

# Ruby and Elizabeth Cohen Woodlands Management Plan Colchester, Connecticut

Presented to the Board of Selectmen of Colchester and Jay Gigliotti of the  
Town of Colchester Planning and Zoning Department

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Prepared by students of Dr. Ortega's Wildlife Management Course (NRE 3325) at  
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## **Disclaimer**

It must be noted that this wildlife management plan was completed by a group of students as a part of a class project. While all the recommendations provided in this report are based on real research, professionals in wildlife management should be consulted before any of the recommendations are used by the landowners.

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# Introduction

## Description of Ruby and Elizabeth Cohen Woodlands Property

### *Location and Current Land Use*

The Ruby and Elizabeth Cohen Woodlands, also known as the Ruby Cohen Property and/or Cohen Woodlands, is in and owned by the Town of Colchester, Connecticut (41°33'07.5"N 72°18'11.0"W) (See Figures 1 and 2 in Appendix 2A). The property is currently over 205.82 acres due to a series of land acquisitions<sup>4</sup>.

The property is surrounded by a residential area, but the park is mostly undeveloped. There is a gazebo, a parking lot, a few information billboards, picnic tables, fences, a small garden, and a few footbridges along the walking paths. There is also an old stone foundation at the back of the property where there used to be a barn, as the property was used as a farm in colonial times (See Figure 10 in Appendix 2A)<sup>2</sup>.

In 2010, the park was certified by the National Wildlife Federation as a community wildlife habitat (See Figure 8 in Appendix 2A). The garden, developed by the Advanced Master Gardener and Colchester Garden Club, has also been certified as a monarch waystation by MonarchWatch<sup>4</sup>.

The property is home to the Colchester Story Walk, a trail through the park where children can read as they walk (See Figure 9 in Appendix 2A). The Story Walk was created by a Boy Scout from Colchester named Jack Boyden. He created stations along one of the hiking trails on the Ruby Cohen property, where each station contained two pages of a book and some form of interactive component. The Story Walk promotes love for reading and the outdoors<sup>2</sup>.

The park is mainly used for recreational use. Locals bring their children and dogs to the park, people use the ponds for fishing, and many different bird species and other animals can be

spotted by wildlife watchers. Many local groups use the park, including students from the Colchester Elementary School, Bacon Academy (the local high school), local Scout BSA troops, the Colchester Garden Club, and the general public<sup>4</sup>.

### *History of the Land*

Before the land of Ruby and Elizabeth Cohen Woodlands became a park, it belonged to Connecticut politician Rubin H. “Ruby” Cohen, where he lived with his wife Elizabeth until he passed away in 1999<sup>4</sup>. The Ruby Cohen property was first turned into a public park in 2000, when the town of Colchester obtained a grant to purchase 123.53 acres of the property for over \$200,000<sup>3</sup>. Over the years, the park has grown to nearly 206 acres through grants and donations of land, including the Moroch land obtained in 2013.

### *Habitat Types and Vegetation*

Most of the property is covered by deciduous forest and marshland. There are two freshwater ponds, along with a small stream, multiple freshwater wetland systems, and an open grass field at the center of the property<sup>5</sup>. The property also lies on Dutton Swamp, a natural freshwater emergent wetland (See Figures 4 and 5 in Appendix 2A for a map of the different habitat types). There are three main hiking trails that cover most of the property: red, blue, and yellow (See Figure 3 in Appendix 2A).

A considerable amount of the habitat on the property would be best classified as swamp/lowland forest. This habitat type is identified by the wet nature of the soil and presence of specific species<sup>6</sup>. Some species on the property that constitute this classification include yellow birch, red maple, skunk cabbage, and highbush blueberry (See Table 2 in Appendix 1 for the scientific names of the different species mentioned in the text) (See Figure 11 in Appendix 2A).

The region to the northeast of the property, which is unmarked by trails, is a superb example of this habitat type, as well as much of the yellow trail and its intersection with the blue trail.

The forest composition throughout is best classified as mixed hardwood. This is especially true along the red trail where the soil did not quite constitute the swamp classification seen along much of the other trails. There were clear indicators of forest-loving species as well, including the distinctive excavations of pileated woodpeckers, a species that is indicative of mixed hardwood forest habitat.

There is an area of marshland to the northwest of the property that can be seen along the yellow trail. While unable to identify the exact species present in the area, there appeared to be an abundance of grasses (perhaps cattails) which are associated with this habitat type. Additionally, there was a significant number of spring peepers calling in the area, suggesting that there is substantial water coverage.

The property contains two permanent ponds, which are both man-made. These provide a habitat for many organisms, including at least one active beaver lodge (See Figure 14 in Appendix 2A). These ponds are experiencing a variety of issues, such as infilling, which will be addressed later in this management plan. Additionally, there is evidence of another source of water off the blue trail, as determined by the calling of spring peepers in the vicinity. The water source may be a vernal pool since we were unable to determine its depth and long-term viability.

A large open meadow directly to the southwest and northeast of the parking lot provides a valuable habitat for species that require open spaces such as the eastern bluebird, which was observed foraging in the area. The meadows appear to be mowed seasonally, and their maintenance to promote biodiversity is explored later in this analysis. It should be noted that

open habitats like this are in decline throughout the state, so the preservation of this area is essential for wildlife.

Very few species of herbaceous vegetation were located upon analysis. However, this is likely due to the time of year when the survey was conducted, as the seasonal conditions had only recently become conducive to above-ground plant growth (note: surveys were conducted during late winter/very early spring). As a result, most of the noticeable plant growth displays an evergreen state and is therefore visible throughout the year. Such species include spotted wintergreen, Christmas fern, and princess pine. Special attention should be taken to the prevalence of princess pine throughout the property, as this species serves to indicate a healthy mycorrhizal community within the forest (See Figure 12 in Appendix 2A).

Small woody plants that were noticed on the property include: highbush blueberry, multiflora rose, and Japanese barberry. It should be noted that there are most certainly more species, but due to the lack of characteristic foliage, flowers, or fruit, other identifications would have been haphazard. Additionally, the presence of invasive plants such as Japanese barberry and multiflora rose are cause for some concern and could present a topic for future management actions.

A variety of tree species can be found on the property, as well as many different age compositions. Tree species that were noticed in the area include: white pine, spruce species, American beech, American hornbeam, white oak, red oak, unidentified oak species, sugar maple, red maple, yellow birch, shagbark hickory, and unidentified hickory species. Additionally, White Ash specimens were identified on the property, which are currently facing huge population declines due to the introduced Emerald Ash-Borer. As such, consideration should be given to the potential need for future management of the dead trees/snags.

The age range of the tree species differed greatly depending on the particular location in the area, but there was a universal overabundance of relatively young trees in many spots. It is unclear as to the exact reason for this age discrepancy, as the growing conditions appear favorable and there is no recorded recent disturbances on the property. However, the presence of at least one active beaver den in the area could be at least partially responsible for the plethora of younger stems, as the beavers are likely removing much of the older and thicker vegetation. For a full list of the vegetation species observed on the property, see Table 2 in Appendix 1.

A variety of mammal, bird, fish, and other animal species were observed on the property by camera traps and visual surveys conducted by team members upon visiting the park (See Figure 7 in Appendix 2A for map of camera trap locations). A wide variety of mammals were observed, including predators like bobcats, coyotes, and American mink, and a variety of prey species like racoon, cottontails, Virginia opossums, skunks, beavers, muskrat, and eastern gray squirrels, among others. A large diversity of birds was also observed, including: wood ducks, great blue herons, American robins, eastern bluebirds, broad-winged hawks, great crested flycatchers, black-capped chickadees, red-winged blackbirds, and wild turkey, among many others. For a full list of the species observed see Table 1 in Appendix 1 and see some of the camera trap photos taken in Appendix 2B. For more details about the soil composition of the property, also see Figure 6 in Appendix 2A.

# **Wildlife Management Goals and Objectives**

## **Main Goal of Wildlife Management Plan**

The goal of this wildlife management plan is to suggest management strategies that encourage the health of the ecosystem in the Ruby and Elizabeth Cohen Woodlands while reducing the harmful interactions between the park's human users and the wildlife that inhabits it.

## ***Wildlife Management Objectives***

To achieve our goal outlined above, we will address these different objectives:

- 1) Manage the pond ecosystems on the property to reduce eutrophication and address any potential issues the beavers on the property may present
- 2) Reduce and manage the human footprint and impact on the property by reducing pet waste, litter, and off-trail hiking.
- 3) Control the vegetation on the property by removing invasive species like bittersweet, phragmites, and Japanese knotweed, and controlling poison ivy along the trails.
- 4) Promote the presence of valuable wildlife species and their habitats by managing the meadow habitat effectively and putting in bird and bat boxes.

# Wildlife Management Practices

## Pond Management

### *Observed Issue*

The two ponds located on the Ruby and Elizabeth Cohen Woodlands represent an important natural resource in the Town of Colchester. One important ecosystem service that the ponds provide is the habitat they create for numerous fish, reptiles, amphibians, mammals, and birds. Through our sampling efforts, we identified five species of fish in the ponds: largemouth bass, chain pickerel, bluegill, pumpkinseed, and the banded sunfish. These species represent the typical assemblage of warmwater fish species that are commonly found in Connecticut ponds, where largemouth bass and chain pickerel represent the apex predators of the pond ecosystem and sunfish, bluegill, and pumpkinseed serve as forage species for the predators<sup>1</sup>.

On site surveys revealed the presence of other species that use the ponds for habitat. Beavers were observed on both ponds and an active beaver hut is located on the southwest shore of the large pond (See Figure 14 in Appendix 2A). Not far from the beaver hut, a possible muskrat den is also present (See Figure 15 in Appendix 2A). Three waterfowl species were observed on the ponds during bird surveys: Canada geese, mallards, and the ring-necked duck. A pair of wood ducks were also caught by camera traps (See Figure 16 in Appendix 2A). It is possible that other waterfowl species use the ponds throughout the year, especially during migration periods. We also identified two reptile species in the ponds: the painted turtle and the spotted turtle. The green frog was also spotted on the small pond, along with other frogs that could not be identified.

Both ponds are shallow in depth; the small pond is less than four feet deep throughout and the larger pond is mostly less than three feet deep with one deeper section immediately in

front of the dam breachway. While our sampling occurred during the early spring, aerial photographs and decaying vegetation show that the ponds contain very dense aquatic vegetation during the summer months. The shallow depth and abundant aquatic vegetation present in the ponds mean that they can be classified as eutrophic water bodies<sup>1</sup> (See Figure 13 in Appendix 2A). All-natural lakes and ponds naturally progress from oligotrophic to eutrophic water bodies as time progresses. Oligotrophic ponds are characterized by having deep, clear water with few aquatic plants or animals present. Over time, tributary streams deposit sediment into ponds while organic matter builds up on the pond bottom, causing the pond to become more and more shallow until the pond eventually transitions into a marsh or bog. Eutrophic ponds contain dense aquatic vegetation because they contain abundant nutrients and their shallow depth allows sunlight to penetrate to the bottom.

While the eutrophication of ponds is a natural process, human activities can accelerate the process. The grassy habitats along the pond can encourage greater numbers of Canada geese, whose excrement can greatly increase nutrient levels in the pond leading to increased aquatic vegetation<sup>1</sup>. This condition is likely accelerating the eutrophication of the Ruby Cohen ponds as goose excrement was observed on the grassy areas surrounding the ponds during surveys. Fertilizer from nearby lawns and farms can also run off into the pond, encouraging weed growth, while erosion can increase the rate at which sediment accumulates in ponds.

Shallow, eutrophic ponds can provide excellent habitat for a wide variety of species, even as they transition into a marsh habitat<sup>4</sup>. On site surveys revealed that the ponds on the property are supporting numerous fish, reptile, amphibian, bird, and mammal species. However, fish and wildlife habitat is not the only ecosystem service that ponds provide; ponds are also an important recreational resource due to the angling opportunities that they provide for the local community.

Ponds are also appreciated for the aesthetic beauty that they can add to the landscape. The current condition of the ponds in the Ruby and Elizabeth Cohen Woodlands suggest that improvements could be made to improve the recreational and aesthetic value of the ponds. For optimal fishing conditions, the CT DEEP recommends that only 20% to 40% of the pond should contain aquatic vegetation, but in their current state the coverage of aquatic vegetation on the ponds is closer to 90-100% during the summer months<sup>1</sup>. Experts also recommend that ponds in Northern latitudes contain an extensive area that is at least 8 to 10 feet deep in order to provide refuge habitat for fish species during the winter months<sup>3</sup>. The shallow, weedy conditions that are found in the Ruby Cohen ponds can make angling nearly impossible, decrease the scenic value of the ponds, and increase the risk of winter fish kills.

Dredging is a common management practice that can create deep water habitat for fish, decrease the coverage of aquatic vegetation, and increase the aesthetic value of small ponds through the removal of sediment buildup<sup>2</sup>. Pond dredging is an expensive process that must be done on a regular basis since sediment deposition into ponds is a natural process that will always occur even if steps are taken to reduce erosion. If the removed sediment is not contaminated by pollutants, it can often be used as sediment filler and fertilizer to offset some of the cost of dredging. However, sediment that is contaminated by pollutants will require expensive disposal costs. Aquatic herbicides and mechanical vegetation removal can also be used to decrease the coverage of aquatic vegetation; however, these measures only address the symptom of the problem (excessive weed growth) and not the cause of the problem (shallow pond depth, excess nutrients) <sup>2</sup>.

## *Pond Management Strategies*

### **Option 1:** *Leave the ponds in their current state*

*Objective:* Conserve the ponds in their current condition in order to provide important habitat for a diverse variety of fish, mammal, bird, reptile, and amphibian species.

*Description:* This management strategy is the least expensive option and requires minimal work from the Town of Colchester. The town will let the pond eutrophication process continue, and the ponds will continue to become more and more shallow due to sedimentation until they eventually turn into wetlands. This outcome is desirable because the ponds will still support a diverse array of wildlife without requiring much maintenance or investment from the town.

Ponds with an average depth of one to four feet like the Ruby Cohen ponds are considered to be the most suitable for wildlife habitat<sup>4</sup>. However, the recreational angling and aesthetic value of the ponds will continue to decline. The only management this strategy might include are measures to reduce the presence of Canada geese along the ponds in order to prevent nutrient pollution from their excrement and to create a more pleasant walking area for park visitors.

Recommendations for how to control nuisance Canada geese can be found in the “Problems with Canada Geese” CT DEEP web page in section five of the appendix.

### **Option 2:** *Rehabilitation of both ponds*

*Objective:* Deepen both ponds in order to promote better recreational fishing opportunities and to ensure the ponds remain a part of the landscape for future generations.

*Description:* This strategy will require the Town of Colchester to fund a dredging project in order to deepen both of the Ruby Cohen ponds. Deepening of the ponds will reverse the negative impacts of sedimentation and will reduce the aquatic vegetation coverage of the ponds<sup>2</sup>. The

ponds will be more suitable for recreational angling and will provide better fish habitat throughout the year. In addition to improving the fishing, the ponds will be more aesthetically pleasing and will remain on the landscape without transitioning into marshes or bogs. This management strategy is very intensive and expensive. Rehabilitation projects for town park ponds in nearby towns will help give the Town of Colchester an idea of the cost and scope of such a project. Dredging will also need to be done on a regular basis (every 20 to 30 years on many small ponds) to reverse the continual effects of sedimentation, although taking steps to reduce erosion on the park grounds and installing a settling basin upstream of the ponds could decrease the rate of sediment buildup<sup>2</sup>. An environmental assessment will be necessary to determine the potential impacts of the dredging project on local wildlife.

**Recommended Solution:** *Leave ponds in current condition or dredge*

The best solution to the eutrophication of the ponds at Ruby Cohen depends on the priorities of the Town of Colchester. If the town values the aesthetic value and recreational value of angling at the ponds the most, then the second option of rehabilitating both ponds through dredging is recommended, although it will be expensive. If the town would prefer to keep park maintenance costs to a minimum while also promoting biodiversity, then the first option of leaving the ponds in their current condition is recommended. This option would still provide suitable habitat for the wildlife of Ruby Cohen, and it would come at no additional cost to the town.

## **Phragmites Management**

### *Observed Issue*

The common reed, or phragmites, is an invasive, fast growing wetland plant that grows up to 5.5 meters tall and shades out native plants surrounding it<sup>1</sup>. There is a vast expanse of phragmites on the Ruby Cohen property which has displaced native wetland vegetation and reduced suitable habitat for species of birds, macro invertebrates, and other wildlife<sup>1</sup> (See Figures 17 and 18 in Appendix 2A). Phragmites can spread using multiple strategies including the use of rhizomes (underground stems that sprout off of a parent plant, creating clones of itself around the parent plant), stolons (above-ground stems), and/or seed dispersal<sup>2</sup>.

### *Phragmites Management Strategies*

#### **Option 1: Herbicides**

There are several established management techniques used to suppress phragmites growth, however all techniques must be used alongside an integrated management plan or else the invasive species is likely to come back and cause problems once again. Using herbicides like glyphosate and imazapyr may be an effective method of phragmites removal, however all parts of the clone must be treated, including deep roots, or the plant may produce new stems and regrow and spread the next year<sup>2</sup>. This would require a follow-up herbicide session. Mechanical removal of dead biomass is also suggested following an herbicide event. Another con of herbicide use includes potential damage to native species and other wildlife, as the chemicals are not species-specific and could be toxic to other plants and animals. The pesticide must be approved for aquatic use or else damage to aquatic and semi-aquatic species may occur<sup>2</sup>. The

phragmites stand at Ruby-Cohen is about 22 acres and would require aerial spraying, which poses threats to surrounding plants, animals, and homes/communities because of pesticide drift.

### **Option 2:** *Prescribed Burning*

A second management technique used to remove phragmites is prescribed burning. This method is used to remove dead biomass but does not kill the plant's root system, so it is usually undertaken following herbicide application to remove dead biomass so the land is more accessible<sup>2</sup>. By removing the dead biomass, native species have a better chance of re-establishment. Fires provide plants with nutrients to support growth and increase access to sunlight which would be unavailable to many native plants in the presence of tall phragmites stands<sup>3</sup>. However, burning could also encourage phragmites to grow back because of the positive conditions. Prescribed burning must be carefully executed and overseen so that fire doesn't spread into unintended areas of the property or beyond the property lines.

### **Option 3:** *Manual Removal*

Manual removal is another approach to phragmites removal. However, it would require many laborers and many hours of work, especially with how dense and expansive the phragmites stand is on the Ruby Cohen property. Even if volunteers helped with the removal process, the plant would likely come back if the roots were not properly and fully removed, and the process of removing every individual root of phragmites on the property would be very time consuming. This option is not feasible on this property and not recommended.

**Option 4:** *No action*

A final management option would be to do nothing, often called the “business as usual” approach. A consultation with Dr. B. Lawrence (Assistant Professor Department of Natural Resources and the Environment, UConn) mentioned that a ‘do nothing’ approach may be a good option for this site depending on the town of Colchester’s goals. As all municipalities have a limited budget subject to taxpayer scrutiny, the options listed above are likely too costly, require a large crew, many man-hours, equipment, and follow-up maintenance. Currently, the stand of phragmites is not causing a direct threat to the property. Although the invasive plant is likely reducing the biodiversity of this section of the property, there are some potential benefits of keeping the phragmites stand. Phragmites are net carbon sinks, an important trait to consider as carbon dioxide levels in the atmosphere rise<sup>4</sup>. Phragmites have also been found to take up nitrogen that otherwise would pollute the wetland<sup>4</sup>. Some native species also use phragmites reedbeds for habitat<sup>5</sup>. Songbirds, like red-winged blackbirds, can be found roosting in phragmites and have been seen doing so on the property. Birds also use the plant for nesting material, and muskrats and beavers, which live on the Ruby Cohen property, sometimes use the material during lodge construction<sup>4</sup>.

In conclusion, leaving the phragmites on the property alone is likely the best approach for the town to take, as it is very expensive, time consuming, and difficult to remove fully, is likely to continuously repopulate on the property, and there are studies that show some benefits to preserving phragmites wetlands.

### **Recommended Solution:** *No Action*

It is our recommendation that no action be taken to manage the phragmites at Ruby Cohen. Even though this seems counterintuitive after identifying it as an issue, the other management strategies are too complex and expensive, and may still be ineffective at controlling the plant. Additionally, phragmites can offer some benefits, in that the plants store carbon, take up nitrogen, and can serve as an important habitat for some species.

### **Additional Invasive Species Management**

#### *Observed Issue*

The most prevalent invasive species, in addition to phragmites, observed at the park are oriental bittersweet and Japanese knotweed (See Figures 19, 20, & 21 in Appendix 2A). Bittersweet is a woody vine, recognizable by its striking red seeds surrounded by orange capsules. As the name suggests, oriental bittersweet is native to Japan, Korea, and China. First introduced to the United States in 1860 for ornamental purposes, as well as for erosion control, within 60 years it had spread throughout Connecticut and Massachusetts<sup>2</sup>. By 1938 it had spread to New Hampshire, and by 1978 over 33 states had occurrences of oriental bittersweet. While it is more dominant in southern states, bittersweet is considered invasive in New York and Connecticut<sup>2</sup>. Based on its native habitat, oriental bittersweet has been predicted to spread further north. In Connecticut, oriental bittersweet has been found in a number of environments, including mixed-hardwood, conifer, shrub land, and old-field communities, many of which are present in Ruby Cohen. Bittersweet has high tolerance to shade and sunlight, but grows fastest in partial sunlight, which makes the wooded areas of the park ideal habitat<sup>2</sup>. Oriental bittersweet

has been shown to completely replace native species, including American bittersweet, and many species in the process of establishing and growing. When left unchecked, oriental bittersweet creates a thick canopy, blocking sunlight and stifling the growth of understory species. In addition, the vines can result in mechanical damage to native species; sometimes trees fall due to the weight of the vines or the vines may wrap tightly around trees, choking off the vascular system of the tree. Estimates of oriental bittersweet coverage throughout New England may be used to roughly estimate the coverage within Ruby Cohen Woodlands. Such estimates span anywhere from 0.6% coverage by area to 2.2%<sup>2</sup>.

Japanese knotweed is an invasive herbaceous, shrub-like plant native to, as the name suggests, Japan, China, and Korea. It was introduced to the United States in the late 1800s for many of the same reasons that oriental bittersweet was, both functional and aesthetic. Japanese knotweed may be identified by its reddish stems and light green flowers in summer. Knotweed is capable of growing exceptionally fast and establishes itself quite firmly with deep roots. Roots are able to spread as far as 65 feet<sup>4</sup>. After its first introduction to the United States, the Japanese knotweed saw an approximately 50-year lag time before shifting towards exponential growth patterns<sup>4</sup>. As of 2006, in the United States the growth rate of Japanese knotweed was still increasing. In 1960, only one county in Washington State was known to have an established invasive knotweed population; by the year 2000 it had spread to more than 50 counties in the surrounding area. In New England, Japanese knotweed has been observed in a number of environments including floodplain forests, forested wetlands, herbaceous wetlands, shrub wetlands, and wet meadows, some of which are present within Ruby Cohen. While it is considered invasive, Japanese knotweed can serve some ecological roles in foreign environments, mainly as a source of food for certain mammals and insects. Rabbits, white-tail

deer, woodchucks, and some leaf-eating insects like the Japanese beetle have been observed consuming it<sup>3</sup>. However, the rhizomes of the plant are known to be toxic to some livestock species. Even though it may serve as a food source for some species, if left unchecked, invasive knotweed will dominate and kill native species in the area, ultimately leading to decreases in plant and wildlife diversity. In terms of land area covered by Japanese knotweed, it has been observed in some areas to reach as high as 25%<sup>4</sup>, however that is far from the case within the Ruby Cohen property.

### *Invasive Species Management Strategies*

In order to effectively manage the spread of oriental bittersweet, it is important to act as soon as the invasion is noticed, however caution is required so as to not mistake the invasive species for its native counterpart.

#### **Option A1:** *Oriental Bittersweet - Early Prevention*

One of the most effective methods of managing invasive species is the prevention of invasion in the first place, if possible. This can be done by monitoring the spread of oriental bittersweet and removing it when found in new areas. Based on the current method of regular but minimal management, early prevention will require increasing the time and number of personnel utilized in management.

#### **Option A2:** *Oriental Bittersweet - Mechanical Prevention*

Given the park's resources and its proximity to residential areas, the most effective way of removing the bittersweet will be via mechanical methods, as opposed to using herbicides, controlled burns, or biological methods. Mechanical management mainly consists of frequently

mowing, cutting, and disposing of the vines as often as possible. In this method it is important to remove, to the best of one's ability, the entire root system of the plant, as it is capable of regrowth from roots. Once the vines are removed, it is also important to dispose of them in a way that will not result in rooting. This can be done by bagging the removed material and burning, as is currently being done to some extent, or leaving until the seeds and vines have died.

**Option B1:** *Japanese Knotweed - Mowing/Cutting*

Management of Japanese knotweed can come in many forms, but the wider management community has yet to agree upon any one most effective method<sup>1</sup>. Mowing and cutting clusters of invasive knotweed can be effective methods of dealing with new or young instances of it, but more established instances of Japanese knotweed may be resistant to such methods due to their deep and widely spread roots. Like the oriental bittersweet, it is critical to completely remove the root system in order to fully prevent regrowth and to properly store any removed plant matter to prevent rooting.

While widely invasive throughout the greater area, based on our observations, both Japanese knotweed and oriental bittersweet are relatively under control within the park property. Currently there is some management of these species by the Colchester Garden Club, mostly in the form of occasionally removing and burning as much of both species as possible. More intensive management methods, like herbicides or prescribed burns, are likely to have more negative consequences than positive and should be avoided. Given the location of the two ponds and the private residences nearby, chemical herbicides could seep into the water and spread beyond their intended area of effect. A similar problem arises with the use of fire on a large scale. The current management methods appear to be sufficient and should be continued,

although it would be beneficial to increase the frequency of removing both the oriental bittersweet and Japanese knotweed.

**Recommended Solution:** *Continue current management and monitor for new growths*

It is our recommendation that the current management strategy of the manual removal of Japanese knotweed be continued, and that the manual removal of oriental bittersweet along the woodland edges be initiated to control that invasive species as well. Both species should also be monitored closely for new growth throughout the park so they can be prevented from growing further.

## **Pet Waste and Litter Management**

### *Observed Issue*

Moving on to issues more directly related to the human users of the property, upon first arriving at the park it is quickly noted that there is no area to discard waste. There are no garbage receptacles on the property, which encourages litter, a major issue noted on the trails. Pet feces were found on the trails, sometimes left in plastic pet waste bags beside the trail or in the trees (See Figure 22 in Appendix 2A). To avoid littering, any person that goes to the property with their pet must drive or walk home with their pet's waste, which the average citizen is unlikely to do. Additionally, the property has picnic tables which encourage people to eat meals there, which could also encourage littering, as there is no place to throw away any garbage that may accumulate. The lack of waste management has led to the accumulation of pet waste and litter throughout the park, which decreases the aesthetics of the park for human visitors, introduces potential toxic substances and diseases to the environment, and presents a danger to any wildlife

that might try to ingest the trash (See Figure 23 in Appendix 2A) <sup>2</sup>. The Town of Colchester has a brochure on the website that addresses the concerns that pet waste damages the environment<sup>2</sup>. While having the information available to the public is beneficial, until the lack of waste receptacles on the Ruby Cohen property is addressed the issue will likely continue.

### *Pet Waste and Litter Management Strategies*

#### **Option 1:** *Signs and Resources*

If obtaining a vesicle to store waste is not achievable at the moment, having a sign to deter littering is important. The signs signify to the public that there is no waste removal and whatever they bring must be taken back with them. For example, a *leave only footprints* campaign of posters or signs might be beneficial. Additionally, the aforementioned flyer about the hazards of pet waste already created by the Town of Colchester, could be posted at Ruby Cohen on the bulletin board.<sup>2</sup> This would be the cheapest option because the only costs are the signs and the labor to put them up. Along the trails there are wooden posts that at one point had information about the woodland, so signage could potentially be attached to these pre-existing structures. (See Figure in Appendix 2A).

#### **Option 2:** *Trash and recycling bins*

Placing trash receptacles on the property, especially near the parking lot or trail heads, would improve waste management and reduce littering. The easiest solutions would be to have a dumpster placed in the parking lot area or to have one large (at least 32 gallon) plastic trash can with a lid placed near the parking lot and picnic tables. A metal trash receptacle would be sturdier against wind, snow, and other elements, but also more expensive. These heavier duty

trash cans may be less of an eye sore than a dumpster or the plastic trash cans and improve the aesthetic appeal of the park to human visitors. There are also options that look more natural and do not take away from the beauty of the property, these can be bought or handmade. Whatever option is chosen, secure lids must be prioritized so that wildlife cannot access the waste and be harmed. These smaller trash receptacle options could be placed around the property along the trails, although this would require labor to regularly walk the trails and empty the trash cans. Another option would be to place storage boxes with biodegradable pet waste bags along the trails, potentially on the posts already on the trails. This would not only remind people to pick up their pet's waste, but also give them a resource to do so. If this is not coupled with trash receptacles, however, people may still leave their bagged pet waste along the trails.

**Option 3:** *Get the community involved*

The project of putting waste management into Ruby Cohen might be a great way to get the community involved, such as through encouraging further work on Ruby Cohen with Scouts BSA. Scouts have worked with the Cohen Woodlands before on service projects like the Story Walk. Other Scouts could work on a project to make animal safe trash receptacles, like Ashton Raymer did for his community service project at Boyd Hill Nature Preserve Park.<sup>3</sup> This allows the community to get involved with a waste management plan that is cost effective, while improving the aesthetic look of the park and benefiting the wildlife at the Ruby and Elizabeth Cohen Woodlands.

**Recommended Solution:** *Dumpster placed in parking lot*

It is our recommendation that both signs asking people to “leave no trace” on the trails be installed and a dumpster be placed in the parking lot at Ruby Cohen to provide a place for

visitors to dump their trash and pet waste. This would be the simplest option as it would not require any labor to empty trash receptacles throughout the park, and it would mean less wildlife would be exposed to or have access to trash in the park. It could also serve as a temporary solution until a more effective waste management system (such as wooden trash receptacles along the trails) can be implemented.

