

**DRAFT**

**LAND MANAGEMENT PLAN FOR**

**Greenways  
Conservation Area**

**IN**

**WAYLAND, MASSACHUSETTS**



**Prepared for the Wayland Conservation Commission and  
the Sudbury Valley Trustees**

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## Section 1: Introduction

The intent of this plan is to provide management recommendations for the Greenways Conservation Area in Wayland that foster ecological values, passive recreational uses, and aesthetic qualities. The site includes areas of forest, wetlands, and significant areas of managed grasslands and shrublands. The plan will address management of the upland forested areas, wetlands, open areas for grassland and shrubland birds, efforts to control invasive species, other habitat enhancement opportunities, and management of passive recreation uses. It will also provide a comprehensive approach for management of the area across jurisdictional boundaries and include an assessment of the existing trail system.

### 1.1 – History

Native Americans lived in the Wayland area for thousands of years. They had settlements along the Sudbury River where they fished, and they hunted game in the rich floodplains and uplands. The colonists began to settle the area in 1638. They chose farm sites along the river for the same reasons as the Native Americans – the rich abundance of natural resources. They cleared much of the land for crops, hay, and pastures. Stonewalls throughout the Greenways Conservation Area are testimony to the land being completely cleared by the early 1800s. By 1905 there were 866 cows in Wayland and hay and pasture were major uses of land. European grasses such as timothy and orchard grass, found today in the fields of the Greenways Conservation Area, were planted to provide feed for the dairy cows. Much of the area that is now Greenways was owned and farmed by the Johnson family. The best soils would have been used for crops or hayfields while the rockier soils would have been used as pasture. The steepest and stoniest soils would have been let go back to forest.

By the early 1900s farm estates began to be developed by wealthy Bostonians, more as an amenity than a means of making a living from the land. Francis Shaw bought more than 800 acres, including the land that had been owned by the Johnson family. He sold 200+ acres on the west side of Route 126 to Edwin Farnham Green (for whom Green Way is named) who built a brick mansion and developed gardens with a view to the river. A 1909 map of the area shows fields and woods much as they appear today. Green sold the land to Frank Paine in 1926 and it became known as the Paine Estate. After Mrs. Paine died the estate was sold to the Town of Wayland and the Sudbury Valley Trustees. The mansion is now part of Traditions of Wayland, a senior care facility.

## Section 2: Land Management Plan Goals

The main management goals for this property are to improve the habitat value for species that require grasslands or shrublands to fulfill all or a portion of their life cycle and to achieve this while allowing visitor use of the property.

## 2.1 – Greenways Conservation Area Goals and Challenges:

Objectives for the site are to:

- enhance grassland fields and shrublands to improve habitat for birds and pollinators,
- improve the habitat values for a diversity of species,
- maintain forest and wetland habitats,
- identify other species that could be attracted to Greenways grasslands, shrublands and forests,
- assess condition of existing access / trails to identify any issues and recommend improvements,
- develop a grassland mowing and shrubland maintenance schedule / timetable,
- suggest how to mitigate the negative effects of dogs (waste, wildlife disturbance, erosion, etc.), and
- recommend methods to manage invasive species.

Challenges include

- maintaining mowing and shrubland management to enhance habitat
- controlling invasive species
- balancing the uses between natural resources conservation, passive recreation, and use by dog walkers

Recommendations for addressing these goals and challenges are detailed below.

## Section 3: Property Description

### 3.1 – Site Setting and Context

Greenways Conservation Area is a portion of the former Paine Estate, purchased by SVT and the Town of Wayland in 1995, with assistance from the Massachusetts Department of Conservation and Recreation (MassDCR). Historic sites, woods, open fields, wetlands, and almost one-half mile of shoreline on the Sudbury River make Greenways a remarkable place. Visitors can explore nearly two miles of trails, many of them old cart paths. The Greenways Conservation Area consists of 124 acres, 88 acres are permanently protected for conservation, the other 36 acres are assigned to general municipal and recreation. The Sudbury Valley Trustees (SVT) owns 63 acres of the protected conservation area – primarily wetlands. The Massachusetts Department of Conservation and Recreation owns a Conservation Restriction over the entirety of SVT's property.

The privately owned Noyes-Parris House (c1690), the oldest extant house in Wayland, is surrounded by the Conservation Area. It and its barn are protected by a preservation restriction held by the Wayland Historical Society.

The close juxtaposition of the conservation area's fields and shrublands (38 acres), varied upland forest types (45 acres), wetlands and wet meadows (41 acres), and at least three vernal pools, with the Sudbury River, Great Meadows National Wildlife Refuge, Heard Farm Conservation Area and Heard

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Pond, and its proximity to other open spaces is a boon to wildlife and visitors. More than 200 species of birds have been recorded at the Heard Farm Conservation Area across the River and more than 130 have been recorded at Greenways. The northern half of Greenways is designated as part of a Massachusetts Noteworthy Scenic Landscape and the river is designated as a National Wild and Scenic River. These factors confirm the state-wide and national ecological and scenic significance of the site.



*Figure 1 – Greenways Conservation Area and Vicinity*

The more than two miles of trails allow access to field, forest, and wetland habitats. Access into the property is from the small parking area at the end of Green Way. The 124 acres, just minutes away from the center of town, is highly valued for the passive recreational opportunities they provide to the surrounding community. Any use for more active recreation needs to be balanced with preserving the diversity of habitats favored by a great variety of wildlife and visitors seeking a respite from their hectic lives. Examples for balancing use and preservation include maintaining mowed trails that hug the forest edge to minimize disturbance to grassland bird nesting habitat, as well as smart meadow management including late season mowing and leash law enforcement for dog walkers especially during the nesting season.





### 3.2 – Ecological Features

An extensive and detailed natural resource inventory and stewardship plan for the Greenways Conservation Area was prepared in 1996-7 by Francis H. Clark (botanist) and Bryan S. Windmiller, Ph. D (wildlife biologist)<sup>1</sup>. This current report will summarize and update some of their work but cannot fully replicate their much more extensive effort that took more than a year to complete and involved several volunteers. Any management going ahead should be done with their report as a resource.

The site includes a variety of significant ecological features, including physical features such as topography and soils, and natural habitats.

#### 3.2a – Topography

As seen in Figure 3, the Greenways Conservation Area has mostly gentle slopes running from just over 186 feet in the South Woods and 144 feet near the parking lot and sloping down to the Great Meadows National Wildlife Refuge along the Sudbury River at 120 feet. There are some slopes up to 15% in the South Woods. The relative lack of steep slopes on the property, make it suitable for trails around the

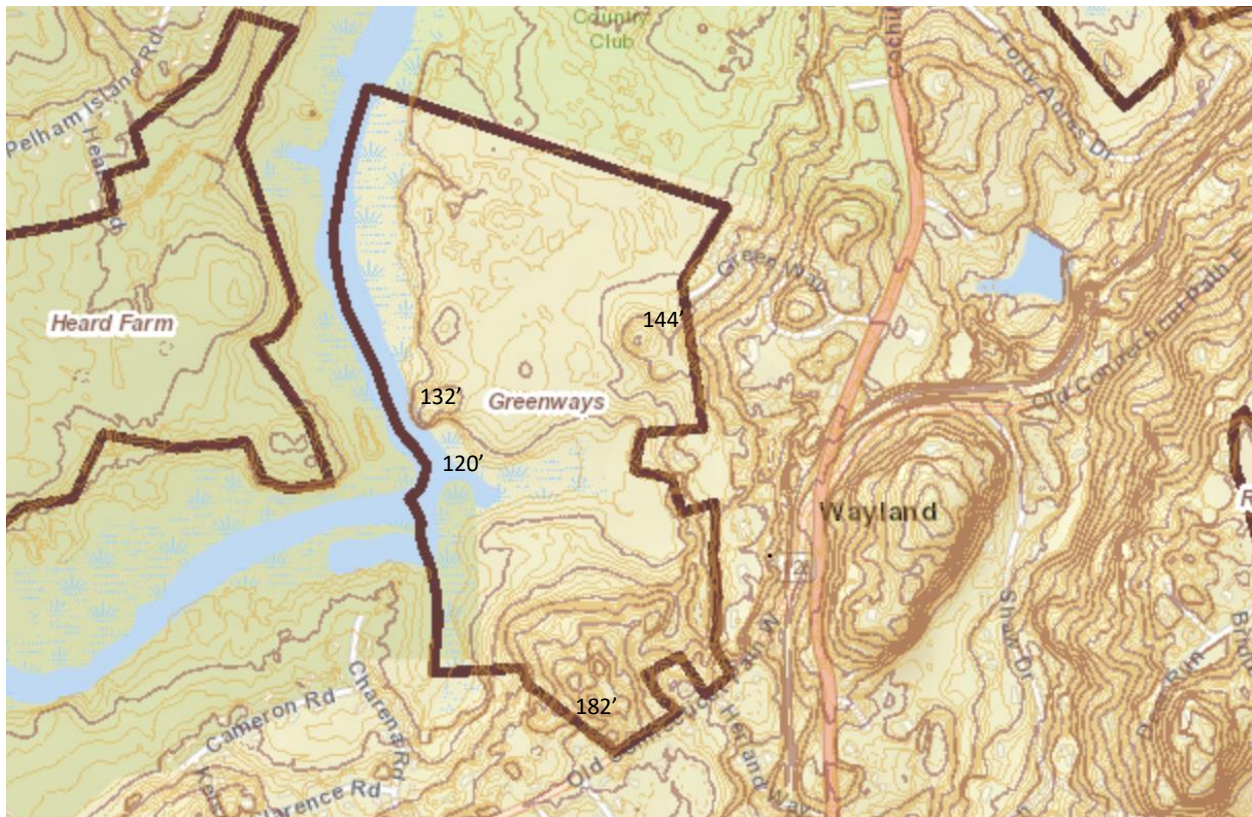


Figure 3 – Topography

<sup>1</sup> Clark, Francis H. and Windmiller, Bryan S. Greenways Conservation Area – Natural Resource Inventory & Stewardship Plan, prepared for Sudbury Valley Trustees and Town of Wayland, January 1997.

field edges and through the wooded sections. A Knoll overlooking the Sudbury River has an elevation of 132 feet. Water drains from the higher areas toward the Sudbury River and its floodplain. There are two streams that run through the property; one fed by springs near the South Woods and another that originates of the property near Charena Road.

### 3.2b – Soils

Soil texture is classified by the relative composition of clay, silt and sand particles. Sandy soils tend to be well-drained and nutrient poor. Silt laden soils are described as “dusty” and commonly found in floodplains. Clay soils are typically poorly drained and are often heavy, dense, and sticky; conditions that limit root growth in some plants. Ideal agricultural soil, a “loam”, is a combination of sand, silt and clay with moderate drainage and nutrient availability, and density conducive to root growth and microbial community colonization. Loamy soils can retain moisture but drain moderately well so the soils do not remain saturated for longer periods of time. Most of the soils at the Greenways are high quality agricultural soils.

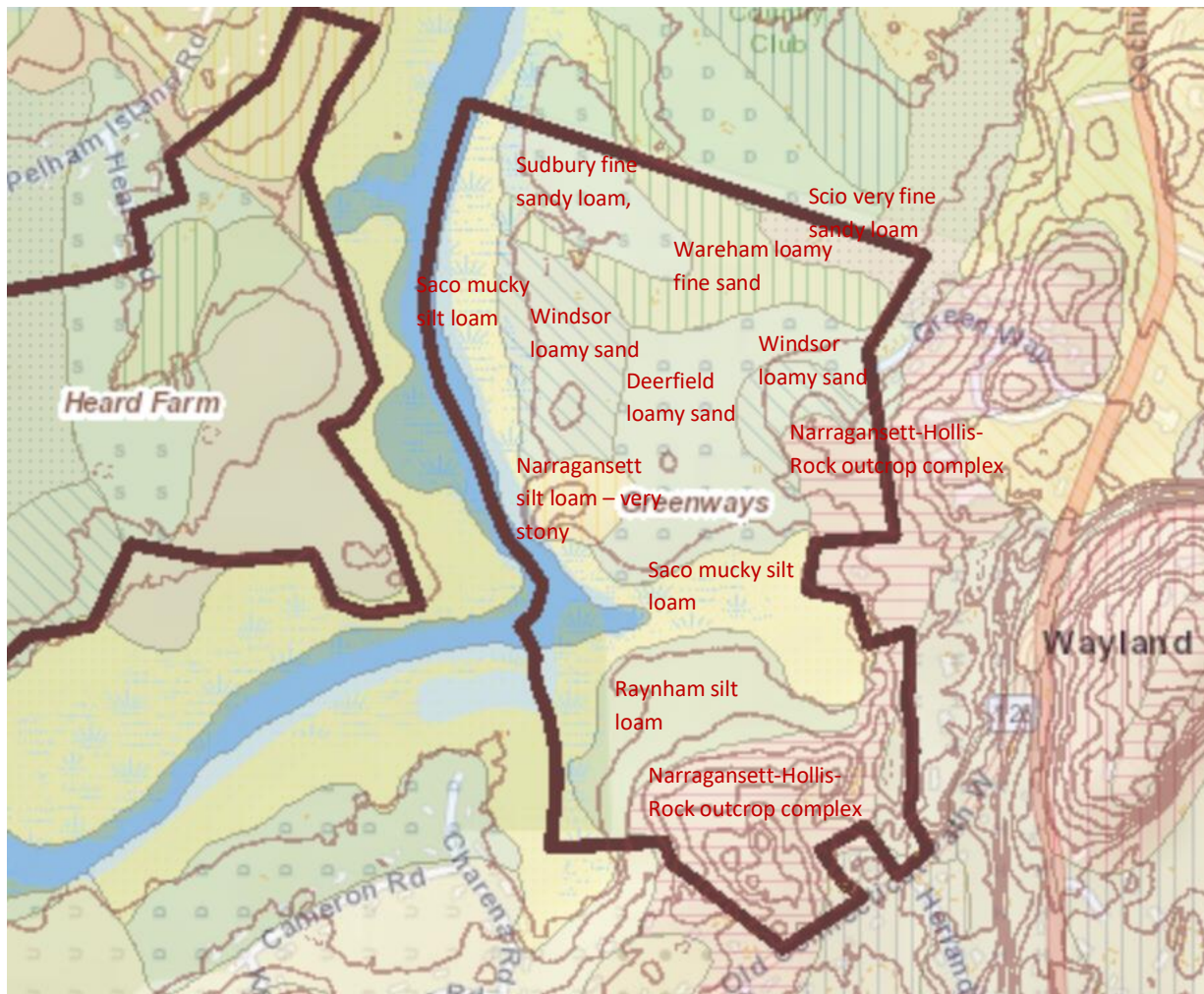


Figure 4 – Soils

Soils at Greenways include both poorly drained mucks (along the perimeter, adjacent to the Sudbury River), rich in organic material from decaying wetland plants, and moderately drained sandy loams (Figure 4). Some of the sandy loams (Winsor soils types) are listed as “Prime Agricultural Soils” and are an important agricultural resource.

### *3.2c – Natural Communities*

Natural communities are divisions in plant communities based on conditions determined by the entire landscape. Soil composition, slope, aspect, elevation, and land use history are all factors that determine the distribution of natural communities on a site.

Greenways Conservation Area is comprised of a variety of fields and some areas of old fields turning to shrubs (a total of about 38 acres), mixed woodlands (about 45 acres), and wetlands (41 acres). See Figure 7 for a map of natural communities as described by Clark and Windmiller. Each will be discussed in more detail in the section on management.

### *3.2 d – Wildlife*

The Greenways Conservation Area includes Priority Habitats of Rare Species for American bittern (state endangered) and Eastern pond mussel as defined by the 14<sup>th</sup> edition of the Massachusetts Natural Heritage Atlas on its North-western edge abutting the Great Meadows National Wildlife Refuge. According to Mass. Department of Natural Heritage there are no certified vernal pools and ten potential vernal pools located in the North Woods portion of the site. The Clark/Windmiller inventory in 1996 examined twelve “ponded areas”, 7 in a cluster near the northern boundary of the site, 3 in the North Field, and 2 in the North Woods. Three of the 12 met criteria as vernal pools (Crescent Pool, Northern Pool NW-2, and North Field Pool #2 – see Figure 8). Two other pools contained facultative invertebrates and “might, in some years, marginally meet the biological criteria of vernal pool habitat.”<sup>2</sup>

#### *Mammals*

The 1997 Clark/Windmiller report recorded 13 relatively common mammal species. The most plentiful were meadow voles and short-tailed shrews. Larger mammals included deer, coyote, and red fox. Other species included Eastern chipmunk, Eastern gray squirrel, raccoon, red squirrel, woodchuck, and hairy-tailed mole. Mink and river otters were suspected to be present but were not confirmed by sightings or signs.

