



CITY OF ROCHESTER HILLS

LONG-TERM STEWARDSHIP PLAN

2017 ANNUAL REPORT



In 2017, Niswander Environmental spent 179 man days performing eighteen (18) separate and unique stewardship activities on four (4) of the City's Greenspace properties. This project began in 2014, when Niswander Environmental was contracted by the City to implement its Natural Features Stewardship Program. Under this program, Niswander Environmental was tasked with providing invasive species control, habitat restoration, open space evaluations and planning, ecological assessments, endangered species surveys, and any additional ecological services as needed by the City. In order to effectively implement this program, Niswander Environmental developed and submitted a Long-Term Management Plan in 2015 that would guide the City in its management goals.

In the spring and summer of 2015, ecological assessments were conducted on all the green space properties (Greenspace). Each Greenspace property along with the Clinton River corridor was assessed in spring and early summer 2015, with particular attention paid to existing and potential ecological issues that impact or could otherwise potentially harm the integrity of the properties or surrounding natural features. Based on the identified threats to the Greenspace properties and Clinton River corridor, Niswander Environmental developed over 20 individual projects to ensure the long-term preservation and stewardship of these areas. A project rating system was developed, and each project was ranked based on metrics developed using the goals and objectives of the Green Space Advisory Board (GSAB). Based on these assessments, the Long-Term Management Plan was developed for all the properties.



Tamarack pine cone at White Greenspace



The Long-Term Management Plan outlines the results of the ecological assessments for each property and the Clinton River, potential restoration/enhancement projects, a priority rating of restoration/enhancement activities, and an annual work plan with immediate, short-term (5-year), and long-term (10⁺-year) goals identified. The Long-Term Management Plan is intended to provide guidance to the GSAB as they make decisions on the management and stewardship of the Greenspace properties. In 2016, the City and GSAB directed Niswander Environmental to implement the Long-Term Management Plan that involved twelve (12) individual restoration and/or habitat enhancement projects at the Harding and White Greenspace properties (6 projects at each site). The projects associated with the two properties involved invasive species control, enhancement or restoration of locally unique habitats, and prairie restoration.

In 2017, two more stewardship activities were added to the White and Harding Greenspaces, and Niswander Environmental was directed to continue the execution of the Long-Term Management Plan at two additional Greenspace properties, the Clear Creek and Cloverport Greenspaces, bringing the total number of stewardship projects to 18.

It is usually difficult to determine the initial success of management efforts since restored areas typically need multiple treatments and/or growing seasons to respond. In the two years since Niswander Environmental implemented the Long-Term Management Plan, most of the stewardship projects are already considered to be highly successful and several have even entered a maintenance phase. For example, two of the prairie areas and the pond area at the Harding Greenspace already feature an abundance of native wildflowers and grasses. Additionally, the wet meadow area at the Harding Greenspace responded very favorably to treatment of invasive cattail and woody species control, and minimal swallow-wort and barberry remain at the White Greenspace. In these instances, change was immediate after the first year of management, and the areas responded a bit faster than anticipated.

A comprehensive assessment will be performed in the early summer of 2018 to determine the overall success of each project thus far, and management techniques may be adapted if warranted. Budget will be allocated once again to each stewardship project in 2018; portions of the budget will be reserved for continued intensive management of each of the four Greenspaces while other portions of the budget will be earmarked primarily for maintenance purposes. Additionally, Niswander Environmental intends to implement new projects at the newly acquired Ruby Road Greenspace in 2018 and will take any recommendations from the GSAB with regards to other Greenspace sites into serious consideration. Below is a summary of 18 stewardship activities completed by Niswander Environmental on the four Greenspace properties in 2017 (January – December).

