Ecological Assessment

"Parcel 1"

West Side of NYS Route 22 Town of Amenia, Dutchess County, New York

Prepared for: **Silo Ridge Ventures, LLC**
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Table of Contents

List of Attachments

1.0
Introduction

This ecological assessment has been prepared by VHB Engineering, Surveying and Landscape Architecture, P.C. (VHB) for the 98± acre property located to the west of New York State (NYS) Route 22, and immediately south of the Silo Ridge Golf Course, in the Town of Amenia, Dutchess County, New York (hereinafter, "Parcel 1" or the "site", see Attachment A, Figure 1). The site is identified as Parcel No. 7066-00-870350 on the Town of Amenia tax maps.

Parcel 1 is currently undeveloped with any structures and supports several habitat types. The western and southern portions of Parcel 1 are comprised of forested habitats growing over the steeply-sloped ridge complex that forms the western boundary of the Harlem Valley. The central portion of the site is occupied by an inactive, capped landfill (the former Harlem Valley Landfill). A wetland habitat occurs on the flat terrain located between the landfill and NYS Route 22 to the east. The northern portion of Parcel 1 is comprised primarily of early- and mid-successional habitats growing over gently-to-moderately-sloped terrain. Several successional woodland patches are also located in this area. An unpaved roadway bisects the site and encircles the landfill perimeter and the wetland area. An additional network of unpaved roads traverses the aforementioned ridge complex. Access to the site is available via a gated entrance located along the western side of NYS Route 22, or from the Silo Ridge Golf Course, located at the northern adjoining property. Based upon review of the United States Geological Survey (USGS) 7.5-minute series topographic map for the Amenia, New York Quadrangle, Parcel 1 has a topographic elevation ranging from 500±- to 1,110±-feet above mean sea level (amsl) (Attachment A, Figure 2).

This report provides an assessment of the existing ecological conditions at Parcel 1, based upon a review of government agency maps and records, and multiple habitat assessments and flora/fauna surveys conducted by VHB during 2013 and 2014.

2.0

Existing Ecological Conditions

Existing ecological conditions at Parcel 1 were assessed through a review of United States Fish and Wildlife Service (USFWS), New York State Department of Environmental Conservation (NYSDEC), New York Natural Heritage Program[1] (NYNHP) and Dutchess County records, as well as a multiple habitat assessments and flora/fauna surveys of the site conducted by VHB during July, August, October and November of 2013 and April and May of 2014. These include a May 2014 breeding bird survey, and an amphibian survey of the Parcel 1 wetland habitat conducted during April and May of 2014. Additionally, the aforementioned wetland habit was delineated by VHB in November 2013. Field work for this ecological assessment was conducted by VHB Chief Environmental Scientist Dr. Lisa Standley, PhD, VHB Project Scientist David Kennedy, MS and VHB Environmental Scientist Erica Reeves (resumes included as Attachment B).

2.1 Habitats/Vegetation

As observed during VHB's habitat assessments, Parcel 1 supports forested, early successional and wetland habitats. In order to further characterize these on-site habitats, VHB consulted the publication "Ecological Communities of New York State"[2] (ECNYS), which provides detailed descriptions and includes global and state rarity rankings for many habitats found within New York State. Utilizing this resource, seven ECNYS communities were identified at Parcel 1 during the field inspection as listed below and shown on Figures 3 and 4 of Attachment A.

- Beech-Maple Mesic Forest
- Appalachian Oak-Hickory Forest
- Successional Old Field
- Successional Shrubland
- Successional Southern Hardwoods

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[1] The NY Natural Heritage Program is a partnership between the New York State Department of Environmental Conservation and the State University of New York College of Environmental Science and Forestry.
[2] Edinger, G.J., et al. (editors). 2002. *Ecological Communities of New York State*. Second Edition (Draft). New York Natural Heritage Program, NYSDEC.

- Shallow Emergent Marsh
- Reedgrass/Purple Loosestrife Marsh

The following narrative provides a description of each of the seven above-listed ecological communities, based upon the ECNYS descriptions and supplemented with field observations from the site.

Beech-Maple Mesic Forest

The lower and mid-level slopes and benches of the ridge complex at the southern and western portions of Parcel 1 support forested habitat resembling the ECNYS Beech-Maple Mesic Forest community description, which is defined in ECNYS as follows:

> "*A hardwood forest with sugar maple (Acer saccharum) and beech (Fagus grandifolia) codominant. This is a broadly defined community type with several regional and edaphic variants. These forests occur on moist, well-drained, usually acid soils. Common associates are yellow birch (Betula alleghaniensis), white ash (Fraxinus americana), eastern hop hornbeam (Ostrya virginiana), and red maple (Acer rubrum). There are relatively few shrubs and herbs.*
>
> *Characteristic small trees or tall shrubs are hobblebush (Viburnum lantanoides), American hornbeam (Carpinus caroliniana), striped maple (Acer pensylvanicum), witch hazel (Hamamelis virginiana), and alternate-leaved dogwood (Cornus alternifolia).*
>
> *Dominant groundlayer species are star flower (Trientalis borealis), common wood-sorrel (Oxalis montana), Canada mayflower (Maianthemum canadense), painted trillium (Trillium undulatum), purple trillium (T. erectum), shining club moss (Lycopodium lucidulum) and intermediate wood fern (Dryopteris intermedia). Associated herbs include Christmas fern (Polystichum acrostichoides), jack-in-the-pulpit (Arisaema triphyllum) and false Solomon's seal (Smilacina racemosa). There are many spring ephemerals which bloom before the canopy trees leaf out. Typically there is also an abundance of tree seedlings, especially of sugar maple; beech and sugar maple saplings are often the most abundant "shrubs" and small trees.*
>
> *Hemlock (Tsuga canadensis) may be present at a low density…Within extensive areas of beech-maple mesic forest, there are often associated small patches of hemlock-northern hardwood forest in steep ravines and gullies where hemlock is locally dominant."*

According to the NYNHP, the Beech-Maple Mesic Forest ecological community is distributed throughout New York State and has been assigned global and New York State rarity rankings of G4 and S4, respectively. As defined by the NYNHP, G4 indicates a community that is considered "*apparently secure globally, though it might be quite rare in parts of its range, especially at the periphery*." The S4 ranking denotes a community that is considered "*apparently secure in New York State*."

As indicated previously and depicted on Figure 4 of Attachment A, the Beech-Maple Mesic Forest community is established within the lower and middle slopes and ledges of the Parcel 1 ridge complex. Similar to the ECNYS description, the canopy stratum of this community is co-dominated by sugar maple, American beech, yellow birch, white ash and red maple, with eastern hemlock locally dominant, particularly along east-facing ledges. Other trees observed to be locally co-dominant include sweet birch (*Betula lenta*), big-tooth aspen (*Populus grandidentata*) and black locust (*Robinia pseudoacacia*). Hickories (*Carya spp*.) and oaks (*Quercus* spp.) are present within higher elevation transition areas with the neighboring Appalachian Oak-Hickory Forest community (as described below), while the canopy within lower boundary areas along the capped landfill supports additional tree species, including black cherry (*Prunus serotina*), eastern cottonwood (*Populus deltoides*), paper birch (*Betula papyrifera*) and the non-native invasive species amur cork (*Phellodendron amurense*).

The sub-canopy and shrub strata are generally sparse within the on-site Beech-Maple Mesic forest community. Representative species include eastern hop-hornbeam, American hornbeam, striped maple, witch hazel and saplings of the aforementioned canopy tree species. Also present within interior areas are scattered non-native barberry (*Berberis sp*.). The community edge along the capped landfill supports a denser shrub community, featuring both native and non-native shrub species, including brambles (Rubus spp.), honeysuckles (*Lonicera spp*.) and multiflora rose (*Rosa multiflora*).

The groundcover stratum is unevenly distributed and ranges from non-existent to moderately dense throughout the Parcel 1 Beech-Maple Mesic Forest community. Representative species include many from the ECNYS community description, including common wood-sorrel, Canada mayflower, trilliums, jack-in-the-pulpit, false Solomon's seal and club mosses. The groundcover stratum also supports a variety of ferns and spleenworts, including Christmas fern, New York fern (*Thelypteris noveboracensis*), northern maidenhair fern (*Adiantum pedatum*), sensitive fern (*Onoclea sensibilis*), hay-scented fern (*Dennstaedtia punctilobula*), lady fern (*Athyrium filix-femina*), common polypody (*Polypodium vulgare*), and ebony spleenwort (*Asplenium ebeneum*).

Appalachian Oak-Hickory Forest

The upper slopes and summit of the ridge complex support a wooded habitat that is best described by the ECNYS Appalachian Oak-Hickory Forest community description:

> *"A hardwood forest that occurs on well-drained sites, usually on ridge tops, upper slopes, or south- and west-facing slopes. The soils are usually loams or sandy loams. This is a broadly defined forest community with several regional and edaphic variants.*
>
> *The dominant trees include one or more of the following oaks: red oak (Quercus rubra), white oak (Q. alba), and black oak (Q. velutina). Mixed with the oaks, usually at lower densities, are one or more of the following hickories: pignut (Carya glabra), shagbark (C. ovata), and sweet pignut (C. ovalis). Common associates are white ash*

(Fraxinus americana), red maple (Acer rubrum), and Eastern hop hornbeam (Ostrya virginiana).

There is typically a sub canopy stratum of small trees and tall shrubs including flowering dogwood (Cornus florida), witch hazel (Hamamelis virginiana), shadbush (Amelanchier arborea), and choke cherry (Prunus virginiana). Common low shrubs include maple-leaf viburnum (Viburnum acerifolium), blueberries (Vaccinium angustifolium, V. pallidum), red raspberry (Rubus idaeus), gray dogwood (Cornus foemina ssp. racemosa), and beaked hazelnut (Corylus cornuta). The shrub layer and groundlayer flora may be diverse.

Characteristic groundlayer herbs are wild sarsaparilla (Aralia nudicaulis), false Solomon's seal (Smilacina racemosa), Pennsylvania sedge (Carex pensylvanica), tick-trefoil (Desmodium glutinosum, D. paniculatum), black cohosh (Cimicifuga racemosa), rattlesnake root (Prenanthes alba), white goldenrod (Solidago bicolor) and hepatica (Hepatica americana)."

The NYNHP has assigned rarity rankings of G4G5, S4 to the Appalachian Oak-Hickory Forest ecological community. The G5 ranking indicates a community that is considered "*demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery*."

The Appalachian Oak-Hickory Forest observed along the upper portions of the Parcel 1 Ridge complex is characterized by a lower and generally more open canopy than the neighboring Beech-Maple Mesic Forest community, particularly along the ridge crest where clearings that are devoid of trees occur commonly. Dominant oaks within the canopy include red, black and chestnut oak (*Quercus montana*). Due to the presence of co-dominant hickories along with the aforementioned oaks within the canopy stratum (i.e., pignut, shagbark and mockernut [*Carya tomentosa*] hickories), this on-site community is more characteristic of an Appalachian Oak-Hickory Forest rather than the ECNYS Chestnut Oak Forest community. Other representative canopy trees include eastern hop-hornbeam and red maple, as well as American beech and yellow birch in transition areas with the adjacent Beech-Maple Mesic Forest.

Witch hazel, choke cherry, beaked hazelnut, mountain laurel (*Kalmia latifolia*) and striped maple are represented within the shrub stratum in the lower portions of the community. Similar to the ECNYS description, a low-growing layer of ericaceous shrubs (i.e., blueberries and black huckleberry [*Gaylussacia baccata*]) is present in clearings between the widely-spaced trees along the ridge crest.

The ground cover stratum ranges from sparse to moderately dense, with most of the herbaceous plants included in the ECNYS community description represented, including large colonial patches of Pennsylvania sedge.

Successional Old Field

The Successional Old Field community represents the initial stage in the process of ecological succession, which is the process by which a cleared or otherwise disturbed habitat progresses by stages to a climax forest community over time. The majority of the successional habitat that occurs within the northern and eastern portions of Parcel 1 is representative of the Successional Old Field community description, which is defined in ECNYS as follows:

> *"A meadow dominated by forbs and grasses that occurs on sites that have been cleared and plowed (for farming or development), and then abandoned.*
>
> *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), old field cinquefoil (Potentilla simplex), calico aster (Aster lateriflorus), New England aster (Aster novae-angliae), wild strawberry (Fragaria virginiana), Queen-Anne's lace (Daucus corota), ragweed (Ambrosia artemisiifolia), hawkweeds (Hieracium spp.), dandelion (Taraxacum officinale), and ox-tongue (Picris hieracioides). Shrubs may be 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)..."*

The NYNHP reports that the Successional Old Field ecological community is distributed throughout New York State and is ranked as G4, S4.

Based upon field observations during 2013 and 2014, periodic mowing occurs over portions of Parcel 1 (including the capped landfill), thus preventing the establishment of significant shrub cover and maintaining the Successional Old Field community in these areas. However, mowing does not appear to occur more than once or twice annually, thus preventing classification under the ECNYS Mowed Lawn community description, which is typically applied to more frequently mowed anthropogenic (created or altered by humans) habitats. Slopes within the Parcel 1 Successional Old Field community generally range from gentle to moderate, with the exception of the steep slopes associated with the capped landfill. Scattered areas of exposed bedrock and unvegetated, gravelly soils are prevalent, particularly at the northern portion of the site.

Native and introduced grasses and forbs are the dominant vegetation types noted within the Parcel 1 Successional Old Field community, including fescues (*Festuca* spp.), bluegrasses, foxtails (*Setaria spp*.), little bluestem (*Schizachyrium scoparium*), bedstraws (*Galium* spp.), clovers (*Trifolium spp.*), asters, vetches (*Vicia* spp.), goldenrods (*Solidago* spp.), mugwort (*Artemisia vulgaris*), butter-and-eggs (*Linaria vulgaris*), chicory (*Chicorium intybus*) and

Queen Anne's lace. Portions of this community located to the east of the capped landfill have been colonized by common reed (*Phragmites australis*) from the neighboring wetland community. Scattered non-native and native shrubs, including autumn and Russian olive (*Elaeagnus* spp.), honeysuckle (*Lonicera* sp.), multiflora rose (*Rosa multiflora*) and eastern redcedar (*Juniperus virginianus*) are also present, in addition to scattered individuals or small patches of eastern cottonwood (*Populus deltoides*), gray birch (*Betula populifolia*) and other trees.

It is important to note that the capped landfill located at the northern portion of Parcel 1 currently supports a flora comprised of grasses and forbs, including many of those listed above. As such, the landfill is included as part of the Successional Old Field community for the purposes of this ecological assessment, rather than the ECNYS Landfill/Dump community, which describes ecological conditions of active, uncapped landfills. Based upon site observations during 2013 and 2014, the capped landfill appears to be subject to a more frequent mowing regime than the surrounding Successional Old Field habitat.

Successional Shrubland

The Successional Shrubland community, which follows the Successional Old Field community in the process of ecological succession, includes successional habitats with at least 50 percent shrub cover. As depicted on Figure 4 of Attachment A, a narrow band of this community type occurs at the northern portion of Parcel 1, between the Successional Old Field community and the adjoining woodlands to the north. ECNYS provides the following definition for the Successional Shrubland Ecological community:

> *"A shrubland that occurs on sites that have been cleared (for farming, logging, development, etc.) or otherwise disturbed. This community has at least 50% cover of shrubs.*
>
> *Characteristic shrubs include gray dogwood (Cornus foemina ssp. racemosa), eastern red cedar (Juniperus virginiana), raspberries (Rubus spp.), hawthorn (Crataegus spp.), serviceberries (Amelanchier spp.), choke-cherry (Prunus virginiana), wild plum (Prunus americana), sumac (Rhus glabra, R. typhina), nanny-berry (Viburnum lentago), arrowwood (Viburnum recognitum), and multiflora rose…"*

According to the NYNHP, the Successional Shrubland ecological community is distributed throughout New York State and is ranked as G4, S4.

The on-site Successional Shrubland community consists primarily of dense thickets of non-native/invasive autumn and Russian olive, with scattered multiflora rose and eastern redcedar also present. Herbaceous plants, including little bluestem and mugwort, predominate between the shrub thickets.

Successional Southern Hardwoods

Successional Southern Hardwoods follows Successional Shrubland and represents a later stage in the process of ecological succession. This wooded habitat, which occurs along the northern boundary of Parcel 1 and in isolated patches to the northeast and east of the landfill, is defined in ECNYS as follows:

> "*A hardwood or mixed forest that occurs on sites that have been cleared or otherwise disturbed.*
>
> *Characteristic trees and shrubs include any of the following: American elm (Ulmus americana), slippery elm (U. rubra), white ash (Fraxinus americana), red maple (Acer rubrum), box elder (Acer negundo), silver maple (A. saccharinum), sassafras (Sassafras albidum), gray birch (Betula populifolia), hawthorns (Crataegus spp.), eastern red cedar (Juniperus virginiana), and choke-cherry (Prunus virginiana). Certain introduced species are commonly found in successional forests, including black locust (Robinia pseudo-acacia), tree-of-heaven (Ailanthus altissima), and buckthorn (Rhamnus cathartica). Any of these may be dominant or co-dominant in a Successional Southern Hardwoods forest. Southern indicators include American elm, white ash, red maple, box elder, choke-cherry, and sassafras. This is a broadly defined community and several seral and regional variants are known…"*

The NYNHP has assigned rarity rankings of G5, S5 to the Successional Southern Hardwoods ecological community. The S5 ranking is indicative of a community that is considered to be "*demonstrably secure in New York State*."

A Successional Southern Hardwoods community occurs along the northern site boundary, immediately to the north of the Successional Shrubland community described above. This wooded habitat grows over uneven terrain that appears to have been disturbed as a result of historic excavation and stockpiling. Maples, sweet birch, black cherry, grapes and barberry are among the dominant tree shrub and woody vines species, with a sparse to non-existent herbaceous groundcover stratum. This community transitions into a more diverse, and apparently less disturbed forest community located beyond Parcel 1 to the north.

Two additional patches of Successional Southern Hardwoods occur further south within Parcel 1, to the northeast of the capped landfill. These two isolated communities include a variety of tree species that are typical of successional woodlands, including black locust, eastern cottonwood, white ash, elms, black locust, red maple, grey birch, black cherry and eastern redcedar. The woodland patches also support a dense understory stratum of mostly non-native/invasive shrubs and vines, including autumn and Russian olive, multiflora rose, honeysuckles and Asiatic bittersweet (*Celastrus orbiculatus*).

In addition to the diverse successional habitat patches described above, a small mono-specific stand of eastern cottonwood occurs between the landfill and the wetland habitat to the east.

Shallow Emergent Marsh and Reedgrass/Purple Loosestrife Marsh

As depicted on Figures 3 and 4 of Attachment A, the wetland complex located to east of the capped landfill and to the west of NYS Route 22 includes habitats that are representative of both the ECNYS Shallow Emergent Marsh and the Reedgrass/Purple Loosestrife Marsh ecological communities. The Shallow Emergent Marsh community is defined in ECNYS as follows:

> *"A marsh meadow community that occurs on mineral soil or deep muck soils (rather than true peat), that are permanently saturated and seasonally flooded. This marsh is better drained than a deep emergent marsh; water depths may range from 6 in to 3.3 ft. (15 cm to 1 m) during flood stages, but the water level usually drops by mid to late summer and the substrate is exposed during an average year.*
>
> *Most abundant herbaceous plants include bluejoint grass (Calamagrostis canadensis), cattails (Typha latifolia, T. angustifolia, T. x glauca), sedges (Carex spp.), marsh fern (Thelypteris palustris), manna grasses (Glyceria pallida, G. canadensis), spike rushes (Eleocharis smalliana, E. obtusa), bulrushes (Scirpus cyperinus, S. tabernaemontani, S. atrovirens), threeway sedge (Dulichium arundinaceum), sweet flag (Acorus americanus), tall meadow-rue (Thalictrum pubescens), marsh St. John's-wort (Triadenum virginicum), arrowhead (Sagittaria latifolia), goldenrods (Solidago rugosa, S. gigantea), eupatoriums (Eupatorium maculatum, E. perfoliatum), smartweeds (Polygonum coccineum, P. amphibium, P. hydropiperoides), marsh bedstraw (Galium palustre), jewelweed (Impatiens capensis), loosestrifes (Lysimachia thyrsiflora, L. terrestris, L. ciliata). Frequently in degraded examples reed canary grass (Phalaris arundinacea) and/or purple loosestrife (Lythrum salicaria) may become abundant.*
>
> *Sedges (Carex spp.) may be abundant in shallow emergent marshes, but are not usually dominant. Marshes must have less than 50% cover of peat and tussock-forming sedges such as tussock sedges (Carex stricta), otherwise it may be classified as a sedge meadow. Characteristic shallow emergent marsh sedges include Carex stricta, C. lacustris, C. lurida, C. hystricina, C. alata, C. vulpinoidea, C. comosa, C. utriculata, C. scoparia, C. gynandra, C. stipata, and C. crinita.*
>
> *Other plants characteristic of shallow emergent marshes (most frequent listed first) include blue flag iris (Iris versicolor), sensitive fern (Onoclea sensibilis), common skullcap (Scutellaria galericulata), beggerticks (Bidens spp.), water-horehounds (Lycopus uniflorus, L. americanus*), bur-weeds (*Sparganium americanum, S. eurycarpum), swamp milkweed (Asclepias incarnata), water-hemlock (Cicuta bulbifera), asters (Aster umbellatus, A. puniceus), marsh bellflower (Campanula aparinoides), water purslane (Ludwigia palustris), royal and cinnamon ferns (Osmunda regalis, O. cinnamomea), marsh cinquefoil (Potentilla palustris), rushes (Juncus effusus, J. canadensis), arrowleaf (Peltandra virginica), purple-stem angelica (Angelica atropurpurea), water docks (Rumex orbiculatus, R. verticillatus),*

turtlehead (Chelone glabra), water parsnip (Sium suave), and cardinal flower (Lobelia cardinalis).

Shallow emergent marshes may have scattered shrubs including rough alder (Alnus incana ssp. rugosa), water willow (Decodon verticillatus), shrubby dogwoods (Cornus amomum, C. sericea), willows (Salix spp.), meadow sweet (Spiraea alba var. latifolia) and buttonbush (Cephalanthus occidentalis). Areas with greater than 50% shrub cover are classified as shrub swamps.

Amphibians that may be found in shallow emergent marshes include frogs such as eastern American toad (Bufo a. americanus), northern spring peeper (Pseudoacris c. crucifer), green frog (Rana clamitans melanota), and wood frog (Rana sylvatica) and salamanders such as northern redback salamander (Plethodon c. cinereus)."

The NYNHP reports that the Shallow Emergent Marsh ecological community is distributed throughout New York State and is ranked as G5, S5.

ECNYS provides the following description for the Reedgrass/Purple Loosestrife Marsh ecological community:

"A marsh that has been disturbed by draining, filling, road salts, etc. in which reedgrass (Phragmites australis) or purple loosestrife (Lythrum salicaria) has become dominant. This community is common along highways and railroads."

According to the NYNHP, the Reedgrass/Purple Loosestrife Marsh ecological community is distributed throughout New York State and is ranked as G5, S5.

The aforementioned wetland feature occurs over flat terrain and is surrounded by an unpaved perimeter roadway and earthen berms to the north, east and south. Based upon these observations, the wetland may have been a former farm pond that was altered in association with the establishment of the adjacent landfill. The northern and western portions of the wetland are characteristic of the Shallow Emergent Marsh ecological community described above. Saturated soils with no surface inundation were noted within this community during the summer and fall of 2013, while inundated conditions were observed within portions of the wetland during the spring of 2014. The wettest portions of this habitat support various sedges and rushes including wool grass, soft rush (*Juncus effusus*), spike rushes (*Eleocharis* spp.) and tussock sedge, as well as other plants such as cattails, blue flag, smartweeds and water horsetail (*Equisetum fluviatile*). Similar to the ECNYS community description, reed canary grass and purple loosestrife are present within boundary areas of this wetland community, indicating disturbed/degraded conditions. Scattered willow and alder shrubs also occur within the wetland, and eastern cottonwood trees grow along perimeter areas. The drier western portions of the wetland transition into the adjacent Successional Old Field community to the west. These transitional areas are dominated by typical wet meadow vegetation, including various grasses, sedges and herbaceous plants (e.g., reed canary grass, common reed, broom sedge [*Carex scoparia*] bedstraws and purple loosestrife).

The eastern and southern portions of the wetland appear to have been subject to a greater degree of historic and more recent ground disturbance and are representative of the ECNYS Reedgrass/Purple Loosestrife ecological community. These areas have been overtaken and are currently dominated by dense stands of common reed. Based upon observations of hydrology and wetland fauna (i.e., amphibians) during 2013-2014, it appears that portions of this wetland community have remained permanently or semi-permanently flooded during recent years.

Plant Species List

The following list provides an inventory of vegetation observed at Parcel during July, August, October and November of 2013 and April and May of 2014. This plant species list is not intended to be an all-inclusive inventory of the vegetative species present at Parcel 1.

Trees

red maple	*Acer rubrum*
Norway maple	*Acer plantanoides*
black walnut	*Juglans nigra*
tulip poplar	*Liriodendron tulipifera*
eastern white pine	*Pinus strobus*
green ash	*Fraxinus pensylvanica*
crabapple	*Malus sp.*
spruce	*Picea sp.*
hawthorn	*Crataegus sp.*
basswood	*Tilia americana*
boxelder	*Acer negundo*
striped maple	*Acer pensylvanicum*
sugar maple	*Acer saccharum*
mountain maple	*Acer spicatum*
tree-of heaven	*Ailanthus altissima*
yellow birch	*Betula alleghaniensis*
sweet birch	*Betula lenta*
paper birch	*Betula papyrifera*
grey birch	*Betula populifolia*
American hornbeam	*Carpinus caroliniana*
pignut hickory	*Carya glabra*
sweet pignut hickory	*Carya ovalis*
shagbark hickory	*Carya ovata*
mockernut hickory	*Carya tomentosa*
flowering dogwood	*Cornus florida*
American beech	*Fagus grandifolia*
white ash	*Fraxinus americana*
eastern redcedar	*Juniperus virginiana*
eastern hop-hornbeam	*Ostrya virginiana*
amur cork	*Phellodendron amurense*
eastern cottonwood	*Populus deltoides*
big-tooth aspen	*Populus grandidentata*

quaking aspen	*Populus tremuloides*
black cherry	*Prunus serotina*
white oak	*Quercus alba*
scarlet oak	*Quercus coccinea*
chestnut oak	*Quercus montana*
northern red oak	*Quercus rubra*
black oak	*Quercus velutina*
black locust	*Robinia pseudoacacia*
willow	*Salix* sp.
sassafras	*Sassafras albidum*
eastern hemlock	*Tsuga canadensis*
American elm	*Ulmus americana*
slippery elm	*Ulmus rubra*

Shrubs and Vines

speckled alder	*Alnus incana*
shadbush	*Amelanchier arborea*
barberry	*Berberis sp.*
Asiatic bittersweet	*Celastrus orbiculatus*
buttonbush	*Cephalanthus occidentalis*
alternate-leaved dogwood	*Cornus alternifolia*
grey dogwood	*Cornus racemosa*
beaked hazelnut	*Corylus cornuta*
Russian olive	*Elaeagnus angustifolia*
autumn olive	*Elaeagnus umbellata*
forsythia	*Forsythia sp.*
black huckleberry	*Gaylussacia baccata*
witch hazel	*Hamamelis virginiana*
privet	*Ligustrum sp.*
Japanese honeysuckle	*Lonicera japonica*
honeysuckle	*Lonicera sp.*
Tatarian honeysuckle	*Lonicera tatarica*
Virginia creeper	*Parthenocissus quinquefolia*
choke cherry	*Prunus virginianica*
staghorn sumac	*Rhus typhina*
multiflora rose	*Rosa multiflora*
red raspberry	*Rubus idaeus*
black raspberry	*Rubus occidentalis*
brambles	*Rubus sp.*
pussy willow	*Salix discolor*
roundleaf greenbrier	*Smilax rotundifolia*
poison ivy	*Toxicodendron radicans*
late lowbush blueberry	*Vaccinium angustifolium*
highbush blueberry	*Vaccinium corymbosum*
early lowbush blueberry	*Vaccinium pallidum*
maple-leaf viburnum	*Viburnum acerifolium*
witch-hobble	*Viburnum lantanoides*
northern arrowwood	*Viburnum recognitum*
summer grape	*Vitis aestivalis.*
grape	*Vitis* sp.

Herbaceous Plants/Groundcover

common yarrow	*Achillea millefolium*
northern maidenhair fern	*Adiantum pedatum*
garlic mustard	*Allaria petiolata*
smooth pigweed	*Amaranthus hybridus*
redroot pigweed	*Amaranthus retroflexus*
common ragweed	*Ambrosia artemisiifolia*
broomsedge	*Andropogon virginicus*
hemp dogbane	*Apocynum cannabinum*
wild sarsaparilla	*Aralia nudicaulis*
jack-in-the-pulpit	*Arisaema triphyllum*
common mugwort	*Artemisia vulgaris*
common milkweed	*Asclepias syriaca*
ebony spleenwort	*Asplenium ebeneum*
lady fern	*Athyrium filix-femina*
yellow rocket	*Barbarea vulgaris*
Pennsylvania sedge	*Carex pensylvanica*
tussock sedge	*Carex stricta*
broom sedge	*Carex scoparia*
chicory	*Chicorium intybus*
orchard grass	*Dactylis glomerata*
Queen Anne's lace	*Daucus carota*
hay-scented fern	*Dennstaedtia punctilobula*
deertongue grass	*Dichanthelium clandestinum*
crabgrasses	*Digitaria spp.*
spike rush	*Eleocharis sp.*
spike rush	*Eleocharis tenuis*
water horsetail	*Equisetum fluviatile*
daisy fleabane	*Erigeron annuus*
white wood aster	*Eurybia divaricata*
fescues	*Festuca spp.*
wild strawberry	*Fragaria virginiana*
bedstraws	*Galium spp.*
smooth bedstraw	*Gallium mollugo*
wild geranium	*Geranium maculatum*
field hawkweed	*Hieracium pratense*
blue flag iris	*Iris versicolor*
soft rush	*Juncus effusus*
butter-and-eggs	*Linaria vulgaris*
ryegrasses	*Lolium spp.*
birdsfoot trefoil	*Lotus corniculatus*
shining club moss	*Lycopodium lucidulum*
purple loosestrife	*Lythrum salicaria*
Canada mayflower	*Maianthemum canadense*
bee balm	*Monarda fistulosa*
Indian pipe	*Monotropa uniflora*
sensitive fern	*Onoclea sensibilis*
common wood sorrel	*Oxalis montana*
yellow wood sorrel	*Oxalis stricta*
switch grass	*Panicum virgatum*
reed canary grass	*Phalaris arundinacea*
timothy grass	*Phleum pratense*
common reed	*Phragmites australis*

pokeweed	*Phytolacca americana*
narrowleaf plantain	*Plantago lanceolata*
broadleaf plantain	*Plantago major*
bluegrasses	Poa spp.
smartweed	*Polygonum sp.*
common polypody	*Polypodium vulgare*
Christmas fern	*Polystichum acrostichoides*
dwarf cinquefoil	*Potentilla canadensis*
little bluestem	*Schizachyrium scoparium*
wool grass	*Scirpus cyperinus*
giant foxtail	*Setaria faberi*
yellow foxtail	*Setaria glauca*
false Solomon's seal	*Smilacina racemosa*
tall goldenrod	*Solidago altissma*
Canada goldenrod	*Solidago canadensis*
sweet goldenrod	*Solidago odura*
rough-stemmed goldenrod	*Solidago rugosa*
goldenrod	*Solidago sp.*
perennial sowthistle	*Sonchus arvensis*
annual sowthistle	*Sonchus oleraceus*
common chickweed	*Stellaria media*
bushy aster	*Symphyotrichum dumosum*
panicled aster	*Symphyotrichum lanceolatum*
New England aster	*Symphyotrichum novae-angliae*
common dandelion	*Taraxacum officinale*
New York fern	*Thelypteris noveboracensis*
starflower	*Trientalis borealis*
hop clover	*Trifolium dubium*
red clover	*Trifolium pratense*
white clover	*Trifolium repens*
purple trillium	*Trillium erectum*
narrowleaf cattail	*Typha angustifolia*
common mullein	*Verbascum thapsus*
trout lily	*Erythronium americanum*
vetches	*Vicia* spp.
common violet	*Viola sororia*

2.2 Wildlife

VHB performed habitat assessments and species inventories at Parcel 1 during July, August, October and November of 2013 and April and May of 2014. In addition, VHB conducted a breeding bird survey at the site in May of 2014 and amphibian surveys of the on-site wetland habitat during April and May of 2014. To supplement these studies, and in order to further investigate the potential onsite wildlife species assemblage, VHB consulted with the NYNHP and reviewed NYSDEC, USFWS and Dutchess County records and publications regarding the potential presence or absence of particular wildlife species at and in the vicinity of Parcel 1. In addition, VHB reviewed ecological assessment reports prepared by another consultant for

the northern adjoining property in 2006 and 2007.[3,4] Based upon these resources and the aforementioned field studies, a summary of the birds, mammals and herpetofauna (amphibians and reptiles) observed or expected at Parcel 1 follows.

