

2020 Final Report

Capital Region PRISM

Project Request for Proposals

Name of Contractor: Edmund Niles Huyck Preserve, Inc.

Name and Title of Contact: Anne Rhoads, Ph.D., Executive Director

Project Title: Initiation of Hemlock Woolly Adelgid and Continued Invasive Species Management and Monitoring at the Edmund Niles Huyck Preserve

Contract Number: 20-005

Background

The Edmund Niles Huyck Preserve is a 2,072-acre nature preserve and biological field station founded in 1931. Its mission is to preserve the natural beauty of the Rensselaerville Falls, the watershed of Lake Myosotis and surrounding lands, to conduct long-term research on natural systems as part of a global effort to understand and protect the Earth's biodiversity, and to increase appreciation of this effort through innovative, field-based educational programs for students, teachers, and the community. Because of its four-pronged mission (conservation, education, research, recreation), the Huyck Preserve is uniquely committed to engaging in invasive species management, research, and education as a way of reducing the threats that invasive species pose to natural ecosystems within and beyond its borders. A 2018 NYSCPP Catalyst Grant allowed the Preserve to draft its first invasive species management and monitoring plan which was adopted by the Huyck Preserve Board of Directors in January 2020. In 2019, funds made available through Capital Region PRISM's RFP allowed the Huyck Preserve to initiate active management and monitoring of invasive species for the first time. This 2020 project continued the momentum started last year in managing and monitoring priority species and priority areas through the hiring of seasonal employees and also enabled the initiation of the Preserve's first hemlock woolly adelgid treatment.

Goals

The 2020 goals for invasive species management were as follows:

- Perform the Huyck Preserve's first treatment of hemlock woolly adelgid in a forest stand earning highest priority for protection.
- Monitor and continue management of Tier 1 and 2 species identified on the property with the goal of eradication.
- Eliminate small, discrete populations of Tier 4 and 5 invasive species within the Huyck Preserve that are more widespread regionally.
- Contain Tier 4 invasive populations that are too large or too labor intensive to eradicate for now, but that are relatively discrete and may be prevented from spreading widely across the Preserve.
- Control widespread invasive species in target areas.
- Engage the public by building our volunteer invasive steward base and add invasive species lessons and programs to our education and outreach activities.

Accomplishments

We hired two seasonal invasive species employees under this RFP to work approximately six weeks over the season. One assistant was a 2020 graduate of Ithaca College with a major in Environmental Science. The other attended Paul Smith's College and SUNY Cobleskill.

Hand tools were purchased to perform invasive species management including loppers (1) and pruning shears (2). Contractor bags and a black tarp were purchased for solarization and disposal of plant materials.

General principles were followed when managing for invasive species. The hemlock woolly adelgid treatment was performed by an experienced contractor using well-established BMPs. Invasive plant management was performed by Huyck Preserve Stewardship Coordinator, Garrett Chisholm, and seasonal staff using only mechanical methods. When possible, all plant materials (including roots) were removed and bagged. For plants not removed completely, aboveground biomass was removed with a goal of reducing stored energy and eliminating the plant over a longer period. Following this idea, for shrubs too large to pull or dig, stems were cut near the ground and wrapped in black plastic. Herbaceous plants too widespread to eliminate were cut repeatedly. Sites managed in 2019 as well as those first managed in 2020 were monitored every one to two weeks to check for regrowth, and resprouts were removed. Management activities were logged using iMapinvasives and in-house records were kept for each individual or patch including GPS coordinates, size of patch if relevant, dates managed, activities performed, and people involved.

Priority I – Treat the Lower Falls Hemlock Stand for Hemlock Woolly Adelgid

1. CGL Arbor Services (Angelo Schembari) was hired to perform the chemical application which was performed on May 12, 13, 14, and 20, 2020. Trees >8-inch dbh and with a live crown ratio $\geq 30\%$ were treated in an area delineated by Huyck Preserve staff prior to treatment. Treated trees were marked by the contractor using aluminum tags which included a yellow paint splash indicating the season and year of treatment. The primary treatment method was directed basal bark spray using Imidacloprid and Dinotefuran (Safari) Insecticides. This treatment method was used for trees that were at least 15-feet away from water (Ten-Mile Creek). Trees within 15-feet from water were injected with Imidacloprid.

Post-treatment assessments of the stand were begun in fall 2020 and revealed some residual, HWA. Mark Witmore of the NYS Hemlock Initiative and Angelo Schembari of CGL Arbor Services visited the site with us on December 10, 2020, and we believe that the dry summer impacted the movement of the chemicals in some treated trees. We expect HWA remaining in trees treated in 2020 to be killed by spring 2021, but another assessment will be performed in spring 2021 to confirm this.