HARDING GREENSPACE PROPERTY

2016-2017 SUMMARY

Niswander Environmental spent 83 man-days at the Harding Greenspace in 2017, managing and expanding the previously restored area from 5.18 acres to 5.69 acres. A great deal of time was allocated to converting degraded old field and/or lawn areas along Harding Avenue to native upland prairie, and enhancing the area surrounding the pond (Figure 1 – Harding Property 2017 Management Map). Invasive woody species such as buckthorn, honeysuckle, autumn olive, and Asian bittersweet comprise a significant percentage of this site, and efforts were made to remove these species from the trail network for easier and safer pedestrian passage. Other highly invasive plants such as Japanese knotweed, garlic mustard, and swallow-wort were treated for a second time in 2017. Perhaps the most significant project involved the restoration of the small wet meadow area south of the Clinton River Trail, which had been overrun in recent years with undesirable plants such as willow, buckthorn, and non-native cattail. An evaluation in summer 2018 will reveal the overall success of the 2016-2017 stewardship efforts at the 26.81-acre Harding Greenspace. Project highlights are presented below:



Wood-betony

Wet Meadow Restoration and Enhancement

- Expanded and restored 0.47 acres of wet meadow habitat along the Clinton River Trail through cut/stump treatment of roughly 1,000 nuisance willow and dogwood, and invasive glossy buckthorn, honeysuckle, and autumn olive. Niswander Environmental cleared and treated these shrubs to expand the high-quality wet meadow layer that had previously been dominant several years prior, but was rapidly transitioning into lower quality scrubland.
- Strategically created brush piles from cut shrubs to be used as shelter for wildlife.
- Results from early winter treatments were immediate; assessments conducted in August 2016 revealed presence of locally uncommon, high-quality species such as yellow lady's slipper orchid, blue-eyed grass, star grass, golden ragwort, fringed loosestrife, marsh skullcap, culver's root, and hairy beardtongue, none of which had been previously observed. In spring/summer 2017 these species were abundant and expanding into areas treated in 2016.
- Hand wicked thousands of individual non-native cattail from edges of 2016 treatment area in August 2017 in an attempt to decrease the total amount of cattail while simultaneously increasing the overall size of the wet meadow. Fewer than 100 cattail stalks survived from the original 2016 treatment areas.
- GPS'd the boundary of invasive cattail to use as a comparative tool for future years.
- 2018 Plan Forward: Continue to treat woody species as they emerge in 2018, continue to treat woody species along the edge of the restored area to expand wet meadow, and continue to control invasive cattail.



Hand-wicking nuisance cattail

Upland Prairie Restoration



- Prepped an additional 1.08 acres of old field habitat for conversion to upland prairie by utilizing typical prairie restoration BMP's such as brush-hogging to reduce thatch, herbicide treatments to kill emerging cool-season, non-native grasses and weeds, and roto-tilling to prepare the soil for planting. Treatment of mature invasive shrubs were the primary focus to expand the overall area of the onsite prairies.

Installing native wildflower in restored lawn area at the Harding Greenspace

- Installed a native seed mix in May 2017, consisting of showy, high-nectar producing prairie wildflowers, including various milkweeds, asters, coneflowers, sunflowers, goldenrods, coreopsis, bee-balm, ironweed, blazing star, black-eyed susan and native prairie grasses, among others in the lawn portion of the prairie and other newly expanded areas.
- Hand-planted 1,200 native wildflower plugs in May 2017 that flourished throughout the summer. Native prairie seed typically requires 2-3 full growing seasons before establishing, so the addition of plugs sped the process by providing mature plants for instant color in the highly visible areas.
- Installed an additional 750 native plugs into upper and middle prairie area with the help of volunteers from Oakland University in October 2017.
- Expanded the overall prairie habitat through continued cut-stump treatment of honeysuckle and Asian bittersweet in 2017, particularly around the eastern edges of lower prairie area.
- 2018 Plan Forward: The newly restored prairie areas will be seasonally managed as appropriate (i.e., periodic mowing, supplemental planting, herbicide treatments, expansion by removal of woody species on edges, etc.).