Birds

In order to provide a detailed estimate of avian species potentially utilizing Parcel 1, *The New York State Breeding Bird Atlas*[5] was consulted. According to this resource, a total of 100 distinct bird species were identified between 2000 and 2005 within the two nine square-mile survey blocks within which the site is located (Blocks 6163C and 6162A). Of these species, 44 are confirmed as breeding, 14 are listed as probable breeders and 31 are listed as possibly breeding within Block 6163C. For Block 6162A, 33 birds are confirmed breeders, 23 are probable breeders and 27 species are possible breeders. Copies of the atlas reports for Blocks 6163C and 6162A are included in Attachment C.

In order to identify the avian species that use Parcel 1 for breeding purposes, VHB conducted a breeding bird survey in May, 2014 (a copy of the breeding bird survey report is included in Attachment C). The purpose of this survey was to determine whether Parcel 1 provides breeding habitat for obligate grassland species (e.g., grasshopper sparrow, eastern meadowlark, upland sandpiper, bobolink, savannah sparrow, etc.), as well as to identify other avian species that may utilize the site.

The breeding bird survey was conducted by VHB Chief Environmental Scientist, Dr. Lisa Standley (resume included in Attachment B). Dr. Standley is an ecologist with over 25 years of experience conducting wildlife habitat and bird surveys in the Northeast, with a focus on surveys of grassland bird species. In addition to her professional qualifications, Dr. Standley also serves on the Massachusetts Audubon Society Council and Science Advisory Committee.

The breeding bird survey included preliminary field work conducted on May 8, 2014, in order to map vegetation/cover type units within the survey area, identify survey point locations, and record bird species present on that date. As the chief purpose of the survey was to assess whether Parcel 1 provides habitat for grassland bird species, the survey area was limited to the non-forested habitats at Parcel 1. During the preliminary field work, Parcel 1 was characterized as eight distinct vegetation/cover type units.

The detailed survey was conducted from 6 AM to 9:30 AM on May 29, 2014. The weather during the survey was clear with no wind, with temperatures ranging from 42^0 to 59^0 F. At the time of the detailed survey, it was observed that the grassed areas of the site had been mowed subsequent to the May 8, 2014 preliminary site visit, with grass heights averaging six inches. The detailed survey was conducted using standard point-centered breeding bird survey methods. VHB scientists stood at pre-determined survey points for 15-minute

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[3] The Chazen Companies. 2006-2007. *Habitat Assessment Report – Silo Ridge Country Club Golf Resort Community.*
[4] The Chazen Companies. 2007. *Supplemental Ecological Report – Silo Ridge Country Club Golf Resort Community.*
[5] McGowan, K.J. and K. Corwin, eds. 2008. *The Atlas of Breeding Birds in New York State*. Cornell University Press. Data also available online at http://www.dec.ny.gov/animals/51030.html. Accessed November 10, 2014.

intervals, and recorded all bird species seen or identified by calls/song. Where possible, the number of birds of each species was recorded. Any additional species observed while walking between survey points were also recorded.

Species were classified as confirmed breeding if nesting, carrying nesting materials, or carrying food was observed. Species were classified as probable breeding if pairs were observed, or territorial singing was observed. Species classified as potential breeding were observed to be foraging on the site, as a single individual or if preferred nesting habitat was not present. Species classified as "flyover" were flying over the site, either in transit or foraging for aerial insects. This classification system is based on the New York Breeding Bird Atlas methodology.

As detailed in the table below, a total of 36 species were recorded at Parcel 1 during the course of the two site visits. Of these, 24 were confirmed/probable/potential breeding species.

The results of the breeding bird survey show that the majority of confirmed or probable breeding bird species using Parcel 1 on May 29, 2014 were also present during the first week of May. Two species seen during the preliminary survey were not present during the detailed survey in late May (eastern phoebe, black and white warbler), indicating that these species either failed to establish breeding territories or moved further north.

The breeding bird species on Parcel 1 are characteristic of marsh and shrub-swamp wetlands (red-winged blackbird, willow flycatcher, yellow warbler, common yellowthroat) and of old field habitats (catbird, towhee, blue-winged warbler, prairie warbler, field sparrow, song sparrow, robin, indigo bunting). Two species (warbling vireo, northern oriole) preferentially nest in tall trees, often near watercourses, consistent with field observations of these species in the taller eastern cottonwoods that occur near the Parcel 1 wetland habitat.

None of the birds observed on Parcel 1 during the breeding bird survey, whether breeding, foraging, or transient, are classified as New York State endangered, threatened or special concern species. Further, none of the observed species are considered to be obligate grassland birds.

Parcel 1 Breeding Bird Survey Observations, May 2014

May 29	May 8	Observation
blackbird, red-winged	blackbird, red-winged	Confirmed
blue jay		Potential
bunting, indigo		Probable
cardinal		Potential
catbird, gray	catbird	Confirmed
cedar waxwing		Potential
chimney swift		Flyover
cowbird, brown-headed		Potential

	flicker, northern	In woods offsite
dove, mourning		Flyover
flycatcher, willow		Probable
goldfinch		Potential
grackle, common		Potential
hummingbird, ruby-throated		Probable (note: feeding on *Lonicera* and *Elaeagnus*)
killdeer		Confirmed
kingbird, eastern		Potential
oriole, northern		Probable
ovenbird	ovenbird	In woods offsite
	phoebe, eastern	
redstart	redstart	In woods offsite
robin	robin	Confirmed
sparrow, chipping		Potential
sparrow, field	sparrow, field	Confirmed
sparrow, song	sparrow, song	Probable
swallow, barn		Flyover
swallow, tree		Flyover
thrush, wood		In woods offsite
towhee, eastern	Towhee, eastern	Potential
turkey		In woods offsite
vireo, warbling	vireo, warbling	Probable
	warbler, black and white	
vulture, turkey		Flyover (resting on landfill)
warbler, blue-winged	warbler, blue-winged	Probable
warbler, prairie	warbler, prairie	Probable
warbler, yellow	warbler, yellow	Probable
yellowthroat, common	yellowthroat, common	Probable

Rather, the species observed during the Parcel 1 breeding bird survey are characteristic of common old field and wetland habitats found throughout Dutchess County.[6] All of the species identified during the May 2014 Parcel 1 breeding bird survey were previously recorded in New York State Breeding Bird Atlas Blocks 6163C and/or 6162A between 2000 and 2005.

Additional avian species that were not noted during the breeding bird survey were seen or identified by calls/song at or flying over Parcel 1 during VHB's spring, summer and fall field inspections. The following species observed within the Parcel 1 forested ridge communities are among those that are commonly associated with forest and forest edge habitats in

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[6] Kiviat, Eric. 1984. *Vegetation of Dutchess County, New York*. In The Hudson Valley Regional Review, September 1984. Pp 144-173.

Dutchess County, including black-capped chickadee, downy woodpecker, hairy woodpecker, red-bellied woodpecker, white-breasted nuthatch, red-breasted nuthatch, red-eyed vireo, and eastern wood peewee. A similar species assemblage was observed during avian surveys within the contiguous forested ridge communities at the northern adjoining property in 2006 and 2007. Those surveys also documented several additional woodland birds, including veery, hermit thrush, pileated woodpecker, rose-breasted grosbeak, scarlet tanager, great crested flycatcher and yellow-bellied sapsucker. Given that similar contiguous forested habitats also occur at Parcel 1, it is anticipated that these species may also occur at the site.

Other avian species observed at or over Parcel 1 during the spring, summer and fall field inspections include American crow, chipping sparrow, white-throated sparrow, cedar waxwing, American goldfinch, red-tailed hawk, purple finch, common grackle, eastern kingbird, common raven and mallard. All of these species were previously recorded in New York State Breeding Bird Atlas Blocks 6163C and/or 6162A between 2000 and 2005.

In summary, based upon the results of the breeding bird survey, Parcel 1 supports wetlands and periodically-mowed Successional Old Field and Successional Shrubland habitats that do not serve as a significant breeding habitat for obligate grassland bird species. Instead, it appears that these communities provide breeding habitat for avian species of common old field and wetland habitats found throughout Dutchess County. Observed or expected birds within the forested ridge communities are species adapted to wooded habitats, including those recorded in site-specific avian surveys at the northern adjoining property, as well as those noted in the general surrounding area during the most recent New York State Breeding Bird Atlas survey. No NYS-Endangered, -Threatened or -Special Concern species avian species were observed at Parcel 1 during the breeding bird survey or VHB's 2013-2014 field inspections of the site.

Mammals

Five mammal species were directly observed at Parcel 1 during VHB's field inspections: eastern chipmunk (*Tamias striatus*), eastern cottontail (*Sylvilagus floridanus*), eastern gray squirrel (*Sciurus carolinensis*), whitetail deer (*Odocoileus virginianus*) and woodchuck (*Marmota monax*). Additionally, evidence of black bear (*Ursus americanus*) (scat), raccoon *Procyon lotor*) (tracks) and eastern coyote (*Canis latrans*) (calls) were noted at the site.

In order to determine other mammal species that may utilize the Parcel 1, VHB consulted existing mammalian surveys of Dutchess County.[7,8] Based upon these resources, as well as an evaluation of existing ecological conditions during the field inspections, an inventory of the observed and expected mammals at the site is provided below. However, this list is not intended to be an all-inclusive inventory of on-site mammals.

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[7] Cunningham, Mary Ann, Neil Curri, Robert Wills. 2010. Biological Resources and Biodiversity of Dutchess County, NY. Natural Resources Inventor of Dutchess County NY, Chapter 6.
[8] The Cary Arboretum. 1975. *Wilcox Park: Analysis of Resources and Recommendations for Recreational and Educational Development.* Millbrook, NY.

Observed and Expected Mammals at Parcel 1

shrews	Family Soricidae
eastern coyote**	*Canis latrans*
Virginia opossum	*Didelphis virginialis*
mice/voles	Family Criscetidae
moles	Family Talpidae
jumping mice	Family Zapodidae
southern flying squirrel	*Glaucomys volans*
woodchuck*	*Marmota monax*
striped skunk	*Mephitis mephitis*
weasels	*Mustela* spp.
whitetail deer*	*Odocoileus virginianus*
bats	Order Chiroptera
raccoon	*Procyon lotor*
eastern gray squirrel*	*Sciurus carolinensis*
eastern cottontail*	*Sylvilagus floridanus*
eastern chipmunk*	*Tamias striatus*
gray fox	*Urocyon cinereoargenteus*
black bear**	*Ursus americanus*
red fox	*Vulpes vulpes*

*Indicates species was directly observed at Parcel 1.

**Indicates evidence of species was observed at Parcel 1.

Due to resource limitations, it is not anticipated that all of the species listed above actually utilize Parcel 1. Species adapted to wetland, old field and forested habitats, including the smaller species listed above (e.g., mice, moles and shrews) are expected to be the most abundant mammals at the site. However, due to their diminutive sizes and predominantly subterranean life histories, these species are not easily observed. The five mammals observed during the field inspection are anticipated to be among the most commonly observed mammal species at Parcel 1. Due to the lack of permanent surface waters at Parcel 1, it is not expected that highly aquatic mammals known from Dutchess County, i.e., muskrat (*Ondatra zibethicus*), mink (*Neovison vison*) and beaver (*Castor canadensis*), use the site.

Additionally, habitat for tree-dwelling bats was identified at Parcel 1. A discussion of the federal and/or New York State listed Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*) is provided in Section 2.3 below.

Herpetofauna

In order to identify herpetofauna that may be present at Parcel 1, the New York State Amphibian and Reptile Atlas Project (NYSARAP)[9] was consulted. According to the NYSARAP data (collected from 1990 to 1999), 27 amphibian and reptile species have been identified within the area covered by the Amenia, New York Quadrangle within which Parcel 1 is located (NYSARAP species list included as Attachment D).

Taking into account the existing ecological conditions observed during the 2013-2014 field inspections of the site, it is not expected that Parcel 1 is utilized by all of the 27 herpetofauna species on the NYSARAP list for the Amenia New York, Quadrangle, due to resource limitations and individual species habitat requirements. In order to determine those herpetofauna species that are actually present at Parcel 1, VHB reviewed herpetofauna surveys performed at the northern adjoining property in 2006-2007,[3,4] conducted site-wide habitat assessments and performed amphibian surveys of the Parcel 1 wetland feature located to the east of the landfill during April and May of 2014. Based upon these resources, a summary of the observed and expected herpetofuana species at Parcel 1 follows.

During field surveys in October and November of 2013, VHB identified several potential vernal pool habitats within concave terrain features located along the mid- and upper-level portions of the Parcel 1 ridge complex. However, as no standing water was observed within these depressions during habitat assessments conducted in April and May of 2014, these features did not represent breeding habitat for obligate vernal pool amphibians (e.g., wood frog [*Rana sylvatica*], spotted salamander [*Ambystoma maculatum*], etc.) during the 2014 breeding season. Based upon observations of the topography, soils and an observed lack of hydrological indicators, it is not expected that the aforementioned depressions support inundated conditions conducive to breeding by vernal pool obligates during most years. As such, unlike the northern adjoining property, the ridge complex within Parcel 1 does not represent a significant vernal pool breeding area for amphibians. Furthermore, with the exception of the Parcel 1 wetland located to the east of the landfill, no other potential breeding waters for vernal pool obligates were identified at Parcel 1 during VHB's 2013-2014 field surveys.

As described in detail in Section 2.1 of this report, the Parcel 1 wetland includes the ECNYS Shallow Emergent Marsh and the Reedgrass/Purple Loosestrife Marsh ecological communities, as well as seasonal wet meadow conditions within transitional areas with the neighboring Successional Old Field community to the west. Larvae of three amphibian species were collected within this wetland on August 20, 2013 by Town of Amenia environmental consultant, Dr. Michael W. Klemens: gray treefrog (*Hyla versicolor*), red-spotted newt (*Notophthalmus viridescens*) and green frog (*Rana clamitans*) (correspondence from Dr. Klemens included in Attachment D). According to Dr. Klemens, the specimens of

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[9] New York State Department of Environmental Conservation. 2014. Available online at: http://www.dec.ny.gov/animals/7140.html. Accessed November 10, 2014.

the latter species included tadpoles hatched from eggs deposited within the wetland during the previous two years.

VHB conducted amphibian surveys within the Parcel 1 wetland on April 17-18 and May 27-28, 2014. The purpose of these surveys was to determine if additional amphibian species, including vernal pool obligates, use this wetland as breeding habitat. A combination of visual observations, egg mass counts, audial recognition, dip netting efforts and minnow traps were employed during the surveys.

As detailed in the table below, five amphibian species were identified within the Parcel 1 wetland during the amphibian surveys. Audial recognitions of spring peeper occurred during the April survey of the wetland. Also during the April survey, a total of 26 American toad (*Bufo americanus*) egg strands were observed, in addition to multiple instances of adult trilling and visual observation of two adult American toads in amplexus. During the April and May surveys of the wetland, first-year tadpoles and transforming tadpoles of green frog were captured and released during dip-netting and/or minnow trap efforts. Similarly, wood frog (*Rana sylvatica*) tadpoles were also captured and released during the April and May surveys. Additionally, both larval stage and adult stage red-spotted newts were captured and released during the May survey. The presence of the latter life stage indicates that these individual had entered or re-entered the wetland following the terrestrial or "red eft" life stage of this species. Although noted during the spring of 2014 within a wetland habitat at the southern adjoining property ("Parcel 2"), no egg masses or larvae of the vernal pool obligate spotted salamander (*Ambystoma maculatum*) noted within the Parcel 1 wetland.

Parcel 1 Wetland Amphibian Survey Results

Common Name	Scientific Name	Observation(s)
red-spotted newt	*Notophthalmus viridescens*	larval and post-terrestrial stages
green frog	*Rana clamitans*	multi-year year larval stages
wood frog	*Hyla versicolor*	larval stage
American toad	Bufo americanus	egg strands, trilling, adults in amplexus
spring peeper	*Pseudacris crucifer*	calling

Combined with the results of the survey conducted by Dr. Klemens in 2013, a total of six amphibian species have been confirmed as breeding within the Parcel 1 wetland. It is noteworthy that the presence of multi-year classes of green frog tadpoles observed in 2013 and 2014 indicates overwintering behavior, and thus permanently or semi-permanently flooded conditions within portions of the wetland during the prior two years. During November 2013 field surveys, shallow inundation was observed within small, isolated portions of the Reedgrass/Purple Loosestrife Marsh area of the Parcel 1 wetland.

In additions to the species noted during the wetland surveys, three herpetofuana species were observed within the forested communities of the ridge complex during 2013: American toad, red-spotted newt and eastern redback salamander (*Plethodon cinereus*).

In order to determine other amphibian and reptile species potentially present on-site, the aforementioned herpetofuana surveys from the northern adjoining property were consulted. A total of 16 herpetofauna species were identified at the northern adjoining property during these terrestrial and aquatic surveys, including the seven species identified at Parcel 1 during 2013 and 2014. Of the remaining ten species, three are highly aquatic species that typically occur in ponds, lakes and other permanent surface waters and therefore are not expected at Parcel 1 due to a lack of suitable habitat. These are: snapping turtle (*Chelydra serpentina*), eastern painted turtle (*Chrysemys picta*) and northern water snake (*Nerodia sipedon*). Two other highly aquatic species, American bullfrog (*Rana catesbeiana*) and pickerel frog (Lithobates palustris) were also observed within ponds and/or streams at the northern adjoining property, however these amphibians were not noted within the 2013 and 2014 surveys of the Parcel 1 wetland. Several seeps and ephemeral streams noted within the steep terrain of the Parcel 1 ridge complex during the spring of 2014 may provide limited habitat for the two streamside salamanders observed at the northern adjoining property: northern dusky salamander (*Desmognathus fuscus*) and northern two-lined salamander (*Eurycea bislineata*). Finally, it is likely that the two terrestrial snake species noted at the northern adjoining property, eastern garter snake (*Thamnophis sirtalis*) and northern black racer (*Coluber constrictor*) are also present within the successional and/or forested habitats of Parcel 1.

Given that spotted salamander egg masses were observed within a wetland habitat at the southern adjoining property ("Parcel 2") during the spring of 2014, the possibility exists that adults of this species inhabit the nearby forested ridge complex of Parcel 1.

Although not noted at the site or during surveys of the northern adjoining property, potentially suitable habitat exists at Parcel 1 for several other terrestrial snake species noted in the general surrounding area on the NYSARAP list, including black rat snake *(Elaphe obsoleta obsoleta*), eastern milk snake (*Lampropeltis triangulum*), eastern ribbon snake (*Thamnophis sauritus*), northern brown snake (*Storeria d. dekayi*) and northern ringneck snake (*Diadophis punctatus*).

The New York State Special Concern species wood turtle (*Clemmys insculpta*) has been reported by Dr. Klemens from Amenia Brook, in the vicinity of the northern adjoining property. However, due to the lack of any permanent stream corridors at or adjacent to Parcel 1, the presence of this species at the site is considered unlikely. Although not observed at the site or at the northern adjoin property, the forested and successional communities at the base of and adjacent to the ridge complex represent potentially suitable habitat for another New York State Special Concern turtle included on the NYSARAP list, eastern box turtle (*Terrapene carolina*).

The Federally-listed Threatened and New York State Endangered bog turtle (*Clemmys muhlenbergii*) is included on the NYSARP list and has been reported from wetlands in the general vicinity of Parcel 1. Based upon the results of a Phase 1 bog turtle habitat assessment conducted on August 20, 2013, Dr. Klemens concluded that the Parcel 1 wetland does not represent a bog turtle habitat, due to unsuitable bottom substrate and hydrology.

As such, this species is not expected at the site (correspondence from Dr. Klemens included in Attachment D). Additional discussion of bog turtle is provided in Section 2.3 below.

According to the NYSDEC, timber rattlesnake (*Crotalus horridus*) is known to occur in Dutchess County, and potential habitat for this snake exists along the upper ridge complex at Parcel 1. According to the ecological assessment reports prepared in 2006 and 2007 for the northern adjoining property, timber rattlesnake is known to occur approximately 1.6 miles to the east of the site. The aforementioned assessments, which included a survey of the upper ridge complex at the northern adjoining property by a local timber rattlesnake expert, concluded that no suitable basking or den sites exist at that property for timber rattlesnake. Nevertheless, a site-specific survey of the upper ridge complex at Parcel 1 would be necessary to assess the habitat potential for timber rattlesnake at Parcel 1. Additional discussion regarding timber rattlesnake is provided in Section 2.3 below.

2.3 Rare/Protected Species and Communities

No New York State- or federally-listed endangered, threatened or special concern plants or wildlife, or significant natural communities, were observed at Parcel 1 during the habitat assessments, flora/fauna surveys, breeding bird survey, amphibian survey and wetland delineation conducted during July, August, October and November of 2013 and April and May of 2014.

The USFWS Federally Endangered and Threatened and Candidate Species List for Dutchess County (a copy of the list is included as Attachment E) includes the federally threatened and New York State endangered bog turtle, the candidate for federal listing New England cottontail (*Sylvilagus transitionalis*) and the federally and New York State endangered Indiana bat (*Myotis sodalis*). Additionally, northern long-eared bat (*Myotis septentrionalis*) is currently proposed for federal listing.

According to 16 U.S. Code § 1532(6), federally endangered species are defined as:

> *"Any species which is in danger of extinction throughout all or a significant portion of its range…"*

Federally threatened species are defined 16 U.S. Code § 1532(20) as:

> "*Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range"*

New York State endangered wildlife species are defined in 6 NYCRR §182.2(e), as:

> "*…native species in imminent danger of extirpation or extinction in New York…or any species listed as endangered by the United States Department of the Interior in the Code of the Federal Regulations (50 CFR part 17)*."

Pursuant to 6 NYCRR §182.2(e), New York State endangered wildlife species receive the following protection:

> "*No person shall take or engage in any activity that is likely to result in a take of any species listed as endangered or threatened in this Part, except as authorized by an incidental take permit issued by the department pursuant to this Part or as otherwise authorized as an exempt activity in section 182.13 of this Part*."

Consultations with the USFWS and/or the NYSDEC are required if impacts to federally- or New York State-listed species or their habitats are proposed. A discussion of the four aforementioned species follows.

Bog Turtle

The bog turtle, which is included on the NYSARP list for Dutchess County, has been documented in wetlands in the general vicinity of the Parcel 1 by the NYSDEC, however no NYSDEC records currently exist for bog turtles at or adjacent to the site.[10] Based upon the results of a Phase 1 bog turtle habitat assessment conducted on August 20, 2013, Dr. Klemens concluded that the Parcel 1 wetland does not represent a bog turtle habitat, due to unsuitable bottom substrate and hydrology. As this habitat represents the only potential bog turtle habitat at Parcel 1, this species is not expected to occur at the site.

New England Cottontail

As indicated previously, New England cottontail is currently a candidate for Federal listing. Although Candidate species receive no statutory protection under the Endangered Species Act (ESA), "*the USFWS encourages cooperative conservation efforts for these species because they are, by definition, species that may warrant future protection under the ESA*."[11]

According to the NYSDEC, New England cottontail has not been reported from Parcel 1,[12] although recent survey efforts indicate that extant populations of this species occur within four southeastern New York State counties, including Dutchess County.[13] In New York and within southeastern New York State in particular, New England cottontail is known to occur within isolated early successional habitats, including shrubby areas, thickets, wetlands and disturbed areas, including edge habitats of agricultural fields and road corridors. As such, the

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[10] New York State Department of Environmental Conservation. 2014. New York Nature Explorer database. Available online at: http://www.dec.ny.gov/natureexplorer/app/ Accessed November 10, 2014.
[11] United States Fish and Wildlife Service. 2014. Candidate Species, *Section 4 of the Endangered Species Act* Fact Sheet. Available online at: http://www.fws.gov/endangered/esa-library/pdf/candidate_species.pdf . Accessed November 10, 2014.
[12] New York State Department of Environmental Conservation. 2014. New York Nature Explorer database. Available online at: http://www.dec.ny.gov/natureexplorer/app/ Accessed November 10, 2014.
[13] New York Natural Heritage Program. New England Cottontail Conservation Guide. 2014. Available online at: http://www.acris.nynhp.org/guide.php?id=7415 Accessed November 10, 2014.

Successional Old Field, Successional Shrubland and wetland area at the northern and eastern portions of Parcel 1 represent potential, though limited habitat for this species.

Indiana Bat

According to the NYSDEC, there are no known hibernacula sites for Indiana bat within Dutchess County, however summer maternity and bachelor roosting colonies have been identified through radio-telemetry studies and mist net captures in Dutchess County.[14] No NYSDEC records currently exist for Indiana bat roosting colonies at or adjacent to Parcel 1.[15] However, summer roosting colonies of Indiana bat are known to occur within living, dying and dead trees within rural and suburban landscapes, including the Appalachian Oak-Hickory Forest and Beech-Maple Mesic Forest communities,[16] both of which occur at Parcel 1 (see Section 2 of this report).

Based upon the foregoing considerations, an Indiana bat mist net survey was conducted at the northern adjoining property in August 2007 by Stearns and Wheeler.[17] The mist net survey, which was conducted pursuant to the existing federal protocols for surveying the Indiana bat[18], included survey efforts within potential roosting, foraging, and travel habitats of this species, most notably stream corridors and open understories of forested communities. According to the aforementioned survey report, although 30 individuals representing five bat species were captured during the mist net survey, no Indiana bats were netted. The survey report further indicates that no mines, caves or other suitable winter hibernation sites for Indiana bat were observed at the northern adjoining property. As such, potential summer roosting and foraging habitat exists for Indiana bat at Parcel 1, however no records currently exist for this species at or in the vicinity of the site, and Indiana bat was not captured during the mist net survey at the northern adjoining property.

Northern Long-Eared Bat

On June 30, 2014, the USFWS issued a six-month extension of the final determination of whether to list the northern long-eared bat as a Federally-endangered species, with a final determination expected on or before April2, 2015.[19] According to the USFWS, the extension was issued because *"substantial disagreement over the sufficiency or accuracy of existing information on white-nose syndrome, which has been identified as the primary threat to the species, have led to disagreement regarding the current status of the species.*"

Similar to Indiana bat, winter roosting habitat for northern long-eared bat occurs within caves or mines, while summer roosting habitat occurs either singly or in colonies underneath the bark or in cavities or crevices of living or dead trees.[20] Foraging habitat includes forested understories of hillsides and ridges, as well as the surfaces of aquatic habitats. As detailed in the aforementioned Stearns and Wheeler mist net survey report, 10 northern long-eared

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[14] New York Natural Heritage Program. Indiana Bat Conservation Guide. 2014. Available online at: http://www.acris.nynhp.org/guide.php?id=7405 November 10, 2014.
[15] New York State Department of Environmental Conservation. 2014. New York Nature Explorer database. Available online at: http://www.dec.ny.gov/natureexplorer/app/ Accessed November 10, 2014.
[16] Edinger, G.J., et al. (editors). 2002. *Ecological Communities of New York State*. Second Edition (Draft). New York Natural Heritage Program, NYSDEC.
[17] Stearns and Wheeler. 2007. Federal Protocol Mist Net Survey for Indiana Bay (*Myotis sodalis*) at the Silo Ridge Golf Course and Proposed Residential Development, Town of Amenia, Dutchess County, New York.
[18] United States Department of the Interior, Fish and Wildlife Service. 2007. *Indiana Bat (Myotis sodalis) Draft Recovery Plan: First Revision* (Appendix 5).
[19] Federal Register Vol. 79, No. 125. Monday, June 30, 2014 / Proposed Rules
[20] United States Fish and Wildlife Service. 2014. Northern Long-Eared Bat (*Myotis septenrionalis*) Fact Sheet. Available online at: http://www.fws.gov/midwest/endangered/mammals/nlba/nlbaFactSheet.html. Accessed November 10, 2014.

bats were captured during survey efforts conducted at the northern adjoining property in August 2007. Based upon these considerations, winter roosting habitat does not exist, potential summer roosting habitat is supported and potential foraging habitat exists within the Appalachian Oak-Hickory Forest and Beech-Maple Mesic Forest communities at Parcel 1.

As part of this assessment, consultations were undertaken with NYNHP to determine whether records exist for known occurrences of rare or State-listed wildlife, plants or significant natural communities at or in the immediate vicinity (generally within one-half mile) of Parcel 1. In correspondence dated June 27, 2014, the NYNHP reported that a record from 2001 currently exists for the New York State Threatened plant species Hill's pondweed (*Potomogeton hilli*) (NYNHP correspondence included as Attachment E). Pursuant to 6 NYCRR §193.3, New York State Threatened plants are defined:

> "*…species that are likely to become endangered within the foreseeable future throughout all or a significant portion of their ranges within the state*."

New York State threatened plants receive the following protection under New York State Environmental Conservation Law (ECL) Section 9-1503:

> "*It is a violation for any person, anywhere in the state to pick, pluck, sever, remove, damage by the application of herbicides or defoliants, or carry away, without the consent of the owner, any protected plant. Each protected plant so picked, plucked, severed, removed, damaged or carried away shall constitute a separate violation*."

As indicated above, it is not a violation of New York State law for a property owner or those authorized by the property owner to remove or otherwise disturb New York State-protected plants growing at their property.

According to the 2006 ecological assessment report for the northern adjoining property, the location for the NYNHP Hill's pondweed record is NYSDEC Freshwater Wetland AM-15, located at the northern adjoining property.

The NYNHP Hill's Pondweed Conservation Guide[21] indicates that this aquatic plant species typically occurs in waterways (e.g., ponds, lakes, streams, marshes, etc.), particularly those situated over calcareous bedrock. The plant is characterized by masses of long, very narrow leaves with nine-to-15 veins, two rows of large open cells on either side of the mid-vein and a small, pointed bristle at the tip of each leaf. The best time to identify Hill's pondweed is from mid-June to early September. Although potential habitat for this species exists within the Parcel 1 Shallow Emergent Marsh community, this species was not observed within this feature during VHB's summer habitat assessments/species inventories. As this wetland represents the only potential habitat for Hill's pondweed at Parcel 1, it is not expected that this species occurs at the site.

