2021 Final Report – SLELO PRISM

Aquatic Restoration Initiative Phase II

Aquatic and Riparian Invasive Species Management and Native Habitat Restoration Project

December 21, 2021

Cardno®

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New York State Environmental Protection Fund,
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Project scope, development and coordination by the
Saint Lawrence Eastern Lake Ontario
Partnership for Regional Invasive Species Management,
hosted by
The Nature Conservancy of New York.

Report prepared by Cardno, Inc.

Contact Brittney Rogers, Brittney.Rogers@TNC.ORG
with questions regarding the Aquatic Restoration Initiative
and this 2021 Phase II final report.

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1 Technical Approach

In accordance with the plans and requirements outlined in the RFQ dated March 1, 2021, Cardno proposed the following tasks in order to accomplish the project goals within the stated budget.

Cardno conducted an in-depth field assessment of all treatment locations on Tuesday, May 25th 2021. Based upon this assessment, it was determined that a NYSDEC aquatics use permit would not be required to complete the on-site herbicide work as none of the treatment areas contained open-water. However, Cardno proposed varying treatment methodologies, as described below, to further mitigate any water-herbicide contact.

1.1 Task 1: Suppress Purple Loosestrife (All Project Locations)

The goal of this task is the establishment of biological controls for local populations of purple loosestrife (*Lythrum salicaria*) found throughout and adjacent to the project areas identified in the RFQ. This control will be achieved over the long term through the release of loosestrife beetles (*Galerucella* spp.). Based upon email correspondence from March 8, 2021, Cardno's understanding is that SLELO-PRISM has coordinated the acquisition of loosestrife beetles with NYSDEC; though a permit for the release of these beetles has yet to be obtained. Based upon this information, Cardno's scope of services covered under this item will include technical assistance for obtaining a permit for beetle release from NYSDEC, along with labor and mobilization costs associated with releasing beetles at each of the three sites indicated in the RFQ. Beetles are to be released in areas where there is no herbicide to be applied to maximize survival. Loosestrife beetle release will occur in early summer (June and July) during the active growth of purple loosestrife and coincide with insect's peak egg laying period.

1.2 Task 2: Suppress Japanese Knotweed (Sandy Creek, South Sandy Creek)

Cardno will utilize an integrated pest management approach to control 2.03 acres of Japanese knotweed by incorporating both mechanical and chemical control measures. Individual plants within 5' of the bank or water's edge (whichever is more applicable) will be stem-injected with a systemic herbicide in order to minimize the potential for absorption into the soil, damage to non-target plants, and introduction into surrounding water. By stem-injecting all plants that are most adjacent to the water, the potential for any spray to drift to the water surface will be mitigated, effectively creating a chemical safety "buffer." Stem injections will be completed using an undiluted Glyphosate-based herbicide. Stems will be injected between the second and third nodule from the ground using best invasive species management practices as recommended by the equipment manufacturer and in accordance with the herbicide label. This method of application has proven to be effective in delivering the herbicide directly to the root zone and eradicating the species with minimal effort. A photograph of the stem-injection process can be found on the next page. All individual stems further than 5' from bank or water's edge will be treated with a foliar herbicide application. This application will be made with a diluted Glyphosate-product at a 2-6% concentration, in accordance with product labeling, to be determined based upon field and site conditions.

Two to three weeks following the stem-injection herbicide application, Cardno will mechanically cut dead biomass utilizing brush saws. At this point, any identified cut live stems can be treated with a solution of Glyphosate. All biomass material of cut Japanese knotweed along the north bank of South Sandy Creek will be initially cut down using brush saws and further mulched in place with the use of a walk-behind brush mower. Due to an inability to access the south bank of South Sandy Creek with the mower, all knotweed biomass will initially be cut down with brush saws then moved by hand into piles. These piles will be covered tightly with tarps for the duration of the growing season. This action will block any UV light from contacting the cut material and prevent it from re-sprouting. Based on the volume of biomass along South Sandy Creek, Cardno believes it will be best to leave any cut material on-site, with utilization of the aforementioned methods to prevent re-growth. By not removing the biomass material from site, Cardno will be decreasing the potential of spread via the transportation of cut material. All cut biomass material on

Seaman's Island along Sandy Creek will be bagged and removed from the site entirely and disposed of at an approved facility. Any re-sprouting vegetation will be treated with a foliar application three to four weeks after mechanical removal, as they will be lower to the ground and easy to treat without impacts to non-target vegetation.

