

3.4 Wildlife Ecology

3.4.1 Existing Conditions

The project site consists of undulating topography and is almost entirely wooded, and contains 50-acre lake (known as Lost Lake on local maps and Trout Lake on USGS maps) in the northeastern portion of the property. The project site is generally bisected by a lowland/wetland corridor oriented in a NW/SE direction containing an unnamed stream that flows to the Bush Kill in the southeastern corner, and ultimately to the Neversink River.

Biologists from Tim Miller Associates (TMA) performed numerous surveys of the project site to determine what species of wildlife currently inhabit the site and to assess the potential for species to utilize the site based on the on-site ecological habitats. Surveys for specific wildlife are described in detail below. In addition to the surveys outlined in this chapter, TMA delineated the on-site wetlands during the Fall of 2007 and Spring of 2008. Due to the site's rugged terrain and the remote location of wetlands, each was delineated by a pair of biologists. This delineation methodology allowed one biologist to focus on the wetland boundary while the second biologist could make observations on vegetation and wildlife both inside and outside of the wetlands.

Correspondence received from the New York State Department of Environmental Conservation (NYSDEC) Natural Heritage Program (NHP) dated September 13, 2007 and October 20, 2009 identify one locally known wildlife species in its records, the state-listed threatened bald eagle (*Haliaeetus leucocephalus*), as occurring at, or in the vicinity of the project site (correspondence is in Appendix B).¹ NHP reported no records of significant habitats occurring on or near the Lost Lake Resort site. In addition, communication with the NYSDEC during scoping of the DEIS indicated the presence of documented timber rattlesnake (*Crotalus horridus*) dens within close proximity to the project site. Discussion of these two species is provided later in this chapter.

Mammals

On-site ecological investigations for mammals were combined with efforts to identify other species of wildlife, in particular reptiles and amphibians. Surveys employed a series of random, zig-zag field transects where observations were made based on visual and auditory cues, observation of biological indices (i.e. scat, tracks, markings, carcasses, etc.) and prolonged observation at several locations on the site. The random nature of these transects allowed the biologists to observe and actively investigate features of interest along the way. This tactic also allowed data to be collected from a greater variety of micro-habitats than might be included along fixed transect routes. Observations of mammals during other ecological surveys and wetland delineations were recorded as well.

Mammals observed directly or indirectly (by track or scat) included species that are relatively common and active during daylight such as white-tailed deer, raccoon, gray squirrel, Eastern cottontail, and Eastern chipmunk. Other less common or primarily nocturnal species such as bear, coyote, mice, skunks and raccoons were observed on the property as well. Small reptiles and amphibians that may be present would offer food sources to some of the larger omnivorous mammals found on the site (e.g., raccoons, fox). Table 3.4-1 below shows a list of mammal

¹ As indicated in the NHP letters, the attachment to the letters is not included in this document as it is considered sensitive information by NHP.

species directly observed and those that are expected to occur on the project site based on available habitats.

Table 3.4-1 Observed and Expected Mammalian Species	
Common Name	Scientific Name
Beaver *	<i>Castor canadensis</i>
Big Brown Bat	<i>Eptesicus fuscus</i>
Black Bear *	<i>Ursus americanus</i>
Bobcat	<i>Lynx rufus</i>
Deer Mouse *	<i>Peromyscus maniculatus</i>
Eastern Chipmunk *	<i>Tamias striatus</i>
Eastern Cottontail *	<i>Sylvilagus floridanus</i>
Eastern Coyote *	<i>Canis latrans</i>
Eastern Mole *	<i>Scalopus aquaticus</i>
Eastern Pippistrelle	<i>Pipistrellus subflavus</i>
Ermine	<i>Mustela erminea</i>
Gray Fox *	<i>Urocyon cinereoargenteus</i>
Gray Squirrel *	<i>Sciurus carolinensis</i>
Hairy-tailed Mole	<i>Parascalops breweri</i>
Hoary Bat	<i>Lasiurus cinereus</i>
Little Brown Bat	<i>Myotis lucifugus</i>
Long-tail Weasel	<i>Mustela frenata</i>
Masked Shrew	<i>Sorex cinereus</i>
Meadow Vole *	<i>Microtus pennsylvanicus</i>
Mink	<i>Mustela vison</i>
Muskrat	<i>Ondatra zibethicus</i>
Opossum *	<i>Didelphis virginiana</i>
Porcupine *	<i>Erithizon dorsatum</i>
Raccoon *	<i>Procyon lotor</i>
Red Bat	<i>Lasiurus borealis</i>
Red Fox *	<i>Vulpes vulpes</i>
Red Squirrel *	<i>Tamiasciurus hudsonicus</i>
Short-tail Shrew	<i>Blarina brevicauda</i>
Silver-haired Bat	<i>Lasionycteris noctivagans</i>
Star-nosed Mole *	<i>Condylura cristata</i>
Striped Skunk *	<i>Mephitis mephitis</i>
Southern Flying Squirrel	<i>Glaucomys volans</i>
Southern Red-backed Vole	<i>Clethrionomys gapperi</i>
Water Shrew	<i>Sorex palustris</i>
White-tailed Deer *	<i>Odocoileus virginianus</i>
Woodchuck *	<i>Marmota monax</i>
Woodland Jumping Mouse	<i>Napaeozapus insignis</i>
Woodland Vole	<i>Microtus pinetorum</i>
* Indicates species directly observed during wildlife surveys.	
Source: Tim Miller Associates, Inc. 2009.	

As requested in the adopted scope, the site's use by black bear was analyzed.

Black Bear (Ursus americanus)

Black bears are omnivorous, feeding on grasses and forbs in the spring, soft mast and colonial insects in the summer, and berries and nuts in the fall. Bears also feed on a variety of human subsidized food sources, including crops, honey, bird seed, garbage, and pet food when readily available. Black bears play a vital role in ecosystems due to their effect on populations of insects and fruits. They help to disperse the seeds of the plants they eat and consume large numbers of colonial insects and moth larvae. They sometimes take small and large mammals as prey, such as rabbits and deer.²

Bears are very opportunistic and may travel extensively to locate available food supplies. The species is typically found in large extensive forests, however, they are adaptable and do utilize open and developed areas especially where shelter or thick cover can be found nearby. New York State has a relatively high percent of forest cover, diverse food sources and an abundance of water. Due to changes in land use and reforestation, New York's bear habitat has improved and significantly increased in area during the last 100 years. New York's Adirondack and Catskill Forest Preserves alone encompass approximately 325,000 hectares (800,000 acres) of black bear habitat.

Once thought to inhabit only large forests, over the past two decades, black bears have been expanding their range throughout New York and can now be found in a variety of habitats, including developed areas. Black bear populations are not evenly distributed throughout New York State. Changes in land use are altering the landscape to allow some areas to become more forested, while others are seeing development that fragments bear habitat.

As recently as the mid-1990s, black bears occupied three relatively distinct ranges: Adirondack (northern New York), Catskill (southeastern New York), and Allegany (western New York). Currently, bears have moved between the Catskill and Allegany ranges and now occupy habitat across the Southern Tier. It is now more appropriate to refer to Northern and Southern Bear Ranges. The Northern Bear Range consists of the expanded Adirondack range of northern New York, while the Southern Bear Range includes expanded Catskill and Allegany ranges that now connect through the Southern Tier. New York's 6,000 to 7,000 black bears are great travelers and occasionally inhabit or pass through virtually every upstate county of our state. The Adirondack region in the Northern Bear Range is home to the largest black bear population in New York State (4,000 to 5,000 bears) and the Catskill region in the Southern Bear Range, which includes the Town of Forestburgh, contains the second largest population (1,500 to 2,000).³

Black bears are typically solitary animals except during the breeding season and when a female has cubs. Overall, home ranges for bears are extremely variable and are dependent on the season and available food resources. Young male bears dispersing from their maternal home range may travel great distances. For example, one yearling male bear was treed and captured in Rockland county New York. The bear was tagged and moved 49 miles northwest into preferable bear range in the Catskills. One year later the bear was treed and recaptured in Westhaven, Connecticut, approximately 115 miles due east. Several months later the bear moved over 124 miles southwest to Pennsylvania where a hunter harvested it during the hunting season.

² Lariviere, S. 2001. *Ursus americanus*. *Mammalian Species*, 647: 1-11. Accessed June 15, 2009 at <http://www.science.smith.edu/departments/Biology/VHAYSEN/msi/default.html>.

³ <http://www.dec.ny.gov/animals/6960.html>

Territories are established by adult females during the summer. Males establish territories that are large enough to obtain food and overlap with the ranges of several females.

Black bears do not truly hibernate during the winter, but rather exhibit a period of dormancy. Typically, female bears enter a den during October or November, and males enter their dens in November or December. Adult bears do not eat, drink, urinate or defecate during the denning period. Males leave their dens in March or April while females leave their dens later than males, sometimes as late as May. In New York, bear dens have been located in hollow trees, rock outcroppings, holes in the ground, under houses and even in more open places such as brush piles and blowdowns. Dens are normally not reused from one year to the next.

Legal harvest is the primary source of mortality for black bears in New York. Vehicle collisions are another source of mortality, especially during droughts or other periods of unusual food availability or shortages when the abundance of natural foods is reduced and results in increased movement of bears. Often, the increased movement occurs outside of their normal home range where the bear is less familiar with the landscape and thus more vulnerable to road hazards. Various other types of accidents (e.g., struck by trains, electrocutions) and predation or aggression by other black bears are additional sources of mortality.

Given the opportunity, black bears will nearly always avoid people. However, bears that learn to associate people with food and garbage can become accustomed to the presence of people. The act of black bears feeding on human food and garbage creates the potential for unsafe interactions between bears and people. Bears feeding on garbage or accidentally trapped near or in dwellings can exhibit defensive behavior that present human safety concerns. Bear social structure includes a number of dominant/subordinate relationships and when humans inadvertently assume the subordinate role, a nuisance situation can escalate into an unsafe human-bear interaction.⁴

Many people believe that problematic interactions with bears will stop if wildlife managers simply relocate the bear. Unfortunately, relocating a bear is not an effective way to stop bear-human interactions. Black bears have an excellent homing ability and they may readily return to the location from which they were removed. For example, an adult female bear in the Adirondacks, captured and marked because of nuisance behavior, returned to the same location after being relocated over 41 miles from the original site. Numerous bears, including several family groups of sows and cubs, have been relocated from public sites where illegal feeding occurred in the Catskills, only to return to the exact same location shortly after and resume the nuisance behavior. Even if the bear does not return, its comfort level with humans has already been established so it may simply repeat its undesirable behavior at a new location.

Common activities, such as feeding birds and other wildlife, cooking food outdoors, feeding domestic animals in outdoor locations, and improperly storing refuse set the stage for bear-human conflicts. Most bear-human conflicts can be alleviated or resolved by removing or adequately protecting whatever attracted the bear. Modifications to human behavior are an important and often overlooked means of addressing problems with bears. Occasionally a bear becomes so habituated and conditioned to an attraction that its dangerous behavior cannot be changed and killing the bear becomes the only option.

Evidence of black bear was observed throughout the project site. Trails, tracks, scat, claw marks, and fur were commonly observed. It did not appear that the bears congregate in one

⁴ Lariviere, S. 2001. *Ursus americanus*. Mammalian Species, 647: 1-11. Accessed June 15, 2009 at <http://www.science.smith.edu/departments/Biology/VHAYSEN/msi/default.html>.

specific area of the project site. Direct sightings of bears during surveys occurred in several locations. Based on the composition of scat and direction of tracks, it appears black bears readily forage on the abundant blueberries and mast provided by vegetation on the project site and travel back and forth to feeding locations and water sources. As adjacent properties are composed of habitats similar to those found on the project site, individual bears are expected to move freely into and out of the project site.

Reptiles and Amphibians

As with mammalian surveys, investigations for reptiles and amphibians took place in combination with surveys for other wildlife (i.e. amphibians and mammals). In addition to general surveys, a survey for the New York State and Federally threatened timber rattlesnake took place in April and May of 2009. The results of the timber rattlesnake survey are documented later in this chapter.

Table 3.4-2 below shows a list of reptilian species that were directly observed or are expected to inhabit the project site based on available habitats.

Table 3.4-2 Observed and Expected Reptile Species	
Common Name	Scientific Name
Black Rat Snake *	<i>Elaphe obsoleta</i>
Common Garter Snake *	<i>Thamnophis sirtalis</i>
Common Snapping Turtle *	<i>Chelydra serpentina</i>
Eastern Hognose Snake ³ *	<i>Heterodon platirhinos</i>
Eastern Milk Snake	<i>Lampropeltis triangulum</i>
Eastern Ribbon Snake *	<i>Thamnophis sauritus</i>
Northern Black Racer	<i>Coluber constrictor</i>
Northern Brown Snake	<i>Storeria dekayi</i>
Northern Redbelly Snake *	<i>Storeria occipitomaculata</i>
Northern Ringneck Snake *	<i>Diadophis punctatus edwardsii</i>
Northern Water Snake *	<i>Nerodia sipedon</i>
Painted Turtle *	<i>Chrysemys picta</i>
Smooth Green Snake *	<i>Liochlorophis vernalis</i>
Timber Rattlesnake ²	<i>Crotalus horridus</i>
Wood Turtle ³	<i>Clemmys insculpta</i>
<p>* Indicates species directly observed during wildlife surveys. ² Species identified by NYSDEC as Threatened. ³ Species identified by NYSDEC as Species of Special Concern.</p>	
Source: Tim Miller Associates, 2009.	

