Haines Pond Management Plan

Town of Southeast, New York

METROPOLITAN CONSERVATION ALLIANCE

A PROGRAM OF THE

Cary Institute of Ecosystem Studies

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Haines Pond Management Plan

by

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Front cover image:
Collage of Haines Pond habitats (photos by E. Davison)

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1.0 INTRODUCTION

1.1 *Background*

In 2009, a biodiversity study was conducted at Haines Pond and its surrounding landscape (referred to hereafter as "the study area") by the Metropolitan Conservation Alliance (MCA), a program of the Cary Institute of Ecosystem Studies. The results of that study are catalogued in a report entitled *Haines Pond Biodiversity Study* (MCA Technical Paper No. 15). This report builds upon our previous study and is intended to provide guidance to land stewards on managing the site's diversity of species and habitat types in order to preserve or enhance wildlife diversity. Recreational uses of the site are also discussed and analyzed as to their potential to adversely impact wildlife; however, this is not intended to be a guidance document on recreational development of the site.

1.2 *Acknowledgements*

We acknowledge financial support provided by the Westchester Community Foundation, the Gage Fund, and by Dr. Lucy Waletzky. Logistical support and encouragement was provided by the Town of Southeast's Open Space Committee. We particularly recognize the tireless efforts of Milly Nugent, Chair of the Southeast Open Space Committee and the support and encouragement of Southeast Supervisor Michael Rights and members of the Southeast Town Board.

2.0 SITE DESCRIPTION

From a regional perspective the study area is located in southern Putnam County within the Hudson Highlands Ecozone (Andrle and Caroll 1988). The study area is located around a headwater wetland system which flows west into the East Branch Reservoir, a drinking water supply reservoir for New York City. The easternmost boundary of the study area straddles the CT-NY state line and is located at the watershed divide between the Hudson River and Housatonic River drainage basins.

The Haines Pond acquisition parcel totals approximately 160 acres and is located in the southeast portion of the Town of Southeast, bordering the Connecticut state line at the Town of Danbury (see Figure 1). The study area

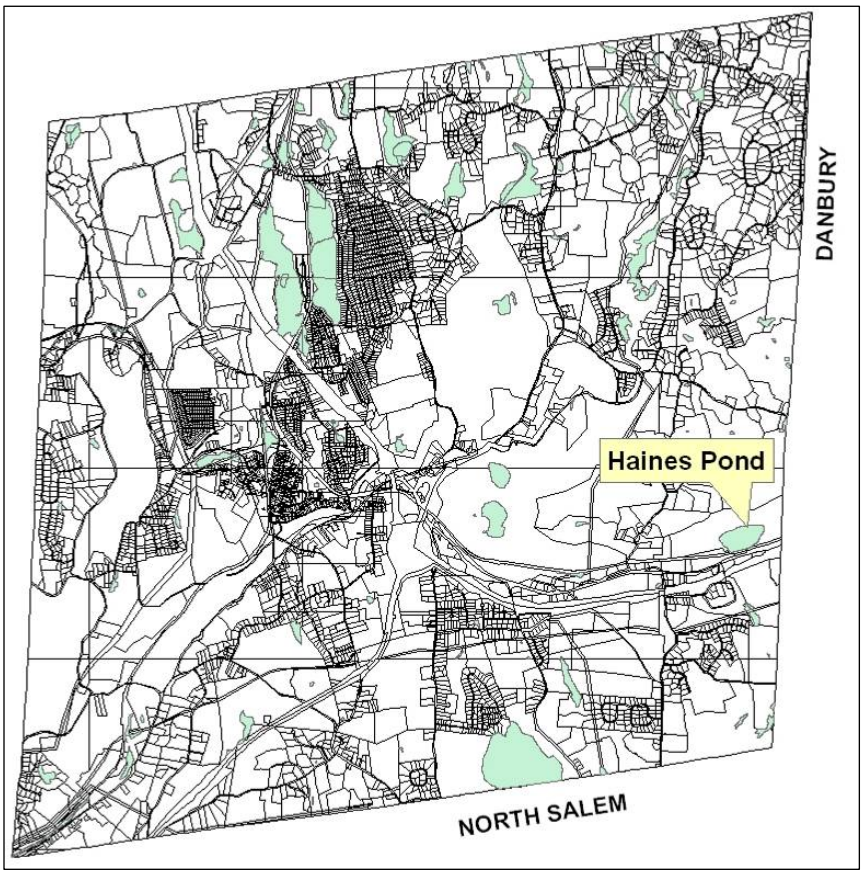

Figure 1: Town parcel map showing location of Haines Pond

encompassing 233 acres includes Haines Pond as well as contiguous habitats located along the inactive railroad line between Joes Hill Road and the Connecticut state line (see Figures 2-3).

The Haines Pond ecosystem is connected to open space to the north, east and the west, forming a contiguous habitat block of 2,300 acres of interconnected open space with minimal fragmentation from roads and development (see Figure 2). To the west, wetlands and lands of the NYC DEP connect the site to the East Branch Reservoir. To the east, the recently protected Sanford's Pond parcel in the Town of Danbury extends the biodiversity corridor to the village of Mill Plain. To the north, across Joes Hill Road, lie the sparsely developed lands surrounding Round Mountain and Boggs Pond.

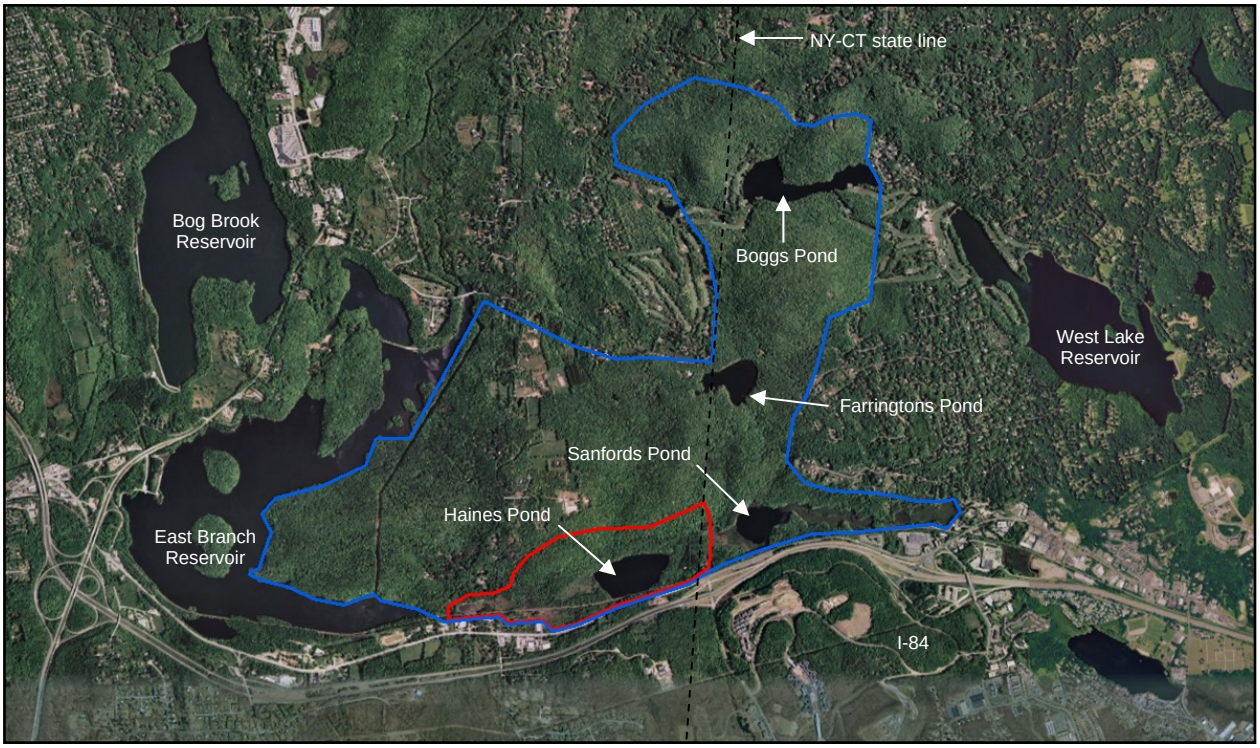

Figure 2: Interconnected ecosystem (outlined in blue) surrounding the Haines Pond study area (outlined in red)

The 2009 biodiversity study documented a variety of habitats occurring in the Haines Pond study area that supported a rich diversity of amphibians, reptiles and birds Moreover, many of the species observed are becoming increasingly rare in northern Westchester and adjacent Putnam County, making their presence at the site even more significant. Species documented such as the Eastern Box Turtle (*Terrapene c. carolina*), Spotted Turtle (*Clemmys guttata*) and Hognose Snake (*Heterodon platirhinos*) are near their natural northern range limit and are on the NY State list of special concern species.

