Mass Audubon
Protecting the Nature of Massachusetts

Natural Resources Inventory and Management Plan

for

Nahanton Park

in Newton, Massachusetts

Image from Google Earth

Completed by

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Mass Audubon's Ecological Extension Service shares the considerable expertise we have developed managing over 34,000 acres of land across the Commonwealth with conservation partners such as towns, land trusts, and state and federal agencies. Conclusions and recommendations in this report reflect best conservation practices but do not represent formal policies or positions of the organization. For more information, contact Jeffrey Collins at jcollins@massaudubon.org or 781-259-2159.

Ecological Extension Service
Mass Audubon

Nahanton Park is a 57-acre City-owned parcel in the southwestern portion of the city of Newton, Massachusetts (Figures 1 and 2). It is bounded by the Charles River to the west, Nahanton Street to the South, properties of the Leventhal-Sidman Jewish Community Center and Winchester Street to the East, and property of the Charles River Country Club to the North.

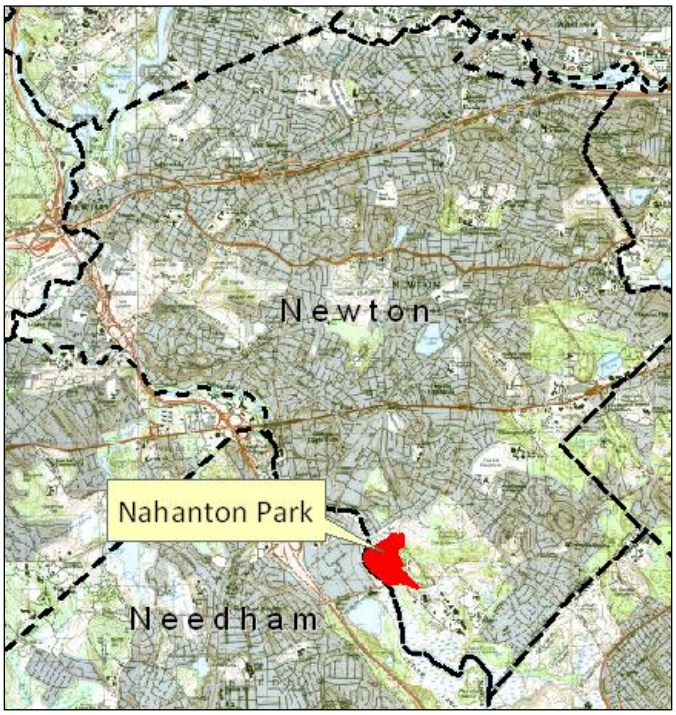

Figure 1. Nahanton Park in southwestern Newton.

Mass Audubon's Ecological Extension Service was hired by the City of Newton, working in partnership with the Newton Conservators and the Friends of Nahanton Park, to complete this natural resources inventory and management plan in the interest of helping Newton Parks & Recreation Department staff review the functioning of current uses of the park, consider proposals for new activities in the park, and comment on the current or potential impacts to natural resources of these activities. To complete this report, we met with some members of the Nahanton Park Task Force, held a public meeting to receive input on use and planning for the park, walked the property with those who know the park well, held phone conversations with board members of the Friends of Nahanton Park and Newton Community Farmers, and reviewed past plans, reports, and other documents relating to the property as well as spatial data available from the Massachusetts Office of Geographic Information (MassGIS).

Bedrock & Surficial Geology

The park is underlain primarily by ~600 million year old materials of the Mattapan Volcanic Complex. These various types of extrusive rocks – rhyolites, melaphyres, tuffs, and agglomerates – stretching from Mattapan to Sherborn, date from a period of continental rifting when the African tectonic plate was pulling away from the North American plate. These bedrocks are well-buried by the more modern surficial material and so play little role in the soil chemistry or the current vegetation or uses of the park.

While the bedrock dates back hundreds of millions of years, the surficial material of the park, that is the unconsolidated material on top of bedrock, largely dates back to the advance and retreat of our last glacier some 15,000 years ago. The eastern portion of the park, along Winchester Street and the boundary with the JCC, is characterized by glacial till, and unsorted mix of stones, gravel, sand, and finer materials carried forth by the advancing glacier and dumped in place upon its melting. Ground moraine, a dense, nearly impermeable layer of similar material smeared down underneath the advancing glacier, may underlie this same area of the park. Other than the modern-day organic muck accumulated in the swampy area at the northwest corner of the park, the surficial material in the rest of the park reflects the presence of Glacial Lake Charles, a once huge body of freshwater stretching down the Charles River basin from Weston to Dedham, created when the partially melted glacier acted as a dam, blocking drainage to the north. Sediments carried by the Charles and other rivers draining into the lake precipitated out of the still water, forming deep sandy lakebed deposits that now underlie the park and other low-lying areas along this reach of the Charles River.

Topography & Soils

The park has a rolling topography, generally sloping west towards the Charles River (Figure 3), although the two river-side hillocks, sites of the Upper Community Gardens and the Woodcock Meadow, also give the park a bowl-like structure, with the Playing Fields lying in the middle. This varied topography contributes tremendously to both the aesthetic appeal and the practical values of the park, making for varied sight lines on a walk and also creating several discrete spaces which over the years have been dedicated to the various current uses.

Soils reflect the surficial bedrock material described above, ranging from the Charlton-Hollis-Rock Outcrop Complex at the northeast corner, through the loamy sands of the park's interior, to the Swansea muck of the riverside wetlands. Soil units are mapped and defined by the Natural Resource Conservation Service based on particle size, depth, and soil chemistry. Details on each type shown in Figure 4 are presented in Table 1.

Soil characteristics are largely driven by the relative proportions of sand, silt, and clay, which are defined solely on particle size. A "loam", as the term is used in soil science, has a balance of the three types of particles so that it is not dominated by limitations of one particle. For example, very sandy soils are very fast-draining, are usually lower in nutrients, and tend to be more acidic. Silty soils are more poorly drained and can be slippery and difficult to work when wet. Clays can be nearly impermeable and very difficult to cultivate or work in any way. Loams hit the sweet spot and make for good agricultural soils as well as good foundation for building. A sandy loam is one that tends toward the sandier end of the loam sweet spot, and a loamy sand is a very sandy soil with enough silt and clay to give it some characteristics of loams.

Figure 2. Nahanton Park

0 100 200 300 Feet

1 inch = 300 feet

Boundaries from Newton Assessor's data. MassGIS 2008 aerial photo.