Painted turtles were not observed in Lost Lake, but the species was observed on numerous occasions in an off-site pond east of the project site associated with New York State Department of Environmental Conservation wetland HA-41. A hatchling painted turtle and snapping turtle were observed on St. Joseph's Road, indicating both of these species breed on or near the project site. Predated nests, likely of painted turtles, were observed along the former railroad bed on the eastern border of the property.

Table 3.4-3 below shows the amphibian species directly observed on the project site, as well as species that may be present based on available on-site habitats.

Table 3.4-3 Observed and Expected Amphibian Species	
Common Name	Scientific Name
Allegheny Dusky Salamander	<i>Desmognathus ochrophaeus</i>
Blue-spotted Salamander ³	<i>Ambystoma laterale</i>
Bullfrog	<i>Rana catesbeiana</i>
Eastern American Toad *	<i>Bufo americanus</i>
Gray Treefrog *	<i>Hyla versicolor</i>
Green Frog *	<i>Rana clamitans melanota</i>
Jefferson Salamander ³	<i>Ambystoma jeffersonianum</i>
Jefferson Salamander Complex	<i>Ambystoma jeffersonianum x laterale</i>
Marbled Salamander ³	<i>Ambystoma opacum</i>
Northern Dusky Salamander	<i>Desmognathus fuscus</i>
Northern Leopard Frog	<i>Rana pipiens</i>
Northern Red Salamander	<i>Pseudotriton ruber</i>
Northern Redback Salamander *	<i>Plethodon cinereus</i>
Northern Slimy Salamander *	<i>Plethodon glutinosus</i>
Northern Spring Peeper *	<i>Pseudacris crucifer</i>
Northern Spring Salamander *	<i>Gyrinophilus porphyriticus</i>
Northern Two-lined Salamander *	<i>Eurycea bislineata</i>
Pickerel Frog *	<i>Rana palustris</i>
Red-spotted Newt *	<i>Notophthalmus viridescens</i>
Spotted Salamander *	<i>Ambystoma maculatum</i>
Wood Frog *	<i>Rana sylvatica</i>
* Indicates species directly observed during wildlife surveys.	
³ Species identified by NYSDEC as Species of Special Concern.	
Source: Tim Miller Associates, 2009.	

Northern redback salamander were readily found throughout the entire project site, as well as red-spotted newt. The talus slope in the east-central portion of the property contained northern slimy salamander and gray tree frog and other portions of the property are expected to house these species as well. Northern two-lined salamanders were observed in all regulated streams, and a northern spring salamander was observed in the sphagnum moss fringe of NYSDEC wetland HA-40. Frog species were observed in numerous wetlands throughout the project site. Several of the wetlands provide habitat for species of salamanders that do not rely on vernal pools for breeding habitat, such as the dusky salamanders and northern red salamander. Sections of stream corridors with sphagnum moss and stationary logs provide ideal habitat for some of these species.

Vernal Pool Breeding Amphibians

Three species of ambystomid salamanders, Jefferson salamander (*Ambystoma jeffersonianum*) blue spotted salamander (*Ambystoma laterale*), and marbled salamander (*Ambystoma opacum*) are listed as Species of Special Concern in New York State. A Species of Special Concern is defined by NYSDEC as “any native species for which a welfare concern or risk of endangerment has been documented in New York State.”⁵ Special Concern species are not afforded specific

⁵ New York State Department of Environmental Conservation. 2006. List of Endangered, Threatened and Special Concern Fish & Wildlife Species of New York State.

protection under State Law and are listed for informational purposes only. None of the three species of ambystomid salamanders identified as species of special concern were observed on the project site.

Adult ambystomid salamanders, also known as mole salamanders, likely maintain small home ranges during the summer (a few square meters), avoiding others of the same species except during the breeding season. They may remain below ground in burrows or tunnels all year except during breeding season, thus the name "mole" salamanders. Adults do not dig their own burrows but make use of small mammal burrows. They eat mainly invertebrates (e.g. earthworms, spiders, insects, snails and slugs). Larvae are generalized predators and have even been reported to eat minnows.

These species will tend to forage in deciduous or mixed hardwood forest with moderate to dense canopy cover. The adults are secretive, remaining in burrows and under rotting logs and leaf litter during the day.

There is typically very little movement among adults except during breeding season. Breeding individuals may follow creek beds and drainageways to the breeding pool. Adults do require a wooded habitat to move between the summer habitat and breeding ponds.

Unlike the other members of the genus, the breeding season for the marbled salamander is in the autumn and courtship, breeding, and egg-laying all occur on land. The eggs are laid in September or October under logs, moss, leaves, or debris along the margins of a vernal pool and are attended to by the female. When autumn rains fill the pool and inundate the eggs, the female leaves and the eggs hatch. The aquatic larvae then overwinter in the pond, completing metamorphosis the following spring or summer.

Along with those observed during general wildlife surveys, amphibian species were identified during a vernal pool-breeding amphibian survey. Identification of vernal pools was completed during the wetland delineation and also during the Fall of 2008. The locations of the on-site vernal pools can be seen in Figure 3.4-1.

Surveys for vernal pool-breeding amphibians were completed in the Spring of 2009 based on a methodology reviewed by NYSDEC (via verbal comments received and in correspondence dated March 13, 2009 in Appendix B). Surveys started on April 1, 2009 and continued weekly through May 20, 2009, with individual surveys typically separated by at least one rainy night. Surveys during this time frame consisted of visits to previously identified vernal pools to search for signs of amphibian breeding, such as egg masses, spermatophores, larvae, or potential burrow sites in close proximity to the pool areas. Searches included dip net searches within the pools, as well as cover object searches (i.e. turning over logs, rocks, tree bark, etc.) in upland forest immediately adjacent to the vernal pools. Data collected for each survey included the water depth of the pool, status of emergent vegetation, and the number and species of any egg mass, spermatophores, or larvae observed. A form for recording vernal pool survey observations was developed based on NYSDEC input and is attached to the adopted DEIS Scope. The data sheet for each vernal pool survey is included in Appendix H.

No vernal pool-breeding species listed as Species of Special Concern in New York State (i.e. Jefferson, blue-spotted, or marbled salamanders) were observed on the project site during the vernal pool-breeding amphibian survey. Evidence of a non-listed species of ambystomid salamander, the spotted salamander, and wood frogs were observed in multiple wetlands on the project site. Wood frogs are far more opportunistic than salamanders, and will lay eggs within

water filled deep-test holes and tire ruts. The spotted salamander is one of the most widely distributed salamanders in New York State.⁶

Conservation of Vernal Pool-Breeding Amphibians

A 2002 publication by the Wildlife Conservation Society (Klemens & Calhoun) titled “Best Development Practices: Conserving Pool-Breeding Amphibians in Residential and Commercial Developments in the Northeastern U.S.” provides management recommendations for conserving vernal pools and their adjacent critical terrestrial habitats that contribute a vast amount of diversity to landscapes of the northeast.

The document describes three zones that comprise a vernal pool habitat: the vernal pool depression, the vernal pool envelope, and the critical terrestrial habitat. The vernal pool depression is defined as the entire vernal pool depression up to the spring high water mark. The publication recommends preserving the vernal pool depression in its entirety. The vernal pool envelope is described as the 100-foot area surrounding the vernal pool depression that is critical to maintaining the vernal pool’s water quality, providing shade and litter for the pool habitat, and providing suitable terrestrial habitat for pool-breeding amphibian populations. The publication recommends maintaining the envelope in its natural state by avoiding disturbance to vegetation, protecting pool hydrology and water quality, maintaining a pesticide-free environment and avoiding placing barriers to amphibian dispersal. The critical terrestrial habitat is the area that extends up to 750 feet beyond the edge of the vernal pool depression (including the vernal pool envelope). This area is vital for upland populations of amphibians that breed in vernal pools by providing habitat during the non-breeding season for foraging, dispersing, and hibernating. Figure 3.4-1 schematically identifies the critical terrestrial habitat surrounding the vernal pool envelope locations.

The document’s relevance to the Lost Lake Resort project site is somewhat questionable. The document specifically targets vernal pools located on relatively small parcels of land at the suburban-rural frontier, usually less than several hundred acres, that have been targeted for development. The Lost Lake Resort project site contains over 2000 undeveloped acres owned by the Applicant and is part of a substantially larger tract of undeveloped land. The questionable aspect of the document comes into focus when assessing the relative ecological value of vernal pools per the document’s vernal pool assessment sheet (Appendix H). By utilizing the vernal pool assessment sheet provided by the document, the ecological value of vernal pools on an undeveloped site situated within an even larger tract of undeveloped land could be overrated due to the assessment sheet’s proclivity to place emphasis on undeveloped land.

On a site such as the location of the slated Lost Lake Resort, if a vernal pool is not already productive in terms of species diversity and/or density while the surrounding land is undeveloped, placement of a protective buffer zone is not likely to enhance biodiversity nor species density once development is placed beyond the buffer zone. Vernal pool-breeding species are not known to be long-distance migrants that would colonize these pools in the future, especially if the area outside of the protective buffer zone is developed. This is not to say the individuals that currently reproduce in a vernal pool could not increase populations by continuing to breed in the vernal pool and buffer zone post development. Preservation of critical terrestrial habitats associated with vernal pools on the Lost Lake Resort project site would more or less act to protect biodiversity of vernal pool-breeding amphibians, although the diversity of these species across the project site is low.

⁶ <http://www.dec.ny.gov/animals/44517.html>

In an effort to protect biodiversity, the recommendations provided in the document were analyzed and loosely followed for the vernal pools with the highest value as identified by the project biologists. Nine vernal pools on the project site were identified to contain vernal pool-breeding amphibians. Five of these nine vernal pools were observed to accommodate two vernal pool-breeding amphibian species, and therefore considered productive in terms of conservation value. The species and number of egg masses are shown in Table 3.4-4 below.

Table 3.4-4 Productive Vernal Pools		
Vernal Pool Location	Species Observed	Number of Species
Wetland EE	Spotted Salamander	4-6 egg masses
	Wood Frog	250-300 egg masses
Wetland CC (NYSDEC HA-40 & Part of Wetland ABD)	Spotted Salamander	3 egg masses
	Wood Frog	10 egg masses
Wetland ABD (NYSDEC HA-40)	Spotted Salamander	20 egg masses
	Wood Frog	More than 10 egg masses
Wetland TT-A	Spotted Salamander	3 egg masses
	Wood Frog	8 egg masses, adults
Wetland T-C	Spotted Salamander	More than 34 egg masses
	Wood Frog	250-300 egg masses
Wetland M-A	Spotted Salamander	4 egg masses
Wetland DD	Wood Frog	20-30 egg masses
Wetland U	Wood Frog	100-150 egg masses, numerous tadpoles
Wetland V	Wood Frog	Numerous tadpoles
Source: Tim Miller Associates, 2009. Refer to Figure 3.4-1 for vernal pool locations.		

Endangered, Threatened or Special Concern Reptiles and Amphibians

A map showing the approximate locations of observations of special concern species identified at the site can be seen in Figure 3.4-2. Observations of species listed as threatened are not included in the figure as the NYSDEC prefers specific locations of these species not be included in public information to protect the species from illegal taking. No listed endangered species were identified at the site.

Bog turtle (Glyptemys muhlenbergii)

Although historical records come from a larger area of the state, extant populations are known from small portions of six counties in the lower Hudson River Valley, including Sullivan County.

The ecological habits of the bog turtle, as presented in the United States Fish and Wildlife Service (USFWS) species recovery plan⁷, generally define the animal as a semi-aquatic species, preferring habitat with cool, shallow, slow-moving water, deep soft muck soils, and tussock-forming herbaceous vegetation in areas of broadly open tree or shrub canopies. Nesting typically occurs on top of relatively tall and sparsely vegetated tussocks while shrub and

⁷ Klemens, M. 2001. Bog Turtle (*Clemmys muhlenbergii*) Northern Population Recovery Plan. 2001. United States Fish and Wildlife Service, Region 5, Hadley, Massachusetts. 83 pp. + appendices.

tree root systems are frequently associated with hibernation sites. Bog turtle habitats are typically areas where groundwater discharge produces a shallow flow of surface water and saturated soils throughout all four seasons. Subsurface groundwater flow and shallow rivulets are common indicators of appropriate hydrology within a bog turtle wetland.

The project site does not contain the habitat needed to support bog turtles and the NYSDEC Herpetological Atlas does not list this species as having been observed within the mapping unit that includes the project site. Thus, it is unlikely that the species would be present on or in the near vicinity of the project.

Wood Turtle (Clemmys insculpta)

Wood turtles inhabit moderate to fast flowing rivers and large streams with deep bank undercuts for winter burrows and large, landscape-scale, habitats for summer foraging. While not directly observed during surveys of the project site, the open water stream habitat found within NYSDEC wetland HA-40 appears to exhibit habitat requirements typical of the wood turtle, a New York State Species of Special Concern. The upland forests surrounding NYSDEC wetland HA-40 would provide breeding habitat for wood turtles. The former train tracks along the eastern property boundary would provide ideal nesting habitat for the species as well.

