

# BROX PROPERTY – MILFORD, NEW HAMPSHIRE

## NATURAL RESOURCES INVENTORY AND RECOMMENDATIONS



**Prepared for:**



Conservation Commission  
1 Union Square  
Milford, NH 03055

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**Prepared by:**  
FB Environmental Associates  
170 West Road  
Portsmouth, NH 03801  
[www.fbenvironmental.com](http://www.fbenvironmental.com)

# **Brox Property, Milford New Hampshire Natural Resources Inventory and Recommendations**

March 2015

**FB Environmental Associates**

170 West Road, Suite 6

Portsmouth, NH 03801

[www.fbenvironmental.com](http://www.fbenvironmental.com)

**Principal Authors:**

Kevin J. Ryan, Ph.D., Wildlife Ecologist, FBE

Jennifer Jespersen, Senior Scientist, FBE

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A beaver-created impoundment on the Brox property.

# 1. Introduction

## 1.1 Background Information

The area known as the “Brox Property” is comprised of ten parcels encompassing 268 acres of land in the Town of Milford, New Hampshire (Figure 1). The majority of the property is situated east of Whitten road and south of NH Route 101, although the northernmost portion lies just north of NH Route 101. The property is divided into two areas referred to as the “Community Lands” and the “Commercial Lands”. The Community Lands consist of a residentially-zoned 139-acre parcel on the south end of the property. The Commercial Lands encompass the remaining 129 acres and include the remaining nine industrial-zoned parcels to the north of the Community Lands.

At present the property contains numerous wetlands, a large, open sand pit, and woodlands. In undisturbed areas, the topography consists of small undulating hills and depressions. Disturbed areas are associated with past and present sand and gravel mining operations. These areas have features typical of gravel pits including steep, excavated slopes, soil piles, stump piles, and boulders. (The Milford Public Works Department currently uses the large, open sand pit area for staging and storing materials, and some sand is still extracted for use on town roads during the winter.) Undisturbed forested areas at the site consist mainly of mature, mixed hardwood and white pine (*Pinus strobus*) forest. Several gravel roads traverse the property, and several previously cleared and excavated areas have reverted back to forest, with trees generally smaller in size compared to undisturbed areas. Several other recently disturbed areas now have dense shrubby vegetation, and the Commercial Lands contain several stands of planted white pine.

The property has three stream systems running through it. Tucker Brook flows through the northernmost end of the property, Birch Brook runs through roughly the center, and Cold Brook borders the southernmost property boundary. Each of these systems have associated with them vast wetland complexes consisting of numerous wetland types ranging from open canopy marshes to forested riparian systems, to scrub-shrub wetlands; all of which may contain areas functioning as vernal pools. Beaver activity is highly prevalent within these systems, notably at Birch Brook where a large dam has

### WHAT IS A NATURAL RESOURCE INVENTORY?

A Natural Resource Inventory (NRI) lists and describes important, naturally occurring natural resources, provides the basis for land conservation planning, and allows natural resources information to be included in local planning and zoning. A NRI includes maps, data, and a written report summarizing findings and recommendations. The completed NRI can help support voluntary land conservation and improved resource protection measures, and provides a "snapshot" of current natural resource conditions that can be used as a baseline for evaluating the impact of future growth.

*Derived from: University of New Hampshire Cooperative Extension. 2001. Natural Resource Inventories. A Guide for New Hampshire Communities and Conservation Groups. Online: <http://extension.unh.edu/resources>*

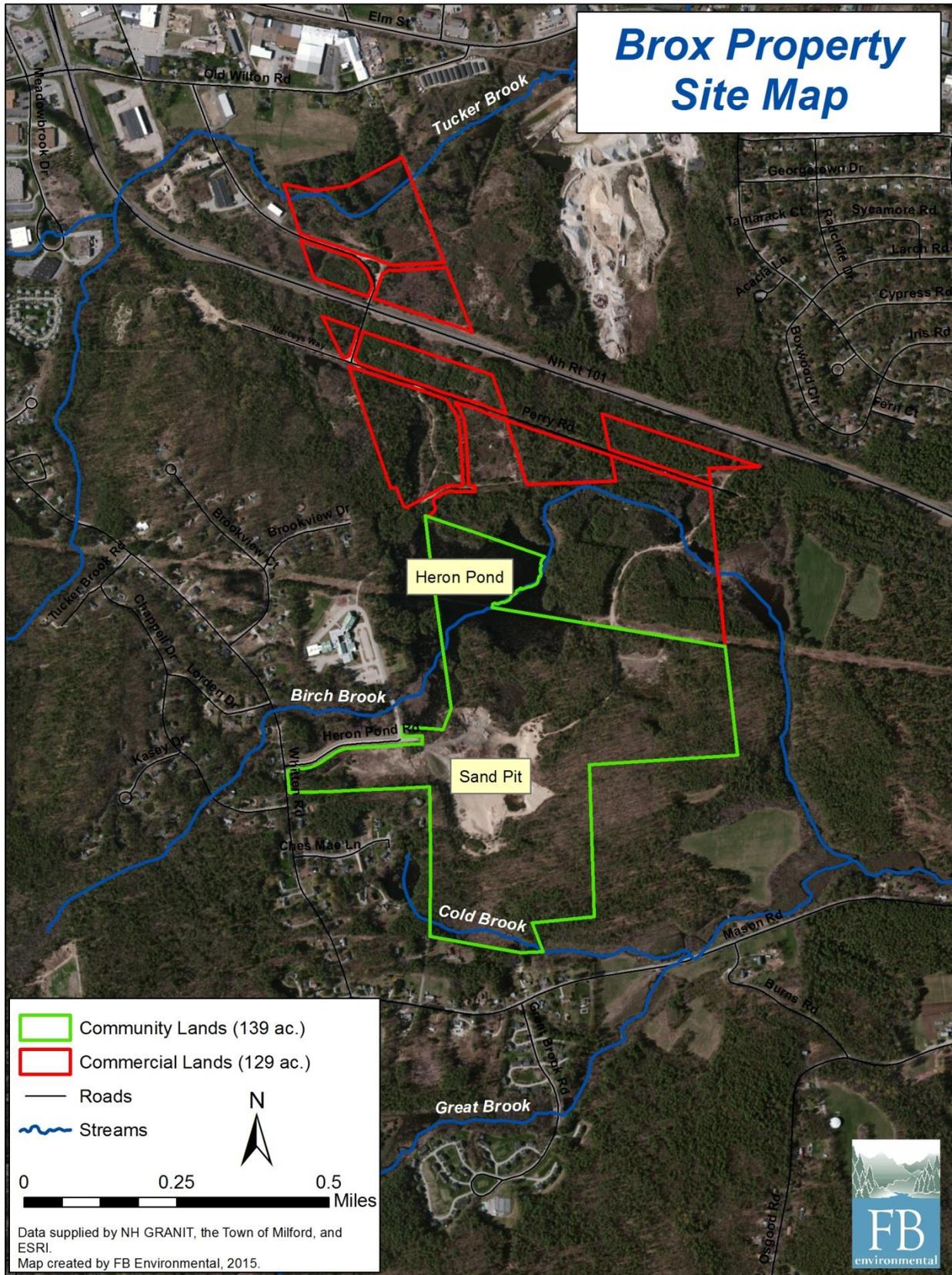


Figure 1. Site map of the Brox property highlighting property boundaries, major stream systems, Heron Pond, and the open sand pit

created Heron Pond, an approximately 37 acre open water wetland presumably named after the great blue heron (*Ardea herodias*) rookery present within it. Numerous other wetlands not hydrologically connected to the major stream systems are also present throughout the property. Some of these wetlands are “classic” vernal pools (i.e., those that look like large puddles in the woods during the spring), and an approximately two acre peatland complex is present just south of Heron Pond.

In its entirety, the Brox property has very high natural resource value due to the significant variety of wetlands and natural cover types present. The upland forests and freshwater streams and wetlands provide habitat for a variety of bird, mammal, reptile, and amphibian species. This includes several state-listed species known to inhabit the site: the Blanding’s turtle (*Emydoidea blandingii*) (Endangered), spotted turtle (*Clemmys guttata*) (Threatened) and eastern hognose snake (*Heterodon platirhinos*) (Endangered).

The Brox property is at the forefront of the town’s agenda. The Planning Board recently accepted a conceptual plan for the development of a school, municipal buildings, athletic fields, and a cemetery on the Community Lands (Appendix A). The industrial parcels have been designated to be sold for property tax-generating development.

### **1.2 Purpose of this Report**

The Town of Milford Conservation Commission hired FB Environmental Associates (FBE) in October 2014 to develop a Natural Resources Inventory (NRI) report for the Brox Property. The goal of the NRI report is to provide a current inventory and evaluation of important natural resource features, and to identify areas that may be sensitive to future development or changes in land use. This NRI describes priority areas for conservation at the Brox property, and provides recommendations for maintaining its ecological integrity.

### **1.3 Brox Property History**

The Brox Property was previously owned by Brox Industries, and has been mined for sand and gravel since the 1950’s. In 1994 Brox industries approached Milford’s Board of Selectmen to inquire about interest in acquisition of the 320 acres of previously undeveloped property.

After a review and analysis of the property’s value to the Town by a voter-based Brox Commission and input from local boards, commissions and the public, the Town authorized purchase of 268 acres in March of 2000 for \$1.4 million. The Milford School District purchased 50 acres of land in 1999 for the site of the Heron Pond Elementary School, which was constructed in 2001.

### **1.4 Current Uses**

The Milford Public Works Department currently uses the sand pit area for staging and storing materials, and some sand is still extracted for use on town roads during the winter. The property offers public access for many forms of low-impact recreation, including hunting, biking, walking, and skiing/snowshoeing, etc. A well-used network of mountain bike trails can be found throughout the property, and the adjacent Heron Pond Elementary School uses the area as an outdoor science classroom.

## 1.5 Proposed Uses

The *Brox property Community Land Master Plan: 2014 Update and Recommendations* document sets forth conceptual plans for future development of the Community Lands portion of the Brox property (Appendix A). Proposed development includes a fire substation/training facility, public works facility, recreation field complex, cemeteries, and a school. Prior to construction, the Town plans to harvest timber and soil from a portion of the site. The document also sets forth area to be set aside for conservation/open space.



## 2. NRI Methodology

The Natural Resource Inventory (NRI) for the Brox Property included four major tasks:

- Task 1) Review existing information and reports;
- Task 2) Conduct a desktop analysis of the landscape using GIS software;
- Task 3) Conduct an on-the-ground field investigation of the property;
- Task 4) Develop a list of recommendations based on existing information and field observations.

The following information was obtained from the Milford Conservation Commission and reviewed by FBE to gain an understanding of the history, conservation values, and planned future development of the Brox property:

- *Birch Brook Wetland Investigation & Inventory, Milford, New Hampshire* – UNH Senior Project (1998)
- *Natural Resource Protection at Brox* - Town Correspondence (2000 and 2001)
- *Geotechnical Engineering Report Soil Mining Feasibility Study for Milford, New Hampshire* – Clough, Harbour & Associates LLP (2004)
- *Brox Property Community Land Master Plan Study* – Clough, Harbour & Associates LLP (2005)
- *Brox Environmental Citizens Recommendations* (2013)
- *Brox Wetland Delineation Report* - Fieldstone Land Consultants, LLC (2013)
- *Brox Property Community Land Master Plan* (updated 2014)
- *NH METHOD spreadsheet for Heron Pond* (2014)
- *Brox Environmental Citizens (BEC) Annotated Map of Brox Property Including School*
- Wildlife photographs taken by Brox Environmental Citizens
- *Preliminary development plans, Brox Community Lands* - Fieldstone Land Consultants (revised December 24, 2014)

- Letter regarding Brox Community Lands Mining Feasibility Study - Fieldstone Land Consultants, LLC (December 24, 2014)

Additional information included:

- General and natural resource specific correspondence related to the property
- Tax map of the property
- Recent aerial photographs
- Soils maps (SSURGO)
- New Hampshire Wetlands Base Map
- New Hampshire NHB data on rare species and exemplary natural communities

Field surveys of the Brox property were conducted over two days on November 4 - 5, 2014 by FBE Senior Scientist Jennifer Jespersen and Wildlife Ecologist Kevin Ryan. The survey included a rapid field assessment of the entire property (268 acres). The Brox Environmental Citizens annotated map of the property, and the New Hampshire Natural Heritage Bureau (NHB) data on rare species and exemplary natural communities were used to target specific natural communities and natural resource features for field review. All National Wetlands Inventory (NWI) mapped wetlands were visited to verify presence or absence of wetlands, and any unmapped wetlands were documented. GPS points and photographs were collected at 54 locations across the property (see Appendix B and C).

