis that makes use of the Project size and turbine configuration but does not include any site-specific bald eagle use or fatality monitoring data. Therefore, a conservative approach was used that may overestimate annual and cumulative take at the outset of the permit. We anticipate that the predicted level of take would be refined in precision as data from Project-specific monitoring is incorporated into the prediction as part of each 5-year check-in. The Service's Collision Risk Model summary can be found in Attachment D.

Avoidance and Minimization: A number of pre-construction AMMs were developed and implemented by the Applicant, but because the Project has already been constructed, we are only presenting operational avoidance and minimization in this section. A complete description of the

Project-specific AMMs can be found Section 8.2 of the Applicant's ECP (Attachment A). A summary of these operational AMMs is as follows:

- Foraging opportunities for eagles and other raptors would be limited by implementing the following measures during Project operations:
    - Removing rock and brush piles that could create prey habitat within the Project
    - Removing road-kill or other carcasses from within the Project
    - Prohibiting food waste littering by employees
    - Providing educational materials to landowners in the wind farm on non-raptor attracting livestock disposal
- If a bald eagle nest is identified in the vicinity of the Project during operations, coordination with the Service would occur and the nest may be monitored as described in Section 9.3 of the ECP (Attachment A)

Adaptive Management: The proposed conservation measures include adaptive management that could result in additional monitoring and operational adjustments. Applicant-committed adaptive management requirements are described in Section 8.4 of the ECP (Attachment A) and would be incorporated into permit conditions.

A tiered adaptive management protocol is outlined in Table 3, which would be implemented to ensure that the Applicant stays within permit compliance. Under the Proposed Action, take of up to 151 bald eagles would be allowed over the 30-year permit term; this averages to 5.01 bald eagles per year, or up to 26 bald eagles between each 5-year check-in. However, a take estimate above 26 bald eagles at the 5-year check-in would not cause non-compliance with the permit conditions. Rather, a higher-than-expected take estimate would trigger consideration of adaptive management responses to ensure the Project stays in compliance with the permit conditions. The Applicant and the Service intend this approach to be flexible, with the potential for more than one tier level to be carried out in response to a single trigger event or for tiers to be skipped if the response is not situation-appropriate. All response actions in the table below would be undertaken in coordination with the Service using best available science and all project-specific information collected to date. A timeline for each management response would be developed including check-ins and benchmarks, as well as measures to determine if a specific management action has been successful.

Table 3: Adaptive Management Guidelines for the Apple Blossom Wind Project*

Level	Threshold or Trigger	Adaptive Management Response
1	Up to 10 bald eagle fatalities estimated** within a 5-year period	• Continue implementation of Eagle Conservation Plan (ECP); and • assess the cause or likely contributing risk factor(s) to the bald eagle fatality and whether a management response is warranted and/or feasible.
2	Between 11 and 23 bald eagle fatalities estimated** within a 5-year period	• Level 1 adaptive management responses; • evaluate cumulative monitoring effort to date to assess if take estimate is inflated by limitations in survey design; and • consult with the Service to help determine if: o immediate response or management action is needed; o additional carcass removal or landowner carcass disposal outreach efforts should be implemented to minimize the presence of bald eagle attractants within the Project; and/or o a longer term action plan or management response plan should be developed.
3	24 or more bald eagle fatalities estimated** within a 5-year period	• Levels 1 and 2 adaptive management responses; and • as appropriate and in consultation with the Service, temporarily implement and test the effectiveness of additional conservation measures to further avoid or minimize risk to bald eagles.

* Because 5-year check-ins may adjust the permitted take number, the number of bald eagle fatalities that trigger a change in action may also change, and this table would be updated accordingly. However, the adaptive management responses would stay the same.

** Evidence of Absence, or another approved estimator, would be used to develop an estimate of bald eagle fatalities based on the results of eagle mortality monitoring. These triggers would also be evaluated immediately (within the same season) following the discovery of any bald eagle remains documented at the site.

Under Level 3 of the adaptive management guidelines described in Table 3, the Applicant would discuss with the Service additional conservation measures to implement to reduce risk to bald eagles at the Project. To ensure that take associated with the Project stays within the permitted level, the following adaptive management measures would be considered for implementation:

- seasonal, daily, or hourly weather-related turbine shut-downs targeting "problem" turbines (e.g., additional measures may only be required for implementation during the season(s) when take has occurred or in the area(s) where take has previously occurred);
- detect-and-curtail systems through the use of bio-monitors, radar, or camera imaging systems (or other available systems) that could be used to identify at risk bald eagles and shut-down or slow turbine operations; or
- detect-and-deter systems that might detect bald eagles and use sound, light, or drones to deter bald eagles from the area.

At the conclusion of each year when formal third-party monitoring occurs (Years 6, 11, 16, 21, and 26 of the permit term; see Section 5.2, below), coordination between the Applicant and the Service would occur to determine if the existing monitoring plan is providing adequate information to ensure the Project is in compliance with the ITP.

Consultation between the Applicant and the Service would occur as needed following discovery (both incidental finds and from systematic searches) of injured bald eagles or remains at the Project. In these situations, neither party would wait for the 5-year check-in to determine if assessment and/or implementation of adaptive management are needed. The Applicant would implement the adaptive management responses described in Table 3 when the associated threshold is met; while the Applicant would follow the processes described at each level, the specific corrective response (for example, carcass removal, additional monitoring, and/or implementation of additional conservation measures) would be developed through coordination with the Service and analysis of the data to determine the most appropriate response.

If incidental take were to reach the Level 3 thresholds, additional adaptive management measures would be implemented as outlined in Table 3. The Service would work with the Applicant to identify what additional conservation measures are appropriate. Such conservation measures (as described above) would be tested, and if determined to be effective at reducing the risk to bald eagles at the Project, the measures would be continued as long as the specific risk they are intended to minimize is still present at the Project. As an alternative to long-term implementation of Level 3 adaptive management measures, the Applicant could request an amendment to the bald eagle ITP based on a revised take estimate.

Implementation of the adaptive management measures is intended to bring the Applicant back into compliance with the permit thresholds, and could also result in decreased bald eagle fatalities over the 30-year permit term. This anticipated decrease cannot be quantified at this

time, but would have the potential to reduce the 30-year total to less than 151 bald eagles. The monitoring and compliance checks that would occur as part of each 5-year check-in would result in regular updates to the number of estimated bald eagle fatalities over the 30 year permit term. Additionally, the eagle mortality monitoring occurring as a requirement of the ITP under this alternative (described in Section 5.2) has been designed to provide a Project-specific fatality estimate for bald eagles, and determine whether the permitted take level (up to 26 bald eagles over a 5-year period, derived from our Collision Risk Model output of 5.01 bald eagles per year) is accurate.