*First full growing season of the prairie
(top, below)*



Oakland University volunteers



Middle prairie area before (left) and after (middle) woody species removal in March 2017. Middle prairie area in October 2017 (right) during native plug planting day with students from Oakland University.

Pond Area Enhancement

- Treated and removed approximately 100 invasive shrubs (re-sprouts and seedlings) from the 0.49 acres treated in 2016
- Monitored the red-osier dogwood live stakes that were installed along the banks of the pond in 2016 - it appears that approximately 75% survived.
- Over-seeded the areas initially seeded in 2016 with a collection of native woodland wildflowers and grasses, including milkweed, columbine, asters, goldenrods, and native clovers and mints.
- Installed approximately 500 native wildflower plugs and 61 native shrubs (dogwoods, viburnums, and chokeberry) along pond perimeter in mid-May. Shrubs and plugs were watered 2-3 times a week and sprayed with a deer and rabbit repellent as needed. The shrubs appear to be doing much better this year than in the previous year, likely due to the repellent.
- 2018 Plan Forward: Monitor the area to determine success from 2016 and 2017 restoration efforts, supplement area with seed, plugs, and/or shrubs if warranted. Continue to treat any unwanted invasive seedlings.



Planting native wildflower plugs along pond

Japanese Knotweed Control

- Identified and GPS'd existing populations of highly invasive Japanese knotweed to create detailed basemaps for field use. This information will aid in tracking potential spread and/or new populations in the future. The 2017 assessment showed the infestations have not spread and remain limited to the northern portion of the property near Harding Avenue.
- Successfully treated approximately 0.58 acres containing Japanese knotweed with glyphosate in early August 2017. All known populations appear to have decreased dramatically since 2015 and have now been treated for a second season.
- 2018 Plan Forward: Continue to assess the treatment areas in early summer 2018 and re-treat if necessary. Continue meander searches for this species and GPS new locations if discovered.

Garlic Mustard Control

- Drafted brochures to promote the Garlic Mustard Challenge, which was intended to utilize volunteers to help pull garlic mustard from specified areas on the Harding site. In the future, this volunteer event will help bring the community together and give citizens a sense of ownership of this Greenspace.
- The Garlic Mustard Challenge event had 6 attendees, and approximately 80 lbs of garlic mustard was pulled from along the trail network.



Volunteers helping pull garlic mustard

- Niswander Environmental staff continued to pull garlic mustard in early-May 2017, eventually removing over 700 lbs from 1.25 acres of the property over 3 days. All data was supplied to The Stewardship Network as part of their overall Garlic Mustard Challenge.
- 2018 Plan Forward: Promote the volunteer-based Garlic Mustard Challenge in February, March, and April 2018. Assess areas from which this species was removed over the past two years, since it often takes several years to fully deplete the existing seedbank. Continue to hand-pull garlic mustard from infested areas in hopes of eventually eliminating this plant from most of the property over the next five years.



Before pulling garlic mustard



After pulling garlic mustard

Upland Woody Species Control

- From January through March and July through December, Niswander Environmental cut and treated roughly 5,000 mature, seeding invasive shrubs on either side of the main trail network that begins at the Riverbend Drive trailhead. This particular area had a dense population of 30-foot deep border of honeysuckle, autumn olive, buckthorn, and Asian bittersweet along the trail before opening into a healthy woodlot with minimal invasive plants.
- Hand-seeded the cleared restoration area with a collection of native woodland wildflowers and grasses, including wild geranium, bedstraw, cardinal flower, woodland asters, and Dutchmen's breeches.