Treatment Type	Number of Stems Treated	Total Diameter Treated (in.)
Basal Bark Spray	394	5,839
Imidacloprid Injection	16	212
Total	410	6,051

Table 1. Number of stems treated for hemlock woolly adelgid and diameter treated by treatment type



Fig. 1 Shaded HWA Treatment Area with red dots indicating actual treatment area

Fig. 2 Tree treated with Imidacloprid injection

Fig. 3 Tree treated with directed basal bark spray

Priority II – Monitor and Continue Eradication Efforts of Tier 1 and 2 species at the Huyck Preserve

1. In summer 2019, five patches of yellow archangel (*Lamium galeobdolon*) were removed and monitored. This year, only two resprouts were found, and apparent eradication was reached in August 2020. The lack of resprouts when monitoring in 2020 revealed the importance of removing both the roots and the leaves while managing the patch, with follow-up monitoring required to catch residuals. Continuing this effort of meticulous clean-up of above and below ground biomass will ensure eradication of the species from the Preserve.



Fig. 4 Invasive seasonal crew member performing initial removal of yellow archangel in summer 2019



Fig. 5 One of two yellow archangel resprouts found in the area managed in 2019 and eradicated in 2020

No additional Tier 1 or Tier 2 species were found in 2020.

Priority III - Eliminate or reduce the size of small, isolated populations of mostly Tier 4 and 5 species

1. We monitored the patch of bishop's goutweed (*Aegopodium podagraria*) discovered near the Lake Myosotis boat launch in 2019 and managed that summer. This area was monitored in 2020, and resprouts were found and removed from that area once. An additional patch was discovered on a parcel of land acquired by the Preserve in February 2020. That patch was removed by hand in June, and resprouts found and removed during subsequent monitoring visits. The lack of regrowth from the 2019 patch near the Lake Myosotis boat launch guided management of the 2020 patch. The two patches grow under different light conditions (Lake Myosotis patch is shaded, while the new patch is on the sunny roadside), and we are curious how this will impact growth and management. The modest size of these patches meant that a focus could be on the complete removal of the root system. Follow-up monitoring of the regrowth from any residual roots will help with eradication of the populations.



Fig. 6 and 7 Bishop's goutweed found on new Huyck Preserve parcel (left before, right after)

2. February daphne (*Daphne mezereum*) exists in one location on the Huyck Preserve property. This year, the site was monitored every two weeks. Twenty-five young plants were found when first monitored in August. It is unclear whether these were sprouts from residual roots or seedlings from seeds remaining in the soil. Subsequent monitoring visits found and removed fewer stems. Future work will evaluate if this population has been eradicated.



Fig. 8 February daphne sprout at the Huyck Preserve in 2020

3. False spiraea (*Sorbaria sorbifolia*) is found in two locations at the Huyck Preserve. In 2019, the above-ground biomass of one patch was fully removed and subsequently monitored and managed. In 2020, root sprouts were pulled on a biweekly basis. The second, larger (25mx35m) patch, that was only 50% managed in 2019, had all aboveground biomass removed in 2020 and was monitored for regrowth. Many root sprouts in 2020 came from large residual roots from 2019 management. Removal of the remaining biomass from the larger patch was crucial for its successful management. Because of persistent roots, continued monitoring and removal will be needed until the patches are deemed eradicated.



Fig. 9 Large false spiraea patch on Loop Three Trail before management

Fig. 10 Removal of bags of false spiraea from large patch

4. European privet (*Ligustrum vulgare*) was originally planted along the driveway to Davis Cottage and the boat launch on the Huyck Preserve's Lake Myosotis. Because of last year's management, shrubs did not flower or set fruit this year. In November of this year, shrubs were again cut. Repeated cutting of the shrubs will be necessary for containment until the shrubs can be removed in entirety.



Fig. 11 European privet along Lake Myosotis driveway before management in 2020

Fig. 12 European privet along Lake Myosotis driveway after management in 2020

5. The 2017 plant inventory showed only eight autumn olive (*Elaeagnus umbellata*) plants, but in summer 2019, 38 individuals were identified. All were either pulled out or, if too large, were cut and solarized with black plastic. Much of the 2019 management effectively eliminated individuals. Monitoring and re-treatment of 18 managed sites occurred in 2020. We have learned that stumps must be cut back as close to the ground as possible before being solarized with black plastic to prevent resprouting year to year. Additionally, 16 new individuals were found, treated, and monitored in 2020.



