Appendix C

Technical Reports

Appendix C.1

Natural Resources and Wetland Survey

Natural Resources and Wetland Survey

Hilltop Village at Wappinger
All Angels Hill Road
Town of Wappinger, New York

June 13, 2011

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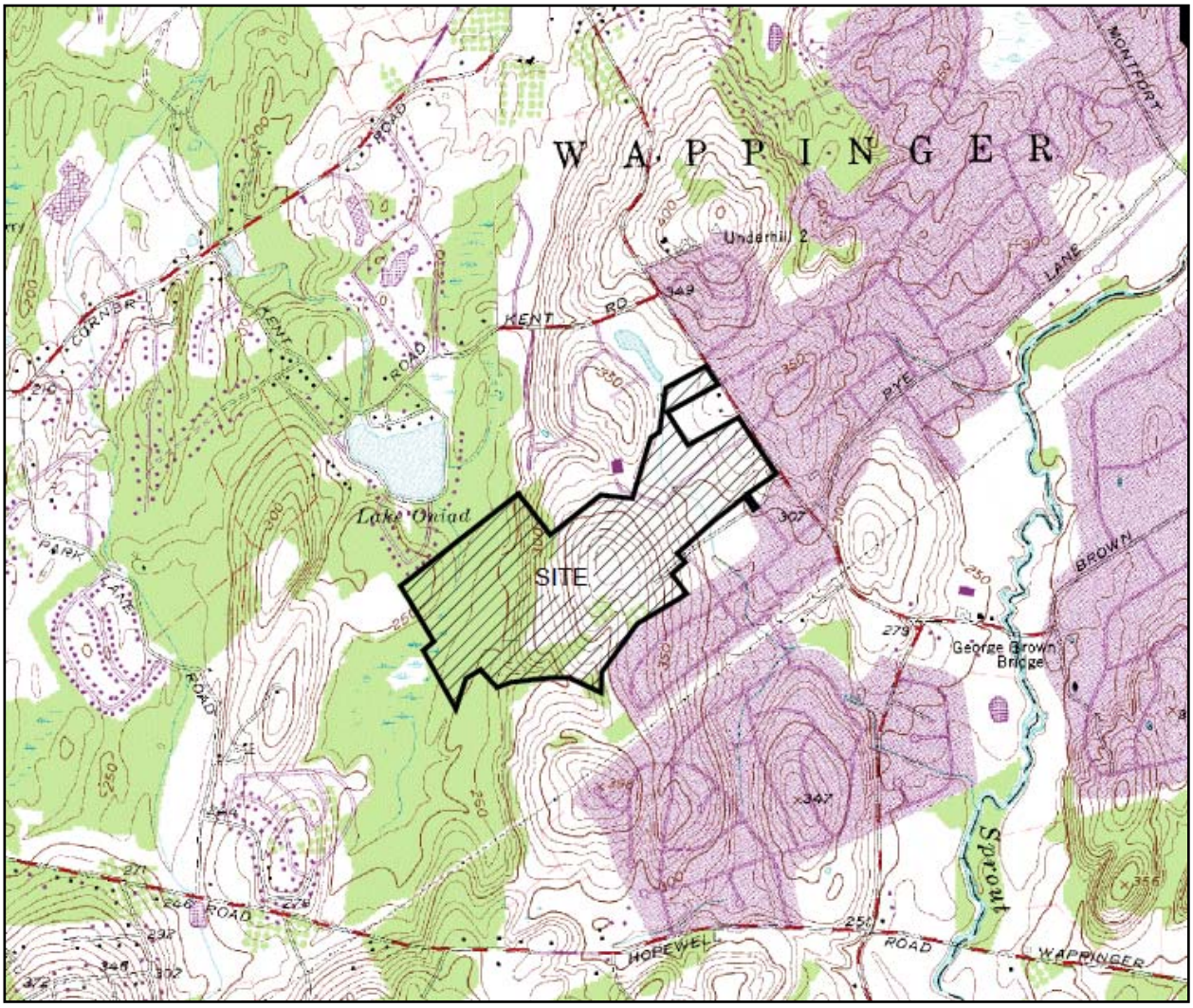
1.0 INTRODUCTION

The property owner, contracted with Ecological Solutions, LLC to complete a natural resources survey and wetland evaluation on the 149.35 acres property tax grid number Section 6257, Block 02, Lot 630770 (*Figure 1.0-1 Location Map*) located on All Angels Hill Road in the Town of Wappinger with access from this road.

The data contained in this report was gathered on March 24, 30, April 6, 21, May 8, 14, 22, 29, June 4, and 12, 2011. The fieldwork occurred generally in blocks from 5:30 am to 8:30 am, 10:00 am to 2:00 pm or from 5:30 pm to 8:30 pm and totaled approximately 100 man hours. Weather conditions varied during the field visits from cool with rain to extremely hot, humid days. Large portions of the site were reviewed during each of the field visits so that the entire property was extensively evaluated. A resume of field personnel is attached.

The purpose of the inventory was to document existing vegetation and habitat cover types, plant species, and wildlife species on the property.

Figure 1.0-1 Location Map



2.0 METHODS

2.1 Agency Correspondence/Inquiry

As part of the environmental review for the subject property, Ecological Solutions, LLC, requested correspondence regarding the status of rare, threatened, or endangered species on the property from the New York State Department of Environmental Conservation (NYSDEC) attached at the end of this report. The correspondence indicates that Blanding's turtle (*Emys blandingii*) and Indiana bat (*Myotis sodalis*) may exist on or in the vicinity of the property. The US Fish and Wildlife Service (USFWS) website search attached to the end of this report lists bog turtle (*Glyptemys muhlenbeghii*), Indiana bats (*Myotis sodalis*), and peregrine falcon (*Falco peregrinus*) as threatened or endangered species in Dutchess County.

In addition, the wetlands on the property, were thoroughly investigated to determine if marbled salamander (*Ambystoma opacum*), Jefferson salamander (*Ambystoma jeffersonianum*), and blue spotted salamander (*Ambystoma laterale*) all NYSDEC designated "species of special concern" utilized the wetlands for breeding habitat. Other species of special concern including spotted turtle (*Clemmys guttata*), eastern box turtle (*Terrapene Carolina*) and wood turtle (*Clemmys insculpta*) were also searched for during the surveys.

2.2 Ecological Community and Habitat Field Inventory

The vegetation inventory included identification of ecological communities or habitat cover types. Cover type surveys were conducted by first reviewing aerial photographs of the property and adjacent properties and subsequently by investigating the habitats on the property to identify and classify each. Within each cover type, visual searches for herbaceous and woody plant species or parts thereof, including leaves, bark, twigs, seeds, flowers, fruits, or other identifiable plant structures were conducted to identify and document vegetation on the property. Trees, shrubs, and fall flowering plants were identified to species levels where possible.

The Plot Transect method was employed for the vegetation inventory. The methods used to search for species on the property are outlined in *Biodiversity Assessment Manual for the Hudson River Estuary Corridor*.[1]

[1] *Hudsonia Ltd., 2001*

2.3 Wildlife Field Inventory

Extensive field surveys were conducted for wildlife species including mammals, birds, and herpetiles (reptiles and amphibians). Special surveys were also conducted to identify and locate seasonally active species of special concern such as the marbled salamander, Jefferson salamander, and blue spotted salamander, spotted, eastern box, and wood turtle all NYSDEC designated "species of special concern".

Multiple methods were used in these surveys, as multiple methodologies increase the potential accuracy of surveys. Methods used are outlined below.

A. **Mammals**. The following survey methods that are outlined in detail in *Biodiversity Assessment Manual for the Hudson River Estuary Corridor* were utilized during the field survey:

1. Sign search, in which the observer records any recognizable signs (tracks, droppings, hair, bones, etc.) of mammal species.

2. Opportunistic mammal sightings, in which the observer identifies mammals encountered in the field at random.

Mammals were identified based on visual encounters, vocalizations, tracks, fur, bones, rubs, scrapes, droppings, and other recognizable signs in habitats throughout the property. Sampling routes were established throughout the property and wildlife was recorded as encountered.

B. **Birds.** Field methods used to survey for avian species were based on methods outlined in *Biodiversity Assessment Manual for the Hudson River Estuary Corridor* and included:

1. Walking transects where the observer records all species encountered (seen/heard) along a trail.

2. Opportunistic bird sighting, where the observer records birds encountered randomly.

3. Sign search, where the observer records signs (feathers, nests, droppings, tracks, etc.) of birds encountered in the field.

Birds were detected and identified by visual encounter with individuals, vocalizations, tracks, feathers, bones, droppings, castings, nests, drillings, or other recognizable signs.

In addition, breeding bird surveys were completed on May 8, 14, 22, 29, June 4, and 12, 2011 and typically began at 5:30 am and ended at 8:30 am or occurred in early evening at around 5:30pm. May and June are the months when most birds in New York breed, although a small number of species breed anytime from January through August. Early July can be especially productive since many adults with food for young and recently fledged young can be seen at that time.

C. **Herptiles (Reptiles and Amphibians)**. Field methods used to survey for herptile species were based on methods outlined in *Biodiversity Assessment Manual for the Hudson River Estuary Corridor* and included:

1. Log rolling (overturning logs, large stones, and other debris to reveal herptiles underneath).

2. Aural surveys were conducted for vocal herptiles. Herptiles were detected and identified by visual encounter, vocalizations, spermatophores, egg masses, and remains.