Timber Rattlesnake (Crotalus horridus)

Based on the presence of the New York State and Federally threatened timber rattlesnake within the Neversink River Unique Area located south and east of the project site, a rattlesnake investigation was undertaken on the project site to determine the possibility of the species utilizing the property. In April and May of 2009, a timber rattlesnake habitat assessment and presence-absence survey of the site was performed by Randy Stechert with assistance from TMA. Mr. Stechert is a recognized timber rattlesnake biologist with over 40 years of experience in rattlesnake monitoring, habitat assessment, and den identification. The timber rattlesnake survey methodology is based on the Survey Protocol Report issued to the Natural Heritage Program in 2007 by Mr. Stechert. The assessment for timber rattlesnakes resulted in the identification of two areas with habitat suitable for rattlesnake dens on the project site. The two potential den and surrounding areas were visited multiple times by Mr. Stechert over the course of the period of spring emergence from their dens. No timber rattlesnakes were observed in or around these areas. Although marginal habitat for rattlesnakes does exist on the project site, the absence of active den sites on the project parcel in conjunction with the lack of reported rattlesnake sightings along roads or other areas adjacent to the project site is a strong indication that this species does not use the site, thereby limiting the project's potential for impacts on the species.

A full copy of the timber rattlesnake habitat assessment and presence-absence survey report is provided in Appendix I, as well as an outline of the methodology used.

Eastern Hognose Snake (Heterodon platirhinos)

The Eastern hognose snake, a New York State species of special concern, was observed in two separate locations on the project site. A single adult was observed in a small stand of pine trees near the southern end of NYSDEC wetland HA-40 and another lone adult was observed at the northern border of NYSDEC wetland HA-39 (see Figure 3.4-2). This highly secretive species may inhabit other parts of the project site, utilizing any of the stone outcrops or wooded areas

with sandy soils on the site for cover and feeding. This species also is adaptable to new fields and suburban areas.

Avian Species

Several surveys and analyses were performed to determine what species of birds utilize the project site. The studies were conducted in accordance with the survey methodology reviewed by NYSDEC (via verbal comments received and in correspondence dated March 13, 2009 in Appendix B) and attached to the adopted DEIS Scope.

Breeding Bird Atlas Review

The NYS Breeding Bird Atlas (BBA) is a comprehensive, statewide bird survey that documents the breeding birds identified by trained volunteers in three-mile square blocks across the state throughout two survey periods: 1980 to 1985 and 2000 to 2005. The most recent surveys (2000 through 2005) have been completed and data has been compiled and included in the final report titled "The Second Atlas of Breeding Birds in New York State" released in December of 2008. The listings include data on the breeding behavior observed, the year the bird(s) was observed and the state protection status of the species.

It is important to note that birds will choose to breed in the habitat most suitable to their species. Therefore, the listing of a particular bird in a breeding block is not an indication that the species will breed everywhere in that block, and the list for each block will include a greater number of breeding birds than will utilize any given site within that block.

The Lost Lake Resort project site falls within the eastern portion of BBA Block number 5160D and within the western portion of BBA Block number 5260C.⁸ The breeding bird lists for these blocks are available from both the 1980-1985 and the 2000-2005 surveys and may be considered to provide the most inclusive list of bird species possibly expected to be observed in areas on or near the site. Both are included as Appendix J.

A total of 67 species were observed within Block 5160D during the 1980-1985 surveys. Of these 67 species, 19 were potential breeders, 20 were probable breeders, and 28 were confirmed breeders. The 2000-2005 survey observed 76 species total, with 27 potential, 34 probable, and 15 confirmed breeding species. The 1980-1985 survey of Block 5260C observed 14 potential, 30 probable, and 18 confirmed breeding species for a total of 67 species observed. The 2000-2005 survey of the block showed similar numbers of species with a total of 69, consisting of 37 potential, 27 probable, and 5 confirmed breeding species.

Bird Inventory

General surveys to determine what species of birds use the project site were performed on June 6, 7, and 11, September 23, and October 24 of 2008. Surveys generally started before 6:00 AM and were completed by 3:00 PM. Surveys were conducted in fair to sunny weather, with temperatures ranging from 40 to 85 degrees F.

Biologists walked survey routes through previously identified ecological communities to collect data that identified what species inhabited the property. Survey routes were chosen to access multiple ecological communities, with the surveyors recording any species seen or heard.

⁸ New York State Department of Environmental Conservation. 2006. NYS Breeding Bird Atlas. Website: <http://www.dec.state.ny.us/apps/bba/>.

Observations of any breeding behavior was recorded and is included in the breeding bird survey results.

Breeding Bird Survey

Specific breeding bird surveys were conducted on April 30, May 12, 14, and 19, June 1, 10, and 17, and July 7 of 2009. Survey dates were chosen to encompass the entire seasonal period of breeding bird activity. Some survey dates were adjusted based on weather conditions and observations by TMA biologists during bird surveys of projects at other locations. Methodology for performing surveys was submitted to the NYSDEC before any survey work was performed.

Surveys generally started before 6:00 AM and were completed by 11:00 AM. Several of the surveys were extended until 12:30 PM if the surveyors continued to observe active behavior past 10:00 AM. Surveys were conducted in fair to sunny weather, with temperatures ranging from 40 to 75 degrees F.

Representative survey points were selected across the project site within or near each of the previously identified ecological communities to collect data that represented bird use in all habitat types found on the property. Survey routes were chosen to access multiple ecological communities, with the surveyors stopping at established points within differing communities along the route to make stationary observations for a period of up to fifteen minutes. The general location of survey routes and stopping points can be seen in Figure 3.4-3. Any birds approached between points along the survey route were recorded. Observations during other surveys (i.e. amphibian, vegetation, wetland) were also recorded. Observations of breeding behavior from the previous bird inventory were included in the results of this survey as well.

Stationary observations were performed at each identified location points for up to fifteen minutes. Surveyors recorded all birds heard and/or seen during this period and also documented evidence of breeding behavior when possible. Observations of birds and other indicators, including nests and feathers, were documented. Incidental observations were recorded as surveyors traveled between identified survey points and on days environmental staff was on-site for purposes other than bird surveys. Data sheets for breeding bird surveys can be seen in Appendix J.

Birds identified during the breeding bird survey are shown in Table 3.4-5 below. Their behavior, as to whether the species was confirmed (CO) breeding on the site, potentially (PO) breeding on the site, or a probable (PR) breeder on the site, is included in the table. The behavior codes are explained below:

PO: Indicates the species has the possibility of breeding on the project site. This behavior includes the species observed within potential nesting habitat or singing male(s) present during the breeding season.

PR: Indicates the species probably breeds on the project site, but was not confirmed. This behavior includes a singing male present on more than one survey in the same area, a bird (or pair) observed in suitable habitat during the breeding season, a bird (or pair) apparently holding territory, courtship and display, agitated behavior, copulation, a bird visiting a probable nest site, or nest building or excavation of a nest site.

CO: Indicates the species was confirmed to breed on the project site. This behavior includes distraction or injury feigning by a bird, observation of a used nest, recently fledged

young, adults entering or leaving a nest site (indicates occupied nest), adults carrying food for young or feeding young, observations of a bird sitting on a nest, observations of a nest with eggs or young, or observations of eggshells.

MI: Indicates the species was likely in migration or over-wintering on the project site. These species are not expected to breed on the project site.

Not all species identified during the 2008 bird inventory were again observed during the 2009 breeding bird survey. The breeding habitat requirements for these species was compared to the habitat offered by ecological communities on the project site to determine if any of these species could potentially breed on the site. These species are also included in Table 3.4-5.

Table 3.4-5 Comprehensive List of Observed Bird Species (Table continues on several pages.)		
Common Name	Scientific Name	Behavior
Acadian Flycatcher	<i>Empidonax virescens</i>	PO
Alder Flycatcher	<i>Empidonax alnorum</i>	PR
American Black Duck	<i>Anas rubripes</i>	PO
American Crow	<i>Corvus brachyrhynchos</i>	PO
American Goldfinch	<i>Carduelis tristis</i>	PR
American Kestrel	<i>Falco sparverius</i>	PO [^]
American Redstart	<i>Setophaga ruticella</i>	PR
American Robin	<i>Turdus migratorius</i>	PR
American Tree Sparrow	<i>Spizella arborea</i>	PO
American Woodcock	<i>Scolopax minor</i>	CO
Bald Eagle ¹	<i>Haliaeetus leucocephalus</i>	CO [^]
Baltimore Oriole	<i>Icterus galbula</i>	PR
Barred Owl	<i>Strix varia</i>	PR
Belted Kingfisher	<i>Ceryle alcyon</i>	PO
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	PO
Black-and-white Warbler	<i>Mniotilta varia</i>	PR
Black-capped Chickadee	<i>Parus atricapillus</i>	PR
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>	PR
Black-throated Green Warbler	<i>Dendroica virens</i>	PR
Blackburnian Warbler	<i>Dendroica fusca</i>	PR
Blackpoll Warbler	<i>Dendroica striata</i>	MI
Black Vulture	<i>Coragyps atratus</i>	PO
Blue-grey Gnatcatcher	<i>Polioptila caerulea</i>	MI
Blue-winged Warbler	<i>Vermivora pinus</i>	PO
Blue Jay	<i>Cyanocitta cristata</i>	PR
Broad-winged Hawk	<i>Buteo platypterus</i>	PR
Brown Creeper	<i>Certhia americana</i>	PR
Brown-headed Cowbird	<i>Molotherus ater</i>	PR
Brown Thrasher	<i>Toxostoma rufum</i>	PO
Canada Goose	<i>Branta canadensis</i>	CO
Canada Warbler	<i>Wilsonia canadensis</i>	PR
Carolina Wren	<i>Thryothorus ludovicianus</i>	PO
Cedar Waxwing	<i>Bombycilla cedrorum</i>	CO [^]
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	CO
Chipping Sparrow	<i>Spizella passerina</i>	PR
Common Grackle	<i>Quiscalus quiscula</i>	PO
Common Raven	<i>Corvus corax</i>	PO
Common Yellowthroat	<i>Geothlypis trichas</i>	PR
Cooper's Hawk ²	<i>Accipiter cooperii</i>	PO
Dark-eyed Junco	<i>Junco hyemalis</i>	PR
Downy Woodpecker	<i>Picoides pubescens</i>	PR
Double Crested Cormorant	<i>Phalacrocorax auritus</i>	MI
Eastern Bluebird	<i>Sialia sialis</i>	CO [^]
Eastern Phoebe	<i>Sayornis phoebe</i>	CO
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	PR
Eastern Wood Peewee	<i>Contopus Virens</i>	PR

Table 3.4-5 Comprehensive List of Observed Bird Species (Table continues on several pages.)		
Common Name	Scientific Name	Behavior
European Starling	<i>Sturnus vulgaris</i>	PO [^]
Field Sparrow	<i>Spizella pusilla</i>	PO
Golden-crowned Kinglet	<i>Regulus satrapa</i>	MI
Gray Catbird	<i>Dumetella carolinensis</i>	PR
Great Blue Heron	<i>Ardea herodias</i>	PO
Great-horned Owl	<i>Bubo virginianus</i>	PR
Hairy Woodpecker	<i>Picoides villosus</i>	PR
Hermit Thrush	<i>Catharus guttatus</i>	PR
Hooded Warbler	<i>Wilsonia citrina</i>	PO
House Finch	<i>Carpodacus mexicanus</i>	MI
House Wren	<i>Troglodytes aedon</i>	MI
Indigo Bunting	<i>Passerina cyanea</i>	PO
Louisiana Waterthrush	<i>Seiurus motacilla</i>	PO
Magnolia Warbler	<i>Dendroica magnolia</i>	PR
Mallard	<i>Anas platyrhynchos</i>	PR
Mourning Dove	<i>Zenaida macroura</i>	PR
Northern Cardinal	<i>Cardinalis cardinalis</i>	PR
Nashville Warbler	<i>Vermivora ruficapilla</i>	PR
Northern Flicker	<i>Colaptes auratus</i>	PR
Northern Goshawk ²	<i>Accipiter gentilis</i>	CO [^]
Northern Mockingbird	<i>Mimus polyglottos</i>	PR
Northern Parula Warbler	<i>Parula americana</i>	PO
Northern Saw-whet Owl	<i>Aegolius acadicus</i>	PR
Northern Waterthrush	<i>Seiurus noveboracensis</i>	PR
Orange-crowned Warbler	<i>Vermivora celata</i>	MI
Ovenbird	<i>Seiurus aurocapillus</i>	CO
Osprey ²	<i>Pandion haliaetus</i>	PO
Palm Warbler	<i>Dendroica palmarum</i>	PO
Pied-billed Grebe ¹	<i>Podilymbus podiceps</i>	MI [^]
Pileated Woodpecker	<i>Dryocopus pileatus</i>	CO
Pine Siskin	<i>Carduelis pinus</i>	PO
Pine Warbler	<i>Dendroica pinus</i>	PR
Purple Finch	<i>Carpodacus purpureus</i>	PR
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	PR
Red-breasted Nuthatch	<i>Sitta canadensis</i>	PR
Red-eyed Vireo	<i>Vireo olivaceus</i>	PR
Red-headed Woodpecker ²	<i>Melanerpes erythrocephalus</i>	PO
Red-shouldered Hawk ²	<i>Buteo lineatus</i>	PR
Red-tailed Hawk	<i>Buteo jamaicensis</i>	PR
Red-winged Blackbird	<i>Agelaius tricolor</i>	PR
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	PR
Ruby-crowned Kinglet	<i>Regulus calendula</i>	PR
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	PR
Ruffed Grouse	<i>Bonasa umbellus</i>	CO
Scarlet Tanager	<i>Piranga olivacea</i>	PR
Sharp-shinned Hawk ²	<i>Accipiter striatus</i>	PR
Solitary Vireo	<i>Vireo solitarius</i>	PR