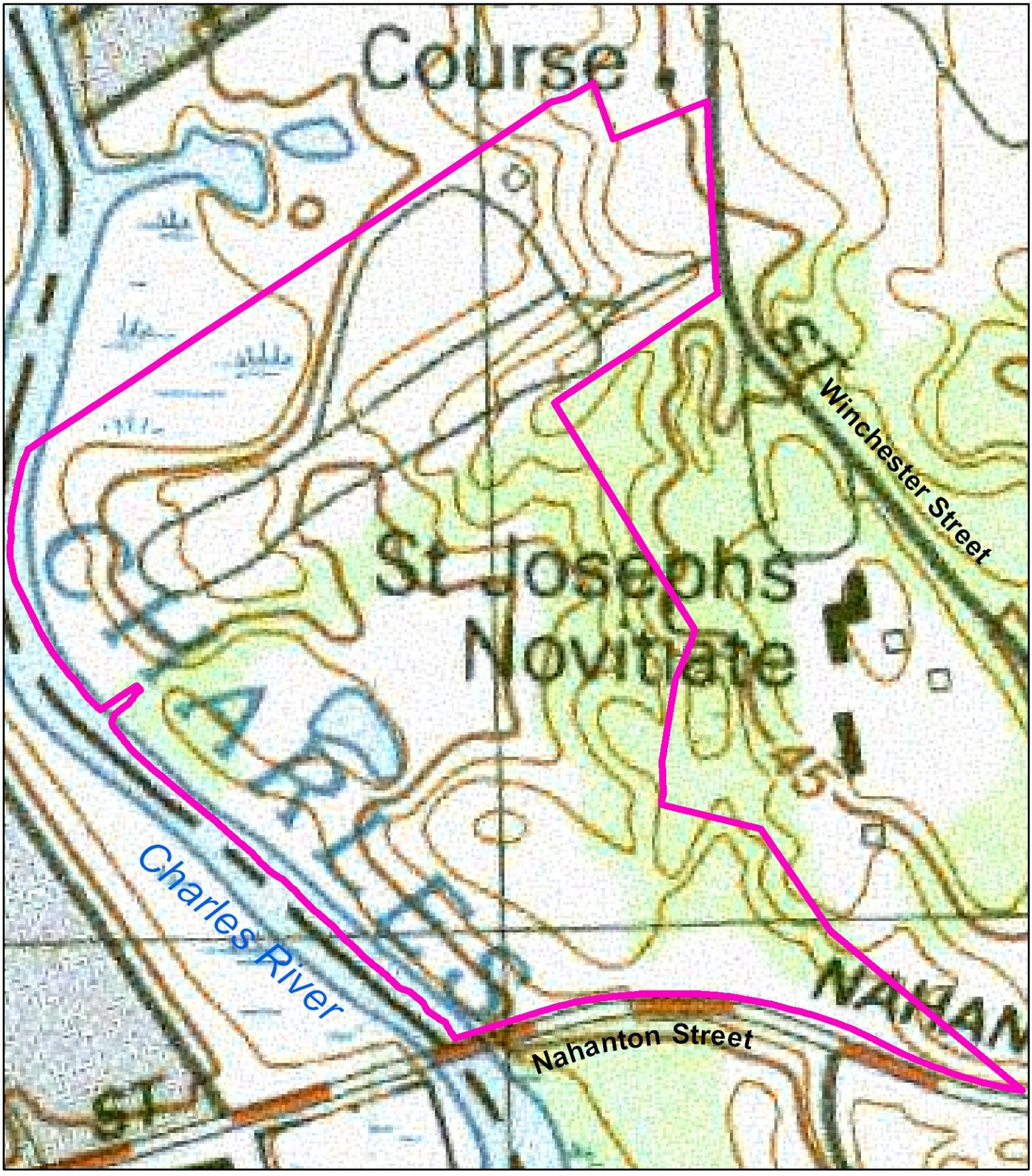

Figure 3. Nahanton Park Topography

0 100 200 300 Feet

1 inch = 300 feet

Boundaries from Newton Assessor's data. Newton 1987 USGS topographic map from MassGIS.

Figure 4. Nahanton Park Soils

0 150 300 450 Feet

1 inch = 400 feet

Boundaries from Newton Assessor's data. NRCS soils data and 2008 aerial photo from MassGIS.

Table 1. Soil Characteristics.

Soil Unit	Description
Swansea Muck	This is a very deep, nearly level, very poorly drained soil in depressions or in lowlying level areas. Areas of the soil are circular or irregular in shape and range from 5 to 20 acres. Typically. the surface layer is black and dark yellowish brown muck about 34 inches thick. The substratum is loose, olive gray gravelly sand to a depth of 60 inches or more.
Canton Fine Sandy Loam	Found on lower slopes of hills, these soils formed in friable glacial till from gneiss and granite. Due to rapid permeability of the substratum, available water capacity is moderate, making these areas poorly suited to crops. Poor filtering capacity of the substratum may lead to and groundwater pollution from septic tank absorption fields, making these areas poorly suited to development. Many areas of Canton soils are used as woodlands.
Udorthents, Sandy	This map unit consists of nearly level to steep areas where the original soils have been removed for use as roadfill, concrete aggregate, or landfill. The original soils were typically excessively drained to well drained and on glacial outwash plains, terraces, kames, and eskers. Areas of Udorthents, sandy, are irregular in shape and range from 6 to 150 acres. Slopes are complex but are dominantly 0 to 5 percent at the base of cutout areas and have side slopes of 8 to 35 percent following the perimeter of the unit map. Typically, Udorthents, sandy, are the remaining substratum material from Canton, Hinckley, Merrimac, and Windsor soils, after the upper 4 to 40 feet of the soil material was removed. Most areas are stratified sand and gravel to a depth of 60 inches or more, In many areas stones and boulders 10 inches to 10 feet in diameter are scattered randomly on the surface or are in piles. Where heavy machinery has made continual passes over the same area, the surface is firm and compact. In a few areas the surface layer is thin and is brown or dark brown sandy loam or loamy sand.
Hinckley Loamy Sand	These deep, soils form the side slopes of glacial terraces, and on kames and eskers. These soils are poorly suited to crops because droughtiness due to rapid permeability of the surface, subsoil and substratum. This permeability also makes areas of these soils poorly suited to septic tank absorption fields. Most areas of this phase of Hinckley soils are used as woodland, and potential productivity for eastern white pine (*Pinus strobus*) is high.
Saco Mucky Very Fine Sandy Loam	This very deep, nearly level, very poorly drained soil is in low areas on flood plains. The areas are long and narrow or irregularly shaped. They range from 10 to 15 acres in size. Typically, the surface layer is very dark gray mucky very fine sandy loam about 12 inches thick. The upper 8 inches of the substratum is grayish brown very find sandy loam, the lower part to a depth of about 65 inches is light olive gray very find sandy loam and fine sand.
Merrimac Fine Sandy Loam	These deep soils formed in sorted, sandy glacial material on outwash plains, terraces and kames. They have a rapidly-permeable substrata of stratified sand and gravel, and surface soils that are moderately rapidly permeable. This soil series is rated as prime farmland by the USDA Natural Resources Conservation Service: land that has the best combination of physical and chemical properties for the production of food, feed, forage and other crops.
Charlton-Hollis-Rock outcrop complex	Typically found on upland hills with bedrock near at or near the surface. Very deep Charlton soils occur on side slopes, and the shallow Hollis soils on the tops of hills and ridges, and near outcrops. In addition to areas of outcropping bedrock, stones and boulders 10 inches to 10 feet in diameter cover from 1 to 10% of the surface. Steep slopes, shallowness to bedrock and stoniness makes these soils poorly suited to cropland, pasture or development. Most areas of this complex are used as woodland.

Drainage & Wetlands

Following the general western aspect, water in the park drains toward the Charles River. The very southern portion of the park, the part of Woodcock Meadow and the parking along Nahanton Street, may run to storm water drains that then run to the Charles (Figure 5).

- The northern section of the park – north of a line running roughly from the Winchester Street entrance along the driveway, then across the top of the meadow and along the north side of the Upper Gardens – drains to the north. The area from the Building Department Yard to the Lower Gardens drains toward a small pond on the golf course which leads to the Charles River, while the steep slopes north of the Upper and Lower Gardens drain north into the red maple swamp and on into the Charles River.
- The central portion of the park –south of the line described above, and north of a line running along the north side of the Woodcock Meadow, drains to the Pool and on to the Charles River.
- The southern portion of the park drains west to the Charles River, either directly or along Nahanton Street.

As most of this drainage takes the form of sheet runoff or groundwater flow, and since very little water flows *onto* the property, there is only one small intermittent stream found in the park, which runs from a low temporary pool just north of the Playing Fields turnaround to the Pool. The Pool itself drains northwest to the Charles River in a sluggish channel. The Pool is a very attractive natural resource and is utilized by birds for breeding, overwintering, and during migration. It is a semi-permanent water body, nearly drying up in some years. The fact that the channel connects the pond to the Charles River allowing fish to re- enter the Pool even after years when it does dry up would tend to handicap its functioning as a vernal pool, but it has recently been recognized as a Certified Vernal Pool due in part to an abundance of Spotted salamander egg masses found in the Spring.

The red maple swamp to the north of the Upper Gardens and the silver maple floodplain swamp along the Charles River are excellent wetlands, contributing important storm and flood water storage and providing habitat for a wide range of birds and wildlife throughout the year.

Cover Types & Wildlife Habitat

Cover types are shown in Figure 6.