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[21] New York Natural Heritage Program. Hill's Pondweed Conservation Guide. 2014. Available online at: http://www.acris.nynhp.org/guide.php?id=9799&part=2 Accessed November 10, 2014.

As summarized previously in Section 2.2 of this report, the New York State threatened timber rattlesnake is known to occur in Dutchess County. New York State Threatened wildlife species are defined in 6 NYCRR §182.2(y) as:

> "*…native species likely to become an endangered species within the foreseeable future in New York…or any species listed as threatened by the U.S. Department of the Interior in the Code of the Federal Regulations (50 CFR part 17)*."

Pursuant to 6 NYCRR §182.2(e), New York State Threatened wildlife species receive the following protection:

> "*No person shall take or engage in any activity that is likely to result in a take of any species listed as endangered or threatened in this Part, except as authorized by an incidental take permit issued by the department pursuant to this Part or as otherwise authorized as an exempt activity in section 182.13 of this Part*."

According to the NYSDEC Timber rattlesnake Fact Sheet,[22] timber rattlesnakes in New York State inhabit deciduous forests in rugged terrain. Dens are typically located on open, steep, south facing slopes with rock fissures or talus surrounded by hardwood forests. Potential habitat for timber rattlesnake exists along the upper ridge complex at Parcel 1. According to the ecological assessment reports prepared in 2006 and 2007 for the northern adjoining property, timber rattlesnake is known to occur approximately 1.6 miles to the east of the site. The aforementioned assessments, which included a survey of the upper ridge complex at the northern adjoining property by a local timber rattlesnake expert, concluded that no suitable basking or den sites exist at that property for timber rattlesnake. Nevertheless, a site-specific survey of the upper ridge complex at Parcel 1 would be necessary to assess the habitat potential for timber rattlesnake at Parcel 1.

2.4 Wetlands

As described in Section 2.1 of this report and depicted on Figures 3 and 4 of Attachment A, the wetland complex located to east of the capped landfill and to the west of NYS Route 22 includes habitats that are representative of both the ECNYS Shallow Emergent Marsh and the Reedgrass/Purple Loosestrife Marsh ecological communities, both of which are distributed throughout New York State and are ranked by the NYNHP as G5, S5.

The aforementioned wetland feature occurs over flat terrain and is surrounded by an unpaved perimeter roadway and earthen berms to the north, east and south. Based upon these observations, the wetland may have been a former farm pond that was altered in

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[22] New York State Department of Environmental Conservation. 2014. Timber Rattlesnake Fact Sheet. Available online at: http://www.dec.ny.gov/animals/7147.html?showprintstyles. Accessed November 10, 2014.

association with the establishment of the adjacent landfill. The northern and western portions of the wetland are characteristic of the Shallow Emergent Marsh ecological. Saturated soils with no surface inundation were noted within this community during the summer and fall of 2013, while inundated conditions were observed within portions of the wetland during the spring of 2014. The wettest portions of this habitat support various sedges and rushes including wool grass, soft rush, spike rushes and tussock sedge, as well as other plants such as cattails, blue flag, smartweeds and water horsetail. Similar to the ECNYS community description, reed canary grass and purple loosestrife are present within portions of the wetland community, indicating disturbed/degraded conditions. Scattered willow and alder shrubs also occur within the wetland, and eastern cottonwood trees grow along perimeter areas. The drier western portions of the wetland transition into the adjacent Successional Old Field community. These transitional areas are dominated by typical wet meadow vegetation, including various grasses, sedges and herbaceous plants (e.g., reed canary grass, common reed, broom sedge bedstraws and purple loosestrife).

The eastern and southern portions of the wetland appear to have been subject to a greater degree of historic and more recent ground disturbance and are representative of the ECNYS Reedgrass/Purple Loosestrife ecological community. These areas have been overtaken and are currently dominated by dense stands of common reed. Based upon observations of hydrology and wetland fauna (i.e., amphibians) during 2013-2014, it appears that portions of this wetland community have remained permanently or semi-permanently flooded during recent years.

The Parcel 1 wetland feature was delineated by VHB wetland scientists on November 12, 2014 (Attachment A, Figure 3). The wetland delineation was conducted based upon an evaluation of vegetation, soils and hydrology performed in accordance with the procedures set forth in the 1987 USACE Wetland Delineation Manual[23] and the 2012 USACE Regional Supplement for the Northcentral and Northeast Region.[24]

Based upon a review of the NYSDEC Environmental Resource Mapper (ERM) website[25] and the NYSDEC Freshwater Wetland Maps, Amenia, New York Quadrangle,[26] the on-site wetland feature is not mapped by New York State, and there are no New York State-regulated freshwater wetlands located at or adjacent to Parcel 1.

The USFWS National Wetlands Inventory (NWI) maps provide information to the public on the extent and status of the Nation's wetlands, and these maps are guidance documents made available "*…to provide [USFWS biologists] and others with information on the distribution of wetlands to aid in wetland conservation efforts."*[27] Although certain wetlands that appear on the NWI maps *may* be regulated by the federal government as "waters of the

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[23] Environmental Laboratory. 1987. "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.
[24] United States Army Corps of Engineers Engineer Research and Development Center. 2012. Regional Supplement to the Corps of Engineers Wetland delineation Manual: Northcentral and Northeast Region (Version 2.0).
[25] New York State Department of Environmental Conservation. 2014. Available online at: http://www.dec.ny.gov/imsmaps/ERM/viewer.htm Accessed November 10, 2014.
[26] New York State Department of Environmental Conservation New York State Freshwater Wetland Maps. 1975.
[27] United States Fish and Wildlife Service. 2014. Available online at http://www.fws.gov/wetlands/NWI/index.html Accessed November 10, 2014.

United States," according to the NWI Wetlands Mapper website, "*There is no attempt to define the limits of proprietary jurisdiction of any Federal, state, or local government, or to establish the geographical scope of the regulatory programs of government agencies."*[28] According to the NWI, the Parcel 1 wetland is comprised of two NWI wetland category types: PUBHx (Palustrine, Unconsolidated Bottom, Permanently Flooded, Deciduous) and PEM1Ex (Palustrine, Emergent, Persistent, Seasonally Flooded/Saturated, Excavated).

The Parcel 1 wetland has the potential to be regulated by the federal government. In general, any proposed direct impact to federally-regulated wetlands (e.g., draining, filling, dredging, discharges, outfalls, construction of structures, etc.) requires a permit from the United States Army Corps of Engineers (USACE). Accordingly, consultations with the USACE would be necessary to determine if the Parcel 1 wetland falls under federal jurisdiction and if a permit would be required for any proposed direct impacts to this wetland feature.

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[28] United States Fish and Wildlife Service National Wetlands Inventory. 2014. Available online at: http://www.fws.gov/wetlands/Data/mapper.html. Accessed November 10, 2014.

3.0

Summary

This ecological assessment has been prepared by VHB for the 88± acre property located to the west of NYS Route 22, and immediately south of the Silo Ridge Golf Course, in the Town of Amenia, Dutchess County, New York. The site is identified as Parcel No. 7066-00-870350 on the Town of Amenia tax maps and is commonly referred to as "Parcel 1". The existing ecological conditions at Parcel 1 were assessed based upon a review of USFWS, NYSDEC, NYNHP and Dutchess County records and publications, as well as multiple habitat assessments and flora/fauna surveys conducted by VHB during July, August, October and November of 2013 and April and May of 2014. These include a May 2014 breeding bird survey, and an amphibian survey of the Parcel 1 wetland habitat conducted during April and May of 2014. Additionally, the aforementioned wetland habit was delineated by VHB in November 2013. Field work for this ecological assessment was conducted by VHB Chief Environmental Scientist Dr. Lisa Standley, PhD, VHB Project Scientist David Kennedy, MS and VHB Environmental Scientist Erica Reeves.

Parcel 1 is currently undeveloped with any structures and supports several habitat types. The western and southern portions of Parcel 1 are comprised of forested habitats growing over the steeply-sloped ridge complex that forms the western boundary of the Harlem Valley. The central portion of the site is occupied by an inactive, capped landfill (the former Harlem Valley Landfill). A wetland habitat occurs on the flat terrain located between the landfill and NYS Route 22 to the east. The northern portion of Parcel 1 is comprised primarily of early- and mid-successional habitats growing over gently-to-moderately-sloped terrain. Several successional woodland patches are also located in this area. An unpaved roadway bisects the site and encircles the landfill perimeter and the wetland area. An additional network of unpaved roads traverses the aforementioned ridge complex. Access to the site is available via a gated entrance located along the western side of NYS Route 22, or from the Silo Ridge Golf Course, located at the northern adjoining property. Based upon review of the USGS 7.5-minute series topographic map for the Amenia, New York Quadrangle, Parcel 1 has a topographic elevation ranging from 500±- to 1,110±-feet amsl.

As identified during VHB's habitat assessments, Parcel 1 supports five ECNYS terrestrial ecological communities and two ECNYS wetland communities. The forested ridge complex at the western and southern portions of Parcel 1 is comprised of steeply-sloped terrain and ridgetop habitats that support the ECNYS Beech-Maple Mesic Forest and Appalachian Oak-

Hickory Forest communities. The southern and eastern portions of the site, including the capped landfill, support the Successional Old Field, Successional Shrubland and Successional Southern Hardwoods communities. The wetland habitat located to the east of the landfill is comprised of the ECNYS Shallow Emergent Marsh and Reedgrass/Purple Loosestrife Marsh communities. The seven aforementioned communities are considered by the NYNHP to be either demonstrably secure or apparently secure, both globally and in New York State. The trees, shrubs vines and herbaceous plants identified during VHB's flora surveys include many common, characteristic species of the seven ecological communities identified above. Native plant species predominate within the two forested habitats of the ridge complex, while the successional and wetland habitats support a flora comprised of both native and non-native plants, some of which are considered invasive.

The avian species identified during the Parcel 1 breeding bird survey are characteristic of old field, shrubland, marsh and shrub-swamp wetlands. None of the birds observed on Parcel 1 during the breeding bird survey, whether breeding, foraging, or transient, are classified as NYS-endangered, -threatened or -special concern species. Further, none of the observed species are considered to be obligate grassland birds. Other avian species observed at or over Parcel 1 include birds of forest and forest edge habitats, including many of the species recorded in New York State Breeding Bird Atlas survey of the general surrounding area of the site between 2000 and 2005.

Observed and expected herpetofuana at Parcel 1 includes 18± amphibians and reptiles. Five amphibian species were identified as breeding within the Parcel 1 wetland habitat by VHB during the spring 2014 amphibian survey: American toad, green frog, spring peeper, red-spotted newt and wood frog. An additional species, gray treefrog, was identified as breeding within the wetland by Town of Amenia environmental consultant Dr. Michael W. Klemens. No vernal pool amphibian breeding habitats were identified within the Parcel 1 ridge complex during VHB's 2013-2014 habitats assessments.

A variety of mammals are expected to utilize Parcel 1, including eight species that were directly or indirectly observed during 2013 and 2014.

With respect to rare/protected species, no New York State- or federally-listed endangered, threatened or special concern plants or wildlife, or significant natural communities, were observed at Parcel 1 during the habitat assessments, flora/fauna surveys, breeding bird survey, amphibian survey and wetland delineation conducted during July, August, October and November of 2013 and April and May of 2014. Portions of Parcel 1 supports potential habitat the federal and New York State endangered Indiana bat, the proposed for federal listing northern long-eared bat, the candidate for federal listing New England cottontail and the New York State threatened timber rattlesnake. Potential habitat for New England cottontail includes the Successional Old Field, Successional Shrubland and wetland edge habitat identified at Parcel 1, while potential on-site habitat for the two bat species occurs within the forested portions of the site and the wetland feature. Potential habitat for timber rattlesnake includes the upper slopes and ridgetop area of Parcel 1. Consultations with the USFWS and/or the NYSDEC are required if impacts to federally- or New York State-listed species or their habitats are proposed.

Based upon the results of a Phase 1 bog turtle habitat assessment conducted in 2013 by Dr. Klemens, the Parcel 1 wetland does not represent a bog turtle habitat, due to unsuitable bottom substrate and hydrology. As this habitat represents the only potential bog turtle habitat at Parcel 1, this species is not expected to occur at the site.

According to the NYNHP, records exist for the New York State threatened plant Hill's pondweed as occurring at the northern adjoining property to Parcel 1. Potential habitat for this species exists within the Shallow Emergent Marsh community of the Parcel 1 wetland. However Hill's pondweed was not observed within this feature during VHB's habitat assessments/species inventories. As this wetland represents the only potential habitat for Hill's pondweed at Parcel 1, it is not expected that this species occurs at the site.

As summarized previously, the Parcel 1 wetland feature located to the east of the landfill is comprised of the ECNYS Shallow Emergent Marsh and the Reedgrass/Purple Loosestrife Marsh ecological communities and serves as breeding habitat for six amphibian species. The wetland, which was delineated by VHB on November 12, 2013, is not regulated by the NYSDEC, but may be subject to federal regulation. Accordingly, consultations with the USACE would be necessary to determine if the Parcel 1 wetland falls under federal jurisdiction and if a permit would be required for any proposed direct impacts to this wetland feature.

Attachment A

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SCALE IN FEET

EXISTING
ACCESS ROAD

Existing Capped Landfill

PARCEL 1

NYS ROUTE 22

Vanasse Hangen Brustlin, Inc.

November 2014

Figure 1
Silo Ridge Resort Community
South Parcel 1 Aerial

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SCALE IN FEET

EXISTING
ACCESS ROAD

Existing Capped Landfill

PARCEL 1

NYS ROUTE 22

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Figure 2
Silo Ridge Resort Community
South Parcel 1
Existing Topography

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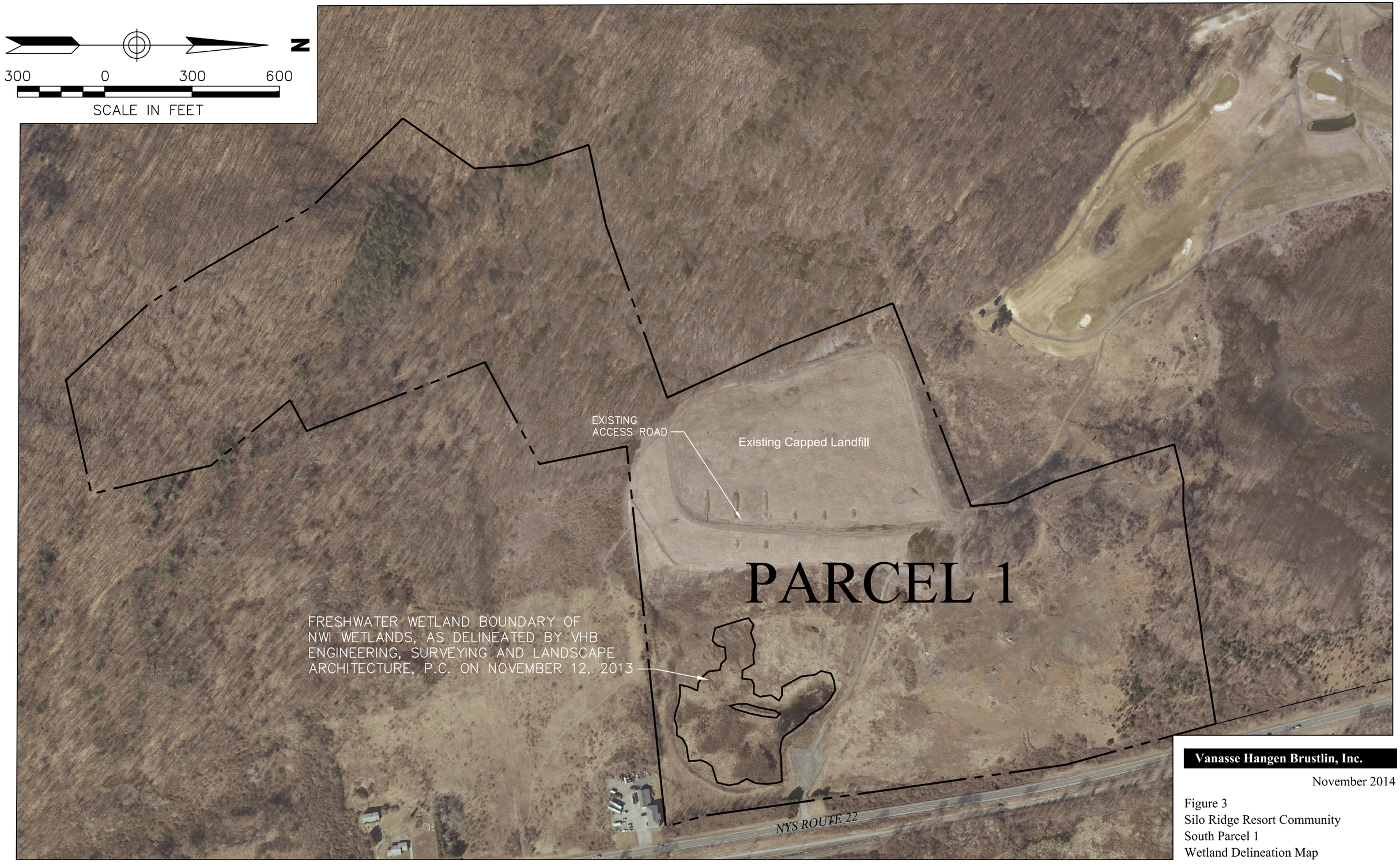

Vanasse Hangen Brustlin, Inc.

November 2014

Figure 3
Silo Ridge Resort Community
South Parcel 1
Wetland Delineation Map

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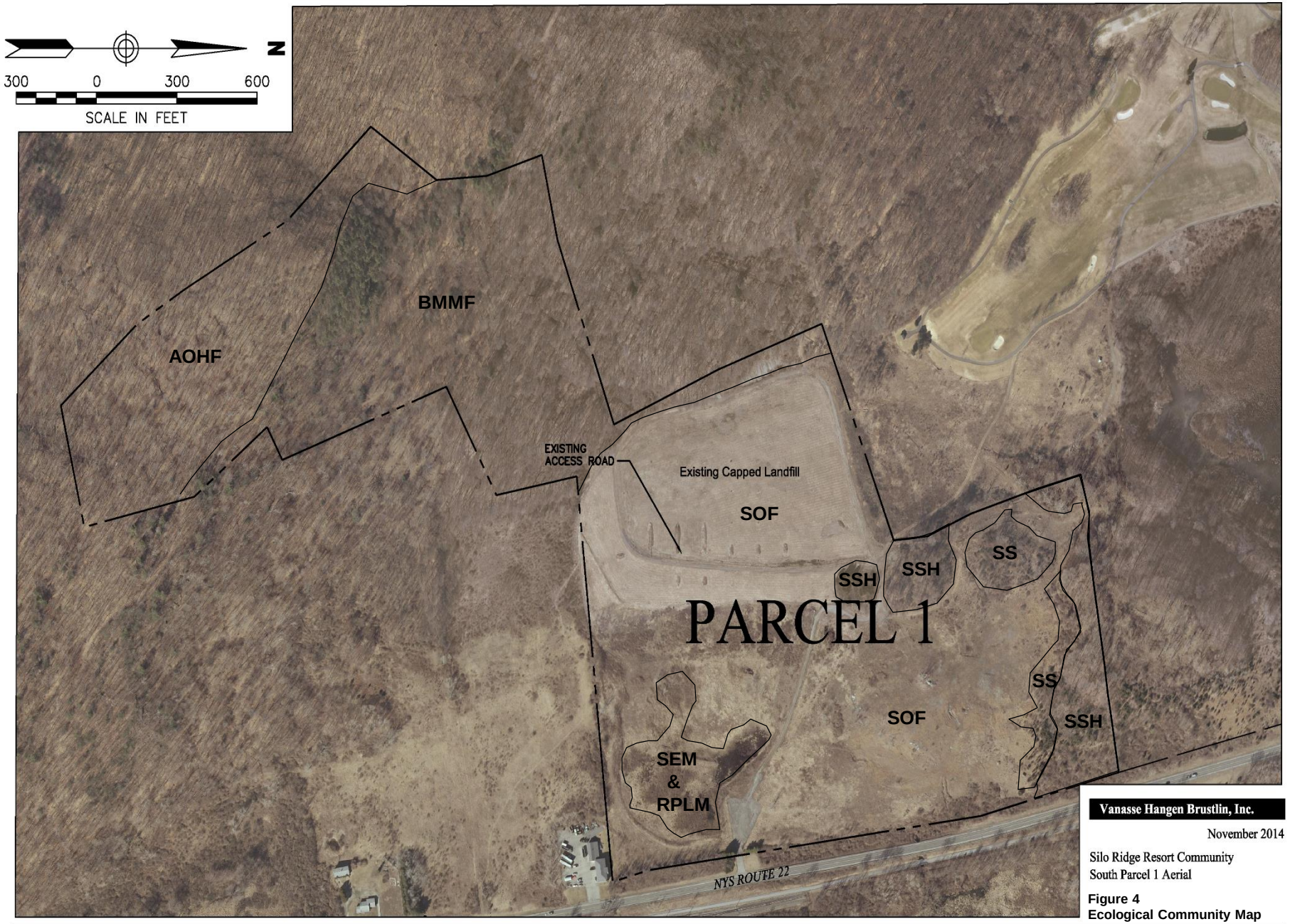

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November 2014

Silo Ridge Resort Community
South Parcel 1 Aerial

Figure 4
Ecological Community Map

AOHF – Appalachian Oak-Hickory Forest
BMMF – Beech-Maple Mesic Forest
SOF – Successional Old Field
SS – Successional Shrubland
SSH – Successional Southern Hardwoods
RPLM – Reedgrass/Purple Loosestrife Marsh
SEM – Shallow Emergent Marsh

Attachment B

Dredging, Bulkhead Replacement and Revetment Construction Project, East Marion, NY

Mr. Kennedy performed a wetland delineation and ecological survey at an 18-acre former oyster processing facility for a proposed dredging, bulkhead replacement and revetment construction project located on Gardiners Bay in the Town of Southold, NY. Mr. Kennedy also obtained a Tidal Wetland Permit from the New York State Department of Environmental Conservation and is currently in the process of obtaining a United States Army Corps of Engineers Individual Permit for the project. As part of the permitting process, Mr. Kennedy also prepared and Essential Fish Habitat assessment for the National Oceanographic and Atmospheric Administration (NOAA) and endangered species assessment for the United States Fish and Wildlife Service (USFWS). Additionally, Mr. Kennedy prepared a consistency analysis with New York State Department of State (NYSDOS) Coastal Policies, and subsequently received a Coastal Concurrence letter from the NYSDOS. Mr. Kennedy also prepared a consistency analysis Town of Southold Local Waterfront Revitalization Program (LWRP) Coastal Policies.

EPCAL Redevelopment Plan and Habitat Protection Plan, Town of Riverhead, NY

Mr. Kennedy performed an ecological assessment in association with the Draft Supplemental Environmental Impact Statement (DSGEIS) for the 2,323.9-acre Enterprise Park at Calverton (EPCAL) property. The subject property consists of portions of land formerly owned by the United States Department of the Navy (U.S. Navy) and known as the Naval Weapons Industrial Reserve Plant (NWIRP). The site supports extensive wooded and wetland habitats, and also includes the largest remaining native grassland habitat on Long Island. The site provides habitat for a number of rare wildlife and plant species, including several NYS-Endangered, -Threatened and Special Concern species. The ecological assessment included habitat characterization, species inventories and rare species assessments. Mr. Kennedy also performed an evaluation of potential impacts of the proposed action to on-site ecological resources and further prepared a comprehensive habitat protection plan (CHPP) for the site. The CHHP includes measures to protect and preserve existing habitats and resident wildlife and plant species, and provides for the preservation, creation, maintenance and enhancement of 596.4 acrs of native grassland habitat as a wildlife preserve for grassland birds and other species.

Northwoods Property Existing Ecological Conditions Assessment, Manorville, NY

Mr. Kennedy performed an ecological assessment on this 662-acre wooded property located within the Long Island Central Pine Barrens. The ecological assessment included plant and wildlife species inventories, habitat characterization and evaluation, and a rare/protected species survey for several New York State-listed plant and wildlife species.

Multi-Use Development, Town of Amenia, Dutchess County, NY

Mr. Kennedy conducted an ecological survey on this 188-acre property, which includes wooded, meadow, ridgeline, wetland and developed habitats and supports a number of New York State- and federally-protected plant and wildlife species. The ecological survey included a habitat assessment, vegetation and wildlife species inventories and an evaluation for impacts to rare species and ecological communities. Additionally, Mr. Kennedy conducted amphibian trapping surveys of on-site wetlands and vernal pools and assisted in a breeding bird survey at the site. Mr. Kennedy also performed wetland delineations and further secured a Nationwide Permit determination from the United States Army Corps of Engineers for wetland impacts associated with the construction of a golf course at the site. Mr. Kennedy further prepared and submitted a USACE permit application package for a proposed residential development at the site. The application package included the preparation of habitat assessments for the United States Fish and Wildlife Service regarding four federally-listed wildlife species.

Mr. Kennedy is a Project Scientist who conducts ecological surveys, habitat assessments, species inventories and rare species evaluations. He also performs freshwater and tidal wetland delineations and provides wetland permitting services for clients with federal, state and local government agencies. Mr. Kennedy also conducts Phase I and Phase II Environmental Site Assessments, oversees environmental remediation projects and designs and oversees soil management plans.

10 years of professional experience

Proposed Solar Energy Generation Facility, Calverton, NY

Mr. Kennedy conducted an ecological survey of this 45-acre site, which supports agricultural, woodland and wetland/aquatic habitats. The ecological survey included a habitat assessment, observed/expected vegetation and wildlife species inventories and an evaluation for the presence of rare/protected species and ecological communities. Mr. Kennedy further performed a wetland delineation at the site and prepared a Request for Determination of Non-Jurisdiction to the New York State Department of Environmental Conservation for a proposed solar power generating facility at the site.Mr. Kennedy further conducted a Phase I Environmental Site Assessent of the property, which included an evaluation of recognized environmental conditions and recommendations for further evaluation and remedial action.

The Landmark Colony EAS, Staten Island, NY

Mr. Kennedy conducted an ecological survey for the preparation of an EAS and supplemental environmental studies for a new senior-age residential community in the Willowbrook area of Staten Island. The project site, which supports both woodland and developed habitats, is a 46-acre parcel owned by the City of New York and located within the New York City Farm Colony-Sea View Hospital Historic District. The ecological survey included a habitat assessment, observed/expected vegetation and wildlife species inventories and an evaluation for the presence of rare/protected species and ecological communities. Existing conditions, potential impacts, and mitigation measures were also addressed. In addition, Mr. Kennedy performed a wetland delineation and prepared a request for jurisdictional determination submittedor submission to the United States Army Corps of Engineers. Mr. Kennedy is also tasked with preparing a consistency analysis with New York State Department of State Coastal Policies. Mr. Kennedy further conducted a Phase II Environmental Site Assessent, in order to evaluate the impacts of past site usage on soils and groundwater. The Phase II ESA included a geophysical survey, as well as soil, soil vapor and groundwater sampling.

Phase 1 and Phase 2 Environmental Site Assessments, Tidal Wetland Permitting, Avalon at Great Neck Residential Development, Great Neck, NY

Mr. Kennedy conducted Phase I and Phase II Environmental Site Assessments in order to assess impacts to soil and groundwater due to historic site usage at this marine terminal and major oil storage facility, which is proposed for residential redevelopment. The investigation included surficial and sub-surface soil sampling, groundwater monitoring well installation and sampling and an analysis of tidal influence on water table elevation beneath the site. Mr. Kennedy also conducted a wetland investigation and prepared a New York State Department of Environmental Conservation tidal wetland permit application package for the proposed residential redevelopment. Mr. Kennedy further provided technical support in the design of a wetland mitigation and restoration plan for the site.

NYSDOT Accelerated Bridge Program, Albany NY

As part of a $31.3 million Accelerated Bridge Program to rehabilitate bridges in the Capital District and northern New York State, the New York State Department of Transportation designated 13 bridges as below par due to deteriorating bridge decks. Listed on the deficient bridge list, the structures range from 30-foot-long, two-lane bridges in rural environments to a 2,000-foot-long, four-lane bridge in an urban environment. Mr. Kenney conducted wetland identifications and wetland permitting associated with this bridge rehabilitation project.

Town of Islip Landfill Site Investigation, Costco, Bay Shore, NY

Mr. Kennedy performed a comprehensive Phase II Environmental Site Assessment of this 24 acre inactive municipal landfill, incinerator and sewage treatment facility, which is proposed for

commercial redevelopment. The investigation included soil vapor monitoring, surficial soil sampling, test pit excavation and groundwater monitoring well installation. Mr. Kennedy also conducted a freshwater wetland delineation and assisted with securing a New York State Department of Environmental Conservation freshwater wetlands permit for the Phase II investigation. He designed and oversaw the site restoration and mitigation plan following completion of the investigation. Mr. Kennedy further conducted an ecological survey of the site which included a habitat assessment, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities.

Proposed Solar Energy Generation Facility, Southold, NY

Mr. Kennedy conducted an ecological survey of this 21 acre site, which supports agricultural, successional, woodland and wetland/aquatic habitats. The ecological survey included a habitat assessment, observed/expected vegetation and wildlife species inventories and an evaluation for the presence of rare/protected species and ecological communities. Mr. Kennedy further conducted a Phase I Environmental Site Inspection of the property, to identify and assess existing environmental concerns for future redvelopment.

Country Pointe Development, Plainview, NY

Mr. Kennedy conducted an ecological survey of this 143 acre property, which supports woodland, meadow, landscaped and developed habitats. The survey included a habitat assessment, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Mr. Kennedy further prepared an Ecology Resources section for the Draft Environmental Impact Statement for this proposed residential development. Existing conditions, potential impacts and mitigation measures were addressed.

LaGuardia Airport Runway Area Safety Enhancements EA, Queens, NY

Mr. Kennedy served as a project scientist for preparation of an Environmental Assessment for the construction of runway safety area improvements at LaGuardia Airport in accordance with NEPA and SEQRA requirements. The Environmental Assessment addressed the airport's unique environmental conditions along the Flushing Bay and Bowery Bay waterfronts in Queens. Mr. Kennedy performed an assessment of existing terrestrial ecological resources, including an inventory of observed and expected flora and fauna and an assessment of rare species and habitats, as well as an impact analysis on these natural resources.

Tidal Wetland Permitting and Phase I ESA, Verizon Wireless Communications Site, Captree Island, NY

Mr. Kennedy performed a wetland delineation and obtained a tidal wetland permit from the New York State Department of Environmental Conservation for the construction of a wireless communications facility located within and adjacent to regulated tidal wetlands. Mr. Kennedy further secured permit ammendments from the New York State Department of Environmental Conservation in response to project design changes by the site engineer. Additionally, Mr. Kennedy completed a Phase I ESA of the site.

Tidal Wetland Permitting, Seaford Union Free School District, Seaford, NY

Mr. Kennedy obtained tidal wetland permits from the New York State Department of Environmental Conservation and the United States Army Corps of Engineers for the construction of an access driveway on an undeveloped parcel adjacent to the Seaford Harbor School. Mr. Kennedy also conducted an ecological survey and prepared an ecology resources report for the subject property. The survey included an assessment of existing wooded and wetland habitats, vegetation and wildlife species inventories and an evaluation for the presence of rare species

Continued, p. 4

and ecological communities. Potential impacts of the proposed action and wetland mitigation measures were also addressed.