Mitigation: The Proposed Action incorporates measures to avoid and minimize risk to the maximum extent practicable, as required by regulation. To ensure that regional bald eagle populations are maintained consistent with the preservation standard, compensatory mitigation is required for any take that cannot practicably be avoided and is above EMU take limits and may be required for take greater than 5% of the LAP, if necessary to maintain the persistence of local bald eagle populations throughout their geographic range (Service 2016d). Based on the *Final Environmental Assessment, Proposal to Permit Take as Provided under the Bald and Golden Eagle Protection Act* (Service 2009) and the thresholds described in the ECPG (Service 2013), the Service has determined that compensatory mitigation targeted to offset estimated mortality would not be required for the Project (Service 2016d). This determination is based on the proposed permitted take number being below the EMU take limit and less than 5% of the LAP; therefore, no compensatory mitigation is needed to meet the Eagle Act preservation standard.

Monitoring: Monitoring is a critical component of adaptive management. The eagle mortality monitoring associated with the Proposed Action is described in both Section 9.2 and Appendix 3 of the Applicant's ECP (Attachment A), and would allow the Service and permittee to estimate the total number of annual bald eagle fatalities. The impacts of monitoring would primarily be limited to the potential for bald eagle-vehicle collisions, which would be minimized through implementation of vehicle speed limits; impacts associated with monitoring would be minimal and would not exceed those analyzed in the PEIS (Service 2016d). Post-construction nest disturbance monitoring of bald eagle nesting territories near the Project and management responses associated with the Proposed Action are described in Sections 8.4 and 9.3 of the Applicant's ECP (Attachment A). Any new bald eagle nests documented within 0.6 mile of turbines would be reported to the Service and checked for activity status during the breeding season by trained on-site personnel.

The Applicant has proposed to monitor eagle fatalities using independent, third-party monitors that report directly to the Service during Years 1 and 2 of the permit term. During Years 3, 4, and 5 of the permit term, O&M staff would conduct eagle mortality monitoring at the Project. For the remaining 25 years of the permit term, third-party mortality monitoring would occur at 5-year intervals (Years 6, 11, 16, 21, and 26). In the years when third-party monitoring is not conducted in the remaining 25 years, O&M staff would visit each turbine quarterly; during visits, the staff

would inspect roads, pads, and any other area visible by binoculars (out to approximately 150 meters) from their vehicle. For both third-party monitors and O&M staff, estimates of searcher efficiency would be used to adjust the total number of carcasses found for those missed by searchers, correcting for detection bias. Permit compliance monitoring is described in additional detail in the *Post-Construction Eagle Fatality Monitoring Study Plan for the Apple Blossom Wind Project* (appended to the Applicant's ECP [Attachment A]). The need for additional eagle mortality monitoring would be discussed if estimated take approaches or is above the predicted levels (see Table 3), or if high uncertainty exists regarding take estimates.

Significance Criteria: Under the Proposed Action, the Service recognizes that the Project is already built and operational in a lawful manner at the time of permit issuance. Additionally, all Applicant-committed measures and adaptive management requirements as outlined in the ECP (Attachment A) and permit conditions would be fulfilled.

As documented in Section 3.2.2 of the PEIS, the Service has determined that take levels under the Proposed Action (which result in a cumulative authorized take less than 5% of LAP and do not exceed the EMU take limit) would not result in significant impacts to bald eagle populations, and is compatible with permit issuance criteria. The Applicant's proposed approach would be compatible with the preservation of bald eagles, both within the EMU as well as the LAP. Based on the intensity and context of these effects and consideration of the elements associated with granting a bald eagle ITP for the Project, the Proposed Action is not expected to result in significant adverse effects to the bald eagle population.

4.1.2 Golden Eagle

Permitted Take: The Proposed Action does not involve take authorization for golden eagles at the Project. No golden eagles have been observed within the Project footprint during surveys or by incidental observations. Based on data from eBird, the closest golden eagle observation was a November 2017 report of a golden eagle south of Wildfowl Bay, approximately 2.6 miles west of the Project (eBird 2018b).

Given the seasonal occurrence of golden eagles in Michigan, and that no golden eagles were detected during Project surveys, the Applicant opted not to seek coverage for golden eagles. We ran the Service's CRM for golden eagles based on presumed seasonal use of the Project site and using non-site-specific exposure priors, assuming golden eagles were only present on site (and therefore only at risk) from 16 October through 14 May. The model estimated a take of 2.59 golden eagles per year (80th quantile of the priors-only CRM estimate) or 78 golden eagles over the 30-year life of the Project. The golden eagle take estimate is likely a conservative overestimate and actual golden eagle take may be lower. As stated in Section 3.2, the Service and the Applicant would refine the estimated take number based on Project-specific fatality monitoring data throughout the life of the permit.

Avoidance and Minimization: Measures proposed by the Applicant to avoid or minimize impacts to bald eagles could also be effective for golden eagles. However, these effects would be expected to have a negligible impact to golden eagles due to their rarity in the area.

Adaptive Management: Applicant-committed conservation measures and adaptive management requirements detailed for bald eagles that would be implemented in compliance with the ECP under the Proposed Action would also serve to minimize risk to golden eagles.

Mitigation: Offsetting mitigation would not be conducted, as take is not being requested.

Monitoring: The Service would consider the need for golden eagle monitoring, studies, minimization measures, and take permitting if golden eagles are documented in the Project area. Mortality monitoring for bald eagles may also discover any golden eagles that may be taken at the Project. If an unpermitted golden eagle injury or fatality were to occur, the Applicant would follow the recovery and notification protocol outlined in the ECPG (Service 2013) and outlined in Section 9.4 of the ECP. The Service would work with the Applicant in conjunction with the Office of Law Enforcement (OLE) and the Office of the Solicitor (SOL) to determine next steps. If appropriate, the stepwise approach to adaptive management described in Table 3 may be applied. After approval from OLE and SOL, the Service would likely work with the Applicant to determine if there is a need to amend the ECP and permit to include golden eagles. Amending the permit to include golden eagles would require compensatory mitigation and additional NEPA analysis. Amending the ITP to include golden eagles would likely also trigger additional eagle mortality monitoring.

Significance Criteria: The Applicant is not requesting take for golden eagles at this time; no significant impacts to golden eagle populations are anticipated under the Proposed Action.