- Forest (34.4 acres) – The lovely oak-dominated forests of the eastern portion of the park, draped over the varied topography of the uplands, feature towering 50-foot canopy of black and white oaks, white pine, and pignut hickory over a subcanopy of the same species along with black cherry and sassafras. The shrub layer, which includes maple-leaved viburnum and tall blueberry, ranges from dense to very open, and a groundcover of ferns, wild sarsaparilla, and tree saplings similarly ranges from thick in places to sparse in others. There are very few invasives in the forest. The varied vegetation of the forested areas and the varied topographical forms make for a very enjoyable walk along existing trails, offering the visitor an opportunity to explore the quieter side of the park.

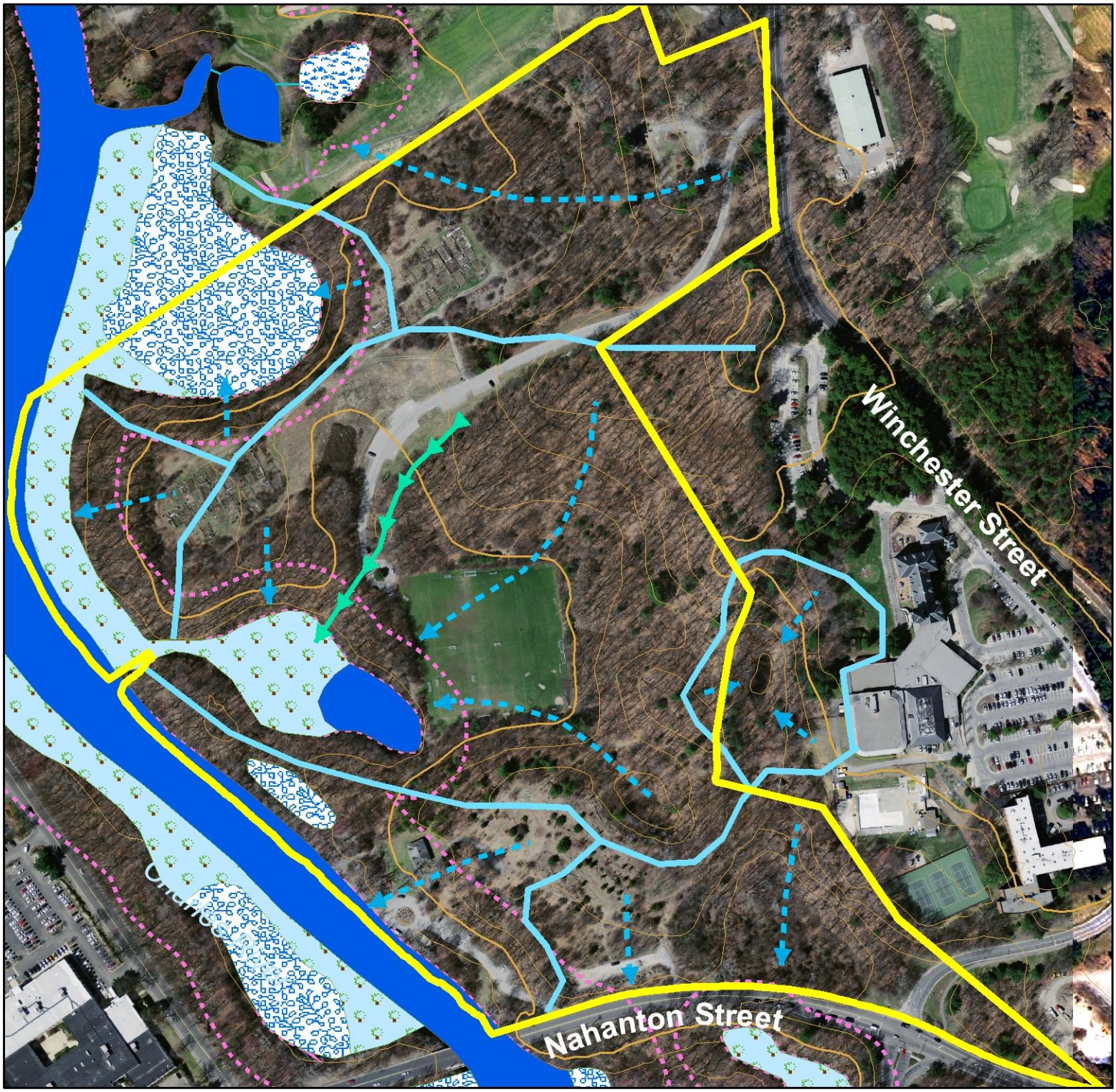

Figure 5. Nahanton Park Wetlands and Hydrology

0 100 200 Feet

1 inch = 300 feet

Direction of flow
Intermittent stream?
Estimated watershed divide
Open water
Shrub swamp
Deciduous wooded swamp
Wet Meadow
Wetland (100 ft.) and Riverfront (200 ft.) Buffer

Boundaries from Newton Assessor's data. Topographic lines, DEP wetland data, and 2008 aerial photo from MassGIS.

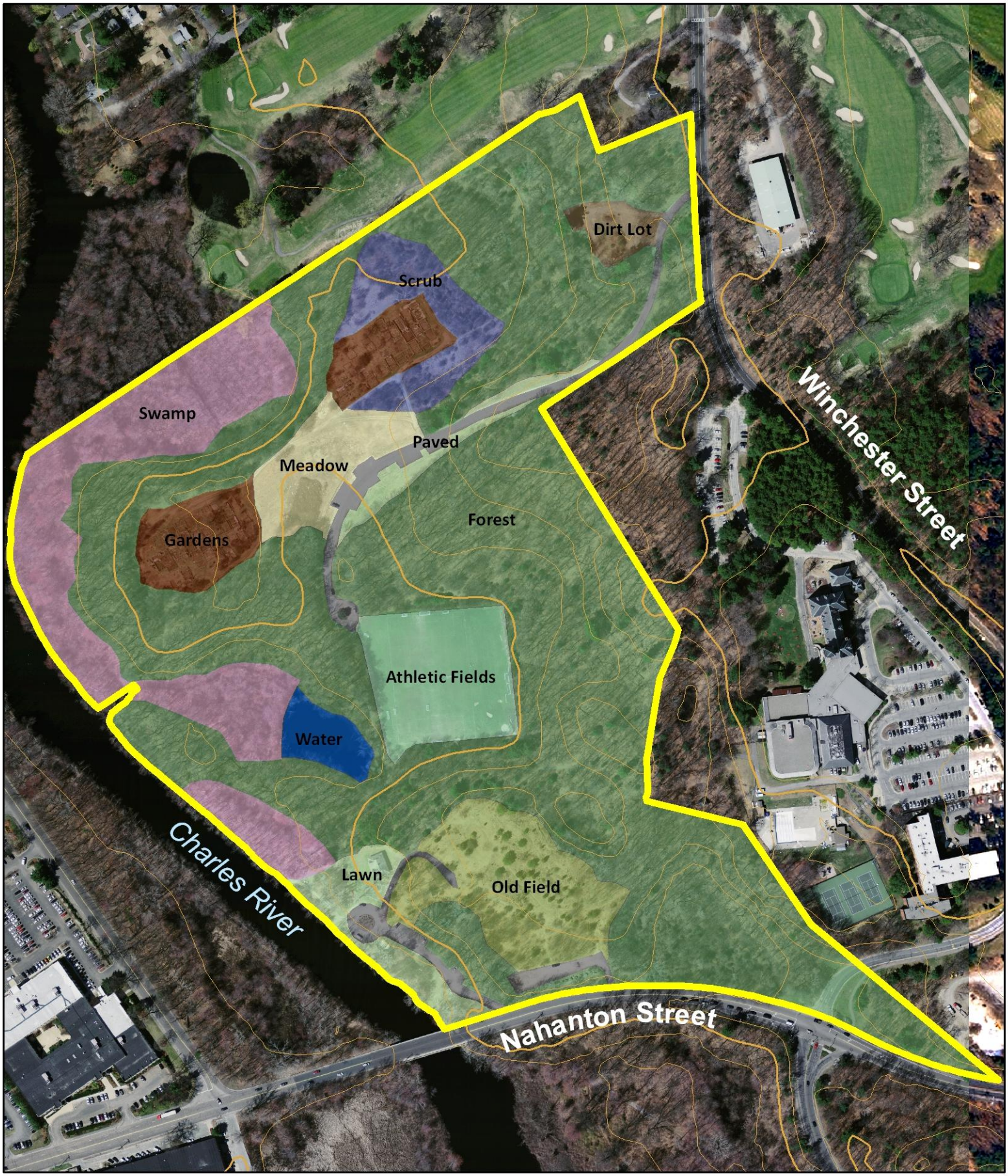

Figure 6. Nahanton Park Cover Types

0 100 200 300 Feet

1 inch = 300 feet

Boundaries from Newton Assessor's data. 2008 aerial photo from MassGIS.