## 3. Natural Resources Inventory- Results

### 3.1 Landforms, Geology and Soils

The topography of the Brox property ranges from 300 to 350 feet above sea level, and consists of small undulating hills and depressions. According to the United States Geological Survey's (USGS) GIS database for New Hampshire geologic units, the entire area is underlain by granite. As with most soils in the Northeast, glacial sediments comprise the parent material for the soils present within the area. The Soil Survey Geographic Database (SSURGO) for New Hampshire shows that the Brox Property consists mainly of Hinckley loamy sand, although other soils are present in lesser amounts including Saco variant silt loam, Borochemists, and Pipestone loamy sand (Figure 2)

An investigation by Clough, Harbour & Associates (2005) states that the Community Lands contain up to 1.17 million cubic yards of loose fine to coarse sand with some (20% to 35%) to little (10% to 20%) silt. The report states that silty sand soil at the project site appeared to fit the gradation materials for a number of construction materials used by the NHDOT.

### 3.2 Terrestrial and Wetland Communities

#### 3.2.1 Terrestrial Communities

Tree species observed throughout much of the community lands included red oak (*Quercus rubra*), black oak (*Quercus velutina*), white oak (*Quercus alba*), chestnut oak (*Quercus montana*) and white pine. Understory shrubs included lowbush blueberry (*Vaccinium angustifolia*), mountain laurel (*Kalmia*

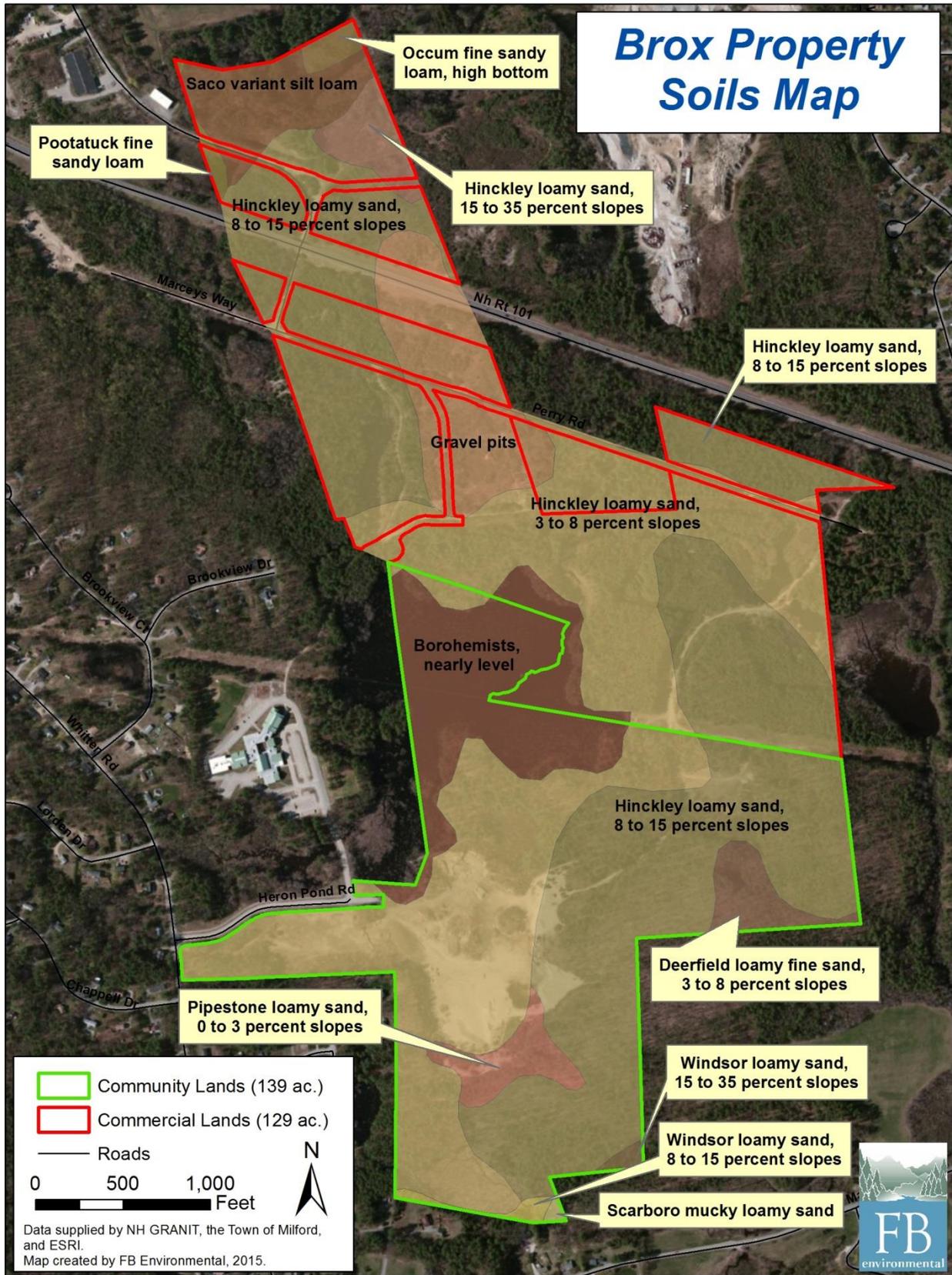


Figure 2. Soils map of the Brox property.

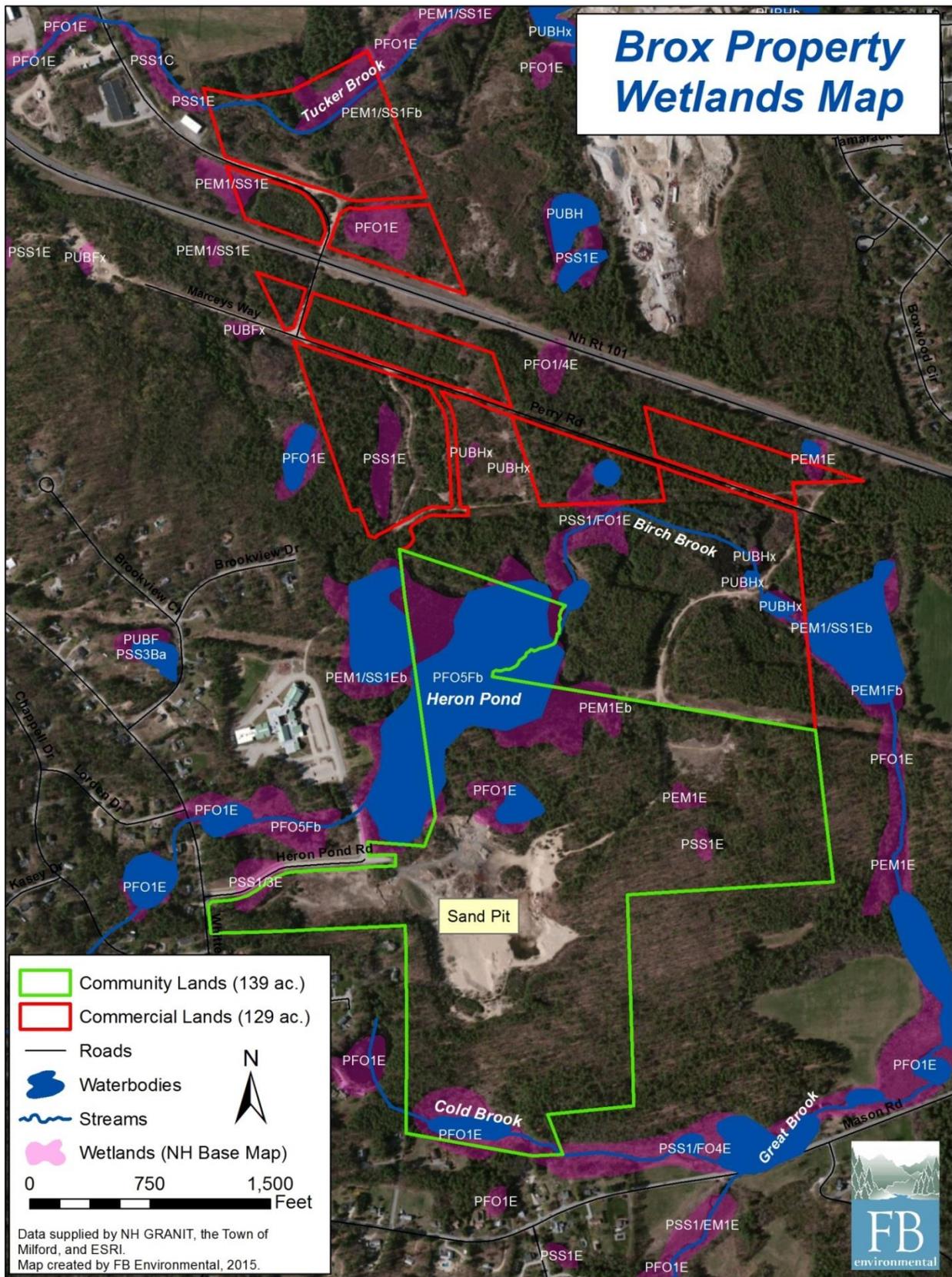
*latifolia*) and sheep laurel (*Kalmia angustifolia*), and common groundcover plants included partridgeberry (*Mitchella repens*) and wintergreen (*Gaultheria procumbens*). Although natural community delineations were not conducted during this assessment, this forest type meets the New Hampshire Wildlife Action Plan (NHFB 2005) definition of an Appalachian Oak-Pine Forest due its plant species composition and relatively dry soils.

This forest type is found primarily in warm-temperate climates of the central and Appalachian states, but it does extend into southern and coastal New Hampshire and Maine (Sperduto and Nichols 2011). Appalachian Oak-Pine forest has a very limited distribution in New Hampshire, covering less than 10% of the state's land area. This forest type is known to support 104 vertebrate species in New Hampshire, including 8 amphibians, 12 reptiles, 67 birds, and 17 mammals. Threatened and endangered wildlife species which inhabit this forest type include osprey (*Pandion haliaetus*), Cooper's hawk (*Accipiter cooperii*), timber rattlesnake (*Crotalus horridus*), and eastern hognose snake (NHFG 2005). Traditionally, Appalachian Oak-Pine Forests have been influenced and maintained by fires, which occurred much more frequently than in the Laurentian and Acadian forests to the north (Sperduto and Nichols 2011). Intense development pressure, however, particularly in the southeast corner of the state, has dramatically reduced naturally occurring fires as well as increased fragmentation of this forest type (NHFG 2005).

Hemlock (*Tsuga canadensis*), white pine, red maple (*Acer rubrum*) and birches (*Betula spp.*) are present in mesic (i.e., areas with a moderate or well-balanced supply of moisture) portions of the property, particularly in the commercial lands. This forest type most closely matches the state's definition of Hemlock-Hardwood-Pine Forest. This forest type is the most wide-spread in New Hampshire and is transitional between lower elevations of Appalachian oak-pine forest, and higher elevation of northern hardwood forest. Hemlock-Hardwood-Pine forests cover almost 50% of New Hampshire, most of it south of the White Mountains (UNH Cooperative Extension website).

Several pitch pines (*Pinus rigida*) were observed within the southern portion of the community lands. While several trees are present, the area does not meet the description of a Pine Barrens, as pitch pine is not the *dominant* (most abundant) tree, and scrub oak (*Quercus ilicifolia*) is not present in the understory. Also, numerous sycamore trees (*Platanus occidentalis*) were observed at the northeastern-most portion of the commercial lands in the floodplain forest along Tucker Brook. This species is worthy of mention in that it reaches its northern range limits southern New Hampshire and southwestern Maine.

