

1.0 INTRODUCTION

Glacial Lakes Conservancy (GLC) is a private, non-profit (501)(c)3 conservation organization with a mission of permanently preserving and protecting land and water resources for future generations. GLC is committed to land protection through private landowner conservation, stewardship of its preserves and easements, advocacy, and community leadership. GLC received funding from the Natural Resource Damage Assessment (NRDA) fund to implement some of these stewardship projects. The goal of this project is to control proliferation of target invasive species on the 143 acre Willow Creek Preserve. Treatment areas will be limited to those that pose a threat to further restoration projects, habitat, or native plant communities. Efforts to eradicate other invasives not listed as target species found in each site are desired, outside of those species; Reed Canary Grass (*Phalaris arundinacea*) and Cattail (*Typha angustifolia*).

Invasive plant species targeted within this project include:

Japanese knotweed (*Polygonum cuspidatum*), giant reed grass (*Phragmites australis*), garlic mustard (*Alliaria petiolata*), buckthorn (*Rhamnus* spp.) and honeysuckle (*Lonicera* spp.). While the site is host to many others.

2.0 METHODS

Ecologists and GIS specialists conducted vegetation surveys of Willow Creek in 2022 to aid in the creation of a Land Management Plan. During this time, they evaluated plant populations evident, Management Areas, and goals within these management areas. All attached corresponding maps and materials have been created using these Management Areas (MA's).

3.0 SITE ASSESSMENT

The Project Area consists of approximately 143 acres along the Sheboygan River and Willow Creek, a tributary to the River. This site was a prior Dairy Farm, owned by the Schuchardt Family. This site contains diverse native species including NHI plant species forked aster (*Eurybia furcata*), Hairy Beardtongue (*Penstemon hirsutus*), and Fragrant Sumac (*Rhus aromatica*), however, heavy competition is posed by the invasives that have proliferated over the years.

4.0 TREATMENT PLAN

Funding for the treatment of the targeted invasive plant species within the Project Area under this plan will occur between 2024-2026.

Treatment Goals:

Initiate management of targeted invasive species within the Project Area including carrying out surveying and monitoring. Improve habitat by targeting and treating a diversity of invasive plant species. Monitoring and management of each species, and adjustment of priorities and treatment methods as necessary. Maintain work logs of management of each species. These logs should

contain; dates of management, control method used, type and amount of herbicide used, approximate area of extent covered each day, as well as any additional notes as necessary. After 2026, the goal is to achieve approximately 75% control of treated phragmites priority areas, not including cattail, black locusts, and reed canary grass and 90% control of treated buckthorn, garlic mustard, and japanese knotweed.

Priority Treatment Areas:

The Project Area is divided into three different priority treatment areas (high, medium, and low). The goal is to treat areas that pose the greatest threat to restoration and habitat success; areas that include large seed bearing or sprouting populations, a low relative abundance of targeted invasive plants when compared to native species (allowing for potential natural regrowth of native species after invasive species are controlled), and/or improves fish and wildlife habitat. Identifying these areas will focus the treatment of targeted invasive plants, identifying the most imperative sites to ensure effective control with available resources. By utilizing effective and efficient management techniques, and monitoring the populations of garlic mustard, buckthorn, Japanese knotweed, honeysuckle and phragmites populations, habitat can be improved. Treatment areas are defined below.

Larger and highly threatening populations have been included in the high priority treatment areas. Treatments of these areas are anticipated to have the greatest impact on invasive plant populations and reduction of seed production. Areas selected for the other treatment include large populations that are congruent with harder to access areas and or lower wildlife benefit.

High Priority Treatment Area: targeted areas of concern that should be first priority when allocating funds. These areas include:

- High Densities of buckthorn, honeysuckle and phragmites
- Areas of concern for garlic mustard beyond the scope of eradication by staff and volunteers.

Other Treatment Area: targeted areas of concern that should be second priority when allocating any additional funds. These areas include:

- Similar populations to the highest priority areas, with less immediate need for restoration due to impending projects surrounding wetland enhancement, aquatic species and fisheries habitat restoration, and stormwater management projects.
- Areas of large populations with lesser benefit to wildlife species.
- Areas that will require additional tools and resources to access, unavailable at this point in time.

