Appendix H: Species Consultation

- Request for USFWS Review, August 16, 2018
- USFWS Response, August 17, 2018
- Request for ODNR Review, August 16, 2018
- ODNR Response, October 9, 2018
- Kirtland's Snake Report, November 2018

TETRA TECH

August 16, 2018

United States Fish and Wildlife Service
Ohio Field Office
4625 Morse Road, Suite 104
Columbus, OH 43230-8355

Subject: Threatened and Endangered Species Review Information Request, Nestlewood Solar

To Whom It May Concern:

Tetra Tech, Inc. is requesting information from the United States Fish and Wildlife Service (USFWS) regarding the potential presence of threatened or endangered species on or near an approximately 700-acre property located west of the Village of Hamersville, shown on the attached Figures 1 and 2 (the Project Area). The specific parcels within the Project Area will be refined as layout progresses. Lendlease Energy Development LLC is proposing to develop and operate Nestlewood Solar, an 80-megawatt photovoltaic solar facility (the Project). The Project will be the subject of an application for submittal to the Ohio Power Siting Board.

The Project Area is located near State Route 774 on the boundary of Tate Township in Claremont County, Ohio and Lewis Township in Brown County, Ohio at a latitude of 38.916 degrees north, and longitude of 84.037 degrees west. The Project Area is approximately 1.5 miles west-northwest of the Village of Hamersville, approximately 3 miles southeast of the Village of Bethel, 3 miles southeast of Bethel, Ohio, and 9 miles north of the Ohio River.

The Project Area primarily consists of agricultural land, characterized by fairly flat topography with elevations ranging between 908 feet and 951 feet above mean sea level. Existing electric transmission lines cross the Project Area. All Project components, including the point of interconnection to the existing electric grid will be located within the Project Area. Should any associated components extend beyond this area, a separate request for review will be submitted.

We would appreciate it if you could review your files and provide any available information to indicate whether additional studies are required to determine the potential for protected species impact. If you have any questions or require additional information, please do not hesitate to contact me (978.203.5352; lynn.gresock@tetratech.com). Thank you in advance for your assistance.

Sincerely,

Tetra Tech, Inc.

Lynn Gresock

Lynn Gresock - Environmental Consultant

Attachments:

Figure 1: Project Location – Topographic Map
Figure 2: Project Location – Aerial Photograph

Tetra Tech, Inc.
2 Lan Drive, Suite 210, Westford, MA 01886
Tel 978.203.5352 Fax 978.692.4592 www.tetratech.com