4.1.3 Migratory Birds

Direct impacts associated with operation of the Project on migratory bird populations were quantified through post-construction mortality monitoring from June 2018 through May 2019. The estimated fatality rate for all birds was 3.55 bird fatalities per megawatt per three-season study period (Tetra Tech 2019). This fatality rate does not appear substantially different from the median annual bird fatality rates for the USFWS Midwest Region, where the Project occurs (2.63 birds per megawatt per year; American Wind Wildlife Institute 2019), and does not indicate potential significant impacts to migratory bird populations. The bird species most commonly detected as a fatality was the horned lark (*Eremophila alpestris*), a common and widespread bird in agricultural fields. One state-listed bird, merlin (*Falco columbarius*; state threatened), was found as a fatality during standardized carcass searches. No federally listed bird species were found as fatalities during searches or incidentally.

While wind facilities in general can have negative impacts to migratory birds, the issuance of a bald eagle ITP is not anticipated to increase these impacts. Additionally, the effects on non-eagle migratory birds (generally anticipated to be neutral to slightly beneficial) from implementation of the minimization measures and adaptive management process outlined in the ECP would be realized for the life of the Project. Examples include regular removal of livestock and road kill carcasses and reducing speed limits on access roads.

Through implementation of the ECP, the Proposed Action is compatible with the significance criteria listed in Section 3.5.2.1 of the PEIS (Service 2016d) for evaluating effects on migratory birds that would be anticipated to occur.

4.1.4 Federally Listed and Candidate Species

The issuance of an ITP for bald eagles and implementation of the ECP under the Proposed Action would not have a significant impact to the northern long-eared bat. While wind facilities in general have negative impacts to bats, we do not anticipate that the issuance of a bald eagle ITP would increase or decrease this impact. No impacts to forested habitat are anticipated under the Proposed Action, and no federally listed bat species were found as fatalities during the post-construction mortality monitoring from June 2018 – May 2019. There are no proposed permit conditions or adaptive management actions that would result in habitat alternation. Adaptive management as part of eagle take permit conditions may include daytime turbine curtailment. Should changes in operational conditions be proposed as part of the eagle ITP adaptive management, the Service would assess if reinitation of this Section 7 consultation is appropriate, as detailed in Section 1.6 of this EA. As documented in the BBCS, the Applicant has developed multiple measures during the siting (Section 6.0 of the BBCS), construction (Section 7.0 of the BBCS), and operation of the Project (Section 8.0 of the BBCS) to avoid and minimize impacts to bats, including the northern long-eared bat.

The issuance of an ITP for bald eagles under the Proposed Action would not have a significant impact to the piping plover and rufa red knot. While wind facilities in general can have negative impacts to migratory birds, the issuance of a bald eagle ITP is not anticipated to increase these impacts. Implementation of the minimization measures and adaptive management process outlined in the ECP would be realized for the life of the Project, and would likely further minimize potential impacts to the piping plover and rufa red knot.

The Project is already operational and no ground disturbance is being authorized under either of the alternatives considered in this EA. Furthermore, the eastern massasauga, eastern prairie fringed orchid, and Pitcher's thistle are not known to occur within the Project area due to a lack or minimal amount of suitable habitat (see Section 3.4 of this EA). As such, the issuance of an ITP for bald eagles and implementation of the ECP under the Proposed Action would not have a significant impact to these three species. The monarch butterfly has the potential to occur within the Project area; however, there are no proposed actions that would result from the issuance of

the bald eagle ITP or associated permit conditions that would alter habitat or otherwise impact potential monarch resources.

The Service's Intra-Service Section 7 Biological Evaluation documents if and how issuance of the permit (and associated implementation of the ECP and permit conditions under either Action Alternative) would affect federally listed species. Based on this evaluation, the Service determined that the Project May Affect, but is Not Likely to Adversely Affect the northern long-eared bat, piping plover, and rufa red knot, and would have No Effect on the eastern massasauga, eastern prairie fringed orchid, and Pitcher's thistle (Attachment C). Additionally, the issuance of this ITP would not be likely to jeopardize the monarch butterfly.

Should new information become available that shows the likelihood of additional listed species in the Project area, or the status of a species changes, the Applicant would coordinate with the Service to determine Project risk and whether any additional measures are recommended, such as operational minimization during high risk periods and/or coverage for take of federally listed species under Section 10 of the ESA through development and implementation of a Habitat Conservation Plan.

We do not find any significant impacts to known listed species in the Project area (northern long-eared bat, piping plover, rufa red knot, eastern massasauga, eastern prairie fringed orchid, or Pitcher's thistle), or the candidate species monarch butterfly through implementation of the Proposed Action.

4.1.5 Cumulative Effects Analysis

Take of bald eagles has the potential to affect the larger eagle population. Accordingly, the 2016 PEIS, which is incorporated herein by reference, analyzed the cumulative effects of permitting take of bald eagles in combination with ongoing unauthorized sources of human-caused eagle mortality and other present or foreseeable future actions affecting bald eagle populations. As part of the analysis, the Service determined sustainable limits for permitted take of bald eagles within each EMU. The bald eagle take that would be authorized by this permit does not exceed the EMU take limit for bald eagles, so would not significantly impact the EMU bald eagle population. The avoidance and minimization measures for bald eagles that would be required under the permit, along with adaptive management measures, are designed to further ensure that the permit is compatible with the preservation of bald eagles at the regional EMU population scale.

Additionally, to ensure that eagle populations at the local scale are not depleted by cumulative take in the local area, the Service analyzed in the 2016 PEIS the amount of take that can be authorized while still maintaining the LAP of eagles. In order to issue a permit, cumulative authorized take should not exceed 5% nor can cumulative unauthorized take exceed 10% of a LAP, unless the Service can demonstrate why allowing take to exceed that limit is still

compatible with the preservation of eagles. The ETP regulations require the Service to conduct an individual LAP analysis for each permit application as part of our application review.

We, therefore, considered cumulative effects to the LAP surrounding Apple Blossom to evaluate whether the take to be authorized under this permit, together with other sources of permitted take and unpermitted eagle mortality, may be incompatible with the persistence of the Project LAP. We incorporated data provided by the applicant, our data on other eagle take authorized and permitted by the Service, and other reliably documented unauthorized eagle mortalities (i.e., known eagle take at nearby wind farms, electrocution, and documented mortalities due to anthropogenic and natural causes) to estimate cumulative impacts to the LAP. The scale of our LAP analysis is an 86-mile radius around the project site for bald eagles. We conducted our cumulative effects analysis as described in the Appendix F of the ECPG (Service 2013).

4.1.5.1 Project Permit Proposed Take

We are proposing to issue a permit with a take of up to 151 bald eagles over the 30-year permit term, derived from our Collision Risk Model output of 5.01 bald eagles per year. We estimated take using the 80th quantile of the priors-only CRM fatality probability distribution. The Project LAP falls within the Mississippi Flyway EMU (as defined in the 2016 PEIS). Prior to the 2016 Eagle Rule, the Service managed bald eagles using different EMUs (defined in the 2009 Eagle Rule) that were smaller, geographically; as shown in the 2016 PEIS, the Project's LAP falls within the Great Lakes Region. Because the 2016 PEIS (Service 2016d) analyzed both the 2009 and 2016 EMUs, we used the bald eagle densities associated with the more site-specific Eagle Density Units for the Great Lakes Region EMU that was proposed in the 2016 draft PEIS for the LAP analysis, rather than the average bald eagle densities for the entire Mississippi Flyway EMU.