- Playing Fields & Lawn (4.4 acres) – The Playing Fields in the center of the park and the lawns along the south side of the Winchester Street entrance road and near the Nature Center are maintained for aesthetic and active recreation purposes. They offer very little in the way of habitat.
- Gardens (2.4 acres) – The portion of the areas dedicated to gardens, when they are in use, are plainly a human-shaped rather than a natural landscape. Naturally-occurring plants here include problematic invasives such as black swallowwort. The gardens, including the actively cultivated plots, provide some food resources to invertebrates and to birds, especially in winter.
- Central Meadow (1.6 acres) – The meadow has suffered from use as a snow-storage area, but has been replanted with a wildflower seed mix. While it is too small to provide breeding habitat for some of our declining grassland-nesting birds, this meadow supports feeding invertebrates and is frequented by birds for foraging, both on the ground and in the air.
- Old Field (3.2 acres) – This lovely old field, known as the Woodcock Meadow, is characterized by scattered red cedars, gray birch, and quaking aspen standing among low, sandy-meadow vegetation dominated by little bluestem grass. The margins of the meadow, especially on the south where it abuts a parking area, are dominated by stands of staghorn sumac with some black locust. Poison ivy is common in places.
- Scrub (1.8 acres) – This area ranges from more open overgrown old field north of the Lower Gardens to the dense, scrubby vegetation east of the Lower Garden that has grown in since mowing was abandoned, likely in the early 1990s. The densest areas are dominated by common buckthorn with multiflora rose and honeysuckles also present. These three invasive species provide only marginal benefit as a food resource for wildlife. The dense shrubby cover itself is important habitat for a wide range of overwintering, migrating, and breeding birds; however if this is left unmanaged, it will mature to a taller forest that is of lower habitat value for these species.
- Swamp (6.5 acres) – The swampy area ranges from red maple dominated canopy further from the Charles River to silver maple dominated nearer the river bank. The silver maple-dominated area provides important floodplain habitat for birds and mammals. Although the understory and shrub layers include many native species, the most notable feature of the vegetation here is the near complete dominance of the shrub layer by glossy buckthorn.
- Water (0.7 acre) – The Pool appears to have been either entirely man-made or at least enhanced by previous land owners to serve as a swimming hole. There is a very old set of concrete steps leading to the water level at the southeastern end of the Pool. Today, however, the Pool serves as more of a natural element to the park, with logs and leaf litter accumulating in the water, shrubs and low trees leaning over the water's edge, and taller trees shading the Pool itself. The Pool is actively used by migrating birds and has been certified as a vernal pool.
- Pavement and Other (2.2 acres) – Driveways, parking areas, and the dirt lot near the Winchester Street entrance make up the balance of the park's acreage.

Important Habitat for Rare Species

None of Nahanton Park is currently identified as Priority Habitat of Rare Species or Estimated Habitat of Rare Wildlife by the Massachusetts Natural Heritage and Endangered Species Program. The nearest Priority Habitat is roughly one half mile upstream (south) along the Charles River where the riverside marshes widen and provide more extensive wetland habitat.

Vernal Pools

There is one Certified Vernal Pool on the property, the Pool, which was certified in 2011 (Figure 7). The following summary from the Vernal Pool Association (www.vernalpool.org) explains why vernal pools are recognized as important habitat:

> A vernal pool, because of its periodic drying, does not support breeding populations of fish. Many organisms have evolved to use a temporary wetland which will dry but where they are not eaten by fish. These organisms are the "obligate" vernal pool species, so called because they **must** use a vernal pool for various parts of their life cycle. If the obligate species are using a body of water, then that water **is** a vernal pool. In New England, the easily recognizable obligate species are the fairy shrimp, the mole salamanders and the wood frog.
>
> Fairy shrimp are small (about 1 inch) crustaceans which spend their entire lives (a few weeks) in a vernal pool. Eggs hatch in late winter/early spring and adults may be observed in pools in the spring. Females eventually drop an egg case which remains on the pool bottom after the pool dries. The eggs pass through a cycle of drying and freezing, and then hatch another year when water returns. The presence of fairy shrimp indicates that a water body is a vernal pool.
>
> Wood frogs are an amphibian species of upland forests. They venture to vernal pools in early spring, lay their eggs, and return to the moist woodland for the remainder of the year. The tadpoles develop in the pool and eventually follow the adults to adjacent uplands. The presence of evidence of breeding by wood frogs (chorusing or mating adults, egg masses or tadpoles) indicates that a pool is a vernal pool.
>
> The mole salamanders are also upland organisms. They spend most of their lives in burrows on the forest floor. Annually, on certain rainy nights, they migrate to ancestral vernal pools to mate and lay their eggs. They soon return to the upland. The eggs develop in the pool and, by the time the pool dries, the young emerge to begin their life as a terrestrial animal. Evidence that mole salamanders breed in an area make that water body a vernal pool. Breeding evidence would be a breeding congress, spermatophores, egg masses or larvae.

While the certification of a pool establishes that it functions biologically as a vernal pool, certified vernal pools are protected only if they fall under the jurisdiction of the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00). In the case of Nahanton Park, this vernal pool does fall within a wetland resource area, Bordering Land Subject to Flooding, as determined by the FEMA 100-year floodplain from the Flood Insurance Rate Maps. As such, the Certified Vernal Pool is afforded status as Vernal Pool Habitat and according to *A guide to Understanding and Administering the Massachusetts Wetlands Protection Act* (Colburn 1995) “both the pool and a zone extending within the Land Subject to Flooding

up to 100 feet from the vernal pool boundary are protected as Vernal Pool Habitat. No adverse effects on the wildlife habitat characteristics of the area are permitted".

Certified vernal pools are also afforded protection under the state Water Quality Certification regulations (401 Program), the state Title 5 regulations, and the Forest Cutting Practices Act regulations. From Colburn (1995), "[u]nder these regulations, no discharges of stormwater, fill, or other materials are allowed into vernal pools".

BioMap2

The wetlands and adjacent uplands in the western-most portion of the park are included in BioMap2 (Figure 7), a statewide conservation plan designed to identify the areas that are most critical for ensuring the long-term persistence of rare and other native species and their habitats, exemplary natural communities, and a diversity of ecosystems. Land mapped in BioMap2 is divided into two types:

- *BioMap2* **Core Habitat** identifies specific areas necessary to promote the long-term persistence of Species of Conservation Concern (those listed under the Massachusetts Endangered Species Act as well as additional species identified in the State Wildlife Action Plan), exemplary natural communities, and intact ecosystems.
- *BioMap2* **Critical Natural Landscape** was created to identify and prioritize intact landscapes in Massachusetts that are better able to support ecological processes and disturbance regimes, and a wide array of species and habitats over long time frames.

The Massachusetts Natural Heritage & Endangered Species Program and The Nature Conservancy's Massachusetts Program developed *BioMap2* in 2010 as a conservation plan to protect the state's biodiversity. *BioMap2* is designed to guide strategic biodiversity conservation in Massachusetts over the next decade by focusing land protection and stewardship on the areas that are most critical for ensuring the long-term persistence of rare and other native species and their habitats, exemplary natural communities, and a diversity of ecosystems. The summary document is available from Massachusetts Natural Heritage and Endangered Species Program (www.nhesp.org).