3.0 WHAT IS HABITAT MANAGEMENT?

Habitat management is the maintenance and manipulation of a particular habitat type (e.g. grassland, forest, wetland) to make that habitat more suitable for a target organisms or groups/guilds of species. Through methods such as mowing, burning, and selective cutting or logging, habitats can be manipulated to provide the desired complex of vegetative diversity and structure that a particular species needs to survive. Aldo Leopold wrote in his textbook titled Game Management, *"game can be restored by the creative use of the same tools which have heretofore destroyed it-axe, plow, cow, fire, and gun."* By actively controlling the density and diversity of vegetation within a habitat, land managers can seek to provide optimal habitat conditions for target species.

4.0 HABITAT TYPES

A rich diversity of both upland and wetland habitats occur within the study area (see Figure 3). The study area's wetland habitats are interconnected and their characteristics are strongly influenced (in a positive manner) by the engineering activity of beavers, which have created a wide range of hydrologic conditions resulting from the cycle of creation and subsequent draining of beaver ponds. These include seasonally-saturated wetlands in which surface water is limited to springs and shallow surface flow (e.g. hillside wooded swamps), seasonally-flooded wetlands in which standing water is present throughout the spring and early summer and generally absent by late summer (e.g., marshes, shrub-scrub and wooded swamp wetlands occurring on gentle topography) and permanently-flooded wetlands in which water is present throughout the year (e.g., Haines Pond). As previously mentioned, Haines Pond is part of a larger ecological complex extending east and west.

Site habitat types are listed in Table 1. They include: (1) old field; (2) mixed hardwood forest, (3) pine/spruce stand; (3) open water (Haines Pond and Joes Hill Pond); (5) wooded swamp; (6) stream; (7) emergent marsh/scrub-shrub wetland complex and (8) vernal pool. These habitat types are discussed hereafter as distinct "habitat management units" in which protective measures or management prescriptions are discussed for each unit.

Table 1: Summary of habitat management units, Haines Pond, Southeast, NY

Unit	Habitat Type	Acres	Location / Extent
Upland Habitat Types			
1	Old field	8.25	Two patches occur within the study area, one eight acre patch located immediately east of Haines Pond and one one-quarter acre patch located along the NY-CT state line near Sanford's Pond
2	Mixed hardwood forest	123*	Predominately located on the ridgeline north-northeast of Haines Pond
3	Pine/spruce stand	12	Located west of Haines Pond along the NY-CT state line
Wetland Habitat Types			
4	Open water	35	Includes Haines Pond (32 acres) and Joes Hill Pond (3 acres)
5	Wooded swamp	16**	Located north, northeast and east of Haines Pond within low-lying areas
6	Streams	N/A	Three unnamed streams are located within and immediately adjacent to the study area. The first originates north of the study area on Joes Hill and drains southward into Haines Pond. The second originates south of the study area and northeast of Peach Lake and drains northward under both Route 6 and I-84 before reaching the study area. The third drains out of the study area westward into the East Branch Reservoir.
7	Emergent marsh/shrub swamp complex	20	Emergent marsh/shrub swamp habitats occur between Joes Hill Pond and Haines Pond
8	Vernal pool	N/A	Two vernal pools occur within the study area. The first is located north of Haines Pond along the forested ridgetop of Joes Hill. The second pool is located adjacent to the northeast corner of Haines Pond
**Mixed hardwood forest acreage for the Haines Pond parcel alone totals approx 100 acres* ***Wooded swamp acreage is a rough approximation only based on field observations and aerial photograph interpretation*			

5.0 HABITAT MANAGEMENT UNITS

5.1 *Unit 1: Old Field*

Two areas of old field occur within the study area, one eight acre patch located immediately west of Haines Pond as well as a one-quarter acre patch located east of Haines Pond straddling the CT-NY state line (see Figure 4).

The term "old field" (sometimes referred to as "meadow" or "shrubland") refers to non-forested early-successional habitats dominated by a mixture of herbaceous vegetation with scattered shrubs and small trees. Old field communities provide vegetative structure and diversity that serve as vital nesting, brood rearing, feeding and escape habitats for early-successional wildlife. The vegetative make-up of an old field is variable and dynamic depending on the length of time since abandonment, management history, and other factors that can affect the long-term stability and composition of plants that occupy the site (Oehler, *et. al.* 2006).

Of forty bird species associated with old field habitats, twenty-two are undergoing significant population declines in eastern North America (Oehler, *et. al.* 2006). Several of these species, including the Eastern Kingbird and Blue-winged Warbler, occur at Haines Pond (Davison and Klemens, 2009). Old field habitats located in the northeastern U.S. also contain higher proportions of state-listed butterflies and moths than any other habitat types. In the northeastern U.S., fifty-eight species are dependent upon shrublands, which provide sunny open areas in combination with desired host plants such as scrub oak and blueberry. Fifty-six of these butterflies and moths are considered rare (Oehler, *et. al.* 2006).

Figure 4: Aerial photograph showing old field habitat patches both east and west of Haines Pond

The western old field occurs on a flat outwash plain consisting of Knickerbocker soils, a sandy, somewhat-excessively drained soil formed in glaciofluvial deposits. The field appears to have been created as the result of a previous anthropogenic disturbance, most likely for the removal of sand and gravel. Vegetation consists of Black Locust (*Robinia pseudoacacia*) and Trembling Aspen (*Populus tremuloides*) dominant in the sapling and shrub layer and Goldenrods (*Solidago spp.*), Switchgrass (*Panicum virgatum*), Little Bluestem (*Schizachyrium scoparium*) and the Eurasian Mugwort (*Artemisia vulgaris*) common in the herb layer.

Figure 5: Eight-acre old field habitat west of Haines Pond. Indigo Bunting and Great-crested Flycatcher nest here

Figure 6:Quarter-acre old field located along CT state line. Hognose Snake and Box Turtle were observed basking in this sunny forest opening

The eastern old field occurs at the edge of the spruce/pine stand east of Haines Pond along the NY-CT state line. This area is a small habitat patch (1/4 acre in size) created from an old sand and gravel excavation or "borrow pit". Two state-listed special concern reptiles were observed in this field, the Eastern Hognose Snake (*Heterodon platirhinos*) and Eastern Box Turtle (*Terrapene c. carolina*).

The eastern old field occurs on Hinckley soils, an excessively-drained sandy-gravelly soil. Vegetation is dominated by Goldenrod (*Solidago sp.*), Deer-Tongue (*Panicum clandestinum*), Aster (*Aster sp.*), Wild Strawberry (*Fragaria virginiana*), Black Birch (*Betula lenta*) saplings, Little Bluestem (*Schizachyrium scoparium*), Cherry (*Prunus serotina*), Multiflora Rose (*Rosa multiflora*), Asiatic Bittersweet (*Celastrus orbiculatus*), Mugwort (*Artemesia vulgaris*), and Japanese Stiltgrass (*Microstegium vimineum*). Invasive plant species, i.e., Mugwort, Japanese Stiltgrass and Asiatic Bittersweet, are present but do not form large monocultures, therefore they are currently at a state in which control measures could effectively eliminate or greatly reduce their numbers within this habitat patch.

5.1.1 *Old Field – Compatible Recreational Uses*

Suitable low impact recreation or non-consumptive uses include hiking, bird watching or other wildlife observation. Activities that require large-scale conversion of vegetation or high-intensity uses such as playing field development or picnic areas should be avoided as these would likely have a significant negative impact on wildlife. This area is a basking and feeding site for hognose snake and box turtle, two species highly susceptible to human disturbance and collection for the pet trade. Therefore, activities

which allow for prolonged human presence, such as a picnic area or campsite, will have a negative impact on wildlife.

5.1.2 *Old Field Habitat Management Goals*

Most early-successional habitats are by definition temporary and dynamic in nature, constantly changing as more shade-tolerant trees replace sun-loving shrubs. Since old-field habitats have a relatively short duration (20 to 25 years in most cases), periodic management must be conducted to maintain the desired habitat structure and prevent succession into a more forested habitat.

The frequency of vegetation management activities necessary to maintain old-field habitat conditions will depend on several factors including plant species present, land-use history and soil type. Old fields that are relatively stable still require monitoring and occasional selective cutting, mowing, or selective spot-applications of herbicide in order to control small trees that invade the area. Recommended management is approximately every five to ten years.