Cold Spring Harbor Laboratory Waterfront Project, New York

Mr. Kennedy conducted wetlands assessments for the proposed redevelopment of a waterfront property on the campus of Cold Spring Harbor Laboratory in the Village of Laurel Hollow. Mr. Kennedy further delineated on-site wetlands, designed a wetland mitigation planting plan and obtained a tidal wetland permit from the New York State Department of Environmental Conservation for the project.

Hebrew Home at Riverdale Expansion, Bronx, NY

Mr. Kennedy is conducting an ecological survey for the proposed expansion of the Hebrew Home at Riverdale campus located in the Riverdale neighborhood of the Bronx, as part of a proposed Continuing Care Retirement Community. The project involves new construction on 32 acres of both the existing campus and on a newly-acquired adjacent property. The project site supports both vegetated and developed habitats and is located proximate to the Hudson River. The ecological survey will include a habitat assessment, observed/expected vegetation and wildlife species inventories and an evaluation for the presence of rare/protected species and ecological communities. Existing conditions, potential impacts, and mitigation measures will be addressed in accordance with City Environmental Quality Review procedures. In addition, Mr. Kennedy will perform a wetland evaluation and will prepare wetland non-jurisdiction request packages for submission to the New York State Department of Environmental Conservation and/or the United States Army Corps of Engineers, as necessary. Mr. Kennedy is also tasked with preparing a consistency analysis with New York State Department of State Coastal Policies.

Westchester County Airport Master Plan, Westchester County, NY

Mr. Kennedy performed a review of existing biological and wetland resources at Westchester County Airport, as part of the Westchester County Airport Master Plan. The review included research of government agency records and prior ecological assessments of the site. Mr. Kennedy further identified and characterized various terrestrial, palustrine and aquatic ecological communities and wildlife species during a field survey of the airport property.

Open Space Study DGEIS, City of White Plains, Westchester County, New York

As part of Draft Generic Environmental Impact Statement (DGEIS) to evaluate the potential impacts of the adoption of a new open space zoning classification within the City of White Plains, Mr. Kennedy performed an analysis of existing natural resources at five golf course properties. The analysis included field assessments and research of local, state and federal government agency records pertaining to wildlife, vegetation, protected species/habitats, wetlands and water resourcesat the five properties. Mr. Kennedy further performed an impact assessment of the proposed action and alternatives on the aforementioned resources.

The Preserve at North Bellmore, Kabro, North Bellmore, NY

Mr. Kennedy conducted a Phase I Site Assessment to identify and assess environmental concerns at this aa-acre site. Mr. Kennedy further performed an environmental investigation and site remediation activities in accordance with a Nassau County Department of Health-approved work plan for the site, which is proposed for a residential redevelopment. Field activities included sampling of soils, groundwater, sanitary and stormwater systems, and the remediation of underground injection control structures and subsurface soils.

Port Authority of New York and New Jersey Airport Capacity Study

Continued, p. 5

Mr. Kennedy performed a comprehensive assessment of existing natural resources at the five Port Authority of New York and New Jersey airport properties (John F. Kennedy, LaGuardia, Newark, Stewart and Teterboro airports. The assessment included a summary of observed and expected flora and fauna, rare/protected species and wetland resources at the five airport properties.

East Hampton Airport Environmental Assessment, Town of East Hampton, Suffolk County, New York

As part of an environmental assessment for a proposed seasonal air traffic control tower construction project, Mr. Kennedy performed field surveys and researched government agency records pertaining to flora, fauna, endangered/threatened species, wetlands, water resources, coastal resources, floodplains and farmlands. Mr. Kennedy further prepared an assessment of existing conditions and expected impacts of the proposed action on the aforementioned resources.

Center Square Development Zoumas Property, Wading River, NY

Mr. Kennedy conducted an endangered/threatened species survey of this 18 acre fallow agricultural property, which is proposed for a mixed use commercial development and open space preservation. The survey included a habitat assessment, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Mr. Kennedy prepared a summary report which included conclusions and recommendations regarding the potential impacts of the proposed action.

Proposed Retail Fuel Facility Phase I and II ESA, Staten Island, NY

Mr. Kennedy performed Phase I and II Environmental Site Assessments, to determine if onsite soils and groundwater had been impacted as a result of past usage of the site and adjacent properties. As part of the Phase II ESA, Mr. Kennedy also directed the installation of groundwater monitoring wells and soil borings and the collection of representative samples from same. Mr. Kennedy further wrote a comprehensive health and safety plan for the project and served as the site safety officer.

Verizon Wireless Communications Facility, Hylan Boulevard, Staten Island, NY

Mr. Kennedy performed a Phase I ESA and wrote a comprehensive soil management plan for the installation of a wireless communications facility at the site. Mr. Kennedy also conducted a wetland investigation in association with the Verizon Wireless equipment installation.

LA Fitness, LA Fitness International, Patchogue, NY

Mr. Kennedy performed wetland delineation and secured New York State Department of Environmental Conservation and Town of Brookhaven freshwater wetlands permits for the construction of a health club facility on this eight-acre wooded property. Mr. Kennedy also prepared a Town of Brookhaven Part 1 Environmental Assessment Form (EAF) for the health club facility.

Brookhaven Village Square, Blumenfeld Development Group, Bellport, NY

Mr. Kennedy conducted an ecological survey of this 58 acre wooded property. The survey included a habitat assessment, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Mr. Kennedy further prepared an Ecology Resources section for the Expanded Environmental Assessment Form for this proposed commercial/industrial development. Existing conditions, potential impacts and mitigation measures were addressed.

Continued, p. 6

Islip Pines, Serota Properties, Holbrook, NY
Mr. Kennedy conducted an ecological survey of this 135 acre wooded property. The survey included a habitat assessment, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Mr. Kennedy further prepared an Ecology Resources section for the Draft Environmental Impact Statement for this proposed residential development. Existing conditions, potential impacts and mitigation measures were addressed.

Salzman Property, Montauk, NY
Mr. Kennedy was a contributing scientist in a delineation of over 12 acres of freshwater wetlands on this 40 acre undeveloped property.

Avalon at Mitchel Field, Avalon Bay Communities, Inc., Garden City, NY
Mr. Kennedy performed a comprehensive environmental site investigation in accordance with a Nassau County Department of Health-approved work plan for this 11 acre site, which is proposed for a residential redevelopment. The assessment included surficial and subsurface soil sampling, and bottom sediment sampling of underground injection control structures.

Proposed Wireless Communications Facility, East End Wireless, West Gilgo Beach, NY
Mr. Kennedy performed tidal wetland delineations at two proposed locations for this public utility wireless communications facility.

Ronkonkoma Hub Transit-Orientated Development, Ronkonkoma, NY
Mr. Kennedy conducted an ecological survey of this 54 acre property. The survey included an assessment of both developed and undeveloped habitats, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Mr. Kennedy further prepared an Ecology Resources section for the Draft Generic Environmental Impact Statement for this proposed mixed use development. Existing conditions, potential impacts and mitigation measures were addressed.

NSTAR Right-of-Way, NSTAR, Eastern MA
Mr. Kennedy was a contributing scientist in a delineation of freshwater wetlands along an approximately five-mile section of this utility company right-of-way, for which additional power transmission lines are proposed.

Vintage Vines, Vintage Vines, LLC, Bridgehampton, NY
Mr. Kennedy was a contributing scientist in an ecological assessment and tiger salamander survey for a proposed residential development on this 49 acre undeveloped property. He co-wrote the Ecology Resources section for the Draft Environmental Impact Statement, in which existing ecological conditions, potential impacts and mitigation measures were addressed. Mr. Kennedy also responded to public comments in the Final Environmental Impact Statement for the proposed action.

Queen of Peace Cemetery, Archdiocese of Rockville Centre, Old Westbury, NY
Mr. Kennedy oversaw the installation of groundwater monitoring wells and conducted quarterly groundwater sampling on two cemetery properties. He also prepared summary reports to measure and evaluate potential groundwater impacts from the two properties.

Silver Oak Stables, Nissequogue, NY

Continued, p. 7

Mr. Kennedy obtained a freshwater wetlands permit the New York State Department of Environmental for an extensive demolition and construction project at this 35 acre equestrian center and boarding facility. Mr. Kennedy also conducted an ecological survey and prepared an ecology resources report for the subject property. The survey included an assessment of existing meadow and wetland habitats, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Potential impacts of the proposed action and wetland mitigation measures were also addressed in the report.

Proposed Gas Station/Convenience Store, Stop and Shop, Farmingville, NY

Mr. Kennedy soil borings sampled underground injection control structures and oversaw the installation of groundwater monitoring wells, in order to assess impacts from prior site uses on soils and groundwater.

Proposed Wireless Communications Facility, metroPCS, Islip, NY

Mr. Kennedy conducted freshwater wetland delineation and obtained a New York State Department of Environmental Conservation freshwater wetlands permit for this public utility wireless communications facility.

Baypoint at Woodmere, Woodmere, NY

Mr. Kennedy conducted a comprehensive environmental site investigation in order to evaluate impacts to surficial and subsurface soils from past deposition of fill material on this waterfront site, which is proposed for residential redevelopment.

Brookhaven Town Drainage Project, Stony Brook, NY

Mr. Kennedy secured tidal and freshwater permits from the New York State Department of Environmental Conservation and the United States Army Corps of Engineers for the Town of Brookhaven for this highway drainage improvement project.

Passionist Monastery, Shelter Island, NY

Mr. Kennedy delineated tidal wetlands on this shorefront property in association with a proposed redevelopment project.

Highway Improvement Project, Incorporated Village of Lloyd Harbor, Lloyd Harbor, NY

Mr. Kennedy prepared and submitted application packages and secured tidal and freshwater permits from the New York State Department of Environmental Conservation for a traffic safety improvement project along six miles of public roadways within the Incorporated Village of Lloyd Harbor.

B&C Golf, East Hampton Country Club, East Hampton, NY

Mr. Kennedy has conducted semiannual groundwater monitoring on this golf club property since 2007, in order to assess potential impacts on area groundwater from pesticides, herbicides and fertilizers.

Multiplex Cinema Property, Lowes Home Centers, Inc., Commack, NY

Mr. Kennedy conducted an ecological survey of this 22 acre property, which is currently developed with a multiplex cinema and is proposed for commercial redevelopment with a retail home improvement center. The ecological assessment included wetland evaluation of a recharge basin located at the site. Mr. Kennedy further obtained a United States Army Corps of Engineers Nationwide Permit and New York State Department of Environmental Conservation Water Quality Certificate for the proposed redevelopment. Mr. Kennedy also conducted Phase I

Continued, p. 8

and Phase II Environmental Site Assessments of the property, which included surficial and subsurface soil sampling, and bottom sediment sampling of underground injection control structures.

Kirmse Residence, Westhampton, NY

Mr. Kennedy engaged in consultations with Town of Southampton Environmental Division officials and secured a Town wetlands permit for the reconstruction of a single-family home on this waterfront property. He also testified in support of the project at a Town of Southampton Environmental Board hearing.

Avalon at Huntington Station, Avalon Bay Communities, Inc., Huntington, NY

Mr. Kennedy conducted an ecological survey of this 27 acre undeveloped property, which is proposed for a residential subdivision. The survey included a habitat assessment, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Mr. Kennedy further prepared an Ecology Resources section for the Draft Environmental Impact Statement for the proposed action. Existing conditions, potential impacts and mitigation measures were addressed.

Malverne UFSD, Malverne, NY

Mr. Kennedy performed an ecological survey and wetland assessment and prepared a development potential review report for this 38 acre undeveloped property, which is proposed for development with a school building.

Hydrogeologist, Long Island Consulting Firm

Prior to VHB, Mr. Kennedy performed groundwater monitoring and evaluation activities at federal, state and local government sites, including the United States Department of Energy's Brookhaven National Laboratory facility.

New York State Department of Environmental Conservation Fish and Wildlife Technician

Prior to VHB, Mr. Kennedy conducted biological assessments, population surveys, water quality evaluations and fish stocking of various local waters for the New York State Department of Environmental Conservation. Mr. Kennedy also participated in endangered species surveys, invasive species remediation projects, environmental education workshops and public outreach events.

Visiting Scientist Position, The Nyanza Project, Tanzania, East Africa

Prior to VHB, Mr. Kennedy performed multi-disciplinary scientific research activities as a student (2003) and visiting scientist/teaching assistant (2004) with The Nyanza Project, an international tropical lakes research program held annually at Lake Tanganyika, Tanzania, East Africa.

Education

Massachusets Audobon Society Wetland Construction and Restoration Workshop, 2013

Continued, p. 9

Winter Vegetation Identification for Wetland Delineation, Rutgers University, 2012

Summer Vegetation Identification for Wetland Delineation, Rutgers University, 2011

United States Army Corp of Engineers 38 Hour Wetland Delineation Training Program, 2010

Rutgers University Wetland Delineation Training Program, 2007

OSHA Hazardous Waste Operations and Emergency Response Training, 2006, 2008, 2009, 2011, 2012, 2103 and 2014

MS, Geosciences, University of Arizona, 2005

BS, Environmental Science, Paul Smith's College, 2003

Publications

Eggermont, H., Kennedy, D., Hasiotis, S.T., Verschuren D. & Cohen, A. 2008. Distribution of living larval Chironomidae (Insecta: Diptera) along a depth transect at Kigoma Bay, Lake Tanganyika: implications for palaeoenvironmental reconstruction. African Entomology 16(2): 162-184.

Lisa A. Standley, PhD

Chief Environmental Scientist

Dr. Standley is a Chief Environmental Scientist in VHB's Watertown, Massachusetts headquarters. Her expertise encompasses the diverse range of environmental and permitting issues that affect transportation projects. She has prepared Environmental Notification Forms (ENF) and Environmental Impact Reports (EIR) in response to the National Environmental Policy Act (NEPA), Massachusetts Environmental Policy Act (MEPA), Section 404 Water Quality Certification applications, nationwide permits, and individual permits, as well as reviewed nationwide permit requests for verification for the United States Army Corps of Engineers (USACOE). Most recently, Dr. Standley has focused her efforts on projects for airports that range in size from small regional airfields to large, complex international hubs.

All Aboard Florida Orlando to Miami Intercity Passenger Rail EIS, Florida

Project Manager

VHB was selected as the 3rd party contractor to the Federal Railroad Administration (FRA) to prepare an Environmental Impact Statement (EIS) for a privately-funded and operated passenger rail line linking Orlando International Airport and Miami, Florida. As VHB's Project Manager, Dr. Standley is responsible for reviewing technical information prepared by the applicant and preparing an EIS in accordance with FRA's National Environmental Policy Act (NEPA) guidelines. The 230-mile project is primarily improvements within an existing freight rail right-of-way, but includes a 40-mile new railroad alignment parallel to an existing highway. Major environmental issues include an alternatives analysis, wetland impacts, stormwater, Section 4(f), wildlife, and cumulative impacts of rail and highway development. In addition to the EIS, Dr. Standley is overseeing VHB's work on the NEPA scoping process, agency coordination, developing cooperating agency agreements, and assisting FRA with Section 106 and Section 7 consultations. Dr. Standley is managing a team of VHB and subconsultant technical and NEPA experts from Florida to Massachusetts to efficiently complete the NEPA process on an anticipated 12-month schedule.

Completion Date: 1/1900
VHB Project ID: 61827.00

Astra-Zeneca Facility, Waltham, MA

Environmental Task Manager

Dr. Standley was responsible for permitting of a phased corporate park development that included a state-of-the-art comprehensive stormwater management system to protect water quality in Hobbs Brook, tributary to the Cambridge water supply. She worked successfully with the Cambridge Water Department staff during design and construction to implement the design and provide water quality protection.

Completion Date: 9/2001
VHB Project ID: 05447.00

Cape Cod National Seashore Salt Pond Visitor Center Rehabilitation, Eastham, MA

Environmental Task Manager

Dr. Standley oversaw the preparation of an Environmental Assessment (EA) and Finding of No Significant Impact for the National Park Service, in compliance with the National Environmental Protection Act (NEPA), for the Salt Pond Visitor Center. Critical issues included impacts to park users, historic resources, cultural landscape, and natural vegetation.

Completion Date: 1/2003
VHB Project ID: 07529.01

Cisco Systems Campus, Boxborough, MA

Environmental Scientist

Dr. Standley is a Chief Environmental Scientist in VHB's Watertown, Massachusetts headquarters. Her expertise encompasses the diverse range of environmental and permitting issues that affect transportation projects. She has prepared Environmental Notification Forms (ENF) and Environmental Impact Reports (EIR) in response to the National Environmental Policy Act (NEPA), Masachusetts Environmental Policy Act (MEPA), Section 404 Water Quality Certification applications, nationwide permits, and individual permits, as well as reviewed nationwide permit requests for verification for the United States Army Corps of Engineers (ACOE). Most recently, Dr. Standley has focused her efforts on projects for airports that range in size from small regional airfields to large, complex international hubs.

39 years of professional experience

Continued, p. 2

Dr. Standley prepared Massachusetts Environmental Policy Act (MEPA) documents and compliance for a 350-acre corporate campus center and obtained a Conservation Permit from the Massachusetts Division of Fisheries and Wildlife. She conducted botanical and wildlife survey, including trapping and radiotelemetry, of the site to identify vernal pools and document habitat usage by state-listed rare turtle species. She successfully developed site development and mitigation plan, including habitat preservation, habitat enhancement, wildlife corridors and tunnels, and long-term research program standards for three turtle species. As part of this work, Dr. Standley designed and completed long-term monitoring studies of two state-listed turtle species, coordinated with Natural Heritage Program staff, and designed a comprehensive mitigation program for construction in upland habitats of protected species that allowed the project to obtain a Conservation Permit under the Massachusetts Endangered Species Act.

Completion Date: 1/2002
VHB Project ID: 06791.07

Norfolk International Airport EIS, Norfolk, VA

Environmental Leader

Dr. Standley is directing environmental services for the preparation of an Environmental Impact Statement in accordance with NEPA requirements at Norfolk International Airport in southeast Virginia. Conducted on behalf of the Norwalk Airport Authority and Federal Aviation Administration, the initial phase of this project includes reviewing existing studies, formulating a plan of study, conducting agency and public outreach, scoping the EIS, and developing the Purpose and Need Statement.

Completion Date: 1/1900
VHB Project ID: 12780.00

Logan International Airport, Coastal Wetlands Inventory, East Boston, MA

Environmental Scientist

Under contract with the Massachusetts Port Authority (Massport), as part of the preparation of a Generic Environmental Impact Report (GEIR) for the Logan International Airport Master Plan, Dr. Standley managed an inventory of the coastal wetland resources located at the perimeter of the airfield. Inventories of plants, invertebrates, birds, and mammals utilizing these coastal wetlands were conducted to assess the functions of Logan's unique coastal wetlands. The study resulted in the identification and mapping of all areas of coastal bank, coastal beach, salt marsh, and tidal flats adjacent to the airfield.

Completion Date: 5/1999
VHB Project ID: 05395.00

Worcester Airport CAT-III ILS and Taxiway Project, Worcester, MA

Environmental Leader

Dr. Standley is the Environmental Lead for the CAT-III ILS and Taxiway study, working with the Massachusetts Port Authority (Massport) to develop a strategic environmental approach for this project, which is key to the long-term success of the airport. The current project involves developing a robust purpose and need statement, evaluating alternatives that achieve the project purpose and minimize environmental impacts to wetlands, drinking water supplies, vernal pools, and rare species habitat. The project includes preparing state Massachusetts Environmental Policy Act (MEPA) and federal National Environmental Policy Act (NEPA) documents that will facilitate obtaining environmental permits.

Completion Date: 1/1900
VHB Project ID: 12471.00, 12471.02

Continued, p. 3

Massport, Chelsea Creek Bulkhead Project, Boston, MA

Environmental Task Manager

Dr. Standley was responsible for preparing permit applications to allow installation of protective bulkheads within Chelsea Creek to facilitate dredging to widen the federal navigation channel. She worked closely with the Massachusetts Department of Transportation, the Massachusetts Port Authority (Massport), and local, state, and federal resource agencies to expedite permit issuance for this time-sensitive project in the marine ecosystem. She successfully obtained all environmental permits within three months of project initiation.

Completion Date: 5/2012

VHB Project ID: 11614.00

Massport, Conley Terminal Improvements, Dedicated Freight Corridor and Buffer Open Space, South Boston, MA

Environmental Task Leader

For the Massachusetts Port Authority (Massport), Dr. Standley was the Environmental Task Leader for improvements to the Conley Terminal in South Boston. She was responsible for developing the environmental strategy and Environmental Notification Form required under the Massachusetts Environmental Policy Act (MEPA), working closely with Massport staff and resource agencies to identify environmental concerns, and obtained early clearance from the US Coast Guard to expedite construction of a new bridge.

Completion Date: 1/2013

VHB Project ID: 10629.11, 11870.00

Downeaster Rail Extension, Boston, MA to Portland, ME

Environmental Task Manager

Dr. Standley prepared the draft and final Environmental Assessments (EA) in accordance with the Federal Transit Authority (FTA) National Environmental Protection Act (NEPA) requirements for the extension of Amtrak passenger rail service from Boston to Portland, which included restoration of 78 miles of existing track and 47 bridges, construction of a new layover facility, and selection of seven new commuter rail station sites. The EA included an extensive alternatives analysis to identify station and layover facility locations, as well as analysis of potential impacts to natural, social, and cultural resources. She coordinated subconsultant activities for environmental site assessments and historic and archaeological resource investigations.

Completion Date: 10/1988

VHB Project ID: 03829.00

Downtown Transit Center Alternatives Analysis & Concept Design, Burlington, VT

Environmental Task Manager

Dr. Standley was the Environmental Task Manager responsible for a Categorical Exclusion Checklist for the Federal Transit Administration. Retained by the City of Burlington, VHB led an effort to evaluate several potential sites for the relocation of the downtown transit center, which serves the city and the Chittenden County Transportation Authority. VHB performed a thorough alternatives analysis of the final two sites under consideration, including operations planning, concept design and cost estimating, traffic analysis, air quality analysis, environmental screening, zoning analysis, field visits with photographs, historic research, and alternatives analysis, including screening and ranking. VHB also conducted a charrette/workshop to help evaluate and rank the sites.

Completion Date: 6/2008

Continued, p. 4

VHB Project ID: 09887.00

East-West Parkway Design-Build, Weymouth, MA

Environmental Task Manager

Dr. Standley is the Environmental Task Manager for the construction of the East-West Parkway, a critical transportation corridor required for redevelopment of the former South Weymouth Naval Air Station. She was responsible for securing state and local wetland permits for this design/build project, working closely with the South Shore Tri-Town Development Corporation, the construction contractor, local municipalities, and the Natural Heritage and Endangered Species Program staff to develop final mitigation plans, including restoration of a 400-foot long segment of the Old Swamp River and restoration of over 6 acres of box turtle nesting habitat.

Completion Date: 1/1900

VHB Project ID: 10697.00,10697.01,10697.02

Broadmoor Wildlife Sanctuary, Ecological Management Plan, Natick, MA

Environmental Scientist

Dr. Standley prepared a comprehensive ecological management plan for a 600-acre Massachusetts Audubon sanctuary. She conducted habitat assessments and vegetation mapping, identified management concerns (invasive plant species, loss of grassland habitat, wildlife corridors, beavers), and developed a long-term ecological management plan to achieve habitat goals.

Completion Date: 8/2000

VHB Project ID:

Eel Point Bicycle Path, Nantucket, MA

Project Manager

Dr. Standley was the Project Manager for environmental documentation and permitting for a new bike path connecting the Cliff Road path with Dionis Beach on Nantucket. She oversaw project design, wetlands delineation, functional assessments, impact minimization, and permit preparation. The project successfully obtained permits from the local conservation commission and the United States Army Corps of Engineers (USACE), as well as approvals under the Massachusetts Environmental Policy Act (MEPA).

Completion Date: 5/1999

VHB Project ID: 04899.00

Downeast Regional Airport, Environmental Assessment, Machias, ME

Project Manager

Dr. Standley was Project Manager for the Town of Machias' effort to relocate the existing municipal airport, which could not be reconstructed to meet federal safety standards at its current location due to wetlands constraints, federally-listed endangered species, and U.S. Route 1. She prepared National Environmental Protection Act (NEPA) analysis and documentation, which included a Draft Environmental Assessment that was circulated for public comment, and managed National Environmental Policy Act (NEPA) compliance as well as natural, social, and cultural resource assessment. The Environmental Assessment examined a wide range of potential alternative sites in light of impacts to wildlife habitat, Section 4(f) properties, noise, wetlands, and agricultural lands. Dr. Standley oversaw data collection, site evaluation, wetlands mapping, and cultural resources evaluation at 14 potential new airport sites in the vicinity of Machias. The project included an extensive public involvement process and close coordination with the Maine Department of Transportation's planning section and the

Continued, p. 5

New England office of the Federal Aviation Association (FAA). A subsequent EA will evaluate airport layout alternatives for the selected site.

Completion Date: 10/2010
VHB Project ID: 09547.00

MaineDOT, Lewiston/Auburn Intermodal Transportation Center, Lewiston and Auburn, ME

Project Manager

Dr. Standley managed an Environmental Assessment for the proposed Lewiston/Auburn Intermodal Transportation Center. Retained by the Maine Department of Transportation (MaineDOT), VHB led a project to create a facility that would allow travelers to connect between rail, bus, and airline services. VHB provided National Environmental Policy Act (NEPA) documentation and an Environmental Assessment, as well as investigation of existing conditions of the project area, analysis of demand, and an analysis of alternatives for transportation planning purposes.

Completion Date: 4/2007
VHB Project ID: 09813.00

MaineDOT, Aroostook County Transportation Study, Aroostook County, ME

Project Manager

Under contract to the Maine Department of Transportation (MaineDOT), Dr. Standley managed environmental data collection, impact analysis, and preparation of a Tiered Environmental Impact Statement (EIS) for transportation corridor improvements in northeastern Aroostook County. The Draft EIS compared four corridors extending the length of the 50-mile study area. The subsequent Supplemental DEIS and Final EIS evaluated a Proposed Action within limited portions of the overall corridor, and developed Highway Methodology documentation in support of a Least Environmentally Damaging Practicable Alternative (LEDPA). Dr. Standley oversaw the preparation of Tier 1 and Tier 2 FEIS documents and worked directly with the Federal Highway Administration (FHWA) to prepare Records of Decision (RODs) for two Tier-2 segments that had advanced into the final design and construction stages. The study involved developing base mapping for key environmental constraints, iterative evaluation of corridor alternatives, and all aspects of National Environmental Policy Act (NEPA) compliance and Highway Methodology documentation in support of a LEDPA for new highway alignments that would bypass two municipal centers. Significant issues evaluated in the EIS included impacts to wetlands and wildlife corridors, fisheries, farmland, and economic impacts on town centers.

Completion Date: 4/2013
VHB Project ID: 06520.01,06520.02

MaineDOT, Sears Island Dry Cargo Terminal, Searsport, ME

Environmental Consultant

Dr. Standley reviewed and provided objective technical critique of wetland identification and assessments, wildlife habitat analyses, and impact assessments for preparation of an Environmental Impact Statement (EIS) for a new cargo port and extension of the existing rail connection. She advised the Maine Department of Transportation (MaineDOT) with regard to National Environmental Policy Act (NEPA) and Section 404 compliance issues.

Completion Date: 2/1996
VHB Project ID: 03636.00

FWS, Monomoy National Wildlife Refuge, Environmental Planning and Permitting, Chatham, MA

Continued, p. 6

Environmental Scientist

For the US Fish and Wildlife Service (FWS), Dr. Standley was responsible for preparing chapters of the Comprehensive Conservation Plan (CCP) for the Monomoy Natural Wildlife Refuge (NWR) on Cape Cod. VHB has integrated information provided by the Refuge staff to create a CCP, using standard FWS templates. Critical elements include identifying key issues such as horseshoe crab harvesting, defining alternatives, and evaluating uses of the refuge for consistency with the overall mission and purpose.

Completion Date: 6/2009
VHB Project ID: 10719.00

Syngenta Seeds, Environmental Report, Raleigh, NC

Project Manager

Dr. Standley is the Project Manager and chief scientist responsible for preparation of an Environmental Report in support of Syngenta's petition to deregulate a new transgenic crop. The Environmental Report is an applicant-prepared Environmental Assessment developed as part of the USDA-APHIS Biotechnology Research Service's NEPA Pilot Program, and addresses several key issues that have been highlighted in recent litigation: impacts to organic farmers, impacts to non-target organisms, including endangered species, and the cumulative impacts of "stacking" combinations of genetically-engineered traits.

Completion Date: 5/2013
VHB Project ID: 11548.00,11548.01

Forest Hill Park, Cleveland, OH

Environmental Scientist

Dr. Standley conducted a vegetation and wildlife habitat analysis of a 200-acre city park, formerly one of the Rockefeller estates, to assist in development of a master plan. Preliminary research indicated that extensive areas of the park contained old-growth forests. She also assessed the significance of the park's habitats for wildlife.

Completion Date: 1/1998
VHB Project ID: 05878.00

Fort Devens Re-Use Plan, Devens, MA

Environmental Scientist

For the potential redevelopment of the former military facility, Dr. Standley developed natural resource protection measures incorporated into MassDevelopment's Re-Use Plan. This included mapping wetland resource areas, wildlife habitat, rare species habitats, and greenbelt corridors, and designing and conducting grassland bird breeding habitat usage surveys. She also worked with the re-use advisory committee to develop bylaws and regulations for the protection of natural areas, open space, surface and groundwater resources. Dr. Standley also designed and conducted grassland bird breeding habitat usage surveys for the potential redevelopment of the former Moore Army Airfield, and coordinated with NHESP to develop a draft Conservation and Management Plan to allow redevelopment of the airfield while protecting grassland bird habitat and state-listed turtle breeding habitats.

Completion Date: 3/2008
VHB Project ID: 10176.00

Golf Course Development, New England

Environmental Task Manager

Dr. Standley has participated in the development of golf courses across New England, including locations in Boxborough, Harvard, and South Weymouth in Massachusetts, and Misquamicut in

Continued, p. 7

Rhode Island. Her work for has included delineation of wetlands, environmental impact analysis, water quality assessment and wetland protection, wildlife habitat evaluation and mitigation design, rare species analysis, and general permitting assistance.

Completion Date:
VHB Project ID:

PANYNJ, LaGuardia Airport, Runway Safety Improvements, New York, NY

Environmental Lead

For the Port Authority of New York and New Jersey (PANYNJ), Dr. Standley was responsible for preparing an Environmental Assessment for constructing runway safety areas at the ends of two runways at LaGuardia Airport. This complex project included two decks with engineered materials arresting system (EMAS) constructed in Flushing Bay, an off-airport construction staging area, and a new restricted vehicle service road. Issues successfully addressed in the Environmental Assessment included federal endangered species (sturgeon), essential fish habitat, and Section 106 cultural resources consultation.

Completion Date: 12/2013
VHB Project ID: 28878.00

PANYNJ, Airport System Capacity Planning Study, New York and New Jersey

Senior Scientist

For the Port Authority of New York and New Jersey (PANYNJ), Dr. Standley acts as a Senior Scientist on the project, contributing to the development of the environmental screening process and analysis of resources. The PANYNJ planning study develops sufficient information to define the needed improvements to accommodate unconstrained air travel demand at the PANYNJ airports. She is responsible for specific technical work related to natural resources, including waterbodies and wetlands.