4.1.5.2 Local Area Population Benchmarks

As discussed in the Service's 2016 PEIS, if existing bald eagle permitted take exceeds 1 percent of the estimated population size within the LAP, additional take is of concern. If take exceeds 5 percent of the estimated population size within the LAP, additional take is considered inadvisable unless the permitted activity would actually result in a lowering of take levels. We estimate the number of bald eagles within the Project LAP to be 818.58 bald eagles. The 1% and 5% benchmarks of the Project LAP are 8.19 and 40.93 bald eagles, respectively.

The PEIS analyzed take of up to 5 percent of the LAP benchmark; take higher than this can be permitted but would require additional NEPA analysis and additional mitigation if necessary to maintain the persistence of local bald eagle populations throughout their geographic range.

To evaluate cumulative impacts to bald eagles, we followed the guidance provided in Appendix F of the ECPG (Service 2013). To quantify cumulative impacts of our permit issuance,

we used the Service's CET run on June 17, 2021. The CET calculates the LAP of bald eagles for an activity or project under consideration for a permit (focal project), and then summarizes existing and ongoing take that may affect the same LAP. This includes all known sources of bald eagle permitted take and bald eagle unpermitted take within the LAP and areas surrounding the LAP. The analysis allows for a contextual assessment of cumulative impacts to the LAP of bald eagles associated with the focal project, and provides a scientifically defensible decision process for determining the allowable levels of bald eagle take that can be permitted sustainably under each permit.

Because the number and location of bald eagle permitted take is precisely known in relation to the Project LAP, it can be quantified with a higher level of accuracy than bald eagle unpermitted take, which is based on opportunistic or incidental reports. For this reason, bald eagle permitted take and bald eagle unpermitted take are discussed separately in the sections below.

Bald Eagle Permitted Take

We ran the CET on June 17, 2021, using the most current data available on bald eagle permitted take. We found four permitted projects that had overlapping LAPs with the Project LAP. All four projects were for bald eagle nest disturbance permits, and no long-term bald eagle ITPs overlap with the Project LAP. The total overlapping take for one year was 1.24 bald eagles (0.15% of the Project LAP; Table 4). Overlapping take is estimated by taking the LAP of existing permitted projects and determining percent overlap with the Project LAP, and multiplying the authorized take by that percentage. If the Project is permitted to allow take of 5.00 bald eagles per year (151 total eagles over the 30-year permit term), this would be a cumulative impact of 6.24 bald eagles per year (0.76% of the Project LAP). This percentage of the Project LAP is below the 1 percent threshold; the effects of which have been analyzed in the PEIS and found to be within the preservation standard of bald eagles.

Table 4: Combined Existing Overlapping Permitted Take with Proposed Annual Take within the Project LAP

Results	Number of Bald Eagles	Percent of Project LAP
Total Overlapping Take	1.24	0.15
Project Predicted Take	5.00	0.61
Project + Total Overlapping Take	**6.24**	**0.76**

Bald Eagle Unpermitted Take

In order to account for bald eagle unpermitted take, we reviewed data from the Service's proprietary Injury and Mortality Database, accessed through the CET/LAP tool on June 17, 2021 These bald eagle mortality records represent the best available data on bald eagle unpermitted deaths. However, most records were obtained opportunistically or through incidental reporting, and not from systematic survey efforts to detect bald eagle mortalities using a statistically valid

protocol or sampling methodology, and therefore could underestimate bald eagle unpermitted take within the LAP. For most records, no searcher efficiency or carcass persistence trials were associated with the record, so a bias correction factor could not be applied. Some industries that impact bald eagles self-report bald eagle mortalities at a higher rate than other industries, and some types of bald eagle mortalities lend themselves better to discovery and reporting (e.g., road collisions). Additionally, the location and date of the fatality is not always known or exact. Finally, some recent bald eagle fatality records may not be available in the database due to on-going investigations by the Service's Office of Law Enforcement or backlog in entering mortality data. We recognize the inherent bias associated with these data and recommend this data be reviewed with a qualitative, rather than quantitative lens.

We reviewed known bald eagle deaths within the period from 2011 to 2020. Data were examined on both a temporal (year) and spatial (e.g., state, county) scale, as well as by suspected cause. We looked at the overlap of the Project LAP and the LAP of the bald eagle unpermitted take; thus, some bald eagle unpermitted take may have occurred within the distance of up to two times the Project LAP (172 miles; to account for the cumulative impact of overlapping LAPs; Figure 4).

When we examined bald eagle unpermitted take within the analysis area, we did not observe a consistent pattern. Michigan (where the majority of the 172-mile analysis area occurs; Figure 4) had a disproportionally higher number of bald eagle unpermitted take compared to other states and countries in the analysis area (Indiana, Ohio, and Ontario, Canada; Figure 4). Because reporting compliance may vary by state and we have no data from Canada to compare, we are not able to identify any patterns in the geographic distribution of bald eagle unpermitted take. We did not examine bald eagle unpermitted take on a finer-scale than state because our database does not always provide exact location within a county.

Between 2011 and 2020, there were 421 reported bald eagle deaths with an LAP that overlapped with the Project LAP. These mortalities are all considered to be unpermitted take. Of these reported mortalities, the largest source of known bald eagle unpermitted take was due to vehicle collision (135; 32.1%), followed by lead poisoning (59; 14.0%,). All but 26 (6.2%) were due to anthropogenic causes (e.g. vehicle collision, lead poisoning, electrocution).

Averaged over the 10-year period, the 395 reported anthropogenic mortalities yields 26.3 bald eagle deaths per year, which represents 3.2% percent of the Project LAP at a maximum. The bald eagle unpermitted take analysis does not provide percent overlap with the Project LAP. However, this amount of unpermitted take is well below the 10% threshold level for unpermitted take within the LAP identified in the Service's 2016 PEIS as requiring additional analysis.

Identified types of bald eagle unpermitted take allows for focus of future conservation efforts, if needed, within the Project LAP (e.g., lead abatement, vehicle-collision public information campaigns).

