

# Restoration Plan for Invasive Species at Irish Hill, Berlin Town Forest

Berlin, VT

Prepared for the Town of Berlin by Vermont Land Trust

*October, 2022*



## Executive Summary

- Berlin Town Forest consists of three conserved parcels and one non-conserved parcel, which create a contiguous block of +/-741 acres that include Northern Hardwood Forest, Seepage Forest, and vernal pools. These lands provide public access for community recreation. The forest management objectives for the town forest emphasize conservation of natural communities, habitats, and natural resources, while providing recreational and educational uses of the property. The forest management plan (FMP) states that invasives should be controlled and removed due to detrimental health effects to wildlife and valuable resources. To maintain ecological health, as well as the aesthetic, recreational, and educational aspects of the site, invasive maintenance is crucial.
- This plan was developed to address invasive plant management on Berlin Town Forest property in Berlin, Vermont. These plants, also referred to as exotic or alien, are plants that have been introduced to an area outside their native range, either purposefully, through landscape plantings, or accidentally, as seeds in the soil of other imported plants or soil on other products. Once introduced, they can spread through the nursery trade or accidentally by birds, other wildlife, vehicle tires, boots or pets. If left unchecked these non-native invasive plants outcompete desirable native plants, provide inferior food for wildlife, alter ecosystems, and impact human health. For example, barberry is associated with higher populations of blacklegged ticks that carry Lyme disease. Further, dense stands of invasive shrubs, especially ones with thorns, are particularly hard to navigate through and can adversely affect one's recreational experience and connection to the land. The successful management of invasive plants offers a number of benefits: maintaining forest productivity, promoting native species that provide superior food and nesting structure for a number of bird and other wildlife species, and reducing the risk of human health issues.
- The survey of Berlin Town Forest found six invasive species: common buckthorn (*Rhamnus cathartica*), glossy buckthorn (*Frangula alnus*), wall lettuce (*Mycelis muralis*), bush honeysuckle (*Lonicera* sp.), Japanese barberry (*Berberis thunbergii*), and goutweed (*Aegopodium podagraria*.) Common buckthorn is the most common species and was found in dense patches along Darling Rd and in the southwestern corner of the River Conservancy parcel in particular. The inventory focused on areas where invasive plants were more likely to occur, such as along field edges, trails, or canopy openings. The inventory was collected through the ArcGIS collector app and was conducted June 16<sup>th</sup> through June 21<sup>st</sup> by Vermont Land Trust (VLT) intern, Abigail Golitz.
- We recommend securing funding and working with a contractor to create a control plan for glossy and common buckthorn, bush honeysuckle, and Japanese barberry. Wall lettuce and goutweed are much more difficult to control so eradication is unrealistic. A more realistic goal for these species may be to prevent the plants from spreading

beyond the areas where they're currently established by focusing control efforts around the perimeter of the infestations and on any small, isolated areas. Herbicide application using different control methods is the most effective and least costly method for controlling an infestation of this magnitude. If the town is able to recruit volunteers to help with control efforts then work with the contractor to identify opportunities for volunteers. Volunteers can also conduct annual monitoring of the trails to detect new introductions.

- Prevent further introduction of invasive plant seeds via boots and bike tires and practice early detection of new invasive plant introductions through annual monitoring and immediately remove newly detected plants.

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## Property Description

Berlin Town Forest is located off of I-89, west of the Berlin Pond in the town of Berlin, VT. The property consists of three conserved parcels: the 406 acre Malone lot; 110 acre Lawson lot; and the 48 acre Dufrense lot. Together these three parcels are a contiguous block of +/-573 acres. The town of Berlin also owns a 168 acre non-conserved piece of forestland, called the Kelly Parcel that lies to the southeast of the Malone lot.

Prior to town ownership, the forest had been heavily harvested. The majority of the trees that remained were then damaged during the 1998 ice storm. The majority of this parcel is northern hardwood forest and provides important habitat and food resources for mammals and birds.

