

Captain George N. Harding Conservation Area Land Management Plan



Invasive Plants Present

Norway Maple	(<i>Acer platanoides</i>)
Porcelain Vine	(<i>Ampelopsis brevipedunculata</i>)
Trumpet Vine	(<i>Campis radicans</i>)
Asiatic Bittersweet	(<i>Celastrus orbiculatus</i>)
Autumn Olive	(<i>Elaeagnus umbellata</i>)
Japanese Knotweed	(<i>Polygonum cuspidatum</i>)
Border Privet	(<i>Ligustrum vulgare</i>)
Shrub Honeysuckle	(<i>Lonicera morrowii and x bella</i>)
Silver Poplar	(<i>Populus alba</i>)
Multiflora Rose	(<i>Rosa multiflora</i>)

Non Invasive Plants Present

Trees and Shrubs

Eastern Red Cedar	(<i>Juniperis virginiana</i>)
Bayberry	(<i>Myrica pensylvanica</i>)
Black Cherry	(<i>Prunus serotina</i>)
Smooth Sumac	(<i>Rhus glabra</i>)
Pasture Rose	(<i>Rosa carolina</i>)
Poison Ivy	(<i>Toxicodendron radicans</i>)

Herbaceous Plants

Pussytoes	(<i>Antennaria plantarinifolia</i>)
Common Milkweed	(<i>Asclepias syriaca</i>)
Poverty Grass	(<i>Danthonia spicata</i>)
Queen Annes Lace	(<i>Daucus carota</i>)
Roughleaved Goldenrod	(<i>Solidago rugosa</i>)
St. Johns-wort	(<i>Hypericum perforatum</i>)
Aster	(<i>Aster sp.</i>)
Evening Primrose	(<i>Oenothera biennis</i>)
Switchgrass	(<i>Panicum virgatum</i>)
Dewberry	(<i>Rubus sp</i>)
Little Bluestem	(<i>Schizachyrium scoparium</i>)

Existing Conditions

The Captain Harding Conservation Area is a small meadow adjacent to developed land to the east and west as well as a woodland and Benares's Pond to the north. It is located to the north of busy route 28; this location offers a unique opportunity to expose the public to a diverse group of plants as well as management strategies for a small parcel of open space. The parcel was previously developed and over time became overgrown with numerous invasive plant species. Public access is provided by a meandering path which allows visitors to move through the area. The meadow was recently restored and seeded with native grasses and forbs which are starting to become well established. There are both herbaceous and woody invasive plants growing throughout the meadow that will continue to spread if not controlled.

Additional Property Information

- The land was purchased with Land Bank funds for the purpose of conservation and passive recreation. The deed references that the property is to be maintained as a meadow.
- A portion of the property lies within Priority Habitat for rare and endangered species according to the October 2008 map of the MA Division of Fisheries & Wildlife, Natural Heritage of Endangered Species Program.

Goal:

The goal of this management plan is create and maintain a meadow-type habitat through the control of invasive plants and the encouragement of the native plant community for the purposes of protecting the natural values of biodiversity, wildlife habitat and rare species habitat, while maintaining public access and showcasing the beauty of native plants in the setting of a neighborhood center. With the increase of development, habitat for plants and wildlife becomes irrevocably lost. The wildlife habitat that exists on Cape Cod today is a fraction of what existed just fifty years ago. Preserving and carefully managing protected habitat should be a common goal for communities

Objectives:

- Biological diversity and wildlife habitat will be enhanced by managing invasive plants.
- Planting seed of indigenous plants and encouraging existing native plants.
- Invasive plant management will be a critical objective because state-recognized invasive species threaten both biological diversity and the wildlife habitat of this parcel.
- Management will be developed to support State-Listed Rare and Endangered Species which depend on open habitats and grassland communities*.
- The utmost care should be taken throughout all aspects of the intensive management period to protect, nurture and support existing native plants during management activities.
- Any voids created from invasive species removal will be re-planted with suitable native species.

*Savannah sparrow, Northern harriers (Threatened), short-eared owls (Endangered), long-eared owls (Special Concern), barn owls (Special Concern), American woodcocks and whip-poor-wills, which all require nearby open habitat for hunting, foraging or breeding could all benefit from the proposed habitat restoration. Raptor species such as the northern harrier, short-eared owl, barn owl, and great horned owl are all known to hunt in open grasslands and roost in conifers or other trees, or in the case of short-eared owls, on the ground.

Treatment Options and Important Timing Considerations for Habitat Management and Invasive Plant Treatments

Mowing:

~**Spring Mow**~ Minimize habitat disturbance by timing mowing treatments to be conducted late in the Month of March in order to allow winter cover of dense vegetation for small mammals as well as cover and forage habitat for bird species in winter when grass and wildflower seeds becomes an important winter food source for many overwintering species. With a mowing in late March, the habitat disturbance is minimized because the meadow begins to grow again in April.

