Conservation Analysis for Bonavenia Enterprises Subdivision

Location:
East Noxon Road and Clapp Hill Road
Town of Union Vale
County of Dutchess

Date: March 25, 2024

DAY | STOKOSA
ENGINEERING P.C.

3 Van Wyck Lane
Suite 2
Wappingers Falls, New York 12590
Phone: 845-223-3202

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APPENDIX

1 Introduction

This report has been prepared for Bonavenia Enterprises Subdivisions and has been developed to document a site analysis for the proposed Conservation Subdivision.

1.1 Project Background

The parcel is approximately 44.83 acres in size located in the Town of Union Vale at the intersection of East Noxon Road and Clapp Hill Road. The parcel tax map number is 135400-6660-00-437115. The project is located within the Town Center Zone (TC) zoning district. The site is served by individual private wells and sewage septic systems.

The site is formerly used as a mining site for sand and gravel by Bonavenia Enterprises. There are existing improvements, traveled paths and structures clustered along the southern portion of the site which supported the mining operations on the subject site and adjoining parcel under permit from the NYS DEC since the 1990's. Most of the improvement's pre-date zoning.

A location map has been provided in Figure A below, which shows an aerial view of the site and the surrounding area.

1.2 Proposed Project

The applicant wishes to subdivide the parcel into 52 parcels. 2 of the parcels will consist of single-family residential building lots. Each of the proposed 48 townhouses will be provided with an individual lot as is typical. A single lot will encompass the existing structures that will remain in conjunction with the business operations of Bonavenia Enterprises. The balance of the parent parcel will be held by a Homeowners Association and contain all improvements and shared infrastructure serving the town house lots including stormwater, common sewer, public water, visitor parking, roads, open space etc. The single-family lots and commercial lot will be served by private water and sewage facilitates on each site and are not included in the HOA.

Figure A - Location Map

2 Existing Site Features

The site in the present condition is mostly mowed upland meadow ground cover. There is a forested wetland with wooded wetland drainage ways that extend southward from the northeastern portion of the site. There is also a perennial stream in the southern portion of the site that runs under Clapp Hill Road and across the parcel in a westerly direction approximately parallel to the property line. The existing impervious improvements are located between this stream and the southern property line. A location map has been provided in Figure A above, which shows an aerial view of the site and the surrounding area.

3 Zoning and Districts

The property is located in the Town Center zoning district. It Is not in any additional Town districts or overlay districts. There are no existing or planned municipal sewer or water services or districts. The parcel is located within Dutchess Agricultural District 23.

4 Steep Slopes

Areas with slopes of 25% or steeper are considered steep. The site has minor areas of steep slopes which the proposed development avoids. Areas are included on the site analysis map.

5 Site Soils

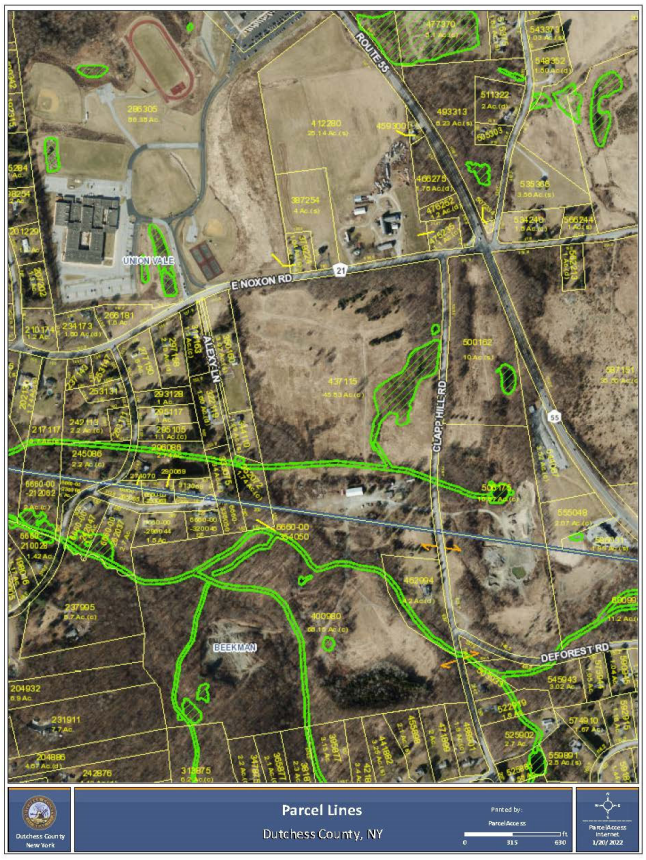
The official soil types indicated by the USDA National Resources Conservation Service for the Site is “Hoosioc Gravelly Loam” of various slopes, “Fredon Silt Loam” and “Sun Silt Loam”. Refer to the soil report and soils map in the appendix for additional soil information and descriptions.

Figure B - Soil Map

6 Wetlands

The project is located in the vicinity of a federal wetlands according to the USFWS wetlands inventory. The mapping is provided in Figure C below for reference.

Figure C - Wetland Map



The limits of the wetland have been delineated by a consultant and included in the site plan. No disturbance of the wetland is proposed. Minimal disturbance within a 100-foot buffer may occur. Additional information is provided in the appendix. The area of the existing wetland and associated stream are considered primary conservation areas.

7 Threated and Endangered Species

According to the online NYS DEC environmental mapper screening tool (https://www.dec.ny.gov/eafmapper/) the project site is subject to areas that may be a suitable habitat for the Indiana Bat. A threatened and endangered species habitat

suitability assessment report has been completed by the consultant concluding that disturbance activities will not result in an adverse impact to the species given the minimal removal of trees. A copy of the report is included in the appendix of the report.

Additional species and rare vegetation habitat potential are identified in other reports and noted as not found in the field. The site being used as a former mine generally has heavily disturbed the site and minimized potential for substantial habitation. Most remaining habitat that is most suitable for species of interest occur within the wetland areas which are not proposed to be disturbed.

The Hudsonia 2009 report identifies the site, as it does nearly the entire TC zoning district, as potential Blanding's turtle habitat and in a conservation zone based upon methodologies described therein. There have not been any noted colonies onsite or the immediate area. The property is somewhat isolated from the core habitat by HYS route 55, Clapp Hill Road as well as East Noxon Road. Typical turtle fencing will be used around the perimeter of construction.

8 Cultural Resources

According to the online NYS DEC environmental mapper screening tool (https://www.dec.ny.gov/eafmapper/) the project site is neither located in an area of archeological sensitivity nor contains a structure listed on either the State or National Register of Historic places. As confirmed during the SEQRA process and determination with the Town Planning Board, there are no existing or potential cultural resource factors to consider.

9 Town Resources

There are no existing conservation easements or significant recreational areas on or are adjacent to the exiting parcel. There are no existing sidewalks or noted scenic locations.

10 Conclusions

Based upon the foregoing the wetlands and stream have been considered primary conservation areas and areas of existing brush and wooded areas have been included as secondary areas. 22.5 acres has been proposed as open space and include all of the primary areas and as much of the secondary areas as possible. The proposed lay

Appendix

DIEHLUX, LLC

- Innovative Ecology -

July 12, 2018

Mr. Angelo Bonavenia
Bonavenia Construction Corporation
20 Old Pawling Road
Pawling, New York 12564

RE: CLAPP HILL ROAD PROPERTY
SECTION-BLOCK-LOT: 135400-6660-00-437115-0000
TOWN OF UNION VALE, DUTCHESS COUNTY, NEW YORK
RARE, THREATENED, AND ENDANGERED SPECIES INVESTIGATION

Dear Mr. Bonavenia:

The following represents our findings, recommendations, and conclusions upon completion of the rare, threatened and endangered (RTE) species investigation services authorized by Angelo Bonavenia, herein referred to as the "Client," on February 18, 2018. This service was performed to assist the Client with investigation of existing field conditions and potential environmental permitting as it related to state and federally regulated RTE species for the future residential development of the 45.83-acre property located south of East Noxon Road (Route 21) and west of Clap Hill Road in the Town of Union Vale, Dutchess County, New York.

The survey focused on the portion of the property from East Noxon Road southward to an unnamed perennial tributary to Jackson Creek, which crosses the property in an east to west direction in the southern part of the property. The surveyed portion of the property, which totals approximately 38 acres, is hereinafter referred to as the "Site". A copy of the site location map provided by the Client is documented as Appendix I.

A. Preliminary Review

According to the United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (iPaC) Project Planning Tool (Appendix V), the following federally-listed endangered and threatened species are listed for the project area:

Federally-Listed Species:

Common Name	Scientific Name	Status
Northern Long-Eared Bat	*Myotis septentrionalis*	Threatened
Indiana Bat	*Myotis sodalis*	Endangered
Bog Turtle	*Clemmys muhlenbergii*	Threatened
Dwarf Wedgemussel	*Alasmidonata heterdon*	Endangered

In addition, the Client submitted a formal request to the NYSDEC Natural Heritage Program (NHP) for the above referenced property regarding New York's rare or state-listed animals or plants, significant natural communities, and other significant habitats. This standard preliminary investigation was performed in order to determine what impacts, if any, would occur or possibly adversely affect state-listed endangered and threatened species within the proposed project footprint and action area.

A response from the NYSDEC NHP office was received on July 5, 2018, indicating "no records of rare or state-listed animals or plants, or significant natural communities at the project Site or in its immediate vicinity" (Appendix IV). However, the NHP response also indicated "within one mile of the project Site is a documented maternity colony of Indiana bat (IB) – a state and federally listed endangered species". The main impact of concern for bats is the cutting or removal of potential roost trees 3-inches diameter at breast height (DBH) or greater from April – October.

NY State-Listed Species:

Common Name	Scientific Name	Status
Indiana Bat	*Myotis sodalis*	Endangered

B. Field Findings

A broad RTE field investigation was completed on-Site by a qualified biologist in May, 2018. The weather was partly cloudy and an average temperature of 65° Fahrenheit. Field conditions were not problematic and were conducive to performing the fieldwork. The field investigation was completed in accordance with the following technical manual(s):

- U.S. Fish and Wildlife Service (USFWS) Northern Long-Eared Bat Interim Conference and Planning Guidance. USFWS Regions 2, 3, 4, 5 & 6. January 6, 2014: http://www.fws.gov/midwest/endangered/mammals/nlba/pdf/NLEBinterimGuidance6Jan2014.pdf

- U.S Fish and Wildlife Service (USFWS) Range Wide Indiana Bat Survey Guidelines, April, 2018: https://www.fws.gov/midwest/endangered/mammals/inba/surveys/pdf/2018RangewideIBatSurveyGuidelines.pdf

The Site consists largely of open grass fields with wetland and upland components, along with wooded wetland drainageways that extend southward from the northeastern portion of the Site by Clapp Hill Road and along the perennial stream in the southern portion of the site. The northernmost portion of the Site adjacent to East Noxon Road contains upland woodlands. The open areas were likely harvested for hay. Paths are present throughout the Site. Adjacent land uses include undeveloped woodlands east of Clapp Hill Road, a cemetery, farm and middle school northern of East Noxon Road, and residence properties off Alexy Lane to the west.

An extensive wetland network is located in the central to southern portion of the site. Red maple swamp and emergent marsh and wet meadow wetlands were observed throughout the Site. The saturated emergent wetlands consisted mainly of cattails with a few areas of phragmites. An upland sugar maple community is located just south of East Noxon Road. This community had little understory and minimal ground cover – some poison ivy and garlic mustard. The trees averaged approximately 5 to 12-inches DBH and 80 to 120-feet in height. Between the sugar maple community and the open field is an area of black locust, Norway spruce, red cedar, and some black oak trees. Understory of shrubs and saplings of honeysuckle, black locust and red cedar exist. Ground cover includes goldenrods and garlic mustard. These trees are smaller than the adjacent maple communities.

Copies of aerial images are documented in Appendix II and Site photographs are documented as Appendix III. A broad habitat map is included in Appendix VII.

C. Conclusions & Recommendations

No federal or state-listed threatened or endangered species were observed within the limits of the proposed Site. However, potential suitable summer roosting habitat for the NLEB and IB was observed within the limits of the Site. Upland mature forest lined the edge of much of the Site and meet the 3-inch DBH criteria as listed in the NLEB/IB guidance documents issued by the USFWS.

The bog turtle is a 1 to 1.5- inch long turtle found in disjunct colonies within New York. This turtle is generally found in open, early successional types of habitats such as wet meadows or open calcareous boggy areas generally dominated by sedges (*Carex spp.*) or sphagnum moss. Much of the Site is emergent wetland and wet meadow. If there will be

proposed impacts to such wetlands or in the immediate vicinity on-Site, a Phase I Bog Turtle Survey may need to be completed along with consultation with USFWS.

The habitat for the dwarf wedge mussel includes running waters of all sizes, from small brooks to large rivers. Bottom substrates include silt, sand and gravel. This species has been documented in watercourses in Dutchess County. If there will be proposed impacts to the drainage ditches/stream located along the southern portion of the Site, additional investigation by a freshwater mussel biologist may be required. Further consultation with USFWS is anticipated.

It is DIEHLUX's opinion that the proposed project requires further consultation with USFWS Cortland Office and Region 3 office of NYSDEC given the IB maternity roost trees proximity to project Site. Further, as there is potential IB/NLEB habitat on-Site (3-inch DBH criteria as listed in the NLEB guidance document), USFWS/DEC may require any tree clearing to be completed from November 1st – March 31st. Specific scope details and site plans are needed to formally consult with regulatory agencies as to the potential impacts to aforementioned RTE species. Species fact sheets are located in Appendix VI.

If Site plans or the area of disturbance change, DIEHLUX recommends an additional review to ensure there are no impacts to aforementioned federal and state designated RTE species.