## **Trail Maintenance Management**

### *Observed Issue*

When walking the trails on the south side of the property, our team noticed that the trails are in poor repair. Especially along the Red Trail it is very difficult to tell in which direction the trail is going. The trail markers are either faded, nonexistent, or do not properly show when and where the trail turns. The maps of the trails also do not match the actual trails on the property. There are many smaller loops and trails coming off from the main red trail, but none of these are labeled on any publicly available maps. There is also a lot of debris on and along the trails, including pools of water, mud, fallen logs, and hanging branches, making it difficult to walk the trails and to see which direction the trail continues. There was even a tree down on the Blue Trail that forced users to create another trail around it, and a footbridge washed out along the Red Trail (See Figure 25 in Appendix 2A). The disrepair of the trails can cause hikers to go off-trail, which can cause damage to wildlife and sensitive vegetation, and should be avoided at all costs. The other trails in the park, including the blue and yellow trails, are well traveled and have little debris in the paths, but the red trail is very difficult to navigate and is not user friendly.

## *Trail Maintenance Management Strategies*

### **Option 1:** *Trail Blaze Maintenance and Map Updating*

The trail blazes along the Red Trail should be updated. This can be done easily with a can of red spray paint. It is important to ensure that blazes are put going both directions along the trail, and that you can always see the next blaze ahead of you while standing next to another blaze. It is also important to make sure that there are blazes showing where the trail turns and bends, which occurs frequently on the Red Trails and the loops that branch off them. Putting two blazes on top of each other, with the upper blaze pointing in the direction the hiker should turn, will help to provide clear directions and ensure that no one gets lost or goes off trail (See Figure 24 in Appendix 2). It is recommended that a new trail map be created once the trail blazes are updated, so that visitors can know where they are going, not get lost, and not go off trail. If trails are better maintained and more clearly marked, fewer people will go off-trail and the wildlife and vegetation of the woodlands should be less affected.

### **Option 2:** *Trail Clearing*

Trail clearing and maintenance needs to be done. While not necessary, it may be helpful to rake the paths along the red trail, as there is a lot of leaf litter and small debris making it difficult to discern the trail from the rest of the forest floor. Large branches should also be moved from the middle of the trail. These branches could be used in many ways. They could be used as liners on the edges of the trails, differentiating the trail from the rest of the forest and guiding people where to go. They could also be used as erosion control, holding back sediment on steeper parts of the trail. Extra branches could even be piled up someplace off trail, as piles of leaves, branches, and other debris often make great homes for small rodents and other forms of

wildlife. Branches could also be used to make bridges over the watery and muddy portions of the trail. These water and mud holes are likely seasonal, but they are large and cover the entire width of the trail in some areas, forcing people to walk off-trail to get around them. If the fallen logs are not enough to make these mud and water holes crossable, small footbridges may need to be constructed. Luckily, there are already piles of logs on the Moroch section of the property that could be cut and turned into planks and bridges, reducing the costs of creating these walkways. Branches hanging over the path will also need to be removed, but this can easily be done with hedge shears or similar tools.

**Recommended Solution:** *Improve trail blazes, remove debris, and update trail map*

It is our recommendation that the debris on the trails at Ruby Cohen be removed, perhaps with volunteer labor, the washed-out footbridge on the Red Trail be repaired, and that the trail blazes and trail map be updated (especially along the Red Trail). This will not only improve the experiences of park visitors, but also reduce any damage to the wildlife and plants affected by people walking off the trails.

## **Poison Ivy Management**

### *Observed Issue*

The team has noticed a heavy presence of poison ivy along the walking trails of the property (See Figures 26 and 27 in Appendix 2A). Poison ivy can be distinctly identified by its shiny, green three-leafed makeup, and it was noticed along the trails and some of the white pines by the ponds on the property<sup>4</sup>. This warrants concern in terms of public safety. Upon contact poison ivy plants cause skin irritation that often lead to a variety of symptoms such as itching,

rashes and blisters <sup>7</sup>. This is because the toxin urushiol in the stems, leaves, and roots of the plant (and even the flowers and fruits), is released whenever the plant is damaged, such as when it is crushed or stepped on. Urushiol can cause contact dermatitis through both direct contact with the plant and indirect contact with pet fur, clothing or objects that have contacted poison ivy, and it can remain potent for weeks on different surfaces<sup>6</sup>. Some humans can have severe reactions to exposure to poison ivy, while others have more mild reactions, but either way it is a public health hazard that should be managed to make the park more enjoyable and safe for human users<sup>5</sup>, <sup>6</sup>.

### *Poison Ivy Management Strategies*

#### **Option 1:** *Eradication Via Herbicides*

Unfortunately, the use of herbicides is likely the most effective solution for managing the poison ivy at Ruby Cohen. While the use of herbicides could potentially have a negative impact on wildlife and plant species in the areas sprayed, the alternative of hand-removal of poison ivy presents a danger to anyone removing it, and it requires that every part of the plant (including the roots) be removed - which can be quite difficult. <sup>6</sup> As a result, the hazardous and labor-intensive method of physical eradication is not recommended, and herbicides are the best removal option. Herbicides like glyphosate, 2, 4-D, and Triclopyr could be used to kill poison ivy in both selective and non-selective repeated applications, although a selective method is recommended to reduce damage done to nearby native plants and the amount of toxins released into the environment<sup>5</sup>. If applied properly, the use of herbicides to kill poison ivy along the trails at Ruby Cohen may be the most effective solution to the problem. It should be noted that poison ivy should never be burned in any management attempt: when burned the allergens in the plant can be inhaled through smoke and cause lung irritation<sup>7</sup>.

## **Option 2:** *Public Notice*

Because the presence of poison ivy at Ruby Cohen is a concern for public safety, it is probably a good idea to inform the public about its presence at the park, the danger it presents, and how to treat any symptoms if exposed to the plant. This could be done with signs including tips for identification of the plant and on how to treat poison ivy once exposed. This will help prevent contact amongst the plant and the public. A potential source for more information on the health risks of poison ivy might be the CDC's page on poisonous plants: see the literature cited for the link<sup>7</sup>.

## **Recommended Solution:** *Herbicides and Informational Campaign*

It is our recommendation that both informational signs be put up and the poison ivy be treated with herbicides to remove the threat altogether while also ensuring the public knows about its presence to reduce contact even further if the entire property cannot be treated for the plant.

## **Meadow/Field Habitat Management**

### *Observed Issue*

Throughout much of the Northeastern United States there has been a decline in open habitats such as meadows, fields, and early successional woodlands. This is due in large part to the historical movement of agriculture and significant forestry operations from the area. Since land is not being disturbed by these activities, the areas in which they were maintained revert to woodlands. Additionally, much of the land that is cleared is done so for the purpose of development, making it unsuitable for the species that would have benefited from open habitat. The regional decline in this habitat type has directly contributed to the decreasing populations of

many species, in some cases even rendering them locally endangered. Some of the CT-listed endangered species that rely upon open habitat for foraging and/or reproduction include: Least Shrew, Barn Owls, Grasshopper Sparrow, Long-eared Owl, Northern Harrier, Red-headed Woodpecker, Upland Sandpiper, Vesper Sparrow, and Yellow-breasted Chat<sup>1</sup>. There is a decent amount of open land present on the property, and it appears to be mowed annually to stimulate regrowth of meadow vegetation (See Figures 28 & 29 in Appendix 2A). The time and manner in which the area is mowed could provide an opportunity to provide suitable habitat for many of the aforementioned species.

### *Meadow/Field Habitat Management Strategies*

**Option 1:** *Maintain the open meadow habitat and alter the seasonal timing of mowing to ensure habitat viability*

#### **A. Mowing during the early fall:**

While annual mowing prevents woody plants from taking over and eventually reforesting the meadow, the timing of the mowing is critical in order to avoid doing more harm than good. Many species, including some of those listed earlier, actually rear their young in the vegetation, meaning that mowing at the wrong time can be deadly. Therefore, the first and most critical aspect to future management of this area is knowing the breeding and nesting seasons of the species that would be present. According to the USDA, the risk to juvenile birds that were reared in meadows/fields is at its peak between early April and early August<sup>2</sup>. Therefore, any mowing that takes place should occur well removed from this timeframe, maybe late September at the earliest.

## **B. Mowing during the late winter:**

Mowing in the early fall removes the potential seed sources and foraging that many species could use in the fall and winter. By instead mowing in the late winter, such as February or early March, spent growth would be removed after it had been used for food<sup>3</sup>. Of course, being New England, there is always the possibility of snow during the late winter, which would prevent any mowing. It is critical to remember then that if the snow makes it impossible to mow by late March, it is best to wait until after the young birds have left in late September. Therefore, if the unpredictability of snow proves to be inconvenient, it may be best to instead use the previous recommendation (Option 1a), as the health and direct survival of the species is far more important than additional forage.

**Option 2:** *Promote a slightly older meadow via mowing over a period of years instead of annually*

While mowing annually serves to prevent reforestation in the area, increasing the time between each mowing can increase the plant and animal diversity. Instead of mowing the area every year, by waiting for two or three years the potential forage for resident species increases due to the increased plant diversity. For example, the increased time frame allows for berry-producing plants such as blueberry (*Vaccinium*) to grow and produce fruit, a valuable resource for many birds and mammals<sup>4</sup>. It is possible to wait longer than 2-3 years between mowing, but by this point woody plants may begin to become prevalent, altering the efficacy of the landscape for many species and making mowing much more difficult for most machinery. It should be noted that this method of biennial or triennial mowing should be used in conjunction with option

1 (a or b), as protecting the resident species is the most important aspect of this management issue.

**Recommended Solution:** *Mow in early fall and every 2-3 years*

It is our recommendation that the meadow areas on the property be mowed every two to three years in the early fall (in late September) to promote an older, more complex meadow habitat that will host more bird species, and to protect the nesting habitat of those species already there.

## **Bird Encouragement Management**

### *Observed Issue*

Many bird species have been seen around the park, both by our team and by local birders. Most of the birds that have been recorded were common birds in their native habitats, and do not require any additional species protection or management. No invasive or parasitic species have been documented either. However, historical data from eBird<sup>3</sup> suggests that some at risk and special concern species have been seen on the property, including a broad-winged hawk, and Great-crested flycatchers. Many birds popular with bird watchers have been seen around the park as well, including Eastern Bluebirds, which can be further encouraged with the provision of nest boxes.

## *Bird Encouragement Management Strategies*

### **Option 1:** *Broad-winged Hawk Habitat Maintenance*

In the early 20th century, Broad-winged hawks were heavily hunted, decreasing their population numbers. Now, with legal protection, their numbers are beginning to rise, but it is important to continue to protect this species<sup>1</sup>. Broad-winged hawks have been spotted over Ruby Cohen property a few times in the past year, by the team and by other birders, suggesting there may be at least one resident bird on the property<sup>3</sup>. Luckily, these birds prefer deciduous or mixed forests near water or open clearings, making Ruby Cohen a perfect habitat for these hawks already. Broad-winged hawks eat a wide variety of smaller animals, including small mammals, amphibians, reptiles, fish, and birds<sup>1</sup>, all of which have been seen in abundance on the property. However, climate change and urbanization have been affecting the ranges of the Broad-winged Hawk. Therefore, it is important that the forests of Ruby Cohen remain relatively unchanged and the open areas are properly maintained to promote this species.

### **Option 2:** *Great Crested Flycatcher Habitat Maintenance*

Great Crested Flycatchers have also been spotted on the property<sup>3</sup>. While not officially listed as a species of concern, this species is vulnerable to declines in numbers due to habitat loss. Great Crested Flycatchers prefer deciduous and mixed forests, and are often seen on the edges of clearings, making Ruby Cohen Woodlands an ideal habitat for the species. They feed mostly on insects, and particularly enjoy caterpillars, moths, and butterflies<sup>2</sup>. To continue promoting this species on the property, it is important that the forests and edge habitats remain relatively undisturbed. It would also benefit the birds if the pollinator garden/ meadow was expanded. Planting more shrubs and flowers that attract moths and butterflies would provide

more food for the flycatchers and promote their nesting and breeding in the area. This could be accomplished by the local garden club, which has already developed a pollinator garden on the property.

### **Option 3:** *Nest Boxes*

The installation and maintenance of man-made nest boxes could help to promote the presence of popular species such as the eastern bluebird. Any and all nest boxes should be certain to use untreated wood, no paint (at least on the interior), and predator guards where possible. (See attached plans for nest box construction in Appendix 5) Predator guards are mounted on the post directly below the bird box in order to prevent predators from climbing up to the nest and eating the vulnerable young/eggs. The nest box itself should be mounted on a pole at a height between four and six feet high and the nest hole should be directly placed in, or at least facing, an open area facing east<sup>4</sup>.

There is evidence that previous attempts have been made to provide housing for bluebirds on the property, as there is a broken nest box on a pole leaning against a tree east of the parking lot (See Figure 27 in Appendix 2A). This particular area would in fact be perfect for setting up bluebird housing, as the species has been directly observed foraging in the area by a group member. When setting up the bluebird houses, the amount of suitable open habitat is limited to the two fields adjacent to the parking lot and could likely support a maximum of one bluebird pair in each. However, tree swallows and house wrens will use similar nest boxes. In order to account for this, two nest boxes should be placed a short distance from each other (about 15-20 ft apart), as one can accommodate a bluebird pair while the other would be open to use by these other territorial species<sup>4</sup>. This helps to prevent competition between these species for nesting that

can result in bluebird nest failure. Therefore, a total of four nest boxes would suffice to provide nesting opportunities in the open area.

**Recommended Solution:** *Nest Boxes and Continued Maintenance*

It is our recommendation that a few bluebird houses be installed around the smaller pond at Ruby Cohen (where bluebirds were most prevalently observed) and that the rest of the property be maintained as is to preserve the habitat for the Broad-winged Hawks and Great Crested Flycatchers observed on the property, so as to promote the abundance of all three species.

## **Bat and Mosquito Management**

### *Observed Issue*

While conducting surveys at the Ruby and Elizabeth Cohen Woodlands, it was observed that there was a high prevalence of mosquitos and other potential nuisance insects. The notable presence of these “pest species”, even in early spring when they are just coming out of hibernation indicates that this may be a potential issue and nuisance to the humans that enjoy the park. Mosquitoes go through both their pupal and larval stages in stagnant water and given the two large ponds and many wetland areas of Ruby Cohen, it is likely that mosquitos thrive in abundant populations on the property. Although less than half of the 54 mosquito species in Connecticut are considered “pest species”, the species that are considered pests can be very irritating to the humans and other species they feed on. Additionally, many mosquito species transmit and spread diseases by feeding on infected wildlife species and then later feeding on humans and domestic species and passing on the disease.<sup>2</sup> Just some of the diseases that

mosquitoes are known to transmit include: yellow fever, malaria, Zika virus, dog heartworm, and Eastern Equine Encephalitis (EEE virus) that can infect and kill humans and horses, and of which there was a recent outbreak in Connecticut in the fall of 2019.<sup>2,3,4</sup> Clearly, mosquitos are both a nuisance and a potential danger to both human and non-human users of the Ruby and Elizabeth Cohen Woodlands, and so management action is recommended.

Another issue more general to the state of Connecticut is the recent decline of bat populations throughout the state, which have been significantly reduced due to the epidemic known as White-Nose Syndrome (WNS), which is caused by the fungus *Pseudogymnoascus destructans* (*Pd*). The disease affects cave-hibernating bat species by growing on the muzzles and wings of hibernating bats (which have reduced immune system capability), causing them to wake-up more frequently during hibernation and burn through their limited energy reserves before the spring when food is available and temperatures are warmer, effectively killing them through starvation and exposure to the cold. In Connecticut, the little brown bat, tri-colored bat, and northern long-eared bat have been hit particularly hard, and other bat species have declined both due to WNS and other factors. As of 2015, the Connecticut Department of Energy and Environmental Protection (DEEP), has listed all bat species in the state as being of the “Greatest Conservation Need” status, with 5 of the state’s 9 bat species also listed as Endangered, and another 3 species as Special Concern in the state as well.<sup>1</sup>

### *Bat and Mosquito Management Strategies*

#### **Option 1:** *Manage Mosquito Populations through Chemical Control*

Spraying mosquitoes with pesticides is one option, as insecticides like resmethrin<sup>2</sup> can be up to 90% effective in killing the insects it makes contact with, but this option is not as strongly

recommended because some mosquitos do survive the sprays and the sprays do not kill mosquito larvae so repeated spraying will be necessary to kill the increasing numbers of adults that aren't killed when young.<sup>2</sup> Additionally, pesticides like resmethrin can have negative impacts on the humans exposed to it, and it can be lethal to honeybees and aquatic life.<sup>6</sup> Given that Ruby Cohen has a pollinator garden and an active aquatic ecosystem in the two ponds – which are also frequently fished – spraying pesticides to control mosquitoes may not be the best option because it could negatively impact some of the wildlife and human activities in the park. If this option was decided upon, however, pesticides should be sprayed at night (after sunset) so contact with airborne mosquitos is maximized.<sup>2</sup>

**Option 2:** *Increase Bat Population as Natural Mosquito Control*

A better option that might solve both the mosquito problem and the problems facing Connecticut's bat populations would be to encourage bat populations at the Ruby and Elizabeth Cohen Woodlands. Most of the bat species in Connecticut are nocturnal insectivores and one of the only major predators of insects active at night. According to CT DEEP bats are even more effective at controlling mosquitos than birds or bug zappers, which can be expensive. In fact, species like the little brown bat is so effective at catching mosquitos that just one can eat up to 1,200 mosquitos and other nocturnal insects in one hour.<sup>1</sup> Little brown bats were one of the species particularly devastated by WNS, so encouraging their populations would both control the mosquito population and help in the conservation of an important Connecticut species. Although no direct observations (or other evidence) of bats were made at the property, certain steps could be taken to increase bat presence in the area, which, with the ponds and wetlands and resulting high populations of mosquitoes and other insects, would be potentially good habitat for them. To encourage more bats at Ruby Cohen, we recommend putting up a few bat houses on the property.

Instructions from CT DEEP about how to do this properly are included in Appendix 5, but our primary recommendations would be to put up a mix of smaller and larger bat houses (which provide roosting habitat for nursing colonies). While CT DEEP recommends bat houses attached to buildings for the greatest success, Ruby Cohen has no human structures large enough, so we recommend putting bat houses up on a few free standing poles, close to the ponds (but strategically placed to avoid human interference) and wetland areas in Ruby Cohen. We do not recommend putting them up on trees, as those are frequently unused and could leave bats susceptible to predation. The bat houses should also be faced south or southeast to maximize thermal gain, and they should be put up in April to maximize the chances of occupation.<sup>1</sup>

**Option 3:** *Put-up Informational Signs Warning About Mosquitos*

Finally, we recommend that informational signs about the mosquito populations, and the bat houses (if that recommendation is taken) on the billboards at Ruby Cohen to inform the public about the risks and ensure public safety. If none of the other recommendations are taken, informing the public about the mosquitoes in the park, the potential for disease transmission, and the individual safety precautions they can take like wearing long-sleeved clothing and using bug spray, may be a good option.<sup>2</sup> If pesticides are used to control mosquito populations, the public should also be informed of that and any potential health risks if exposed. If the bat houses were put up, informational signs about the project would be recommended as there are many negative stereotypes associated with bats, and some people may be concerned about potential rabies transmissions. Bats can transmit rabies, and so the public should be informed about potential behaviors bats could display that could indicate rabies, but the CT DEEP also says that rabies is not on the rise in bat populations, and as long as people give the bats space, the risk of rabies transmissions should be low.<sup>1</sup> Informing the public about the true risks – and benefits – of bats

would be an important way of both keeping people and the bats safe, while also educating them about the ecology of Ruby Cohen.

**Recommended Solution:** *Bat house installation and informational signs*

It is our recommendation that a few bat houses should be installed near the ponds and wetlands at Ruby Cohen and that informational signs about the bats and threats of the mosquitos on the property be installed. Pesticide control of mosquito populations is not recommended as it will be expensive and potentially dangerous to the environment of the park. Installing bat houses would be a much less expensive and more natural way of controlling the mosquito population at Ruby Cohen, and it would serve the dual purpose of assisting in the conservation of the declining bat populations in Connecticut.

## **Conclusion**

To conclude this report, we would like to acknowledge that the Ruby and Elizabeth Cohen Woodlands is a wonderful property that the Town of Colchester has preserved. If taken, all of the recommendations for management action above may help improve the property for the wildlife and humans who use the park, but on the whole, the property is home to a thriving ecosystem. The property is a wonderful space for the humans and wildlife that use it alike. Its wetlands and meadow habitat are especially important habitat for many species of conservation concern, and we are glad the Town of Colchester is preserving it as a space for humans to enjoy and wildlife to inhabit.

## **Acknowledgements**

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## **Appendices**

## Appendix 1: Tables

### Appendix 1A: General Tables

**Table 1.** List of Wildlife Species Observed at the Ruby and Elizabeth Cohen Woodlands

Common Name	Genus	Species	Date	Location (approx.)	Number	Evidence	Notes
<i>Birds</i>							
Red-winged Blackbird	Agelaius	phoeniceus	3/9	Marsh Area	2	sight/sound	
Turkey Vulture	Cathartes	aura	3/9	Over main fields	1	sight	
Blue jay	Cyanocitta	cristata	3/9	Forest edge and trees around fields	multiple	sound	
Red shouldered hawk	Buteo	lineatus	3/9	Over main fields	2	sight	possible mating pair
Black-capped chickadee	Poecile	atricapillus	3/9	Off blue and yellow trails	multiple	sight/sound	
American crow	Corvus	brachyrhynchos	3/9	Forest	multiple	sight/sound	
Eastern Bluebird	Sialia	sialis	3/9	Trees by smaller pond		sight	
Wild Turkey	Meleagris	gallopavo	3/15	Camera traps at forest edge and beaver/marsh area	many	camera traps	same flock?
House finch	Haemorhous	mexicanus	3/25	Southeast blue loop	3	sight	
Tufted titmouse	Baeolophus	bicolor	3/25	Red and blue loops in forest	10+	sight, sound	very vocal, breeding time
Broad-winged Hawk	Buteo	platypterus	3/25	red loop	1	sight, sound	tucked and dove across treeline
Woodpecker sp.			3/25	red loop	1	sound	heard pecking, couldn't find
Red-tailed hawk	Buteo	jamaicensis	3/25	red loops	multiple	sound	

Chipping sparrow	Spizella	passerina	3/25	By large pond	1	sight	
Mallard	Anas	platyrhynchos	3/25	on large pond	2	sight	breeding? pair, male and female together
Ring-necked duck	Aythya	collaris	3/25	on large pond	10	sight	9 males, 1 female
Black-capped chickadee	Poecile	atricapillus	3/25	By large pond, along red and blue trails	multiple	sight, sound	
White-breasted nuthatch	Sitta	carolinensis	3/25	Red and blue loops in forest	multiple (3+)	sight, sound	
Song sparrow	Melospiza	melodia	3/25	By large pond	2	sight, sound	mating pair?
Blue jay	Cyanocitta	cristata	3/25	along field edges	multiple	sight, sound	
American robin	Turdus	migratorius	3/25	in main field	6+	sight, sound	
American Goldfinch	Spinus	tristis	3/27	in main field	~2-3	sight, sound	
American Robin	Turdus	migratorius	3/27	in main field/ along forest edges	multiple (5+)	sight, sound	
Downy Woodpecker	Dryobates	pubescens	3/27	along red trail	one (confirmed)	sound	
Tufted Titmouse	Baeolophus	bicolor	3/27	along forest edge/ throughout the forest	multiple (7+)	sight, sound	
Song Sparrow	Melospiza	melodia	3/27	along forest edge/ in main field	multiple (3+)	sight, sound	
Blue Jay	Cyanocitta	cristata	3/27	along forest edge/ in main field	2	sound, feather	
Black-capped Chickadee	Poecile	atricapillus	3/27	along forest edge/ on red trail	multiple (~4)	sight, sound	
White-breasted Nuthatch	Sitta	carolinesis	3/27	throughout the forest	multiple (~3)	sound	
Red-bellied Woodpecker	Melanerpes	carolinus	3/27	along blue trail	one (confirmed)	sight, sound	
Mourning Dove	Zenaida	macroura	3/27	in main field	one (confirmed)	sound	

Eastern Phoebe	Sayornis	phoebe	3/27	along forest edge	one (confirmed)	sound	
Canada Goose	Branta	canadensis	3/27	in main field/ pond	7+	sight, sound	
Crow	Corvus	brachyrhynchos	3/27	in main field	~2-3	sight, sound	
Ring-necked Duck	Aythya	collaris	3/27	pond	5	sight	Flock appeared to include 4 males and 1 female
Common Grackle	Quiscalus	quiscula	3/27	near pond	one (confirmed)	sound	
Turkey Vulture	Cathartes	aura	3/27	in main field	one (confirmed)	sight	
Eastern Bluebird	Sialia	sialis	3/27	in main field	~4-5	sight/ sound	Multiple pairs foraging by using the story path stands as perches
Pine Warbler	Setophaga	pinus	3/27	along yellow trail	one (confirmed)	sound	
Northern Cardinal	Cardinalis	cardinalis	3/27	in main field	one (confirmed)	sound	
Cedar Waxwing	Bombycilla	cedrorum	3/27	near blue trail/ in main field	one (confirmed)	sound	
Pileated Woodpecker	Dryocopus	pileatus	3/27	along blue trail	one (confirmed)	evidence of foraging	signature rectangular excavation (have pics if needed)
<b>Mammals</b>							
White-Tailed Deer	Odocoileus	virginianus	3/9/21	Wetland/Woodland Area	N/A	scat/hoofprints	
Coyote	Canis	latrans	3/9/21	Field across road, and beaver dam camera	N/A 1-2?	scat, camera trap photo	

Beaver	Castor	canadensis	3/9/21	Wetland/Marsh Area, Large Pond	N/A	freshly chewed logs	
Muskrat	Ondatra	zibethicus	3/9/21	Large Pond	At Least 2	holes in bank & "splash", camera trap	
Bobcat	Lynx	rufus	3/20/21	Edge and Beaver Dam Camera	1, 2-3? (could be same one moving through)	camera traps	caught either beaver or muskrat at the dam?
Racoon	Procyon	lotor	3/14/21	Edge and Wetland Camera	2	Camera Traps	
Striped skunk	Mephitis	mephitis	3/11/21	Edge Camera	1	Camera Trap	Frequently in that spot, same individual? possible den nearby?
Cottontail (Eastern or New England)	Sylvilagus	floridanus or transitionalis	3/11/21	Edge Camera	1	Camera Trap	
Gray Squirrel	Sciurus	carolinensis	3/21/21	In forest near yellow trail, edge camera area	Many	Observation & Camera Trap	
Mouse*			3/20/21	Wetland/Beaver Camera Area		Camera Trap	some small mammal, unsure of species
American Mink	Neovison	vison		Beaver Camera Area	1	Camera Trap	
Opossum*	Didelphis	virginiana		Edge Camera	1	Camera Trap	*Marsupial, not a mammal
<i>Insects</i>							
Mourning Cloak	Nymphalis	antiopa	3/25	Back blue trail, middle of the woods	1	sight	trying to warm up? landed on Jamie and notebook
Mourning Cloak	Nymphalis	antiopa	3/27	Blue trail, near the red trail	1	sight	flying around

Dog Tick (?)	Dermacentor	variabilis	3/27	Unsure where it was picked up, but noticed near trail cam 2	1	sight	on pant leg
<i>Reptiles</i>							
Painted turtle	Chrysemys	picta	3/25	Large pond	8	seen basking on logs	
Spotted turtle	Clemmys	guttata	3/25	Small pond	1	Found on bank	juvenile photographed
<b>Amphibians</b>							
Green frog	Lithobates / Rana	clamitans	3/25	small pond	1 identified, other frogs seen	sight	
Salamander sp.			3/25	stream along northwest blue trail	1	sight	
Spring peeper	Pseudacris	crucifer	3/25	Southwest pond on blue trail	multiple	calls	
Wood Frog	Lithobates	sylvaticus	3/27	stream at intersection of blue and yellow trail	1	sight	
<i>Fish</i>							
Largemouth Bass	Micropterus	salmoides	3/25/ 21	Both ponds		Caught through angling	Majority 8" - 12" with some larger present (15")
Banded Sunfish	Enneacanthus	obesus	3/25/ 21	Both ponds		observed in shallow water, caught by locals	
Bluegill	Lepomis	macrochirus	3/25/ 21	Both ponds		observed in shallow water, caught by locals	
Pumpkinseed	Lepomis	gibbosus	3/25/ 21	Both ponds		observed in shallow water,	

						caught by locals	
Chain Pickerel	Esox	niger	3/25/ 21	So far only observed in large pond		Caught through angling	Majority 10" - 14"

**Table 2.** List of Vegetation Species Observed at the Ruby and Elizabeth Cohen

Woodlands

Common Name	Genus	Species	Date	Location (approx.)	Number	Evidence	Notes
<i>Trees</i>							
Shagbark Hickory	Carya	ovata	3/27	particularly prevalent on the red trail, but also throughout			
Hickory sp.	Carya	sp.	3/27	throughout			
Sugar Maple	Acer	saccharum	3/27	throughout			
Red Maple	Acer	rubrum	3/27	throughout			
White Ash	Fraxinus	americana	3/27	throughout	Regional Emerald Ash Borer impacts should be noted for future manage ment		
Beech	Fagus	grandifolia	3/27	throughout			
Yellow Birch	Betula	alleghaniensis	3/27	particularly prevalent in moist areas like on the yellow trail			
Musclewood (American Hornbeam)	Carpinus	caroliniana	3/27	throughout			
White Oak	Quercus	alba	3/27	throughout			
Red Oak	Quercus	rubra	3/27	throughout			

Pin Oak (or Scarlet Oak)	Quercus	palustris	3/27	west edge of the main field			
White Pine	Pinus	strobus	3/27	throughout			
White Spruce (or Red Spruce)	Picea	glauca	3/27	near pond facing the road	appears that these might have been planted given location		
(There were likely more, I am a bit rusty with my tree id though)							
<i>Other Plants</i>							
Skunk Cabbage	Symplocarpus	foetidus	3/27	along yellow and blue trail, as well as in area near cam 2 with no trails	Indicative of wet soil conditions		
Christmas Fern	Polystichum	acrostichoides	3/27	throughout			
Spotted Wintergreen	Chimaphila	maculata	3/27	along blue trail and red trail primarily			
Princess Pine	Lycopodium	obscurum	3/27	throughout	Important indicator of mycorrhizal network health (more princess pine= healthier soil)		

