

Oneida County Phragmites Rapid Response Project

Final Report



Project ID: AIRR24219

Project Dates: June 1, 2018 – December 31, 2022

Prepared for

The Wisconsin Department of Natural Resources

Prepared by

Stephanie Boismenu

Aquatic Invasive Species Coordinator and Conservation Technician

Oneida County Land and Water Conservation Department, Rhinelander, Wisconsin

Project Title: Oneida County Phragmites Rapid Response Project
Project Sponsor: Oneida County Land & Water Conservation Department
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Project Oversight and Direction

Stephanie Boismenu, AIS Coordinator & Conservation Technician

Oneida County Land & Water Conservation Department

Michele Sadauskas, County Conservationist
Stephanie Boismenu, AIS Coordinator & Conservation Technician
Jonna Jewell, Office Assistant

Oneida County Conservation & UWEX Education Committee

Jim Winkler, Chair
Collette Sorgel
Robert Thome, Jr.
Linnaea Newman
Tommy Ryden
John Engel, Farmer Rep

Thank you to Wisconsin's Department of Natural Resources for project support, guidance and financial support.

Thank you to Art Hilgendorf, Geospatial Administrator/Assistant LIO Director, Oneida County Land Information Office, for the technical support.

Thank you to James Karow for identifying the Phragmites along the shoreline of his newly purchased property and obtaining verification through the Wisconsin Department of Natural Resources. Had he not taken the initiative to seek verification, the invasive, non-native Phragmites *australis* would have spread throughout the entire Rhinelander Flowage.

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Introduction

This report provides documentation of the accomplishments achieved under Wisconsin's Aquatic Invasive Species (AIS) grant program sponsored by the Oneida County Land and Water Conservation Department (LWCD). Funding for the grant project titled *Oneida County Phragmites Rapid Response Project* was awarded to Oneida County by the Wisconsin Department of Natural Resources (DNR). The original project period, within the contract, was from June 1, 2018 through June 30, 2020. Grant extensions were obtained and the final project period ended December 1, 2022. This report also serves as the "Final Report" identified as a deliverable in the grant agreement.

The LWCD thanks the DNR for their continued support of the County's AIS program. With assistance from the DNR AIS grant program, LWCD managed and eradicated a pioneer population of the invasive, non-native *Phragmites P. australis subs Australis*, and restored the site's shoreline to its original native habitat. These actions helped protect our invaluable water resources, prevented Phragmites from spreading to new waterbodies, created a stronger and more connected community, and provided a brighter future for the lakes, rivers, streams, and wetlands throughout the entire state. Without financial support from the DNR grant program, Oneida County's efforts would have been severely limited.

The concept of this project focused on using a comprehensive and integrated management approach to maintain the biological integrity of the ecosystem and to protect our valuable water resources within and surrounding Oneida County. This was achieved through 13 site visits to obtain pre-and post-treatment and biomass surveys, two herbicide treatments, and monitoring the Rhinelander Flowage for additional occurrences of the invasive. Three years after the last herbicide treatment, no new growth, nor regrowth, had occurred and a diverse community of native aquatic vegetation had moved into the littoral zone where the Phragmites once stood. At this point, the LWCD felt confident that the Phragmites was completely eradicated and on June 30, 2022, the AIS Team restored 450 square feet of the landward shoreline using a diverse mixture of native shrubs and herbaceous ground cover, totaling 234 plants. LWCD is proud of this achievement.

Along those lines, this project contributed to the Oneida County Land and Water Resource Management Plan (LWRMP) for 2020-2029. The plan focuses on local natural resource concerns and provides the basis for local, state, and federal agencies to coordinate implementation of land and water programs. This grant project fits within the LWRMP's first 5-year work plan and has augmented the following goals and objectives within the plan:

Goal 1: Protect and enhance wetlands and surface water quality.

Objective A: Protect and restore shoreland buffers

Objective C: Encourage conservation and restoration of wetland function

Goal 2: Increase our community's natural resources knowledge and inspire stewardship.

Objective B: Build capacity

Objective G: Increase awareness of sensitive areas and species

Goal 4: Protect native species, habitats, and landscapes from invasive species.

Objective A: Continue providing education and outreach

Objective B: Continue early detection and rapid response of invasive species.

Objective C: Control and manage invasive species

Objective D: Restore native species and habitat after invasive species are removed

Objective E: Build capacity through cooperation with other groups.

