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March 8, 2016

Colonel Andy Stephan
200th Red Horse Squadron Commander
1200 N. Camp Perry E. Road
Port Clinton, Ohio
43452-9577

Dear Colonel Stephan,

TAILS# 03E15000-2016-F-0180

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion for the Proposed Wind Turbine on the Ohio Air National Guard Station, Camp Perry, in Ottawa County, Ohio and its effects on the federally listed rufa red knot (*Calidris canutus rufa*), piping plover (*Charadrius melodus*), and Kirtland's warbler (*Setophaga kirtlandii*) in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). We received your request for formal consultation on October 20, 2015.

We submitted a draft Biological Opinion to you for review on January 13, 2016 and received your agency's comments on January 27, 2016. Upon considering the comments we have made the appropriate modifications and clarifications in the final document.

This concludes formal consultation on the Camp Perry Proposed Wind Turbine. If you have any questions regarding this consultation, please contact Keith Lott, of my staff, at (614) 416-8993, ext.31 or Keith.Lott@fws.gov.

Sincerely,

Dan Everson
Field Supervisor

Biological Opinion and Incidental Take Statement
for the Proposed Wind Turbine
on the Ohio Air National Guard Station, Camp Perry, Ohio

March 8, 2016

Prepared by:

U.S. Fish and Wildlife Service
Ohio Ecological Services Field Office
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INTRODUCTION

This document is the U.S. Fish and Wildlife Service’s (Service’s) biological opinion based on our review of the proposed wind turbine installation at the Ohio Air National Guard (ANG) Station, Camp Perry, Ohio, and its effects on the rufa red knot (*Calidris canutus rufa*), piping plover (*Charadrius melodus*), and Kirtland’s warbler (*Setophaga kirtlandii*) per section 7 of the Endangered Species Act of 1973, as amended (Act, 16 U.S.C. 1531 *et seq.*). Your October 20, 2015 request for formal consultation was received on October 23, 2015.

This biological opinion is based on information provided in the December 2015 Biological Assessment (Vernadero Group 2015), telephone conversations, and other sources of information. A complete administrative record of this consultation is on file at the Service’s Columbus, Ohio Ecological Services Field Office.

Consultation History

ANG determined that the wind turbine project is likely to adversely affect the rufa red knot, piping plover, and Kirtland’s warbler and submitted a request for initiation of formal consultation to the Service on October 20, 2015. In a November 12, 2015 response letter, the Service agreed that the initiation package was complete in accordance with 50 CFR §402.14, and that the timeframe for formal consultation had begun effective October 20, 2015.

Table 1. Consultation History

Date	Event
Oct. 24, 2007	ANG consultants Curry & Kerlinger send letter to Service requesting input on proposal to install wind turbines at Camp Perry.
Dec. 4, 2007	Service letter to consultants Curry & Kerlinger regarding early coordination on proposed wind turbine at ANG. Comments addressed the following topics: proximity to Ottawa National Wildlife Refuge; bald eagle; endangered species; and migratory birds.
Dec. 2009	Onsite meeting between Service and ANG.
Feb. 23, 2010	Conference call between Service and ANG
April 8, 2010	Service letter to ANG regarding pre-construction monitoring for bald eagle.
May 17, 2010	Service receives Draft Environmental Assessment (EA) for the proposed wind turbine at Camp Perry.
June 16, 2010	Service letter to ANG providing comments on the Draft EA for the proposed wind turbine. Comments addressed the following topics: impacts to migratory birds; impacts to federally-listed endangered and threatened species; impacts to bald eagles; and compliance with National Environmental Policy Act (NEPA).
July 31, 2012	Meeting between Service, ANG, U.S. Representative Kaptur, Consultants, Univ. of Toledo, and Bowling Green State Univ. Discussion addressed: status of EA; bald eagles and migratory birds; bat surveys that were conducted; radar data collected; and post-construction monitoring.
Aug. 28, 2012	Service receives Final EA for the proposed wind turbine at Camp Perry.

Sept. 5, 2012	Meeting between Service and ANG to discuss: final EA; measures to minimize impact to endangered species, bald eagles, and migratory birds; and monitoring and adaptive management.
Sept. 25, 2012	Service letter to ANG providing comments on the Final EA for the proposed wind turbine. Comments addressed the following topics: Endangered species impacts; bald eagle impacts; and migratory bird impacts.
Aug. 23, 2013	Service receives email from ANG with Finding of No Significant Impact (FONSI) and Addendum to the Final EA.
Sept. 10, 2013	Service letter to ANG regarding FONSI and Addendum to the Final EA. Comments addressed Service's concern that take of bald eagles is likely, and that take of Kirtland's warbler and piping plover may occur unless minimization measures are implemented. Additional comments on migratory birds, monitoring, and un-listed bat species are also provided.
Sept. 13, 2013	Service email to ANG regarding piping plover observations at Camp Perry.
Jan. 8, 2014	Service receives Notice of Intent to Sue from Meyer Glitzenstein & Crystal, relative to the Camp Perry wind energy project.
June 11, 2014	Meeting between Service and ANG and Ohio Department of Natural Resources (ODNR). Discussed ANG's intent to develop a new EA; siting alternatives; Bald and Golden Eagle Protection Act; Migratory Bird Treaty Act; Endangered Species Act; and engaging stakeholders.
March 2, 2015	ANG letter to Service, inviting Service to be a cooperating agency under NEPA in development of a new EA for the project.
April 7, 2015	Service letter to ANG, declining invitation to be a cooperating agency under NEPA, but committing to work closely on issues of concern to the Service.
Oct. 20, 2015	ANG letter to Service requesting formal consultation under Section 7 of ESA, accompanied by Biological Assessment (BA).
Oct. 30, 2015	Conference call between Service and ANG to address questions on BA.
Nov. 12, 2015	Service letter to ANG, indicating that initiation package was complete, and that the timeframe for formal consultation had begun effective October 20, 2015. Letter also provided suggested revisions to content of BA.
Dec. 2, 2015	ANG email to Service transmitting revised final BA.
Jan. 13, 2015	Service email to ANG with the Draft BO.
Jan. 27, 2015	Comments on Draft BO received from ANG.