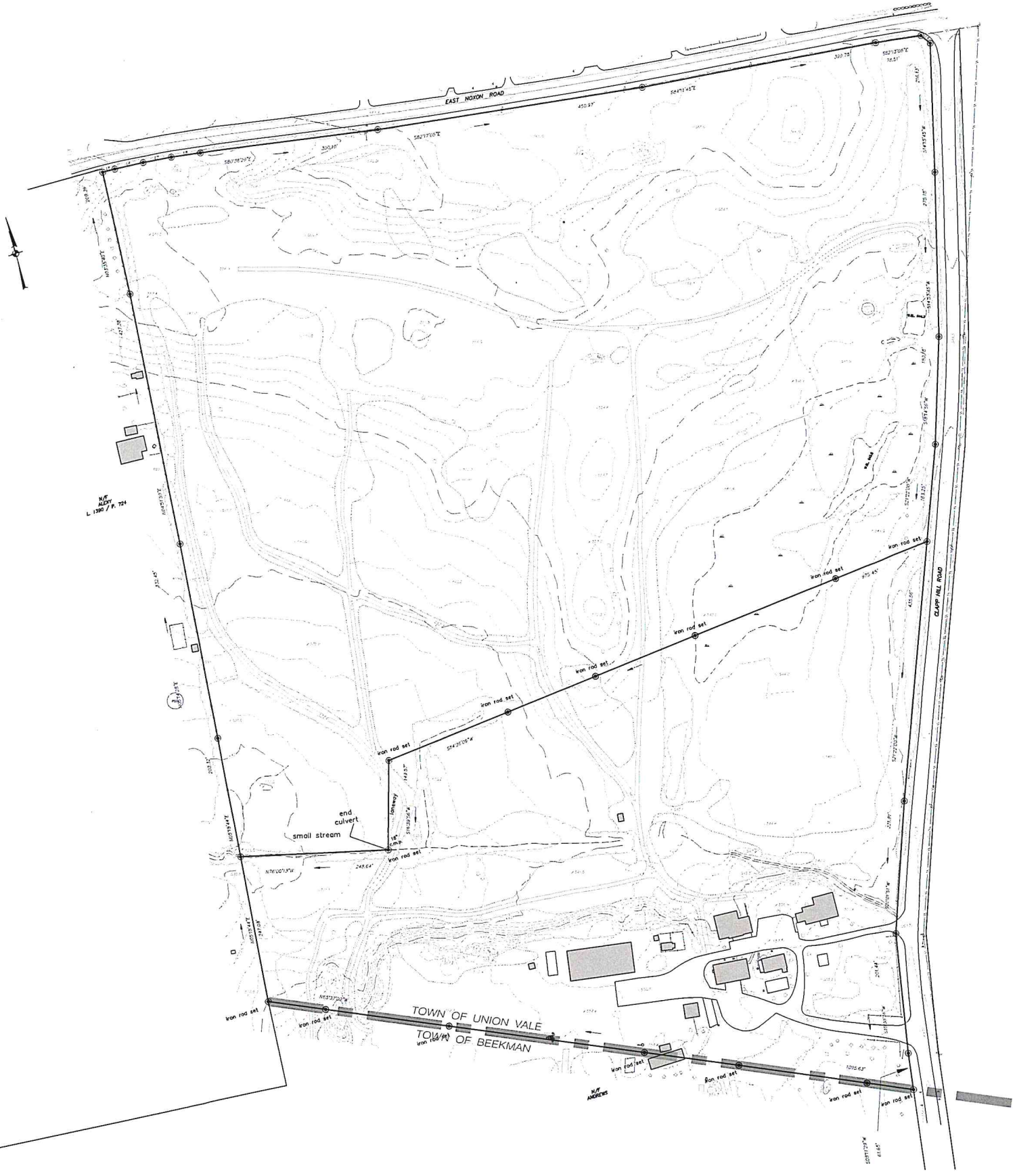
We appreciate the opportunity to be involved in your project and hope that you have found our services helpful. We are happy to assist with any required permit applications or follow up should the project sponsor choose to move forward as planned. Please contact us if you have any questions, comments, concerns or requests for additional information.

Respectfully Submitted,

Travis Money
Vice President/Senior Ecologist

Attachments: Appendix I – Conceptual Plan
Appendix II - Preliminary Site Review Data
Appendix III – Site Photographs
Appendix IV – NHP Response
Appendix V – IPAC Response
Appendix VI – Species Fact Sheets/Info
Appendix VII – Habitat Map

APPENDIX I

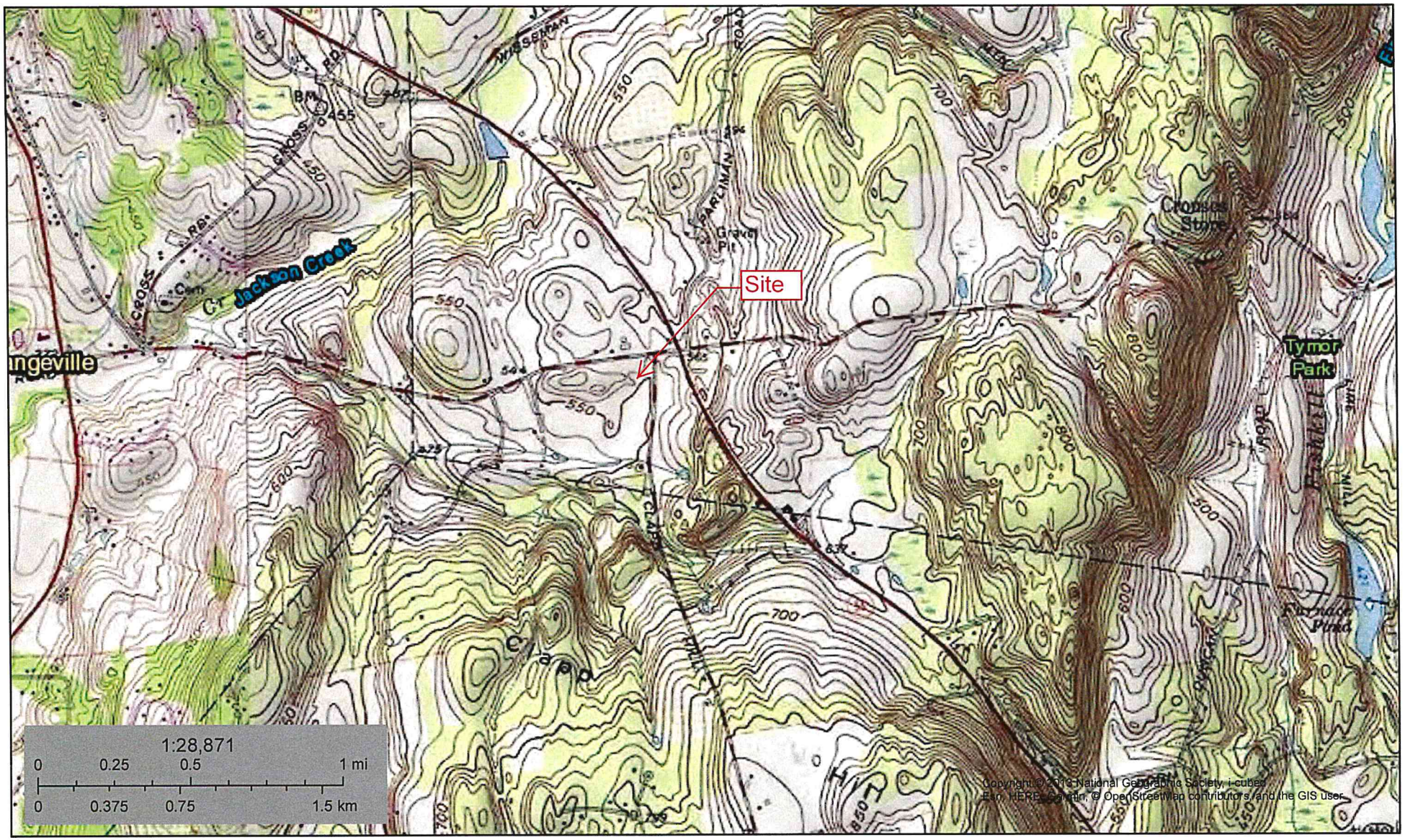

EAST NOXON ROAD
CLAPP HILL ROAD
TOWN OF UNION VALE
TOWN OF BEEKMAN
N/F
KLOTZ
L. 1390 / P. 724
N/F
ANDREWS
end
culvert
small stream
iron rod set

APPENDIX II

U.S. Fish and Wildlife Service

National Wetlands Inventory

USGS Topographic Map



June 9, 2018

Figure 1
Clapp Hill Road, Union Vale, NY
USGS Topographic Map

Figure 2
Clapp Hill Road, Union Vale, NY
Dutchess County Parcel Data

U.S. Fish and Wildlife Service
National Wetlands Inventory

NWI Wetlands Mapping

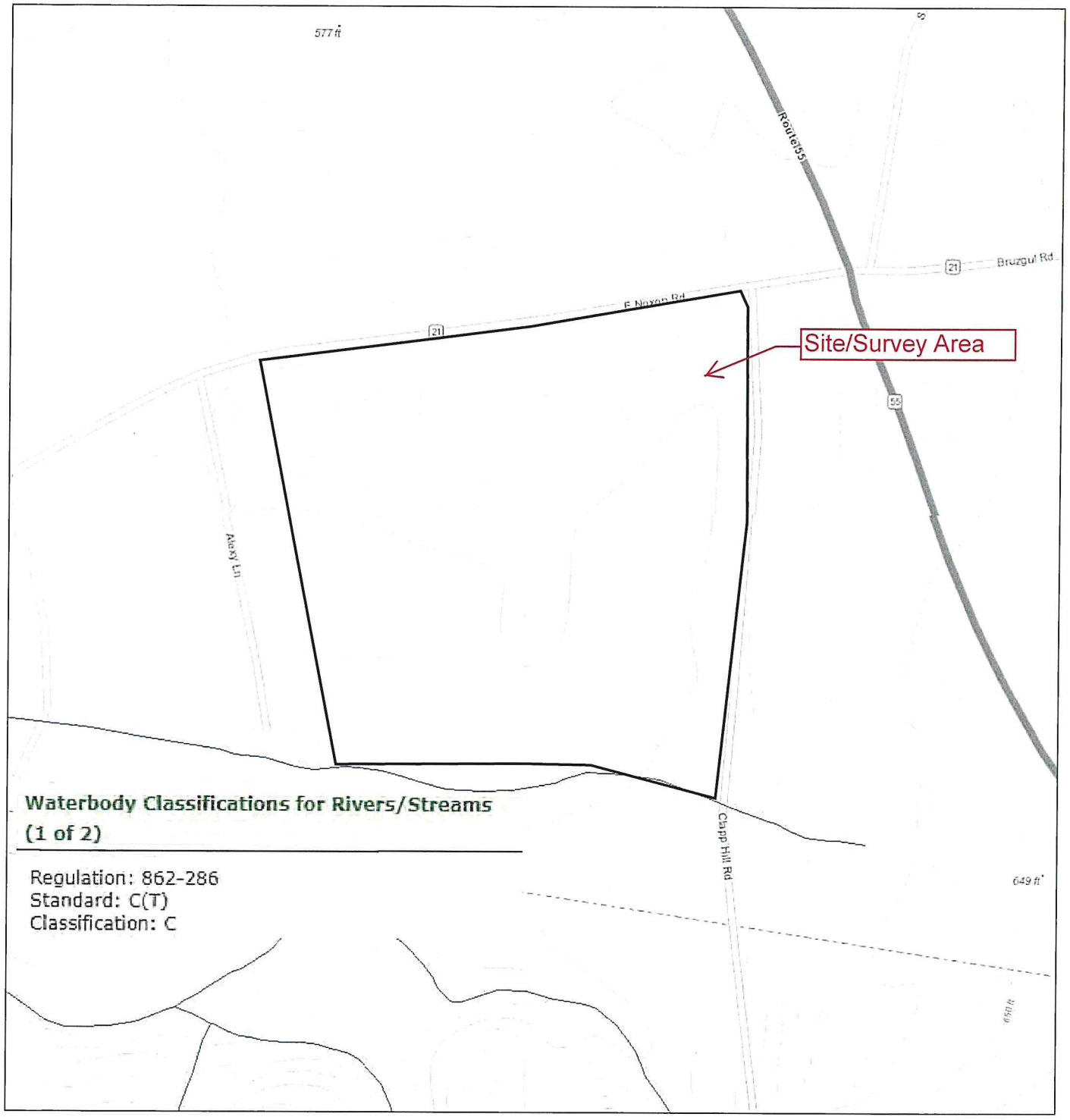
June 9, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Figure 3
Clapp Hill Road, Union Vale, NY
NWI Wetland Mapping

Clapp Hill Road Property - NYS Protected Wetlands and Streams



June 9, 2018

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0 0.075 0.15 0.3 km

Waterbody Classifications for Rivers/Streams

Waterbody Classifications for Lakes

State Regulated Freshwater Wetlands

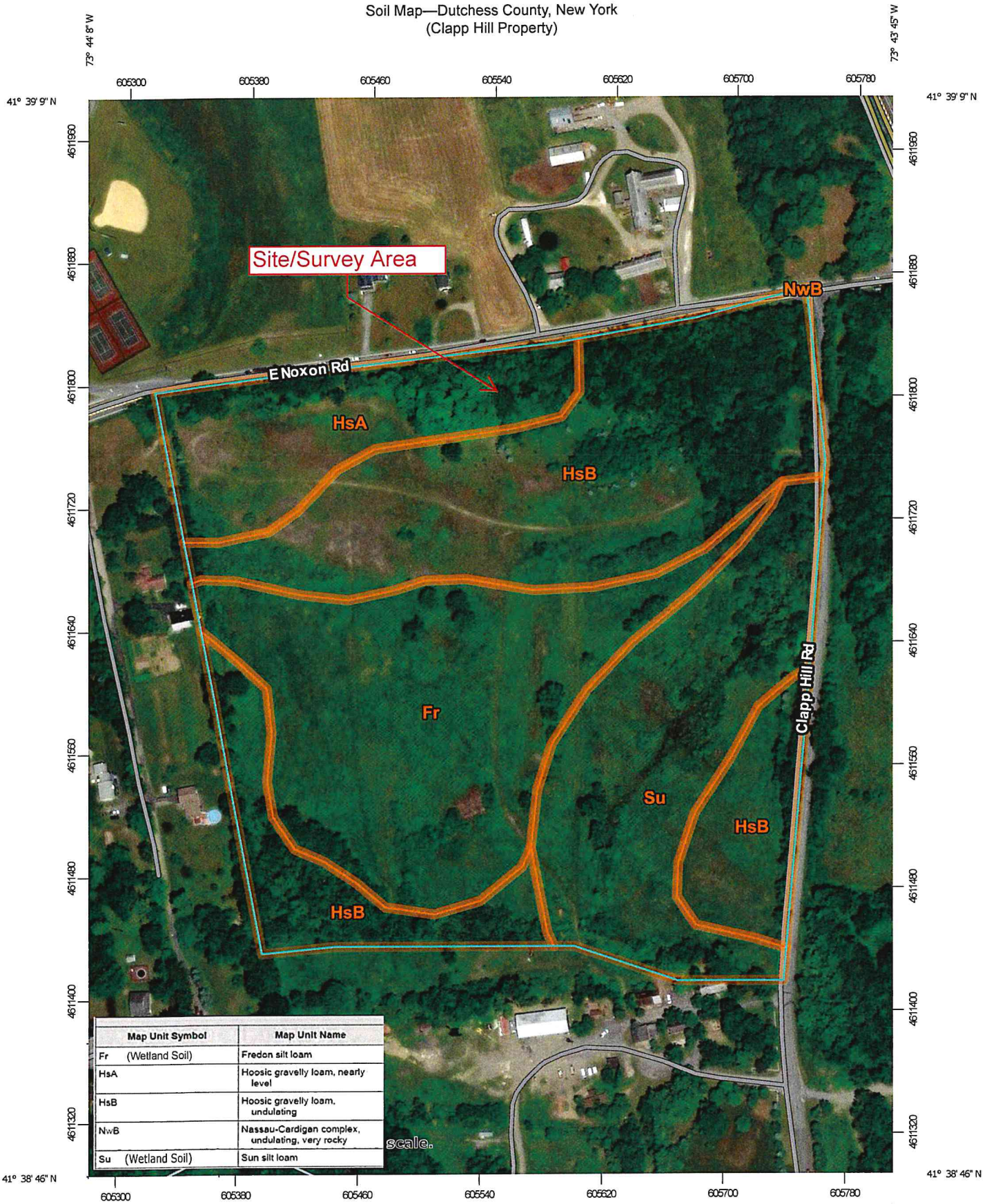
State Regulated Wetland Checkzone

Figure 4
Clapp Hill Road, Union Vale, NY
NYS Protected Wetland and Streams

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

NYS Department of Environmental Conservation
Not a legal document

Soil Map—Dutchess County, New York
(Clapp Hill Property)



Map Unit Symbol	Map Unit Name
Fr (Wetland Soil)	Fredon silt loam
HsA	Hoosic gravelly loam, nearly level
HsB	Hoosic gravelly loam, undulating
NwB	Nassau-Cardigan complex, undulating, very rocky
Su (Wetland Soil)	Sun silt loam

scale.