Knotweed stem injection in-process

1.3 Task 3: Suppress Common Reed (South Sandy Creek)

Cardno will mechanically cut and mulch all biomass approximately 0.3 acres of common reed (*Phragmites australis*) followed by foliar herbicide application two to three weeks after mowing and mulching. A second treatment of foliar herbicide application will take place later in the growing season to treat any remaining new growth. This will typically occur mid-fall to improve the effect of the treatment. Low-volume foliar applications will be completed with the use of backpack sprayers or by hand-wicking individual stems when high populations of desirable natives are present. Wetland-approved herbicides will be utilized in accordance with the lowest recommended label rate concentration. Care will be taken to insure appropriate herbicide coverage is achieved, while minimizing overspray and damage to surrounding non-target species. All regrowth within 5' of the water or bank's edge (whichever is more applicable) will be treated with hand wicking in order to mitigate the potential of herbicide contacting the water. All common reed stems inland of the 5' buffer will be treated using the foliar application method mentioned above.

1.4 Task 4: Habitat Restoration (Sandy Creek, South Sandy Creek)

It is assumed that natural recruitment from adjacent natural areas will be the primary means by which these target locations are revegetated. In order to enhance this process, Cardno will install an appropriate Riparian Buffer seed mix to all treatment areas at the Sandy Creek and South Sandy Creek sites. Following the mechanical removal and foliar follow-up treatments, bare soil areas will be lightly graded with hand rakes and seeded via broadcast application. Application of seed will be evenly distributed at a rate of 50 lbs per acre (30 lbs cover crop, 20 lbs native seed). Particular attention will be paid to areas lacking vegetation in order to stabilize exposed soils and reduce the opportunity of re-establishment of invasive species.

Native trees and shrubs provide diversity and structure to wetland habitats while also providing significant long-term competition for invasive early-successional species. In order to enhance the long-term stability and resiliency of the treatment areas, Cardno is recommending the installation of bare root trees and shrubs on 10' spacing throughout the various treatment areas. Prior to installation, a Cardno supervisor will survey the areas to compile a list of appropriate species and planting locations. The supervisor will

take into account any variations in terrain and soil moisture to ensure the species planted will be able to thrive over the long term. Cardno proposes planting approximately 1,200 bare root seedlings throughout the treatment areas and will work with SLELO PRISM and The Nature Conservancy to finalize the species planting plan.

1.5 Task 5: Outreach: Interpretive Panel (South Sandy Creek)

Cardno will draft, design, provide specifications, and install one education and outreach interpretive sign detailing the habitat restoration project. All exterior signage will be weather tight, rigid and flat, free from warping and bowing, and resistant to scratching, ink, paint, crayon, steam, acids, and fragrances. All ink, crayon, or paint markings should be readily removable with soap and water or solvents without harm. Cardno will draft content and provide a digital file with images, fonts, and artwork to SLELO PRISM and the land manager for final approval before printing and installation. NYSDEC, The Nature Conservancy, and SLELO PRISM will be acknowledged on the interpretive panel unless otherwise directed. Cardno will verify the location and details for installation with the land manager prior to installation.

1.6 Task 6: Resilient and Connected Landscapes (All Project Locations)

Cardno will take a systematic approach to suppression of invasive species and restoration of habitat both upstream and downstream of the project sites. A total of 10% of the project budget has been set aside to fulfill this task. Cardno has allocated two days for invasive species control efforts outside of the treatment areas identified in the RFQ. This work will be coordinated with other tasks identified on the project schedule in order to minimize mobilization tasks, and any work outside of the prescribed treatment areas will be coordinated and approved by NYSDEC and/or SLELO-PRISM staff. Fieldwork will be conducted as identified throughout 2021 with updates provided in the mid-season update, final report, and final presentation.

1.7 Proposed Schedule

Proposed Implementation Schedule												
Project Site	**Project Task**	**June**				**July**				**August**		**September**	
		7-Jun	**14-Jun**	**21-Jun**	**28-Jun**	**5-Jul**	**12-Jul**	**19-Jul**	**26-Jul**	**2-Aug**	**9-Aug**	**20-Sep**	**27-Sep**
South Sandy Creek	Gallerucella spp. Release												
	Japanese Knotweed Herbicide Treatment												
	Japanese Knotweed Mechanical Cutting & Mulching/Removal												
	Phragmites Herbicide Treatments												
	Phragmites Cutting/Mulching												
	Restoration Planting/Seeding												
	Outreach sign Design & Installation												
Sandy Creek	Gallerucella spp. Release												
	Japanese Knotweed Herbicide Treatment												
	Japanese Knotweed Mechanical Cutting & Mulching/Removal												
	Restoration Planting/Seeding												
Deer Creek	Gallerucella spp. Release												

2 Management and Restoration Summary

2.1 Task 1: Suppress Purple Loosestrife (All Project Locations)

Cardno's Technical Proposal included the following for this item:

> "Based upon email correspondence from March 8, 2021, Cardno's understanding is that SLELO-PRISM has coordinated the acquisition of loosestrife beetles with NYSDEC; though a permit for the release of these beetles has yet to be obtained. Based upon this information, Cardno's scope of services covered under this item will include technical assistance for obtaining a permit for beetle release from NYSDEC, along with labor and mobilization costs associated with releasing beetles at each of the three sites indicated in the RFQ."

