D. Natural Resources

The natural resources on the Site were well documented in the detailed studies that were conducted under the direction of Dr. Michael Klemens, LLC in 2004. The information provided in this section relies heavily upon the results of these studies presented in the technical reports that were prepared by Dr. Klemens and his sub-contracted professionals. In addition to these studies, a summer woodland bat mist net survey was conducted by Bat Conservation and Management, Inc. in 2008. Additional fieldwork and analyses were conducted by Evans Associates Environmental Consulting, Inc. (Evans Associates) between 2006 and 200-9. The date, staff, on site hours and description of the field activity by Evans Associates are summarized in Table III.D-1. In total, Evans Associates staff spent approximately 310 hours on the site. The detailed technical reports are included in the Appendix of this document. The results of these studies are summarized below.

Table III.D-1
Evans Associates Field Time on Site

Date	Staff	On-site Person Hours	Description of Activity
2/9/2006	BE	2.00	site characterization
08/01/06	RG&ES	12.50	Initial site recon
08/09/06	RG&ES	7.00	wetlands delineation & habitat characterization
08/10/06	BE	6.50	site characterization
08/16/06	RG&ES	15.00	wetlands delineation & habitat characterization
08/17/06	ES	4.00	wetlands delineation & habitat characterization
08/18/06	ES	7.50	wetlands delineation & habitat characterization
08/22/06	RG&ES	15.00	wetlands delineation & habitat characterization
08/23/06	RG	6.50	wetlands delineation & habitat characterization
08/24/06	RG&ES	16.00	wetlands delineation & habitat characterization
08/31/06	RG&ES	15.00	wetlands delineation & habitat characterization
10/10/06	ES	7.25	wetlands delineation & habitat characterization
10/11/06	ES	8.25	wetlands delineation & habitat characterization
10/15/06	BE	4.00	site characterization
10/16/06	ES	7.00	wetlands delineation & habitat characterization
10/24/06	ES	6.75	wetlands delineation & habitat characterization
10/25/06	ES	7.25	wetlands delineation & habitat characterization
10/27/06	ES	8.00	wetlands delineation & habitat characterization
10/30/06	ES	6.75	wetlands delineation & habitat characterization
11/03/06	RG&ES	13.00	wetlands delineation & habitat characterization
11/06/06	RG&ES	13.50	wetlands delineation & habitat characterization
11/07/06	ES	8.00	wetlands delineation & habitat characterization
11/09/06	RG&ES	15.00	wetlands delineation & habitat characterization
11/09/06	BE	2.00	site characterization
11/15/06	RG&ES	12.50	wetlands delineation & habitat characterization
11/16/06	BE	3.00	site characterization
11/17/06	RG&ES	14.00	wetlands delineation & habitat characterization
11/20/06	RG&ES	14.50	review wetlands with DEC
11/22/06	BE	3.00	site characterization
12/18/06	RG&ES	12.00	review wetlands with DEC
03/02/07	BE	3.00	site characterization

Date	Staff	On-site Person Hours	Description of Activity
04/03/07	BE	4.00	site characterization
06/18/07	BE	2.00	site characterization
08/07/07	BE	4.00	site characterization
10/25/07	BE	6.00	site characterization
10/10/08	RG&ES	12.00	wetlands delineation along Rt 22 & mitigation area ID
02/25/09	RG&RS	8.00	timber rattlesnake habitat assessment
	total	**309.75**	

Evans Associates Staff: BE = Beth Evans, RG = Ron Gautreau, ES = Eva Szigeti, RS = Randy Stechert

1. Existing Conditions

Description of Ecological Setting of the Site

The site is located in the hamlet of Wingdale in the Harlem Valley which is recognized as an especially rich area for biological diversity. Land use on the site ranges from developed and disturbed areas associated with the former psychiatric hospital to relatively pristine habitats in the hills in the eastern portion of the site. The topography ranges from nearly level areas on and adjacent to the floodplain of the Swamp River, rolling hills to the west and steep, rocky hills to the east. The site drains to the Swamp River which flows north to the Tenmile River which is a tributary to the Housatonic River. A Town park is located to the north of the site on the east side of Route 55. The land use to the east of the site includes mostly unbroken woodlands with some low intensity residential development. The land use to the south of the site, east of Route 22, is a combination of single-family residential development and unbroken forests. The land use to the south of the site, west of Route 22, is a combination of floodplain forest associated with the Swamp River and single-family residential development along Old Pawling Road. There are single-family residences along Old Pawling Road which forms the west property boundary with areas of unbroken forest to the west of the houses. The land use to the north of the site consists of a combination of low intensity residential development along Pleasant Ridge Road, agricultural areas and wooded areas. Additional details on the site area are presented in the Appendix in *"Habitats and Rare Plants at the proposed Dover Knolls Development Site*" (Hudsonia Ltd., February 2005).

Mapping and Description of Habitats found on the Site

A detailed description of the habitats that were identified on the site is presented in *"Habitats and Rare Plants at the proposed Dover Knolls Development Site*" (Hudsonia Ltd., February 2005). The habitats were classified by Hudsonia Ltd. in accordance with the "*Biodiversity Assessment Manual for the Hudson River Corridor Estuary*" (Hudsonia Ltd., 2001) but included several additional habitats not profiled in the document. The resulting habitat map was prepared largely by remote sensing, with field observations at selected locations. Hudsonia's small-scale habitat maps (Figure 2a and Figure 2b) as well as the large scale aerial photo map entitled, "*Habitats of the Proposed Dover Knolls Site*" are included with their report in the Appendix of this document. The habitat boundaries that were mapped by Hudsonia, Ltd. were refined by Evans Associates using: 1) more recent aerial photography, 2) the results of the surveyed wetlands delineation, and, 3) additional site visits (see Table III.D-1). The resulting Habitat Map is included as Exhibits III.D-1 and III.D-2. An aerial photo that depicts the environmental features

surrounding the site, as well as the extent of off site NYS DEC regulated wetlands is included as Exhibit III.E-1A, On- and Off-site DEC Wetlands. A summary description of each of the habitats identified on the site is presented below. It should be noted that the disjunct triangular shaped piece of property that is in the far southeast portion of the site was included in the Hudsonia study area but was not included in the study area for the DEIS since it is outside of the Project Site. This resulted in some slight discrepancies between the habitat summary descriptions in the DEIS versus the Hudsonia report. For example, a small area that was mapped by Hudsonia as oak-heath barren (ohb) was only found in this area. Upland communities (i.e., non-wetland communities) comprise approximately 752 acres (~80%) and wetland communities comprise approximately 185 acres (~20%) of the ±937 acre site. Plants species found in the habitats on the site are listed in Table III.D-2. The majority of the plants contained in this table are from the Hudsonia report with a few additional species added by Evans Associates.

Upland Habitats

Upland Deciduous Forest (udf)

The deciduous forest habitat is by far the most common forest community found on the site. Large tracks of relatively undisturbed mature forest are found on the hillsides on the east side of the site while smaller patches of deciduous forest are found in areas that were more recently disturbed on the west side of the site. The large forested areas in the east portion of the site provide forest interior habitat used by certain species that require large blocks of continuous habitat for survival. The forested areas on the west side of the site have been fragmented by past development and agricultural practices and would be less likely to support forest interior species.

Upland Mixed Forest (umf)

The mixed forest habitat type consists of a combination of deciduous and coniferous trees where neither represents greater than 75 percent of the canopy. This habitat type is found in moderate sized patches within the upland deciduous forested areas on the east side of the site as well as in smaller patches on the west side of the site.

Upland Conifer Forest (ucf)

This community includes forested areas that have greater than 75 percent cover of conifer trees. There are two areas in the east-central portion of the site that were mapped as this habitat. Eastern hemlock was the dominant tree species in the upland conifer forest areas on the site.

Marble Knoll (mk)

Marble knolls are an uncommon habitat type that in Dutchess County is found only in the Harlem Valley. Marble knolls can support a diversity of rare plants as well as habitat for several rare animal species. This habitat is only found on the portion of the site that is west of the Swamp River with most occurrences (9 of 11) being north of Wheeler Road. Vegetation communities within areas mapped as marble knolls vary according to disturbance history. Marble knoll areas on gentler slopes that have been disturbed in the recent past have now reverted to calcareous grassland or red cedar woodland. Less disturbed areas supported dense forests of eastern red cedar.