Highbush Blueberry	Vaccinium	corymbosum	3/27	particularly prevalent in the area near cam 2 with no trails			
(Definitely more, but many are not visible yet)							
<i>Invasive Plants</i>							
Multiflora Rose	Rosa	multiflora	3/27	along red trail and a large area on the yellow trail			
Japanese Barberry	Berberis	thunbergii	3/27	throughout (including area near cam 2 with no trails)			
Japanese Knotweed	Reynoutria	japonica	3/9/21	At yellow trail head			
Phragmites	Phragmites		3/9/21	In marsh and wetland area			

Table 3. Management Problems and Recommended Solution for Ruby Cohen

Management Problem	Issue	Option 1	Option 2	Option 3	Option 4	Recommended Solution
Pond Management	Eutrophication of ponds and shallow waters hurt recreational fishing value	Leave ponds in current condition	Restore ponds through dredging	-	-	Option 1 if town prioritizes keeping maintenance costs low while promoting biodiversity Option 2 if town prioritizes recreational value of ponds
Phragmites Management	Invasive phragmites has taken over wetland near the yellow trail	Herbicide treatment	Prescribed Burning	Manual Removal	No action	Option 4 - No action
Invasive Plant Species Management	Invasive Oriental Bittersweet and Japanese Knotweed found at edges of woodlands	Manual removal of oriental bittersweet	Monitor for new growths of oriental bittersweet	Continue periodic removal and burning of japanese knotweed	Mow young japanese knotweed	Options 1, 2, & 3 - Manual removal and monitoring of oriental bittersweet and japanese knotweed
Pet Waste and	Lack of waste	Add signs	Dumpster	Place trash	-	Option 2 - Dumpster in

Litter Management	management on property leads to litter and pet waste all over trails	for "Leave Footprints Only"	placed in parking lot	cans and/or recycling cans around trails and near picnic area		parking lot
Trail Maintenance	Trails (especially red trail) covered in debris and not well marked	Trail blaze maintenance and map update	Trail clearing	-	-	Options 1 & 2 - Trail clearing and trail blaze maintenance
Poison Ivy Management	Poison ivy has been found along trails which could harm the health of park users	Put up informational signs warning public	Herbicide treatment	-	-	Options 1 & 2 - Herbicide treatment & informational signs
Meadow and Field Habitat Management	Decline in meadow habitat like that found on property throughout Connecticut	Alter seasonal timing of mowing to early fall or late winter	Mow over period of years rather than annually to promote older meadow growth	-	-	Options 1 & 2 - Mow in early fall every few years
Bird Encouragement	Lots of bird species seen on the property that it might be good to encourage	Manage habitat by keeping habitat structure as it is currently	Provide bird boxes as additional nesting habitat	-	-	Options 1 & 2 - Maintain habitat structure and install bird houses
Bat and Mosquito Management	Lots of mosquitos near the ponds, and bats declining in the state	Manage mosquitos with pesticides	Install a few bat houses on posts near the ponds and wetlands	Put up informational signs about the mosquitos and bats (if bat houses are installed)	-	Options 2 & 3 - Install bat houses and put up informational signs

**Table 4.** Contacts for Project

Contact Name	Title/Description	How to Reach	Contribution towards	Team Member Contact
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		them	the project	
Dr. Beth Lawrence	Assistant Professor Department of Natural Resources and the Environment, UConn	beth.lawrence@uc onn.edu	Expert on wetlands, gave phragmites management advice	Madison
Colleen Pittard	Partnership Manager National Recreation and Park Association	cpittard@nrpa.org	Information towards grants and Funding	Elle

**Table 5. Team Activity Log**

Name	Date	Activity Done/Work Accomplished	Time In	Time Out	Total Time (in Minutes)
Madison	2/19/21	Initial Team Meeting	9:00am	9:30am	30
Madison	2/26/21	Meeting with Jay	3:00pm	3:40pm	40
Madison	3/02/21	Group meeting with Morty	8:00pm	8:45pm	45
Madison	3/11/21	Site visit	3:00pm	5:50pm	170
Madison	3/16/21	Team meeting	8:00pm	8:30pm	30
Madison	3/22/21	Reviewed camera trap photos and formatted report	10:00am	11:00am	60
Madison	3/23/21	Consulted with Dr. Lawrence	10:30am	11:00am	30
Madison	3/24/21	Transcribed meeting notes	11:00am	11:30am	30
Madison	3/30/21	Research and drafting of Phragmites section	11:00am	12:00pm	60
Madison	4/02/21	Wrote Phragmites management sections	2:30pm	3:30pm	60
Madison	4/03/21	Team Meeting	5:30pm	6:40pm	70
Madison	4/04/21	Edited first draft of paper	5:50pm	6:50pm	60
Madison	4/12/21	Reviewed Morty's comments and made edits	1:43pm	2:43pm	60

Madison	4/18/21	Created and drafted PowerPoint presentation	5:50pm	7:00pm	70
Madison	4/19/21	Added to Phragmites section, added tables to appendix	9:45am	10:30am	45
Madison	4/19/21	Team meeting	8:00pm	8:50pm	50
Madison	4/22/21	Researched and added Phrag. Budget section	10:30am	12:00	90
Madison	4/22/21	Presentation to Jay	3:00pm	4:00pm	60
Brendan	2/19/21	First group meeting	9:00 Am	9:30AM	30
Brendan	2/26/21	Meeting with Jay	3:00PM	3:40PM	40
Brendan	3/2/21	Group Meeting with Morty	8:00PM	8:50PM	50
Brendan	3/9/21	Pre-visit meeting	8:00AM	8:10AM	10
Brendan	3/9/21	First Visit to park	12:20PM	4:50PM	270
Brendan	3/26/21	Group meeting about first draft	7:30PM	8:35PM	65
Brendan	3/30/21	Research for first draft	9:20PM	10:30 PM	70
Brendan	4/1/21	Research/typing first draft	12:00AM	1:30AM	90
Brendan	4/1/21	Typing first draft	3:00PM	4:00PM	60
Brendan	4/1/21	First draft work	9:00PM	12:00AM	180
Brendan	4/3/21	Group editing meeting	5:30PM	6:40PM	70
Brendan	4/4/21	Editing first draft	4:00PM	5:30PM	90
Brendan	4/4/21	Editing first draft	8:55PM	9:25PM	30
Brendan	4/19/21	Group meeting before presentation	8:00PM	8:50PM	50
Brendan	4/20/21	Working on presentation	8:35PM	11:10PM	155

Brendan	4/20/21	Adding to appendices	11:10PM	11:25PM	15
Brendan	4/21/21	Adding info to slides	6:30PM	6:45PM	15
Brendan	4/22/21	Presentation to Jay	3:00PM	4:00PM	60
Brendan	5/6/21	Presentation to Board	7:00PM	8:00PM	60
Jamie	2/19/21	Initial team meeting	9:00AM	9:30AM	30
Jamie	2/26/21	Met with Jay and the team	3:00PM	3:40PM	40
Jamie	3/2/21	Group meeting with Morty	8:00PM	8:45PM	45
Jamie	3/5/21	Found data on bird species in the park	9:45AM	10:15AM	30
Jamie	3/9/21	Pre first visit group meeting	8:00AM	8:10AM	10
Jamie	3/9/21	First visit to park	12:30PM	4:30PM	240
Jamie	3/12/21	Adding notes to drive	11:50AM	12:15PM	25
Jamie	3/16/21	Group meeting and wetlands research	8:00PM	9:00PM	60
Jamie	3/21/21	Bird research	9:00PM	10:30PM	90
Jamie	3/25/21	Visit to park	11:15AM	3:30PM	255
Jamie	3/26/21	Group meeting and data entry	7:30PM	9:30PM	120
Jamie	3/30/21	Researching / writing park history	1:00PM	2:15PM	75
Jamie	4/2/21	Researching / writing bird management section	12:00PM	1:00PM	60
Jamie	4/2/21	Researching / writing trail maintenance section	8:30PM	9:30PM	60
Jamie	4/12/21	Making Morty's edits	12:00PM	1:30PM	90
Jamie	4/19/21	Group meeting	8:00PM	8:50PM	50

Jamie	4/19/21	Work on presentation	8:50PM	9:40PM	50
Jamie	4/21/21	Work on document	11:00AM	1:20PM	140
Jamie	4/22/21	Preparing for Presentation	10:00AM	11:00AM	60
Jamie	4/22/21	Present to Jay	3:00PM	4:00PM	75
Jamie	4/22/21	Adding to appendices and citations	4:15PM	5:00PM	45
Jamie	4/25/21	Finishing typing	9:00PM	9:45PM	45
Jamie	5/6/21	Present to Board of Selectmen	7:00PM	8:00PM	60
Nicholas	2/19/21	First Group Meeting	9:00AM	9:30AM	30
Nicholas	3/2/21	Group Meeting with Morty	8:00PM	8:45PM	45
Nicholas	3/9/21	Pre-visit meeting	8:00AM	8:10AM	10
Nicholas	3/9/21	First Visit to Park	12:00PM	5:00PM	300
Nicholas	3/15/21	Researched pond management literature	8:00AM	9:00AM	60
Nicholas	3/23/21	Found GIS map layers	8:00AM	9:00AM	60
Nicholas	3/25/21	Sampling pond species	12:00PM	4:30PM	270
Nicholas	3/29/21	Working on draft	8:00AM	10:00AM	120
Nicholas	3/30/21	Working on draft	7:30PM	8:30PM	60
Nicholas	3/31/21	Creating maps in ArcGIS	9:00AM	10:00AM	60
Nicholas	4/2/21	Working on draft	7:00PM	8:00PM	60
Nicholas	4/3/21	Created cover type map in ArcGIS	8:00AM	10:00AM	120
Nicholas	4/4/21	Editing draft	8:00PM	9:00PM	60

Nicholas	4/19/21	Group Meeting	8:00PM	8:50PM	50
Nicholas	4/20/21	Working on Presentation	8:00AM	9:00AM	60
Nicholas	4/22/21	Presenting to Jay	3:00PM	4:00PM	60
Nicholas	4/26/21	Finish editing final draft	8:00AM	9:00AM	60
Nicholas	5/6/21	Present to Board of Selectmen	7:00PM	8:00PM	60
Kelly	2/19	Initial team meeting	9:00AM	9:30 AM	30
Kelly	2/26	Meeting with Jay	3:00PM	3:40 PM	40
Kelly	3/2	Meeting with Morty	8:00 PM	8:45 PM	45
Kelly	3/26	Team meeting	8:00 PM	8:30 PM	30
Kelly	3/27	Visited the property to collect species data	11:00 AM	5:00 PM	360
Kelly	3/27	Entered species data	9:00 PM	10:30 PM	90
Kelly	3/28	Entered species data	2:00 PM	3:00 PM	60
Kelly	3/31	Writing Vegetation Summary	7:30 PM	8:45 PM	90
Kelly	4/1	Writing Habitat Summary	2:00 PM	3:00 PM	60
Kelly	4/1	Finishing Habitat and Vegetation Summary	4:00 PM	5:05 PM	65
Kelly	4/2	Meadow Management Writing and Research	1:35 PM/7:00 PM	3:25 PM/8:00 PM	180
Kelly	4/2	Bird Management Writing	4:30 PM	5:30 PM	60
Kelly	4/3	Team meeting and some editing	5:30 PM/8:20 PM	6:40 PM/8:30 PM	90

Kelly	4/5	Finishing up editing for first draft	12:10 PM	1:05 PM	55
Kelly	4/19	Team Meeting	8:00 PM	8:50 PM	50
Kelly	4/20	Work on Presentation	6:30 PM/10:30 PM	7:00 PM/10:45 PM	45
Kelly	4/22	Work on Presentation	10:30 AM/1:45 PM	11:00 AM/2:45 PM	90
Kelly	4/22	Present to Jay	3:00 PM	4:00 PM	60
Kelly	4/25	Final Draft Work	3:20 PM	4:20 PM	60
Kelly	5/2	Budget Entry and Final Edits to Draft	3:45 PM	4:15 PM	30
Kelly	5/6	Present to the Board of Selectmen	7:00 PM	8:00 PM	60
Elle	2/19	first team meeting	9am	9:30am	30
Elle	2/26	meeting with jay	3pm	3:40pm	40
Elle	3/2	meeting with morty	8pm	8:45pm	45
Elle	3/11	first visit to park	3pm	6pm	180
Elle	3/27	second visit to park	11am	3pm	240
Elle	4/2	contacting NRPA and Research	12:45pm	1:30pm	45
Elle	3/30	research/writing	4pm	6pm	120
Elle	4/2	team meeting	8pm	8:50pm	50
Elle	4/1	research/writing	1am	2am	60
Elle	4/1	editing	5pm	6pm	60
Elle	4/3	research/writing	3pm	5pm	120

Elle	4/4	reaching out to Willimantic waste	8:30pm	8:45pm	15
Elle	4/4	research/writing	6pm	8:30pm	150
Elle	4/19	team meeting	8pm	9pm	60
Elle	4/23	working on budget	11am	12pm	60
Elle	4/23	Presentation to Jay	3pm	4:15pm	75
Kylee	2/16	Meeting with Morty	NA	NA	NA
Kylee	2/26	Pre-screening meeting	NA	NA	NA
Kylee	3/2	Management Plan Meeting	NA	NA	NA
Kylee	3/23	Draft Management Plan Meeting	NA	NA	NA
Joan	2/19/2021	First Group Meeting	9:00 AM	9:30 AM	0:30
Joan	2/25/2021	Leader Meeting With Morty	3:30 PM	3:50 PM	0:20
Joan	2/26/2021	First Meeting with Town & Emails	3:00 PM	3:50 PM	0:50
Joan	3/1/2021	Prep for Group Meeting	11:20 PM	12:40 AM	1:20
Joan	3/2/2021	Group Meeting 2	8:00 PM	8:45 PM	0:45
Joan	3/8/2021	Prep for Pre-Survey Meeting	11:30 PM	11:45 PM	0:15
Joan	3/9/2021	Pre-Survey Meeting	8:00 AM	8:10 AM	0:10
Joan	3/9/2021	Travel to Site	12:00 PM	1:00 PM	1:00

Joan	3/9/20 21	First Site Survey	1:00 PM	4:15 PM	3:15
Joan	3/9/20 21	Hung up signs for camera traps	5:20 PM	6:00 PM	0:40
Joan	3/9/20 21	Travel from Site	6:50 PM	7:30 PM	0:40
Joan	3/9/20 21	Follow Up-Work	8:30 PM	9:30 PM	1:00
Joan	3/11/2 021	Travel to Site	2:40 PM	3:30 PM	0:50
Joan	3/11/2 021	Site Surveys	3:30 PM	5:30 PM	2:00
Joan	3/11/2 021	Travel from Site/Follow-up work	6:45 PM	8:00 PM	1:15
Joan	3/16/2 021	Meeting With Group	8:00 PM	8:45 PM	0:45
Joan	3/21/2 021	Camera Trap Check On-site	1:45 PM	4:25 PM	2:40
Joan	3/21/2 021	Travel from site	5:50 PM	6:30 PM	0:40
Joan	3/21/2 021	Follow Up-Work	8:00 PM	9:00 PM	1:00
Joan	3/22/2 021	Meeting with Morty	1:00 PM	1:30 PM	0:30
Joan	3/26/2 021	Group Meeting/Prep	7:15 PM	9:00 PM	1:45
Joan	3/30/2 021	Research	9:00 PM	9:45 PM	0:45
Joan	3/31/2 021	Draft	11:15 AM	1:15 PM	2:00

Joan	4/3/20 21	Group Meeting on Draft	5:30 PM	6:45 PM	1:15
Joan	4/3/20 21	Draft	8:30 PM	10:00 PM	1:30
Joan	4/3/20 21	Draft	11:20 PM	11:59 PM	0:39
Joan	4/5/20 21	Draft	5:00 PM	5:30 PM	0:30
Joan	4/6/20 21	Camera Trap Collection On-site	2:50 PM	5:00 PM	2:10
Joan	4/12/2 021	Review & Photos	11:15 PM	11:45 PM	0:30
Joan	4/18/2 021	Edit Draft and Powerpoint	10:00 PM	11:00 PM	1:00
Joan	4/19/2 021	Emails and Meeting Prep	4:00 PM	4:45 PM	0:45
Joan	4/19/2 021	Presentation Meeting	8:00 PM	8:45 PM	0:45
Joan	4/20/2 021	Slides for Presentation	11:00 PM	11:30 PM	0:30
Joan	4/21/2 021	Budget for Management	11:00 PM	11:30 PM	0:30
Joan	4/22/2 021	Slides and Budget	12:00 PM	3:00 PM	3:00
Joan	4/22/2 021	Presentation	3:00 PM	4:15 PM	1:15
Joan	4/26/2 021	Reviewed Draft	5:00 PM	5:30 PM	0:30
Joan	4/30/2 021	Reviewed Draft	3:00 PM	7:00 PM	4:00

Joan	5/6/20 21	Finished final draft & prepped for final presentation	3:30 PM	7:00 PM	3:30
Joan	5/6/20 21	Presentation to Board of Selectmen	7:00 PM	8:00 PM	1:00
Joan	5/6/20 21	Final Meeting with Morty	8:00 PM	9:30 PM	1:30

**Table 3:** Team Time Log

Name	Jamie	Nicholas	Brendan	Elle	Kylee	Madison	Kelly	Joan
Total number of hours	29.25	25.75	23.5	22.5	17	20	27.5	49.73

## Appendix 1B: Budget

**Table 4.** Consulting Fees by Team Member

Name	Total Hours Worked	Consulting Fee (\$ at \$120/hr)
Brendan	23.5	2,820
Elle	22.5	2,700
Jamie	29.25	3,510
Joan	49.73	5,967.60
Kelly	27.5	3,300
Kylee	17	2,040
Madison	19	2,280
Nicholas	25.75	3,090
<b>Total</b>	214.23	\$25,707.60

**Table 5.** Grand Total for Recommended Solutions and Consulting Fee

Item	Subtotals
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Pond Management 1.1	\$0
Pond Management 1.2	Possibly exceeding \$500,000
Recommended Solutions	\$0
Phragmites Management 2.1	\$846
Phragmites Management 2.2	\$480
Phragmites Management 2.3	\$900
Phragmites Management 2.4	\$0
Recommended Solutions	\$0
Additional Invasive Species Management 3.A1	\$350
Additional Invasive Species Management 3.A2	\$296
Additional Invasive Species Management 3.B1	\$2016
Recommended Solutions	\$2662
Pet Waste and Litter Management 4.1	\$140
Pet Waste and Litter Management 4.2	\$800+ 420/year
Pet Waste and Litter Management 4.3	\$120
Recommended Solutions	\$800+ 420/year
Trail Maintenance Management 5.1	\$18.00
Trail Maintenance Management 5.2	\$5,869.98
Recommended Solutions	\$5887.98
Poison Ivy Management 6.1	\$30
Poison Ivy Management 6.2	\$700
Recommended Solutions	\$730
Meadow/Field Habitat Management 7.1	\$0 (Assuming access to mowing is consistent)
Meadow/Field Habitat Management 7.2	\$0 (Assuming access to mowing is consistent)

Recommended Solutions	\$0
Bird Encouragement Management 8.1	\$0
Bird Encouragement Management 8.2	\$0 (See Meadow/Field Habitat Management)
Bird Encouragement Management 8.3	\$200-\$300 (for 4 bird boxes)
Recommended Solutions	\$200-\$300 (for 4 bird boxes)
Bat and Mosquito Management 9.1	\$30,129 - \$71,874
Bat and Mosquito Management 9.2	\$52.36 - \$304.63
Bat and Mosquito Management 9.3	\$8.97
Recommended Solutions	\$61.33 - \$313.60
Team Consulting Fee	\$25,707.60
<b>Grand Total</b> (Based on recommended solutions)	<b>\$36,568.91</b>

**Table 6.** Budget Breakdown by Management Strategy

**Budget 1.1: Pond Management Strategies Option 1**

*Leave ponds in their current state*

Item	Units	Unit Price	Subtotal
N/A	-	-	\$0
<b>Subtotal</b>	-	-	<b>\$0</b>

**Budget 1.2: Pond Management Strategies Option 2**

*Rehabilitation of both ponds*

Item	Units	Unit Price	Subtotal
Pond Dredging Project	N/A	N/A	Variable, could possibly exceed \$500,000.
<b>Subtotal</b>	<b>N/A</b>	<b>N/A</b>	Variable, could possibly exceed \$500,000.

**Budget 2.1: Phragmites Management Strategies Option 1***Herbicides*

Item	Units	Unit Price	Subtotal
Glyphosate	6	\$97 for 2.5 gallons	\$582
Aerial Sprayer	22 acres	\$10-15 per acre	\$264
<b>Subtotal</b>			<b>\$846</b>

See Phragmites Treatment Herbicide Guide in appendix 5 for percentages and amount of herbicide required. Cost justifications found below.

**Budget 2.2: Phragmites Management Strategies Option 2***Prescribed burning*

Item	Units	Unit Price	Subtotal
Prescribed burning cost- includes equipment transport and rental cost	22 acres	\$30/acre	\$660
<b>Subtotal</b>			<b>\$480</b>

**Budget 2.3: Phragmites Management Strategies Option 3***Manual removal*

Item	Units	Unit Price	Subtotal
Labor		0- volunteer based	
Garden hoes	25	\$36/ea	\$900
<b>Subtotal</b>			<b>\$900</b>

**Budget 2.4: Phragmites Management Strategies Option 4***No action*

Item	Units	Unit Price	Subtotal
No cost	0	0	0
<b>Subtotal</b>	<b>0</b>	<b>0</b>	<b>0</b>

**Budget 3.A1: Additional Invasive Species Management Strategies Option A1***Oriental bittersweet - early prevention*

Item	Units	Unit Price	Subtotal
Labor (Volunteers)	10+	\$0	\$0
Labor (Employees)	5	\$13/hr	\$65/hr
Metal Rakes	5	\$15	\$75
Loppers	3	\$60	\$180
Shovels	2	\$15	\$30
<b>Subtotal</b>			<b>\$350</b>

**Budget 3.A2: Additional Invasive Species Management Strategies Option A2**

*Oriental bittersweet - mechanical prevention*

Item	Units	Unit Price	Subtotal
Labor (Volunteers)	10+	\$0	\$0
Labor (Employees)	2	\$13/hr	\$26/hr
Ladder (20')	1	\$150	\$150
Loppers	2	\$60	\$120
<b>Subtotal</b>			<b>\$296</b>

**Budget 3.B1: Additional Invasive Species Management Strategies Option B1**

*Japanese knotweed - mowing/cutting*

Item	Units	Unit Price	Subtotal
Labor	1	\$13/hr	13
Field and Brush Mower	1	\$2000	\$2000
Gas/Fuel	1 gal.	\$3	\$3
<b>Subtotal</b>			<b>\$2016</b>

**Budget 4.1: Pet Waste and Litter Management Strategies Option 1**

*Signs and Resources*

Item	Units	Unit Price	Subtotal
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Sign	3	\$20	\$60
pole	3	\$30	\$90
<b>Subtotal</b>			<b>\$140</b>

#### **Budget 4.2: Pet Waste and Litter Management Strategies Option 2**

*Trash and recycling bins*

<b>Item</b>	<b>Units</b>	<b>Unit Price</b>	<b>Subtotal</b>
Dumpster	1	\$800	\$800
Labor	Per month	\$35	\$420/year
<b>Subtotal</b>			<b>\$800+ 420/year</b>

#### **Budget 4.3: Pet Waste and Litter Management Strategies Option 3**

*Get the community involved*

<b>Item</b>	<b>Units</b>	<b>Unit Price</b>	<b>Subtotal</b>
Trash bags	4	\$30	\$120
<b>Subtotal</b>			<b>120</b>

#### **Budget 5.1: Trail Maintenance Management Strategies Option 1**

*Trail blaze maintenance and map updating*

<b>Item</b>	<b>Units</b>	<b>Unit Price</b>	<b>Subtotal</b>
Spray paint	3	\$6.00	\$18.00
<b>Subtotal</b>			<b>\$18.00</b>

#### **Budget 5.2: Trail Maintenance Management Strategies Option 2**

*Trail Clearing*

<b>Item</b>	<b>Units</b>	<b>Unit Price</b>	<b>Subtotal</b>
Rake	3	\$10.00	\$30.00
Cordless chainsaw	1	\$129.00	\$129.00
Wood planks	100	\$27.00	\$2,700

Table saw	1	\$2,849.00	\$2,849.00
Screws (10 lbs)	1	\$32.98	\$32.98
Battery drill	1	\$99.00	\$99.00
Hedge shears	1	\$30.00	\$30.00
<b>Subtotal</b>			<b>\$5,869.98</b>

#### **Budget 6.1: Poison Ivy Management Strategies**

##### *Identification Signage*

<b>Item</b>	<b>Units</b>	<b>Unit Price</b>	<b>Subtotal</b>
Identification Signage	6	\$5	\$30
<b>Subtotal</b>			<b>\$30</b>

#### **Budget 6.2: Poison Ivy Management Strategies**

##### *Eradication vis herbicides*

<b>Item</b>	<b>Units</b>	<b>Unit Price</b>	<b>Subtotal</b>
Pesticide Treatment			\$700
<b>Subtotal</b>			<b>\$700</b>

#### **Budget 7.1: Meadow/Field Habitat Management Strategies Option 1**

*Maintain the open meadow habitat and alter the seasonal timing of mowing to ensure habitat viability*

<b>Item</b>	<b>Units</b>	<b>Unit Price</b>	<b>Subtotal</b>
No additional cost			
<b>Subtotal</b>			

#### **Budget 7.2: Meadow / Field Habitat Management Strategies Option 2**

*Promote a slightly older meadow via mowing over a period of years instead of annually*

<b>Item</b>	<b>Units</b>	<b>Unit Price</b>	<b>Subtotal</b>
No additional cost			

<b>Subtotal</b>			

### **Budget 8.1: Bird Encouragement Management Strategies Option 1**

*Broad-winged hawk habitat maintenance*

<b>Item</b>	<b>Units</b>	<b>Unit Price</b>	<b>Subtotal</b>
No action			
<b>Subtotal</b>			

### **Budget 8.2: Bird Encouragement Management Strategies Option 2**

*Great crested flycatcher habitat maintenance*

<b>Item</b>	<b>Units</b>	<b>Unit Price</b>	<b>Subtotal</b>
No additional cost			
<b>Subtotal</b>			

### **Budget 8.3: Bird Encouragement Management Strategies Option 3**

*Nest boxes*

<b>Item</b>	<b>Units</b>	<b>Unit Price</b>	<b>Subtotal</b>
Nest Box (Eastern Bluebird)	4	~\$25	\$100
Pole and Predator Guard	4	~\$25-\$35	\$100-\$140
<b>Subtotal</b>	<b>4</b>		<b>~\$200-\$240</b>

### **Budget 9.1: Bat and Mosquito Management Strategies Option 1**

*Manage mosquito populations through chemical control*

<b>Item</b>	<b>Units</b>	<b>Unit Price</b>	<b>Subtotal</b>
One-Time Treatment <sup>7</sup>	1 service on 1 acre	\$249	\$30,129 for 121 acres
Monthly Treatments	1 service on 1 acre	\$99	\$71,874 for 6

for 6 Months <sup>7</sup>			treatment on 121 acres
<b>Subtotal</b>			<b>\$30,129 - \$71,874</b>

## **Budget 9.2: Bat and Mosquito Management Strategies Option 2**

*Increase bat population as natural mosquito control*

<b>Item</b>	<b>Units</b>	<b>Unit Price</b>	<b>Subtotal</b>
Cost of Tools/Supplies to Build Bat Houses (Quotes from Lowes)	1 (for small bat houses) 5 (for large bat houses)	\$22.48	\$22.48 \$112.40
Plywood (½” thick, exterior)			
Mesh	1 4’x7ft sheet	\$44.13	\$44.13
Caulk	1 tube	\$8.98	\$8.98
Tar Paper	1 roll	\$17.95	\$17.95
Dry Wall Screws	1 box	\$5.98	\$5.98
Dark Stain	1 can of stain	\$8.99	\$8.99
Circular Saw	1 saw	\$28.64	\$28.64
Battery Drill	1 drill	\$49.99	\$49.99
Build Bat Houses (Large)	1 large bat house with 3 cavities, according to CT DEEP instructions	\$277.06	\$277.06
Build Bat Houses	1 small bat house	\$187.14	\$187.14

(Small)	with 1 cavity, according to CT DEEP instructions		
Buy Bat Houses (Large) (quotes from Amazon)	Large, 3 chamber bat house (Amazon)	\$29.99	\$29.99
Buy Bat Houses (Small) (quotes from Amazon)	Small, 1 chamber bat house, 3 units (Amazon)	\$24.79	\$24.79
Posts to Mount Bat Houses (Quotes from Lowes)	4 x6" pressure treated post, 3 units		\$ 27.57
<b>Subtotal</b> (To buy or build and mount 1 bat house; 1 small bought to 1 large built)			<b>\$52.36 - \$304.63</b>

### **Budget 9.3: Bat and Mosquito Management Strategies Option 3**

*Put-up informational signs warning about mosquitos*

<b>Item</b>	<b>Units</b>	<b>Unit Price</b>	<b>Subtotal</b>
Print and laminate 3 flyers (Quote from Office Depot) <sup>8</sup>	3 laminated flyers	\$2.99	\$8.97
<b>Subtotal</b>			<b>\$8.97</b>

## **Budget Justifications**

### **Objective 1.1**

There would be no cost to the Town of Colchester to leave the Ruby Cohen ponds in their current condition.