Map Scale: 1:3,420 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

Figure 5
Clapp Hill Road, Union Vale, NY
NRCS Soil Map

USDA Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

6/7/2018

Clapp Hill Road Property - Aerial View

June 9, 2018

1:4,514

0 0.05 0.1 0.2 mi

0 0.075 0.15 0.3 km

Figure 6
Clapp Hill Road, Union Vale, NY
Aerial View

Esri, HERE, Garmin, © OpenStreetMap contributors
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

NYS Department of Environmental Conservation

APPENDIX III

PHOTO 1 View northeast from Clapp Hill Road along the eastern Site/property boundary.

PHOTO 2 Easterly view of the perennial tributary of Jackson Creek (Stream B1) where it enters the Site via a culvert under Clapp Hill Road.

PHOTO 3 Representative view of emergent portion of Wetland 1 looking northwest from southeastern corner of the Site.

PHOTO 4 Intermittent tributary to Stream B1 (Stream B2), looking south from path/culvert crossing. Stream B2 borders Wetland 1 in southern part of the Site.

PHOTO 5 Representative view of the scrub-shrub wetland community in Wetland 1.

PHOTO 6 Representative view of the forested wetland community in Wetland 1 (present in Wetland 2 also).

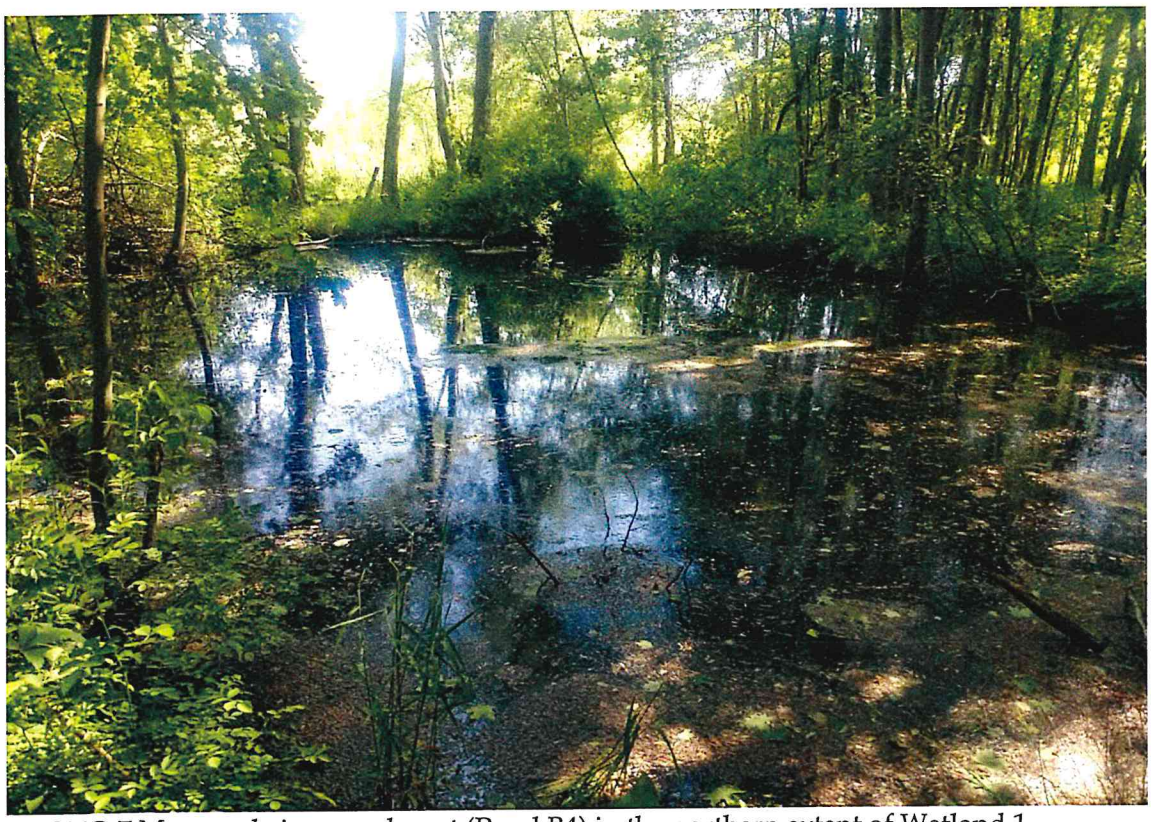


PHOTO 7 Man-made impoundment (Pond B4) in the northern extent of Wetland 1.

PHOTO 8 View of emergent and scrub-shrub communities in Wetland 2.

PHOTO 9 Intermittent tributary to Stream B1 (Stream B3) located in Wetland 2. View is looking southward from path over a culvert crossing.

PHOTO 10 Wetland 3 (emergent) along Stream B1 in southeastern corner of the Site.

PHOTO 11 Representative view of upland open fields on the Site. View is in the northwestern part of the Site looking east.

PHOTO 12 Upland woodlands along East Noxon Road.

PHOTO 13 Black locust/Norway spruce forest edge in northcentral portion of Site

PHOTO 14 Black locust/Norway spruce forest edge in northcentral portion of Site

PHOTO 15 Phragmites/cattail in emergent wetland

APPENDIX IV

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Fish and Wildlife, New York Natural Heritage Program
625 Broadway, Fifth Floor, Albany, NY 12233-4757
P: (518) 402-8935 | F: (518) 402-8925
www.dec.ny.gov

July 5, 2018

Travis Money
DIEHLUX, LLC
2434 County Road 39
East Bloomfield, NY 14469

Re: Clap Hill Road
County: Dutchess Town/City: Union Vale

Dear Mr. Money:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

We have no records of rare or state-listed animals or plants, or significant natural communities at the project site or in its immediate vicinity.

Within one mile of the project site is a documented maternity colony of **Indiana bat** (*Myotis sodalis*, state and federally listed as Endangered). There are several more within 2.5 miles. These bats may travel 2.5 miles or more from documented locations. The main impact of concern for bats is the cutting or removal of potential roost trees. For information about any permit considerations for your project, please contact the Permits staff at the NYSDEC Region 3 Office at dep.r3@dec.ny.gov, (845) 256-3054. For information about potential impacts of your project on this species and how to avoid, minimize, or mitigate any impacts, contact the Region 3 Wildlife staff at Wildlife.R3@dec.ny.gov, (845) 256-3098.

For most sites, comprehensive field surveys have not been conducted. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other resources may be required to fully assess impacts on biological resources.

For information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the Permits staff at the NYSDEC Region 3 Office as described above.

Sincerely,

Heidi Krahling
Environmental Review Specialist
New York Natural Heritage Program

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APPENDIX V

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9349
Phone: (607) 753-9334 Fax: (607) 753-9699
http://www.fws.gov/northeast/nyfo/es/section7.htm

In Reply Refer To:
Consultation Code: 05E1NY00-2017-SLI-3319
Event Code: 05E1NY00-2017-E-09595
Project Name: Clapp Hill Road

September 11, 2017

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). This list can also be used to determine whether listed species may be present for projects without federal agency involvement. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list.

Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list. If listed, proposed, or candidate species were identified as potentially occurring in the project area, coordination with our office is encouraged. Information on the steps involved with assessing potential impacts from projects can be found at: http://www.fws.gov/northeast/nyfo/es/section7.htm

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (

http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the Services wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9349
(607) 753-9334

Project Summary

Consultation Code: 05E1NY00-2017-SLI-3319

Event Code: 05E1NY00-2017-E-09595

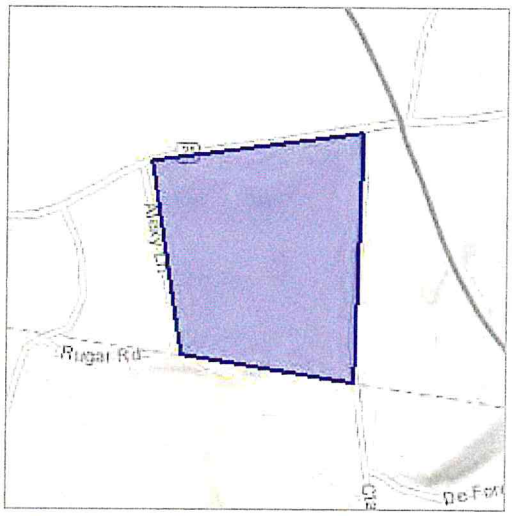
Project Name: Clapp Hill Road

Project Type: DEVELOPMENT

Project Description: Residential build

Project Location:

Approximate location of the project can be viewed in Google Maps:
https://www.google.com/maps/place/41.648937637828716N73.73261437235747W



Counties: Dutchess, NY

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

Mammals

NAME	STATUS
Indiana Bat *Myotis sodalis* There is **final designated** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Reptiles

NAME	STATUS
Bog Turtle *Clemmys muhlenbergii* Population: Wherever found, except GA, NC, SC, TN, VA No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6962 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/182/office/52410.pdf Habitat assessment guidelines: https://ecos.fws.gov/ipac/guideline/assessment/population/182/office/52410.pdf	Threatened

Clams

NAME	STATUS
Dwarf Wedgemussel *Alasmidonta heterodon* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/784 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/363/office/52410.pdf	Endangered

Critical habitats

There are no critical habitats within your project area under this office's jurisdiction.

APPENDIX VI

Northeast Region

New York Field Office

Friday, July 06, 2018

Home
Endangered Species
Conservation Planning Assistance
Environmental Quality
Partners for Fish & Wildlife
Congressional Briefings
Contact Information and Directions
Long Island Field Office
Great Lakes Restoration Initiative
Fish Enhancement, Mitigation & Research Fund
Upper Susquehanna Conservation Alliance
Newsroom

Bog Turtle

(*Clemmys [=Glyptemys] muhlenbergii*)

[Threatened]

What's New in Endangered Species?
Overview
Listing & Classification
Recovery
Training & Presentations
Long Island Recovery Efforts
Project Reviews
Species in New York State

Overview

The Bog Turtle was federally listed as a threatened species in 1997.

At only about 4 inches long, the Bog Turtle is one of North America's smallest Turtles. This species typically shows a bright yellow, orange, or red blotch on each side of the head. The nearly parallel sides of the upper shell (carapace) give Bog Turtles an oblong appearance when viewed from above. These small, semi-aquatic Turtles consume a varied diet including insects, snails, worms, seeds, and carrion.

Photo by Richard C. Back.

Habitat

Bog Turtles usually occur in small, discrete populations, generally occupying open-canopy, herbaceous sedge meadows and fens bordered by wooded areas. These wetlands are a mosaic of micro-habitats that include dry pockets, saturated areas, and areas that are periodically flooded. Bog Turtles depend upon this diversity of micro-habitats for foraging, nesting, basking, hibernating, and sheltering. Unfragmented riparian (river) systems that are sufficiently dynamic to allow the natural creation of open habitat are needed to compensate for ecological succession. Beaver, deer, and cattle may be instrumental in maintaining the open-canopy wetlands essential for this species' survival.

Bog Turtles inhabit open, unpolluted emergent and scrub/shrub wetlands such as shallow spring-fed fens, sphagnum bogs, swamps, marshy meadows, and wet pastures. These habitats are characterized by soft muddy bottoms, interspersed wet and dry pockets, vegetation dominated by low grasses and sedges, and a low volume of standing or slow-moving water which often forms a network of shallow pools and rivulets. Bog Turtles prefer areas with ample sunlight, high evaporation rates, high humidity in the near-ground microclimate, and perennial saturation of portions of the ground. Eggs are often laid in elevated areas, such as the tops of tussocks. Bog Turtles generally retreat into more densely vegetated areas to hibernate from mid-September through mid-April.

The greatest threats to the Bog Turtle are the loss, degradation, and fragmentation of its habitat from wetland alteration, development, pollution, invasive species, and natural vegetational succession. The species is also threatened by collection for illegal wildlife trade.

Distribution in New York

Species Range: The northern population of Bog Turtles ranges from New York and western Massachusetts south to Maryland. Disjunct populations, some of which are extirpated, have been reported from western Pennsylvania and the Lake George and Finger Lakes regions of New York. The southern population, which occurs in the Appalachian Mountains from Virginia to Georgia, is listed as threatened due to similarity of appearance to the northern population. There is a 250-mile gap in the species' current known distribution from northeastern Maryland to southern Virginia.

Species Range by County

Albany, Cayuga, Columbia, Dutchess, Genesee, Monroe, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Rockland, Seneca, Sullivan, Tompkins, Ulster, Warren, Wayne, Westchester.

See Federally Listed Species Occurrences by County [PDF].

Conservation/Recovery

Recovery Plan [7.9 MB pdf]
Recovery Units (pdf)
Spotlight Species Action Plan (pdf)
Natural Resource Conservation Service Working Lands for Wildlife Program
Great Lakes Restoration Initiative
NYSDEC Landowner Incentive Program - Bog Turtle Habitat Protection Program

What to Do if this Species Occurs on your Property or Project Site

- Contact the U.S. Fish and Wildlife Service early in planning for any project or activity that may affect the Bog Turtle or its habitat. See New York Field Office Procedures for Project Reviews and Technical Assistance for instructions. Through the technical assistance or Project Reviews processes of the Endangered Species Act, the Service will provide project-specific recommendations to avoid or minimize adverse effects to listed species.
- Individual landowners with suitable habitat can also contact the Service for site-specific, proactive conservation recommendations. In addition, technical and/or material assistance may be available through various State and or Federal programs to restore or maintain Bog Turtle habitat. Most land in New York is privately owned. Voluntary conservation efforts by New York's residents are critical in the conservation and recovery of threatened and endangered species.
- Also see "Endangered Species and You" Frequently Asked Questions.