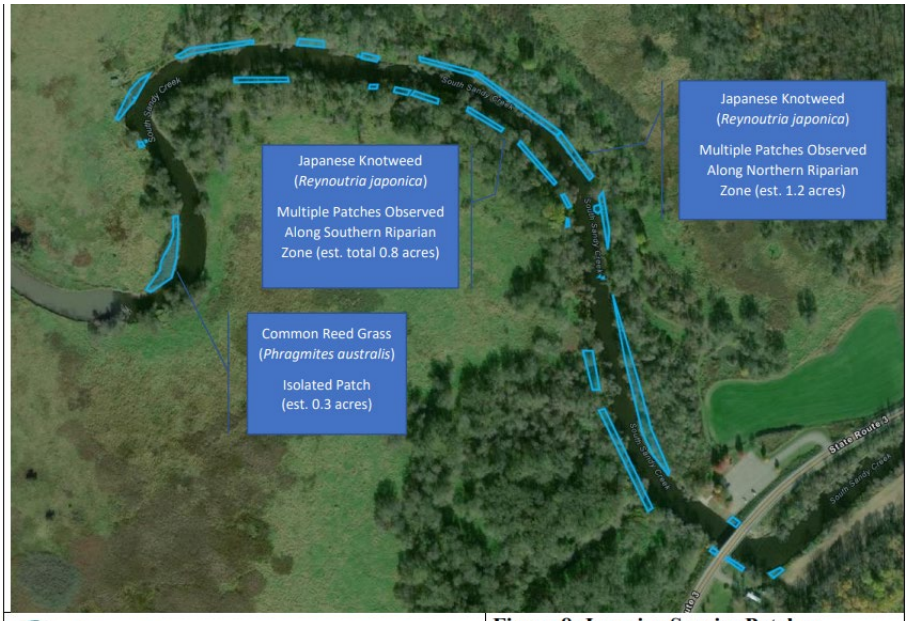
This item was listed on the NYSDEC Joint Application form submitted on June 22, 2021, however the loosestrife beetles were apparently unavailable for the project per subsequent conversations with SLELO-PRISM staff. Cardno staff assisted with contacting various state staff and agencies regarding access to beetles for release in 2021 to no avail.

2.2 Task 2: Suppress Japanese Knotweed (Sandy Creek, South Sandy Creek)

Treatment activities for Japanese knotweed at Sandy Creek and South Sandy Creek began on May 25, 2021 with Cardno staff performing the initial site reconnaissance in order to assess and map potential treatment areas throughout the two project areas. The general location, size, and orientation of these treatment areas was known based upon information provided in the project RFQ and as show in Figures 7 and 8 below from the RFQ.

Rootz

Figure 7: Invasive Species Patch Observed Along Riparian Zone on Sandy Creek



Rootz

Figure 8: Invasive Species Patches Observed Along Riparian Zone on South Sandy Creek

Through the use of ArcGIS and an R1 transponder, Cardno staff were able to map the actual treatment areas as shown in Figure 1 below. This information should allow for future monitoring efforts to determine the true effectiveness of these treatments while also allowing for accurate monitoring to track the progress of re-vegetation efforts.