The following general habitat management goals are recommended:

(1) *Maintain or increase old field habitat acreage onsite*. An overall goal for this habitat management unit is maintenance or expansion of total acreage onsite (see Figure 7). Optimal habitat should consist of a complex of shrubs, herbaceous and woody vegetation which is maintained using mowing and selective cutting on a rotational basis every five to ten years. Patch size is an important consideration when managing old field/shrubland habitat. For instance, patch sizes less than two acres will generally not support early-successional bird specialists, but rather will support species found at habitat ecotones (referred to as "edge species"), such as Hognose Snake and Box Turtle.

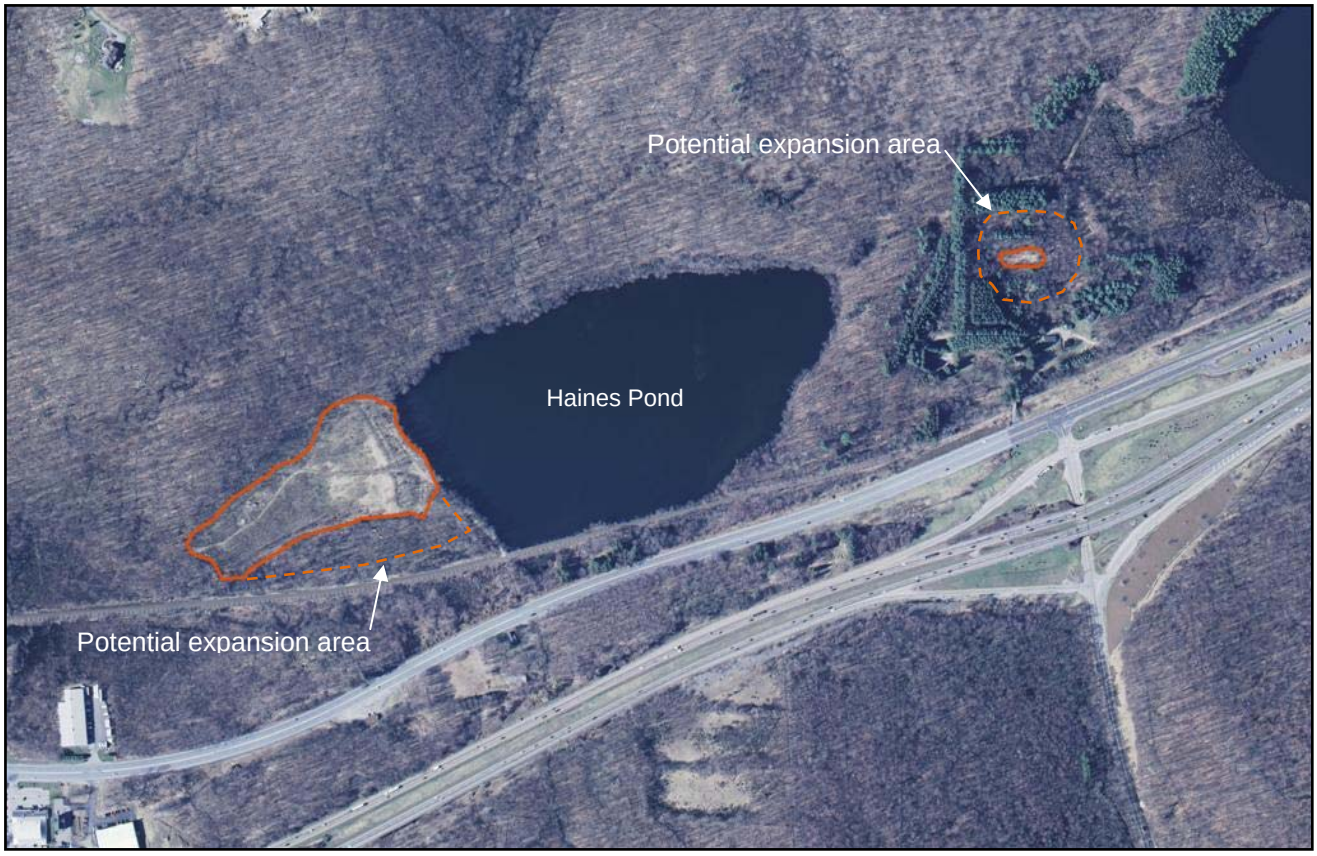

Figure 7: Aerial photograph showing potential old field expansion areas

Optimally, minimum patch size should be ten acres or greater in order to provide suitable habitat for most old field bird specialists. Currently, the existing patches are smaller than the minimum optimal size of ten acres; therefore, expansion would increase their suitability for old field bird specialists.

(2) *Control invasive species*. The general goal for this management unit with respect to invasive species is modest control achieved through mowing, selective cutting and spot application of herbicide. Where infestation densities are significant, control efforts should focus on increasing plant species diversity, vegetative structural diversity and avoid the development of invasive plant monocultures. The goal of complete eradication is unrealistic, as this would require significant time and effort, and would likely be unsuccessful.

(3) Eastern old field maintenance. This ¼ acre habitat patch should be maintained by periodic pruning and/or removal of small trees along the perimeter of the patch which are growing inward toward the center of the habitat causing canopy closure and unwanted shading. The center of the patch should be maintained via annual or bi-annual mowing between November and March when most wildlife are inactive. This habitat patch could be expanded into the adjacent woodland by clearing trees and replanting with herbs and low growing shrubs and trees such as Scrub Oak (*Quercus ilicifolia*).

(4) *Western old field maintenance*. This field should be mowed every 5-10 years to maintain old field vegetation. The initial years of mowing will require a brush hog or heavy duty land-clearing equipment such as a hydro-axe or brontosaurus, or individual cutting of larger trees using a chain saw, as typical mowing equipment will not be able to handle the existing dense woody growth. This habitat patch is heavily infested with two invasive plant species, Black Locust and Mugwort, with other non-native species including Multiflora Rose and cool-season Eurasian grasses present. Due to the high level of infestation, eradication of these species would be labor intensive, costly to implement and the chance of successful eradication would be low. Rather than eradication of these species the goal should be to increase species diversity via selective removal and supplemental planting. Species diversity could be increased by selective removal of some existing Black Locust trees and replacing them with Scrub Oak or other small trees or shrubs. The planting of shrubs or small trees would provide a more stable plant community and reduce the frequency of mowing required to maintain the field. Small Black Locust trees can be removed using a backhoe, taking care to remove the root mass with the tree. Larger specimens should be cut with a chain saw and herbicide should be applied to the cut stumps so that the herbicide can translocate through the root system to prevent re-growth through root sprouting or suckering. Mugwort can be controlled using multiple herbicide applications and replaced with Goldenrod, warm-season bunch grasses, wildflowers or other broad-leaved forb species.

5.2 *Unit 2: Mixed Hardwood Forest*

Figure 8: Forest bordering Haines Pond

Mixed hardwood forest is the dominant upland (non-wetland) habitat type in the study area. A total of approximately 123 acres of mixed hardwood forest occurs within the 233 acre study area, with 100 acres occurring on the Haines Pond parcel. The study area is located within the oak-northern hardwood forest type of New York (Andrle and Caroll, 1988). The forest is mature, dominated by large poletimber [poletimber refers to trees 4-12 inches dbh (diameter at breast height)] with scattered sawtimber trees (>12 inches dbh). A few very large or "specimen" trees of oak and tulip occur along the slope on the north side of Haines Pond, with massive trunks reaching greater than 40 inches in diameter.

Common tree species include Chestnut Oak (*Quercus prinus*), Black Oak (*Quercus velutina*), Red Oak (*Quercus rubra*), White Oak (*Quercus alba*), Wild Cherry (*Prunus serotina*), Tulip Tree (*Liriodendron*

tulipifera), Paper Birch (*Betula papyrifera*), Black Birch (*Betula lenta*), American Beech (*Fagus grandifolia*), hickory (*Carya spp.*) and Sugar Maple (*Acer saccharum*). Common midstory and understory vegetation includes Sassafras (*Sassafras albidium*), Mapleleaf Viburnum (*Viburnum acerifolium*) Musclewood (*Carpinus caroliniana*),

Figure 9: Forest with bedrock outcropping

White Pine (*Pinus strobus*), the occasional invasive exotic Burning Bush (*Euonymus alata*), Witchhazel (*Hamamelis virginiana*) and the occasional invasive exotic Japanese Barberry (*Berberis thunbergii*). Christmas Fern (*Polystichum acrostichoides*), False Solomon's Seal (*Smilacina racemosa*), Pennsylvania Sedge (*Carex pennsylvanica*) and the invasive exotic Garlic Mustard (*Alliaria petiolata*) are common in the herb layer.