Since cessation of most sand and gravel mining at the Brox property, numerous previously cleared or excavated areas have since reverted back to forest. Formerly excavated areas across the property have similar vegetative composition to undisturbed areas, but the trees are generally smaller in size, the ground has been scarified, and in some places, wetlands have formed as a result of the ground surface being lowered closer to the water table. Several other recently disturbed areas now consist of dense, shrubby vegetation such as speckled alder (*Alnus incana*) and meadowsweet (*Spiraea latifolia*). Several areas of planted white pine were observed in the commercial lands and a stand of small red pines is present near the proposed baseball and soccer fields on the community lands.



**Figure 3.** Wetlands map of the Brox property. Letter/number combinations over purple polygons represent NWI codes (see Appendix D).

### 3.2.2 Wetlands

Wetland delineations were conducted on the Community Lands in 2013. A total of ten wetland areas were identified and delineated. The report contains detailed descriptions of each of these areas. It is unknown whether formal wetland delineations have been conducted on the commercial lands.

Field surveys indicate that wetlands at the Brox property are numerous and diverse, and largely associated with streams on the property including Tucker Brook, Birch Brook, and Cold Brook (Figure 3). Tucker Brook is a tributary to the Souhegan River, and Birch Brook and Cold Brook flow into Great Brook which feeds Osgood Pond. These systems form a vast wetland complex consisting of numerous wetland types ranging from open canopy marshes to forested riparian systems, to scrub-shrub wetlands; all of which may contain areas functioning as vernal pools. Beaver activity is highly prevalent within these systems, notably Heron Pond, which is the most well-known wetland on the property due to its large size (approximately 37 acres) and the presence of a Heron Rookery.

Numerous “isolated” wetlands (i.e., not hydrologically connected to the other systems) are present throughout the property as well. Some of these wetlands are “classic” vernal pools (i.e., those that look like large puddles in the woods during the spring), although a peatland complex (approximately 2 acres in size) is present in-between Heron Pond and the sand pit area; the southern edge of the peatland is separated from the open sand pit by an earthen berm.

Many of the wetlands observed during the field survey were quite pristine, though manmade (due to previous excavation activity) or altered wetlands were also observed. Several of the human-created wetlands are present in the open sand pit area; these areas appear to be functioning as short-hydroperiod vernal pools. Excavation has altered natural wetlands particularly within the Commercial Lands.

Although the Brox Property (and the wetlands it contains) has been altered by human activity, water quality is likely very good for most of the wetlands, streams, and waterbodies on the property. This is due to the fact that with the exception of Cold Brook and the western end of Heron Pond, there is not much development immediately in the vicinity of these areas.

Though the Town of Milford does not currently have any designated Prime Wetlands, it is likely that a significant portion of the wetlands at the Brox property would be designated as Prime, due to their large size and that they support rare species (e.g., Blanding’s and Spotted Turtles), provide critical wildlife habitat to a wide range of wildlife species, provide recreational and educational opportunities, flood control, and more. Prime Wetland designation is based on the relative quality of wetlands to one another within an entire town. Town-wide inventories are a big undertaking and therefore may not be feasible within the timeframe of this project.

If a town-wide wetland survey were to be conducted, wetlands associated with Tucker, Birch, and Cold Brooks would likely be considered prime due to the reasons stated above and to their importance for storing large amounts of flood water. These areas also support fish and aquatic life habitat and water-based recreation in the form of fishing, bird watching, and paddling/kayaking.

## **A PRIMER ON PRIME WETLANDS**

Under RSA 482-A:15 and administrative rules Env-Wt 700, individual municipalities may elect to designate wetlands as “prime-wetlands” if, after thorough analysis, it is determined that high-quality wetlands are present. Typically, a wetland receives this designation because of its large size, unspoiled character and ability to sustain populations of rare or threatened plant and animal species. Field and “desk top” data are used for the evaluation process.

After high-value wetlands are identified, the municipality holds a public hearing before the residents of the community to vote on the designation. Once the municipality approves the wetlands for designation as prime, the municipality provides to the DES Wetlands Program a copy of the study and tax maps with the designated prime wetlands identified. DES reviews the submission from the municipality to ensure that it is complete and in accordance with Env-Wt 702.03.

Once the town's prime wetland submission is considered complete and approved, DES will apply the law and rules that are applicable to any future projects that are within the prime wetland or the 100 foot prime wetland buffer.”

There are currently 33 towns in New Hampshire that have designated prime wetlands. This designation provides a means by which these towns can provide additional protection to wetlands that are particularly unique, or sensitive to disturbance by restricting construction or earthwork in or within 100 ft of these resources.

Source: *Prime Wetlands in NH Communities*, New Hampshire Department of Environmental Services. Online: [http://des.nh.gov/organization/divisions/water/wetlands/prime\\_wetlands.htm](http://des.nh.gov/organization/divisions/water/wetlands/prime_wetlands.htm)

Several rare species known to occur at the site are dependent upon wetlands (e.g., Blanding’s and Spotted Turtles, and vernal pool-breeding species) or are dependent upon species that use wetlands (e.g., hognose snakes). Wetlands will therefore be discussed in the sections concerning rare/notable species below.

### **3.3 Rare, Threatened, Endangered, or Notable Wildlife Species**

Prior to the field investigation, FBE contacted the NH Natural Heritage Bureau (NHB) requesting a search of the NHB database for the presence of rare, Threatened or Endangered species and exemplary natural communities in the vicinity of the Brox Property. Database records indicate the presence of Blanding’s turtles, spotted turtles, and eastern hognose snakes within the property boundaries. These records show that there are additional species of concern outside of the project area, but within the vicinity, including Blanding’s turtle and hognose snake records, and records of the wood turtle (*Glyptemys insculpta*), American eel (*Anguilla rostrata*), banded sunfish (*Enneacanthus obesus*), and bald eagle (*Haliaeetus leucocephalus*)(Appendix E).

The section below provides an overview of the rare species that have been historically observed on the property, as well as a few other notable species such as beaver (*Castor canadensis*), bank swallow (*Riparia riparia*), and New England cottontail (*Sylvilagus transitionalis*).

### 3.3.1 Eastern Hognose Snake (State Endangered)

The non-venomous eastern hognose snake is perhaps the most unusual snake in New England. When encountered, these snakes may emulate cobras by lifting the front part of their bodies off the ground and inflating a flattened “hood” along their neck, followed by loud hissing and closed-mouth strikes. This behavior often leads people to kill the snakes, erroneously believing that they are dangerous. Hognose snakes may also feign death, which includes rolling on their backs, and regurgitating food and drooling (Klemens 1993).



An adult eastern hognose snake. Photo courtesy of Dennis Quinn.



The black color morph of the eastern hognose snake. Photo courtesy of Dennis Quinn.

Southern New Hampshire is the northern range limit for the Eastern hognose snake. These snakes prefer sandy, gravelly well-drained soils which are the preferred habitat of toads (*Anaxyrus spp.*), their main prey item. They may occur on wooded hillsides, open pine or deciduous forest, old fields, and ecotone (edge) areas bordering young, second-growth deciduous woodland. Hognose snakes can burrow, and will often use subterranean refuges of small mammals (Klemens 1993, Gibbs et al. 2007). Throughout their range in New England, these snakes are typically not found in high numbers. In seventeen

years of research, the maximum number of hognose snakes Klemens (1993) found at a single site was two.

Hognose snakes in New England need further study. Platt (1969, cited in Klemens [1993]) stated that hognose snakes seem to be able to survive in proximity to humans at the southern portion of their range; however their numbers have declined in many parts of the north since 1900. This suggests that hognose snakes may be more sensitive to human disturbance near the limits of their range.

From the initial site visit, there appears to be suitable hognose snake habitat in and surrounding the open sand pit. Other areas of the site may contain suitable habitat as well.

### 3.3.2 Blanding’s Turtle (State Endangered)

The Blanding’s turtle is primarily a Midwestern species, ranging from southwestern Quebec and southern Ontario west to Minnesota and Nebraska, and south to central Illinois. Blanding’s turtles range in the east is characterized by disjunct populations in Nova Scotia, southern Maine, eastern Massachusetts and southeaster New Hampshire (Gibbs et al. 2007).

Highly mobile for a turtle, Blanding's turtles move throughout a variety of wetland and terrestrial habitats throughout the year. Utilized wetland habitats include those with permanent shallow water and emergent vegetation such as marshes, swamps, bogs, and ponds. The turtles also use vernal pools extensively in spring and while traveling through the landscape (NHFG website). The drying of shallow water habitat in summer induces some individuals to move over land to other bodies of water, while other will burrow under roots, mud, or on land under leaf litter and aestivate until conditions improve (Harding 1997). Gravid females may travel over a kilometer (0.6 miles) from water to find suitable nesting sites, which are typically open, sunny spots with moist but well-drained sandy or loamy soil (Harding 1997).



An adult Blanding's turtle. The yellow throat is a key identification feature for this species. Photo courtesy of Mike Marchand.

The turtles are long-lived and may reach 50-70 years of age. Long-term studies of a Blanding's turtle population in Michigan (Congdon et al. 1993, cited in Harding 1997) found that sexual maturity was not reached until age 14-20. Investigators calculated that greater than 93% of adults and 72% of juveniles greater than one year of age needed to survive each year to maintain a stable population.

Key to Blanding's turtle conservation is maintaining connections between the various habitats used by the species. Road mortality and incidental collection by humans has severe deleterious effects on turtle populations, and the construction of roads between aquatic and terrestrial habitat may result in extirpation of local Blanding's turtle populations, and are the primary reasons for the species' decline (Harding 1997, Kiviat and Stevens 2003, cited in Gibbs et al. 2007).

The Brox property contains a significant amount of Blanding's turtle habitat. This is due to the property's extensive mosaic of wetlands and terrestrial cover types.

### 3.3.3 Spotted Turtle (State Threatened)

Spotted turtles are found in the eastern United States from southern Maine, New Hampshire, and New York, southward along the Atlantic Coastal Plain and Piedmont to northern Florida, westward to though Pennsylvania, southern Ontario, and northern Ohio, to northern Indiana, southern Michigan and extreme eastern Illinois. Disjunct populations exist in the western Carolinas, central Indiana, and Quebec (Klemens 1993).

The turtles may be found in a wide variety of permanent and temporary shallow water habitats. In southern New England, spotted turtles inhabit muddy-bottomed slow-moving streams, marshy areas of large lakes, river floodplains, fens, drainage ditches, red maple swamps, vernal pools, quarry pools, bogs, small ponds, and tidal creeks. Female turtles nest on well-drained embankments and pastures,

and in the tops of tussocks in fens and bogs (Klemens 1993). Terrestrial habitat is used extensively while searching for suitable nesting sites, traveling among wetland habitats, and when moving to terrestrial aestivation sites during periods of high temperatures (NHFG website).

This species' ability to utilize a wide variety of wetland types may account for its widespread distribution. The small and shallow wetlands used by spotted turtles however have traditionally have



An adult spotted turtle. Photo courtesy of Kevin Ryan.

received little or no legal protection, and many have been drained or fragmented by development. Spotted turtles may be locally common in some areas of New England, though they have become rare in urbanized areas. Over-collection of these turtles for pets poses a threat to populations in close proximity to humans. As with Blanding's turtles, habitat loss and fragmentation are the primary conservation problem negatively affecting this species' survival (Klemens 1993).

As with the Blanding's turtle, the Brox property contains a significant amount of spotted turtle habitat as well. This is also due to the property's extensive mosaic of wetlands and terrestrial cover types.

### 3.3.4 Pool-Breeding Amphibians

Pool-breeding amphibians in New Hampshire consist of spotted salamanders (*Ambystoma maculatum*), marbled salamanders (*Ambystoma opacum*) (State Endangered), blue spotted-Jefferson complex salamanders (*Ambystoma jeffersonianum-laterale*) (State Species of Special Concern) and wood frogs (*Lithobates sylvaticus*).

These pool-breeding amphibians spend the majority of their lives in terrestrial habitat adjacent to breeding pools. That is, they require both terrestrial *and* aquatic terrestrial habitats for survival. Most adult pool-breeding amphibians in New Hampshire spend less than

one month in their breeding pools; the rest is spent in adjacent terrestrial or wetland areas (Semlitch 1981, 2000 cited in Calhoun and Klemens 2002). In their terrestrial habitats, both juvenile and adult amphibians require areas of deep, uncompacted organic material (leaf litter), coarse woody material (e.g., logs, sticks, branches), and shade.