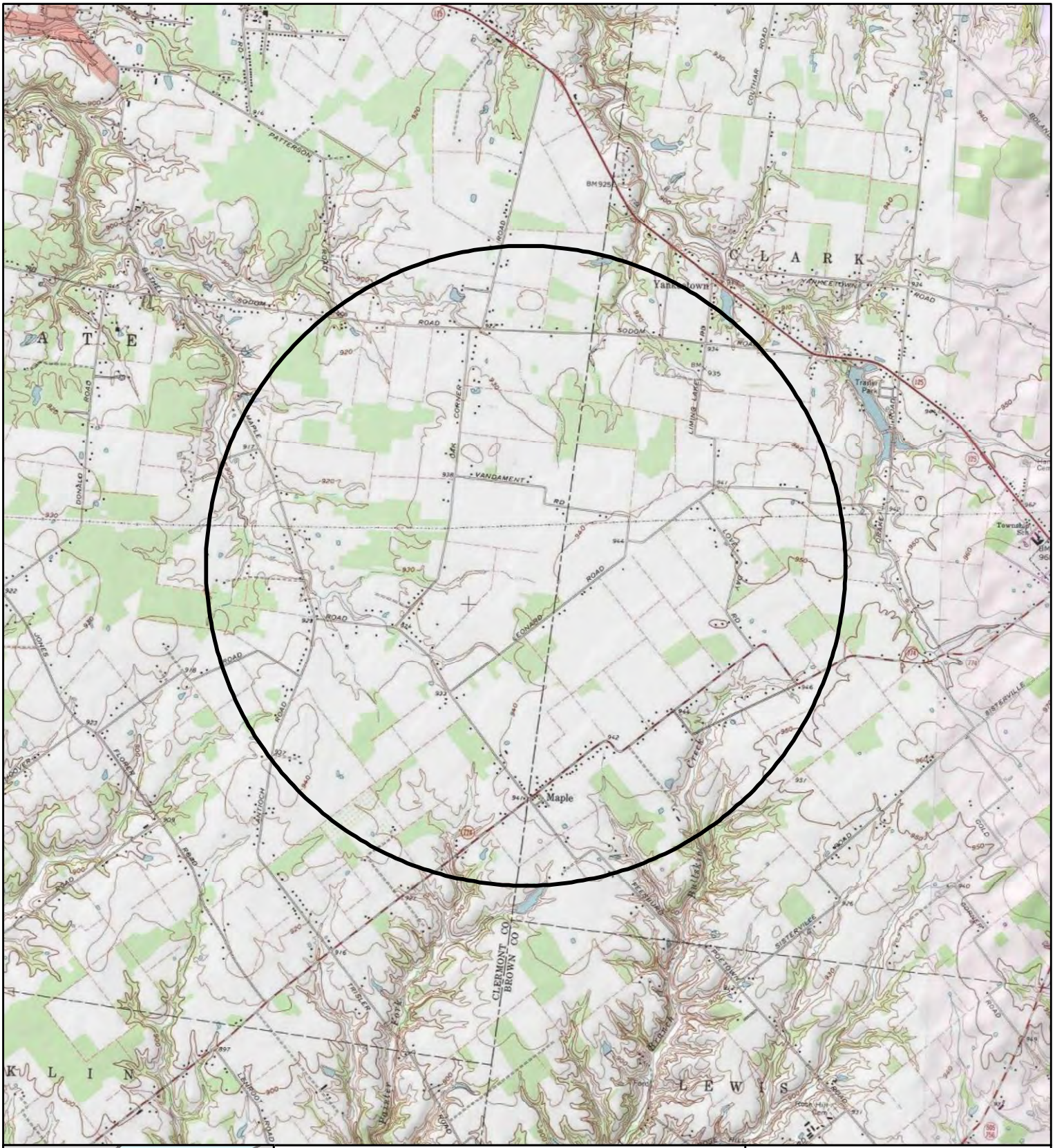

Figure 1
Project Location - Topographic Map

Nestlewood Solar
Clermont and Brown Counties, Ohio

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Legend

Approximate Project Area

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0 0.25 0.5 1

Miles

Figure 2
Project Location -
Aerial Photograph

Nestlewood Solar
Clermont and Brown Counties, Ohio

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UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. Fish and Wildlife Service
Ecological Services Office
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / Fax (614) 416-8994

August 17, 2018

Lynn Gresock
Tetra Tech, Inc.
2 Lan Drive, Suite 210
Westford, MA 01886

TAILS#03E15000-2018-TA-1896

Re: Nestlewood Solar Project, Clermont County, Ohio

Dear Ms. Gresock,

We have received your recent correspondence requesting information about the subject proposal. There are no federal wilderness areas, wildlife refuges or designated critical habitat within the vicinity of the project area. The following comments and recommendations will assist you in fulfilling the requirements for consultation under section 7 of the Endangered Species Act of 1973, as amended (ESA).

The U.S. Fish and Wildlife Service (Service) recommends that proposed developments avoid and minimize water quality impacts and impacts to high quality fish and wildlife habitat (e.g., forests, streams, wetlands). Additionally, natural buffers around streams and wetlands should be preserved to enhance beneficial functions. If streams or wetlands will be impacted, the Corps of Engineers should be contacted to determine whether a Clean Water Act section 404 permit is required. Best management practices should be used to minimize erosion, especially on slopes. All disturbed areas should be mulched and revegetated with native plant species. Prevention of non-native, invasive plant establishment is critical in maintaining high quality habitats.

FEDERALLY LISTED SPECIES COMMENTS: All projects in the State of Ohio lie within the range of the federally endangered **Indiana bat** (*Myotis sodalis*) and the federally threatened **northern long-eared bat** (*Myotis septentrionalis*). In Ohio, presence of the Indiana bat and northern long-eared bat is assumed wherever suitable habitat occurs unless a presence/absence survey has been performed to document absence. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥3 inches diameter at breast height (dbh) that have any exfoliating bark, cracks, crevices, hollows and/or cavities), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other

forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat. In the winter, Indiana bats and northern long-eared bats hibernate in caves and abandoned mines.

The proposed project is in the vicinity of one or more confirmed records of Indiana bats and is in very close proximity to a known Indiana bat maternity roost tree. Therefore, we strongly recommend additional coordination with my office if any tree clearing will be necessary for the proposed project.