The Oneida County Phragmites Rapid Response Project was overseen by the Oneida County Conservation and UWEX Education Committee, with day-to-day activities developed and administered by Stephanie Boismenu, AIS Coordinator and Conservation Technician. Field work and technical assistance was provided by LWCD's AIS Program Assistants. Additional support provided by Michele Sadauskas, Oneida County Conservationist, and Jonna Jewell, Administrative Assistant.

Problem Statement

In 2018, a 643.81 square foot pioneer population of the invasive, non-native Phragmites *P. australis* subs *Australis* was identified along a riparian shoreline located on the Rhinelander Flowage in Oneida County, Wisconsin (Figure 1). At the time of discovery, the stand was monotypic and growing in both the water and on land. Phragmites is an NR40 Prohibited invasive species in Oneida County and it is of the utmost importance to implement rapid control, management, and eradication efforts that will protect the biological integrity of the Rhinelander Flowage's ecosystem and prevent phragmites from spreading to other waterbodies.

The invasive, non-native phragmites *australis*, also known as common reed, is a tall grass that rapidly invades and dominates wet habitats across North America. Once established, it aggressively invades exposed lake beds, shorelines, marshes, streams, swamps, rivers, roadside ditches, heavily disturbed sites and other low, wet areas. The dense stands limit access to hunting areas, block sunlight, eliminates native plant diversity, food sources, nesting habitat, and reduce stop over locations for migratory birds. In Wisconsin, phragmites is regulated under the NR40 Invasive Species Rule and classified as a Prohibited species in Oneida County and counties in the western half of Wisconsin. The Rhinelander Flowage site is the third phragmites site in Oneida County.

Project Area

The phragmites site is located at 3984 Harbor Drive, Rhinelander, which is situated in a bay at the southeast end of the Rhinelander Flowage, Oneida County, Wisconsin (Figure 2). The Rhinelander Flowage is a 1372-acre drainage impoundment of the Upper Wisconsin River, located within the Rhinelander Flowage watershed. It has a maximum depth of 10 feet. The substrate consists of 75% sand and 25% muck. There are five public boat launches. The Flowage is a popular and busy recreational waterbody, both in the summer and winter. Musky, panfish, largemouth bass, smallmouth bass, northern pike and walleye inhabit the lake. Special features include wild rice beds, wetlands, upland forests, and habitats that support abundant wildlife. Eagle and osprey nests are common, loons and a variety of waterfowl, shorebirds, and wading birds use the lake for migration and nesting. Over 250 dwellings, one resort, and three bars are located on the shoreline. The Rhinelander hydroelectric dam, owned by Expera Specialty Solutions, maintains the water levels. There is not an active lake association on the Rhinelander Flowage.

Project Development

In May 2018, James Karow (landowner), riparian owner on the Rhinelander Flowage, suspected the tall grass along his shoreline was non-native phragmites. He had recently purchased the property, so it is not known how long the phragmites stand existed at that location. The landowner submitted a specimen to the DNR. The DNR sent the specimen to Dr. Robert W. Freckmann at the UW-Stevens Point Freckmann Herbarium for verification. On June 7, 2018, Dr. Freckmann reported "the Phragmites as *P. australis* subs. *Australis* – the alien Phragmites." The DNR contacted both the LWCD and landowner to discuss control and funding options. The LWCD agreed to manage the site and sponsor an AIS Early Detection Rapid

Response project through the DNR's Surface Water Grant Program because landowner was not an eligible sponsor. The LWCD and landowner worked closely with the DNR to establish and implement the Oneida County Phragmites Rapid Response project with the following goals and objectives.

Goal: obtain genetic verification; monitor control, map and eliminate a small isolated population of the non-native phragmites *australis*; and site restoration.

Objective: Before control actions begin, further genetic testing is necessary to confirm the site is actually the non-native subspecies. If non-native, LWCD will assist the landowner with two consecutive years of chemical treatment of phragmites and restore the shoreline habitat using native plants. Prevent phragmites from spreading throughout the Rhinelander Flowage and to other waterbodies.

Methods

The LWCD staff conducted 13 site visits to obtain pre-and post-treatment surveys, established fixed photo points on the site to record changes over time, removed seedheads and biomass, coordinated two herbicide treatments and permits, and monitored the Rhinelander Flowage for additional occurrences of the invasive phragmites, of which none were found, and restored the shoreland area.