Figure 7. Important Habitat for Rare Species

NHESP/TNC BioMap2 Core Habitat
NHESP/TNC BioMap2 Critical Natural Landscape
100-Year Flood
500-Year Flood

0 100 200 300 Feet

1 inch = 300 feet

Boundaries from Newton Assessor's data. BioMap2, FEMA flood data, and 2008 aerial photo from MassGIS.

Existing Uses

Existing uses in Nahanton Park are described below with location of each shown in Figure 8.

Access

The Park is accessed by two main entrances. The driveway from Winchester Street leads 1,000 feet past the dirt lot and down a gently sloped, shaded, curving approach where it opens up to take in the meadow and a view of the Upper Gardens. Lined parking spaces accommodate approximately 30 cars with space for additional parallel parking along the grass. There is a kiosk near these parking spaces that provides information on the park and upcoming programs and a dirt road leading from the driveway to the Upper and Lower Gardens, providing access for gardeners. The driveway continues downhill another 500 feet to a cul-de-sac at the entrance to the Playing Fields. There is no formal parking at the playing fields although it is possible to park alongside the driveway and cul-de-sac.

The second formal entrance is off of Nahanton Street, just east of the Charles River, where a wide, level, paved driveway leads 400 feet to a cul-de-sac in front of the Nature Center. The driveway, which has marked parking for 12-15 cars, also provides access to the boat launch and to Florrie's Path which leads along the Charles River and an additional accessible path leading to the Playing fields. In 2011 a van-accessible parking space was added to the cul-de-sac along with a new branch of the accessible pathway system.

There is a third parking lot located 250 feet further east on Nahanton Street. Although this lot is not as clearly signed as the main entrances, the dirt surface is not well-maintained, and there are no lines for parking spots, it is regularly used by park visitors. While the 1987 Pressley Associates plan sketched this lot with 45 parking spaces, the use of large boulders to mark the southern edge of the lot and encroachment by woody vegetation on the north side have narrowed the lot and make the true capacity much lower. The lot provides overflow parking for activities at the Nature Center and beginning in 2010 has been heavily used by boaters coming to rent from the Charles River Canoe & Kayak operations. The lot is also regularly used by road cyclists who park in the lot and meet up for group rides. An internet search finds rides organized out of Nahanton Park by both the Charles River Wheelmen and the Boston Road Club.

The interior of the park is only accessed by foot. There are no park roadways interconnecting the 3 vehicular entrances, essentially creating two sides to the park.

Figure 8. Nahanton Park Existing Uses

0 100 200 300 Feet

1 inch = 300 feet

Areas of Existing Uses

Trail to Keep

Trail to Restore

Trail to Eliminate

Boundaries from Newton Assessor's data. Trail data from field work. 2008 aerial photo from MassGIS.

Community Gardens

The community gardens, divided into the Upper Garden and the Lower Garden, provide space for subscribers to tend vegetables and flowers. The gardens are much loved and a very important function of the Park for a large number of loyal users. Each of these 1-acre garden areas is divided into plots measuring 10 feet by 20 feet. In return for the $40 fee to rent a plot for the year, the city provides water for use by gardeners and hires a dumpster in the Spring and in the Fall to haul away debris. The gardens were intended to have 200 plots in total, 100 at the Upper Gardens and 100 at the Lower Gardens. The actual number of plots has varied over time, but currently some 100 plots are rented, including some rented in pairs or in sets of four. There are 50 gardeners in total this year with 18 interested users left on the wait list for 2011 while this review is completed. The Community Garden manager feels that demand will increase even more when availability of plots is advertised to the public.

The individual garden plots have traditionally been re-assigned to users year to year. Gardeners invest time, effort, and funds into enriching the soil in their plot to maximize productivity and develop a sense of ownership of their plot over time. While this contributes to stability and community at the gardens, it may also create difficulties in enforcing garden regulations. For instance, many of the garden plots feature permanent structures such as fences and sheds (Figure 9) even though this is clearly not allowed by the regulations. Some users have expanded their plots beyond the designated boundary (Figure 10), and there are several piles of compost and some trash alongside the garden areas.

Figure 9. Fencing and other structures installed in the Lower Gardens at Nahanton Park (4/11/11).

Figure 10. Aerial photo of the Upper Gardens (2008) showing plots of various size.

Playing Fields

The 2.5 acre playing fields are heavily used by Newton Youth Soccer in Spring and Fall. During the Summer, the fields are used by the JCC summer camp and the Outdoor Adventure Camp run by Newton Recreation Department out of Nature Center. The field is also popular with cross-country skiers in the winter. There is a sense that the playing fields have expanded over time, chipping away at the adjacent forest. However aerial photographs available through Google Earth demonstrate that at least as far back as 1995, the playing fields have been near their current extent and alignment (Figure 11).


(a) (b)

Figure 11. Nahanton Park Playing Fields in (a) 1995 and (b) 2008. Images accessed through Google Earth.

Nature Center & Parking Lot

The Nature Center is located off of Nahanton Street just east of the Charles River. The driveway accommodates parking for up to 15 cars in designated spots, with capacity for several additional cars parallel parked along the grass. The handicapped accessible building, open from 10 am to 2pm Monday through Friday, includes a multi-purpose room, kitchen, office, and public rest rooms and water fountain.

The Puddlestompers Nature Exploration program offers nature classes for parents and children during the school year, and offers school vacation week and summer camps for 3-6 year olds. Extreme Outdoor Adventure offers programs for boy and girls in grades 4 through 8. Popular themes at all of these camps include fishing, canoeing, swimming, orienteering, birding, nature games, and arts and crafts. The center also hosts the Basic Freshwater Fishing Program in collaboration with Massachusetts Division of Fisheries and Wildlife, a Babysitter Certification course, and CPR training among other programs. In addition, there is a metal and wood dock on the river for year-round use by anglers and boaters.

Canoe & Kayak Rental

In 2010, Charles River Canoe and Kayak and the City of Newton entered into an agreement to pilot canoe and kayak rentals from the boat dock near the Nature Center. The pilot program was deemed a success and, after a public bidding process, has continued in 2011. Nahanton Park is now one of the five locations CRCK advertises on their website (www.paddleboston.com). The website directs patrons to park at the Nature Center spaces or, if those are full, in the dirt lot off of Nahanton Street.

Building Department Lot & Building

Staff of the Newton Building Department and Department of Public Works make use of the half-acre dirt lot and brick building located just beside the Winchester Street park entrance. DPW used the lot for brush storage after ice storms in 2011, and it appears to have been used as storage or dumping space at other times as well. The presence of dumped materials and the proximity of the lot to the Winchester Street park entrance seems to invite illegal dumping of household trash and construction debris. The exterior of the building is in poor condition and the lot and building together give this entire corner of the park an air of neglect (Figure 12 and 13). Newton Building Department is currently undertaking a review of all City-owned buildings. The work is not yet complete, but the initial assessment of the building is that it is currently unusable as a public building.

(a) 

(b) 

(c) 

(d) 

Figure 12. Utility lot (a) viewed from Winchester Street entrance, (b) with brush pile on 4/11/11. A view (c) of the brick building and (d) unkempt exterior.

Figure 13.Aerial view of dirt lot near Winchester Street entrance (MassGIS 2008 aerial photo).

Snow Dumping

For a number of years, the meadow in the middle of Nahanton Park and the overflow parking lot on Nahanton Street have been used for storage of snow plowed off of City streets. During the extraordinarily snowy winter of 2010/2011, the Meadow was completely covered in snow piles 10 to 15 feet high (Figure 14)as was either side of the driveway nearly all the way to the soccer fields. The heavy dump trucks operating in the meadow leave deep ruts in the soil and the snow, upon melting, reveals all of the roadside trash that was plowed up with the snow (Figure 15). Runoff from this melting snow undoubtedly also contains oils and other pollutants accumulated from the roads. Each year after the meadow has been used for snow dumping, the Department of Public Works has carried out a restoration, smoothing the soil and planting a meadow wildflower mix (Figure 16).