Completion Date: 1/1900
VHB Project ID: 28590.00

Logan International Airport, Runway Safety Area (RSA) Improvements, East Boston, MA

Environmental Task Manager

Dr. Standley was the Environmental Task Manager for preparation of an Environmental Assessment (EA) in compliance with the Federal Aviation Administration's (FAA) National Environmental Policy Act (NEPA) regulations, and a state Environmental Impact Report (EIR) for improvements to the runway safety areas at two of Logan's runway ends (22R and 33L). These complex projects required extending the RSAs into Boston Harbor, with impacts to salt marsh, submerged aquatic vegetation, shellfish beds, and other sensitive coastal resources. Studies undertaken for this project include surveys of biological resources, hydrodynamics, sediment transport, scour, and water quality. Dr. Standley prepared plans for restoring more than four acres of salt marsh and four acres of eelgrass habitat, and successfully obtained all environmental permits within an expedited time frame.

Completion Date: 6/2011
VHB Project ID: 09980.00

Manchester-Boston Airport, Runway Safety Area Improvement Project, Manchester, NH

Environmental Task Manager

Dr. Standley prepared an Environmental Assessment (EA) to add a runway safety area to the airport's secondary runway without reducing runway length. The EA successfully addressed

Continued, p. 8

complex issues including relocating part of a state highway, avoiding impacts to a sensitive wetland community, performing archaeological surveys, and developing mitigation measures to compensate for the loss of federally jurisdictional wetlands. Construction of the selected alternative, using Engineered Materials Arresting System (EMAS), was initiated in 2007.

Completion Date: 1/2007
VHB Project ID: 09980.00

New Bedford Regional Airport, Runway Extension EIS/EIR, New Bedford, MA

Project Manager and Environmental Lead Consultant

For the Federal Aviation Authority (FAA) and New Bedford Regional Airport, Dr. Standley was the Project Manager for preparation of an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) and a state Environmental Impact Report (EIR) under the Massachusetts Environmental Policy Act (MEPA) for improvements to the New Bedford Regional Airport. Areas of concern included study of extending the primary runway, expanding the vegetation management program, expanding terminal and hangar facilities, and enhancing runway safety areas. The EIS addressed controversial issues, including impacts to an ecologically significant wetland complex, several rare species, roadway relocation and traffic impacts, impacts to public drinking water supplies, and noise impacts to minority and low-income neighborhoods in the vicinity of the airport. As part of this work, Dr. Standley supervised surveys for state-listed bird and plant species, mapped state-listed turtle habitat, and oversaw vernal pool surveys. She was also responsible for designing over 14 acres of compensatory mitigation wetlands. In addition, Dr. Standley also provided overall technical review and quality control and managed the response to comments, as well as coordinated with local, state, and federal resource agencies. Because of the ethnic diversity of the New Bedford area, the executive summary and public notification materials were provided in Spanish and Portuguese versions. The project successfully obtained all environmental permits, including a Variance under the Massachusetts Wetlands Protection Act and an Individual Section 404 Permit, as well as a Record of Decision (ROD) under the National Environmental Policy Act (NEPA).

Completion Date: 11/2009
VHB Project ID: 09731.01,09731.02,09731.03

New I-93 Interchange Linking to the Industri-Plex Development, Woburn, MA

Environmental Lead

Dr. Standley was responsible for wetlands identification and assessment, wildlife habitat analysis, water quality, and rare species (Mystic Valley Amphipod (Crangonyx aberrans), a state-listed Species of Special Concern) impact assessment for preparation of an Environmental Impact Report (EIR), Notice of Intent, and Request for a Variance for a proposed fully directional interchange and connector roadway providing access from the highway to an industrial park and transportation center. She coordinated Massachusetts Environmental Policy Act (MEPA) and Department of Environmental Protection review of the project, and successfully obtained a final Certificate.

Completion Date: 12/1998
VHB Project ID: 04809.00

Philadelphia International Airport Runway Extension EIS, Philadelphia, PA

Environmental Task Manager

VHB was the lead consultant to the FAA for preparation of two Environmental Impact Statements (EISs) for airport improvements, including short-term improvements (runway extension) and long-term major airside and landside improvements to enhance airport capacity. Dr. Standley was responsible for the preparation of the EIS for the Runway 17-35 Extension

Continued, p. 9

Project, which included managing the National Environmental Policy Act (NEPA) scoping process, coordinating studies of impacts to natural and cultural resources, including state-listed rare species, sensitive coastal wetlands, a National Historic Landmark, and an adjacent National Wildlife Refuge, and coordinating studies of air quality, noise, and other environmental impacts. The Runway 17-35 Extension Project was a designated Federal Streamlining Project by Executive Order 13274, and included an expedited agency review and consensus process, and the Record of Decision drafted by VHB was signed less than 20 months after publication of the Notice of Intent in the Federal Register. She also served as Environmental Task Manager for the Capacity Enhancement Program EIS and oversaw wetland impact studies, state-listed rare species studies, and coordinated directly with the National Marine Fisheries Service concerning potential impacts to federally-listed fish species. The NMFS consultation resulted in a determination of no adverse impact and allowed the project to move forward without full formal consultation under Section 7 of the ESA.

Completion Date: 6/2010
VHB Project ID: 08495.00

Pine Hills Community, Plymouth, MA

Environmental Scientist

Dr. Standley conducted a vegetation and wildlife habitat analysis of a 3,000-acre site, including inventory and mapping of vegetation communities, a forest fragmentation analysis, and identification of wildlife communities and critical wildlife corridors. She identified plant communities likely to be used by pine barrens lepidoptera and developed strategies to protect and enhance suitable habitat areas.

Completion Date: 5/2011
VHB Project ID: 05517.00

Polpis Road Bicycle Path, Nantucket, MA

Environmental Task Manager

Dr. Standley was the Environmental Task Manager responsible for environmental documentation and permitting for an 8.7-mile bike path route. She located populations of two state-listed rare plant species and developed strategies for protection during construction, population relocation, and habitat enhancement resulting in the signing of a Memorandum of Agreement between the Massachusetts Highway Department (now the Massachusetts Transportation Department) and the Division of Fisheries and Wildlife. She was responsible for wetlands delineation, functional assessments, impact minimization and permit preparation. Although “categorically included” for preparation of an Environmental Impact Statement (EIR), the project was accepted under the Massachusetts Environmental Policy Act (MEPA) following the submittal of an Environmental Notification Form (ENF). The project successfully obtained permits from the local conservation commission, the United States Army Corps of Engineers (USACE), and the Massachusetts Department of Environmental Protection under a Variance. Compensatory mitigation for this project consisted of an innovative design for a 2.5-acre wetland system with a coastal plain pondshore community.

Completion Date: 10/2000
VHB Project ID: 07133.00

Rare Species Transplant Program, Falmouth, ME

Environmental Scientist

Dr. Standley conducted an assessment of a rare plant species population (Carex polymorpha, US Endangered Species Act Candidate Species) at the location of a proposed Alzheimer’s nursing

Continued, p. 10

home. She developed a successful program/protocol for habitat enhancement and transplantation of affected subpopulations.

Completion Date: 1995
VHB Project ID:

CTDOT, Route 2/2A/32 Transportation and Environmental Studies, Southeastern Connecticut

Project Manager

For the Connecticut Department of Transportation (CTDOT), Dr. Standley was Project Manager for preparation of an Environmental Impact Statement (EIS) for regional transportation solutions in the rapidly growing area of Connecticut between New London, Norwich, and Stonington, including the Mohegan Sun and Foxwoods Casinos. The study included investigations of commuter rail, light rail, and monorail transit as well as roadway improvements and new roadway construction. Key issues were secondary and cumulative impacts, wildlife habitat impacts, and Section 4(f) compliance. Secondary and cumulative impacts were a critical element in the evaluation of alternatives. A Proposed Action was selected and evaluated in the Final EIS based on input from the local communities, analysis of transportation effects, and consideration of effects on natural, social (including environmental justice considerations), and cultural resources within the study area. Dr. Standley oversaw preparation of the Record of Decision for the Federal Highway Administration (FHWA) at the completion of the EIS process.

Completion Date: 7/2010
VHB Project ID: 40185.00

CTDOT, Route 7, Brookfield, CT

Project Manager

Under contract with the Connecticut Department of Transportation (CTDOT), Dr. Standley conducted surveys to locate populations of several state-listed rare grass species, and designed and implemented a habitat enhancement plan and long-term population monitoring program within the right-of-way of a proposed highway extension. She assisted CTDOT in obtaining a rare species permit to allow highway construction. She also worked with the final design team to develop a construction mitigation plan and construction specifications for protecting and enhancing existing habitat and constructing new suitable habitat areas, and conducted a multi-year post-construction monitoring study to assess impacts to rare species populations and the effectiveness of mitigation measures.

Completion Date: 9/2010
VHB Project ID: 40085.00

CTDOT, West Haven/Orange Commuter Rail Station, West Haven and Orange, CT

Environmental Task Manager

Under contract with the Connecticut Department of Transportation (CTDOT), Dr. Standley was responsible for preparing an Environmental Assessment (EA)/ Environmental Impact Evaluation (EIE) under Federal Transit Authority (FTA) National Environmental Policy Act (NEPA) guidelines and Connecticut Environmental Policy Act (CEPA) regulations for construction of a new commuter rail station on the MetroNorth line in southern Connecticut. The EA/EIE evaluated two potential station sites, considering ridership, environmental effects, traffic impacts, and the beneficial effects of secondary development and transit-oriented development. Environmental Justice considerations, particularly the potential beneficial effects of improved transit access to minority and low-income populations, were evaluated as part of the study.

Completion Date: 10/2007

Continued, p. 11

VHB Project ID: 40669.00,40848.00

Route 312 Relocation Feasibility Study, Traverse City, MI

Environmental Task Manager

Dr. Standley coordinated environmental assessments and public participation elements of a corridor feasibility study to relieve traffic congestion and promote regional mobility in Traverse City, a vibrant tourist-destination community bisected by a busy state highway. Key issues included protection of sensitive watershed systems from increased non-point source pollution, protection of farmlands, bypass effects on local businesses, and wildlife corridors.

Completion Date: 9/1998
VHB Project ID: 04526.00

VTrans, Route 9/100 Transportation Improvement Study, Wilmington, VT

Project Manager

Under contract with the Vermont Agency of Transportation (VTrans), Dr. Standley was Project Manager for the preparation of an Environmental Impact Statement (EIS) for transportation improvements intended to eliminate functional conflicts and congestion in a small Vermont community. Her work included overseeing all aspects of public participation, documenting existing environmental conditions and potential project impacts, and synthesizing environmental, economic, and transportation data to support the selection of the Least Environmentally Damaging Preferred Alternative. The primary issues addressed during the EIS were functional conflicts between regional through-traffic and local traffic; impacts of a bypass on village businesses and on wildlife; noise impacts; and induced development (sprawl). The EIS included developing and analyzing bypass alternatives using data from traffic studies, land use and wildlife habitat, historic and archaeological resources, and wetlands and waterways. Secondary and cumulative impacts were identified as a critical issue in the evaluation of alternatives. The project included an extensive public participation process involving a local Citizens Advisory Group, newsletters, and public information meetings throughout the study. Coordination with the United States Army Corps of Engineers (USACE) and other federal agencies followed the Highway Methodology. Dr. Standley analyzed 16 corridor alternatives in a Draft EIS, identified a preferred alternative, and prepared a detailed Final EIS with key issues of secondary and cumulative impacts, Section 4(f) compliance, and impacts to wildlife habitat. VHB prepared the Record of Decision for the Federal Highway Authority (FHWA) at the completion of the National Environmental Policy Act (NEPA) process.

Completion Date: 11/2004
VHB Project ID: 03691.00

Skill Area: Ecological Research/Instruction

Instructor

Dr. Standley is Curator of the Vascular Plant Herbarium and past President of the New England Botanical Club, an organization of botanists that publishes the peer-reviewed journal Rhodora and maintains a research herbarium of over 250,000 specimens. She has served as a member of the New England Plant Conservation Program's Regional Advisory Committee, which establishes priorities for research and preservation of rare plants in the New England region. Dr. Standley has conducted field research projects and vegetation studies in the northeast, central states, mid-Atlantic coastal states, Pacific northwest, Rocky Mountain states, southern California, and Canada. She has published numerous scientific articles in peer-reviewed journals, including a study of taxonomic problems in rare species, presented seminars at universities and national scientific meetings, and has been the recipient of grants from the National Science Foundation for various studies in the genus Carex, and from the Nature Conservancy, and the

Continued, p. 12

Massachusetts Natural Heritage Program for the study of the rare sedge, Carex polymorpha. She also participated in a conference held at Acadia National Park to advise park staff on rare species monitoring. Dr. Standley has taught courses in botany, ecology, and horticulture at Cornell, University of Washington, and Wellesley College and currently lectures and teaches about plant identification, wetland ecology, wetland regulations, and rare species for several nonprofit organizations. She has taught regulatory courses and workshops sponsored by the Massachusetts Conservation Commission (MACC), the Association of Massachusetts Wetland Scientists, and the Massachusetts Department of Environmental Protection, and she regularly teaches courses in wetland plant identification for the University of New Hampshire's Continuing Education division. Dr. Standley is the author of the Field Guide to Carex in New England.

Completion Date:
VHB Project ID:

Skill Area: Environmental Constraints Analysis

Environmental Scientist

Dr. Standley conducts environmental constraints analyses and planning-level feasibility analyses for public infrastructure projects throughout New England.

Completion Date:
VHB Project ID:

Skill Area: Environmental Permitting

Environmental Task Manager

Dr. Standley has prepared Environmental Notification Forms (ENF) and Environmental Impact Reports (EIR) in response to the Massachusetts Environmental Policy Act (MEPA), Section 404 Water Quality Certification applications, Nationwide Permits, and Individual Permits, as well as reviewed Nationwide Permit requests for verification for the United States Army Corps of Engineers (USACE).

Completion Date:
VHB Project ID:

Skill Area: MEPA Environmental Impact Analysis

Environmental Task Manager

Dr. Standley has been responsible for several major interdisciplinary projects subject to review under the Massachusetts Policy Act (MEPA) guidelines. She has coordinated environmental investigations (including wetlands and historic/cultural resources), GIS mapping and analysis of resources, aerial mapping and ground survey, engineering, traffic studies, and public participation. She has been responsible for all aspects of preparing Categorical Exclusions, Environmental Assessments, Findings of No Significant Impact, Environmental Impact Statements, and Records of Decision for federal agencies including the Federal Aviation Administration (FAA), Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), Federal Transit Administration (FTA), National Park Service (NPS), and Fish and Wildlife Service (FWS).

Completion Date:
VHB Project ID:

Skill Area: Vegetation

Environmental Task Manager

Dr. Standley has conducted field research projects and vegetation studies in the northeast, central states, mid-Atlantic coastal states, Pacific northwest, Rocky Mountain states, and

Continued, p. 13

southern California and in Canada. She has published numerous scientific articles in peer-reviewed journals, and has presented seminars at universities and national scientific meetings, and has been the recipient of grants from the National Science Foundation, the Nature Conservancy, and the Massachusetts Natural Heritage Program.

Completion Date:
VHB Project ID:

Skill Area: Wetland Mitigation and Restoration Design

Environmental Scientist

Dr. Standley has designed compensatory wetland mitigation areas ranging from 5,000 square feet to 18 acres, including both freshwater and salt marsh as well as eelgrass restoration, and vernal pool habitat replacements and stream bank replacement and restorations. For the United States Army Corps of Engineers (USACE), she conducted a study of wetland mitigation effectiveness identifying successful compensatory areas, criteria for determining success, and comparisons between wetland functions and values for filled and replacement wetlands. In her analyses of wetland functions, she has used WET, the Connecticut Evaluation Method, and the Hollands-Magee method.

Completion Date:
VHB Project ID:

Skill Area: Wetland Permitting

Environmental Task Manager

Dr. Standley prepares applications to conservation commissions in New England involving both coastal and inland projects including commercial, industrial, and residential development. She has been responsible for the accuracy and quality of wetland identifications and boundary delineations, and for preparation of Requests for Determination, Notices of Intent, United States Army Corps of Engineers (USACE) permit applications, Water Quality Certifications, and Requests for Superseding Orders of Conditions. Dr. Standley has obtained Superseding Orders of Conditions and Variances from the Massachusetts Department of Environmental Protection, and has provided expert testimony in adjudicatory hearing cases.

Completion Date:
VHB Project ID:

Skill Area: Wildlife Habitat Analysis

Environmental Task Manager

Using Massachusetts wetland standards and US Fish & Wildlife HEP analysis techniques, Dr. Standley conducts wildlife habitat analyses of wetland and upland areas during the course of which she has identified vernal pools and studied vernal pool amphibians, plankton, and water quality. She has expertise in using GIS and aerial photography to evaluate forest fragmentation and wildlife corridors, and has designed mitigation measures ranging from wildlife passages to habitat enhancement and restoration for a wide range of wildlife species.

Completion Date:
VHB Project ID:

MBTA, Red Line-Blue Line Connector, Boston, MA

Environmental Task Manager

Dr. Standley prepared a Draft Environmental Impact Report under Massachusetts Environmental Policy Act (MEPA) regulations for extending the Massachusetts Bay Transportation Authority's (MBTA) Blue Line from Government Center Station to Charles Circle Station to connect to the Red Line. The environmental documents compared two service

Continued, p. 14

alternatives and two route alternatives (construction methods) and focused on key issues of ridership, noise and vibration impacts, impacts to historic resources, Section 4(f) evaluation, and construction-period traffic and neighborhood impacts.

Completion Date: 6/2010
VHB Project ID: 10803.00

MBTA, North Shore Transportation Study, Massachusetts

Environmental Task Manager

As part of a feasibility study conducted for the Massachusetts Bay Transportation Authority (MBTA), Dr. Standley examined new public transportation options for improved transit service to Boston's North Shore region. She was responsible for analysis of environmental constraints and potential environmental impacts, identification of permit requirements, comparison of alternatives, and development of a regulatory strategy to facilitate construction/implementation of transportation improvements.

Completion Date: 12/1998
VHB Project ID: 04703.00

MBTA, Green Line Light Rail Arborway Extension, Boston, MA

Environmental Task Manager

Under contract with the Massachusetts Bay Transportation Authority (MBTA), Dr. Standley was responsible for preparing an expanded Environmental Notification Form (ENF) for the proposed Green Line streetcar restoration. The ENF included an evaluation of project-related changes to the noise, vibration, and traffic environments, as well as impacts to historic properties and parks. The ENF also evaluated compliance with state and federal environmental justice policies.

Completion Date: 3/2003
VHB Project ID: 08219.00

MBTA, Green Line Light Rail Service Northwest Extension, Cambridge, Somerville and Medford, MA

Environmental Task Manager

Dr. Standley was the Environmental Task Manager for preparing a Single Environmental Impact Report (EIR) for the proposed Green Line Extension. Retained by the Massachusetts Bay Transportation Authority (MBTA), VHB led a project that investigated cost-effective transit solutions that will increase transit accessibility, improve corridor mobility, increase transit ridership, and improve regional air quality. VHB provided MEPA/NEPA documentation (including acquisition of Federal Transit Authority New Starts funding) and conceptual design of the route and infrastructure for the new light rail transit line, as well as continued extensive community outreach and agency liaison.

Completion Date: 12/2011
VHB Project ID: 10303.00,10303.03,10303.05,10303.06

MassDOT/MBTA, South Coast Rail Commuter Rail Extension, New Bedford to Fall River, MA

Environmental Task Manager

For the Massachusetts Department of Transportation (MassDOT) and the Massachusetts Bay Transportation Authority (MBTA), Dr. Standley served as the Environmental Task Manager responsible for successful preparation of a Draft and Final Environmental Impact Report (EIR) for restoration of commuter rail service connecting Boston with the South Coast cities. The preparation of the Massachusetts Environmental Policy Act (MEPA) documents included extensive studies of state-listed rare wildlife species, sensitive wetlands and natural

Continued, p. 15

communities, coastal wetlands, and wildlife corridors. Dr. Standley coordinated subconsultants and oversaw the preparation of detailed Environmental Reports for each resource area to support the United States Army Corps of Engineers' (USACE) preparation of an Environmental Impact Statement (EIS), including studies of existing environmental conditions and potential project impacts, mitigation measures, and synthesizing environmental, economic, and transportation data to support the selection of a Least Environmentally Damaging Preferred Alternative (LEDPA). She directly coordinated with state and federal resource agencies through an Interagency Coordinating Group formed to review technical submittals and streamline the environmental review process.

Completion Date: 1/1900
VHB Project ID: 10111.00,10111.31,10111.32,10111.33,10111.34,10111.35

MassDOT, Route 3 North Design-Build, Burlington, MA to Nashua, NH

Environmental Consultant

Dr. Standley provided construction services to the Massachusetts Highway Department (now the Massachusetts Department of Transportation) and Modern Continental Construction for a complex design-build roadway rehabilitation project. Services included monitoring compliance with environmental permit conditions, successfully obtaining amendments to permits issued by the Massachusetts Department of Environmental Protection (MADEP) and the United States Army Corps of Engineers (USACE) to accommodate construction changes, and working closely with agency staff during the design and construction of wetland replacement areas needed as compensation for the project impacts.

Completion Date: 10/2006
VHB Project ID: 07917.00

South Weymouth Naval Air Station Redevelopment, South Weymouth, MA

Environmental Scientist

Dr. Standley was responsible for rare species surveys and wildlife habitat evaluation and mitigation measures for the redevelopment of a former military base and airfield. Services included surveys to assess state-listed grassland bird habitat usage, vernal pool studies, and developing mitigation measures to protect eastern box turtles. She assessed impacts of a golf course and site roadway on wildlife habitat, wildlife movement corridors, and state-listed bird and turtle populations, and designed mitigation measures for grassland habitat restoration and long-term habitat monitoring. Dr. Standley worked closely with the Massachusetts Natural Heritage Program to successfully obtain a Conservation and Management Permit for the base redevelopment project.

Completion Date: 6/2009
VHB Project ID: 08890.00

Southern Nevada Supplemental Airport Environmental Impact Statement, Las Vegas, NV

Environmental Task Manager

Dr. Standley served as VHB's Environmental Task Manager, overseeing technical studies on natural resources within the study area for the proposed Southern Nevada Supplemental Airport south of Las Vegas. She conducted field studies on plant communities and rare plant distributions, assisted in ethnobotanical studies, and oversaw studies of wild horses and burros, areas of critical environmental concern, wilderness areas, rangeland, and wetlands.

Completion Date: 7/2010
VHB Project ID: 09541.00

Continued, p. 16

NHDOT, Spaulding Turnpike Widening, Rochester, NH

Environmental Task Manager

For the New Hampshire Department of Transportation (NHDOT), Dr. Standley prepared an Environmental Assessment (EA) for the widening of a two-lane section of the Spaulding Turnpike, including delineation and functional assessment for over 100 wetland areas. Utilizing the United States Army Corps of Engineers' (USACE) Highway Methodology, a preferred alternative was selected that minimized wetland impacts. Ramp configurations were redesigned to avoid impacts to rare plant species identified during the project. Dr. Standley also conducted a botanical survey for two state-listed sedges. She developed avoidance alternatives and reviewed them with the state agency.

Completion Date: 10/1998

VHB Project ID: 50923.00

NPS, St. Croix International Historic Site, Calais, ME

Environmental Task Manager

Dr. Standley prepared an Environmental Assessment (EA) and Finding of No Significant Impact for the National Park Service (NPS) for improvements to the St. Croix International Historic Site, in preparation for the 400th anniversary of the St. Croix Island settlement. Critical issues included modifications to the site access, historic and archaeological resources, cultural landscape, and coastal resources.

Completion Date: 11/2002

VHB Project ID: 07529.03

NPS, Acadia National Park, Bar Harbor, ME

Environmental Task Manager

For the National Park Service (NPS), Dr. Standley was responsible for the preparation of Environmental Assessments (EAs) in compliance with the National Environmental Policy Act (NEPA) for several projects within Acadia National Park and the associated Saint Croix International Historic Site. Projects included campground rehabilitation, roadway and drainage reconstruction, replacement of visitor facilities, and changes in access. Critical issues included impacts to park users, noise, water quality, and economic effects on local businesses.

Completion Date: 12/2002

VHB Project ID: 07529.04

T.F. Green Airport, Improvement Program, Warwick, RI

Environmental Task Manager

For the Rhode Island Airport Corporation (RIAC), Dr. Standley was responsible for natural resources analyses for an Environmental Impact Statement (EIS) for improvements to T. F. Green Airport, including runway safety area improvements, a potential runway extension, and related terminal and support facility improvements The EIS includes developing and analyzing safety, runway, and roadway alternatives using data from traffic studies, land use and socio-economic effects, wildlife habitat, fisheries, historic and archaeological resources, water quality and wetlands and waterways. Secondary and cumulative impacts were identified as a critical issue in the evaluation of alternatives. The project includes an extensive public participation process involving an Interagency Coordination Group, newsletters and a website, and public information meetings throughout the study.

Completion Date: 1/1900

VHB Project ID: 09228.00,09228.01,09228.02,09228.03,09228.04,09228.05,09228.06,09228.10

Continued, p. 17

Tall Pines Subdivision, Carlisle, MA

Environmental Scientist

Dr. Standley was responsible for wetland delineation, compensatory wetland design, and rare species habitat assessment for a 125-acre residential subdivision. The project successfully obtained a Superseding Order of Conditions from the Massachusetts Department of Environmental Protection, which permitted the construction of four wetland crossings to access separate upland areas of the site. Stormwater runoff from the subdivision roadway system will be treated by four detention basins designed to protect rare species habitat and certified vernal pools.

Completion Date: 11/2000
VHB Project ID: 03607.00

Three Bridges Project, New Bedford, MA

Environmental Task Manager

Dr. Standley was Environmental Task Manager for preparing a Categorical Exclusion for the Federal Railroad Administration (FRA) under an accelerated time schedule to allow TIGER grant funding to be issued for reconstruction of three freight rail bridges in New Bedford. She coordinated directly with FRA environmental staff and state historic preservation office staff to develop the Categorical Exclusion documentation.

Completion Date: 6/2010
VHB Project ID: 10111.32

Towermarc Business Park, Boxborough, MA

Environmental Scientist

Dr. Standley prepared Massachusetts Environmental Policy Act (MEPA) documents and compliance for a 350-acre corporate campus center and obtained a Conservation Permit from the Massachusetts Division of Fisheries and Wildlife. She conducted botanical and wildlife survey, including trapping and radiotelemetry, of the site to identify vernal pools and document habitat usage by state-listed rare turtle species. She successfully developed site development and mitigation plan, including habitat preservation, habitat enhancement, wildlife corridors and tunnels, and long-term research program standards for three turtle species. As part of this work, Dr. Standley designed and completed long-term monitoring studies of two state-listed turtle species, coordinated with Natural Heritage Program staff, and designed a comprehensive mitigation program for construction in upland habitats of protected species that allowed the project to obtain a Conservation Permit under the Massachusetts Endangered Species Act.

Completion Date: 1/2002
VHB Project ID: 06791.07

U.S. Postal Service Mail Distribution Facility, Waltham, MA

Environmental Scientist

For a new mail distribution facility, Dr. Standley assisted with design of innovative stormwater management and treatment system intended to provide protection to adjacent municipal drinking water supplies. She developed successful permit applications for remediation of contaminated groundwater supplies, including long-term monitoring program to detect changes in wetland vegetation affected by groundwater withdrawal.

Completion Date: 11/1996
VHB Project ID: 04288.13

Wachusett Mountain Ski Area, Environmental Impact Report, Princeton, MA

Continued, p. 18

Environmental Scientist

Dr. Standley prepared an Environmental Impact Report (EIR) for expansion of a ski area, including new ski trails and lifts, expanded snowmaking capacity, and base lodge expansion. She coordinated environmental, noise, traffic, and historic and archaeological resource investigations, and examined issues regarding vegetation analysis, wetland delineation, wildlife habitat investigations, water quality assessments, and Traditional Cultural Properties assessments. The project required innovative investigations for traditional cultural properties and old growth forests. Dr. Standley coordinated with the Massachusetts Division of Conservation and Recreation and Natural Heritage and Endangered Species Program during project development, and successfully obtained environmental permits for the construction of a new snowboard slope, lift, and base lodge expansion.

Completion Date: 4/2001
VHB Project ID: 03931.00

Wellesley College, Henry Woods Son's Paint Factory Environmental Remediation, Wellesley, MA

Project Manager

Dr. Standley was Project Manager for preparation of an Environmental Impact Report (EIR) and for successfully obtaining permits from the local conservation commission, the Massachusetts Department of Environmental Protection, and the United States Army Corps of Engineers (USACE) for the complex remediation of a historically contaminated at a 30-acre former paint factory site. She successfully obtained environmental permits and approvals under the Massachusetts Wetlands Protection Act, Section 401, Section 404, the Massachusetts Environmental Policy Act (MEPA), and the Massachusetts Waterways program for remediation of contaminated soils and sediments. The project included excavation of contaminated sediments from over six acres of wetlands, and the restoration and replacement of 7.5 acres of wetlands as compensatory mitigation. An extensive alternatives analysis was undertaken to allow relocation of wetlands needed to accommodate the construction of new athletic facilities as part of the remediation of the site. Dr. Standley led the VHB team that designed the wetland mitigation areas, including preparation of construction specifications and construction oversight.

Completion Date: 9/2006
VHB Project ID: 09927.00

Wellesley College, West Campus Improvements Project, Wellesley, MA

Environmental Task Manager

Dr. Standley was the Environmental Task Manager for the design and permitting of improvements to the western segment of the Wellesley College campus, including constructing a naturalized landscape and stormwater treatment wetland within a former parking lot. The project included alteration of wetlands adjacent to Lake Waban to remediate contaminated sediments, restoration of wetlands and upland buffer zones using native species, and invasive species controls, as well as enhanced public access to the lake.

Completion Date: 5/2009
VHB Project ID: 07877.00

Wetlands Delineation and Assessment, Centerville City, UT

Environmental Task Manager

Dr. Standley successfully obtained a United States Army Corps of Engineers (USACE) concurrence with the identification, delineation, and functional assessment of hydrologically-altered wetlands. She used vegetation analysis, soils analysis, and interpretation of historical

Continued, p. 19

aerial photographs to determine “normal circumstances” in disturbed saline wetlands on a 150-acre property within the Great Salt Lake basin. Dr. Standley conducted surveys of the property to determine migratory waterfowl usage and to document habitat of threatened and endangered plant and wildlife species.

Completion Date: 1/1999
VHB Project ID: 05695.00

Wrentham Village Premium Outlets, Wrentham, MA

Environmental Task Manager

Dr. Standley was responsible for existing conditions site analysis, wetland delineation, resource agency coordination, and permitting for construction of a major regional outlet mall. The project included obtaining local conservation commission and United States Army Corps of Engineers (USACE) concurrence with wetland delineations, and the design of an innovative stormwater treatment system.

Completion Date: 12/1996
VHB Project ID: 70592.00

Education

PhD, Botany, University of Washington, 1981

MS, Botany, Cornell University, 1977

BS, Botany/Ecology, Cornell University, 1975

Professional Registrations/ Certifications

Envision™ Sustainability Professional 2013

Affiliations/ Memberships

Society of Wetland Scientists

Society for Ecological Restoration

Association of Massachusetts Wetland Scientists

Massachusetts Association of Wetland Scientists

Society for Conservation Biology

Torrey Botanical Society

Erika (Gorczyca) Reeves

Environmental Scientist

As an Environmental Scientist, Ms. Reeves provides project support via extensive field experience associated with wetland, waterbody, habitat and general environmental assessment, permitting, compliance, and inspection services. She has also performed screening assessments for rare, threatened and endangered species. Ms. Reeves has performed several Ecological Risk Assessments and water quality testing programs and is well versed in state and federal regulations. She also provides leadership and coordination of rigorous field work programs requiring multi-agency and consultant coordination.

