

*Federal Threatened and Endangered Species
Habitat Suitability Assessment and Wetland Report*

Johnson Farm Solar Array
121 Johnson Road
Town of Chester
Orange County, NY

October 27, 2015

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1.0 INTRODUCTION

A Habitat Suitability Assessment was completed for five federally listed species including the dwarf wedgemussel (*Alasmodonta heterodon*), small whorled pogonia (*Isotria medeoloides*), Indiana bat (*Myotis sodalis*), Northern long-eared bat (*Myotis septentrionalis*), and bog turtle (*Glyptemys muhlenbergii*) and as part of the environmental review for the proposed Solar Array project on the site. A field assessment was conducted on October 26, 2015 to determine whether suitable habitat for these species is present in the project area of the property. Habitat cover types were also observed and are described below.

TABLE 1
COVER TYPES IDENTIFIED ON THE SITE

<u>HABITAT COVER TYPES</u>			
NO.	DESCRIPTION	COVERAGE (ACRES)	DISTURBANCE (ACRES)
2	Agricultural Field	10	8.0
3	Mixed Upland Forest	1.0	0.5

Agricultural Field - The proposed solar array site is currently a corn field.

Mixed Upland Forest – There is about an acre of mixed upland forest in the project area that contains black cherry, Norway maple, white ash, crab apple, and understory species including stiff dogwood, hawthorn, and sumac. Approximately 0.5 acres will be removed for the solar array.