The Service has assessed the avoidance and minimization measures included in the BA (Vernadero Group 2015) to address the potential for take of the Northern long-eared bat (*Myotis septentrionalis*), a federally threatened species, and the Indiana bat (*Myotis sodalis*), a federally endangered species. No critical habitat for either species will be impacted by this project. We have concluded that the minimization measures, primarily feathering the turbine until a cut-in wind speed of 6.9 m/s is reached at night, from March 15-October 31, are sufficient to avoid take of these species. Thus, ANG has determined that the project is not likely to adversely affect these species, and the Service concurs with this determination. Should, during the term of this action, additional information on these species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, consultation with

the Service should be reinitiated to assess whether the determinations are still valid. These species will not be addressed further in this biological opinion.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The federal action evaluated in this biological opinion (BO) is the construction, operation, and maintenance of a single 600 kilowatt (kW) Vestas 44 wind turbine at the Camp Perry ANG site, north of State Route 2, Erie Township, Ottawa County, Ohio (Figure 1).

The Service is issuing this BO pursuant to section 7 of the ESA. Direct and indirect effects of the federal action (construction and operation of the wind turbine) and the interrelated or interdependent activities are analyzed to ensure they are not likely to jeopardize the continued existence of federally listed or proposed endangered or threatened species. Indirect effects of the federal action include, "...effects that are caused by or result from the action, are later in time but are reasonably certain to occur..." Interdependent actions have no independent utility apart from the proposed action, and interrelated actions are part of a larger action and depend on the larger action for their justification (50 CFR §402.02).

Camp Perry ANG is north of State Route 2 in the Erie Township portion of Ottawa County, Ohio. The ANG is approximately 5 kilometers west of Port Clinton, near the mouth of the Portage River, 1.6 km southwest of Lake Erie and approximately 6.5 km northwest of Sandusky Bay.

The following project description is taken primarily from the BA (Vernadero Group 2015):

The proposed wind turbine would be located entirely within the Camp Perry ANG property boundary and would be erected within the southern lawn of the facility (Figure 1). The southern lawn encompasses 7,632 square meters (m²) of previously disturbed and routinely maintained land. Vehicles and equipment would be staged on this lawn during construction or within the nearby parking lots which cover approximately 5,800 m² near the proposed project site.

The foundation for the wind turbine occupies 16 m² and has already been constructed. A single 600 kW Vestas 44 wind turbine is proposed for construction. This model has a rotor diameter of 44 meters (m) and a tower height of 40 m. The rotor has three blades, and its swept area would cover 1,520.53 m². The maximum height of the rotor tip on any single blade in the 12 o'clock position would be 60.5 m above ground level (agl). In the 6 o'clock position the rotor tip would be as low as 26 m agl. The turbine would be mounted on a tubular steel tower with lighting that will comply with the Federal Aviation Administration's (FAA's) *Obstruction Marking and Lighting (AC 70/7460-1K)*. A flashing red light emitting diode (LED) would be placed at the top of the wind turbine tower. All electrical interconnection lines are internal to the turbine and

would connect underground to an existing onsite electrical substation for Camp Perry ANG. No electrical aboveground lines will be exposed for the turbine. The ANG expects the turbine to be operational for 25 years.

Camp Perry proposes to construct the wind turbine as part of a Phase IV Renewable Energy Demonstration Project. Because the wind turbine will be operated as a Renewable Energy Demonstration Project, goals for power generation are not necessary for this turbine. The proposed 600 kW Vestas 44 turbine can operate at a cut-in wind speed (the minimum speed in which it can operate) of 4 m per second (m/s). The cut-out wind speed (the maximum wind speed it can operate under) for this turbine model is 20 m/s. The proposed turbine would be able to generate electricity at a maximum capacity of 16 m/s based on its wind speed rated performance standards (Bundesverband WindEnergie 2015). To minimize potential bat and bird strikes, Camp Perry ANG proposes avoidance and minimization measures that would stop the rotation of the rotor blades during certain periods of time, depending on factors including wind speed, season, and time of day/night.

Routine maintenance and service of the proposed wind turbine would be performed in accordance with the manufacturer's guidelines. Routine maintenance will ensure the turbine is operating properly, minimizing wear and tear on the equipment and reducing downtime due to breakdowns and repairs. Unplanned maintenance would be carried out should there be an equipment malfunction.

Conservation Measures

The ANG has implemented the following design considerations to avoid or minimize the potential impacts to local natural resources from the construction of the wind turbine (USFWS 2012b):

- The wind turbine's design does not include guy wires, which reduces the likelihood of injury or death of birds and bats due to collision and minimizes the area available for raptors to perch. Additionally, the turbine is a monopole, which reduces the potential for perching.
- The wind turbine would be built in a previously disturbed area, thereby eliminating the potential for habitat loss during construction.
- Limiting construction to one turbine will reduce the project footprint and the potential for strikes. The initial project concept included three turbines; however, this was revised as a result of coordination with the USFWS.
- All interconnection wires would be internal to the turbine. Electrical lines connecting the turbine to an existing substation on Camp Perry would be installed underground, thereby reducing or eliminating potential risks of electrocution and collision associated with overhead electrical lines.

- The design uses a FAA-approved red LED strobe light to reduce collisions by birds that are attracted to steadily burning lights.

ANG has also completed the following pre-construction monitoring measures:

- ANG has conducted 2.5 years of avian and bat surveys using a MERLIN avian radar system to collect data on local bird and bat movements.
- ANG conducted a bat mist net survey in a nearby woodlot to document bat species diversity and identify potential risks to federally listed bats.

ANG has committed to implement the following minimization measures:

- The ANG would implement scalable operational controls during periods of higher bird and bat activity and when weather conditions could potentially increase bird and bat activity near the operational zone of the turbine. This includes adjusting the cut-in speed at 6.9 m/s as suggested by the USFWS (2014b) and establishing protocols for cessation of operations to reduce biologically significant impacts, particularly during the nighttime and spring and fall migration periods (Table 2).
- The ANG would maintain the southern lawn regularly to help reduce prey populations that could attract raptors.
- ANG will remove and properly dispose of any animal carcasses not part of the post-construction monitoring studies found within 100 m of the turbine in conformance with local regulations.
- The ANG would light buildings and structures within a half-mile of the turbine to the minimum level possible, while still complying with facility security requirements, to reduce prey (insects) attracted to the lights. The street lighting and lighting at the closest buildings have already been changed to LED high-color temperature lights to reduce attraction of insects in and around the area.