#### *Birds*

Greenways Conservation Area is a Cornell University eBird “hot spot” and birders have reported a total of 136 species there since 2001 (see Appendix C for the entire list). Among the more notable species were barred owl, black-billed cuckoo, Northern rough-winged swallow, American woodcock, Savannah sparrow and bobolink. Woodcock are known to breed at the site most years and bobolink are regularly seen early in the season, but have not been known to breed regularly at Greenways, though they are

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<sup>2</sup> Clark and Windmiller: Greenways – Stewardship Report page 2.20.

regularly breeding at Heard Farm Conservation Area on the other side of the river. Both screech owls and great-horned owls were heard at Greenways Conservation Area during the Mass Audubon Bird-at-Home-A-Thon in May 2020 by George Bennett<sup>3</sup>.

Forests, wetlands, shrublands, and fields are critical wildlife habitats that are essential for the survival of many wildlife species. The loss of these habitats through conversion to other land uses, residential development or through succession, is resulting in the decline and disappearance of some wildlife dependent on early-successional habitats. See Mass Audubon's report on the State of The Birds for more details on these declines (<https://www.massaudubon.org/our-conservation-work/wildlife-research-conservation/statewide-bird-monitoring/state-of-the-birds>).

The 1997 report recorded 88 total species of birds. There were 52 species of birds during the nesting season with 37 probable breeders. 2010 to 2020 Cornell University eBird data has shown the presence of a total of 132 species and 74 species during the ten breeding seasons.



Figure 5 – American Woodcock

The Sudbury Valley Trustees conducted Breeding Bird Surveys for several years between 2005 and 2015, including listening points in the North Field, the North Woods, and the Central Fields (See Appendix C for complete list). Bobolinks were observed during the breeding season in the Central

Fields in 2007, 2008, and 2015. Baltimore orioles and rose-breasted grosbeaks were consistently present and forest nesting birds including ovenbird and scarlet tanager were sparse. Yellow-billed cuckoo was present in 2015.

### Grassland Birds

As noted above, grassland species including bobolink, American woodcock, and savannah sparrow, have all been reported at the site. American woodcocks appear to regularly nest at Greenways. All these species have seen dramatic declines in the Northeast and the rest of the country as the amount of farmland has decreased.

### Shrubland Birds

Shrubland species including Eastern towhee, alder flycatcher, blue-winged warbler, brown thrasher, and white-throated sparrow have all been reported at Greenways. All these species have seen dramatic declines in the Northeast and the rest of the country as the amount of shrubland has decreased.

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<sup>3</sup> Personal communication  
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### Forest Birds

Forest species including wood thrush, Canada warbler, Eastern wood peewee, and ovenbird have all been reported at Greenways. These species too have seen dramatic declines in the Northeast.

### *Fish, Amphibians, and Reptiles*

The 1997 Clark/Windmill report noted the presence of blue-gill sunfish and chain pickerel in the river near the Knoll. Largemouth bass, pumpkinseed sunfish, redbfin pickerel, white sucker, black crappie, and Northern pike are among other fish that are regularly observed in the Sudbury River.

The same report noted 11 of the 12 relatively common species of amphibians that normally occur in the Sudbury Valley, including wood frog, green frog, American toad, leopard frog, pickerel frog, and grey treefrog. These also included a large population of spotted salamanders and a two-lined salamander. The report also noted two species of reptiles, Eastern garter snake and painted turtle. Northern water snake, milk snake, stinkpot, and common snapping turtle were also noted as likely to occur. An updated inventory of amphibians and reptiles would be a good citizen science project.



Figure 6 - Spotted Salamander

### *Invertebrates*

SVT's management of the North Field has restored the high diversity of butterflies that had been found there in 1997. The butterfly diversity had plummeted in 2000s but the removal of buckthorn and plantings of native plants has helped the invertebrate diversity to rebound. The Hundreds of species of insects and other invertebrates are likely to occur at Greenways. An inventory done in 2015 recorded 31 species of butterflies (see [Appendix X](#) for the lists) again with the highest diversity in the North Field.

The 1997 report recorded the presence of 17 species of dragonflies and damselflies and proposed that a more intensive inventory would likely identify 30 species. A population of sand dragon on the Sudbury River beach was a highlight.

The report also noted that the Greenways fields supported huge populations of red-legged grasshoppers. Carolina locusts, striped ground crickets, field crickets, and snowy tree crickets were also noted as seasonally abundant.

### 3.3: Permitted Uses

Greenways Conservation Area is open for the public to enjoy multiple passive use opportunities including walking, hiking, Nordic skiing, snowshoeing, and wildlife watching. According to the town website, on leash dog walking is also permitted with the following restrictions:

- All dogs must be leashed in parking lots and conservation areas;
- For the safety of nesting birds, all dogs must be leashed on prime grassland birding sites (Heard Farm and Cow Common<sup>4</sup>) from May 1-July 15 or until the fields are mowed; NOTE: Greenways Conservation Area should be added>
- All dogs must be leashed or under voice control at all times;
- Visitors are allowed up to 3 dogs per person, but only 2 may be off leash at one time;
- Please keep your dogs on the trails for the safety of the area's wildlife and field nesting sites;
- Please bring plastic bags to pick up and properly dispose of all dog waste;
- Please leash your dogs when encountering other dogs or people, especially children.

### 3.4: Safety Concerns

There are few concerns about public safety relating to the condition of the property. The open fields could host stinging insects and ticks. Poison ivy was readily observed in the fields, forest understory, and along the forest edges. Given the trails are along the field edges and within the forest, special efforts should be made after high wind events to survey the trails for fallen trees and hanging branches overhead and remove any hazards identified. Some old farm equipment and an old cistern in the South Woods are potential hazards.

Concerns have been raised about aggressive or uncontrolled dogs. The Town of Weston in cooperation with the Sudbury Valley Trustees recruited volunteer "Bark Rangers" to walk some of the town's trails and spread the message about the negative impacts dogs can have on wildlife, water quality, and other visitors. Bark Rangers encouraged trail walkers to keep dogs under their command and on the trails and to "scoop the poop".

Hunting is not allowed on town conservation land but is allowed within the Great Meadows National Wildlife Refuge. Trail walkers should take care during the hunting season, especially near the perimeter of the site.

There have been occasional blooms of cyano-bacteria in ponds and other waterways. These bacteria can be a deadly danger for dogs and dog-walkers should be aware.

### 3.5: Threats and Opportunities

Invasive species pose one of the main threats to ecological integrity of the Greenways Conservation Area. Glossy buckthorn, common buckthorn, oriental bittersweet, bush honeysuckle, and multiflora rose edge the forest and grassland interface. Glossy buckthorn is the main invasive growing in the forest understory. Multiflora rose, oriental bittersweet, and buckthorns are also present in the fields.

Enforcing the regulations on dogs is another challenge. It is important to assure that dogs are kept on leash during the grassland bird breeding season. Measures to improve enforcement will be addressed in the section on management.

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<sup>4</sup> Note: Cow Common is located on Old Sudbury Road about 1 mile north of Heard Farm on the Sudbury River.  
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Another challenge for management is the mixture of ownerships and jurisdictions at Greenways Conservation Area. The Sudbury Valley Trustees own 63 acres of permanently protected conservation land including the North Field, a portion of the North Woods, and all the wetlands. The Wayland Conservation Commission manages some permanently protected land assigned to them (25.4 acres). Other land under the jurisdiction of the Board of Selectmen (26.4 acres) has been largely neglected because of a lack of resources. A portion of the 25.4 acres assigned to and managed by the Conservation Commission is assigned to the Recreation Commission (10.1 acres that is that is earmarked for future development). Limited resources for land management and the knowledge that these unprotected portions of the site (a total of 35.5 acres) could be lost to future development do not leave much incentive for stewarding the land as if its future were to always be a natural area and ecological asset for the community. Such future development would also greatly fragment and degrade the ecological values of the permanently protected land owned and managed by the Sudbury Valley Trustees and the Conservation Commission.

The Greenways Conservation Area is an extremely popular site for passive recreation at all seasons. This is an important opportunity to engage the public.

## **Section 4: General Management Recommendations**

The following recommendations will describe land management in a time of climate change, past management efforts, management of the fields for grassland and shrubland species, efforts to control invasive species, other wildlife enhancement opportunities, and management of passive recreation uses. It will also make recommendations for how the town and SVT can effectively coordinate management efforts.

### **4.1 – Management of Natural Areas in a Time of Changing Climate**

The management of natural resources has largely assumed a stable climatic background. Now there is widespread agreement among scientists that the climate is changing because of human activities – largely attributed to the burning of fossil fuels resulting in the production of carbon dioxide. Massachusetts is already experiencing the effects of climate change, from hotter Summers, warmer Winters with less snow cover, rising sea levels, more frequent severe weather events, and inland flooding.

Climate impacts that may affect open spaces are predicted to:

- increase the number of extremely hot days and degrade air quality
- compromise infrastructure like trails (e.g. more erosion, blowdowns, and flooding)
- increase the risks from storm events
- increase non-native plants and pests
- increase vector-borne illnesses (like West Nile and Lyme disease).

Some of these impacts are likely to affect the future management of conservation lands in complex ways. Manomet Center for Conservation Science and the Massachusetts Division of Fisheries and Wildlife have published a study<sup>5</sup> promoting two primary objectives for the management of sites and habitats – managing resilience and managing change. Unfortunately, the report does not address the management of grasslands and shrublands. Still, the concepts of resilience and managing change may be useful to keep in mind.

#### *4.1a – Management for Resilience and Managing Change*

Bob Wilber, Mass Audubon’s Director of Land Protection, recently articulated four principles for increasing the resilience of conservation land.<sup>6</sup>

1. **Reduce Non-climate Stressors** – for example, controlling invasive plants and pests.
2. **Restore Form and Function** – for example, removing a dam to promote spawning of anadromous fishes.
3. **Increase Complexity** – for example, increasing diversity and microclimates.
4. **Create Linkages** – for example connecting to adjacent land and creating corridors.

The previously mentioned Manomet report does make recommendations for forests and freshwater wetlands that are relevant for Greenways Conservation Area.

#### *Forested Habitats*

- **Diversify the age structure and species composition** of the forested landscape in advance of climate change could increase resilience of forested ecosystems and overall resistance to the impacts of a changing climate.
- **Control of white-tailed deer densities.** High levels of browsing by white-tailed deer have adversely affected the structure, composition, and functioning of Massachusetts forested ecosystems, particularly through the elimination of preferred food species such as Red Oak, and thereby reduced their diversity and resilience. Also, overgrazing by deer has opened the way for increased rates of infestation by non-native plants.
- **Control invasive species and pests.** Damage caused by non-native plants and insect pests will become more serious under climate change. Forest managers will need to:
  - detect and track infestations and outbreaks in their early stages, and
  - take aggressive actions to eliminate these problems before they escape control.
- **Manage change.** Past management has been primarily guided by the concept of preserving natural habitats and associated species. Adaptive management is recognizing that preserving

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<sup>5</sup> Manomet Center for Conservation Sciences & Massachusetts Division of Fisheries and Wildlife, Habitat Management, April 2010 (<https://www.manomet.org/wp-content/uploads/old-files/Climate%20Change%20and%20Massachusetts%20Fisheries%20and%20Wildlife%20Reports,%20Vol.%203%20April%202010.pdf>)

<sup>6</sup> Massachusetts Land Conference, Resilient Lands Webinar, May 5, 2020.



the *status quo* may not always be possible. When preservation of a habitat or species is no longer feasible, how do we adapt management practices to guide change? One answer may be to think about planting more southern species that will help maintain diversity or other ecological values. Much of the science of adaptive change still needs to be done.

### *Freshwater Wetlands*

The main threats to freshwater wetlands in Massachusetts are likely to be impaired hydrology and habitat loss, and ecological injuries caused by non-native pest species, the same threats that currently affect wetland quality and function. The regulations that currently protect wetlands have been extraordinarily successful. However, climate change may require us to rethink how these regulations are applied. Active management of wetlands may be an important tool under climate change. For example, it may become beneficial to alter wetland hydrology, or expand their boundaries. If such management is impeded by the way some regulations are currently applied, they may have to be modified to reflect changing circumstances.

**Control of Invasives.** It is likely that the problems that are currently posed by invasive plant species to wetlands will be exacerbated by the higher levels of environmental stress introduced by climate change (droughts, extreme events, etc.). To continue to protect valued wetlands will require three things:

- **More active monitoring.** It will be essential to detect pest outbreaks in their earlier stages, rather than later when they have secured a foothold. This can only be accomplished if active detection and monitoring schemes are implemented.
- **Aggressive control activities.** More resources will be needed to eliminate or control outbreaks of pests in their early stages.
- **Education on and enforcement of best management practices.** Many pests are transported from site to site by humans. To reduce this hazard, it will be necessary to educate users of wetland resources (e.g., anglers, hunters, nature viewers) about the dangers posed and to provide them with guidance and facilities to reduce off-site transport.

**Watershed Protection.** Wetlands are impacted by what happens within the entire watershed. The nexus of expanding human populations, land-use change, and climate change requires that we adopt a watershed focus when considering how to protect wetlands. Land protection within the watershed is also watershed protection.

## **4.2 – Description of Past Management Efforts**

Since the land was purchased in 1995 management efforts have been focused on maintaining fields and accommodating visitors. These management efforts have tended to be sporadic and limited by available resources.

### **4.2a – Forested Areas**

The 1997 Clark/Windmill report recommended clearing poison ivy from the edge of trails and monitoring invasive buckthorn. It also recommended closing off the trail down to the river from the

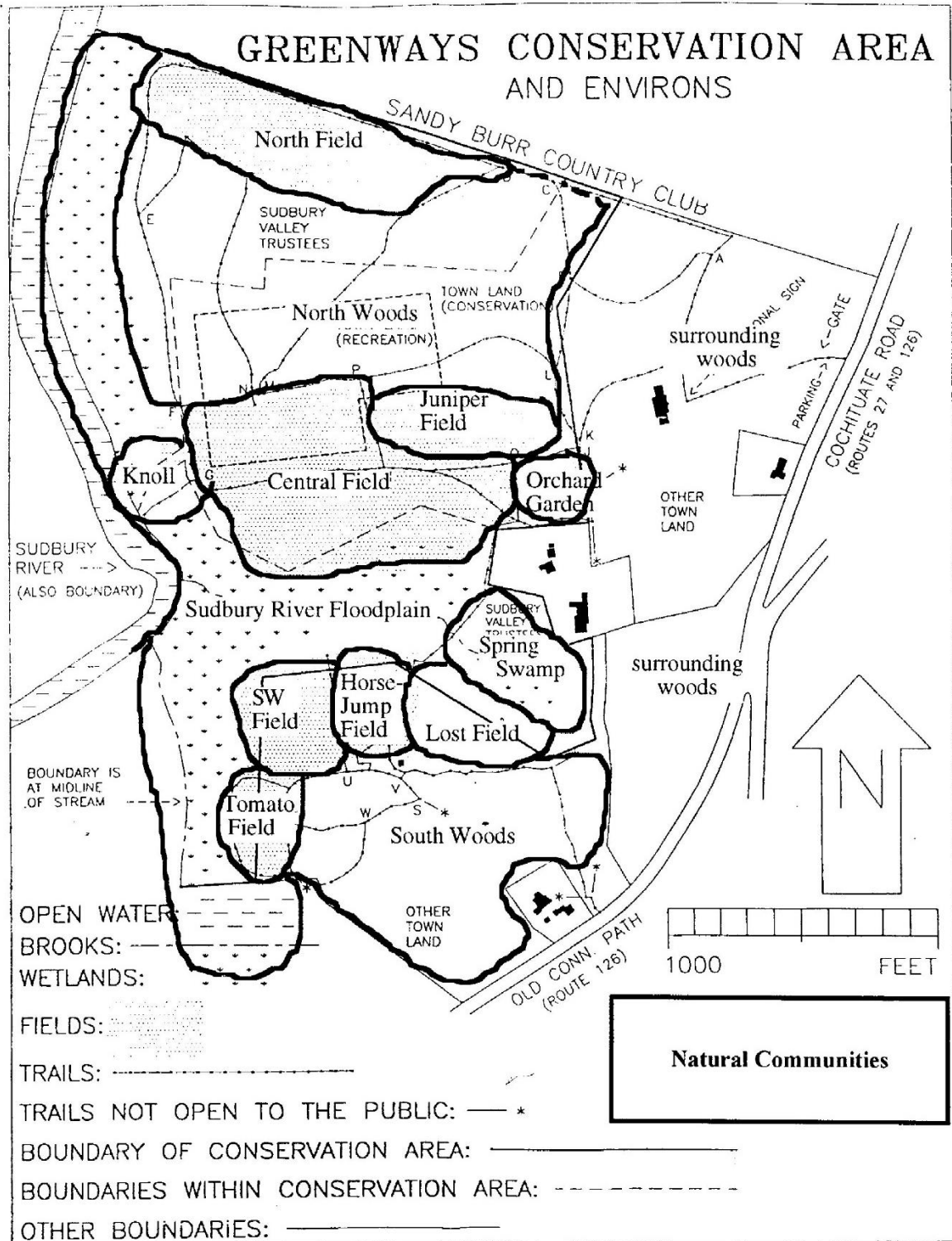


Figure 7 - Greenways Natural Communities - 1997

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Knoll as soon as the canoe landing was built and encouraging catbrier on the steep slopes because of the potential for soil erosion caused by visitor use; the installation of interpretive materials on the natural and cultural history of the Sudbury River at the Knoll overlook; and cleaning up some debris, etc., covering a cistern, and monitoring Norway maples and other exotics in the South Woods.

