Sudbury Valley Trustees
FINAL REPORT
January 6, 2016

**GREENWAYS CONSERVATION AREA**
**HABITAT IMPROVEMENT PROJECT**


**EXECUTIVE SUMMARY**

The Greenways Conservation Area is a 124-acre conservation area located on the Sudbury River in the Town of Wayland, in a section of nationally designated Wild & Scenic River. The conservation area contains lands owed by Sudbury Valley Trustees (SVT) and the Town of Wayland. SVT is the project leader. The site is a mix of wetlands, wet meadows, upland field, mixed hardwoods and white pine forest. The overall goal of the project is to maximize habitat value of three large field areas and shrub wetland borders, providing habitat for field-nesting birds such as bobolink, native pollinators and field-shrub edge specialists such as American woodcock and gray catbird. Invasive plant control, primarily of glossy buckthorn and multiflora rose, was conducted over three years, 2013 – 2015. Treatments consisted of both mowing followed by spraying regrowth and cut and paint applications to large shrubs. These treatments reduced invasive cover by approximately 85% in all habitat areas.

Native plants were successfully re-introduced to one field. A mix of 1,650 native forbes and grass plugs were planted in two 30 ft x 30 ft. plots in late June, 2015. In spite of drought conditions, plant survival rate was over 85% and most plants flowered in the first year, attracting a diversity of native pollinators. SVT will be continuing native plantings in 2016.


**Introduction**

The Greenways Conservation Area is a 124 acre conservation and recreation area located on the Sudbury River in the Town of Wayland. Eighty eight (88) acres are permanently protected for conservation; the other 36 are assigned to general municipal and recreation uses but are presently managed by the Wayland Conservation Commission. SVT owns 63 acres within this area, primarily wetlands.

The site is a mix of wetlands, wet meadows, upland fields, mixed hardwood forest and white pine forest. The site includes ½ mile of riverfront, which is part of the National Wild & Scenic River designation. This conservation area is partially within NHESP Bio Map Core Habitat and Priority Site and partially within NHESP Bio Map Supporting Natural Landscape.

Listed or *at-risk species* (as identified in the Massachusetts State Wildlife Action Plan) that have been observed breeding at the Conservation Area include American bobolink, American woodcock and Gray catbird. In recent years, bobolinks have been observed breeding in the larger central fields, but the field mowing regime has been inconsistent, probably causing some mortality. American woodcock have been observed displaying in the center field edges most years and occasionally in the south field edges.

Unfortunately, as with most conservation lands in this region, invasive plants having been seriously degrading habitat quality. Glossy buckthorn is ubiquitous in all habitat types. Glossy buckthorn is

invading the central fields and the overall vegetation quality has been degrading. Multiflora rose is common on field edges and hedgerows. Oriental bittersweet is common in the eastern margins of the conservation land as well as the hedgerows and edges of the southern fields.

The 7-acre north field is spotted with small depressions and rimmed in part by drainage ditches. This field had the greatest diversity of butterflies of any other habitat in the Greenways Conservation Area, based on a survey conducted in 1995 (Clark and Windmiller, 1997). However, both plant and butterfly diversity had decreased significantly and buckthorn and other invasive plants were encroaching into the field.

The overall goal of the project is to maximize habitat value of the fields and shrub wetland borders, providing habitat for field-nesting birds such as bobolink, native pollinators and field-shrub edge specialists such as American woodcock and gray catbird. The north field is being restored to a mixed native forb and grassland, emphasizing a high diversity of plants to attract native butterflies and other pollinators. We are reducing the extent and dominance of invasive plants located in field interiors, field edges, and hedge rows.

**Project Description**

Prior to NYANZA funding, we had conducted shrub margin/invasive shrub clearing and selective herbicide treatment for several years at the North field, owned by SVT. The NYANZA funding allowed us to continue invasive plant control and re-introduce native field plants to the north field. Additionally, the NYANZA funding allowed us to reduce invasive species abundance in field/shrub borders and eliminate an invasive shrub hedgerow in the south fields of the conservation area.