The forested slope north of Haines Pond is stony and boulder-strewn, with large bedrock outcroppings common on the midslope of the ridge (see figure 9). These outcroppings are picturesque and would provide an excellent view point for a hiking trail.

5.2.1 *Mixed Hardwood Forest – Compatible Recreational Uses*

Compatible low impact or non-consumptive uses include hiking, selective tree-cutting or thinning, wildlife observation and trail establishment. Small clearings of understory and ground cover vegetation for the establishment of picnic or camping areas would also be suitable, but clearing which significantly opens the tree canopy should be considered carefully as this has the potential to impact the suitability of the forest for forest-interior bird species (i.e., species which avoid forest edges). Likewise, large-scale clearing of forest for the purposes of recreational development should be avoided, as this would drastically alter the existing wildlife community, in particular it would make the site unsuitable for forest-dwelling bird species.

5.2.2 *Mixed Hardwood Forest – Habitat Management Goals*

A detailed forest management plan is beyond the scope of this work. How a forest is managed depends upon a landowner's objectives, and objectives often reflect how an owner may "value" their forest. For example, forests managed solely for wood production would require a far different management strategy than a forest managed for Wood Thrush nesting habitat. Additionally, many forest areas are often managed for multiple uses including timber, wildlife and recreational purposes (e.g., state forest land). These are sometimes referred to in broad forest management categories as income-focused management, habitat-focused management and recreation/aesthetics-focused management (Ek, *et. al.*, undated).

Income-focused management is focused on the maximization of growth and quality of wood for maximum economic profit. Fertilization, irrigation, site preparation, control of competition, and planting of genetically improved stock are tools used in such management. The establishment and tending of plantations is an example of income focused management. This regime is inappropriate for the Haines Pond ecosystem, as this would result in significant loss and/or extirpation of key species within the Haines Pond ecosystem.

Habitat-focused management has lower resource impacts as well as lower costs and economic returns. An example of habitat-focused management is maintaining mixed hardwood stands for diverse forest conditions that favor songbird species. Habitat-focused management requires managing on extended rotations, managing for old growth characteristics, and managing for increased ecological complexity, species diversity and forest heterogeneity. This is the management regime most compatible with maintaining the biodiversity of the Haines Pond ecosystem.

Recreation/aesthetics-focused management focuses on recreational uses of forest as well as providing aesthetics value. Typical focal uses include trail development, campground and picnic area development and creating vistas. Limited application of this management regime would be compatible with Haines Pond's unique biodiversity values.

A detailed forest management plan should be undertaken once the landowner's objectives have been clarified. Forest management plans are based on and limited by what is biologically/ecologically possible at a site, what is economically and organizationally feasible, and what is socially and politically desirable.

Developing a forest management plan begins with an inventory of all forest resources. Vegetation data are collected, including tree species, condition, numbers, age, volume, value, growth, and basal area. Soil/site quality is evaluated to determine what the site can produce with respect to timber production. Other data typically collected include topographic survey, property boundary survey, wildlife use, streams/wetlands, trails, roads, campsites, vistas and viewsheds.

5.3 *Unit 3: Pine-Spruce Stand*

On the glacial outwash plateau that separates Haines Pond and Sanfords Pond lies an approximately 11.5-acre plantation of Spruce (*Picea sp.*) and White Pine (*Pinus strobus*) (see Figure 10). This area is now densely forested, having not been "thinned" during the growth process (a process where trees are removed at intervals during the maturation process to prevent overcrowding).

Figure 10: Aerial photograph showing Spruce-Pine stand outlined in purple

The exact time period in which these trees were planted and their intended use is unknown; regardless of its origin or purpose, the presence of a conifer stand in a forest area dominated by deciduous trees adds to the overall forest diversity of the site. Conifer plantings provide habitat for a variety of wildlife, most notably winter and migratory cover for birds. Conifer stands near large lakes and ponds also offer preferred habitat for several species of owls, including wintering habitat for the rare Long-eared and Short-eared Owls.

Figure 11: Pine – Spruce stand

The stand has a dense tree-canopy that allows very little light to reach the forest floor. Therefore, the understory is open with little shrub and herbaceous vegetation present, consisting of shade-tolerant species including Spicebush (*Lindera benzoin*) and maples. The pine and spruce are planted in small monocultures rather than interspersed within the overall plantation. The white pine trees are mature, with an average dbh of 22 inches and ranging in size from approximately 15-30 inches. Areas of spruce are dominated by an average dbh of 10-15 inches and ranging in size from 10-30 inches dbh.

5.3.1 *Pine-Spruce Stand – Compatible Recreational Uses*

Compatible recreational or non-consumptive uses include hiking, wildlife observation and selective tree clearing. Logging of this stand would not be practical, as the trees in their current state have little economic value, and the loss of this habitat type from the site could negatively affect wildlife.

5.3.2 *Pine-Spruce Stand – Management Goals*

No management measures are proposed for this habitat type. This forest should be left undisturbed and intact as it is located within the Haines Pond vernal pool management zone (i.e., within 750feet of a vernal pool) and is therefore likely to serve as upland habitat for vernal pool amphibians (see section 8). As described, harvesting would offer little financial benefit, and the presence of this coniferous vegetation in a region dominated by deciduous forest far outweighs the minimal value of the timber.

5.4 *Unit 4: Open Water*

Two open water wetlands occur within the study area, Haines Pond as well as a small unnamed pond located immediately east of Joes Hill Road, referred to informally as "Joes Hill Pond" (see Figure 12).

Figure 12: Aerial photograph showing Joes Hill Pond and Haines Pond

Joes Hill Pond totals approximately three acres. It is retained by a small concrete dam located at the pond's western end. This dam has been enhanced by beavers, which have added material to the face of the dam in order to raise the surface water elevation of the pond. Nevertheless the pond is very shallow, with an overall depth of less than three feet. This shallow depth is due in part to significant sediment accumulations in the pond basin. The pond is surrounded by shallow marsh as well as standing dead timber, providing excellent habitat for waterfowl, wading birds, migrating shorebirds as well as amphibians and reptiles.

Haines Pond totals approximately 32-acres. The pond has no water control structure but is connected to wetlands on the south side of the railroad tracks via several small culverts. During periods of peak inundation, the pond floods over the railroad tracks at its southwest

Figure 13: Haines Pond overflowing railroad tracks

corner, draining into the adjacent marsh system (see Figure 13). Haines Pond is fed by a small unnamed stream that drains from the hillside to the north, but the pond is primarily groundwater-fed.

The pond is shallow throughout, less than ten feet deep and heavily infested with the invasive submergent aquatic weed Eurasian Watermilfoil (*Myriophyllum spicatum*). This species has been identified as problematic primarily due to the fact that it interferes with recreational activities, particularly power-boating as well as being an annoyance to swimmers.

Although fishery surveys were not part of this study, several fish species were observed in Haines Pond, including Pickerel (*Esox nigra*), Bluegill (*Lepomis macrochirus*), Bass (*Micropterus sp.*) and unidentified species of minnows and catfish.

5.4.1 Haines Pond – Compatible Recreational Uses

The primary function of Haines Pond is as an aesthetic focal point of the site, as it is visible from many areas of the surrounding property. Haines Pond is suitable for a variety of aquatic recreation activities including kayaking/canoeing and fishing. Fishing already occurs at the pond despite the fact that it is privately-owned, due to the fact that it is visible and easily accessible from nearby Route 6. Desirable warm-water game fish species including Bass, Pickerel and Bluegill present in the pond also attract fisherman. However, shallow water, dense submergent weeds and downed woody debris occur throughout the pond, making fishing with all but floating fishing tackle difficult. The pond is well-suited for safe canoeing/kayaking given the lack of current, shallow water and easy access. A formal small craft launch could easily be established on the pond's west side to accommodate canoes and kayaks. The pond could potentially be used as a swimming area, although this potential is hampered by shallow water depths and dense Milfoil growth which can be a nuisance to swimmers. Detailed water quality analysis would need to be conducted to determine if local health code standards for public swimming areas are met. However, there is limited area on the Haines Pond parcel where parking could be accommodated without impacting significant habitats. This lack of parking area limits some of the aforementioned active recreation uses (see discussion under Section 6.0).