Invasive Plant Treatment Specifications:

Recommended methods and timing of management for each species are discussed below. Areas of standing water or within 100LF of standing water may require the use of aquatic-approved herbicides. Herbicide applications in standing water, near standing water, or below the Ordinary High Water Mark (OHWM) may require an aquatic plant management permit. And additionally, AMP permits will be obtained from the WDNR as necessary.

See *Appendix B* for management timelines for each species.

Giant Reed Grass (*Phragmites australis*)

Common reed or often referred to as simply *Phragmites*, is a perennial reed grass that grows 1-6 meters tall, forming dense stands of monotypic live and dead vegetation. *Phragmites*' native range is Australia, originating from the Middle East. It now has worldwide distribution and is considered native in Europe. Introduced in the U.S. in the late 1700s, it is considered a highly invasive wetland species. It is a hardy plant that can survive and proliferate in a range of environmental conditions but prefers a wetland-upland interface. It is often found thriving in disturbed sites with altered hydrology, sedimentation, and nutrient enrichment. *Phragmites* is capable of sexual reproduction aided through wind pollination, but primary spread is clonally through vast networks of underground rhizomes. Control of established stands of *Phragmites* is difficult, and reinvasion is likely if management methodology is not maintained. Few control techniques are effective when used alone, and which control methods should be used are site and condition dependent. It is often necessary to conduct repeated treatments for several years to prevent any surviving rhizomes from resprouting.

Management Specifications:

- Management of Giant Reed Grass or *Phragmites* should follow treatment methods and protocols as outlined within the [Phragmites Statewide Strategy](#) using BMPs and following timelines as outlined to have the most effect with as little harm to native wildlife and plant populations.

Japanese Knotweed (*Polygonum cuspidatum*)

Japanese knotweed is a perennial herbaceous species introduced to the U.S. from Asia in the late 1800s. Creamy white flowers develop in late summer and are attractive to bees. However, knotweed grows very aggressively in disturbed areas and excludes native plants by light limitation, nutrient cycling, and allelopathy. Full sun conditions are preferable although this plant can tolerate shade and a wide range of soil and moisture conditions. Japanese knotweed can be found along roadsides, wetlands, woodland edges, or stream banks. Japanese knotweed spreads rapidly by rhizomes forming large, dense thickets eliminating native vegetation and wildlife habitat. Fertile plants are rare, often spreading by rhizomes washed downstream during flooding.

Due to the nature of this species, it is very important to begin control efforts as soon as this plant is observed. Once established, it is extremely difficult to eradicate.

Management Specifications:

- Management of Japanese Knotweed should follow methods and protocol as outlined within the [Renzi Weed Science Invasive Plant Fact Sheet A3924-11](#) following timelines provided.

Garlic Mustard (*Alliaria petiolata*)

This biennial plant can quickly become a major threat to native woodland vegetation and wildlife. It can tolerate a wide variety of moisture regimes and has evolved to emerge at lower soil temperatures than native plant species. This means that garlic mustard will be present earlier in the spring and easier to manage before native species have emerged. Garlic mustard reproduces rapidly through thousands of prolific wind, water, and animal dispersed seeds that allow this species to spread rapidly and form dense colonies that shade out native wildflowers (forbes) and native tree seedlings. Each seed capsule can contain hundreds of seeds, with many seed capsules forming on each individual. Seeds can remain viable in the seedbank for up to five years. Thus, woodlands with little to no native vegetative component (especially bare soil) can quickly become dominated by garlic mustard unless proper management practices are implemented. The goal is to prevent seed production for several years, long enough for the seed bank to be depleted.

Management Specifications:

- Management and treatment of Garlic Mustard should follow methods and protocol as outlines within the [Renzi Weed Science Invasive Plant Fact Sheet A3924-07](#)

Honeysuckle (*Lonicera* spp.)