1. North Field (8 Acres) – *owned by SVT*

We conducted three consecutive years of herbicide treatment of invasive plants, primarily glossy buckthorn, within the field and around the field perimeter. This has yielded a greatly reduced extent of invasive plants in the field (approximately reduced by 85%).

A 25% glyphosate mixture was applied to cut stumps of large buckthorn around the perimeter of the field. The main field was mowed and then resprouted bushes of buckthorn were sprayed with a 3% concentrate of glyphosate. Approximately half the field and perimeter areas were treated in the first year, then the other half in the second year. In the third year, a spot treatment using the spray technique was conducted over 70% of the field and field edges.

In 2015, we began the introduction of native plants into the north field. We prepared two 30 x 30 ft. plots and planted 1,650 plants among the two plots. The plots were prepared by laying down cardboard mulch in the early spring to try to kill the existing plants, dominated by sensitive fern. We installed deer fencing around each plot to protect the new plants from herbivory; this fencing was installed by local boy scouts.

Unfortunately, we found that when we removed the cardboard, although the sensitive fern was not flourishing, the roots and plants were still alive. In one plot, we dug out small areas to plant each plant plug. We rototilled the other plot completely. The planting in the tilled plot was much easier; however, growth results in both plots were fairly similar. We had to conduct more weeding in the

non-rototilled plot. Overall, we recommend rototilling prior to planting. If using cardboard, or other mulch, it would be more effective to mulch the plots for a full year before planting. (One could also use another method to kill existing vegetation in the plot, such as solarization with plastic.)

Plants were purchased from New England Wild Flower Society based on recommendations by their field botanist. The native plants included *Asclepius syriaca (common* milkweed), *Doellingeria umbellate*(flat-topped aster) *, Eutrochium maculatum* (spotted Joe-Pye weed)*. Pycnanthemum tenuifolium* (narrowleaf mountain mint) *, Solidago nemoralis* (gray goldenrod)*, Symphyotrichum novae-angliae* (New England aster), *Eragrostis spectabilis* (purple love grass), *Panicum virgatum* (switchgrass), and *Schizachyrium scoparium* (little blue-stem grass). Planting was conducted in the third week of June (upon delivery). In spite of drought conditions, we achieved approximately 85% survival with most plants flowering this year. This success was attributed to good planting methods and many hours of staff and volunteer hours watering and weeding over the summer. We brought water to the field in large barrels loaded on a pick-up truck and then watered the plants with 5-gallon buckets. The labor over the summer was very intensive.

The planting project was highlighted on SVT's web site over the summer months. We posted interpretive information in the kiosk that we maintain at the north field. We conducted additional outreach to local residents and to Wayland girl scouts about the project.

Inspired by our success, we conducted research about plants for pollinators in order to continue planting the coming season. We consulted with the Massachusetts Butterfly Club and the Xerces Society. We prepared one 20 x 25 foot plot for planting in the coming season. We will be focusing on plants good for native bees and other native pollinators. We have received a grant from the River Stewardship Council for native planting at this site and at our Wolbach Farm. We have submitted an additional proposal to Suasco CISMA for funds for this same project.

2. Center Fields and Shrub Swamp Border

We had originally understood that the Town of Wayland was in agreement to remove the large tree hedgerow that separates the center field from a smaller "juniper field;" however, they decided to only remove a portion of the underbrush. This decision was made because there is a concern of public reaction to the cutting of large trees and the Town would prefer to keep the large trees. They utilized summer interns to do the clearing work. This partial clearing improved aesthetics and reduced extent of invasive shrubs, but did not effectively improve habitat for field-nesting birds (specifically, American bobolink). The Town did not enter into an agreement with any farmer for restoring the hay field. They did mow the field in 2015; however, invasive plants within the field are still a problem.

In late fall 2013, the shrub swamp/field margins (10ft. wide) were mowed with tracked machinery. Then in late summer of 2014, the contractor went back and selectively treated invasive shrub regrowth with an herbicide application, using Garlon 3A (1.5%), Rodeo (2%), MSO, LI700 and a colorant (Bulls Eye). These chemicals are all wetland approved. Contractors conducted foliar spraying from a tank system mounted on a truck and backpack sprayers. The first year's application was very effective (85%). A spot treatment of the same area was conducted in the fall of 2015.