Figure 14. Snow stored in the central meadow at Nahanton Park (2/24/11).

Figure 15. Trash left in melting snow piles (4/11/11).

Figure 16. Meadow restored with wildflower mix (9/15/11).

Dog Walking

The park is popular for dog walking. City of Newton Ordinance Chapter 3, Article II, Section 3-26 states that "No dog shall be permitted in any street or public place within the city unless it is effectively restrained by a chain or leash not exceeding ten (10) feet in length," yet dogs are frequently walked off leash in the park.

Passive Recreation

The park is used extensively by residents and visitors to walk for exercise, for birding, cross-country skiing and snowshoeing and general enjoyment of nature. On several visits I noted use of the trails and driveways by elderly visitors who arrive at the Nature Center in a van and take time to enjoy strolls along the riverside path, on the accessible trail leading to the playing fields and the fields themselves, and the driveway to Winchester Street. I did not observe users on the forest trails during my weekday visits, but the well-worn condition of these trails, and the trails in Woodcock Meadow, indicate that they are frequently used.

The park offers a variety of walks ranging from short strolls on level, accessible paths to longer rambles through the woods and along the Charles River taking in the entire park. While the woods trails on the eastern portion of the park are in excellent shape, the trails along the river and west of the Upper Gardens are in need of renovation and relocation in some places.

The park is well known as a destination for birders. The Woodcock Meadow east of the Nature Center is noted as a destination to see and hear the Spring display of American woodcocks, the riverside trail is a good spot to see ducks and migrant warblers, and the scrubby areas, especially adjacent to the Lower Gardens, are known as habitat for overwintering sparrows and Spring migrants and are considered excellent habitat for viewing the Fall sparrow migration. The Brookline Bird Club leads walks to the park at least annually.

Dumping

Illegal dumping is a serious issue at the overflow parking lot off of Nahanton Street and in the Building Department lot near the Winchester Street entrance. These two areas are directly adjacent to main roads, are relatively secluded, and each have the appearance of not being well cared for. Appliance parts were seen dumped at the Winchester Street entrance lot and a furnace, tires, and shingles were seen on various visits to the Nahanton Street overflow lot.

Proposed New Uses

Community Farms

In April, 2010, Newton Community Farm, Inc. submitted to the Parks & Recreation Department a proposal to use a small part of Nahanton Park (~0.5 acre) for their farming and farm education programs. Newton Community Farm (NCF) is a non-profit community farm located on the historic

Angino farmstead in Newton, MA. According to their website, the organization "strives to benefit the community by providing locally-grown produce through a CSA, farm stand, and Newton Farmers' Markets; educating the public about the sustainable use of land and other natural resources through hands-on classes, workshops, and drop-in farm hours; preserving Newton's last working farm as a historic site and valuable open space; [and] connecting gardening enthusiasts through events and networking opportunities."

The proposed Nahanton Park operations would be an expansion of their programs at Angino Farm at the corner of Winchester and Nahanton Streets. The proposal identified three areas where farm operations might be accommodated at the park (Figure 17):

- Area 1 is a half-acre scrubby area dominated by shrubs with some tree saplings and grasses in the more open portion. Invasive species including multiflora rose and common buckthorn are very common. The ground slopes gently to the north.
- Area 2, also one-half acre, is part of the Lower Gardens and, while it is not as actively used in recent years as the eastern portion of the Lower Gardens, there are active plots here. Programming this area for use by Newton Community Farm would remove the area from consideration for potential expansion of the Community Gardens.
- Area 3 is the Meadow. It slopes generally toward the driveway, forming a convex 'amphitheater' shape. The Meadow has been used for snow dumping and annually restored with a wildflower mix.

Figure 17. Potential options for a new farming area proposed by Newton Community Farm, Inc.

The Meadow is not a good location for more intensive use such as farming. While the area has been subjected to rough treatment in recent years due to snow dumping, ongoing conversations between the Department of Parks & Recreation and the Department of Public Works seem to be moving in the direction of minimizing future snow storage in the Meadow. Even with the pattern of snow dumping and Spring restoration, the Meadow provides Summer and Fall habitat for sun-loving plants and the invertebrates that feed on them. The invertebrates in turn form an important part of the food web for

other wildlife. The Meadow is also an aesthetic centerpiece of the park, serving as the focal point for the visitor driving, cycling, or walking down the Winchester Street driveway. While farm operations have their own appealing aesthetic, conversion of this prominent swath of open ground may give the park too much of a 'working' feel.

Area 2, the western portion of the Lower Gardens is also problematic, but less from a habitat and aesthetic perspective than from the sense of best use of the land to provide opportunity for the most users. While this area has not been as well maintained as the Upper Gardens or the eastern half of the Lower Gardens, there is space for additional Community Garden Plots here. There is currently a wait list for garden plots and the Community Garden managers feels that demand will increase even further if the program is advertised. This area is in need of some renovation, focusing on removal of invasive woody plants.

Of the three areas identified in the NCF proposal, Area 1 has the most potential to provide additional space for farming with the least disturbance to current activities at the park. Proximity to the Lower Gardens would contribute to NCF's goal of working closely with community gardeners to enhance their experience and would provide opportunities for NCF to cooperate in concrete ways with community gardeners, such as by managing a central compost pile, providing enhanced security through their presence, or offering the use of equipment for tilling, etc. This area does contribute to the habitat needs of a wide range of birds, and together with the land to the east and north of the Lower Gardens represents the only example of shrub habitat at the park, a habitat type that is in steep decline across the state. Conversion of this area to farming use should only happen with an agreement that results in ongoing maintenance of the other shrub habitat areas to maintain their habitat quality.

One additional area not included in the NCF proposal that may fit their needs is the dirt lot near the Winchester Street entrance. The fairly level portions of this lot total roughly 0.4 acres, the location is very accessible from Winchester Street, there is additional room for parking, and the existing building could be used for storage of equipment. The building even has a garage door that could accommodate a tractor. Converting this area from an underutilized and unsightly distraction right at the main entrance to a high-visibility satellite of the successful operations at Angino Farm may serve NCF's purposes in a way that dramatically improves the park rather than impacts existing uses or habitat areas. Such a conversion would involve considerable expense, planning, and considerations of public reaction. At a minimum several large oak trees and white pine trees would need to be removed from the southern side of the dirt lot to improve sunlight at the site. Broken pavement and weedy vegetation would need to be removed from the entire site. Most importantly, the soils here, of the Charlton-Hollis-Rock outcrop complex, are not as well-suited to farming as the soils near the community gardens and may need to be amended with topsoil. Site conditions would need to be investigated further and a funding source identified in order to consider this area for conversion to farming.

Expanded Overflow Parking

As detailed above, the existing overflow parking lot off of Nahanton Street is not providing as much parking capacity as it could be. Newton Parks & Recreation staff have proposed widening the lot, expanding to the north, to accommodate more parking. The initial estimate is that the lot would need

to be expanded 25 feet to the north, which would push into the Woodcock Meadow. The 1978 Pressley Associates plan sketched this as a lot for 45 cars and measuring 200 feet long by 60 feet wide. I estimated in the field that the lot is currently 190 feet long and ranges from 25 feet wide near the eastern end to 40 feet wide at the western end. I feel that the lot could be reshaped to the measurements of the Pressley Associates plan with only minimal impact to the habitat in the Woodcock Meadow.

The southern side of the lot is bordered by 10 feet of weedy vegetation and then lined with large boulders to prevent cars approaching the steep slope down to Nahanton Street. If the boulders were replaced with wooden bollards or steel guardrail, the lot could be expanded at least 20 feet to the south. Clearing of existing weedy and woody vegetation on the north side would expand the lot at least 10 feet without having a negative impact on the Woodcock Meadow. In fact a low wall running for a portion of the north side of the lot forms a natural barrier to further northward expansion. If the lot were paved and lined, it would fit at least 44 cars.