Figure 1 Location Map

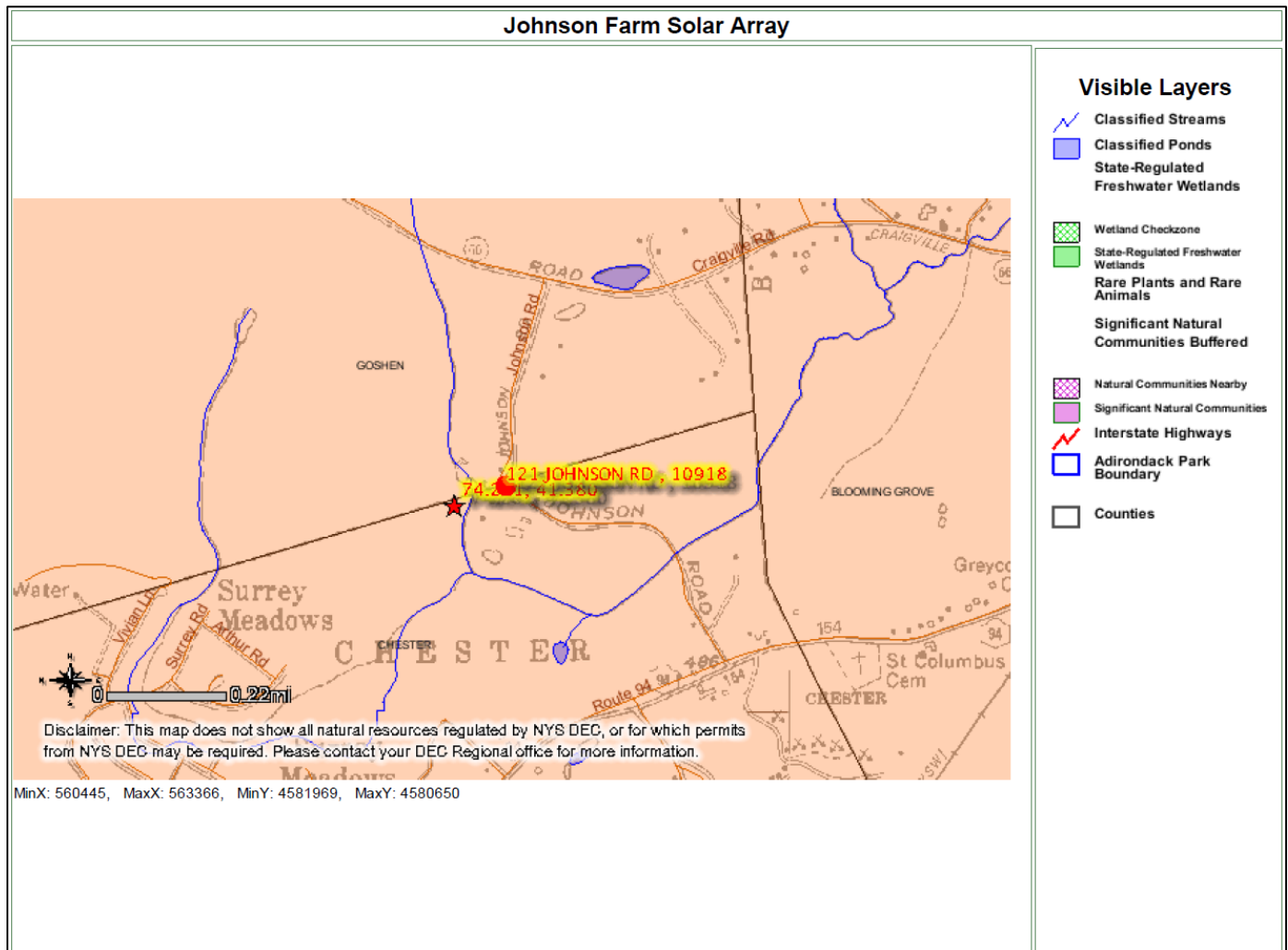


Figure 2 Soil Map



Map Unit Symbol	Map Unit Name
ErB	Erie gravelly silt loam, 3 to 8 percent slopes
MdC	Mardin gravelly silt loam, 8 to 15 percent slopes
MdD	Mardin gravelly silt loam, 15 to 25 percent slopes

Figure 3 NYSDEC Map



2.0 HABITAT SUITABILITY ASSESSMENT/CONCLUSION

2.1 Dwarf wedgemussel

The dwarf wedge mussel is a small freshwater mussel that rarely exceeds 1.5 inches (38 mm) in length. It is brown or yellowish-brown in color. Adult mussels are filter-feeders, feeding on algae and other small suspended particles. They spend most of their time buried almost completely in the bottom of streams and rivers. Typical habitat for this mussel includes running waters of all sizes, from small brooks to large rivers. Bottom substrates include silt, sand and gravel, which may be distributed in relatively small patches behind larger cobbles and boulders. The river velocity is usually slow to moderate. Dwarf wedge mussels appear to select or are at least tolerant of relatively low levels of calcium in the water.

Conclusion - There is no potential habitat for this species in the project area since there is no impacts to tributaries.

2.1 Small whorled pogonia

The small whorled pogonia is a member of the orchid family. It usually has a single grayish-green stem that grows about 10 inches tall when in flower and about 14 inches when bearing fruit. The plant is named for the whorl of five or six leaves near the top of the stem and beneath the flower. The leaves are grayish-green, somewhat oblong and 1 to 3.5 inches long. The single or paired greenish-yellow flowers are about 0.5 to 1 inch long and appear in May or June. The fruit, an upright ellipsoid capsule, appears later in the year. This orchid grows in older hardwood stands of beech, birch, maple, oak, and hickory that have an open understory. Sometimes it grows in stands of softwoods such as hemlock. It prefers acidic soils with a thick layer of dead leaves, often on slopes near small streams.

Conclusion - There is no potential habitat for this species in the project area since there is no older forest on the property but mainly cornfield and a small area of young woods with a thick dense understory.

