

Non-Native Invasive Species Management Plan for;
Jonathan and Anna-Marie Pierce
Parcel 38.-3-9
Rockwald Ln
Philipstown, NY

Prepared by;
Thomas Lewis, Principal
Trillium ISM, INC
26 February 2022

I – Introduction

A. Site Description

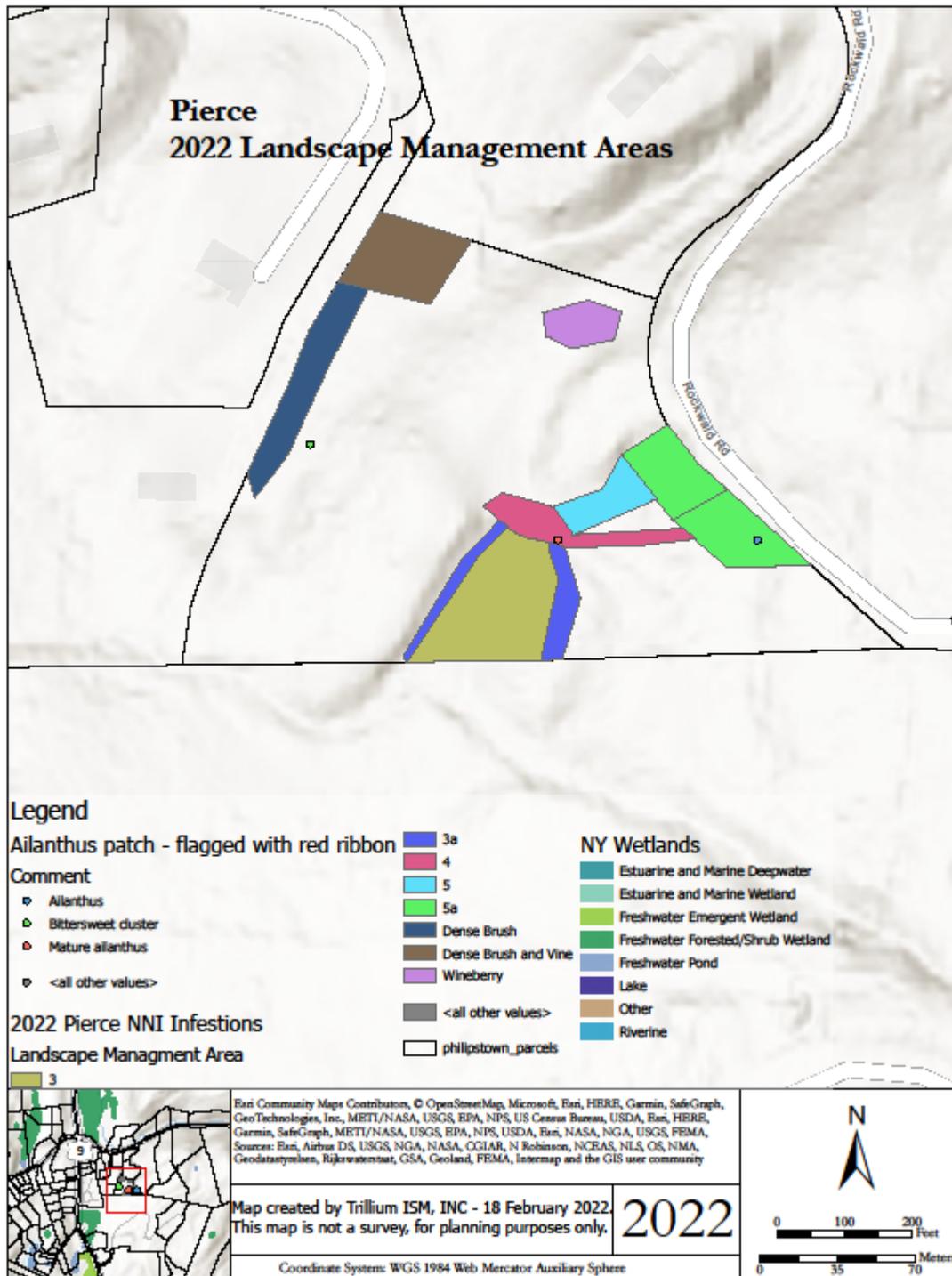
The site is a wooded parcel, approximately 5.4 acres in area, that is planned to be developed for residential use. The driveway descends from Rockwald rd., heads West and passes through a complex of forested, ephemeral streams and wetlands. The eastern edge of the parcel is the height of the land and is bounded by Rockwood Road. Much of the parcel is invaded by a suite of non-native invasive (NNI) plants. Some are dispersed by water from uphill, many are bird and wind dispersed. Native plant communities remain in some areas and may be a source for propagule, plant rescue and guide restoration efforts.