Table 2. Operational curtailment regimes.

Species	Operational control	Dates of curtailment	Desired outcome
Indiana and northern long-eared bats	Curtail turbines at night when wind speed are less than 6.9 m/s.	15 March – 31 October	Avoid take of these two species.
Piping plover	Full curtailment at night.	1 April – 31 May, and 15 July – 31 October	Minimize potential impacts
Red knot	Full curtailment at night.	1 April – 31 October	Minimize potential impacts
Kirtland's warbler	Full curtailment at night.	22 April – 1 June, and 15 August – 15 October	Minimize potential impacts

The ANG would conduct post-construction monitoring for at least two years to document any take of special status species, migratory birds, or eagles. This monitoring would follow the Ohio Department of Natural Resources single-turbine protocol at a minimum.

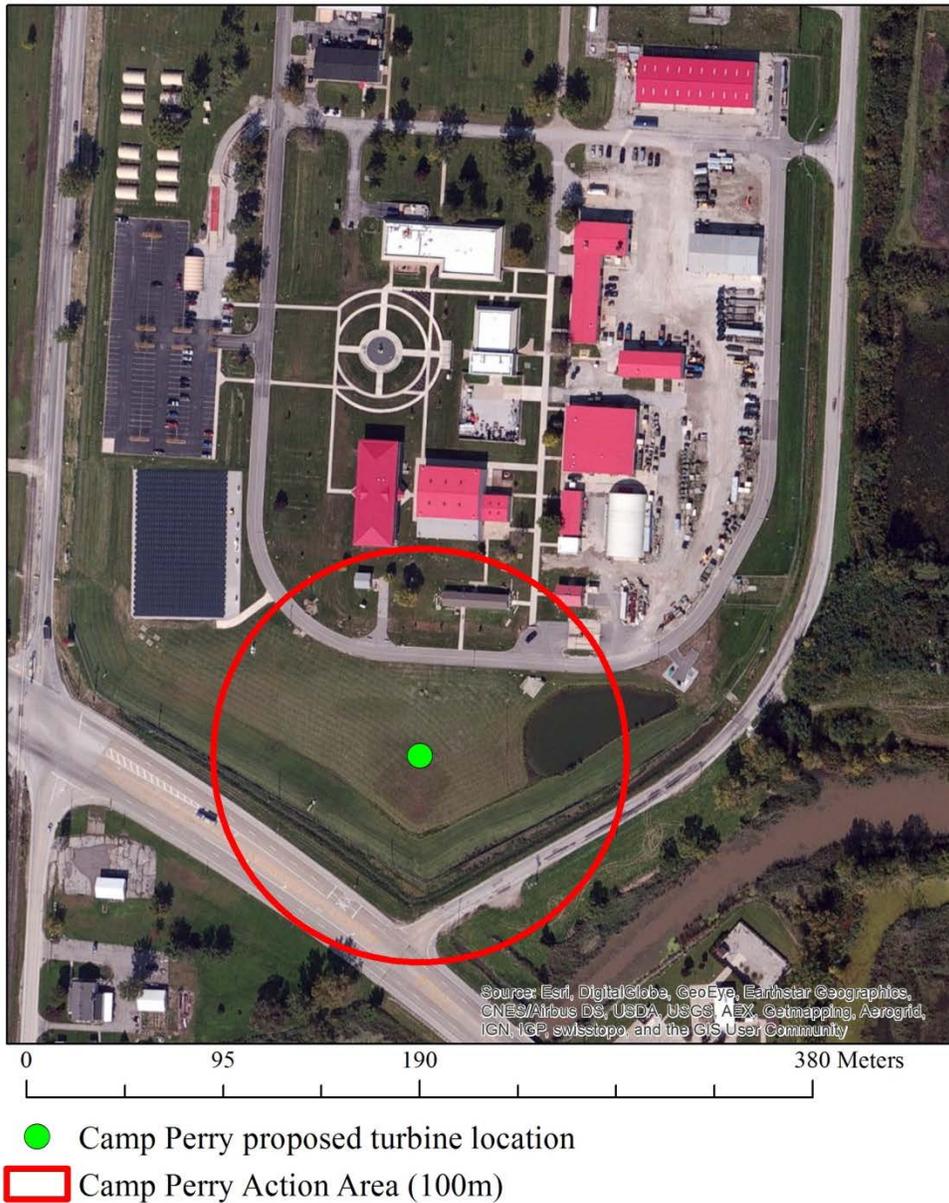
Action Area

In 50 CFR §402.02 “Action Area” is defined as, “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action.” The Action Area is not limited to the footprint of the action and should consider the effects to the environment resulting from the action. Within a set Action Area, all activities that can cause measurable or detectable changes in land, air, and water or to other measurable factors that may elicit a response in the species or critical habitat are considered. The Action Area is not defined by the range of the species that would be impacted; rather it is defined by the impacts to the environment that would elicit a response in the species (USFWS and NMFS 1998). Therefore, the Action Area includes the on the ground footprint of the turbine and the geographic extent of the area that could be affected by the construction, operation, and maintenance of the turbine either directly, indirectly, or through interrelated or interdependent actions.

Since the base of the turbine has already been installed, significant amounts of additional ground disturbance are not expected. Of the project activities, noise from turbine construction and operation is expected to result in the most far reaching changes to the natural environment. The estimated ambient noise level at the turbine location on Camp Perry ANG is 50 decibels (dBA). The 50 dBA ambient level is based on that of a typical road with heavy traffic (Ohio Department of Transportation 2006), which would be indicative of noise associated with State Route 2, approximately 70 m from the base of the turbine. Based upon noise measurements on a similar model turbine (Vestas V47-660kw; Vestas 2003) sound levels generated by the turbine are expected to be reduced to ambient levels (50 dBA) at a distance of 100 m from the turbine (Ohio Department of Transportation 2006).

The construction, maintenance, and operation of the turbine will result in direct effects and indirect effects throughout the project area and the surrounding area up to 100 m from the base of the turbine. Therefore, the Action Area for this consultation extends from the base of the turbine, to a distance of 100 m along the ground, and 60.5 m vertically (the maximum height of the turbine with the blade oriented at the 12 o’clock position). The Action Area encompasses approximately 7.72 acres (Figure 1).