From top to bottom: a spotted salamander, marbled salamander, and blue-spotted salamander. Photo courtesy of Kevin Ryan.



Salamanders belonging to the blue-spotted-Jefferson complex.  
Photo courtesy of Danielle LaBruna.

breeding within it (e.g., Faccio, 2003; McDonough and Paton, 2007). Conservation strategies that only focus on protecting breeding pools (and not the associated critical terrestrial habitat) will most likely fail to maintain a viable amphibian population. Protection of critical terrestrial habitat therefore must also be a priority (Marsh and Trenham 2001 cited in Calhoun and Klemens 2002).

Numerous potential vernal pool-breeding amphibian breeding areas were observed during the field investigation. In addition, both the Fieldstone Land Consultants' wetland delineation report and Annotated map of the Brox property created by the Brox Environmental Citizens note the presence of spotted salamander and wood frog egg masses in numerous wetlands throughout the site.

### 3.3.5 American Beaver

The American beaver is native to the United States, Canada, and Mexico. It was nearly extirpated as a result of the fur trade, but protection and re-introduction programs have re-established the animal throughout its former range (most of North America). It is now abundant (International Union for the Conservation of Nature Red List Website). Individual beavers have been observed to move 150 or more miles from their birth place in search of suitable habitat. Typical dispersal movements however, are less than six miles (Reid 2006).

Beavers inhabit areas near lakes, ponds, and streams, provided they have access to suitable food (e.g., aspen, birch, maple, willow, and alder) and building materials (Reid 2006). The animals are best known for their ability to modify an area through the construction of dams, which often lead to flooding of the surrounding areas which in some cases leads to conflict with humans.

Semlitsch in (1998) summarized the results of a number of studies examining how far pool-breeding amphibians move from their breeding pools. He found that a "critical terrestrial habitat" zone surrounding a breeding pool should extend 164.3 m from the pool's edge to encompass the distance moved from a breeding pool of 95% of the individuals within a breeding amphibian population. Conservation of pool-breeding amphibians has since operated using circular "life zones" to surround a wetland in order to meet the terrestrial habitat requirements of the amphibian species



An adult wood frog. Photo courtesy of Kevin Ryan.

Beaver activity was observed throughout the larger wetland complexes on the property. The most prominent activity is the large dam at the northeast end of Heron Pond. Personal communication with a town employee indicates that the increased water level in Heron Pond due to beaver activity has led to seasonal flooding of portions of the open sand pit.

### 3.3.6 Bank Swallow (State Species of Special Concern)

The bank swallow is the smallest swallow in New Hampshire, where it nests colonially in steep riverbank cliffs, gravel pits, and highway cuts (National Geographic Society 1997). It forages over nearby meadows and water. Bank swallows are migratory and winter chiefly in South America (Sibley 2003).

While locally common throughout most of its range, the 2014 State of the Birds Report (North American Bird Conservation Initiative 2014) listed them as a "Common Bird in Steep Decline". Threats to bank swallows typically come from changes to its nesting areas. Erosion control, flood control, and road-building projects that remove banks or reduce their steepness make them unsuitable for bank swallows. Construction and mining projects that involve steep cut banks and/or high mounds of gravel or dirt can attract nesting bank swallows. This activity can also destroy nests, however, if the material is removed during the nesting season (allaboutbirds.org). The birds, their eggs, and young are federally protected and may not be killed, and active nests may not be destroyed during the summer breeding season (Swallow CORE).

Bank swallows have been reported to occur in the open sand pit by the Brox Environmental Citizens. Several members of the Milford Conservation Commission have also reported the occurrence of bank swallows within the area (Audrey Frazier, personal communication).

### 3.3.7 New England Cottontail (State Endangered)

All three lagomorph species in New Hampshire – the eastern cottontail (*Sylvilagus floridanus*), New England cottontail, and snowshoe hare (*Lepus americanus*) may be present on the Brox property. The eastern cottontail and snowshoe hare are considered secure in New Hampshire and are may be hunted in some parts of the state. The New England Cottontail, however, is listed as Endangered in New Hampshire. They are very similar in appearance to the more widespread eastern cottontail but occupy different habitats. The Eastern cottontail is apparently more tolerant of development and occupies open, grassy areas such as fields, golf courses, and even lawns. New England cottontails are a forest species which depends on areas of thick shrubs and young trees. Habitat loss and forest succession over the past 50 years or so has resulted in the decline of this species throughout its range (newenglandcottontail.org).



A New England cottontail. Photo courtesy of Mike Marchand.

FBE field surveys documented a brushy area within the Commercial lands with characteristic cover types and lagomorph (hare or rabbit) scat, suggesting that this may be suitable habitat for the New England cottontail. Similar habitats on the property may be suitable habitat as well; however no formal surveys were conducted as part of the project.

### **3.4 Non-Native, Invasive Plant Species**

Several invasive plant species were documented across the property. These occurrences appear to be limited to isolated incidences, but have the potential to spread and threaten high value wetland habitat. Species observed include Oriental bittersweet (*Celastrus orbiculatus*) and autumn olive (*Elaeagnus umbellata*) in the open sand pit, Japanese knotweed (*Fallopia japonica*) in some of the formerly mined areas of the Commercial Lands and Japanese barberry (*Berberis thunbergii*) in the Tucker Brook floodplain.

## **4. NRI Recommendations**

The following recommendations are based on review of existing research and reports, a desktop analysis of the site and its natural resource features, and two days of field surveys. Recommendations focus on the following areas: wetlands, wildlife, invasive plants, and development and conservation recommendations.

### **4.1 Wetlands**

#### **4.1.1 Prime Wetlands**

As described in the previous section, the Town of Milford may designate certain high-quality wetlands within its borders as “Prime”. This designation provides additional protection to high-value/high-quality wetlands. Specifically, 100-foot buffers are implemented around these wetlands. These buffered areas can contain wetlands, transitional areas, and natural and developed upland. Impacting areas within prime wetlands themselves or within their buffer zones often requires a permit from NHDES Wetlands Bureau.

Based on the information gathered for this NRI, it is recommended that the Town move forward with designating Prime Wetlands. As alluded to above, this would require a more thorough assessment of the high-value wetlands not only on the Brox property, but throughout the town.

A Prime Wetland Evaluation is conducted using the Method for Comparative Evaluation of Non-tidal Wetlands in New Hampshire (1991). NH METHOD provides a procedure to evaluate and rank wetlands on a municipality-wide basis. Wetlands are evaluated according to the following 12 criteria: 1) ecological integrity; 2) wetland-dependent wildlife habitat; 3) educational potential; 4) Fish & Aquatic Life Habitat; 5) scenic quality; 6) water-based recreation; 7) flood storage; 8) groundwater recharge; 9) sediment trapping; 10) nutrient trapping/retention/transformation; 11) shoreline anchoring; 12) noteworthiness.

After candidate wetlands for Prime status with a given town are identified, that town must hold a public hearing before the residents of the community to vote on designation. Once a municipality approves the designated wetlands as prime, the municipality provides to the DES Wetlands Program a copy of the study and tax maps with the designated prime wetlands identified. DES reviews the submission from the municipality to ensure that it is complete and in accordance with Env-Wt 702.03.

Once the town's prime wetland submission is considered complete and approved, DES will apply the law and rules that are applicable to any future projects that are within the prime wetland or the 100 foot prime wetland buffer.

Note that the NH METHOD was updated in 2013. The New Hampshire Code of Administrative Rules refers to an older version of the method which contained 14 criteria (urban quality of life potential and historical site potential have been removed). Env-Wt 701.03 states that a given town must use 10 of the 14 (now 12) functions in their evaluation of the identified wetlands in designating the wetlands as prime. The NH METHOD manual also states that when legal proceedings require detailed information about individual wetlands, additional detailed field data are needed to supplement NH Method data; the NH Method data alone do not suffice in this instance.

Recommendations specific to vernal pools and wildlife associated with wetlands and vernal pools are provided in Section 4.2 below.

#### 4.1.2 Low Impact Development

Water quality of the wetlands, waterbodies, and watercourses at the property should be protected through the implementation of Low Impact Development (LID) practices. LID is a way of encouraging more infiltration, filtration, and storage of stormwater so that the hydrology of a developed site mimics natural or undeveloped conditions. Extensive research describes the water quality benefits of LID and green buildings. LID practices such as gravel wetlands, bioretention, and porous asphalt have been widely used in the northeast to protect water quality. The University of New Hampshire Storm Center has shown that gravel wetlands can remove 99% of sediments, 98% of nitrogen, and greater than 50% of phosphorus (UNHSC, 2010).

Since LID is intended to mimic the natural conditions of a site, it works to disperse large volumes of stormwater rather than concentrating it in one place. LID techniques are also more aesthetically pleasing than conventional stormwater systems, and often less expensive. The US Environmental Protection Agency reports that LID practices are both fiscally and environmentally beneficial to communities. In a few cases, initial design costs were higher, but significant savings were achieved through lower costs for site grading, land disturbance, and stormwater infrastructure (Peterson et al., 2009). Several other studies have shown that cost savings for developers that incorporate LID techniques to treat stormwater can be as great as 66% when compared to conventional stormwater treatment systems (NIRPC, 2010).

## 4.2 Wildlife

### 4.2.1 Eastern Hognose Snake

As with the other development-sensitive species present at the Brox property, a survey should be conducted to determine which portions of the property are inhabited by Eastern hognose snakes. Visual encounter- and cover board surveys can be utilized to detect the presence of the snakes. As hognose snakes may be found utilizing (unintentionally) human-created areas, an area of hognose snake habitat may be created as part of the development process.

#### ***Specific Recommendations:***

- a) Assess the area(s) used by hognose snakes by using visual encounter and cover board surveys.

### 4.2.2 Blanding's and Spotted Turtles

Both Blanding's and spotted turtles move throughout a variety of wetland and upland types throughout the year. A complex and dynamic landscape (such as the one present at the Brox property) is therefore necessary to sustain populations of these rare turtles. These diverse habitat requirements require frequent terrestrial movements which is what primarily exposes individuals to threats including road mortality and illegal collection (Beaudry et al. 2009).

Attempting to conserve the Blanding's and spotted turtle populations at the Brox property using narrow (25 or 50-foot) upland buffers will very likely fail. This will be due to the terrestrial connections between individual wetlands being severed (from the perspective of a turtle).

Ideally, land managers should have an idea of how development-sensitive wildlife species are using a particular site prior to creation of development plans. To that effect, using radio-telemetry technology to track the movements of Blanding's and spotted turtles at the site for *at least* one year would be ideal. However, if this is not feasible due to financial and/or time constraints, the site should be developed using the best available information on these two species. This would consist of maintaining large swaths of terrestrial area between individual wetlands that these species are likely utilizing.

#### ***Specific Recommendations:***

- a) Confirm the presence of Blanding's and spotted turtles at the Brox property by conducting visual encounter surveys and turtle-trapping.
- b) Conduct radio-telemetry studies on a subset of Blanding's and Spotted turtles at the Brox property.
- c) Develop the property in a fashion that does not sever terrestrial connections between individual wetlands (see Section 4.4).

### 4.2.3 Vernal Pool Amphibians

The 2013 wetland delineation conducted by Fieldstone Land Consultants indicated that numerous wetlands on the Community Lands contained vernal pool amphibian egg masses, notably wood frogs and spotted salamanders. The BEC annotated map of the Brox property also indicates that

numerous wetlands on the site (including the commercial lands) contain vernal pool amphibian egg masses.

Proactive methods of pool-breeding amphibian conservation are set forth in *Best Development Practices: Conserving Pool-breeding amphibians in residential and commercial developments in the northeastern US* (BDP) (Calhoun and Klemens 2002, submitted with this report). The BDP provides guidance on how to classify a vernal pool into one of three tiers; Tier 1 pools are exemplary and have the strictest management criteria applied to them. It is recommended that no development take place within 100 feet of these pools, and that development be limited to 25% of the area from 100 - 750 feet from the vernal pool. There are undoubtedly a significant number of vernal pools on the Brox property as detailed in the 2013 wetland delineation report, the BEC annotated map, and field verification of these wetlands during field surveys in 2014. Further assessment of these pools according to the guidelines set forth in the BDP will help to rank the relative importance of each pool and provide justification for being more stringent with how the area is developed compared with others.