2.3 Indiana bats

The Indiana bat typically hibernates in caves/mines in the winter and roosts under bark or in tree crevices in the spring, summer, and fall. Suitable potential summer roosting habitat is characterized by trees (dead, dying, or alive) or snags with exfoliating or defoliating bark, or containing cracks or crevices that could potentially be used by Indiana bats as a roost. The minimum diameter of roost trees observed to date is 2.5 inches for males and 4.3 inches for females. However, maternity colonies generally use trees greater than or equal to 9 inches dbh. Overall, roost tree structure appears to be more important to Indiana bats than a particular tree species or habitat type. Females appear to be more habitat specific than males presumably because of the warmer temperature requirements associated with gestation and rearing of young. As a result, they are generally found at lower elevations than males may be found. Roosts are warmed by direct exposure to solar radiation, thus trees exposed to extended periods of direct sunlight are preferred over those in shaded areas. However, shaded roosts may be preferred in very hot conditions. As

larger trees afford a greater thermal mass for heat retention, they appear to be preferred over smaller trees.

Streams associated with floodplain forests, and impounded water bodies (ponds, wetlands, reservoirs, etc.) where abundant supplies of flying insects are likely found provide preferred foraging habitat for Indiana bats, some of which may fly up to 2-5 miles from upland roosts on a regular basis. Indiana bats also forage within the canopy of upland forests, over clearings with early successional vegetation (e.g., old fields), along the borders of croplands, along wooded fencerows, and over farm ponds in pastures. While Indiana bats appear to forage in a wide variety of habitats, they seem to tend to stay fairly close to tree cover.

Conclusion - The project area is almost all cornfield with about an acres of young mixed woods with none of the qualities associated with bat roosting or foraging because of the lack of suitable trees and no vegetation with exfoliating bark, holes, or crevices. No hibernacula are noted on the property. No impacts are expected to occur to this species.

2.4 Northern long-eared bat

Winter Habitat: Same as the Indiana bat northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. They typically use large caves or mines with large passages and entrances; constant temperatures; and high humidity with no air currents. Specific areas where they hibernate have very high humidity, so much so that droplets of water are often seen on their fur. Within hibernacula, surveyors find them in small crevices or cracks, often with only the nose and ears visible.

Summer Habitat: During summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Males and non-reproductive females may also roost in cooler places, like caves and mines. This bat seems opportunistic in selecting roosts, using tree species based on suitability to retain bark or provide cavities or crevices. It has also been found, rarely, roosting in structures like barns and sheds.

Feeding Habits: Northern long-eared bats emerge at dusk to fly through the understory of forested hillsides and ridges feeding on moths, flies, leafhoppers, caddisflies, and beetles, which they catch while in flight using echolocation. This bat also feeds by gleaning motionless insects from vegetation and water surfaces.

Conclusion - The northern long eared bat requires/occupies practically the same habitat niche as the Indiana bat. No mitigation measures are required.

2.5 Bog turtle

According to the U.S. Fish and Wildlife Service, in the 2001 Bog Turtle (*Clemmys muhlenbergii*), Northern Population Recovery Plan. Hadley, Massachusetts. 103 pp. last revised on April 13, 2006 bog turtle habitat is recognized by three criteria:

1. **Suitable hydrology.** Bog turtle wetlands are typically spring-fed with shallow surface water or saturated soils present year-round, although in summer the wet area(s) may be restricted to near spring head(s). Typically these wetlands are interspersed with dry and wet pockets. There is often subsurface flow. In addition, shallow rivulets (less than 4 inches deep) or pseudo-rivulets are often present.

2. **Suitable soils.** Usually a bottom substrate of permanently saturated organic or mineral soils. These are often soft, mucky-like soils (this does not refer to a technical soil type); you will usually sink to your ankles (3-5 inches) or deeper in muck, although in degraded wetlands or summers of dry years this may be limited to areas near spring heads or drainage ditches. In some portions of the species' range, the soft substrate consists of scattered pockets of peat instead of muck.