Figure 1. Action Area



The Action Area is comprised primarily of mowed grass and paved surfaces. There is a portion of a retention pond within the Action Area, and three trees (Table 3). Most of the Action Area is owned and managed by Camp Perry ANG. The Action Area also encompasses a portion of State Route 2, a four-lane highway owned by the Ohio Department of Transportation. Thus all of the Action Area is owned by federal or state government agencies.

Table 3.

Land cover	Percent coverage
Developed open space	24%
Developed low intensity	31.5%

Developed medium intensity	42.6%
Developed high intensity	1.9%

The area surrounding the Action Area is comprised of a mix of natural and developed lands. The entire Camp Perry Air National Guard Station is 59 acres in size, and is mostly comprised of buildings, roads, and maintained grass. The area south of Camp Perry is predominately agricultural, with the Republic Services Ottawa County Landfill approximately 0.5 miles to the south (Figure 2). Camp Perry abuts Lake Erie to the north, and a portion of Ottawa National Wildlife Refuge to the east. To the west there is an approximate 80 acre forest block and the Lake Erie Business Park (a commercial development).

Figure 2. Proposed turbine location and surrounding area.



STATUS OF THE SPECIES

The proposed turbine locations lies within the range of the federally listed Indiana bat ^E, Kirtland's warbler ^E, piping plover ^E, northern long-eared bat ^T, eastern prairie fringed orchid ^T (*Platanthera leucophaea*), Lakeside daisy ^T (*Hymenoxys herbacea*), rufa red knot ^T (*Calidris canutus rufa*), eastern massasauga ^{PT} (*Sistrurus catenatus*), Lake Erie watersnake ^{SC} (*Nerodia sipedon insularum*), and bald eagle ^{SC} (*Haliaeetus leucocephalus*)¹. The Action Area lacks suitable habitat for these species, but there is the potential that listed birds or bats may be struck by this turbine as they fly through the airspace surrounding the turbine. Camp Perry ANG has agreed to implement measures to avoid take of listed species of bats (Indiana bat and northern long-eared bat), therefore they will not be considered further in this BO. The bald eagle is no longer listed, though still protected under the Bald and Gold Eagle Protection Act. The U.S. Fish & Wildlife Service has a separate process to address impacts to bald eagle, therefore that species will not be addressed in this BO. This BO will address federally listed birds that have the potential to collide with the turbine when flying through the airspace surrounding the turbine.

Rufa Red Knot

Species Description: The rufa red knot is a medium-sized shorebird about 9 to 11 inches (in) (23 to 28 centimeters (cm)) in length. Additional information on this species' biology or threats can be found with the 2014 Rufa Red Knot Final Rule (79 FR 73706).

Life History and Biology: The red knot migrates annually between its breeding grounds in the Canadian Arctic and several wintering regions, including the Southeast United States (Southeast), the Northeast Gulf of Mexico, northern Brazil, and Tierra del Fuego at the southern tip of South America (79 FR 73706). During both the northbound (spring) and southbound (fall) migrations, red knots use key staging and stopover areas to rest and feed (USFWS 2014a). Shorebird migration typically occurs at night, and during the day the birds stopover to rest, though they will make short distance flights during the day, from one patch of habitat to another. Migration stopover habitat is typically comprised of beaches and mudflats.

Threats: Threats to the red knot from habitat destruction and modification are occurring throughout the entire range of the subspecies. These threats include climate change, shoreline stabilization, and coastal development, exacerbated regionally or locally by lesser habitat-related threats such as beach cleaning, invasive vegetation, agriculture, and aquaculture (USFWS 2014a).

Rangewide Status: Within the Final Rule it was determined that an overall, sustained decline of red knot numbers occurred at Tierra del Fuego and Delaware Bay in the 2000s, and that the red knot populations may have stabilized at a relatively low level in the last few years. And while sufficient data did not exist throughout the wintering and stopover range, declines at these two sites likely have driven an overall population decline.

¹ E: Endangered, T: Threatened, PT: Proposed threatened, SC: Species of Concern

Status in Ohio: Red knots are an annual migrant in small numbers in Ohio. The vast majority of observations of this species in Ohio are from along the shoreline of Lake Erie. Other observations are along large waterbodies such as lakes and reservoirs. Red knots have a prolonged migration and may occur in Ohio anytime between 1 April – 31 October. Red knots have been documented in Ottawa County, along the shore of Lake Erie within 1.2 miles of the project area (Figure 3).

Critical Habitat: No Critical Habitat has been designated for this species at this time.

Conservation Needs: The species' conservation needs define what is needed in terms of reproduction, numbers, and distribution to ensure the species is no longer in danger of extinction. The conservation needs should be defined in the species' recovery outline or plan. Relative to the migration period, conservation of important stopover habitat and ensuring food availability is key to success during migratory periods (USFWS 2014a).

Piping Plover

Species Description: Piping plovers are a small, stocky shorebird that has a sand-colored upper body, a white underside, and orange legs. During the breeding season, adults have a black forehead, a black breast band, and an orange bill. Additional information on this species' biology or threats can be found with the 2009 Piping Plover 5-Year Review (USFWS 2009).

Life History and Biology: Piping plovers are migratory birds. The Great Lakes population is known to nest primarily in Michigan, Wisconsin, and Ontario, Canada. These birds typically over-winter along the southeastern U.S. Atlantic Coast. Piping plovers use wide, flat, open, sandy beaches with very little grass or other vegetation during both nesting and winter seasons. During migration piping plovers are often documented stopping over along the shores of inland lakes and reservoirs.

Threats: Primary threats to this species include the loss and/or modification of habitat in their breeding and wintering grounds. This includes shoreline development, disturbance (beach nourishment, stabilization projects, or beach cleaning), sand mining, etc.

Rangewide Status: The Great Lakes piping plover population, which has been traditionally represented as the number of breeding pairs, has increased since the completion of the recovery plan in 2003 (Stucker et al. 2003; Stucker and Cuthbert 2004; Westbrook et al. 2005; Cuthbert and Roche 2006, 2007). The Great Lakes piping plover recovery plan documents the 2002 population at 51 breeding pairs (USFWS 2003). The most recent census conducted in 2008 found 63 breeding pairs, an increase of approximately 23% (USFWS 2009). In addition, the number of non-nesting individuals has increased annually since 2003.