5.4.2 *Haines Pond – Management Goals*

Management goals are as follows:

(1) *Develop a management plan for Haines* Pond. Detailed pond management plan is beyond the scope of this report. The management plan should include collection of baseline data on water quality including standard chemical and physical parameters which may be important for the pond's development as an aquatic recreation site, as well as those that can affect fish and aquatic wildlife. These include dissolved oxygen, clarity, hardness, indicator bacteria, pH, phosphorus and nitrogen. The management plan should also include a fisheries and aquatic wildlife survey, as well as methods for controlling Water Milfoil. The plan should also address water quantity, with an assessment of annual hydrology and an examination of the function and maintenance of existing outlet structures.

5.5 *Unit 5: Wooded Swamp*

Wooded swamps are the most abundant wetland type in the region and have a vegetational community which is characterized by a forest canopy at least 20 feet tall. Wooded swamps occur on the broad south facing hillside upslope of Haines Pond as well as low-lying areas between Haines Pond and Joes Hill Pond (see Figure 14). The majority of these wetlands are steeply sloping, draining downslope into Haines

Pond and adjacent marshes. Dominant plant species include Red Maple (*Acer rubrum*) and Green Ash (*Fraxinus pennsylvanica*) in the tree layer, Spicebush (*Lindera benzoin*) in the shrub layer and Skunk Cabbage (*Symplocarpus foetidus*) in the herb layer.

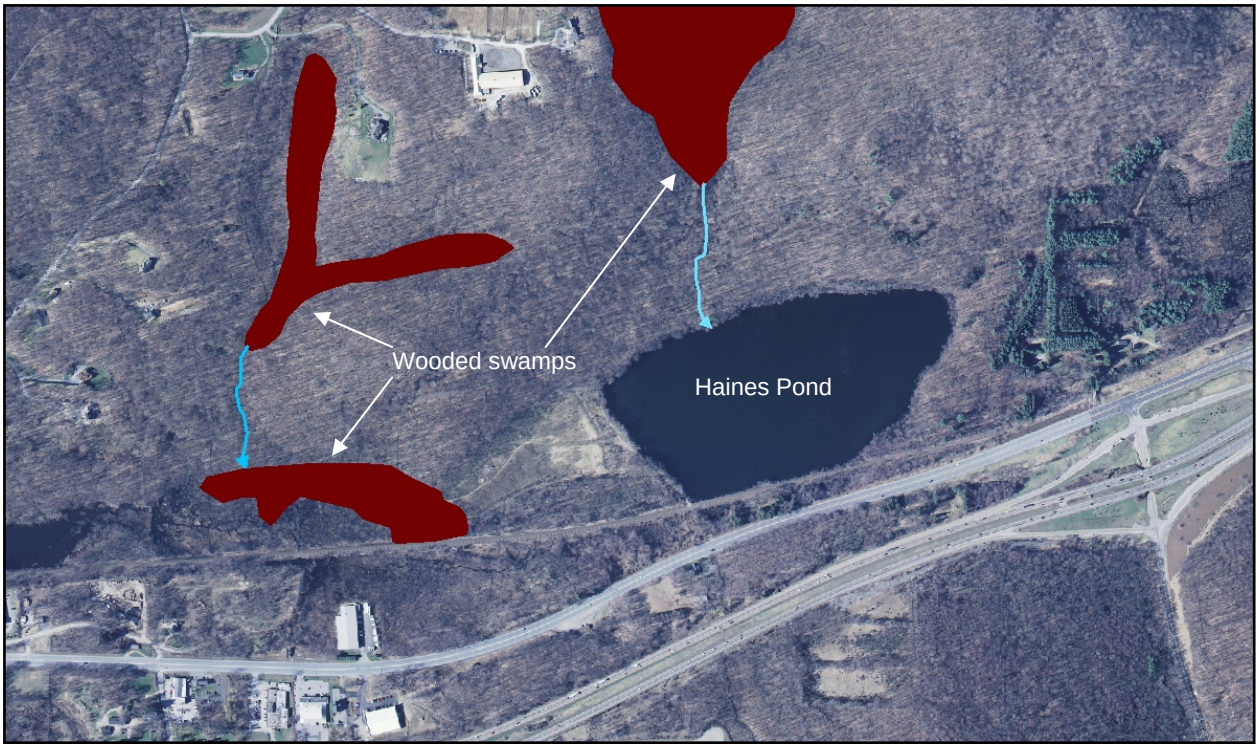

Figure 14: Aerial photograph showing wooded swamps with streams (arrows indicate direction of stream flow)

5.5.1 *Wooded Swamps – Compatible Recreational Uses*

Wooded swamps offer little recreational opportunities due to the presence of standing water and mucky soils. Wooded swamps are suitable for wildlife observations, but trails constructed through wooded swamp areas should include wooded bridges or other structural material to prevent soil erosion.

5.5.2 *Wooded Swamps – Management Goals*

Wooded swamps need little in the way of habitat management to be maintained, as they represent a stable, late-stage or "climax" plant community. The primary management goals are as follows:

(1) *Maintain wetland hydroperiod.* Any activities that alter wetland hydroperiod (i.e., depth and duration of standing water) should be avoided, as long-term alteration of the hydroperiod can affect both the plant and animal community inhabiting these wetlands.

5.6 *Unit 6: Streams*

Three unnamed streams are located within and immediately adjacent to the study area (see Figure 15). The first originates north of the study area on Joes Hill and drains southward into Haines Pond; this is the only stream located within the Haines Pond parcel. This stream is high-gradient (steeply sloping) with shallow banks and a stony-cobbly stream bottom (generally three inch to ten inch stones). Flows are likely very low or intermittent during the summer.

The second originates south of the study area and northeast of Peach Lake and drains northward under both Route 6 and the interstate highway before reaching the study area. The third drains out of the study area westward into the East Branch Reservoir.

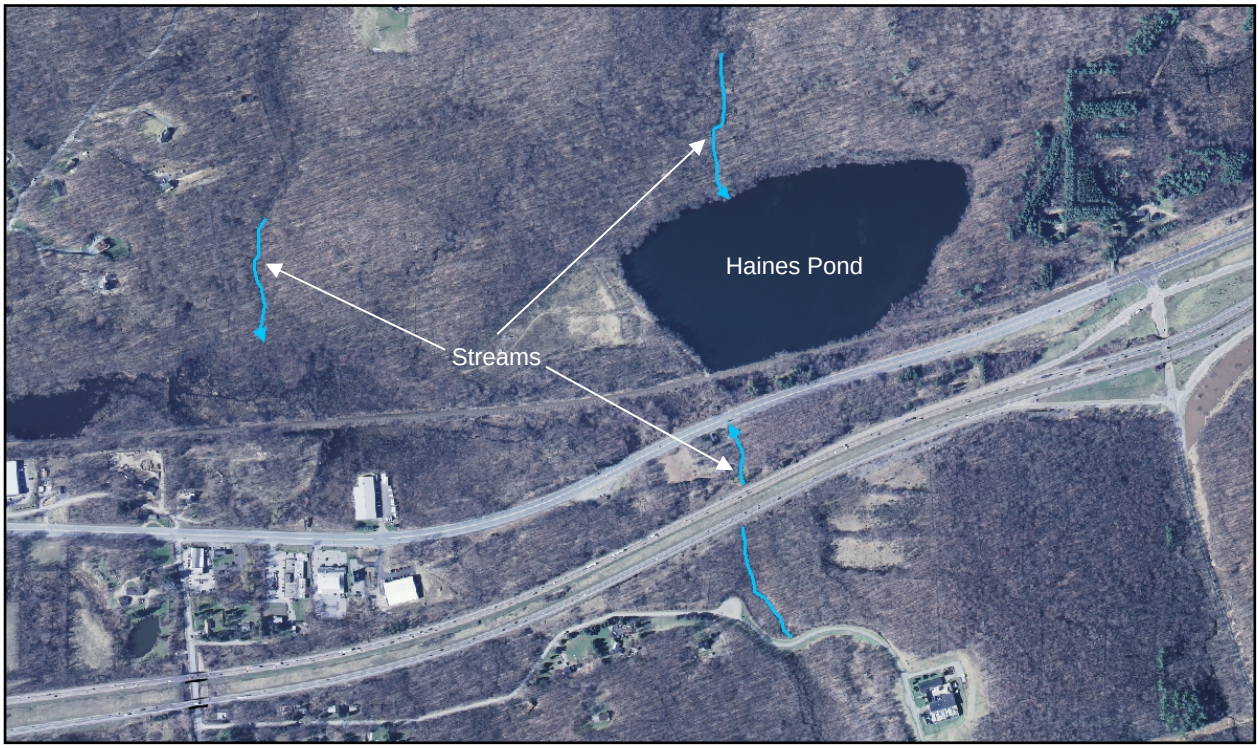

Figure 15: Aerial photograph showing streams in the study area (arrows indicate direction of stream flow)

5.6.1 *Streams – Compatible Recreational Uses*

Only one stream occurs on the Haines Pond parcel, with the remaining two streams occurring in the greater study area. This stream is small and has seasonal or intermittent flow, particularly during drought conditions, limiting its suitability for aquatic recreational uses.