The canoe landing has been built and the trail down from the Knoll overlook is now blocked off and beginning to revegetate. Poison ivy along the trails and buckthorn are plentiful in most of the forested areas. Old farm equipment and debris are still to be found in the South Woods. The cistern is now covered with a loose steel plate that is easily removed, making the cistern a safety hazard.

#### *4.2b – Fields*

The Clark/Windmill report recommended mowing the North Field every two years, the Central Field three-times per year to control buckthorn and then once per year to encourage grassland birds, the Juniper Field once per year, and it recommended crops or community gardens for Horse-jump, Southwest, Tomato and Lost Fields.

Since Greenways was acquired by SVT and the town in 1995, field management has generally been inconsistent. Google Earth photos show all the fields as open and recently mowed in December 2001. By April 2004, fields still appeared to be recently mowed. By April 2005, the Central Field appears to have been recently mowed, but the other fields showed signs of shrub growth.

#### *North Field*

Since acquisition, SVT has mowed the north field approximately every year or every other year. In 2007, SVT hired a contractor to clear the substantial and mostly invasive plant shrubby borders to expand the field area. In 2012, SVT began a multi-year effort to improve plant diversity and to control and reduce the extent of invasive plants in the north field through chemical treatments. The invasive targets were predominantly glossy buckthorn and multiflora rose.

The field was mowed in June and that fall, certified applicators selectively treated glossy buckthorn and multiflora rose throughout the field. Also volunteers and certified applicators cut and dabbed buckthorn with herbicide in un-mowed portions of the field. A small patch of reed canary grass did not return after the mowing. The mowing followed by selective herbicide backpack spraying was repeated for three consecutive years focusing primarily glossy buckthorn, within the field and around the field perimeter. That effort yielded a greatly reduced extent of invasive plants in the field (approximately reduced by 85%).

A 25% glyphosate mixture was applied to cut stumps of large buckthorn around the perimeter of the field. Volunteers assisted by cutting the stems prior to certified applicators dabbing. The main field was mowed, and then re-sprouted bushes of buckthorn were sprayed with a 3% concentrate of glyphosate. Approximately half the field and perimeter areas were treated in the first year, then the other half in the second year. In the third year, a spot treatment using the spray technique was conducted over 70% of the field and field edges.

Overall, the invasive plant treatments took much longer than anticipated. A plant species assessment in 2014 demonstrated that the diversity had increased since the inception of the restoration in 2012.

In 2015, SVT began the introduction of native plants into the north field. They prepared two 30 x 30 ft. plots and planted 1,650 plants among the two plots. The plots were prepared by laying down cardboard mulch in the early spring to try to kill the existing plants, dominated by sensitive fern. Local boy scouts installed deer fencing around each plot to protect the new plants from herbivory.

Unfortunately, SVT found that when the cardboard was removed, although the sensitive fern was not flourishing, the roots and plants were still alive. In one plot, we dug out small areas to plant each plant plug. The other plot was rototilled completely. The planting in the tilled plot was much easier; however, growth results in both plots were similar. More weeding was required in the non-rototilled plot. Overall, SVT recommends rototilling prior to planting. If using cardboard, or other mulch, it would be more effective to mulch the plots for a full year before planting. (One could also use another method to kill existing vegetation in the plot, such as solarization with plastic.)

Plants were purchased from New England Wildflower Society based on recommendations by their field botanist. The native plants included *Asclepius syriaca* (common milkweed), *Doellingeria umbellata* (flat-topped aster), *Eutrochium maculatum* (spotted Joe-Pye weed), *Pycnanthemum tenuifolium* (narrowleaf mountain mint), *Solidago nemoralis* (gray goldenrod), *Symphotrichum novae-angliae* (New England aster), *Eragrostis spectabilis* (purple love grass), *Panicum virgatum* (switchgrass), and *Schizachyrium scoparium* (little blue-stem grass). Planting was conducted in the third week of June (upon delivery). Despite drought conditions, we achieved approximately 85% survival with most plants flowering this year. This success was attributed to good planting methods and many hours of staff and volunteer hours watering and weeding over the summer. Water was brought to the field in large barrels loaded on a pick-up truck, then the plants were watered with 5-gallon buckets. The labor over the summer was very intensive.

In 2015 and 2016, in consultation with the Massachusetts Butterfly Club and the Xerces Society, SVT prepared and planted one 20 x 25-foot plot and 10 small plots (5 x 5 ft) with an additional 800 native plants. Plants were chosen to provide nectar and pollen for native bees and other native pollinators.

After a lapse of almost three years (due to logistical hurdles) the field was mowed in winter 2019/2020.

### Central Fields

Along the southern border of the center fields and the northern and western border of the south fields, SVT conducted invasive plant control, primarily of glossy buckthorn and multiflora rose, over three years, 2013 – 2015. Treatments consisted of mowing followed by spraying regrowth and cut and paint applications to large shrubs. These treatments reduced invasive cover by approximately 85% in all habitat areas. In late fall 2013, the shrub swamp/field margins (10ft. wide) were mowed with tracked machinery. Then in late summer of 2014, the contractor went back and selectively treated invasive shrub regrowth with an herbicide application, using Garlon 3A (1.5%), Rodeo (2%), MSO, LI700 and a colorant (Bulls Eye). These chemicals are all wetland approved. Contractors conducted foliar spraying

from a tank system mounted on a truck and backpack sprayers. The first year's application was highly effective (85%). A spot treatment of the same area was conducted in the fall of 2015.

Between 2013 – 2015, the Town of Wayland conducted hand mechanical removal of shrubs and small trees in the hedgerow between the Juniper Field and the large Center Fields. The original idea to remove the entire hedge row was abandoned due concerns of public reaction to the cutting of large trees and the Town decided that it would prefer to keep the large trees.

In 2015, SVT and the Town of Wayland hired a contractor to clear the hedgerows (mostly invasive plants) from between the south fields. The town also mowed all the fields, South and Central.

## Section 5: Recommendations for Future Management

The following recommendations will address forest, wetland, shrubland and field management; control of invasive plants; wildlife enhancement measures; and passive recreation uses. A sperate section will include an assessment of the trail system.

Note that the 1997 Clark/Windmill report has much more detailed description of each management area with species lists of the plants and animal species they found in each area.

### 5.1 – Forest Management Recommendations

Clearing back poison ivy from trails, monitoring and control of most troublesome invasives (see Section 5.4), closing off a few trails, and cleaning up a couple of areas of old farm equipment, etc. were recommended for the forested areas in the 1997 Clark/Windmiller stewardship plan. There are still the remains of some rusted farm equipment in the South Woods that could pose a safety risk.

The only recommendation beyond these would be to consider a forest management plan prepared by a forester trained under the “Foresters for the Birds” program<sup>7</sup>. Such a plan

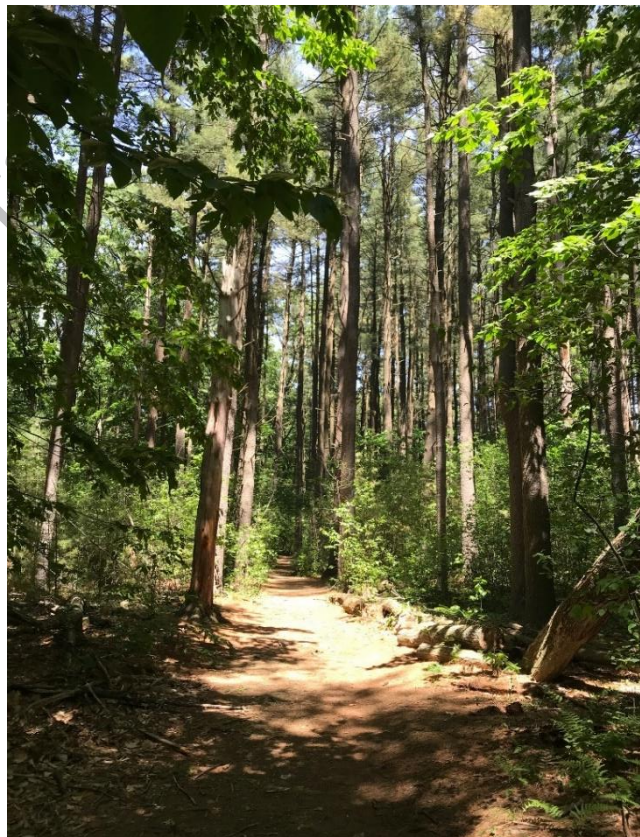


Figure 8 - North Woods

<sup>7</sup> <https://www.massaudubon.org/our-conservation-work/wildlife-research-conservation/forest-birds>

could pay for itself through income generated by a low-intensity harvest. In addition, the Massachusetts Department of Conservation and Recreation has a grant program to fund Forest Stewardship Plans.

**5.1a – North Woods**

The North Woods cover about 30 acres. There are three subareas: a large area of mixed woods (20+ acres) with red oak, red maple, American beech, and white pine; a smaller area with a white pine stand (some more than 80 feet tall) and a plantation of Norway spruce together covering about 4 acres; and a low-lying mixed forest area to the north with vernal pools and forested wetlands (dominated by red maple). A network of ditches indicate that the area was once cleared and drained.

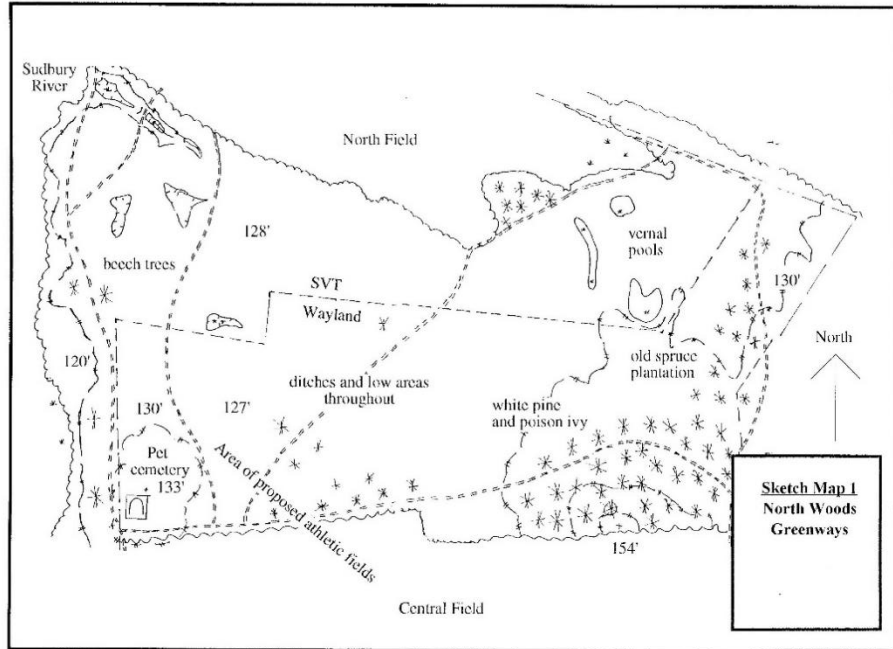


Figure 9 - North Woods

ditches indicate

The area is marginally large enough to provide habitat for a few forest-interior birds (wood thrush and wood peewee) and many generalist forest species. The forest near the vernal pools is critical habitat for spotted salamanders, wood frogs, grey tree frogs, and American toads.

Ownership is divided between the SVT and the town. The northern 1/3 of the forest is owned by SVT and the town owns the remainder. The town’s portion had been designated as potential new playing fields. The 2018 “Wayland Town-wide Recreation



Figure 10 - Proposed multi-purpose playing field

Facilities Strategic Plan”<sup>8</sup> has proposed one 240’ x 360’ multi-purpose field in the Center Field at the edge of the North Woods “to not disturb the wooded area”. It would include a gravel access driveway, a parking area with 23 spaces, and spectator bleachers and team benches. Such a development would greatly impact the aesthetic and ecological values of the Greenways Conservation Area and forever change the tranquility visitors have grown to value in the last 25 years. It is not hard to imagine how bringing cars and the noise of playing children and cheering spectators would change this area that is now much the same as it has been for the last 200+ years.

### 5.1b – Knoll

Owned by the SVT, the Knoll is covered by a mature stand of mixed deciduous trees including oaks, hickories, and beech. Many trees exceed 60 feet. The dry, well-drained soils limit the subcanopy to a sparse mixture of similar species and a variety of shrubs. The shade and dryness result in mostly bare ground that is easily eroded. The knoll at 132 feet slopes down to the river and its floodplain at 114 feet. Since 1995, a defined lookout with a picnic table has been installed, the pathway down to the beach has recently been blocked off, and an accessible canoe landing has been installed in the area indicated on the 1997 Sketch Map. After the installation of the canoe landing, SVT worked with volunteers on several iterations of plantings to stabilize the slope and increase native plant diversity. Recently SVT has planted lowbush blueberry and Pennsylvania sedge that has been doing well.

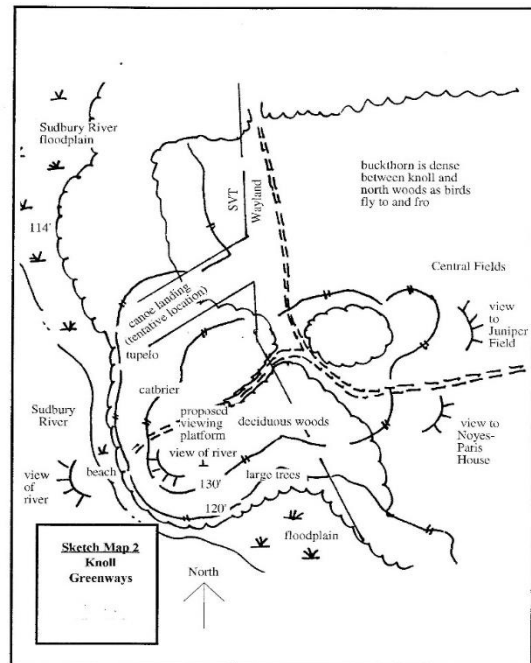


Figure 11 - Knoll

The Knoll has proven to be a destination for visitors. It offers overlooks of the fields to the east and the Sudbury River and its wetlands to the west. Controlling off-trail access remains a problem and efforts have included fencing and barriers. A “habitat restoration” sign or two might help (they were being installed on June 18, 2020). Also, the Clark/Windmiller report recommended some interpretive signage on the natural and cultural resources. Rather than an interpretive sign a QR code marker with a link to interpretive information would be an option that would be less costly and less prone to vandalism.