Status in Ohio: Piping plovers are an annual migrant in small numbers in Ohio. The vast majority of observations of this species in Ohio are from along the shoreline of Lake Erie. Other observations are along large waterbodies such as lakes and reservoirs. Piping plovers typically pass through Ohio in 1 April – 31 May, and 15 July – 31 October. Piping plovers have been documented in Ottawa County, along the shore of Lake Erie within 1.3 miles of the project area (Figure 3).

Critical Habitat: Critical Habitat was designated for the Great Lakes population in 2001 (USFWS 2001), while a different rule-making determined critical habitat for the Northern Great Plains population in 2002 (USFWS 2002). There are two sites of Critical Habitat in Ohio; these are at Mentor Headlands Beach and Sheldon Marsh (approximately 21 and 91 miles away respectively).

Conservation Needs: Maintaining and improving breeding grounds, while preserving stopover habitat (USFWS 2009).

Kirtland's Warbler

Species Description: The Kirtland's warbler is a relatively large, long-tailed and heavy-billed wood warbler, measuring approximately 14 cm in length and 12-15 g in weight (Mayfield 1960; Walkinshaw 1983; Dunn and Garrett 1997). The plumage is generally bluish-gray on the upperparts and heavily streaked with black on the back. The throat, breast and belly are lemon-yellow in color and streaked in black on the sides and flanks, becoming white on the undertail coverts.

Life History and Biology: The Kirtland's warbler nests only in young jack pine forests growing on a special type of sandy soil. The warblers prefer to nest in forests that are about 80 acres (roughly 60 football fields) or larger with numerous small, grassy openings. Kirtland's warblers prefer to nest in groups. They build their nests only on the ground among grass or other plants like blueberry bushes. The jack pine trees in its nesting area must be just the right height (about 5 to 16 feet tall) and the trees must be spaced to let sunlight through to the ground. Kirtland's warblers nest in Michigan, Wisconsin, and Ontario. In the fall they migrate to the Bahamas, and will return in the spring (April-May). Stopover habitat for Kirtland's warblers is typically comprised of deciduous scrub/shrub vegetation.

Threats: The ultimate limiting factor on the nesting population is the special habitat requirement of young jack pine forests. Historically, wildfires were the most important factor in the establishment of natural jack pine forests and Kirtland's warbler nesting habitat. However, modern wildfire suppression has greatly altered the natural disturbance regime that generated Kirtland's warbler breeding habitat for thousands of years (Byelich et al. 1985; Cleland et al. 2004). Other factors have adversely affected the Kirtland's warbler, such as nest parasitism by brown-headed cowbirds. Cowbird control has been conducted since 1972.

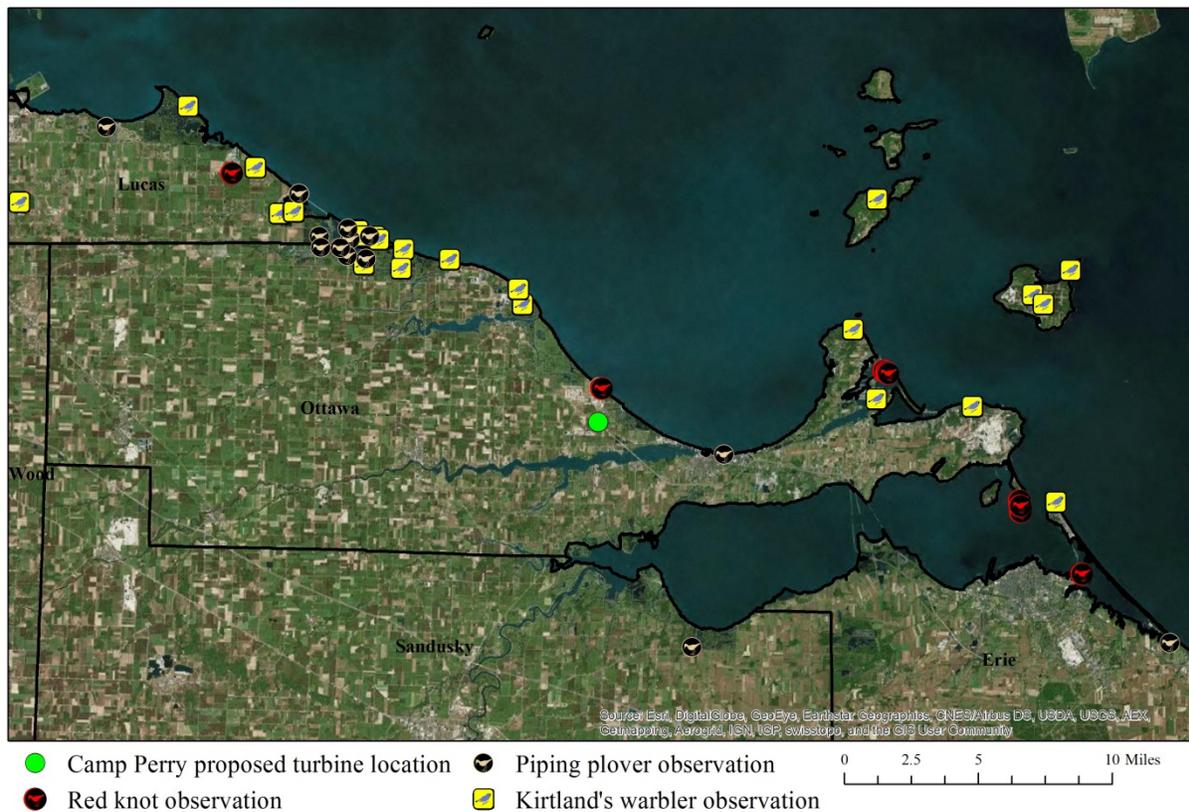
Rangewide Status: Following listing under the Endangered Species Act, the Kirtland's warbler population level remained relatively stable at approximately 200 singing males but experienced record lows of only 167 singing males in 1974 and again in 1987. Shortly after 1987, the population began a dramatic increase, reaching a record high of 1,828 singing males in 2011.

Status in Ohio: Kirtland’s warblers do not breed within Ohio. But, outside of Michigan, Ohio has the highest number of Kirtland’s warbler observations during migration, signifying that a significant portion of the population passes through Ohio on their way to and from the Bahamas. Kirtland’s warblers typically pass through Ohio in 22 April – 1 June, and 15 August – 15 October. Kirtland’s warblers have been documented in Ottawa County, within 5.2 miles of the project area (Figure 3).