Crest, Ledge and/or Talus (clt)
Crest, ledge and/or talus on acidic bedrock is found in a few areas in the hilly eastern portion of the site. The largest example occurs on the very steep slope to the northwest of the reservoir. This area contains some talus as well as crest and ledge. The other larger area is located directly to the southeast of the reservoir. This area contains exposed bedrock but does not contain talus. The areas are either closed canopy deciduous forest or mixed forest. As discussed below, none of these areas provide suitable habitat for timer rattlesnakes.

Calcareous Crest, Ledge and/or Talus (cclt)
Calcareous crest, ledge and/or talus is similar to the previous habitat type except that the bedrock is calcareous. This habitat type is found on the west side of the site and generally coincides with the location of the marble knoll habitat described previously. The Stockbridge Marble formation created a landscape of gently rolling hills and steeper knolls and ledges in this portion of the site. Areas mapped as this habitat type mostly consisted of small bedrock outcrops, exposed bedrock pavement and ledge with very little calcareous talus present. As discussed below, none of these areas provide suitable habitat for timer rattlesnakes.

Red Cedar Woodland (rcw)
Red cedar woodlands are former old field habitat that is now dominated (>50 percent total cover) by red cedar trees. Red cedar woodlands occur in small areas on the west side of the site, north of Wheeler Road.

Shrubby Old Field (sof)
Shrubby old field habitat is a transitional habitat between upland meadow and young forest habitat where shrubs are now dominant in areas that were relatively recently disturbed. The shrubby old field habitats on the site ranged from being dominated by mostly non-native shrub species in the more disturbed areas to areas that were mostly vegetated with native shrub species. Some of the shrubby old field habitat areas contained the aggressive, non-native mile-a-minute (*Polygonum perfoliatum*) vine. In particular, the shrubby old fields that are located to the east of Hutchinson Avenue were dominated by this species.

Upland Meadow (um)
The upland meadow habitat includes hayfields, pastures and abandoned fields dominated by grasses and forbs. Included in this habitat type are active cornfields which can revert to upland meadow habitat if left uncultivated.

Waste Ground (wg)
Waste ground includes areas that have been severely altered by past or current human activity but lacks pavement or structures. These areas are sparsely vegetated and on the site include areas of coal slag near the abandoned rail road bed.

Cultural (c)

Cultural habitats include areas that are altered and intensely managed but do not include buildings or paved areas. Areas mapped as cultural on the site include the active golf course on the west side of the site as well as the lawn areas around the track on the east side of the site.

Developed (d)
Developed areas include the active and abandoned buildings as well as the paved surfaces.

Wetland Habitats
The wetlands on the site were field delineated by Evans Associates. A detailed description of each of the wetlands on the site is included in the Wetlands section of the DEIS. The boundaries of the wetland habitats on the Habitat Map correspond to the surveyed wetland boundaries.

Hardwood and Shrub Swamp (sw)
The hardwood and shrub swamp habitat consists of wetlands that are dominated by hardwood trees and in some areas dense shrubs. Red maple trees and spicebush shrubs are the most common species in this habitat. The largest area of hardwood and shrub swamp is associated with the Swamp River which is part of the Great Swamp. Large areas of hardwood and shrub swamp are also located along the east side of Route 22, north of Wheeler Road and east of the reservoir.

Emergent Marsh (em)
Emergent marsh habitat has shallow standing water for most or all of the growing season and has rooted herbaceous vegetation that emerges above the water surface. At the site emergent marsh occurs along the fringe of deeper water in rivers and ponds as well as within hardwood swamp habitats.

Fen (f)
Fens are open herbaceous and low shrub dominated wetlands that are sustained by calcareous (i.e., containing high proportions of calcium carbonate) groundwater seepage. Fens are very biologically diverse habitats that because of their unusual chemistry, hydrology and structure provide habitat for several highly specialized species. The fens on the site have not been recently grazed or mowed and some contained dense tall shrub thickets with some openings of diverse plant communities. Four fens were identified on the site. The largest fen is located in the northwest portion of the site just south of Pleasant Ridge Road. The other fens are smaller patches located within larger wetland systems. Two smaller fens are located along the northeast property boundary and one was located in the southwest corner of the site.

Wet Meadow (wm)
Wet meadow habitat is a wetland that is dominated by herbaceous species with little or no standing water for much of the year. Wet meadow habitat at the site occurs as areas of dense stands of one or more invasive species such as common reed, purple

loosestrife or reed canary grass in the vicinity of areas that have experienced disturbance. In less disturbed areas wet meadow habitat is vegetated with native herbaceous species.

Calcareous Wet Meadow (cwm)
A calcareous wet meadow differs from the wet meadow habitat in that it is strongly influenced by calcareous groundwater or soils. Calcareous wet meadows contain similar species to those found in wet meadows but also contain species that are adapted to calcareous environments. Calcareous wet meadow habitat is found on the site at the margins of fens or calcareous swamps. Calcareous wet meadows were also mapped in maintained areas such as the center of the track. In total 11 calcareous wet meadows were documented on the site.

Intermittent Woodland Pool (iwp)
Intermittent woodland pools are small wetland habitats that have standing water during the winter and spring and typically dry up by mid- to late summer. The duration of inundation (hydroperiod) can vary from year to year depending on the seasonal precipitation. Intermittent woodland pools have no permanent inlet or outlet and are generally isolated from other wetland systems. Although they are typically small wetlands, intermittent woodland pools are one of biologically most valuable in that they can provide breeding and nursery habitat to several amphibian species that rely upon their presence to complete their life cycle. Four intermittent woodland pools were identified on the site. Three of the intermittent woodland pools are located in the far eastern portion of the site and one small intermittent woodland pool is located in the northwest corner of the site.

Constructed Pond (cp)
Constructed ponds are waterbodies that have been excavated or dammed either in wetlands or upland terrain for such purposes as aesthetics, recreation and/or drinking water. There are two small constructed ponds on the west side of the site. One constructed pond is south of Wheeler Road within the golf course. The second small constructed pond is north of Wheeler Road on the edge of an agricultural field that is north of the golf course. The reservoir in the east portion of the site is a larger (~9 acres) waterbody that although is dammed has a naturally vegetated shoreline and mimics a natural pond.

River (r)
The Swamp River flows slowly northward across the west-central portion of the site. Most of the segment of the Swamp River that is on the site has been channelized and straightened in the past.

Intermittent and Perennial Stream
Perennial streams flow continuously during years with normal precipitation but may dry up during droughts while intermittent streams flow only during certain times of the year or after rains and snowmelt. At least 25 stream or segments of streams were

mapped on the site. Most of the streams were small and intermittent and were located on the hillsides in the eastern portion of the site.

Springs and Seeps

Springs and seeps are areas where the surficial groundwater table is expressed at the surface. Springs discharge groundwater at single point while seeps discharge groundwater over a broad area. Eight distinct springs or seeps that discharge into upland areas feeding small streams were identified on the site. With the exception of one seep on the west side of the site all springs or seeps were found on the hillsides on the east side of the site.

Table III.D-2
Plant Species Documented on the Site

Common Name (1)	Scientific Name	Rarity Rank (2)
TREES AND SAPLINGS		
Red maple	*Acer rubrum*	
Silver maple	*Acer saccharinum*	
Sugar maple	*Acer saccharum*	
Tree-of-heaven	*Ailanthus altissima*	
Black birch	*Betula lenta*	
Pignut hickory	*Carya glabra*	
Shagbark hickory	*Carya ovata*	
Alternate leaf dogwood	*Cornus alternifolia*	
American beech	*Fagus grandifolia*	
White ash	*Fraxinus americana*	
Black ash	*Fraxinus nigra*	
Green ash	*Fraxinus pennsylvanica*	
Black walnut	*Juglans nigra*	
Red cedar	*Juniperus virginiana*	
Tulip tree	*Liriodendron tulipifera*	
Apple	*Malus sp.*	
Norway spruce	*Picea abies*	
White pine	*Pinus strobus*	
Sycamore	*Platanus occidentalis*	
Cottonwood	*Populus deltoides*	
Black cherry	*Prunus serotina*	
White oak	*Quercus alba*	
Swamp white oak	*Quercus bicolor*	
Mossycup oak	*Quercus macrocarpa*	RR
Chestnut oak	*Quercus prinus*	
Red oak	*Quercus rubra*	
Black oak	*Quercus velutina*	
Black locust	*Robina pseudoacacia*	
Sassafras	*Sassafras albidum*	
American basswood	*Tilia americana*	