<sup>8</sup> <http://waylandrec.com/wp-content/uploads/2018/12/Wayland-Townwide-Rec-Strategic-Plan-FINAL-2.pdf>

### 5.1c – South Woods

The South Woods is a 19-acre stand of mixed deciduous trees and white pines. Oaks (black, red, scarlet, and white) white ash, mockernut hickory, pignut hickory, beech, paper birch, and hemlock are present. White pine dominates in the northern area with some with a 36" diameter. The varied topography and northern aspect give these woods a quite different feel from the North Woods. There is a varied understory with maple-leaved viburnum, black huckleberry, and blueberry. Poison ivy, buckthorn, bittersweet, Japanese barberry, and Norway maple are also present.



Figure 12 - South Woods

Some of the safety issues mentioned in the Clark/Windmill report have been partially addressed. Rusting farm equipment, and other debris remains, the dilapidated outbuildings were smashed, but the flattened ruins are now overgrown with Japanese knotweed. The cistern is loosely covered with a round steel plate that is easily removed and is a safety hazard. There is also what appears to be a deer stand near the cistern, that should be removed.

The South Woods are wholly owned by the Town of Wayland and are “reserved for future municipal purposes”, under the control of the Board of Selectmen. No ongoing resources have been allocated for its care. Landscape contractors are dumping yard waste and trimmings in the ravine where there is a vernal pool, along Henry Knox Road at the area’s eastern boundary. A “no dumping” sign and/or talking with the landowners may be warranted.

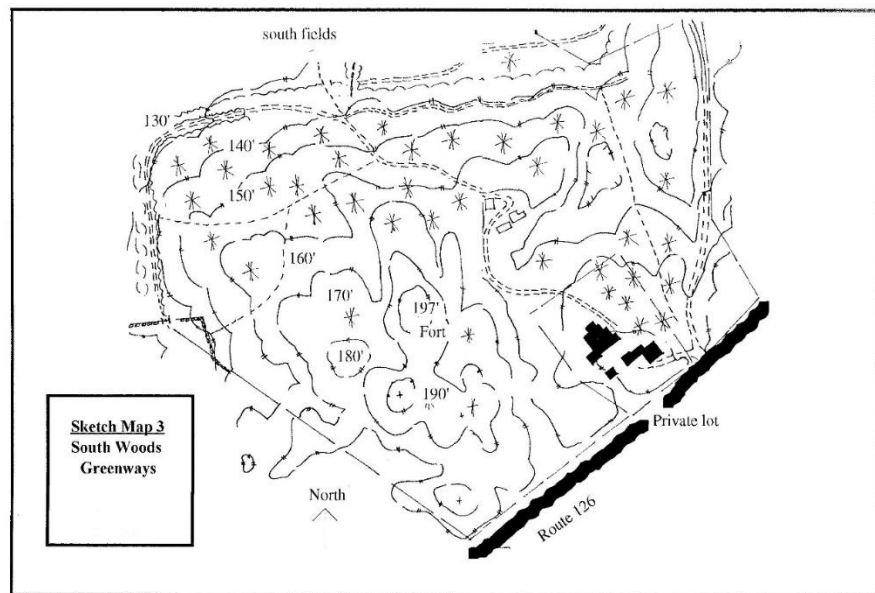


Figure 13 - South Woods



The 2017 Final Report of the Wayland Real Asset Planning Committee<sup>9</sup> recommended that the 26.4-acre parcel assigned for future municipal uses (including the South Woods and the town-owned adjacent fields) be developed as a multiple-use campus for town uses with a master plan before any construction.

## 5.2: Wetland Management Recommendations

The wetland areas at the Greenways Conservation Area are owned by the Sudbury Valley Trustees and the U. S. Fish and Wildlife Service as part of the Great Meadows National Wildlife Refuge. The Massachusetts Department of Environmental Management also holds a conservation restriction on the SVT owned parcels.

The 1997 Clark/Windmill report recommended managing the wetlands in coordination with the U. S. Fish and Wildlife Service to maximize wildlife protection and minimize incompatible uses. It also recommended a maximum buffer around the floodplain with only a single overlook from the Knoll and the canoe landing.

The Clark/Windmill report describes two wetland areas: the Sudbury River Floodplain and Spring Swamp, a red maple forested wetland.

### 5.2a – Sudbury River Floodplain

This area has a river edge floodplain forest of silver maple and red maple in the upper reaches that grade into a dense buttonbush shrub swamp. Other wetland plants include scattered sedges; royal, cinnamon, and sensitive ferns; silky dogwood; buckthorn; smartweeds; wool grass; duckweeds; and pondweeds. These wetlands support the



Figure 14 - Greenways wetland with abandoned beaver lodge

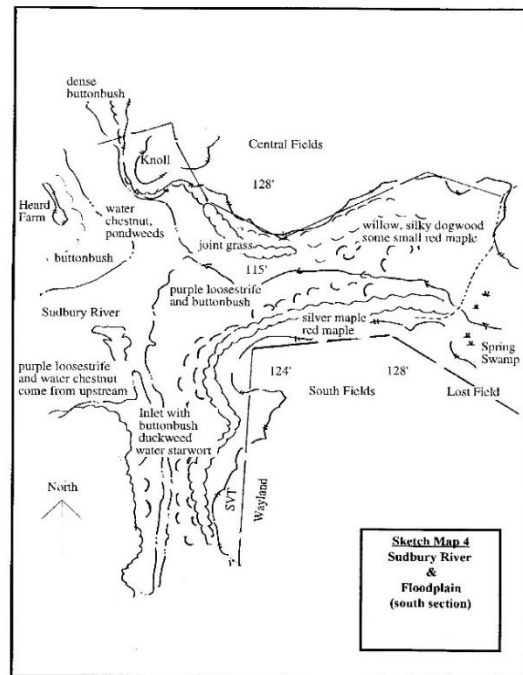


Figure 15 - Sudbury River Floodplain

<sup>9</sup> Wayland Real Asset Planning Committee, Final Report, June 2017.

<https://www.wayland.ma.us/sites/g/files/vyhlif4016/f/uploads/wrapfinaljune2017.pdf>

highest diversity of vertebrate species found at Greenways. Birds include red-winged blackbirds, common yellowthroats, warbling vireos, common grackles, willow flycatchers, and migrating warblers in the Spring and Fall. The river, designated as a Wild and Scenic River, is essential habitat for many ducks, geese, wading birds, and turtles. Coyote sign is plentiful in the adjacent fields and they hunt the wetlands. Mink, muskrats, star-nosed moles, bats, beavers, and river otters are also likely.

No management activities are recommended beyond monitoring and coordination with the U. S. Fish and Wildlife Service.

### 5.2b – Spring Swamp

This small red maple swamp along a spring-fed stream includes some white pine and white ash. The shrub layer is heavily infested with European buckthorn but also includes sweet pepperbush and young red maple and white ash. Skunk cabbage, hummocks of tussock sedge, marsh marigold, fox grape, jewelweed, and lush grouping of cinnamon and royal fern border along the boardwalk. During early Spring much of the swamp is flooded as part of the floodplain. Poison ivy is frequent, and one occurrence of poison sumac was noted in the 1997 inventory report, which also noted Pennsylvania bitter cress, swamp azalea, and winterberry.

The Clark/Windmill report recommended the boardwalk that now crosses the stream and is high enough to use in the Spring floods. It also recommended hand pulling of the invasive buckthorn. The buckthorn is still a concern as it crowds out native species.

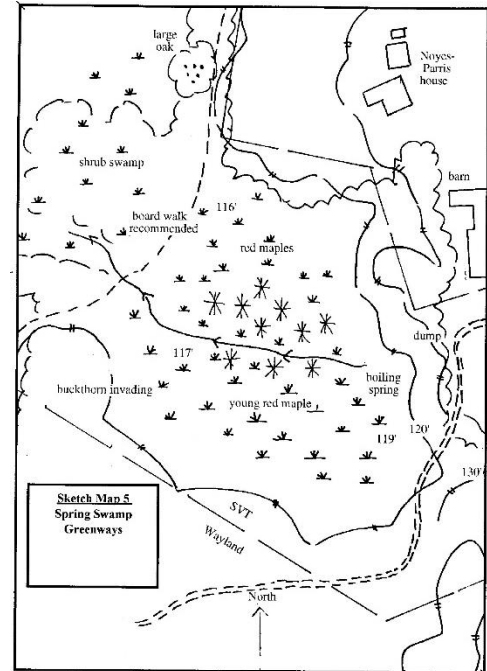


Figure 16 - Spring Swamp

### 5.3 – Shrubland and Grassland/Field Management Recommendations

Greenways Conservation Area presents a dilemma for managing field and shrubland habitats. Since 1997 when the Clark/Windmill report was prepared, many of the fields they recommended to be maintained or improved for grassland bird habitat have become shrublands. If left to grow these former fields will become forest. Only the North Field, Juniper Field, and part of the Central Field are now being consistently maintained as fields. As noted in Section 4.2 on past management, significant efforts to curtail the development of shrublands were applied in the western portion of the Central Field in 2013 - 2014 and the Southwest Field, Horse Jump Field, and Tomato Field in 2014. Afterwards the mowing regime that would have been required to maintain these areas as fields was not continued and they are now once again shrublands. Lost Field was utterly lost as a field in 1997 and is now an impenetrable thicket that serves as a seed source for buckthorn, bittersweet, and multiflora rose. It serves as a warning of what will happen if fields and shrublands are not actively maintained.

Both types of habitat have values for different species of wildlife. Of 40 bird species associated with shrubland habitats, 22 are undergoing significant population declines in eastern North America (Table 1). Additionally, 139 species of reptiles, amphibians, birds, and mammals either prefer (17 species) or utilize (122 species) shrub and old-field habitats. Shrubland habitats in the Northeast also contain higher proportions of state-listed butterflies and moths than other natural community types. Of 3,500 species of butterflies and moths in the Northeast, 58 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 are considered rare.

On the other hand, grassland-nesting birds are among the most imperiled birds in the nation. Between 1966 and 2012, these species experienced steeper, more consistent, and more widespread population declines than any other group in North America. These declines have been the direct result of three factors:

- the conversion of grassland habitat to other uses;
- the natural reversion of grassland to forest; and
- the intensification of agricultural practices on the grasslands that remain.

The New England Grassland Bird Resurvey Project<sup>10</sup> compared recent surveys of grassland birds with similar surveys done in the 1990s. They found that 8 of the 9 species surveyed were detected at an average of 41% fewer sites in 2015 compared to the 1990s. The ninth species, Upland Sandpiper, was found in only 4% of the sites where they were previously found. Eastern Meadowlark site occupancy had declined by 76%. Losses of grassland birds from sites were most severe in Connecticut and Massachusetts. These surveys provide concrete evidence for declines in grassland bird populations in New England.

In addition to seven species of state-listed birds, Massachusetts grasslands also provide habitat for nine species of state-listed moths and butterflies, 38 species of state-listed plants, and a variety of wildlife both rare and common.

The grasslands at Greenways Conservation Area have provided habitat for Northern bobwhite and American woodcock, both are known to be declining in Massachusetts. Bobwhites generally prefer hayfields and are more abundant at the Heard Farm Conservation Area on the other side of the river. Woodcocks prefer habitat that is less open and more structurally complex, with shrubs and young trees distributed in scattered patches throughout the grassland

Fortunately, we have the tools and knowledge to halt the decline of grassland birds. Mowing grasslands on conservation land before May 15 and after August 15 is key. For a general discussion of field

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<sup>10</sup> <https://vtcostudies.org/projects/grasslands/new-england-grassland-bird-re-survey/>

Table 1 - Selected list of wildlife that use shrubland and old field habitats, including seasonal use and population trends in New England - from DeGraaf and Yamasaki 2001<sup>11</sup> with an added column indication Massachusetts status

Common Name	Habitat Preference <sup>a</sup>	Seasonal Use <sup>b</sup>	Population Trend <sup>c</sup>	State Status <sup>d</sup>
Spotted turtle	Preferred	B/NB	Locally common	Non-listed
Black rat snake	Preferred	B/NB	Locally common	Endangered
<b>Northern harrier</b>	<b>Utilized</b>	<b>W</b>	<b>Decreasing</b>	<b>Threatened</b>
<b>American kestrel</b>	<b>Utilized</b>	<b>W</b>	<b>Decreasing</b>	<b>Non-listed</b>
Ring-necked pheasant	Preferred	B/W	-----	Non-listed
<b>Northern bobwhite</b>	<b>Utilized</b>	<b>B/W</b>	<b>Decreasing</b>	<b>Non-listed</b>
<b>American woodcock</b>	<b>Utilized</b>	<b>B</b>	<b>Decreasing</b>	<b>Non-listed</b>
<b>Mourning dove</b>	<b>Utilized</b>	<b>B/W</b>	<b>Decreasing</b>	<b>Non-listed</b>
<b>Black-billed cuckoo</b>	<b>Utilized</b>	<b>B</b>	<b>Decreasing</b>	<b>Non-listed</b>
<b>Yellow-billed cuckoo</b>	<b>Utilized</b>	<b>B</b>	<b>Decreasing</b>	<b>Non-listed</b>
Common nighthawk	Utilized	B	Decreasing	Non-listed
Whip-poor-will	Utilized	B	Decreasing	Special Concern
<b>Willow flycatcher</b>	<b>Preferred</b>	<b>B</b>	<b>Trend Uncertain</b>	<b>Non-listed</b>
<b>Eastern kingbird</b>	<b>Utilized</b>	<b>B</b>	<b>Decreasing</b>	<b>Non-listed</b>
Loggerhead shrike	Utilized	B	Decreasing	Non-listed
<b>Northern mockingbird</b>	<b>Preferred</b>	<b>B/W</b>	-----	<b>Non-listed</b>
<b>Blue-winged warbler</b>	<b>Preferred</b>	<b>B</b>	<b>Stable</b>	<b>Non-listed</b>
Golden-winged warbler	Preferred	B	Decreasing	Endangered
<b>Chestnut-sided warbler</b>	<b>Utilized</b>	<b>B</b>	<b>Decreasing</b>	<b>Non-listed</b>
Prairie warbler	Preferred	B	Decreasing	Non-listed
Mourning warbler	Utilized	B	Decreasing	Special Concern
<b>Common yellowthroat</b>	<b>Utilized</b>	<b>B</b>	<b>Decreasing</b>	<b>Non-listed</b>
Yellow-breasted chat	Utilized	B	Decreasing	Non-listed
<b>American tree sparrow</b>	<b>Utilized</b>	<b>W</b>	<b>Decreasing</b>	<b>Non-listed</b>
<b>Field sparrow</b>	<b>Utilized</b>	<b>B/W</b>	<b>Decreasing</b>	<b>Non-listed</b>
Vesper sparrow	Utilized	B	Decreasing	Threatened
<b>Fox sparrow</b>	<b>Preferred</b>	<b>W</b>	<b>Stable</b>	<b>Non-listed</b>
<b>Song sparrow</b>	<b>Preferred</b>	<b>B/W</b>	-----	<b>Non-listed</b>
<b>White-throated sparrow</b>	<b>Preferred</b>	<b>B/W</b>	<b>Decreasing</b>	<b>Non-listed</b>
<b>American goldfinch</b>	<b>Utilized</b>	<b>B/W</b>	<b>Decreasing</b>	<b>Non-listed</b>
<b>Eastern cottontail</b>	<b>Preferred</b>	<b>B/W</b>	<b>Common</b>	<b>Non-listed</b>
New England cottontail	Preferred	B/W	Rare	Non-listed
Snowshoe hare	Preferred	B/W	Common	Non-listed
<b>White-footed mouse</b>	<b>Preferred</b>	<b>B/W</b>	<b>Common</b>	<b>Non-listed</b>
Ermine	Preferred	B/W	Common	Non-listed

<sup>a</sup> Habitat Preference as described by DeGraaf and Yamasaki (2001)

<sup>b</sup> Seasonal use of habitats: B = Breeding. NB = Non-breeding. W= Wintering, as described by Degraaf and Yamasaki (2001)

<sup>c</sup> Continental population trend taken from Breeding Bird Survey data for avian species (Hunter et al. 2001); New England status after Degraaf and Yamasaki (2001)

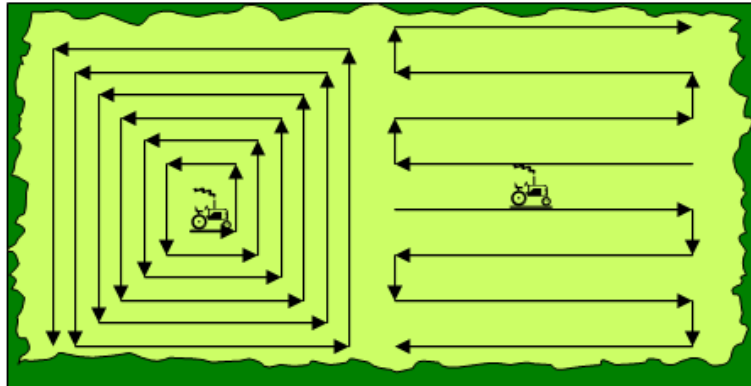
<sup>dd</sup> State Status from Massachusetts Endangered Species Program (2020)

**Bold** indicates species that have been recorded at Greenways.

<sup>11</sup> DeGraaf, R.M. and M. Yamasaki. 2001. New England wildlife: habitat, natural history, and distribution. University Press of New England, Hanover, NH. 482 pp.

management for grassland birds see Mass Audubon's report [Best Management Practices for Nesting Grassland Birds](#)<sup>12</sup>.