Critical Habitat: No Critical Habitat has been designated for this species at this time.

Conservation Needs: Artificial regeneration of suitable habitat has been critical to Kirtland’s warbler dramatic rebound in population size. In addition to forest management, brown-headed cowbird control has been identified as a continuing conservation need.

Figure 3. Observations of listed species of bird in Ottawa County, Ohio.



ENVIRONMENTAL BASELINE

The Environmental Baseline analyzes the effects of past and ongoing human and natural factors leading to the current status of the species, its habitat, and the ecosystem within the Action Area. In order to assess the potential for take of listed birds to occur within the Action Area, the Service must formulate reasonable assumptions. These assumptions must be made in order to analyze the potential effects of the action. It is important to note that the Service has been mandated by Congress to provide the benefit-of-the-doubt to federally listed species (H.R.Conf. Report No. 697, 96th Cong., 2d Session, 1979). That is to say, the Service must err on the conservative side (the side of the species) when making reasoned assumptions.

Status of the Species in the Action Area

None of the three listed bird species (Kirtland's warbler, rufa red knot, and piping plover) breed or winter within the Action Area, thus the risk this project poses is limited to the migration period. While each of the species has been found within Ottawa County, and several within a few miles of the site during migration, none have been observed with the Action Area (Figure 3).

Factors affecting the Species' Environment in the Action Area

The Action Area is primarily comprised of maintained lawn, asphalt (parking lots and roads), a small sediment retention pond, and several buildings (Table 3). Based upon aerial photographs there are approximately three trees within the Action Area. The vegetation and habitat types within the Action Area do not represent suitable habitat for these species. However, the airspace within the action area may provide suitable migration habitat. As rufa red knot, piping plover, and Kirtland's warbler are all known to occur within a few miles of the Action Area during migration, it is reasonable to assume that they may also fly through the airspace in the Action Area during migration. If they were to fly through the airspace of the Action Area during migration they may be struck by the turbine.

EFFECTS OF THE ACTION

Direct Effects

Birds are known to occasionally collide with tall stationary structures such as buildings, power lines, and communication towers. It is estimated that between 100 million and 1 billion birds are killed annually in the U.S. from striking man-made structures (Klem 1990; Manville 2000). Wind turbines pose an added threat to birds which may collide with the stationary base, or may be struck by the spinning blades (Erickson et al. 2014). Erickson et al. 2003 estimated that between 20,000 and 37,000 birds are struck by turbines each year. Rates of avian collision mortality at existing wind facilities in the east and upper Midwest of the United States have been documented to range from zero to approximately 10 bird fatalities per turbine per year (Erickson et al. 2001). Although avian collision mortality can occur at any time of year, patterns in avian

collision mortality at tall towers, buildings, wind turbines, and other structures suggest that the majority of fatalities occur during the spring and fall migration period (NRC 2007). Limited data from existing wind facilities suggest that migrant species represent roughly half the fatalities, while resident species represent the other half (NRC 2007).

While most bird mortality estimates are generated from commercial-scale wind energy facilities, bird mortality has also been documented at non-utility-scale turbines. The Ohio Department of Natural Resources has been working with the public to monitor three small turbines for bird and bat mortality. Over the last 4 years a total of 18 birds have been found as a result of these searches (USFWS unpublished data).

Using data from 116 post-construction monitoring studies conducted at wind energy facilities, Erickson et al. (2014) estimated the small bird mortality rate at wind turbines to be 2.10 to 3.35 birds/megawatt (MW) annually. The shoreline of Lake Erie, specifically Ottawa County (the County where this project is proposed), is known to be an important stopover location for large numbers of birds during spring and fall migration; while many of the locations used for the Erickson et al. study area may be “low bird-use” areas (agricultural areas). Thus the higher estimate of 3.35 birds/MW was used while estimating take for these species. While some facilities have documented higher than average bird mortality levels reported by Erickson et al. (2014), the ANG is proposing to use strict cut-in speed and curtailment methods at night during spring and fall migration for birds, and at night during summer for bats in order to keep mortality rates low. Thus, we believe it is reasonable to assume that higher than average bird mortality is not likely to occur at the ANG wind turbine. The model turbine proposed for this location is a 600 kilowatt (0.6 MW) turbine. The expected operational life-span of a turbine is approximately 25 years, thus we assume this turbine will operate for 25 years.

Rufa red knot

Erickson et al. (2014) estimated that shorebirds comprised approximately 1% of the birds found at the 116 projects included within the study. Thus, we assume that 1% of all birds killed at the ANG wind turbine over the 25 year life of the project will be shorebirds. Since there were no species-specific estimates of mortality for shorebirds, in order to estimate a “worst-case” scenario we assume that all shorebirds found at this project could be rufa red knots. To estimate rufa red knot mortality over the life of the ANG turbine, we multiply the number of birds anticipated to be killed per MW of energy generated per year by the 25 year life span of the project by percent shorebird composition of the all-bird mortality rate by the wattage of the ANG turbine:

$3.35 \text{ birds/MW/year} * 25 \text{ years} * 1\% \text{ shorebird composition} * 0.6 \text{ MW turbine} = 0.50 \text{ rufa red knots over the 25 year period.}$

It is not possible to only take 0.5 birds, thus we assume that one rufa red knot will be killed over the life of the ANG turbine.

Due to the broad overwintering range of the red knot there are currently no range-wide population estimates for this species (USFWS 2014b). Summing the results of various overwintering surveys gives an estimate of approximately 30,000 birds. The take of one bird over a 25 year period would represent 0.003% of this one-year estimate. This level of take is unlikely to effect the distribution or reproductive success, or significantly impact the number of individuals within the population of this species.

Piping plover

Erickson et al. (2014) estimated that shorebirds comprised approximately 1% of the birds found at the 116 projects included within the study. Thus, we assume that 1% of all birds killed at the ANG wind turbine over the 25 year life of the project will be shorebirds. Since there were no species specific estimates of mortality for shorebirds, in order to estimate a “worst-case” scenario we assume that all shorebirds found at this project could be piping plovers. To estimate piping plover mortality over the life of the ANG turbine, we multiply the number of birds anticipated to be killed per MW of energy generated per year by the 25 year life span of the project by percent shorebird composition of the all-bird mortality rate by the wattage of the ANG turbine:

3.35 birds/MW/year * 25 years * 1% shorebird composition * 0.6 MW turbine = 0.50 piping plovers over the 25 year period

It is not possible to only take 0.5 birds, thus we assume that one piping plover will be killed over the life of the ANG turbine.