Common Name (1)	Scientific Name	Rarity Rank (2)
Eastern hemlock	*Tsuga canadensis*	
American elm	*Ulmus americana*	
SHRUBS		
Striped maple	*Acer pensylvanicum*	
Speckled alder	*Alnus incana*	
Common shadbush	*Amelanchier arborea*	
Japanese barberry	*Berberis thunbergii*	
American chestnut	*Castanea dentata*	
Buttonbush	*Cephalanthus occidentalis*	
Alternate-leaf dogwood	*Cornus alternifolia*	
Silky dogwood	*Cornus amomum*	
Gray dogwood	*Cornus racemosa*	
Round leaf dogwood	*Cornus rugosa*	
Red-osier dogwood	*Cornus sericea*	
Bush-honeysuckle	*Diervilla lonicera*	
Leatherwood	*Dirca palustris*	RR
Autumn olive	*Elaeagnus umbellata*	
Witch hazel	*Hamamelis virginiana*	
Winterberry	*Ilex verticillata*	
Mountain laurel	*Kalmia latifolia*	
Spicebush	*Lindera benzoin*	
Bell's honeysuckle	*Lonicera x bella*	
Shrubby cinquefoil	*Potentilla fruticosa*	
Common buckthorn	*Rhamnus cathartica*	
Northern gooseberry	*Ribes hirtellum*	
Multiflora rose	*Rosa multiflora*	
Swamp azalea	*Rhododendron viscosum*	
Beaked willow	*Salix bebbiana*	
Pussy willow	*Salix discolor*	
Poison sumac	*Toxicodendron vernix*	
Lowbush blueberry	*Vaccinium angustifolium*	
Highbush blueberry	*Vaccinium corymbosum*	
Maple-leaf viburnum	*Viburnum acerifolium*	
Northern arrowwood	*Viburnum dentatum var. lucidum*	
Nannyberry	*Viburnum lentago*	
VINES		
Asiatic bittersweet	*Celastrus orbiculata*	
Mile-a-minute vine	*Persicaria perfoliata*	
Japanese honeysuckle	*Lonicera japonica*	
Virginia creeper	*Parthenocissus quinquefolia*	
Poison ivy	*Toxicodendron radicans*	
Grape	*Vitis sp.*	
HERBACEOUS		

Common Name (1)	Scientific Name	Rarity Rank (2)
White baneberry	*Actaea pachypoda*	
Maidenhair fern	*Adiantum pedatum*	
Garlic mustard	*Alliaria petiolata*	
Big bluestem	*Andropogon gerardii*	RS
Field pussytoes	*Antennaria neglecta*	
Sweet vernal grass	*Anthoxanthum odoratum*	
Spikenard	*Aralia racemosa*	
Wild sarsaparilla	*Aralia nudicaulis*	
Jack-in-the-pulpit	*Arisaema triphyllum*	
Mugwort	*Artemisia vulgaris*	
Wild ginger	*Asarum canadense*	
Ebony spleenwort	*Asplenium platyneuron*	
White wood aster	*Aster divaricatus*	
White-panicled aster	*Aster lanceolatus*	
Starved aster	*Aster lateriflorus*	
Large-leaved aster	*Aster macrophyllus*	
New England aster	*Aster novae-angliae*	
Late purple aster	*Aster patens*	
Heath aster	*Aster pilosus*	
Purple stem aster	*Aster puniceus*	
Lady fern	*Athyrium filix-femina*	
False nettle	*Boehmeria cylindrica*	
Rattlesnake fern	*Botrychium virginianum*	
White tinged sedge	*Carex albicans var. albicans*	
Emmon's sedge	*Carex albicans var.emmonsii*	S3 W
Prickly bog sedge	*Carex atlantica ssp. atlantica*	
Silver-fruited sedge	*Carex argyrantha*	RR
Bicknell's sedge	*Carex bicknellii*	T, S3TW
Eastern woodland sedge	*Carex blanda*	
Bush's sedge	*Carex bushii*	S3W
Longhair sedge	*Carex comosa*	
Fringed sedge	*Carex crinita*	
Slender woodland sedge	*Carex digitalis*	
Yellow sedge	*Carex flava*	
Meadow sedge	*Carex granulus*	
Porcupine sedge	*Carex hystericina*	
Interior sedge	*Carex interior*	
Lake sedge	*Carex lacustris*	
Wooly fruit sedge	*Carex lasiocarpa*	
Bristly-stalked sedge	*Carex leptalea*	
Hop sedge	*Carex lupulina*	
Lurid sedge	*Carex lurida*	
Muhlenberg's sedge	*Carex muhlenbergii*	

Common Name (1)	Scientific Name	Rarity Rank (2)
Rich woods sedge	*Carex oligocarpa*	RR
Wooly sedge	*Carex pellita*	RR
Pennsylvania sedge	*Carex pensylvanica*	
Plantain sedge	*Carex plantaginea*	RR
Broadleaf sedge	*Carex platyphylla*	
Sprengel's sedge	*Carex sprengelii*	RR
Tussock sedge	*Carex stricta*	
Brown knapweed	*Centaurea jacea*	
Spotted knapweed	*Centaurea maculosa*	
Spiny coontail	*Ceratophyllum echinatum*	T, S3W
Twig rush	*Cladium mariscoides*	
Horse balm	*Collinsonia canadensis*	
Two-headed water starwort	*Callitriche heterophylla*	
Canada horseweed	*Conyza canadensis*	
Straw-colored flat sedge	*Cyperus strigosus*	
Bulblet bladder fern	*Cystopteris bulbifera*	
Swamp dodder	*Cuscuta gronovii*	
Smartweed dodder	*Cuscuta polygonorum*	E, S1
Poverty grass	*Danthonia spicata*	
Queen Anne's lace	*Daucus carota*	
Water willow	*Decodon verticillata*	
Toothwort	*Dentaria diphylla*	
Whitlow grass	*Draba reptans*	
Whitlow grass	*Draba verna*	T, S2
Common wood fern	*Dryopteris intermedia*	
Marginal shield fern	*Dryopteris marginalis*	
Western waterweed	*Elodea nuttallii*	
Fleabanes	*Erigeron spp.*	
Cottongrass	*Eriophorum sp.*	
Lance-leaved goldenrod	*Euthamia graminifolia*	
Wild madder	*Galium mollugo*	
Fringed gentian	*Gentianopsis crinita*	
Wild geranium	*Geranium maculatum*	
Purple avens	*Geum rivale*	
Creeping bluets	*Houstonia serpyllifolia*	
Jewelweed	*Impatiens capensis*	
Yellow iris	*Iris pseudacorus*	
Larger blue flag	*Iris versicolor*	
Soft rush	*Juncus effusus*	
Path rush	*Juncus tenuis*	
Rice cutgrass	*Leersia oryzoides*	
Grooved flax	*Linum sulcatum*	T, S2
Cardinal flower	*Lobelia cardinalis*	
Common water purslane	*Ludwigia palustris*	

Common Name (1)	**Scientific Name**	**Rarity Rank (2)**
Winged loosestrife	*Lythrum alatum*	RR
Purple loosestrife	*Lythrum salicaria*	
Canada mayflower	*Maianthemum canadense*	
White sweet clover	*Melilotus alba*	
Bishop's cap	*Mitella diphylla*	
Smaller forget-me-not	*Myosotis laxa*	
Pond lily	*Nuphar advena*	
Sensitive fern	*Onoclea sensibilis*	
Wild marjoram	*Origanum vulgare*	
Deer-tongue grass	*Panicum clandestinum*	
Grass-of-parnassus	*Parnassia glauca*	
Arrow arum	*Peltandra virginica*	
Reed canary grass	*Phalaris arundinacea*	
Common reed	*Phragmites australis*	
Clammy ground cherry	*Physalis heterophylla var. ambigua*	
Japanese knotweed	*Polygonum cuspidatum*	
Mild water pepper	*Polygonum hydropiperoides*	
Dotted smartweed	*Polygonum punctatum*	
Christmas fern	*Polystichum acrostichoides*	
Pickerelweed	*Pontederia cordata*	
Frie's pondweed	*Ptomageton friesii*	RR
Dwarf cinquefoil	*Potentilla canadensis*	
Self heal	*Prunella vulgaris*	
Dewberry	*Rubus hispidus*	
Arrowhead	*Sagittaria latifolia*	
Bloodroot	*Sanguinaria canadensis*	
little bluestem	*Schizachyrium scoparium*	
Wool-grass	*Scirpus cyperinus*	
Drooping sedge	*Scirpus pendulus*	
Horse nettle	*Solanum carolinense*	
Blue-stemmed goldenrod	*Solidago caesia*	
Canada goldenrod	*Solidago canadensis*	
Zigzag goldenrod	*Solidago flexicaulis*	
Giant goldenrod	*Solidago gigantea*	
Gray goldenrod	*Solidago nemoralis*	
Spreading goldenrod	*Solidago patula*	
Rough-stemmed goldenrod	*Solidago rugosa*	
Bog goldenrod	*Solidago uliginosa*	
American bur-reed	*Sparganium americanum*	
Skunk cabbage	*Symplocarpus foetidus*	
New York fern	*Thelypteris noveboracensis*	
Marsh fern	*Thelypteris thelypteroides*	
Red clover	*Trifolium pratense*	