The NNI species present were likely introduced via wildlife, wind and hydrology. In general, the edges of the property are more densely invaded, with the notable exception of garlic mustard which occurs throughout much of the parcel. A list of NNI observed on-site may be found in the table below. All NNI are also present on adjacent properties; indicating that most NNI control goals will realistically be for suppression.

The productivity and spread of existing NNI populations will likely increase as site development introduces soil disturbance and increases sunlight available to the ground level. In order to sustain native plant community restoration, monitoring and control will be required into the foreseeable future.

The goal of this management plan is to enable restoration activities by providing options for NNI management activities throughout the property. Specific recommendations are provided for disturbed areas, wetlands, restoration areas, watercourses and buffer areas. Several recommendations are made for specific Landscape Management Units that were developed by Hudson Garden Studio, LLC.

Management activities within much of this plan are for areas that are regulated by the Town of Philipstown. An annual permit from the Town of Philipstown is required in order to implement management actions that employ herbicides within the wetland, watercourses and buffers.



Note: where not specifically mapped, all NNI plants exist at low-medium density throughout the site. It is recommended to manage low-medium density areas before beginning management of high-density areas.

B. Management Recommendation Summary

This plan recommends a strategy of removal and suppression for the majority of invasive plants found onsite. Tactics towards this end include propane torching, hand-pulling, cut-stem application of herbicide, brush mowing and foliar application of herbicide.

More selective application techniques are to be employed within the wetland and its buffer. No applications of herbicide may contact Waters of the State without an Article 15 permit from the NYSDEC. No recommendations within the plan call for applications to Waters of the State.

Management options have been provided for;

- a. Invasive brush and vines – Elimination and suppression by use of propane torching, cutting, cut-stump treatment and foliar application.
- b. Invasive herbaceous perennials (i.e., mugwort and garlic mustard) – hand pulling and foliar application of herbicide.
- c. Japanese stiltgrass – to be updated in mid-May – potential options include propane torching, foliar application of herbicide and hand-pulling.
- d. Ailanthus altissima – tree of heaven – basal bark and frill application of herbicide.

Recommended herbicides:

Rodeo (EPA Reg. No. 62719-324) – glyphosate – nonselective herbicide (water carrier)

Vastlan (EPA Reg. No. 62719-687) – triclopyr – broadleaf selective herbicide (water carrier)

Pathfinder II (EPA Reg. No. 62719-176) – triclopyr – broadleaf selective herbicide (oil carrier)

Segment II (EPA Reg. No. 7969-398) – sethoxydim – grass selective herbicide (water carrier)

-Alternative herbicides may be used per applicator's judgement, providing the product is labeled for the target and location.

-Application rates vary by product and target; read the label carefully before using any pesticide.

II – Invasive Species Inventory

Latin Name	Common Name	NYS Invasiveness Rank	LHPRISM Priority Category
Exotic Invasive Plants			
Ailanthus altissima	Tree-of-heaven	M	Tier 4
Alliaria petiolata	Garlic mustard	VH	Tier 4
Artemisia vulgaris	Common mugwort	H	Tier 4
Berberis thunbergii	Japanese barberry	VH	Tier 4
Celastrus orbiculatus	Oriental bittersweet	VH	Tier 4
Lonicera japonica	Japanese honeysuckle	VH	Tier 4
Microstegium vimineum	Japanese stiltgrass	VH	Tier 4
Rosa multiflora	Multiflora rose	VH	Tier 4
Rubus phoenicolasius	Wine berry	VH	Tier 4

This inventory was conducted in Winter 2022 and should not be considered exhaustive.