If there is a federal nexus for the project (e.g., federal funding provided, federal permits required to construct), no portion of the project should be initiated until consultation under section 7 of the ESA, between the Service and the federal action agency, is completed. We recommend that the federal action agency submit a determination of effects to this office, relative to the Indiana bat and northern long-eared bat, for our review and concurrence.

Due to the project type, size, and location, we do not anticipate adverse effects to any other federally endangered, threatened, proposed, or candidate species. Should the project design change, or during the term of this action, additional information on listed or proposed 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 initiated to assess any potential impacts.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the ESA, and are consistent with the intent of the National Environmental Policy Act of 1969 and the Service's Mitigation Policy. This letter provides technical assistance only and does not serve as a completed section 7 consultation document. We recommend that the project be coordinated with the Ohio Department of Natural Resources due to the potential for the project to affect state listed species and/or state lands. Contact John Kessler, Environmental Services Administrator, at (614) 265-6621 or at john.kessler@dnr.state.oh.us.

If you have questions, or if we can be of further assistance in this matter, please contact our office at (614) 416-8993 or ohio@fws.gov.

Sincerely,

for Scott Pruitt
Acting Field Supervisor

cc: Nathan Reardon, ODNR-DOW
Kate Parsons, ODNR-DOW

TETRA TECH

August 16, 2018

Ohio Department of Natural Resources
Division of Wildlife
Ohio Natural Heritage Program
2045 Morse Road
Columbus, OH 43229-6693

Subject: Threatened and Endangered Species Review Information Request, Nestlewood Solar

To Whom It May Concern:

Tetra Tech, Inc. is requesting information from the Ohio Department of Natural Resources (ODNR) regarding the potential presence of threatened or endangered species on or near property located west of the Village of Hamersville, shown on the attached Figures 1 and 2 (the Project Area). The specific parcels within the Project Area will be refined as layout progresses. Lendlease Energy Development LLC is proposing to develop and operate Nestlewood Solar, an 80-megawatt photovoltaic solar facility (the Project). The Project will be the subject of an application for submittal to the Ohio Power Siting Board.

The Project Area is located near State Route 774 on the boundary of Tate Township in Claremont County, Ohio and Lewis Township in Brown County, Ohio at a latitude of 38.916 degrees north, and longitude of 84.037 degrees west. The Project Area is approximately 1.5 miles west-northwest of the Village of Hamersville, approximately 3 miles southeast of the Village of Bethel, 3 miles southeast of Bethel, Ohio, and 9 miles north of the Ohio River.

The Project Area primarily consists of agricultural land, characterized by fairly flat topography with elevations ranging between 908 feet and 951 feet above mean sea level. Existing electric transmission lines cross the Project Area. All Project components, including the point of interconnection to the existing electric grid will be located within the Project Area. Should any associated components extend beyond this area, a separate request for review will be submitted.

We would appreciate it if you could review your files and provide any available information to indicate whether additional studies are required to determine the potential for protected species impact. A Natural Heritage Data Request Form accompanies this letter. If you have any questions or require additional information, please do not hesitate to contact me (978.203.5352; lynn.gresock@tetratech.com). Thank you in advance for your assistance.

Sincerely,

Tetra Tech, Inc.

Lynn Gresock

Lynn Gresock - Environmental Consultant

Attachments:

Figure 1: Project Location – Topographic Map
Figure 2: Project Location – Aerial Photograph
Natural Heritage Data Request Form

Tetra Tech, Inc.
2 Lan Drive, Suite 210, Westford, MA 01886
Tel 978.203.5352 Fax 978.692.4592 www.tetratech.com