The northern-most parcel, the Lawson lot, was acquired in 2002 by the town. The Lawson parcel is traversed by Darling Brook, which flows into Berlin Pond. Surrounding the stream is a seepage forest. Three vernal pools are also found on this parcel. This area provides rich habitat for many animals. Darling Road is a legal trail that provides public access from Brookfield Road, through land owned by the City of Montpelier, to the Berlin Town Forest.

The Dufrense property links the Malone and Lawson parcels. The western boundary is defined by Mountain Road, and the eastern boundary by a stone wall. The higher elevation on this parcel is dominated by early successional species, and there are open meadows in the northerly portion of the parcel.

Public, non-motorized, non-commercial recreational access is encouraged in the Berlin Town Forest. There is a trail corridor manager agreement with various organized user groups. Each user group (ex: snowmobiling and mountain biking) is responsible for the establishment, maintenance, reparation of the trail, and enforcement of trail rules. Trails are designed and maintained to allow individuals to access the property, while avoiding ecologically sensitive areas, minimize erosion, and maximize aesthetically pleasing areas. There is a specific request in the plan that “trails will be maintained in a manner that reduces the introduction and spread of invasive plants.”

The Forest Management Plan (FMP) states that invasives should be controlled and removed, due to detrimental health effects to wildlife and valuable resources. Invasive control is an important part of the FMP, as the objectives for this site emphasize conservation of natural communities, habitats, and natural resources, while providing recreational and educational uses of the property.

## Field Methods

The inventory focused on areas where invasive plants were more likely to occur, such as along field edges, trails, or canopy openings. The invasive inventory was conducted from June 16<sup>th</sup> through June 21<sup>st</sup> by Vermont Land Trust (VLT) intern, Abigail Golitz.

Data was collected in the field using the ArcGIS Field Maps app, which allows you to download a map to your smart phone and map data points and shapes. A point was taken each time an



individual plant or cluster of plants was identified and the species name and percent cover were recorded. [Refer to Invasive Plant Inventory Protocol].

Using the field inventory data, ArcGIS, a geographic mapping program, was used to generate maps of patches of invasive plants (polygons) and individual plants or small clusters (point observations).

## Invasive Plant Management

### Why Manage?

If left unchecked the common and glossy buckthorn, wall lettuce, bush honeysuckle, Japanese barberry, and goutweed will outcompete native species in the forest, such as birch, butternut, blue cohosh, and rare species such as wood fern, wood millet, and puttyroot. Invasives provide inferior food sources for wildlife, like migrating birds. And some invasives pose a negative human health risk, like the terrible rash caused by poison parsnip. Further, dense stands of invasive shrubs in particular are hard to navigate through, are unappealing to the eye, and can adversely impact people's experience on the land. The successful management of invasive plants offers a number of benefits that directly affect the forest ecosystem, wildlife, and the visitor's experience.

### Summary of Infestation Level and Management Goal by Species

There were six invasive plants found on the property: Common and glossy buckthorn, wall lettuce, bush honeysuckle, Japanese barberry, and goutweed.

Common buckthorn plants were found all throughout the conserved and non-conserved properties along trail and road edges, in disturbed areas (ex: openings created when trees died or were knocked over by wind), along stream edges, as well as in the middle of forested areas and the wetland. Heaviest concentrations were in the southwest corner of the Malone parcel, south of Darling Stream, and (although not Berlin property) along the telecommunication trail from Brookfield Road to the telecommunication towers. Most were mature and below 5', although many were 5'-10'.

Bush honeysuckle was found scattered across the northern two parcels. Immature and mature plants were found alongside current and old trails. Most plants were less than 5' tall. A few mature bush honeysuckles between 5'-10' tall were found in the wetland and meadows in the Dufrense and in the northern part of the Malone parcel.

Wall lettuce on the conserved property was found along active trails, in small clusters or growing as individual plants. On the non-conserved property, wall lettuce was discovered in larger clusters in forested areas that resided alongside out-grown trails, and alongside Onion River Road.

Two mature Japanese barberry plants below 5' were found in the south-western corner of the Malone parcel.