How the mowing is done also influences the wildlife. Mowing from the outside toward the center has the potential to trap small mammals, fledgling birds, reptiles, and amphibians in the center. Mowing from the middle and working outward allows more wildlife to have a chance to escape.



*Figure 17 - When mowing start in the middle and work outward.*

Another measure to assure the maximum area for species that prefer old fields and shrublands is to keep pushing back the edges and/or removing tree lines and trails that fragment, separate, or reduce the fields. Trees and shrubs along the interface between the fields and the forests are always seeking more sun by trying to grow out into or overhang the field edges. It is important to keep this from happening by trimming back the branches of the trees and shrubs. Another means to improve the fields and shrublands for nesting birds is to eliminate trails that fragment them and keep trails on the edges of these habitats.

Both grasslands and shrublands require management. Grasslands must be mowed at least every other year, or they become shrublands. Shrublands also must be maintained in shrubby growth (e.g. periodically removing tree saplings and invasive species) or they will become forests. Grasslands/fields need to be mowed with a tractor in a time window between August 15 and May 15, but usually cannot be mowed in the Winter. Shrublands can be maintained with hand tools pretty much any time of year. A general rule-of-thumb is to cut shrubs when their diameter is between 1" to 1-1/2" inch. The stems of buckthorn and other invasives should then be treated with an herbicide to keep them from re-sprouting. Each of the fields/ shrublands will be discussed in the following. An alternative for maintaining shrublands is to contract to mow them with large machinery approximately every 7 to 9 years.

<sup>12</sup> [https://www.massaudubon.org/content/download/19413/274073/file/Best-Management-Practices\\_Grasslands.pdf](https://www.massaudubon.org/content/download/19413/274073/file/Best-Management-Practices_Grasslands.pdf)

### 5.3a – North Field

Owned by the Sudbury Valley Trustees, the 8-acre North Field has had the most consistent management since 1995. Most years it has been mowed. When saplings and invasives got out of control they were aggressively removed in a sustained effort between 2007 and 2016 using contractors and volunteers. Native field species and wildflowers were planted in 2016.

Clark/Windmiller noted that this meadow had great diversity because of its variable soils, high water table and topographic variability. The high water table results in wetland pockets in lower areas in a matrix of grasses and forbs in slightly higher areas. They considered this field to be the most varied natural community for both plants and animals in the Greenways Conservation Area. Their management concerns included the

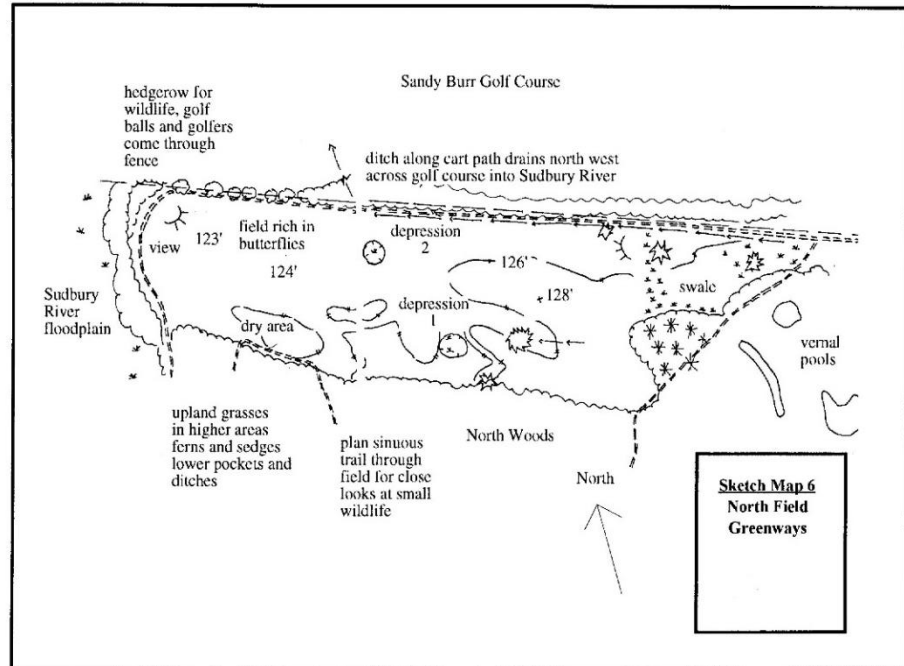


Figure 18 - North Field

colonization by invasive exotics that would result in diminished diversity of plants and animals, and the visual intrusion of the adjacent golf course.

This field has also consistently had the highest diversity of butterflies. The 1997 Clark/Windmiller report recommended a “sinuous trail through the field for close looks at small wildlife”. The two trails that now exist are on the perimeters of the northern and southern edges of the field. In general Mass Audubon is working to remove trails from the interior of fields and keeping them on the edges so as not to fragment the habitat. This field is considered too small to be attractive for most ground nesting birds.



Figure 19 - North Field plots

Maintaining habitat for pollinators is the primary objective. Monitoring and controlling invasives and mowing at least every other year should be continued. Additional shrub plantings along the northern edge to screen the view of the golf course, as recommended in the Clark/Windmill report, would be desirable to help maintain the naturalistic ambiance.

### 5.3b – Central Field

Most of the 11.7-acre Central Field is owned by the Town of Wayland, some of the perimeter areas (in the floodplain) are owned by the Sudbury Valley Trustees. The trail running east to west separates the town ownership with the area to the north designated for recreation use (see Section 5.1a – North Woods for description of proposed recreation use) and the area to the south for conservation.

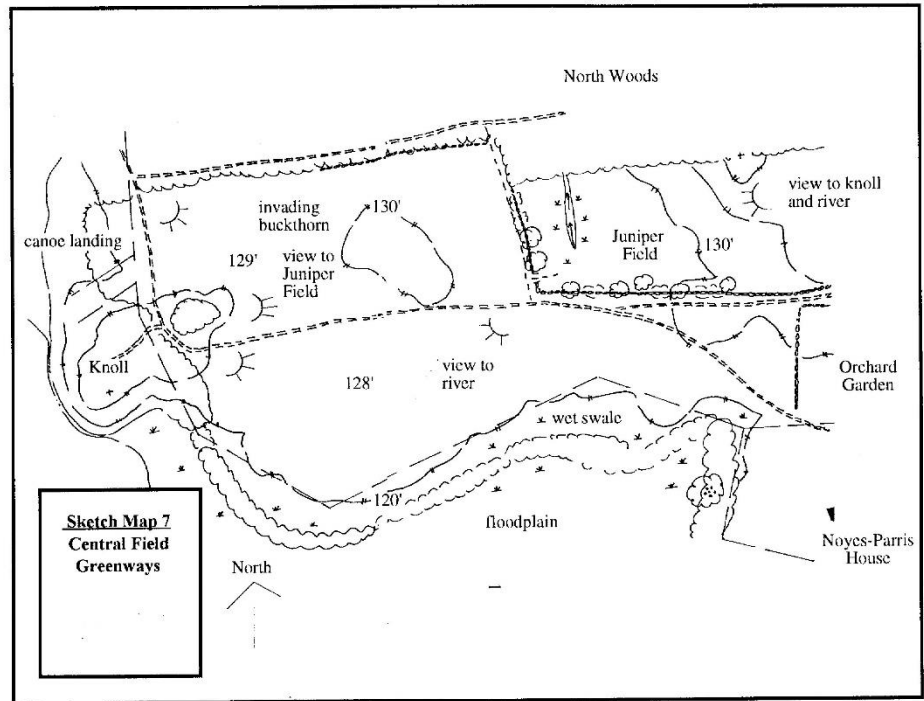


Figure 21 - Central Field

The northern portion has been mowed recently and the area to the south is now shrubland. If this entire field were maintained as grassland (without recreation use and with the trail relocated to the perimeter) it would be large enough to attract bobolinks to nest. The 1997 Clark/Windmill report noted that this field, because of its association with the Noyes-Parris House has been maintained as a cultivated vista for more than 350 years. It has provided this scenic vista down to the river and it may be the oldest such vista in this part of the state.

In addition to the ecological reasons for managing the entire Central Field as a grassland there is an historical/aesthetic reason. The vista looking across this field was a major feature of the Wayland landscape, dating back to when the land was first cleared in the late 1600s or early 1700s and was a compelling reason for its protection by the town and SVT.

Buckthorn was a major management concern in the 1997 report and continues to be an invasive species that is crowding out more desirable species. That report imagined the possibility of managing the entire area to attract grassland nesting species as well as pollinators, but it noted that if the ballfield is developed the area would be fragmented and too small to attract most grassland birds.

The southern portion, permanently designated as town conservation land, is now shrubland and has attracted blue-winged warblers, willow flycatchers, and other shrubland birds. If the ballfield is developed this shrubland could continue to be an important habitat for a variety of shrubland species. But as noted above, it needs to be managed to remain shrubland. There are numerous 3 to 4-year old white pine saplings that will need removing before they get larger and harder to remove. Buckthorn is also rampant and will need aggressive efforts to control. This is all made harder by the abundant poison ivy. One advantage of leaving the area as shrubland is that it discourages dogs from running loose as they do in the more open fields.

In any case, American woodcock use the edges of the Central Fields near the river for both mating-season display and nesting. Maintaining open areas in the shrubby edge will encourage their continued presence.

As noted twenty-three years ago in the Clark/Windmiller report, the potential of the future development of a ballfield stands in the way of making a firm decision about whether this field can be managed in its entirety for diminishing grassland bird species or whether it becomes too small for that purpose. Controlling or removing buckthorn and tree saplings is needed now. It would take a major effort to mow the shrubby area and return it to grassland.

### *5.3c - Juniper Field*

This 7.25-acre field, owned by the Town of Wayland and managed by the Conservation Commission, has been kept as an old field by relatively consistent mowing. As shown in Figure 21 the field has an approximately 150' high point at the northeastern side and slopes down to a somewhat wet area at the western side at 124'. The Clark/Windmiller report noted that this lower end had thick areas of goldenrods and patches of sensitive ferns while the higher area had a rich mixture of grasses. These aspects have remained mostly constant. Buckthorn and poison ivy were frequent



*Figure 22 - Juniper Field Looking East from Near the Ditch Toward the High Point*

throughout and still are with the addition of bittersweet. The view from the high area down to the river was noted as a favorite of Mrs. Paine. The field is separated from the Central Field by stone walls along the western and southern edges that have large red maples and red oaks. The report recommended mowing once a year and controlling buckthorn. It also recommended a mowed path and picnic table for enjoying the view toward the river. A picnic table that was probably once at this high point has now



been tucked into the edge of the woods and there is no mowed trail to access it. Too small for grassland birds there is no reason not to develop a mowed area at the high point for enjoying the views and moving the picnic table back out of the woods. The 1997 report noted that the 2' deep ditch was a hazard when covered with dense vegetation and should be marked, but if visitors are restricted to staying on trails because of ticks this should not be an issue. It also mentioned clearing bittersweet and other exotics from climbing the junipers and growing over the stone walls. A grove of poplars has colonized the southwest corner. All the 1997 recommendations seem appropriate today except for making the ditch.

### 5.3d – Orchard Field

In 1997 this small 1.4-acre area was an overgrown, former vegetable garden and orchard with brambles, grasses, sumac, and buckthorn. It is now mostly a field with old apple trees in the northeast corner and a dense tangle of sumac, bittersweet, and buckthorn along the southern border, between the field and the Noyes-Parris House. The field provides a view toward the Central Field (shrubland area). It also has two nest boxes that are occasionally used by bluebirds or tree swallows. The area is designated as conservation land administered by the Conservation Commission.

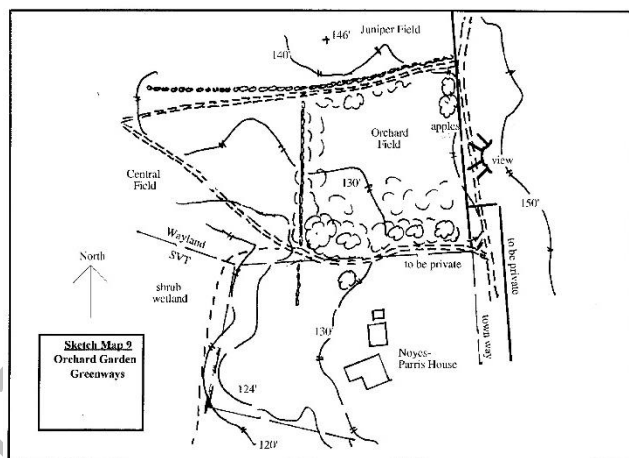


Figure 23 - Orchard Field

The Clark/Windmill report recommend experimenting with wildlife management techniques like a butterfly garden, bird nest boxes, and brush piles for birds and other wildlife (See section on Wildlife Management Recommendations). It also suggested interpretive information at the viewpoint at the east end of the field. These recommendations are all valid today. But maintaining the area as a small field with a pleasant view should be the priority.

### 5.3e – Southwest Field, Horse Jump Field, and Tomato Field

Horse Jump Field (3.4 acres), Tomato Field (1.8 acres), and Southwest Field (4 acres) are owned by the town and designated for future municipal development. In 1997 Horse Jump Field was an abandoned old field infested with buckthorn, Oriental bittersweet, Morrow's honeysuckle, Russian olive, and other exotics. Some of the wetter edges to the north had wet meadow species such as Joe-pye weed, late goldenrod, and silky dogwood. Hedgerows included white ash and red maple and were overrun with exotics that served as a seed source for the exotics colonizing the fields. Tomato Field was recently abandoned cropland in 1997. The western boundary includes a row of large weeping willows, planted for aesthetic reasons by the Paine family, and boxelders. The Southwest Field was still a field dominated by grasses and was just beginning to be colonized by buckthorn and other exotics in 1997. The lower

areas to the north and west included wet meadow species, including Joe-pye weed, ironweed, and tall goldenrod, with a dense perimeter of European buckthorn. Woodcock have been heard in this area most springs and are presumed to nest.

As noted in Section 4.2b, the town tried to restore these overgrown fields in 2014. Southwest Field and Horse Jump Field were mowed with a heavy-duty machine, and herbicides were applied to prevent re-sprouting. Unfortunately, resources were not allocated to continue to maintain the area as grassland and it has now reverted to shrubland. At present the town-owned land not assigned to the Conservation Commission has been for 23 years and remains in limbo – not really designated for a specific use either development or conservation and suffering from neglect.

Horse Jump Field is now so overgrown with shrubs and saplings that it would take another major effort to keep it from joining Lost Field as an impenetrable tangle. Southwest Field is at a critical tipping point. Some of it could now be mowed with a brush hog mower and the rest hand cut to eliminate shrubs and saplings over 1" to 1-1/2". Cut stems of buckthorn and other exotics (Morrow's honeysuckle, Oriental bittersweet, etc.) should be painted with herbicide to prevent re-sprouting. If not done this year or next the Southwest Field will be too overgrown to tackle with anything but a heavy-duty mower like a Brown Brontosaurus. Tomato Field is now dominated by goldenrods with few invasives and can be mowed to be maintained as a field for pollinators.