~Summer Mow~ Minimize both habitat disturbance and development of native grasses with a mow in late July. Most ground nesting birds and mammals have fledged or vacated their nests by late July, so nesting is not disturbed with a mow in the last week of July. Native cool season grasses (grass species which do most of their growth and seed development early in the summer) have successfully developed and released viable seed by late July and the warm-season grasses (grass species which do most of their growth and seed development later in the summer) have just begun to grow and have not developed significant stalks or flower heads in the last week of July. Mowing in July also allows good vegetative development of native grasses and wildflowers in the late summer and fall growing season, which provides cover in the dormant winter months.

Mowing twice per year tends to support herbaceous species and discourage woody species, thus encouraging healthy meadow communities. Mowing in the Spring tends to set the woody plants back to sprouting from the ground, when they would otherwise develop leaf buds and continue the building on the former year's growth. Summer mowing effectively discourages woody weeds by forcing them to regenerate new growth when they would typically be generating flowers and fruit, thus reducing energy in their root reserves over time.

Hand Pulling or Mechanical Removal:

There is almost no bad time to pull an undesirable weed, however certain times are better than others. Most species will most readily uproot when the soils are moist and unfrozen. If one is attempting to pull a weed which has an extensive root system or a root which is prone to breakage, then attempt to pull the species after it has expended energy developing flowers, but before the seeds are viable so as not to spread the seed.

If a weed is too difficult to remove by hand, try using a specialized weed wrench which can accommodate up to a 2 ½ to 3 inch stem (Available from the New England Wildflower Society or New Tribe Manufacturing in California). Another method of mechanical removal is to mechanically remove the seed heads by hand, with pruners, or with a motorized string trimmer before the seed is viable.

Warning: Hand pulling is not effective on invasive species such as Asiatic Bittersweet, White Poplar, Porcelain Berry, and Japanese Knotweed. These species may spread or colonize disturbed areas when hand pulling is attempted.

Herbicide Application:

With most invasive species, the most effective time to apply herbicide is between July 1 and October 1st when the plants are fully photosynthesizing and delivering sugars created in the leaves to build up root reserves. As destroying the root material is always the goal of herbicide use; it is best to apply the herbicide during this timeframe, when the herbicide will translocate effectively to the roots and prevent future re-sprouting.

Please Note: Herbicides are regulated as Pesticides under the MA Pesticide Regulations and a Pesticide Applicators License and specialized insurance are required to apply herbicides in Massachusetts.

~Cut and Wipe Application~ One of the most effective methods of herbicide application also happens to be one of the most environmentally sensitive and selective methods of application. In this technique, a concentrated herbicide (usually a Glyphosate-based herbicide at 41% concentration) is applied directly to the cut stem within 5 minutes of cutting the stem. For larger diameter shrubs and trees, a frill cut is effective, where the applicator cuts back the bark with a knife or hatchet and exposing the cambium where the herbicide is wiped on. This technique is effective with all of the invasive species found on this site with the exception of Japanese Knotweed.

~Stem Injection~ This herbicide technique is effective with hollow stemmed species such as Japanese Knotweed. This treatment can be conducted either by injecting the stem of the plant between the nodes on the stalk with a specialized hypodermic needle designed for plants or by cutting off the tops and using a medicine dropper to deliver the herbicide. In both instances, 5 cubic centimeters is effective as the measured dose for each stem.

Management Strategies & Actions:

- Meadow renovation will involve physically removing target species, re-seeding with native plants, and timely mowing. A vigorous turf of native grasses and forbs resists invasion of invasive plants. With this in mind; a healthy dense network of native grasses and wildflowers in the meadow is a goal of this management plan. Invasive plants will first be removed; voids and bare areas of turf will then be re-seeded or re-planted. Mowing should be timed to discourage the growth of invasive plants while also encouraging the growth and reproduction of native grasses and forbs. An early spring mowing will impact woody plants as well as cool season and biannual invasive plants while allowing warm season grasses to thrive. A second mowing in late July, before warm season grasses such as little bluestem and switchgrass have set seed; will again reduce unwanted woody plants. If it is not possible to remove invasive herbaceous plants before they set seed an effort should be made to remove the flower heads. This can be accomplished efficiently with a gas powered string trimmer. Some plant species such as knotweed, Asiatic bittersweet and porcelain berry are very difficult to control, if not impossible to control without the use of herbicides. Once management activities have begun it is important to continue until unwanted plants are under control.
- Removing the **Asiatic bittersweet** and **porcelain vine** which grows around the perimeter of the property is a priority project. The plants are growing vigorously and delaying management will allow the plants to spread by seed and vegetative means and increase the difficulty of control. These vines are very hard to control without the use of herbicides. Fortunately, the treatment involves a relatively small amount of herbicide that is applied to the cut stem. The recommended procedure for control is based on the phenology of the plant. Cutting and herbicide application by a licensed applicator should be scheduled when carbohydrates have been transferred from the roots to the above-ground portion of the plant, thus causing the most damage to the plant and eliminating carbohydrate stores, which weaken the plant over time. Herbicide application should only be conducted after the invasive plants have fully developed foliage and are delivering carbohydrate back the roots to allow for the most efficient translocation