3. Just about the time most other amphibians are looking for places to hibernate, marbled salamanders are heading to breeding areas. The only fall breeding salamander, they seek out small areas (micro habitats) with temperatures around 60°F. The female will lay an average of 100 eggs in a nest constructed in a shallow depression under leaf litter or in a log. The female remains with the eggs until fall rains fill the nest property. Eggs will hatch within two weeks. In mild winters, larvae can feed and grow and transform in late spring or early summer. If the nest does not flood, eggs will go dormant until the following spring. The salamander larvae that hatch in fall metamorphose into terrestrial adults in late spring or June or July.

   The habitat they select varies with the season. During the spring and summer, the adults spend their time in sandy upland deciduous forests. They seek shelter under logs or in underground tunnels of other animals. In autumn, they congregate in groups near lowland forested habitat to breed.

   Both Jefferson and Blue spotted salamanders are early spring breeders and are often the first amphibians found breeding in vernal pools.

3.0 WETLAND IDENTIFICATION

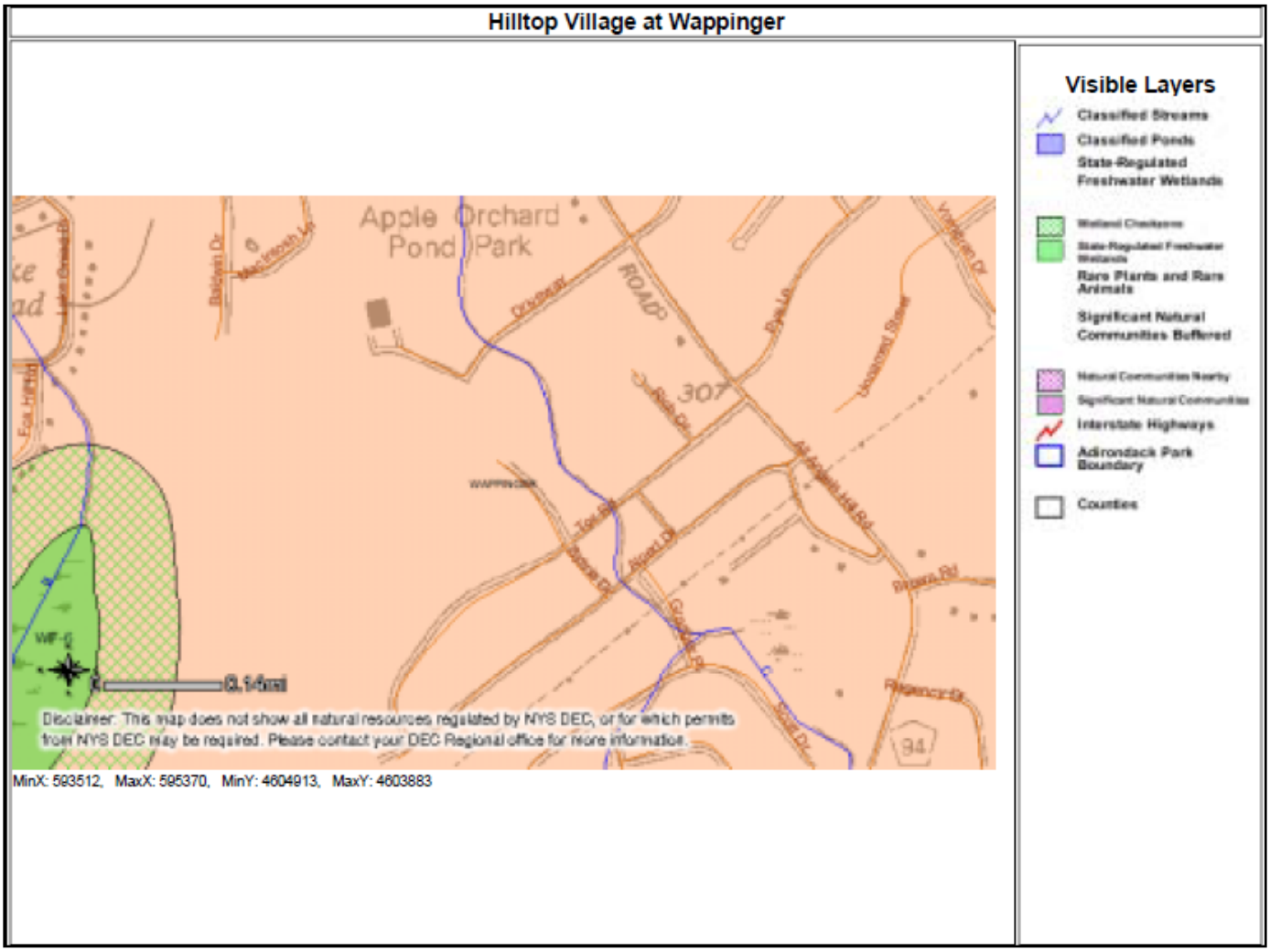
3.1 Wetland Delineation

A wetland delineation was completed on the site by Ecological Solutions, LLC most recently in October 2010 when the original wetland flags were re-established in the field by the project surveyor. The delineation was completed in accordance with the *US Army Corps of Engineers* (USACE) *Wetlands Delineation Manual, Technical Report Y-87-1*[2], NYSDEC Article 24 Freshwater Wetland regulations for state wetland WF-6 (*Figure 3.1-1*), and Town of Wappinger wetland code Chapter 137.

Ecological Solutions, LLC field checked the delineated the wetlands on this property and obtained a validated wetland map from the NYSDEC for state regulated wetland WF-6 (Attachment) and verification letter from the Town of Wappinger Environmental Consultant as per the Town's Planner F.P. Clark for local regulated wetlands (Attachment). A Jurisdictional Determination from the US Army Corps of Engineers (USACE) is scheduled for this spring/summer season.

[2] *(U.S. Army Corps of Engineers Environmental Laboratory, 1987) (1987 Federal Manual)*

Figure 3.1-1 NYSDEC Website



3.2 Wetland Functional Evaluation

The property consists of 149.35(+-) acres including successional southern hardwood forest, mixed successional shrub community, red maple swamp community, scrub/shrub swamp, and unpaved road/path. The results of the site inspection indicate that a total of two (2) separate wetlands exhibiting wetland hydrology, soils, and vegetation are present on the property. The flag series and corresponding wetland classification nomenclature (Cowardin et al., 1979) are as follows:

Site Wetlands

Wetland WF-6 (B-C-D), E, (F-G), and (H-J) - Palustrine Forested and Scrub/Shrub (PFO1 and PSS1)

All of the wetland areas observed on the site exhibited one or more of the following (1) flowing water, (2) soil saturation. On average water depths within the on-site wetlands ranged from 0-4 inches. Water table elevations within on-site wetlands are presumed to occur within a fairly wide range of elevations (up to one half foot). Forested wetlands on the site exhibit a distinct hummock-hollow topography, which varies with the degree of water table fluctuations.

All of the wetlands are associated with either an ephemeral, intermittent, or perennial stream channel. Surface water and ground water trend in a north-south direction, and ultimately discharge off the property to the Hudson River via off site tributaries.

The hydric mapping units on the site are the Canandaigua silt loam (Ca) and Carlisle muck (Cc) soil series. All of the wetlands identified on the site occur in these series.

Herbaceous species identified generally within the site wetlands included *Symplocarpus foetidus* (skunk cabbage), *Onoclea sensibilis* (sensitive fern), *Osmunda cinnamomea* (cinnamon fern), *Carex stricta* (tussock sedge), and *Viola sp.* (violet).

Shrub species observed included *Acer rubrum* (red maple), and *Lindera benzoin* (spicebush), *Ilex verticillata* (winterberry), and *Cornus amomum* (silky dogwood).

Tree species included *Acer rubrum* (red maple), *Ostrya virginiana* (eastern hophornbeam), F*raxinus pennsylvanica* (green ash), *Ulmus americana* (American elm), *Quercus bicolor*, (swamp white oak), and *Platanus occidentalis* (American sycamore).

An assessment of wetland functions and values was conducted on the wetlands that were identified and delineated on the property. Using a widely accepted method for wetland functions and values assessment developed by the New England District, U.S. Army Corps of Engineers, 13 distinct wetland functions and values were assessed for the delineated wetlands on the site. This method yielded an objective, descriptive quality index of each wetland rather than a subjective quantified rating of each wetland. This assessment had two major objectives:

1. Objectively identify the functions and values provided by each of the wetlands identified on the site.

2. Provide baseline data with which the Applicant could work in planning land uses, and against which the Applicant could assess potential impacts of proposed development of the site

The descriptive quality index of each wetland, based on this methodology, is summarized in this report.

Wetlands are legally protected because of the functions they perform and the benefits that society reaps from those functions. Wetland functions are chemical, physical, and biological processes that wetlands naturally perform as a matter of course, such as absorption of nutrients or floodwaters, or provision of habitat for fish and wildlife. Wetland values are the benefits that society derives from wetland functions, such as flood abatement, or water quality maintenance.

The functions and values assessment conducted on the property was based on the method outlined in *The Highway Methodology Workbook Supplement: Wetland Functions and Values, A Descriptive Approach*, by the U.S. Army Corps of Engineers New England District (November 1995). This method was selected over an arbitrary numeric quantifying assessment scheme because it provides an objective, descriptive approach to functions and values assessment based on professional observation and judgment rather than a simple numeric value rating system. Quantified functions and values assessments do not always provide for descriptive information about wetlands and therefore may overlook important aspects of wetland functions and values.