Common Name (1)	Scientific Name	Rarity Rank (2)
Purple trillium	*Trillium erectum*	
Broad-leaf cattails	*Typha latifolia*	
Stinging nettle	*Urtica dioica*	
Blue vervain	*Verbena hastata*	
Hoar vervain	*Verbena stricta*	
New York ironweed	*Vernonia noveboracensis*	

(1) Most species identified by Hudsonia, Ltd. with a few additions by Evans Associates
(2) NYS ranks: E = Endangered, T = Threatened
NYNHP ranks: S1, S2, S3, W (see Appendix A in Hudsonia Ltd. Report)
Regional ranks: RR = regionally rare; RS = regionally scarce (see Appendix A in Hudsonia Ltd. Report)

Wildlife Assessment

The site consists of a mosaic of several different terrestrial and wetland communities that provide habitat for a wide variety of species of animals. As discussed in the previous section, the habitats on the site range from highly disturbed areas around the former psychiatric hospital buildings and golf course to relatively intact forest interior habitat in the east side of the site. Under the direction of Dr. Michael Klemens, LLC, detailed field investigations were conducted to document the birds, amphibians and reptiles that occur on, or potentially occur on, the site. The sections below summarize the findings of these studies that are presented in the technical reports that are included in the Appendix. No site specific studies were conducted for mammals or fish. However, a summer woodland bat survey was conducted by Bat Conservation and Management, Inc. The discussions of mammals and fish rely upon the review of existing data sources to assess what species may potentially utilize the site as well as on incidental sightings during field work. The mammals, birds, reptiles, amphibians and fish that were documented as occurring on the Site are included in Table III.D-3 and are discussed in the following sections. Species that were not documented on the Site but may potentially utilize the Site, based on review of available literature, are also included in Table III.D-3.

Mammals

The "New England Wildlife: Habitat, Natural History and Distribution" (DeGraaf and Yamasaki, 2001)[1] was reviewed to produce a list of mammals that could potentially utilize the habitats present on the Site. Other than the woodland bat mist net surveys, no other species-specific mammal surveys or trapping were conducted. The technical report by Bat Conservation and Management, Inc. for the summer woodland bat survey is included in the Appendix. Some of the common human tolerant species of mammals that utilize the disturbed portions of the site around the former psychiatric hospital buildings and golf course include raccoon, gray squirrel, eastern chipmunk, Virginia opossum, striped skunk, white-footed mouse and white tailed deer. Less human tolerant species that may utilize the larger areas of undisturbed forested habitats on the eastern portion of the site include bobcat, black bear, fisher and

[1] DeGraaf, R. M. and Yamasaki, M. 2001. New England Wildlife, Habitat, Natural History and Distribution. University Press of New England. Hanover and London.

porcupine. Bats documented on the site during the mist net surveys include big brown bat, little brown bat, northern long-eared bat, eastern red bat, Indiana bat and small-footed bat.

Birds

Under the direction of Michael W. Klemens, LLC. a spring/early-summer breeding bird survey was conducted by Nicholas A. Miller. The technical report, "Bird Surveys at the proposed Dover Knolls Development Site" report, dated January 2005 is included in the Appendix. The details of the survey methodology, results and conclusions are presented in this report and are summarized below.

Eight surveys (i.e., field visits) were conducted between 17 May 2004 and 28 June 2004 following protocols for breeding bird surveys that are established in the scientific literature. The principle survey method involved systematic physical ground searches along random transects throughout each of the habitat types. Except for one night survey for owls, all surveys were conducted from sunrise (around 5:00 AM) and continued until bird activity levels declined (typically late morning and occasionally into early afternoon). All birds seen or heard were identified and recorded to genus and species name and are listed in Table III.D-3. Birds included in Table III.D-2 were documented on the site during the surveys but may not necessarily be utilizing the site for breeding.

A total of 101 different bird species were observed on the site during the spring 2004 census. The species ranged from those that require large blocks of unfragmented forest interior habitat to those that are tolerant of human disturbance and typical of residential backyard settings. Of the total breeding bird species identified, several of the species would be considered forest interior species that usually require larger tracts of forested lands. The eastern portion of the site contains a large expanse of unfragmented forest that spans the ridgeline, adjacent slopes, rocky outcrops and surrounding areas. Many portions of this forest are high quality and capable of supporting forest interior species that are more sensitive to habitat changes. Some of the more environmentally sensitive forest interior bird species observed include the hairy woodpecker, hooded warbler, ovenbird, wood thrush, veery, scarlet tanager, eastern wood peewee and rose-breasted grosbeak. The upland forests west of Route 22 are smaller, more fragmented, less mature, less structurally diverse and contain more invasive plant species than the forests east of Route 22. These forested areas did provide habitat for bird species that utilize smaller patches of forest and more fragmented areas with forest/field edges. The Swamp River, ponds, reservoir and seasonally inundated marshes adjacent to these waterbodies provide habitat for several waterfowl species as well as other water dependent species. Birds observed in these habitats include black duck, mallard, wood duck, green heron, great blue heron and belted kingfisher. The extensive tracts of high quality forested wetlands and shrub swamps associated with the Swamp River and to the east of the reservoir provide habitat for a number of bird species. Species that were observed in the forested/scrub-shrub wetlands include northern water thrush, northern parula, yellow-bellied sapsucker, swamp sparrow, chestnut-sided warbler, yellow-billed cuckoo,

eastern towhee and veery. The upland meadows, agricultural fields and post-agricultural fields primarily found on the west side of the site provide habitat for a number of bird species. Birds that were detected in the more open habitats on the site include field sparrow, chipping sparrow, song sparrow, American kestrel, barn swallow, indigo bunting, prairie warbler, eastern kingbird, eastern meadowlark, American robin and eastern bluebird.

Amphibians and Reptiles

A spring/summer amphibian and reptile survey was conducted by Michael W. Klemens, LLC. in 2004. The technical report, "Amphibians and Reptiles of the proposed Dover Knolls Development Site" report, dated February 2005 is included in the Appendix. The details of the survey methodology, results and conclusions are presented in this report and are summarized below.

The herpetological surveys were conducted between April 4, 2004 and September 25, 2004. The early season surveys focused on documenting amphibian breeding activity with particular focus on vernal pools. The late spring to early summer surveys focused on detecting snakes and turtles while continuing to gather data on vernal pools and amphibians. Late summer surveys were conducted to target neonate snakes and turtles as well as the fall breeding marbled salamander. The surveys also included an assessment of the suitability of the wetland habitats on the site as potential bog turtle habitat (i.e., Phase One assessment). The guidelines for a Phase One assessment are presented in "Bog Turtle (*Clemmys muhlenbergii*) – Northern Population Recovery Plan" (US Fish & Wildlife Service, May 2001). The purpose of the Phase One assessment is to determine whether or not a wetland is *potential* bog turtle habitat and does not include searching for individual turtles.

The amphibian and reptile species documented on, or potentially occurring on, the Site are listed in Table III.D-3. Based on the field investigations six species of salamanders, eight species of frogs, three species of turtles and three species of snakes were documented on the site. Three species of mole salamanders were found on the site. Jefferson salamanders, spotted salamanders and marbled salamanders were all found in the high quality vernal pool that straddles the eastern property boundary. Spotted salamanders were also found in the two smaller vernal pools south of the reservoir as well as in the wooded swamp that is located in the far southwest corner of the site. More common species such as the redback salamander, two-lined salamander and red-spotted newt were also found on the site. Frogs that were found in, and around the wetlands and aquatic habitats on the site include green frog, bullfrog, spring peeper, gray treefrog, wood frog, pickerel frog and American toad. Painted turtles and snapping turtles were common on the site and abundant in the Swamp River and associated wetlands. Two individuals of the less common spotted turtle were found in the forested and scrub-shrub wetland that is located in the southwest corner of the site. No individuals of the legally protected bog turtle were found on the site. However, some areas of various quality bog turtle habitat were identified in the west portion of the site. Additional discussion about this species is included in the next section of the DEIS. Only three species of snakes were

documented on the site. Single individuals of a water snake and a ring-neck snake were found on the site while garter snakes were found scattered throughout the site in a variety of habitats.