It is recommended that a formal vernal pool survey be conducted at the Brox property beginning in the spring of 2015. Formal surveys may also detect the presence of the State Endangered marbled salamander of which there are historical records in Milford. It is further recommended that development of the Brox property follow the standards set forth in Calhoun and Klemens (2002).

### ***Specific Recommendations***

- a) Conduct a formal vernal pool assessment to rank pools according to Calhoun and Klemens (2002) and possibly detect the presence of marbled salamanders. A vernal pool assessment includes egg mass counts, and efforts to detect the presence of marbled salamanders.
- b) Develop the site following the recommendations set forth in Calhoun and Klemens (2002).

#### **4.2.4 American Beaver**

Beaver activity is widespread throughout the Brox property. The animal's ability to alter a landscape is second only to humans. They are important to ecosystems because their activity creates habitat for a number of other species. However, this activity can cause damage to human-created infrastructure and it is not unreasonable for people to take action to reverse the effects of beaver activity in a given area.

A beaver dam destroyed by humans will immediately be rebuilt by the beavers. Problem beavers may be trapped and killed in an effort to fix the problem, but it is likely other beavers will recolonize the area. An often more viable option is the installation of custom "beaver deceivers" which allow a colony of beavers to maintain a dam but at the same time allows humans to keep water at a desired level. Beaver Deceivers International (BDI) is a well-known company for beaver management in the Northeast and elsewhere. The company can be contacted to mitigate any undesired beaver activity at the Brox property.

***Specific Recommendations:***

- a. Install beaver deceiver devices to mitigate the effects of undesirable beaver activity.

***4.2.5 Bank Swallows***

While there have been sightings of bank swallows at the Brox property by the Brox Environmental Citizens, the presence of breeding bank swallows on the property should be confirmed. This can be accomplished by having a knowledgeable ornithologist assess the site for the presence of nests from early to mid-May. If the presence of nesting birds is confirmed, extraction activities around nesting areas should be avoided to minimize disturbance. Once birds have finished nesting they no longer use their nesting holes, so extraction activity may be resumed. The steep, unvegetated vertical faces created by extraction activity can actually result in creation of bank swallow nesting habitat which is more suitable than older, more gradual, or vegetated cliffs (Swallow CORE).

***Specific Recommendations:***

- a. Conduct a survey to confirm the presence of breeding bank swallows.
- b. If presence is confirmed, manage the nesting area to ensure continued existence (i.e., maintain a steep, unvegetated bank).

***4.2.6 New England Cottontail (State Endangered)***

Due to their Endangered status, a formal survey should be conducted to determine the presence of the New England Cottontail at the Brox Property. This may be accomplished through the use of game cameras and DNA analysis of fecal pellets collected at the site.

***Specific Recommendations:***

- a) Determine the presence/absence of the New England cottontail through DNA analysis of fecal pellets.

***4.3 Recommendations Regarding Non-Native, Invasive Plants***

The observed non-native invasive plants Present at the Brox property have the potential to spread and threaten high value wetland habitat. A formal invasive species survey should be conducted, and management strategies should be implemented to eradicate the species before additional excavation or development moves forward to prevent the spread of these plants.

***Specific Recommendations:***

- a) Conduct an invasive plant survey of the Brox property.
- b) Monitor and control the spread of invasive plants following any construction-related soil disturbance

***4.4 Development and Conservation Recommendations***

As proposed, the Conceptual Plan for the Brox property (Appendix A) will likely have severe deleterious effects on development-sensitive wildlife present at the Brox property. Specifically, the extension of

Heron Pond Road past the intersection with the school access road just to the south of the peatland complex just south of Heron Pond and the development proposed to the north and east of the road will reduce the amount of habitat available to development-sensitive species, and sever terrestrial connections between individual wetlands. Hopefully the town can reach a compromise for the property that includes some needed town development along with a substantial amount of land being permanently protected.

***Specific Recommendations:***

- a) Reduce the potential effects to development-sensitive species by concentrating development within the existing open sand pit and the forested areas immediately south and east of it. That is, do not develop past the intersection with the school access road just to the south of the peatland complex just south of Heron Pond his would ultimately reduce the overall amount of development at the site, but would still provide enough space for some municipal and/or sports facilities, and allow the Town to generate revenue through sand and gravel extraction. Keeping development concentrated in the open gravel pit will maintain terrestrial connections between wetlands at the site and allow wildlife to move throughout much of the site.
- b) Consider working with a local conservation organization, such as the New Hampshire Chapter of the Nature Conservancy, the Society for the Protection of New Hampshire forests, or a local land trust to put undeveloped portions of the land in a conservation easement.
- c) Find a local champion to facilitate the permanent conservation of the Brox property, and pursue funding from the New Hampshire Department of Environmental Services (NHDES) Wetlands Bureau's Aquatic Resource Mitigation Fund Program to purchase the undeveloped portion of the property. The Brox property meets the eligibility criteria in that rare resources (i.e., threatened/endangered wildlife) will benefit, and aquatic resources and their associated terrestrial connections will be protected.

## References

- New Hampshire Fish and Game Department. Blanding's Turtle. Available at:  
[http://www.wildlife.state.nh.us/Wildlife/Nongame/turtles/blanding\\_s\\_turtle.htm](http://www.wildlife.state.nh.us/Wildlife/Nongame/turtles/blanding_s_turtle.htm)
- Beaudry, F., P. G. deMaynadier, and M. L. Hunter. 2009. Seasonally Dynamic Habitat Use by Spotted (*Clemmys guttata*) and Blanding's Turtles (*Emydoidea blandingii*) in Maine. *Journal of Herpetology* 43:636-645.
- Brox Community Land Master Plan Committee. 2014. Brox Property Community Land Master Plan: 2014 Update and Recommendations. Accepted by Planning Board August 19, 2014.
- Brox Environmental Citizens. 2013. Conservation recommendations.
- Brox Environmental Citizens. Date unknown. Annotated map of Brox Property including school.
- Calhoun, A. J. K. and M. W. Klemens. 2002. Best development practices: conserving pool-breeding amphibians in residential and commercial developments in the northeastern United States. MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, New York.
- Clough, Harbour & Associates LLP. 2005. Brox Property Community Land Master Plan Study.
- Clough, Harbour & Associates LLP. 2004. Geotechnical Engineering Report Soil Mining Feasibility Study for Milford, New Hampshire.
- Congdon, A.E. Dunham, and R.C. van Loben Sels. 1993. Delayed sexual maturity and demographics of Blanding's turtles (*Emydoidea blandingii*): Implications for conservation and management of long-lived organisms. *Conservation Biology* 7(4):826-833.
- Faccio, S. D. 2003. Postbreeding emigration and habitat use by Jefferson and spotted salamanders in Vermont. *Journal of Herpetology* 37:479-489.
- Fieldstone Land Consultants, LLC. 2013. Brox Wetland Delineation Report.
- Gibbs, J. P., A. R. Breisch, P. K. Ducey, G. Johnson, J. L. Behler, and R. C. Bothner. 2007. *The Amphibians and Reptiles of New York State: Identification, Natural History, and Conservation*. Oxford University Press, New York.
- Harding, J. H. 1997. *Amphibians and reptiles of the great lakes region*. The University of Michigan Press, Ann Arbor.
- IUCN Red List of Threatened Species. 2014. *Castor canadensis*. [Internet]. Available at:  
<http://www.iucnredlist.org/details/4003/0>
- Kiviat, E., and G. Stevens. 2003. Environmental deterioration of the outwash plains: Necropsy of a landscape. *News from Hudsonia*, 18:3-5.
- Klemens, M. W. 1993. *Amphibians and reptiles of Connecticut and adjacent regions*. State Geological and Natural History Survey of Connecticut, Bulletin No. 112. Connecticut Department of Environmental Protection, Hartford.

- Marsh, D. M. and P. C. Trenham. 2001. Metapopulation Dynamics and Amphibian Conservation. *Conservation Biology* 15:40-49.
- McDonough, C. and P. W. C. Paton. 2007. Salamander dispersal across a forested landscape fragmented by a golf course. *Journal of Wildlife Management* 71:1163-1169.
- New Hampshire Fish and Game Department. 2014. Blanding's Turtle. [http://www.wildlife.state.nh.us/Wildlife/Nongame/turtles/blandings\\_turtle.htm](http://www.wildlife.state.nh.us/Wildlife/Nongame/turtles/blandings_turtle.htm)
- NIRPC. 2010. How Land Use Planning and Zoning Can Protect and Conserve Water Resources: A Guide for Local Governments. Available online at: <http://www.nirpc.org/media/4377/landuseplanning.pdf>.
- Peterson, Julia, Stone, Amanda, and Houle, James. 2009. Protecting Water Resources and Managing Stormwater: A Bird's Eye View for New Hampshire Communities. Available online at: [http://extension.unh.edu/resources/files/Resource002615\\_Rep3886.pdf](http://extension.unh.edu/resources/files/Resource002615_Rep3886.pdf).
- Platt, D. R. 1969. Natural history of the hognose snakes, *Heterodon platirhinos* and *Heterodon nasicus*. University of Kansas Publications, Museum of Natural History 18:253-420.
- Reid, F. A. 2006. Mammals of North America. Petersen Field Guides. Houghton Mifflin Company.
- Semlitsch, R. D. 2000. Principles for management of aquatic-breeding amphibians. *Journal of Wildlife Management* 64: 615-631.
- Semlitsch, R. D. 1998. Biological delineation of terrestrial buffer zones for pond-breeding salamanders. *Conservation Biology* 12:1113-1119.
- Semlitsch, R. D. 1981. Terrestrial activity and summer home range of the mole salamander, *Ambystoma talpoideum*. *Canadian Journal of Zoology* 59:315-322.
- Sperduto, D.D. and W. F. Nichols. 2011. Natural Communities of New Hampshire. 2<sup>nd</sup> Ed. NH Natural Heritage Bureau, Concord, NH. Pub. UNH Cooperative Extension, Durham, NH.
- New Hampshire Fish and Game Department. 2005. New Hampshire Wildlife Action Plan.
- Parker, B. 2001. Natural Resource Protection at the Brox Property. Town correspondence from 2000 and 2001.
- Sperduto, D.D. and William F. Nichols. 2011. Natural Communities of New Hampshire. 2nd Ed. NH Natural Heritage Bureau, Concord, NH. Pub. UNH Cooperative Extension, Durham, NH.
- Swan, H., D. Cross, K. Nyhan, M. Handwork, K. Hathaway, and S., Monroe. 1998. Birch Brook Wetland Investigation & Inventory, Milford, New Hampshire. University of New Hampshire Senior Project, Spring 1998.
- University of New Hampshire Cooperative Extension. Hemlock-Hardwood-Pine Forests. Available at <http://extension.unh.edu/Hemlock-Hardwood-Pine-Forests#IMPORTANT>.
- University of New Hampshire Stormwater Center. 2010. University of New Hampshire Stormwater Center 2009 Biannual Report. Available online at: [http://ciceet.unh.edu/news/releases/unhsc\\_report\\_2009/report.pdf](http://ciceet.unh.edu/news/releases/unhsc_report_2009/report.pdf).