- Installed approximately 150 native wildflower plugs and 80 native shrubs (serviceberry, redbud, chokeberry, and arrowwood) in newly cleared area along walking path. Shrubs and plugs were mulched, watered weekly, and sprayed with a deer and rabbit repellent to ensure their survival.
- Significant progress was made in controlling Asian bittersweet, which is dominating portions of the property. Foliar broadcast treated “carpets” of emerging (young) Asian bittersweet, and cut mature vining bittersweet from oaks, cherries, hickories, pine, and other canopy species to prevent further tree mortality.
- 2018 Plan Forward: Controlling fruiting invasive shrubs will continue through 2018, with an emphasis on expanding larger pockets that can be reintroduced with understory vegetation such as redbud, serviceberry, flowering dogwood, and other native flowering trees and shrubs. An access trail will be established connecting the trail from Riverbend Drive to the Clinton River Trail through the southern portion of the site.



American toad

Swallow-Wort Control

- Identified and GPS'd existing locations of swallow-wort at the Harding Greenspace. The only known population was found around the perimeter of the pond, but off-site areas along the Clinton River Trail have the potential to spread into the property.
- Treated all infestations of swallow-wort in early June 2017 using glyphosate-based herbicide (approximately 2,000 sf). Began to witness results within several days of treatment. Conducted a second treatment in late June 2017 as a new generation of swallow-wort emerged.
- 2018 Plan Forward: This species will be actively searched out in 2018 due to its highly-invasive nature; any new or missed infestations will be GPS'd and treated at the appropriate time if discovered.

WHITE GREENSPACE PROPERTY

2016-2017 SUMMARY

Niswander Environmental spent 44 man-days at the White Greenspace property in 2017 to expand upon the previously restored 32.68 acres in 2016 (two additional acres were restored in 2017). The White property is relatively healthy overall, and features rolling hills, numerous creeks, locally rare tamarack and remnant fen habitat, and provides excellent habitat for woodland wildlife, particularly deer and wild turkey. Despite this, areas of this site are dominated by invasive species such as Phragmites, glossy buckthorn, honeysuckle, and Japanese barberry, which threaten the biotic integrity of this property. Significant effort was undertaken to enhance high-quality habitat types through various invasive species control methods (Figure 2 – White Property 2017 Management Map). A considerable amount of time was spent removing dense populations of glossy buckthorn from the northern sections of the site to expand upon several small pockets of remnant fen habitat that had been identified in 2016. The following is a summary of each of the seven stewardship projects at the 48.38-acre White Greenspace property in 2016 and 2017.

Remnant Fen and Tamarack Swamp Enhancement

- Cut and treated approximately 2,000 re-sprouted invasive glossy buckthorn and honeysuckle from approximately 4.33 acres of the Tamarack Swamp Zone in early winter 2017 (Jan – Mar).
- Utilized Argo to treat Phragmites in mid-September 2017. This area was treated in 2016 with a successful kill rate of 50-75%. We expect to see a kill rate of close to 80-90% in this area for the 2018 season.
- 2018 Plan Forward: Continue with cut-stump treatments to control glossy buckthorn and honeysuckle from this area. Phragmites treatments will again occur in fall 2018 as conditions allow.

Forested Wetland Enhancement

- Cut and treated approximately 1,000 re-sprouted invasive shrubs and emerging seedlings from the forested wetland portion of the White Greenspace property (primarily glossy buckthorn, honeysuckle, barberry, autumn olive, and nuisance wild grape).
- 2018 Plan Forward: This area will be closely monitored throughout 2018, and additional work will be conducted in 2018 to cut and treat any re-emerging buckthorn and honeysuckle.



Before woody spp. removal



After woody spp. removal

Swallow-Wort Control

- Identified and GPS'd existing locations of swallow-wort on the White Greenspace property. The infestation remained the same general size from what was mapped in 2016.
- Treated all infestations of known swallow-wort in early June 2017 using glyphosate-based herbicide (approximately 2,000 sf), treating approximately 20 plants. Began to witness results within several days of treatment. Conducted a second treatment in late June 2017 as a new generation of swallow-wort emerged.



Minimal swallow-wort

- 2018 Plan Forward: This species will be actively searched out in 2018 due to its highly-invasive nature; any new or missed infestations will be GPS'd and treated at the appropriate time if discovered.