Table 3.4-5 Comprehensive List of Observed Bird Species (Table continues on several pages.)		
Common Name	Scientific Name	Behavior
Song Sparrow	<i>Melospiza melodia</i>	PR
Swamp Sparrow	<i>Melospiza georgiana</i>	PR
Tennessee Warbler	<i>Vermivora peregrina</i>	MI
Tree Swallow	<i>Tachycineta bicolor</i>	CO
Tufted Titmouse	<i>Parus bicolor</i>	CO
Turkey Vulture	<i>Cathartes aura</i>	PO
Veery	<i>Catharus fuscescens</i>	PR
Warbling Vireo	<i>Vireo gilvus</i>	PR
White-breasted Nuthatch	<i>Sitta carolinensis</i>	PR
White-throated Sparrow	<i>Zonotrichia albicollis</i>	PR
White-winged Crossbill	<i>Loxia leucoptera</i>	MI
Wild Turkey	<i>Meleagris gallopavo</i>	CO
Winter Wren	<i>Troglodytes troglodytes</i>	PR ¹
Worm-eating Warbler	<i>Helmitheros vermivorus</i>	PR
Wood Duck	<i>Aix sponsa</i>	CO
Wood Thrush	<i>Hylocichla mustelina</i>	CO
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	PO
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	PR
Yellow-rumped Warbler	<i>Dendroica coronata</i>	PR
Yellow-throated vireo	<i>Vireo flavifrons</i>	PO
Yellow Warbler	<i>Dendroica petechia</i>	PR

Species in **bold** indicate species that may inhabit the project site based on available habitat but were not observed during surveys.
¹ Species identified by NYSDEC as Threatened.
² Species identified by NYSDEC as Species of Special Concern
[^] Indicates the species behavior was observed on an adjacent property.
Sources: Tim Miller Associates, Inc., 2009., NYS BBA data, 1980-1985 and 2000-2004.

Breeding Raptor Survey

Surveys to detect breeding raptors were partially based on data collected during the general and breeding bird surveys. In areas where raptors were observed along survey routes, their behavior was noted and nest searches were conducted if suitable nesting habitat occurred near that location. Nest searches were generally performed in leaf-off conditions to allow for increased visibility of nests, but some searches did occur during periods of leaf-on conditions as reports were observed during the breeding survey. Nest searches consisted of multiple surveyors walking through potential nesting habitat and visually scanning the tree canopy for potential nests or nesting cavities. Other indicators of raptor presence (i.e. feathers, droppings, pellets) were searched for, as well. Any nests were located by GPS and revisited to determine if the nests were active and, if so, to what species they belong.

Three inactive nests potentially used by raptors were located on the project site.⁹ The first inactive nest was located at the southeast edge of Wetland T. This tattered nest was located in a red maple tree and appeared to have not been in use for several years. A second, tattered nest was observed in a hemlock tree along the northern edge of Wetland Q. If either of these

⁹ Exact location of sensitive species is not disclosed in this document to protect the species.

nests belonged to a raptor, the size and location of the nests would restrict the owner to one of the smaller woodland raptors (e.g. sharp-shinned hawk, Cooper's hawk, broad-winged hawk).

A third, larger nest was discovered within NYSDEC wetland HA-40 (Wetland ABD) and appeared in better condition than the others. This nest was located in the crotch of a red maple tree along the interior of the northeastern edge of the wetland. The nest was checked three times throughout the Spring of 2009 and showed no sign of occupancy. While no raptors were seen actively using the nest, the nest appeared to be in a condition that would indicate it could have been active within the past year or two. The nest could have belonged to a red-shouldered hawk since it is found in appropriate habitat (i.e. wooded riparian corridor) and several observations of the species occurred in proximity to the nest location.

While several inactive nests that matched the profile of raptor's nests were found, no species of raptor were confirmed to breed on the project site.

Endangered, Threatened or Special Concern Avian Species

Two avian species listed as threatened in New York State and six species of special concern were identified on or within close proximity to the project site during bird surveys. A map showing the approximate locations of observations at the site of special concern species can be seen in Figure 3.4-2. No listed endangered species were identified at the site.

Pied-billed Grebe (Podilymbus podiceps)

Pied-billed grebe, a threatened species in New York State, was observed on the south end of Crane Pond, located approximately 1.2 miles southeast of the project site, during an April 24, 2009 timber rattlesnake survey. It is believed that this individual was using Crane Pond as a stopover during migration since the species was not observed during further visits to the pond throughout spring and summer of 2009 surveys, nor were any seen on Lost Lake.

The pied-billed grebe is a small diving bird that breeds in seasonal or permanent water bodies with still or slow flowing water. A floating nest is built within dense patches of emergent vegetation. The species is often vocal during the day throughout its breeding season and forages in open water. Past declines in the population of pied-billed grebes were contributed to the drainage of ponds and streams and loss of wetlands. Preservation of these habitat types has allowed the grebes to continue breeding in New York.

Pied-billed grebe was not observed on the project site, however migratory stopover habitat and marginal breeding habitat is available on Lost Lake and within portions of NYSDEC wetland HA-40 (Wetland ABD).

Bald Eagle (Haliaeetus leucocephalus)

Bald eagle, a threatened species in New York State, was observed multiple times over the project site. The adjacent St. Joseph's Lake, located approximately 0.5 miles west of the project site, was confirmed by the NYSDEC as hosting two pair of nesting eagles.

A bald eagle (unknown age) was observed flying over Lost Lake in December of 2007 before any formal wildlife surveys were initiated. On December 2 of the following year, a second year eagle was observed flying over St. Joseph's Road in a northeasterly direction. This bird was losing altitude as it soared and could have been dropping down to Lost Lake. Two eagles, one

first year juvenile and one sub-adult, were observed flying over Lost Lake on October 24, 2008. These two birds were flying in a southeast direction and were believed to be in migration. No other observations of bald eagles took place during wildlife surveys of the project site.

On July 7, 2009 biologists from TMA entered Lost Lake by boat to inspect the forested shoreline for presence of potential eagle nesting or roosting activity. Nesting activity could include active nests, remnants of failed nests, or remnants of attempted nests. Indicators of eagle roosting locations include a “white wash” of feces or high quantities of prey carcasses under a potential roosting tree. The survey did not find any evidence of eagles nesting or roosting on Lost Lake. The Lost Lake shoreline contains limited potential for eagle nesting as it lacks any substantial white pine (*Pinus strobus*) trees along the lake that are typically associated with eagle nests.

The USFWS has removed the bald eagle from the Federal list of threatened and endangered species effective August 8, 2007. The eagle will continue to be protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Act.

Bald eagle reports since 2006 have shown a decline in the total number of wintering bald eagles within the Mongaup River System area due to the repair of and subsequent de-watering of the Swinging Bridge Reservoir. The reservoir was refilled in 2007 and hydro-electric operations resumed after a multi-year hiatus that directly impacted the wintering habitat available to eagles within the area of the Mongaup River System. The 2007 refilling of the reservoir, however, did not equate to an immediate increase in the number of wintering bald eagles for the 2008 season due to the impacted fish populations directly associated with the low water condition of the reservoir while repairs were made. The total number of eagles within the Mongaup River System is expected to increase in the years following the 2008 Bald Eagle Report as fish populations recover to numbers similar to those before the reservoir was drained for repairs.

Northern Goshawk (Accipiter gentilis)

The northern goshawk, a New York State species of special concern, was observed three times on or near the project site. The first observation occurred on June 11, 2008 when an adult goshawk flew over St. Joseph’s Road in a northerly direction. A second observation took place on October 24, 2008 when an adult male flew over Wetland L traveling south. An adult goshawk was also observed on November 21, 2008 perched in a shrubby area just east of the project site along Cold Spring Road.

New York State is near the southeastern edge of the Northern goshawk’s breeding range. The goshawk typically nests in mature mixed deciduous-coniferous forests with an open understory. The species is known to be secretive and difficult to detect, contributing to its status as Special Concern in New York since not enough information exists on its population status. Threats to the goshawk include loss of forest habitat for major prey species, including ruffed grouse.

The project site contains large tracts of mixed deciduous-coniferous woodland that are often associated with the breeding habitat of goshawks. Searches for raptor nests during the early spring of 2008 did not locate any goshawk nests. Verbal communication with members of the Sullivan County Audubon Society indicated goshawks have been known to nest east of the site in the Neversink River Unique Area. A major prey species of the goshawk, the ruffed grouse, appeared to have a healthy population on the project site.

Red-shouldered Hawk (Buteo lineatus)

Red-shouldered hawk, a New York State species of special concern, was observed numerous times throughout the breeding bird and wildlife surveys of the project site. Audible observations occurred on June 11, 2008 and May 19, 2009. Visual observations occurred on June 6, 2008 and May 20, June 10, and June 17 of 2009. Most of the observations occurred within or near the extensive strip of NYSDEC wetland HA-40, with the exceptions of the June 6, 2008 observation occurring at Wetland L and the June 17, 2009 observation occurring in the northeast corner of the project site. NYSDEC wetland HA-40 contains mature woodlands along streams and swampy areas, typical nesting habitat for red-shouldered hawk.

Red-headed Woodpecker (Melanerpes erythrocephalus)

At least three red-headed woodpecker, a species of special concern in New York State, were observed on the project site during an April 12, 2009 amphibian survey, but were not observed again on the site. During the April 12 survey, biologists observed a single male at Wetland T while hearing another red-headed woodpecker call near the location. Later during this survey, a red-headed woodpecker was heard calling along the western property line, approximately 2,000 feet north of the previous observations at Wetland T.

Once common in New York State, the red-headed woodpecker has undergone a long, slow population decline believed by some to be caused by nest site competition from European starling and removal of dead trees (used for nesting) from woodlands. In New York, red-headed woodpecker breeds in either open, park-like upland woods or open wooded swamps and river bottoms with dead trees standing in water. Golf courses with woodland edge or flooded forests created by beaver activity often produce suitable breeding habitat for the species.

Neither of the two locations where the red-headed woodpecker observations occurred contain habitat expected to support breeding of the species. It is likely that the observations were of migrating individuals, although potential breeding habitat does occur on the property. NYSDEC wetland HA-40 (Wetland ABD) contains open wetland forest with some standing trees and NYSDEC wetland HA-19 (Wetland L) contains numerous standing dead trees that could host a breeding pair of red-headed woodpeckers. Since the species was only observed once during the two years of wildlife surveys, the red-headed woodpecker is not thought to actively breed on the project site.

Sharp-shinned Hawk (Accipiter striatus)

Sharp-shinned hawk, a species of special concern in New York State, was observed twice during bird surveys of the project site. On October 24, 2008 an adult was observed flying high over Lost Lake in a southeast direction, likely in migration. A second observation of an adult maneuvering through the woods took place on May 6, 2009 on the north side of NYSDEC wetland HA-40.

The sharp-shinned hawk occupies woodland areas including coniferous and mixed deciduous forests, bushy and riparian areas, and even urban areas. The females may nest in woodlots, conifer plantations, riparian forests, or forest patches in a matrix of farmlands. The nest is often found near forest openings or edges, and near a stream, lake, or other body of water. Like the Cooper's Hawk, the sharp-shinned may be nesting with increasing frequency near sources of human disturbance.

Populations of sharp-shinned hawks have been steadily increasing since sharp declines occurred in the mid-1900s due to DDT and DDE contamination. However, the species remains sensitive to introduced contaminants and remains a species of special concern.

Cooper's Hawk (Accipiter cooperii)

A single Cooper's Hawk was observed flying over the field east of the project site along St. Joseph's Road on June 17, 2009.

During the breeding season, Cooper's hawk, a NYSDEC species of special concern, inhabits deciduous, coniferous, and mixed riparian or wetland forests. An individual's territory often contains edge habitat and small openings along streams or roads, which can be utilized for hunting. Nest sites are often located within closed canopy forests that provide, moderate to heavy shrub cover, and trees more than 30 years old. As more land is developed, nests have been observed increasingly closer to human activity.

Much like the sharp-shinned hawk, Cooper's hawk populations have been recovering significantly from declines caused by pesticide poisoning in the mid-1900s, but are still listed as species of special concern in New York due to their sensitive nature and potential exposure to unregulated pesticides on their wintering grounds outside of the southern United States (i.e. Mexico).

Osprey (Pandion haliaetus)

A single osprey was observed on June 1, 2009 in NYSDEC wetland HA-40 (Wetland ABD) where it was perched then flew in a southerly direction. This bird was likely hunting the open water found within the wetland since this was the only observation of the species. Anecdotal reports from local fisherman indicated osprey have occasionally been observed hunting Lost Lake.