Protocols/Best Management Practices

- Bog Turtle Conservation Zones (pdf)
- Bog Turtle Health Bulletin for Surveyors and Researchers
- Guidelines for Bog Turtle Surveys (pdf)
- Hudson/Housatonic/Walkill RU Qualified Bog Turtle Surveyors (pdf)
- NEPARC Disinfection of Field Equipment to Minimize Risk of Spread of Chytridiomycosis and Ranavirus
- Phase One Habitat Survey Report NEW (pdf)
- Hudson/Housatonic Recovery Unit Fact Sheet (pdf)
- Hudson/Housatonic Recovery Unit Phase 1 Survey Form (pdf)
- Prairie Peninsula/Lake Plain RU Qualified Bog Turtle Surveyors (pdf)
- Prairie Peninsula/Lake Plain RU Phase 1 Survey Form (pdf)
- Prairie Peninsula/Lake Plain Recovery Unit Fact Sheet (pdf)

Additional Information

- ECOS Bog Turtle Page (regulatory documents, recovery plan)
- NYDEC Fact Sheet
- Natural Resource Conservation Service's soil maps
- U.S. EPA Wetlands
- State of Connecticut Bog Turtle Fact Sheet
- State of New Jersey Bog Turtle Fact Sheet

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Bog Turtle Fact Sheet

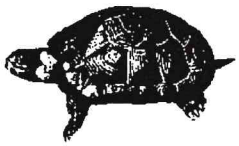
Bog Turtle

Clemmys muhlenbergii

New York Status: Endangered
Federal Status: Threatened

Description

The bog turtle is New York's smallest turtle, reaching a maximum length of 4.5 inches. It is one of seventeen species of turtles found in New York State, including marine turtles. A bright yellow or orange blotch on each side of its head and neck are a distinctive feature of this species. The body color is dark with an orange-red wash on the inside of the legs of some individuals. The carapace (upper shell) is domed and somewhat rectangular, often with prominent rings on the shell plates (scutes). In some older individuals, or those that burrow frequently in coarse substrates, the shell may become quite smooth and polished. Although generally black, the carapace is sometimes highlighted by a chestnut sunburst pattern in each scute. The plastron (lower shell) is hingeless, with a pattern of cream and black blotches. As with most turtles, the plastron of the male is slightly concave while the female's is flat.

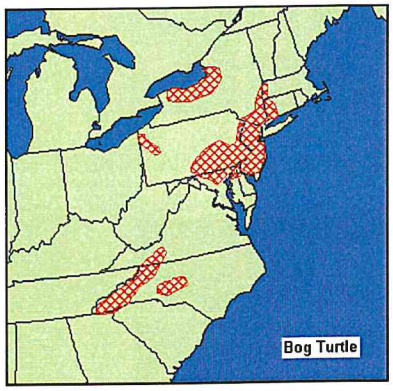


Life History

In New York, the bog turtle emerges from hibernation, often spent in an abandoned muskrat lodge or other burrow, by mid-April. In New York bog turtles often hibernate communally with other bog turtles and with spotted turtles (*Clemmys guttata*). Generally both the air and water temperature must exceed 50 degrees F for the turtle to become active. Mating occurs primarily in the spring but may also occur in the fall and may be focused in or near the hibernaculum (winter shelter). In early to mid-June, a clutch of two to four eggs is laid in a nest which is generally located inside the upper part of an unshaded tussock. The eggs hatch around mid-September. Some young turtles spend the winter in the nest, emerging the following spring. The adults enter hibernation in late October. Sexual maturity may be reached at eight years or as late as eleven. A bog turtle may live for more than 30 years.

Although generally very secretive, the bog turtle can be seen basking in the open, especially in the early spring just after emerging from hibernation. It is an opportunistic feeder, eating what it can get, although it prefers invertebrates such as slugs, worms, and insects. Seeds, plant leaves, and carrion are also included in its diet.

Distribution and Habitat



The bog turtle is found in the eastern United States scattered in disjunct colonies from New York and Massachusetts south to southern Tennessee and Georgia. This is a semi-aquatic species, preferring habitat with cool, shallow, slow-moving water, deep soft muck soils, and tussock-forming herbaceous vegetation. In New York, the bog turtle is generally found in open, early successional types of habitats such as wet meadows or open calcareous boggy areas generally dominated by sedges (*Carex spp.*) or sphagnum moss. Like other cold-blooded or ectothermic species, it requires habitats with a good deal of solar penetration for basking and nesting. Plants such as purple loosestrife (*Lythrum salicaria*) and reed (*Phragmites australis*) can quickly invade such areas resulting in the loss of basking and nesting habitat.

Status

More than half of the 74 historic bog turtle locations in New York still contain apparently suitable habitat. Only one quarter of these sites, however, are known to support extant populations, primarily in southeastern New York.

The primary threats to this species are loss or degradation of habitat and illegal collecting. In New York, development and natural succession are the major threat to bog turtle habitat. As sites deteriorate, bog turtles normally move out of their old sites to new areas where fire, beavers agriculture or other causes have created an open wet meadow type habitat. Development, especially roads, residential, commercial and reservoir construction inhibits the species' ability to move to new, potential habitat. Consequently new populations are not being established as old sites deteriorate.

Collection of the bog turtle without a permit is prohibited in all states where it occurs. It was listed as threatened in 1997 by the U. S. Fish and Wildlife Service, and has been listed in CITES Appendix I, (Convention of International Trade in Endangered Species) since 1975. Unfortunately, illegal collection still goes on threatening this long-lived, slow reproducing turtle.

Contamination by pesticides, agricultural run-off and industrial discharge may negatively affect the bog turtle and its habitat directly. Contaminates may also accumulate in or adversely affect the turtle's invertebrate food supply.

Management and Research Needs

Since 1976, the New York State Department of Environmental Conservation has been conducting field surveys of historic and potential bog turtle sites to document current populations and habitat suitability. Some currently inhabited bog turtle sites and some historic sites are under the ownership of the State or conservation organizations. Many of the best remaining sites are still in private ownership and efforts continue to acquire or otherwise protect theses areas.

Information is being gathered on reproductive potential, daily and seasonal movements, nesting and hibernation areas, and habitat use through the tracking of animals tagged with radio transmitters. Since the bog turtle is sensitive to habitat changes that are the result of natural succession, studies are underway that will monitor the responses of a bog turtle population to habitat manipulations.

Techniques for breeding and raising bog turtles in captivity have been developed and a study has begun to investigate the effectiveness of releasing young or adult turtles into the wild.

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Map adapted from Conant and Collins (1998),Ernst, Lovich and Barbour (1994) and Harding (1997)

Indiana Bat
(Myotis sodalis)

The Indiana bat is an endangered species. Endangered species are animals and plants that are in danger of becoming extinct. Threatened species are those that are likely to become endangered in the foreseeable future. Identifying, protecting, and restoring endangered and threatened species are primary objectives of the U.S. Fish and Wildlife Service's endangered species program.

Photo by Rich Fields

Indiana bats eat up to half their body weight in insects each night.

What is the Indiana Bat?

Description

The scientific name of the Indiana bat is *Myotis sodalis* and it is an accurate description of the species. Myotis means "mouse ear" and refers to the relatively small, mouse-like ears of the bats in this group. Sodalis is the Latin word for "companion." The Indiana bat is a very social species; large numbers cluster together during hibernation. The species is called the Indiana bat because the first specimen described to science in 1928 was based on a specimen found in southern Indiana's Wyandotte Cave in 1904.

The Indiana bat is quite small, weighing only one-quarter of an ounce (about the weight of three pennies). In flight, it has a wingspan of 9 to 11 inches. The fur is dark-brown to black. The Indiana bat is similar in appearance to many other related species. Biologists can distinguish it from similar species by comparing characteristics such as the structure of the foot and color variations in the fur.

Habitat

Indiana bats hibernate during winter in caves or, occasionally, in abandoned mines. For hibernation, they require cool, humid caves with stable temperatures, under 50° F but above freezing. Very few caves within the range of the species have these conditions.

Hibernation is an adaptation for survival during the cold winter months when no insects are available for bats to eat. Bats must store energy in the form of fat before hibernating. During the six months of hibernation the stored fat is their only source of energy. If bats are disturbed or cave temperatures increase, more energy is needed and hibernating bats may starve.

After hibernation, Indiana bats migrate to their summer habitat in wooded areas where they usually roost under loose tree bark on dead or dying trees. During summer, males roost alone or in small groups, while females roost in larger groups of up to 100 bats or more. Indiana bats also forage in or along the edges of forested areas.

Reproduction

Indiana bats mate during fall before they enter caves to hibernate. Females store the sperm through winter and become pregnant in spring soon after they emerge from the caves.

After migrating to their summer areas, females roost under the peeling bark of dead and dying trees in groups of up to 100 or more. Such groups are called maternity colonies. Each female in the colony gives birth to only one pup per year. Young bats are nursed by the mother, who leaves the roost tree only to forage for food. The young stay with the maternity colony throughout their first summer.

Feeding Habits

Indiana bats eat a variety of flying insects found along rivers or lakes and in uplands. Like all insect-eating bats, they benefit people by consuming insects that are considered pests or otherwise harmful to humans. Their role in insect control is not insignificant – Indiana bats eat up to half their body weight in insects each night.

Range

Indiana bats are found over most of the eastern half of the United States. Almost half of all Indiana bats (207,000

in 2005) hibernate in caves in southern Indiana. In 2005, other states which supported populations of over 40,000 included Missouri (65,000), Kentucky (62,000), Illinois (43,000) and New York (42,000). Other states within the current range of the Indiana bat include Alabama, Arkansas, Connecticut, Iowa, Maryland, Michigan, New Jersey, North Carolina, Ohio, Oklahoma, Pennsylvania, Tennessee, Vermont, Virginia, West Virginia. The 2005 population estimate is about 457,000 Indiana bats, half as many as when the species was listed as endangered in 1967.

Why is the Indiana Bat Endangered?

Human Disturbance

Indiana bats, because they hibernate in large numbers in only a few caves, are extremely vulnerable to disturbance. During hibernation, they cluster in groups of up to 500 per square foot. Since the largest hibernation caves support from 20,000 to 50,000 bats, it is easy to see how a large part of the total population can be affected by a single event. Episodes of large numbers of Indiana bat deaths have occurred due to human disturbance during hibernation.

Cave Commercialization and Improper Gating

The commercialization of caves – allowing visitors to tour caves during hibernation – drives bats away. Changes in the structure of caves, such as blocking an entrance, can change the temperature in a cave. A change of even a few degrees can make a cave unsuitable for hibernating bats. Some caves are fitted with gates to keep people out, but improper gating that prevents access by bats or alters air flow, temperature, or humidity can also be harmful. Properly constructed gates are beneficial because they keep people from disturbing hibernating bats while maintaining temperature and other requirements and allowing access for bats.

Summer Habitat Loss or Degradation

Indiana bats use trees as roosting and foraging sites during summer months. Loss and fragmentation of forested habitats can affect bat populations.

Pesticides and Environmental Contaminants

Insect-eating bats may seem to have an unlimited food supply, but in local areas, insects may not be plentiful because of pesticide use. This can also affect the quality of the bats' food supply. Many scientists believe that population declines occurring today might be due, in part, to pesticides and environmental contaminants. Bats may be affected by eating contaminated insects, drinking contaminated water, or absorbing the chemicals while feeding in areas that have been recently treated.

What is Being Done to Prevent Extinction of the Indiana Bat?

Listing

Prompted by declining populations caused by disturbance of bats during hibernation and modification of hibernacula, the Indiana bat was listed in 1967 as "in danger of extinction" under the Endangered Species Preservation Act of 1966. It is listed as "endangered" under the current Endangered Species Act of 1973. Listing under the Endangered Species Act protects the Indiana bat from take (harming, harassing, killing) and requires Federal agencies to work to conserve it.

Recovery Plan

The Endangered Species Act requires that recovery plans be prepared for all listed species. The U.S. Fish and Wildlife Service developed a recovery plan for the Indiana bat in 1983 and is now revising that Plan. The recovery plan describes actions needed to help the bat recover.

Habitat Protection

Public lands like National Wildlife Refuges, military areas, and U.S. Forest Service lands are managed for Indiana bats by protecting forests. This means ensuring that there are the size and species of trees needed by Indiana bats for roosting; and providing a supply of dead and dying trees that can be used as roost sites. In addition, caves used for hibernation are managed to maintain suitable conditions for hibernation and eliminate disturbance.

Education and Outreach

Understanding the important role played by Indiana bats is a key to conserving the species. Helping people learn more about the Indiana bat and other endangered species can lead to more effective recovery efforts.

U.S. Fish & Wildlife Service
1 Federal Drive
Fort Snelling, Minnesota 55111
612/713-5350
http://www.fws.gov/midwest/endangered

December 2006

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Dwarf Wedge Mussel Fact Sheet

Dwarf Wedge Mussel
Alasmidonta heterodon

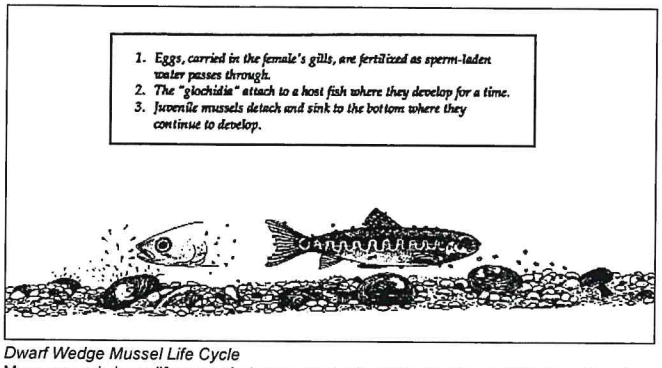
New York Status: Endangered
Federal Status: Endangered

Description

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.

Life History

The dwarf wedge mussel is sexually dimorphic, with separate sexes, unlike some mussels which are hermaphroditic, with individuals having both male and female reproductive organs. Even so, the dimorphism is very subtle; routine determination of sex in dwarf wedge mussels is at best difficult. Male dwarf wedge mussels release sperm into the water column during the mid-summer or fall. Females collect the sperm while siphoning water for food; the eggs are then fertilized and kept within the female until they are released the following spring. By then, each egg has developed into a parasitic larvae called a glochidium. After release from the female, the glochidium attaches itself to a fish with the aid of a small hook-like appendage. Mussel glochidia are generally species-specific and will only live if they find the correct host. With dwarf wedge mussels, the right hosts are small bottom-dwelling fish, the tessellated darter (*Etheostoma olmstedi*) and the mottled sculpin (*Cottus bairdi*). It appears that the glochidium receives little nutrition from the fish, but uses it only as a means of dispersal. After several weeks, the glochidium detaches itself from the unharmed fish and drops to the river bottom. It is then a juvenile mussel.



Dwarf Wedge Mussel Life Cycle

Many mussels have lifespans that range upwards of 20, 30 or even 100 years. The dwarf wedge mussel is considerably different in this regard, though, as it appears to only live about 10 years. Adults must therefore be constantly replaced to maintain a viable population.

Distribution and Habitat

The dwarf wedge mussel is found at 17 sites in seven Atlantic Coast drainages. These are located in New Hampshire, Vermont, Connecticut, New York, Maryland, Virginia and North Carolina.