Goutweed was found in a dense patch on the non-conserved Kelley parcel in an over-grown trail. The goutweed was mature and flowering at the time it was discovered.

The following table summarizes the invasive species present on the property, management goals, and recommendations for initial and follow-up treatments. The priority is based on a cost/benefit analysis of invasive plant management. Priority 1 is lowest effort, highest feasibility (low cost), and the highest benefit. Priority 2 is medium effort, moderately feasible (medium cost), with high or medium benefit. Priority 3 is high effort and feasible only at great cost, with medium benefit. For more information on each plant's life cycle, identification, management options and proper disposal; safe and effective use of herbicides; and tips on working with an invasive plant contractor please visit [vtinvasives.org](http://vtinvasives.org).

| Priority | Species                     | Goal                               | Initial treatment   | Follow-up treatments | Capacity   |
|----------|-----------------------------|------------------------------------|---|----------------------|--|
| 1        | Common and Glossy Buckthorn | Control and prevent further spread | Hire an invasive plant contractor to treat the populations using herbicides   | 1-3 years            | Volunteers may be able to assist contractor efforts by hand pulling plants less than 1' tall and removing isolated individuals using weed wrenches and shovels |
| 1        | Bush Honeysuckle            | Eradicate                          | Hire an invasive plant contractor to treat using herbicides   | 1-3 years            | Volunteers may be able to assist contractor efforts by removing isolated individuals using weed wrenches, shovels or hand pulling small plants                 |
| 1        | Japanese Barberry           | Eradicate                          | Hire an invasive plant contractor to treat using herbicides or have volunteers remove the couple of plants using a weed wrench or shovel and hand pull any small plants | 1-3 years            | There are only a few plants. Control can be done in tandem with work on buckthorn and honeysuckle  |
| 2        | Goutweed                    | Prevent further spread             | Hire an invasive plant contractor to treat using herbicides   | 1-3 Years            |  |
| 3        | Wall Lettuce                | Prevent further spread             | Consult contractor on best approach. Volunteers could be recruited to hand pull plants along the perimeter  | Yearly               | The main infestation is in a remote area so accessing it will be time consuming  |

## Summary of Management Recommendations

An integrated pest management strategy focuses on using manual, mechanical and chemical options where appropriate; strategies for preventing further introductions; and on-going monitoring. After analyzing the management goals, risks, and costs we are recommending the following approach for dealing with the invasives on the property:

1. Hire contractors to control buckthorn, honeysuckle, barberry, and potentially goutweed using chemical control methods.

For glossy and common buckthorn, bush honeysuckle, and Japanese barberry, we recommend that you secure funding and work with a contractor to create a treatment plan. Herbicide application using different methods (cut stump, foliar application and basal bark treatment) have proven to be an effective and cost efficient approach for invasive plant management.

For wall lettuce and goutweed, management is not simple. These two plants are very difficult to control making eradication unrealistic. The Nature Conservancy controlled a wall lettuce population at one of their preserves by using volunteers to hand pull them but this patch was much smaller and required annual attention. A more realistic goal for wall lettuce and goutweed may be to prevent the plants from spreading beyond the areas where they're currently established by focusing manual or chemical control efforts on the perimeter of the infestation. Discuss options with a contractor.

2. Identify opportunities for volunteers to help with the control work.

Contractors can treat the larger buckthorn and honeysuckle plants, where treatment is more effective and necessary to prevent spread, while smaller buckthorn (less than 1 foot tall) can be easily pulled by volunteers. Volunteers could also work on removing isolated plants. One example of that would be the plants identified along the ridgeline.

## Monitoring

Invasive species management is never "complete." Some species require follow-up treatments for several years to exhaust the seed bank or control re-sprouts. Even when a plant has been eradicated it is important to monitor the property annually for the introduction of new species or new populations and remove plants immediately upon detection. Particular attention should be given to areas that have been disturbed, such as recently harvested areas, roadsides and trails, and canopy gaps created by wind storms or tree mortality. Volunteers can easily be trained to detect and remove new plants as they become established.