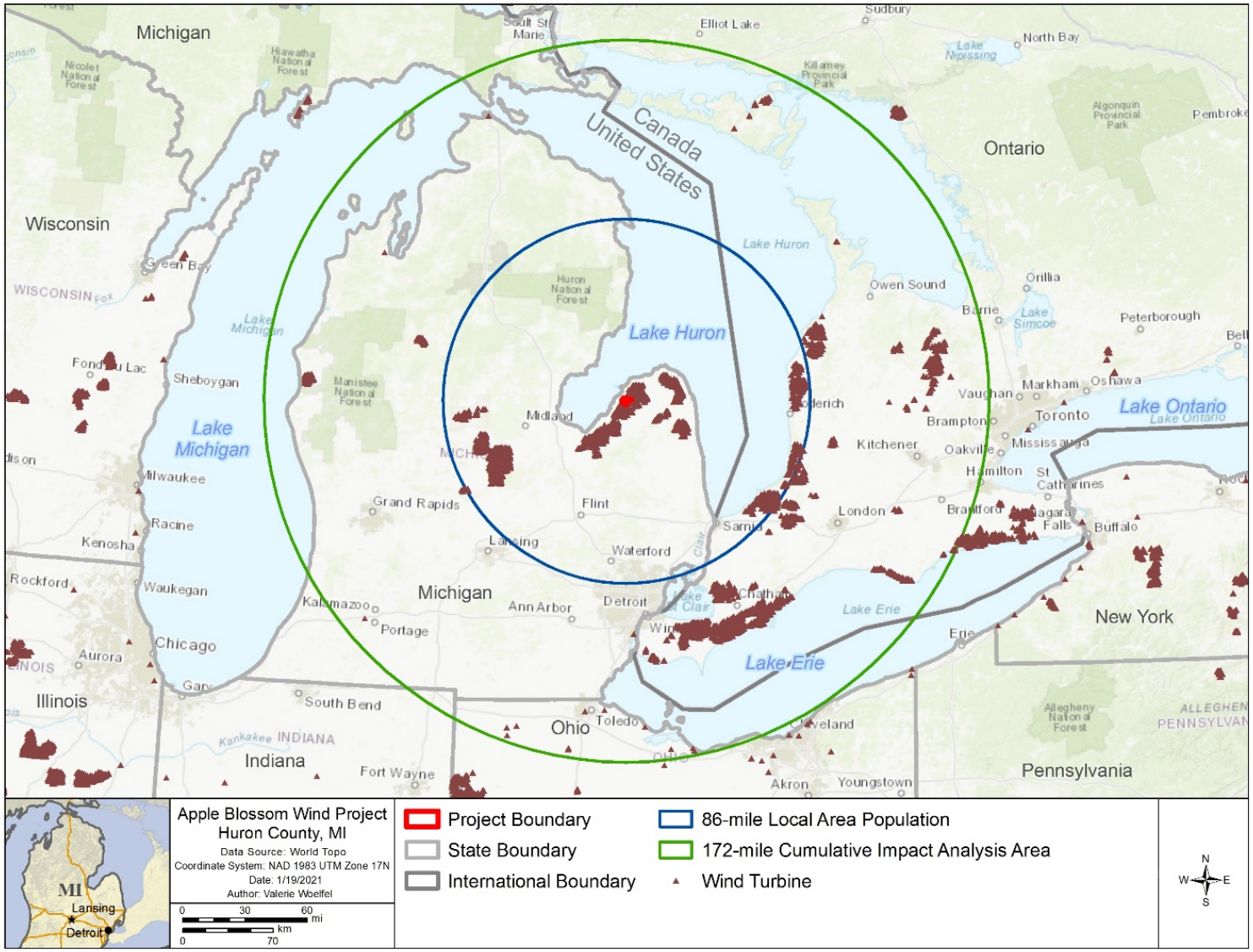

Figure 4. Other Wind Farms within the Local Area Population of Bald Eagles associated with the Apple Blossom Wind Project

4.1.5.3 Cumulative Effects not Analyzed through the Service's Project-Specific LAP Analysis

Michigan contains many operational windfarms, as well as windfarms that will be operational in the coming years. Within the Project LAP, there are currently an additional 43 wind facilities, totaling 1,677 additional turbines (Figure 4; Hoen et al. 2018; Natural Resources Canada 2021). It is feasible that bald eagles within the Project LAP may pass through areas containing these wind turbines. Portions of the Project LAP have experienced rapid wind facility development and we expect additional turbines will be constructed within the Project LAP. The anticipated mean build-out for wind power in Michigan by 2030 is 22 projects with a capacity of 5,771 megawatts (Service 2016c). No estimates are available for potential buildout in Canada.

Within a 172-mile radius of the Project (two-times the Project LAP, which is the extent to which another project's LAP may overlap with this Project LAP) there are 84 additional wind facilities totaling 1,716 additional turbines (Figure 4; Hoen et al. 2018, Natural Resources Canada 2021). It is feasible that the impacts to bald eagles from operation of the various wind farms could overlap, contributing to a cumulative landscape level impact. However, without site-specific information from bald eagle-related impacts of these projects, we cannot accurately assess the impact of this potential cumulative take.

Currently there are no pending permits with known take estimates either within or overlapping with The Project's LAP. The Service anticipates future receipt of applications for bald eagle disturbance and nest removal within the Project LAP. However, these permits tend to be short-term in duration (1–3 years), and we anticipate the level of impact from these permits will stay consistent every year. Currently, the amount of bald eagle take from short-term disturbance and nest removal permits overlapping the Project LAP is 5.32 bald eagles per year, with an overlapping impact of 1.24 eagles per year. Even with the anticipated impact of issuance of future long-term bald eagle take permits and yearly issuance of short-term disturbance and bald eagle nest removal permits, the Service's LAP and EMU take limits are not expected to be exceeded.

While existing unpermitted wind developments, additional future wind developments, and other activities may further increase bald eagle take within the Project LAP during the 30-year permit term, the Service cannot reasonably predict the resulting impacts to bald eagles of such projects when important aspects (e.g., size, location, configuration, lifespan, and site-specific risk to bald eagles) are currently unknown. There is no reasonable basis to consider such speculative impacts in this EA.

There are no nests within two miles of the Project turbines, therefore we do not anticipate impacts from our permit decision to impact individual nesting eagle pairs. Furthermore, the Applicant would coordinate with the Service if a new nest was found in or near the Project

throughout the permit term. Any new nests near the Project may be monitored for potential disturbance from Project operations, and to document nest success and productivity.

