How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (:)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (-)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

▥ probability of presence ▥ breeding season ▥ survey effort ▥ no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
American Kestrel BCC - BCR												
Bachman's Sparrow BCC Rangewide (CON)												

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.
Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the project area, it may be important to minimize habitat modification and to schedule work to helpful impact minimization measures. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of surveys, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Regional Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of surveys, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "I'ill me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles)

potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and interactive tools about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and options for interpreting your results, go to the PDF introduction to migratory birds in IPaC and "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what kinds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

RIVERINE

- Riverine

FRESHWATER EMERGENT WETLAND

- Palustrine

IPaC User Contact Information

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Phone: 7706230755

United States Department of the Interior

West Georgia Sub Office
P.O. Box 57510
Jr. Building, Georgia 31901

Fish and Wildlife Service
RG Stephens, Jr. Federal Building
355 East Hancock Avenue, Room 320, Box 7
Athens, Georgia 30601

Coastal Sub Office
4980 Wildlife Drive
Townsend, Georgia 31331

December 2, 2020

Ms. Tori Gosbeig
Terracon
2105 Newspoint Place, Suite 600
Lawrenceville, GA 30043

Re: FWS Log No. 2021-TA-0464

Dear Ms. Gosbeig:

The U.S. Fish and Wildlife Service (Service) has reviewed your letter on behalf of Macom Solar Project, LLC (applicant) dated October 28, 2020, requesting information on federally listed endangered, threatened, and proposed species that may occur in your proposed project in Brooks County, Georgia. The proposed action will involve development of a photovoltaic solar power generating facility within approximately 2,780 acres of land. Most of the proposed project area has historically been cleared of natural forest cover and has been in agriculture and silviculture. We submit the following comments on this project under provisions of the Endangered Species Act of 1973 (Act) as amended (16 U.S.C. 1531 et seq.).

Threatened and Endangered Species - Prior to field surveys on the property, Terracon reviewed the Service's Iris database for listed species and designated critical habitat that may occur in your project area. Federally-protected species we have to occur in the area of the project site: wood stork (*Mycteria americana*), frosted flatwoods salamander (*Ambystoma cingulatum*) and the eastern indigo snake (*Drymarchon corais couperi*)(*Drymarchon couperi*). Furthermore, one federal candidate (non-listed) species, gopher tortoise (*Gopherus polyphemus*), is known to occur in the area of the project site. No designated critical habitat occurs on the project site. The Service has reviewed the information you provided regarding your proposed project and habitat analysis and determined that approximately 85 acres are suitable for eastern indigo snakes and gopher tortoises. During September 2020 a gopher tortoise survey was conducted on the 85 acres. As a result, three gopher tortoise burrows were found and the applicant commitment to avoid the burrows and a 25-foot buffer zone. The proposed development. The proposed project occurs within the known range of the eastern indigo snake, however no recent records have been documented nest (within 10 miles) the project site. The potential for eastern indigo snakes to occur is low due to consistently disturbed habitat from agricultural activities and distance from recent records. Suitable potential habitat occurs for the wood stork and frosted flatwoods salamander, however, no observations were reported.

The Service understands the proposed project will include the following avoidance and minimization measures:

- A 25-foot buffer will be maintained along all surface waters (e.g. wetlands, streams and ponds) to avoid potential impacts to the wood stork and the frosted flatwoods salamander;
- No gopher tortoise burrows will be impacted by the development; and
- Any sightings of gopher tortoises or eastern indigo snakes during construction will be reported to Terracon immediately.

Based on the information provided and the avoidance and minimization measures to be employed, the Service has determined that the proposed project may affect listed species in a manner or to an extent not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered under this technical assistance, or (3) new species are listed or critical habitat designated that might be affected by the proposed action.

Other Considerations - Although solar energy production is a fast-growing, renewable energy source that can lessen overall impacts to natural resources when compared to conventional energy sources (coal, oil, gas, etc.), the Service believes solar farms can negatively impact valuable natural resources. Impacts to natural resources from the construction and operation of solar farms include: loss of wildlife habitat (including loss of forest, forest edge, forests and riparian buffers); creation of monotypic habitat; introduction of invasive species; use of herbicides; creation of large, clear open spaces; and barrens created from fencing.

Therefore in addition to the avoidance and minimization measures listed above, the Service provides the following considerations, for conserving the eastern indigo snake and other at-risk species: (1) provide eastern indigo snake educational materials to construction personnel and other contractors, post educational materials at the construction site, and report the presence of an eastern indigo snake is sighted; (2) minimize habitat fragmentation by using the smallest area of land needed for construction and operation, and by maintaining habitat along drainages and wetlands) along all aquatic zones; (3) implement and maintain best management practices for erosion control for the duration of the proposed project and that alternative, natural fiber erosion mesh or matting be used rather than plastic monofilament mesh or matting to minimize wildlife entanglement; (4) use only native seed mixtures for any ground cover/seed mixes that are compatible with species needs, while meeting local ordinances and project requirements; and (5) evaluate fencing options that allow for appropriate conservation corridors, such as creating openings in fencing to allow passage of gopher tortoises and other wildlife.