## Prevention and Education

Always use clean tools and make sure that your clothes and shoes will not transport new invasive plant seeds into the treatment area. Additionally, clean all equipment and check clothes for seeds before leaving the site so that you do not introduce the invasives somewhere else. The town might want to think about preventing further introduction of invasive species by installing boot brushes and posting informational fliers at trailheads about cleaning bike tires.



## References

*Add any other references you may have used to create this document. The ones below are for the invasive treatment information.*

Maine Dept. of Environmental Protection, *Invasives*,  
<http://www.maine.gov/dep/water/wetlands/invasive.html>

University of Vermont Extension, Vermont Department of Forests, Parks and Recreation, Vermont Department of Environmental Conservation, and Vermont Nature Conservancy, *Vermont Invasives: Gallery of Terrestrial Plants*, [vtinvasives.org/gallery-of-terrestrial-plants](http://vtinvasives.org/gallery-of-terrestrial-plants).

University of Connecticut Extension Forestry Program, Video Series - *Japanese Barberry Control: Managing Barberry Can Help Prevent Lyme Disease and Improve Forest Health*, [www.ctforestry.uconn.edu/japanesebarberrycontrol.html](http://www.ctforestry.uconn.edu/japanesebarberrycontrol.html).

US. Forest Service Fire Effects Information System (FEIS), Species Review Database, [www.feis-crs/feis/faces/index.xhtml](http://www.feis-crs/feis/faces/index.xhtml).

Peter Smallidge, Cornell University Cooperative Extension Department of Natural Resources, Webinar – *Flame Weeding Control of Invasive Woodland Shrubs in New York*, [www.youtube.com/watch?v=wsXp6yR1WFU](http://www.youtube.com/watch?v=wsXp6yR1WFU).