Addison Rutland Natural Gas Project, Phase 2 Vermont to New York

Water Quality Scientist

Prepared an Application for Vermont Gas Systems to Construct a Fuel Gas Transmission Line Under Article VII, Section 121-a of Public Service Law. Conducted consultations with federal, state and local permitting authorities as necessary to support the application. Provided SWPPP preparation support.

Completion Date:

VHB Project ID:

American Petroleum Institute, Clean Water Act Report

Environmental Scientist

Ms. Reeves was an Environmental Scientist at another firm where she provided team support and facilitated collaboration among an expert panel to create an impact analysis report for API based the new jurisdictional wetlands defined under the USACE and EPA Draft Guidance on Identifying Water Protected by the Clean Water Act.

Completion Date:

VHB Project ID: 88888.88

Constitution Pipeline Company, Williams, PA and NY

Environmental Scientist

Prior to joining VHB, Ms. Reeves was an Environmental Scientist at another firm where she worked on a Greenfield development of a 120-mile long transmission pipeline from PA to NY; two-part project included environmental assessment and public outreach. She performed responsibilities of a wetland field team lead, including: delineation of wetlands and streams, identification of sensitive habitat, threatened, endangered, rare and invasive species, coordination and planning of field team's activities, interaction with landowners and land agents, performing daily safety meetings and communication with field coordinator. Also doubled as a GPS technician utilizing Trimble YUMA with ArcPad to survey delineations. Created an outreach database including all public representatives, officials, and stakeholders associated with the 120 mile route. Collaborated with outreach team to conduct stakeholder meetings, landowner and stakeholder notifications, and FERC mailings and open houses.

Completion Date:

VHB Project ID: 88888.88

Duluth, Forest Glen Annex: Ecological Risk Assessments

Environmental Scientist

As an Environmental Scientist at another firm where she assisted in performing a Tier 1 and 2 Screening Level Ecological Risk Assessment (SERA), modeling and calculations, preparation of related SERA documents according to the USEPA guidance for superfund sites.

Completion Date:

VHB Project ID: 88888.88

Ms. Reeves recently joined VHB's Albany office with experience in environmental assessment, permitting, compliance, and inspection. She has performed screening assessments for rare, threatened and endangered species, has been responsible for project permitting and habitat assessment consultations, and has performed wetland delineation for wetlands and other Waters of the United States in support of permitting and remediation design.

4 years of professional experience

Continued, p. 2

Lower Passaic River Restoration Project, Cooperating Parties, RI/FS, NJ

Environmental Scientist

While with another firm, Ms. Reeves was involved with a large urban estuarine waterway with long industrial history and multiple sources of contamination, including chemical and biological where constituents of primary interest included dioxins, PCBs, heavy metals, and PAHs. She performed high-flow vertical profile sampling to evaluate the distribution of contaminants of concern within the water column during different tidal events for Chemical Water Column Monitoring (CWCM).

Completion Date:

VHB Project ID: 88888.88

NPS, Inventory & Monitoring

Biological Science Technician

Prior to joining VHB, Ms. Reeves was biological science technician for the National Park Service (NPS) where she gained experience in forest health sampling procedures and techniques, creation of permanent forest plots, and collection and separation of soil samples by horizon. She efficiently read topographic maps and navigated with GPS, map, and compass to perform duties in remote locations and gained experience in utilizing GPS equipment and software, electronic data collectors, and other monitoring and survey equipment. She demonstrated ability to work efficiently on a forest vegetation monitoring and research team with minimal supervision and gained knowledge of mid-Atlantic and Northeastern flora, and identified herbaceous and woody vegetation in the field.

Completion Date: 2009

VHB Project ID: 88888.88

Remediation Plan for Bloody Brook, Lockheed-Martin, Liverpool, NY

Environmental Scientist

Prior to joining VHB, Ms. Reeves was an Environmental Scientist at another firm where she was a member of wetland team for remediation of Bloody Brook. She performed wetland delineation for wetlands and other Waters of the United States in support of permitting and remediation design to reduce risk to human and ecological receptors from exposure to heavy metals in Bloody Brook. Ms. Reeves also assisted in the preparation of the design of the restoration of remediated wetlands, provided support to the RAWP team, and utilized ProUCL for statistical analysis and risk assessment.

Completion Date:

VHB Project ID: 88888.88

Sawkill Road Bridge over Sawkill, Ulster County, NY

Environmental Scientist

Ms. Reeves was an Environmental Scientist at another firm where she performed habitat screening assessment for rare, threatened and endangered species. She was responsible for project permitting and habitat assessment consultations.

Completion Date:

VHB Project ID: 88888.88

Continued, p. 3

Education

MS, Ecology and Environmental Science, University of Maine, 2011

BS, Environmental Science and Policy, Clarkson University, 2009

AS, Mathematics and Science, Jefferson Community College, 2006

Professional Registrations/ Certifications

OSHA Certified Hazardous Waste Health and Safety Operator (OSHA 1910.120) (8-Hour HAZWOPER Refresher) 2013 (reg. # S3NA-003-TP2)

OSHA Construction Safety and Health Certificate (10-Hour) 2013 (reg. # 36-004581179)

Erosion and Sediment Control for Contractors 2013 (reg. # 32T-103013-25)

Publications

Gorczyca, E., Leahy, J., Bell K.P., and Wilson, J., "Social Learning to Improve Use of Family Forest Models in Policy Decisions," to be submitted to Journal of Forestry. Full draft written, needs final review. Expected submission: June 30, 2013

Gorczyca, E., Leahy, J., Wilson, J., Bell K.P., and Mercier, W., "An Application of Agent-Based Modeling: Harvest Decisions of Family Forest Landowners in Maine," to be submitted to Forest Economics and Policy. Full draft written, needs final review. Expected submission: June 30, 2013

Gorczyca, E., Lyons, P., Leahy, J., and Johnson, T. "Improving Family Forest Knowledge Transfer through Social Network Analysis," to be submitted to the Northern Journal of Applied Forestry. Full draft written, needs final review. Expected submission: Spring, 2013

Leahy, J., and Gorczyca, E. "Opportunities and Challenges for Agent-Based Modeling of Family Forests: A Review," to be submitted to the Forest Science. Full draft written, needs final review. Expected submission: June 30, 2013.

Presentations

Gorczyca E., Leahy, J., and Mercier, W. "A Family Matter: The Use of Agent-Based Modeling and Social Learning to Promote Sustainable Family Forest Management in Maine," for the Small Woodland Owners Association of Maine Annual Meeting, January 2011. Augusta, ME

Gorczyca, E. "A Family Matter: The Use of Agent-Based

Continued, p. 4

Modeling and Social Learning to Promote Sustainable Family Forest Management in Maine," for the School of Forest Resources Noontime Seminar, December 2010. Orono, ME

Gorczyca, E. "A Family Matter: The Use of Agent-Based Modeling and Social Learning to Promote Sustainable Family Forest Solutions in Maine" Graduate Research Award Candidate Presentation, February 22, 2012. Orono, ME

Gorczyca, E. "A Family Matter: The Use of Agent-Based Modeling and Social Learning to Promote Sustainable Family Forest Solutions in Maine" Thesis Defense Seminar, December 2, 2011. Orono, ME

Gorczyca, E. "A Python Application of Agent-Based Modeling: Automating Data Analysis," Guest speaker for ERS 602: Topics in Earth Science- Computational Methods in Earth Science using Python, December 2010, Orono, ME

Gorczyca, E. and Leahy, J. "Opportunities and Challenges for Agent-Based Modeling in Family Forest Management" Guest lecture for ECO 581: Modeling Sustainability, October 17, 2011, Orono, ME

Gorczyca, E., Leahy, J., Bell, K., and Wilson, J. "Improving SES with SES: Considering the Suitability of Engaging Stakeholders in Forest-based Socio-ecological Systems Modeling," for the International Symposium on Society and Resource Management, June 2011. Madison, WI

Gorczyca, E., Leahy, J., Wilson, J., Bell, K., and Mercier, W. "Exploring Family Forests Using an Agent-Based

Gorczyca, E., Lyons, P., Leahy, J., and Johnson, T. "Applying Social Network Analysis to Identify Stakeholders for Engagement in Human Dimensions of Natural Resources Research," for the International Symposium on Society and Resource Management, June 2010. Corpus Christi, TX

Leahy, J., Gorczyca, E., Mercier, W., Hutchins, K., Lindenfeld, L., Silka, L., and Bell, K. "A Case Study of Combining Coupled Social-Ecological System Modeling with Knowledge-to-Action Research: Agent-Based Modeling of Family Forests," for the International Symposium on Society and Resource Management, June 2010. Corpus Christi, TX

Leahy, J., Gorczyca, E., Wilson, J., Bell, K., and Mercier, W. "An Application of Agent-Based Modeling: Harvest Decisions of Family Forest Landowners in Maine," for the

Continued, p. 5

International Symposium on Society and Resource Management, June 2011. Madison, WI

Model" for the Society of American Foresters National Convention, November 2011. Honolulu, Hawaii

Awards

Clarkson University Transfer Leadership Award ($33,000), 2006-2009

Phi Theta Kappa Scholarship ($18,000), 2006-2009

Northern NY Community Foundations, Inc. ($4,500), 2006-2009

Attachment C

NYS Breeding Bird Atlas

Block 6163C

2000-2005

Navigation Tools
Perform Another Search
Show All Records
Sort by Field Card Order
Sort by Taxonomic Order
View 1985 Data

Block 6163C Summary	
Total Species:	89
Possible:	31
Probable:	14
Confirmed:	44

Click on column heading to sort by that category.

List of Species Breeding in Atlas Block 6163C

Common Name	Scientific Name	Behavior Code	Date	NY Legal Status
Spotted Sandpiper	*Actitis macularius*	X1	7/18/2001	Protected
Red-winged Blackbird	*Agelaius phoeniceus*	FY	6/3/2004	Protected
Wood Duck	*Aix sponsa*	FL	7/20/2004	Game Species
Mallard	*Anas platyrhynchos*	X1	6/3/2004	Game Species
Ruby-throated Hummingbird	*Archilochus colubris*	X1	7/12/2000	Protected
Great Blue Heron	*Ardea herodias*	X1	7/12/2000	Protected
Tufted Titmouse	*Baeolophus bicolor*	FL	7/12/2000	Protected
Cedar Waxwing	*Bombycilla cedrorum*	NE	7/3/2002	Protected
Canada Goose	*Branta canadensis*	FL	5/17/2004	Game Species
Great Horned Owl	*Bubo virginianus*	NE	4/20/2005	Protected
Red-tailed Hawk	*Buteo jamaicensis*	FL	7/16/2003	Protected
Northern Cardinal	*Cardinalis cardinalis*	FL	7/14/2004	Protected
House Finch	*Carpodacus mexicanus*	FL	7/20/2004	Protected
Purple Finch	*Carpodacus purpureus*	X1	5/29/2004	Protected
Turkey Vulture	*Cathartes aura*	X1	7/12/2000	Protected
Veery	*Catharus fuscescens*	NY	7/18/2001	Protected
Chimney Swift	*Chaetura pelagica*	X1	7/18/2001	Protected
Killdeer	*Charadrius vociferus*	DD	6/3/2004	Protected

Black-billed Cuckoo	*Coccyzus erythropthalmus*	X1	7/18/2001	Protected
Northern Flicker	*Colaptes auratus*	X1	7/18/2001	Protected
Rock Pigeon	*Columba livia*	X1	6/3/2004	Unprotected
Eastern Wood-Pewee	*Contopus virens*	X1	7/12/2000	Protected
Black Vulture	*Coragyps atratus*	X1	7/14/2004	Protected
American Crow	*Corvus brachyrhynchos*	B2	3/14/2004	Game Species
Common Raven	*Corvus corax*	FL	6/13/2001	Protected
Blue Jay	*Cyanocitta cristata*	X1	7/12/2000	Protected
Prairie Warbler	*Dendroica discolor*	X1	6/3/2004	Protected
Blackburnian Warbler	*Dendroica fusca*	FL	7/12/2000	Protected
Chestnut-sided Warbler	*Dendroica pensylvanica*	X1	6/3/2004	Protected
Yellow Warbler	*Dendroica petechia*	P2	5/17/2004	Protected
Black-throated Green Warbler	*Dendroica virens*	FY	7/14/2004	Protected
Bobolink	*Dolichonyx oryzivorus*	T2	6/3/2004	Protected
Pileated Woodpecker	*Dryocopus pileatus*	X1	7/16/2003	Protected
Gray Catbird	*Dumetella carolinensis*	FY	6/8/2004	Protected
Least Flycatcher	*Empidonax minimus*	FY	7/14/2004	Protected
Willow Flycatcher	*Empidonax traillii*	X1	7/18/2001	Protected
Acadian Flycatcher	*Empidonax virescens*	S2	7/20/2004	Protected
American Kestrel	*Falco sparverius*	X1	7/20/2004	Protected
Common Yellowthroat	*Geothlypis trichas*	FY	7/12/2000	Protected
Worm-eating Warbler	*Helmitheros vermivorum*	X1	7/16/2003	Protected
Barn Swallow	*Hirundo rustica*	FL	7/20/2004	Protected
Wood Thrush	*Hylocichla mustelina*	FY	7/14/2004	Protected
Baltimore Oriole	*Icterus galbula*	P2	5/17/2004	Protected
Dark-eyed Junco	*Junco hyemalis*	FY	7/14/2004	Protected
Belted Kingfisher	*Megaceryle alcyon*	S2	7/20/2004	Protected
Red-bellied Woodpecker	*Melanerpes carolinus*	X1	7/12/2000	Protected
Swamp Sparrow	*Melospiza georgiana*	X1	5/17/2004	Protected
Song Sparrow	*Melospiza melodia*	P2	5/17/2004	Protected
Northern Mockingbird	*Mimus polyglottos*	FL	7/20/2004	Protected
Black-and-white Warbler	*Mniotilta varia*	X1	7/14/2004	Protected
Brown-headed Cowbird	*Molothrus ater*	FL	8/11/2001	Protected

Great Crested Flycatcher	*Myiarchus crinitus*	X1	7/14/2004	Protected
House Sparrow	*Passer domesticus*	FL	7/20/2004	Unprotected
Savannah Sparrow	*Passerculus sandwichensis*	T2	6/3/2004	Protected
Indigo Bunting	*Passerina cyanea*	FL	7/20/2004	Protected
Ring-necked Pheasant	*Phasianus colchicus*	X1	6/3/2004	Game Species
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	FL	7/20/2004	Protected
Downy Woodpecker	*Picoides pubescens*	X1	7/12/2000	Protected
Eastern Towhee	*Pipilo erythrophthalmus*	X1	7/18/2001	Protected
Scarlet Tanager	*Piranga olivacea*	S2	7/14/2004	Protected
Black-capped Chickadee	*Poecile atricapillus*	FL	7/14/2004	Protected
Blue-gray Gnatcatcher	*Polioptila caerulea*	X1	5/17/2004	Protected
Common Grackle	*Quiscalus quiscula*	FY	6/3/2004	Protected
Bank Swallow	*Riparia riparia*	NY	5/29/2004	Protected
Eastern Phoebe	*Sayornis phoebe*	NY	7/18/2001	Protected
Ovenbird	*Seiurus aurocapilla*	FY	7/18/2001	Protected
Louisiana Waterthrush	*Seiurus motacilla*	FY	7/18/2001	Protected
American Redstart	*Setophaga ruticilla*	FL	7/12/2000	Protected
Eastern Bluebird	*Sialia sialis*	FY	5/29/2004	Protected
White-breasted Nuthatch	*Sitta carolinensis*	X1	7/18/2001	Protected
Yellow-bellied Sapsucker	*Sphyrapicus varius*	ON	5/17/2004	Protected
American Goldfinch	*Spinus tristis*	X1	7/12/2000	Protected
Chipping Sparrow	*Spizella passerina*	NY	6/13/2001	Protected
Field Sparrow	*Spizella pusilla*	S2	7/20/2004	Protected
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	ON	6/3/2004	Protected
Eastern Meadowlark	*Sturnella magna*	S2	6/3/2004	Protected
European Starling	*Sturnus vulgaris*	FY	6/3/2004	Unprotected
Tree Swallow	*Tachycineta bicolor*	FL	7/20/2004	Protected
Carolina Wren	*Thryothorus ludovicianus*	X1	7/14/2004	Protected
House Wren	*Troglodytes aedon*	FL	7/20/2004	Protected
Winter Wren	*Troglodytes troglodytes*	FL	7/13/2005	Protected
American Robin	*Turdus migratorius*	NY	8/11/2001	Protected
Eastern Kingbird	*Tyrannus tyrannus*	FL	7/20/2004	Protected

Blue-winged Warbler	*Vermivora pinus*	X1	5/17/2004	Protected
Yellow-throated Vireo	*Vireo flavifrons*	P2	5/17/2004	Protected
Warbling Vireo	*Vireo gilvus*	S2	6/3/2004	Protected
Red-eyed Vireo	*Vireo olivaceus*	FY	7/14/2004	Protected
Blue-headed Vireo	*Vireo solitarius*	FY	6/12/2002	Protected
Mourning Dove	*Zenaida macroura*	P2	6/3/2004	Protected

Current Date: 7/24/2014

NYS Breeding Bird Atlas

Block 6162A

2000-2005

Navigation Tools
Perform Another Search
Show All Records
Sort by Field Card Order
Sort by Taxonomic Order
View 1985 Data

Block 6162A Summary	
Total Species:	83
Possible:	27
Probable:	23
Confirmed:	33

Click on column heading to sort by that category.

List of Species Breeding in Atlas Block 6162A

Common Name	Scientific Name	Behavior Code	Date	NY Legal Status
Red-winged Blackbird	*Agelaius phoeniceus*	T2	7/10/2002	Protected
Ruby-throated Hummingbird	*Archilochus colubris*	X1	5/24/2002	Protected
Tufted Titmouse	*Baeolophus bicolor*	FY	6/12/2002	Protected
Cedar Waxwing	*Bombycilla cedrorum*	B2	6/21/2002	Protected
Ruffed Grouse	*Bonasa umbellus*	NE	//2000	Game Species
Great Horned Owl	*Bubo virginianus*	NE	//2000	Protected
Red-tailed Hawk	*Buteo jamaicensis*	NY	5/16/2001	Protected
Northern Cardinal	*Cardinalis cardinalis*	X1	5/28/2003	Protected
Purple Finch	*Carpodacus purpureus*	X1	5/28/2003	Protected
Turkey Vulture	*Cathartes aura*	X1	5/28/2003	Protected
Veery	*Catharus fuscescens*	D2	5/12/2004	Protected
Hermit Thrush	*Catharus guttatus*	S2	6/21/2002	Protected
Brown Creeper	*Certhia americana*	X1	6/21/2002	Protected
Chimney Swift	*Chaetura pelagica*	X1	6/12/2002	Protected
Yellow-billed Cuckoo	*Coccyzus americanus*	S2	6/21/2002	Protected
Black-billed Cuckoo	*Coccyzus erythropthalmus*	X1	5/16/2002	Protected
Northern Flicker	*Colaptes auratus*	FL	6/21/2002	Protected
Rock Pigeon	*Columba livia*	X1	5/28/2003	Unprotected
Eastern Wood-Pewee	*Contopus virens*	FY	8/10/2002	Protected

Black Vulture	*Coragyps atratus*	NE	5/5/2002	Protected
American Crow	*Corvus brachyrhynchos*	X1	7/10/2002	Game Species
Common Raven	*Corvus corax*	NY	4//2002	Protected
Blue Jay	*Cyanocitta cristata*	FL	8/11/2001	Protected
Prairie Warbler	*Dendroica discolor*	X1	5/24/2002	Protected
Blackburnian Warbler	*Dendroica fusca*	P2	5/28/2003	Protected
Magnolia Warbler	*Dendroica magnolia*	X1	7/16/2005	Protected
Chestnut-sided Warbler	*Dendroica pensylvanica*	P2	5/16/2002	Protected
Yellow Warbler	*Dendroica petechia*	X1	5/24/2002	Protected
Black-throated Green Warbler	*Dendroica virens*	FY	8/11/2001	Protected
Pileated Woodpecker	*Dryocopus pileatus*	P2	5/24/2002	Protected
Gray Catbird	*Dumetella carolinensis*	FY	6/13/2001	Protected
Least Flycatcher	*Empidonax minimus*	S2	5/24/2002	Protected
Acadian Flycatcher	*Empidonax virescens*	FL	7/10/2002	Protected
Common Yellowthroat	*Geothlypis trichas*	X1	6/12/2002	Protected
Worm-eating Warbler	*Helmitheros vermivorum*	X1	5/28/2003	Protected
Barn Swallow	*Hirundo rustica*	NE	5/28/2003	Protected
Wood Thrush	*Hylocichla mustelina*	B2	5/12/2004	Protected
Baltimore Oriole	*Icterus galbula*	NE	5/28/2003	Protected
Dark-eyed Junco	*Junco hyemalis*	NY	6/14/2002	Protected
Belted Kingfisher	*Megaceryle alcyon*	X1	5/24/2002	Protected
Red-bellied Woodpecker	*Melanerpes carolinus*	X1	6/21/2002	Protected
Wild Turkey	*Meleagris gallopavo*	X1	6/12/2002	Game Species
Song Sparrow	*Melospiza melodia*	FY	5/16/2001	Protected
Northern Mockingbird	*Mimus polyglottos*	X1	5/28/2003	Protected
Black-and-white Warbler	*Mniotilta varia*	FY	6/13/2001	Protected
Brown-headed Cowbird	*Molothrus ater*	D2	5/16/2002	Protected
Great Crested Flycatcher	*Myiarchus crinitus*	X1	6/12/2002	Protected
Northern Parula	*Parula americana*	NY	6/12/2002	Protected
House Sparrow	*Passer domesticus*	X1	7/10/2002	Unprotected
Indigo Bunting	*Passerina cyanea*	FY	6/21/2002	Protected
Cliff Swallow	*Petrochelidon pyrrhonota*	NY	6/13/2001	Protected

Rose-breasted Grosbeak	*Pheucticus ludovicianus*	FL	8/10/2002	Protected
Downy Woodpecker	*Picoides pubescens*	X1	6/21/2002	Protected
Hairy Woodpecker	*Picoides villosus*	FY	6/21/2002	Protected
Eastern Towhee	*Pipilo erythrophthalmus*	S2	6/21/2002	Protected
Scarlet Tanager	*Piranga olivacea*	FY	6/21/2002	Protected
Black-capped Chickadee	*Poecile atricapillus*	FY	5/24/2000	Protected
Blue-gray Gnatcatcher	*Polioptila caerulea*	S2	5/24/2002	Protected
Common Grackle	*Quiscalus quiscula*	X1	6/12/2002	Protected
Bank Swallow	*Riparia riparia*	FY	6/13/2001	Protected
Eastern Phoebe	*Sayornis phoebe*	S2	6/21/2002	Protected
Ovenbird	*Seiurus aurocapilla*	S2	5/24/2002	Protected
Louisiana Waterthrush	*Seiurus motacilla*	FL	5/24/2000	Protected
American Redstart	*Setophaga ruticilla*	FY	8/10/2002	Protected
White-breasted Nuthatch	*Sitta carolinensis*	S2	6/21/2002	Protected
Yellow-bellied Sapsucker	*Sphyrapicus varius*	FY	6/21/2002	Protected
American Goldfinch	*Spinus tristis*	P2	5/16/2002	Protected
Chipping Sparrow	*Spizella passerina*	D2	5/16/2002	Protected
Field Sparrow	*Spizella pusilla*	B2	5/16/2002	Protected
Barred Owl	*Strix varia*	FL	//2000	Protected
European Starling	*Sturnus vulgaris*	NY	6/13/2001	Unprotected
Carolina Wren	*Thryothorus ludovicianus*	X1	7/10/2002	Protected
House Wren	*Troglodytes aedon*	X1	7/10/2002	Protected
Winter Wren	*Troglodytes troglodytes*	FL	7/16/2005	Protected
American Robin	*Turdus migratorius*	NY	5/16/2002	Protected
Eastern Kingbird	*Tyrannus tyrannus*	P2	5/24/2002	Protected
Blue-winged Warbler	*Vermivora pinus*	X1	5/16/2002	Protected
Yellow-throated Vireo	*Vireo flavifrons*	T2	5/16/2002	Protected
Warbling Vireo	*Vireo gilvus*	T2	5/28/2003	Protected
Red-eyed Vireo	*Vireo olivaceus*	NY	6/12/2002	Protected
Blue-headed Vireo	*Vireo solitarius*	X1	5/24/2002	Protected
Canada Warbler	*Wilsonia canadensis*	B2	6/13/2001	Protected
Mourning Dove	*Zenaida macroura*	X1	5/16/2002	Protected

Current Date: 7/24/2014

Breeding Bird Survey – Parcel 1

Silo Ridge Resort Community

Amenia
New York

Prepared for: Silo Ridge Ventures, LLC.
5021 US Route 44
Amenia, New York 12501
Phone: 845.373.8020

Prepared by: VHB Engineering, Surveying and Landscape Architecture, P.C.
50 Main Street, Suite 360
White Plains, NY 10606
Phone: 914.761.3582

August, 2014

1 Introduction

1.1 Purpose of this Report

A breeding bird survey was conducted for the Silo Ridge South Parcel, an area that was not surveyed for the 2008 Habitat Management Plan but is now included in the development plan. The purpose of this survey was to identify the avian species using the site, and to particularly to determine whether the portions of the South Parcel site included in the development plan provides habitat for grassland bird species. The survey was requested by the Town's environmental consultant, Dr. Michael Klemens.

1.2 Site Description

Parcel 1 is located along Route 22, south of the main Silo Ridge property. It is bisected by an unpaved road. The property includes the former Hudson Valley Landfill. During an initial site evaluation on May 8, 2014, Parcel 1 was characterized as eight distinct vegetation/cover type units, described below and shown on Figure 1.

- **Area A** (5.4 acres) – immediately north of the South Gate. A rolling area of roughly mowed cultural grassland (grassland dominated by introduced grass species) with small islands of shrubs and trees. The grass is mowed to control shrub establishment. Dominant species include *Festuca* spp. (fescues), *Galium* spp. (bedstraws), asters, *Vicia* sp. (vetch), red clover (*Trifolium pratense*) and yellow hop clover (*T. dubium*). Shrubs are primarily the invasive *Elaeagnus*, with some *Rosa multiflora*. Scattered small trees are primarily cottonwood (*Populus deltoides*).
- **Area B** (4.8 acres) - west and north of Area A. This area has more steeply sloping topography and bedrock outcrops, with areas of exposed gravel soils. The non-native grasses dominant in Site A are largely replaced with the native little bluestem (*Schizachyrium scoparium*). A dense thicket of invasive shrubs, primarily *Elaeagnus* (Russian or autumn olive) occurs between the field and the woods to the north. Small thicketts of the non-native mugwort (*Artemisia vulgaris*) and sparse small red cedars (*Juniperus virginiana*) also occur in Area B.

- **Area C (**4.4 acres**)** – this is a flat area with apparently richer soils than Area B, and has a similar plant composition to Area A. Area C transitions to a small forested area with dense shrub borders.
- **Area D** (9.2 acres) – this mostly natural area is a slope separating the golf course from the capped former landfill. It consists of patches of grass (similar to Area A) interspersed with shrub patches and small stands of gray birch (*Betula populifolia*).
- **Area E** (15.1 acres) – the capped former landfill (the former Hudson Valley Landfill), is a large flat expanse of cultural grassland with an array of hoods and vents. The vegetation is quite uniform, a dense grass cover of *Festuca* and *Poa* (bluegrass) species, with some patches of *Setaria* (foxtail grass*). Galium, Trifolium,* asters, and *Vicia* are also common. There are no shrubs in this area. Area E is mowed as required by NYSDEC to maintain the landfill cap.
- **Area H** (3.4 acres) - the slope below Area E. This slope is dominated by invasive shrubs interspersed with patches of mugwort.
- **Area I-J** (8.2 acres) is a flat area north of an earthen dam. It appears likely that the entire area was once a farm pond. Currently, the western portion of this area is vegetated by cultural grassland, with a high proportion of mugwort. Wetland species, including *Phalaris arundinacea* (reed canary grass), some *Lythrum salicaria* (purple loosestrife), and occasional *Carex* spp. also occur here, as well as a small stand of cottonwoods. This grassland is being overtaken by *Phragmites*. (common reed) This vegetation type transitions into a wetland with patches of open water and shrubs, as well as a dense stand of *Phragmites*.

According to Kiviat[1], these communities are characterized as old fields (Area B, D, H, I), mowed fields and pastures (Area A, C, E) and marshes (Area J). Cunningham et al.[2] characterize these as shrubland, grassland, and non-tidal wetlands. A more fine-grained ecological classification is provided by Edinger et al.[3]. Based on the NYSDEC classification, communities on Parcel 1 include Successional Old Field, Successional Shrubland, Landfill, Shallow Emergent Marsh, and Reed Grass/Purple Loosestrife Marsh.

Although there are forested areas west and north of the parcel, these were not investigated as part of this survey and are similar to the forested habitats included in the 2008 study.

1.3 Methodology

The breeding bird survey included a preliminary survey in early May, 2014 and a detailed survey on May 29, 2014.

[1] Kiviat, Eric. 1984. Vegetation of Dutchess County, New York. In The Hudson Valley Regional Review, September 1984. Pp 144-173.
[2] Cunningham, Mary Ann, Neil Curri, Robert Wills. 2010. Biological Resources and Biodiversity of Dutchess County, NY. Natural Resources Inventory of Dutchess County NY, Chapter 6.
[3] Edinger, G.J. et al. 2002. Ecological Communities of New York State. Second Edition (Draft). New York Natural Heritage Program, NYSDEC.

1.3.1 Preliminary Survey

VHB biologists conducted a preliminary survey on May 8, 2014 to map vegetation units, identify survey point locations, and record bird species present on that date. Because May 8 is early in the migratory season, birds present may be still migrating further north, or may not have established breeding territories. The birds observed at that date are indicative of birds that may nest on the site, but cannot be confirmed as breeding species. This preliminary survey was conducted from 9 AM to 12 PM. The temperature was 55^0F, and there was a light drizzle. Bird species recorded were seen or identified by calls/song.

1.3.2 Detailed Survey

The detailed survey was conducted using standard point-centered breeding bird survey methods. VHB biologists stood at pre-determined survey points for 15-minute intervals, and recorded all bird species seen or identified by calls/song. Where possible, the number of birds of each species was recorded. However, the numbers may not be accurate given that the birds were moving around within each vegetation unit and, in some cases, between vegetation units. Any additional species observed while walking between survey points were also recorded.

Species were classified as confirmed breeding if nesting, carrying nesting materials, or carrying food was observed. Species were classified as probable breeding if pairs were observed, or territorial singing was observed. Species classified as potential breeding were observed to be foraging on the site, as a single individual or if preferred nesting habitat was not present. Species classified as "flyover" were flying over the site, either in transit or foraging for aerial insects. This classification system was based on the New York Breeding Bird Atlas methodology[4].