Asian bush honeysuckle is a deciduous shrub native to Asia. Historically, honeysuckle was used in ornamental and landscape settings. This species has since escaped and is now considered a highly invasive species in Wisconsin. There are several species of Asian bush honeysuckle present in Wisconsin that tolerate a wide variety of light and moisture levels. Asian bush honeysuckle thrives in disturbed closed canopy mesic sites but can also be found in open meadows and old fields as an aggressive pioneer species. Research has shown that birds who utilize honeysuckle for nesting experience increased predation when compared to native shrubs (Schmidt and Whelan 1999).

Management Specifications:

- Management and treatment should follow methods and protocol outlined regarding species specific best management practices outlined within the [Renzi Weed Science Fact Sheets](#) within timelines provided.

Buckthorn (*Rhamnus* spp.)

Buckthorn is a deciduous shrub introduced to the U.S. as an ornamental hedge species. There are two species of buckthorn found in Wisconsin, common (*Rhamnus cathartica*) and glossy (*Rhamnus frangula*). Common buckthorn leaves are toothed while glossy buckthorn leaves are smooth with hairy undersides. Buckthorn tolerates a wide range of moisture conditions and is competitive in areas of full sun or dense shade. Buckthorn features rapid growth rates, with abundant seed production, long distance seed dispersal, and the ability to spread clonally through underground rhizomes. Buckthorn produces leaves in early spring before most native species and retains its leaves late into fall, making it easy to identify and manage. These species have the potential to colonize an area and decimate the native community, shading out most native herbaceous and shrubby vegetation. The seed bank remains viable for 2 - 3 years.

Management Specifications

- Management and treatment should follow best management practices outlined within the [Renz Weed Science Invasive Plant Fact Sheet A3924-02](#) following timelines provided.

Supplemental Seeding & Planting

Native seeding and planting is recommended following the treatment of an area with invasives that is vulnerable to erosion or unwanted plant establishment. This will encompass most of the 80 plus acres delineated in *Exhibit C*. Each area should be assessed, and planted/seeded with appropriate native plant species and erosion control measures. A list of native aggressive species is identified below which can be used in tandem with other seeds suggested by the contractor and approved by GLC, or as a standalone site specific mix..

Re-seeding & Planting Strategy:

Timing is very important when planting or seeding native perennials. Spring is the traditional time for native seeding, after the initial spring thaw and before the end of June. Late fall is another option when seeding, and may require fewer resources (labor, water, site preparation, etc.) of the land manager. In the fall, seeds may be broadcast on exposed soil and left to frost into the ground; however, seeding too early in the fall may encourage germination as well as increased exposure to wildlife. Seed as near to first snow as possible. Nurse crops and cover crops are often used to prepare an area for seeding. They help with erosion control and weed suppression. A cover crop could be used in conjunction with native seeding. Additional resources for favorable seeding methods can be found through [Prairie Nurseries Guide to Establishing Native Seed](#) and [WIDNR Seeding and planting considerations](#).