Project Implementation

Timeline of Activities

<u>Site Visits</u>	<u>LWCD Field Staff</u>	<u>Activities</u>
06/28/2018	Stephanie, Aubrey, Jodi and Vanessa	Initial site visit and seed head removal
05/24/2019	Stephanie and Isaac	Pre-treatment monitoring
07/30/2019	Stephanie	Pre-treatment monitoring
10/18/2019	Stephanie	Post treatment monitoring
10/22/2019	Stephanie	Pre-treatment monitoring
11/01/2019	Lauren	Post-treatment monitoring
06/04/2020	Stephanie, Aubrey and Rachel	Monitor & biomass removal
09/08/2020	Stephanie	Monitor, post-treatment
07/13/2021	Stephanie	Monitor, post treatment
06/14/2022	Aubrey, and Madeline	Monitor, post treatment
06/23/2022	Stephanie, and Madeline	Prepared site for restoration
06/29/2022	Stephanie, and Madeline	Prepared site & purchased plants
06/30/2022	Stephanie, Aubrey and Madeline	Site restoration
<u>Additional Phragmites Monitoring</u>		
10/18/2019	Stephanie and Lauren	Monitored Rhinelander Flowage via boat
<u>Herbicide Applications</u>		
07/31/2019	Lee Shambeau, 4 Control, Inc.	Herbicide application
10/23/2019	Lee Shambeau, 4-Control, Inc	Herbicide application

Field Notes

On June 28, 2018, the LWCD's AIS Team made their initial visit to the Rhinelander Flowage phragmites site and were amazed by the maturity and density of the stand. They obtained quantitative data on stem density, native species diversity, littoral zone characteristics, and GPS coordinates around the outer perimeter of the stand (Figure 3 & 4). Photos were taken at key locations to assist in visually tracking changes through time. In addition, they walked along the rest of the landowner's shoreline and dock to

visually scan out across the water for other populations of phragmites within the bay. No additional plants were observed.

Three fourths of the plants were in standing water, and one quarter of the plants were on land. The entire stand runs parallel along the landowners riprap shoreline for 60 feet and extends about 1 foot onto the neighbor's property to the west. The dimensions around the stand resulted in an oblong polygon and measured 643.81 square feet (.02 acres). The plants in the littoral zone extended water ward for 10 feet with a maximum water depth of 2 feet and stem density was 75%-100% coverage. On the landward side of the stand, individual and small clumps (5 stems or less) of phragmites emerged between the rock riprap and through the mowed lawn. A diverse mix of native submerged, emergent, and floating leaf aquatic plants were present around the outer edge of the stand and a few were scattered throughout the phragmites stand (Figure 5). Several frogs were observed in amongst the rock riprap.

During this site visit, the Team cautiously and carefully cut off the seed heads to prevent seed dispersal via wind and water, and starting on the outer perimeter of the stand and working to the center of the stand (Figure 6). The cut plant material was deposited directly into large Rubbermaid containers lined with clear, heavy duty contractor trash bags (Figures 7 & 8). Dead standing biomass was removed and phragmites litter on the lawn and littoral zone was cleaned-up and bagged as well. All trash bags were labeled "Invasive plants – approved by DNR for landfilling" and disposed of in an approved dumpster at the Oneida County Courthouse.

On July 31, 2019, professional herbicide applicator, Lee Shambeau of 4-Control, Inc treated the site with Arsenal (Imazapyr) and Rodeo (Glyphosate).

On September 1, 2019, the landowner contacted LWCD to report the top half of the plants were still green and the culms appeared dead. This news raised concerns that the herbicide treatment may not have work. The landowner provided photos as well that showed exactly what he described (Figure 9). LWCD contacted the DNR to discuss the issue and determined that another treatment should be applied this fall.

On October 18, 2019, approximately 12 weeks after the herbicide treatment, LWCD staff took a boat out on the Rhinelander Flowage to search for additional occurrences of non-native phragmites (Figure 10). Findings: Other than the existing phragmites site, no additional occurrences were observed.

They launched at the public access off of Journey's End Road, located on the north end of the Flowage. The weather was not ideal – it was 55 degrees Fahrenheit, very windy, and partly cloudy, but the waterfowl were abundant. They headed south along the western shoreline to the end of the flowage and monitored the eastern shoreline as they headed north. They meander in and out of bays, around islands, and structures. Both sides of the boat were searched and binoculars were used to scan the shoreline.

As they headed north along the eastern shoreline, they stopped by the existing phragmites to see how it looked after the July 31 treatment. However, due to low water and emerging stumps, they observed the stand from about 75 yards away and noted very little die-back compared to the landowners photo submitted on September 1st. The top of the plants were still green and the lower clum's appeared dead (Figures 11).