Golden Eagle

As described in Section 4.1.2, golden eagles were not observed during pre-construction avian surveys at the Project, documented occurrences near the Project are low, and the Project area provides limited foraging habitat and no suitable nesting sites for this species. As such, the estimated take for golden eagles (2.59 golden eagles per year, based on the 80th quantile of the priors-only CRM estimate) is expected to be an overestimate, due to the absence of golden eagle observations during the Project-specific eagle use surveys and our inability to incorporate that information into the CRM. Therefore, the Proposed Action's contribution to cumulative impacts would likely be negligible. However, if golden eagles were to occur in the area, risk could potentially be minimized by implementation of the conservation measures that would be adopted by the Proposed Action, as outlined in the Applicant's ECP (Section 8 of Attachment A). As stated above, the Service would work with the Applicant to update the CRM and estimated take rate for golden eagles using Project-specific monitoring data throughout the permit term, to ensure that potential impacts to golden eagles are sufficiently addressed.

Migratory Birds

As noted above in Section 4.1.3, fatality monitoring was conducted during three seasons (summer 2018, fall 2018, and spring 2019) after Project began commercial operation in 2017. Fatality rates for the Project were similar to publicly available rates for the USFWS Midwest Region, and impacts to migratory bird populations are expected to be similar to other wind facilities in the region (Tetra Tech 2019). The Proposed Action would include implementation of conservation measures outlined in the Applicant's ECP (Section 8 of Attachment A), which could further reduce impacts to migratory birds. As a result, the Proposed Action's contribution to cumulative impacts to migratory birds are expected to be minor.

Federally Listed and Candidate Species

As described in Section 4.1.4, the issuance of an ITP for bald eagles and implementation of the ECP would not have a significant or negative impact to the northern long-eared bat, piping plover, rufa red knot, eastern massasauga, eastern prairie fringed orchid, or Pitcher's thistle. Additionally, issuance of the ITP is not anticipated to jeopardize the continued existence of the candidate monarch butterfly. There is potential for northern long-eared bat, rufa red knot, or piping plover to occur in the project area during migration, however any risk to those species could potentially be minimized by implementation of some of the conservation measures that would be adopted by the Proposed Action outlined in the Applicant's ECP (Section 8 of Attachment A) and Section 9 of the BBCS (Attachment B).

4.1.6 Significance of Impacts

The take that would be authorized by this permit for the Project does not exceed 5 percent of the Project LAP and would not significantly impact the Project LAP for bald eagles. Known unpermitted take within the Project LAP does not exceed 10 percent and does not appear concentrated by region or type of take. Granting the 30-year permit would meet the purpose and need by permitting potential bald eagle take through operation of the Project and is consistent with the preservation standard as identified in the Service's 2016 Eagle Rule Revision.

4.1.7 Purpose and Need

The Proposed Action meets the purpose and need by issuing a bald eagle ITP to Apple Blossom Wind. The Applicant has met all the permit issuance criteria. This action complies with all applicable regulatory requirements, and is compatible with the preservation of bald eagles.

4.2 No-Action Alternative

Even though we would take no action on the permit application under the No-Action Alternative, the Project would likely continue to operate without authorization for take of bald eagles. Under this alternative, we assume that the Applicant would take some reasonable steps to avoid taking bald eagles, but the Applicant would not be protected from enforcement for violating the Eagle Act should take of a bald eagle occur. The total number of bald eagles taken under this Project would likely remain the same, conservatively estimated using the priors-only CRM at 5.01 bald eagles per year. However, the lack of requirements for the Applicant to follow the ECP, monitor the take of bald eagles over the life of the Project, and/or implement an adaptive management plan in response to unexpected levels or take or changes in the bald eagle population outside of the context of a permit would not allow for the Applicant and the Service to refine the take estimate over the life of the permit and would result in less certainty over the effect of the Project compared to the Proposed Action.

4.2.1 Bald Eagle

Beyond the one year of third-party monitoring that was conducted from June 2018 – May 2019 as part of BBCS commitments, no further standardized monitoring would occur under this alternative to identify direct impacts to bald eagles. Under this alternative, direct impacts of the Project on the bald eagle population would be based on reporting of incidental finds during regular O&M activities (or, as has previously occurred, finds reported by landowners, see Section 3.1.7), which would continue to inform the level of direct impacts of the Project on bald eagles.

Under this alternative, direct impacts of the Apple Blossom Wind Project on the bald eagle population over the 30-year life of the Project are expected to be up to 151 bald eagles. This take would not be offset by compensatory mitigation.

Given the estimated effects of this alternative (presumed use of some voluntary avoidance and minimization measures to reduce risk), it is likely that the actual take of bald eagles associated with the No-Action Alternative would be similar to what is estimated for the Proposed Action (although as stated in Section 4.1.1, it is anticipated that the monitoring and adaptive management that would occur under the Proposed Action could reduce take to less than 151 bald eagles over 30 years). Therefore, while the No-Action Alternative could potentially result in somewhat higher take of bald eagles than the Proposed Action, the conservative expected take amount (based on the priors-only CRM) would still be up to 151 bald eagles over 30 years, which is not expected to result in significant adverse effects to the bald eagle population. However, the lack of requirements for the Applicant to follow the ECP, monitor the take of bald eagles, or implement an adaptive management plan over the life of the Project outside of the context of a permit would result in less certainty of the Project's impact.

4.2.2 Golden Eagle

Under the No-Action Alternative, the Service would take no action on the permit application (for take of bald eagles) and no permit would be issued. Under this alternative, direct impacts of the Project on the golden eagle population would be identified based on reporting of incidental finds during regular O&M activities and/or by landowners. As stated above for bald eagles, we assume the Applicant would take some reasonable steps to avoid taking golden eagles, but the Applicant would not be protected from enforcement for violating the Eagle Act should take of a golden eagle occur. Also, the lack of monitoring and implementation of an adaptive management plan associated with issuance of a bald eagle ITP would result in additional uncertainty of the Project's impacts to golden eagles.

Although the current risk to golden eagles at this Project is unknown due to a lack of golden eagle observations in the Project-specific data, the conservative priors-only CRM estimate of 2.59 golden eagles per year provides a baseline mortality that could be expected under the No-Action Alternative. As stated above, this take estimate is likely a conservative overestimate, based on no golden eagles being observed during pre-construction surveys and no golden eagle fatalities being recorded during post-construction monitoring. Golden eagle risk may increase in the future should the golden eagle population increase (either in the EMU or LAP), and without implementation of eagle mortality monitoring associated with the Proposed Action, increased risk to golden eagles may go undocumented.

4.2.3 Migratory Birds

Under the No-Action Alternative, all Applicant-committed operational measures regarding minimizing risk to migratory birds as described in the BBCS (see Section 8 in Attachment B) would be followed, absent the issuance of a permit for the taking of bald eagles. Direct impacts of the Project on migratory bird populations were quantified through the year of standardized bird and bat mortality monitoring that occurred from June 2018 through May 2019. Impacts to migratory birds under the No-Action Alternative are assumed to be similar to those under the Proposed Action.