The Highway Method provides for assessment of each wetland for thirteen defined functions and values. Of these, the first eight are considered wetland functions, and the last five are considered to be wetland values. These are:

1. **Groundwater Recharge/Discharge –** the potential for a wetland to serve as a recharge area for an aquifer or as a surface discharge point for groundwater.

2. **Floodflow Attenuation–** A wetland's ability to store and attenuate floodwaters during prolonged precipitation events, thereby reducing or preventing flood damage.

3. **Fish and Shellfish Habitat –** The ability of permanent or temporary water bodies to provide suitable habitat for fish or shellfish.

4. **Sediment/Toxicant/Pathogen Retention –** The effectiveness of the wetland in trapping sediments, toxicants or pathogens, thereby protecting water quality.

5. **Nutrient Removal/Retention/Transformation –** The effectiveness of the wetland at absorbing, retaining, and transforming or binding excess nutrients, thereby protecting water quality.

6. **Production Export –** The wetland's ability to produce food or usable products for humans or other living organisms.

7. **Sediment/Shoreline Stabilization –** The wetland's ability to prevent erosion and sedimentation by stabilizing soils along stream banks or the shorelines of water bodies.

8. **Wildlife Habitat** – The ability of wetlands to provide food, water, cover, or space for wildlife populations typically associated with wetlands or their adjacent areas, both resident and migratory. *

9. **Recreation –** The value placed on a wetland by society for providing consumptive and non-consumptive as well as active or passive recreational opportunities such as canoeing/boating, fishing, hunting, bird/wildlife watching, hiking, etc.

10. **Education/Scientific Value –** The value placed on a wetland by society for providing subjects for scientific study or research or providing a teaching resource for schools.

11. **Uniqueness/Heritage –** The value placed on a wetland by society for having unique characteristics such as archaeological sites or sites of historical events,

unusual aesthetic qualities, or unique plants, animals, or geologic features, etc.

12. **Visual Quality/Aesthetics –** The value placed on a wetland by society for having visual and/or other aesthetic qualities.

13. **Threatened or Endangered Species Habitat –** The value placed on a wetland by society for effectively harboring or providing habitat for threatened or endangered species.

Each function or value in the list has a set list of qualifiers for identifying which functions and values are performed or provided by each wetland. The qualifiers are referenced by number on a standard evaluation form to document the functions and values assessment. In addition to outlining qualifying rationale for each function and value, the data forms also document information on each wetland's size, distance to nearest road or other development, adjacent land uses, position in the watershed, impacts from human activity, tributaries, cover types, connectivity to other wetlands, and general condition. All of these elements factor into the functions and values assessment. Assessments were performed on wetlands on the site. Findings of the assessment are outlined below.

Wetlands WF-6 (B-C-D), E, (F-G), and (H-J) receive water primarily from overland sheet flow and perennial/intermittent tributaries located within each wetland. Hydrological indicators identified within the wetlands included soil saturation, watermarks, drift lines, drainage patterns, and water stained leaves. The wetlands are mainly broad-leafed deciduous forested wetland (PFO1E). These are red maple-spicebush dominated swamps with dense understory of skunk cabbage (*Syplocarpus foetidus*) that is seasonally saturated. These systems are surrounded by dense second-growth forest with some patches of more mature open forest area to the north and south of the property. Functions and values provided by these wetlands include groundwater recharge, floodflow attenuation, sediment trapping, nutrient removal, production export, shoreline stabilization, wildlife habitat, and visual quality. Of these, the most significant functions based on extent of rationale in identifying functions and values, are floodflow attenuation, sediment trapping, and wildlife habitat.

3.3 Anticipated Impacts to Wetlands, Wetland Adjacent Area, and Waterbodies

The proposed development of the property will require a Federal Section 404 Nationwide Permit #29 and Local Town wetland permit under Chapter 137 for development activities associated with the placement of less than 0.041 acres of fill in

jurisdictional wetlands on the property to bring the existing entrance road to Town standards and construct the emergency access road. No NYSDEC Article 24 Freshwater Wetland Permit is required however a Section 401 Water Quality Certification is required since there is federal jurisdictional wetland fill on the property.

The regulated wetlands on the property will continue to provide the same functional benefits after completion of the proposed development of the property including: maintenance of flood, erosion and storm control; control of pollution and sedimentation; provision of area for wildlife habitat; and provision of areas for passive and active recreational use.

Short-term physical impacts to wetlands on the property will be avoided by the use of erosion controls throughout the property especially in critical areas adjacent to regulated wetlands. No regulated watercourse will be impacted as a result of the proposed development. The entrance road expansion will impact a NYSDEC Class "C" watercourse and is not subject to Article 15 protection of Waters permitting.

3.4 Wetland Mitigation

Avoidance

Complete avoidance of jurisdictional wetlands could not be attained since the entrance road must be expanded and improved and the emergency access road requires a crossing of a small tributary.

Mitigation

No wetland mitigation measures are required by the NYSDEC or USACE since there are no impacts to NYSDEC regulated wetlands and only 0.041 acres of federal wetland. A small mitigation area could be created for the Town if required by Chapter 137 of the Code.

4.0 FINDINGS

4.1 Habitat

There is several distinct dominant cover types identified on the property as classified by Edinger 2002. Approximate physical impacts to each habitat type are shown and listed in Table 4.1-1 and shown in Figure 4.1-1.

TABLE 4.1-1
HABITAT COVER TYPE IMPACTS
HILLTOP AT WAPPINGERPROPERTY

NO.	EDINGER 2002	ACRES IDENTIFIED	PROPOSED IMPACTS
	Successional Southern Hardwoods	105.69	68.21
2	Red Maple Hardwood Swamp	29.71	0.04
3	Scrub/Shrub Swamp	9.96	0.01
4	Unpaved Road/Path	3.99	3.32
	Total	**149.35**	**71.58**

Figure 4.1-1 Habitat Map

4.1-1 Terrestrial System

The terrestrial system consists of upland habitats. These habitats have well-drained soils that are dry to mesic (never hydric), and vegetative cover that is never predominantly hydrophytic, even if the soil surface is occasionally or seasonally flooded or saturated. In other words, this is a broadly defined system that includes everything except aquatic, wetland, and subterranean communities.

FORESTED UPLANDS

This subsystem includes upland communities with more than 60% canopy cover of trees; these communities occur on substrates with less than 50% rock outcrop or shallow soil over bedrock.

Successional Southern Hardwoods

A mixed forest occurring on previously cleared or otherwise disturbed land. Characteristic trees and shrubs include the following: American elm (*Ulmus americana*), slippery elm (*Ulmus rubra*), white ash (*Fraxinus americana*), red maple (*Acer rubrum*), box elder (*Acer negundo*), silver maple (*Acer saccharinum*), sassafras (*Sassafras albidum*), gray birch (*Betula populifolia*), hawthorns (*Crataegus spp.*), eastern red cedar (*Juniperus virginiana*), and choke-cherry (*Prunus virginiana*). Other species commonly found in this successional forests includes tree-of-heaven (*Ailanthus altissima*) and buckthorn (*Rhamnus cathartica*). A characteristic bird found on this site is chestnut-sided warbler (*Dendroica pensylvanica*).

Unpaved road/path

A sparsely vegetated road or pathway of gravel, bare soil, or bedrock outcrop. These roads or pathways are maintained by regular trampling or scraping of the land surface. The substrate consists of the soil or parent material at the site, which may be modified by the addition of local organic material (woodchips, logs, etc.) or sand and gravel. One characteristic plant is path rush (*Juncus tenuis*). A characteristic bird is killdeer (*Charadrius vociferus*).

4.1-2 Palustrine System

The palustrine system consists of non-tidal, perennial wetlands characterized by emergent vegetation. The system includes wetlands permanently saturated by seepage, permanently flooded wetlands, and wetlands that are seasonally or intermittently flooded (these may be seasonally dry) with vegetative cover that is predominantly

hydrophytic with hydric soils. Wetland communities on the property are distinguished by their plant composition (hydrophytes), substrate (hydric soils), and hydrologic regime (frequency of flooding).

Red Maple Hardwood Swamp

In general on the site this ecological community is a type of hardwood swamp that occurs in poorly drained depressions usually on inorganic soils in New York State. Red maple (*Acer rubrum)* is dominant and the co dominants consist of American elm *(Ulmus Americana),* Swamp White Oak, (*Quercus bicolor)* and Pin Oak *(Quercus palustris)*. The shrub layer consists mainly of Arrowood *(Viburnum recognitum)*, Silky Dogwood *(Cornus amoemum)* and Smooth Alder *(Alnus serrulata).* The herbaceous layer contains skunk cabbage (*Symplocarpus foetidus)*, tussock sedge (*Carex stricta)*, sensitive fern (*Onoclea sensibilis)*, and sphagnum moss (*Sphagnum spp.).* This ecological community occurs in the protected wetlands occupying the low areas between the north south running ridges. These wetland areas exist in valleys and are mostly associated with watercourses. This ecological community will remain almost completely undisturbed by the proposed development. There are two forested landscapes on the site and are identified as (Rich Mesophytic Forest) or middle age climax forest along the steep slopes and mixed age, second growth forest (*Successional Northern Hardwoods*) covering the remainder of the upland portion of the site. Mixed age second growth trees ranged in size from 6 to 12 inches diameter at breast height (DBH), with larger specimen trees in the 30 - 36 inches dbh range scattered throughout the site. Overall species diversity was excellent except for a low reptile count on the site.