On October 22, 2019, LWCD visited the site for a twelve weeks post herbicide application check. Most of the leaves were beginning to turn yellow, which could be a result of fall dieback and/or the herbicide application. All of the plants on land were dead and dead biomass litter was scattered on the ground

(Figures 12 & 13). The majority of the plants standing in the water appeared to have some amount of dieback, but a few plants that were clearly alive as noted by the green leaves and stems (Figures 14, 15 & 16).

On October 23, 2019, Lee Shambeau of 4-Control, Inc., applied a second herbicide application. The following year it was determined the treatment reduced the cover 100%.

On September 8, 2020, LWCD monitored the site to check on the progress from the second herbicide application. The majority of dead biomass had been removed by landowner and all that remained were dead stems sticking out of the ground and littoral zone (Figure 17 & 18). The team pulled 50 dead stems out of the ground and all of the plant parts were dead. In addition, 10 stems, including their rhizomes and stolons, were carefully dug out of the littoral area and all plant parts were dead.

LWCD and Landowner continued to monitor the site for three additional years and new growth nor regrowth were found.

Shoreland Habitat Restoration

In the spring of 2022, nearly three years after the last herbicide treatment, no regrowth nor new growth had occurred and the entire phragmites site remained eradicated by 100%. On the landward side of the treated area, patches of grass starting filling in, but for the most part the ground remained bare soil. Within the littoral zone, a diverse community of native aquatic plants began filling in. A contributing factor to the success of native aquatic plant recovery may have been because the phragmites seed heads were removed before the first herbicide treatment and all phragmites litter was removed after the last herbicide treatment. At this point, the LWCD felt confident that the phragmites had been completely eradicated, the soil along the shoreline on the landward side had had enough time to recover from any potential residual herbicide and was now safe to restore the habitat with native plantings.

On June 30, 2022, the LWCD restored 450 square feet of shoreland habitat using a diverse mixture of native shrubs and herbaceous ground cover, totaling 260 plants (Figures 19-24). The planting area started behind the existing rock riprap, followed the natural contour of the shoreline for 45 feet, and expanded landward for a maximum of 10 feet. Before planting the plants, Curlex NetFree Erosion Control Blanket (100 % biodegradable) was installed in the planting area to protect plants and topsoil from wind and water erosion, while simultaneously promoting ideal growing conditions. The native plants were planted within the Curlex and filled in with compost. The landowner is responsible for watering and maintenance.

The LWCD followed the Natural Resource Conservation Services' Shoreland Habitat Practice Standard #643A and 'Wisconsin Biology Technical Note 1' to establish the planting densities and standards used for this project. Plant numbers were calculated based on the area in square feet to be reestablished and the appropriate density. A total of 260 native plants were chosen based on the sites soil, moisture, light, and existing native vegetation in the area, and the herbaceous ground cover comprised of a minimum of 30% grasses and/or sedges (Figure 25). The planting plan included:

- 9 Shrubs/woody plants
- 158 wildflowers (purchased)
- 26 wildflowers that the LWCD started from seed for the project
- 67 grasses and/or sedges
- 4 bags of compost
- 50 square yards of Curlex and 25 Curlex staples

Results

I am pleased to say that the Rhinelander Flowage phragmites site has been 100% eradicated and the shoreland habitat has been restored with native vegetation. This Furthermore, tracking the changes through time, as shown in Figure 26, has been exciting and gives me hope that similar phragmites projects can have the same success. Factors that may have contributed to the success of this project include:

- Landowner identified and reported the phragmites within a few days of purchasing the property
- Funding was rapidly secured and an effective project plan was developed and implemented
- Phragmites seed heads were removed during first site visit to prevent dispersal
- Phragmites seed heads were removed before the first herbicide treatment
- 2 herbicide applications
- Phragmites litter was removed during each site visit.
- Biomass was removed after the last herbicide treatment
- Soil in the restoration area had nearly three years to recover from any potential residual herbicide
- A native planting plan was established
- Native plants, that are native to Oneida County, were carefully chosen.
- 234 native plant plugs were purchased from a local greenhouse
- An additional 26 wildflowers were provided by LWCD staff that started the plants from seeds collected locally
- Landowner performed 35 hours of volunteer monitoring and management efforts
- LWCD's AIS Coordinator and staff monitored the site often
- Photos were taken at key locations to assist in visually tracking changes through time
- The Rhinelander Flowage was monitored by boat for additional occurrences of phragmites