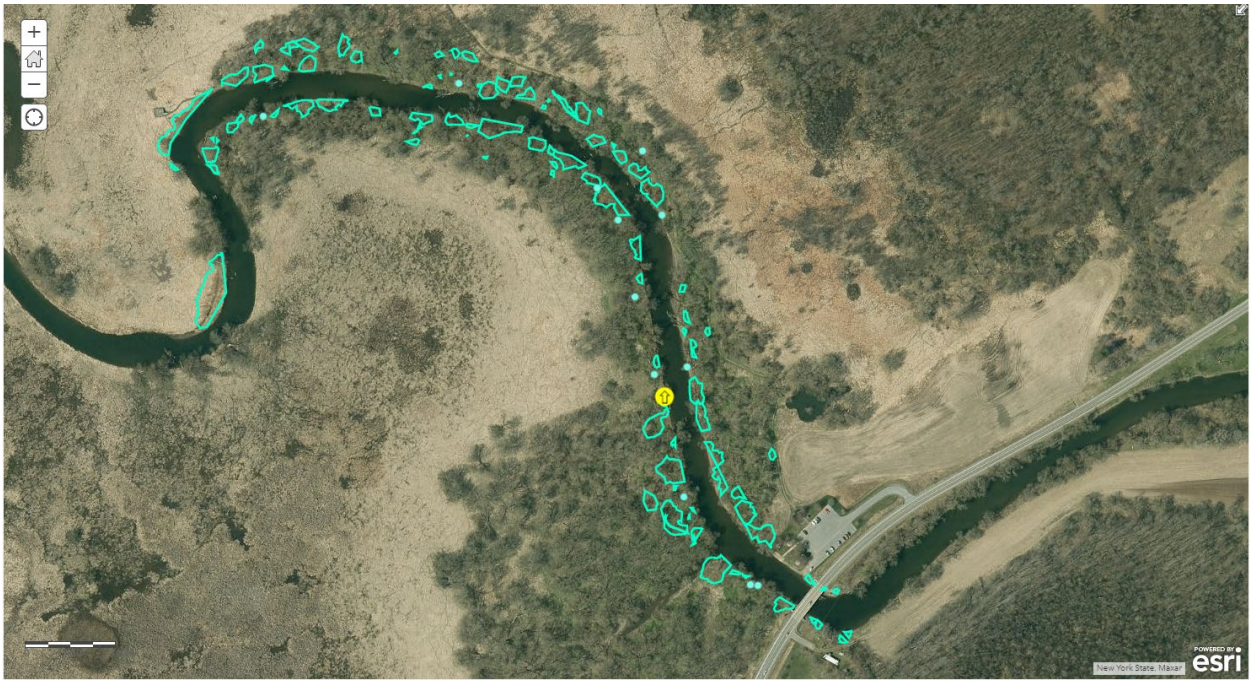


Figure 1. 2021 Invasive species (IS) treatment areas

Following the initial site reconnaissance and mapping, Cardno staff began planning for mobilizations in mid-summer in order to begin treatments while the Japanese knotweed was fully active and growing. Below is a summary of treatment activities by date. Copies of the field reports for each treatment mobilization can be found in Appendix A of this document.

- July 8-9: Initial mobilization for stem-injection treatments along South Sandy Creek. Rain and high water made for difficult access and treatment conditions. Approximately 25% of South Sandy Creek treatment area was treated.

Large, mature Japanese knotweed prior to treatment (July 8, 2021)

- July 26-30: Stem-injections were completed on the remaining 75% of the site. All stems located within 10' of the creek were injected and tagged with marking paint. Japanese knotweed located greater than 10' from the creek edge is treated via foliar application. Additional isolated pockets of Japanese knotweed not mapped or called out in the RFQ were located, mapped, and treated. The isolated patch of Japanese knotweed noted in Figure 7 from the RFQ was also treated.

Cardno technician performing stem-injections on a dense stand of Japanese knotweed (July 27, 2021)

- September 27-28: Foliar re-sprout applications of Japanese knotweed are conducted throughout the entire project area. Results of the initial treatment are encouraging with an estimated Japanese knotweed mortality of greater than 80%. Areas of dense standing dead Japanese knotweed on the north bank are mowed and mulched to allow for easier access during future seeding events.

Dense Japanese knotweed patch following cutting and re-treatment (September 28, 2021)

Figure 2. Treatment Area Map for South Sandy Creek. Areas indicated in Green received herbicide treatments and biomass-reduction mowing. Areas indicated in Yellow received herbicide treatments and were not mowed.

Summary tables for the treatment areas are included below. A third table indicating areas that were treated in areas beyond the immediate riparian edge indicated in the original RFP. Populations of knotweed were treated using a combination of stem-injections and foliar application. All knotweed stems within 10' of the water's edge were injected with concentrated Rodeo. Knotweed located further than 10' from the water's edge were foliar treated with a 3% solution of Rodeo that also included non-ionic surfactant and marker dye. This methodology was selected in order to minimize the likelihood of herbicide drift into aquatic areas.

2.3 Task 3: Suppress Common Reed (South Sandy Creek)

Common reed treatments were conducted concurrently with the Japanese knotweed treatments during the late July and September mobilizations. Treatment methods included hand-wicking herbicide solution onto the target plants that were growing within 10' of the water and foliar applications to plants growing further inland. Phragmites populations were treated with a 2% solution of Rodeo herbicide that included a non-ionic surfactant and marker dye. A total of 0.34 acres of common reed was mapped and treated as part of this project and no biomass removal was performed.