Shrub swamp

This portion of the wetland is dominated by tall shrubs that occur as a transition zone between the upland community and the red maple swamp community. The substrate is mineral soil. The shrub swamp is codominated by a mixture of species including gray dogwood (*Cornus foemina ssp. racemosa*), highbush blueberry (*Vaccinium corymbosum*), spicebush (*Lindera benzoin*), willows (*Salix discolor*), and arrowwood (*Viburnum recognitum*). Birds found in the shrub swamp include common species such as common yellowthroat (*Geothlypis trichas*).

4.2 Wildlife

4.2.1 Breeding Birds

The following is a list of breeding birds identified on the property in 2011. Most of the species were found in multiple habitats although some were observed in specific

habitats. The list of observed species includes: Wood Duck (*Aix sponsa*), Mallard (*Anas platyrhynchos*), Wild Turkey (*Meleagris gallopavo*), Turkey Vulture (*Cathartes aura*), Broad-winged Hawk (*Buteo platypterus*), Red-tailed Hawk (*Buteo jamaicensis*), Killdeer (*Charadrius vociferus*), Mourning Dove (*Zenaida macroura*), Chimney Swift (*Chaetura pelagica*), Ruby throated hummingbird (*Archilochus colubris*), Yellow-bellied Sapsucker (*Sphyrapicus varius*), Downy Woodpecker (*Picoides pubescens*), Northern Flicker (*Colaptes auratus*), Pileated Woodpecker (*Dryocopus pileatus*), Eastern Wood-Pewee (*Contopus virens*), Eastern Phoebe (*Sayornis phoebe*), Eastern Kingbird (*Tyrannus tyrannus*), Red-eyed Vireo (*Vireo olivaceus*), Blue Jay (*Cyanocitta cristata*), American Crow (*Corvus brachyrhynchos*), Tree Swallow (*Tachycineta bicolor*), Barn Swallow (*Hirundo rustica*), Black-capped Chickadee (*Poecile atricapillus*), Tufted Titmouse (*Baeolophus bicolor*), White-breasted Nuthatch (*Sitta carolinensis*), Carolina Wren (*Thryothorus ludovicianus*), House Wren (*Troglodytes aedon*), Eastern Bluebird (*Sialia sialis*), Veery (*Catharus fuscescens*), Wood Thrush (*Hylocichla mustelina*), American Robin (*Turdus migratorius*), Gray Catbird (*Dumetella carolinensis*), Northern Mockingbird (*Mimus polyglottos*), European Starling (*Sturnus vulgaris*), Yellow Warbler (*Dendroica petechia*), Chestnut-sided Warbler (*Dendroica pensylvanica*), American Redstart (*Setophaga ruticilla*), Ovenbird (*Seiurus aurocapilla*), Scarlet Tanager (*Piranga olivacea*), Common Yellowthroat (*Geothlypis trichas*), Eastern Towhee (*Pipilo erythrophthalmus*), Chipping Sparrow (*Spizella passerina*), Song Sparrow (*Melospiza melodia*), Northern Cardinal (*Cardinalis cardinalis*), Indigo Bunting (*Passerina cyanea*), Common Grackle (*Quiscalus quiscula*), Brown-headed Cowbird (*Molothrus ater*), Baltimore Oriole (*Icterus galbula*), House Finch (*Carpodacus mexicanus*), American Goldfinch (*Carduelis tristis*), Great Blue Heron (*Ardea herodias*), and Brown Thrasher (*Toxostoma rufum*).

4.2.2 Mammals

The following is a list mammals identified on the property in 2011. Most of the species were found in multiple habitats although some were observed in specific habitats. The list of observed species includes: Opossum (*Didelphis virginiana*), Little Brown Bat (*Myotis lucifugus*), Deer Mouse (*Peromyscus maniculatus*), Gray Squirrel (*Sciurus carolinensis*), Eastern Chipmunk (*Tamias striatus*), Woodchuck (*Marmota monax*), Raccoon (*Procyon lotor*), Striped Skunk (*Mephitis mephitis*), Red Fox (*Vulpes vulpes*), White-tailed Deer (*Odocoileus virginiana*), and Coyote (*Canis latrans*).

4.2.3 Amphibian/Reptiles

The following is a list of amphibians and reptiles identified on the property in 2011. Most of the species were found in multiple habitats although some were observed in specific habitats. The list of observed species includes: Red-backed Salamander

(*Plethodon cinereus*), Garter Snake (*Thamnophis sirtalis*), Red Eft (*Notophtalmus viridescens*), Spotted Salamander (*Ambystoma maculatum*), Two-lined Salamander (*Eurycea bislineata*), Wood Frog (*Rana sylvatica*), Green Frog (*Rana pipens*), Gray Tree Frog (*Hyla versicolor*), Spring Peeper (*Hyla crucifer*), Black Rat Snake (*Elaphe obsoleta*), Bullfrog (*Rana catesbiana*), American Toad (*Bufo americanus*), Painted Turtle (*Chrysemys picta*), Snapping Turtle (Chelydra serpentina), Northern Ringneck Snake (*Diadophis punctatus*), and Brown Snake (*Storeria dekayi*).

5.0 POTENTIAL THREATENED/ENDANGERED SPECIES

5.1 Bog Turtle

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

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

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

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

The wetlands on the property were surveyed and the wetland communities were assessed for the presence of habitat characteristics consistent with the bog turtle federal recovery plan (U.S. Fish and Wildlife Service, 2001): 1) soft, saturated organic and/or mineral soil; 2) hydrologic regime derived from perennial groundwater discharge; 3)

plant community represented by a predominance of low-growing, native flora including sedges, rushes, grasses, forbs, mosses, and sometimes low shrubs; 4) tree canopy cover less than 50% allowing adequate sunlight to reach the ground, and 5)Fen indicator plants (calcicoles) including, shrubby cinquefoil (*Pentaphylloides floribunda*), grass-of-parnassus (*Parnassia glauca*), and tamarack (*Larix larcina*).

None of the wetlands areas delineated and identified on the property met the criteria to be bog turtle habitat. None of the wetlands contained perennial groundwater seepage or upwellings, rivulets, or the structure such as open canopy or mucky substrate to be classified as potential bog turtle habitat.

5.2 Indiana Bats

Indiana bat hibernacula and hibernacula characteristics have been well documented by numerous observational studies reported in the literature. Indiana bats spend the winter months in secluded caves or mines. There are several hibernacula currently known in Albany, Essex, Warren, Jefferson, Onondaga and Dutchess Counties. To date there are three known hibernacula located in the immediate vicinity of Kingston, New York. The hibernacula are critical to the survival of this species because so few are known to exist. The USFWS and NYSDEC are continually documenting habitat utilization by this species once emergence occurs.

With the coming of spring, Indiana bats disperse from their winter homes, known as hibernacula, some going hundreds of miles. They feed solely on flying insects and presumably males spend the summer preparing for the breeding season and winter that follows. Females congregate in nursery colonies, only a handful of which have ever been discovered. These were located along the banks of streams or lakes in forested habitat, under the loose bark of mature shagbark hickory trees, and some dead trees that have open or hanging bark to provide shelter for the bats, and which can contain from 50-100 females. A single young is born to each female, probably late in June, and is capable of flight within a month.

Outside the hibernation period, Indiana bats are very mobile and use both live trees greater than 5 inches dbh especially containing dead wood and snags or dead trees in a variety of habitats for roosts during the summer months. Although roosts have been documented in a wide array of hardwood and pine species, trees and snags that have exfoliating bark or crevices, such as shagbark hickory and black locust, appear to be most important to this species because females and their young rest under the bark. Trees, equal to or greater than 9 inches dbh with exfoliating bark/crevices, southern or

western exposure, and solar exposure appear to be the most important habitat for maternal colonies during the summer months.

In August or early September, Indiana bats swarm at the entrance of selected caves or mines. This is when mating takes place. Indiana bats spend the winter months in secluded caves or mines averaging 37 to 43 degrees F.

5.2-1 Indiana Bat Foraging Habitat

Information provided in this section was taken from a publication entitled, "*Review of the Forest Habitat Relationships of the Indiana Bat (Myotis sodalis)*".

Indiana bats often forage in riparian areas, woodlots, and upland forests. Indiana bats primarily forage 2 to 30 m above the ground and most foraging occurs along habitat edges. Foraging occurs above, below, and around tree canopies in forested habitats, along the forest/stream edge in riparian areas, and along the edge of pastures and old fields.

Stand Structure/Canopy Cover

Brack (1983) noted that net sites where Indiana bats were captured had openings (gaps) in the forest canopy. Callahan (1993) located Indiana bat maternity roosts in northern Missouri in a stand that had been heavily logged within the past 20 years and in a hoglot where many overstory trees had been killed. He noted that these habitat modifications may have benefited *M. sodalis* by removing most of the canopy cover and leaving many standing dead trees. It is unclear how structural changes caused by logging or the girdling of overstory trees in the hoglot affected the use of these areas by foraging bats.

In Illinois, Indiana bats forage in areas that had been selectively harvested (Gardner et al. 1991b; J. MacGregor pers. observ.). These observations suggest that Indiana bats forage in areas where some timber harvesting has occurred, but they are not useful in determining preference or avoidance of harvested areas.

Relationship Between Habitat Selection and Stand Structure

Humphrey et al. (1977) suggested that Indiana bats forage only in riparian areas with some vertical structure, i.e., *M. sodalis* were not observed foraging along riparian areas denuded of woody vegetation. In addition, although there were other habitats with

little or no vertical structure (e.g., pastures, cornfields) near the maternity roosts monitored, Humphrey et al. did not observe Indiana bats foraging in them.