3. **Suitable vegetation.** Dominant vegetation of low grasses and sedges (in emergent wetlands), often with a scrub-shrub wetland component. Common emergent vegetation includes, but is not limited to: tussock sedge (*Carex stricta*), soft rush (*Juncus effusus*), rice cut grass (*Leersia oryzoides*), sensitive fern (*Onoclea sensibilis*), tearthumbs (*Polygonum spp.*), jewelweeds (*Impatiens spp.*), arrowheads (*Sagittaria spp.*), skunk cabbage (*Symplocarpus foetidus*), panic grasses (*Panicum spp.*), other sedges (*Carex spp.*), spike rushes (*Eleocharis spp.*), grass-of-Parnassus (*Parnassia glauca*), shrubby cinquefoil (*Dasiphora fruticosa*), sweet-flag (*Acorus calamus*), and in disturbed sites, reed canary grass (*Phalaris arundinacea*) or purple loosestrife (*Lythrum salicaria*). Common scrub-shrub species include alder (*Alnus spp.*), red maple (*Acer rubrum*), willow (*Salix spp.*), tamarack (*Larix laricina*), and in disturbed sites, multiflora rose (*Rosa multiflora*). Some forested wetland habitats are suitable given hydrology, soils and/or historic land use. These forested wetlands include red maple, tamarack, and cedar swamps.

The wetlands on the property were surveyed and the wetland communities were assessed for the presence of habitat characteristics consistent with the bog turtle federal recovery plan (U.S. Fish and Wildlife Service, 2001): 1) soft, saturated organic and/or mineral soil; 2) hydrologic regime derived from perennial groundwater discharge; 3) plant community represented by a predominance of low-growing, native flora including sedges, rushes, grasses, forbs, mosses, and sometimes low shrubs; 4) tree canopy cover less than 50% allowing adequate sunlight to reach the ground, and 5) Fen indicator plants (calcicoles) including, shrubby cinquefoil (*Pentaphylloides floribunda*), grass-of-parnassus (*Parnassia glauca*), and tamarack (*Larix laricina*).

Conclusion - There are no wetlands in the project area. There are no groundwater seeps or upwellings that would indicate potential bog turtle habitat and soils are hard mineral soils where wetlands were observed. With the lack of suitable hydrology, continuously saturated soils, and wetlands it is concluded that no bog turtle habitat exists in the project area or within 300 feet. There will be no impact to this species so no mitigation is required.

3.0 WETLANDS

Ecological Solutions, LLC completed a wetland delineation on October 26, 2015 on the portion of property associated with the proposed Solar Array and adjacent 200 feet of property. The delineation was completed in accordance with the Army Corps of Engineers (USACE) Wetlands Delineation Manual (January 1987), Routine Determination Method and recent Northcentral/Northeast supplement. One small wetland finger area was delineated directly east of the proposed solar array about 200 feet from the area. Wetland flags A1 to A4 were placed in the field at the boundary of this area.

Federal wetlands were delineated based upon the identification of the three mandatory criteria for wetland determination as outlined in the 1987 Federal Manual and supplement: dominant hydrophytic vegetation, hydric soils, and evidence of wetland hydrology. The Routine Methodology procedure for wetland determination was used. Transects consisting of at several sample points were walked. Dominant vegetation around each sample point was identified and its percent cover quantified. The areas were checked in detail for the presence of wetland hydrologic indicators. Soil profiles were then observed and characterized at each point.

The detailed field investigation included:

1. Identification of vegetation species to determine whether there was a dominance of hydrophytic plants and areas containing transitional but primarily wetland-oriented species.
2. Determination of soil features for hydric (poorly and very poorly drained) natural soils.
3. Observation of site features displaying evidence of wetland hydrology based on the presence of inundated areas, apparent high seasonal water tables, and evidence of saturation within 12 inches of the surface (considered the root zone) during sufficient periods during the growing season to provide for anaerobic/hydric soil conditions.

4.0 PHOTOGRAPHS

Area of proposed Solar Array



Delineated wetland area below Solar Array



Cornfield - Solar Array area