Osprey were not observed nesting on the project site and are not expected to due to the habitat provided by the site. The osprey, a species of special concern in New York State, is typically found breeding in dead trees, buoys, towers, or poles along inland waterways with abundant fish populations. The species relies almost exclusively on live fish for sustenance. Breeding pairs of osprey have been increasing in New York State over the past 25 years. It is probable that the project site only provides marginal hunting opportunities for osprey based on the limited observations and reports of the species.

Forest Interior Bird Species

Several species of birds with habitat requirements consisting of unfragmented forest were observed as both transient species and breeding residents of the project site. Some of these species include scarlet tanager, hermit thrush, red-eyed vireo, black throated-blue warbler, black and white warbler, eastern wood-pewee, and yellow-bellied sapsucker.

Fish Species

The project site hosts numerous water resources that provide habitat for fish species. These water resources were evaluated throughout the course of the ecological surveys from 2007 through 2009.

Lost Lake

Surveys for the presence or absence of fish within Lost Lake consisted of creel surveys and interviews with local fishermen who have fished the lake for several years. Based on the surveys and interviews, Lost Lake is host to bluegill (*Lepomis macrochirus*), largemouth bass (*Micropterus salmoides*), yellow perch (*Perca flavescens*), American eel (*Anguila rostrata*), chain pickerel (*Esox niger*), and brown bullhead (*Ictalurus nebulosus*). These common species are typical of aquatic environments similar to Lost Lake and are not listed as endangered, threatened, or special concern species by the NYSDEC.

Regulated Streams

On September 2, 2009, biologists from TMA accompanied NYSDEC fisheries biologist Bob Angyal to survey regulated streams on the project site. Five locations within the regulated streams on the project site were electroshocked to determine what fish were present. The locations of the surveys are shown on Figure 3.4-4.

The first stream survey took place in the Bush Kill (NYSDEC # D-1-22) at the northern former railroad crossing. While this stream is classified as a Class B trout stream by the NYSDEC, brook trout were not observed within this section. Species of fish found during this survey include American eel, brown bullhead, white sucker (*Catostomus commersonii*), and bluegill.

The second survey was performed in the southern end of the Bush Kill tributary (NYSDEC #D-1-22-3), just east of the first survey location. Shocking of this stream resulted in a single brook trout (*Salvelinus fontinalis*) and one bluegill. This area of stream is below an old dam within NYSDEC wetland HA-40 and is believed to have very low amounts of dissolved oxygen. The low oxygen content of the stream could be a contributing factor to the low volume of fish found in the stream.

A sub-tributary to the Bush Kill (NYSDEC # D-1-22-3-1) was site of the third fish sampling effort. Five brook trout were collected from this stream for NYSDEC data and numerous other fish were observed but not caught. The fourth survey took place in a tributary to the Bush Kill's sub-tributary (NYSDEC # D-1-22-3-1-1). Shocking of this stream also resulted in numerous brook trout. The presence of fingerling brook trout within these two streams confirms the stream's use as a spawning area for the species.

The fifth stream survey was performed within a second sub-tributary of the Bush Kill (NYSDEC # D-1-22-3-3). Electroshocking efforts in this section resulted in no observations of fish. The high gradient of this stream, paired with low flow volume, presents the likelihood of the stream drying out during various periods of the year. Little to no stream flow is obviously unfavorable to fish species and could contribute to their absence within this particular stream.

NYSDEC personnel determined that surveying two other streams on the site was not warranted. One of these streams, a third sub-tributary to the Bush Kill (NYSDEC # D-1-22-3-2), is an ephemeral stream that is not likely to hold water consistently throughout the year, therefore not presenting prime habitat for most fish species. The other stream is the outlet stream from Lost Lake and is also a tributary to the Bush Kill (NYSDEC # D-1-22-4). Since a majority of the stream's base flow is provided by water spilling over from Lost Lake, any fish species inhabiting Lost Lake may temporarily or permanently reside within the outlet stream as well.

Species of Greatest Conservation Need

The State Wildlife Grants program provides funds for conservation efforts aimed at preventing fish and wildlife populations from declining, reducing the potential for these species to be listed as endangered. In order to access these grant funds, New York State was required to develop a Comprehensive Wildlife Conservation Strategy (CWCS) that focuses on the "species of greatest conservation need." This includes those species that are deemed rare, imperiled and those for which status has not been established.

Species are chosen as species of greatest conservation need (SGCN) using the following criteria:

- Species on the current federal list of endangered or threatened species that occur in New York
- Species that are currently State-listed as endangered, threatened or special concern
- Species with 20 or fewer elemental occurrences in the New York Natural Heritage Program database
- Estuarine and marine species of greatest conservation need as determined by New York Department of Environmental Conservation, Bureau of Marine Resources staff

Based on this criteria, NYSDEC staff produced a list of 537 species of greatest conservation need. The list of species is certainly not exhaustive, but includes those species for which systematic assessments had been made by staff of the NYSDEC Division of Fish, Wildlife and Marine Resources and the NHP. The list serves as a basis for the NYSDEC in allocating resources from the State Wildlife Grants program and as a way of prioritizing or directing other conservation programs in New York, including habitat protection and management, surveys, and research that may be funded from other sources.

Of the wildlife observed on the project site, 22 are included in the Comprehensive Wildlife Conservation Strategy list of the species of greatest conservation need. These species can be seen in Table 3.4-6 below.

Table 3.4-6 Species of Greatest Conservation Need Identified on the Project Site	
Common Name	Scientific Name
Birds	
American Black Duck	<i>Anas rubripes</i>
American Woodcock	<i>Scolopax minor</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>
Blue-winged Warbler	<i>Vermivora pinus</i>
Canada Warbler	<i>Wilsonia canadensis</i>
Cooper's Hawk	<i>Accipiter cooperii</i>
Northern Goshawk	<i>Accipiter gentilis</i>
Red-shouldered Hawk	<i>Buteo lineatus</i>
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>
Ruffed Grouse	<i>Bonasa umbellus</i>
Scarlet Tanager	<i>Piranga olivacea</i>
Sharp-shinned Hawk	<i>Accipiter striatus</i>
Tennessee Warbler	<i>Vermivora peregrina</i>
Wood Thrush	<i>Hylocichla mustelina</i>
Worm-eating Warbler	<i>Helmitheros vermivorus</i>
Reptiles	
Eastern Hognose Snake	<i>Heterodon platirhinos</i>
Eastern Ribbon Snake	<i>Thamnophis sauritus sauritis</i>
Northern Black Racer	<i>Coluber constrictor</i>
Snapping Turtle	<i>Chelydra serpentina</i>
Fish	
American Eel	<i>Anguilla rostrata</i>
Brook Trout	<i>Salvelinus fontinalis</i>
Sources: New York State Department of Environmental Conservation, Tim Miller Associates, Inc. 2009.	

Wildlife Habitats

The project site includes twelve principal habitat/ecosystems which correspond with the following broadly described "Ecological Communities of New York State"¹⁰:

1. Allegheny Oak Forest
2. Appalachian Oak-Pine Forest
3. Hemlock-Northern hardwood forest
4. Beech-Maple Mesic Forest
5. Talus Slope
6. Shallow Emergent Marsh
7. Shrub Swamp
8. Red Maple-Hardwood Swamp
9. Hemlock-Hardwood Swamp
10. Highbush Blueberry Bog Thicket
11. Red Maple-Tamarack Peat Swamp
12. Impounded Lake

¹⁰Edinger, G.J. et al (Eds.) 2002. Ecological Communities of New York State. Second Edition. NYSNHP, NYSDEC. Albany, NY. 136 pp.

The unique composition of each of these habitats provide a variety of foraging, nesting, and transient habitat for wildlife that occur on the project site. Descriptions of the vegetative characteristics of each community can be found in Chapter 3.3 Vegetation. The distribution of these habitats across the project site is shown in Figure 3.3-2 Upland Ecological Communities, Figure 3.3-3 Wetland Communities, and Figure 3.4-1 Vernal Pool Locations. Each of the vegetative communities noted above represents a different type of wildlife habitat. The "edge habitats", or ecotones, between the different vegetative communities provide a diversity of vegetative structure and niches for wildlife species. The overall value of the project site as wildlife habitat is generally moderate to high, due to the variety and unfragmented, interconnected habitats and the presence of both open and flowing water.

In general, the upland forests and portions of forested wetlands contain mature trees with deadfalls, including limbs and stumps. Populations of insects, earthworms, snails and slugs within dead and decaying wood and in the leaf litter collectively form the basis for the food chain on this site. The scattered abundance of wetlands throughout the site provides additional benefit to wildlife by offering a water source and additional forage opportunities. A number of trees that are either standing dead or damaged provide potential habitat for cavity dwellers (e.g., woodpeckers, owls, flying squirrels and chipmunks).

The dense layers of mountain laurel and other heath shrubs found within the Allegheny oak and Appalachian oak-pine forests provide excellent habitat for species of songbirds such as eastern towhee, gray catbird, black throated-blue warbler, and American redstart. The cover provided by the shrub layer presents nesting and protective habitat for these bird species, as well as foraging and cover opportunities for mammals such as white-tailed deer and black bear. The mature trees in these communities provide mast for a multitude of wildlife, as well as nesting opportunities for birds and small mammals.

Hemlock-hardwood forests provide habitat for species of bird that inhabit forest with inclusions of coniferous trees such as black throated-green warbler, magnolia warbler, pine warbler, golden-crowned kinglet, acadian flycatcher, and pileated woodpecker. Forest stands with inclusions of hemlocks typically provide more shade at the ground level and thus provide a cooler micro-climate for wildlife to seek out during hot and dry weather. The hemlock hardwood swamp community is generally found along stream corridors on the project site and has a cooling effect on the streams.

Wetland communities with an extensive shrub layer, such as the highbush blueberry bog thicket and shrub swamp communities, offer excellent cover for various species of wildlife. Songbirds such as common yellowthroat, swamp sparrow, song sparrow, and alder flycatcher utilize the shrubby wetland communities found in NYSDEC wetlands HA-40 and HA-41 for nesting and foraging opportunities. Cottontail rabbits and other small mammals exploit these areas for cover as well. Wetland communities also provide suitable habitat for several species of amphibians, such as American toad, green frog, and redback salamander. Small reptiles and amphibians living within the wetland areas offer an additional food source to some of the larger omnivorous mammals that are present (i.e., raccoons, fox). Larger species of wildlife, such as white tail deer, are also likely to forage in the wetland and use it as a drinking source.

Open water communities, such as Lost Lake and parts of NYSDEC wetland HA-40 provide habitat for aquatic species, as previously described in this chapter. Species of birds utilizing the open water communities include wood duck, American black duck, Canada goose, osprey, bald eagle, and tree swallow. Mammalian species, such as beaver, were observed within Lost Lake and portions of NYSDEC wetlands HA-40 and HA-41.

Wildlife Corridors and Movement of Wildlife

In its current state, the project site does not act as a substantial wildlife corridor between significant habitats. This is not to say wildlife, specifically large mammals and birds, do not move into and out of the site, but rather the site exists as part of a significantly large tract of nearly contiguous habitat that most species reside within. The site contains access to both standing and flowing water among unfragmented upland forests that many species require. As these habitat requirements are met within the property boundaries and adjacent properties contain similar habitats, wildlife use of the property as a corridor is expected to be minimal.

Large mammals, such as white-tailed deer and bear, and birds are wildlife species that are expected to use the project as some type of movement corridor as their home ranges can be large. In addition, large mammals will likely move into or out of the project site during times of severe drought or during years when food resources are scarce.

During site visits in October 2008 and again in September 2009, several hawks of different species were observed migrating south over the project site. In September 2009, project biologists saw numerous broad-winged hawk "kettles" in a short observation period. "Kettles" of broad-winged hawks form when migrating broad-wings utilize rising thermals of warm air to gain lift, then glide off to another rising thermal to avoid the strain associated with excessive flapping on their migration to South America. Several other hawk species, including sharp-shinned hawk, Cooper's hawk, and bald eagle were observed migrating over the project site as well. A review of USGS topographic maps of the project site and surrounding areas show that the center of the parcel contains a high point of two intersecting ridgelines that could be favorable to migrating raptors. South of this high point on the property, portions of NYSDEC wetland HA-40 containing open, shrubby land are likely to heat up quicker than forested portions of the property, creating a source of rising air thermals favorable to migrating broad-winged hawks.

3.4.2 Potential Impacts

Impacts to Wildlife Including Transient Migration of Wildlife Species

The project site is currently a part of a large tract of unfragmented forest with minimal development. The site's location within this contiguous tract allows transient wildlife to freely move about the forest. The addition of roads and development to the project site will impair wildlife movement, however this impact is not anticipated to be significant. The retention of approximately 1,215 acres¹¹ of upland forest, along with the revegetation of temporarily disturbed areas in the form of landscaping, stormwater management practices, and golf course will still allow opportunities for wildlife to move into and out of the project site.

Full development of the project is not anticipated to be completed for decades and will take place gradually over time. The gradual construction of homes through a phased construction plan will allow wildlife time to adjust their movement patterns and seek out the preserved areas of the project site to utilize as corridors.