## **Appendices**

**Appendix A.** Plat from the 2014 Brox Community Land Conceptual Master Plan

**Appendix B.** Brox NRI Field Survey Photo Points Map

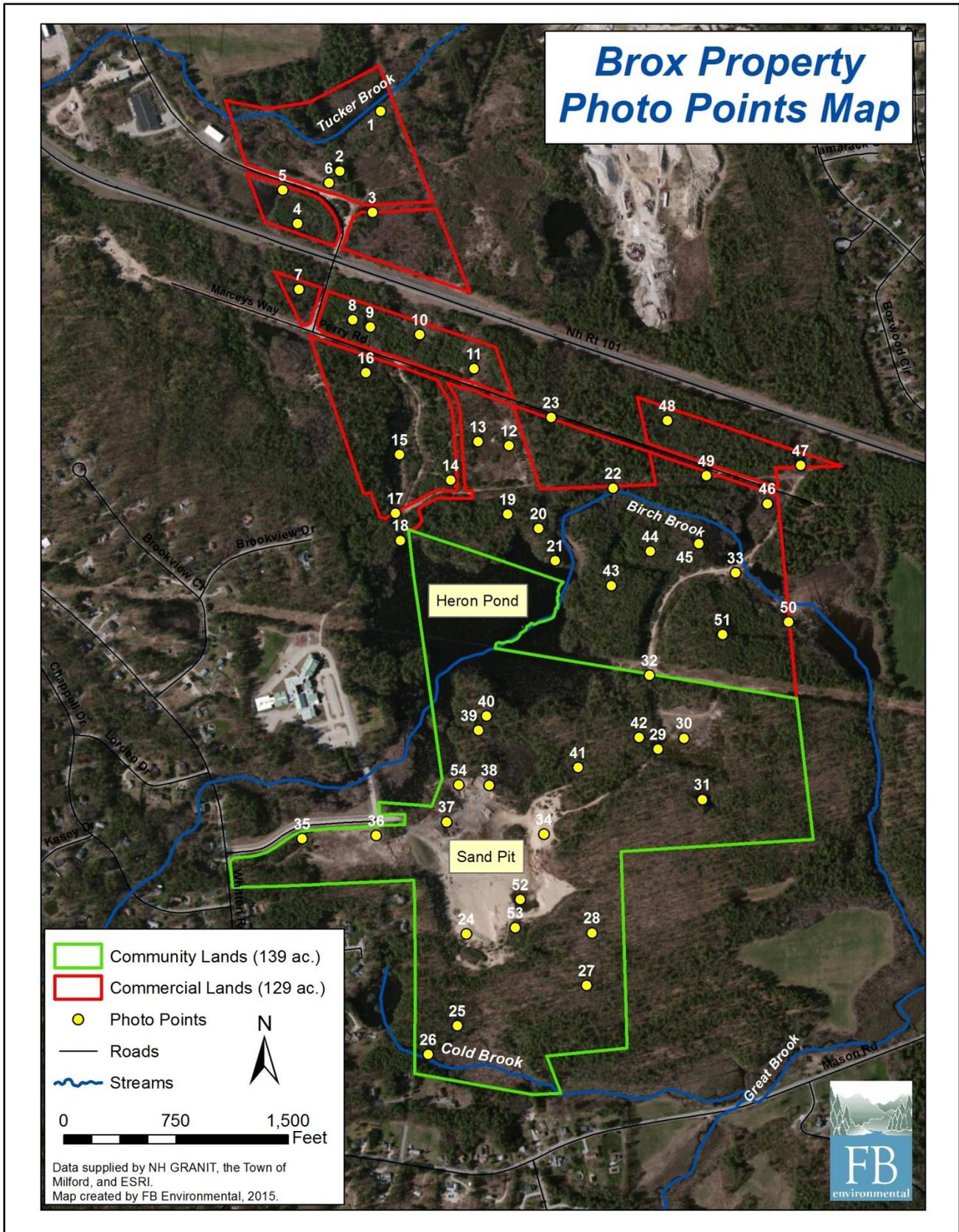
**Appendix C.** Site Photographs

**Appendix D.** NWI Wetland Classification Codes

**Appendix E.** Natural Heritage Bureau Correspondence



**Appendix B. Brox NRI Field Survey Photo Points Map**



**Appendix C. Site Photographs**



Photo point 1. View southwest of the floodplain forest along Tucker Brook. Numerous sycamore trees were observed at this location.



Photo point 2. View south of an excavated wetland in a formerly mined area near the floodplain forest pictured in photo point 1.



Photo point 3. View south of a wetland at the northern end of the property which flows to Tucker Brook.



Photo point 4. View north of an area of planted white pines.



Photo point 5. View west of a large marsh which continues off the Brox property. Beaver activity (stripped branches) was observed in this wetland.



Photo point 6. A small scarified area just north of Perry Road. Various species of turtle may nest in such areas.



Photo point 7. View east toward Perry Road from within a forested area containing red and white oak and hemlock.



Photo point 8. View west towards an area of exposed bedrock.



Photo point 9. View east towards a potential wetland area. (The area does not appear on NWI maps.)



Photo point 10. View south of a small stream with wetland fringes.



Photo point 11. View east of thick vegetation containing invasive species in a formerly mined area just off of Perry Road.



Photo point 12. View north of a potential wetland in a formerly mined area. An old access road runs through this area.



Photo point 13. View east into a formerly excavated area which now consists of dense, early successional habitat.



Photo point 13. Potential New England cottontail scat observed at the edge of the early successional habitat area shown in photo point 13.



Photo point 14. View north of a small open area surrounded by white pines.



Photo point 15. View north of a beaver-created impoundment known as “Long Beaver Pond”.



Photo point 16. View south of a potential vernal pool.



Photo point 17. A vernal pool south of Long Beaver Pond.



Photo point 18. View south from the northwest corner of Heron Pond towards the Heron Rookery.



Photo point 19. A mountain bike trail north of Heron Pond.



Photo point 20. A vernal pool downslope from the mountain bike trail in photo point 20.



Photo point 21. View east of the large beaver dam at the northeast end of Heron Pond. Otter scat was observed on the dam.



Photo point 22. A scrub-shrub wetland downstream of the Heron Pond beaver dam. This wetland type is often inhabited by spotted turtles.



Photo point 23. View south of a small forested wetland on the south side of Perry Road. The wetland is hydrologically connected to a large wetland north of NH Route 101.



Photo point 24. View north from the south end of the large sand pit on the community lands. A person walking their dog and stockpiles of material are visible in the background.



Photo point 25. View south of the riparian wetland system at the southern end of the Brox property. This system is a tributary to Great Brook.



Photo point 26. View south from the riparian wetland system at the southern end of the Brox property. A residence (circled in red), not far from the wetland is somewhat visible in the background.



Photo point 27. The woods south of the gravel pit. Observed trees included both red and white oak, white pine, and pitch pine.



Photo point 28. A pitch pine in the woods just south of the gravel pit.



Photo point 29. Red pines along the dirt road bordering the proposed cemetery area.



Photo point 30. The area of the proposed cemetery.



Photo point 31. A vernal pool in the woods south of the proposed cemetery area.



Photo point 32. View west across Heron Pond from within the powerline corridor at the east side the pond.



Photo point 33. A washed-out dirt road crossing through the Birch Brook wetland complex.



Photo point 34. View west from the northeast end of the gravel pit.



Photo point 35. A wetland resulting from excavation activity on the south side of Heron Pond Road near Whitten Road. This area is potential New England cottontail habitat.



Photo point 36. A proposed recreational field area on the south side of Heron Pond Road. View north toward photo point 36.



Photo point 37. An area of the sand pit used for material storage.



Photo point 38. View north towards a scrub-shrub wetland (peat fen) from the edge of a berm at the north end of the sand pit.



Photo point 39. A vernal pool situated between Heron Pond and the peat fen. View north toward Heron Pond (visible in background).



Photo point 40. View north toward Heron Pond from the mountain bike trails.



Photo point 41. A forested area between Heron Pond and the sand pit.



Photo point 42. A potential vernal pool west of the proposed cemetery area. No water was present in the depression during the field visit.



Photo point 43. A forested area east of the northeast end of Heron Pond. View west towards Heron Pond, which is visible in the background.



Photo point 44. A wetland in the forested area between Heron Pond and the dirt road through the property.



Photo point 45. A scrub-shrub wetland associated with Birch Brook northwest of the washed-out crossing.



Photo point 46. A potential vernal pool on the south side of the eastern end of Perry Road.



Photo point 47. A scrub-shrub wetland adjacent to Route 101 at the easternmost end of the property.



Photo point 48. A stand of hemlocks south of NH Route 101.



Photo point 49. A small excavated pool south of Perry Road.



Photo point 50. A large open wetland associated with Birch Brook. View east from the eastern property boundary.



Photo point 51. An area of pine forest east of the dirt road north of the powerline corridor.



Photo point 52. A pool created by mining activity at the southeast end of the sand pit.