The 1997 report recommended either maintaining the fields as cropland, maintaining them as grassland, or maintaining them as shrublands: or some combination of the any of the three options. Each option has benefits for

different groups of wildlife. As noted above, several species of both grassland and shrubland birds are in decline. We would recommend maintaining Horse Jump Field and Southwest Field as shrubland. Regular removal of shrubs with a stem more than 1" to 1-1/2" and maintaining some clearings as singing areas for woodcock is recommended. The area, whether grassland or shrubland is currently fragmented by

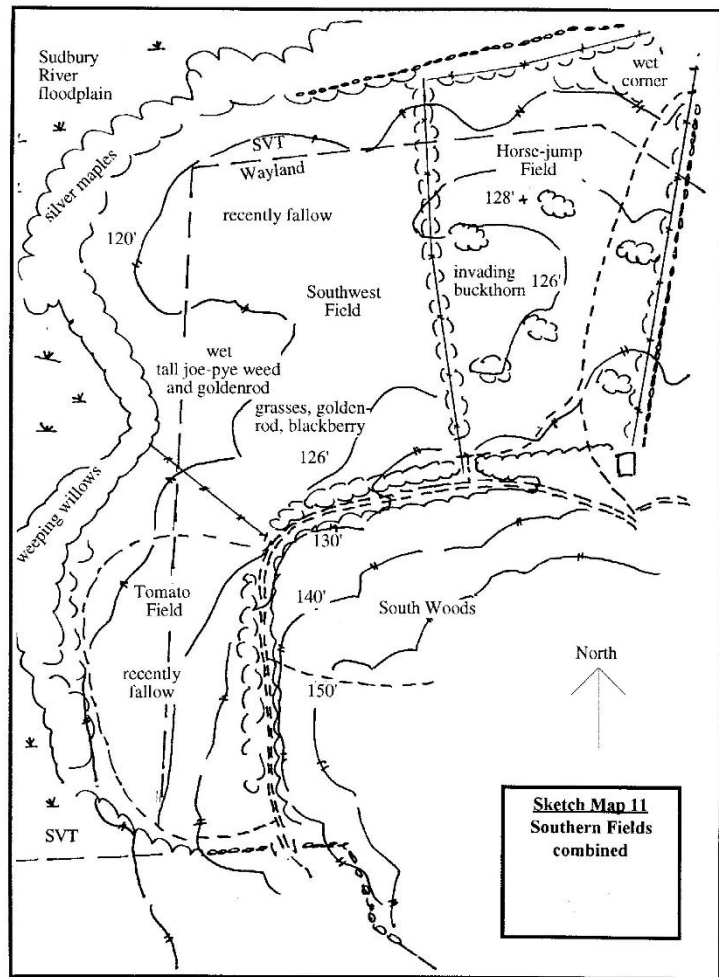


Figure 24 - Southern Fields

trails that go through the area rather than stay on the perimeter. Tomato Field could be mowed every other year and be maintained as goldenrod field.

Alternatively, these fields could all be restored to grassland with considerable effort.

#### 5.4 – Management of Invasive Plants

One of the largest threats to the ecological integrity and economic value of conservation land in general and Greenways Conservation Area is the presence of invasive plant species. Manual or mechanical treatment (mowing and or disking) is effective management for the open areas of grassland. For dense infestation, wet areas, or particularly hard to treat species limited use of herbicide may be necessary. Dense infestations should be sprayed with backpack sprayers. Cut and paint herbicide application techniques should be used in wet areas and in areas where erosion is a concern. An outside contractor with a license can be hired, but it may be more economical for town and SVT staff to obtain and use the license.

- Obtain an herbicide applicator’s license by staff
- Strategically treat invasive plants within the property:
  - Treat invasive plants along the trail system
  - Treat invasive plants along the edges of the fields
  - Treat invasive plants within the forested areas of the property working from the trail system towards the interior of the property
  - Treat invasive plants in areas to be maintained as shrubland.

See Appendix A for more information for treatment of various species.

#### 5.5 – Wildlife Enhancement Management Recommendations

Maintaining grasslands and shrublands at Greenways Conservation Area is a priority for wildlife species that depend on those habitats. However, there are several other actions that can enhance wildlife habitat quality and make the conservation area a more interesting destination.

##### **Brush piles**

Strategically place piles of brush in the forested areas or at the edges of the fields can be assembled to provide resting/escape cover and den sites for wildlife. Brush piles are used for cover by eastern cottontails and other small mammals. Songbirds may use brush piles for perch sites, especially if the piles are located near feeding or nest sites. Also, if brush piles are adjacent to a water source, amphibians and reptiles may use them for breeding, feeding, or resting. See <https://extension.psu.edu/management-practices-for-enhancing-wildlife-habitat> for more information on steps for enhancing wildlife habitat.

##### **Snags**

Leaving dead or partially dead standing trees provide several important benefits to a variety of wildlife. Snags provide cavities for nesting and resting, perches for hunting and displaying, and an abundant supply of food for insect eaters. There are over numerous species of birds and mammals that use snags at some point in their life cycles. The best method to provide snags for wildlife is to retain existing snags

in places where they will not create a dangerous situation for people using the nearby area for outdoor activities.

### **Nest boxes**

Nest boxes, platforms, and other types of nesting structures provide nest sites for wildlife in areas where natural nest sites (particularly cavities) are absent or available only in low numbers. They are also used to attract wildlife to specific areas even when nest sites are not limited. Nest boxes can be used to provide nest sites for birds such as bluebirds, tree swallows, wrens, and wood ducks. Nest boxes also provide nest sites for mammals like squirrels and bats. Platforms and other structures are used to provide nest sites for species like the ospreys, eastern phoebe, barn swallow, and some waterfowl. Special colonial nest boxes can be erected for purple martins. Bat boxes can also be erected along the field edges. See Mass Audubon's website <https://www.massaudubon.org/learn/nature-wildlife/birds/birdhouses> for instruction for building and placing nest boxes.

### **Vernal pools**

According to MassGIS there are ten potential vernal pools at Greenways Conservation Area. The 1997 report identified several that had wood frogs and one that had spotted salamanders. These areas may be critical for several other species of amphibians and invertebrates. We recommend that they be investigated and certified if they meet the criteria.

### **Pollinator plantings**

Pollinator-friendly plantings support numerous kinds of native bees, as well as honeybees, butterflies, hummingbirds, and other pollinators. Planting a diverse mix of flowering plants that provides a sequence of blooms from early spring to late fall will have the most impact. Even a small patch of the right flowers can help, as it adds to the larger landscape mosaic in which the pollinators live and search for food. For a list of plants and guidelines for planting see [https://extension.unh.edu/resources/files/Resource005973\\_Rep8387.pdf](https://extension.unh.edu/resources/files/Resource005973_Rep8387.pdf). The Sudbury Valley Trustees have worked to maintain the North Field as an area for pollinators. The town could explore establishing a small pollinator garden in the Orchard Field.

## **5.6 – Passive Recreation Management Recommendations**

Greenways Conservation Area is a popular destination for birders, walkers, dog-walkers, and just folks looking for a break without distractions. For the most part these activities and the conservation area's values for wildlife are in harmony. The only possible exception is dogs off-lease especially during the nesting season. Dogs and ground nesting birds do not mix without disastrous consequences for the birds. It is town policy that dogs be kept on lease during the nesting season, from May 1 until the fields are mowed in late July or August. Few visitors observe this regulation and person power for enforcement is limited. More people might obey the regulation if they have enough information to understand the harm that their pets may cause. Education is the key.

**Ecological Extension Service**  
Mass Audubon  
208 South Great Road  
Lincoln, Massachusetts 01773

781 259 2198  
781 259 2398 (fax)



*Figure 25 - Purple martin house*

Several elements of a program to encourage keeping dogs on lease are recommended.

- Some interpretive signs telling about the precarious state of ground nesting and shrubland bird species and the adverse impacts of loose dogs can be posted during the nesting season at the information kiosk and at the head of the trails leaving the parking area. Mass Audubon would be able to help develop such signage.
- Use symbolic fencing to indicate the boundaries of the field. The “fencing” can be made of simple posts and rope or string with signs to explain the importance of staying out of nesting areas.
- Try and have volunteer docents during busy weekends to show people the birds and explain a bit about their life cycle and remind them of the importance of keeping their pets on-leash.
- Consider reducing the width of the mowed trails along the perimeter of the fields to no more than 6 to 8 feet during the nesting season.
- Consider a volunteer program like the “Bark Ranger” initiative begun in 2018 by Weston and the Sudbury Valley Trustees.

The trail should be mown every two weeks and woody vegetation should be clipped back annually. Some trails are currently being mowed 6-10 ft wide. A decrease in the width of the trail will save time and other town staff resources. Trails should be walked regularly but particularly after large storm events to remove down trees and make necessary repairs.

Any programs or recreational opportunities open to the public will need to follow ADA regulations. Every recreational opportunity does not need to be ADA accessible. However, the town needs to provide people with disabilities equal opportunities to participate in programs and recreational opportunities in the town. This means, the town of Wayland should look at all of its trails and conservation areas and have an equal representation for the type of experience offered for that activity that is accessible to people of all abilities. Not every trail has to be accessible nor can or should be made accessible if it would fundamentally alter the experience of that activity. The Conservation Commission will need to communicate with the designated ADA Coordinator in Wayland (Town Administrator) for official guidance on providing equal opportunities to the public.

### 5.7 – Schedule of Management Activity

The following matrix is proposed for yearly management activities. Quantities and estimated costs will be shown in Appendix B.

### 5.7a – Yearly ongoing Activities

	Winter	Spring	Summer	Fall
	Dec-Feb	Mar-May	Jun-Aug	Sep-Nov
Permitting for Planned Projects				
Monthly Property Visits				
Annual Work Plan with Staff and Stewards				
Safety Meeting with Staff, Stewards, Police and Fire Dept.				
Trail Walk/Clean Up (downed limbs, drainage issues, signage needs)				
Repair Equipment and tools				
Building Projects (kiosks, signposts, etc.)				
Invasive Plant Management				
Shrubland management				
Mowing of Fields (After August 15 <sup>th</sup> )				
Boundary Walk (monitoring for encroachments, signage, etc.)				

### 5.7b – Short term Projects

#### Field management recommendations

- Continue mowing fields after mid-August

#### Shrubland management recommendations

- Brush hog shrublands and hand cut shrubs and saplings over 1” to 1-1/2” and treat invasive cut stems with herbicide

#### Invasive plant management recommendations:

- Obtain an herbicide applicator’s license by staff

#### Wildlife enhancement management recommendations:

- Dependent on volunteer and staff resources
- Establish regular bird censusing effort, especially during the summer breeding season. Fixed point counts with a regular protocol. Mass Audubon could provide a “training manual”, but then the work would depend on volunteers.

#### Passive recreation management recommendations:

- Prepare and install interpretive signs at parking lot and trail heads to educate visitors about the importance of keeping dogs on-leash
- Reduce the width of the perimeter trails to 6 to 8 feet
- Install “symbolic fencing” and signs around fields
- Explore having volunteer docents to explain about the importance of field and shrubland habitats

### 5.7c – Long Term Projects

#### Field Management

- Continue mowing fields after mid-August

#### Invasive plant management recommendations:

- Maintain an herbicide applicator’s license by staff
- Strategically treat invasive plants within the property:
  - Treat invasive plants along the trail system
  - Treat invasive plants in shrublands and fields
  - Treat invasive plants along the edges of the fields
  - Treat invasive plants within the forested areas of the property working from the trail system towards the interior of the property.

#### Wildlife enhancement management recommendations:

- Periodically (every five years) remove larger trees and shrubs from shrubland areas
- Other actions dependent on volunteer and staff resources

#### Passive recreation management recommendations:

- Mow trails on perimeter of fields to 6 to 8ft in width
- Walk trails after storm events to clear tree hazards and make repairs to boardwalks
- Initiate a volunteer “Bark Ranger” program

## Section 6 – Access and Trail Assessment

### 6.1 – Access

Access is provided at a small parking area (about 20 cars) at the end of Green Way. Visitors pass through a residential neighborhood to arrive at the parking area. Parts of the parking area have poor drainage and are prone to puddles and mud. The size of the parking area helps to control the number of users. The proposed multi-purpose playing field in the Center Field includes an extended entrance drive and additional parking for 23 cars. The playing field, drive, and parking would represent a major change to the conservation character of the entire site.

A minor second access is off Henry Knox Road. This access has no parking and serves residents on Henry Knox Road.

The existing means of access seem adequate for the uses. A load of gravel would reduce the mud and puddles.

### 6.2 – Trail Assessment

Trail assessments provide a snapshot of tread conditions that can be used for planning and budgeting purposes. They can provide detailed information which is useful in developing trail restoration plans as

well as seeking funds for the restoration of trails. They can help managers see the larger picture so that sound restoration or maintenance priorities can be developed. Like buildings, trails should be viewed as assets which depreciate and thus need periodic refurbishment or structural upgrading. Larger structures on trails such as bridges, boardwalks, observation platforms, and any other elevated structures will deteriorate over time and will need regular inspection to ensure that they are sound. Comprehensive trail assessments are usually done every 5 to 10 years to evaluate conditions.

He approximately 2.3 miles of trails at the Greenways Conservation Area are generally in good condition. We do recommend several actions, including:

- Removing tripping hazards – there are a few places (identified in the following Section Assessments) where roots (and in some places stones) could be tripping hazards.
- Monitoring boardwalks – structures like bridges and boardwalks need to be evaluated frequently and repaired or replaced, as necessary.
- Drainage and erosion problems – there are a few places (noted in the Section Assessments) where minor maintenance actions or drainage improvements are recommended.
- Abandon redundant trails – several trails are redundant and could be abandoned. This would save time and expense on maintenance.
- Abandon trails that dead end – There are a couple of trails that end up as dead ends and could be abandoned.
- Reduce habitat fragmentation – some trails are currently running through the middle of fields. Abandoning those trails in favor of trails that are at the periphery of the fields (or in the case of the trail from “T” to “U” to “V” abandoning the trail in the field in favor of the trail at the edge of the woods, along the stone wall) will improve the quality of the habitats.

There have been some changes to the trail layout, and we are recommending some others. The trail map needs to be updated to show these changes.

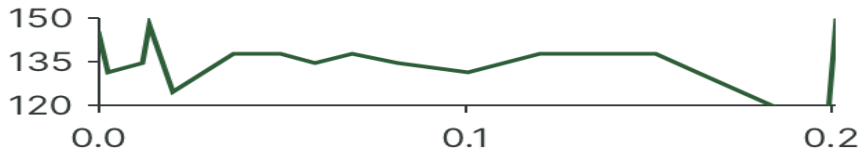
#### *Trail Section J to D to C to D*

Trail Segment	Trail Markers J to D to C to D		
Length	.69 mile		
Distance	Location	Condition	Comments/Work Needed
0	Parking Lot – “J”		
87’	Beginning of boardwalk	Wet area at beginning of boardwalk Roots	Extend boardwalk or improve flow from small stream
196’	End of boardwalk	Boardwalk is in good condition	Monitor for board replacement
420’	2 board ditch crossing	One board feels springy	Monitor for board replacement
.16 mile	Junction “D”	Roots	Consider removing roots?
.21 mile		Fewer roots	



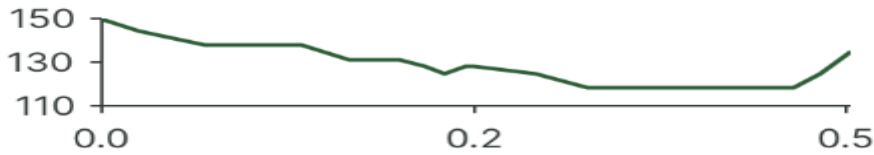
.23 mile	Junction "C"		
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**Elevation Profile (ft)**



0	Junction "C"		
.13 mile	Junction with trail to "N"	Trail is mowed trough field	Note: a boardwalk has been proposed for a seasonally wet area in this section
.16 mile	Junction with trail to "E"	Trail is mowed through field	Mowing during growing season
.29 mile	Junction with trial to "E" & "F"	Trail is mowed through field	Mowing during growing season
.46 mile	Junction "D"	Some areas with roots	Consider removing roots?