Fig. 13 2020 Autumn olive before treatment

Fig. 14 2020 Autumn olive after treatment

6. Common barberry (*Berberis vulgaris*) is emerging at the Huyck Preserve, particularly near the Lake Myosotis beach and along roads. In 2017, three individuals were identified. In summer 2019, 18 individuals were found and managed. No new individuals were found in 2020, but three plants managed in 2019 required additional treatment and were cut and solarized in 2020 and monitored for regrowth. The four individuals that did not return in 2020 had the entirety of their root systems removed in 2019, guiding management for 2021. Time will be dedicated in early spring 2021 for full removal of remaining root systems. Continued monitoring of these managed sites and in the remainder of the Preserve will be necessary to ensure that the species has, in fact, been eliminated.



Fig. 15 Common barberry before treatment in 2020

Fig. 16 Common barberry after treatment in 2020

7. Burning Bush (*Euonymus alatus*) was planted at the Huyck Preserve in front of Ordway house and has escaped from there and other locations in the hamlet to the Lake Myosotis beach, the forest near the Visitors' Center, and to other limited Preserve locations. Of the nine individuals managed in 2019, four required follow-up management this year, with root sprouts pulled and roots dug out. Individuals that were solarized in 2019 had the plastic removed and the stump cut back to be solarized again in 2020. Root sprouts that appeared in 2020 from 2019 management revealed that eradication will not be possible without the complete removal of the root system.



Fig. 17 Roots and sprouts from previously managed burning bush



Fig. 18 Solarized large stump of burning bush

8. Last year's management and monitoring efforts were effective in significantly reducing our only population of water chestnut (*Trapa natans*) (on Lincoln Pond). A total of 15 mature plants were found in 2020. It is unclear if these are coming from an off-site upstream source or are the result of seeds germinating from the long-lasting seed bank in the pond bottom. Lake Myosotis and Ten-Mile Creek (the connector between Lincoln Pond and Lake Myosotis) were monitored for water chestnut throughout the growing season, but no plants were found outside of Lincoln Pond.



Fig. 19 and 20 Water chestnut on Lincoln Pond in 2020

9. Monitoring of Lake Myosotis in the areas managed for Eurasian watermilfoil (*Myriophyllum spicatum*) and curly-leaf pondweed (*Potamogeton crispus*) in 2019 and across the entire lake was performed beginning in June 2020. A significant population of Eurasian watermilfoil was

again located on the north side of Lake Myosotis and removed throughout the summer. Curly-leaf pondweed was hand pulled from the north side of the lake. The lake was monitored every week and any remaining individuals removed. We recognize the limitations of non-chemical control of these two species but hope that with weekly management throughout the growing season we will contain and reduce the population. Future monitoring should continue to look for remains of the population and ensure that management does not contribute to the problem through growth of fragments.



Fig. 21 and 22 Eurasian watermilfoil on Lake Myosotis



Fig. 23 Curly-leaf pondweed on Lake Myosotis

Priority IV. Contain Tier 4 invasive populations that are too large or too labor intensive to eradicate

1. In the 2017 inventory, pale swallow-wort (*Vincetoxicum rossicum*) was found on the Loop One Trail. In 2019, a smaller patch was also found along the Wheeler Watson Trail. The population along the Wheeler Watson Trail continued to be monitored in 2020 and remaining individuals were hand pulled. The larger Loop One Trail patch was managed using a weed trimmer with approximately 70% managed. The goal for Wheeler Watson is eradication through continued pulling of plants before fruiting. The goal for Loop One is containment through frequent cutting back at the start of and throughout future growing seasons. Using a weed trimmer to cut back the plant before fruiting will aid in containment and gradually diminish underground resources. A solid crew of seasonal and regular staff and volunteers beginning management early in the season with repeated cutting throughout is needed to fully complete the work.



Fig. 24 and 25 Kristopher Williams (left) and Huyck Preserve seasonal assistant Gavin Berdan (right) weed trimming pale swallow-wort

Eight populations of black swallow-wort (*Vincetoxicum nigrum*) are known to exist at the Preserve. In 2020, two small populations were managed through hand-pulling and two were cut back to control spread. This is the first time that management of black swallow-wort has taken place, and future monitoring and management efforts will focus on reducing populations and preventing spread. Follow-up monitoring occurred twice after initial management was completed, with resprouts only being found during the first monitoring visit. Containment of the two larger populations will follow the same principles as those used in the large patch of pale swallow-wort.