### **Objective 1.2**

The Town of Colchester would need to obtain bids from multiple companies who specialize in pond dredging projects. There is no “one size fits all” rate for pond dredging, the total cost of the project would depend on the various companies’ assessments of the project and could vary considerably from company to company. To give an idea of the project’s potential cost, a pond

dredging project on a similarly sized pond in the Town of Manchester cost over \$600,000. See the following article for more details:

[Pond cleanup part of larger effort at Manchester's Center Springs Park - Hartford Courant](#)

### **Objective 2.1**

Glyphosate price found as \$97 for 2.5 gallons DoMyOwn.com at [https://www.domyown.com/glyphosate-c-114\\_359.html?msclkid=006bb89a43a21163801ad8e5245d2ae4&utm\\_source=bing&utm\\_medium=cpc&utm\\_campaign=Active%20Ingredients%20-%20JumpFly&utm\\_term=glyphosate%20products&utm\\_content=Glyphosate](https://www.domyown.com/glyphosate-c-114_359.html?msclkid=006bb89a43a21163801ad8e5245d2ae4&utm_source=bing&utm_medium=cpc&utm_campaign=Active%20Ingredients%20-%20JumpFly&utm_term=glyphosate%20products&utm_content=Glyphosate). A formula that was suitable for both terrestrial and aquatic usage was selected. Given how much land the phragmites covers, about 22 acres, aerial spraying is recommended as backpack spraying would require many workers and man-hours and aerial spraying can be done quickly. Aerial spraying cost estimate given by the USDA found on [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd497004.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd497004.pdf). The cost was given as a range of \$10-\$15 per acre and for this budget we used the middle value of \$12. The, the Phragmites Treatment and Herbicide Quick Guide found at <https://www.greatlakesphragmites.net/files/HerbicideQuickGuide.pdf> was used to estimate how much of the pesticide was needed for the property. Aerial spraying requires 4-6 pints per acre which was converted to gallons and multiplied by the acreage of the property. 6 units of the chemical are needed to cover the 22 acres of the invasive plant.

### **Objective 2.2**

Cost estimates for prescribed burning provided by the North Carolina Forest Service were found at: [https://www.ncforestservice.gov/Managing\\_your\\_forest/pdf/Burning%20rates.pdf](https://www.ncforestservice.gov/Managing_your_forest/pdf/Burning%20rates.pdf). Sites that did not require preparation were estimated to cost \$30 per acre. This option would cost the town \$660.

### **Objective 2.3**

The manual removal method requires a tool that will dig into the earth in order to remove the roots and underground stems of the plant. A garden hoe would be suitable for this project. If 25 volunteers were to work at a time on small sections of the wetland, 25 hoes would be required at \$36 each according to Grainger.com, a maintenance webstore. This would bring the total to \$900 and make this the most expensive phragmites removal option.

### **Objective 2.4**

Leaving the phragmites as is can be a good option for the town as discussed in the body of the plan and costs \$0.

### **Objective 3.A1**

The early prevention of oriental bittersweet requires common garden tools to prune and remove the plant and root system. Rakes and shovels can be found at any home improvement or gardening store for approximately \$15. Loppers are larger and more expensive, going for about \$60 each at any similar store. The loppers will be useful in the removal of oriental bittersweet, but only at certain stages of the removal, so fewer will be needed than rakes or shovels. Volunteers would be ideal for this method as it is not particularly dangerous in any way and volunteers may even be able to supply their own tools.

### **Objective 3.A2**

The mechanical removal of existing instances of oriental bittersweet is best performed by paid employees of the park because it will involve climbing a ladder to reach high up areas, which may be potentially dangerous. On top of this, the use of clippers or loppers in this situation may not be suitable for volunteers. A 20 foot ladder will provide adequate reach to remove most of the oriental bittersweet throughout the park and may be purchased for about \$150. The cost of employees is based on the current Connecticut minimum wage of \$13 per hour and is listed as an hourly rate. This represents a hypothetical minimum and may be greater in reality.

### **Objective 3.B1**

The use of a brush mower is best performed by a paid employee due to the potential dangers involved in using bladed machinery. As stated above, the cost of employee labor is based on the current Connecticut minimum wage. A brush mower may be purchased for about \$2000. Gas prices are highly variable and are based on \$3/gallon prices.

### **Objective 4.1**

The estimate for “leave only footprints” signs came from this website: <https://www.campgroundsigns.com/take-nothing-but-pictures-leave-nothing-but-footprints-sign/sku-k-0630>. The estimate for the posts for the signs came from: <https://www.zoro.com/tapco-post-u-channel-7ft-galvanized-2lbs-per-foot-054-00207/i/G8522857/>

### **Objective 4.2**

The quotes for the dumpster solution came from the following website: <https://williwaste.com/commercial-resources/>.

### **Objective 4.3**

The quotes for trash bags came from the following website: [https://www.amazon.com/Glad-ForceFlex-Resistant-Drawstring-Garbage/dp/B00757QVVS/ref=sr\\_1\\_16?dchild=1&keywords=32+gallon+trash+bags&qid=1620596969&sr=8-16](https://www.amazon.com/Glad-ForceFlex-Resistant-Drawstring-Garbage/dp/B00757QVVS/ref=sr_1_16?dchild=1&keywords=32+gallon+trash+bags&qid=1620596969&sr=8-16)

### **Objective 5**

Most of the costs associated with trail management would be basic costs for labor of the park maintenance crew. However, it may be possible to get volunteers, such as the local Scout BSA troops or school groups, to take on the work as a project, which would bring costs to a minimum. There may also be some costs associated with equipment, such as chainsaws that may be needed to remove some of the larger trees from the paths, branch cutters, or costs from materials needed to construct footpaths and paint for trail blazes. However, locals or the park maintenance crew may already have these tools and supplies. Most, if not all tools, supplies, and labor for these projects can likely be found, donated, or volunteered to bring costs to a minimum.

Spray paint - 3 cans of paint are needed, one of red, blue, and yellow, to mark each of the three trails. Average price of multiple products listed, price may vary.

Rake - More or less units may be needed. Average price of multiple products listed, price may vary.

Cordless chainsaw - Cordless needed in order to use on the trail. Average price of multiple products listed, price may vary.

Wood planks - May not be necessary, if collected debris is enough to make suitable footbridges. Western red cedar, redwood, and cypress are the best woods for weather and rot resistance<sup>1</sup>. Average price of multiple products listed, price may vary. More or less product may be needed to assemble footbridges if debris is not enough or not viable.

Table saw - May not be necessary, only needed if wood and logs need to be cut to assemble footbridges. Larger saw blade will be more useful in cutting larger trunks. However, uncut logs may be enough, making the table saw unnecessary.

Screws - Only needed if constructing footbridges. 10lb container of construction screws recommended for best bulk price. Fewer may be necessary, and other screw types may be used.

Battery drill - Only needed if constructing footbridges. Average price of multiple products listed, price may vary.

Hedge shears - Other cutting tools may be used. Average price of multiple products listed, price may vary.

Labor costs cannot be estimated because most work can be completed with volunteers, hiring of additional personnel will raise costs.

### **Objective 6.1**

The cost is given at price per sign HDPE plastic signs. We would start with buying 2 signs per trial at a price of \$5 per sign that would come to a total of \$30 for all 3 trials.

<https://www.mysafetysign.com/poison-ivy-oak-signs>

### **Objective 6.2**

The cost for herbicide treatment of poison ivy was estimated using this website:

<https://www.fixr.com/costs/poison-ivy-removal>

### **Objective 9.1**

Estimates for mosquito management through pesticide treatments came from Modern Pest Services, a pest management firm based in New England. According to their website: <https://www.modernpest.com/residential-pest-control/homecare-mosquito-tick-control/>, mosquito, flea and tick control treatments start at \$99 per acre per month for 6 months of service. The site also lists a single service costing \$249 per acre. The prices listed above were calculated using these rates for 121 acres of property (which is the size Ruby Cohen is listed at on Google, but it has since been brought to our attention that the property is actually 205.82 acres). Regardless, it is unlikely that every acre of the property would need to be sprayed to control the mosquito population, as the mosquitos are most likely to be densest near the ponds and wetlands, and are only a problem where human users can come into contact with them. So, the amount of land that would actually have to be treated is likely less, although the wetlands and ponds do make up a sizable portion of the property.

### **Objective 9.2**

The estimates for the building of the bat houses include the cost of both the materials and tools needed to construct them based on the instructions from the CT DEEP website on bats: <https://portal.ct.gov/DEEP/Wildlife/Fact-Sheets/Bats>. (See Appendix 5 for further details). Most of the prices for tools and materials come from Lowe's website, although the quote on netting for the bat houses comes from the following site: <https://www.industrialnetting.com/xv1672-bat->

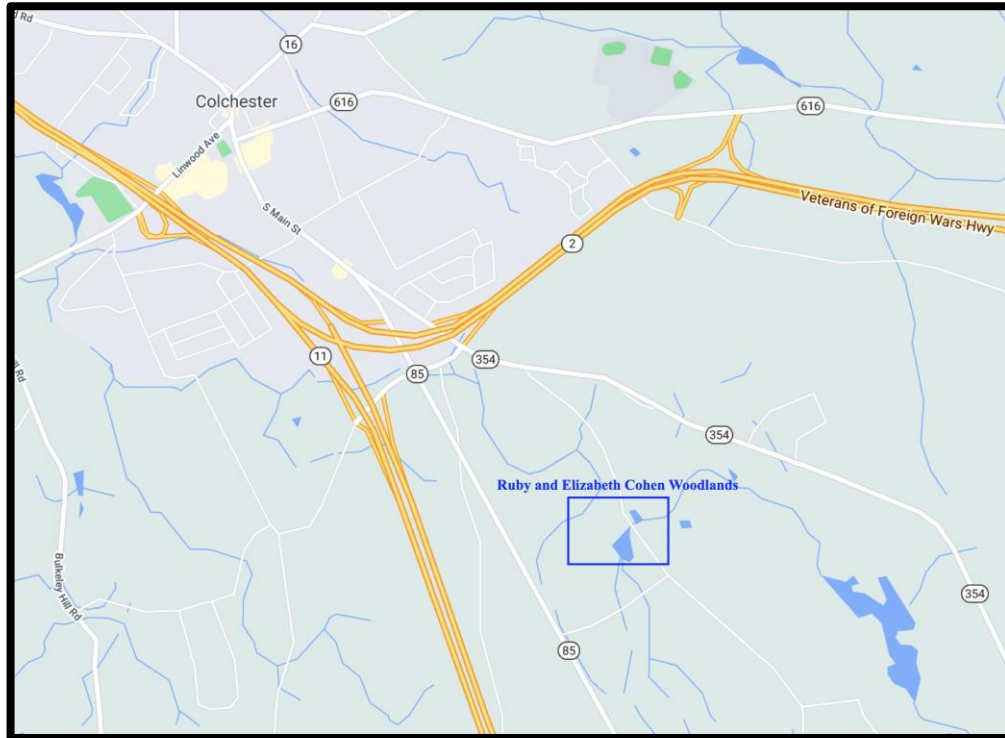
[house-netting-4ft-7ft.html](#). The cost of building the bat houses would also increase with the cost of labor needed to construct them, but if the bat houses were built by volunteers this cost would be avoided altogether. Additionally, if the town or any volunteers already has some of the tools and materials required to build the bat houses, the cost to build and install them should be much less. Building bat houses and installing them on posts might make for a good Eagle Scout or high school woodshop class project, for example.

Buying the bat houses online from a site like Amazon (which is where the above quotes come from: [https://www.amazon.com/INCLY-Outdoors-Shelter-Roosting-Pre-Finished/dp/B089VR9JN5/ref=sr\\_1\\_8?dchild=1&gclid=CjwKCAjwkN6EBhBNEiwADVfya\\_k9fu7PKDGkksnb--0tYdY66xMI9xQEygKeu-zWmO6CMFpFeb7KBoCFoMQAvD\\_BwE&hvadid=323244762476&hvdev=c&hvlocphy=1014695&hvnetw=g&hvqmt=b&hvrnd=4986142799381935254&hvtargid=kwd-605710000518&hydacr=3505\\_10303750&keywords=triple+bat+house&qid=1620597735&sr=8-8](https://www.amazon.com/INCLY-Outdoors-Shelter-Roosting-Pre-Finished/dp/B089VR9JN5/ref=sr_1_8?dchild=1&gclid=CjwKCAjwkN6EBhBNEiwADVfya_k9fu7PKDGkksnb--0tYdY66xMI9xQEygKeu-zWmO6CMFpFeb7KBoCFoMQAvD_BwE&hvadid=323244762476&hvdev=c&hvlocphy=1014695&hvnetw=g&hvqmt=b&hvrnd=4986142799381935254&hvtargid=kwd-605710000518&hydacr=3505_10303750&keywords=triple+bat+house&qid=1620597735&sr=8-8) and [### Objective 9.3](https://www.amazon.com/Kenley-Bat-House-Handcrafted-Resistant/dp/B01EYTVBLE/ref=sxin_9_pa_sp_search_thematic_ssapa?cv_ct_cx=bat+house&dchild=1&keywords=bat+house&pd_rd_i=B01EYTVBLE&pd_rd_r=0384c0da-c542-4938-a2db-0f3e9abb8b77&pd_rd_w=o92q1&pd_rd_wg=HvJey&pf_rd_p=bdaaff03e-e2e6-4d0a-96ed-05f1bace8b61&pf_rd_r=CPDA5ZHSYVCGFRABBCKZ&qid=1620597800&sr=1-2-a8004193-6951-43f6-852a-aff7dbba9115-spons&psc=1&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUEwVzkwVjkwRTJGWVZOJmVuY3J5cHRlZElkPUEwNzI5NTgxMTgxMkE3TTgwU1IGSCZlbnNyeXB0ZWRBZEIkPUEwMDA4NzkwMzI1JT1FUQzRUQU9DWCZ3aWRnZXROYW1lPjNwX3NlYXJjaF90aGVtYXRpYyZhY3Rpb249Y2xpY2tSZWRpcmVjdCZkb05vdExvZ0NsaWNrPXRydWU=) is a much cheaper option, however, it would mean less community involvement in the project, but if the town would rather save funds on this project if it cannot find many volunteers, a few small and/or large bat houses could be purchased online and installed on posts as well.</p></div><div data-bbox=)

The cost of making informational posters about mosquitoes and the health risks they present (and about bats if the bat houses were to be installed), is quite low. The price listed above is a quote for 3 laminated posters from Office Depot: <https://www.officedepot.com/cm/print-and-copy/print-services>. But if the town already has a laminator and materials, the only real cost would be the time it takes for someone to make the posters - which could, again, be done by volunteers.

## Appendix 2: Figures

### 2A: Figures Referenced



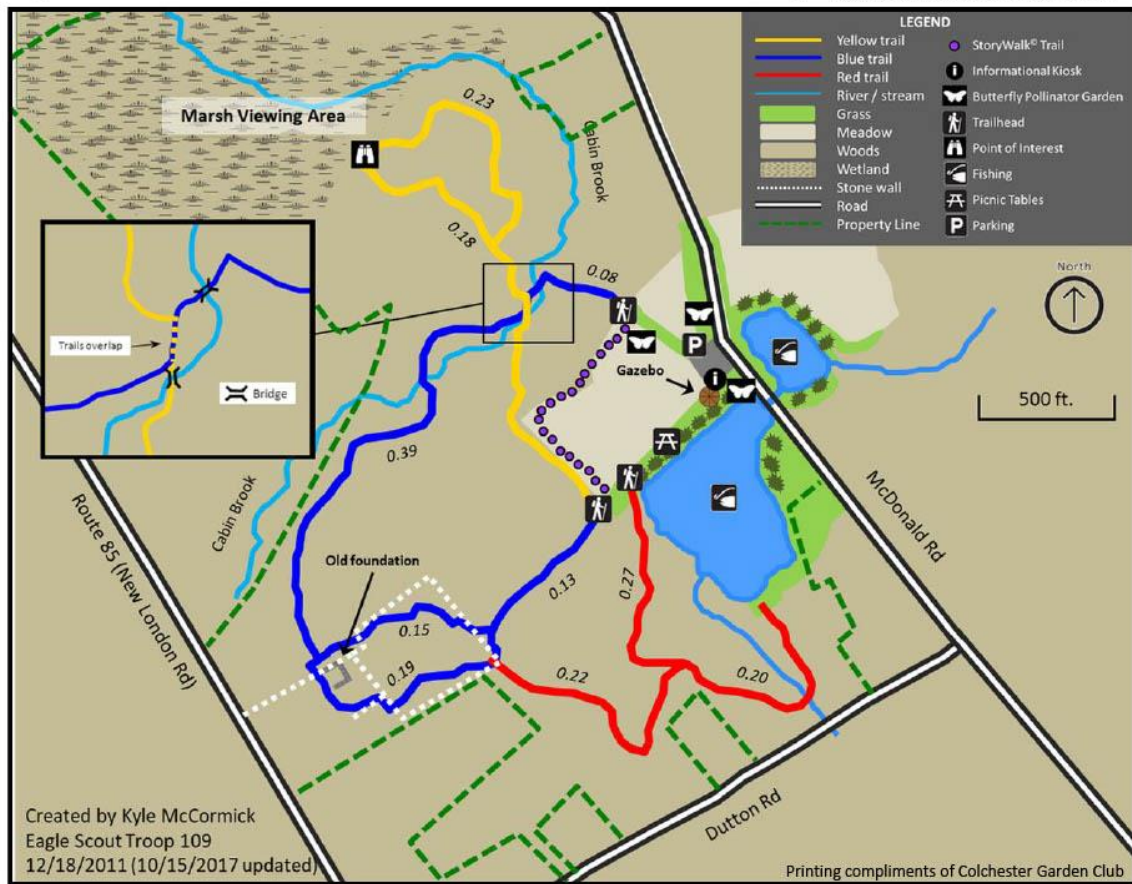
**Figure 1.** Location of the Ruby and Elizabeth Cohen Woodlands.  
(Source: <https://www.google.com/maps/>)



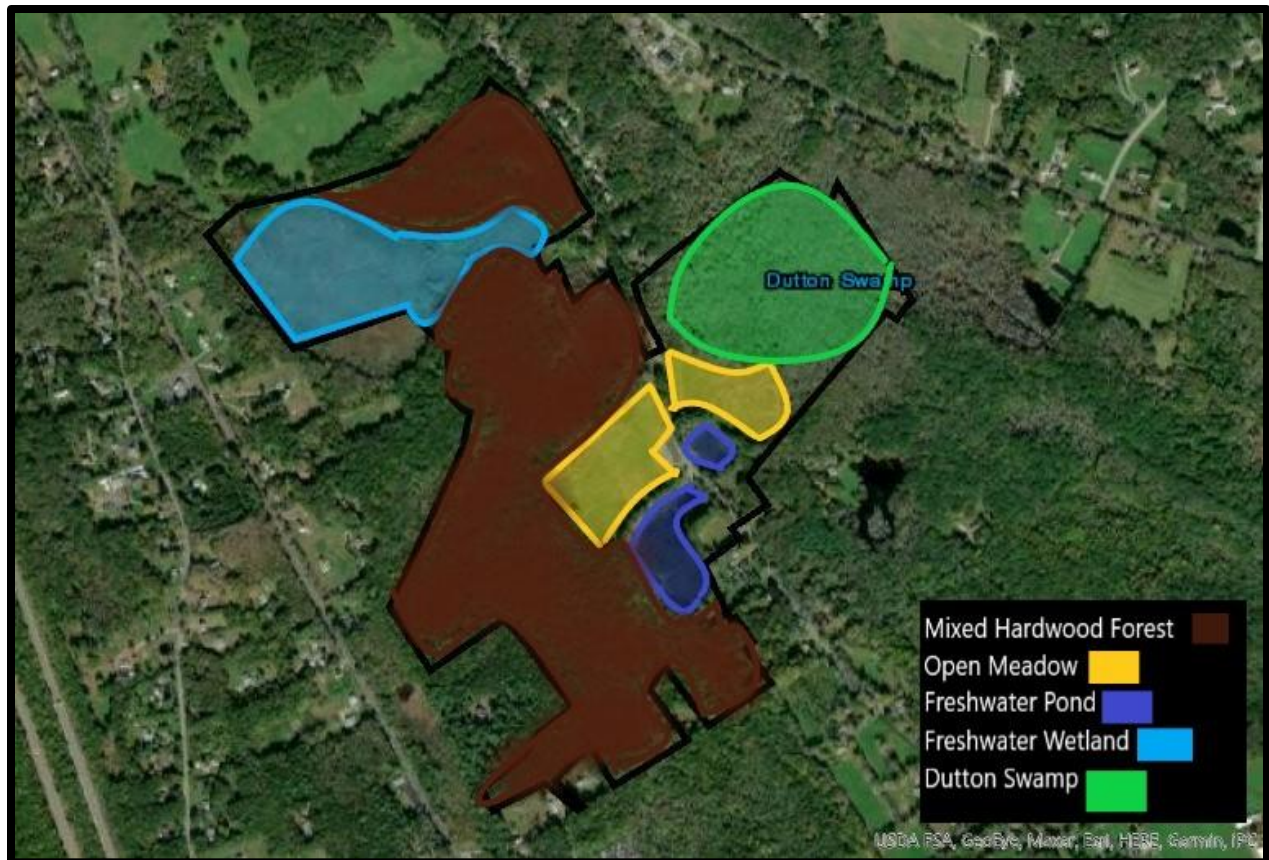
**Figure 2.** Aerial imagery of the Ruby and Elizabeth Cohen Woodlands.  
(Source: Jay Gigliotti)

# Ruby and Elizabeth Cohen Woodlands – Park and Trail Map

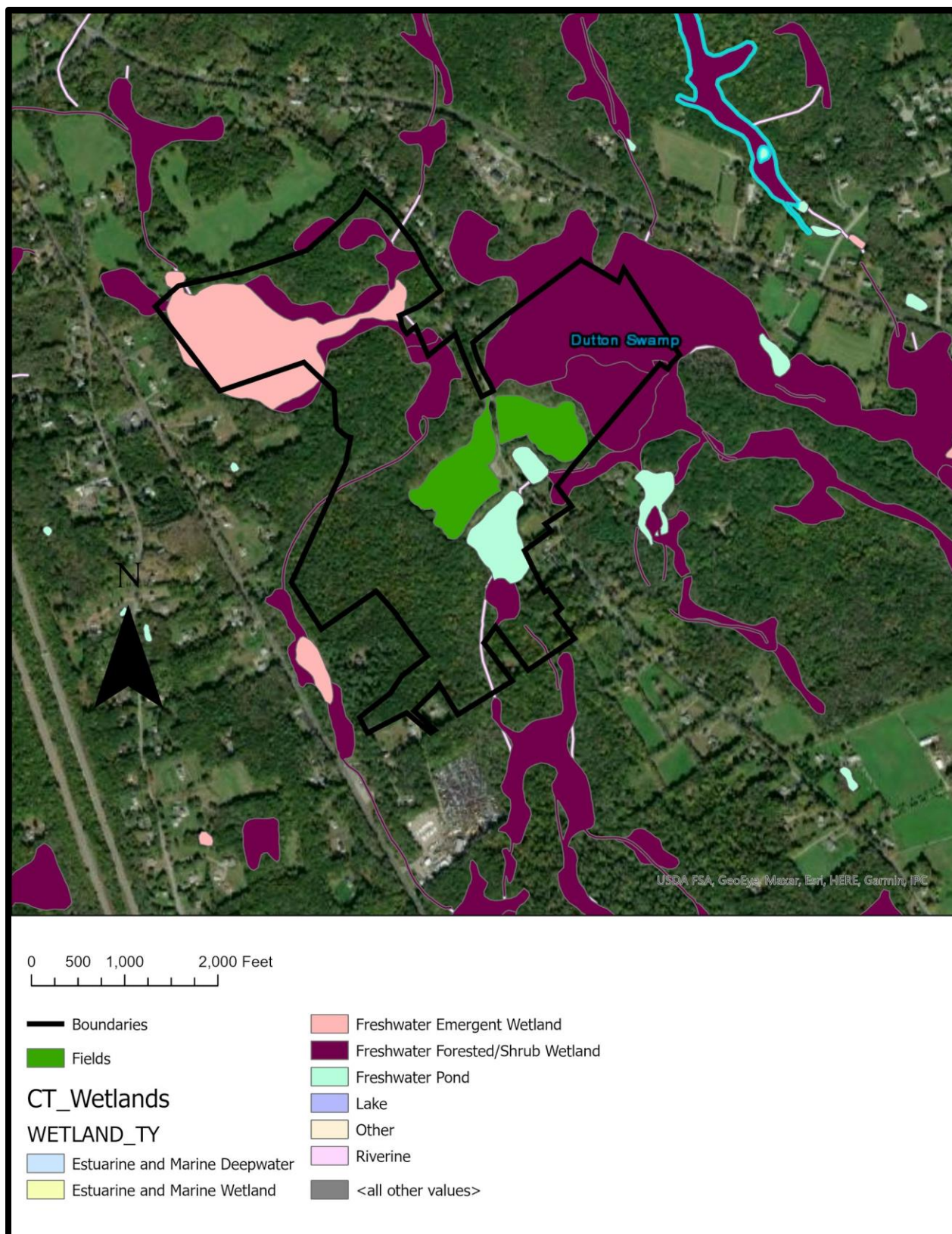
96 McDonald Road, Colchester, CT  
Colchester Parks and Recreation



**Figure 3.** Park and Trail Map available to visitors of the Ruby and Elizabeth Cohen Woodlands.  
(Source: Jay Gigliotti)







































**Figure 4.** Map of Habitat Types at the Ruby and Elizabeth Cohen Woodlands.  
(Source: Wildlife Management Team)



**Figure 5.** Cover types map of the Ruby and Elizabeth Cohen Woodlands.  
(Source: CT DEEP GIS Open Data website)



## MAP LEGEND

<b>Area of Interest (AOI)</b>			Spoil Area
	Area of Interest (AOI)		Stony Spot
<b>Soils</b>			Very Stony Spot
	Soil Map Unit Polygons		Wet Spot
	Soil Map Unit Lines		Other
	Soil Map Unit Points		Special Line Features
<b>Special Point Features</b>		<b>Water Features</b>	
	Blowout		Streams and Canals
	Borrow Pit	<b>Transportation</b>	
	Clay Spot		Rails
	Closed Depression		Interstate Highways
	Gravel Pit		US Routes
	Gravelly Spot		Major Roads
	Landfill		Local Roads
	Lava Flow	<b>Background</b>	
	Marsh or swamp		Aerial Photography
	Mine or Quarry		
	Miscellaneous Water		
	Perennial Water		
	Rock Outcrop		
	Saline Spot		
	Sandy Spot		
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut  
Survey Area Data: Version 20, Jun 9, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 20, 2019—Mar 27, 2019

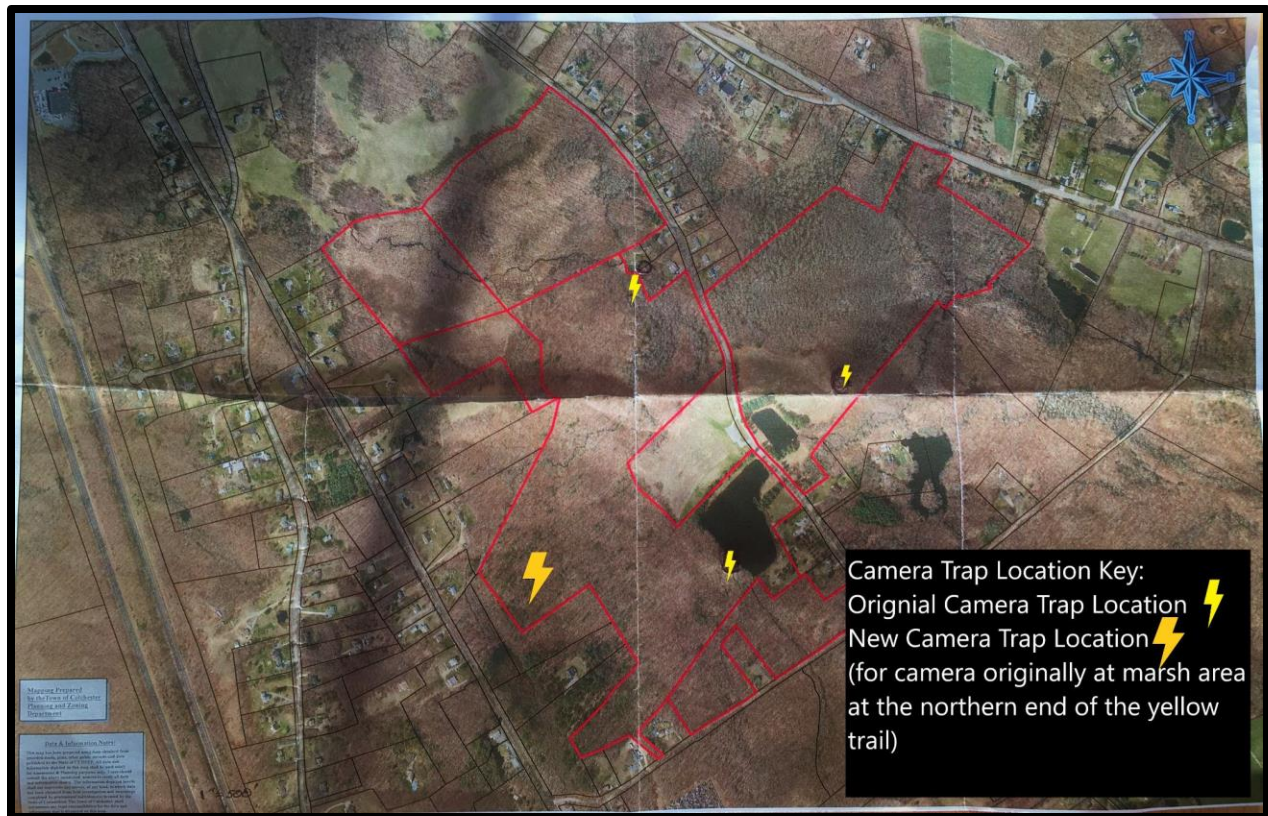
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	17.9	8.3%
12	Raypol silt loam	3.9	1.8%
17	Timakwa and Natchaug soils, 0 to 2 percent slopes	17.1	7.9%
18	Catden and Freetown soils, 0 to 2 percent slopes	29.5	13.8%
23A	Sudbury sandy loam, 0 to 5 percent slopes	14.7	6.9%
29A	Agawam fine sandy loam, 0 to 3 percent slopes	2.0	0.9%
29B	Agawam fine sandy loam, 3 to 8 percent slopes	3.7	1.7%
34B	Merrimac fine sandy loam, 3 to 8 percent slopes	11.3	5.2%
36B	Windsor loamy sand, 3 to 8 percent slopes	10.6	4.9%
38A	Hinckley loamy sand, 0 to 3 percent slopes	0.5	0.2%
38C	Hinckley loamy sand, 3 to 15 percent slopes	13.1	6.1%
45A	Woodbridge fine sandy loam, 0 to 3 percent slopes	5.5	2.6%
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	7.4	3.4%
46B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	42.9	20.0%
51B	Sutton fine sandy loam, 0 to 8 percent slopes, very stony	13.6	6.3%
52C	Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	4.3	2.0%
60D	Canton and Charlton soils, 15 to 25 percent slopes	1.7	0.8%
61B	Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony	3.4	1.6%
72C	Nipmuck-Brookfield complex, 3 to 15 percent slopes, very rocky	4.0	1.9%
701B	Ninigret fine sandy loam, 3 to 8 percent slopes	2.0	0.9%