**Elevation Profile (ft)**

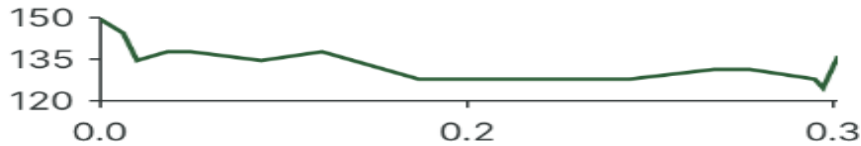


**Trail Section - A to H to G**

Trail Segment	Trail Markers A to B to H to G		
Length	.29 mile		
Distance	Location	Condition	Comments/Work Needed
0	"A"		
90'	"B"	8' wide – good condition	None
198'	"B" to junction at Juniper Field	8' wide – good condition	None
.16 mile	"H"	Mowed trail thru field - good condition Note: this trail is thru middle of field not along edge as shown on trail map. Trails on edges of Juniper Field are no longer there.	Mowing during growing season

.29 mile	"G"	Mowed trail thru center of Center Field. Shrubland on left mowed field on right – good condition	If grassland birds are a goal this trail should be relocated to edge of field.
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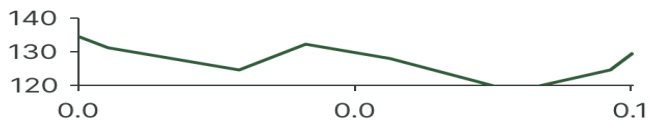
### Elevation Profile (ft)



### Trail Section – G to Overlook to Canoe Landing

Trail Segment	Trail Marker G to Overlook to Canoe Landing		
Length	948'		
Distance	Location	Condition	Comments/Work Needed
0	"G"		
210'	Overlook	Gravel of varying widths – good condition	None
346'	Eroded area along trail before intersection to Canoe Landing	Traffic has created a berm on the out-slope side of trail, creating a swale that is causing erosion	Remove berm and create some grade reversals
525'	Intersection to Canoe Landing	Badly eroded area due to cumulation of runoff from up the trail	Should be solved by removing berm and creating grade reversals uphill
948'	Canoe Landing	Good	None

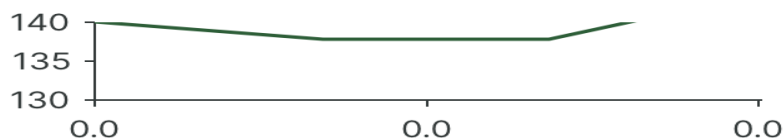
### Elevation Profile (ft)



### Trail Section - Intersection to Canoe Landing to F

Trail Segment	Intersection to Canoe Landing to "F"		
Length	193'		
Distance	Location	Condition	Comments/Work Needed
0	Intersection to Canoe Landing		
193'	"F"	Mowed trail along Center Field edge – good condition	Mowing during growing season

## Elevation Profile (ft)

*Trail Section – Intersection to Canoe Landing to G*

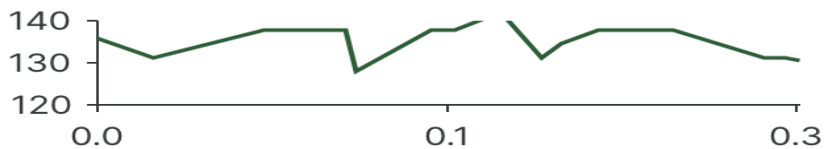
Trail Segment	Intersection to Canoe Landing to “G”		
Length	150’		
Distance	Location	Condition	Comments/Work Needed
0	Intersection to Canoe Landing		
150’	“G”	Good condition – Trail has some subtle grade reversals that are preventing erosion	Mowing during growing season Maintain grade reversals and prevent berm on edge of out-slope

*Trail Section – H to South Fields*

Trail Segment	“H” to South Fields/ Boardwalk		
Length:	.28 mile		
Distance	Location	Condition	Comments/Work Needed
0	“H”		
.1 mile	West corner of Orchard Field	Good condition – Mowed trail along stone wall	Mowing during growing season. If grassland birds are a goal this trail should be relocated to edge of field.
.12 mile	Opening thru stone wall into Orchard Field	3’ to 4’ wide natural treadway – good condition, shrubs along edges of trail	Mowing and trimming back shrubs during growing season
.14 mile	Intersection with redundant trail form H	Good	Consider abandoning diagonal trail from “H” to this location (redundant)
.17 mile	Tree with SVT sign	3’ wide trail – good condition, some roots	None
.21 mile	Beginning of boardwalk	3’ wide trail – good condition, some roots	None
.24 mile	Center of stream below boardwalk	4’ wide boardwalk 2x6 decking with no central stringer – could be considered under-built	Monitor for replacement of boards. Consider replacing

			with better engineered walk in future.
.26 mile	End of boardwalk	Boardwalk is about 260' long	
.28 mile	Stonewall at beginning of South Fields	3' to 4' wide trail – good condition, some roots	None

### Elevation Profile (ft)



### Trail Section- Junction of Trail from H with Trail Leading to Boardwalk, North to B

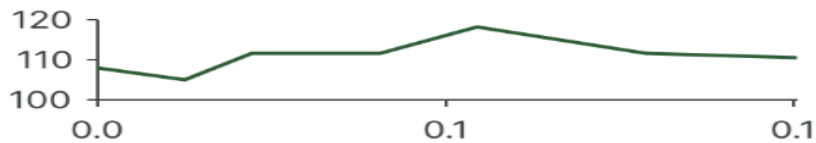
Trail Segment	Junction of trail from H with trail leading to boardwalk, north to B		
Length	534'		
Distance	Location	Condition	Comments/Work Needed
0	Junction of trail from "H" with trail to boardwalk		
123'	Stone wall entrance into Juniper Field	3' to 4' wide natural treadway – good condition, shrubs along edges of trail	Mowing and trimming of shrubs during growing season
534'	Junction "B"	Mowed trail along easter edge of Juniper Field – good condition	Mowing during growing season

### Trail Section- South Fields Mowed Trails

Trail Segment	South Fields Mowed Fields		
Length	.12 mile		
Distance	Location	Condition	Comments/Work Needed
0	Stonewall at beginning of South Fields	Counterclockwise	
.26 mile	Junction in middle of field	Mowed grass treadway 3' wide	Mowing during growing season
.38 mile	Dead end at stonewall	Mowed grass treadway 3' wide	Mowing during growing season
0	Junction in middle of field	Mowed grass treadway 3' wide	Mowing during growing season

			Consider rerouting trail to periphery of field to avoid fragmenting field habitat.
119'	Junction/ remains of old gate	Mowed grass treadway 3' wide	Mowing during growing season
150'	Junction/ to right into South Woods	Mowed grass treadway 3' wide	Mowing during growing season
262'	Junction/ right into South Woods	Mowed grass treadway 3' wide	Mowing during growing season
.12 mile	Stonewall at beginning of South Fields	Mowed grass treadway 3' wide	Mowing during growing season

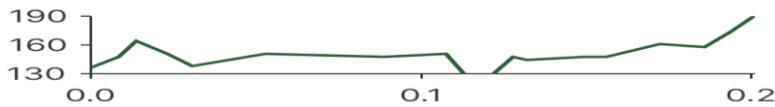
### Elevation Profile (ft)



### Trail Section- South Woods Trails – junction in field to V to Henry Knox Road

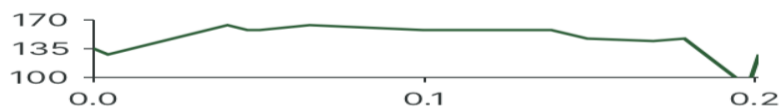
Trail Segment	South Woods Trails – junction in field to V to Henry Knox Road		
Length	.22 mile		
Distance	Location	Condition	Comments/Work Needed
0	Junction into South Woods to “V” (same junction as at 262’ above)		
71’	Stone wall	Mowed grass treadway – 3’ wide to stonewall	Mowing during growing season
144’	“V” junction	Natural treadway – 3’ wide	None
.13 mile	Abandoned trail to left toward road	Abandoned – little sign of use. Natural treadway 3’ wide	Brush in more to make clear that trail is abandoned
.21 mile	Fallen tree across trail	Natural treadway 3’ wide	Remove fallen tree
.22 mile	Junction with drive to Bennett barn from Henry Knox Road	Natural treadway – 3’ wide Henry Knox Rd. is about 30’ to left – provides access to Greenways from neighbors living on Henry Knox Rd.	None

Elevation Profile (ft)

**Trail Section- South Woods Trails – from V to S to T**

Trail Segment	South Woods Trails – from V to S to T		
Length	.15 mile		
Distance	Location	Condition	Comments/Work Needed
0	“V” junction		
163’	“S” junction	Old cart path 8’ wide on fall line – subject to erosion	Cart path continues uphill to private residence (Bennett’s) – should be for maintenance only, as it dead ends at barn
300’	Old truck body to left of trail	Natural treadway – 3’ wide	None
590’	Beginning of steep area		
.13	Junction marker “T”	96’ long steep area subject to erosion. Natural treadway – 3’ wide	Currently there is no junction at “T”. Trail to right is overgrown
.15	Junction with field edge trail		

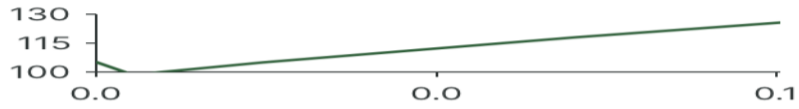
Elevation Profile (ft)

**Trail Section- South Woods Trails – from T to U to V**

Trail Segment	South Woods Trails – from T to U to V		
Length	400’		
Distance	Location	Condition	Comments/Work Needed
0	Junction with field edge below “T”		
275’	“U” junction, trail to left to field edge	Old cart path 8’ wide along stone wall	This trail runs parallel to a mowed trail at the southern edge of the field. Recommend abandoning mowed trail (redundant

			and habitat fragmentation) from below "T" to connection to field trail at "V"
400'	"V" junction	Old cart path 8' wide along stone wall	None

Elevation Profile (ft)



Draft

## Appendix A – Control of Invasive Plants

Several species of invasive plants are currently found within the Greenways Conservation Area and we have described their management as it pertains to specific goals and objectives outlined in this plan. In general, we recommend that the stewards assess threats from invasive species during annual monitoring and implement treatment according to specifications outlined by the town.

If herbicide is used, the exact concentration, chemical, and type of application should be decided by the applicator and approved by the town. The applicator should develop an Invasive Plant Management plan for the area and make recommendations to the town that are best suited for the site.

### Glossy and Common Buckthorn

Manual, mechanical and chemical means are effective in controlling glossy buckthorn and is most effectively controlled by recognizing its appearance early and removing isolated plants before they begin to produce seed. With large infestations, remove the largest seed-producing plants first. Currently no means of biological control is available for controlling buckthorn. Hand pulling is effective in small infestations. Remove the entire root section or re-sprouting will occur. Weed wrenches can be very effective in uprooting buckthorn.

Chemical treatment is also an option. The type of herbicide determines the best time of year to apply based on how the chemicals disrupt the biological process of the plant. Triclopyr herbicides are much more effective early in the growing season. Glossy buckthorn retains its leaves late into the Fall, so you can apply herbicide fairly late in the season. However, the application should not be too late, or the leaves will no longer be photosynthetically active (or minimally so) and will easily fall from the twigs without affecting the roots. During the growing season, cut the stems near ground level and apply a 20%-25% herbicide mixture to the stumps. Re-sprouts should be cut and treated again or sprayed with a hand sprayer of 1.5%. Foliar applications over non-water sites can also be used. Foliar application of herbicides using a backpack sprayer is effective, but less selective.

### Common Reed – Phragmites

Control with herbicides is effective for controlling areas with large, established, populations of phragmites. Other options include mowing and prescribed burning. New stands of phragmites commonly occur when new wetlands are created, or the soil is disturbed. Minimizing land disturbances and water pollution helps deter this invasive species. Land management practices that guard against erosion, sedimentation, fluctuating water levels, and nutrient loading in wetlands are the best long-term solution.

Control of phragmites is difficult. Repeated cutting can slow its growth and possibly hinder its spread but will not eliminate it altogether. The best method to eliminate phragmites is the foliar application of a systemic herbicide when the plants are actively growing. Currently no means of biological control is available for treating phragmites infestations. Manual or mechanical cutting or pulling has been used



successfully to control phragmites. Treatments usually need to be repeated annually. The best time to cut phragmites is at the end of July. Cutting at other times may increase stand density. Phragmites stems should be cut below the lowest leaf, leaving a 6" or shorter stump. Hand-pulling is an effective technique for controlling phragmites in small areas with sandy soils.

Repeated mowing is effective at slowing the spread of established stands but is unlikely to kill the plant. Excavation of sediments may also be effective, but root fragments left in the soil may lead to reestablishment. Prescribed burning after the plant has flowered, either alone or in combination with herbicide treatment, is also effective. Burning after herbicide treatment also reduces standing dead stem and litter biomass which may help to encourage germination of native plants in the following growing season. Do not burn plants in the Spring or Summer before flowering as this may stimulate growth. Chemical treatments are effective in controlling established populations. If a population can be controlled soon after it has established the chances of eliminating the infestation are much higher because the below-ground rhizome network will not be as extensive. Herbicides are best applied in late Summer/early Fall after the plant has flowered either as a cut stem treatment or as a foliar spray. Repeat treatments are required for several years to prevent any surviving rhizomes from re-sprouting.

### **Multiflora Rose**

Mechanical and chemical methods are effective methods for managing multiflora rose but may need to be combined with chemical treatment in large or persistent infestations. The most important steps to controlling multiflora rose are to destroy existing plants and begin a yearly program to control seedlings as they appear. Biological control is not yet available for management of multiflora rose. However, researchers are investigating several options, including a native viral pathogen (rose-rosette disease), which is spread by a tiny native mite, and a seed-infesting wasp, the European rose chalcid.

Manual and mechanical control consisting of frequent, repeated cutting or mowing three to six times per growing season for two to four years is effective in achieving high mortality of multiflora rose. In high quality natural communities, cut the individual plants to minimize habitat disturbance. Herbicides are successful in controlling multiflora rose, but follow-up treatments are required because of the long-lived stores of seed in the soil. Apply systemic herbicides (such as glyphosate) late in the growing season to freshly cut stumps or to regrowth. In wetlands, where multiflora rose may occur, make sure to use a wetland-formulated concentrate. Use an active ingredient concentration of 25-35% when you apply herbicide to the cut stem. Plant growth regulators control the spread of multiflora rose by preventing fruit set.

### **Oriental Bittersweet**

A combination of cutting followed by application of concentrated systemic herbicide to rooted, living cut surfaces is an effective approach for removing Oriental bittersweet. For large infestations spanning extensive areas of ground, a foliar herbicide is recommended over manual or mechanical methods, which would create soil disturbance to minimize soil disturbance. Manual, mechanical and chemical control methods are effective in removing and killing Oriental bittersweet. A combination of methods

often yields the best results and may reduce potential impacts to native plants, animals and people. The method selected depends on the extent and type of infestation, the amount of native vegetation on the site, and the time, labor and available resources. No biological controls are currently available for this plant.

Manual control of small infestations can be achieved by hand-pulling, but the entire plant should be removed including all the root portions. If fruits are present, collect, bag, and dispose of them in heavy garbage bags. Always wear gloves and long sleeves to protect your skin from poison ivy and barbed or spiny plants. Plants can also be controlled by cutting climbing vines near the ground at a comfortable height to kill upper portions and to relieve the tree canopy. Vines can be cut using pruning snips or a pruning saw for smaller stems, or a hand axe or chain saw for larger vines. Minimize the damage to the bark of the host tree. Rooted portions will remain alive and should be repeatedly cut to the ground or treated with herbicide. Cutting without herbicide treatment requires vigilance and repeated cutting because plants will re-sprout from the base. Begin treatment early in the growing season and repeat the treatment every two weeks until autumn

Systemic herbicides are absorbed into plant tissues and carried to the roots, killing the entire plant within about a week. This method is most effective if the stems are first cut and herbicide is applied immediately to the cut stem tissue.

Fall and Winter applications will avoid or minimize impacts to native plants and animals. Repeated treatments will be required. Any herbicide applications should be carefully targeted to avoid damage to native, non-target species. If native grasses are intermingled with the bittersweet, triclopyr is better to use than glyphosate because it is selective for broad-leaved plants and will not harm grasses. Follow-up monitoring is required to ensure effective control.