Proportion of Landscape in Foraging Habitat

At the landscape scale, Miller et al. (1996) compared abundances of several habitat types, forest perimeter, tree species present, d.b.h., and percent canopy cover between sites in Missouri where Indiana bats had and had not been captured. They found no difference in percent coverage of forest, row crop, grassland, or water cover between capture and noncapture sites. However, sites where Indiana bats were present contained a significantly greater number of large-diameter trees than sites where *M. sodalis* were absent. Miller et al. used mist netting to verify the presence or absence of Indiana bat maternity colonies. It is relatively easy to verify Indiana bat presence via mist nets, but failure to capture an Indiana bat does not verify absence. Callahan (1993) characterized roost types selected by *M. sodalis* maternity colonies. He also attempted to elucidate "habitat characteristics of areas used by maternal Indiana bat colonies." He defined the use areas in two ways: (1) the smallest circle that encompassed all maternal roost tees located in a colony (defined as the minimum roost range), and (2) a 3-km circle centered around the minimum roost range.

Potential for Foraging Habitat on the Hilltop at Wappinger Property

According to the correspondence received from the NYSDEC there are known roost trees approximately 2 miles from the Hilltop at Wappinger property. The property contains the habitat components, as described in the literature, conducive to foraging activities by Indiana Bats as well as other bat species.

The proposed project impact area is undeveloped and generally wooded containing dense second growth mixed upland forest with no openings or clearings observed. The property has gentle to moderately steep slopes in the mixed upland forest areas. The forested wetland area and uplands at the extreme south and north and along the border of NYSDEC wetland WF-6 on the property contains older aged trees generally with some trees exhibiting exfoliating bark as well as snags and dead wood present useful for Indiana bat roosting or colony formation. None of these areas will be impacted. All of the proposed development occurs in the dense second growth forest that is not habitat for Indiana bats because of the thick canopy and inability to fly or foraging in this canopy.

The second growth forest area vegetated with trees significantly less than 9″ dbh that do not contain loose exfoliating bark, cavities, or holes and therefore the development

area is not considered to possess significant potential to contain Indiana Bat roosting or maternal colony trees.

5.3 Blanding's Turtles

The Blanding's Turtle assessment was completed in accordance with the guidance issued by the New York State Department of Environmental Conservation (NYSDEC) entitled, "*Guidelines for Reviewing Projects for Potential Impacts to the Blanding's Turtle*" because the property contains habitats that meet the NYSDEC guidelines for further investigation including: (1) there is a known Blanding's turtle occurrence within 0.621 miles (3,280 feet) of the property as identified by the Natural Heritage Program correspondence, (2) there appears to be a potential "core" habitat adjacent to the western property boundary (about 100 feet away), and (3) potential nesting habitat areas may occur on the property.

Potential Blanding's turtle habitat complexes include core wetlands (regularly used wetlands, particularly important as overwintering and early spring habitat), associated wetlands (irregularly used wetlands important for adult foraging, basking, rehydrating, and as year round habitat for juvenile turtles), potential nesting habitats (sparsely vegetated areas such as meadows and fields), and the forested and meadow areas between these habitats (used for summer aestivation and for travel). Characteristics that indicate core habitat are: shrubby pools with permanent or intermittent hydroperiod with little flow through; high water depths of 0.5–4.0 feet; tree canopy open or absent; tree fringe present; and a dense cover of shrubs, forbs, lemnids or nymphaeids, with coarse and fine organic debris. In addition to core wetlands it is known that Blanding's turtles use a complex of habitat types during different periods in their life cycle. According to the NYSDEC "Aquatic/wetland habitat usage by Blanding's turtles includes different types of freshwater systems such as emergent marshes, woodland pools, red maple swamps, buttonbush swamps, ponds, lakes, rivers, and streams. Juvenile Blanding's are normally associated with shallower water and more densely vegetated habitats as compared to that of adults". Visual observations along transects through the habitats on the property were an important part of the assessment with areas scanned using binoculars. These points were grouped in close proximity to the wetland on the north and west portion of the property since the core wetland is offsite in this location.

As a result of the habitat assessment completed in 2011 it is certain that there are no core habitats for this species identified on the Hilltop Village at Wappinger property. A potential core habitat has been identified approximately 100 feet west of the western property boundary (*Figure 5.3-1*). Ecological Solutions, LLC, identified one area of

potential nesting habitat on the property encompassing 7.53 acres. The critical factor in determining this area as potential nesting habitat was the Hoosic gravelly loam soil type found in this location. Invariably, Blanding's turtle nesting activities occur in Hoosic soil conditions almost always with low growing vegetation since sunlight is absolutely necessary for egg development. The Hoosic soil on the property however supports a mature forest area that borders several residential properties to the northwest of the property. In any event this area is north of wetland WF-6 and is not part of any development proposal. There is no Hoosic soil area covered by low growing meadow vegetation anywhere on the property and in fact there is no low growing vegetation anywhere on the property.

Blanding's turtles are known to migrate or use corridors for travel from different habitats during the active season. The Hilltop at Wappinger property offers a potential travel corridor via state wetland WF-6 which is a red maple swamp that occupies and accounts for 29 acres of the western portion of the property. This wetland is a large mass that extends from the northern to southern property boundary and contains a perennial tributary at the center. Bordering this wetland to the east is the 100 foot regulated adjacent area that is older growth mixed upland forest. Upslope of this edge to the east to the hilltop is the dense successional southern forest area or area of development. This forest is exceedingly thick with a very high stem density as to be almost impenetrable on foot. Beyond this area again to the east is another wetland which the entrance road bisects into two. This wetland is saturated only and has never been viewed with any standing water. This wetland rises slightly to the east to another area of proposed development along All Angels Hill Road.

Hudsonia Ltd. has developed a series of zones around the perimeter of a typical core habitat that correspond to a Priority Zone, Conservation Zone, and Area of Concern. The Priority Zone is the area approximately 660 feet from the boundary surrounding the core wetland habitat. This area is typically made up of upland habitat and is extensively used by Blanding's turtles from April through October. Nesting may occur in this area. The Conservation Zone encompasses the area approximately 3,280 feet from the boundary of the core wetland. According to Hudsonia, Blanding's turtles use this area on a seasonal basis and they represent most of the nesting areas and travel corridors used by this species. The Area of Concern measures approximately 6,562 feet from the core wetland and is used by turtles during longer migrations to find new habitats and possibly to nest.

Potential Blanding's turtle migration efforts could only be assessed for the project absent hard data (actual turtle captures and movement studies) and relied on the literature from similar projects because there was no opportunity to trap this species on the site given the lack of core habitat components on the property. The assessment, therefore, focused on the potential or most likely travel corridors especially during the active late spring and hot summer months, availability of wet habitats on the property or adjacent which is key for this species during hot summer months to keep hydrated, and conditions occurring on the property. The analysis concluded that soil types on the property for potential travelling to nesting locations, and the existing State wetland are corridors or openings which could influence this species movements and use of the western portion of the property for these movements. It seems that turtles could travel through the wetland to reach Lake Oniad to the north. The conditions here (western portion of the property) are suitable for use by this species whereas, the higher elevation of the property or hilltop is almost impenetrable by foot for mammals as evidenced by the field walks this spring and summer and would surely be an impediment to turtle movements. Indeed no turtles or herpetiles of any kind except garter snakes where observed in this location. This impenetrable barrier would also serve the turtle well since beyond this forest lie All Angels Hill Road and little or no observed suitable habitat there.

The western state wetland (WF-6) and adjacent Hoosic soil uplands will be preserved so that potential use by Blanding's turtles will not change. There was no other observable potential habitat on the property so that fragmentation of habitat is not anticipated. The forested area underlain by Hoosic soils is a candidate area for enhancement to make the area conducive for nesting. Outside the active season trees could be cut by hand to make this area more attractive or useful for nesting.

In addition, NYSDEC recommended mitigation measures will be used on the property during development activities. The following measures will be incorporated to assure that any potential impacts are avoided and minimized:

<u>Temporary Barrier</u>

A temporary restrictive barrier in the form of silt fencing will be installed around the perimeter of the disturbance footprint. The barrier will be: 1) installed before during the winter hibernation period and maintained until the end of the construction phase of the project or until the beginning of the next winter hibernation period, whichever occurs first, 2) inspected daily and, if necessary, repaired immediately to a fully functional condition, and 3) constructed in accordance with the following design specifications:

Made of fine-mesh (¼ inch square) filter-fabric or non-woven geotextiles;
A minimum of 42″ high;
Anchored into the ground with reinforcement bars placed on the "disturbance side" of the barrier and spaced between 6 – 8 feet apart;
Secured at the base (barrier/ground interface) with at least 8″ of fence material covered with soil backfill.

Blanding's Turtle Monitor

The project will employ a site monitor to assure that all the stated measures are implemented, and to monitor for potential impacts. The monitor must be a qualified biologist that has knowledge of Blanding's turtle ecology and relocation procedures; the biologist must also have experience handling Blanding's turtles and be licensed by New York State to do so.

The monitor's responsibilities should include:

- Conducting reconnaissance surveys for Blanding's turtles within the specified work area prior to the initiation of any disturbance activities, and relocating any turtles if ever found;
- Training all personnel working at the site to be able to identify, locate, and remove or relocate Blanding's turtles, if necessary;
- Monitoring the proper placement and maintenance of temporary restrictive barriers, and
- Providing oversight during the disturbance phase of the project.