In 2009 the Great Lakes population of piping plovers was estimated to be 126 individuals (USFWS 2003). At current population levels the take of one bird over a 25 year period would represent 0.79% of the population. This level of take is unlikely to effect the distribution or reproductive success, or significantly impact the numbers of individuals within the population of this species.

Kirtland’s warbler

Wood warblers comprise 10.8% of bird mortalities at wind turbines (Erickson et al. 2014). While a Kirtland’s warbler has never been documented during post-construction mortality studies at wind energy facilities, blackpoll warblers (*Setophaga striata*), which are also nocturnally migrating wood warblers of similar size, have been found at wind turbine facilities. Blackpoll warblers comprised 1.6% of the birds found during the post-construction monitoring studies pooled by Erickson et al. (2014). The International Union for Conservation of Nature (IUCN) Red List of Threatened Species lists the blackpoll warbler as a species of “Least Concern,” and that the species population is “extremely large” (IUCN 2012, accessed 1/11/2016). Therefore it is more likely that a blackpoll warbler would strike the turbine than a Kirtland’s warbler, however in order to estimate a “worst-case” scenario we assume that the number of blackpoll warblers that may be taken is equivalent to the number of Kirtland’s warblers that may be taken.

To estimate Kirtland's warbler mortality over the life of the ANG turbine, we multiply the number of birds anticipated to be killed per MW of energy generated per year by the 25 year life span of the project by percent blackpoll warbler composition of the all-bird mortality rate by the wattage of the ANG turbine:

$3.35 \text{ birds/MW/year} * 25\text{-years} * 1.6\% \text{ blackpoll composition} * 0.6 \text{ MW turbine} = 0.804$
Kirtland's warblers over the 25 year period

It is not possible to only take 0.804 birds, thus we assume that one Kirtland's warbler will be killed over the life of the ANG turbine.

During the 2011 census of singing male Kirtland's warbler over 1,800 males were found (USFWS 2012a). Given a 50:50 sex ratio, this would result in a population of approximately 3,600 individuals. At current population levels the take of one bird over 25 years would represent 0.02% of the population. This level of take is unlikely to effect the distribution or reproductive success, or significantly impact the numbers of individuals within the population of this species.

Indirect Effects

Indirect effects are those effects that are caused by or will result from the proposed action and are later in time, but are still reasonably certain to occur. Because the primary effect is caused by operation of the turbine, effects are largely direct. Further, because no suitable habitat occurs within the Action Area, no indirect effects are anticipated from habitat loss.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the Action Area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation under section 7 of the Act.

Because most of the Action Area is federally owned by ANG, future activities on this portion of the Action Area would be subject to a separate consultation under section 7 of the Act, and thus are not considered in cumulative effects.

A portion of the Action Area is comprised of State Route 2 and adjacent right-of-way, owned by the Ohio Department of Transportation (ODOT). ODOT receives substantial funding from the Federal Highway Administration, a federal agency, to operate, maintain, repair, and reconstruct roads, and thus, all ODOT projects are considered federal actions and are subject to separate consultation under section 7 of the Act. ODOT actions therefore, are not considered in cumulative effects.

Due to the small size of the Action Area, and that the Action Area is all federally-owned, it is unlikely that any additional non-Federal projects would occur within this area that would contribute to cumulative effects.

Summary of Effects

Based upon mortality rates observed at other turbines we anticipate that a maximum of one individual rufa red knot, piping plover, and Kirtland's warbler may be subject to lethal take during the 25 year lifespan of this project. Because there will be no impacts to suitable habitat, no indirect impacts are expected. Take of one of each individual species is unlikely to impact the reproduction, numbers, or distribution of any of the species over 25 years.

CONCLUSION

After reviewing the current status of the species, the environmental baseline for the Action Area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the rufa red knot, piping plover, or Kirtland's warbler. No critical habitat exists for these species within the Action Area; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR § 17.3). Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR § 17.3). Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

Amount or Extent of Take Anticipated

The Service believes that over the 25 year expected lifespan of this turbine potentially one of each of the species covered in this Biological Opinion (rufa red knot, piping plover, and Kirtland's warbler) may be taken. If the take of one of these species is documented the ANG

should reinitiate consultation with this office prior to continuing operation of the turbine in order to avoid exceeding the level of take analyzed in this Biological Opinion.

Effect of the Take

Due to the extremely low level of take expected from this project, impacts to the distribution, reproductive success, or significant impacts to the overall population for the three species covered in this Biological Opinion are not anticipated. This project is not likely to cause jeopardy to the Kirtland's warbler, piping plover, or the rufa red knot.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures (RPMs) are necessary and appropriate to minimize the impacts of incidental take of listed birds during the construction and operation of the ANG Camp Perry Wind Project:

1. Conduct post-construction monitoring at the turbine for at least two years commencing as soon as the turbine is operational.
2. Provide the Service with results of post-construction monitoring studies annually.
3. Reduce lighting around the turbine to the maximum extent practicable.
4. Should the turbine be inoperable for more than one year, the turbine should be removed.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, ANG must comply with the following terms and conditions, which implement the reasonable and prudent measures. These terms and conditions are non-discretionary.

1. At a minimum post-construction monitoring effort should follow that of Ohio Department of Natural Resources Division of Wildlife *Small-Turbine Fatality Search Protocols* (attached). Any proposed variation from this protocol should be approved by the U.S. Fish and Wildlife Service Ohio Ecological Services Field Office.
2. Reports on the results of post-construction monitoring annually, including incidental finds. Reports are due annually one year after the start of monitoring.

Conservation Recommendations

Section 7(a)(1) of the ESA directs federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid the adverse effects of a proposed action on listed species or critical habitat, to help carry out recovery plans, or to develop information.

The Service has identified the following actions that, if undertaken by ANG, would further the conservation of the listed birds.

1. Restoration of scrub/shrub habitat along the shoreline of Lake Erie to provide important stopover habitat for migrating song birds including Kirtland's warbler.
2. Beach restoration or enhancement to improve stopover habitat for red knot, piping plover, and other shorebirds.