Fig. 25 Black swallow-wort before management

2. *Phragmites* (*Phragmites australis*) was managed for the first time in 2020 at both Hennicke and Hagaman marshes. At both sites, stems were broken at the base or cut below the waterline when possible and biomass was laid flat and left in place. At Hagaman Creek, 25% of the patch was also covered with carpet to see how effective this method would be at preventing regrowth. Future management will be needed to contain these populations, and monitoring will assess the effectiveness of these techniques.



Fig. 26 and 27 Phragmites at Hennicke Marsh before (left) and after (right) management

Priority V. Control widespread invasive species in target areas

1. Japanese knotweed (*Reynoutria japonica*) is widespread on Preserve property south of the Hamlet of Rensselaerville along Ten-Mile Creek, but may be containable in the core area of the Preserve. The intensive mechanical management in two patches begun in 2019 was repeated in 2020. On three occasions, both patches were cut to the ground and all biomass bagged and removed. Additionally, two small patches of Japanese knotweed were found on a parcel of

land acquired by the Huyck Preserve in February 2020. These patches were managed using the same protocols and timing as the other two sites. Our goal is to repeat this throughout every growing season as a way of depleting the plants' stored resources until they can no longer resprout.



Fig. 28 Japanese knotweed on new Huyck Preserve parcel before treatment in 2020

Fig. 29 Japanese knotweed on new Huyck Preserve parcel after treatment in 2020

2. Japanese barberry (*Berberis thunbergii*) is the second-most abundant species at the Preserve with individual shrubs scattered across the Preserve property. Management in 2020 consisted of using a weed wrench to remove individual plants from the most heavily-trafficked trails at the Preserve, especially along Lincoln Pond trail and south of Lake Myosotis along the Ten-Mile Creek. Bushes were cut back to the base and, when possible, roots were removed.



Fig. 30 Seasonal assistant Gavin Berdan removing Japanese barberry near Lincoln Pond

Fig. 31 Large patch of Japanese barberry near Lake Myosotis

Priority III. Education and Outreach

The Huyck Preserve's mission includes an imperative to increase appreciation of the preservation of Earth's biodiversity "through innovative, field-based educational programs for students, teachers and the community." This year, our education efforts were hampered by Covid-19; we did not run our summer k-16 education program and had almost no public events. We did, though, begin a new Adopt-a-Trail program and have eight new trail stewards monitoring our 12+ miles of trails and performing light trail maintenance which includes invasive species management along the trails. We also worked with volunteer middle school students who helped with Asiatic bittersweet (*Celastrus orbiculatus*) management near our Lake Myosotis beach and worked on Eurasian watermilfoil monitoring and management. We also published several articles related to this project in our fall newsletter¹ including an update on the year's invasive plant work, a report on HWA at the Preserve, and a new, regular newsletter column with news from the land written by Garrett Chisholm, Stewardship Coordinator. We look forward to bringing back public work days and education events as we can.

Summary

In 2020, the Huyck Preserve elevated its commitment to invasive species management when we hired our first Stewardship Coordinator, a regular (non-seasonal) position. Even with this dedicated staff person, without a seasonal crew, it would be impossible to maintain the pace of progress that we have begun to achieve. This 2020 RFP allowed the Huyck Preserve to continue the momentum in invasive species management and monitoring started last year. We know that invasive species management is a long-term process, and continuity in funding also supports our learning from past efforts. As time passes and we return to managed sites for monitoring visits, we learn more about the effectiveness of our management techniques and make adjustments to our strategies. This is information that helps us better reach our own goals but can also be useful to others working on invasive species management outside our organization.

A significant result of this RFP was the first treatment of HWA at the Huyck Preserve. This critical treatment not only protects an infested high priority hemlock stand, it also slows the spread of HWA to other priority stands across our 2,000+ acres and beyond. Public outreach about the project increased our supporters' knowledge of the risks of HWA and treatment options.

The Huyck Preserve and invasive species management are becoming synonymous in our area, and people are beginning to look to us to learn more, whether through work days, or in years like this one, through outreach materials.

¹ https://www.huyckpreserve.org/uploads/2/4/5/6/24560510/newletter_fall_2020.pdf

The Huyck Preserve has made a long-term commitment to controlling and eradicating invasive species on our 2,000+ acres. The funds, connections, advice, and time provided by Capital Region PRISM make this work possible and help us reach our goals for ecological conservation.