Off-Leash Dog Walking Area

Nahanton Park is one of approximately 24 City-owned properties being considered for construction of an off-leash dog walking area. Areas of Nahanton Park mentioned for this use include the strip of lawn south of the Winchester Street driveway, opposite the Meadow, and the Woodcock Meadow, north of the overflow parking area. Parks and Recreation Department staff and its advisory board, the Off-Leash Area Working Group (OLAWG), will be reviewing this proposed use in the future.

Recommendations

Nahanton Park serves an amazing number and variety of users. It is well loved, actively used, and attentively managed by city staff and friends. The following recommendations are aimed at maximizing the functioning of the park for the various user groups while maintaining the high quality wildlife habitat and passive recreation opportunities currently found at the park.

Standardize the Community Gardens

The traditions of the community gardens have evolved over the years away from the regulations which each gardener agrees to when renting a plot. Although permanent structures are expressly forbidden by the current regulations, most users erect complex fencing, some including cedar 4x4s sunk well into the ground; plots stretch well beyond the 10 x 20 foot assigned area; gardeners store materials, compost, and sometimes trash outside of their plot and outside of the community garden area; and in some instances, users have expanded the garden into adjacent natural area.

There seem to be two central issues that contribute to this pattern. The first is the practice of allowing users to build increasingly complex structures on their plots. The second issue seems to be the lack of an outer fence that would dissuade browsing by wildlife and casual theft by non-gardeners. Budget and programmatic limitations have led to the lack of the outer fence; and tradition and language barriers have contributed to the individual fence-building.

In many community gardens, the landowner builds and maintains an outer fence, with gates, that provide for security needs. With the outer fence in place, there is no need for each plot to have a high fence. Without permanent structures, the landowner can implement a policy whereby all materials have to be removed from a plot by a given date in the Fall and then the entire garden is plowed under to incorporate organic material into the soil and to prepare for the coming planting season. In the Spring, the plots are re-staked and re-assigned. At Nahanton Park, the garden manager could certainly work with gardeners so that plots are maintained year after year so that efforts to improve the soil can be enjoyed over a longer term.

Parks and Recreation Department staff need to create a dialogue with users to discuss how garden operations could be enhanced from their perspective and what needs to happen to get away from the tradition of placing permanent fencing and other structures. The conversations should include a review of the cost of each plot, discussion of regulations and policies, and review of the policies and practices at other community gardens. The services of a professional facilitator and an impartial translator would enhance this dialogue tremendously.

Mass Audubon went through this process when we took ownership of the Boston Nature Center property in Mattapan. In the years since this state hospital property had been abandoned, community members made use of the land for gardening. When the property was converted to a Wildlife Sanctuary and Nature Center, community members expressed strong interest in maintaining the community gardens. Mass Audubon worked with the group, organized into the Clark Cooper Community Gardens, to discuss the gardeners' needs and preferences and to convert the area to a communally-managed garden with an outer fence, compost area, better access to water, and tool storage, sitting area, and annual tilling (Figure 18). We would be happy to meet with the appropriate City staff to visit the Boston Nature Center and discuss our experiences there.

Figure 18. Clark Cooper Community Gardens at the Boston Nature Center in Mattapan.

An alternative to the outer fence approach would be to expressly allow permanent structures, but to regulate them to some extent. New regulations could be discussed and agreed to with current gardeners and the garden regulations updated to reflect an arrangement that meets the needs of

gardeners for defining their plot and protecting their gardens from browsing and theft, and the City's interest in creating an equitable experience for all.

Standardizing the community gardens, both Upper and Lower, would resolve issues of supply of plots versus demand, outer bounds of the gardens, and trade-offs between garden space and wildlife habitat.

Restore the Dirt Lot at the Winchester Street Entrance

The dirt lot and brick building near the Winchester Street park entrance currently create an unappealing welcome to the park. Staff of Newton Parks & Recreation Department and other City departments should continue conversations focused on finding a new location for the Building Department and DPW operations currently carried out in the dirt lot and building near the Winchester Street park entrance. Use of the parking area for brush dumping should be discontinued and the area should be periodically monitored for illegal dumping and dumped materials should be removed as soon as possible.

The building would seem to be unusable without a major investment by some future user. If an alternative use can be identified that would enhance the visual appeal of this park entrance and clearly contribute to the enjoyment of park users,

The building has recently undergone a thorough assessment, and while the final report is not yet complete, the building has been deemed unsuitable for public use. It has been suggested that in its current condition it be used for storage only, however any future use should include an agreement with the Parks & Recreation Department that the exterior of the building and the access are be maintained in a state that contributes to an attractive park entrance. If a desired alternative use along with a funding source could be identified, the building could be restored and the lot restored to an attractive parking area.

If no alternative use is found for the building, it should be removed and the dirt lot should be renovated for use by Newton Community Farm or restored to natural cover. Use for farming would require extensive and expensive improvements to the site and should be investigated with NCF. Restoration to natural cover would be an expensive process as well, but with removal of the broken pavement and restoration of the soil, this opening could become an additional early successional habitat area that would serve as another attractive wildlife habitat for the enjoyment of birders and other users.

Manage Early Successional Habitat with Thinning and Periodic Clearing

The scrub habitat surrounding the Lower Gardens and the scrubby Woodcock Meadow provide critical habitat for migrating and breeding birds. These cover types are in decline throughout Massachusetts and the region and, as a result, birds that rely on these cover types for breeding are in steep decline. If left undisturbed, meadows and old fields will *succeed* to forest as tree saplings become established and grow. The regeneration of forest across the state has been a boon for forest dwelling species, but at a cost to early successional specialists. Since very little forest is sufficiently disturbed to create much shrub habitat in Massachusetts, where shrub habitat exists, it should be managed to continue as early successional habitat.

The Woodcock Meadow should be thinned so that the woody plants currently found there do not take over the entire meadow. Roughly two-thirds of the red cedar and gray birch should be cut down in the meadow. All white pines should be removed from the meadow. Black locust should be removed from the east and southeast parts of the meadow and this species should be carefully monitored as it will aggressively invade meadows. The staghorn sumac at the southwest of the meadow should be monitored so it does not advance further into the meadow. It should be noted that the City does have an ordinance that controls the removal of all trees greater than eight inches in diameter on City land. The ordinance requires that under most circumstances any protected tree that is removed should be replaced. The Parks and Recreation Commissioner, as Tree Warden, has the ability to alter these requirements as needed given certain circumstances and as he sees appropriate. Any protected tree removals in the Woodcock Meadow would require the Commissioner to decide on their removal and potential replacement.

The entire area around the Lower Gardens shown as Scrub or Old Field in Figure 6, should be completely cut back with heavy equipment such as Brontosaur-type vegetation clearing machine or with chainsaws and brush hogs if possible. Ideally, the 1.5 acre scrub area would be cleared back in stages such that there always remains some habitat available for breeding and migrating birds. In this scenario, the scrub area would be divided into two areas, e.g. north and south, and one of these two areas would be cleared every three years Alternatively, the clearing could be carried out all at once and repeated every 5 to 6 years. In general, apple trees should be left as they provide habitat for a wide variety of wildlife.

The area identified as Scrub at the northeast corner of the Meadow (Figure 19) should be restored to grassy cover as part of the Meadow through regular mowing. Opening up this area would also contribute to increased visibility of the Lower Gardens from the driveway and a corresponding sense of safety for gardeners.

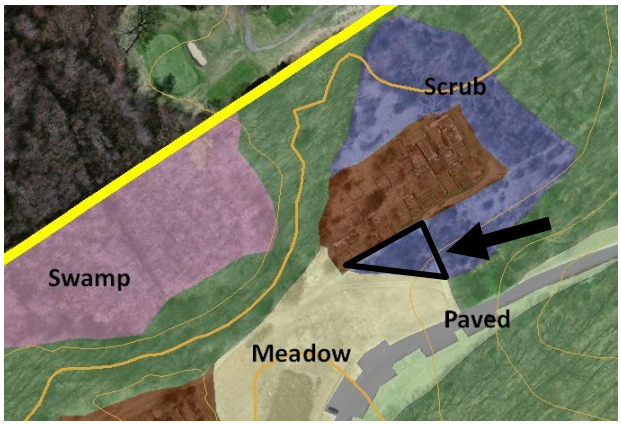

Figure 19. Scrub area that should be converted to meadow shown in black outline.