2.4 Task 4: Habitat Restoration (Sandy Creek, South Sandy Creek)

Based upon observations collected during the invasive species treatments and discussions with SLELO PRISM staff, it was determined that all of the invasive species treatment areas would be seeded with a native mix that included species that could tolerate a range of moisture conditions. Cardno staff mobilized to the project site on November, 23 2021 and installed the seed mix listed below by hand broadcasting throughout the entirety of the treatment areas. There is a significant quantity of wild rye (*Elymus* virginicus) included within this mix as it is filling the role of cover crop in place of a non-native annual or seed oat species. For ease of spreading, wood shavings were mixed with the seed to act as a carrier. The packing slip for this seed mix is included in Appendix C at the end of this document.

Scientific Name	Common Name	Quantity Ordered	Units
Bolboschoenus fluviatilis	river bulrush	12	ounce
Calamagrostis canadensis	blue joint grass	4	ounce
Carex vulpinoidea	brown fox sedge	12	ounce
Elymus virginicus	Virginia wild rye	184	ounce
Eutrochium maculatum	spotted joe pye weed	16	ounce
Glyceria striata	fowl manna grass	4	ounce
Helenium autumnale	sneezeweed	4	ounce
Juncus effusus	common rush	8	ounce
Persicaria pensylvanica	pinkweed	12	ounce
Rudbeckia laciniata	wild golden glow	4	ounce
Scirpus atrovirens	dark green rush	8	ounce

2.5 Task 5 Outreach: Interpretive Panel (South Sandy Creek)

Cardno staff began coordinating with Irene Mazzocchi (NYSDEC) and Brittney Rogers (SLELO PRISM) on August 23, 2021 to gather information regarding the size, type, and location for the sign to be placed at the project site. Based upon the budget Cardno proposed and the needs of the project, a 2'x3' angled panel was proposed. The location for this sign will be near the existing parking lot for the kayak launch as it was determined this would be the most visible and appropriate location. Additionally, there were several ideas proposed for the sign content and layout that were shared with Cardno. In general, it was determined that the informational sign should highlight three main themes including:

- The importance of invasive species management
- Shoreline/habitat resiliency through native planting
- Public outreach in regards of how the public can help

Based upon this feedback, the following sign panel (Figure 2) has been drafted and submitted for review and approval. Once approved, this sign will be ordered for print and installation in the spring of 2022. A detailed drawing of the proposed sign construction with installation constructions is shown in Figure 3. The proposed location as discussed during the August 23, 2021 meeting is shown in Figure 4.