4.2.4 Federally Listed and Candidate Species

Under the No-Action Alternative, no significant impacts are expected to the six federally listed species whose known range currently overlaps the Project area. Similar to the Proposed Action, all Applicant-committed measures regarding minimizing risk to listed species, particularly birds and bats, as described in the BBCS (see Sections 6, 7, and 8 in Attachment B) would be followed, absent the issuance of a permit for the taking of bald eagles. Direct impacts of the Project on listed bird and bat populations were quantified during the year of standardized bird and bat mortality monitoring, which did not document mortality of any listed species. As noted above in Section 3.5, should new information become available that shows the likelihood of additional listed species in the Project area, or the status of a species changes, the Applicant would coordinate with the Service to determine Project risk and whether any additional measures are recommended, such as operational minimization during high risk periods and/or coverage for take of federally listed species under Section 10 of the ESA through development and implementation of a Habitat Conservation Plan.

Impacts to federally listed species (northern long-eared bat, piping plover, rufa red knot, eastern massasauga, eastern prairie fringed orchid, or Pitcher's thistle) and the candidate monarch butterfly under the No-Action Alternative are assumed to be similar to those under the Proposed Action.

4.2.5 Cumulative Effects

The cumulative effects of the No-Action Alternative are similar to that of the Proposed Action; the Project would continue to be operational and bald eagle take would likely be the same or similar to the conservative take levels estimated for the Proposed Action using the priors-only CRM (5.01 bald eagles per year). Predicted take of bald eagles at the Project would be sustainable at both the LAP and EMU levels, and therefore complies with the preservation standard set forth in the Eagle Act. However, any bald eagle take that occurs would not be authorized. Additionally, the absence of requirements for the Applicant to follow the ECP, monitor the take of bald eagles over the life of the Project, and/or implement an adaptive management plan in response to unexpected levels of take or changes in the bald eagle

population outside of the context of a permit would result in less certainty of eagle take compared to the Proposed Action.

The cumulative effects of the No-Action Alternative on golden eagles, migratory birds, and federally listed species would be similar to that of the Proposed Action. Because risk of take of golden eagles is unknown and golden eagle risk would not be refined using Project-specific mortality monitoring data under the No-Action Alternative, there would be less certainty over the actual impacts to the golden eagle population, and the potential for cumulative effects to golden eagles under the No-Action Alternative would likely be higher than under the Proposed Action. Similarly, post-construction mortality monitoring conducted from June 2018 through May 2019 did not indicate that impacts to bird or bat populations would be higher than impacts from other wind facilities in the region, and did not document any federally listed bird fatalities or any federally or state-listed bat fatalities. One state-listed bird fatality (merlin) was found during the standardized post-construction fatality monitoring. With the continued implementation of the BBCS, cumulative impacts to these resources are expected to be minor and similar to cumulative impacts under the Proposed Action.

4.2.6 Significance of Impacts

Under the No-Action Alternative, the Service would take no action on the permit application and no permit would be issued. Under this alternative, direct impacts of the Project on the bald eagle population would occur, likely at a similar rate as the Proposed Action because the Applicant is anticipated to take measures to minimize and avoid the take of bald eagles at the Project in order to minimize the risk of violating the Eagle Act. Under the No-Action Alternative, the take estimate for the 30-year life of the Project is up to 151 bald eagles (up to 26 bald eagles between each 5-year check-in). Similar to the Proposed Action, the No-Action Alternative would be compatible with the preservation of bald eagles, both within the EMU as well as the LAP. Based on the intensity and context of these effects and consideration of the elements associated with this alternative, the Proposed Action is not expected to result in significant adverse effects to the bald eagle population. However, there would be greater uncertainty around the actual number of bald eagles taken by the Project, and the Service would lose the ability to refine the our take estimate with eagle mortality data, as well as respond to changing conditions through adaptive management.

4.2.7 Purpose and Need

This alternative does not meet the purpose and need for the action because, by regulation (50 CFR 13.21), when in receipt of a completed application, the Service must either issue or deny a permit to the Applicant.

No additional alternatives were evaluated in detail in this EA.

4.3 Comparison of Effects of Alternatives

The effects of the No-Action Alternative and the Proposed Action are compared in Table 5.

Table 5: Comparison of the No-Action Alternative and the Proposed Action

	No-Action	Proposed Action (Issue Permit)
Eagle Take Levels	151 bald eagles over 30 years (26 bald eagles over each 5-year interval) 78 golden eagles over 30 years (13 golden eagles over each 5-year interval) No ability to update collision risk estimates Uncertainty over actual take levels	151 bald eagles over 30 years (26 bald eagles over each 5-year interval) 78 golden eagles over 30 years (13 golden eagles over each 5-year interval) Ability to update and refine collision risk take estimates
Avoidance and Minimization [1]	None required Applicant would likely implement some, but not all measures Service would have no reports as to efficacy of avoidance and minimization measures (AMMs)	Limit foraging opportunities by: Removing rock and brush piles that could create prey habitat within the Project Removing road-kill or other carcasses from within the Project Prohibiting food waste littering by employees
Monitoring	One year of post-construction mortality monitoring by a third party (completed) Operations staff would be trained to look for carcasses near turbines and report incidental observations for the life of the Project, but Service cannot use these mortalities to update model due to lack of bias trials, etc.	One year of post-construction mortality monitoring by a third party (completed) Eagle mortality monitoring by a third party would occur during Years 1, 2, 6, 11, 16, 21, and 26 of the permit term Operations staff to monitor the area around each turbine quarterly during years when third-party monitoring does not occur for the remainder of the permit term Searcher efficiency trials conducted for third-party monitors during Years 1, 2, 6, 11, 16, 21, and 26 and for operations staff for at least one year during each 5-year period of the permit term

Table 5: Comparison of the No-Action Alternative and the Proposed Action

	No-Action	Proposed Action (Issue Permit)
Adaptive Management[2]	None	Up to 10 estimated bald eagle fatalities within 5-year period – assess the cause and whether a management response is warranted and/or feasible Between 11 and 23 estimated bald eagle fatalities within 5-year period – above action plus consult with Service to evaluate cumulative monitoring effort to date to assess if take estimate is inflated by limitations in survey design, and to determine if immediate action, increased carcass removal programs and landowner education, or development of long-term action plan are warranted 24 or more estimated bald eagle fatalities within a 5-year period - above actions plus implement and test additional conservation measures (e.g., experimental measures, informed curtailment)
Data Collected by Service	Incidents involving an eagle would be reported within 24 hours of discovery	Annual monitoring report: Report of fatalities from 3rd party monitors conducting eagle mortality monitoring during Years 1, 2, 6, 11, 16, 21, and 26 Report of fatalities from monitoring conducted by operations staff during years third-party monitoring is not conducted Quarterly incident report in accordance with state Site Permit Reporting of injured bald or golden eagles, if found
Company Liability for Eagle Take	Yes	Bald eagles: No (if in compliance with permit conditions) Golden eagles: Yes

[1] A number of pre-construction avoidance and minimization measures (AMMs) were implemented, but because, the Project has already been constructed, we are only examining operational avoidance and minimization.