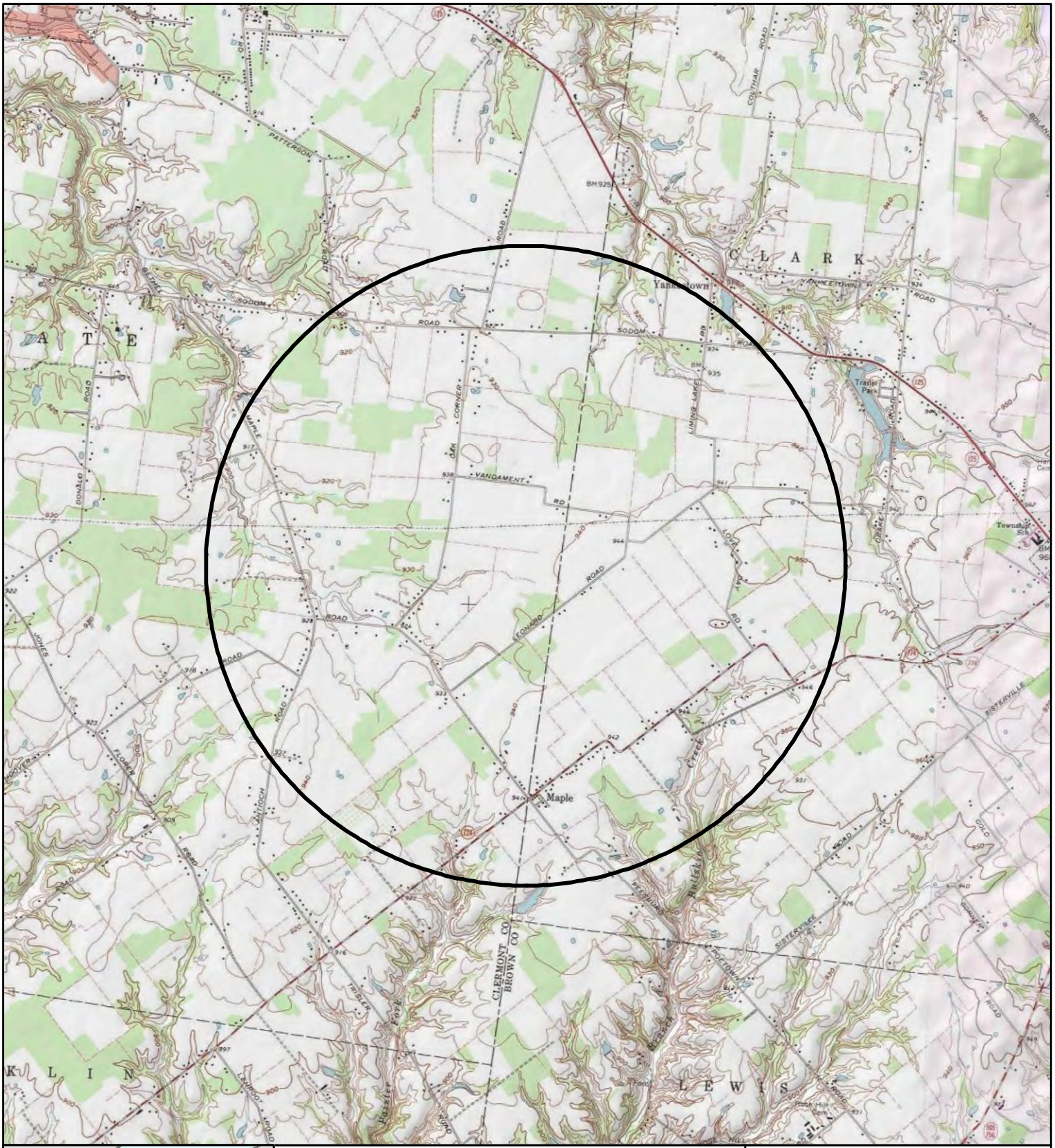

Figure 1
Project Location - Topographic Map

Nestlewood Solar
Clermont and Brown Counties, Ohio

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Legend

Approximate Project Area

N

0 0.25 0.5 1

Miles

Figure 2
Project Location -
Aerial Photograph

Nestlewood Solar
Clermont and Brown Counties, Ohio

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Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR JAMES ZEHRINGER, DIRECTOR

Office of Real Estate
Paul R. Baldridge, Chief
2045 Morse Road – Bldg. E-2
Columbus, OH 43229
Phone: (614) 265-6649
Fax: (614) 267-4764

October 9, 2018

Lynn Gresock
Tetra Tech Inc.
661 Anderson Drive
Pittsburgh, PA 15220

Re: 18-970; Threatened and Endangered Species Review Information Request, Nestlewood Solar

Project: The proposed project involves developing and operation of the Nestlewood Solar 80-megawatt photovoltaic solar facility.

Location: The proposed project is located in Tate Township, Clermont County, Ohio.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

Natural Heritage Database: A review of the Natural Heritage Database has the following record at or within a one-mile radius of the project area:

Kirtland's snake (*Clonophis kirtlandii*), State threatened, federal species of concern

The review was performed on the project area you specified in your request as well as an additional one-mile radius. Records searched date from 1980. This information is provided to inform you of features present within your project area and vicinity. Additional comments on some of the features may be found in pertinent sections below.