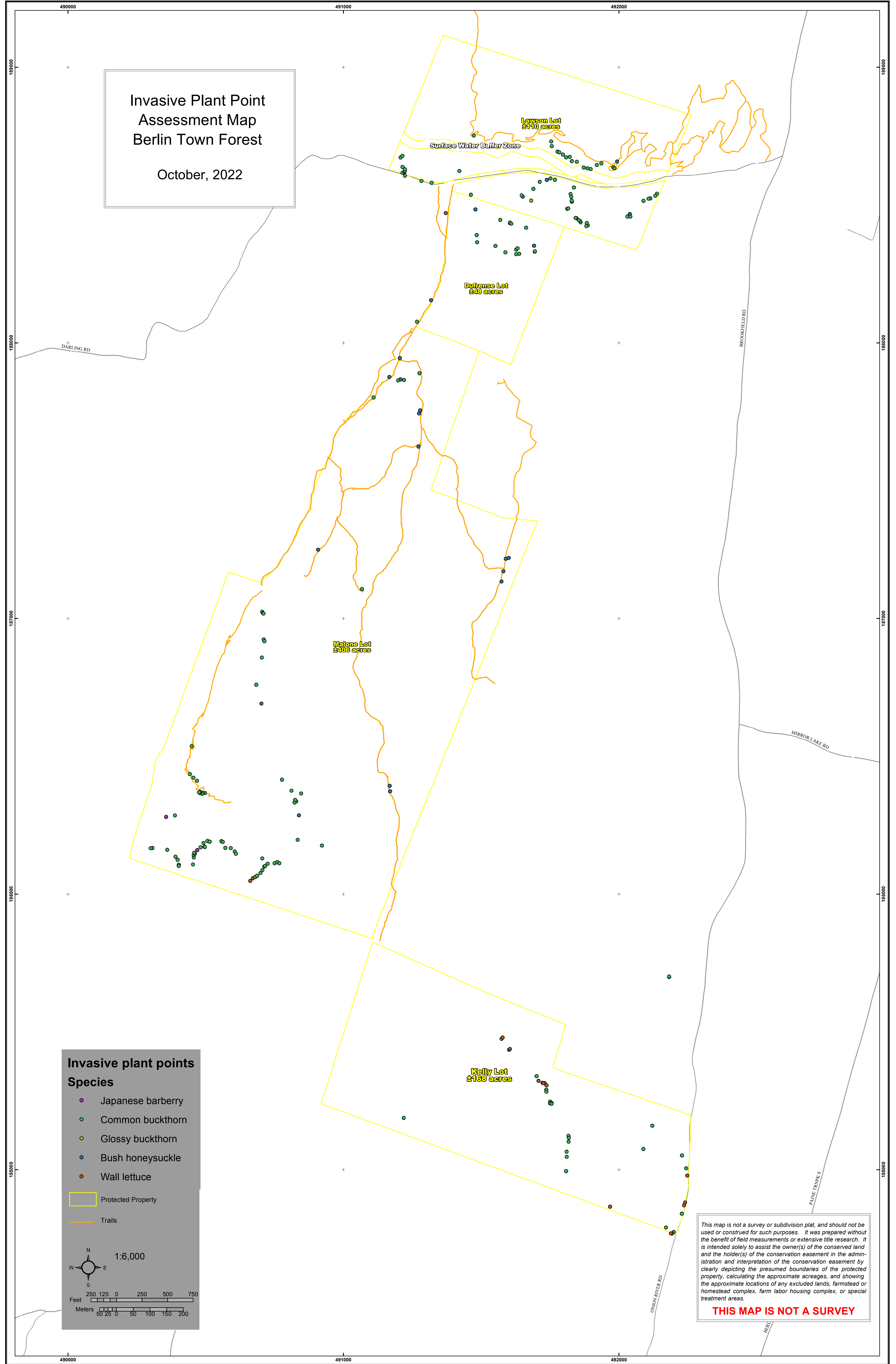
## Appendix I: Invasive Plant Maps

*Put your species maps here! Individual plants should be marked with just a point. Polygons should be classified as 10%-20% cover, 20-50% cover, and Greater Than 50% cover.*

Table #. Definitions of cover classifications for point and polygon observations of invasive plants.

| <b>Symbol</b> | <b>Level of Cover</b> | <b>Represents</b>  |
|---------------|-----------------------|--|
| Points        | Individual plant      | In one spot, there was an individual plant, or a small cluster of 2-3 plants |
| Patches       | Light Cover           | Spread over an area, between 10 and 20% cover                                |
| Patches       | Medium Cover          | Spread over an area, between 20 and 50% cover                                |
| Patches       | Heavy Cover           | Spread over an area, greater than 50% cover                                  |

Invasive Plant Point  
Assessment Map  
Berlin Town Forest  
October, 2022



**Invasive plant points**

**Species**

- Japanese barberry
- Common buckthorn
- Glossy buckthorn
- Bush honeysuckle
- Wall lettuce