Recent evidence indicates that pollinators, especially native bees and monarch butterflies, are in decline due to loss of habitat and diminished native food sources. Therefore, additional considerations include protecting and maintaining diverse, native herbaceous groundcover wherever possible. For example, planting (or preserving) native wildflowers and other native plants that provide nectar and pollen throughout the growing season. Pollinators are restricted during the summer months and planting (or preserving) low growing (underscore native species) under the solar panels and between the rows of solar panels would provide benefits to pollinators while also minimizing the need for maintenance (mowing) and herbicide application. Planting (or preserving) milkweed (*Asclepias* species) (milkweed is an important host plant for monarch butterflies) is especially beneficial. Additional information regarding plant species, warm season grasses, seed mixes, and pollinator habitat requirements can be provided upon request. For additional information and actions that can be taken to benefit pollinators please visit the following website: https://www.fws.gov/pollinators/pollinators/pages/yourhelp.html

The Service recommends you continue to coordinate with the Georgia Department of Natural Resources regarding impacts to gopher tortoises and potential impacts to other State-protected species. If you have further questions or need additional information, please contact Michelle Hasson of our staff at (912) 651-1571 or at michele_ehasson@fws.gov.

Sincerely,

Donald Sun
Field Supervisor

APPENDIX C

Site Photographs

Responsive Resourceful Reliable

Threatened and Endangered Species Habitat Assessment
Morven Solar Site ■ Brooks County, GA
October 28, 2022 ■ Terracon Project No. 492272968

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Photo # 1 View of agricultural ditches on site.

Photo # 2 View of open water habitat.

Photo # 3 View of typical stream channels in forested wetland environment.

Photo # 4 View from PRP-2 facing west.

Photo # 5 View of typical planted pine habitat.

Photo # 6 View of mixed Hardwood pine habitat

Threatened and Endangered Species Habitat Assessment
Morven Solar Site ■ Brooks County, GA
October 28, 2022 ■ Terracon Project No. 492272968

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Photo # 7 View of the northern portion of the transmission line easement, facing south.

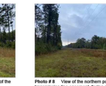
Photo # 8 View of the northern portion of the transmission line easement, facing north.

Photo # 9 Abandoned, adult burrow located along the easement (GS1).

Photo # 10 View of the southern portion of the transmission line easement where wetland vegetation comes in, facing south.

Photo # 11 View of the southern portion of the maintained pecan orchard

Photo # 12 View of the northern portion of the maintained pecan orchard.

Threatened and Endangered Species Habitat Assessment
Morven Solar Site ■ Brooks County, GA
October 28, 2022 ■ Terracon Project No. 492272968

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Photo # 13 View of the eastern portion of the planted pine stand, facing north.

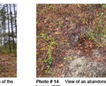
Photo # 14 View of an abandoned, adult burrow (GS2).

Photo # 15 View of an active, adult burrow (GS3).

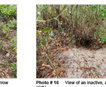
Photo # 16 View of an inactive, adult burrow (GS5).

Photo # 17 View of an abandoned, sub-adult burrow (GS6).

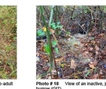
Photo # 18 View of an inactive, juvenile burrow (GS7).

Threatened and Endangered Species Habitat Assessment
Morven Solar Site ■ Brooks County, GA
October 28, 2022 ■ Terracon Project No. 492272968

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Photo # 19 View of western portion of planted pine stand.

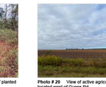
Photo # 20 View of active agricultural field located west of Guess Rd.

Photo # 21 View of active cotton field located north of Lawson Pond Road.

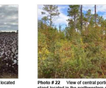
Photo # 22 View of central portion of pine stand located in the northwestern corner of the site displaying thick ground cover.

Photo # 23 View of central portion of pine stand located in the northwestern corner of the site displaying thick ground cover.

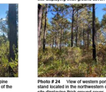
Photo # 24 View of western portion of pine stand located in the northwestern corner of the site displaying thick ground cover.

Threatened and Endangered Species Habitat Assessment
Morven Solar Site ■ Brooks County, GA
October 28, 2022 ■ Terracon Project No. 492272968

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Photo # 25 View of active cotton field located east of Valdosta Highway.

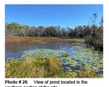
Photo # 26 View of pond located in the southern portion of the site.

MAP IS IN COMPLIANCE WITH
SECTION 9.8-10 (C)(3) OF
ORDINANCE

PINEGATE RENEWABLES

130 ROBERTS STREET
ASHEVILLE, NC 28801

LEGEND

PROJECT BOUNDARY	
GIS PARCEL LINES	
ELECTRICAL (OVERHEAD)	OHE
VEGETATIVE/VISUAL BUFFER	
T&E SPECIES HABITAT	
8 FT WILDLIFE-PERMEABLE FENCING	

SHEET NAME:

HABITAT MITIGATION PLAN

NORTH

N

GRAPHIC SCALE

600' 0 600'

1" = 600'

SHEET NUMBER:

ZPP-104B

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