In general, as a site is developed, many wildlife species move out of the areas of disturbance. Upon project completion, the developed areas no longer function as habitat for many species of wildlife currently using the project site. Most species will be forced to search for acceptable

¹¹This number refers to the total area of undisturbed upland woods after construction, to be distinguished from the term "open space" discussed elsewhere in this document.

habitats off site, with bird species being able to fly in search of new habitat and terrestrial species having to make overland movements. Wildlife movement from this site is expected to be multi-directional since vast tracts of unfragmented forest exist on all sides of the property. It is expected, however, that a majority of the wildlife moving from the site will be to the south and east, towards to Neversink River Unique Area. The Neversink River Unique Area, sometimes referred to as the Neversink Gorge, is a New York State owned and NYSDEC operated management unit comprised of the 4,881 acre Neversink River Unique Area and the 585 acre Wolf Brook Multiple Use Area. The 5,466 acres included in the Neversink Unique Area contains a wide diversity of wildlife habitats, with vast, unfragmented expanses of those found on the Lost Lake Resort project site. Since this land is owned by New York State and current management plans propose to maintain the area as pristine woodland, wildlife displaced by activities on the Lost Lake Resort project site are expected to make the transition to inhabiting the Neversink River Unique Area, as such wildlife populations are not expected to be significantly impacted.

During development of the site, construction activities could potentially result in a temporary increase in road mortality rates for some of the species vacating the site. After the proposed development and the alteration of the habitat on the project site, wildlife movements into and out of the project site are likely to be reduced, as the site will offer fewer opportunities for food and cover.

Many bird species are migratory, and therefore have always left the subject property annually. Upon return, most migratory species will adaptively seek other nearby or regionally available environments in response to alterations to this property. Land with similar habitats surrounding the property, specifically within the Neversink River Unique Area located to the south and east, could provide alternative habitat for most of these species. However, these lands are expected to already have established resident wildlife populations and it is not determined whether such areas will be able to support the arrival of new individuals. For this reason, the loss of habitat associated with the proposed action may result in reduced regional wildlife populations. This loss, however, is expected to be minimal due to the mitigation measures outlined further in Section 3.4.3 of this chapter and the large tracts of contiguous undisturbed and protected land surrounding the project site. The possibility also exists that these adjacent parcels have excess carrying capacity and be able to accommodate additional individuals.

Development of the project site will not likely create any significant adverse impacts to migrating raptors as the high point of the property will still function as part of a ridgeline that may be part of a preferred migratory path. Migrating raptors are not known to avoid migrating over development, as witnessed at several stationary hawkwatches in the northeast that have continued to monitor migrating raptors for decades, despite development within the immediate area. There is the potential that increased development of the site could produce more warm air thermals, which will aid hawks that continue to migrate through the area.

Wildlife species associated with wetland habitats are not expected to be impacted by the development and will not migrate to upland areas as these areas offer significantly drier habitat than the wetland areas.

After the project development is completed, the composition of the wildlife population on the project site will adjust to the final site conditions. Species better able to adapt to generally open and landscaped environments (such as raccoons, opossum, woodchucks, mice and certain songbirds) will have a greater ability to populate the site in comparison to species that are less tolerant of human activity.

While not as valuable as the existing forested habitat, the proposed landscaping will be planted with species of trees and shrubs that provide wildlife benefits such as forage and nesting sites for birds and small mammals. Denning sites for small mammals will also persist after completion of the project. The preserved habitat areas of the wetlands, watercourses and open field along with the re-vegetated open space areas will continue to be used by deer and other human subsidized species.

Vernal Pool Breeding Amphibians

Of the nine productive vernal pools identified on the project site, portions of upland habitat within the vernal pool envelope and critical terrestrial habitat surrounding five of the pools will be preserved. In addition, the vernal pool depression of all nine will remain intact. As depicted on the site plan, the vernal pool within wetland DD is found almost entirely on a proposed lot. This lot will likely become a conservation lot or one of several no-build lots. Conservation lots or no-build lots are proposed lots that have identified environmental constraints that will inhibit development. These lots will be preserved as open space or could be paired with adjacent lots and deed restrictions will prevent building on portions of the lot with environmental constraints. Several of these lots will likely exist within the critical terrestrial habitat areas of the productive vernal pools.

Vernal pools in wetlands T-C, U, V, TT-A, and DD will still contain over one-third of their critical terrestrial habitat while vernal pools in wetlands M-A, CC, and ABD will maintain approximately one-half or more of their critical terrestrial habitat after construction of the proposed action. The vernal pool in wetland EE will maintain less than one-quarter of its critical terrestrial habitat.

Impacts to vernal pool breeding amphibians will result from construction of the proposed action. While portions of critical terrestrial habitat associated with all of the productive vernal pools will be maintained, the area being preserved surrounding some of the vernal pools may not be sufficient to maintain amphibian populations at their current levels. The reduction in vernal pool amphibians resulting from a loss of critical terrestrial habitat is not expected to be significant at a regional scale since none of the vernal pool dependent species observed on the project site are identified as species of special concern or species of greatest conservation need, and breeding populations will continue to exist on the project site, albeit likely at lower concentrations. It is noted that vernal pools do not have any greater regulatory protection than any other wetland type.

Forest Interior Bird Species

Removal of trees in the area of proposed development outside the breeding season, generally late summer through early spring, will cause the returning migrant forest interior bird species using the site to seek out other nearby woodland habitats surrounding the project site. If construction were to take place during the breeding season, direct impacts to nesting pairs could result. As the proposed action will not result in significant adverse impacts to the local populations of these bird species on or in the vicinity of the project site, mitigation for the loss of their habitat is not proposed. The proposed plan includes preservation of an expanse of the central wetland and buffers surrounding it in contiguous, undisturbed forest cover (comprising approximately 233 acres not counting additional forest left undisturbed on adjoining house lots) that would continue to provide breeding habitat for many forest interior bird species.

Impacts to Endangered, Threatened, or Special Concern Species

Impacts to the protected species that were observed or are expected on the project site are assessed below. No listed endangered species were observed or are expected at the site.

Bog turtle (Glyptemys muhlenbergii)

Since the project site does not contain the habitat needed to support a population of bog turtles, impacts to this species are not anticipated as a result of the proposed action.

Wood Turtle (Clemmys insculpta)

Approximately 99 percent of typical wood turtle habitat provided by NYSDEC wetland HA-40 will be preserved in its entirety and will continue to provide habitat for the species if a population is, in fact, present on the project site. Blocks of wooded habitat will be preserved in areas surrounding NYSDEC wetland HA-40 that will provide upland breeding habitat needed for the species, specifically the former train tracks on the eastern property boundary.

Timber Rattlesnake (Crotalus horridus)

The absence of timber rattlesnakes on or within close proximity to the project site significantly reduces the potential for impacts to this species. While populations of timber rattlesnakes occur within several miles of the project site, the proposed action is not expected to impact these populations in any way.

Eastern Hognose Snake (Heterodon platirhinos)

Significant adverse impacts to this species are not anticipated by development of the proposed action. Since the proposed development will preserve wooded and wetland habitats, the property could continue to maintain a population of hognose snakes.

Bald Eagle (Haliaeetus leucocephalus)

The bald eagle was cited by the NYSDEC as having a presence within the vicinity of the project. As discussed earlier, this species is known to nest within close proximity to the project site.

Bald Eagle Status and Nest Protection Background

In order to ensure the bald eagle remains off of the threatened and endangered species list, the USFWS has generated the National Bald Eagle Management Guidelines (the Guidelines) dated May 2007 (copies available on the USFWS website). Protocols for protection of this avian species have been and continue to be focused on the nest tree and surrounding environs. The Guidelines, as with past bald eagle management documents, utilizes nest tree protection zones within which activities are restricted. These zones "...vary depending on the topography and other ecological characteristics surrounding the nest." The protection zone distances documented in the Guidelines range from 330 feet (where the activity is not visible from the nest site) to "660 feet, or as close as existing tolerated activities of similar scope" (where the activity is visible from the nest site). There are no similar protections afforded eagles for foraging or roosting sites; protection is focused on the nest site.

The Guidelines are intended to:

- (1) Publicize the provisions of the Eagle Act that continue to protect bald eagles, in order to reduce the possibility that people will violate the law,
- (2) Advise landowners, land managers and the general public of the potential for various human activities to disturb bald eagles, and
- (3) Encourage additional non-binding land management practices that benefit bald eagles.

Adherence to the Guidelines will benefit individuals, agencies, organizations, and companies by helping them avoid violations of the law. However, the Guidelines themselves are not law. Rather, they are recommendations based on several decades of behavioral observations, science, and conservation measures to avoid or minimize adverse impacts to bald eagles."

The document goes on to state that "[t]o avoid disturbing nesting bald eagles, we (USFWS) recommend (1) keeping a distance between the activity and the nest (distance buffers), (2) maintaining preferably forested (or natural) areas between the activity and around nest trees (landscape buffers), and (3) avoiding certain activities during the breeding season. The buffer areas serve to minimize visual and auditory impacts associated with human activities near nest sites. Ideally, buffers will be large enough to protect existing nest trees and provide for alternative or replacement nest trees."

The bald eagle remains protected in New York State as a threatened species by the NYSDEC. The State refers to the new USFWS Guidelines when working with property owners to protect nest sites.

During discussions with NYSDEC Region 3 Bureau of Wildlife Endangered Species Program personnel, it was determined that the bird's habitat in the vicinity of the project site is limited to two nesting site located on St. Joseph's Lake. This is not to say that bald eagles do not actively hunt Lost Lake nor have never used a tree on the project site to roost during winter or summer months.

Development on the western portion of the project will be approximately 4,000 feet from the shoreline of St. Joseph's Lake. Review of the USGS Hartwood quadrangle shows the shoreline elevation of St. Joseph's Lake at approximately 1,430 feet. Assuming an eagle's nest is built approximately 60 feet high in a tree, the St. Joseph's Lake nest(s) will exist at an elevation of 1490 feet. Ground elevation rises to approximately 1,500 feet between St. Joseph's Lake and the Lost Lake Resort's western property line. Aerial photography of this area shows it to be completely forested, with trees likely to exceed 60 feet in height. This forested hillside between St. Joseph's Lake and the project site will likely provide a dense visual buffer between the St. Joseph's Lake eagle's nest(s) and development on the project site.

Since there are no known nest trees on the site and only inconsistent use of Lost Lake for hunting, significant impacts to the species are not expected and therefore, there will be no need for protective buffer lands for this species in the vicinity of the proposed project. Should a pair of bald eagles build a nest on the project site prior to the start of construction of the proposed action, the Applicant will work with the NYSDEC to develop an acceptable plan that will limit impacts to this protected species.

Pied-billed Grebe (Podilymbus podiceps)

Impacts to pied-billed grebe are not anticipated as a result of the proposed action. While this species was not directly identified as using the project site, a single individual of this species, likely in migration, was observed on Crane Pond south of the project site. While the open water resource of Lost Lake could provide migratory stopover habitat, the proposed action will not eliminate the resource.

Northern Goshawk (Accipiter gentilis)

The disturbance of approximately 600 acres of upland forest will impact hunting and nesting opportunities currently provided to northern goshawk. The removal of trees associated with the limit of disturbance will remove potential nesting trees for goshawk, though the species was not identified as a species utilizing the site for breeding purposes. The disturbance associated with the project will also impact prey species (e.g. ruffed grouse) of the goshawk.

Red-shouldered Hawk (Buteo lineatus)

Impacts to red-shouldered hawk are anticipated to be minimal. Observations of this species typically occurred near the vast stretch of NYSDEC Wetland HA-40. Wetland HA-40 will be preserved as open space and will not be disturbed at any point. The preservation of this wetland corridor and its 100 foot buffer area, along with tracts of connected forested open space throughout the property, will continue to meet the habitat requirements for this species.

Red-headed Woodpecker (Melanerpes erythrocephalus)

Impacts related to development of the project to red-headed woodpecker are not anticipated as a result of the proposed action. The red-headed woodpeckers observed on the project site were likely migrants due to their presence only during an April 2009 amphibian survey. Nevertheless, the species could reside on the property within any of the wooded swamps, in particular NYSDEC wetlands HA-40 and HA-39 near the locations of the observations. As stated above, approximately 99 percent of NYSDEC wetland HA-40 will remain undisturbed after completion of the proposed action and NYSDEC wetland HA-39 will be preserved in its entirety. These two wetlands will remain as potential habitat for red-headed woodpecker.

The proposed action will actually provide additional habitat for red-headed woodpecker. The species often inhabits park-like woodland or golf courses with woodland edge. The addition of a 200 acre golf course to the project site will provide an increase in suitable breeding habitat for the species and thus, could increase the species population.

Sharp-shinned Hawk (Accipiter striatus)

The removal of approximately 600 acres of upland forest will impact hunting and potential nesting opportunities for the sharp-shinned hawk. This species was not observed regularly during surveys of the project site and is not believed to nest on the site. While the elimination of upland forest will reduce habitat for sharp-shinned hawk, impacts are not anticipated to be significant due to the preservation of half of the project site as open space that will still present hunting and nesting opportunities to the species.

Cooper's Hawk (Accipiter cooperii)

Cooper's hawk habitat requirements are nearly identical to those of the sharp-shinned hawk. As with the sharp-shinned hawk, the removal of approximately 600 acres of upland forest on the project site will impact potential nesting and hunting habitat for Cooper's hawk. The preservation of half of the project site as open space will continue to provide habitat suitable for Cooper's hawk.