Trap Hazard Protection

Water control structures, such as drainpipes, may create a trap hazard to Blanding's turtles. To prevent possible entrapment of Blanding's turtles, the storm drain grates will be designed with the smallest possible grate opening without compromising safety or necessary flow rate while meeting the Town standards.

Below-ground swimming pools should be surrounded by fencing to exclude turtles of all age classes. Fine grade wire cloth (1/4 inch square mesh size) at the base of a picket fence or a 10″ - 12″ high barrier can be used to prevent turtles from traveling into the hazard area.

Window wells should have grates (1 inch square mesh size or less) or 10″ - 12″ high vertical barriers surrounding the well.

Figure 5.3-1 Potential Blanding's Turtle Core Habitat

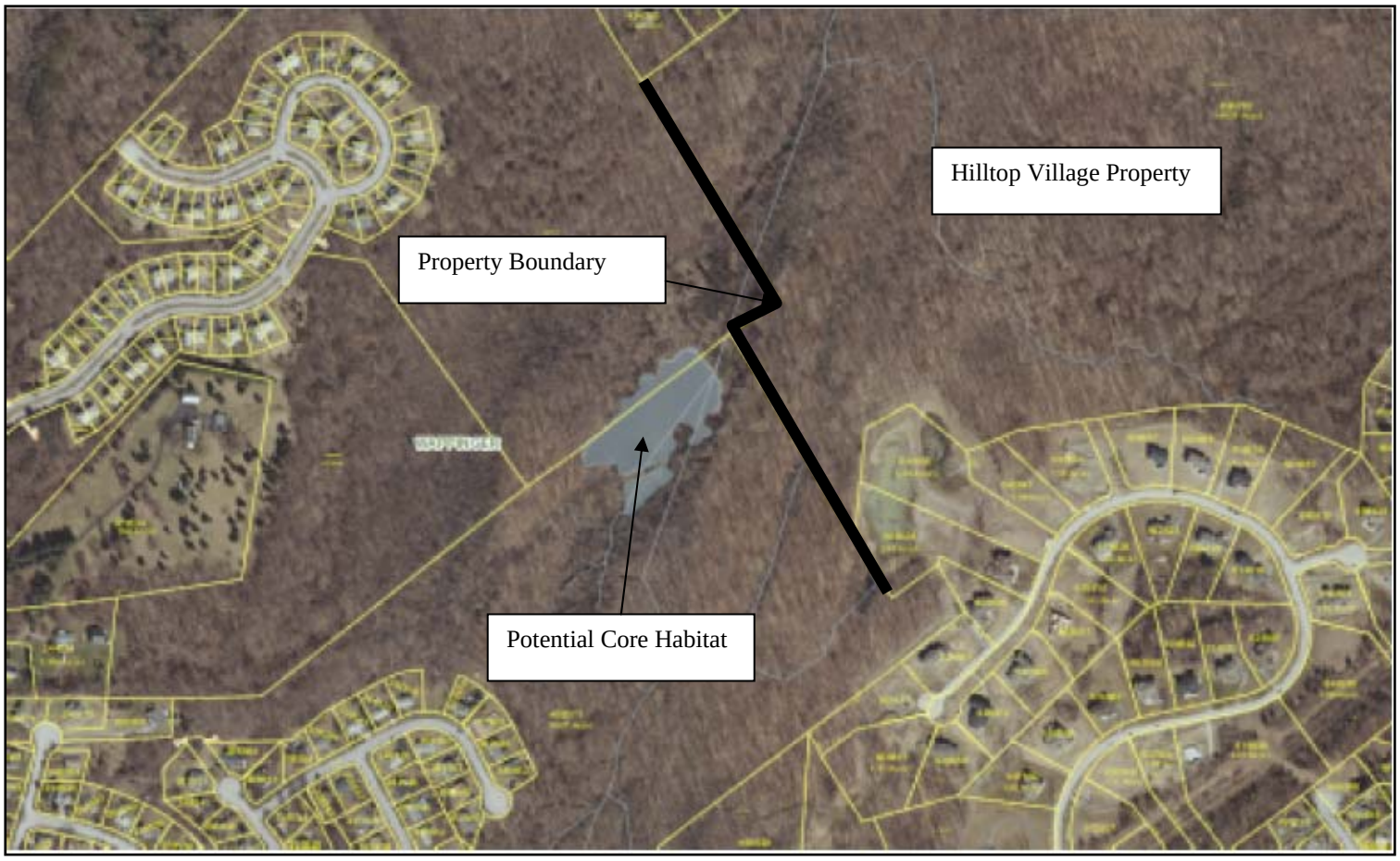


Figure 5.3-1 Soils Map

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BeB	Bernardston silt loam, 3 to 8 percent slopes	5.1	3.5%
BeC	Bernardston silt loam, 8 to 15 percent slopes	43.8	29.8%
BeD	Bernardston silt loam, 15 to 25 percent slopes	14.0	9.5%
Ca	Canandaigua silt loam, neutral substratum	26.7	18.2%
Cc	Carlisle muck	3.3	2.2%
DwB	Dutchess-Cardigan complex, undulating, rocky	13.4	9.1%
HsA	Hoosic gravelly loam, nearly level	3.3	2.2%
HsC	Hoosic gravelly loam, rolling	2.2	1.5%
PwB	Pittstown silt loam, 3 to 8 percent slopes	0.7	0.5%
PzB	Punsit silt loam, 3 to 8 percent slopes	34.5	23.5%
	Totals for Area of Interest	147.0	100.0%

6.0 ANTICIPATED IMPACTS

The proposed development and its appurtenant features will necessarily require clearing of certain habitats as shown in Table 4.1-2.

Earth moving (excavation, filling, and grading), operation of heavy machinery, construction, alteration of existing drainage patterns, addition of impervious surfaces, changes in traffic patterns, and increased human activity will occur on the subject property.

Anticipated impacts from these activities are outlined below.

6.1 Impacts to Vegetation and Cover Types

1. **Successional Southern Hardwoods Loss.** The proposed activities will require the removal of approximately 64.5 percent of this cover type from the property.

2. **Red Maple Hardwood Swamp.** Development activities have been planned to avoid impacts to wetlands except for approximately 0.038 acres for the emergency access road.

3. **Scrub/Shrub Wetland.** Development activities have been planned to avoid impacts to wetlands except for approximately 0.007 acres for the upgrade to the existing entrance road.

4. **Forest Fragmentation.** The closed canopy in the forested area will be partially cleared to allow for development. The majority of the forest, however, will be preserved leaving protection for forest interior species from invasion of and competition with edge species. Potential fragmentation of the Successional Southern Hardwood forest habitats on this site is not anticipated to significantly alter site biodiversity because the proposed development is centralized and leaves a wooded periphery adjacent to the large wetland areas on the property.

5. **Habitat Fragmentation.** Habitat fragmentation differs from forest fragmentation in that forest fragmentation is the practice of opening up closed forest canopy, allowing edge-oriented species to penetrate into areas of the forest that they probably would not reach before. While this adversely impacts forest interior species, it potentially benefits edge species.

Habitat fragmentation is the separation and isolation of habitats and wildlife populations by placing impenetrable barriers between habitats that prevent mixing formerly connected or adjacent wildlife populations creating "habitat islands".

Development barriers can be as minor as a 6-inch curb on a road that prevents movement of amphibians, reptiles, or any small sized wildlife. Private fences around homes or lots if proposed can prevent wildlife movement to and from breeding, nesting, or feeding areas such as the watercourse.

Extensive concentrated clearing of overhead vegetation can also hinder summer movement of some wildlife, most notably amphibians, because of possible exposure to direct sunlight at midday in cleared areas, making it difficult for some species to travel without the risk of becoming desiccated.

6.2 Impacts to Wildlife

A. All Species. All wildlife species require food, water, and cover. Trees and woody plants provide two of these directly. Many wildlife species, particularly birds, shift their food habits seasonally. Many winter seedeaters switch to insects in summer. Some wildlife species are resident (they are present in the same general area all year). Many others are migratory. The main migratory periods in our area are: spring (April 15 through June 1); fall (August 15 through October 1). Migratory species are present only when passing through, or during part of the year. Some species are here only in the summer and leave for warmer climates during the winter. Others breed north of us and are present only during winter. A few species exhibit altitudinal migrations. That is, they spend part of the year at high elevations (summer, usually) and part of the year at low elevations (winter, usually). Direct impacts to wildlife biodiversity from the proposed development will primarily be displacement and some direct loss especially to species that spend a large percentage of their life cycle underground. Most species found on the property are typically found in suburban settings especially in Wappinger and may have already adapted to proximal human habitation. These species will remain on the developed portion of the property, though possibly in fewer numbers, as availability of basic habitat features (food, cover, and space) may be decreased in the developed areas.

B. General Species Migration Patterns. The impact of habitat modification is most relevant for forest species, which includes most of the key species (forest interior birds, and mammals). No amphibians or reptiles were observed on the

hilltop or surrounding uplands but rather were concentrated at the western wetland area. The less mobile amphibians and reptiles are more vulnerable to migratory barriers but on this site it appears that the dense successional southern forest community is already a barrier to herpetile movements from the western wetland east – no movements of this class of animal was documented during the surveys. Impacts to a property on a local level will not significantly affect large mammal, or migratory bird species movements since these species are highly mobile and not typically confined to small corridors within a property. The proposed project will impact 71.58 of 149.35 acres with the largest impacts associated with the successional southern forest and trail/path habitats.