3. South Fields and Shrub Swamp Border

In late fall 2013, the shrub swamp/field margins (10ft. wide) were mowed with tracked machinery. Then in late summer of 2014, the contractor went back and selectively treated invasive shrub regrowth with an herbicide application (same application as described under #2 above). The first year's application was highly effective (90%). A spot treatment of the area was conducted in the fall of 2015.

In the fall of 2015, SVT worked with the Town of Wayland to hire a contractor to clear the hedgerows (mostly invasive shrubs) from between the south fields. The town also mowed all of the fields. The Town has not made any final decisions on how they will manage the fields into the future.

4. Pigor's Land

One day of treatment was conducted in late summer of 2013 (which used the full $1,300 allocated to his site). In 2014, SVT staff conducted a site assessment. The treatment had reduced the extent and vigor of invasive plant growth. While further treatment would be required to achieve higher long-term success, we believe this treatment was helpful to reduce the invasion of non-native plants after the disturbance of the red pines that died and fell.

**Summary of Results and Discussion**

All originally proposed work was completed except for the clearing of the tree hedgerow between the central field and the smaller juniper field and the restoration of the center field to a hay field. These two items were the responsibility of the Town of Wayland.

Control of invasive shrubs in and around field edges, where the invasive cover is significant (over 50%), is extremely resource intensive. On the north field alone, in addition to mechanical clearing with large machinery along the field edges, over a four-year period, contractors put in eight days of herbicide treatment. We estimate that we have reduced invasive plant cover by approximately 90%; however we anticipate needing some spot treatment in future years. With the glossy buckthorn seed source being so abundant in the surrounding landscape, we are uncertain of how the field will evolve. These projects may cost tens of thousands of dollars and require an experienced program manager to coordinate and maintain.

Planting native plants for pollinators in fields can be successful. The plants are expensive and may require significant watering in drought years. Dependent upon site preparation, additional weeding may also be necessary. We were careful to choose plants that are appropriate for our region and for the specific site conditions. We recommend preparing plots for planting one year in advance (with mulch, herbicide treatment or solarization) to more effectively kill existing vegetation. In addition to hundreds of honey bees and tens of bumble bees, our plants attracted 17 species of moths and butterflies. Only two monarch individuals were observed during surveys.

Volunteers can be helpful to both invasive plant control and native planting efforts. Volunteers teamed up with certified applicators in the first year to cut large shrubs ahead of the applicator who then treated the cut stump. Volunteers also assisted with moving shrub material. Volunteers assisted with plot preparation, planting, watering and weeding of the new native plants.

**Project Budget Allocation Summary**

| | | | Grant Proposal | | Actual Expenses |
|---|---|---|---|---|---|
| | | | | | |
| | Project Coordination/implementation | | 5,000 | | 6,834 |
| | Mowing North Field | | 0 | | 778 |
| | Bird & Butterfly surveys | | 300 | | 382 |
| | Herbicide Contract work | | 16,900 | | 14,580 |
| | Center Fields hedgerow removal | | 5,500 | | 0 |
| | South Fields hedgerow removal | | 2,000 | | 2,500 |
| | Center Field mowing | | 0 | | 0 |
| | Biological surveys | | 300 | | 0 |
| | Native Plant purchase and planting | | 2,000 | | 7,726 |
| | Pigors Land Herbicide Treatment | | 2,000 | | 1,200 |
| | | **Total:** | **$34,000** | | **$34,000** |