5.6.2 *Streams – Management Goals*

Perennial streams do not require habitat management in the traditional sense (i.e., vegetation management). Rather, in order for stream habitats to remain unimpaired and continue to provide habitat for stream species they require protection measures or "best management practices" be implemented to protect riparian vegetation and maintain water quality and quantity. Management goals are as follows:

(1) *Maintain water quality and base flow*. The only onsite stream is a small stream that feeds Haines Pond. This is an unnamed, first-order headwater stream draining from the steep bedrock-controlled

hillside to the north. In order to preserve the stream's base flow, disturbance within the stream's watershed should be avoided or minimized. This includes grading, land-clearing, soil grubbing or logging, particularly within 100 feet of the stream channel.

(2) *Preserve streamside vegetation*. Streamside vegetation is important for streambank stabilization, organic deposition, pollutant/nutrient uptake and control of erosion into streams. Removal of streamside vegetation within a minimum of 100 feet of the stream channel should be avoided or minimized.

(3) Monitor water-quality in stream draining north under I-84 and Route 6. This stream has the potential to carry pollutants received from road surfaces into the Haines Pond ecosystem. Of particular concern are hydrocarbons and road salts. If unacceptable levels of these pollutants are present, mitigation measures should be initiated in consultation with the NY DOT.

5.7 *Unit 7: Emergent Marsh / Shrub Swamp Complex*

The system of emergent marshes and shrub swamps located along the railroad tracks from Haines Pond to Joes Hill Pond have been lumped into one management unit (see Figure 16). These wetlands are geographically and hydrologically connected, and differ only by dominant vegetation type. Emergent marshes are dominated by persistent and non-persistent grasses, sedges, rushes, and other herbaceous grass-like plants while shrub swamps (a.k.a. shrub-scrub wetlands) are dominated by woody vegetation, shrubs with some scattered stunted trees less than twenty feet in height.

Figure 16: Aerial photograph showing marsh/shrub swamp wetlands in the study area

5.7.1 *Emergent Marsh / Shrub Swamp – Compatible Recreational Uses*

Site marshes and shrub swamps offer excellent locations for wildlife and plant observation. Direct use of these wetlands for traditional recreational activities is not possible, due to the presence of standing water, mucky (organic) soils and high vegetative density. Their primary value is aesthetic, as they contain an abundance of colorful fruiting and flowering plant species.

5.7.2 *Emergent Marsh / Shrub Swamp Complex – Management Goals*

The primary management goals of this unit are as follows:

(1) *Control invasive plant species*. Invasive species infestation in marshes and shrub swamps can be problematic, as many of our most aggressive invaders, such as Giant Reed (*Phragmites australis*), Purple Loosestrife (*Lythrum salicaria*) and Reed Canarygrass (*Phalaris arundinaceae*), thrive in marshes and shrub swamps. Complete eradication of invasive plants is difficult, costly and unnecessary. The goal instead should be control in a manner that retains a moderate to high level of plant species diversity and maintains vegetative structural diversity critical to wetland-dependant bird species. An example of an unacceptable invasive growth pattern would be if large monocultures were to form, as is often common with phragmites. These monocultures result in reduced plant species diversity and low vegetative structural diversity, offering limited habitat for wetland wildlife. Invasive control should be focused on areas in which such monocultures develop. Typically, these herbaceous monocultures can be controlled with a combination of mowing and herbicide treatments.

During the 2009 field surveys, Galarucella beetles were observed near Joes Hill Pond (see Figure 17). Galarucella beetles (*Galerucella calmariensis* and *G. pusilla*) are European beetles introduced to North America in 1992 as part of a program to control purple loosestrife, an exotic weed infesting North American wetlands. The release appears to be a success, as little purple loosestrife was observed within this wetland system, and those plants present were stressed as a result of heavy damage from beetle browse (see Figure 17).

Figure 17: Galarucella beetle on heavily browsed loosestrife plant near Joes Hill Pond

(2) *Maintain hydrology and overall water budget.* It is critical that wetland hydrology be maintained to preserve suitable habitat for existing species which rely on a particular hydroperiod (i.e., depth and duration of standing water) for survival. This would require that the outlet structure at Joes Pond be maintained and that no significant watershed changes occur that would increase or decrease the level of runoff feeding this system.

(3) *Allow beaver* dams. The activity cycle of beavers which includes wetland colonization, dam construction and flooding and subsequent abandonment and dam failure, is critical to the creation and maintenance of early-successional wetland habitats (i.e., emergent and shrub swamps) in this system. The action of dam building and flooding of wetlands results in die off of trees and the promotion of marsh and shrub swamp habitats. Once the beavers abandon the system for a lack of food resources the dams eventually fail, the beaver pond then drains, and non-forested marshes and shrubs swamps develop in the drained beaver pond. Without this periodic disturbance, this wetland system would slowly succeed into a Red Maple swamp and would cease to provide habitat for a number of notable marsh and shrub swamp dependant species.

5.8 *Unit 8: Vernal Pools*

Two vernal pools were identified within the study area (see Figure 19). The first is located north of Haines Pond along the forested ridgetop of Joes Hill. This vernal pool is not located on the Haines Pond parcel. This pool is embedded within a larger wooded swamp system. Egg masses of two vernal pool obligate species, the Wood Frog (*Rana syvatica*) and Spotted Salamander (*Ambystoma maculatum*), were observed in the pool during a spring field visit.

Figure 18: Vernal pool northeast of Haines Pond

The second pool is located adjacent to the northeast corner of Haines Pond (see Figure 18). The pool's water level fluctuates throughout the growing season but is semi-permanently ponded. During periods of peak runoff and high groundwater, this pool maintains a direct surface water connection with Haines Pond. The pool contained egg masses of Spotted Salamander and possibly the state-listed Blue-spotted Salamander complex (*Ambystoma* cf *laterale*).

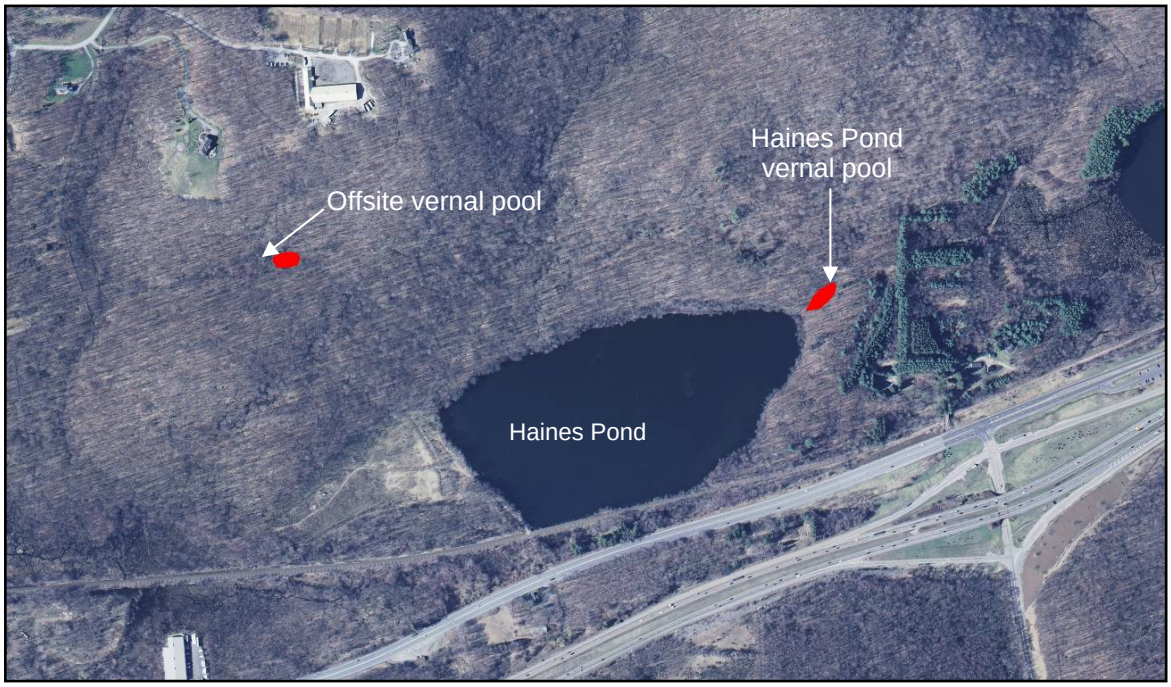

Figure 19: Aerial photograph showing two vernal pools occurring in the study area

5.5.1 *Vernal Pools - Suitable Recreational Uses*

Vernal pools are isolated ponded wetlands which do not provide traditional recreation opportunities. No recreational uses of any kind should be allowed in vernal pools as this could negatively impact breeding amphibians. Vernal pools are suitable sites for scientific study or wildlife observation, but care must be taken not disrupt amphibian breeding activity.