A review of the New York Invasive Species Map (iMapInvasives) found records nearby for species that should be monitored for on the property;

Forest Pests;

- Emerald Ash Borer (EAB) – This is a common forest pest that is killing >90% of our ash trees, of all species. Any ash trees on the property that are deemed worthy of preservation would require annual treatment with a pesticide. This is typically not recommended except for special cases, i.e., specimen trees, which have not been observed on the property.
 - o Note that dead Ash trees may be very dangerous to fell and should be considered hazardous.
- Non-native Invasive Plants.
 - o Mile-a-minute – *Persicaria perfoliata*
 - o Japanese angelica tree – *Aralia elata*
 - o Black swallow-wort – *Cynanchum louiseae*

Many widespread (Tier 4) invasive species were observed in the immediate vicinity of the site. A list of widespread species may be found at lhprism.org along with a description of the Tier system.

III – Control Strategy Guidelines

- A. Prevention – Always the first line of defense when managing for invasive species, this section outlines ways that invasive species may enter the property and associated mitigation to reduce potential invasion.
- a. Introduction - As human traffic increases on a property, so does the risk of unintentional introduction of invasive propagule. The sources can be heavy machinery and equipment used in site development or forest management, such as log skidders, skid/track steers or dump trucks. Seeds easily hitch a ride in metal tracks, tire treads, and mud-caked surfaces. Perhaps more surprising and easily over looked is the spread of seeds through visitors’ and workers shoes, clothing, and pets as they pass through the site. Properly cleaning equipment before working on the site will lower the chance of bringing in unwanted plant and insect travelers.
 - b. Clearing - The removal of trees opens the canopy and exposes once shaded areas to sunlight. The newly created growing space will fill with vegetation from seeds that were banked in the understory. The release of the canopy in a pristine environment will fill with native plants, however in an area with invasive species looming around the site, this opening could usher in an opportunity for NNI to proliferate rapidly. To combat this, the area should be surveyed, and any unwanted species treated prior to any forest composition changes.
 - c. Soil Disturbance - Any type of soil disturbance also creates a growing space for highly competitive plants such as invasive plants. Simply removing vegetation that acted as a ground cover can create a gap in which light reaches the soil and provides the needed amount of energy for invasives to germinate. More drastically, if the soil is overturned this can bring invasive seeds to a convenient growing depth. Further, moving soil, fill and debris intra-site may transport and spread NNI.
 - d. Soil Importation – When soil or fill is brought to a site, it often contains propagule of the plants growing at the soil’s origination. Unfortunately, all too often this means the importation of NNI propagule. Any soil/fill brought onto site should be carefully monitored for NNI growth. Rapidly responding to new introductions will reduce the effort required to manage infestations in the future.

B. Control Strategy Specifications

a. Invasive brush and vines –

Multiple species of woody invasive brush and vines were found on the property. These all spread rapidly in this area and are an ecological threat. Shrub species create dense patches that block sunlight and crowd out native plants. Some shrubs such as barberry and multiflora rose provide harbor for ticks and their hosts such as mice. Invasive vines present a structural threat to the forest by smothering shrubs and trees, toppling them, and eliminating a layering of canopies.

Infestation Comments:

Several species of invasive brush and vines were found on-site. They were found in variable density throughout the entire site. NNI infestations comprised primarily of Japanese barberry, multiflora rose and oriental bittersweet.

Treatment recommendations:

Wetland and edge (LMA 3 and 3a) – Propane torching of shrubs and stiltgrass in July with follow-up treatments as required. Cut-stem application of glyphosate to oriental bittersweet, before April and after May.