Japanese Barberry Control

- Treatment lanes were cut in January-March to create easier access for interior access to populations of Japanese barberry in early summer.
- Foliar broadcast treated approximately 2 acres of Japanese barberry using glyphosate-based herbicide in early June 2017 (first application was in 2016).



2016 barberry treatment results



Spot spraying any surviving barberry

- 2018 Plan Forward: Dense stands of Japanese barberry were successfully eliminated in 2016 and 2017, with only individual shrubs remaining as of October 2017. Moving forward, barberry control will be completed while doing upland woody species control. This project is complete.

Scrub-Shrub Wetland Enhancement

- Began cutting and treating approximately 10,000 invasive glossy buckthorn and autumn olive from the western edge of the scrub-shrub wetland, in the northern portion of the property. This area was the focus in the winter months (January-March) because many small fragmented remnant fen areas were identified. Approximately 2.50 acres were restored in 2017.
- Utilized Argos and backpack sprayers to treat dense, tall Phragmites in mid-September 2017. Treatment lanes created in fall 2016 made a significant difference and allowed easier and safer access for Phragmites treatment in 2017. Excellent results are expected.
- 2018 Plan Forward: Continue to push east and south through the glossy buckthorn thickets in the first quarter of 2018 to open additional areas of fen habitat, and to create more treatment lanes that will allow us to reach more Phragmites. These new “lanes” not only remove buckthorn, but will allow Niswander Environmental to more effectively treat Phragmites in the future. Any newly discovered remnant fen areas will be assessed and will receive high priority for restoration later in the year.



Treatment of cut stump treatment

Upland Woody Species Control

- Removed approximately 500 non-native shrubs (primarily seedlings) from 17.93 acres of upland habitat from August through December employing cut stump methods.
- 2018 Plan Forward: Continue to control invasive shrubs in upland portions of the White Greenspace throughout 2018, with particular attention paid to common buckthorn and barberry.

Garlic Mustard Control

- Niswander Environmental staff pulled garlic mustard in early-May 2017, eventually removing over 150 lbs from 0.69 acres of the site. All data was supplied to The Stewardship Network as part of their overall Garlic Mustard Challenge.
- 2018 Plan Forward: Assess areas from which this species was removed, since it often takes several years to fully deplete the existing seedbank. Continue to hand-pull garlic mustard from infested areas in hopes of eventually eliminating this plant from most of the property over the next three years.



Pulling garlic mustard near Regan Dr.

CLEAR CREEK GREENSPACE PROPERTY

2016-2017 SUMMARY

Niswander Environmental spent 30 man-days at the Clear Creek Greenspace property in 2017 to control Phragmites and restore approximately 0.55 acres of high quality wet meadow habitat. A majority of the Clear Creek property is dominated with invasive buckthorn and autumn olive. A great deal of time was allocated to converting an overgrown buckthorn thicket into a high-quality meadow. Efforts were made to remove these woody shrubs from areas where unique native wet meadow species are present. Locally rare species such as bottled gentian, Riddell's goldenrod, turtlehead, and mountain mint are now prevalent throughout the meadow, and a population of state-threatened hollow-stemmed joe-pye weed was discovered for the first time.

The site also has numerous areas that contain non-native Phragmites, particularly along the roadways. These areas were accessed and treated for the first time in 2017 using backpack sprayers and an ATV (Figure 3 – Clear Creek 2017 Management Map). Purple loosestrife, a highly invasive wetland plant, is also common in the wetland areas on this site, and will be managed in 2018 through the use of a biological control. The following is a summary of each of the projects implemented at the 23.68-acre Clear Creek Greenspace property in 2017.

Scrub Shrub and Wet Meadow Enhancement

- Removed approximately 12,000 - 15,000 non-native shrubs from 0.55 acres of scrub-shrub habitat from January through March and August through December employing cut stump methods. Large brush piles of cut material were created to provide shelter for woodland wildlife such as fox, coyote, rabbits, skunks, raccoons, and opossums.