**Figures 6.1, 6.2, and 6.3.** Soil Cover Map and Keys for the Ruby and Elizabeth Cohen Woodlands.

(Source: USDA Natural Resources Conservation Service Web Soil Survey)



**Figure 7.** Map of locations of camera traps during survey period.  
(Source: Created by Wildlife Management Team)



**Figure 8.** Photograph of sign informing the public that Ruby Cohen is a certified community wildlife habitat according to the standards of the National Wildlife Federation.  
(Source: Joan Tremblay)



**Figure 9.** Image of the Story Walk at Ruby Cohen.  
(Source: Joan Tremblay)



**Figure 10.** Image of old stone foundation from barn when Ruby Cohen was previously a farm.  
(Source: Joan Tremblay)



**Figure 11.** Image of a yellow birch tree, which was quite abundant in the park and indicative of a swamp/lowland forest habitat.  
(Source: Joan Tremblay)



**Figure 12.** Image of princess pine, a plant abundant in Ruby Cohen and an indicator of a healthy mycorrhizal community.  
(Source: Joan Tremblay)



**Figure 13.** Image of leaf litter and organic matter build-up in the bottom of the larger pond at Ruby Cohen.  
(Source: Joan Tremblay)



**Figure 14.** Photograph of beaver lodge along southwestern edge of large pond at Ruby Cohen.  
(Source: Joan Tremblay)



**Figure 15.** Photograph of a potential muskrat burrow in the southwestern bank of the large pond, near the red trail.  
(Source: Joan Tremblay)



**Figure 16.** Camera trap image of a pair of Wood Ducks at the beaver lodge on 4 April 2021 at 7:35 AM.



**Figure 17.** Image of phragmites covering the marsh area in the north end of the park, as seen from the marsh viewing area along the yellow trail.  
(Source: Joan Tremblay)



**Figure 18.** Close-up photograph of phragmites in the wetland area at the northern end of the yellow trail.  
(Source: Jamie Kurowski)



**Figure 19.** Photograph of oriental bittersweet vine climbing a tree at the edge of the woods near the entrance to the yellow trail.  
(Source: Joan Tremblay)



**Figure 20.** Another photograph of oriental bittersweet vine at the edge of the woods near the entrance to the yellow trail.  
(Source: Joan Tremblay)



**Figure 21.** Photograph of the area of where japanese knotweed is mechanically managed by the Colchester Garden Club at Ruby Cohen.  
(Source: Joan Tremblay)

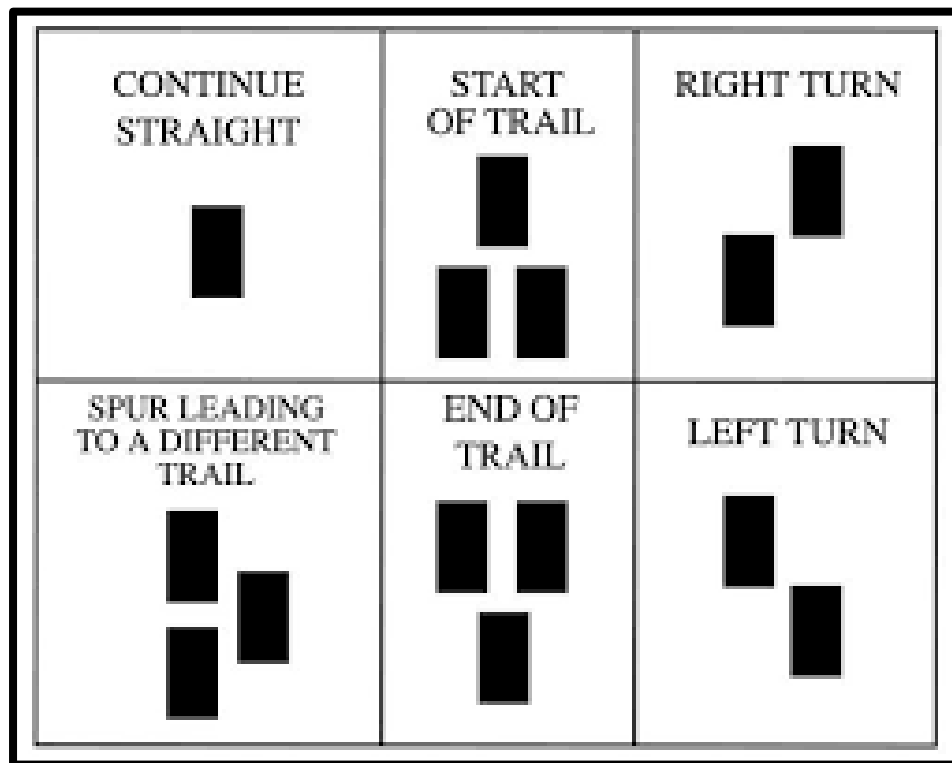


**Figure 22.** Image of pet waste in a plastic bag found along the yellow trail in a tree.  
(Source: Joan Tremblay)



**Figure 23.** Image of litter found at the entrance of the blue trail.

(Source: Joan Tremblay)



**Figure 24.** Trail blaze markings that should be used to indicate what direction the trail ahead leads / turns.

(Source: <https://sectionhiker.com/how-to-follow-a-trail/>)



**Figure 25.** Image of washed out footbridge on southern end of the red trail - an example of the damage and debris making some of the trails difficult to use at Ruby Cohen.  
(Source: Jamie Kurowski)



**Figure 26.** Image of poison ivy vines covering white pine tree near the picnic area at the side of the large pond at Ruby Cohen.  
(Source: Joan Tremblay)



**Figure 27.** Image of abandoned bluebird box against a white pine tree near the smaller pond on the north side of the road. Note the poison ivy vines on this tree, just like those in Figure 12.  
(Source: Joan Tremblay)



**Figure 28.** Photograph of meadow area on parking-lot side of Ruby Cohen.  
(Source: Jamie Kurowski)



**Figure 29.** Photograph of meadow area on northern side of road at Ruby Cohen.  
(Source: Joan Tremblay)

## 2B: Additional Figures



**Figure 30.** Management Areas Recommended by Wildlife Management Team  
(Created by Wildlife Management Team)



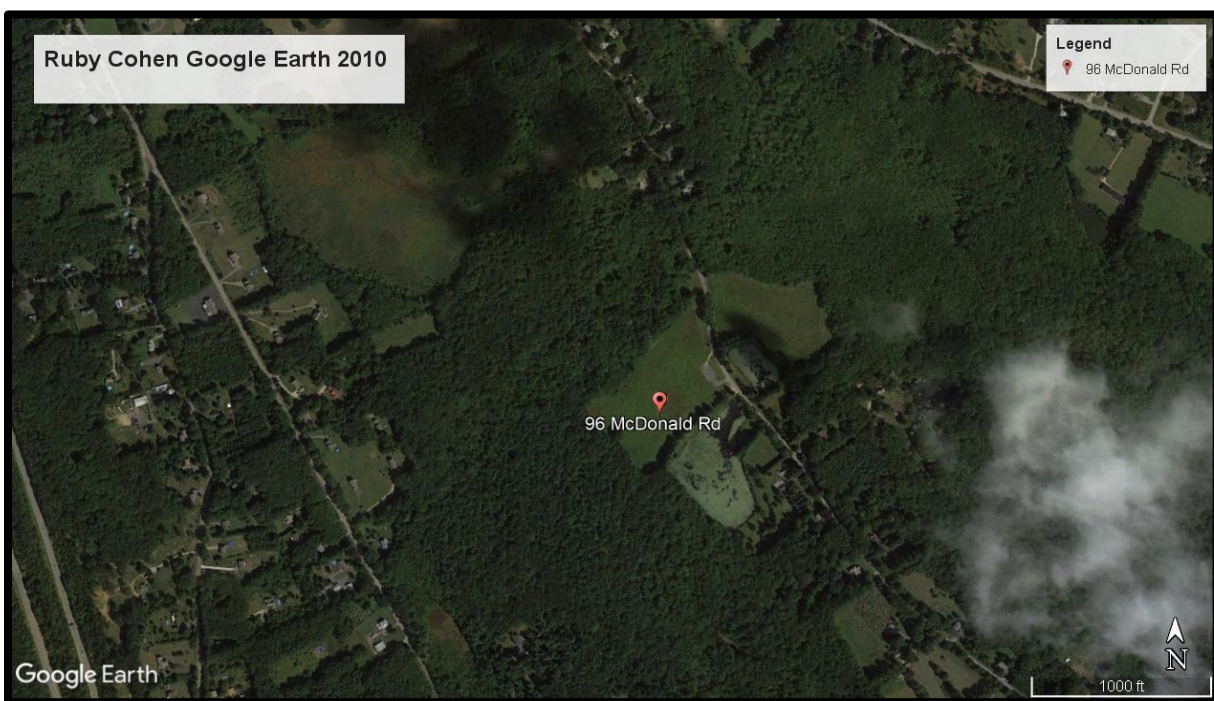
**Figure 31.** Satellite image of Ruby Cohen in March 1991.  
(Source: Google Earth Pro)



**Figure 32.** Satellite image of Ruby Cohen in March 2012  
(Source: Google Earth Pro)



**Figure 33.** Satellite image of Ruby Cohen in August 2006.  
(Source: Google Earth Pro)



**Figure 34.** Satellite image of Ruby Cohen in September 2010.  
(Source: Google Earth Pro)



**Figure 35.** Image of wetland area on side of northern end of the yellow trail.  
(Source: Jamie Kurowski)



**Figure 36.** Image of beaver dam on small stream entering southern end of the larger pond at Ruby Cohen.

(Source: Jamie Kurowski)



**Figure 37.** Image of smaller pond on the northern side of the road at Ruby Cohen.  
(Source: Joan Tremblay)



**Figure 38.** Photograph of a small stream running through woodlands near the northwestern end of the park, along the blue and yellow trails.  
(Source: Joan Tremblay)



**Figure 39.** Photograph of a dead tree (or snag) with woodpecker holes in the Ruby Cohen woodlands. Snags are an important habitat for many wildlife species and should be left up when possible.

(Source: Joan Tremblay)



**Figure 40.** Image of muscle wood trees along the yellow trail at Ruby Cohen.  
(Source: Joan Tremblay)



**Figure 41.** Image of Christmas fern found in woodlands at Ruby Cohen.  
(Source: Joan Tremblay)



**Figure 42.** Image of white pine sapling in woodlands at Ruby Cohen.  
(Source: Joan Tremblay)



**Figure 43.** Close-up photograph of beaver lodge in the center of the southwestern edge of the large pond at Ruby Cohen.  
(Source: Joan Tremblay)



**Figure 44.** Photograph of a tree that had been chewed by beavers some time ago, along the wetland area beside the northern end of the yellow trail.  
(Source: Joan Tremblay)



**Figure 45.** Photograph of a tree recently chewed by beavers along the southwestern edge of the large pond, near the beaver lodge.  
(Source: Joan Tremblay)



**Figure 46.** Photograph of deer scat found in woods along the yellow trail.  
(Source: Joan Tremblay)



**Figure 47.** Photograph of deer track in the snow in the woods along the yellow trail.  
(Source: Joan Tremblay)



**Figure 48.** Camera trap image of a Bobcat catching a muskrat or beaver coming off the beaver lodge in the large pond, on 18 March 2021.



**Figures 49.1 and 49.2:** Camera trap photograph of a beaver at night on 5 April 2021 (upper). Photograph of a beaver diving underwater on 6 April 2021 (lower). Captured by the larger pond on the property.



**Figure 50.** Camera trap image of a coyote coming off the beaver lodge on 10 March 2021 at 2:33 AM.



**Figure 51.** Camera trap image of an American mink at the beaver lodge on 26 March 2021 at 12:23 PM.



**Figure 52.** Camera trap image of a northern raccoon at the forest edge camera trap on 19 March 2021 at 12:00 AM.



**Figure 53.** Camera trap image of a bobcat at the forest edge on 24 March 2021 at 7:35 AM



**Figure 54.** Camera trap image of a skunk at the forest edge on 15 March 2021 at 5:27 AM.



**Figure 55.** Camera trap image of a cottontail at the forest edge on 28 March 2021 at 8:29 PM.



**Figure 56.** Camera trap image of an eastern coyote in the woodlands at the center of the blue trail on 3 April 2021 at 8:28 AM.



**Figure 57.** Camera trap image of an eastern gray squirrel in the woodlands at the center of the blue trail on 4 April 2021 at 8:01 AM.



**Figure 58.** Camera trap image of a white-tailed deer at the beaver lodge on 21 March 2021 at 7:47 PM.



**Figure 59.** Camera trap image of a white-tailed deer at the beaver lodge on 22 March 2021 at 5:45 AM.



**Figure 60.** Camera trap image of two muskrat at the beaver lodge on 27 March 2021 at 3:20 PM.



**Figure 61.** Camera trap image of a group of White-tailed Deer at the edge of the woods on 4 April 2021 at 11:23 AM.



**Figure 62.** Camera trap image of a Virginia Opossum at the edge of the woods on 25 March 2021 at 12:15 AM.



**Figure 63.** Camera trap image of a beaver with building materials at the beaver lodge on 30 March 2021 at 5:12 AM.



**Figure 64.** Camera trap image of a bobcat at the beaver lodge on 5 April 2021 at 9:31 PM.



**Figure 65.** Camera trap image of a bobcat heading towards the southern end of the park at the forest edge across the road from the parking area on 20 March 2021 at 10:41 PM.



**Figure 66.** Camera trap image of an American robin at the beaver lodge on 31 March 2021 at 10:23 AM.



**Figure 67.** Camera trap image of two mallard ducks at the beaver lodge on 2 April 2021 at 11:31 AM.



**Figure 68.** Camera trap image of a Canada goose at the beaver lodge on 3 April 2021 at 5:35 AM.



**Figure 69.** Camera trap image of two wood ducks by the beaver lodge on 5 April 2021 at 9:45 AM.



**Figure 70.** Camera trap image of an eastern bluebird at the beaver lodge on 29 March 2021 at 1:35 PM.



**Figure 71.** Camera trap image of a Great Blue Heron at the beaver lodge on 5 April 2021 at 9:50 AM.



**Figure 72.** Camera trap image of a flock of wild turkeys at the forest edge camera on 15 March 2021 at 9:46 AM.

## **Appendix 3: Deed**

**FIDUCIARY'S DEED-PRIVATE SALE**

**KNOW ALL MEN BY THESE PRESENTS,**

**THAT SUSAN C. FREEDMAN**, of the Town of Glastonbury, County of Hartford and State of Connecticut, Executrix of the **ESTATE OF RUBIN COHEN**, late of Colchester, Connecticut, deceased, by virtue of Article 3 of the Last Will and Testament of the deceased, dated August 2, 1995 and in consideration of the sum of **TWENTY-FIVE THOUSAND AND 00/100 (\$25,000.00) DOLLARS** and other good and valuable consideration, received to her full satisfaction of The **Town of Colchester**, a municipal Corporation duly existing under the laws of the State of Connecticut and having its territorial limits within said Town of Colchester, does hereby grant, bargain, sell and confirm unto the said **Town of Colchester**, all such right, title, interest, claim and demand which the said deceased had at the time of his death which said estate now has in and to a certain piece or parcel of land, situated in the Town of Colchester, County of New London and State of Connecticut, known as a parcel which is situated in the Town of Colchester and State of Connecticut, which parcel is more particularly described as follows:

*See Schedule A attached hereto and made a part hereof*

Said Parcel is conveyed subject to the following:

1. Said premises are conveyed subject to taxes to the Town of Colchester on the Grand List of October 1, 1999, which the Grantee herein assumes and agrees to pay as part consideration for this deed.
2. Any and all provisions of any ordinance, municipal regulation, or public or private law, declarations, restrictions, covenants, and easements of record.
3. Current municipal taxes and assessments.
4. Grantee agrees that Grantor shall have the right to approve the name selected for the property.
5. Grantee agrees to restrict the use of the premises to a) open space and b) active and passive recreational uses as deemed appropriate by the Town.
6. Grantee, its successors, and assigns, agrees that it shall not erect any structures within 150 feet of the boundary line of Lot 6 "House Lot" being 2.113 acres, as shown on said map or plan.
7. Notes on said referenced map or plan.

\* 2775  
**TO HAVE AND TO HOLD**, the above granted and bargained premises with the appurtenances thereof, unto the **Town of Colchester**, the said grantee, to it and its' proper use and hereof. And that said **SUSAN C. FREEDMAN**, Executrix does hereby covenant with the said grantee **Town of Colchester**, that **SUSAN C. FREEDMAN** has full power and authority as Executrix, to grant and convey the above described premises in manner and form as aforesaid

RECEIVED  
 COLCHESTER, CT  
 SEP 2 P11 1:54  
 NAHCOA BRAY  
 TOWN CLERK

and for herself and her heirs, executors, administrators, successors and assigns does further covenant to warrant and defend the same to the said grantee, **Town of Colchester**, against the claims of any person whomsoever claiming by, from or under the **ESTATE OF RUBIN COHEN**, as aforesaid.

In Witness Whereof, **SUSAN C. FREEDMAN**, Executrix, has hereunto set her hand this 31<sup>st</sup> day of July, 2000.

WITNESS

GRANTOR

Estate of Rubin Cohen

Sherry L. Bartfield  
Sherry L. Bartfield  
Sharon H. Putti

By: Susan C. Freedman  
SUSAN C. FREEDMAN, Executrix

STATE OF CONNECTICUT :

COUNTY OF HARTFORD :

ss: Glastonbury July 31, 2000

On this 31<sup>st</sup> day of July, 2000, before me, Sharon H. Putti the undersigned officer, personally appeared, **SUSAN C. FREEDMAN**, of the Town of Glastonbury, County of Hartford and State of Connecticut, Executrix of the Estate of Rubin Cohen, known to me to be the person described in the foregoing instrument, and acknowledged that she executed the same in the capacity therein stated and for the purposes therein contained.

"No Conveyance Tax collected

Nancy A. Bray  
Town Clerk of Colchester"

Sharon H. Putti  
Sharon H. Putti  
Commissioner of the Superior Court  
~~Notary Public~~  
~~My Commission Expires:~~

**SCHEDULE A**

A certain piece or parcel of land, with all the buildings and improvements thereon, situated in the said Town of Colchester, easterly on Route 85, but not adjacent hereto, and northerly of the other premises conveyed to Helen Naumec by the heirs of Mary Chemerynski, and being bounded and described as follows:

- NORTHERLY:** by land of R. Cohen, Five Hundred Fifty-two (552) feet;
- EASTERLY:** by land of R. Cohen, Three Hundred Seventy-seven (377) feet;
- SOUTHERLY:** by land conveyed to Helen Naumec by the heirs of Mary Chemerynski, Seven Hundred (700) feet; more or less;
- WESTERLY:** by land of the estate of Mary Chemerynski, also known as Mary Czernerynski, Seven Hundred Ninety-five (795) feet; and
- EASTERLY:** again by land of R. Cohen, Eighty-five (85) feet; and
- EASTERLY:** again by land of R. Cohen, Four Hundred Forty (440) feet.

Together with a right of way for any or all purposes Fifteen (15) feet in width, running Easterly from Route 85 over other land adjacent to Route 85 as shown on a survey of Geo. E. Pichter & Sons Scale 1" = 50', dated October 12, 1958; the described premises also being shown on said survey, reference to which is hereby made.

Said parcel is also a portion of a parcel situated on the west side of McDonald Road in the Town of Colchester containing 90.09 acres, more or less, and shown on a map or plan entitled:

"Division Plan For Municipal Purposes The Estate of RUBIN  
COHEN McDonald Rd., Colchester, CT West Side Scale  
1"=100' Date 6/1/99 Joseph Kirkup, Land Surveyor Revised  
7/9/99, 7/27/99, 10/28/99 and 8/13/2000 Sheet 1 of 2"

which map is to be filed in the land records of the Town of Colchester.

Excepting therefrom the parcels conveyed this date by Susan C. Freedman, Trustee and Margaret E. Wiley, Trustee, by Warranty Deed to the Town of Colchester.

Said parcel is the same parcel conveyed by Quit Claim Deed from Hayward Realty Co. Inc. to Rubin Cohen dated June 22, 1988 and recorded in Volume 210 at Page 30 of the Colchester Land Records.

## WARRANTEE DEED (Statutory Form)

To all People to whom these Presents shall come, Greeting:

KNOW YE, THAT SUSAN C. FREEDMAN, TRUSTEE, of the Town of Glastonbury, County of Hartford and State of Connecticut, and MARGARET E. WILEY, TRUSTEE, of the Town Orchard Park, County of Erie and State of New York hereinafter referred to as the Grantors, for the consideration of FOUR HUNDRED SIXTY-FIVE THOUSAND AND 00/100 DOLLARS (\$465,000.00) received to their full satisfaction of TOWN OF COLCHESTER, a municipal corporation duly existing under the laws of the State of Connecticut and having its territorial limits within said Town of Colchester, hereinafter referred to as the Grantee, do give, grant, bargain, sell and confirm unto the said TOWN OF COLCHESTER, with WARRANTY COVENANTS, the following described premises:

**See Schedule A attached hereto and made a part hereof**

Said parcels are conveyed subject to the following:

1. Said premises are conveyed subject to taxes to the Town of Colchester on the Grand List of October 1, 1999, which the Grantee herein assumes and agrees to pay as part consideration for this deed.
2. Any and all provisions of any ordinance, municipal regulation, or public or private law; declarations, restrictions, covenants, and easements of record.
3. Current municipal taxes and assessments.
4. Grantee agrees that Grantor shall have the right to approve the name selected for the property.
5. Grantee agrees to restrict the use of the premises to a) open space and b) active and passive recreational uses as deemed appropriate by the Town.
6. Grantee, its successors, and assigns, agrees that it shall not erect any structures within 150 feet of the boundary line of Lot 6 "House Lot" being 2.113 acres, as shown on said map or plan.
7. Notes on said referenced map or plans.

#2776 IN WITNESS WHEREOF, SUSAN C. FREEDMAN, TRUSTEE, and MARGARET E. WILEY, TRUSTEE have set their hands and seals this 20th day of July, 2000.

"No Conveyance Tax collected"

Signed and Delivered in the presence of:

Nancy A. Bray  
Town Clerk of Colchester

Susan C. Freedman  
Susan C. Freedman, Trustee

Sharon H. Furrill

Sherry L. Buntfield

Janet M. Wright  
Beverly E. Hudson

Margaret E. Wiley  
Margaret E. Wiley, Trustee

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COLCHESTER, CT  
00 SEP 12 PM 1:59

STATE OF CONNECTICUT )  
COUNTY OF HARTFORD )

ss. Glastonbury

July 31, 2000

Personally appeared Susan C. Freedman, Trustee, signer and sealer of the foregoing instrument and acknowledged the same to be her free act and deed, before me.

Sharon H. Hart  
Sharon H. Hart  
Commissioner of Superior Court  
Notary Public:  
~~My Commission Expires:~~

STATE OF NEW YORK )  
COUNTY OF ERIE )

ss. \_\_\_\_\_

July \_\_\_\_, 2000

Personally appeared Margaret E. Wiley, Trustee, signer and sealer of the foregoing instrument and acknowledged the same to be her free act and deed, before me.

Marie A. Dykstra  
Notary Public:  
My Commission Expires:

Grantees' Mailing Address:

127 Norwich Avenue  
Colchester, Connecticut 06415

MARIE A. DYKSTRA  
NOTARY PUBLIC, STATE OF NEW YORK  
QUALIFIED IN ERIE COUNTY  
MY COMMISSION EXPIRES JUNE 1, 2001

## Schedule A

**First Parcel:**

Two certain pieces or parcels of land situated on the west side of McDonald Road, in the Town of Colchester, County of New London and State of Connecticut, containing 87.605 acres, more or less, and designated as "Lot 6B" Area 435,600 square feet 10.000 Acres" and as "Lot 6C" Area 3,380,483 square feet 77.605 Acres" and shown on a map or plan entitled:

"Division Plan For Municipal Purposes The  
Estate of RUBIN COHEN McDonald Rd.,  
Colchester, CT West Side Scale 1"=100'  
Date 6/1/99 Joseph Kirkup, Land Surveyor  
Revised 7/9/99, 7/27/99, 10/28/99 6/13/00  
Sheet 1 of 2 and Sheet 2 of 2"

which map is to be filed in the land records of the Town of Colchester.

Said parcel is more particularly described as follows:

Commencing at a point which point is the Southeasterly corner of Parcel A as shown on said map and a Northeasterly corner of the herein described premises which point is on the Assumed Westerly Street Line of McDonald Road all as shown on said map or plan;

Thence proceeding S 05° 37' 50" E a distance of 254.10 (Two Hundred Fifty-Four and Ten One-Hundredths) feet to a point;

Thence proceeding S 10° 21' 25" E a distance of 320.71 (Three Hundred Twenty and Seventy-One One Hundredths) feet to a point;

Thence proceeding S 02° 00' 57" W a distance of 95.19 (Ninety-Five and Nineteen One-Hundredths) feet to a point;

Thence proceeding S 07° 19' 46" W a distance of 171.68 (One Hundred Seventy-One and Sixty-Eight One Hundredths) feet to a point;

Thence proceeding S 02° 18' 48" W a distance of 183.03 (One Hundred Eighty-Three and Three One Hundredths) feet to a point;

Thence proceeding S 11° 48' 50" E a distance of 98.94 (Ninety-Eight and Ninety-Four One Hundredths) feet to a point;

Thence proceeding S 18° 57' 52" E a distance of 111.50 (One Hundred Eleven and Fifty One Hundredths) feet to a point;

Thence proceeding S 24° 16' 53" E a distance of 78.46 (Seventy-Eight and Forty-Six One Hundredths) feet to a point;

Thence proceeding S 26° 28' 01" a distance of 314.00 (Three Hundred Fourteen and No One Hundredths) feet to a point;

Thence proceeding S 21° 43' 43" E a distance of 115.59 (One Hundred Fifteen and Fifty-Nine One Hundredths) feet to a point;

The preceding ten (10) courses are all along the Assumed Westerly Street Line of McDonald Road as shown on said map or plan.

Thence proceeding S 66° 13' 48" W a distance of 235.00 (Two Hundred Thirty-Five and No One Hundredths) feet to a point;

Thence proceeding S 11° 47' 02" E a distance of 377.49 (Three Hundred Seventy-Seven and Forty-Nine One Hundredths) feet to a point;

The preceding two (2) courses are along other land retained by the Grantor herein.

Thence proceeding S 62° 57' 02" W a distance of 129.27 (One Hundred Twenty-Nine and Twenty-Seven One Hundredths) feet to a point;

Thence proceeding S 63° 04' 26" W a distance of 185.78 (One Hundred Eighty-Five and Seventy-Eight One Hundredths) feet to a point;

Thence proceeding N 23° 29' 28" W a distance of 68.90 (Sixty-Eight and Ninety One Hundredths) feet to a point;

Thence proceeding N 17° 30' 22" W a distance of 87.92 (Eighty-Seven and Ninety-Two One Hundredths) feet to a point;

Thence proceeding S 61° 40' 46" W a distance of 73.39 (Seventy-Three and Thirty-Nine One Hundredths) feet to a point;

Thence proceeding S 51° 50' 51" W a distance of 256.47 (Two Hundred Fifty-Six and Forty-Seven One Hundredths) feet to a point;

Thence proceeding S 54° 00' 17" W a distance of 103.63 (One Hundred Three and Sixty-Three One Hundredths) feet to a point;

Thence proceeding S 52° 26' 46" W a distance of 154.40 (One Hundred Fifty-Four and Forty One Hundredths) feet to a point;

Thence proceeding S 52° 54' 51" W a distance of 241.84 (Two Hundred Forty-One and Eighty-Four One Hundredths) feet to a point;

Thence proceeding S 49° 44' 12" W a distance of 65.66 (Sixty-Five and Sixty-Six One Hundredths) feet to an iron pin found;

The preceding ten (10) courses are along land now or formerly of Moroch as shown on said map or plan.

Thence proceeding S 52° 40' 39" W a distance of 72.06 (Seventy-Two and Six One Hundredths) feet to a point;

Thence proceeding S 55° 48' 11" W a distance of 211.76 (Two Hundred Eleven and Seventy-Six One Hundredths) feet to an iron pin found;

Thence proceeding S 33° 37' 24" E a distance of 221.30 (Two Hundred Twenty-One and Thirty One Hundredths) feet to an iron pin set;

The preceding three (3) courses are along land now or formerly of Moroch as shown on said map or plan.

Thence proceeding S 70° 29' 34" W, along the northerly side of Dutton Road as shown on said map or plan, a distance of 30.93 (Thirty and Ninety-Three One Hundredths) feet to an iron pin set.

Thence proceeding N 33° 37' 24" W a distance of 252.23 (Two Hundred Fifty-Two and Twenty-Three One Hundredths) feet to a point;

Thence proceeding S 62° 04' 21" W a distance of 93.63 (Ninety-Three and Sixty-Three One Hundredths) feet to a point;

Thence proceeding S 75° 48' 56" W a distance of 86.48 (Eighty-Six and Forty-Eight One Hundredths) feet to a point;

Thence proceeding S 84° 52' 34" W a distance of 198.10 (One Hundred Ninety-Eight and Ten One Hundredths) feet to a point;

Thence proceeding N 12° 44' 59" W a distance of 41.14 (Forty-One and Fourteen One Hundredths) feet to a point;

Thence proceeding N 17° 41' 02" W a distance of 55.10 (Fifty-Five and Ten One Hundredths) feet to a point;

Thence proceeding N 11° 49' 11" W a distance of 49.11 (Forty-Nine and Eleven One Hundredths) feet to a point;

The preceding seven (7) courses are along land formerly of Pearl and now or formerly of Parsons as shown on said map or plan.