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.

Status

This mussel was once found at 70 locations in 15 major Atlantic Coast drainages. Its numbers have declined drastically; most populations that remain number in the 100's. The two exceptions are the lower Neversink River in Orange County, where there appears to be at least ten thousand if not tens of thousands of dwarf wedge mussels, and the Tar River in North Carolina.

Water pollution, including sediments and chemicals from agriculture and other development projects such as golf courses, have been implicated in the mussel's decline. Also, impoundments and channelization may have eliminated the mussel from former habitat.

Management and Research Needs

Studies by the Institute of Ecosystem Studies at Millbrook, New York and the Nature Conservancy are presently underway to better understand the habitat requirements of the dwarf wedge mussel. It is still largely unknown what determines the location of mussel beds on the river bottom. More detailed population surveys in the Neversink River will be done to determine the age structure, distribution and size of the New York population. Research will focus on potential threats to the mussels such as the effects of dams and agricultural practices.

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Conserving the Nature of America

Raleigh Ecological Services Field Office

Dwarf wedgemussel (*Alasmidonta heterodon*)

Dwarf wedgemussel

Federal Status: Endangered, Listed March 14, 1990

Description: The dwarf wedgemussel is a small bivalve, rarely exceeding 45 mm in length. Clean young shells are usually greenish-brown with green rays. As the animal ages, the shell color becomes obscured by diatoms or mineral deposits and appears black or brown. The shell is thin but does thicken somewhat with age, especially toward the anterior end. The anterior end is rounded while the posterior end is angular forming a point near the posterio-ventral margin. The ventral margin is only slightly curved. The nacre is bluish-white, appearing whiter in the thicker anterior end. The most distinctive shell character of the dwarf wedgemussel is the arrangement of the lateral teeth. There are two lateral teeth in the right valve and one in the left valve. The typical arrangement for most freshwater mussel species consists of two lateral teeth in the left valve and one in the right valve. The incurrent and excurrent apertures and their associated papillae are usually white. The foot and other organs are also white. Maximum age for the dwarf wedgemussel is around twelve years. The species is a bradytictic breeder, meaning that females become gravid in the early fall and glochidia are released by mid-spring. The tessellated darter (*Etheostoma olmstedi*), johnny darter (*Etheostoma nigrum*), and mottled sulpin (*Cottus bairdi*) have been identified as hosts for the dwarf wedgemussel. An anadromous fish may also serve as a host species but this has not been documented for the dwarf wedgemussel in the southern portion of its range.

Habitat: The dwarf wedgemussel appears to be a generalist in terms of its preference for stream size, substrate and flow conditions – it inhabits small streams less than five meters wide to large rivers more than 100 meters wide; it is found in a variety of substrate types including clay, sand, gravel and pebble, and sometimes in silt depositional areas near banks; and it usually inhabits hydrologically stable areas, including very shallow water along streambanks and under root mats, but it has also been found at depths of 25 feet in the Connecticut River. Dwarf wedgemussels are often patchily distributed in rivers.

Distribution: Historically, the dwarf wedgemussel was found from the Petitcodiac River in New Brunswick, Canada to the Neuse River in North Carolina, and was found in 15 major Atlantic slope river systems. It is now extinct in Canada, extirpated in the Neuse River, and present in low densities through-out much of its former range. It is known from 54 locations in 15 major watersheds, with the largest populations in the Connecticut River watershed. North Carolina supports the greatest number of known sites: Neuse River Basin: Orange County, Wake County, Johnston County, Wilson County, and Nash County; Tar River Basin: Person County, Granville County, Vance County, Franklin County, Warren County, Halifax County, and Nash County. Unfortunately, most of these populations are very small and isolated.

Threats: Impacts including riparian disturbance, pollution, sedimentation, impoundments, artificial flow regimes, and stream fragmentation disrupt mussel life cycles, prevent host fish migration, block gene flow, and prohibit recolonization, resulting in reduced recruitment rates, decreased population densities and increased probability of local extinctions. Toxic effects from industrial, domestic and agricultural pollution are the primary threats to this mussel's survival. Increased acidity, caused by the mobilization of toxic metals by acid rain, is thought to be one of the chief causes of the species' extirpation from the Fort River in Massachusetts. One of the largest remaining populations has declined dramatically in the Ashuelot River, downstream of a golf course. This population probably has been affected by fungicides, herbicides, insecticides, and fertilizers which have been applied to the golf course. Agricultural runoff from adjacent corn fields and pastures also is contributing to this population's decline. Freshwater mussels, including the dwarf wedgemussel, are sensitive to potassium, zinc, copper, cadmium, and other elements associated with industrial pollution.

Short life spans, low fecundity, high degree of host specificity, limited dispersal ability of its primary host, low population densities, coupled with the threats facing the species, likely all contribute to the endangered status of the dwarf wedgemussel.

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Species Contact:

Sarah McRae, Fish and Wildlife Biologist, 919-856-4520 ext. 16

Last Updated: August 24, 2017

Conserving the Nature of America

Raleigh Ecological Services Fiel Office

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Habitat: The dwarf wedgemussel appears to be a generalist in terms of its preference for stream size, substrate and flow conditions – it inhabits small streams less than five meters wide to large rivers more than 100 meters wide; it is found in a variety of substrate types including clay, sand, gravel and pebble, and sometimes in silt depositional areas near banks; and it usually inhabits hydrologically stable areas, including very shallow water along streambanks and under root mats, but it has also been found at depths of 25 feet in the Connecticut River. Dwarf wedgemussels are often patchily distributed in rivers.

Distribution: Historically, the dwarf wedgemussel was found from the Petitcodiac River in New Brunswick, Canada to the Neuse River in North Carolina, and was found in 15 major Atlantic slope river systems. It is now extinct in Canada, extirpated in the Neuse River, and present in low densities through-out much of its former range. It is known from 54 locations in 15 major watersheds, with the largest populations in the Connecticut River watershed. North Carolina supports the greatest number of known sites: Neuse River Basin: Orange County, Wake County, Johnston County, Wilson County, and Nash County; Tar River Basin: Person County, Granville County, Vance County, Franklin County, Warren County, Halifax County, and Nash County. Unfortunately, most of these populations are very small and isolated.

Threats: Impacts including riparian disturbance, pollution, sedimentation, impoundments, artificial flow regimes, and stream fragmentation disrupt mussel life cycles, prevent host fish migration, block gene flow, and prohibit recolonization, resulting in reduced recruitment rates, decreased population densities and increased probability of local extinctions. Toxic effects from industrial, domestic and agricultural pollution are the primary threats to this mussel's survival. Increased acidity, caused by the mobilization of toxic metals by acid rain, is thought to be one of the chief causes of the species' extirpation from the Fort River in Massachusetts. One of the largest remaining populations has declined dramatically in the Ashuelot River, downstream of a golf course. This population probably has been affected by fungicides, herbicides, insecticides, and fertilizers which have been applied to the golf course. Agricultural runoff from adjacent corn fields and pastures also is contributing to this population's decline. Freshwater mussels, including the dwarf wedgemussel, are sensitive to potassium, zinc, copper, cadmium, and other elements associated with industrial pollution.

Short life spans, low fecundity, high degree of host specificity, limited dispersal ability of its primary host, low population densities, coupled with the threats facing the species, likely all contribute to the endangered status of the dwarf wedgemussel.

References:

N.C. Natural Heritage Program. 2001. Guide to Federally Listed Endangered and Threatened Species of North Carolina: Dwarf wedgemussel. NC Department of Environment and Natural Resources, Raleigh, NC. Page 61.

U.S. Fish and Wildlife Service. 1993. Dwarf wedgemussel Recovery Plan. Hadley, MA. 48 pp.

Massachusetts Natural Heritage and Endangered Species Program. 2009. Dwarf wedgemussel (Alasmidonta heterodon). Westborough, MA.

New Hampshire Fish and Game. 2006. New Hampshire Wildlife Action Plan: Appendix A: Species Profiles – Invertebrates. Dwarf Wedgemussel. Concord, NH.

Species Contact:

Sarah McRae, Fish and Wildlife Biologist, 919-856-4520 ext. 16

Last Updated: August 24, 2017

Northern Long-Eared Bat

Myotis septentrionalis

The northern long-eared bat is federally listed as a threatened species under the Endangered Species Act. ***Endangered*** species are animals and plants that are in danger of becoming extinct. ***Threatened*** species are animals and plants that are likely to become endangered in the foreseeable future. Identifying, protecting and restoring endangered and threatened species is the primary objective of the U.S. Fish and Wildlife Service's Endangered Species Program.

Photo by Steve Taylor; University of Illinois

This northern long-eared bat, observed during an Illinois mine survey, shows visible symptoms of white-nose syndrome.

What is the northern long-eared bat?

Appearance: The northern long-eared bat is a medium-sized bat with a body length of 3 to 3.7 inches and a wingspan of 9 to 10 inches. Their fur color can be medium to dark brown on the back and tawny to pale-brown on the underside. As its name suggests, this bat is distinguished by its long ears, particularly as compared to other bats in its genus, *Myotis*.

Winter Habitat: Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. They use areas in various sized caves or mines with constant temperatures, high humidity, and no air currents. Within hibernacula, surveyors find them hibernating most often in small crevices or cracks, often with only the nose and ears visible.

Summer Habitat: During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities or in crevices of both live trees and snags (dead trees). Males and non-reproductive females may also roost in cooler places, like caves and mines. Northern long-eared bats seem to be flexible in selecting roosts, choosing roost trees based on suitability to retain bark or provide cavities or crevices. They rarely roost in human structures like barns and sheds.

Reproduction: Breeding begins in late summer or early fall when males begin to swarm near hibernacula. After copulation, females store sperm during hibernation until spring. In spring, females emerge from their hibernacula, ovulate and the stored sperm fertilizes an egg. This strategy is called delayed fertilization.

After fertilization, pregnant bats migrate to summer areas where they roost in small colonies and give birth to a single pup. Maternity colonies of females and young generally have 30 to 60 bats at the beginning of the summer, although larger maternity colonies have also been observed. Numbers of bats in roosts typically decrease from the time of pregnancy to post-lactation. Most bats within a maternity colony give birth around the same time, which may occur from late May or early June to late July, depending where the colony is located within the species' range. Young bats start flying by 18 to 21 days after birth. Maximum lifespan for the northern long-eared bat is estimated to be up to 18.5 years.

Feeding Habits: Like most bats, northern long-eared bats emerge at dusk to feed. They primarily fly through the understory of forested areas feeding on moths, flies, leafhoppers, caddisflies, and beetles, which they catch while in flight using echolocation or by gleaning motionless insects from vegetation.

Range: The northern long-eared bat's range includes much of the eastern and north central United States, and all Canadian provinces from the Atlantic Ocean west to the southern Yukon Territory and eastern British Columbia. The species' range includes 37 States and the District of Columbia: Alabama, Arkansas, Connecticut, Delaware, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming.

Why is the northern long-eared bat in trouble?

White-nose Syndrome: No other threat is as severe and immediate as

this. If this disease had not emerged, it is unlikely that northern long-eared bat populations would be experiencing such dramatic declines. Since symptoms were first observed in New York in 2006, white-nose syndrome has spread rapidly from the Northeast to the Midwest and Southeast; an area that includes the core of the northern long-eared bat's range, where it was most common before this disease. Numbers of northern long-eared bats (from hibernacula counts) have declined by up to 99 percent in the Northeast. Although there is uncertainty about the rate that white-nose syndrome will spread throughout the species' range, it is expected to continue to spread throughout the United States in the foreseeable future.

Other Sources of Mortality:

Although no significant population declines have been observed due to the sources of mortality listed below, they may now be important factors affecting this bat's viability until we find ways to address WNS.

Impacts to Hibernacula: Gates or other structures intended to exclude people from caves and mines not only restrict bat flight and movement, but also change airflow and microclimates. A change of even a few degrees can make a cave unsuitable for hibernating bats. Also, cave-dwelling bats are vulnerable to human disturbance while hibernating. Arousal during hibernation causes bats to use up their energy stores, which may lead to bats not surviving through winter.

Loss or Degradation of Summer Habitat: Highway construction, commercial development, surface mining, and wind facility construction permanently remove habitat and are activities prevalent in many areas of this bat's range. Many forest management activities benefit bats by keeping areas forested rather than converted to other uses. But, depending on type and timing, some forest management activities can cause mortality and temporarily remove or degrade roosting and foraging habitat.

Wind Farm Operation: Wind turbines kill bats, and, depending on the species, in very large numbers. Mortality from windmills has been documented for northern long-eared bats, although a small number have been found to date. However, there are many wind projects within a large portion of the bat's range and many more are planned.

What Is Being Done to Help the Northern Long-Eared Bat?

Disease Management: Actions have been taken to try to reduce or slow the spread of white-nose syndrome through human transmission of the fungus into caves (e.g. cave and mine closures and advisories; national decontamination protocols). A national plan was prepared by the Service and other state and federal agencies that details actions needed to investigate and manage white-nose syndrome. Many state and federal agencies, universities and non-governmental organizations are researching this disease to try to control its spread and address its affect. See www.whitenosesyndrome.org/ for more.

Addressing Wind Turbine Mortality: The Service and others are working to minimize bat mortality from wind turbines on several fronts. We fund and conduct research to determine why bats are susceptible to turbines, how to operate turbines to minimize mortality and where important bird and bat migration routes are located. The Service, state natural resource agencies, and the wind energy industry are developing a Midwest Wind Energy Habitat Conservation Plan, which will provide wind farms a mechanism to continue operating legally while minimizing and mitigating listed bat mortality.

Listing: The northern long-eared bat is listed as a threatened species under the federal Endangered Species Act. Listing a species affords it the protections of the Act and also increases the priority of the species for funds, grants, and recovery opportunities.

Hibernacula Protection: Many federal and state natural resource agencies and conservation organizations have protected caves and mines that are important hibernacula for cave-dwelling bats.

What Can I Do?

Do Not Disturb Hibernating Bats: To protect bats and their habitats, comply with all cave and mine closures, advisories, and regulations. In areas without a cave and mine closure policy, follow approved decontamination protocols (see http://whitenosesyndrome.org/topics/decontamination). Under no circumstances should clothing, footwear, or equipment that was used in a white-nose syndrome affected state or region be used in unaffected states or regions.

Leave Dead and Dying Trees Standing: Like most eastern bats, the northern long-eared bat roosts in trees during summer. Where possible and not a safety hazard, leave dead or dying trees on your property. Northern long-eared bats and many other animals use these trees.

Install a Bat Box: Dead and dying trees are usually not left standing, so trees suitable for roosting may be in short supply and bat boxes may provide additional roost sites. Bat boxes are especially needed from April to August when females look for safe and quiet places to give birth and raise their pups.