Before woody spp. treatment



After woody spp. treatment



One growing season after treatment

- 2018 Plan Forward: Continue to control invasive shrubs in the wet meadow portions of the Clear Creek property throughout 2018. Begin efforts in additional wetland areas supporting high populations of native sedge species to remove non-native and nuisance shrubs. Introduce *Galeruccella* beetles in spring 2018 into the wet meadow area that feed exclusively on purple loosestrife.



Galeruccella beetles (above) feast on the shoot tips of purple loosestrife plants and can eliminate entire stands within 5 years.

Phragmites Control

- Utilized an ATV and backpacks to spray areas infested with non-native Phragmites, including along Sheldon Road. Niswander Environmental treated the unwanted species in mid-September 2017. Most areas were easily accessible, and a high success rate is expected.
- 2018 Plan Forward: An assessment in late-spring or early-summer 2018 will determine the success rate of the fall of 2017 herbicide applications. Phragmites at the Clear Creek Greenspace property will continue to be monitored and controlled in September 2018, with particular attention paid to higher quality areas such as the wet meadow.



Treating phragmites from ATV (above) and backpack sprayers (left).



Dense stand of Phragmites

CLOVERPORT GREENSPACE PROPERTY

2016-2017 SUMMARY

Niswander Environmental spent 22 man-days at the Cloverport Greenspace property in 2017 to reduce and stabilize the sediment plume that has been created from a failed detention basin upstream of the site, and to control the invasive Phragmites from floodplain areas along the Clinton River. Coconut-fiber coir logs and high-velocity erosion blankets were installed to help contain sediment that has been discharging directly into the Clinton River. The work completed in 2017 may only be temporary until the issue upstream is fully resolved. The Phragmites present on site is also likely due to the failed detention pond upstream, which contains this invasive plant. The following is a summary of each project implemented at the 7.42-acre Cloverport Greenspace property in 2017 (Figure 4 – Cloverport 2017 Management Map).

Sediment Control and Bank Stabilization

- Removed approximately 50 mature, non-native shrubs and vines (honeysuckle and wintercreeper) from 0.05 acres of habitat using cut stump methods. All observed wintercreeper vines were cut from dying trees on the site. Honeysuckle was removed from the plume, so stabilization methods could be applied correctly.
- Installed 8 coir logs along a created channel to reduce further sediment from entering the southern portion of the site. These coir logs help slow down the water allowing the sediment to settle out before reaching the Clinton River.
- Installed approximately 480 linear feet of eroded stream channel with a heavy-duty, high-velocity erosion control blanket. This blanket helps hold existing sediment from being washed downstream and into the river. These areas were also seeded with a native wetland seed mix to help stabilize the banks.
- In mid-November approximately 200 live stakes were installed into blanket and coir logs to hold core logs in place and help stabilize the areas with significant erosion issues.
- 2018 Plan Forward: An assessment in spring 2018 will determine how successful the efforts were to reduce sediment loads from upstream sources; additional materials may be needed to fully resolve this issue.



Installing erosion control blanket



Coconut-fiber coir logs were installed to trap sediment and prevent a point discharge into the Clinton River



Phragmites Control



Using backpack to treat phragmites

- Niswander Environmental used backpacks to chemically treat Phragmites at the Cloverport Greenspace site. The stand of Phragmites is currently limited to a 0.33-acre area along the southern edge of the property. It appears this species is present primarily due to a failed detention basin upstream which contains an abundance of Phragmites. The area was treated for the first time in mid-September 2017. Conditions for treatment were excellent and it is expected to be successful.

- 2018 Plan Forward: An assessment in late-spring or early-summer 2018 will determine the success rate of the fall of 2017 treatment. Phragmites at the Cloverport Greenspace property will continue to be monitored and likely controlled for the foreseeable future.