5.5.2 *Vernal Pools – Management Goals*

Site vernal pools should be managed in accordance with recommendations outlined in *Best development practices: Conserving pool-breeding amphibians in residential and commercial developments in the northeastern United States* (Calhoun and Klemens 2002). This document outlines management recommendations for preservation of vernal pools as well as the adjacent upland forest habitat critical to vernal pool wildlife. Management recommendations include three management zones: (1) the pool basin; (2) the area within 100 feet of the pool and (3) the area within 100-750 feet of the pool. These management zones are illustrated on Figure 20. The BDP manual recommends no activity occur within the pool basin or within 100 feet of the pool and that development, including land-clearing, be limited to 25% of the land within 750 feet of the pool with strict adherence to best development practices as outlined in the manual.

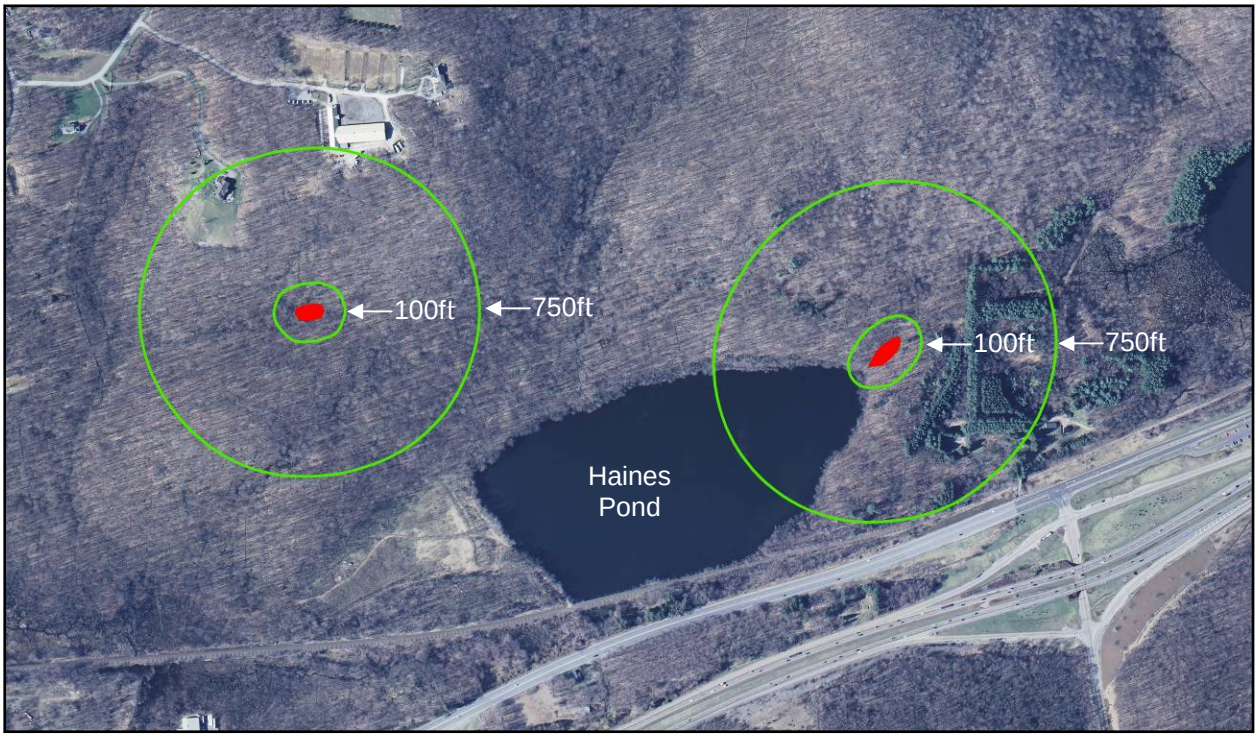

Figure 20: Aerial photo showing vernal pool management zones per Calhoun and Klemens (2002)

6.0 OVERALL SITE MANAGEMENT RECOMMENDATIONS

1. ***Beaver management.*** Beavers are architects of the wetland/lowland landscape in the northeastern United States. Their cycles of wetland creation, abandonment and reforestation result in a rich array of successional wetland habitats, many of which are essential to the maintenance of a diversity of wildlife. Beavers should be allowed to colonize and re-colonize the site provided that their activities do not affect public health or safety. Specifically, beaver activity at the Haines Pond site provides the following benefits:
    a. Beaver browse along the northern edge of Haines Pond has opened the tree canopy and created shallow marsh habitat which provides vegetative and structural diversity along the pond's fringe.
    b. Through feeding as well as the construction and subsequent draining of dams, beavers maintain open-canopy wetlands important to many species of songbirds as well as reptiles and amphibians. These wetlands would otherwise revert over time to wooded swamp habitats.
    c. Beaver ponds and open-canopy wetlands created by beavers provide aesthetical value for hikers or other site visitors.

2. **Provide for turtle access over the railroad**. The railroad line which traverses the southern edge of the site is inactive, except for a single run per year in order to maintain the right-of-way. Railroad beds are often used by turtles for nesting and basking, and at this site turtles are often travelling between wetlands located both north and south of the tracks. Railroad tracks can be difficult for turtles to easily maneuver over, and turtles can often become trapped between the tracks where they are at a greater risk of predation and can succumb to thermal stress. In the Great Swamp at Pawling, NY, Michael Musnick has devised a simple modification of the gravel bed which allows turtles to successfully cross over railroad tracks. This is illustrated in Figure 21. It is recommended that these modifications be located every fifty feet along the railroad tracks.

Figure 21: Modification to railroad track gravel bed to facilitate turtle crossing (photo courtesy of M. Musnick)

3. **Trail establishment.** If new trails are to be established, they should be done so in a manner that:
    a. Does not impact wildlife sensitive to human disturbance. Some species, particularly wading birds and turtles, are easily disrupted when human activity occurs close to nesting, feeding or basking areas. Trails should not be placed in close proximity to such areas, or they should be done in a manner that obscures the animal's line of sight to the trail to reduce the likelihood of flushing the animal. Additionally, trails should not be placed in close proximity to vernal pools (e.g. within 100feet).
    b. Trails should be designed using typical BMP's (e.g., set perpendicular to the slope, use of water bars, etc.) that prevent erosion and limit impacts to soils and vegetation.
    c. A midslope trail could be established upslope of Haines Pond. This area has a stony-bouldery soil surface with a low erosion risk. This area has extensive and prominent bedrock ridges and outcroppings that would provide an aesthetical focal point for trail users.

4. **Parking.** Presently, parking is non-existent at the site. This will severely limit active recreational uses. While it may appear that the logical place to enter the site and park would be using the right-of-way off of eastbound RT 6 at the end of Haines Pond and create a parking area in the field south of Haines Pond, this area has high ecological value. Therefore, we recommend creation of a modest parking area in the area outlined on Figure 20. It is further recommended that any construction work be done from November to March to prevent loss of wildlife, particularly long-lived turtles. The parking lot should be unpaved and unlit, i.e., used only during daylight hours.

5. **Trash.** Human uses will generate garbage. Ideally, Haines Pond should utilize a carry in-carry out trash policy. However if trash cans are to be located, they should be located at the exit of the parking lot along Route 6 (see Figure 22). The rationale is to eliminate any accumulation of trash near the ponds and wetlands, which in turn would attract human-subsidized species such as raccoons and skunks, which are voracious predators of turtle eggs as well as adult turtles.