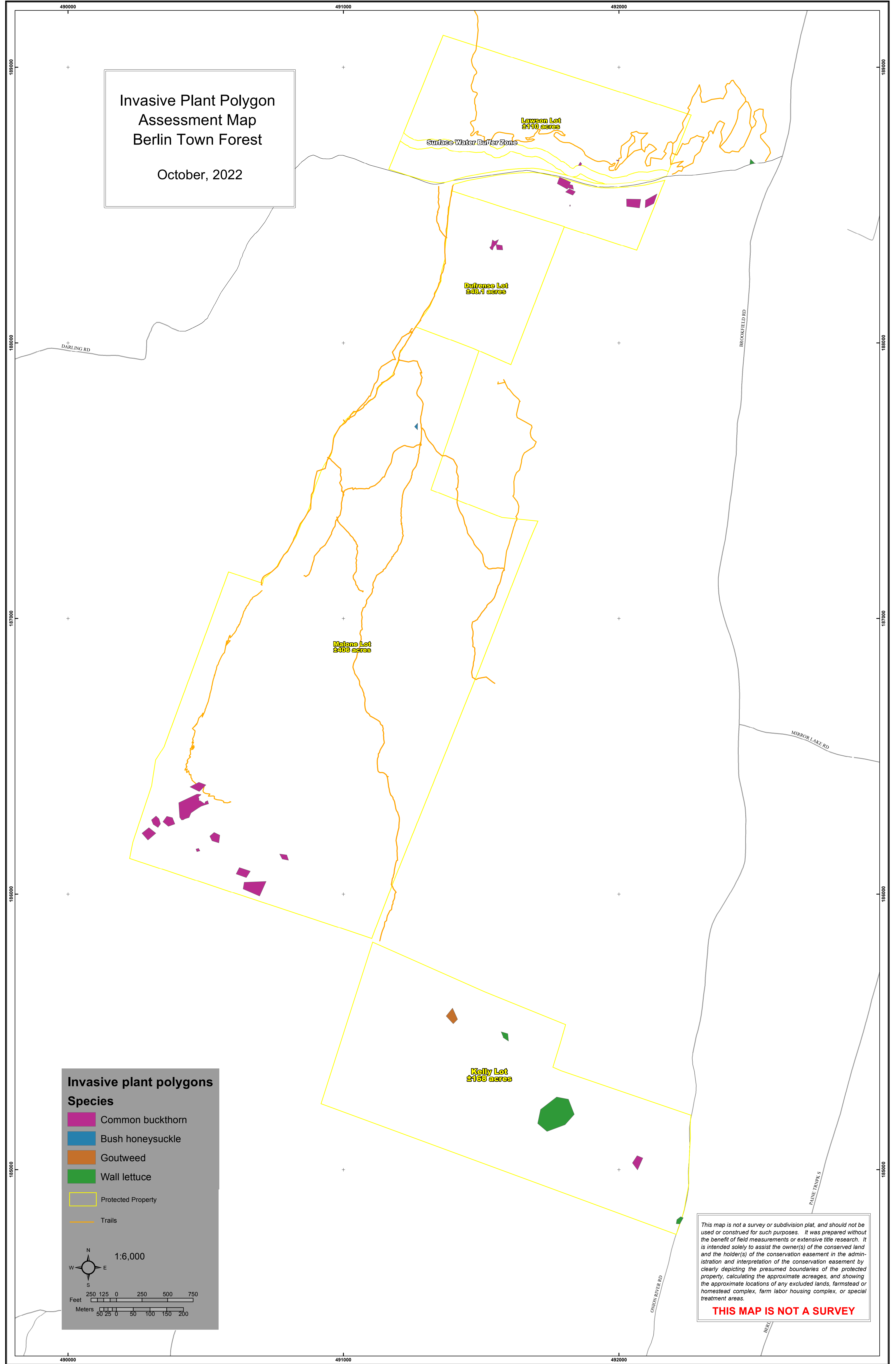
Protected Property  
 Trails

N  
 W — 0 — E  
 S  
 1:6,000  
 Feet 250 125 0 250 500 750  
 Meters 50 25 0 50 100 150 200

*This map is not a survey or subdivision plat, and should not be used or construed for such purposes. It was prepared without the benefit of field measurements or extensive title research. It is intended solely to assist the owner(s) of the conserved land and the holder(s) of the conservation easement in the administration and interpretation of the conservation easement by clearly depicting the presumed boundaries of the protected property, calculating the approximate acreages, and showing the approximate locations of any excluded lands, farmstead or homestead complex, farm labor housing complex, or special treatment areas.*

**THIS MAP IS NOT A SURVEY**

Invasive Plant Polygon  
Assessment Map  
Berlin Town Forest  
October, 2022



**Invasive plant polygons**

**Species**

- Common buckthorn
- Bush honeysuckle
- Goutweed
- Wall lettuce
- Protected Property
- Trails

**Scale**

1:6,000

Feet: 250 125 0 250 500 750

Meters: 50 25 0 50 100 150 200

*This map is not a survey or subdivision plat, and should not be used or construed for such purposes. It was prepared without the benefit of field measurements or extensive title research. It is intended solely to assist the owner(s) of the conserved land and the holder(s) of the conservation easement in the administration and interpretation of the conservation easement by clearly depicting the presumed boundaries of the protected property, calculating the approximate acreages, and showing the approximate locations of any excluded lands, farmstead or homestead complex, farm labor housing complex, or special treatment areas.*

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