Thence proceeding N 61° 45' 52" E a distance of 80.39 (Eighty and Thirty-Nine One Hundredths) feet to a point;

Thence proceeding N 58° 51' 58" E a distance of 228.55 (Two Hundred Twenty-Eight and Fifty-Five One Hundredths) feet to a point;

Thence proceeding N 52° 41' 34" E a distance of 43.89 (Forty-Three and Eighty-Nine One Hundredths) feet to a point;

Thence proceeding N 44° 26' 48" E a distance of 33.16 (Thirty-Three and Sixteen One Hundredths) feet to a point;

Thence proceeding N 53° 28' 19" E a distance of 66.71 (Sixty-Six and Seventy-One One Hundredths) feet to a point;

Thence proceeding N 62° 23' 59" E a distance of 38.12 (Thirty-Eight and Twelve One Hundredths) feet to a point;

Thence proceeding N 59° 52' 09" E a distance of 42.79 (Forty-Two and Seventy-Nine One Hundredths) feet to a point;

Thence proceeding N 61° 24' 17" E a distance of 57.53 (Fifty-Seven and Fifty-Three One Hundredths) feet to a point;

Thence proceeding N 56° 04' 59" E a distance of 72.45 (Seventy-Two and Forty-Five One Hundredths) feet to a point;

Thence proceeding N 19° 34' 18" W a distance of 44.98 (Forty-Four and Ninety-Eight One Hundredths) feet to a point;

Thence proceeding N 19° 52' 41" W a distance of 36.44 (Thirty-Six and Forty-Four One Hundredths) feet to a point;

Thence proceeding N 17° 23' 48" W a distance of 238.29 (Two Hundred Thirty-Eight and Twenty-Nine One Hundredths) feet to a point;

Thence proceeding S 71° 11' 39" W a distance of 57.89 (Fifty-Seven and Eighty-Nine One Hundredths) feet to a point;

Thence proceeding S 78° 34' 21" W a distance of 106.76 (One Hundred Six and Seventy-Six One Hundredths) feet to a point;

Thence proceeding S 75° 19' 26" W a distance of 194.84 (One Hundred Ninety-Four and Eighty-Four One Hundredths) feet to a point;

Thence proceeding S 60° 20' 57" W a distance of 10.06 (Ten and Six One Hundredths) feet to a point;

Thence proceeding S 67° 09' 16" W a distance of 44.06 (Forty-Four and Six One Hundredths) feet to a point;

Thence proceeding S 76° 27' 14" W a distance of 213.11 (Two Hundred Thirteen and Eleven One Hundredths) feet to an iron pin found.

Thence proceeding S 76° 27' 14" W a distance of 73.28 (Seventy-Three and Twenty-Eight One Hundredths) feet to a point;

Thence proceeding N 14° 14' 44" W a distance of 686.53 (Six Hundred Eighty-Six and Fifty-Three One Hundredths) feet to a point;

The preceding twenty (20) courses are along land now or formerly of Glemboski as shown on said map or plan.

Thence proceeding N 52° 39' 39" E a distance of 16.65 (Sixteen and Sixty-Five One Hundredths) feet to a point;

Thence proceeding N 50° 12' 26" E a distance of 68.36 (Sixty-Eight and Thirty-Six One Hundredths) feet to a point;

Thence proceeding N 33° 27' 55" E a distance of 8.13 (Eight and Thirteen One Hundredths) feet to a point;

Thence proceeding N 47° 23' 31" E a distance of 51.76 (Fifty-One and Seventy-Six One Hundredths) feet to a point;

Thence proceeding N 51° 25' 30" E a distance of 78.59 (Seventy-Eight and Fifty-Nine One Hundredths) feet to a point;

Thence proceeding N 47° 08' 48" E a distance of 298.68 (Two Hundred Ninety-Eight and Sixty-Eight One Hundredths) feet to a point;

Thence proceeding N 48° 47' 23" E a distance of 123.06 (One Hundred Twenty-Three and Six One Hundredths) feet to a point;

Thence proceeding N 48° 00' 12" E a distance of 305.88 (Three Hundred Five and Eighty-Eight One Hundredths) feet to a point;

Thence proceeding N 50° 26' 15" E a distance of 79.18 (Seventy-Nine and Eighteen One Hundredths) feet to a point;

Thence proceeding N 44° 10' 39" E a distance of 86.35 (Eighty-Six and Thirty-Five One Hundredths) feet to a point;

Thence proceeding N 55° 09' 12" E a distance of 187.51 (One Hundred Eighty-Seven and Fifty-One One Hundredths) feet to a point;

Thence proceeding N 61° 11' 00" E a distance of 48.76 (Forty-Eight and Seventy-Six One Hundredths) feet to a point;

Thence proceeding N 61° 25' 28" W a distance of 34.49 (Thirty-Four and Forty-Nine One Hundredths) feet to a point;

Thence proceeding N 38° 47' 26" W a distance of 94.82 (Ninety-Four and Eighty-Two One Hundredths) feet to a point;

Thence proceeding N 07° 36' 16" W a distance of 36.66 (Thirty-Six and Sixty-Six One Hundredths) feet to a point;

Thence proceeding N 08° 59' 45" E a distance of 37.95 (Thirty-Seven and Ninety-Five One Hundredths) feet to a point;

Thence proceeding N 13° 55' 57" E a distance of 207.78 (Two Hundred Seven and Seventy-Eight One Hundredths) feet to a point;

Thence proceeding N 34° 45' 11" W a distance of 189.46 (One Hundred Eighty-Nine and Forty-Six One Hundredths) feet to a point;

Thence proceeding N 21° 57' 00" W a distance of 29.58 (Twenty-Nine and Fifty-Eight One Hundredths) feet to a point;

Thence proceeding N 41° 22' 00" W a distance of 55.18 (Fifty-Five and Eighteen One Hundredths) feet to a point;

Thence proceeding N 31° 42' 20" W a distance of 77.49 (Seventy-Seven and Forty-Nine One Hundredths) feet to a point;

Thence proceeding N 41° 48' 16" W a distance of 53.72 (Fifty-Three and Seventy-Two One Hundredths) feet to a point;

Thence proceeding N 34° 55' 47" W a distance of 109.02 (One Hundred Nine and Two One Hundredths) feet to a point;

The preceding twenty-three (23) courses are along land now or formerly of Shugrue as shown on said map or plan.

Thence proceeding N 76° 53' 33" E, along land now or formerly of Fleming as shown on said map or plan, a distance of 825.95 (Eight Hundred Twenty-Five and Ninety-Five One Hundredths) feet to a point;

The proceeding one (1) course are along land now or formerly of Fleming as shown on said map or plan.

Thence proceeding S 14° 57' 44" E a distance of 122.67 (One Hundred Twenty-Two and Sixty-Seven One Hundredths) feet to a point;

Thence proceeding N 69° 20' 41" E a distance of 68.27 (Sixty-Eight and Twenty-Seven One Hundredths) feet to a point;

The preceding two (2) courses are along land now or formerly of Tarnowski as shown on said map or plan.

Thence proceeding S 07° 02' 50" E a distance of 251.44 (Two Hundred Fifty-One and Forty-Four One Hundredths) feet to a point;

Thence proceeding N 69° 20' 41" E a distance of 325.67 (Three Hundred Twenty-Five and Sixty-Seven One Hundredths) feet to an iron pin set, which is the place and point of beginning.

The preceding two (2) courses are along land now or formerly of Kilrain as shown on said map or plan.

Excepting therefrom all that certain piece or parcel of land conveyed this date by Fiduciary Deed from the Susan C. Freedman, Executrix of the Estate of Rubin Cohen to the Town of Colchester. Said excepted parcel is also described in a Quit-Claim Deed from Hayward Realty Co. Inc., to Rubin Cohen, dated June 22, 1988 and recorded in Volume 210 at Page 30 of the Colchester Land Records.

**Second Parcel:**

All that certain piece or parcel of land situated on the east side of McDonald Road, in the Town of Colchester, County of New London and State of Connecticut, containing 35.923 acres 1564847 square feet, and shown on a map or plan entitled:

"Estate of RUBIN COHEN East Side McDonald Rd.,  
Colchester, CT Scale 1"=100' Date 6/1/99 Joseph Kirkup,  
Land Surveyor Revised 7/9/99, 7/27/99, 3/16/00, 4/1/00,  
5/6/00"

which map is to be filed in the land records of the Town of Colchester.

Said parcel is more particularly described as follows:

Commencing at an Iron Pin Set in the easterly street line of McDonald Road in the southwesterly corner of the herein described premises, as shown on said map or plan;

Thence proceeding N 24° 41' 44" W a distance of 57.48 (Fifty-Seven and Forty-Eight One-Hundredths) feet to a point;

Thence proceeding N 26° 31' 01" W a distance of 147.35 (One Hundred Forty-Seven and Thirty-Five One-Hundredths) feet to a point;

Thence proceeding N 25° 20' 07" W a distance of 274.50 (Two Hundred Seventy-Four and Fifty One-Hundredths) feet to a point;

Thence proceeding N 13° 55' 59" W a distance of 193.50 (One Hundred Ninety-Three and Fifty One-Hundredths) feet to a point;

Thence proceeding N 02° 03' 53" E a distance of 118.52 (One Hundred Eighteen and Fifty-Two One-Hundredths) feet to a point;

Thence proceeding N 07° 23' 33" E a distance of 187.23 (One Hundred and Eighty-Seven and Twenty-Three One-Hundredths) feet to a point;

Thence proceeding N 03° 09' 03" E a distance of 125.59 (One Hundred Twenty-Five and Fifty-Nine One-Hundredths) feet to a point;

Thence proceeding N 08° 34' 20" W a distance of 418.75 (Four Hundred Eighteen and Seventy-Five One-Hundredths) feet to a point marked by a Monument Found.

The preceding eight (8) courses are all along the easterly street line of McDonald Road as shown on said map or plan.

Thence proceeding N 65° 11' 26" E along land now or formerly of Demar as shown on said map or plan, a distance of 343.79 (Three Hundred Forty-Three and Seventy-Nine One-Hundredths) feet to a point;

Thence proceeding N 87° 51' 08" W along land now or formerly of Marvin as shown on said map or plan (which line is designated as "Boundary Line By Agreement with C. Marvin"), a distance of 1109.27 (One Thousand One Hundred Nine and Twenty-Seven One-Hundredths) feet to a point;

Thence proceeding S 22° 10' 15" E a distance of 283.65 (Two Hundred Eighty-Three and Sixty-Five One-Hundredths) feet to a point marked by a fence post;

Thence proceeding S 22° 07' 38" E a distance of 281.24 (Two Hundred Eighty-One and Twenty-Four One-Hundredths) feet to a point;

The preceding two (2) courses is along land of uncertain Title as shown on said map or plan.

Thence proceeding S 51° 17' 52" W along land now of formerly of Simon as shown on said map or plan, a distance of 141.38 (One Hundred Forty-One and Thirty-Eight One-Hundredths) feet to a point;

Thence proceeding N 35° 13' 23" W a distance of 90.46 (Ninety and Forty-Six One-Hundredths) feet to a point;

Thence proceeding S 51° 54' 22" W a distance of 160.16 (One Hundred Sixty and Sixteen One-Hundredths) feet to a point;

Thence proceeding S 52° 41' 49" W a distance of 137.66 (One Hundred Thirty-Seven and Sixty-Six One-Hundredths) feet to a point;

Thence proceeding S 55° 39' 05" W a distance of 189.97 (One Hundred Eighty-Nine and Ninety-Seven One-Hundredths) feet to a point;

Thence proceeding S 53° 33' 30" W a distance of 297.90 (Two Hundred Ninety-Seven and Ninety One-Hundredths) feet to a point;

Thence proceeding S 54° 41' 39" W a distance of 296.71 (Two Hundred Ninety-Six and Seventy-One One-Hundredths) feet to a point;

Thence proceeding S 53° 12' 42" W a distance of 87.48 (Eighty-Seven and Forty-Eight One-Hundredths) feet to a point;

Thence proceeding S 56° 04' 50" W a distance of 53.07 (Fifty-Three and Seven One-Hundredths) feet to a point;

The preceding eight (8) courses are along land now of formerly of Glemboski as shown on said map or plan.

Thence proceeding S 47° 45' 37" W a distance of 69.10 (Sixty-Nine and Ten One-Hundredths) feet to a point;

Thence proceeding S 14° 44' 48" W a distance of 26.24 (Twenty-Six and Twenty-Four One-Hundredths) feet to a point;

Thence proceeding S 21° 08' 10" E a distance of 161.85 (One Hundred Sixty-One and Eighty-Five One-Hundredths) feet to a point marked by a Monument Found;

Thence proceeding S 66° 59' 25" W a distance of 219.74 (Two Hundred Nineteen and Seventy-Four One-Hundredths) feet to a point marked by an Iron Pin Set to the point or place of beginning.

The preceding four (4) courses are along land now or formerly of Goodwin as shown on said map or plan.

Said Parcels are a portion of the First Tract and a portion of the Second Tract conveyed to the Grantor's herein by Correcting Executor's Deed from Susan C. Freedman, Executrix of the Estate of Rubin Cohen to Margaret E. Wiley and Susan C. Freedman, Trustees, dated August 2, 1999 and recorded August 3, 1999 in Volume 509 at Page 510 of the Colchester Land Records.

STATUTORY FORM WARRANTY DEED

KNOW YE, that CARVALHO BROTHERS REALTY, LLC, a limited liability company organized and existing under the laws of the State of Connecticut, with its principal office in the Town of Colchester, County of New London and State of Connecticut, hereinafter called the Grantor, for no consideration paid, grant to the TOWN OF COLCHESTER, a municipality located in the County of New London and State of Connecticut, hereinafter called the Grantee, with WARRANTY COVENANTS,

All that certain piece or parcel of land located on the easterly side of New London Road a/k/a Connecticut Route 85 in the Town of Colchester, County of New London and State of Connecticut, consisting of 10.978 acres and being shown as "Area to be deeded to Town" a certain map or plan entitled, "6 LOT SUBDIVISION PREPARED AND PROPERTY OF CARVALHO BROTHERS REALTY, L.L.C." Connecticut Route No. 85 a.k.a. New London Road Colchester, Connecticut, Scale; 1 inch = 100 feet August 30, 2001, Rev. 1 Oct. 2, 2001, Rev. 2 Nov. 7, 2001, Rev. 3 Nov. 14, 2001, Rev. 4 Nov. 19, 2001, Rev. 5 Dec. 12, 2001, Rev. 6 Dec. 13, 2001 Dutch and Associates Sheet 1 of 6 Job No. 01-115", which map is on file in the Colchester Town Clerk's Office to which reference may be had for a more particular description. Said premises are more particularly bounded and described as follows:

Beginning at a point which is 1294.08 feet from the easterly street line of New London Road, and which point marks the northwesterly corner of the property herein described and the northeasterly corner of Lot No. 6 as shown on said map; thence running S 83° 47' 58" E along land now or formerly of the Town of Colchester, a distance of Seven Hundred Sixty-three and 55/100 (763.55) feet; thence running S 07° 45' 24" E, a distance of One Hundred Twenty-three and 13/100 (123.13) feet; thence running S 17° 05' 25" E a distance of One Hundred Nine and 02/100 (109.02) feet; thence running S 23° 57' 54" E a distance of Fifty-three and 72/100 (53.72) feet; thence running S 13° 51' 58" E a distance of Seventy-seven and 49/100 (77.49) feet; thence running S 23° 31' 38" E a distance of Fifty-five and 18/100 (55.18) feet; thence running S 04° 06' 38" E a distance of Twenty-nine and 58/100 (29.58) feet; thence running S 16° 54' 49" E a distance of One Hundred Eighty-nine and 46/100 (189.46) feet; thence running S 31° 46' 19" W a distance of Two Hundred Seven and 78/100 (207.78) feet; thence running S 26° 50' 07" W a distance of Thirty-seven and 95/100 (37.95) feet; thence running S 10° 14' 06" W a distance of Thirty-six and 66/100 (36.66) feet; thence running S 20° 57' 04" E a distance of Ninety-four and 82/100 (94.82) feet; thence running S 43° 25' 06" E, a distance of Thirty-four and 49/100 (34.49) feet, to a point marking the most easterly corner of Lot #3, as shown on said map, the last twelve courses being along land now or formerly of the Town of Colchester; thence turning and running N 73° 05' 05" W along Lot No. 3 as shown on said map, a distance of One Hundred Ninety-one and 59/100 (191.59) feet, to a point marking the southeast corner of land now or formerly of Benjamin and Marion Labonsky; thence turning and running N 03° 30' 11" E along land now or formerly of Benjamin Labonsky, et al, a distance of Four Hundred Three and 00/100 (403.00) feet; thence turning and running N 79° 16' 07" W, along land now or formerly of said Labonsky, a distance of Six Hundred Seventy-nine and 00/100 (679.00) feet; thence turning and running N 03° 11, 36" W, along Lot No. 6 as shown on said map, a distance of Four Hundred Seventy and 78/100 (470.78) feet, to the point and place of beginning.

#248


Being a portion of the premises conveyed to the Grantor herein by Warranty Deed of Ann C. Shugrue dated September 27, 2001 and recorded in Volume 586, Page 8 of the Colchester Land Records.

Said premises are subject to taxes on the list of October 1, 2001 to the Town of Colchester and building, building line and zoning restrictions as of record may appear.

Signed this 16th day of January, 2002.

**Witnessed By:**

**CARVALHO BROTHERS REALTY, LLC**

M. P. Barry  
~~Barry S. Barry~~ M. PETER BARRY  
  
Michael P. Barry

By Jose V. Carvalho  
Jose V. Carvalho, Its Manager  
Duly Authorized


STATE OF CONNECTICUT )  
 ) ss. Wethersfield  
COUNTY OF HARTFORD )

January 16, 2002

Personally appeared Luiz V. Carvalho, who acknowledged himself to be a manager of CARVALHO BROTHERS REALTY, LLC, a limited liability company and that Jose V. Carvalho, as such manager being authorized to do so, executed the foregoing instrument and acknowledged the same to be the free act and deed of said limited liability company, before me.

**"No Conveyance Tax collected**

*Nancy A. Bray*  
\_\_\_\_\_  
Town Clerk of Colchester

  
Michael P. Barry  
Commissioner of the Superior Court

**Grantee's Mailing Address:**

RECEIVED  
COLCHESTER, CT  
02 JAN 18 AM 9:35  
*Nancy A. Bray*  
NANCY A. BRAY  
TOWN CLERK

## CORRECTING WARRANTY DEED

TO ALL PEOPLE TO WHOM THESE PRESENTS SHALL COME, GREETING:

KNOW YE, THAT, PETER J. CARLI, of the Town of Colchester, County of New London and State of Connecticut (hereinafter referred to as "Grantor"), for divers good causes and considerations thereunto moving, especially for ONE DOLLAR (\$1.00) and other good and valuable consideration, received to his full satisfaction of the TOWN OF COLCHESTER, a municipal corporation, having its territorial limits within the County of New London and State of Connecticut ("hereinafter referred to as Grantee"), does hereby give, grant, bargain, sell and convey unto the said TOWN OF COLCHESTER, and to its successors and assigns forever:

A certain parcel of land located in the Town of Colchester, County of New London and State of Connecticut, shown as "This Parcel of Land to be Deeded to the Town of Colchester, 86,222.70 sq. ft. 1.98 acres", more particularly bounded and described as shown on Schedule A, attached hereto and made a part hereof. Said premises are delineated on the following map filed or to be filed in the Colchester Land Records:

"Plan Prepared for Peter Carli 353 Parum Road Colchester, Connecticut OPEN SPACE TO TOWN CHESTNUT HOLLOW Chestnut Hill Road Colchester, Connecticut, R.P. Dimmock Associates Consulting Engineers 11 West High Street, East Hampton, Conn., Job No. 2001-11DET7 Page 15 Scale In Feet As Shown DATE: 1-15-03 Rev: 3-05-03 Rev: 3-21-03 Rev: 6-19-03."

Said premises are subject to any and all provisions of any ordinance, municipal regulation or public or private law.

TO HAVE AND TO HOLD the above granted and bargained premises, with the appurtenances thereof, unto it the said Grantee, its successors and assigns forever, and to it and their their own proper use and behoof. And also, the said Grantor does, for himself, his heirs, successors and assigns, covenant with the said Grantee, its successors and assigns, that at and until the ensembling of these presents, he is well seised of the premises, as a good indefeasible estate in FEE SIMPLE; and he has good right to bargain and sell the same in manner and form as is above written; and that the same is free from all encumbrances whatsoever, except as is above written.

AND FURTHERMORE, the said Grantor does by these presents bind himself, his heirs, successors and assigns forever to WARRANT AND DEFEND the above granted and bargained premises to it, the said Grantee and to its successors and assigns, against all claims and demands whatsoever, except as is above written.

#3065

THE PURPOSE OF THIS DEED is to supercede and correct two previous deeds purporting to convey said Open Space, the first dated December, 2003 and recorded on December 29, 2003 in the Land Records of the Town of Colchester in Volume 761, at Page 148, and the second dated March 5, 2004 and recorded on March 5, 2004 in the Land Records of the Town of Colchester in Volume 771, at Page 240, which deeds are hereby corrected and superceded.

IN WITNESS THEREOF, PETER J. CARLI has hereunto set his hand and seal this 20th day of July, 2004.

WITNESSES:

April M. Kuryk  
April M. Kuryk

Kathryn J. Seltzer  
KATHRYN J. SELTZER

Peter J. Carli  
Peter J. Carli

RECEIVED  
COLCHESTER, CT  
04 JUL 23 PM 1:42  
NANCY A. BRAY  
TOWN CLERK

STATE OF CONNECTICUT }

COUNTY OF HARTFORD }

ss: Glastonbury

July 20, 2004

Personally appeared PETER J. CARLI, signer of the foregoing Instrument, and acknowledged the same to be his free act and deed, before me.

No Conveyance Tax collected

Nancy A. Bray  
Town Clerk of Colchester

Kathryn J. Seltzer

KATHRYN J. SELTZER  
NOTARY PUBLIC  
MY COMMISSION EXPIRES APR. 30, 2007

SCHEDULE A

A certain piece or parcel of land in the Town of Colchester, County of New London and State of Connecticut, and shown on a certain map or plan entitled, "Plan Prepared for Peter Carli 353 Parum Road Colchester, Connecticut OPEN SPACE TO TOWN CHESTNUT HOLLOW Chestnut Hill Road Colchester, Connecticut, R.P. Dimmock Associates Consulting Engineers 11 West High Street, East Hampton, Conn., Job No. 2001-11 DET7 Page 15 Scale In Feet As Shown DATE: 1-15-03 Rev: 3-05-03 Rev: 3-21-03 Rev: 6-19-03.", which parcel is more particularly bounded and described as follows:

COMMENCING at a point, which point is 327.35 feet from the westerly street line of Parum Road, along the northerly boundary of other land of the Grantor with course from said point, N 29°24'01" E, which point marks the northeasterly corner of the premises herein conveyed and the northwesterly corner of other land now or formerly of Peter J. Carli, which point lies in the southerly boundary of land now or formerly of Kathleen K. Urban;

THENCE proceeding S 38°03' 48" E, a distance of 890.55 feet to a point in the northerly boundary of land now or formerly of Jenny Rabinowitz, et al;

THENCE proceeding S 55°34' 50" W, a distance of 99.68 feet to a point in the easterly boundary of land now or formerly of the Town of Colchester;

THENCE proceeding N 38°03' 48" W, a distance of 842.94 feet to a point in the southerly boundary of land now or formerly of Kathleen K. Urban, which point marks the northwest corner of the herein-described parcel;

THENCE proceeding N 29° 24' 01" E, a distance of 107.70 feet to the point and place of beginning.

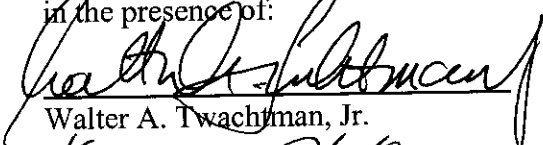
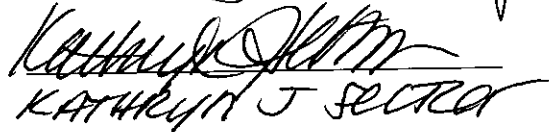
Containing 86,222.70 sq. ft., or 1.98 acres.

## WARRANTY DEED

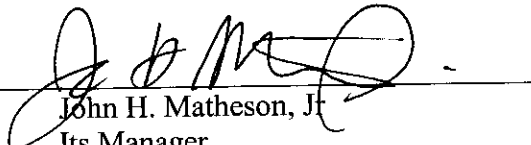
**DPJ LAND COMPANY, LLC**, a Connecticut limited liability company, having an office in the Town of North Canaan, County of Litchfield and State of Connecticut (hereinafter referred to as "Grantor") for no consideration paid, grants to the **TOWN OF COLCHESTER**, a Connecticut municipal corporation with an office located in the Town Colchester, County of New London and State of Connecticut (hereinafter referred to as "Grantee") with **WARRANTY COVENANTS**, the following described real property with any and all improvements, rights and appurtenances thereto; a certain piece or parcel of land known as 352 Parum Road, located in the Town of Colchester, County of New London and State of Connecticut, and being more particularly described in the Schedule A hereto attached and made a part hereof.

Signed this 28 day of March, 2005.

Signed Sealed and Delivered  
in the presence of:

  
Walter A. Twachtman, Jr.  
  
KATHRYN J SECORA

**DPJ LAND COMPANY, LLC**

By:   
John H. Matheson, Jr.  
Its Manager

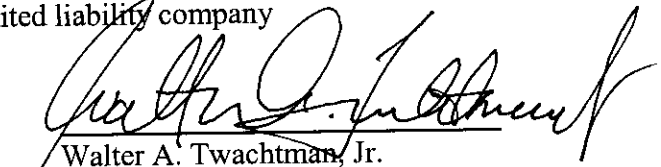
STATE OF CONNECTICUT )  
COUNTY OF HARTFORD )

ss. Glastonbury

March 28, 2005

Personally appeared before me, John H. Matheson, Jr., Manager of **DPJ LAND COMPANY, LLC**, as aforesaid, Signer and Sealer of the foregoing instrument, acknowledged the same to be his free act and deed and the free act and deed of said limited liability company

#1037

  
Walter A. Twachtman, Jr.  
Commissioner of the Superior Court

Grantee's Address:

39 Greene Ave  
North Canaan, CT 06018

"No Conveyance Tax collected"

  
Nancy A. Bray  
Town Clerk of Colchester"

RECEIVED  
TOWN OF COLCHESTER, CT  
NANCY A. BRAY  
TOWN CLERK

05 MAR 30 PM 2:29

## SCHEDULE A

A certain piece or parcel of land in the Town of Colchester, County of New London and State of Connecticut, and shown on a certain map or plan entitled, "Plan Prepared for Peter Carli 353 Parum Road Colchester, Connecticut OPEN SPACE TO TOWN CHESTNUT HOLLOW Chestnut Hill Road Colchester, Connecticut, R.P. Dimmock Associates Consulting Engineers 11 West High Street, East Hampton, Conn., Job No. 2001-11 DET7 Page 15 Scale In Feet As Shown DATE: 1-15-03 Rev: 3-05-03 Rev: 3-21-03 Rev: 6-19-03.", which parcel is more particularly bounded and described as follows:

COMMENCING at a point, in the westerly street line of Parum Road, which point is the northerly most point of the herein described premises, thence proceeding S 29°24' 01 W, a distance of 327.35' to a point;

THENCE proceeding S 38°03' 48" E, along land to be deeded to the Town of Colchester, as shown on said map, a distance of 890.55 feet to a point;

THENCE proceeding N 72° 50' 28" E, a distance of 98.74 feet to a point

THENCE proceeding N 85°22' 39" E, a distance of 34.72 feet to a point;

THENCE proceeding N 16°49' 42" E, a distance of 33.17 feet to a point;

THENCE proceeding N 43°48' 34" E, a distance of 396.35 feet to a point;

THENCE proceeding N 61°52' 52" W, a distance of 728.92 feet to a point;

THENCE proceeding N 26°02' 48" E, a distance of 202.51 feet to a point;

THENCE proceeding along the arc of a curve concave to the herein described premises with a radius of 1949.86' inscribing an interior angle of 07°58' 28", and a distance of 271.38 feet to the point which is the point and place of beginning.

Said parcel contains 378, 364.9 sq. ft., or 8.69 acres

*Return to:***Shipman & Goodwin LLP**

Counselors at Law

One Constitution Plaza

Hartford, Connecticut 06103-1919

*A. Storer, paralegal***TO ALL PEOPLE TO WHOM THESE PRESENTS SHALL COME GREETING:**

**KNOW YE**, That I, **MAUREEN F. HOWLEY** of the Town of Farmington, County of Hartford and State of Connecticut, Executrix of the Will of **Mary Claire Fleming a/k/a Claire Fleming a/k/a M. Claire Fleming** late of Bristol, deceased, by virtue of an order of the Court of Probate, District of Bristol, dated November 4, 2009 and in consideration of the sum of **ONE HUNDRED EIGHTY-TWO, TWO HUNDRED FIFTY and NO ONE-HUNDREDTHS DOLLARS (\$182,250.00)**, received to my full satisfaction of **TOWN OF COLCHESTER**, a municipal corporation duly existing under the laws of the State of Connecticut and having its principal office in the Town of Colchester, County of New London and State of Connecticut, do grant, bargain, sell and confirm unto the said **TOWN OF COLCHESTER**, all the right, title, interest, claim and demand which the said **Mary Claire Fleming a/k/a Claire Fleming a/k/a M. Claire Fleming** had at the time of her decease, or which I as such Executrix have or ought to have in and to two certain pieces or parcels of land with all improvements thereon, situated on the westerly side of McDonald Road in the Town of Colchester, County of New London and State of Connecticut and as more fully described in **Schedule A** attached hereto and made a part hereof.

**TO HAVE AND TO HOLD** the above granted and bargained premises with the appurtenances thereof, unto it the said grantee, its successors and assigns, to it and their own proper use and benefit forever. And I, the said Executrix, do hereby covenant with it the said Grantee, its successors and assigns, that I have full power and authority, as Executrix aforesaid, to grant and convey the above-described premises in manner and form aforesaid and for myself and my heirs, executors and administrators, do further covenant to warrant and defend the same to it the said Grantee, its successors and assigns, against the claims of any person or persons whomsoever, claiming by, from or under me as Executrix aforesaid..