Overall, the field research that was conducted by Michael W. Klemens, LLC. indicated that there is an intact amphibian fauna on the eastern side of the site that is associated with the undisturbed forested areas on the west facing ridge. Reptile diversity was low in this portion of the site and amphibian diversity and biomass are high. A particularly note worthy area was the high quality vernal pool that straddles the eastern property boundary that was used as breeding habitat by three species of mole salamanders as well as wood frogs. In contrast the amphibian and reptile diversity and biomass in the low lying areas on the west side of the site are both quite low.

Fish

The on-site segment of the Swamp River is a relatively narrow, shallow, low gradient stream. The segment of the river that is on the site has been straightened and channelized. The area adjacent to the river in the north and south parts of the site consist of extensive areas of forested wetlands. Portions of the east shoreline in the vicinity of Wheeler Road consist of rip-rap. No site-specific fish surveys were conducted. However, fish surveys were conducted at 17 locations in the Great Swamp in 1998 including two locations in the Swamp River by Van Holt, et. al.(2006)[2]. The two sample locations in the Swamp River were approximately 2 miles upstream and 3 miles downstream of the site. The species of fish that were captured at each of the 17 locations were not presented in the scientific paper. The 23 fish species that were captured as part of the 1998 study were categorized in accordance with their tolerance to environmental stress conditions as: intolerant, moderately tolerant and tolerant. Fish that are likely to inhabit the river in the vicinity of the site are warm water species that are moderately tolerant of environmentally stressful conditions. Based on these studies the fish species that may occur in the section of the Swamp River that is on the site are listed in Table III.D-3.

Table III.D-3
Wildlife Species Documented or Potentially Occurring on the Site

Common Name	Scientific Name	Documented on Site
MAMMALS		
Virginia opossum	*Didelphis virginiana*	X
Masked shrew	*Sorex cinereus*	
Water shrew	*Sorex palustris*	
Smoky shrew	*Sorex fumeus*	
Short-tailed shrew	*Blarina brevicauda*	
Least shrew	*Cryptotis parva*	

[2] Van Holt, T, Murphy, D.M., and Chapman, L. 2006. Local and Landscape Predictors of Fish-assemblage Characteristics in the Great Swamp, New York. Northeastern Naturalist 13(3):353-374.

Common Name	Scientific Name	Documented on Site
Eastern mole	*Scalopus aquaticus*	
Star-nosed mole	*Condylura cristata*	
Hairy tailed mole	*Parascalops breweri*	X
Little brown bat	*Myotis lucifugus*	X
Northern long-eared bat	*Myotis septentrionalis*	X
Indiana bat	*Myotis sodalis*	X
Small-footed bat	*Myotis leibii*	X
Big brown bat	*Eptesicus fuscus*	X
Eastern red bat	*Lasiurus borealis*	X
Hoary bat	*Lasiurus cinereus*	X
Eastern cottontail	*Sylvilagus floridanus*	X
Eastern chipmunk	*Tamias striatus*	X
Woodchuck	*Marmota monax*	X
Gray squirrel	*Sciurus carolinensis*	X
Red squirrel	*Tamiasciurus hudsonicus*	
Southern flying squirrel	*Glaucomys volans*	
Beaver	*Castor canadensis*	X
Deer mouse	*Peromyscus maniculatus*	
White-footed mouse	*Peromyscus leucopus*	
Meadow vole	*Microtus pennsylvanicus*	
Woodland vole	*Microtus pinetorum*	
Muskrat	*Ondatra zibethicus*	
Norway rat	*Rattus norvegicus*	
House mouse	*Mus musculus*	
Woodland jumping mouse	*Napaeozapus insignis*	X
Porcupine	*Erethizon dorsatum*	
Coyote	*Canis latrans*	
Red fox	*Vulpes vulpes*	
Gray fox	*Urocyon cinereoargenteus*	
Black bear	*Ursus americanus*	
Raccoon	*Procyon lotor*	X
Fisher	*Martes pennanti*	
Ermine	*Mustela erminea*	
Long-tailed weasel	*Mustela frenata*	
Mink	*Mustela vison*	
Striped skunk	*Mephitis mephitis*	
River otter	*Lontra canadensis*	
Bobcat	*Lynx rufus*	
White-tailed deer	*Odocoileus virginianus*	X
BIRDS		
Double-crested cormorant	*Phalacrocorax auritus*	X
Mallard	*Anas platyrhynchos*	X
American black duck	*Anas rubripes*	X

Common Name	Scientific Name	Documented on Site
Wood duck	*Aix sponsa*	X
Canada goose	*Branta canadensis*	X
Great blue heron	*Ardea herodias*	X
Green heron	*Butorides striatus*	X
Killdeer	*Charadrius vociferus*	X
Ruffed grouse	*Bonasa umbellus*	X
Wild turkey	*Meleagris gallopavo*	X
Rock dove	*Columbia livia*	X
Mourning dove	*Zenaida macroura*	X
Turkey vulture	*Cathartes aura*	X
Cooper's hawk	*Accipiter cooperii*	X
Red-tailed hawk	*Buteo jamaicensis*	X
Red-shouldered hawk	*Buteo lineatus*	X
American kestrel	*Falco sparverius*	X
Barred owl	*Strix varia*	X
Eastern screech owl	*Otus asio*	X
Yellow-billed cuckoo	*Coccyzus americanus*	X
Black-billed cuckoo	*Coccyzus erythropthalmus*	X
Belted kingfisher	*Megaceryle alcyon*	X
Hairy woodpecker	*Picoides villosus*	X
Downy woodpecker	*Picoides pubescens*	X
Yellow-bellied sapsucker	*Sphyrapicus varius*	X
Pileated woodpecker	*Dryocopus pileatus*	X
Red-bellied woodpecker	*Melanerpes carolinus*	X
Northern flicker	*Colaptes auratus*	X
Chimney swift	*Chaetura pelagica*	X
Ruby-throated hummingbird	*Archilochus colubris*	X
Eastern kingbird	*Tyrannus tyrannus*	X
Great crested flycatcher	*Myiarchus crinitus*	X
Eastern phoebe	*Sayornis phoebe*	X
Eastern wood-pewee	*Contopus virens*	X
Willow flycatcher	*Empidonax trailii*	X
Blue jay	*Cyanocitta cristata*	X
Common raven	*Corvus corax*	X
American crow	*Corvus brachyrhyncos*	X
Fish crow	*Corvus ossifragus*	X
European starling	*Sturnus vulgaris*	X
Brown-headed cowbird	*Molothrus ater*	X
Red-winged blackbird	*Agelaius phoeniceus*	X
Black-capped chickadee	*Parus atricapillus*	X
Eastern meadowlark	*Sturnella magna*	X
Baltimore oriole	*Icterus galbula*	X
Common grackle	*Quiscalus quiscula*	X

Common Name	Scientific Name	Documented on Site
Purple finch	*Carpodacus purpureus*	X
House finch	*Carpodacus mexicanus*	X
American goldfinch	*Carduelis tristis*	X
Chipping sparrow	*Spizella passerina*	X
Field sparrow	*Spizella pusilla*	X
Song sparrow	*Melospiza melodia*	X
Swamp sparrow	*Melospiza georgiana*	X
Eastern towhee	*Pipilo erythrophthalmus*	X
Northern cardinal	*Cardinalis cardinalis*	X
Rose-breasted grosbeak	*Pheucticus ludovicianus*	X
Indigo bunting	*Passerina cyanea*	X
Scarlet tanager	*Piranga olivacea*	X
Barn swallow	*Hirundo rustica*	X
Tree swallow	*Tachycineta bicolor*	X
Bank swallow	*Riparia riparia*	X
Northern rough-winged swallow	*Stelgidopteryx serripennis*	X
Cedar waxwing	*Bombycilla cedrorum*	X
Red-eyed vireo	*Vireo olivaceus*	X
Warbling vireo	*Vireo gilvus*	X
Yellow-throated vireo	*Vireo flavifrons*	X
Blue-headed vireo	*Vireo solitarius*	X
White-eyed vireo	*Vireo griseus*	X
Black-and-white warbler	*Mniotilta varia*	X
Worm-eating warbler	*Helmitheros vermivorum*	X
Blue-winged warbler	*Vermivora pinus*	X
Northern parula	*Parula americana*	X
Yellow warbler	*Dendroica petechia*	X
Black-throated blue warbler	*Dendroica caerulescens*	X
Yellow-rumped warbler	*Dendroica coronata*	X
Cerulean warbler	*Dendroica cerulea*	X
Chestnut-sided warbler	*Dendroica pensylvanica*	X
Blackpool warbler	*Dendroica striata*	X
Prairie warbler	*Dendroica discolor*	X
Ovenbird	*Seiurus aurocapillus*	X
Northern waterthrush	*Seiurus noveboracensis*	X
Louisiana waterthrush	*Seiurus motacilla*	X
Common yellowthroat	*Geothlypis trichas*	X
Hooded warbler	*Wilsonia citrina*	X
American redstart	*Setophaga ruticilla*	X
House sparrow	*Passer domesticus*	X
Northern mockingbird	*Mimus polyglottos*	X
Gray catbird	*Dumetella carolinensis*	X
Carolina wren	*Thryothorus ludovicianus*	X