### **Reed Canary Grass**

Several small patches of reed canary grass (*Phalaris arundinacea*) were noted in the fields. This is a perennial, rhizomatous grass that has been identified as invasive. Mowing before seeds are set will help control its spread, but it also spreads by its rhizomes. Small stands of reed canary grass can be controlled through hand removal. Plants should be dug, taking care to remove as much of the root system as can be found. As even small fragments of the rhizomes can re-sprout, digging is only suitable if the time is taken to get all the roots possible. Plant parts should be disposed of responsibly, as any left in contact with water or moist ground has the potential to re-sprout.

Covering and mulching has been used with some success to control reed canary grass. The entire area should be covered with several layers of cardboard and several inches of mulch, or with a heavy woven plastic fabric anchored in place. The covering must be kept in place and intact for at least an entire growing season. The cover must also extend well clear of all sides of the reed canary grass site, as shoots will grow out from the edges to reach light. Any manual control methods will require careful monitoring of the site over multiple seasons to ensure regrowth does not occur. Chemical treatment is also an option but should only be used for large infestations.

## Appendix B – Estimated Costs and Priorities

Recommendation	Priority Level	Cost Estimate	Variables
Monitoring trails after storm events	High	\$0- \$2,000/year	Volunteers, staff, number of repairs needed
Mowing of fields SVT=8 acres: Town=15.5 acres	High	SVT=\$1,500/year Town=\$3,000/year	Staff & equipment
Mowing of trails in fields SVT=.5 mi. Town=	High	\$?	Staff, volunteers
Brown Brontosaurus type machine to rehabilitate Horse Jump Field to grassland	High	\$5,000	Funding for a contractor
Manage shrublands (Southwest Field, Horse Jump Field, & portion of Center Field) Town=15 acres	High	\$6,000 every 5 years to mow ½ of total area	Staff, volunteers, contractor, amount of invasive species present and whether native plantings are needed
Obtain/ maintain herbicide applicators license	Medium	\$500- \$1,000	Availability of staff, how useful the license would be overall to the town
Control of field invasive plants	Medium	\$500-\$25k over five years	Volunteers, contractor, or staff and extent of follow up treatments needed
Control of forest invasive plants	Medium	\$500-\$25k over five years	Volunteers, contractor, or staff and extent of follow up treatments needed
		\$20,000/year average SVT = \$3,000 Town = \$17,000	

## Appendix C – Birds of Greenways Conservation Area

The following list of more than 130 species was generated using eBird (ebird.org). It includes birds seen in the fields, forests, wetlands, the adjacent Sudbury River, and flying over the area.

### Waterfowl

Canada Goose  
Mute Swan  
Wood Duck  
Blue-winged Teal  
American Wigeon  
Mallard  
American Black Duck  
Northern Pintail  
Green-winged Teal  
Ring-necked Duck  
Bufflehead  
Hooded Merganser  
Common Merganser  
Ruddy Duck

### Grouse, Quail, and Allies

Wild Turkey

### Grebes

Pied-billed Grebe

### Pigeons and Doves

Mourning Dove

### Cuckoos

Black-billed Cuckoo

### Swifts

Chimney Swift

### Hummingbirds

Ruby-throated Hummingbird

### Shorebirds

Killdeer  
Least Sandpiper  
Semipalmated Sandpiper  
American Woodcock  
Wilson's Snipe  
Spotted Sandpiper  
Solitary Sandpiper  
Lesser Yellowlegs

### Gulls, Terns, and Skimmers

Ring-billed Gull

### Cormorants and Anhingas

Double-crested Cormorant

### Hérons, Ibis, and Allies

Great Blue Heron  
Great Egret  
Green Heron

### Vultures, Hawks, and Allies

Turkey Vulture  
Osprey  
Northern Harrier  
Sharp-shinned Hawk  
Cooper's Hawk  
Bald Eagle  
Red-shouldered Hawk  
Broad-winged Hawk  
Red-tailed Hawk

### Owls

Eastern Screech-Owl  
Great Horned Owl  
Barred Owl

### Kingfishers

Belted Kingfisher

### Woodpeckers

Yellow-bellied Sapsucker  
Red-bellied Woodpecker  
Downy Woodpecker  
Hairy Woodpecker  
Pileated Woodpecker  
Northern Flicker

### Falcons

American Kestrel  
Merlin

### Tyrant Flycatchers: Pewees,

### Kingbirds, and Allies

Eastern Wood-Pewee  
Alder Flycatcher  
Willow Flycatcher  
Least Flycatcher  
Eastern Phoebe  
Great Crested Flycatcher  
Eastern Kingbird

### Vireos

Yellow-throated Vireo  
Blue-headed Vireo  
Warbling Vireo  
Red-eyed Vireo

### Jays, Magpies, Crows, and Ravens

Blue Jay  
American Crow

### Tits, Chickadees, and Titmice

Black-capped Chickadee  
Tufted Titmouse

### Martins and Swallows

Northern Rough-winged Swallow  
Tree Swallow  
Barn Swallow

### Kinglets

Golden-crowned Kinglet  
Ruby-crowned Kinglet

### Nuthatches

Red-breasted Nuthatch  
White-breasted Nuthatch

### Treecreepers

Brown Creeper

### Gnatcatchers

Blue-gray Gnatcatcher

### Wrens

House Wren  
Winter Wren  
Marsh Wren  
Carolina Wren

### Starlings and Mynas

European Starling  
Gray Catbird  
Brown Thrasher  
Northern Mockingbird

**Thrushes**

Eastern Bluebird  
 Veery  
 Hermit Thrush  
 Wood Thrush  
 American Robin

**Waxwings**

Cedar Waxwing

**Old World Sparrows**

House Sparrow

**Wagtails and Pipits**

American Pipit

**Finches, Euphonias, and****Allies**

House Finch  
 Purple Finch  
 Common Redpoll  
 Pine Siskin  
 American Goldfinch

**New World Sparrows**

Chipping Sparrow  
 Field Sparrow  
 American Tree Sparrow  
 Fox Sparrow  
 Dark-eyed Junco  
 White-crowned Sparrow  
 White-throated Sparrow  
 Savannah Sparrow  
 Song Sparrow  
 Swamp Sparrow  
 Eastern Towhee

**Blackbirds**

Bobolink  
 Eastern Meadowlark  
 Orchard Oriole  
 Baltimore Oriole  
 Red-winged Blackbird  
 Brown-headed Cowbird  
 Rusty Blackbird  
 Common Grackle

**Wood-Warblers**

Ovenbird  
 Louisiana Waterthrush  
 Northern Waterthrush  
 Blue-winged Warbler  
 Black-and-white Warbler  
 Orange-crowned Warbler

Nashville Warbler  
 Common Yellowthroat  
 American Redstart  
 Northern Parula  
 Yellow Warbler  
 Chestnut-sided Warbler  
 Blackpoll Warbler  
 Black-throated Blue Warbler  
 Palm Warbler  
 Pine Warbler  
 Yellow-rumped Warbler  
 Wilson's Warbler

**Cardinals, Grosbeaks, and  
Allies**

Scarlet Tanager  
 Northern Cardinal  
 Rose-breasted Grosbeak  
 Indigo Bunting

Draft

## Reservation Species Report for 1/1/2005 through 12/1/2015

Reservation: GREENWAYS

Survey Type: BBS - Breeding Bird Survey

Species Types: All Species Types

Wildlife Type: Bird

Common Name	Latin Name	Species Type(s)
Wood Duck	<i>Aix sponsa</i>	Focal
Canada Goose	<i>Branta canadensis</i>	
Mourning Dove	<i>Zenaida macroura</i>	
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	
Downy Woodpecker	<i>Picoides pubescens</i>	
Pileated Woodpecker	<i>Dryocopus pileatus</i>	Focal
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	
Northern Flicker	<i>Colaptes auratus</i>	
Eastern Kingbird	<i>Tyrannus tyrannus</i>	Priority
Eastern Wood-Pewee	<i>Contopus virens</i>	Priority Focal
Blue Jay	<i>Cyanocitta cristata</i>	
American Crow	<i>Corvus brachyrhynchos</i>	
Bobolink	<i>Dolichonyx oryzivorus</i>	Priority Focal
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	
Baltimore Oriole	<i>Icterus galbula</i>	Priority
American Goldfinch	<i>Carduelis tristis</i>	
Chipping Sparrow	<i>Spizella passerina</i>	
Song Sparrow	<i>Melospiza melodia</i>	
Northern Cardinal	<i>Cardinalis cardinalis</i>	
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	Priority
Scarlet Tanager	<i>Piranga olivacea</i>	Priority
Tree Swallow	<i>Tachycineta bicolor</i>	
Cedar Waxwing	<i>Bombycilla cedrorum</i>	
Warbling Vireo	<i>Vireo gilvus</i>	
Yellow Warbler	<i>Dendroica petechia</i>	
Tufted Titmouse	<i>Baeolophus bicolor</i>	
Black-capped Chickadee	<i>Poecile atricapillus</i>	
American Robin	<i>Turdus migratorius</i>	
Eastern Bluebird	<i>Sialia sialis</i>	Focal

## Appendix D – Butterflies of Greenways Conservation Area

### Butterfly Inventory

### Reservation Name

### Town, State

Greenways Conservation  
Area  
Wayland, MA

Observer:

I think it was Michael Newton, Mass.  
Butterfly Club (L. Mattei)

DATE OF  
OBSERVATION

Common Name	Latin Name	Area	# individuals	Date
Cabbage White	<i>Pieris rapae</i>	North Field	1	5/6/2015
Common Ringlet	<i>Coenonympha tullia</i>	North Field	1	6/4/2015
Little Wood Saytr	<i>Megisto cymela</i>	North Field	1	6/4/2015
Red Admiral	<i>Vanessa atalanta</i>	North Field	1	6/4/2015
Pearl Crescent	<i>Phyciodes tharos</i>	Center Field	5	6/4/2015
Common Ringlet	<i>Coenonympha tullia</i>	Center Field	23	6/4/2015
European Skipper	<i>Thymelicus lineola</i>	Center Field	>50	6/4/2015
Peck's Skipper	<i>Polites peckius</i>	Center Field	2	6/4/2015
Tawny Edge Skipper	<i>Polites themistocles</i>	Center Field	1	6/4/2015
Hobomok Skipper	<i>Poanes hobomok</i>	Center Field	1	6/4/2015
Eastern Tailed Blue	<i>Cupido comyntas</i>	Center Field	1	6/4/2015
Peck's Skipper	<i>Polites peckius</i>	North Field	6	6/11/2015
Pearl Crescent	<i>Phyciodes tharos</i>	North Field	1	6/11/2015
Spring Azure	<i>Celastrina ladon</i>	North Field	1	6/11/2015
Cabbage White	<i>Pieris rapae</i>	North Field	1	6/11/2015
Red Admiral	<i>Vanessa atalanta</i>	North Field	1	6/11/2015
Peck's Skipper	<i>Polites peckius</i>	Sedge Meadow	20	6/11/2015
European Skipper	<i>Thymelicus lineola</i>	Sedge Meadow	>50	6/11/2015
Tawny Edge Skipper	<i>Polites themistocles</i>	Sedge Meadow	5	6/11/2015
Long Dash	<i>Polites mystic</i>	Sedge Meadow	1	6/11/2015
Cabbage White	<i>Pieris rapae</i>	Sedge Meadow	2	6/11/2015
Orange Sulfur	<i>Colias eurytheme</i>	Sedge Meadow	1	6/11/2015
Clouded Sulfur	<i>Colias philodice</i>	Sedge Meadow	3	6/11/2015
Common Ringlet	<i>Coenonympha tullia</i>	Sedge Meadow	20	6/11/2015
Viceroy	<i>Limenitis archippus</i>	Sedge Meadow	1	6/11/2015
Bronze Copper	<i>Lycaena hyllus</i>	Sedge Meadow	2	6/11/2015
Great Spangled Fritillary	<i>Speyeria cybele</i>	North Field	1	6/23/2015
Cabbage White	<i>Pieris rapae</i>	North Field	7	6/23/2015


Ecological Extension Service  
Mass Audubon  
208 South Great Road  
Lincoln, Massachusetts 01773

781 259 2198  
781 259 2398 (fax)

Summer Azure	<i>Celastrina neglecta</i>	North Field	10	6/23/2015
Silver Spotted Skipper	<i>Epargyreus clarus</i>	North Field	2	6/23/2015
Peck's Skipper	<i>Polites peckius</i>	North Field	1	6/23/2015
Baltimore Checkerspot	<i>Euphydryas phaeton</i>	Center Field	>40	6/26/2015
European Skipper	<i>Thymelicus lineola</i>	Center Field	20	6/26/2015
Summer Azure	<i>Celastrina neglecta</i>	Center Field	3	6/26/2015
Clouded Sulfur	<i>Colias philodice</i>	Center Field	7	6/26/2015
Cabbage White	<i>Pieris rapae</i>	Center Field	10	6/26/2015
Silver Spotted Skipper	<i>Epargyreus clarus</i>	Center Field	2	6/26/2015
Great Spangled Fritillary	<i>Speyeria cybele</i>	Center Field	1	6/26/2015
Viceroy	<i>Limenitis archippus</i>	Center Field	1	6/26/2015
Bronze Copper	<i>Lycaena hylus</i>	North Field	2	6/26/2015
Banded Hairstreak	<i>Calycopis cecrops</i>	North Field	2	6/26/2015
Summer Azure	<i>Celastrina neglecta</i>	North Field	3	6/26/2015
Eastern Tailed Blue	<i>Cupido comyntas</i>	North Field	2	6/26/2015
Gray Hairstreak	<i>Strymon melinus</i>	North Field	1	6/26/2015
Silver Spotted Skipper	<i>Epargyreus clarus</i>	North Field	2	6/26/2015
Great Spangled Fritillary	<i>Speyeria cybele</i>	North Field	2	6/26/2015
Clouded Sulfur	<i>Colias philodice</i>	North Field	4	6/26/2015
Cabbage White	<i>Pieris rapae</i>	North Field	8	6/26/2015
Monarch	<i>Danaus plexippus</i>	North Field	1	6/26/2015
Banded Hairstreak	<i>Calycopis cecrops</i>	Woods	11	6/26/2015
Eastern Comma	<i>Polygonia comma</i>	Woods	3	6/26/2015
Great Spangled Fritillary	<i>Speyeria cybele</i>	North Field	6	7/21/2015
Little Glassywing Skipper	<i>Pompeius verna</i>	North Field	1	7/21/2015
Dun Skipper	<i>Euphyes vestris</i>	North Field	1	7/21/2015
Monarch	<i>Danaus plexippus</i>	Center Field	1	7/21/2015
Great Spangled Fritillary	<i>Speyeria cybele</i>	Center Field	1	7/21/2015
Pearl Crescent	<i>Phyciodes tharos</i>	Center Field	2	7/21/2015
Clouded Sulfur	<i>Colias philodice</i>	Center Field	1	7/21/2015
Summer Azure	<i>Celastrina neglecta</i>	Center Field	1	7/21/2015
Banded Hairstreak	<i>Calycopis cecrops</i>	Woods	1	7/21/2015
Eastern Comma	<i>Polygonia comma</i>	Woods	1	7/21/2015
Mourning Cloak	<i>Nymphalis antiopa</i>	Woods	2	7/21/2015
Question Mark	<i>Polygonia interrogationis</i>	Woods	1	7/21/2015
Great Spangled Fritillary	<i>Speyeria cybele</i>	North Field	1	9/9/2015
Cabbage White	<i>Pieris rapae</i>	North Field	11	9/9/2015
Clouded Sulfur	<i>Colias philodice</i>	North Field	9	9/9/2015
Orange Sulfur	<i>Colias eurytheme</i>	North Field	3	9/9/2015
Pearl Crescent	<i>Phyciodes tharos</i>	North Field	10	9/9/2015



Eastern Tailed Blue	Cupido comyntas	North Field	20	9/9/2015
Gray Hairstreak	Strymon melinus	North Field	1	9/9/2015
Monarch	Danaus plexippus	North Field	1	9/9/2015
Clouded Sulfur	Colias eurytheme	Center Field	10	9/9/2015
Pearl Crescent	Phyciodes tharos	Center Field	40	9/9/2015
Mourning Cloak	Nymphalis antiopa	Center Field	1	9/9/2015

	Denotes focal species
(SC)	Species of Special Concern
(T)	Threatened
(E)	Endangered

Draft