**IN WITNESS WHEREOF**, I as such Executrix, have hereunto set my hand and seal this 6th day of November, 2009.

Signed, Sealed and Delivered in  
the Presence of

*Bernard F. Grabowski*  
Bernard F. Grabowski

**ESTATE OF MARY CLAIRE FLEMING  
A/K/A CLAIRE FLEMING A/K/A M.  
CLAIRE FLEMING**

BY: *Maureen F. Howley*  
Maureen F. Howley, Executrix

*Edmund S. Howley*  
Edmund S. Howley

"No Conveyance Tax collected

*Nancy L. Bray*  
Town Clerk of Colchester"

HANRAHAN,

GRABOWSKI &amp; HAYES, P.C.

ATTORNEYS AT LAW

683 FARMINGTON AVENUE

P. O. BOX 177

BRISTOL, CONNECTICUT

06010-0177

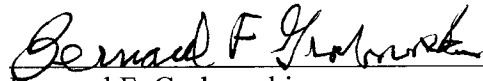
STATE OF CONNECTICUT )

)ss. Hartford

November 6, 2009

COUNTY OF HARTFORD )

Personally appeared, **Maureen F. Howley**, the signer and sealer of the foregoing instrument, who acknowledged that she executed the same in the capacity and for the purposes therein stated, and that the same is her free act and deed, before me.



Bernard F. Grabowski

Commissioner of the Superior Court

Grantee's Address:

Town Hall

127 Norwich Avenue

Colchester, CT 06415

HANRAHAN,

GRABOWSKI & HAYES, P.C.

ATTORNEYS AT LAW

683 FARMINGTON AVENUE

P. O. BOX 177

BRISTOL, CONNECTICUT

06010-0177

SCHEDULE A

**FIRST PIECE:**

A certain piece or parcel of land. situated on the westerly side of MacDonald Road, in the Town of Colchester, County of New London and State of Connecticut and bounded and described as follows:

NORTHERLY: on land now or formerly of Frank Fedus, et al, 1250 feet, more or less;  
EASTERLY: on the highway, MacDonald Road, 1040 feet, more or less;  
SOUTHERLY: on land now or formerly of Mary Claire Fleming, 1,225 feet, more or less;  
and  
WESTERLY: on land now or formerly of Martin and Ann Shugrue, 975 feet, more or less.

Being the same premises conveyed by Certificate of Devise from the Estate of Kathryn M. Fleming a/k/a Katherine M. Fleming to Mary Claire Fleming dated August 4, 1993 and recorded in the Colchester Land Records in Volume 335 at Page 260.

**SECOND PIECE:**

A certain piece or parcel of land with all improvements thereon, situated in the Town of Colchester, County of New Haven and State of Connecticut and bounded and described as follows:

Said parcel of land being a rectangular strip of land heretofore owned by Katherine O'Brien Fleming and described as follows:

NORTH: by land now or formerly of Mary Claire Fleming  
EAST: by the highway, known as McDonald Road, 200 feet;  
SOUTH: by land now or formerly of Henry Fatt; and  
WEST: by land now or formerly of Henry Fatt.

Being the same premises conveyed by Quit-Claim Deed from Kathryn M. Fleming to Kathryn M. Fleming and Mary Claire Fleming dated July 10, 1978 and recorded in the Colchester Land Records in Volume 121 at Page 89. See also Tax Certificate for Land Records from the Estate of Kathryn M. Fleming a/k/a Katherine M. Fleming dated August 4, 1993 and recorded in the Colchester Land Records in Volume 335 at Page 259.

Return to:  
Town Clerk  
Town of Colchester  
127 Norwich Road  
Colchester, CT 06415

## WARRANTY DEED

### TO ALL PEOPLE TO WHOM THESE PRESENTS SHALL COME. GREETING:

**KNOW YE, THAT, WE, ELAINE L. SADLON, ALISON L. DETTORE and JANICE L. DUBENETSKY**, all of the Town of Norwich, County of New London and State of Connecticut, **STANLEY J. MOROCH and STEPHEN E. MOROCH**, both of the Town of Colchester, County of New London and State of Connecticut, **PHYLLIS A. MOROCH**, of the Town of Lisbon, County of New London and State of Connecticut, and **ROBERT W. MOROCH**, of the Town of East Falmouth and Commonwealth of Massachusetts, herein designated as the Grantors, for the consideration of Sixty-Five Thousand (\$65,000.00) Dollars, received to the full satisfaction of the Grantors, from **THE TOWN OF COLCHESTER**, a municipal corporation, of the County of New London and State of Connecticut, herein designated as the Grantee, do hereby give, grant, bargain, sell and convey to the Grantee all that certain real property in Schedule A attached.

**TO HAVE AND TO HOLD** the premises hereby conveyed, with the appurtenances thereof, unto the Grantee, and to the Grantee's successors and assigns forever, and to the Grantee; and its own proper use and behoof; **AND** the Grantors do for themselves, their heirs, successors and assigns, covenant with the Grantee, its successors and assigns, that the Grantors are well seized of the premises, as a good indefeasible estate in FEE SIMPLE; and have good right to grant and convey the same in manner and form as herein written, and the same are free from all encumbrances whatsoever, except as herein stated.

**AND FURTHERMORE**, the Grantors, by these presents, bind themselves and their heirs, successors and assigns forever, to **WARRANT AND DEFEND** the premises hereby conveyed to the Grantee, and its successors and assigns, against all claims and demands whatsoever, except as herein stated.

In all references herein to any parties, persons, entities or corporations, the use of any particular gender or the plural or singular number, is intended to include the appropriate gender or number, as the text of the within instrument may require.

**IN WITNESS WHEREOF**, the Grantors have hereunto set their hands and seals hereto, on the day written.

Signed, Sealed and Delivered in the presence of and Attested by:

Alexis L White

Alexis L. White

witness

Robert W. Moroch

Robert W. Moroch

Trudith A Bruce

TRUDITH A Bruce

witness

Commonwealth of Massachusetts }

County of Barnstable }

SS.

East Falmouth

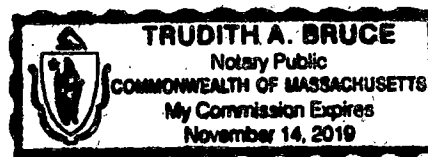
Town where signing

On this 18<sup>th</sup> day of June 2015, before me, the undersigned,  
personally appeared, Robert W. Moroch, known to me or satisfactorily proven to be the person  
whose name is subscribed to the within instrument, and acknowledged that he executed the same  
for the purposes therein contained.

Trudith A Bruce

Notary Public

My commission expires: 11/14/19



No Conveyance Tax collected

Gayle Furman

Town Clerk of Colchester

IN WITNESS WHEREOF, the Grantors have hereunto set their hands and seals, this 3 day of June 2015.

Signed, Sealed and Delivered in the presence of and Attested by:

Gina M. Moroch  
Gina M. Moroch witness

Jean M. Stawicki  
Jean M. Stawicki witness

Elaine L. Sadlon  
Elaine L. Sadlon

Stephen E. Moroch  
Stephen E. Moroch

Janice L. Dubenetsky  
Janice L. Dubenetsky

Stanley J. Moroch  
Stanley J. Moroch

Alison L. Dettore  
Alison L. Dettore

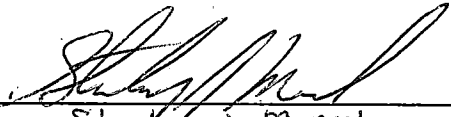
State of Connecticut }  
County of New London } ss. Colchester

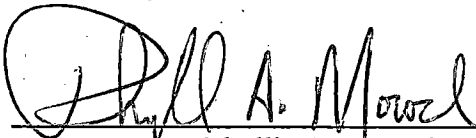
On this 3 day of June 2015, before me, the undersigned, Jean M. Stawicki, personally appeared, Elaine L. Sadlan, Stephen E. Moroch, Janice L. Debenetsky, Stanley J. Moroch and Alison L. Dettore, known to me or satisfactorily proven to be the persons whose names are subscribed to the within instrument, and acknowledged that they executed the same for the purposes therein contained.

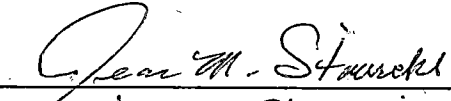
Jean M. Stawicki  
Jean M. Stawicki  
Commissioner of the Superior Court

IN WITNESS WHEREOF, the Grantor has hereunto set her hand and seal, this 5 day of June 2015.

Signed, Sealed and Delivered in the presence of and Attested by:

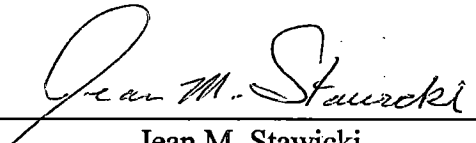
  
Stanley J. Moroch witness

  
Phyllis A. Moroch

  
Jean M. Stawicki witness

State of Connecticut        }  
                                      }  
County of New London       } ss.     Colchester

On this 5 day of June 2015, before me, the undersigned, Jean M. Stawicki, personally appeared, Phyllis A. Moroch, known to me or satisfactorily proven to be the person whose name is subscribed to the within instrument, and acknowledged that she executed the same for the purposes therein contained.

  
Jean M. Stawicki  
Commissioner of the Superior Court

## SCHEDULE A

All that certain piece or parcel of land with all of the improvements thereon situated on the northerly side of Dutton Road in the Town of Colchester, County of New London and State of Connecticut and shown as Parcel "B" on a map entitled, "PROPERTY / BOUNDARY SURVEY PREPARED FOR THE CHILDREN OF STANLEY F. MOROCH, #144 McDonald Road and Dutton Road, Colchester, Connecticut, Date: 10-25-2013, Scale: 1"=60'", Mark H. Sullivan, land surveyor, which map is on file in Volume 48 page 3162 in the Colchester Town Clerk's Office, to which reference may be had for a more particular description, and which parcel is more particularly bounded and described as follows:

Beginning at a point in the northerly line of the right of way of Dutton Road which is the southeasterly corner of the herein described parcel and the southwesterly corner of other property formerly of Stanley F. Moroch, which other property is shown as Parcel "A" and known as 144 McDonald Road, and which point is marked by rebar with a cap set, thence running

S70°44'06"W 523.97 feet along the northerly line of Dutton Road to rebar with cap set; thence

N19°15'54"W 441.48 feet along a wire fence along land now or formerly of Brian Magowan and Paolina Ruberto to an iron pipe recovered; thence

S53°08'30"W 157.36 feet along a wire fence along land of said Magowan and Ruberto to an iron pipe recovered; thence

S19°15'53"E 393.92 feet along a wire fence along land of said Magowan and Ruberto to a 14 inch ash tree; thence

S70°43'32"W 480.40 feet along the northerly line of Dutton Road to a rebar with cap set; thence

N19°15'55"W 290.35 feet along land now or formerly of Stanley and Gina Moroch to an iron pipe recovered; thence

N49°44'12"E 65.66 feet along the remains of a wire fence along land now or formerly of the Town of Colchester to a 4 inch hickory tree with wire; thence

N52°54'51"E 241.84 feet along the remains of a wire fence to an 18 inch hickory tree with wire; thence

N52°26'46"E 154.40 feet along the remains of a wire fence to a 26 inch oak tree with wire; thence

N54°00'17"E 103.63 feet along the remains of a wire fence to an 18 inch dead tree with wire; thence

N51°50'51"E 256.47 feet along the remains of a wire fence to a 10 inch stump with wire; thence

N61°40'46"E 73.39 feet along the remains of a wire fence to a 20 inch maple tree with wire; thence

S17°30'22"E 87.92 feet along a wire fence with concrete posts and wood posts along land of said Town of Colchester to a point; thence

S23°29'28"E 68.90 feet along a wire fence with concrete posts and wood posts to a concrete fence post; thence

N63°04'26"E 185.78 feet along a wire fence with concrete posts and wood posts to a point; thence

N62°57'02"E 99.27 feet along a wire fence with concrete posts and wood posts to a point; thence

N62°57'02"E 30.00 feet along a wire fence with concrete posts and wood posts to a point; thence

N58°20'33"E 30.17 feet along a wire fence with concrete posts and wood posts to a wood fence posts, this and the last 10 courses being along land of said Town of Colchester; thence

S32°16'31"E 180.40 feet along the remains of a wire fence along land now or formerly of Anne Klein to a rebar with a cap set; thence

S57°40'45"W 85.00 feet along said Parcel A to rebar with a cap set; thence

S19°15'54"W 257.86 feet along said Parcel A to the point and place of beginning.

Containing 444,703.1 square feet or 10.21 acres more or less.

Being part of the same premises conveyed by Stanley F. Moroch to Elaine L. Sadlon, Stanley J. Moroch, Phyllis A. Moroch, Stephen E. Moroch, Robert W. Moroch, Janice L. Dubenetsky and Alison L. Dettore by Quit Claim deed dated June 15, 1999 and recorded June 24, 1999 in Volume 505 page 52, by Quit Claim deed dated September 13, 2000 and recorded September 18, 2000 in Volume 541 page 362, by Quit Claim deed dated April 16, 2001 and recorded May 4, 2001 in Volume 564 page 333, by Quit Claim deed dated March 11, 2002 and recorded March 11, 2002 in Volume 616 page 19, by a Certificate of Devise, Decent and Distribution dated May 20, 2014 and recorded May 22, 2014 in Volume 1228 page 60, and by a Release of Life Estate recorded June 3, 2014 in Volume 1229 page 28, all of the Colchester Land Records.

## Appendix 4: Field Notes

### Jamie's Field Notes

#### Visit 1: 3/9

- Japanese knotweed is pulled and burned seasonally by volunteers
- Fields are mowed every other year, no other management
  - Natural grasses, nothing planted or cultivated
- No fertilizers or pesticides used
- Wetlands on yellow trail
  - Covered in phragmites and grasses
  - Lots of deer tracks
  - Beaver marks on trees but appear old
- Ponds
  - Fishing: species currently unknown, no stocking occurs
  - Beaver dam and two huts on main pond
- Structures on the property
  - Gazebo, sign posts, bulletin board, gravel parking lot, picnic tables, wood fences, power lines
  - Property surrounded by houses: residential area
- Geocache found by wetland viewpoint on yellow loop
- Trash is a problem
  - Lots of dog poop in bags or just left exposed
  - Litter
- Signs of predators
  - Owl pellet
  - Fur and bone mat: possibly squirrel
  - Scat with fur and bones: likely coyote
- Could we use a kayak to survey the ponds?
- Poison ivy is present but not overgrown

#### Visit 2: 3/25

- Should we thin the forest along the red trail to promote tree growth?
  - Lots of young trees, few larger trees
  - Beavers are taking all the larger trees
- Add / improve blazes on red trail
- Add planks / bridges to red trail
  - Lots of muck and flooding
  - Vernal pools?
- Lots of trash still

- Bottles along large pond near beaver hut
- Dog poop in trail

## **Appendix 5: Copies of Referenced Articles**

### **Potential Grants for Funding:**

#### **NRPA Grants**

- **Park Access and Environmental Resilience and Health**
  - \$300,000-500,000 for 2.5 years
  - <https://nrpa-grants.secure-platform.com/a/page/learn-more/Resilient-Park-Access-Grant-and-Coaching>
- **Waste Management Charitable Giving**
  - <https://www.wm.com/us/en/inside-wm/social-impact/community-impact>

## Description of Ruby and Elizabeth Cohen Woodlands Property:

### 1.

So many innovative and wonderful projects have been initiated by Boy Scouts working to earn the Merit Badge, and the beautiful StoryWalk® in Colchester is no exception. This charming new feature at the Ruby and Elizabeth Cohen Woodlands gives children and families the chance to be outdoors together while building literacy, thanks to Scout Jack Boyden of Troop 72.

When Boyden heard about the possibility of a StoryWalk® project in his hometown, he knew it was what he wanted to do to move toward the goal of earning his Eagle Scout rank. The original idea was conceived by Boyden's five beneficiaries: Cragin Memorial Library, Colchester Garden Club, Collaborative for Colchester's Children, Colchester Land Trust, and Community Wildlife Habitat of Colchester.

Boyden says, "About a month after accepting this project, I met with my beneficiaries, did a PowerPoint presentation of my thoughts and ideas, and from then on, the StoryWalk® became a part of my life."

The walk is a trail or path with stations along the way. Each station features a two-page spread of a children's book. In the case of the Colchester walk, each page also has an action caption to help engage children in the story they are following. These captions can ask questions, like "Do you see a hole in the ground?" or instruct the child to do something, such as "Can you hop like a bunny?"

The StoryWalk® Project was created by Anne Ferguson of Montpelier, Vermont, and developed in collaboration with the Kellogg-Hubbard Library in Montpelier. The project is a registered service mark owned by Ferguson.

Kate Byroade is director of the Cragin Memorial Library in Colchester and was instrumental in getting the ball rolling for permissions and support from the other four organizations—all of whom were thrilled with the idea. The first iteration of the StoryWalk® was simple and involved a lot of trial and error. Byroade laughs. "And then an Eagle Scout candidate came along, asking to do a project!" she says. "After Jack got involved, things began happening, and we were able to break ground on the stations in late September of last year."

For Boyden, the project had a lot of personal appeal. "Literacy is very important to me because reading is so much a part of our daily lives," says Boyden. "I see this as an important issue for young children as well as adults. I hope that, as people walk the StoryWalk®, station by station, they will not only be motivated by a desire to read, but also to enjoy the beauty of Mother Nature."

Boyden attributes much of his success to help from his troop, his mentor Thomas Robbins, and the five organizations that got behind him in the project. Boyden and his team visited other installations and gathered ideas and input. Kate Byroade mentions that often, unless projects are well thought-out, they are not maintained, and fall into disrepair. Permanent sturdy stations cost around \$400 each.

"Jack was determined that this would be a really nice StoryWalk®, so he and his supporters went into fundraising mode," says Byroade. "They did appeal letters, a car wash, and got people and organizations to sponsor stations."

More than 90 businesses and individuals supported the project.

Boyden is a soft-spoken young man with a ready smile, and he's obviously proud of what he and his team have accomplished. "This project has impacted my life greatly," he says. "I dedicated the last 18 months to this Eagle Scout project in hopes of contributing something special to my community. People stop us on the street to tell us how much they enjoyed the StoryWalk®—there is no better reward than that."

In addition to providing a delightful venue to the people of Colchester, Boyden says he gained a lot.

"By working on this project, I have learned how to fundraise, how to write correspondence asking for donations, create invitations, write thank-you letters, and have become more confident when speaking in front of an audience."

To top it all off, Boyden was honored by the Collaborative for Colchester's Children as their Volunteer of the Year—pretty good stuff for a high school junior. And very good for the community of Colchester, Connecticut.

*Visit the StoryWalk® at Ruby and Elizabeth Cohen Woodlands, 96 McDonald Road, Colchester, CT, 06425*

2.

Those who visit a 121-acre swath of open space in Colchester will get a good sense of who the late Ruby and Elizabeth Cohen were and what they meant to this town.

The Ruby and Elizabeth Cohen Woodlands on McDonald Road was purchased by the town in 2000. The parcel was owned by the late, longtime legislator Rubin H. "Ruby" Cohen. The parcel not only includes fields and woodlands, but also a large wetland known as Dutton Swamp, which is beautiful this time of year with the changing maple trees.

A number of trails snake through the parcel to the west of McDonald Road near the old Cohen family homestead. Cohen served 30 consecutive years in the state House of Representatives and was a resident of Colchester most of his life. Cohen was also well-known as one of the first owners of Harry's Place, a popular drive-up food stand in town.

Elizabeth was an avid walker and shared her husband's love of the land. She served as postmistress of the Colchester Post Office for 20 years and could often be seen walking the property. The family sponsored fishing derbies, weddings and large picnics on the grounds that was once known as the "Ruby Cohen Wildlife Sanctuary."

A small parking area sits in front of a pond where ducks and Canada geese float on the water or squat along the shore. A nice stand of white pine border the pond and a gazebo and scattered picnic tables invite visitors to bird watch or have lunch after the hike.

The main trail, marked with interpretive signs scattered throughout the preserve, travels into an area where a farm once existed. Be on the lookout for an old stone foundation where a barn once sat. The trail passes by old stone walls and apple trees peek through a young forest.

There are plenty of grasslands to explore and wildflowers to identify. The area drains to the Deep River and Salmon River watersheds, so there are large areas of wetland and marshes that draw a plethora of wildlife to the preserve.

*The preserve is located on McDonald Road near the intersection with Dutton Road. Visitors should take Route 2, to Exit 18. Follow Route 16 west to Route 85. Take a right on Route 85 and follow to the junction of Route 354. Look for McDonald Road shortly on the right.*

**3.**

**Town:** Colchester

**Sponsor:** Town of Colchester

**Name:** Ruby Cohen Memorial Open Space Preserve, 111 acres

**Grant Award:** \$200,710.80

This project will acquire 111 acres to continue to maintain present use as a privately owned "Wildlife Sanctuary." Property consists of two small ponds, woodland, wetlands and meadow. The town intends to develop hiking, interpretive trails and a potential recreation/nature center complex.

The current total acreage of Ruby Cohen is 205.82 Acres.

The original purchase included 123.53 acres in 2000.

Approx. 82.3 acres, consisting of multiple parcels, were added to the park over 21 years.

**Trail Maintenance Management:**

**1.**

The three most widely available and suitable exterior lumber choices, not treated with chemical preservatives, include Western red cedar, redwood, and cypress. Your geographic location will determine the availability and cost of these materials. Redwood, for example, is widely available and used in the western United States. Western red cedar is commonly sold in the Midwest, and eastern U.S. cypress, which grows throughout the South and Southeast, often gets the nod in those locales due to its availability and economical price.

## Bird Encouragement Management:

1.

Conservation status	Early in the 20th century, large numbers were sometimes shot during migration, but with legal protection their numbers now seem healthy.
Family	<b>Hawks and Eagles</b>
Habitat	Woods, groves. Typically breeds in deciduous forest or mixed coniferous-deciduous forest, often near water and near clearings or edges. Migrants may be seen over any kind of open country, but tend to stop for the night in forest or extensive groves of trees.
Feeding Behavior	Diet
Hunts by watching for prey from a perch, usually located along edge of woods or near water. When prey is spotted, the hawk swoops down rapidly to capture the creature in its talons. Occasionally hunts by flying through the woods or along watercourses, actively searching for prey.	Includes small mammals, amphibians, reptiles, birds. Varied diet includes mice, voles, squirrels, other small mammals; toads, frogs, snakes, lizards, young turtles; various small birds; large insects. Sometimes eats crayfish, fish, centipedes, earthworms.
Eggs	Nesting
Usually 2-3, sometimes 1-4. Whitish, usually spotted with brown. Incubation is almost entirely by female, 28-31 days. Male brings food to female during incubation, then he may sit on eggs while she eats. Young: Female remains with young almost constantly for first 1-2 weeks after they hatch; male brings food, and female feeds it to nestlings. Young may climb out of nest onto nearby branches at about 4-5 weeks; can fly at about 5-6 weeks, and soon start learning to hunt.	Early in breeding season, pairs circle high in the air, calling. In display, one bird may fly high, then dive steeply toward the ground. Nest site is usually in the lower part of a large tree (either deciduous or coniferous), typically 25-40' above ground. Nest (built by both sexes) is a rather small platform of sticks, lined with softer materials such as bark and moss. Leafy green twigs often added during nesting cycle. Often uses pre-existing nest of hawk, crow, or squirrel, adding material to it.

Conservation status	Could be vulnerable to loss of forest habitat, but current populations apparently stable.
Family	<b>Tyrant Flycatchers</b>
Habitat	Woodlands, groves. Breeds mainly in deciduous forest or mixed forest, but avoids pure stands of conifers. May be found in either continuous deep forest or in more open wooded areas, around edges of clearings or abandoned orchards. Winters in the tropics mostly around edges of forest or second growth.
Feeding Behavior	Diet
Forages by flying out from a perch to catch insects. May hover momentarily while taking insects from foliage or twigs, or may catch them in mid-air. Sometimes drops down to take food from on or near the ground, but usually feeds rather high.	Mostly insects. Feeds on a wide variety of insects, including caterpillars, moths, butterflies, katydids, tree crickets, beetles, true bugs, and others. Also eats spiders and sometimes small lizards, and regularly eats fruits and berries. Small fruits may be a major part of diet in winter in the tropics.

## 2. [Eastern Bluebird - NestWatch](#)

### **Bat and Mosquito Management:**

#### **1. Instructions for Building a Bat House from the CT DEEP**

One of the best ways to help bats is to provide an artificial roost site by installing a specially-made bat house on your property. Pre-made bat houses can be purchased or you can build your own. The following factors are critical to the success of bat houses: maintaining suitable temperature ranges, the distance to food and water, the size and shape of inner roosting spaces, and roughness of clinging surfaces.

Bat house designs range from simple and small-scale to large and complex. Two of the simpler designs are shown here. The small bat house provides only one size roosting space and accommodates fewer bats.

The large bat house provides many roosting options and is ideal for larger nursery colonies of females and young. Following are tips for constructing and installing a bat house:

1. Use the roughest sides of the wood on the inner areas of the house. It also is a good idea to horizontally groove inner surfaces for footholds or attach non-metal screening to provide toe holds. This is also important for landing areas below the entrance.
2. Caulk all outside seams to limit air flow. This helps trap the bats' body heat inside the house. Sealants approved for aquarium or kitchen use are best.
3. Place tar paper or dark shingles on the top of the box and 4 to 6 inches down the sides to increase inside temperatures. Nursery roosts often require temperatures of 90 degrees F or more. A dark stain also helps increase the temperature.
4. Hang houses 10 to 15 feet above ground. South and southeast exposures are best for providing maximum thermal gain. Bats prefer houses that get at least 6 hours of sunlight a day.
5. If possible, protect the house from prevailing winds and provide an unobstructed approach.

Bat houses attached to the sides of buildings have had the greatest reported success. Free-standing poles in open areas also work, but tree-mounted houses generally remain unused. Bat houses placed near water or wetland areas often are most successful. Installing a bat house before April improves the chance of occupancy. Do not be discouraged if bats do not immediately move into their new home. It is not unusual for a house to stand empty for at least a year before it is used.

To assist in conservation efforts, please report any bat house successes or failures to the DEEP Wildlife Division at [deep.batprogram@ct.gov](mailto:deep.batprogram@ct.gov) or **860-424-3011**.

## **Small Bat House**

Use rough-cut lumber or exterior grade plywood (1/2-inch thick minimum). The furring strips (E) should have a finished thickness of approximately 3/4 inch.

Staple 1/8-inch mesh (HDPE plastic) netting to back and front 2 sections. Make sure mesh extends to bottom of back.

Caulk all pieces and assemble with drywall screws to prevent wood from splitting. Apply additional caulk to outside joints as needed.

Apply dark stain to exterior surfaces and use tar paper or shingles on the roof and the top half of the bat house to increase interior temperatures.

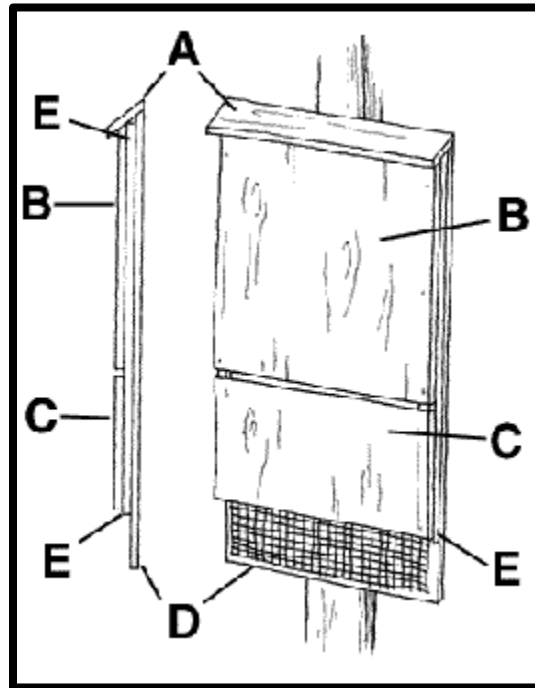
**A** -- Roof, 4 inches by 14 inches

**B** -- Upper front, 12 inches by 20 inches

**C** -- Lower front, 12 inches by 10 inches

**D** -- Back, 12 inches by 36 inches

**E** -- Spacers, (1) 2 inches by 12 inches, (2) 2 inches by 30  $\frac{1}{2}$  inches



## Large Bat House

Use 1/2-inch exterior grade plywood for front and back sections; 1/4 inch for all partitions. Sides are 1 inch by 6 inch stock.

Staple 1/8-inch mesh (HDPE plastic) netting to all partitions and the back panel. Apply caulk to all joints.

Begin assembly by screwing the back to the sides. Attach 31-inch spacers to inside corners.

Place a partition on top of the spacers to within about 1/2 inch of the roof. Put the next set of spacers (26 inches) on top of the partition and screw into the first spacers.

Repeat for remaining partitions ending with 28  $\frac{3}{4}$  inch spacers (flush to roof line). Screw front to sides. Make sure roof angles are aligned.

Screw roof in place and caulk all exterior joints.

Scratch or roughen the front near the vents to provide a toe hold for bats landing on the box.

A dark stain should be applied to all exterior surfaces and tar paper or shingles to the roof and upper half of the house to increase interior temperatures.