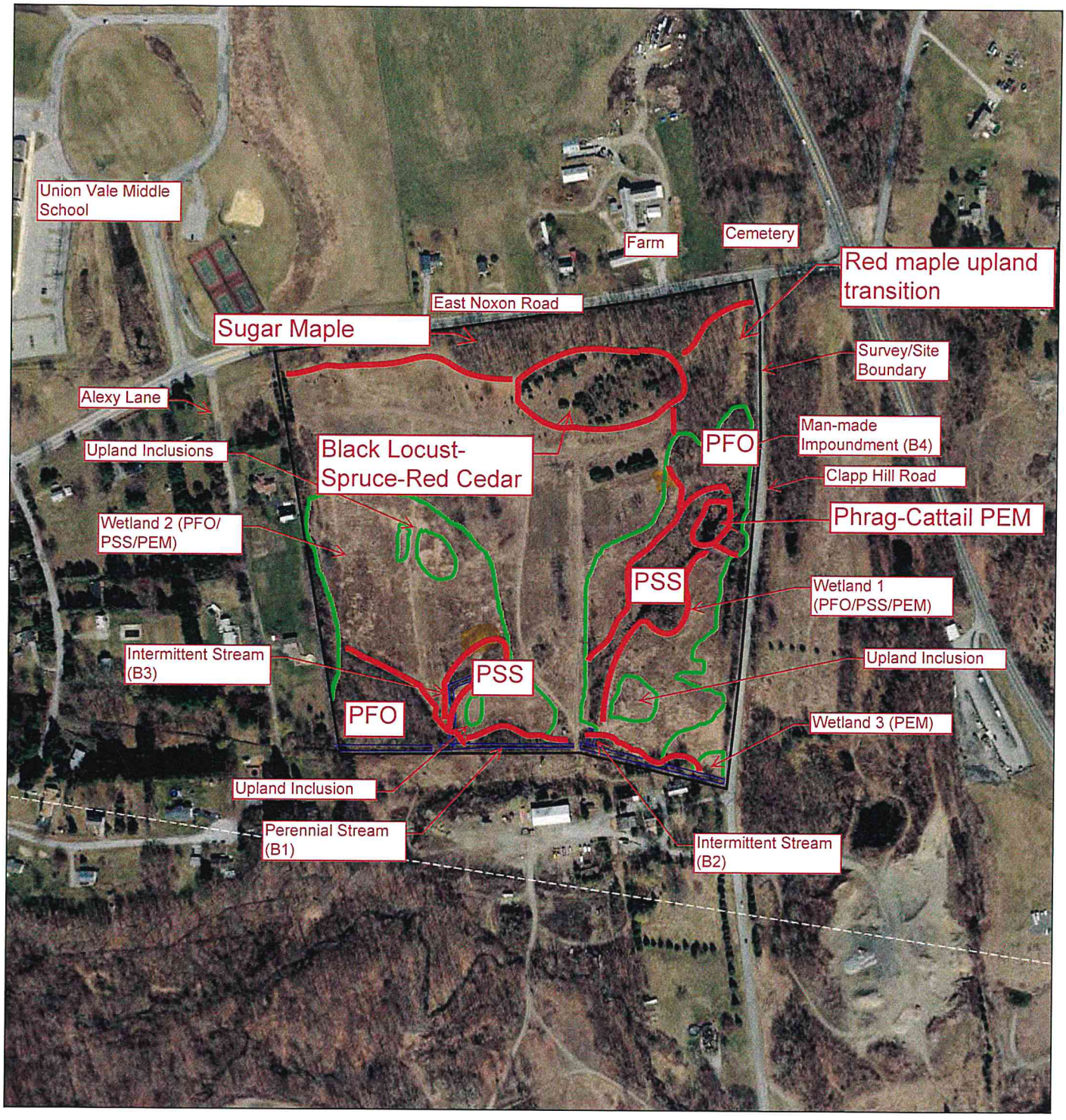
Support Sustainability: Support efforts in your community, county and state to ensure that sustainability is a development goal. Only through sustainable living will we provide rare and declining species, like the northern long-eared bat, the habitat and resources they need to survive alongside us.

Spread the Word: Understanding the important ecological role that bats play is a key to conserving the northern long-eared and other bats. Helping people learn more about the northern long-eared bat and other endangered species can lead to more effective recovery efforts. For more information, visit www.fws.gov/midwest/nleb and www.whitenosesyndrome.org

Join and Volunteer: Join a conservation group; many have local chapters. Volunteer at a local nature center, zoo, or national wildlife refuge. Many state natural resource agencies benefit greatly from citizen involvement in monitoring wildlife. Check your state agency websites and get involved in citizen science efforts in your area.

APPENDIX VII

Clapp Hill Road Property - Wetland Sketch



June 7, 2018

1:4,514

0 0.05 0.1 0.2 mi

0 0.075 0.15 0.3 km

Figure 7
Clapp Hill Road, Union Vale, NY
Wetland Field Sketch (6-7-18)

Author: Phil London

Threatened and Endangered Species Habitat Suitability Assessment Report

BONAVENIA ENTERPRISES
Clapp Hill and East Noxon Road
Town of Union Vale, New York

July 28, 2021

Prepared by:

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Stratton, VT 05360
(203) 910-4716

1.0 INTRODUCTION

Ecological Solutions, LLC completed a threatened and endangered species habitat suitability assessment on the 45.83 acres BONAVENIA ENTERPRISES site (437115) located on Clapp Hill and East Noxon Road in the Town of Union Vale, Dutchess County, New York (*Figure 1*). The site contains mowed field and wetlands and the Applicant seeks to create a residential subdivision on the site.

The New York State Department of Environmental Conservation (NYSDEC) Environmental Assessment form indicates that the Indiana bat (*Myotis sodalis*) may be located in the vicinity of the site. This assessment was completed to determine if suitable habitat exists on the site for this species and determine potential impacts to suitable habitat and recommends measures to mitigate the impacts that can not be avoided or minimized.

Habitat observed on the site on July 26, 2021 is listed in Table 1.

TABLE 1
COVER TYPES IDENTIFIED ON THE SITE

1	Upland Meadow
2	Forested Wetland/Wet Meadow
3	Upland Hardwood Forest

Upland Meadow - The general area of the site is mowed upland meadow. Characteristic herbs include goldenrods (*Solidago altissima, S. nemoralis, S. rugosa, S. juncea, S. canadensis,* and *Euthamia graminifolia*), bluegrasses (*Poa pratensis, P. compressa*), timothy (*Phleum pratense*), quackgrass (*Agropyron repens*), smooth brome (*Bromus inermis*), sweet vernal grass (*Anthoxanthum odoratum*), orchard grass (*Dactylis glomerata*), common chickweed (*Cerastium arvense*), common evening primrose (*Oenothera biennis*), oldfield cinquefoil (*Potentilla simplex*), calico aster (*Aster lateriflorus*), New England aster (*Aster novae-angliae*), wild strawberry (*Fragaria virginiana*), Queen-Anne's lace (*Daucus carota*), ragweed (*Ambrosia artemisiifolia*), hawkweeds (*Hieracium* spp.), dandelion (*Taraxacum officinale*), and ox-tongue (*Picris hieracioides*). Shrubs are present, but collectively they have less than 50% cover in the community. Characteristic shrubs include gray dogwood (*Cornus foemina* ssp. *racemosa*), silky dogwood (*Cornus amomum*), arrowwood (*Viburnum recognitum*), raspberries (*Rubus* spp.), sumac (*Rhus typhina, R. glabra*), and eastern red cedar (*Juniperus virginiana*).

Wetland - There is a small wetland/ponded area located adjacent to Clapp Hill Road. This wetland is generally surrounded by upland mowed field area. The wetland is dominated by tall shrubs that occur as a transition zone to the red maple hardwood swamp. The substrate is mineral soil with some muck. The wetland on the site is codominated by a mixture of species, such as red osier dogwood (*Cornus sericea*), silky dogwood (*C. amomum*), gray dogwood (*Cornus foemina* ssp. *racemosa*), smooth alder (*Alnus*

serrulata), spicebush (*Lindera benzoin*), willows (*Salix bebbiana, S. discolor, S. lucida, S. petiolaris*), and arrowwood (*Viburnum recognitum*).

Upland Hardwood Forest - There are small areas of upland hardwood forest on the site with small trees in the 5-12 inch dbh range with some larger tress located on the site. Some of the trees (sugar maple, black locust, and black oak contain exfoliating bark, crevices, or solar exposure.

2.0 HABITAT SUITABILITY ASSESSMENT/CONCLUSION

2.1 Indiana bat

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 - This proposed project will require about +-5.0-6.0 acres of grubbing and earth moving in upland meadow area. The disturbance activities will not result in adverse to this species since tree loss is minimal. If clearing is necessary it will occur when bats are not on site between October 1 and March 31 or as approved by the NYSDEC (Emergence survey) outside this clearing timeframe. Generation of dust and noise, potential for changes to surface water quality, and increased lighting on the site may cause an impact to foraging bats but can be mitigated as per below.

The site owner proposes to avoid, minimize, and mitigate for effects by:

• Site lighting on the site will use approved light fixtures that have tops that direct light down to minimize light pollution and not interfere with potential bat foraging activities;
• Implementing soil conservation and dust control best management practices, such as watering dry disturbed soil areas to keep dust down, and using staked, recessed silt fence and anti tracking pads to prevent erosion and sedimentation in surface waters on the site, and;
• Stormwater pond/s will not be maintained with any chemicals that might adversely affect bats or insect populations on which they may feed.

These measures will result in avoiding adverse effects to Indiana bats.

3.0 PHOTOGRAPHS

Existing wetland/upland meadow boundary.

Upland Meadow on the site.

Site.

Figure 1 Location Map (Parcel 437115)

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Dutchess County, New York

Bonavenia Subdivision

January 18, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:3,410 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Dutchess County, New York
Survey Area Data: Version 18, Sep 1, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 8, 2020—Oct 14, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Fr	Fredon silt loam	10.7	22.7%
HsA	Hoosic gravelly loam, nearly level	5.4	11.6%
HsB	Hoosic gravelly loam, undulating	20.1	42.8%
HsC	Hoosic gravelly loam, rolling	2.1	4.4%
NwB	Nassau-Cardigan complex, undulating, very rocky	0.0	0.0%
Su	Sun silt loam	8.7	18.5%
Totals for Area of Interest		**47.1**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Dutchess County, New York

Fr—Fredon silt loam

Map Unit Setting

National map unit symbol: 9rfz
Elevation: 250 to 1,200 feet
Mean annual precipitation: 41 to 47 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Fredon and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fredon

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 31 inches: very fine sandy loam
H3 - 31 to 70 inches: stratified very gravelly sand to loamy fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: RareNone
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F144AY029NY - Semi-Rich Wet Outwash
Hydric soil rating: No

Minor Components

Fredon, poorly drained

Percent of map unit: 5 percent
Landform: Depressions

Hydric soil rating: Yes

Unnamed soils, glacial outwash
Percent of map unit: 5 percent
Hydric soil rating: No

Halsey
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

HsA—Hoosic gravelly loam, nearly level

Map Unit Setting
National map unit symbol: 9rgj
Elevation: 100 to 1,100 feet
Mean annual precipitation: 41 to 47 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Hoosic and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoosic

Setting
Landform: Terraces, outwash plains, deltas
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and gravelly glaciofluvial deposits

Typical profile
H1 - 0 to 9 inches: gravelly loam
H2 - 9 to 24 inches: very gravelly sandy loam
H3 - 24 to 70 inches: extremely gravelly loamy sand

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Knickerbocker

Percent of map unit: 5 percent
Hydric soil rating: No

Copake

Percent of map unit: 5 percent
Hydric soil rating: No

Haven

Percent of map unit: 5 percent
Hydric soil rating: No

Fredon

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Halsey

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

HsB—Hoosic gravelly loam, undulating

Map Unit Setting

National map unit symbol: 9rgk
Elevation: 100 to 1,100 feet
Mean annual precipitation: 41 to 47 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hoosic and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoosic

Setting

Landform: Terraces, outwash plains, deltas
Landform position (two-dimensional): Summit

Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: gravelly loam
H2 - 9 to 24 inches: very gravelly sandy loam
H3 - 24 to 70 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Knickerbocker

Percent of map unit: 5 percent
Hydric soil rating: No

Haven

Percent of map unit: 5 percent
Hydric soil rating: No

Copake

Percent of map unit: 5 percent
Hydric soil rating: No

Fredon

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Halsey

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

HsC—Hoosic gravelly loam, rolling

Map Unit Setting

National map unit symbol: 9rgl
Elevation: 100 to 1,100 feet
Mean annual precipitation: 41 to 47 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hoosic and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoosic

Setting

Landform: Terraces, outwash plains, deltas
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: gravelly loam
H2 - 9 to 24 inches: very gravelly sandy loam
H3 - 24 to 70 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 5 to 16 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Knickerbocker
Percent of map unit: 10 percent
Hydric soil rating: No

Copake
Percent of map unit: 5 percent
Hydric soil rating: No

Fredon
Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Halsey
Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

NwB—Nassau-Cardigan complex, undulating, very rocky

Map Unit Setting
National map unit symbol: 9rhc
Elevation: 0 to 1,800 feet
Mean annual precipitation: 41 to 47 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition
Nassau and similar soils: 45 percent
Cardigan and similar soils: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nassau

Setting
Landform: Till plains, ridges, benches
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile
H1 - 0 to 5 inches: channery silt loam
H2 - 5 to 16 inches: very channery silt loam
H3 - 16 to 20 inches: unweathered bedrock

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Cardigan

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till or colluvium derived from phyllite, slate, shale, and schist

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 20 inches: channery loam
H3 - 20 to 30 inches: channery silt loam
H4 - 30 to 34 inches: unweathered bedrock

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Dutchess

Percent of map unit: 10 percent

Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: Unranked

Massena

Percent of map unit: 4 percent
Hydric soil rating: No

Sun

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Su—Sun silt loam

Map Unit Setting

National map unit symbol: 9rj3
Elevation: 600 to 1,800 feet
Mean annual precipitation: 41 to 47 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Sun and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sun

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy till derived primarily from limestone and sandstone, with a component of schist, shale, or granitic rocks in some areas

Typical profile

H1 - 0 to 4 inches: silt loam
H2 - 4 to 22 inches: loam
H3 - 22 to 80 inches: gravelly loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Occasional
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F144AY039NY - Semi-Rich Wet Till Depressions
Hydric soil rating: Yes