The survey was conducted from 6 AM to 9:30 AM on May 29. Weather was clear with no wind. Temperature ranged from 42^0 to 59^0.

On May 29, we observed that all of the grassed areas (Area A, Area C, Area E) had been mowed subsequent to the May 8, 2014 preliminary site visit. Grass heights averaged 6 inches. Several forbs, particularly *Trifolium dubium*, were in flower. The shrubs (*Elaeagnus, Lonicera* spp.) were also in bloom.

1.4 Qualifications

The Breeding Bird survey was conducted by Dr. Lisa Standley. Dr. Standley is an ecologist and VHB's Chief Environmental Scientist. She has over 25 years of conducting wildlife habitat and bird surveys in the Northeast, with a focus on surveys of grassland bird species (grasshopper sparrow, eastern meadowlark, upland sandpiper). In addition to her professional

▼

[4] NYS Department of Environmental conservation, NYS Breeding Bird Atlas 2000. http://www.dec.ny.gov/cfmx/extabbs/bba/index accessed May 30 2014.

qualifications, Dr. Standley serves on the Massachusetts Audubon Society Council and Science Advisory Committee.

2 Results

2.1 Breeding Bird Survey – Species Recorded

A total of 36 species were recorded at Parcel 1 over the two site visits. Of these, 24 were confirmed/probable/potential breeding species.

2.1.1 Preliminary Survey

A total of 16 species were observed in early May, either within the identified vegetation units or were heard calling from the adjacent forested areas. The most abundant species observed were red-winged blackbirds (in Area J), catbirds (all areas), and towhees (Areas B, D).

2.1.2 Detailed Survey

A total of 32 species were observed on May 29, either within the vegetation study units, the adjacent off-site woods (4), or flying overhead (4). The remaining 24 species are confirmed breeding (red-winged blackbird, field sparrow, robin), probable (indigo bunting, willow flycatcher, northern oriole, song sparrow, warbling vireo, blue-winged warbler, prairie warbler, yellow warbler, and northern yellowthroat) or potential breeding species. Killdeer were seen only in Area E, the capped landfill, and were classified as "confirmed" on the basis of broken-wing behavior. The most abundant species in the wetland was red-winged blackbird; robin was most abundant in the upland, followed by catbird and the warbler species.

Table 1. Bird Survey Observations, May 2014

May 29	May 8	Observation/Breeding Status[1]
Blackbird, red-winged	Blackbird, red-winged	Confirmed Breeding
Blue jay		Potential Breeding
Bunting, indigo		Probable Breeding
Cardinal		Potential Breeding
Catbird, gray	Catbird	Confirmed Breeding
Cedar waxwing		Potential Breeding
Chimney swift		Flyover – no habitat present within study area
Cowbird, brown-headed		Potential Breeding
	Flicker, northern	No breeding habitat within study area
Dove, mourning		Flyover – not breeding within study area
Flycatcher, willow		Probable Breeding
Goldfinch		Potential Breeding
Grackle, common		Potential Breeding
Hummingbird, ruby-throated		Probable Breeding (note: feeding on *Lonicera* and *Elaeagnus*)
Killdeer		Confirmed Breeding
Kingbird, eastern		Potential Breeding
Oriole, northern		Probable Breeding
Ovenbird	Ovenbird	No breeding habitat within study area
	Phoebe, eastern	Observed May 8, not present May 29
Redstart	Redstart	Observed in woods, not within study area
Robin	Robin	Confirmed Breeding
Sparrow, chipping		Potential Breeding
Sparrow, field	Sparrow, field	Confirmed Breeding
Sparrow, song	Sparrow, song	Probable Breeding
Swallow, barn		Flyover – no breeding habitat within study area
Swallow, tree		Flyover – no breeding habitat within study area
Thrush, wood		No breeding habitat within study area
Towhee, eastern	Towhee, eastern	Potential Breeding
Turkey		No breeding habitat within study area
Vireo, warbling	Vireo, warbling	Probable Breeding
	Warbler, black and white	Observed May 8, not present May 29
Vulture, turkey		No breeding habitat within study area
Warbler, blue-winged	Warbler, blue-winged	Probable Breeding

Warbler, prairie	Warbler, prairie	Probable Breeding
Warbler, yellow	Warbler, yellow	Probable Breeding
Yellowthroat, common	Yellowthroat, common	Probable Breeding

1 NYS Department of Environmental Conservation, NYS Breeding Bird Atlas breeding categories

2.2 Discussion

The study shows that the majority of confirmed or probable breeding bird species using Parcel 1 were present during the first week of May. Two species seen during the preliminary survey were not present in late May (eastern phoebe, black and white warbler), indicating that these species either failed to establish breeding territories or were still in migration.

The breeding bird species on Parcel 1 are characteristic of marsh and shrub-swamp wetlands (red-winged blackbird, willow flycatcher, yellow warbler, common yellowthroat) and of oldfield habitats (catbird, towhee, blue-winged warbler, prairie warbler, field sparrow, song sparrow, robin, indigo bunting). Two species (warbling vireo, northern oriole) preferentially nest in tall trees, often near watercourses, consistent with our field observations of these species in the taller cottonwoods near Wetland J.

None of the species observed on Parcel 1, whether breeding, foraging, or transient, are considered to be NY species of special concern. None of these are obligate grassland species (for example, grasshopper sparrow, upland sandpiper, bobolink, savannah sparrow). The species observed in Parcel 1 are characteristic of common oldfield and wetland habitats found throughout Dutchess County (see Kiviat 1984; Cunningham et al. 2010).

The NYS Breeding Bird Atlas[5] includes Parcel 1 within Survey Block 6163C. The 2000-2005 Survey identified 89 confirmed, probable or possible species within this block. All of the species identified during the May 2014 Parcel 1 survey were previously recorded in the Atlas Block 6163C.

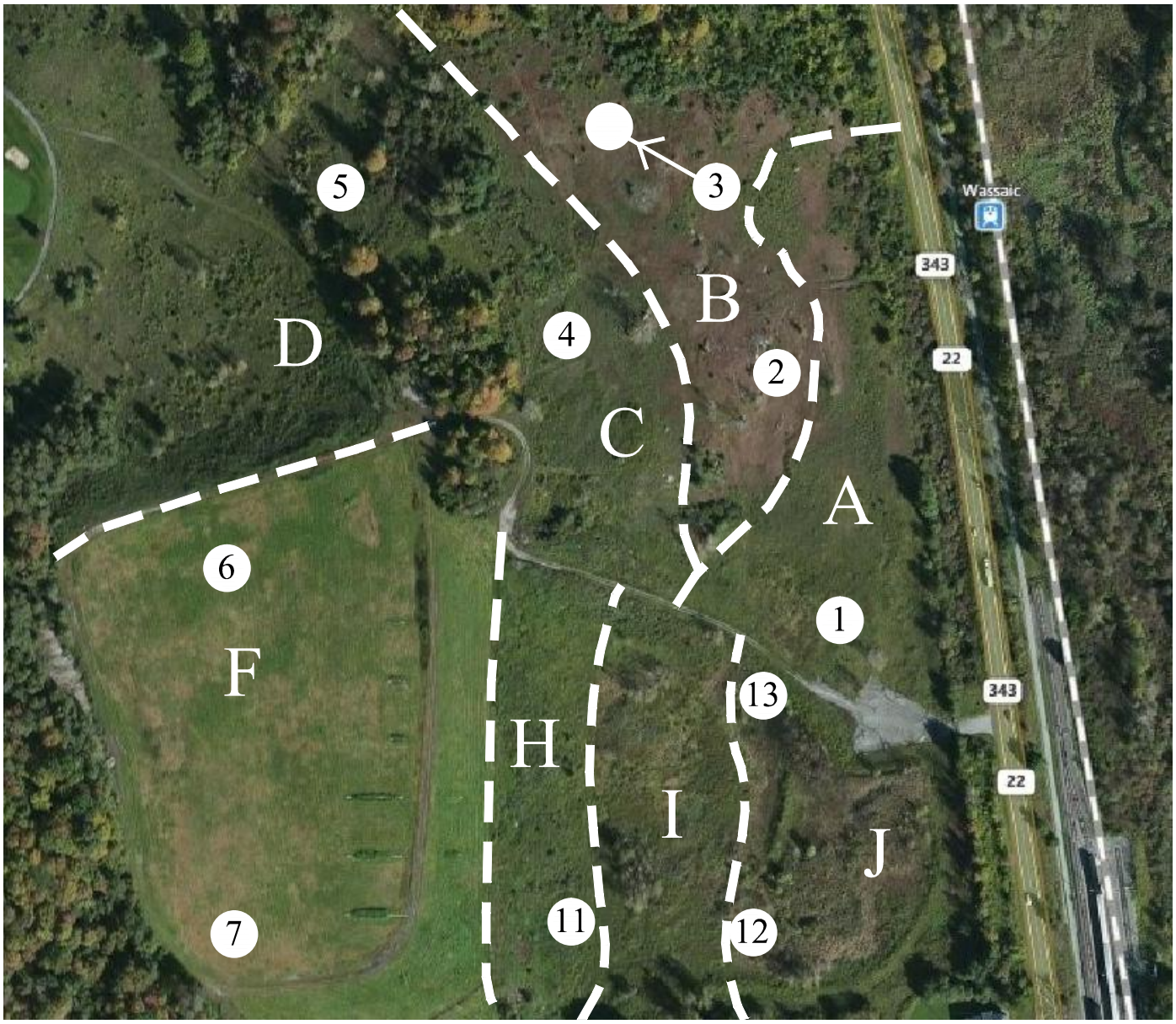
The Town's consultant asked if the old-field and grassland areas (A, B, C) would have the potential to be an "attraction zone" for grassland species if these areas were not mowed. These areas together total 14.6 acres (5.9 hectares) of grassland habitat. In the absence of mowing, it is most likely that invasive shrubs (*Elaeagnus*, *Lonicera*, *Rosa multiflora*) would replace the grass. These species are already present in shrub patches and dominate the northern portion of Area A under existing conditions. This grassed area is not large enough to support populations of area-sensitive grassland sparrows (savannah sparrow, grasshopper sparrow, henslow's sparrow) or other species (bobolink, eastern meadowlark). Smith (1997) found the minimum grassland required for grassland sparrows in upstate New York to be 29 acres (11.7 ha), 40 acres (16.2 ha) and 82 acres (33.2 ha), respectively[6]. He found that

▼

[5] NYS Department of Environmental conservation, NYS Breeding Bird Atlas 2000. http://www.dec.ny.gov/cfmx/extabbs/bba/index accessed May 30 2014.

[6] Smith, C.R. 1997. Use of Public Grazing Lands by Henslow's Sparrows, Grasshopper Sparrows, and Associated Grassland Birds in Central New York State. In Vickery, P.D. and P.W. Dunwiddie, eds. Grasslands of Eastern North America: Ecology and Conservation of Native and Agricultural Landscapes. Massachusetts Audubon Society. Lincoln, MA. Pp. 171-186.

bobolinks and eastern meadowlarks require substantially larger areas (40 acres, 16.2 ha, and 59 acres, 24 ha). While Site E, the former landfill, would have suitable habitat for bobolinks (tall dense mesic grassland) if not mowed, this area is only 15 acres (6 ha) in size and would be unlikely to support a viable population.



VHB Engineering, Surveying & Landscape Architecture, P.C.

Field Sketch - Parcel 1 Bird Survey
Not To Scale

Figure 1
June 3, 2014

Silo Ridge Resort Community
4561 Route 22
Amenia, New York 12501

Attachment D

List of Species Reported for the Amenia, New York Quadrangle Topographic Map during the New York Amphibian and Reptile Atlas Project Survey (1990-1999)

American bullfrog	*Rana catesbeiana*
black rat snake	*Elaphe obsoleta obsoleta*
bog turtle	*Clemmys muhlenbergii*
common musk turtle	*Sternotherus oderatus*
common snapping turtle	*Chelydra serpentina*
eastern American toad	*Bufo americanus*
eastern box turtle	*Terrapene carolina*
eastern garter snake	*Thamnophis sirtalis*
eastern milk snake	*Lampropeltis triangulum*
eastern ribbon snake	*Thamnophis sauritus*
gray treefrog	*Hyla versicolor*
green frog	*Rana clamitans*
northern black racer	*Coluber c. constrictor*
northern brown snake	*Storeria d. dekayi*
northern leopard frog	*Rana pipiens*
northern redback salamander	*Plethodon cinereus*
northern ringneck snake	*Diadophis punctatus*
northern spring peeper	*Pseudacris crucifer*
northern two-line salamander	*Eurycea bislineata*
northern water snake	*Nerodia sipedon*
painted turtle	*Chrysemys picta*
pickerel frog	*Rana palustris*
red-spotted newt	*Notophthalmus viridescens*
spotted turtle	*Clemmys guttata*
timber rattlesnake	*Crotalus horridus*
wood frog	*Rana sylvatica*
wood turtle	*Clemmys insculpta*

Sent from my iPhone

Begin forwarded message:

From: <fenbois@aol.com>
Date: September 12, 2013, 2:27:30 PM EDT
To: <ADeCesare@VHB.com>
Cc: <smetcalfe@ameniany.gov>, <npeek@ameniany.gov>, <ma_johnson@frontiernet.net>
Subject: Field Catalog

Dear Amanda:

Attached is a copy of my field catalog showing Field No's 19772-75 specimens collected during our site visit on 8/20 that will be deposited at the American Museum of Natural History as per the conditions of my scientific collectors license.

MWK 19972 are two larvae of the red spotted newt--one of these was nearing transformation into a red eft (which would then spend several years on land before returning to water)

MWK 19973 is an adult female red spotted newt still exhibiting some granulations in the skin indicating it had just returned to water from the multi-year terrestrial eft stage

MWK 19974 are three gray tree frog tadpoles representing that this species had bred twice in this wetland in 2013 by the size and development variation of these three tadpoles

MWK 19975 are two green frog tadpoles, one small tadpole from eggs deposited in 2013, and a transforming tadpole from eggs laid in 2011. This indicates that a portion of this wetland is permanent or semi permanent as it has not dried completely for at least three seasons. It is possible (and likely) that when the meadow floods out of the deeper central pool, tadpoles move out into the meadow because of the combination of warm shallow water and lots of vegetation to feed on that is conducive to their development. I would consider the meadow a seasonal wetland, that is attached to a permanent/semi-permanent wetland. This makes this wetland complex of high amphibian value and warrants more detailed investigation next spring.

Quite a bit of information from a few sample jars!

Michael W. Klemens

Attachment E

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES AND CANDIDATE SPECIES IN NEW YORK (By County)

This list represents the best available information regarding known or likely County occurrences of Federally-listed and candidate species and is subject to change as new information becomes available.

COUNTY Common Name	Scientific Name	Status
CLINTON		
Bald eagle	*Haliaeetus leucocephalus*	D
Indiana bat (S)	*Myotis sodalis*	E
COLUMBIA		
Bald eagle	*Haliaeetus leucocephalus*	D
Bog turtle	*Clemmys [=Glyptemys] muhlenbergii*	T
Indiana bat (S)	*Myotis sodalis*	E
New England cottontail	*Sylvilagus transitionalis*	C
CORTLAND		
Bald eagle[2]	*Haliaeetus leucocephalus*	D
DELAWARE		
Bald eagle	*Haliaeetus leucocephalus*	D
Dwarf wedgemussel	*Alasmidonta heterodon*	E
Northern monkshood	*Aconitum noveboracense*	T
DUTCHESS		
Bald eagle	*Haliaeetus leucocephalus*	D
Bog turtle	*Clemmys [=Glyptemys] muhlenbergii*	T
Dwarf wedgemussel (Housatonic River Drainage)	*Alasmidonta heterodon*	E
Indiana bat (S)	*Myotis sodalis*	E
New England cottontail	*Sylvilagus transitionalis*	C
ERIE		
Bald eagle[2]	*Haliaeetus leucocephalus*	D
ESSEX		
Indiana bat (W/S)	*Myotis sodalis*	E
FRANKLIN		
Bald eagle[2]	*Haliaeetus leucocephalus*	D
FULTON		
Bald eagle[2]	*Haliaeetus leucocephalus*	D

June 4, 2014

VIA ELECTRONIC MAIL

Ref: 29011.00

Ms. Tara Salerno
Information Services
New York Natural Heritage Program
New York State Department of
Environmental Conservation
625 Broadway, 5th Floor
Albany, New York 12233-4757

Re: Undeveloped Property
Route 22
Town of Amenia
Dutchess County, New York
Town of Amenia Tax Map No.: 7066-00-870350

Dear Ms. Salerno:

VHB Engineering, Surveying and Landscape Architecture, P.C. (VHB) is serving as engineering and environmental consultant to Harlem Valley Landfill, Corp (the "applicant"), which is considering improvements at the above-referenced 88-acre property (the "subject property", see enclosed site location map and excerpt of the USGS Topographic Map, Amenia, New York Quadrangle). The subject property is currently undeveloped with any existing structures and is comprised of an inactive (capped) landfill, meadows, woodlands and wetland habitat. Specifically, the applicant is considering constructing an access driveway and maintenance facility at the subject property, in association with improvements to an existing golf course and a proposed residential development located at the northern adjoining property. As part of the environmental review of the proposed action being conducted by the Town of Amenia Planning Board, VHB has been contracted by our client to prepare an existing ecological conditions assessment of the subject property.

In connection with the existing ecological conditions assessment, we are writing to ask whether there are any New York Natural Heritage Program records of rare plants, animals or significant natural communities at, or proximate to, the subject property.

VHB Engineering, Surveying
and Landscape Architecture, P.C.
2150 Joshua's Path, Suite 300
Hauppauge, New York 11788
631.234.3444 ▪ FAX 631.234.3477
www.vhb.com

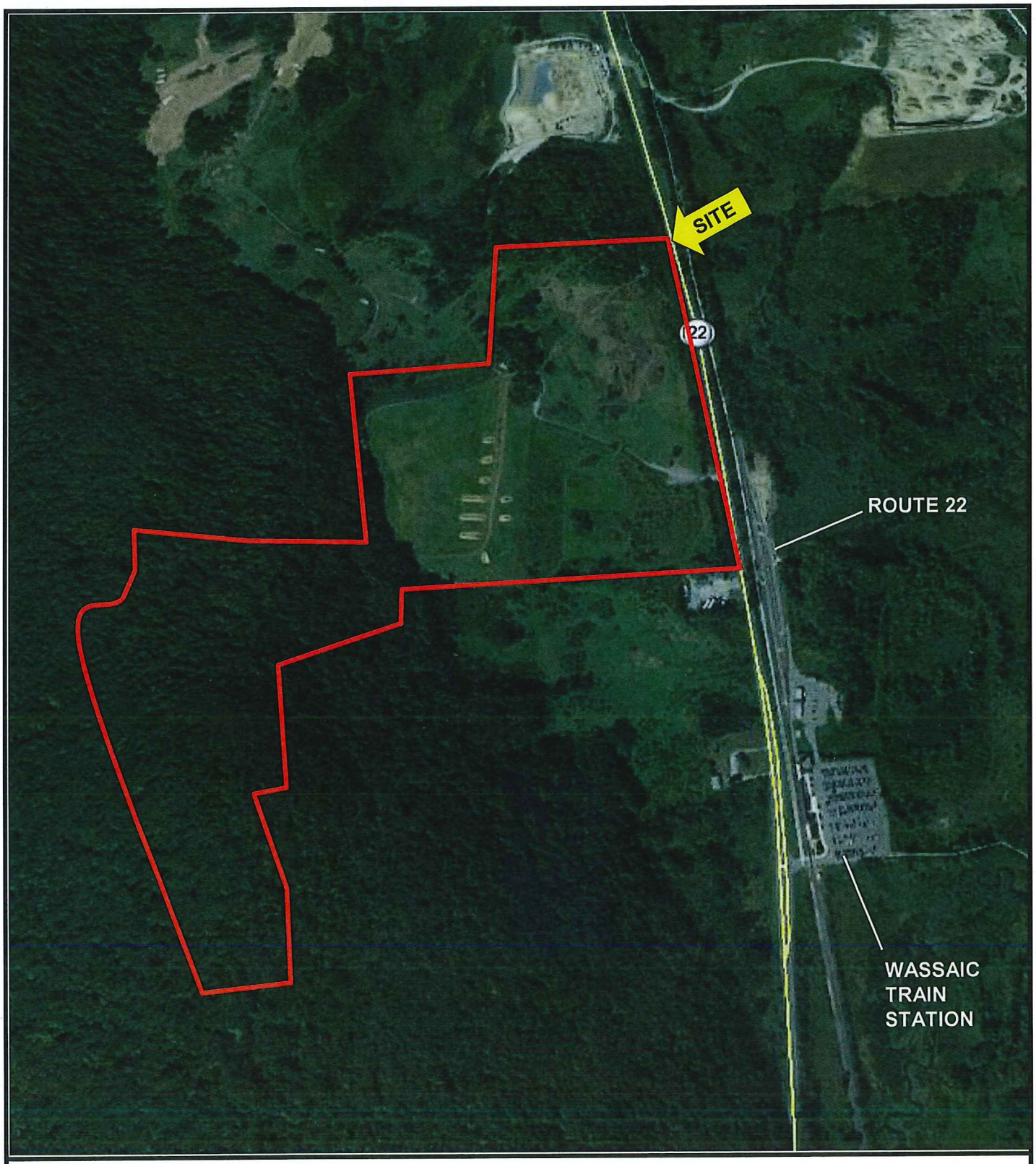
Thank you in advance for your assistance. If additional information is required, or if you have any questions, please do not hesitate to contact me.

Sincerely,

VHB Engineering, Surveying and Landscape Architecture, P.C.

David Kennedy
Project Scientist

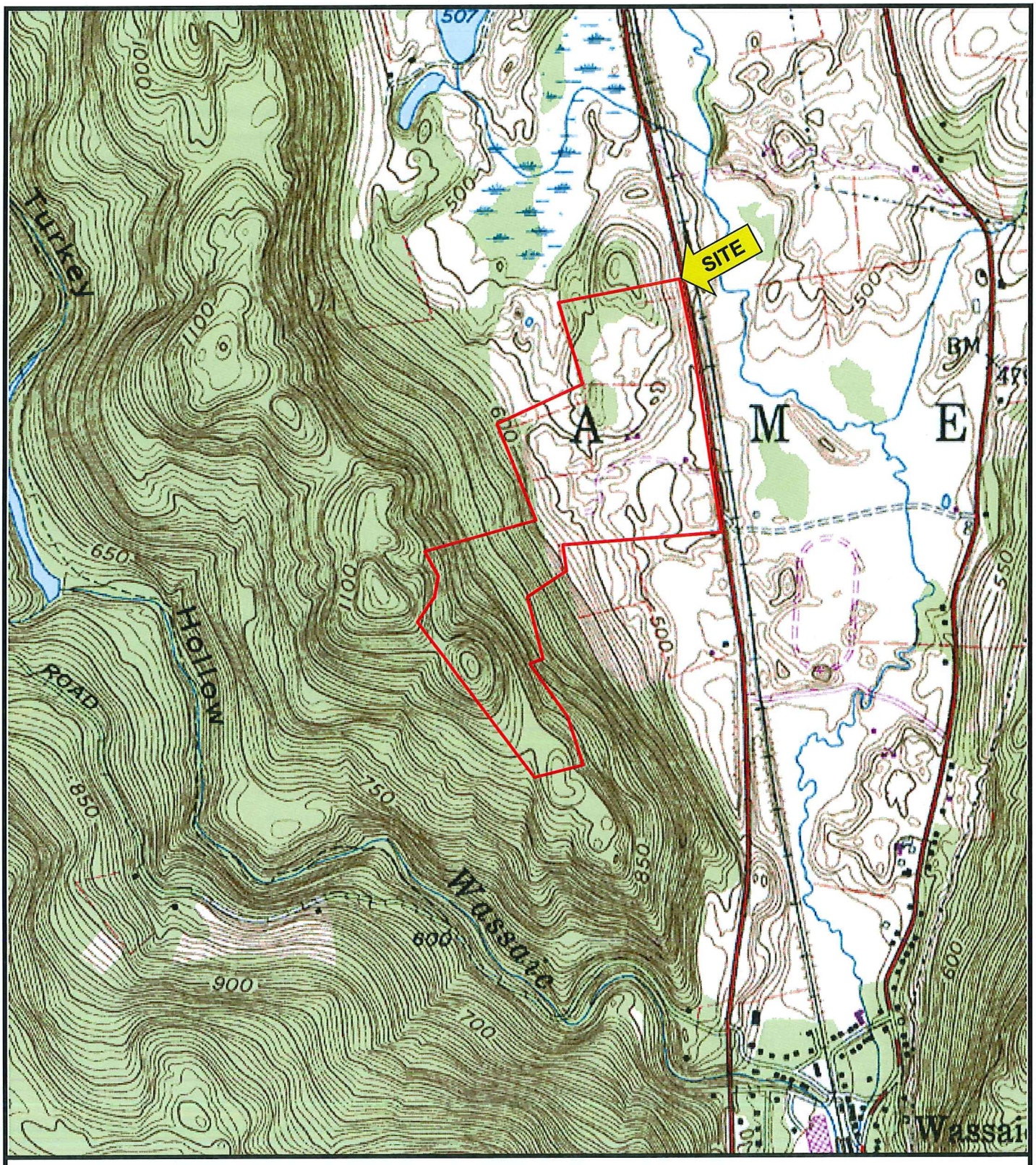
DK/ba
enc.



SITE LOCATION MAP

STREET ADDRESS: Route 22
CITY, STATE, ZIP: Amenia, New York 12501
TOWN OF AMENIA TAX MAP NO.: 7066-00-870350
BASE MAP SOURCE: United States Geological Survey Topographic Map - Riverhead, New York Quadrangle

N



EXCERPT OF USGS TOPOGRAPHIC MAP

STREET ADDRESS: Route 22
CITY, STATE, ZIP: Amenia, New York 12501
TOWN OF AMENIA TAX MAP NO.: 7066-00-870350
BASE MAP SOURCE: United States Geological Survey Topographic Map - Amenia, New York Quadrangle

N

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th Floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **Fax:** (518) 402-8925
Website: www.dec.ny.gov

Joe Martens
Commissioner

June 27, 2014

David Kennedy
VHB Engineering, Surveying and Landscape Architecture, P.C.
2150 Joshuas Path, Suite 300
Hauppauge, NY 11788

Re: Proposed construction of an access driveway and maintenance facility at an undeveloped 88-acre property west of Route 22 (tax map no: 7066-00-870350)
Town/City: Amenia. County: Dutchess.

Dear David Kennedy :

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

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities, 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 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 sources may be required to fully assess impacts on biological resources.

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.

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.

Sincerely,

Andrea Chaloux

Andrea Chaloux
Environmental Review Specialist
New York Natural Heritage Program

The following rare plants, rare animals, and significant natural communities have been documented at your project site, or in its vicinity.

We recommend that potential onsite and offsite impacts of the proposed project on these species or communities be addressed as part of any environmental assessment or review conducted as part of the planning, permitting and approval process, such as reviews conducted under SEQR. Field surveys of the project site may be necessary to determine the status of a species at the site, particularly for sites that are currently undeveloped and may still contain suitable habitat. Final requirements of the project to avoid, minimize, or mitigate potential impacts are determined by the lead permitting agency or the government body approving the project.

The following plants are listed as Endangered or Threatened by New York State, and/or are considered rare by the New York Natural Heritage Program, and so are a vulnerable natural resource of conservation concern.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS*
Vascular Plants			
Hill's Pondweed	*Potamogeton hillii*	Threatened	Imperiled in NYS and Globally Uncommon

Amenia Wetland, 2001-08-18: This is a former beaver marsh that has completely drained with the exception of two small streams flowing through the area. In previous years, water levels were higher and the Potamogeton hillii was likely more widespread. The area is now a semi-dry marsh dominated by graminoids and purple loosestrife. The Potamogeton hillii is currently restricted to the pools near the culvert openings on both sides of the highway, but the plants could become more widespread if water levels rise. The water level of these pools is approximately one foot. 1289

This report only includes records from the NY Natural Heritage databases. For most sites, comprehensive field surveys have not been conducted, and we cannot provide a definitive statement as to the presence or absence of all rare or state-listed species. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about many of the rare animals and plants in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, from NatureServe Explorer at http://www.natureserve.org/explorer, and from USDA's Plants Database at http://plants.usda.gov/index.html (for plants).

Information about many of the natural community types in New York, including identification, dominant and characteristic vegetation, distribution, conservation, and management, is available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org. For descriptions of all community types, go to http://www.dec.ny.gov/animals/29384.html and click on Draft Ecological Communities of New York State.

New England Cottontail

New England cottontail

Photo credits: *Michael N. Marchand*

Scientific Name *Sylvilagus transitionalis* (Bangs, 1895)

Family Name Leporidae
Rabbits and Hares

Did you know?
Due to the decline of over 80% of its range since the 1960s, the New England Cottontail is a candidate for Federal threatened or endangered status (US Fish and Wildlife Service 2004).

Summary

Protection Species of Special Concern in New York State, Candidate for listing federally.

This level of state protection means: A native species at risk of becoming Threatened; does not qualify as Endangered or Threatened, but have been determined to require some measure of protection or attention to ensure that the species does not become threatened. NYSDEC may regulate the takin

This level of federal protection means: A candidate for federal listing by the United State Department of Interior.

Rarity G3, S1

A global rarity rank of G3 means: Either rare and local throughout its range (21 to 100 occurrences), or found locally (even abundantly at some of its locations) in a restricted range (e.g. a physiographic region), or vulnerable to extinction throughout its range because of other factors.
A state rarity rank of S1 means: Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology makes it especially vulnerable in New York State.

Conservation Status in New York

New England cottontails have disappeared from many historical locations including Warren County, the Catskills, and Long Island. It was last documented in Rensselaer County in the 1960s (Benton and Atkinsin 1964). Recent surveys suggest that it continues to decline throughout its range due to forest maturation, habitat loss, habitat fragmentation, and competition with eastern cottontails (Litvaitis et al. 2006). In New York, it is now limited to a few fragmented populations in Columbia, Dutchess, Putnam, and Westchester counties. If current trends continue, the species will likely become extirpated in the state.

Short-term Trends

The species was still found in Rennselaer County in the 1960s, but recent surveys suggest that it continues to decline and is now limited to a few fragmented populations in Columbia, Dutchess, Putnam, and Westchester counties (Litvaitis et al. 2006). If current trends continue, the species will likely become extirpated in New York State.

Long-term Trends

The historical record includes specimens from Warren County to the north, west of the Hudson River in the Catskills, and south to Long Island, but recent records from these locations are lacking. The current distribution is thought to be restricted to the east side of the Hudson River and includes fragmented populations in Columbia, Dutchess, Putnam, and Westchester counties. Recent evidence suggests that it continues to decline in these locations and it is thought that the species will become extirpated if current trends continue.

Conservation and Management

Threats

Changing habitat, fragmentation of forest lands, and competition with the eastern cottontail (Sylvilagus floridanus) have likely contributed to the decline of this species and remain as threats (Litvaitis 1993, Tash and Litvaitis 2007).

Conservation Strategies and Management Practices

If significant habitat characteristics are identified through research, identify potential habitat within the historic range of the species, modify this habitat to increase its suitability, and reintroduce New England cottontails to these locations (Litvaitis and Villafuerte 1996, Tash and Litvaitis 2007).

Research Needs

Comparisons of habitat within extant and historical sites are necessary to see if there are significant differences between the two that may have led to the decline of the New England cottontail (Tash and Litvaitis 2007).