[2] Adaptive management is discussed in Section 8.4 of the Applicant's ECP (Attachment A) and in Section 4.1.1 of this EA. Because 5-year check-ins would likely adjust the permitted number, the number of bald eagle fatalities that trigger a change in action may also change. However, the adaptive management responses would stay the same.

5 Mitigation and Monitoring

5.1 Mitigation

For bald eagles: The Proposed Action incorporates measures to minimize and avoid to the maximum degree practicable, as required by regulation. To ensure that regional bald eagle populations are maintained consistent with the preservation standard, our regulations require that any take that cannot practicably be avoided and is above EMU take limits must be offset by compensatory mitigation. In this case, authorized take remains below the EMU take thresholds and no compensatory mitigation is needed to meet the Eagle Act preservation standard.

For golden eagles: The Applicant is not requesting take of golden eagles in this permit application. However, the Proposed Action incorporates measures to minimize and avoid impacts to the bald eagle to the maximum degree practicable, as required by regulation, which would also benefit golden eagles. To ensure that regional golden eagle populations are maintained consistent with the preservation standard, regulations require that any golden eagle take that cannot practicably be avoided and is above EMU take limits must be offset by compensatory mitigation at a 1.2 to 1 ratio. As golden eagle take limits for all EMUs were determined to be zero (Service 2016d), compensatory mitigation is necessary to offset any authorized take of golden eagles. No golden eagle mitigation would be provided under this action; therefore, permitted take levels of the eastern golden eagle EMU would not need to be adjusted.

5.2 Monitoring

As detailed in the *Post-Construction Eagle Fatality Monitoring Study Plan for the Apple Blossom Wind Project* (appended to the Applicant's ECP [Attachment A]), Apple Blossom Wind has proposed to monitor eagle fatalities using independent, third-party monitors that report directly to the Service during Years 1 and 2 of the permit term. During Years 3, 4, and 5 of the permit term, O&M staff would conduct eagle mortality monitoring at the Project. O&M staff would scan, using binoculars, every turbine on a quarterly basis out to 150 m from a vehicle. Searcher efficiency trials of the O&M staff would be conducted by the third-party monitors in Year 3, and raptor carcass persistence rates measured in Years 1 and 2 would be used to estimate bald eagle fatality numbers for these monitoring periods.

For the remaining 25 years of the permit term, third-party monitoring would occur at 5 year intervals (Years 6, 11, 16, 21, and 26), which would follow the same general approach described below for Years 1 and 2 (see Section 9 and Appendix 3 of Attachment A). In the years when third-party monitoring is not conducted in the remaining 25 years of the permit term, O&M staff would visit each turbine regularly; during visits, the staff would inspect roads, pads, and any other cleared area in the immediate vicinity of turbines visible from their vehicle. O&M searcher efficiency would be estimated by third-party monitors for at least one year during each 5-year period of the 30-year permit term, and carcass persistence rates measured during the third-party

monitoring that would occur once during every 5-year period would be used to estimate bald eagle fatality numbers for these O&M monitoring periods. Because searcher efficiency may vary among searchers, searcher efficiency would be estimated for any new O&M staff if they begin work more than one year before the next scheduled searcher efficiency trials. If eagle remains are found by O&M staff, they would be reported to the Service within 48 hours and coordination would occur to determine if any additional action may be appropriate. The permit conditions would detail the appropriate parties to notify should eagle remains be found.

For the third-party monitoring (in Years 1, 2, 6, 11, 16, 21 and 26 of the permit term), all Project turbines would be checked twice monthly, although searches may be discontinued when crops are greater than 12 inches high and/or significantly obstruct the view. Biologists would visually scan, using binoculars, out to a distance of 150 m from each turbine during these searches. Searcher efficiency trials and carcass persistence trials would occur during these third-party monitoring years in order to provide sufficient statistical data to estimate the number of bald eagle fatalities.

The bald eagle take estimate that results from monitoring would be used to estimate the take of bald eagles; these estimates would be used to determine if adaptive management may be necessary, per the process described in Table 3 of this EA.

Because long-term data is not available on the efficacy of similar monitoring plans, the Service and the Project would coordinate at the conclusion of each year that formal monitoring occurs to review data collected (including systematic searches, bias trials, and scavenging rates). If results reveal mortality rates above what was predicted, or uncertainty exists regarding the confidence of estimated mortalities, the Service and the Project would determine whether additional and/or different mortality monitoring methods are needed for the duration of the permit term.

At 5-year intervals, the Service would review the bald eagle fatality data and other pertinent information, as well as information provided by Apple Blossom Wind and independent third-party monitors, assessing whether Apple Blossom Wind is in compliance with the terms and conditions of the permit and has implemented all applicable adaptive management measures specified in the permit, and ensuring bald eagle take has not exceeded the amount authorized within that time frame. We would update fatality predictions, authorized take levels, and compensatory mitigation, as needed, for future years of the permit. If authorized take levels for the period of review are exceeded in a manner or to a degree not addressed in the adaptive management conditions of the permit, based on the observed levels of take using approved protocols for monitoring and estimating total take, the Service may require additional actions including, but not limited to: adding, removing, or adjusting avoidance, minimization, or compensatory mitigation measures; modifying adaptive management conditions; modifying monitoring requirements; and suspending or revoking the permit.

As described in Section 4.1.1 of this EA and Section 9.3 of the ECP (Attachment A), the Applicant would coordinate with the Service if a new bald eagle nest is observed or reported in the vicinity of the Project. If coordination with the Service warrants further monitoring, utilization/flight path mapping surveys may occur, through coordination with the Service, so that further adaptive management responses, if appropriate, may be identified.

6 List of Preparers

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Attachment A
Eagle Conservation Plan

Available online at:
https://www.fws.gov/midwest/eagle/permits/pdf/AB_ECP.pdf

Attachment B
Bird and Bat Conservation Strategy

Available online at:
https://www.fws.gov/midwest/eagle/permits/pdf/AB_ECP_App2_BBCS.pdf

Attachment C
Intra-Service Section 7 Biological Evaluation

Available online at:
https://www.fws.gov/midwest/eagle/permits/pdf/AB_EA_AttC_S7.pdf

Attachment D
Eagle Collision Risk Model

Available online at:
https://www.fws.gov/midwest/eagle/permits/pdf/AB_EA_AttD_CRM.pdf