Osprey (Pandion haliaetus)

While observations of osprey were limited to a single field observation and anecdotal reports from fisherman, the project site provides marginal hunting habitat for the species. Foraging habitat provided by NYSDEC wetland HA-40 will be preserved nearly in its entirety, and the open water resource of Lost Lake will remain after construction of the proposed action. The preservation of these two areas will continue to allow osprey to utilize the property, therefore no significant adverse impacts are anticipated.

Impacts to On-site Aquatic Species and Species in the Bush Kill and Neversink River

Sedimentation from erosion during construction and development can create potential indirect impacts to aquatic species downstream in the Bush Kill and Neversink River. A Soil Erosion and Sediment Control plan has been developed and provided in the site plans (refer to section 3.1 and the drawings, attached to this document for detailed information relating to the erosion and sediment control plan). All soil erosion and sedimentation controls throughout the site, such as silt fencing and an entrance tire tracking pad, will be installed prior to other construction activities according to the current NYSDEC manual for erosion and sediment plans¹².

The purpose of the plan is to minimize the potential for soil erosion from areas exposed during construction and prevent sediment from entering downgradient wetlands and watercourses. The conceptual Stormwater Pollution Prevention Plan, in Appendix G, further discusses the erosion and sediment control measures to be implemented as a means to protect aquatic species.

3.4.3 Mitigation Measures

The proposed project has been designed to minimize or avoid impacts to natural features as discussed below and to respect the environment to the maximum extent practicable.

Preservation/Protection of Existing Habitat

Approximately 1,215 acres¹³ of upland forested habitats will remain after construction of the Lost Lake Resort. Blocks of undeveloped forest strategically placed throughout the project site will serve as habitat for wildlife after construction of the resort.

Construction of internal roadwork throughout portions of the site will necessitate crossing streams and narrow portions of wetlands. Disturbance to wetlands for construction of these roads will be limited, thereby preserving over 99 percent of the wetlands on the project site. To

¹²NYSDEC. 2005. New York Standards and Specifications for Erosion and Sediment Control - April 2005.
<http://www.dec.state.ny.us/website/dow/toolbox/escstandards/>

¹³This number refers to the total area of undisturbed upland woods after construction, to be distinguished from the term "open space" discussed elsewhere in this document.

mitigate for the loss of wetlands, wetlands will be created on the site. (Refer to Section 3.3 for descriptions and areas of affected wetlands.)

As the project design is developed for each phase some of the proposed lots on the master plan will be designated as conservation lots (no-build lots) or eliminated to become part of the open space land where it is determined due to more detailed review by the developer that these lots contain environmental constraints that will restrain development, such as a site-specific soil condition, excessive rock, evident wildlife activity, or larger desirable wetland buffer. Some lots could be paired with adjacent lots and deed restrictions established to prevent building on portions of the lot with environmental constraints. Several of these lots will likely exist within the critical terrestrial habitat areas of the productive vernal pools, areas with steep slopes, or other areas of significant habitat.

Restoration or Enhancement of Habitat

The creation of stormwater basins, graded and planted in a manner that is consistent with the open marsh portions of the existing wetlands, also contributes to mitigating the potential impacts on the entire wetland corridor. The stormwater basins will be planted with herbaceous wetland vegetation, and provide wetland habitat as well as control of stormwater quality and quantity. While no direct credit is taken for these basins as wetland creation areas, they will in fact perform several wetland functions and result in a net increase of wetland function and benefits on the site following construction.

The addition of a 200-acre golf course will introduce open habitat that is not found on the project site and therefore will attract wildlife species that do not currently inhabit the existing site. Songbirds that reside in open habitat, such as bluebird and eastern meadowlark, will colonize the golf course area after its completion. Nesting boxes will be placed in appropriate perimeter areas of the golf course to provide a safe nesting area for these species. Larger nesting boxes for the open habitat-dwelling American kestrel, a species of falcon showing a steady population decline, will be placed as well.

In addition to the placement of nesting boxes within the golf course, nest boxes for larger species will be placed within tracts of preserved forest and within wetlands. Wood ducks are known to successfully utilize nesting boxes in wooded wetland habitats and some species of owls take advantage of nesting boxes within upland forests. The placement of these nesting boxes will be determined in the field by a properly educated biologist after construction within the surrounding area is completed.

Mitigation of Potential Nuisance Wildlife

In the long term, the composition of the wildlife populations will be altered in areas immediately adjacent to the development, as species able to adapt to a more suburbanized environment (such as raccoons, opossum, woodchucks, mice, songbirds, etc.) will have a greater ecological advantage over species that are less tolerant of human activity; this effect is unavoidable. Edge habitats created by encroachment of the development footprint on forested areas could favor such species, but are not expected to substantially increase local populations of "pest" wildlife as these species (raccoons, skunks, opossum, and geese) will be managed, if necessary, by a licensed pest control specialist upon the addition of the proposed residential development.

Landscaping Utilizing Native Vegetation

A landscaping plan will be developed for the proposed action and will utilize native or adaptive vegetation in areas where practical. The landscaping plan is discussed further in Chapter 3.3 Vegetation.

While the existing woodland vegetation will be replaced by a combination of native and non-native ornamental plants, lawns, and landscaped plots within the developed areas, the introduced plantings could still be used as forage by deer and other wildlife and many of the shrub species chosen for landscaping will provide immediate habitat for songbirds and other avian species. Trees that are planted will mature in the long-term and will provide some roosting and nesting opportunities for birds that are adaptable to suburban conditions. Coniferous trees and shrubs such as pines, spruces, firs, arborvitae, and junipers provide spring and summer nest sites as well as year-round shelter. Unmown grasses, meadows and stormwater berm plantings provide cover for ground-nesting birds.

In addition to their value as hardy plantings, some of the native plant species likely to be used in the landscaping of the project site are cited by the Cornell Lab of Ornithology as berry and seed-bearing trees and shrubs that will offer songbirds seasonal food sources incidental to their use as landscape plantings.

Summer-fruiting plants provide food during nesting season. Many native fruit-bearing plants which are adaptable to landscaping purposes are available for use, including various species of cherry, chokeberry, raspberry, serviceberry, blackberry, blueberry, mulberry, and elderberry.

Fall-fruiting plants are important for birds in building up or maintaining fat reserves during migration. Examples of these include dogwoods, cotoneasters, and buffalo-berries.

Winter-persistent plants provide season-long fruit sources for winter resident species. Adaptable members of this group include varieties of crabapple, snowberry, bittersweet, sumac, viburnums such as American highbush cranberry, eastern wahoo, and winterberry or other hollies. Oaks, hickories, buckeyes, chestnuts, butternuts, walnuts and hazels provide nutrient rich nuts and acorns as food for birds and mammals as well as providing good nesting habitat for many birds and arboreal mammals.

The following landscaping groups and plants develop seasonal fruiting characteristics that are useful as food for wildlife:

- | | |
|-------------------|--|
| Deciduous Trees: | Red maple (spring fruiting) |
| | Sugar maple (summer fruiting) |
| | Mulberries (summer fruiting) |
| | Juneberries (summer fruiting) |
| | Flowering dogwood (fall fruiting) |
| | Crabapples (fall fruiting with winter-persistent fruit) |
| | White oak (fall fruiting with winter-persistent fruit) |
| | Sumacs (fall fruiting with winter-persistent fruit) |
| | American mountain ash (fall fruiting) |
| Coniferous Trees: | Cedars (fall fruiting with winter-persistent fruit; nest sites) |
| | Spruces (fall fruiting with winter-persistent fruit; nest sites) |

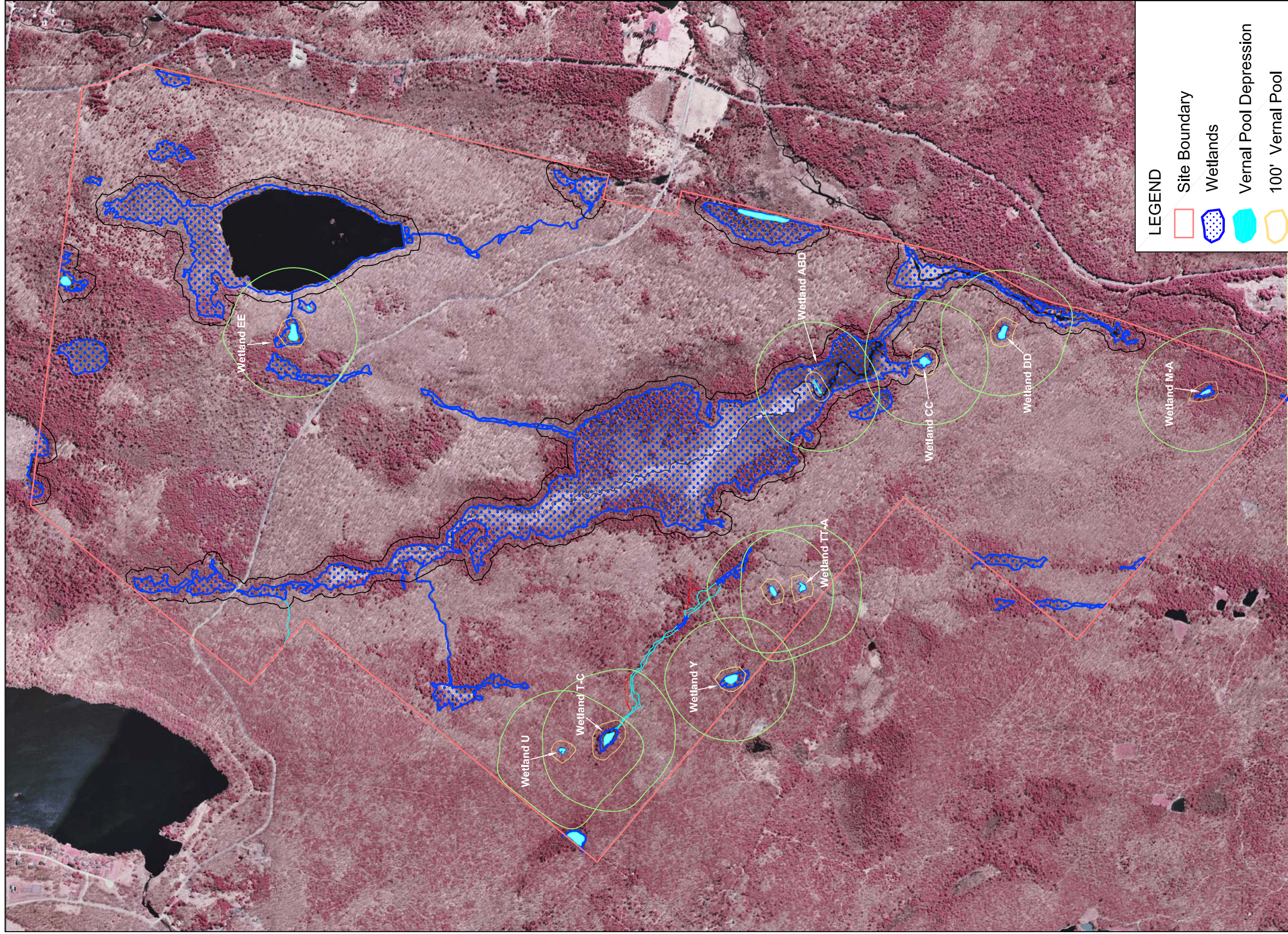
Native Vines:	Virginia creeper (fall fruiting with winter-persistent fruit)
Shrubs:	Dogwoods (fall fruiting) Viburnums (fall fruiting; some being winter-persistent) Winterberry (fall fruiting with winter-persistent fruit) White fringetree (summer fruiting) Northern bayberry (fall fruiting with winter-persistent fruit) Washington hawthorn (fall fruiting)

The proper bedding and positioning of landscape plants is important, as each of the species used will not thrive in all of the soils or exposures presented by the developed site. Particular plant requirements regarding planting, soil, water and sun/shade preferences will be used in determining final plant positioning.

Proposed Measures to Protect Trees to Remain

The limits of disturbance will be established in the field with visible markers, including on every house lot prior to clearing. No trees beyond these limits will be disturbed. These limits will be delineated by fencing or similar methods prior to commencing clearing or grading activities. Individual healthy trees identified to be preserved near working areas will be wrapped at the base by snow fencing to avoid accidental damage to the trunk and additional protections implemented to avoid excessive root damage.

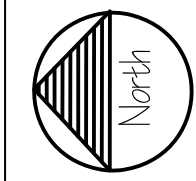
For trees to be protected during construction activities there should be no disturbance of any kind within the root zone of each tree, generally defined as within the drip line of the tree canopy. Snow fencing or other highly visible means of marking should be placed around the maximum area of the root system to prevent the destruction of roots by exposure or through the compaction of soils. Construction crews will be informed to exclude all equipment and material storage or other disturbance from these protected areas. If necessary where grading occurs within the drip line, the root zone of trees identified to be preserved will be preserved by tree wells in fill areas and retaining walls in cut areas.