Please note that Ohio has not been completely surveyed and we rely on receiving information from many sources. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Although all types of plant communities have been surveyed, we only maintain records on the highest quality areas.

Fish and Wildlife: The Division of Wildlife (DOW) has the following comments.

The DOW recommends that impacts to wetlands and other water resources be avoided and minimized to the fullest extent possible, and that best management practices be utilized to minimize erosion and sedimentation.

The project is within the vicinity of records for the Indiana bat (*Myotis sodalis*), a state endangered and federally endangered species. Presence of the Indiana bat has been established in the area, and therefore additional summer surveys would not constitute presence/absence in the area. The following species of trees have relatively high value as potential Indiana bat roost trees to include: shagbark hickory (*Carya ovata*), shellbark hickory (*Carya laciniosa*), bitternut hickory (*Carya cordiformis*), black ash (*Fraxinus nigra*), green ash (*Fraxinus pennsylvanica*), white ash (*Fraxinus americana*), shingle oak (*Quercus imbricaria*), northern red oak (*Quercus rubra*), slippery elm (*Ulmus rubra*), American elm (*Ulmus americana*), eastern cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*), sassafras (*Sassafras albidum*), post oak (*Quercus stellata*), and white oak (*Quercus alba*). Indiana bat roost trees consists of trees that include dead and dying trees with exfoliating bark, crevices, or cavities in upland areas or riparian corridors and living trees with exfoliating bark, cavities, or hollow areas formed from broken branches or tops. However, Indiana bats are also dependent on the forest structure surrounding roost trees. If suitable habitat occurs within the project area, the DOW recommends trees be conserved. If suitable habitat occurs within the project area and trees must be cut, the DOW recommends cutting occur between October 1 and March 31. If no tree removal is proposed, this project is not likely to impact this species.

The project is within the range of the rayed bean (*Villosa fabalis*), a state endangered and federally endangered mussel, the sheepnose (*Plethobasus cyphyus*), a state endangered and federally endangered mussel, the fanshell (*Cyprogenia stegaria*), a state endangered and federally endangered mussel, the pink mucket (*Lampsilis orbiculata*), a state endangered and federally endangered mussel, the snuffbox (*Epioblasma triquetra*), a state endangered and federally endangered mussel, the washboard (*Megalonaias nervosa*), a state endangered mussel, the ebonyshell (*Fusconaia ebena*), a state endangered mussel, the butterfly (*Ellipsaria lineolata*), a state endangered mussel, the elephant-ear (*Elliptio crassidens crassidens*), a state endangered mussel, the Ohio pigtoe (*Pleurobema cordatum*), a state endangered mussel, the little spectaclecase (*Villosa lienosa*), a state endangered mussel, the monkey face (*Quadrula metanevra*), a state endangered mussel, the wartyback (*Quadrula nodulata*), a state endangered mussel, the threehorn wartyback (*Obliquaria reflexa*), a state threatened mussel, and the fawnsfoot (*Truncilla donaciformis*), a state threatened mussel.

This project must not have an impact on freshwater native mussels at the project site. This applies to both listed and non-listed species. Per the Ohio Mussel Survey Protocol (2018), all Group 2, 3, and 4 streams (Appendix A) require a mussel survey. Per the Ohio Mussel Survey Protocol, Group 1 streams (Appendix A) and unlisted streams with a watershed of 10 square miles or larger above the point of impact should be assessed using the Reconnaissance Survey for Unionid Mussels (Appendix B) to determine if mussels are present. Mussel surveys may be recommended for these streams as well. This is further explained within the Ohio Mussel Survey Protocol. Therefore, if in-water work is planned in any stream that meets any of the above criteria, the DOW recommends the applicant provide information to indicate no mussel impacts will occur. If this is not possible, the DOW recommends a professional malacologist conduct a mussel survey in the project area. If mussels that cannot be avoided are found in the project area, as a last resort, the DOW recommends a professional malacologist collect and relocate the mussels to suitable and similar habitat upstream of the project site. Mussel surveys and any subsequent mussel relocation should be done in accordance with the Ohio Mussel Survey Protocol. The Ohio Mussel Survey Protocol (2018) can be found at:

http://wildlife.ohiodnr.gov/portals/wildlife/pdfs/licenses%20&%20permits/OH%20Mussel%20Survey%20Protocol.pdf