Minor Components

Massena

Percent of map unit: 5 percent
Hydric soil rating: No

Palms

Percent of map unit: 5 percent
Landform: Swamps, marshes
Hydric soil rating: Yes

Sun, stony

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Canandaigua

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

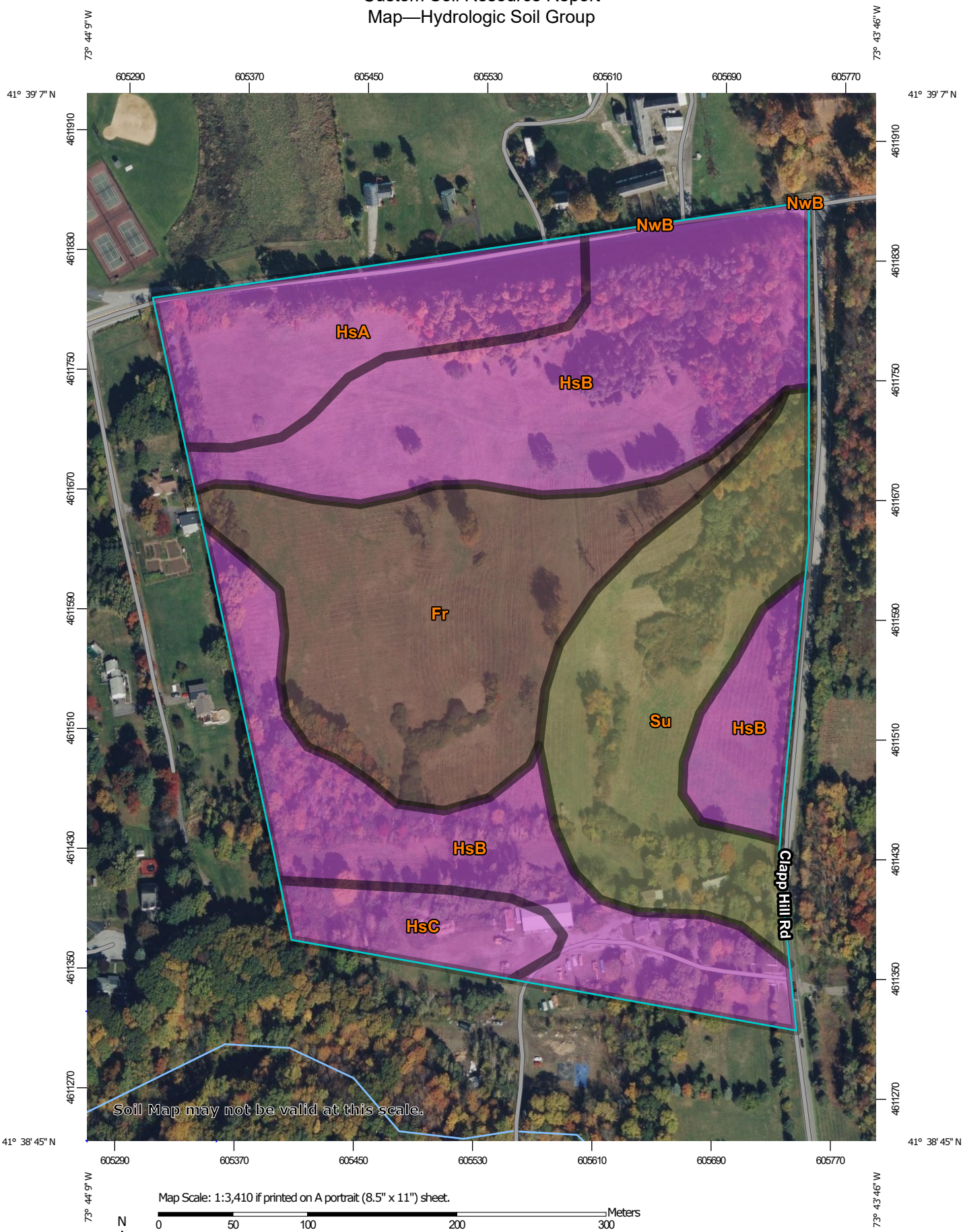
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group



Map Scale: 1:3,410 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Dutchess County, New York
Survey Area Data: Version 18, Sep 1, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 8, 2020—Oct 14, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Fr	Fredon silt loam	B/D	10.7	22.7%
HsA	Hoosic gravelly loam, nearly level	A	5.4	11.6%
HsB	Hoosic gravelly loam, undulating	A	20.1	42.8%
HsC	Hoosic gravelly loam, rolling	A	2.1	4.4%
NwB	Nassau-Cardigan complex, undulating, very rocky	D	0.0	0.0%
Su	Sun silt loam	C/D	8.7	18.5%
Totals for Area of Interest			**47.1**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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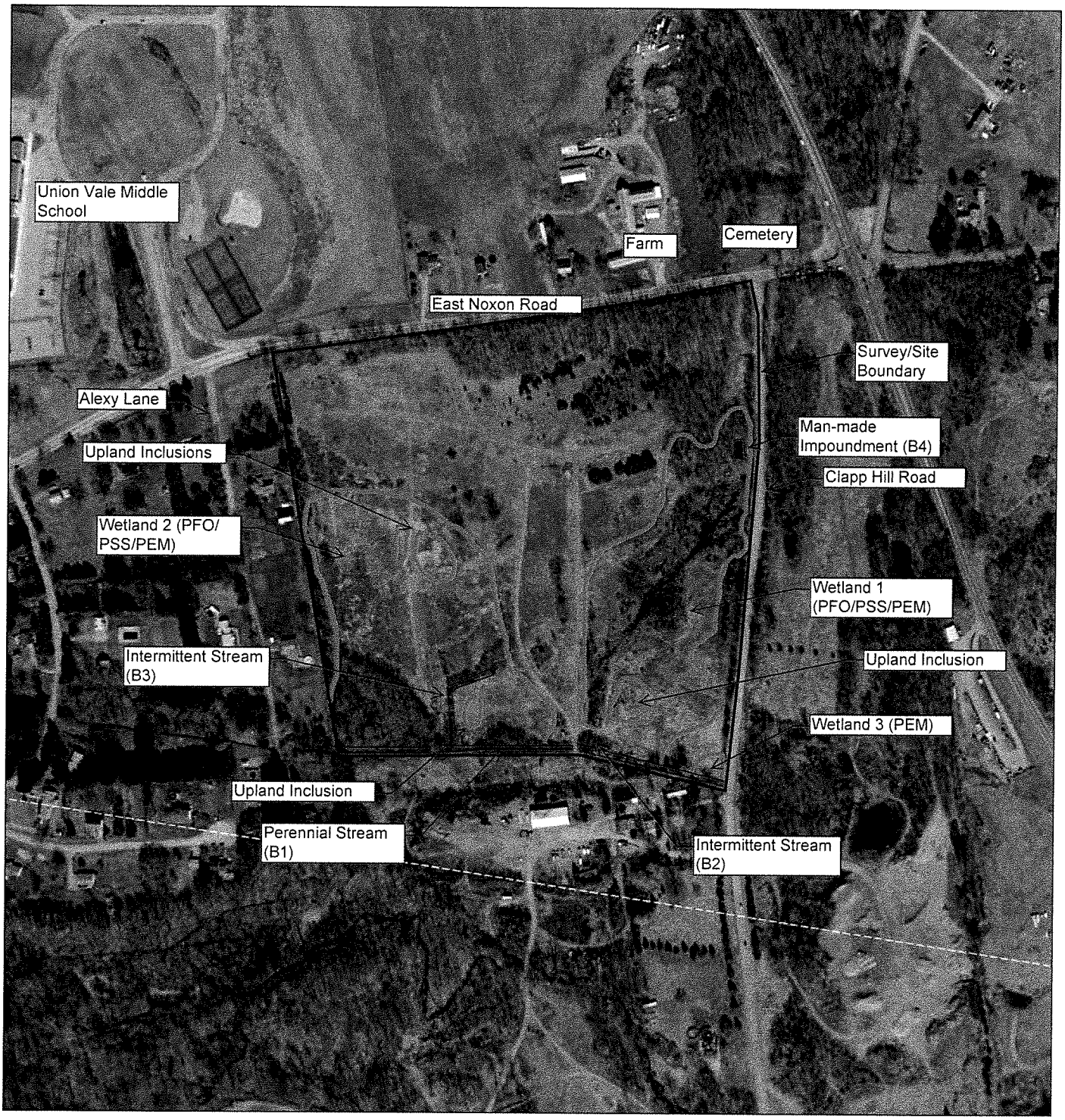
Clapp Hill Road Property - Wetland Sketch



June 7, 2018

1:4,514

0 0.05 0.1 0.2 mi

0 0.075 0.15 0.3 km

Figure 7
Clapp Hill Road, Union Vale, NY
Wetland Field Sketch (6-7-18)

Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Author: Phil London
Not a legal document

Angelo Bonavenia - Clap Hill Road Property
GPS Coordinates from Wetland Survey - 5.2018

ID	Longitude	Latitude	Elevation	Comment/Flag No.
1	-73.7343485	41.647722	430.554	B1-101
2	-73.7343391	41.647738	426.442	B1-201
3	-73.7342482	41.647733	432.218	202
4	-73.7342537	41.647723	423.889	102
5	-73.7341273	41.647757	421.254	203
6	-73.7341422	41.64774	429.994	103
7	-73.734088	41.647738	426.126	104
8	-73.7340502	41.64776	425.298	204
9	-73.733928	41.647751	424.126	205
10	-73.7339469	41.647729	424.803	105
11	-73.7339013	41.647753	431.276	206
12	-73.7338604	41.647734	424.806	106
13	-73.7338058	41.647725	424.464	107
14	-73.7336886	41.647734	425.312	108
15	-73.7336852	41.647754	441.63	208
16	-73.7335774	41.647739	425.669	109
17	-73.7335592	41.64777	426.832	209
18	-73.7334687	41.647761	439.523	210
19	-73.733459	41.647749	426.91	110 path
20	-73.7334593	41.647761	426.888	culvert 20 out
21	-73.733408	41.647758	427.39	culvert 20 in
22	-73.7334299	41.647764	428.31	path
23	-73.7334132	41.64774	436.155	111
24	-73.7334034	41.647772	428.37	211
25	-73.7332919	41.647745	419.475	112
26	-73.73325	41.647779	427.979	212
27	-73.7332031	41.647777	433.5	213
28	-73.733212	41.647758	425.738	113
29	-73.7331061	41.647776	429.576	214
30	-73.7331151	41.647752	428.831	114
31	-73.7330294	41.647751	429.203	115
32	-73.7330253	41.647788	429.413	215
33	-73.7328692	41.647743	421.437	116
34	-73.7328201	41.647764	423.767	117
35	-73.7328624	41.647757	449.226	216
36	-73.7327911	41.647799	432.229	217
37	-73.7326281	41.647792	443.228	218
38	-73.7326455	41.647746	446.238	118
39	-73.7325847	41.647794	445.058	219
40	-73.732572	41.647771	442.636	119
41	-73.7323981	41.647765	440.491	120
42	-73.7324008	41.647801	432.361	220
43	-73.7322552	41.647798	443.889	221
44	-73.7322673	41.647765	433.532	121
45	-73.7320863	41.647771	433.471	122
46	-73.7320794	41.647813	432.53	222

Angelo Bonavenia - Clap Hill Road Property
GPS Coordinates from Wetland Survey - 5.2018

47	-73.7319754	41.647776	435.107	123
48	-73.7319348	41.64778	434.997	124
49	-73.7319581	41.647802	433.452	223
50	-73.731937	41.647794	434.663	224
51	-73.7318711	41.647789	435.189	culvert 12 in
52	-73.7319351	41.647787	435.535	culvert 12 out
53	-73.7319025	41.647788	436.047	path
54	-73.731869	41.647773	435.151	125
55	-73.73187	41.647801	435.261	225
56	-73.7317632	41.647775	444.139	126
57	-73.7317512	41.647788	440.137	226
58	-73.7317844	41.647792	434.157	B2-101 connects to bank
59	-73.73173	41.647908	434.405	B2-102
60	-73.7317563	41.647915	436.034	B2-202
61	-73.7317448	41.64791	435.482	culvert 12 cmp buried out
62	-73.7317251	41.647924	435.565	path
63	-73.7318262	41.647791	438.054	B2-201
64	-73.7317059	41.647784	435.844	227
65	-73.7317128	41.647752	435.434	127
66	-73.7315012	41.647702	437.37	128
67	-73.7316891	41.64778	434.933	228
68	-73.7316992	41.64781	441.744	229
69	-73.7315002	41.647773	436.031	230
70	-73.7313716	41.647719	446.312	129
71	-73.7311941	41.647695	439.43	234
72	-73.7313769	41.647736	437.036	231
73	-73.7313547	41.647726	438.363	232
74	-73.7313201	41.647727	438.193	233
75	-73.7313488	41.647714	439.833	130
76	-73.7313228	41.647721	448.74	131
77	-73.7311897	41.647695	439.188	234
78	-73.7312579	41.647684	438.835	132
79	-73.7311128	41.647664	440.193	133
80	-73.7310496	41.647686	444.438	235
81	-73.7310484	41.647681	439.923	134
82	-73.7309184	41.647644	447.438	135
83	-73.7309077	41.647654	439.172	236
84	-73.7308514	41.647658	445.393	136
85	-73.7307815	41.647645	446.234	137
86	-73.7307909	41.647644	441.928	237
87	-73.7306778	41.647594	442.734	138
88	-73.7307248	41.647607	446.836	238
89	-73.7305973	41.647519	444.291	139
90	-73.7305435	41.647544	439.403	239
91	-73.7304278	41.647484	444.52	140
92	-73.7303983	41.647469	446.087	240
93	-73.7303189	41.647427	443.508	241

Angelo Bonavenia - Clap Hill Road Property
GPS Coordinates from Wetland Survey - 5.2018

94	-73.7303264	41.647416	443.371	141
95	-73.7303223	41.647424	443.588	culvert 12 pcp
96	-73.7317477	41.647944	435.987	143
97	-73.7317849	41.647956	435.61	142
98	-73.7317587	41.648076	436.132	141
99	-73.7317893	41.648241	435.828	140
100	-73.7317467	41.648489	437.651	139
101	-73.7317776	41.64869	437.793	138
102	-73.7318149	41.648839	438.63	137
103	-73.7318341	41.649038	438.979	136
104	-73.7317835	41.64921	439.345	135
105	-73.7316877	41.649354	439.49	134
106	-73.7315832	41.649394	439.418	133
107	-73.7313897	41.649441	439.482	132
108	-73.7312853	41.649458	439.523	131
109	-73.7311378	41.64939	438.628	130
110	-73.7309837	41.649492	438.775	129
111	-73.7310032	41.64963	439.321	128
112	-73.730932	41.649775	440.132	127
113	-73.7308793	41.649948	440.25	124
114	-73.7309227	41.650033	441.318	123
115	-73.730955	41.650072	441.891	122
116	-73.730944	41.650103	442.688	121
117	-73.7308448	41.650164	442.418	120
118	-73.7307551	41.650189	445.041	119
119	-73.730693	41.650139	443.966	118
120	-73.7307832	41.650106	464.944	117
121	-73.730663	41.650074	455.988	116
122	-73.7305495	41.650069	461.943	115
123	-73.7304992	41.650046	463.011	114
124	-73.7304896	41.650119	458.98	113
125	-73.7304041	41.650221	459.774	112
126	-73.7304762	41.650272	464.233	111
127	-73.7303693	41.650297	457.894	110
128	-73.7302726	41.650315	451.382	109
129	-73.7302169	41.650353	456.413	108
130	-73.7302059	41.650416	458.371	107
131	-73.7301679	41.650419	455.824	106
132	-73.7301459	41.65047	458.498	105
133	-73.7301211	41.650489	456.729	104
134	-73.7301249	41.650421	463.297	103
135	-73.7301052	41.650372	448.377	102
136	-73.7300367	41.650316	450.376	101
137	-73.7301422	41.650242	471.107	B4-101
138	-73.7302477	41.650249	454.251	B4-102
139	-73.7302405	41.650132	441.235	B4-103
140	-73.7302797	41.65012	444.215	B4-104