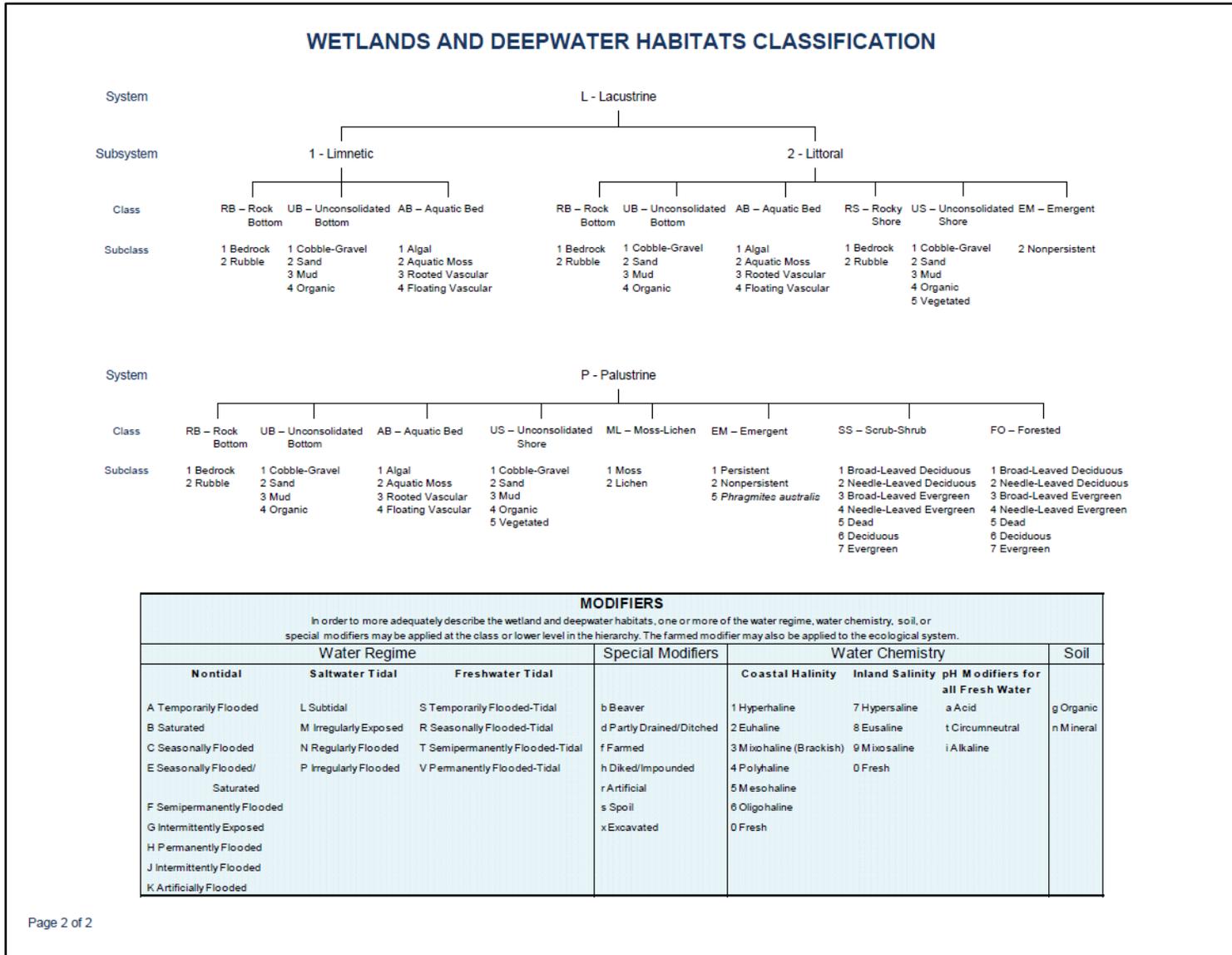


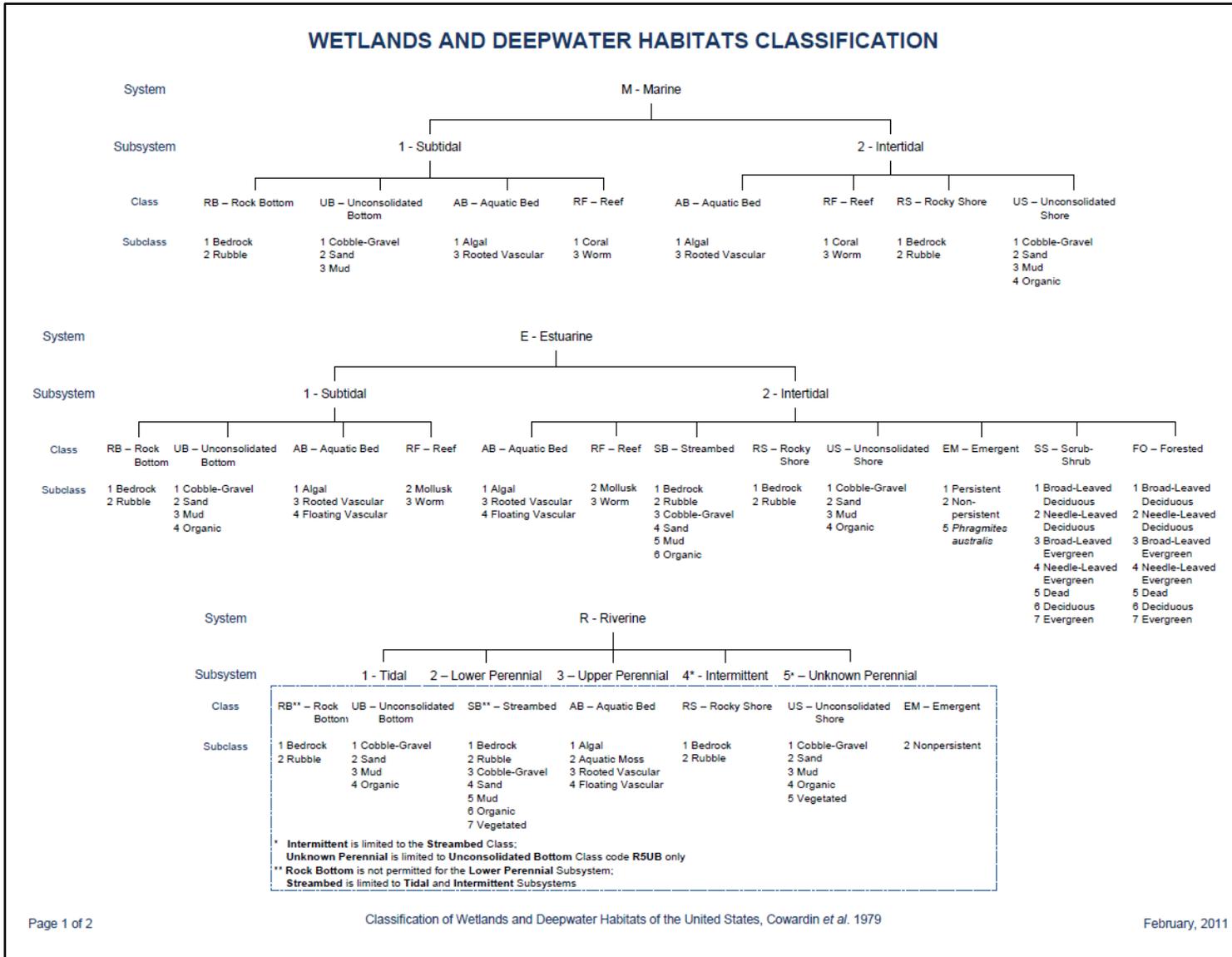
Photo point 53. A second pool created by mining activity at the southeast end of the sand pit.



Photo point 54. Oriental bittersweet growing at the base of a soil pile on the western end of the sand pit.

**Appendix D. NWI Wetland Classification Codes**





***Appendix E. Natural Heritage Bureau Correspondence***

# Memo



NH NATURAL HERITAGE BUREAU  
NHB DATACHECK RESULTS LETTER

**To:** Kevin Ryan, FB Environmental  
97A Exchange Street, Suite 305  
Portland, ME 04101

**From:** Melissa Coppola, NH Natural Heritage Bureau

**Date:** 10/30/2014 (valid for one year from this date)

**Re:** Review by NH Natural Heritage Bureau

NHB File ID: NHB14-4162

Town: Milford

Location: Accible via Heron Pond Road in  
Milford

Description: The property may have built upon it a school, athletic fields, and cemetery. Soil/Gravel extraction may also take place.

cc: Kim Tuttle

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Vertebrate species	State <sup>1</sup>	Federal	Notes
American Eel ( <i>Anguilla rostrata</i> )*	SC	--	Contact the NH Fish & Game Dept (see below).
Bald Eagle ( <i>Haliaeetus leucocephalus</i> )	T	--	Contact the NH Fish & Game Dept (see below).
Banded Sunfish ( <i>Enneacanthus obesus</i> )	SC	--	Contact the NH Fish & Game Dept (see below).
Blanding's Turtle ( <i>Emydoidea blandingii</i> )	E	--	Contact the NH Fish & Game Dept (see below).
Eastern Hognose Snake ( <i>Heterodon platirhinos</i> )	E	--	Contact the NH Fish & Game Dept (see below).
Spotted Turtle ( <i>Clemmys guttata</i> )*	T	--	Contact the NH Fish & Game Dept (see below).
Wood Turtle ( <i>Glyptemys insculpta</i> )	SC	--	Contact the NH Fish & Game Dept (see below).

<sup>1</sup>Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (\*) indicates that the most recent report for that occurrence was more than 20 years ago.

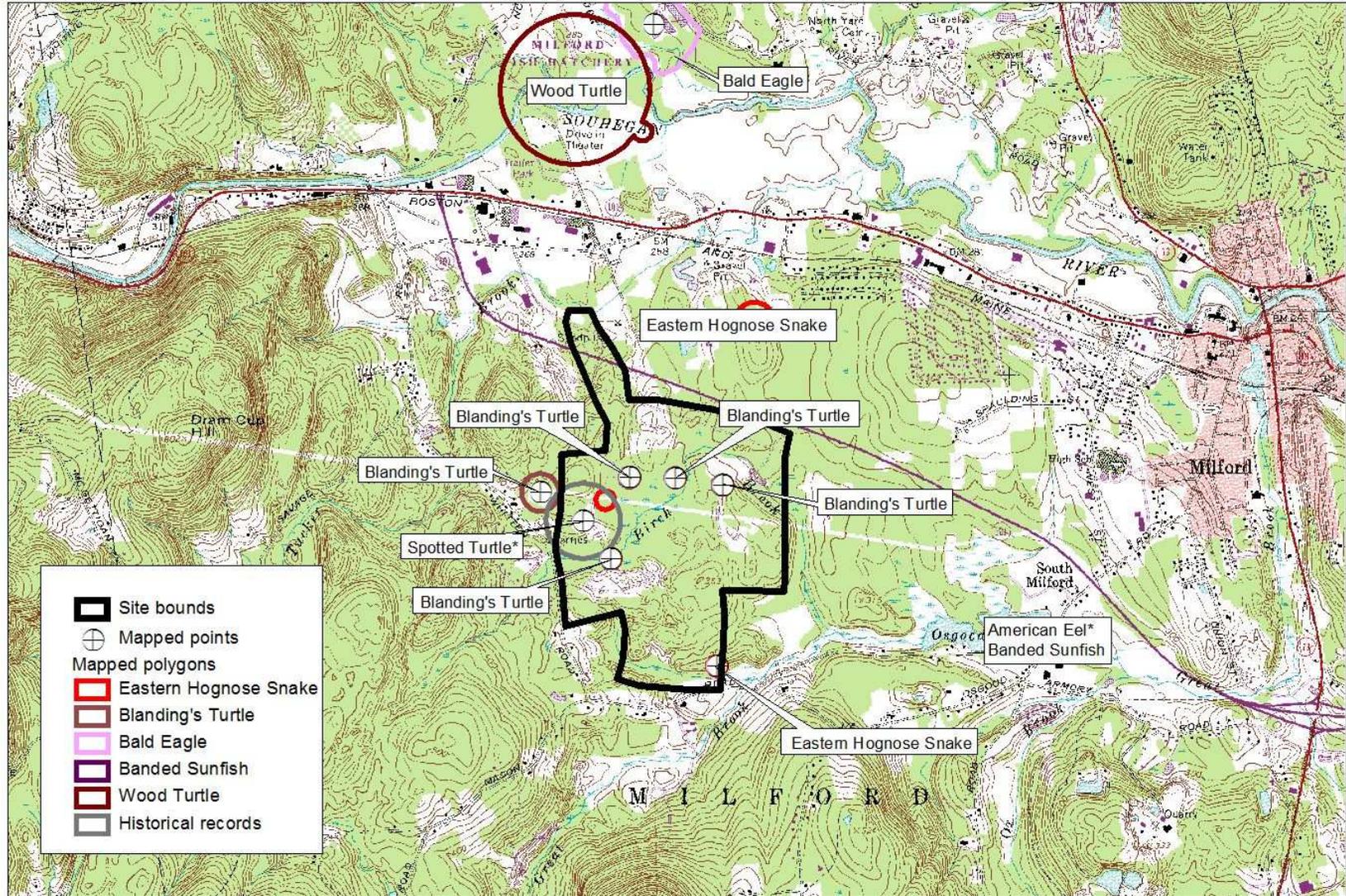
Contact for all animal reviews: Kim Tuttle, NH F&G, (603) 271-6544.

A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.



Known locations of rare species and exemplary natural communities

Note: Mapped locations are not always exact. Occurrences that are not in the vicinity of the project are not shown.



\*Historical record

## New Hampshire Natural Heritage Bureau - Animal Record

### American Eel (*Anguilla rostrata*)

**Legal Status**

Federal: Not listed  
 State: SC

**Conservation Status**

Global: Apparently secure but with cause for concern  
 State: Rare or uncommon

**Description at this Location**

Conservation Rank: Historical records only - current condition unknown.  
 Comments on Rank:

Detailed Description: 1986: Area 13269: 1 observed.  
 General Area:  
 General Comments:  
 Management  
 Comments:

**Location**

Survey Site Name: Beaver Brook  
 Managed By:

County: Hillsborough	USGS quad(s): Milford (4207176)
Town(s): Milford	Lat, Long: 424915N, 0713948W
Size: 1.9 acres	Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 1986: Great Brook (Osgood)

**Dates documented**

First reported: 1986-06-18	Last reported: 1986-06-18
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The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

## New Hampshire Natural Heritage Bureau - Animal Record

### Bald Eagle (*Haliaeetus leucocephalus*)

**Legal Status**

Federal: Not listed  
 State: Listed Threatened

**Conservation Status**

Global: Demonstrably widespread, abundant, and secure  
 State: Imperiled due to rarity or vulnerability

**Description at this Location**

Conservation Rank: Not ranked  
 Comments on Rank:

Detailed Description: Wintering eagles regularly observed at this location.

General Area:

General Comments:

Management

Comments:

**Location**

Survey Site Name: Milford Fish Hatchery  
 Managed By: Milford Fish Hatchery

County: Hillsborough

Town(s): Milford

Size: 37.3 acres

USGS quad(s): Milford (4207176)

Lat, Long: 425101N, 0714122W

Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions:

**Dates documented**

First reported: No date

Last reported: 2011

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

## New Hampshire Natural Heritage Bureau - Animal Record

### Banded Sunfish (*Enneacanthus obesus*)

#### Legal Status

Federal: Not listed  
State: SC

#### Conservation Status

Global: Demonstrably widespread, abundant, and secure  
State: Rare or uncommon

#### Description at this Location

Conservation Rank: Not ranked  
Comments on Rank:

Detailed Description: 2006: Area 11490: 3 adults caught in bag seine. Area 11476: 1 adult caught with bag seine. Area 11472: Large individual adult found in stomach of a chain pickerel caught with bag seine. 2005: Area 9000: 20 observed. 1986: Area 260: 1 observed. 1938: Souhegan River: Specimen collected.

General Area: 2006: Area 11490: Freshwater Pond. Area 11476: Small freshwater pond/wetland. Appears to connect to Souhegan River during high water. Area 11472: Freshwater stream. 2005: Area 9000: Freshwater stream or river. 1986: Area 260: Freshwater stream or river. 1938: Souhegan River: Vegetation moderate: *Potamogeton* (pondweed), rushes; shore-open pasture.