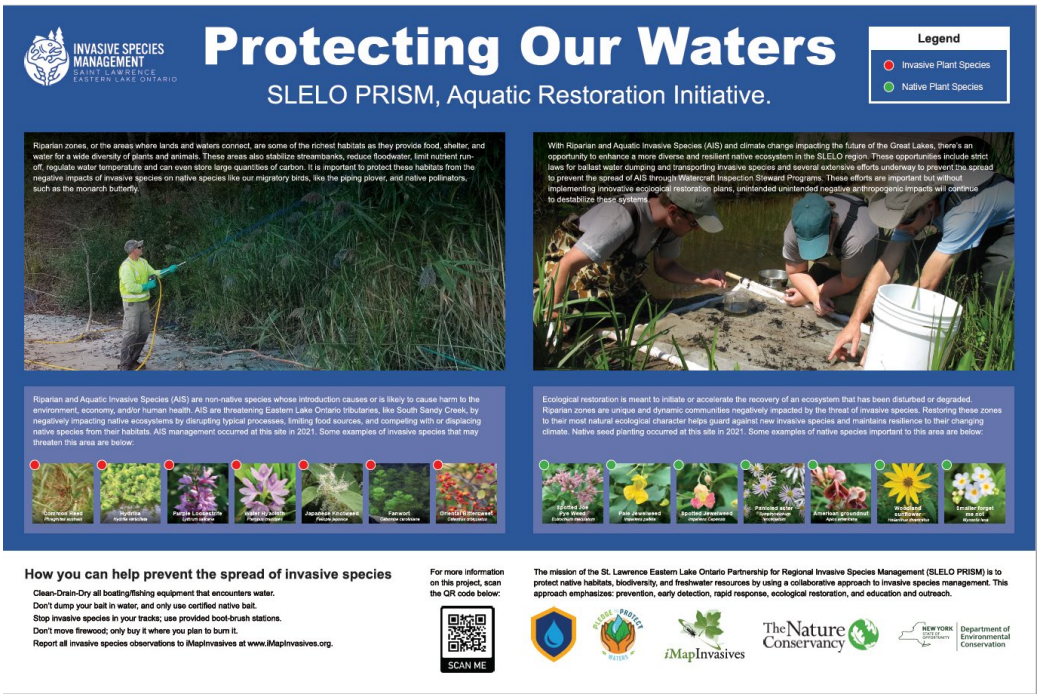


Figure 2. Proposed Informational Sign Panel

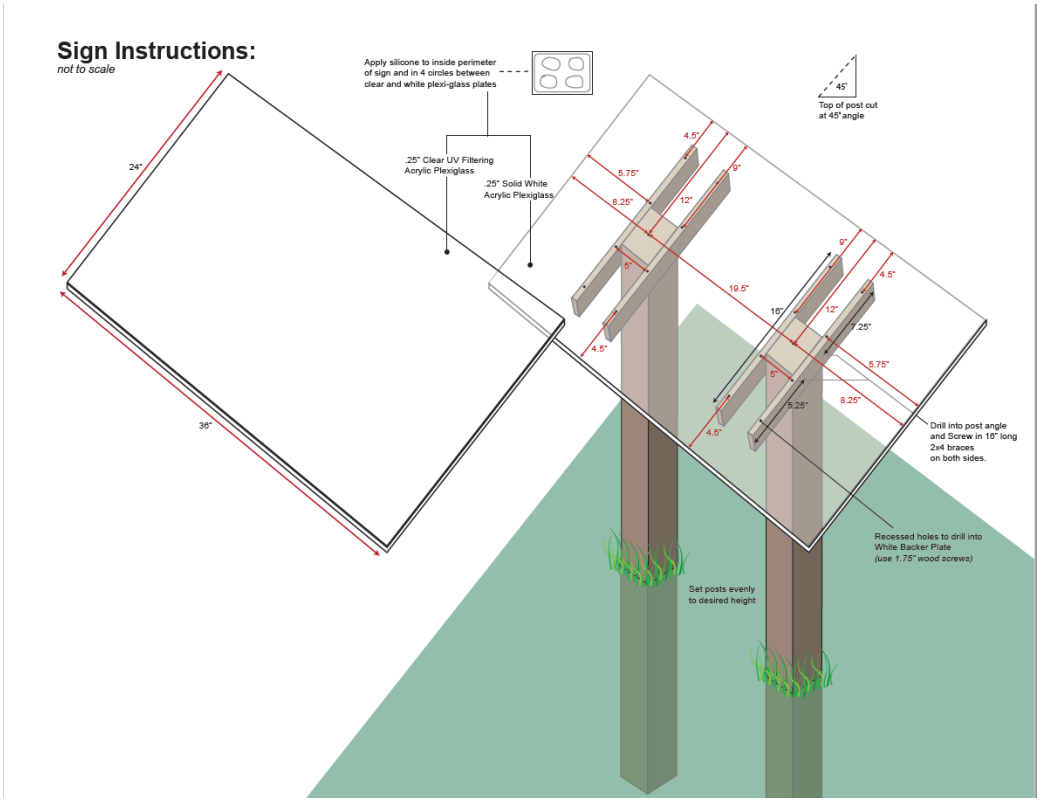


Figure 3. Sign Construction and Installation Drawing

Figure 4. Proposed Sign Installation Location

2.6 Task 6: Resilient and Connected Landscapes (All Project Locations)

The requirements for this task within the RFQ were fairly open ended and allowed the contractor to make a judgement call in the field for how best to utilize the additional 10% of the budget set aside for this task. Through observations made during the initial site visit in May, Cardno determined that the riparian populations of Japanese knotweed were larger than indicated in the RFQ and often extended significantly further inland than originally mapped. Based upon these site observations and discussions with SLELO PRISM staff, Cardno utilized this budget line item to map and treat Japanese knotweed populations beyond the bounds indicated in the RFQ. By performing this work, the areas identified in the RFQ areas will be less likely to be immediately recolonized by Japanese knotweed as there will not be a seed/vegetation source immediately adjacent to the targeted restoration areas.