Native Seed & Plant Restoration List								
Genus	Species	Common Name	Lowland Forest	Upland Forest	Wet-Mesic Prairie	Mesic-Upland Prairie	Emergent	Seeds/ft2
<i>Agastache</i>	<i>foeniculum</i>	blue giant hyssop		x				1.84
<i>Ageratina</i>	<i>altissima</i>	white snakeroot	x					.86
<i>Aquilegia</i>	<i>canadensis</i>	columbine	x	x				.14
<i>Cryptotaenia</i>	<i>canadensis</i>	honewort	x	x				.21
<i>Desmodium</i>	<i>canadense</i>	Canadian tick-trefoil				x		.13
<i>Monarda</i>	<i>fistulosa</i>	bergamot			x	x		1.61
<i>Rudbeckia</i>	<i>hirta</i>	black-eyed Susan				x		6.34
<i>Rudbeckia</i>	<i>laciniata</i>	golden glow			x	x		.23
<i>Rudbeckia</i>	<i>triloba</i>	brown-eyed Susan			x	x		2.75
<i>Scrophularia</i>	<i>lanceolata</i>	early figwort			x		x	1.26
<i>Symphotrichum</i>	<i>lateriflorum</i>	calico aster				x		.92
<i>Zizia</i>	<i>aurea</i>	golden alexanders			x	x		.25
<i>Bouteloua</i>	<i>curtipendula</i>	side-oats Grama			x	x		1.47
<i>Elymus</i>	<i>canadensis</i>	Canada wild-rye			x	x		5.73
<i>Elymus</i>	<i>virginicus</i>	Virginia wild-rye			x			3.86
<i>Festuca</i>	<i>subverticillata</i>	nodding fescue	x	x				.53
<i>Carex</i>	<i>blanda</i>	common wood sedge		x				.31
<i>Acorus</i>	<i>Calamus</i>	Sweet Flag					x	
<i>Actaea</i>	<i>Pachypoda</i>	White Baneberry	x	x				
<i>Actaea</i>	<i>Rubra</i>	Red Baneberry	x	x				
<i>Allium</i>	<i>Cernuum</i>	Nodding Pink Onion			x	x		
<i>Amorpha</i>	<i>Canescens</i>	Leadplant				x		
<i>Amorpha</i>	<i>Fruticosa</i>	False Indigo				x		
<i>Anemone</i>	<i>Canadensis</i>	Canada Anemone	x	x				
<i>Calamagrostis</i>	<i>Canadensis</i>	Blue Joint Grass			x			

*This is a list of native aggressive plants suitable for revegetation - seeding rates should be stuck to for ones listed. Other rates should be determined by a professional through examination of above listed resources.

Monitoring & Adaptive Management:

Initial and continued monitoring of the extent of invasive species populations is an important aspect of this management strategy. Each species has various dispersal mechanisms allowing for the spread and continued reestablishment of the invasive plants throughout the property. Monitoring treatment practices should occur throughout each management season to determine progress, and adjust priorities and treatment methods as necessary. Work logs detailing treatment of each species should also be created and monitored. Management activities should be adjusted as necessary to allocate available resources. Monitoring activities should follow methodology used in the [Floristic Quality Assessment Protocol](#) and the [General Wetland Survey Method](#). At a minimum each site should be monitored no less than 2 times from March to November each year, the technician will walk the project sites, observing for and collecting GPS locations of invasive species in a Field Map. At each survey location, the technician will record invasive plant species characteristics (Date/time, Identification number, Latitude and longitude, Species identification, Approximate percent cover of each type of invasive species (within polygons), Name of collector, and Photograph(s)). When target invasive species' are observed, they will be collected in the map as either points or polygons. Single plants or small populations of a single type of invasive species that occupy an area less than approximately 10 feet in diameter will be collected in the app as a point. Invasive plant populations greater than approximately 10 feet in diameter or populations including multiple types of invasive species will be collected in the app as a polygon. The cut-off of approximately 10 feet in diameter reflects the accuracy of the GPS unit to be used in this project. In instances where polygons are collected, the technician will walk the perimeter of the polygon, logging the boundaries on the map. For each polygon that is collected, it will be noted if there are multiple types of invasive species intermixed within the polygon. If so, the approximate percent cover of each type of invasive species within the polygon will be estimated (percent cover will be reported as an estimated range, i.e. 1-5%, 5-25%, 25-50%, 50-75%, 75-90%, 90-100%). As a reminder, required control of 60-90% treated priority areas, not including cattail, black locusts, and reed canary grass is necessary for project completion in 2026.

5.0 SUMMARY

The goal of this treatment plan is to restore a diverse native plant community and improve fish and wildlife habitat within Willow Creek Preserve boundaries by targeting dominant invasives consisting of Japanese knotweed, garlic mustard, giant reed grass, buckthorn and honeysuckle. By focusing on the management of these specific invasive plant species and priority areas future restoration activities will be made more possible. Proper implementation of this invasive treatment plan by qualified individuals in collaboration with Glacial Lakes Conservancy and the Project Management Team will ensure native plant communities, fish and wildlife habitat improvements within the property boundaries.