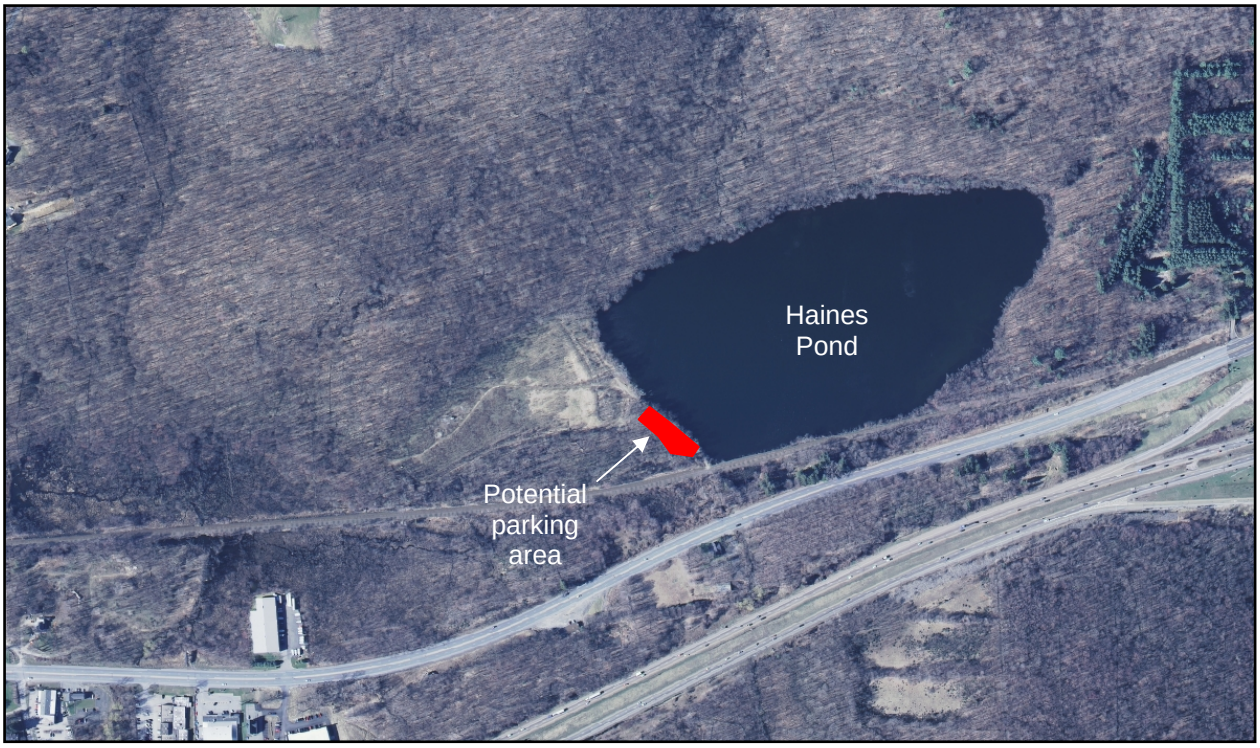

Figure 22: Aerial photo showing potential parking area between the old field and Haines Pond

7.0 SPECIES SPECIFIC MANAGEMENT RECOMMENDATIONS

Haines Pond contains a rich diversity of vertebrates, including many species that are NY State-listed special concern, or are regionally rare and declining (For a complete list of wildlife observed within the study area see Davison and Klemens, 2009). The presence of such a diversity of species is a function of the rich variety of habitats that are contained within the Haines Pond parcel and its immediate study area, as well as the surrounding landscape of more than 2,300 acres of interconnected and sparsely-developed habitat.

7. 1 *Long-lived, Low Fecundity Turtles*

Many declining and rare species of turtles are characterized by a set of life history characteristics that make the survival of individual adult turtles critical (see Klemens, 2000). This suite of characteristics includes delayed sexual and reproductive output, low fecundity, and high egg mortality. The three species of greatest concern at Haines Pond are the Spotted Turtle (*Clemmys guttata*), the Wood Turtle (*Clemmys insculpta*) and the Box Turtle (*Terrapene carolina*). All three of these species flourish in the mosaic of wetland types and edge areas that characterize the site. All of these species make overland movements, where they are most susceptible to predation or human-induced mortality. Spotted turtles are the most aquatic of the three species, moving between a variety of different wetlands on the Haines Pond landscape. Wood turtles frequent beaver meadows and stream corridors in the spring and autumn and spend the summer months on land in woodland and field edges. Box turtles are the most terrestrial, although never far from a small wetland or damp moist woodland area, they inhabit fields and woods, especially at ecotone areas.

We have discussed under previous sections methods for managing habitats utilized by these turtle species. Other management considerations should include awareness and education about the negative effects of turtle collection, strict prohibitions on removal of turtles from the site, limitations on trash receptacles as discussed in Section 6.0 and the installation of turtle ramps to ensure that turtle do not get trapped between the railroad tracks and die of exposure and/or predation.

7.2 *Large Oviparous Snakes*

Three species of large snakes were documented on the site. All of these are of conservation concern, the Hognose Snake (*Heterodon platirhinos*), Black Rat snake (*Elaphe obsoleta*) and the Black Racer (*Coluber constrictor*). All three species benefit from the habitat mosaic that occurs at Haines Pond. Apart from habitat management described previously, collection and wanton killing are additional threats to these species which should be remedied by public education of visitors to the site.

7.3 *Vernal Pool Obligate Amphibians*

Three vernal pool obligate amphibians on site are of conservation concern. These are the Blue-spotted Salamander *complex* (*Ambystoma* cf *laterale*), Spotted Salamander (*Ambystoma maculatum*), and the Wood Frog (*Rana sylvatica*). All three species require strict adherence to the Best Management Practices discussed previously in section 5.5.2 to endure the persistence of robust populations of these amphibians at Haines Pond. As the ridgetop pool is not on the Haines Pond parcel, other protection strategies including conservation easement or purchase of the ridgetop parcel should be explored once the Haines Pond parcel is acquired.

7.4 *Old Field Birds*

Old field or "shrubland" dependant bird species occur primarily within the eight-acre old field patch west of Haines Pond as well as early-successional shrub/edge habitat along the railroad corridor. Notable species include the Eastern Bluebird (*Sialia sialis*), Eastern Kingbird (*Tyrannus tyrannus*), Blue-winged Warbler (*Vermivora pinus*), Indigo Bunting (*Passerina cyanea*) and Rufous-sided Towhee (*Pipilo erythrophthalmus*). As discussed in Section 5.1, the limiting factor for this species assemblage is the limited amount of total available acreage of old field habitat onsite. To increase the number of old field birds breeding onsite, available habitat acreage could be increased. However, expansion of old field habitat should be done judiciously, taking into account adjacent sensitive wetland habitats and forest habitat, as well as consideration of the significant management commitment required to maintain old field habitats in perpetuity.

7.5 *Forest-dwelling Birds*

The existing acreage of forest cover in the study area supports a variety of forest-dwelling birds, including some area-sensitive neo-tropical migrant songbirds. Notable species include the Wood Thrush (*Hylocichla mustelina*), Eastern Wood Pewee (*Contopus virens*) and Ovenbird (*Seiurus aurocapillus*). Any recreational development activities conducted at the site that require clearing of mature trees or forest should be considered carefully, as fragmentation and the encroachment of "edge" habitat into the existing forest can negatively impact forest-dwelling birds by making habitat unsuitable and increasing rates of nest predation and brood parasitism.

8.0 LITERATURE CITED

Andrle, R.F. and J.R. Carroll (eds.). 1988. Atlas of breeding birds in New York State. Cornell University Press, Ithaca, NY.

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.

Davison, E.R., and M.W. Klemens. 2009. Haines Pond Biodiversity Study. MCA Technical Paper No. 15, Metropolitan Conservation Alliance, Cary Institute of Ecosystem Studies, Millbrook, New York.

Ek, A.R, Katovich, S.A, Kilgore, M.A. and Palik, B.J. *Undated*. Forest Management 101: A handbook to forest management in the North Central Region. USDA Forest Service and the University of Minnesota.

Klemens, M. W. (ed.). 2000. Turtle Conservation. Smithsonian Institution Press, Washington, D.C. 344 pp.

Leopold, A. 1987. Game Management: with a new foreword by Laurence R. John. University of Wisconson Press, Madison. 520 pp.

Oehler, J.D, Covell, D.F., Capel, S. and Long, B. 2006. Managing Grasslands, Shrublands, and Young Forest Habitats for Wildlife – A guide for the Northeast. The Northeast Upland Habitat Technical Committee, Massachusetts Division of Fisheries and Wildlife.