Manage Invasive Species

Invasive species represent one of the top threats to our native habitats. These plants and animals, introduced from their natural ranges either intentionally or accidentally, thrive in our natural areas due

to a lack of natural predators and sets of adaptations that allow them to resist removal. There are approximately 100 plant species that have been listed as invasive in Massachusetts, and invasives are found in nearly every corner of eastern Massachusetts, so it is no surprise that they exist in Nahanton Park. Control of invasives can be expensive and requires on-going, dedicated efforts to map, manage, and monitor progress. The most important step in managing invasives is setting priorities and using the available resources wisely. While many species and invasions can be managed with hand-pulling or mechanical control, the most efficacious treatments often involve the judicious use of herbicides. Any use of herbicide in the park would require an application to and approval by the City's Integrated Pest Management Committee. The priorities for Nahanton Park should be:

1) Locate and remove black swallowwort where it exists – This very aggressive, wind-dispersed vine was observed in the Lower Gardens. Vines should be located and hand-pulled. Gardeners should be trained to identify black swallowwort and encouraged to pull it before the seed pods mature and release new seeds. Park staff should be trained to identify the plant and survey other open areas of the park for its spread.
2) Locate and remove tree-of-heaven – This fast-growing and aggressively-spreading tree can form dense monocultures if left uncontrolled. There are few individuals in the Lower Gardens that should be removed. Gardeners and staff should be trained to identify saplings and encouraged to remove them as soon as possible.
3) Reduce number of black locusts in Woodcock Meadow – Black locusts will slowly take over an entire meadow. Simply cutting down saplings leads to root suckering and resprouting of even more saplings. Herbicides applied to the cut stump or to the lower bark of a tree can increase success. Either way, management has to be repeated several times.
4) Reduce invasives in early successional areas – After the early successional areas are cut back to maintain that cover type, the vegetation could be targeted with herbicides to knock back invasives, which tend to respond most quickly to cutting. A more detailed plan will be needed.
5) Reduce extent of glossy buckthorn – The shrub layer of the floodplain forest is nearly completely dominated by glossy buckthorn in places. This is not an uncommon sight, and complete removal of glossy buckthorn may be an impractical goal, but the current extent of the plant should be mapped and volunteer effort should be directed at pulling small and medium sized plants on the periphery of the invasion.
6) Keeping the mature forests clean – The forests east of the playing fields are remarkably free of invasives. Trained volunteers should periodically visit the forest, on and off trail, to look for incipient invasions of the common problem species. Any new invasions should be dealt with immediately. This Early Detection/Rapid Response approach is the best hope for keeping relatively clean areas free from invasives in the future.

Renovate Trails

There are two critical missing pieces of the passive recreational experience at Nahanton Park (Figure 8):

1) a trail leading from the current northern terminus of Florrie's Path, where the channel drains from the Pool to the Charles River, along the riverbank and to the Upper Gardens; and

2) a trail leading around the north side of the Lower Gardens, through the shrubby areas, then south to the Winchester Street entrance driveway.

These two trails exist and have been used until only recently. Access to the riverside path north from Florrie's Path is limited by the lack of a bridge across the channel. There is a trail bed along the riverbank north of the channel, but it is severely overgrown and in several places runs too close to the riverbank. A priority should be to extend Florrie's Path further north by installing a bridge across the channel and then managing vegetation along the bank to the north so that visitors can continue along the trail. This renovated trail would connect to an existing trail running east to the Upper Gardens. This existing trail could also benefit from vegetation management along its length.

Old aerial photos show the existence of several trails in the area between the Lower Gardens and the Winchester Street entrance dirt lot and building. The main trail running northeast from the Lower Gardens, then south to the driveway should be renovated.

Improvement of these trails would create a flagship 1 mile walk taking in the river, floodplain forest, community gardens, wildflower meadow, early successional habitat, mature oak forest, and the Woodcock Meadow.

Continue the Conversation with Newton Community Farms

In the right location, NCF farming could add value to the park experience for other user groups, and with a clear agreement in place, management activities recommended in this report could be completed in partnership between NCF and Newton Parks & Recreation Department. One possibility would be an agreement that allows farming on the land adjacent to the Lower Gardens (Area 1) in exchange for ongoing management of invasive plants and the remaining shrub habitat near the Lower Gardens. Whether or not having NCF operations located in the park is a desirable, appropriate, sustainable, and aesthetically appealing use will need to be assessed by the Parks & Recreation Department, its Commission and the Friends of Nahanton Park.

Each of the locations initially proposed by NCF has limitations in terms of impacts on natural resources or other users. In addition to those locations, the use of the dirt lot for farming should be considered. While an NCF presence at the Winchester Street entrance would contribute to a dramatic improvement of the visitor experience upon entering the park and bring new users to the park, there are challenges at this location. Feasibility of reshaping and restoring this area for farming should be investigated with NCF.

Maintain Meadow as Wildlife Habitat

The Meadow, between the Upper and Lower Gardens, should be reserved for dedicated wildlife habitat. Snow dumping severely disturbs the soil and vegetation at the site impacting perennial grasses and wildflowers and invertebrates that would overwinter in the Meadow. Even with annual restoration, the site's functions as a natural grassland will be compromised. The Meadow should be mown once each year, in the late Fall, to ensure that herbaceous species remain dominant and woody plants are kept at bay. The area at the very northeast of the Meadow, which has overgrown with woody plants, should be

cleared and then mown so that it becomes part of the meadow once again. Whether with fencing or boulders, access to the meadow should be limited from the Winchester Street driveway.

Manage Dog Walking

The Woodcock Meadow is not a suitable location for an off-leash dog walking area. This area provides important early successional habitat for birds and other wildlife and should be managed for its habitat value. Similarly, the Meadow north of the Winchester Street parking lot should be considered off-limits for dog walking. An off-leash yard in the narrow strip of lawn south of the Winchester Street driveway would not severely impact habitat values, but would alter the quiet, open nature of this area and contribute to a feeling of overuse of the park. Signage should be improved at all parking lots to clarify that dogs are to be leashed in the park.

Determine whether stormwater is discharged into Certified Vernal Pool

Water draining down the long driveway leading from Winchester Street and across the driveway from the meadow, runs eventually to a depression on the north side of the cul-de-sac at the Playing Fields. The water may then drain south towards the Pool. Stormwater discharges are not allowed into Certified Vernal Pools. A field inspection of the drainage structure and nearby culverts by DPW staff would likely reveal whether drainage is directed towards the Pool. Alternatively, original project plans may show how the stormwater system was designed.

Improve the Overflow Parking Lot

An engineer or landscape architect should complete a plan detailing an expansion of the overflow lot off of Nahanton Street. The current overgrown and unkempt appearance of the lot contributes to its use for dumping household waste and construction debris, and the encroaching shrubs and uneven surface limit parking capacity. A hasty effort to widen the lot may increase capacity, but it will negatively impact wildlife habitat and will not address the underlying fact that the lot is not in keeping with the very high standards of care and planning indicated by the well-managed Nature Center, boat rental, accessible trails, and playing fields. A carefully planned expansion will be more expensive, but will transition this space from an underperforming space to an important amenity for all park users.

Continue Canoe and Kayak Rental

This newest operation in the park has been embraced by the public. The full impacts of the operation on the park should be assessed by Parks and Recreation at the end of the season, including: increased automobile traffic; foot traffic around the dock and Nature Center and between the dock and the overflow parking area; litter; and other impacts on habitat values, particularly those that led to the designation as BioMap2 Core Habitat. Proposed future expansion of the rental program will also need be carefully considered.