Remainder of property –

- Oriental bittersweet – Cut stem application of glyphosate vines before April and after May.
- Brush
 1. Cutting of above-ground woody invasive stems, to occur in the dormant season, prior to April 15th and after November 1.
 2. In following summer, target regrowth with cut-stem and foliar applications of herbicide, propane torching, or repeated cutting. Use of glyphosate is recommended where dense infestations occur with few non-targets plans nearby and triclopyr where targeting with a selective herbicide is appropriate.
 3. Assess regrowth and retreat as required. If regrowth was dense, brush mowing may be required to break up dead stems after treatment.
 4. Monitor for seedlings. Dense seedling growth may be treated with herbicide, otherwise hand-pulling is most effective, though time consuming.

Notes:

Honeysuckle vine – may be hand pulled, propane torched or treated with cut-stem application of glyphosate.

It is best practice to leave non-hazardous vine debris remaining in shrubs and trees. There will reduce the potential of injury to the non-target plant.

All cut material should be chipped, or piled to deteriorate in a dry location.

b. Invasive herbaceous biennials and perennials –

Control of invasive herbaceous plants must be exercised during the growing season. These plants have resilient tap roots or dense root systems that make non-chemical control a challenge. Digging of these plants (not including hand-pulling of wineberry and biennials like garlic mustard) often results in significant soil disturbance, and root fragments may spread the infestation; as such, digging is not recommended except for very small infestations. Frequent cutting may reduce root mass to the point of elimination. Cutting may also be timed to suppress seed production.

Treatment recommendations:

Garlic mustard (evident in winter throughout all Landscape Management Areas)– Control would improve habitat throughout the property and is particularly suggested wherever restoration plantings are incorporated.

May be hand-pulled prior to seed formation in late Spring. Foliar applications of triclopyr are an effective treatment in Spring and Fall for densely growing rosettes. If in bloom, plant material must be hand pulled, bagged and disposed of in a landfill or other approved facility.

Common mugwort (LMA 5a) - May be controlled with summer applications of glyphosate. Repeat applications over several years will be required to fully eliminate the dense root structure.

Wineberry - May be hand-pulled.

c. Japanese stiltgrass (*Microstegium vimineum*)

Japanese stiltgrass (*Microstegium vimineum*) is native to China, India, Japan, and Malaysia and is a fast-growing, highly invasive species. It colonizes many ecological niches and creates dense monocultures known to significantly impact arthropod communities. Japanese stiltgrass is susceptible to many types of control activities, but ultimately control is very challenging as the plants produce copious amounts of seeds that are easily spread, highly viable and persist in the soil for up to eight years. The grass spreads easily through its seeds, which can be carried by water, passing animals and humans or become tangled in machinery parts or tire treads.

Infestation Comments – Stiltgrass was observed along Rockwald Rd (LMA 5a) and within the wetland (LMA 3 and 3a). Stiltgrass seems to have been introduced primarily via hydrology. Care should be given to avoid distributing this plant across the site. Dense stiltgrass infestations are evident across Rockwald Rd, uphill from the property. Water flowing from culverts into the site are likely introducing seed. A mid-May re-assessment is required to fully evaluate the infestations.

Control Recommendation– (tentative)

Hand pulling (wetland), Propane torching (wetland) and Chemical control (buffer areas and remainder of site)

Timing -

July-August – Chemical control and/or propane torching – Initial application in early July with follow-up application to take place ~4 weeks later.

September – Monitor for, and collection of, any missed individuals. Any plants with viable seeds should be bagged and disposed of appropriately.

d. Tree of heaven – (*Ailanthus altissima*)

Two stands of this large, quickly growing tree exist on site. One along Rockwald rd., the other along the driveway on the north edge of LMA 3. Both stands are composed of several large diameter trees, both male and female. All trees were flagged with red flagging tape on 2/23/2022. Saplings are evident in the area, but not in abundance. It may be expected that opening the forest overstory will stimulate germination of a large seedbank.

Some of the ailanthus trees onsite had rotten bark and there was large diameter ailanthus deadfall on the ground. This indicates the stand is older and deteriorating. Care should be exercised as the trees may have rotten centers.

When cut without pre-treatment with herbicide, the tree will likely respond with vigorous sprouting from its root system. Herbicide applications are best timed in mid-Summer.

Control Recommendations –

Frill applications of glyphosate to all trees with a d.b.h. of 6” or greater in mid-summer.
Basal bark applications of triclopyr to all trees and saplings with d.b.h. less than 6”, Summer through winter.