Appendix

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Appendix A

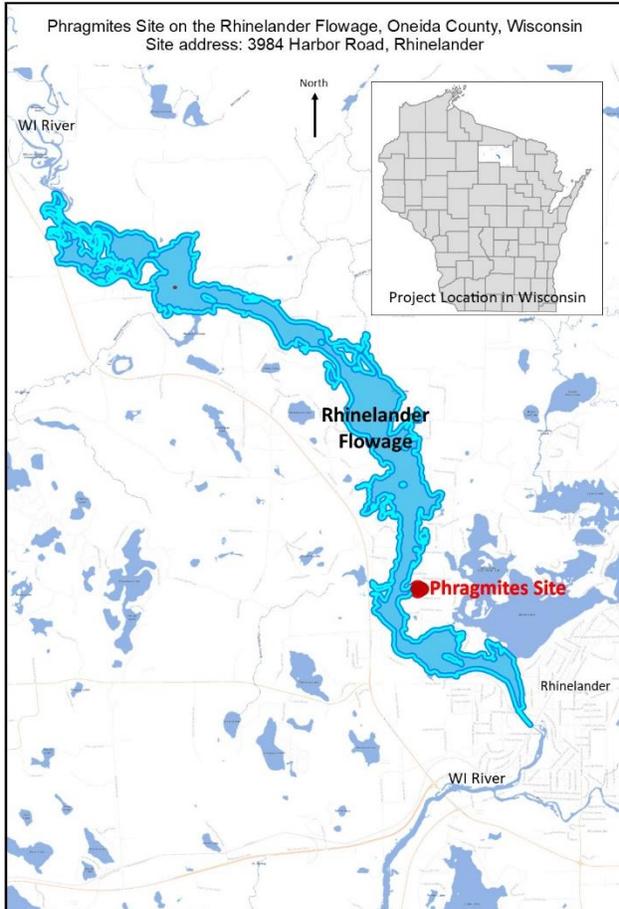


Figure 1. Location of the phragmites site on the Rhinelander



Figure 2. Aerial view of the phragmites site



Figure 3. Photo taken during the initial site visit on 6-28-18. Photo credit Stephanie Boismenu



Figure 4. Photo taken 6-28-18 showing the plants height. Photo credit Stephanie Boismenu



Figure 5. Photo taken 6-28-18 showing a diverse mixture of native aquatic vegetation and the invasive phragmites. Photo credit Stephanie Boismenu



Figure 6. Oneida County AIS Program staff removing seed heads on 6-28-18. Photo credit Stephanie Boismenu



Figures 7 & 8. Oneida County AIS Program staff removing seed heads on 6-28-18. Photos credit Stephanie Boismenu



Figure 9. Photo taken 9-1-19, approximately one month post herbicide treatment. Photo credit James Karow

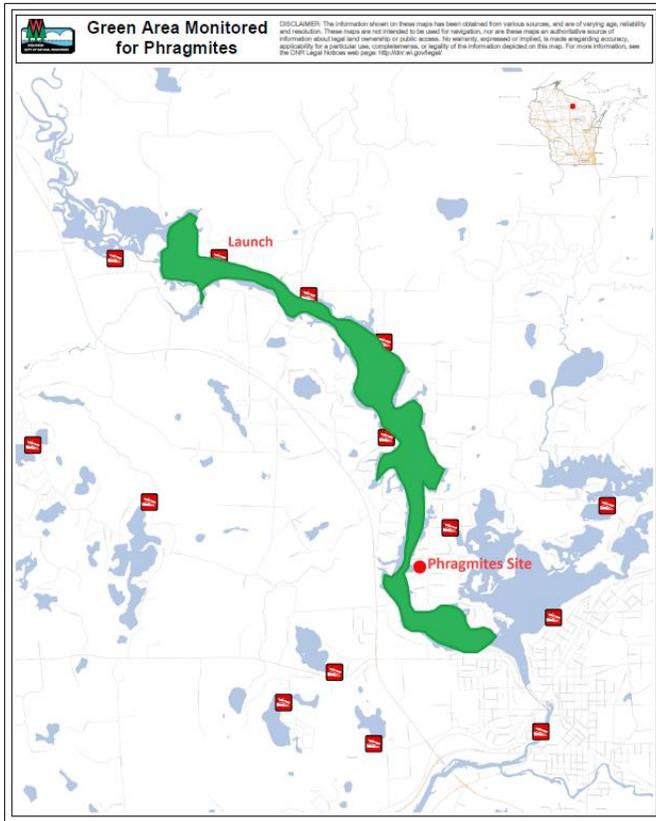


Figure 10. Area in green was monitored for phragmites on 10-18-19.