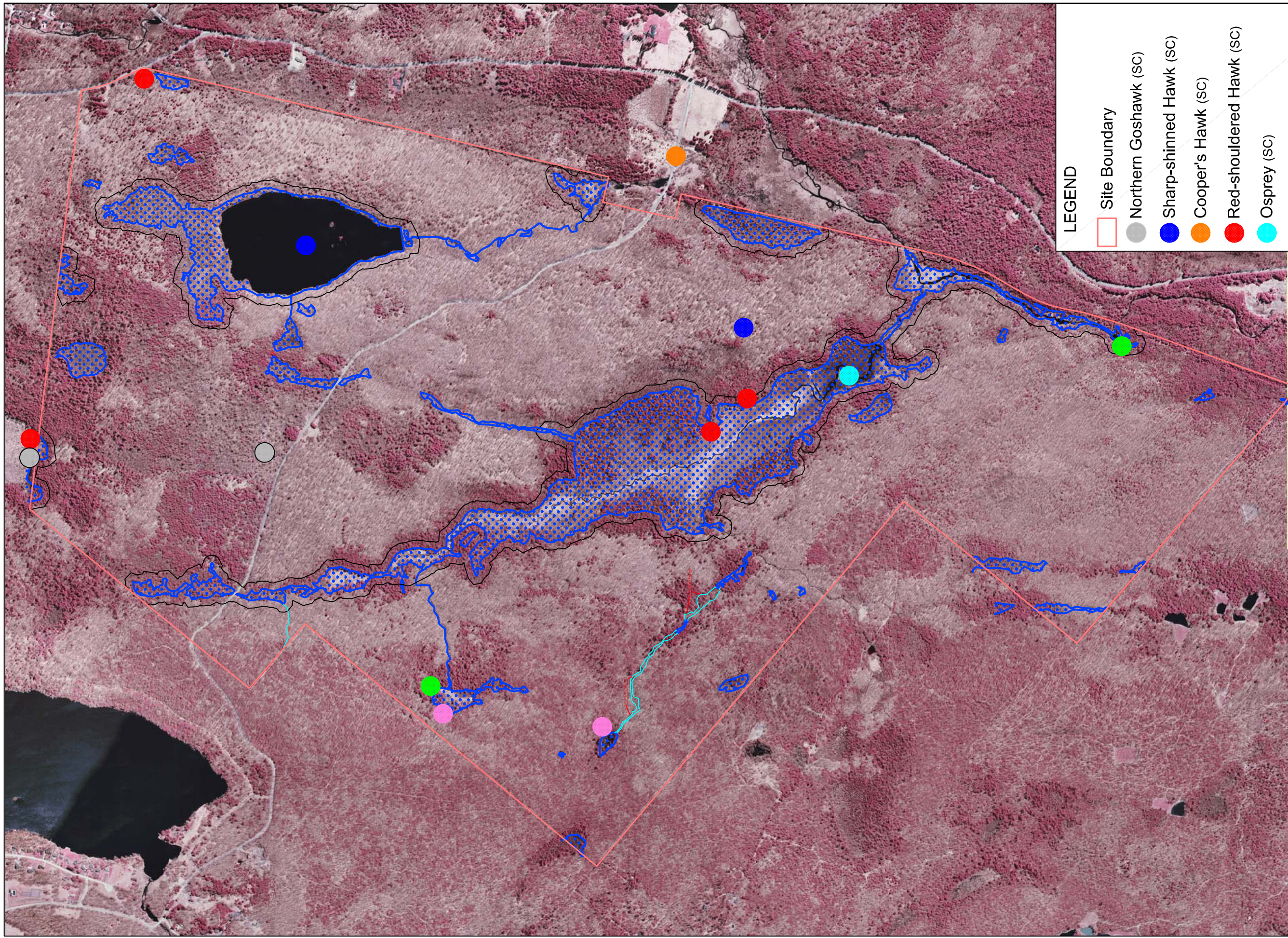


LEGEND

- Site Boundary
- Wetlands
- Vernal Pool Depression
- 100' Vernal Pool Envelope
- 750' Critical Terrestrial Habitat

Figure 3.4-1: Vernal Pool Locations
 Lost Lake Resort
 Town of Forestburgh, Sullivan County, New York
 Basemap: NYS GIS Clearinghouse
 Scale: 1 inch = 1200 feet





LEGEND

- Site Boundary
- Northern Goshawk (SC)
- Sharp-shinned Hawk (SC)
- Cooper's Hawk (SC)
- Red-shouldered Hawk (SC)
- Osprey (SC)
- Red-headed Woodpecker (SC)
- Eastern Hognose Snake (SC)

Note: No endangered species were observed.
 Bald Eagle observations are not shown per NYS DEC regulations.

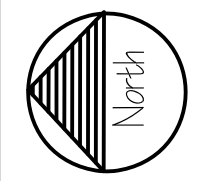
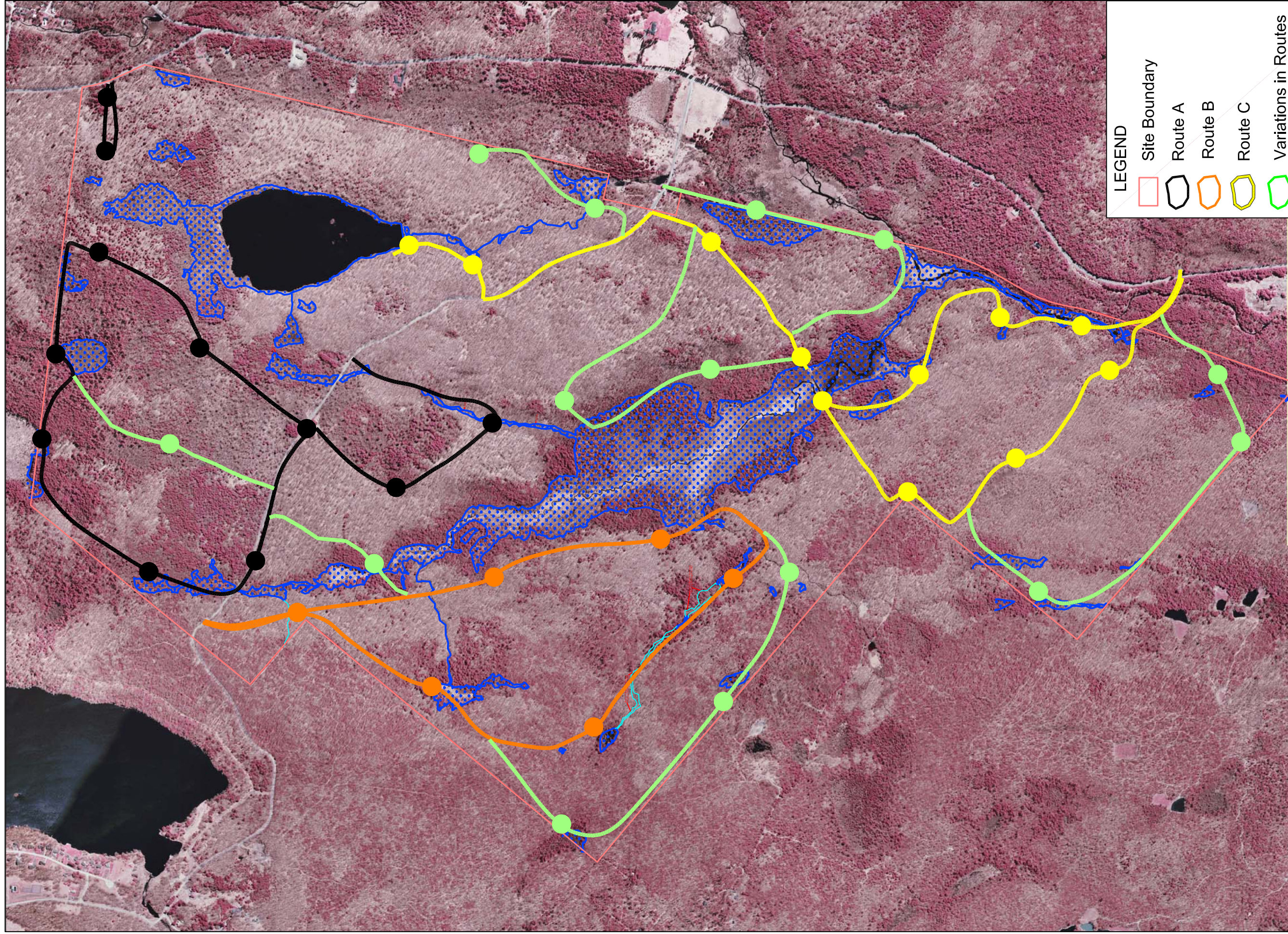








Figure 3.4-2: Observations of Special Concern Species
 Lost Lake Resort
 Town of Forestburgh, Sullivan County, New York
 Basemap: NYS GIS Clearinghouse
 Scale: 1 inch = 1200 feet



LEGEND

-  Site Boundary
-  Route A
-  Route B
-  Route C
-  Variations in Routes
-  Survey Point

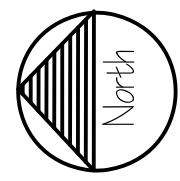
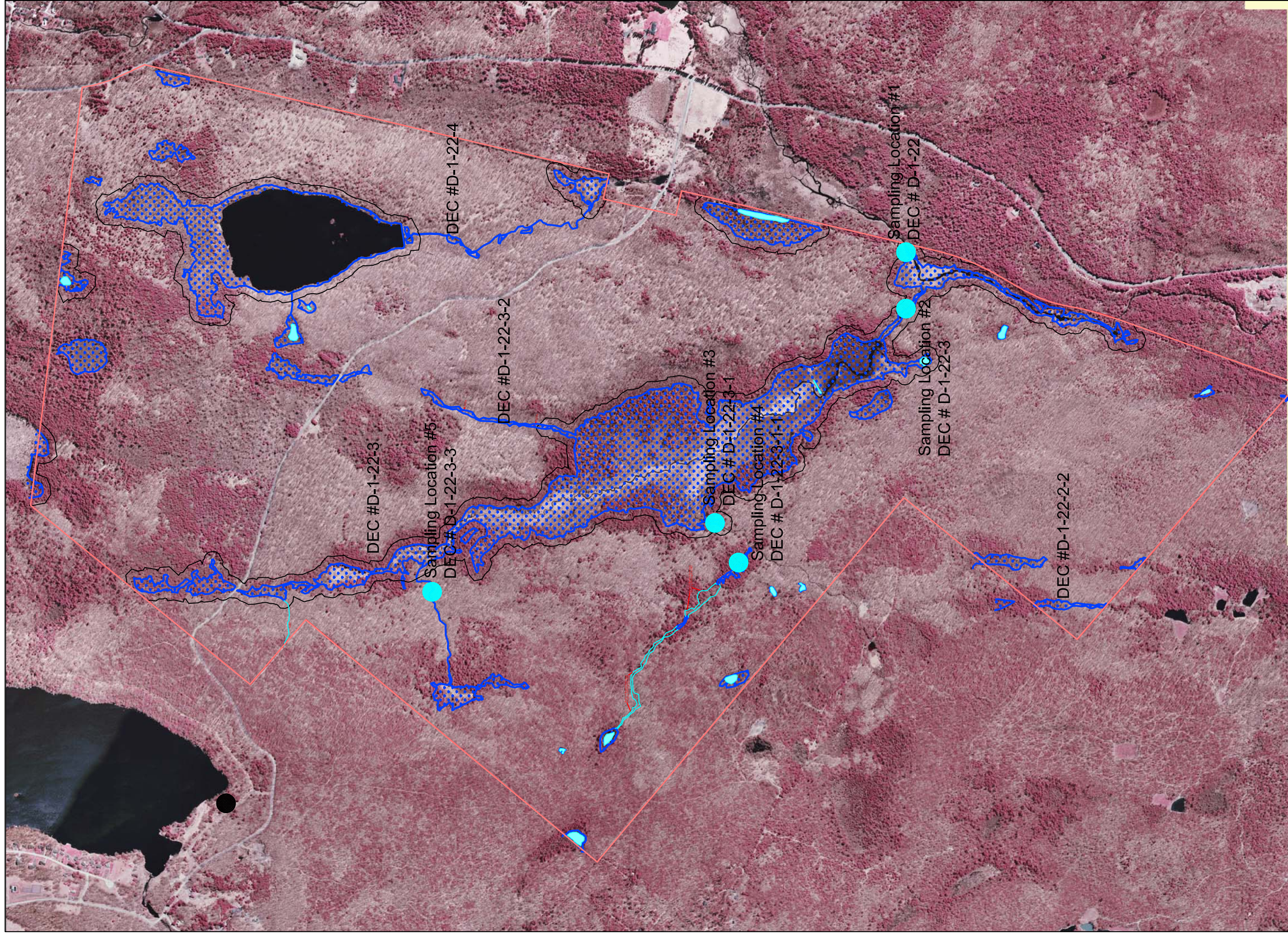


Figure 3.4-3: Breeding Bird Survey Routes
 Lost Lake Resort
 Town of Forestburgh, Sullivan County, New York
 Basemap: NYS GIS Clearinghouse
 Scale: 1 inch = 1200 feet



LEGEND

□ Site Boundary

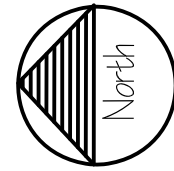


Figure 3.4-4: Stream Survey Locations

Lost Lake Resort
 Town of Forestburgh, Sullivan County, New York
 Basemap: NYS GIS Clearinghouse
 Scale: 1 inch = 1200 feet