Habitat

The New England cottontail is an early-successional species, preferring open woods, disturbed

areas, shrubby areas, thickets, and marshes (Hamilton and Whitaker 1979). Specimens collected in Rensselaer County in the 1960s were from second-growth hardwoods with hemlocks at elevations greater than 1000 feet, and scattered swampy areas with stands of spruce and conifer plantations (Benton and Atkinson 1964). Current populations in southeastern New York can be found in isolated habitat patches that have undergone some form of disturbance such as agricultural fields and edges, and occasionally, brushy edges of transportation corridors (Tash and Litvaitis 2007).

Associated Ecological Communities

Beech-maple Mesic Forest
A hardwood forest with sugar maple and American beech codominant. This is a broadly defined community type with several variants. These forests occur on moist, well-drained, usually acid soils. Common associates are yellow birch, white ash, hop hornbeam, and red maple.

Hemlock-northern Hardwood Forest
A mixed forest that typically occurs on middle to lower slopes of ravines, on cool, mid-elevation slopes, and on moist, well-drained sites at the margins of swamps. Eastern hemlock is present and is often the most abundant tree in the forest.

Sedge Meadow
A wet meadow community that has organic soils (muck or fibrous peat). Soils are permanently saturated and seasonally flooded. The dominant herbs must be members of the sedge family, typically of the genus Carex.

Successional Old Field
A meadow dominated by forbs and grasses that occurs on sites that have been cleared and plowed (for farming or development), and then abandoned or only occasionally mowed.

Successional Shrubland
A shrubland that occurs on sites that have been cleared (for farming, logging, development, etc.) or otherwise disturbed. This community has at least 50% cover of shrubs.

Other Probable Associated Communities

Red maple-hardwood swamp
Shallow emergent marsh
Shrub swamp
Spruce flats
Spruce-fir swamp

Associated Species

Eastern Cottontail (*Sylvilagus floridanus*)

Identification Comments

Identifying Characteristics

The New England cottontail closely resembles the eastern cottontail (Sylvilagus floridanus), but it tends to be a little smaller and darker. The ears are shorter and rounder, with the outer edge possessing a broad, black stripe which does not blend gradually into the browner color of the ear as in the eastern cottontail. There is usually a black spot between the ears, as compared to the white spot found on the forehead of the eastern cottontail. (Chapman 1975, Godin 1977, Litvaitis et al. 1991)

Characteristics Most Useful for Identification

True identification can only be made thrugh DNA analysis or skull characteristics (Hamilton and Whitaker 1979, Ruedas et al. 1989).

Behavior

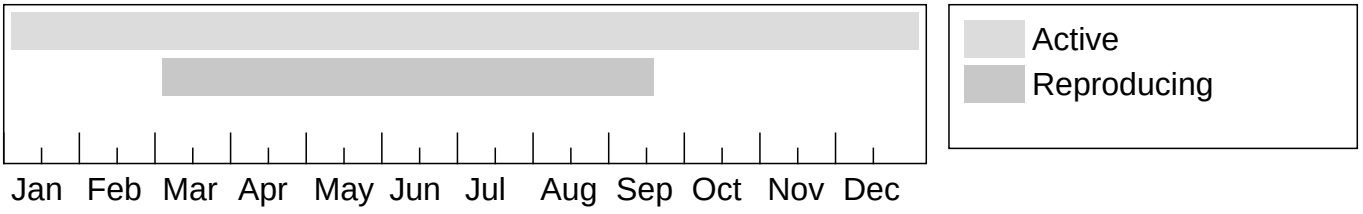
Breeding season is January to September, peaking from March to July. The gestation period is 28 days. Litter size is genrally 3-5 or occasionally up to 8, with up to several litters per year. Litters are smaller but more numerous than in the eastern cottontail, resulting in about the same productivity. Most individuals first breed in their second season, but 18% of pregnancies are in juveniles (Dalke 1942, Hamilton and Whitaker 1979).

Diet

In the spring and summer, New England cottontails feed on grasses and herbs including goldenrods, crabgrass, and chickweed. In the fall and winter, their diet consists of seedlings, bark, twigs of gray birch, red maple, and aspen, and shrubs including blackberry, dewberry, and willow (Dalke and Sime 1941).

The Best Time to See

New England Cottontails are most active at dawn and dusk. The breeding season is typically from March to September.



The time of year you would expect to find New England Cottontail in New York.

Similar Species

Eastern Cottontail(Sylvilagus floridanus): The eastern cottontail is lighter in color and typically has a white spot between the ears, whereas the New England cottontail is darker and typically has a dark spot between the ears.

Taxonomy

Kingdom Animalia
└ **Phylum** Craniata
└ **Class** Mammals (Mammalia)
└ **Order** Pikas, Rabbits, and Hares (Lagomorpha)
└ **Family** Leporidae (Rabbits and Hares)

Additional Resources

Links

Google Images
http://images.google.com/images?q=SYLVILAGUS+TRANSITIONALIS
NatureServe Explorer
http://natureserve.org/explorer/servlet/NatureServe?searchName=SYLVILAGUS+TRANSITIONALIS

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This guide was authored by

Indiana Bat

Indiana Bat

Photo credits: *Jesse W. Jaycox*

Scientific Name *Myotis sodalis*
Miller and Allen, 1928

Family Name Vespertilionidae
Evening Bats and Vesper Bats

Did you know?
The Indiana bat hibernates in mines and caves, but males and females roost in crevices and under the bark of trees during the warmer months of the year. Female Indiana bats form maternity colonies, giving birth and raising their young in these tree roosts.

Summary

Protection Endangered in New York State, Endangered federally.

This level of state protection means: A native species in imminent danger of extirpation or extinction in New York (includes any species listed as federally Endangered by the United States). It is illegal to take, import, transport, possess, or sell an animal listed as Endangered, or its par

This level of federal protection means: Listed as Endangered in the United States by the US Department of Interior.

Rarity G2, S1

A global rarity rank of G2 means: Imperiled globally because of rarity (6 - 20 occurrences, or few remaining acres, or miles of stream) or very vulnerable to extinction throughout its range because of other factors.
A state rarity rank of S1 means: Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology makes it especially vulnerable in New York State.

Conservation Status in New York

There are 10 extant hibernacula that appear to be stable, but overall the population remains vulnerable due to large concentrations of overwintering bats at a few of these sites. Many of the thirteen general areas where maternity and bachelor colonies are known to occur are in areas that are subject to increasing development.

Short-term Trends

The maximum total count has increased from approximately 13,000 to 41,000 Indiana bats. This increase in numbers is largely the result of discovery of new hibernacula and improved methods of counting overwintering bats. However, part of the increase may actually reflect an increase in the overall size of the population.

Conservation and Management

Conservation Strategies and Management Practices

Continue to monitor populations at hibernacula every other year as recommended by the United States Fish and Wildlife Service.

Research Needs

Additional research is needed to locate new maternity and bachelor colonies and to determine habitat use surrounding these areas.

Habitat

Indiana bats hibernate in caves and mines during the winter. Predominately female Indiana bats radio-tracked from hibernacula in Jefferson, Essex, and Ulster Counties were found to move between approximately 12 and 40 miles to roost location on their foraging grounds. The roosts consisted of living, dying, and dead trees in both rural and suburban landscapes.

Associated Ecological Communities

Appalachian Oak-hickory Forest
A hardwood forest that occurs on well-drained sites, usually on ridgetops, upper slopes, or south- and west-facing slopes. The soils are usually loams or sandy loams. This is a broadly defined forest community with several regional and edaphic variants. The dominant trees include red oak, white oak, and/or black oak. Mixed with the oaks, usually at lower densities, are pignut, shagbark, and/or sweet pignut hickory.

Beech-maple Mesic Forest
A hardwood forest with sugar maple and American beech codominant. This is a broadly defined community type with several variants. These forests occur on moist, well-drained, usually acid soils. Common associates are yellow birch, white ash, hop hornbeam, and red maple.

Calcareous Cliff Community
A community that occurs on vertical exposures of resistant, calcareous bedrock (such as limestone or dolomite) or consolidated material; these cliffs often include ledges and small areas of talus.

Calcareous Talus Slope Woodland
An open or closed canopy community that occurs on talus slopes composed of calcareous bedrock such as limestone or dolomite. The soils are usually moist and loamy; there may be numerous rock outcrops.

Deep Emergent Marsh
A marsh community flooded by waters that are not subject to violent wave action. Water depths can range from 6 in to 6.6 ft (15 cm to 2 m). Water levels may fluctuate seasonally, but the substrate is rarely dry, and there is usually standing water in the fall.

Floodplain Forest
A hardwood forest that occurs on mineral soils on low terraces of river floodplains and river deltas. These sites are characterized by their flood regime; low areas are annually flooded in spring, and high areas are flooded irregularly.

Hemlock-northern Hardwood Forest
A mixed forest that typically occurs on middle to lower slopes of ravines, on cool, mid-elevation slopes, and on moist, well-drained sites at the margins of swamps. Eastern hemlock is present and is often the most abundant tree in the forest.

Limestone Woodland
A woodland that occurs on shallow soils over limestone bedrock in non-alvar settings, and usually includes numerous rock outcrops. There are usually several codominant trees, although one species may become dominant in any one stand.

Maple-basswood Rich Mesic Forest
A species rich hardwood forest that typically occurs on well-drained, moist soils of circumneutral pH. Rich herbs are predominant in the ground layer and are usually correlated with calcareous bedrock, although bedrock does not have to be exposed. The dominant trees are sugar maple, basswood, and white ash.

Associated Species

Big Brown Bat (*Eptesicus fuscus*)
Eastern Small-Footed Myotis (*Myotis leibii*)
Little Brown Bat (*Myotis lucifugus*)
Northern Myotis (*Myotis septentrionalis*)
Eastern Pipistrelle (*Pipistrellus subflavus*)

Identification Comments

Identifying Characteristics

The Indiana bat is a small bat, approximately 2 inches (51 mm) in length and weighing approximately 0.2 to 0.3 ounces (6-9 grams) (Harvey et al. 1999; NYSDEC 2006). The pelage is very fine and fluffy and is dark gray to grayish-brown in color and the nose is pinkish in color (NYSDEC 2006). The feet have few hairs that do not extend beyond the tips of the toes. Indiana bats have a keeled calcar, which is a cartilaginous projection from the foot which helps support the membrane between the foot and the tail (NYSDEC 2006).

Characteristics Most Useful for Identification

When in hand, the gray-brown pelage, pinkish nose, toe hairs that don't extend beyong the tips of the toes, and keeled calcar are used in combination to distinguish Indiana bats from little brown bats. Hibernating Indiana bats are distinguished from other bats by their tight clusters, grayish-brown pelage and pinkish noses.

Behavior

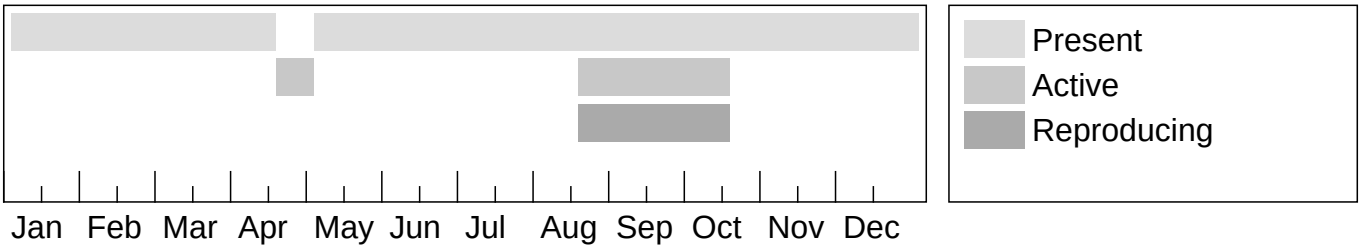
Most Indiana bats migrate seasonally between traditional winter and summer roost sites. Hibernation sites include both natural caves and mines. Caves and mines chosen for hibernation have been reported to have stable temperatures below 10 degrees Celsius (50 degrees Fahrenheit) and preferably from 4-8 degrees Celsisus (39 - 46 degress Fahrenheit). Relative humidities are fairly high at hibernation sites, usually above 74 % (Hall 1962; Humphrey 1978). Depending on local weather conditions, Indiana bats hibernate from October through April (Hall 1962). Summer foraging habitat consists of wooded or semi-wooded areas and may be along streams. Indiana bats have strong fidelity to summer colony areas, roosts, and foraging habitat (USFWS 1999), and radio-telemetry studies in New York have shown this to be true for maternity roost locations. Maternity colonies are generally in hollow trees or under loose bark of living or dead trees that are often exposed to direct sunlight. Although the majority of maternity sites reported have been in riparian areas, recent studies in New York and elsewhere indicate that upland habitats are used more than previously thought (Humphrey et al. 1977; Garner and Gardner 1992).

Diet

Indiana bats feed entirely on flying insects and the food items reflects the environments in which they forage. Prey items may include moths (Lepidoptera), caddisflies and flies (Diptera), mosquitos and midges, bees, wasps, and flying ants (Hymenoptera), beetles (Coleoptera), leafhoppers and treehoppers (Homoptera), stoneflies (Plecoptera), and lacewings (Neuroptera) (NatureServe 2006).

The Best Time to See

Females begin hibernation soon after mating, whereas males often remain active through mid-October to November (Cope and Humphrey 1977). Most individuals are in hibernation by late November although some are still active until December (Barbour and Davis 1969). Activity is resumed generally in April, with few bats still in the hibernation caves by mid-May. In Michigan, bats were present at tree roosts as late as 10 September (Kurta et al. 1993). Primarily nocturnal.



The time of year you would expect to find Indiana Bat in New York.

Similar Species

Little Brown Bat(Myotis lucifugus): The little brown bat differs from the Indiana bat in that it has brown pelage and its ears and nose are slightly darker than the fur (NYSDEC 2006). Little brown bat feet are are also larger and with more hairs that extend beyond the tips of the toes (NYSDEC 2006). Indiana bats have a keeled calcar, which is absent in Little brown bats.

Taxonomy

Kingdom Animalia
└ **Phylum** Craniata
└ **Class** Mammals (Mammalia)
└ **Order** Bats (Chiroptera)
└ **Family** Vespertilionidae (Evening Bats and Vesper Bats)

Additional Resources

Links

Bat Conservation International
http://www.batcon.org/home/default.asp
NatureServe Explorer
http://natureserve.org/explorer/servlet/NatureServe?searchName=MYOTIS+SODALIS
Google Images
http://images.google.com/images?q=MYOTIS+SODALIS
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This guide was authored by

Northern Long-Eared Bat

Myotis septentrionalis

The northern long-eared bat has been proposed to be federally listed as an endangered species under the Endangered Species Act. Endangered species are animals and plants that are in danger of becoming extinct. 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 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 about 3 to 3.7 inches but with a wingspan of 9 to 10 inches. Its 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*, which are actually bats noted for their small ears (Myotis means mouse-eared).

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

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

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

After fertilization, pregnant females migrate to summer areas where they roost in small colonies and give birth to a single pup. Maternity colonies, with young, generally have 30 to 60 bats, although larger maternity colonies have been observed. Most females 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. Adult northern long-eared bats can live up to 19 years.

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

Range: The range of the northern long-eared bat 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. Within the United States, this area includes the following 39 States: Alabama, Arkansas, Connecticut, Delaware, the District of Columbia, Florida, 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 danger of extinction?

White-nose Syndrome: No other threat is as severe and immediate as the disease, white-nose syndrome. If this disease had not emerged, it is unlikely the northern long-eared population would be declining so dramatically. 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 have declined by 99 percent in the Northeast. Although there is uncertainty about the rate that white-nose syndrome will spread within the species' range, it is expected to spread throughout the United States.

Other Sources of Mortality: Although significant population declines have not been observed due to the sources of mortality listed below, they may now be important factors affecting this bat's ability to persist while experiencing dramatic declines caused by white-nose syndrome.

Impacts to Hibernacula: Gates or other structures to exclude people from caves and mines restrict bat flight and movement and change airflow and internal cave and mine microclimates. A few degrees change can make a cave unsuitable for hibernating bats. Also, cave-dwelling bats are vulnerable to human disturbance while hibernating. Bats use up their energy stores when aroused and may not survive the winter or females may not successfully give birth or rear young.

Loss or Degradation of Summer Habitat: Highway and commercial development, surface mining, and wind facility construction permanently remove habitat and are prevalent in many areas of this bat's range. Timber harvest and forest management can remove or alter (improving or degrading) summer roosting and foraging habitat.

Wind Farm Operation: Wind turbines kill bats, including northern long-eared bats, although only a small number have been documented 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 Prevent Extinction of the Northern Long-Eared Bat?

Disease Management: Actions have been taken to 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.

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 bat migration routes are located. The Service, state natural resource agencies, and wind energy industry are developing a Midwest Wind Energy Multi-Species Habitat Conservation Plan that will provide wind farms a mechanism to continue operating legally while minimizing and mitigating listed bat mortality.

Listing: We are proposing to list the northern long-eared bat as an endangered species under the federal Endangered Species Act. Listing affords a species the protections of the Act and increases the priority of the species for funds, grants, and recovery opportunities.

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

What Can I Do?

Do Not Disturb Hibernating Bats: Comply with all cave and mine closures, advisories, and regulations. In areas without a cave and mine closure policy, follow approved decontamination protocols (see 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: 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 can provide additional roost sites.

Hill's Pondweed

Potamogeton hillii

Photo credits: *Beth Yanunk-Platt*

Scientific Name *Potamogeton hillii* Morong

Family Name Potamogetonaceae Pondweed Family

Did you know?
This pondweed was first collected in New York in 1886 in Cayuga Lake near Ithaca but it has not been seen there since. The specific name honors the Reverend E.J. Hill who discovered it in Michigan in 1880. This plant is considered rare in every state/province where it is known.

Summary

Protection Threatened in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 6 to fewer than 20 extant sites, or 2) 1,000 to fewer than 3,000 individuals, or 3) restricted to not less than 4 or more than 7 U.S.G.S. 7 ? minute topographical maps, or 4) listed as threatened by U.S. Department of the Interior.

Rarity G3, S2

A global rarity rank of G3 means: This species is either rare and local throughout its range (21 to 100 occurrences), or found locally (even abundantly at some of its locations) in a restricted range (e.g. a single physiographic region), or is vulnerable to extinction throughout its range because of other factors.
A state rarity rank of S2 means: This plant is threatened/imperiled in New York because of rarity (typically 6-20 populations or few remaining individuals) or is vulnerable to extirpation from New York due to biological factors.

Conservation Status in New York

There are 13 known populations of this globally rare plant in New York. There are three unverifed reports from the 1980s and about a dozen historical locations that need to be surveyed. This indicates that there are potentially up to twenty or more populations within New York State. Most of these populations are likely threatened to some degree from run-off, aquatic herbicide application, motor boat activities, or other activities that reduce water quality.

Short-term Trends

Populations can fluctuate wildly in numbers from year-to-year so it is very difficult to establish a short-term trend although a few populations have disappeared entirely.

Long-term Trends

This plant seems to have declined in the Finger Lakes area but new populations have been found elsewhere in the state so overall numbers are stable.

Conservation and Management

Threats

There is a low threat from surrounding development of water bodies and the use of aquatic herbicides. Most of the present populations have no protection from these threats.

Conservation Strategies and Management Practices

In order to better protect known populations, any application of an aquatic herbicide should carefully consider the impacts on this globally rare plant. Any efforts to protect lands within the watershed where this pondweed is present should be encouraged. At a minimum, the hydrological integrity for known sites should be maintained.

Research Needs

Research needs to be done into the causes of large fluctuations in plant numbers within populations. We need to know how these plants react to disturbance and herbicide use.

Habitat

An aquatic plant of alkaline waterways including ponds, streams, lakes, ditches, and other impoundments. Typically habitat is present along I-90 near the Massachusetts border where ineffective culverts have created shallow impoundments over calcareous bedrock. Recorded water level varies from exposed muddy substrate to 2.5 meters. When water is deeper, the plants scarcely reach the surface (New York Natural Heritage Program 2004). Alkaline waters of marshes, ponds, lakes, and slow-moving streams (Flora of North America 2000). Chiefly in clear, cold, calcareous waters (Gleason and Cronquist 1991). Highly alkaline ponds and streams (Hellquist and Crow 1980).

Associated Ecological Communities

Deep Emergent Marsh
A marsh community flooded by waters that are not subject to violent wave action. Water depths can range from 6 in to 6.6 ft (15 cm to 2 m). Water levels may fluctuate seasonally, but the substrate is rarely dry, and there is usually standing water in the fall.

Marl Pond
The aquatic community of a small, shallow, spring-fed pond in which the water has a high concentration of calcium. The calcium precipitates out of the water as calcium carbonate and forms a marl sediment.

Other Probable Associated Communities

Eutrophic dimictic lake
Farm pond/artificial pond
Marsh headwater stream
Mesotrophic dimictic lake

Associated Species

Water-shield (*Brasenia schreberi*)
Common Hornwort (*Ceratophyllum demersum*)
Broad Waterweed (*Elodea canadensis*)
Lesser Duckweed (*Lemna minor*)
Marsh Seedbox (*Ludwigia palustris*)
Brittle Naiad (*Najas minor*)
Grassy Pondweed (*Potamogeton gramineus*)
Floating Pondweed (*Potamogeton natans*)
Flatleaf Pondweed (*Potamogeton robbinsii*)
Broadleaf Arrowhead (*Sagittaria latifolia*)
Broad-leaf Cattail (*Typha latifolia*)
Horned Bladderwort (*Utricularia cornuta*)
Columbian Watermeal (*Wolffia columbiana*)
Zosterella dubia

Identification Comments

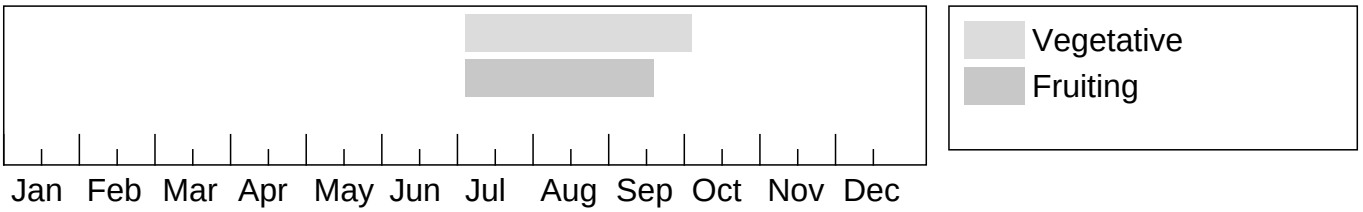
This is an aquatic plant with masses of long, very narrow leaves visible just below the surface of waters with a high pH. There are 9-15 veins running the length of the leaf. There are one or two rows of large open cells on either side of the midvein and a very pointed little bristle at the tip of the leaf.

Best Life Stage for Identifying This Species

This plant can be identified vegetatively, but the presence of fruits makes it easier to run through the identification keys. If found, a specimen with leaves and preferably with mature fruit should be collected and carefully pressed to show the leaves and stipules.

The Best Time to See

Vegetative plants of this aquatic species are present from late spring to early fall. The ideal survey period is mid-June to early September.



The time of year you would expect to find Hill's Pondweed in New York.

Similar Species

Potamogeton hillii is an easily recognized species either in fruit or when sterile. The leaf blade has a bristle tip and five or fewer veins. Those characters combined with the usual absence of nodal glands will separate this species from all other North American linear-leaved species. Ecologically, it is consistently found in more alkaline waters than any other North American pondweed (Flora of North America 2000). Leafy pondweed (*Potamogeton foliosus*) has an acute leaf tip that may have a small mucronate or apiculate tip, but it is not bristle-tipped.

Taxonomy

Kingdom Plantae
- **Phylum** Anthophyta
  - **Class** Monocots (Monocotyledoneae)
    - **Order** Najadales
      - **Family** Potamogetonaceae (Pondweed Family)

Synonyms

Potamogeton porteri (Fernald)

Additional Resources

Links

Flora of North America
http://efloras.org/florataxon.aspx?flora_id=1&taxon_id=222000291
New York Flora Atlas
http://www.newyork.plantatlas.usf.edu/Plant.aspx?id=2499
NatureServe Explorer
http://natureserve.org/explorer/servlet/NatureServe?searchName=POTAMOGETON+HILLII
Google Images
http://images.google.com/images?q=POTAMOGETON+HILLII
USDA Plants Database
http://plants.usda.gov/java/nameSearch?mode=sciname&keywordquery=POTAMOGETON+HILLII

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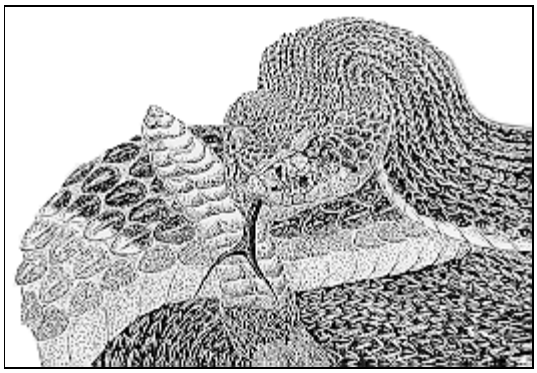
NEW YORK STATE
DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

Timber Rattlesnake Fact Sheet

Timber Rattlesnake
Crotalus horridus

New York Status: Threatened
Federal Status: Not Listed

Description



Measuring from 3-4.5 feet (91-137 cm) or more in length, the timber rattlesnake is the largest venomous snake in New York. The record length is 74 ½ inches (189 cm). Timber rattlers impress one as being very stocky; they are large snakes. Despite their size, cryptic coloration allows them to be easily concealed. Two color patterns are commonly found: a yellow phase, which has black or dark brown crossbands on a lighter background color of yellow, brown or gray, and a black phase, which has dark crossbands on a dark background. Black or dark brown stippling also occurs to varying degrees, to the extent that some individuals appear all black. Scales are ridged, giving this rattlesnake a rough-skinned appearance. The timber rattler has a broadly triangular head with many small scales on the crown of the head bordered by a few large scales, unlike the massasauga rattlesnake which has nine large scales on the top of the head.

Like other members of the pit-viper family, the timber rattlesnake has a temperature- sensitive opening, or pit, on either side of the face between and a little below the eye and nostril. This sensory organ is used to detect prey and potential predators. Another feature distinctive of rattlesnakes is the rattle itself. This structure is made of loosely attached horny segments. A new segment is added each time the snake sheds. When vibrated, the rattle makes a buzzing sound characteristic of a disturbed rattlesnake.

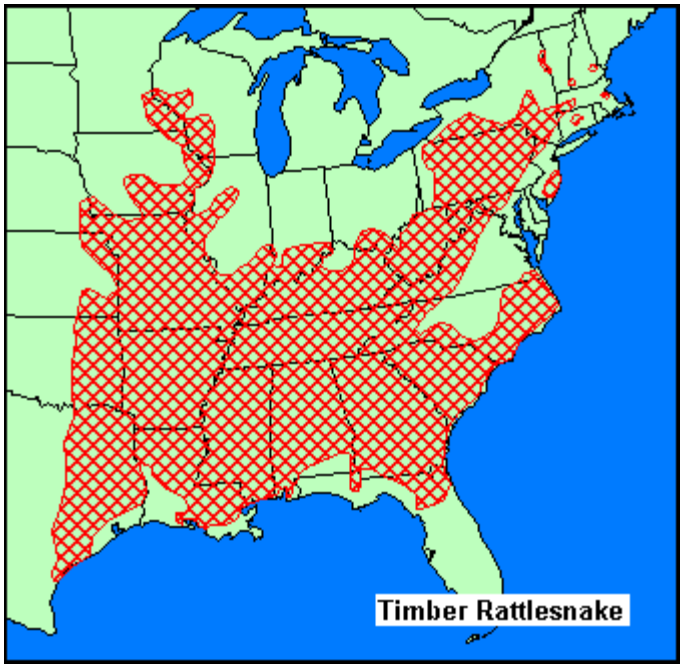
Life History

Timber rattlesnakes are active from late April until mid-October, although in northern New York they may not emerge until mid-May. Upon emerging from the den, they are very lethargic. Little feeding occurs early in the spring. Mating occurs in the spring and fall. Males are especially active at this time, seeking out females by following the pheromone (sex attractant odor) they emit. The gestation period is 4-5 months. Females give birth to 4-14 (average 9) young every three to five years during late August to mid-September. The young are approximately 1 foot (30 cm) in length at birth and emerge singly from the female, encased in a transparent membrane which is shed in a few minutes. Each is equipped with venom, hollow fangs and a tiny rattle segment called a "button." Their skin has a velvety texture and the coloring is essentially the same as the adult's. They remain in the area for 1-2 weeks before shedding their skin and dispersing. The young follow the adult's scent trail back to the den. Males are sexually mature in 5 years, females in 7-11 years. Their average life span is 16-22 years, with a maximum age of about 30 years. During winter, dozens of timber rattlers may congregate together in a den to hibernate below the frost line in association with copperheads (*Agkistrodon contortrix*), other snakes, and skinks (*Eumeces spp.*). Dens are generally on open, steep, south facing slopes with rock fissures or talus surrounded by hardwood forests.

Adults shed their skin every one or two years, with the average being every 1.4 years. A new rattle segment is added each time shedding occurs. Snakes with a complete set of rattles are rarely seen, however, since the rattles regularly break off. This rattler feeds primarily on small mammals, but occasionally takes small birds, amphibians

and other snakes. The venom, which is used primarily to immobilize prey, can be fatal to humans if the bite is untreated. However, in New York there have been no records of human deaths attributable to rattlesnakes in the wild during the last several decades. Contrary to popular opinion, a rattlesnake will not pursue or attack a person unless threatened or provoked.

Distribution and Habitat



The range of the timber rattler extends from southern New Hampshire south through the Appalachian Mountains to northern Georgia and west to southwestern Wisconsin and northeastern Texas. Populations were once found on Long Island and in most mountainous and hilly areas of New York State, except in the higher elevations of the Adirondacks, Catskills and Tug Hill region. They are now found in isolated populations in southeastern New York, the Southern Tier and in the peripheral eastern Adirondacks.

Timber rattlesnakes are generally found in deciduous forests in rugged terrain. In the summer, gravid (pregnant) females seem to prefer open, rocky ledges where temperatures are higher, while the males and non-gravid females seem to prefer cooler, thicker woods where the forest canopy is more closed. Rattlers generally migrate from 1.3 to 2.5 miles (2 to 4 km) from their den each summer, with a maximum movement of 4.5 miles (7.2 km) observed.

Status

Although still fairly common in some local areas, the timber rattlesnake has been extirpated or greatly reduced in numbers in most areas where it was once numerous due to unregulated collection and indiscriminate killing. A contributing factor was the bounty system under which a reward was paid for each timber rattler killed. Bounties were outlawed in New York State in 1971. Even in areas without bounties, the snake was severely persecuted by local residents or overcollected for the pet and curio trade. Timber rattlesnakes reproduce at a low rate, making for slow population growth. Factors such as development, illegal collecting, and the continual disturbance of forests by recreational users will likely prevent or hinder population recovery for many areas.

Management and Research Needs

The New York State Department of Environmental Conservation coordinates a program to monitor and map, using a Geographic Information System, the remaining populations in New York State. Surveys are in progress to identify existing den sites and assess each population's size, reproductive success and any threats to existing habitat. Protection of habitat is now a primary concern. Collecting rattlers from the wild is now prohibited, but poachers are still active in supplying the black market pet trade.

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Drawing by Jean Gawalt

Map adapted from Conant and Collins (1998) and Tyning (1992)