Common Name	Scientific Name	Documented on Site
House wren	*Troglodytes aedon*	X
Brown creeper	*Certhia americana*	X
White-breasted nuthatch	*Sitta carolinensis*	X
Tufted titmouse	*Parus bicolor*	X
Black-capped chickadee	*Poecile atricapillus*	X
Golden-crowned kinglet	*Regulus satrapa*	X
Blue-gray gnatcatcher	*Polioptila caerulea*	X
Wood thrush	*Hylocichla mustelina*	X
Veery	*Catharus fuscescens*	X
Swainson's thrush	*Catharus ustulatus*	X
American robin	*Turdus migratorius*	X
Eastern bluebird	*Sialia sialis*	X
REPTILES AND AMPHIBIANS		
Jefferson salamander	*Ambystoma jeffersonianum*	X
Spotted salamander	*Ambystoma maculatum*	X
Marbled salamander	*Ambystoma opacum*	X
Blue-spotted salamander	*Ambystoma laterale*	
Redback salamander	*Plethodon cinereus*	X
Four-toed salamander	*Hemidactyulium scutatum*	
Northern two-lined salamander	*Eurycea bislineata*	X
Red-spotted newt	*Notophthalmus viridescens*	X
American toad	*Bufo americanus*	X
Northern spring peeper	*Pseudacris c. crucifer*	X
Gray treefrog	*Hyla versicolor*	X
Spring peeper	*Pseudacris crucifer*	X
Bullfrog	*Rana catesbeiana*	X
Green frog	*Rana clamitans melonota*	X
Pickerel frog	*Rana palustris*	X
Wood frog	*Rana sylvatica*	X
Snapping turtle	*Cheyldra serpentina*	X
Painted turtle	*Chrysemys picta*	X
Spotted turtle	*Clemmys guttata*	X
Bog turtle	*Glyptemys muhlenbergii*	
Wood turtle	*Clemmys insculpta*	
Eastern box turtle	*Terrapene carolina*	
Musk turtle	*Sternotherus odoratus*	
Northern copperhead	*Agkistrodon contorix mokasen*	
Northern ring neck snake	*Diadophis punctatus*	X
Black racer	*Coluber constrictor*	
Water snake	*Nerodia sipedon*	X
Hognose snake	*Heterodon platirhinos*	
Milk snake	*Lampropeltis triangulum*	
Ribbon snake	*Thamnophis sauritus*	

Common Name	Scientific Name	Documented on Site
Northern brown snake	*Storeria d. dekayi*	
Eastern garter snake	*Thamnophis s. sirtalis*	X
FISH		
Blacknose dace	*Rhinichthys atratulus*	
Longnose dace	*Rhinichthys cataractae*	
Common shiner	*Notropis cornutus*	
Golden shiner	*Notemigonus crysoleucas*	
Creek chub	*Semotilus atromaculatus*	
Fallfish	*Semotilus corporalis*	
Tessellated darter	*Etheostoma olmstedi*	
Bluegill	*Lepomis macrochirus*	
Pumpkinseed	*Lepomis gibbosus*	
Redbreast sunfish	*Lepomis auritus*	
Yellow bullhead	*Ameiurus natalis*	
Brown bullhead	*Ameiurus nebulosus*	
Redfin pickerel	*Esox americanus*	
Yellow perch	*Perca flavescens*	
Rock bass	*Ambloplites rupestris*	
Smallmouth bass	*Micropterus dolomieu*	
Largemouth bass	*Micropterus salmoides*	
White sucker	*Catostomus commersoni*	

Threatened, Endangered or Protected Species and Rare Habitat Assessment

The potential for threatened, endangered or protected species to occur on the Site was assessed by: 1) determining if rare, unique or significant habitats are present, 2) some species specific field assessments, 3) contact with the New York Natural Heritage Program regarding any known occurrences of rare animals, plants or habitats on, or within the vicinity of, the site, and, 4) reviewing the habitat requirements and geographic range for all animal species that are currently legally protected under the Environmental Conservation Law (ECL) of New York. The results of these analyses are discussed below.

Rare Habitat Assessment

A detailed description of the habitats that were identified on the site is presented in *"Habitats and Rare Plants at the proposed Dover Knolls Development Site*" (Hudsonia Ltd., February 2005) that is included in the Appendix. A summary description of each of the habitats identified on the site was presented in a previous section. Several rare habitats were identified by Hudsonia, Ltd. during their field investigations. Rare habitats that were identified include: fens, calcareous wet meadows and marble knolls. The locations of these habitats are depicted on Exhibits III.D-1 and III.D-2. Some examples of other habitats that are ecologically very valuable (e.g., vernal pool) are also present on the site, but these habitats are not necessarily rare.

Legally Protected Animal Species List Assessment

Table III.D-4 contains a complete list of mammals, birds, reptiles, amphibians and fish that are currently State-listed endangered species (E) or State-listed threatened species (T). State listed threatened species and endangered species are the only species that are legally protected under the Environmental Conservation Law (ECL) of New York, Section 11-0535 and 6 NYCRR (New York Code of Rules and Regulations) Part 182. It is also noted in the table which species are Federally listed that are protected under the Endangered Species Act (ESA). The table includes reasons as to why a species may, or may not, be found on the site. A discussion as to whether there is potential for the Federally protected species the Indiana bat and bog turtle to occur on the site is presented below.

Indiana Bat Assessment

The Indiana bat is a Federally and State listed Endangered species. In New York, knowledge of the distribution of this species is limited to known wintering locations in caves and mines in which they hibernate (hibernacula). There are eight known Indiana bat hibernacula in New York (*NYS DEC Indiana Bat Fact Sheet*). The major potential impact to Indiana bats is disturbance of the hibernacula since this is the most vulnerable period in the life-cycle of this species. There are no caves or abandoned mines on the Site that could be utilized as a potential Indiana bat hibernacula. The closest hibernaculum to the Site is located on the west side of the Hudson River in Ulster County, approximately 30 miles northwest of the Site. Outside the hibernation period, Indiana bats utilize a variety of both live trees and snags with exfoliating bark for roosts in a variety of wetland and upland habitats with solar exposure being an important factor in the choice of trees. Roost trees tend to be large in diameter and have exfoliating bark or trunk crevices. Based on radio-telemetry studies conducted by US F&WS in the spring of 2004 and 2005, most reproductive females utilized trees which had some direct solar exposure, often near the edges of forested areas. During the spring and summer months this species utilizes a wide variety of foraging habitats. The mosaic of forested wetlands, upland forested areas, open fields and aquatic features on the Site meet the requirements as roosting and foraging habitat for this species, and would therefore be considered potential spring/summer habitat.

To assess the potential usage of the site by Indiana bats a summer woodland bat mist net survey was conducted in 2008 by Bat Conservation and Management, Inc. The results of this study are presented in the technical report, “Summer Woodland Bat Survey - Knolls of Dover," which is included in the Appendix, are summarized here. A total of seven species of bats were captured, one of which was the Indiana bat. The species captured are listed in Table III.D-3. In total, 112 bats were captured, two of which were male Indiana bats. One Indiana bat was captured to the east of the reservoir and the other was captured along the east edge the golf course, south of Wheeler Road. No female Indiana bats that may have indicated that a maternal colony was present on the site were captured during the surveys.

Bog Turtle Habitat Assessment

The bog turtle is a Federally listed Threatened species and State listed Endangered species that has the potential to occur in specific types of wetlands in Dutchess County.