**A** -- Roof, 6 inches by 28 inches

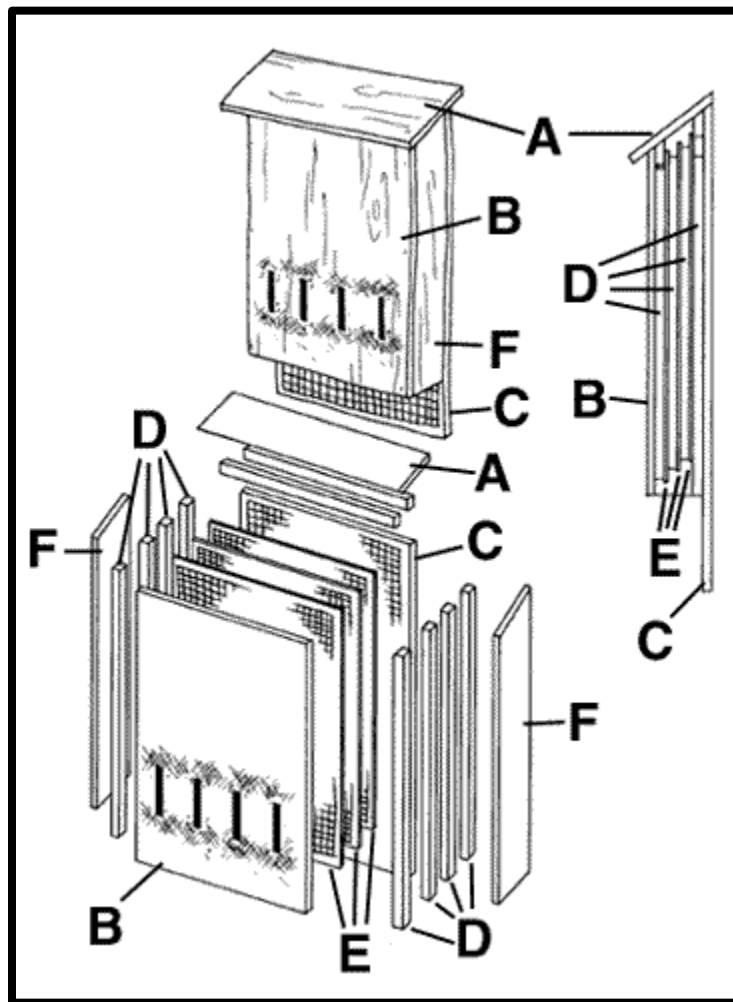
**B** -- Front, 24 inches by  $28\frac{3}{4}$  inches (cut slots for vents, 5 inches above bottom edge)

**C** -- Back, 24 inches by 36 inches

**D** -- Spacers, 1 inch by 2 inches, (4) 26 inches long, (2) 31 inches long, (2)  $28\frac{3}{4}$  inches long

**E** -- Partitions,  $\frac{1}{4}$  inch thick,  $\frac{3}{4}$  inches apart, 26 inches long

**F** -- Sides, 4 inches by  $28\frac{3}{4}$  inches by 31 inches (angle-cut top edges)





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[Home](#) > [Town Services](#) > [Recreation Department](#) > [Parks & Facilities](#) > Ruby and Elizabeth Cohen Woodlands

## Ruby and Elizabeth Cohen Woodlands



Location: 96 McDonald Road

### Facilities

Natural Open Space (206.21 acres), 2 Ponds, Marshland, Marsh Viewing Area, Small Streams, Hiking Trails, Gazebo, Picnic Tables, Butterfly-Pollinator Garden, Colchester StoryWalk

- [Park/Trail Map](#)
- [Cohen Woodlands Butterfly Pollinator Garden Brochure](#)
- **[\\*\\*Ruby Cohen Wildlife Management Plan \(NEW\)\\*\\*](#)**



Rubin H. Cohen 1911-1999

Ruby was a life long resident of the Town of Colchester whose accomplishments started when he purchased Colchester's Landmark restaurant, "Harry's Place" in 1925. Ruby managed Harry's until his retirement in 1973.

Ruby was elected to the Connecticut House of Representatives in 1943. Ruby was instrumental in the establishment of Gay City State Park in Hebron, restoration of the Comstock Bridge in East Hampton, and the preservation of the Gelston House in East Haddam.

However, he was best known by the townspeople as a political advisor and mentor, often holding court in his barn, opening his wildlife preserve for fishing derbies, Boy Scout campouts, picnics, weddings, or simply serving a great burger on the grill to anyone who was hungry or who would listen.

He will be remembered for his political savvy, his love of the outdoors and the environment, and his many contributions to the Town of Colchester and State of Connecticut.

### **About Cohen Woodlands**

Also called the Ruby Cohen Property or Cohen Woodlands. The majority of the Ruby and Elizabeth Cohen Woodlands is heavily covered by trees. There are many acres of grassy open space and two ponds separated by McDonald Road. The property is now 206.21 acres as a result of several land acquisitions. Many students from Bacon Academy use this property as a location in support of various curriculums. Each year the Colchester Elementary School uses this park as a field trip destination for hands-on nature science activities for their young students. Over the years, local Boy Scout Eagle projects have created 3 hiking trails on different areas of the property including a park/trail map, a 6-panel educational board near the gazebo. Cohen Woodlands is certified as a wildlife habitat through the National Wildlife Federation. Colchester earned the NWF Community Wildlife Habitat certification in 2010 being the first such community in Colchester and the 36th in the United States. The Butterfly Pollinator Garden is certified as a Monarch Waystation through MonarchWatch.

### **Cohen Woodlands Butterfly-Pollinator Garden**

To help confront the plight of pollinators and decline of Monarch butterflies, an Advanced Master Gardener/Colchester Garden Club member began a community outreach project to create an educational butterfly-pollinator garden near the park's sign. In 2014, the original garden was reclaimed and planted. The Butterfly-Pollinator garden was doubled in size in late 2015. Native plants including different kinds of Milkweed (*Aesclepias*), perennials, annuals and shrubs were added in 2016 attracting a wide variety of butterflies, other pollinators and hummingbirds. The project was funded by Connecticut Master Gardener Association grants (2014-2016) along with material donations from members of the Colchester Garden Club. Significant volunteer hours were donated by certified Master Gardeners, Master Garden interns, garden club members and community volunteers. Ongoing garden maintenance is a community service project of the Colchester Garden Club.

### **Colchester StoryWalk <sup>TM</sup>**

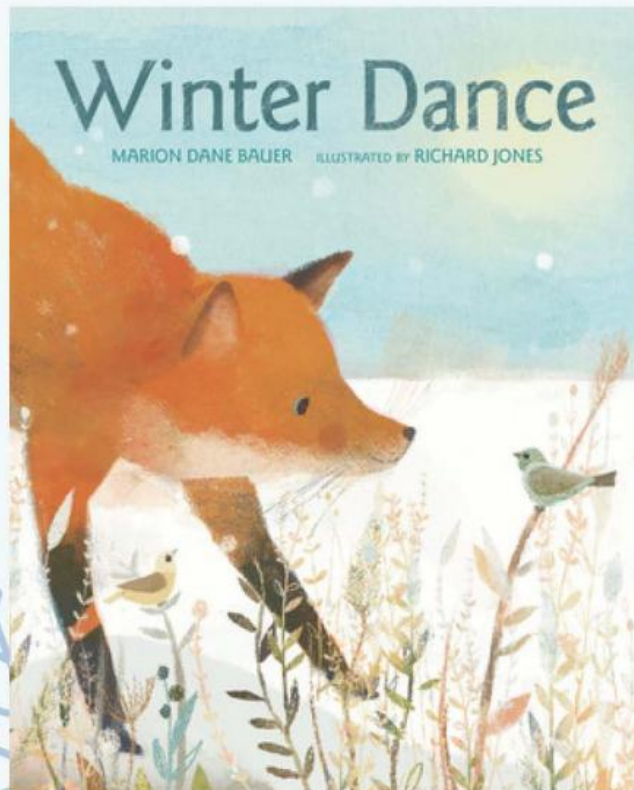
At the Cohen Woodlands location, this provides an opportunity for visitors to walk and read to youngsters a book focused on nature, gardening or wildlife. This literacy, fitness and nature initiative is a partnership between the Cragin Memorial Library, Colchester Children's Collaborative (C3), Colchester Garden Club, Colchester Land Trust and the Community Wildlife Habitat of Colchester. Books will be changed on a periodic basis. It is recommended children wear sneakers or closed-toed shoes. The StoryWalk begins at the right side of the field from the parking lot and continues across the back of the field from right to left.

Current StoryWalk Book Information [LINK](#)

A NEW BOOK HAS ARRIVED!

# Come visit the StoryWalk!

Ruby & Elizabeth Cohen Woodlands McDonald Road  
(off Rte 354)



A StoryWalk® is a fun way to combine physical activity with reading! Pages of an engaging book are transformed into signs on a trail inviting children and their caregivers to read as they move along the path. Explore books in a new way as you discover the next sign, imagine and act out each page, and find yourself within the story!

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[\(/DEEP\)](#)

# Connecticut Department of Energy and Environmental Protection

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Search Department of Energy and Environmental Protection



## Problems with Canada Geese

[Management of Agricultural Damage \(/DEEP/Wildlife/Nuisance-Wildlife/Canada-Goose-Agricultural-Damage-Control\)](#)

[\(/deep/cwp/view.asp?a=2723&q=443484&deepNav\\_GID=1655\)Canada Goose Fact Sheet \(/DEEP/Wildlife/Fact-Sheets/Canada-Goose\)](#)

[Nuisance Problems](#)



Resident Canada geese in Connecticut create a myriad of nuisance problems in many of our public parks and recreational fields. Long-term solutions to these problems are complex and often difficult to fully implement. Most important in formulating a management strategy for alleviating nuisance goose problems is to begin with the understanding that ultimate success will take some time, and unless human tolerance of geese is to change, reduction of the goose population is going to be a necessary part of any lasting solution.

Long-term abatement of nuisance geese requires implementation of a number of different strategies. There is not a “silver bullet” or panacea that can be employed. Each situation is different and requires different strategies. When planning a management strategy, several important considerations need to be evaluated:

- Problem location(s).
- Time(s) of year when the problem(s) occur.
- Available control options given the characteristics of the area(s) involved.
- Effectiveness of the techniques.
- Acceptability of the techniques.
- Cost.
- Community support for taking action.

**Methods for the alleviation of goose problems can be broken down into non-lethal and lethal categories.**

### **Non-lethal Techniques**

Non-lethal methods for goose alleviation can be aimed at modifying goose behavior, human behavior, or the habitat that is attractive to geese.

#### **Do Not Feed Waterfowl**

One of the easiest, and most effective non-lethal methods is a simple one – **prohibit the feeding of geese**. Feeding of geese can be traced as the root of many problems and the cause of persistent problems in urban areas. Feeding not only attracts birds to an area, but keeps them there. Feeding also conditions the birds to lose their fear of humans. Simply discontinuing feeding can go a long way in ending goose habituation to an area.

The DEEP Wildlife Division has developed a “**Do Not Feed Waterfowl**” pamphlet that outlines the detrimental effects of feeding resident Canada geese and other waterfowl. A limited number of "Do Not Feed Waterfowl" informational signs are also available. For more information or to request a sign, call the Wildlife Division (**860-418-5960 (tel:8604185960)**).

## Hazing

Other non-lethal methods geared at modifying goose behavior include various hazing techniques and chemical repellents. Hazing is a means of scaring geese from an area, with the intent of moving them to a location where they do not pose a nuisance. Unfortunately, in such an urbanized state as Connecticut, moving birds from one area to another typically results in merely moving the problem to somewhere else.

Hazing techniques that are typically employed include: noise-making devices, visual deterrents/barriers, motorized vehicles, and trained dogs. All hazing techniques can be successful, but geese are very adaptable and, unless some type of lethal reinforcement is used in conjunction with hazing, geese typically become unfazed by hazing. Most hazing programs are more effective when several different types of techniques are used rather than merely relying upon one method.

Noise-making devices, such as cracker shells, screamers, propane cannons, sirens, and air horns, are used to scare birds from an area. These devices are inexpensive and can be effective; however, they are not well suited for many urban situations and, in the absence of some sort of lethal reinforcement, geese quickly adapt to the noise and the desired effect is not attained. In some instances, taped distress calls have had success, but the effects are typically short-lived.

## Visual Deterrents and Barriers

Visual deterrents and barriers are relatively inexpensive and can be effective. Visual deterrents, which include Mylar tape, balloons, flags, and scarecrows, are used to prevent geese from flying into an area. Geese are particular about where they land and how they take off. Visual deterrents can be very effective in keeping geese from flying into and using a given piece of land. Mylar tape, balloons, and flagging are typically strung throughout an open area to deter use. In many urban situations, such as playing fields, golf courses, and parks, these visual deterrents may not be appropriate due to human use of the area. Flagging and balloons, however, can be used on a playing field and removed prior to use. Drawbacks in the use of visual deterrents are that they can degrade the aesthetics of an area, typically require regular maintenance, and may be targets for vandals. Geese typically become habituated to these devices, especially if they are used alone.

Placing grid wires above ponds will keep birds from using a small waterbody. Grid wires need to be flagged so that birds can see and avoid them. This technique is not well suited to large areas and will detract from the area's aesthetics.

## Other Techniques



Lasers have been shown to be effective at keeping geese off of roosting ponds. Shining lasers at roosting geese often causes the flock to leave the pond and find another roosting site. This method does not help with nuisance issues associated with feces, feathers, and turf damage, but it may assist in water quality concerns at public drinking supply or swimming areas.

Motorized model airplanes and boats have been used with success in certain situations. This technique requires constant monitoring because geese will come back once the plane or boat is gone. Golf carts, powerboats, and other motorized vehicles are sometimes used to haze geese from an area. These techniques are often used out of frustration and have limited long-term utility.

Trained border collies have been shown to be effective in hazing geese out of certain areas. Several private companies in Connecticut offer dog services for goose problems. The main drawbacks of using dogs are cost and the fact that geese are simply displaced, which may cause problems elsewhere. Additionally, geese tend to come back to the area from which they were chased once the dog is gone.

### **Chemical Repellents**

Chemical repellents are topical treatments to grasses that make the turf unpalatable to grazing geese. While they can be effective, chemical repellents are expensive and must be re-applied after it rains. They are practical for small lawns, such as those bordering a lake or pond, but not well suited for large expanses of turf.

### **Habitat Modification**

Apart from lethal removal, habitat modification is the most effective means of reducing nuisance goose problems. Unfortunately, in many areas of the state plagued by nuisance geese, habitat modification to the degree to which it would be successful, is not an option. Habitat modification can take many forms, from installing fencing along the water/lawn interface, to completely changing the vegetative composition of an area.

Installing fencing as a barrier to goose movements from a waterbody to a feeding area is effective during the flightless molt period. When the geese have the ability to fly, this fencing loses much of its effectiveness.

Planting shrubs and small trees along the water's edge or interspersed throughout a feeding area can be effective. Geese need space to land and take off and also are uncomfortable feeding in areas where their view of potential predators is poor. Unfortunately, planting shrubs on a recreational field is not practical nor appropriate.

Allowing grass to grow to a height of one foot or more will make an area less attractive to feeding geese. However, in many of the urban areas where geese pose a nuisance, allowing lawns to grow taller grass is in direct conflict with current public use. Other methods of making turf less attractive to feeding geese include reducing fertilizer use, cease watering, and planting less palatable species.

Some less palatable species include mature tall fescue, periwinkle, myrtle, pachysandra, English ivy, plantain lily, and ground juniper. These options may be acceptable for private landowners, but for most public use areas, they are not feasible.

Non-lethal techniques can be effective, particularly if several different methods are used in concert with each other and at the appropriate time (i.e., it is futile to install fencing around a pond if birds are flying in to feed). Most of the available non-lethal methods, except for habitat modification, are transitory in their effectiveness. Without “harsher” reinforcement, non-lethal techniques typically do not provide long-term solutions.

## **Lethal Techniques**

If habitat is not altered and human tolerance levels do not change, some level of population reduction in concert with non-lethal conditioning is the only way to be successful in the long-term. Population reduction can target annual production (eggs), the adult component, or both. This method, in whatever form it takes, is controversial. Decision makers must be prepared to field some discontent from the public once it is decided that the local goose population is going to be reduced.

### **Egg Addling or Oiling**

Targeting annual reproduction through egg addling, oiling, or puncturing is a popular, relatively uncontroversial way of curbing population growth. Geese are a long-lived species. In Connecticut, most resident geese residing in urban areas can live up to 15 years. They can be productive for 12 of those 15 years, with an average clutch size of 6. Egg addling will halt population growth, if and only if, more than 80% of nests are treated annually. It is very difficult to reduce the local goose population by merely halting annual production because egg addling targets the segment of the population (young) that already has the highest mortality rates. A simplified online registration process replaces the need to apply for and obtain a Federal depredation permit to addle eggs. Before any type of action can occur, participants must **register with the United States Fish and Wildlife Service (USFWS)** (<https://epermits.fws.gov/ercgr/>).

### **Regulated Hunting of Resident Geese**

Reducing the number of breeding adults is the only way to initiate and maintain a population decline of Canada geese. There are a number of ways to remove adult geese: hunting, depredation permits, and round-ups. Regulated hunting is an extremely effective method for reducing resident goose numbers and also keeping remaining birds from using an area. Hunting has resulted in a decline in goose numbers and problems in areas of the state where hunters have access to the birds. Connecticut has liberal goose hunting seasons, which have had a significant impact on resident geese in rural areas. In urban settings, the utility of hunting is limited, thus other means of reducing adult survival are necessary. Many golf courses in Connecticut allow hunting and, where feasible, hunting should be considered. **View information about current Canada goose hunting regulations in Connecticut (/DEEP/Hunting/Migratory-Bird-Guide/Migratory-Bird-Hunting-Guide).**

## Depredation Permits

The USFWS also issues goose depredation permits to qualifying individuals and municipalities. These permits allow for the removal of geese, typically 1-2 per day, in conjunction with active non-lethal methods. The removal of 1-2 geese per day, up to the number allowed by the permit, serves as negative reinforcement to on-going hazing activities.

## Agricultural Depredation Permits

To prevent current or future agriculture depredation from occurring, the CT DEEP maintains a Canada Goose Agricultural Depredation Management Program (/DEEP/Wildlife/Nuisance-Wildlife/Canada-Goose-Agricultural-Damage-Control) that allows persons actively involved in commercial agriculture (**actual or potential gross annual income of \$2,500 or more from commercial cultivated production of livestock and poultry, grain, forage, fruit, vegetables, flowers, ornamental plants, or Christmas trees**)



to conduct lethal resident Canada goose damage management actions. These management actions include the destruction of resident Canada goose nests and eggs and the take of resident Canada geese. The CT DEEP has developed a permitting system to administer this resident Canada goose management program. Upon receipt and review of a completed permit application and signatory page, permits are issued to affected agriculture producers.

## Goose Round-ups

In an effort to provide more tools for the alleviation of resident goose problems in urban areas, the Connecticut State Legislature passed Public Act 03-192 in 2003. This Act allows municipalities, private homeowner associations, and certain non-profit groups to conduct goose round-ups. These operations, conducted during the flightless molting period, can immediately relieve an area of nuisance geese. Geese are herded into portable nets and euthanized, and the meat is donated to soup kitchens and the needy. Many towns in other states participate in round-ups which has shown to be an effective method in reducing their nuisance goose problems. Contact the DEEP Wildlife Division's Migratory Game Bird Program for more information about this program (**860-418-5960** (tel:**8604185960**)).

## The Big Picture

Any successful goose abatement program should include several different non-lethal techniques and, to be successful in the long-term, must also include some type of lethal removal. Geese are prolific and adaptable and, in many urban areas, population levels are well above what humans will tolerate. Despite its attractiveness, merely moving the problem to the next town or public park is not a

workable solution. Ultimately, towns need to take advantage of the tools that are presently available and work with adjacent towns and DEEP to reduce the urban goose population and the problems they pose.

## More Information

Contact the CT DEEP Migratory Game Bird Program, 391 Route 32, North Franklin CT 06254; **860-418-5959 (tel:8604185959); [min.huang@ct.gov](mailto:min.huang@ct.gov) (mailto:min.huang@ct.gov), or 860-418-5960 (tel:8604185960); [kelly.kubik@ct.gov](mailto:kelly.kubik@ct.gov) (mailto:kelly.kubik@ct.gov).**

Need professional assistance in solving common nuisance wildlife problems? View a **[list of licensed Nuisance Wildlife Control Operators](#)**



**[\(http://wildlifehelp.org/\)](http://wildlifehelp.org/)**

Do you need additional help and advice concerning nuisance wildlife? Check out **[www.wildlifehelp.org](http://www.wildlifehelp.org)** **[\(http://www.wildlifehelp.org/\)](http://www.wildlifehelp.org/)** and select "Connecticut" as your state to get started. *WildlifeHelp.org is supported by the Northeast Association of Fish and Wildlife Agencies and the Northeast Wildlife Damage Management Cooperative.*

*Content last updated on April 30, 2019.*

# Phragmites Treatment Herbicide Quick Guide

**Please Note:** This document was developed for interpretive purposes. Treatment decisions should be based on site conditions and management goals. Rates listed below are not meant to override the instructions provided on each individual herbicide label. The label is the law; follow all label instructions. This sheet provides information about concentrations by volume of packaged product NOT by active ingredient (a.i.).

When working over or near water, it is important to use herbicide and surfactant **formulations approved for aquatic uses**. Terrestrial (overland) formulas, such as Roundup, contain ingredients that are dangerous to aquatic species. Use of terrestrial herbicides or surfactants on wet sites violates state and federal laws. **Many states require a permit** to use herbicide over or near water. Check with your local authorities to determine permitting requirements. **In Canadian provinces, no herbicides have been approved for over-water use.**

Herbicide		Imazapyr	Glyphosate	Imazapyr & Glyphosate Combination	Imazamox	Surfactant (nonionic)
Trade Names		Habitat (28.7% a.i.) Arsenal (27.8% a.i.)	Rodeo (53.8% a.i.) AquaNeat (53.8% a.i.) Aquamaster (53.8% a.i.) Accord (53.8% a.i.)		Clearcast (12.1% a.i.)	Cygnat Plus Cide-Kick
Treatment Timing (may vary by region)		Apply to actively growing green foliage <u>after full leaf elongation</u> and up to first killing frost (~ June-Oct)	Apply <u>after plants are in full bloom</u> in late summer up to the first killing frost (late-Aug – Oct)	Apply <u>after plants are in full bloom</u> in late summer up to the first killing frost (late-Aug – Oct)	Apply to actively growing green foliage <u>after full leaf elongation</u> and up to first killing frost (~ June-Oct)	
If the stand has a substantial amount of old stem tissue, mow or burn prior to spray; allow to re-grow to approx. 5' before treatment (>6 weeks)						
Herbicide Rate (% solutions are by volume of packaged product)	High Volume (aerial, boom spray)	4-6 pints/acre	4-6 pints/acre	3 pints imazapyr + 3 pints glyphosate/acre	4 pints/acre (use with 2 pints/acre methylated seed oil (MSO) instead of other surfactants)	1-4 pints/acre
	Low Volume Spray (backpack)	1-1.5% solution	0.75-2% solution	1.5% solution total (0.75% ea. for imazapyr and glyphosate)	1-2% (use with methylated seed oil (MSO) at 0.5-1% instead of other surfactants)	0.25-0.5% solution
	Hand Swiping, Wick, or Boom Wick	10% cover at least 50% of the foliage, best results from covering top half of plant	10% cover at least 50% of the foliage, best results from covering top half of plant	10% cover at least 50% of the foliage, best results from covering top half of plant		0.25-0.5% solution
	Stem injection or cut stem (squeeze bottle/ sponge applicator)		33% solution			0.25-0.5% solution
Pros:		Allows treatment earlier in the growing season	More appropriate if working in sensitive areas or areas near woody species	Reduced cost from imazapyr alone	More appropriate if working in areas near woody species	Use of surfactant is <u>necessary</u> to achieve the labeled results for the herbicides
Cons:		Greater danger of non-target damage and active residuals in the soil; expensive	Treatment window is smaller	Greater danger of non-target damage and active residuals in the soil; treatment window is smaller		
Mandatory setback distance to potable water-intakes		0.5 mile (0.8 kilometer)	0.5 mile (0.8 kilometer)	0.5 mile (0.8 kilometer)	0.25 mile (0.4 kilometer)	

## Amount of Herbicide Needed for Common Percent Solutions

Total amount of spray solution being prepared	Desired percent solution (by volume of packaged product)					
	0.25%	0.75%	1%	1.5%	2%	10%
<b>1 gallon</b>	0.3oz	0.9oz	1.3oz	1.9oz	2.6	12.8
<b>2</b>	0.6	1.9	2.6	3.8	5.1	25.6
<b>3</b>	1	2.8	3.8	5.8	7.7	38.4
<b>4</b>	1.3	3.8	5.1	7.7	10.2	51.2
<b>5</b>	1.6	4.8	6.5	9.6	12.8	64
<b>10</b>	3.2	9.6	12.8	19.2	25.6	128
<b>25</b>	8 (1 cup)	24 (3 cups)	32 (4 cups)	48 (6 cups)	64 (8 cups OR 0.5 gallon)	320 (40 cups OR 2.5 gallons)
<b>50</b>	16 (2 cups)	48 (6 cups)	64 (8 cups OR 0.5 gallon)	96 (12 cups OR 0.75gallon)	128 (16 cups OR 1 gallon)	640 (80 cups OR 5 gallons)

To determine how many ounces of herbicide or surfactant you need to reach a desired concentration by volume, use the chart above for common measurements or follow the equation below to calculate it yourself.

**oz product needed** = total gallons of solution desired x 128 x ( % solution by volume /100)

**Example** If you want 3 gallons of spray solution and want a 1.5% solution of herbicide and a .25% solution of surfactant, how much do you need of each?

Herbicide: oz herbicide needed = 3 x 128 x (1.5/100)  
 oz herbicide needed = 5.76 (round to 5.8oz)

Surfactant: oz surfactant needed = 3 x 128 x (0.25/100)  
 oz surfactant needed = 0.96 (round to 1oz)

Add about 2 gallons of water to your tank. Add 5.8 oz of herbicide. Add 1 oz of surfactant. Add marking dye if desired. Add water until your tank is filled to 3 gallons total.

## Sources and Additional Information:

- [Common Reed \(\*Phragmites australis\*\) Control Fact Sheet](#) (University of Rhode Island)
- [Aquatic Invasive Species: Phragmites](#) (Michigan DEQ)
- [Great Lakes Phragmites Collaborative](#) (Great Lakes Phragmites Collaborative)
- [A Guide to the Control and Management of Invasive Phragmites: Third Edition](#) (Michigan DEQ/DNR)
- [Herbicide Reference Guide for Landowners](#) (Larimer County Weed District) - *This PDF has information on calibrating spray equipment, including handguns and boom sprayers (p23-24)*
- [Phragmites Management Michigan State Parks](#) – Webinar (Ray Fahlsing and Bob Clancy, MI DNR)

- [Accord Label](#)
- [Arsenal Label](#)
- [Aquamaster Label](#)
- [AquaNeat Label](#)
- [Clearcast Label](#)
- [Cide-Kick Label](#)
- [Cygnat Plus Label](#)
- [Habitat Label](#)
- [Methylated Seed Oil Label](#)
- [Rodeo Label](#)

Use the QR code or visit  
[greatlakesphragmites.net/herbicide](http://greatlakesphragmites.net/herbicide)  
 for links to state approved herbicides  
 and permitting information

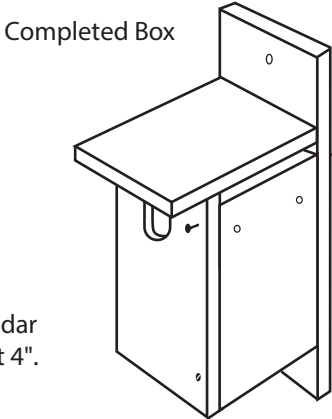
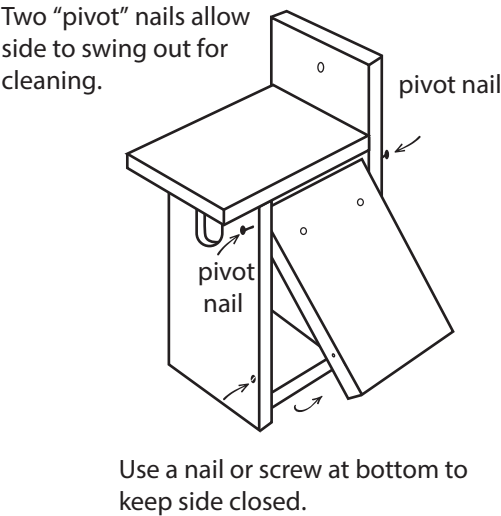
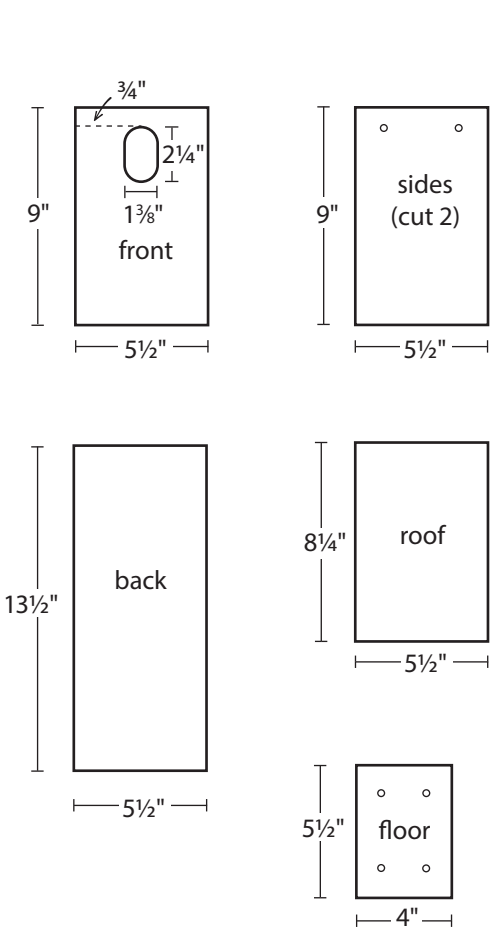


Nest Box

Eastern, Western, and Mountain Bluebirds;  
Tree and Violet-green Swallows

Note: Western Bluebirds need a 1½" diameter round entrance hole and Mountain Bluebirds need a 1⅞" diameter round entrance hole.  
Swallows are smaller than bluebirds and will be able to enter holes 1 ⅜" or larger.

Eastern Bluebird



Increase Your Chances of Nest Box Success!

Information on natural history, habitat, nest box placement, and management for Midwestern birds is available in Woodworking for Wildlife. Order at [minnesotasbookstore.com](http://minnesotasbookstore.com)



Note: these dimensions are for ¾" thick board. Some cedar boards are 7⁄8" thick. If so, the floor must be 3¾" wide, not 4".

Lumber: 1" x 6" x 6'