General Comments: 2006: Area 11490: NHFGD fish survey. Caught with bag seine in thick vegetation next to dam. 1986: Area 260: One banded sunfish (45mm./1oz.) sampled by electrofishing at NHFG Fishing for the Future Index site HI285022. Index site is 300 ft. long.

Management  
Comments:

#### Location

Survey Site Name: Souhegan River  
Managed By: Minot J. Ross Memorial Bird Sanctuary

County: Hillsborough	USGS quad(s): South Merrimack (4207175)
Town(s): Amherst	Lat, Long: 424942N, 0713724W
Size: 11.9 acres	Elevation: 205 feet

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2006: Area 11490: Dam at Osgood Pond off of Osgood Road ca. 0.75 miles south of Rte. 101. Area 11476: Small pond/wetland west side of Boston Post Road just south of bridge over the Souhegan River. Area 11472: Beaver Brook upstream of Thorton Ferry Road. 2005: Area 9000: Purgatory Brook at crossing with North River Rd. 1986: Area 260: Great Brook downstream of Osgood Rd. below Osgood Pond. 1938: Souhegan River: 0.25 mile above T18. 2 miles east of Milford.

#### Dates documented

First reported: 1938	Last reported: 2006-06-28
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The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

## New Hampshire Natural Heritage Bureau - Animal Record

### Blanding's Turtle (*Emydoidea blandingii*)

**Legal Status**

Federal: Not listed  
 State: Listed Endangered

**Conservation Status**

Global: Apparently secure but with cause for concern  
 State: Critically imperiled due to rarity or vulnerability

**Description at this Location**

Conservation Rank: Good quality, condition and landscape context ('B' on a scale of A-D).  
 Comments on Rank:

Detailed Description: 2008: Area 11619: 3 adults seen.  
 General Area: 2008: Area 11619: On rock.  
 General Comments:  
 Management  
 Comments:

**Location**

Survey Site Name: Birch Brook  
 Managed By:

County: Hillsborough	USGS quad(s): Milford (4207176)
Town(s): Milford	Lat, Long:
Size: 7.7 acres	Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2008: Area 11619: Wetland near intersection of Brookview Drive and Brookview Court.

**Dates documented**

First reported: 2008-05-08	Last reported: 2008-05-08
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The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

## New Hampshire Natural Heritage Bureau - Animal Record

### Blanding's Turtle (*Emydoidea blandingii*)

**Legal Status**

Federal: Not listed  
 State: Listed Endangered

**Conservation Status**

Global: Apparently secure but with cause for concern  
 State: Critically imperiled due to rarity or vulnerability

**Description at this Location**

Conservation Rank: Not ranked  
 Comments on Rank:

Detailed Description: 2013: Area 13512: 1 adult observed, sex unknown.  
 General Area: 2013: Area 13512: Deciduous forest. Abandoned gravel pit service road; isolated vernal pool in mixed forest area.  
 General Comments: 2013: Area 13512: Observation comment: This vernal pool was photographed dry in November 2012. On March 28, 2013 we found 30 wood frog egg masses and 13 spotted salamander egg masses.

Management  
 Comments:

**Location**

Survey Site Name: Birch Brook  
 Managed By:

County: Hillsborough	USGS quad(s):
Town(s): Milford	Lat, Long:
Size: 1.9 acres	Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2013: Area 13512: Brox Property North. Vernal pool adjacent to dirt service road that is a hiking trail. Access from trail around large Heron Pond. Parking at Heron Pond Road in Milford, NH.

**Dates documented**

First reported: 2013-04-28	Last reported: 2013-04-28
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The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

## New Hampshire Natural Heritage Bureau - Animal Record

### Blanding's Turtle (*Emydoidea blandingii*)

**Legal Status**

Federal: Not listed  
 State: Listed Endangered

**Conservation Status**

Global: Apparently secure but with cause for concern  
 State: Critically imperiled due to rarity or vulnerability

**Description at this Location**

Conservation Rank: Not ranked  
 Comments on Rank:

Detailed Description: 2013: Area 13528: 3 adults observed, sex unknown.  
 General Area: 2013: Area 13528: Mixed forest. Beaver pond (50 acres?). About a 1,000 feet southeast is a peatland bog (perhaps even a fen, though underwater).  
 General Comments: 2013: Area 13528: Observation comment: Larger-appearing turtle was to the left on the same log as the smaller-appearing turtle that appears to have a V-shaped piece missing from shell. The third turtle was not far but separate.

Management  
 Comments:

**Location**

Survey Site Name: Birch Brook  
 Managed By:

County: Hillsborough	USGS quad(s):
Town(s): Milford	Lat, Long:
Size: 1.9 acres	Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2013: Area 13528: Heron Pond at Brox Property North. Within the large Heron Pond (a beaver pond created by a dam on Birch Brook), northeast corner of pond.

**Dates documented**

First reported: 2013-06-15	Last reported: 2013-06-15
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The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

## New Hampshire Natural Heritage Bureau - Animal Record

### Blanding's Turtle (*Emydoidea blandingii*)

**Legal Status**

Federal: Not listed  
 State: Listed Endangered

**Conservation Status**

Global: Apparently secure but with cause for concern  
 State: Critically imperiled due to rarity or vulnerability

**Description at this Location**

Conservation Rank: Not ranked  
 Comments on Rank:

Detailed Description: 2013: Area 13535: 1 adult observed, sex unknown.  
 General Area: 2013: Area 13535: Mixed forest. Huge beaver pond surrounded by forests, east corner has peatland bog, pond has heron rookery (9 nests).  
 General Comments: 2013: Area 13535: Observation comment: This is the 5th sighting of Blanding's turtles at the Brox Property in Milford, NH. I'll be reporting a 6th separately. GREAT BLANDING'S HABITAT that needs protection.

Management  
 Comments:

**Location**

Survey Site Name: Birch Brook  
 Managed By:

County: Hillsborough	USGS quad(s):
Town(s): Milford	Lat, Long:
Size: 1.9 acres	Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2013: Area 13535: Heron Pond west at Brox Property. Heron Pond is a 50 to 60 acre beaver pond. The impoundment is on Birch Brook. This Blanding's turtle was basking on a log on the western side.

**Dates documented**

First reported: 2013-06-22	Last reported: 2013-06-22
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The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

## New Hampshire Natural Heritage Bureau - Animal Record

### Blanding's Turtle (*Emydoidea blandingii*)

**Legal Status**

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Federal: Not listed  
 State: Listed Endangered

**Conservation Status**

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Global: Apparently secure but with cause for concern  
 State: Critically imperiled due to rarity or vulnerability

**Description at this Location**

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Conservation Rank: Not ranked  
 Comments on Rank:

Detailed Description: 2013: Area 13536: 1 adult observed, sex unknown.  
 General Area: 2013: Area 13536: Roadside, coniferous forest. Two-lane access road divides Heron Pond (fed by Birch Brook) on the east side from the rest of Birch Brook on the west side.  
 General Comments: 2013: Area 13536: Observation comment: This is the 6th sighting of a Blanding's turtle at the Brox Property in Milford. Brox Environmental Citizens is working to protect their habitat. .

Management  
 Comments:

**Location**

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Survey Site Name: Birch Brook  
 Managed By:

County: Hillsborough	USGS quad(s):
Town(s): Milford	Lat, Long:
Size: 1.9 acres	Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2013: Area 13536: Heron Pond Road at Brox Property. Heron Pond Road turns left as the access road to Heron Pond School. The Blanding's was in the road, one side is access to Heron Pond, the other is a sidewalk with a steep curb.

**Dates documented**

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First reported: 2013-07-03	Last reported: 2013-07-03
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The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

## New Hampshire Natural Heritage Bureau - Animal Record

### Eastern Hognose Snake (*Heterodon platirhinos*)

**Legal Status**

Federal: Not listed  
 State: Listed Endangered

**Conservation Status**

Global: Demonstrably widespread, abundant, and secure  
 State: Critically imperiled due to rarity or vulnerability

**Description at this Location**

Conservation Rank: Not ranked  
 Comments on Rank:

Detailed Description: 2013: Area 13549: 1 juvenile observed, sex unknown. 2010: Area 12761: 1 adult observed.  
 General Area: 2013: Area 13549: Mixed forest, near large beaver pon. 2010: Area 12761: Mixed forest.  
 General Comments: 2013: Area 13549: Observation comment: The Brox Property is an undeveloped area that used to have gravel operations.

Management  
 Comments:

**Location**

Survey Site Name: Great Brook  
 Managed By: Burns Farm

County: Hillsborough	USGS quad(s): Milford (4207176)
Town(s): Milford	Lat, Long: 424910N, 0714107W
Size: 3.8 acres	Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2013: Area 13549: Brox Property, Heron Pond School, Milford. Just south of powerlines, 50-100 feet from western shore of the large heron pond. 2010: Area 12761: Burns Farm, Milford.

**Dates documented**

First reported: 2010-07-22	Last reported: 2013-09-01
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The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

## New Hampshire Natural Heritage Bureau - Animal Record

### Eastern Hognose Snake (*Heterodon platirhinos*)

**Legal Status**

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Federal: Not listed  
 State: Listed Endangered

**Conservation Status**

---

Global: Demonstrably widespread, abundant, and secure  
 State: Critically imperiled due to rarity or vulnerability

**Description at this Location**

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Conservation Rank: Not ranked  
 Comments on Rank:

Detailed Description: 2012: Area 13041: 1 adult observed.  
 General Area: 2012: Area 13041: Coniferous forest near sand pit.  
 General Comments:  
 Management  
 Comments:

**Location**

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Survey Site Name: Birch Brook, north of  
 Managed By:

County: Hillsborough	USGS quad(s): Milford (4207176)
Town(s): Milford	Lat, Long: 425010N, 0714058W
Size: 7.7 acres	Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2012: Area 13041: In woods west of Tamarack Ct., Milford, between road and sand pit.

**Dates documented**

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First reported: 2012-08-08	Last reported: 2012-08-08
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The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

## New Hampshire Natural Heritage Bureau - Animal Record

### Spotted Turtle (*Clemmys guttata*)

**Legal Status**

---

Federal: Not listed  
 State: Listed Threatened

**Conservation Status**

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Global: Demonstrably widespread, abundant, and secure  
 State: Imperiled due to rarity or vulnerability

**Description at this Location**

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Conservation Rank: Historical records only - current condition unknown.  
 Comments on Rank:

Detailed Description: 1992: Area 9265: Unknown number of adult turtles observed.  
 General Area: 1992: Area 9265: Abandoned quarry.  
 General Comments:  
 Management  
 Comments:

**Location**

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Survey Site Name: Birch Brook  
 Managed By:

County: Hillsborough	USGS quad(s): Milford (4207176)
Town(s): Milford	Lat, Long:
Size: 30.8 acres	Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 1992: Area 9265: Near abandoned quarry [Ca. 0.15 miles northeast of the junction of Birch Brook and Whitten Road].

**Dates documented**

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First reported: 1992-10-11	Last reported: 1992-10-11
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The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

## New Hampshire Natural Heritage Bureau - Animal Record

### Wood Turtle (*Glyptemys insculpta*)

**Legal Status**

Federal: Not listed  
 State: SC

**Conservation Status**

Global: Apparently secure but with cause for concern  
 State: Rare or uncommon

**Description at this Location**

Conservation Rank: Good quality, condition and landscape context ('B' on a scale of A-D).  
 Comments on Rank:

Detailed Description: 2009: Area 12322: 1 observed.1999: Area 12213: 1 observed, 7-8" shell length.  
 General Area: 2009: Area 12322: Next to well at Superfund site.1999: Area 12213: Riverbank with sycamores.

General Comments:  
 Management  
 Comments:

**Location**

Survey Site Name: Milford Fish Hatchery  
 Managed By: Milford Fish Hatchery

County: Hillsborough  
 Town(s): Milford  
 Size: 125.1 acres

USGS quad(s): Milford (4207176)  
 Lat, Long:  
 Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2009: Area 12322: Savage Well superfund site.1999: Area 12213: Souhegan River Trail approximately 1/3 mile east of "Fitch's Corner Road".

**Dates documented**

First reported: 1999-05-14  
 Last reported: 2009-06-29

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.