Bog turtle wetlands are typically spring-fed with shallow surface water or saturated soils present year-round, although in summer the wet area(s) may be restricted to near spring head(s). Shallow rivulets or pseudo-rivulets are often present. Typically the wetlands are interspersed with dry and wet pockets. Usually the bottom substrate of bog turtle wetlands is soft muck. Dominant vegetation in bog turtle habitat consists of low grasses and sedges (emergent wetland), often with a scrub-shrub wetland component. Nesting habitat consists of open areas with tussocky or hummocky vegetation.

A bog turtle habitat survey (i.e., Phase One survey) was conducted by Michael W. Klemens, LLC part of the 2004 spring/summer amphibian and reptile. The assessment that was conducted followed the methodology described in "Bog Turtle (*Clemmys muhlenbergii*) – Northern Population Recovery Plan", Phase 1 Habitat Survey (US Fish & Wildlife Service, May 2001). The purpose of the Phase One survey is to determine if suitable habitat exists in the wetlands on the site to support bog turtles and not to search for individual animals. The technical report, "Amphibians and Reptiles of the proposed Dover Knolls Development Site" by Michael W. Klemens, LLC is included in the Appendix. The results of the field studies state, "There is no apparent high quality (or even intermediate quality) bog turtle habitat in the western portion of the site south of Wheeler Road. The major function of these open and grassy wetlands may serve is for the occasional passage of bog turtles. By respecting the 100-foot DEC wetland setback (i.e., allowing no development in the setback including the golf course) conservation goals for the bog turtle in these wetlands would be addressed (see USF&WS/Klemens 2001). The ditched wetlands north of Wheeler Road (near the junction of Hoag's Corner Road) are so altered as to no longer render them viable for any use by bog turtles. This spring fed sloping area is completely ditched, drained and channelized and a large portion of the former wetland is now in agricultural production (i.e., corn)." As part of the conceptual wetlands mitigation plan (see Exhibits III.D-3 and III.D-4) a portion of the 100-foot buffer that is currently maintained grass within the golf course would be restored to wetlands or a naturally vegetated wetlands buffer.

Timber Rattlesnake Habitat Assessment

The timber rattlesnake (*Crotalus horridus*) is a State listed Threatened species that is known to occur in the vicinity of the site. To assess the potential usage of the site by this species regional timber rattlesnake expert Randy Stechert conducted a habitat assessment of the site. Mr. Stechert and Ron Gautreau from Evans Associates conducted the field assessment on February 29, 2009. At the time of the field assessment there was a small amount of patchy snow on the ground but conditions were acceptable to conduct the habitat assessment. The results of the habitat assessment are presented in the report, "Timber Rattlesnake (*Crotalus horridus*)

Habitat Assessment on and Adjacent to the Knolls of Dover Property", dated February 29, 2009 by Mr. Stechert that is included in the Appendix of this document. The results of the habitat assessment indicate that no suitable hibernating (i.e., den) or basking habitat exists on the site and that based on Mr. Stechert's knowledge of known dens in the vicinity of the site the proposed development would not impact the nearest rattlesnake population that is located ≥1.5 miles from the site. This conclusion is consistent with the findings by Dr. Michael Klemens in his herpetological assessment of the site.

Contact with New York Natural Heritage Program

A request was made by Evans Associates to the New York Natural Heritage Program (NY NHP) for any known occurrences of rare or state-listed animals and plants, significant natural communities and other significant habitats that occur on, or in the vicinity of the site. As stated in the "User Guide to NY Natural Heritage Data" the response letter may contain ecologically sensitive information and should not be included in a public document. Accordingly, the response letter is not included in the DEIS document but the findings are summarized here. The NY NHP letter indicates that one species of animal, two species of plants and two communities were identified on, or in the vicinity of, the site. Bog turtles were documented within 1 mile of the site. A discussion on the potential usage of the site by bog turtles was presented in the previous section. Records of the NYS threatened plants yellow giant-hyssop (*Agastache nepetoides*) and fairy wand (*Chamaelirium luteum*) were documented in the vicinity of the site. Neither of these species were documented on site by Hudsonia, Ltd. during their rare plant and habitat assessment field studies. In addition to the animal and plant records, the NY NHP identified the DEC-regulated wetlands on the west side of the site as red maple-hardwood swamp or floodplain forest. Although neither of these habitat types are considered rare in New York State, because they are part of the Great Swamp they are considered high quality examples of these community types.

Table III.D-4
Protected Mammals, Birds, Reptiles, Amphibians and Fish in New York State

Common Name	Scientific Name	NY Status	Preferred Habitat Present on Site	Site Within Species Range	Species Extirpated in NY	Potential to Occur on the Site
MAMMALS						
Indiana bat (a)	*Myotis sodalis*	E	yes	yes	no	yes
Allegheny woodrat	*Neotoma magister*	E	no	no	yes	no
Sperm whale	*Physeter catodon*	E	no	no	no	no
Sei whale	*Balaenopter borealis*	E	no	no	no	no
Blue whale	*Balaenopter musculus*	E	no	no	no	no
Finback whale	*Balaenopter physalus*	E	no	no	no	no
Humpback whale	*Megaptera novaeangliae*	E	no	no	no	no
Right whale	*Eubalaena glacialis*	E	no	no	no	no
Gray wolf	*Canis lupus*	E	no	no	yes	no
Cougar	*Felis concolor*	E	no	no	yes	no

Common Name	Scientific Name	NY Status	Preferred Habitat Present on Site	Site Within Species Range	Species Extirpated in NY	Potential to Occur on the Site
Canada lynx	*Lynx canadensis*	T	no	no	yes	no
BIRDS						
Spruce grouse	*Flacipennis canadensis*	E	no	no	no	no
Golden eagle	*Aquila chrysaetos*	E	no	no	yes	no
Peregrine falcon	*Falco peregrinus*	E	no	yes	no	no
Black rail	*Laterallus jamaicensis*	E	no	no	no	no
Piping plover	*Charadrius melodus*	E	no	no	no	no
Eskimo curlew	*Numenius borealis*	E	no	no	yes	no
Roseate tern	*Sterna dougallii dougallii*	E	no	no	no	no
Black tern	*Chlidonias niger*	E	no	no	no	no
Short-eared owl	*Asio flammeus*	E	no	no	no	no
Loggerhead shrike	*Lanius ludovicianus*	E	no	no	no	no
Pied-billed grebe	*Podilymbus podiceps*	T	no	yes	no	no
Least bittern	*Ixobrychus exilis*	T	no	no	no	no
Bald eagle (b)	*Haliaeetus leucocephalus*	T	no	yes	no	no
Northern harrier	*Circus cyaneus*	T	no	no	no	no
King rail	*Rallus elegans*	T	no	no	no	no
Upland sandpiper	*Bartramia longicauda*	T	no	no	no	no
Common tern	*Sterna hirundo*	T	no	no	no	no
Least tern	*Stern antillarum*	T	no	no	no	no
Sedge wren	*Cistothorus platensis*	T	no	no	no	no
Henslow's sparrow	*Ammodramus henslowii*	T	no	no	no	no
REPTILES & AMPHIBIANS						
Tiger salamander	*Ambystoma tigrinum*	E	no	no	no	no
Northern cricket frog	*Acris crepitans*	E	no	no	no	no
Mud turtle	*Kinosternon subrubrum*	E	no	no	no	no
Bog turtle (b)	*Glyptemys muhlenbergii*	E	yes	yes	no	yes
Atlantic hawksbill sea turtle	*Eretmochelys imbricata*	E	no	no	no	no
Atlantic Ridley sea turtle	*Lepidochelys kempii*	E	no	no	no	no
Leatherback sea turtle	*Dermochelys coriacea*	E	no	no	no	no
Queen snake	*Regina septemvittata*	E	no	no	no	no
Massasauga	*Sistrurus catenatus*	E	no	no	no	no
Blanding's turtle	*Emydoidea blandingii*	T	no	no	no	no
Green sea turtle	*Chelonia mydas*	T	no	no	no	no
Loggerhead sea turtle	*Caretta caretta*	T	no	no	no	no
Fence lizard	*Sceloporus undulatus*	T	no	no	no	no
Timber rattlesnake	*Crotalus horridus*	T	no	yes	no	no
FISH						
Shortnose sturgeon (a)	*Acipenser brevirostrum*	E	no	no	no	no
Silver chub	*Macrhybopsis storeriana*	E	no	no	yes	no
Pugnose shiner	*Notropis anogenus*	E	no	no	no	no