- of the herbicide. By commencing management with a cut stem application of herbicide, re-sprouting in the subsequent growing season will be dramatically reduced. All Asiatic bittersweet and porcelain berry vines greater than 1” in basal diameter should be treated by cutting the vine 4-6” from the ground and wiping on a 41% concentration of a Glyphosate-based herbicide to the cut stem. Do not attempt to immediately pull cut vines out of trees as this will likely damage the trees. Conduct a controlled, low-volume foliar application of a 2% Triclopyr-based herbicide to all Asiatic bittersweet stems less than 1” in diameter.
- **Trumpet vine** is currently growing vigorously near the entrance. This plant has ornamental and wildlife value and can be controlled by selectively cutting the plant. Some control is necessary since the plant is spreading into native plants which are growing in the immediate area.
 - **Norway maple** and **autumn olive** are best controlled by either uprooting smaller plants or cutting and wiping the trunk with a systemic herbicide by a licensed applicator to stop re-sprouting. Autumn olive fixes nitrogen which enables other invasive plants to colonize the areas near the tree. Autumn olive has the ability to re-sprout from the roots; it also produces an abundant amount of fruit which is eaten by birds that spread the seeds. Norway maple also produces prolific amounts of seed. In both of these cases it is prudent to identify young plants and physically remove them.
 - **Shrub honeysuckle** and **vine honeysuckle** can quickly colonize large areas eliminating native plants through competition. It is a relatively easy to physically remove shrub honeysuckle, especially when it is small. These plants should be removed early in the season before they have the time to produce fruit which will cause it to spread further. Vine honeysuckle is a common invader after other invasive species have been successfully managed because it can quickly colonize recently managed areas. While small invasions may be addressed by hand-pulling the vine, larger invasions require a dormant season foliar application of a 2% Glyphosate-based herbicide to successfully manage this species. As vine honeysuckle is semi-evergreen, it is possible to apply this dilute herbicide in late November or December, preventing damage to non-target deciduous species which will have dropped their leaves and will therefore be unaffected by such an application.
 - **Silver poplar** is a fast growing tree that colonizes an area by sending up shoots from its roots. It is capable of growing into a large tree and rapidly spreading over a wide area, outcompeting native plants. Given this plant’s root sprouting potential; use of a systemic herbicide by a licensed applicator after cutting is recommended.
 - There is a mature hedge of **border privet** along the property line and has the potential to become a significant management problem on this parcel. Border privet; which can grow into a small tree can annually produce hundreds of viable

seedlings which spread the species rapidly through a variety of habitats. The cut stump herbicide application method is most effective for this species when it is mature, however annual hand pulling of seedlings is a viable long term control method. The property boundary should be defined to prevent inadvertently working on a neighboring parcel.

- **Japanese Knotweed** is well established in various locations on the property. This particularly aggressive species has the ability to colonize large areas if left unmanaged. Japanese knotweed can be successfully managed in late summer by injecting a 10%, Glyphosate-based herbicide directly into the stem of the plant by a licensed pesticide applicator. It is very difficult if not impossible to control without the use of herbicide.
- **Multiflora rose** is growing in several locations and as with many of the other invasive plants it has the ability to colonize large areas. Although it has beautiful fragrant flowers and food value for wildlife it ultimately degrades habitat by displacing native species. The existing plants are relatively small and it is possible to physically uproot them at this time with hand tools.
- **Poison ivy** is a native vine which has both a high wildlife value and is considered a nuisance in many conservation areas with pedestrian access. Poison Ivy should be managed away from paths and intensively used areas. This species should not be eradicated from the conservation area as its fruits are high in lipids which are an important food source for migratory songbirds as they build up fat reserves for the Fall migration. This species can most effectively be managed with a cut and wipe application of a 41% Glyphosate-based herbicide or a controlled, low-volume foliar application of a 2% Triclopyr-based herbicide. There is currently a very low-toxicity herbicide comprised of an acetic-acid formulation of lemon juice, vinegar, clove oil and soap which is effective at defoliating the species, but does not systemically kill the plant. This herbicide, commercially know as Poison Ivy Defoliant, is non-selective and particular care must be taken not to spray native plants when applied as a low-volume foliar application. Any herbicide application must be conducted by a licensed, pesticide applicator.
- Management of invasive species in throughout the parcel should also limit the amount of weeds colonizing the crushed stone footpath. Annual, wind-dispersed weeds may continue to be a management issue, but should also decrease over time due to natural compaction of the footpath. As the path becomes more compact and less porous with additional foot traffic, it will also become less of a seed bed for weeds. This process could be accelerated by compacting the path with a vibratory roller, or similar compacting equipment. Hand pulling of weeds from the pathway should be conducted 3-4 times per year in order to prevent colonization and development of viable seeds.