Hand pulling of seedlings, at any time.

Stumps of any untreated ailanthus trees felled as part of site-clearing actions should be immediately treated with a cut-stump application of glyphosate.

Trees will rot and deteriorate and become hazards. All treated trees should be removed ~30-90 days after treatment. Trees will not be treated by Trillium ISM without a contract in place between homeowner and “other” tree removal crew that has evaluated the trees for safety.

C. Typical Time Frame for Control Work

The anticipated timeframe of most invasive control projects is approximately six-seven years at any location from when control is initiated. This timeframe allows for approximately three-four years of progressive reductions in the existing infestation and three years of monitoring to ensure eradication. Each infestation will have its own unique considerations that will determine a specific timeframe. A persistent seedbank may extend the timeframe significantly.

Perennial plants:

Typically for perennial plants, infestation density is significantly diminished (>80% reduction) from the first year of control work. However, in subsequent years it will be necessary to follow up with thorough treatments to ensure the remaining stems are eliminated and to monitor for seedlings. Soil disturbance may increase seed germination success. Control in subsequent years is likely to consist of targeted applications such as leaf wiping and cut-stem treatment. It may be expected that patches will be eliminated within three to four years; A persistent seedbank or adjacent source of propagule will extend this timeframe. Monitoring should be continued for at least three years post-control to ensure elimination. Any individual patch may be considered eradicated after three consecutive years of no re-growth.

Annual plants:

Control of annual plant infestations is largely dependent on age of infestation, longevity of seed bank and infestation density. It is exceptionally important to inhibit all seed production in any given year of control. Significant reductions in stem density will be observed in the first few years of control work. However, in subsequent years it will be necessary to follow up with thorough management to ensure the remaining stems are eliminated. It may be expected that patches will be eliminated within three to four years; A persistent seedbank or adjacent source of propagule will extend this timeframe. Monitoring should be continued for at least three years post-control to ensure elimination. Any individual patch may be considered eradicated after three consecutive years of no re-growth.

D. Monitoring

Survey and monitoring of the site will be essential to control the non-native invasive populations on-site and ensuring new introductions do not escape unchecked. Monitoring of control areas will confirm control success and guide any adaptations to the management strategy. Surveys will catch any new invasive species introductions before they get out of hand, at a time where elimination will require less intensive control effort.

V – Management Notes

A. Clean Entry

- a. All vehicles and equipment should be cleaned prior to entry to the property. This is particularly important for any construction or forestry equipment. No earth or plant material should be visible on the equipment before entering the property.
- b. All personnel and visitors should ensure that their shoes, clothing and pets do not have seeds or dirt on them

B. Environmental and Permitting Factors

A review of the NYSDEC Environmental Resource Mapper indicated that no part of this property occurs within a state-regulated freshwater wetland. A Wetland/Watercourse Permit from the Town of Philipstown will be required to implement portions of this plan.

Bats listed as rare and endangered are located in the vicinity of the project site.

Applications around waterbodies should only take place when low water conditions exist to ensure direct application to state waters does not occur.

C. Notes on the Use of Herbicides in Natural Areas

Foliar application of herbicides has the potential for off-target impacts through spray drift. All available best management practices shall be followed to reduce drift potential including, but not limited to, conducting application operations in appropriate weather conditions (low wind, no rain or dew), cutting of the plant prior to (often a minimum of eight weeks) application to reduce target height, conducting applications when water levels are low, and the use of air induction nozzles to increase droplet size if necessary. At times, alternative methods may be employed, such as leaf wiping, cut-stem, basal bark or stem injection, which will reduce potential for off-target impact. This plan prescribes the use of pesticides; all product label instructions and guidance shall be strictly adhered to.

The pesticide application rates and usage herein are recommendations based on research and field experience. When considering the use of pesticides, it is the responsibility of the applicator to fully understand the laws, regulations and best practices required to apply pesticides in a responsible manner. Always thoroughly read the label of any pesticide and consult the NYSDEC or a licensed pesticide applicator with questions.

###