3 Recommendations for Future Activities

As this contract was limited to one year, future monitoring and maintenance activities will be critical to ensuring the long term success of this project. In order to work towards achieving the long term goals of this project, Cardo suggests the following tasks be considered for implementation in 2022 and beyond:

- Monitor the success of 2021 IS treatments to determine the effectiveness of the treatment methods and timing
- Perform annual vegetation monitoring within a selection of the treatment areas to evaluate how these areas recover following intensive IS treatments and re-seeding
- Expand IS treatments upstream to the extent possible in order to limit the reintroduction of seed and plant matter from upstream populations
- Coordinate the procurement and release parameters for loosestrife beetles in 2022; based upon market and regulatory conditions experienced in 2021, this process should begin as early as possible in 2022

2021 Year End Report

APPENDIX A

WEEKLY FIELD REPORTS

DAILY FIELD REPORT

Date:	7/8-9/2021	Project Zone:
Project Name/ Number:	SLELO PRISM Aquatic Restoration / J213054800	Knotweed Patches
Project Manager/ Supervisor:	Ryan Allison / Ryan Greer	
Crew Members:	Alex Molik, Steve Bycznski	
Site Conditions:	60 degrees, rainy	Map
Project Completed: (% done, # plugs planted, acres seeded, etc.)	Roughly 25 percent of the initial herbicide treatment.	Photos included
Project Remaining: (% left, # plugs remaining, etc.)	75% of the initial herbicide treatment. Subsequent mowing, treatment, seeding.	
Comments: (problems, areas of concern, notes, etc.)	7/8 – Rain threat and lightning cut the day around 4:30 pm. 7/9 – High water levels and flow made working conditions very dangerous. Still completed injections, but stayed further away from the bank. All injected stems are spray painted.	

TOTAL HOURS								
ACTIVITY	**HRS./ STAFF**	**# STAFF**	**TOTAL HRS.**	**UNIT**	**QNTY.**	**HRS./ UNIT**	**UNIT/ HRS.**	**NOTES** (density, species, etc.)
Stem Injections 7/8	5	3	15					
Stem Injections 7/9	5	2	10					
Backpack Foliar Treatment	5	1	5					
TOTAL	**10**	**3**	**30**					

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DAILY FIELD REPORT

Date:	Week of 7/26 (Work conducted on site 7/26-7/30	Project Zone:
Project Name/ Number:	Lakeview Wildlife Management Area	South Sandy Creek Sandy Creek (Seaman's Island)
Project Manager/ Supervisor:	Ryan Allison & Patricia Shulenburg/ Trey Smith	
Crew Members:	Ryan Greer, Steve Bycznski, Alex Molik,	
Site Conditions:	Normal water levels, mild rain event on Tuesday	Map
Project Completed: (% done, # plugs planted, acres seeded, etc.)	-Completed Buffer herbicide applications on Japanese knotweed, and Phragmites along both sides of South Sandy Creek. All Japanese knotweed stems within 5-10' (depending on bank grade) of the water were stem injected, if any Phragmites were found within 5' of the water they were hand wiped at South Sandy Creek -Completed foliar application of all knotweed greater than 5-10' (depending on bank grade) from the water at South Sandy Creek using 3% Glyphosate (Rodeo) herbicide solution with surfactant and indicator dye. Volume of solution used available upon request. -Identified some additional Japanese knotweed to potentially be treated along South Sandy Creek -Completed stem injections of all Japanese knotweed stems found in the identified location on Seaman's Island using 100% Glyphosate (Rodeo) herbicide solution with surfactant and indicator dye. Volume of solution used available upon request.	GPS coordinates for treatment polygons recorded, however Cardno need access to SLELO PRISM Collector iMap Advanced maps.
Project Remaining: (% left, # plugs remaining, etc.)	-Mechanical treatment of Japanese knotweed and Phragmites -Follow up chemical treatment to regrowth -Sign design, print, and installation -Beetle Release	
Comments: (problems, areas of concern, notes, etc.)	-No foliar applications were made within 2 hours of any rainfall	

TOTAL HOURS								
ACTIVITY	**HRS./ STAFF**	**# STAFF**	**TOTAL HRS.**	**UNIT**	**QNTY.**	**HRS./ UNIT**	**UNIT/ HRS.**	**NOTES** (density, species, etc.)
Stem Injection/Buffer Application	19	2	38	N/A	N/A	N/A	N/A	
Foliar Application	25	3	75	N/A	N/A	N/A	N/A	
GPS Mapping treatments	6	1	6	N/A	N/A	N/A	N/A	

DAILY FIELD REPORT

TOTAL	**50**	**3**	**119**	N/A	N/A	N/A	N/A	

DAILY FIELD REPORT

Date:	Week of 9/27 (Work conducted on site 9/276-9/28	Project Zone:
Project Name/ Number:	Lakeview Wildlife Management Area	South Sandy Creek
Project Manager/ Supervisor:	Ryan Allison / Trey Smith	
Crew Members:	Mitch Laffin, Ryan McAuliffe	
Site Conditions:	Normal water levels, mild rain event on Tuesday	Map
Project Completed: (% done, # plugs planted, acres seeded, etc.)	-Completed foliar respray of basal regrowth from previously treated knotweed -Completed mechanical cutting of knotweed on the N bank of South Sandy Creek -Large standing patches of knotweed were mulched in place, after cutting, to break down the previously treated biomass	
Project Remaining: (% left, # plugs remaining, etc.)	-Sign installation -Beetle Release	
Comments: (problems, areas of concern, notes, etc.)	-No foliar applications were made within 2 hours of any rainfall -Map indicates any knotweed populations within perceived work zone	