Regulated wetlands on the property are generally left completely intact and are considered the most likely migratory corridors for wildlife species on the property, especially the more sensitive species of amphibians and reptiles. The prime migratory corridors and wildlife destinations for breeding found in the regulated wetlands will remain.

C. Threatened/Endangered Species. No other threatened or endangered species from the USFWS list or identified by the NYSDEC have the potential to be on the property.

D. **Species of Special Concern.** There were no Marbled, Blue Spotted, or Jefferson salamanders or evidence of breeding by these species on the property. Also no Spotted, Eastern Box, or Wood turtle were observed on the property.

7.0 MITIGATION MEASURES

As noted above, impacts relating to crossing were avoided as much as practicable by the elimination of the initially proposed additional crossings. The crossing design has minimized impacts as much as possible. In addition, mitigation measures for the potential impacts are outlined below.

7.1 Mitigation For Impacts to Vegetation and Cover Types

The Applicant will minimize impacts by clustering the development and establishing undisturbed, naturally vegetated zones demarcated in the field by orange construction fencing and by clearing only necessary areas within the Limit of Disturbance area or within building envelopes.

The upland forest areas impacted by the developments will not be fully replaced but will be enhanced by revegetating some areas within the development after construction with native plant material. Contiguous forested wetland areas will continue to provide natural habitat and migratory corridors for many species. Native plantings may provide wildlife with some habitat and food source.

Other habitat aspects of the property should be preserved and include existing stonewalls and standing dead trees (snags). Old stonewalls provide microhabitats for small mammals, herptiles, and invertebrates. Snags provide perching, nesting, and feeding areas for a wide variety of wildlife. These elements or parts thereof should be protected where possible. Impacts from habitat and forest fragmentation can be minimized by maintaining substantial corridors between natural habitat areas. Connecting corridors do not have to be entirely unbroken, as long as breaks in the natural vegetation are not excessive.

The property provides year-round habitat for most of the species located there. The property will continue to be "connected" to adjacent undeveloped properties so that potential wildlife migratory routes remain.

7.2 Mitigation for Wildlife Impacts

Temporary wildlife displacement during construction is a short-term impact that will occur. In as much as possible earth moving and tree clearing activities should occur after the spring breeding season (April and May) to allow species to migrate and return unhindered to home areas and should be limited to the (October 1 to March 31) time period to avoid any direct impacts to Indiana bats potentially utilizing the property. In

addition, the US Fish and Wildlife Service in conjunction with the NYSDEC suggest that no dyes or chemicals be placed in stormwater detention facilities that could result in wildlife impacts. This will be incorporated into the development plan.

Impacts associated with the removal of the vernal pool are not considered significant since no species of special concern were located here and all breeding activity by more common species were compromised by the lack of hydrology in the pool during early June. None of the egg masses survived the short hydroperiod of this pool. Substantial wetlands including some of the microhabitats in the wetlands remain on the property for breeding amphibians. The stormwater basins once developed may also be utilized by some amphibians if hydrology is persistent.

In addition, no curbs should exist on roads or driveways to allow herpetiles to migrate through the site and over these areas without obstruction. No other mitigation measure is required.

Although not mitigation for impacts, general amphibian microhabitat requirements that will remain intact on the site include:

- Breeding locations that hold water at least through July,
- Woody debris in adjacent forested areas,
- Canopy cover over breeding and foraging areas, and
- Deciduous leaf litter for moisture retention and feeding,

General reptile microhabitat requirements that will remain intact on the site include:

- Woody debris (standing and down),
- Small open patches for basking, mixed with well shaded areas during drought periods,
- Undisturbed areas in and around wetlands for feeding and breeding, and
- Access to safe den areas.

The habitat requirements listed above will remain intact with this proposed development plan and because large contiguous portions of the property particularly adjacent to wetlands will remain in a naturalized state.

7.2.1 Indiana Bats

The property is considered to possess potential foraging habitat for the Indiana Bat because there are suitable habitat components for foraging as described in the literature

review that exist on the site (wetlands, edge habitat, canopy). However the potential habitat will not be impacted since the areas are beyond the development zone. The trees observed in the proposed development area are generally second growth and young aged with a fairly uniform and dense canopy layer and did not contain the elements associated with suitable roosting or maternal colony locations such as exfoliating bark, good solar exposure, or noticeable holes or cracks. However, the wetlands on the property especially at the edges between habitats does possess potential foraging habitat.

The construction the proposed development will include such activities as tree clearing and grubbing, earth moving, and paving. These activities will result in effects including: loss of trees (foraging habitat), generation of dust and noise, potential for changes to surface water quality, increased lighting on the site, and increased human activity on the currently vacant property.

The project sponsor proposes to avoid, minimize, and mitigate for these effects by:

- Implementing tree clearing during timeframes when bats are not resident on the site October 1 – to March 31;
- Maintaining potential foraging habitat corridor since the proposed will be clustered – habitats remain intact except for the impacted acres;
- Preserving the wetlands on the site to the maximum extent possible which can potentially be used by bats as travel corridors;
- 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;
- Prior to clearing, the limits of proposed clearing will be clearly demarcated on the site with orange construction fencing (or similar) to prevent inadvertent over-clearing of 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 minimizing potential adverse effects to Indiana Bats.

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ATTACHMENT – NYSDEC CORRESPONDENCE

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Alexander B. Grannis
Commissioner

June 4, 2010

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Southbury, CT 06488

Dear Mr. Nowicki:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to an Environmental Assessment for the proposed Development of Hilltop Village at Wappinger Property – 149.35 Acres, area as indicated on the map you provided, located on All Angels Hill Road, Town of Wappinger, Dutchess County.

Enclosed is a report of rare or state-listed animals and plants, significant natural communities, and other significant habitats, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site. For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our databases. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or natural communities. This information should not be substituted for on-site surveys that may be required for environmental impact assessment.

The enclosed report may be included in documents that will be available to the public. However, any enclosed maps displaying locations of rare species are considered sensitive information, and are intended only for the internal use of the recipient; they should not be included in any document that will be made available to the public, without permission from the New York Natural Heritage Program.

The presence of the plants and animals identified in the enclosed report may result in this project requiring additional review or permit conditions. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g. regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, as listed at www.dec.ny.gov/about/39381.html.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

Sincerely,

Tara Salerno jp

Tara Salerno, Information Services
New York Natural Heritage Program # 612

Enc.
cc: Reg. 3, Wildlife Mgr.

40 years of stewardship 1970-2010

Natural Heritage Report on Rare Species

NY Natural Heritage Program, NYS DEC, 625 Broadway, 5th Floor,
Albany, NY 12233-4757
(518) 402-8935

-The information in this report includes only records entered into the NY Natural Heritage databases as of the date of the report. This report is not a definitive statement on the presence or absence of all rare species or significant natural communities at or in the vicinity of this site.
-Refer to the User's Guide for explanations of codes, ranks and fields.
-We do not provide maps for species most vulnerable to disturbance.

Natural Heritage Report on Rare Species and Ecological Communities

MAMMALS

Myotis sodalis
Indiana Bat
Maternity colony

Office Use: 11287, ESU, USFWS

NY Legal Status: Endangered
Federal Listing: Endangered
NYS Rank: S1 - Critically imperiled
Global Rank: G2 - Imperiled
County: Dutchess
Town: Beekman, East Fishkill, Lagrange, Poughkeepsie - Town, Union Vale, Wappinger
Location: Documented within 2 miles of project site. Animals can move 2 miles or more from documented locations. For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager for the Region where the project is located.

REPTILES

Emydoidea blandingii
Blanding's Turtle

Office Use: 9418, ESU, S

NY Legal Status: Threatened
Federal Listing:
NYS Rank: S2S3 - Imperiled
Global Rank: G4 - Apparently secure
County: Dutchess
Town: East Fishkill, Wappinger
Location: Documented within .6 mile of project site. Animals can move .6 mile or more from documented locations. For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager for the Region where the project is located.

2 Records Processed

More detailed information about many of the rare and listed animals in New York, including biology, identification, habitat, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.acris.nynhp.org, from NatureServe Explorer at http://www.natureserve.org/explorer, and from NYSDEC at http://www.dec.ny.gov/animals/7494.html.

May 24, 2010

Page 1 of 1

ATTACHMENT –USFWS LIST – DUTCHESS COUNTY

Group	Name
Birds	Arctic peregrine Falcon (Falco
Clams	Dwarf wedgemussel
Mammals	Indiana bat (Myotis sodalis)
Mammals	New England cottontail rabbit
Reptiles	Bog (=Muhlenberg) turtle

ATTACHMENT – TOWN WETLAND CONSULTANT LETTER

FREDERICK P. CLARK ASSOCIATES, INC.
PLANNING, TRANSPORTATION, ENVIRONMENT AND DEVELOPMENT
RYE, NEW YORK FAIRFIELD, CONNECTICUT

DAVID H. STOLMAN
AICP, PP
PRESIDENT

MICHAEL A. GALANTE
EXECUTIVE
VICE PRESIDENT

550 THEO. FREMD AVE.
RYE, NEW YORK 10580
914 967-6540
FAX: 914 967-6615

CONNECTICUT
203 255-3100

HUDSON VALLEY
845 297-6056

LONG ISLAND
516 364-0504

www.fpclark.com

email@fpclark.com

MEMORANDUM

RECEIVED
MAR 15 2011
PLANNING DEPARTMENT
TOWN OF WAPPINGER

To: Victor Fanuele, Chairman,
and the Town of Wappinger Planning Board

Date: March 14, 2011

Subject: **Hilltop Village at Wappinger – Wetlands Delineation**
Tax Lot 6257-02-630770

As requested, we have reviewed the wetland delineation for Hilltop Village at Wappinger. The property is located on All Angels Hill Road and contains wetlands regulated by the United States Army Corps of Engineers (USACOE), the New York State Department of Environmental Conservation (NYSDEC) and the Town of Wappinger, as well as associated NYSDEC and Town regulated 100-foot wetland buffer areas. Our wetlands specialist has validated the Town regulated wetland boundary in the field pursuant to Chapter 137, Freshwater Wetland, Waterbody and Watercourse Protection, of the Town Code. All necessary corrections were made to the wetland boundaries on the property as depicted on Sheet W-1, *Wetland Plan for Hilltop Village at Wappinger* dated 1/07/11 and revised on 2/22/11.