Common Name	Scientific Name	NY Status	Preferred Habitat Present on Site	Site Within Species Range	Species Extirpated in NY	Potential to Occur on the Site
Round whitefish	*Prosopium cylindraceum*	E	no	no	no	no
Bluebreast darter	*Etheostoma camurum*	E	no	no	no	no
Gilt darter	*Percina evides*	E	no	no	yes	no
Spoonhead sculpin	*Cottus ricei*	E	no	no	yes	no
Deepwater sculpin	*Myoxocephalus*	E	no	no	no	no
Lake sturgeon	*Acipenser fulvescens*	T	no	no	no	no
Mooneye	*Hiodon tergisus*	T	no	no	no	no
Lake chubsucker	*Ermyzon sucetta*	T	no	no	yes	no
Gravel chub	*Erimysta x-punctata*	T	no	no	no	no
Mud sunfish	*Acantharchus pomotis*	T	no	no	yes	no
Banded sunfish	*Enneachanthus obesus*	T	no	no	no	no
Longear sunfish	*Lepomis megalotis*	T	no	no	no	no
Longear darter	*Percina macrocephala*	T	no	no	no	no
Eastern sand darter	*Ammocrypta pellucida*	T	no	no	no	no
Swamp darter	*Etheostoma fusiforme*	T	no	no	no	no
Spotted darter	*Etheostoma maculatum*	T	no	no	no	no

Notes: (a) also a Federally listed Endangered species
(b) also a Federally listed Threatened species

Rare Plant Species Assessment

A field assessment for rare plants was conducted by Hudsonia, Ltd. The results of this assessment are presented in *"Habitats and Rare Plants at the proposed Dover Knolls Development Site*" (Hudsonia Ltd., February 2005) that is included in the Appendix. The rare plants found are listed in Table III.D-5. The locations of the rare plants are included on the Habitat Map, Exhibits III.D-1 and III.D-2.

Table III.D-5
Rare Plant Species Documented on the Site

Common Name	Scientific Name	Rarity Rank (1)	Habitat(s)
NYS- or NYNHP-listed rare species			
Emmon's sedge	*Carex albicans var.emmonsii*	S3W	c, cclt
Bicknell's sedge	*Carex bicknellii*	T, S3TW	mk
Bush's sedge	*Carex bushii*	S3W	mk
Whitlow grass	*Draba verna*	T, S2	mk
Spiny coontail	*Ceratophyllum echinatum*	T, S3W	s, em
Yellow wild flax	*Linum sulcatum*	T, S2	mk
Smartweed dodder	*Cuscuta polygonorum*	E, S1	r, em
Regionally rare or scarce species			
Big bluestem	*Andropogon gerardii*	RS	f
Silver-fruited sedge	*Carex argyrantha*	RR	clt
Plantain sedge	*Carex plantaginea*	RR	r
Rich woods sedge	*Carex oligocarpa*	RR	f

Common Name	Scientific Name	Rarity Rank (1)	Habitat(s)
Wooly sedge	*Carex pellita*	RR	f
Sprengel's sedge	*Carex sprengelii*	RR	iwp
Leatherwood	*Dirca palustris*	RR	r
Winged loosestrife	*Lythrum alatum*	RR	f
Frie's pondweed	*Potomageton friesii*	RR	s
Mossycup oak	*Quercus macrocarpa*	RR	c, sw

(1) NYS ranks: E = Endangered, T = Threatened
NYNHP ranks: S1, S2, S3, W (see Appendix A in Hudsonia Ltd. Report)
Regional ranks: RR = regionally rare; RS = regionally scarce (see Appendix A in Hudsonia Ltd. Report)
(2) Habitat Abbreviations: c = cultural, cclt = calcareous crest; ledge & talus; clt = crest, ledge & talus; cwm = calcareous wet meadow; em = emergent marsh; f = fen; iwp = intermittent woodland pool; mk = marble knoll; r = ravine; s = stream & river; sof = shrubby old field; sw = hardwood/shrub swamp

2. Potential Impacts

To graphically illustrate the proposed habitat impacts, the approximate limit of disturbance was overlain on the habitat maps as depicted on Habitat Impact Map – West, Exhibit III.D-3 and Habitat Impact Map – East, Exhibit III.D-4. The total disturbance area of the Project upon full buildout is estimated at approximately 351 acres. Refer also to Exhibit III.C-5, Areas of Potential Steep Slope Disturbance, for an approximate breakdown of impact by land slope category. Note that this total disturbance area includes approximately 150 acres of land previously disturbed for construction of the former Harlem Valley Psychiatric Center Campus and the existing golf course.

The Project was designed to primarily utilize portions of the site that are currently or previously disturbed by buildings, agricultural practices or the golf course. Many of the higher quality habitats such as the forested wetlands associated with the Swamp River and high quality vernal pools were avoided. As depicted on Exhibit III.D-3 small parts of some of the marble knoll habitats on the west side of the site would be impacted. However, most would be avoided either partially or in their entirety. Specifically, 4.4 acres (or 13 percent) of the 34 acres of marble knolls on the site potentially would be disturbed. The Project also follows many of the conservation recommendations in the natural resources technical reports that were prepared under the direction of Michael W. Klemens, LLC.

The Project would however, result in impacts to some of the natural resources that are present. A portion of the development proposed in the eastern portion of the site, west of the reservoir would be within areas of upland mixed forest and upland deciduous forest that is part of a large block of intact forest. This part of the development would result in a degree of habitat fragmentation, particularly in respect to its utilization by forest interior bird species. The breeding success of bird species that utilize forest interiors is reduced near the edges of a forest due to what is known as the "edge effect". This is largely due to species of birds and small mammals preying upon the eggs and young of forest interior species, as well as nest parasitism from Brown-headed cowbirds. In total, the Project would impact approximately 28 acres of forested areas of which there are 15 acres of

impacts to deciduous forest, 7 acres of impacts to coniferous forest and 6 acres of impacts to mixed forest. Relatively undisturbed north-south oriented corridors are located to the west and east of the site. Several forms of development/disturbance are located to the south and north of the site. The Project would not act as a "bottleneck" or impediment to wildlife movement in the vicinity of the site. The trees would be removed by standard power equipment. Small branches would most likely be chipped on site for use as mulch in disturbed areas. Larger pieces of wood would most like be sold to local mills or fire wood dealers.

The Pawling Nature Preserve is located to the east and south of the site. As stated above, most of the development on the east side of Route 22 would utilize previously disturbed areas where the HVPC buildings are. The portion of the proposed development outside of the area of previous disturbance is greater than 800 feet from the south property boundary and greater than 1000 feet from the east property boundary where the Pawling Nature Preserve is located. As discussed in Section III.E, Water Resources and Wetlands, potential impacts to the wetlands in the Great Swamp were mostly avoided. Impacts were minimized to the maximum extent practicable by keeping the majority of the development activities outside of the wetlands and wetland buffers, and by utilizing already-existing wetland crossings, instead of creating new ones. Diffuse night light has the potential to affect the behavior of forest dwelling nocturnal animals.

The trails proposed within the Project Site would not permit the use of all terrain vehicles (ATV's). Considering the size of the proposed development and the population that would be generated by the Project, hunting activities would not be appropriate or permitted within the dedicated open space located within the boundaries of the Project Site. As a result, no impacts to natural resources from these types of recreational activities would be anticipated.

3. Mitigation Measures

As stated above, the Project was designed to primarily utilize disturbed portions of the site or lower value habitats and generally follows the conservation recommendations in the natural resources technical reports that were prepared under the direction of Michael W. Klemens, LLC. Mitigation within the developed portion of the Site includes implementation of an extensive landscaping plan. As part of the conceptual wetlands and wetland buffers mitigation plan (see Exhibits III.D-5 and III.D-6) several areas on the site have been identified for wetland creation, wetland enhancement or wetland buffer enhancement. In addition, as part of the wetlands mitigation measures in the area of the existing track a walking trail would be established through, and adjacent to, the wetlands to connect to the Town park that is north of the site. The current public access to the Swamp River that is located on the north side of Wheeler Road would be maintained and improved. Potential impacts from night lighting would be minimized by the use of lighting fixtures that would contain lighting within the portions of the site that are proposed to be developed. The applicant has also been in contact with the NYS DEC regarding preparing a plan for the control and/or eradication of the non-native, highly invasive mile-a-minute vine that has become established in several areas on the site.

The Offering Plan would set forth that all wetland mitigation areas shall remain in their rehabilitated state, and no fauna (exclusive of non-native invasive species), soil, or rock shall be removed or altered for any non-emergency purpose, and no activity shall otherwise take place within the mitigation areas without the express consent of the Board of Directors of the Homeowners Association. Yard waste shall expressly be prohibited from being dumped into the mitigation areas under any circumstances.