The project is within the range of the shortnose gar (*Lepisosteus platostomus*), a state endangered fish, the northern madtom (*Noturus stigmosus*), a state endangered fish, the shovelnose sturgeon (*Scaphirhynchus platorynchus*), a state endangered fish, the goldeye (*Hiodon alosoides*), a state endangered fish, the mountain madtom (*Noturus eleutherus*), a state threatened fish, the paddlefish (*Polyodon spathula*) a state threatened fish, the river darter (*Percina shumardi*), a state threatened fish, the bigeye shiner (*Notropis boops*), a state threatened fish, and the channel darter (*Percina copelandi*) a state threatened fish. The DOW recommends no in-water work in perennial streams from April 15 to June 30 to reduce impacts to indigenous aquatic species and their habitat. If no in-water work is proposed in a perennial stream, this project is not likely to impact these species.

The project is within the range of the Kirtland's snake (*Clonophis kirtlandii*), a state threatened species. This secretive species prefers wet fields and meadows. Habitat for this species may exist within the project area. The DOW recommends that a habitat suitability survey be conducted by an approved herpetologist to determine if suitable habitat is present within the project area. If suitable habitat is determined to be present, the DOW recommends that a presence/absence survey be conducted by the approved herpetologist. Approved herpetologist prepared survey reports can be submitted to Nathan Reardon, DOW Compliance Coordinator at Nathan.reardon@dnr.state.oh.us. Once project parcels are finalized, the DOW can rereview, and determine if this recommendation can be removed.

The project is within the range of the northern harrier (*Circus cyaneus*), a state endangered bird. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 15 to August 1. If this habitat will not be impacted, this project is not likely to impact this species.

Due to the potential of impacts to federally listed species, as well as to state listed species, we recommend that this project be coordinated with the US Fish & Wildlife Service.

Water Resources: The Division of Water Resources has the following comments.

The local floodplain administrator should be contacted concerning the possible need for any floodplain permits or approvals for this project. Your local floodplain administrator contact information can be found at the website below.

http://water.ohiodnr.gov/portals/soilwater/pdf/floodplain/Floodplain%20Manager%20Community%20Contact%20List_8_16.pdf

ODNR appreciates the opportunity to provide these comments. Please contact John Kessler at (614) 265-6621 if you have questions about these comments or need additional information.

John Kessler
ODNR Office of Real Estate
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Columbus, Ohio 43229-6693
John.Kessler@dnr.state.oh.us

Doug Wynn LLC
Herpetological Consulting Since 1986
ODNR Approved Herpetologist
241 Chase Street, Suite A1
Russells Point, Ohio 43348
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Sistrurus@aol.com

EXECUTIVE SUMMARY – November 2018

Tetra Tech, Inc.

Nestlewood Solar I LLC

a) The purpose of the following project was to survey multiple parcels in Clermont and Brown Counties, Ohio for Kirtland's Snake Habitats.

b) Desktop surveys were conducted first to identify areas that could be ruled out as suitable habitats.

c) Field surveys were then conducted on October 25, 2018 and focused on wet, open meadows.

d) Two sites were identified as potential suitable habitat for Kirtland's Snakes.

e) A presence-absence survey or avoidance of the potential habitat area is recommended for each of the two potential Kirtland's Snake sites.

If I can be of further assistance or can answer any questions, please advise.

Doug Wynn

A Survey for Kirtland's Snake (*Clonophis kirtlandii)* Habitats for the

Nestlewood Solar Project,

Clermont and Brown Counties, Ohio.

November 2018

Prepared for:

Tetra Tech Inc.
2 Lan Drive
Suite 210
Westford, MA 01886

Prepared by:

Doug Wynn
241 Chase Street, Suite A1
Russell's Point, Ohio 43348
(614) 306-0313
Sistrurus@aol.com

INTRODUCTION:

The Kirtland's Snake is a relatively small snake ranging in size from 4-18 inches. The dorsum is reddish or reddish-brown with four rows of alternating black spots, and all of the Ohio individuals that I have observed have a deep red venter (e.g., underbelly). A row of black spots extends down each side of the venter, which is probably the easiest diagnostic feature. The head is narrow, and the snout rounded. Newborn Kirtland's Snakes are dark and, in some cases, their dorsal blotches blend into the background. They were originally considered a watersnake and superficially resemble a cross between a watersnake and a gartersnake.

This species is found from west central Pennsylvania, across most of Ohio, and ranges just into southern Michigan, across most of Indiana, slightly crossing into northern Kentucky, into Illinois, a small area of northeastern Missouri, and northward into the extreme southeastern corner of Wisconsin.