Figures 11. Photo taken 10-18-19, approximately 12 weeks post herbicide treatment. Photo credit Stephanie Boismenue



Figure 12. Photo take 10-22-19 showing the site twelve weeks post herbicide application. Photo credit Stephanie Boismenu



Figure 13. Photo taken 10-22-19 at twelve weeks post herbicide. Photo credit Stephanie Boismenu



Figure 14. Photo taken 10-22-19 at twelve weeks post herbicide application. Photo Credit Stephanie Boismenu



Figure 15 & 16. Photo taken 10-22-19 at twelve weeks post herbicide application. Photo Credit Stephanie Boismenu



Figure 17. Photos taken 9-8-2020. Photo credit Stephanie Boismenu



Figure 18. Photos taken 9-8-2020. Photo credit Stephanie Boismenu



Figure 19. Photos taken 6-30-22 showing the progression of the shoreland habitat restoration project. Photo credit Stephanie Boismenu



Figure 20. Photos taken 6-30-22 of the shoreland habitat restoration project. Photo credit Stephanie Boismenu



Figure 21. Photos taken 6-30-22 of the shoreland habitat restoration project. Photo credit Stephanie Boismenu



Figure 22. Photos taken 6-30-22 of the shoreland habitat restoration project. Photo credit Stephanie Boismenu



Figure 23. Photos taken 6-30-22 of the completed shoreland habitat restoration project.
Photo credit Stephanie Boismenu



Figure 24. Photos taken 6-30-22 of the completed shoreland habitat restoration project.
Photo credit Stephanie Boismenu

Oneida County Land & Water Conservation Department, AIS Program P.O. Box 400, Rhinelander WI 54501 715-369-7835 Rhinelander Flowage Phragmites Site Removal and Restoration Project AIS Early Detection and Rapid Response Grant ID #AIRR24219		
Project Coordinator: Stephanie Boismenu, AIS Coordinator & Conservation Technician, Oneida Co. Land & Water Site Location: 3984 Harbor Drive, Rhinelander, WI 54501 Property Owner: James Karow		
Plant List		
Shrubs/Woody Plants: Quantity 9 plants. Choose a minimum of 2 species	Number of Pots	Notes
Blueberry	Vaccinium angustifolium	5
Bushhoneysuckle	Diervilla lonicera	2
Red stem dogwood	Cornus stolonifera	0
Virginia's bower	Clematis virginiana	2
		9
Wildflowers: Quantity 158 plants. Choose a minimum of 5 species		
Blue flag iris	Iris versicolor	15
Blue vervain	Verbena hastata	12
Butterfly milkweed	Asclepias tuberosa	10
Cinnamon fern	Osmunda cinnamomea	10
Giant St. Johns Wort	Hypericum perforatum	10
Golden Alexander	Zizia aurea	10
Interrupted fern	Osmunda claytoniana	10
Joe pye weed	Eutrochium maculatum	10
New England aster	Symphyotrichum novae angliae	10
Prairie blazingstar	Liatris pycnostachya	10
Sensitive fern	Onoclea sensibilis	10
Showy blazing star	Liatris ligulistylis	10
Steeplebush	Spiraea tomentosa	8
Swamp aster	Aster puniceus	13
Swamp Milkweed	Asclepias Incarnata	10
		158
Grasses/Sedges: Quantity 67 plants. Choose a minimum of 5 species		
Blue-joint grass	Calamagrostis canadensis	8
Bottlebrush sedge	Carex comosa	8
Lake sedge	Carex lacustris	8
Little bluestem grass	Schizachyrium scoparium	9
Prairie cordgrass	Spartina pectinata	9
Soft rush	Juncus effusus	8
Sweet grass	Hierochloa odorata	9
Switchgrass	Panicum virgatum	8
		67
Total		234 plants
Density: Shrubs 2 plants per 100 sq ft. Herbaceous cover 50 plants per 100 sq ft. The herbaceous ground cover shall be comprised of a minimum of 30% grasses and/or sedges		
2.5" plants/32 pots/flat	225 2.5' plants = 7 flats	4.5" plants =12 pots /flat

Figure 25. List of plants and plant quantities used in the shoreland habitat restoration project.



Figure 26. Photo collage showing the progression of the phragmites site. Photo credit Stephanie Boismenu