The wetland boundary validations for the USACOE and the NYSDEC will be done by these agencies. All correspondence with these agencies should be submitted to the Town for review.

David H. Stolman, AICP, PP
President

Debora Fillis
Senior Associate/Environment

cc: Walter R. Artus, CPESC
Susan Dao
Graham Foster
Robert J. Gray, PE
Barbara Roberti
Albert P. Roberts, Esq.
Michael Nowicki (via email - ccolsol@aol.com)
Richard L. O'Rourke, Esq. (via email - rorourke@kblaw.com)
William Povall, P.E. (via email - whp2@povallengineering.com)

I:\DOCS2\500\Wappinger\Hilltop Village at Wappinger\Hilltop Village.684.pmc.wetlands.dfl.ask.doc

ATTACHMENT – NYSDEC VALIDATED WETLAND MAP

ATTACHMENT – RESUME

Ecological Solutions, LLC

Michael Nowicki, B.S.

ECOLOGICAL SOLUTIONS

Ecological Solutions was started to provide a wide range of natural resource management services to private clients, non-profit organizations, and municipalities. The professional staff of *Ecological Solutions* has over 20 years of experience in wetland and natural resource investigations, permitting, monitoring, and environmental planning. We are dedicated to helping our clients achieve their development goals while conserving and enhancing the existing on-site natural resources. Services include guiding our clients through the changing Federal, State, and Local permitting processes.

EDUCATION

State University of New York-College of Environmental Science and Forestry:
B.S. Environmental and Forest Biology, May 1988.

Rutgers University: Hydric Soils 1993, Endangered and Threatened Species 1999.

PROFESSIONAL EXPERIENCE

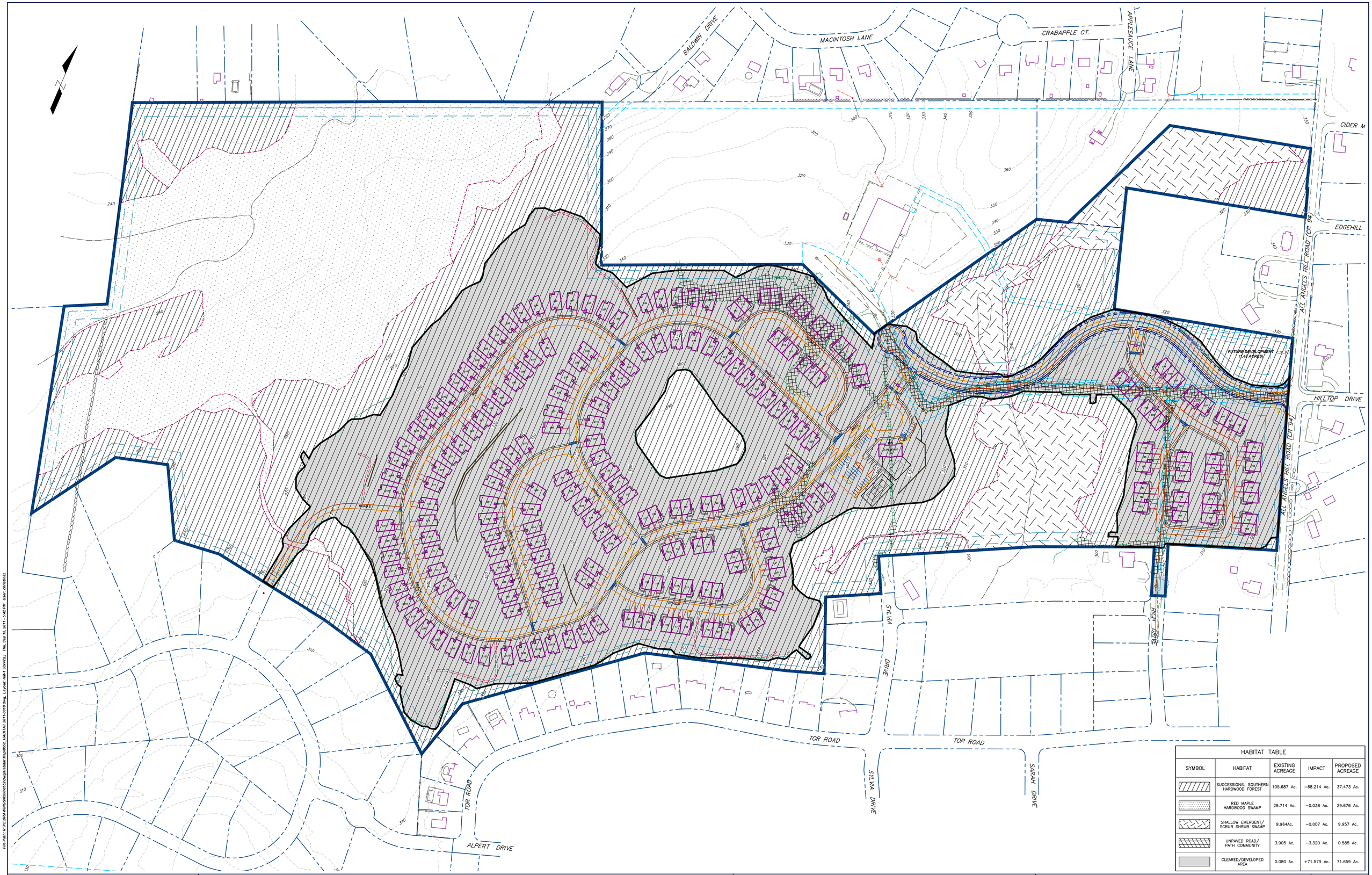
WETLANDS/NATURAL RESOURCES: Mr. Nowicki has over 20 years of experience in natural resources management and providing the following services. Wetland Services: wetland delineations, functional evaluations, Federal, State, and Local Permitting, mitigation, and mitigation monitoring.

Natural Resource Management Services: floral, faunal, and threatened/endangered species surveys including: New York State endangered and threatened plants, Blanding's Turtle, Bog Turtle, Karner Blue Butterfly, Timber Rattlesnake, Indiana Bat, Northern Cricket Frog, and Eastern Tiger Salamander; vegetative cover type description and mapping; pre-development site review; pond and habitat restoration and creation.

Forest and Woodland Management Services: forest tree survey and inventory; forest management plans for economic returns, aesthetic, and safety considerations, and habitat for specific wildlife species;

WILDLIFE ECOLOGY: Mr. Nowicki has 20 years of experience with wildlife ecology field research. He has worked on large mammal projects that include wolf, grizzly bear, and white-tailed deer studies, and raptor surveys.

PLANNING: Mr. Nowicki serves as a project manager and drafts Environmental Impact Statements; implements SEQRA; drafts zoning ordinances, including aquifer and ridgeline protection; makes presentations to Village and Town planning and zoning boards, and reviews projects on behalf of private clients and municipalities.



HABITAT TABLE

SYMBOL	HABITAT	EXISTING ACREAGE	IMPACT	PROPOSED ACREAGE
	SUCCESSIONAL SOUTHERN HARDWOOD FOREST	105.687 Ac.	−68.214 Ac.	37.473 Ac.
	RED MAPLE HARDWOOD SWAMP	29.714 Ac.	−0.038 Ac.	29.676 Ac.
	SHALLOW EMERGENT/ SCRUB SHRUB SWAMP	9.964Ac.	−0.007 Ac.	9.957 Ac.
	UNPAVED ROAD/ PATH COMMUNITY	3.905 Ac.	−3.320 Ac.	0.585 Ac.
	CLEARED/DEVELOPED AREA	0.080 Ac.	+71.579 Ac.	71.659 Ac.

REVISIONS

DATE:	DESCRIPTION:

POVALL ENGINEERING, PLLC

WILLIAM H. POVALL III, P.E.
N.Y.S.P.E. LICENSE #075020

25 CORPORATE PARK DR., SUITE C
HOPEWELL JUNCTION, NY 12533

TEL.: (845) 897-8205
FAX: (845) 897-0042

HABITAT MAP FOR

HILLTOP VILLAGE AT WAPPINGER

TOWN OF WAPPINGER — DUTCHESS COUNTY, NEW YORK

JOB #:	0552
DATE:	06-13-11
SCALE:	1"=120'
HM-1	SHEET 1 OF 1

File Path: R:\PEDRAWINGS\0500\0552\dwg\Habitat Map\0552_HABITAT 2011-0816.dwg, Layout: HM-1 30x42(L) Thu, Sep 15, 2011 - 5:43 PM User: christina
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UCS: WORLD