TOTAL HOURS								
ACTIVITY	**HRS./ STAFF**	**# STAFF**	**TOTAL HRS.**	**UNIT**	**QNTY.**	**HRS./ UNIT**	**UNIT/ HRS.**	**NOTES** (density, species, etc.)
Repray/Mechanical Treatment	17	3	51	Acres	1.42	35.9	.03	
TOTAL	**17**	**3**	**51**	N/A	N/A	N/A	N/A	

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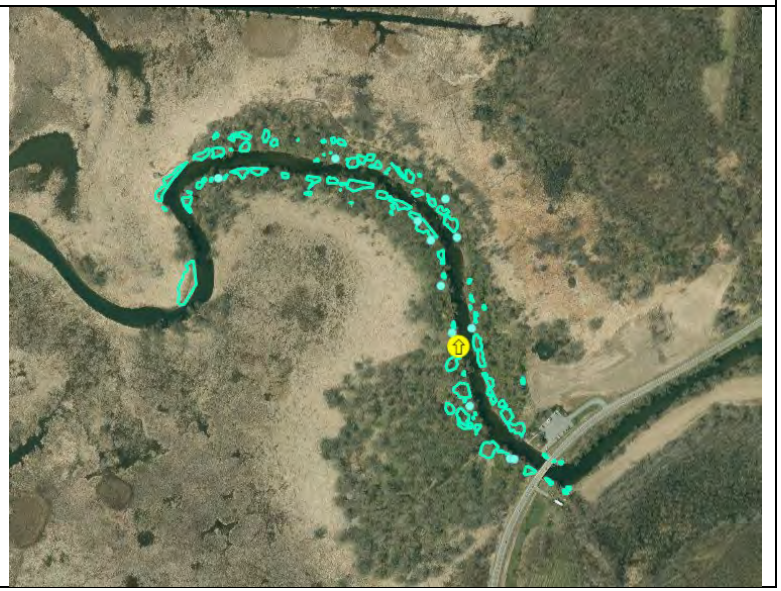
Date:	11/23/2021	Project Zone:
Project Name/ Number:	Lakeview Wildlife Management Area	South Sandy Creek Seaman's Island
Project Manager/ Supervisor:	Ryan Allison / Trey Smith	
Crew Members:	Steve Byczynski	
Site Conditions:	Water levels above normal. Dry site conditions	Map
Project Completed: (% done, # plugs planted, acres seeded, etc.)	-Completed restoration seeding of knotweed treatment areas along South Sandy Creek and Seaman's Island	
Project Remaining: (% left, # plugs remaining, etc.)	-Sign installation -Beetle Release	
Comments: (problems, areas of concern, notes, etc.)		

TOTAL HOURS								
ACTIVITY	**HRS./ STAFF**	**# STAFF**	**TOTAL HRS.**	**UNIT**	**QNTY.**	**HRS./ UNIT**	**UNIT/ HRS.**	**NOTES** (density, species, etc.)
Repray/Mechanical Treatment	5.25	2	10.5	N/A	N/A	N/A	N/A	
TOTAL	**5.25**	**2**	**10.5**	N/A	N/A	N/A	N/A	

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APPENDIX B

ADDITIONAL SITE PHOTOS

Treated and cut knotweed stand. September 2021

Treated knotweed stand. September 2021

Dead stand of common reed. November 2021

Broadcast seeding native seed into treated areas. November 2021

APPENDIX C

NATIVE SEED PACKING SLIP

Please Respect the Environment

About Cardno

Cardno is an ASX-200 professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage, and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

Cardno Zero Harm

Cardno ZERO HARM EVERY JOB. EVERY DAY.

At Cardno, our primary concern is to develop and maintain safe and healthy conditions for anyone involved at our project worksites. We require full compliance with our Health and Safety Policy Manual and established work procedures and expect the same protocol from our subcontractors. We are committed to achieving our Zero Harm goal by continually improving our safety systems, education, and vigilance at the workplace and in the field. Safety is a Cardno core value and through strong leadership and active employee participation, we seek to implement and reinforce these leading actions on every job, every day.

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