Biogeographers have long pointed out the correspondence of the Kirtland's Snake's distribution to the post-glacial peninsula (Conant 1938; Schmidt 1938; Thomas 1951; Smith 1957) and considered the Kirtland's Snake to be a prairie immigrant. After the retreat of the last glacier, a series of climatic changes occurred. Between 4,000 and 2,000 B.C. Ohio was much more arid. Western prairies moved eastward bringing their grassland flora and fauna. These fingers of prairie extended into Ohio and have been referred to as the prairie peninsula. When Ohio's climate became more humid, the present mesic communities replaced most of the prairies.

Thomas (1951) pointed out that the Kirtland's Snake is not found west of central Illinois like the numerous other prairie species that invaded Ohio during the xerothermic period. Thus, he suggested that the snake species was present prior to the glaciations, survived along the edge of the ice, and recolonized as the glacier retreated.

In Ohio the Kirtland's Snake has historically been found throughout the state with the exception of the eastern and southeastern edges. This species is generally restricted to glaciated areas, although it is found in some of Ohio's unglaciated southeastern counties.

It has been documented from Butler, Champaign, Clermont, Greene, Hamilton, Hancock, Licking, Logan, Lucas, Montgomery, Muskingum, Ottawa, Preble, Ross, Warren, Wayne, and Wyandot counties (Wynn and Moody 2006). The Kirtland's Snake was historically locally abundant, including in urban settings. Populations were well-known in Cincinnati, and even the grounds of the Toledo Zoo.

Ecology

The Kirtland's Snake inhabits wet meadows and seeps. In some areas of their range they are found with Massasaugas. These grassy wet meadow areas are often a mosaic of small, early successional woody species such as hawthorn (*Crataegus sp.*),

dogwood (*Cornus sp.*), multiflora rose (*Rosa multiflora*) or raspberry (*Rubus sp.*). Common herbaceous species associated with the Kirtland's Snake may include the sensitive fern (*Onoclea sensibilis*), goldenrod (*Solidago sp.*), partridge pea (*Cassia fasciculata*), cinquefoil (*Potentilla sp.*), strawberry (*Fragaria sp.*), and *Sphagnum*. Conant (1938) mentions that the habitats of the southeastern Ohio records all originate from former river valleys that have been filled with glacial sediments. Thus, wetlands and boggy areas persist, providing habitats for the Kirtland's Snake.

Ohio Kirtland's Snakes are often associated with crayfish burrows (*Cambarus diogenes*) which may or may not be visible due to vegetation heights. These burrows may be utilized for overwintering or shelter during the active season. (Wilsman and Sellers 1988; Anton and Mauger 2004). Bavetz (1994) suggested that Kirtland's Snakes may be utilizing burrows of the prairie crayfish (*Procambarus gracilis*) and the digger crayfish (*Fallicambarus fodiens*). Little is known about their ecology, but their habits are similar to those of the Common Gartersnake in that they eat earthworms, slugs, fish, and crayfish.

When encountered, the Kirtland's Snake may defend itself by flattening the body, musking, and defecating. Some individuals may become very rigid and others may make a feeble attempt to bite. Wood and Duellman (1947) stated that all of the individuals that they collected were "aggressive" and attempted to bite. Ernst and Barbour (1989) report that they will strike, bite, and chew if handled. I have also seen individuals hide their heads under their body when being handled.

SURVEY SITES:

Figure 1 shows the location of the survey sites which are located between Yankeetown and Poetown, and Town of Bethel and on the line between Clermont and Brown counties, Ohio. The area is approximately 30 miles southeast of Cincinnati. An approximate center of the survey sites is located at 38.920548°north and 84.039922°west. Most of the surrounding area is in agriculture. Numerous wetlands, as identified from the National Wetlands Inventory (NWI), are present in the vicinity (as also shown on Figure 1).

Figure 1. The study area (bounded in red) and NWI wetlands (in green).

METHODS:

Prior to conducting the field survey, resources were examined that included published reports, un-published reports, museum holdings, and notes from conversations with other Ohio herpetologists and the general public. Topographic maps and aerial photographs were examined in order to better understand the land use of the area as well as identifying areas that might require more intensive fieldwork. The nearest localities where the Kirtland's Snake has been documented were visited to gain an idea regarding the type of habitats that are utilized by the species in that area.