Reinitiation Notice

This concludes formal consultation for ANG's actions outlined in your request received October 23, 2015. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over an action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded (if any of the species covered in this Biological Opinion are found incidentally or during post-construction studies); (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion, such as a proposed change in the operational minimization measures based on research results; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such a take must cease pending reinitiation.

LITERATURE CITED

- Bundesverband WindEnergie. 2015. *Vestas V44/600kW*. Wind Energy Market [Online] Bundesverband WindEnergie. [Accessed 25 July 2015.] <http://www.wind-energymarket.com/en/wind-turbines/big-plants/details/details/bp/vestas-v44600-kw>.
- Byelich, J., M. E. DeCapita, G. W. Irvine, R. E. Radtke, N. I. Johnson, W. R. Jones, H. Mayfield, and W. J. Mahalak. 1976 (revised 1985). Kirtland's Warbler Recovery Plan. U. S. Fish and Wildlife Service, Twin Cities, MN.
- Cleland, D. T., T. R. Crow, S. C. Saunders, D. I. Dickman, A. L. Maclean, J. K. Jordan, R. L. Watson, A. M. Sloan, and K. D. Brosofske. 2004. Characterizing historical and modern fire regimes in Michigan (USA): a landscape ecosystem approach. *Landscape Ecology*. 19: 311-325.
- Cuthbert, F.J. and E.A. Roche. 2006. Piping plover breeding biology and management in the Great Lakes, 2006. Report submitted to the U.S. Fish and Wildlife Service, East Lansing, Michigan.
- Cuthbert, F.J. and E.A. Roche. 2007. Estimation and evaluation of demographic parameters for recovery of the endangered Great Lakes piping plover population. Unpublished report submitted to the U.S. Fish and Wildlife Service, East Lansing, Michigan.
- Dunn, J. L., and K. L. Garrett. 1997. A field guide to warblers of North America. New York, NY: Houghton Mifflin Company. 349-356 pp.
- Erickson, W. P., J. Jeffrey, K. Kronner, and K. Bay. 2003a. Stateline Wind Project Wildlife Monitoring Annual Report, Results for the Period July 2001 December 2002. FPL Energy, the Oregon Office of Energy, and the Stateline Technical Advisory Committee, Salem, USA.

- Erickson, W.P., M.M. Wolfe, K.J. Bay, D.H. Johnson, J.L. Gehring. 2014. A Comprehensive Analysis of Small-Passerine Fatalities from Collision with Turbines at Wind Energy Facilities. PLoS ONE 9(9): e107491. doi:10.1371/journal.pone.0107491
- IUCN Red List of Threatened Species. 2012. Blackpoll warbler (*Dendroica striata*) global status. [Accessed January 2016] <http://www.iucnredlist.org/details/22721737/0>
- Klem, D., Jr. 1990. Collisions between birds and windows: mortality and prevention. Journal of Field Ornithology 61:120-128.
- Manville, A. 2000. Briefing statement published on the world wide web dated 4/07/00. U.S. Fish and Wildlife Service.
- Mayfield, H. 1960. The Kirtland's warbler. Cranbrook Institute of Science, Bloomfield Hills, MI. 242 pp.
- National Research Council [NRC]. 2007. Environmental Impacts of Wind-Energy Projects Committee on Environmental Impacts of Wind Energy Projects, National Research Council ISBN: 0-309-10835-7. < <http://www.nap.edu/catalog/11935.html>>. Accessed 14 June 2010.
- ODOT (Ohio Department of Transportation). 2006. Statewide Investigation of Noise Abatement Alternatives Final Report. Submitted by: McCormick Taylor Engineers & Planners.
- Stucker, J.H., F.J. Cuthbert, and C.D. Haffner. 2003. Piping plover breeding biology and management in the Great Lakes, 2003. Report submitted to the U.S. Fish and Wildlife Service, East Lansing, Michigan.
- Stucker, J.H. and F.J. Cuthbert. 2004. Piping plover breeding biology and management in the Great Lakes, 2004. Report submitted to the U.S. Fish and Wildlife Service, East Lansing, Michigan.
- USFWS (United States Fish and Wildlife Service). 2001. Final determination of critical habitat for the Great Lakes breeding population of the piping plover. Federal Register 66:22938-22969.
- USFWS (United States Fish and Wildlife Service). 2002. Final designation of critical habitat for the Northern Great Plains breeding population of the piping plover. Federal Register. 67:57637-57717.
- USFWS (United States Fish and Wildlife Service). 2009. Piping Plover (*Charadrius melodus*) 5-Year Review: Summary and Evaluation.
- USFWS (United States Fish and Wildlife Service). 2012a. Kirtland's Warbler (*Dendroica kirtlandii*) 5-Year Review: Summary and Evaluation.
- USFWS (United States Fish and Wildlife Service). 2012b. *Land-Based Wind Energy Guidelines*. 23 March 2012.

USFWS (United States Fish and Wildlife Service). 2003. Recovery plan for the Great Lakes piping plover (*Charadrius melodus*). Ft. Snelling, Minnesota. viii + 141 pp.

USFWS (United States Fish and Wildlife Service). 2014a. Listing the Rufa Red Knot as threatened. Final Rule. Fed. Reg. 79: 238.

USFWS (United States Fish and Wildlife Service). 2014b. Rufa Red Knot Background Information and Threats Assessment. Docket No. FWS-R5-ES-2013-0097; RIN AY17.

USFWS and NMFS (United States Fish and Wildlife Service and National Marine Fisheries Service). 1998. Endangered Species Consultation Handbook – Procedures for Conducting Consultation and Conference Activities under section 7 of the Endangered Species Act.

Vernadero Group. 2015. Biological Assessment for Proposed Wind Turbine on the Air National Guard Station, Camp Perry, Ohio. Prepared for the 200th Red Horse Squadron.

Vestas Wind Systems. 2003. Vestas V47-660 kW with OptiTip and OptiSlip. [Accessed 7 January 2015] http://maritimesenergy.com/flow/uploads/Vestas_V47.pdf

Walkinshaw, L. H. 1983. Kirtland's warbler: the natural history of an endangered species. Cranbrook Institute of Science, Bloomfield Hills, MI. 207 pp.

Westbrock, M., E.A. Roche, F.J. Cuthbert, and J.H. Stucker. 2005. Piping plover breeding biology and management in the Great Lakes, 2005. Report submitted to the U.S. Fish and Wildlife Service, East Lansing, Michigan.