Angelo Bonavenia - Clap Hill Road Property
GPS Coordinates from Wetland Survey - 5.2018

141	-73.7302688	41.650091	449.614	B4-105
142	-73.7301561	41.650069	453.11	B4-106
143	-73.7301059	41.650109	448.124	B4-107
144	-73.7301129	41.650141	451.762	B4-108
145	-73.7301012	41.650205	453.047	B4-109 end
146	-73.7300029	41.650198	455.22	343
147	-73.7300207	41.65006	446.858	342
148	-73.7300227	41.649863	445.981	341
149	-73.7300393	41.649696	449.015	340
150	-73.7300538	41.649611	445.33	339
151	-73.7300732	41.649622	445.705	338
152	-73.7300748	41.649643	446.781	337
153	-73.7300922	41.649717	445.564	336
154	-73.7301143	41.649676	439.004	335
155	-73.7301583	41.649573	452.023	334
156	-73.730179	41.649441	432.64	333
157	-73.7301868	41.649373	438.895	332
158	-73.7303684	41.649266	442.254	331
159	-73.7304452	41.649081	444.057	330
160	-73.7305488	41.648988	437.505	329
161	-73.7305555	41.648837	443.319	328
162	-73.7305962	41.648672	440.972	327
163	-73.7307545	41.648545	441.895	326
164	-73.7304962	41.648495	438.141	325
165	-73.7305028	41.648467	438.812	324
166	-73.7305869	41.648424	439.367	323
167	-73.7306028	41.648381	439.648	322
168	-73.7304933	41.648323	440.67	321
169	-73.7305167	41.648272	437.682	320
170	-73.730547	41.648262	440.303	319
171	-73.7307868	41.648324	439.532	318
172	-73.730782	41.648259	442.027	317
173	-73.7306799	41.648203	439.542	316
174	-73.7305762	41.648127	435.409	315
175	-73.730326	41.648025	443.606	314
176	-73.7305099	41.647513	468.902	W3-101
177	-73.7304731	41.647567	460.21	W3-102
178	-73.730385	41.647554	444.836	W3-103
179	-73.730309	41.647526	446.438	W3-104
180	-73.7303167	41.647427	442.435	W3-105 put on bank
181	-73.7323622	41.647795	432.362	W2-101 on bank
182	-73.7322916	41.647844	432.167	W2-102
183	-73.7322404	41.647833	436.561	W2-103
184	-73.7321958	41.647897	436.701	104
185	-73.7321566	41.64805	443.202	105
186	-73.732154	41.648104	441.895	106
187	-73.732188	41.648153	441.093	107

Angelo Bonavenia - Clap Hill Road Property
GPS Coordinates from Wetland Survey - 5.2018

188	-73.7323385	41.648189	440.628	108
189	-73.7332353	41.647777	434.65	B3-101
190	-73.733233	41.647774	436.052	B3-201
191	-73.7331985	41.647856	450.729	B3-102
192	-73.7331935	41.64791	436.071	B3-103
193	-73.7332231	41.648014	437.375	B3-104
194	-73.7332199	41.648065	437.869	B3-105
195	-73.7332531	41.648068	437.725	culvert metal pipe mostly buried
196	-73.7332374	41.648106	438.488	B3-106
197	-73.7332766	41.648116	444.976	culvert 16 in metal pipe in
198	-73.7332332	41.648072	437.906	path
199	-73.7332478	41.648172	439.685	B3-107
200	-73.7332121	41.64827	441.237	B3-108
201	-73.733075	41.648301	447.862	B3-109
202	-73.7329482	41.648344	447.971	B3-110
203	-73.73286	41.64838	442.454	B3-111
204	-73.7328023	41.648436	445.621	B3-112 end
205	-73.733252	41.647846	464.391	B3-202
206	-73.7332328	41.64792	441.319	B33-203
207	-73.7332506	41.647988	444.405	B3-204
208	-73.7332588	41.648087	438.539	B3-205
209	-73.7332639	41.648099	440.465	B3-206
210	-73.7332862	41.64819	439.929	B3-207
211	-73.7332725	41.648257	439.969	B3-208
212	-73.7332296	41.648284	450.213	B3-209
213	-73.7331256	41.648315	441.156	B3-210
214	-73.7329836	41.648342	438.202	B3-211
215	-73.732859	41.64839	445.382	B3-212
216	-73.7328067	41.648445	440.454	B3-213 end
217	-73.7330005	41.647855	436.181	W2-201 inclusion
218	-73.7329455	41.64788	443.612	W2-202
219	-73.7329261	41.647987	434.862	203
220	-73.7329151	41.648061	432.705	204
221	-73.7329401	41.648135	431.997	205
222	-73.7330704	41.648124	434.467	206
223	-73.7330598	41.648009	432.556	207
224	-73.7324147	41.648102	438.104	109
225	-73.7324601	41.64795	435.557	110
226	-73.7325238	41.648124	426.631	111
227	-73.7324927	41.648226	433.539	112
228	-73.7324852	41.648264	437.311	113
229	-73.7325764	41.648355	434.156	114
230	-73.7326048	41.648499	435.847	115
231	-73.7326313	41.648571	430.161	116
232	-73.7326615	41.648639	433.132	117
233	-73.732686	41.648849	435.878	118
234	-73.7328078	41.649	439.836	119

Angelo Bonavenia - Clap Hill Road Property
GPS Coordinates from Wetland Survey - 5.2018

235	-73.7328731	41.649009	440.168	120
236	-73.7328842	41.649106	445.301	121
237	-73.7329515	41.649115	440.76	122
238	-73.7329601	41.649058	442.316	123
239	-73.7329825	41.649042	442.012	124
240	-73.7330226	41.649118	442.668	125
241	-73.733107	41.649174	436.291	126
242	-73.7330653	41.649232	438.551	127
243	-73.7331427	41.649252	443.55	128
244	-73.7332121	41.649304	441.775	129
245	-73.7332201	41.649426	438.713	130
246	-73.733314	41.649529	441.398	131
247	-73.7334537	41.649569	440.58	132
248	-73.7336273	41.64958	432.254	133
249	-73.7337679	41.649614	436.834	134
250	-73.7337961	41.649541	438.847	135
251	-73.7338823	41.64962	440.241	136
252	-73.7340321	41.649677	440.041	137
253	-73.7342038	41.649711	439.518	138
254	-73.734376	41.649731	439.359	139
255	-73.7345147	41.649774	440.497	140
256	-73.7346946	41.649761	439.709	141
257	-73.734732	41.6497	437.888	142
258	-73.7347485	41.649667	438.42	143
259	-73.73479	41.649528	437.379	144
260	-73.7347706	41.64943	436.452	145
261	-73.7347436	41.649332	436.697	146
262	-73.7346937	41.649338	436.489	147
263	-73.7346465	41.649381	436.218	148
264	-73.7344852	41.649224	439.363	149
265	-73.7344651	41.649026	434.794	150
266	-73.7344088	41.648782	431.291	151
267	-73.7344707	41.648563	429.951	152
268	-73.7345081	41.648521	426.752	153
269	-73.7345686	41.648451	432.163	154
270	-73.7345359	41.648362	430.867	155 end
271	-73.733294	41.649233	439.593	w2-301
272	-73.7332429	41.649123	435.944	302
273	-73.7331613	41.649069	438.304	303
274	-73.7331291	41.649031	436.236	304
275	-73.7331493	41.649	437.017	305
276	-73.7331499	41.648948	435.037	306
277	-73.7331119	41.648927	436.7	307
278	-73.7330881	41.648832	434.96	308
279	-73.7331166	41.648755	431.346	309
280	-73.7331904	41.648798	433.891	310
281	-73.733317	41.648874	434.143	311

Angelo Bonavenia - Clap Hill Road Property
GPS Coordinates from Wetland Survey - 5.2018

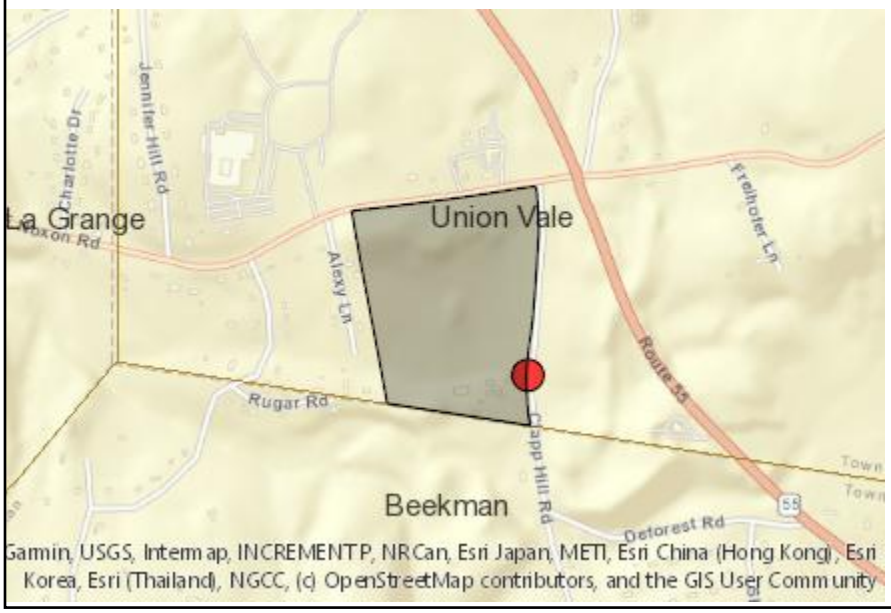
282	-73.733465	41.648932	434.131	312
283	-73.7335748	41.649048	435.193	313
284	-73.7336023	41.649237	437.076	314
285	-73.73367	41.649116	436.233	401
286	-73.733659	41.649016	434.808	402
287	-73.733726	41.64898	433.609	403
288	-73.7338773	41.649027	434.046	404
289	-73.7338689	41.649104	434.494	405
290	-73.7337208	41.649175	435.76	406
291	-73.733514	41.649307	438.178	315
292	-73.7334374	41.649151	437.823	316
293	-73.7333966	41.649144	437.797	317
294	-73.7333979	41.649223	435.998	318 end
295	-73.7317296	41.647908	435.416	w1-144end on ba k
296	-73.7316422	41.648065	435.74	W1- 201 inclusion
297	-73.7315951	41.648145	440.216	202
298	-73.7315796	41.64827	436.864	203
299	-73.7314421	41.648293	438.323	204
300	-73.7314454	41.648349	436.498	205
301	-73.7313849	41.648382	438.053	206
302	-73.7312908	41.648361	438.38	207
303	-73.7312071	41.648347	436.888	208
304	-73.7311881	41.648234	438.995	209
305	-73.7311071	41.648181	439.277	210
306	-73.7310806	41.648065	439.031	211
307	-73.7311593	41.648025	439.224	212
308	-73.73127	41.647991	438.47	213
309	-73.7313225	41.64804	438.39	214
310	-73.7313972	41.647991	437.441	215
311	-73.7314964	41.647939	436.982	216
312	-73.731517	41.647957	437.192	217
313	-73.7315402	41.647963	436.696	217
314	-73.7313946	41.648057	438.463	218
315	-73.7313932	41.648097	438.506	219
316	-73.7314347	41.648102	438.004	220
317	-73.7315161	41.648052	437.025	221
318	-73.7315883	41.648089	436.628	222 end
319	-73.7310769	41.647951	439.246	212A
320	-73.731281	41.647883	438.274	212B
321	-73.7310459	41.647669	440.882	301
322	-73.7310054	41.647751	439.283	302
323	-73.7310533	41.647861	439.374	303
324	-73.7309749	41.64795	439.195	304
325	-73.7308405	41.647917	444.253	305
326	-73.7306861	41.647875	440.382	306
327	-73.730741	41.647842	440.405	307
328	-73.730739	41.647784	440.572	308

Angelo Bonavenia - Clap Hill Road Property
GPS Coordinates from Wetland Survey - 5.2018

329	-73.7306022	41.647724	441.761	309
330	-73.7304756	41.647694	442.438	310
331	-73.7303532	41.647757	443.457	311
332	-73.7303486	41.647915	441.865	312
333	-73.7302851	41.647947	444.237	313is on 16o

EAF Mapper Summary Report

Monday, March 6, 2023 1:52 PM



Disclaimer: The EAF Mapper is a screening tool intended to assist project sponsors and reviewing agencies in preparing an environmental assessment form (EAF). Not all questions asked in the EAF are answered by the EAF Mapper. Additional information on any EAF question can be obtained by consulting the EAF Workbooks. Although the EAF Mapper provides the most up-to-date digital data available to DEC, you may also need to contact local or other data sources in order to obtain data not provided by the Mapper. Digital data is not a substitute for agency determinations.

B.i.i [Coastal or Waterfront Area]	No
B.i.ii [Local Waterfront Revitalization Area]	No
C.2.b. [Special Planning District]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.1.h [DEC Spills or Remediation Site - Potential Contamination History]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.1.h.i [DEC Spills or Remediation Site - Listed]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.1.h.i [DEC Spills or Remediation Site - Environmental Site Remediation Database]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.1.h.iii [Within 2,000' of DEC Remediation Site]	No
E.2.g [Unique Geologic Features]	No
E.2.h.i [Surface Water Features]	Yes
E.2.h.ii [Surface Water Features]	Yes
E.2.h.iii [Surface Water Features]	Yes - Digital mapping information on local and federal wetlands and waterbodies is known to be incomplete. Refer to EAF Workbook.
E.2.h.iv [Surface Water Features - Stream Name]	862-286
E.2.h.iv [Surface Water Features - Stream Classification]	C(T)
E.2.h.iv [Surface Water Features - Wetlands Name]	Federal Waters
E.2.h.v [Impaired Water Bodies]	No
E.2.i. [Floodway]	No
E.2.j. [100 Year Floodplain]	No
E.2.k. [500 Year Floodplain]	No

E.2.l. [Aquifers]	Yes
E.2.l. [Aquifer Names]	Principal Aquifer
E.2.n. [Natural Communities]	No
E.2.o. [Endangered or Threatened Species]	Yes
E.2.o. [Endangered or Threatened Species - Name]	Indiana Bat
E.2.p. [Rare Plants or Animals]	No
E.3.a. [Agricultural District]	Yes
E.3.a. [Agricultural District]	DUTC023
E.3.c. [National Natural Landmark]	No
E.3.d [Critical Environmental Area]	No
E.3.e. [National or State Register of Historic Places or State Eligible Sites]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.3.f. [Archeological Sites]	No
E.3.i. [Designated River Corridor]	No