A desktop survey was conducted first to rule out areas that were clearly not suitable, particularly for fields that were planted in row crops or large tracts of woods. Two sites were then identified that required field checking, as shown on Figure 2. Both were wetlands that are adjacent to grassy, open, habitats (in one case associated with fringe vegetation surrounding a pond and in the other within an electric transmission corridor).

Field surveys were conducted on October 25, 2018 and again focused on wet, open meadows. More specifically the following criteria were used:

a. species of vegetation present
b. structure of vegetation
c. presence of crayfish burrows
d. presence of low-lying habitats with adjacent suitable uplands

e. size of suitable habitat
f. isolation from human disturbances
g. presence/history of human disturbances
h. proximity/presence of suitable migration corridors
i. size of suitable habitats within potential migratory distances
j. proximity to nearest known Kirtland's Snake localities
k. proximity to nearest undocumented, anecdotal Kirtland's Snake sightings
l. general knowledge of county, area, etc., based on museum catalogs
m. inquiries with local residents, soil/water agents, wildlife officers, etc.
n. correspondences with other biologists

RESULTS:

Two sites were identified during the desktop review as being potential suitable habitat for Kirtland's Snakes and were, therefore, field checked. They are located along Oak Corner Road, with Site A located approximately 9.2 miles south of Vandament Road at 38.9192°north, and 84.9423°west, and Site B located 0.48 miles south of Vandamant Road at 38.9223°north, and 84.0482°west, as shown on Figure 2.

Figure 2. Sites that were field checked.

Site A is a pond at the edge of an agricultural field. The pond is approximately 0.31 acres in size and is surrounded by grass and thin shrub habitats approximately 12 to 17 meters in width. The area located approximately 50 feet surrounding the pond, therefore, provides suitable habitats for Kirtland's Snakes.

Site B was initially identified by NWI as a wetland at the margin of an electric transmission corridor approximately 400 meters west of Oak Corner Road. Upon walking off the road and entering the corridor, semi-aquatic plants were encountered, and the area was damp despite a lack of rain in the days prior to the field survey. Areas at the edge of the woods and open corridor still contained water. Thus, the section of the corridor from Oak Corner Road to the second electric structure, originally labeled as Site B, was identified as suitable habitat for Kirtland's Snakes.

The two potential habitat areas are shown on Figure 3.

Figure 3. Location of suitable habitats.

DISCUSSION AND RECOMMENDATIONS

Kirtland's Snakes are small, secretive and can be very sporadic in their behaviors. It is recommended that a presence/absence survey, using coversheets, be conducted unless these potential habitat areas can be avoided. The Kirkland's Snake tends to stay within a small range in its habitat areas; therefore, avoidance of the potential habitat is considered an adequate protection for the species.

REFERENCES CITED:

Anton TG, Mauger, D. 2004. *Clonophis kirtlandii* (Kirtland's Snake). Reproduction. Herpetological Review 35(1):58-59. 0

Bavetz M. 1994. Geographic variation, status, and distribution of Kirtland's Snake (*Clonophis kirtlandii* Kennicott) in Illinois. Transactions of the Illinois State Academy of Science. 87(3-4):151-163.

Conant R. 1938. The Reptiles of Ohio. American Midland Naturalist 20(1):200 p.

Ernst CH, Barbour R. 1989. Snakes of Eastern North America. Fairfax (Virginia): George Mason University Press. 282p.

Schmidt KP. 1938. Herpetological evidence for the postglacial eastward extension of the steppe in North America. Ecology 19(3):396-407.

Smith PW. 1957. An analysis of post-Wisconsin biogeography of the prairie peninsula region based on distributional phenomena among terrestrial vertebrate populations. Ecology 38(2): 205-218.

Thomas ES. 1951. Distribution of Ohio animals. Ohio Journal of Science 51(4):153-167.

Wilsman LA, Sellers, Jr. MA. 1988. *Clonophis kirtlandii* range wide survey. Unpublished report to the U.S. Fish and Wildlife Service. 44 p.

Wood JT, Duellman WE. 1947. Range extension of *Natrix kirtlandii* in Ohio. Herpetologica 3(5):151.

Wynn DE, Moody SM. 2006. Ohio Turtle, Lizard, and Snake Atlas. Ohio Biological Survey Miscellaneous Contribution No. 10. Columbus: Ohio Biological Survey. 8.

Summary: Application Appendix H electronically filed by Mr. Michael J. Settineri on behalf of Nestlewood Solar I LLC