**APPENDIX**

**Butterfly Inventory**

Greenways
Conservation Area
Wayland, MA

DATE OF OBSERVATION

| **Common Name** | ***Latin Name*** | ***Area*** | **#** | ***Date*** |
|---|---|---|---|---|
| Cabbage White | Pieris rapae | North Field | 1 | 5/6/2015 |
| Common Ringlet | Coenonympha tullia | North Field | 1 | 6/4/2015 |
| Little Wood Saytr | Megisto cymela | North Field | 1 | 6/4/2015 |
| Red Admiral | Vanessa atalanta | North Field | 1 | 6/4/2015 |
| Pearl Crescent | Phyciodes tharos | Center Field | 5 | 6/4/2015 |
| Common Ringlet | Coenonympha tullia | Center Field | 23 | 6/4/2015 |
| European Skipper | Thymelicus lineola | Center Field | >50 | 6/4/2015 |
| Peck's Skipper | Polites peckius | Center Field | 2 | 6/4/2015 |
| Tawny Edge Skipper | Polites themistocles | Center Field | 1 | 6/4/2015 |
| Hobomok Skipper | Poanes hobomok | Center Field | 1 | 6/4/2015 |
| Eastern Tailed Blue | Cupido comyntas | Center Field | 1 | 6/4/2015 |
| Peck's Skipper | Polites peckius | North Field | 6 | 6/11/2015 |
| Pearl Crescent | Phyciodes tharos | North Field | 1 | 6/11/2015 |
| Spring Azure | Celastrina ladon | North Field | 1 | 6/11/2015 |
| Cabbage White | Pieris rapae | North Field | 1 | 6/11/2015 |
| Red Admiral | Vanessa atalanta | North Field | 1 | 6/11/2015 |
| Peck's Skipper | Polites peckius | Sedge Meadow | 20 | 6/11/2015 |
| European Skipper | Thymelicus lineola | Sedge Meadow | >50 | 6/11/2015 |
| Tawny Edge Skipper | Polites themistocles | Sedge Meadow | 5 | 6/11/2015 |
| Long Dash | Polites mystic | Sedge Meadow | 1 | 6/11/2015 |
| Cabbage White | Pieris rapae | Sedge Meadow | 2 | 6/11/2015 |
| Orange Sulfur | Colias eurytheme | Sedge Meadow | 1 | 6/11/2015 |
| Clouded Sulfur | Colias philodice | Sedge Meadow | 3 | 6/11/2015 |
| Common Ringlet | Coenonympha tullia | Sedge Meadow | 20 | 6/11/2015 |
| Viceroy | Limenitis archippus | Sedge Meadow | 1 | 6/11/2015 |
| Bronze Copper | Lycaena hyllus | Sedge Meadow | 2 | 6/11/2015 |
| Great Spangled Fritillary | Speyeria cybele | North Field | 1 | 6/23/2015 |
| Cabbage White | Pieris rapae | North Field | 7 | 6/23/2015 |
| Summer Azure | Celastrina neglecta | North Field | 10 | 6/23/2015 |
| Silver Spotted Skipper | Epargyreus clarus | North Field | 2 | 6/23/2015 |
| Peck's Skipper | Polites peckius | North Field | 1 | 6/23/2015 |
| Baltimore Checkerspot | Euphydryas phaeton | Center Field | >40 | 6/26/2015 |
| European Skipper | Thymelicus lineola | Center Field | 20 | 6/26/2015 |
| Summer Azure | Celastrina neglecta | Center Field | 3 | 6/26/2015 |
| Clouded Sulfur | Colias philodice | Center Field | 7 | 6/26/2015 |
| Cabbage White | Pieris rapae | Center Field | 10 | 6/26/2015 |
| Silver Spotted Skipper | Epargyreus clarus | Center Field | 2 | 6/26/2015 |
| Great Spangled Fritillary | Speyeria cybele | Center Field | 1 | 6/26/2015 |

| | | | | |
|---|---|---|---|---|
| Viceroy | Limenitis archippus | Center Field | 1 | 6/26/2015 |
| Bronze Copper | Lycaena hyllus | North Field | 2 | 6/26/2015 |
| Banded Hairstreak | Calycopis cecrops | North Field | 2 | 6/26/2015 |
| Summer Azure | Celastrina neglecta | North Field | 3 | 6/26/2015 |
| Eastern Tailed Blue | Cupido comyntas | North Field | 2 | 6/26/2015 |
| Gray Hairstreak | Strymon melinus | North Field | 1 | 6/26/2015 |
| Silver Spotted Skipper | Epargyreus clarus | North Field | 2 | 6/26/2015 |
| Great Spangled Fritillary | Speyeria cybele | North Field | 2 | 6/26/2015 |
| Clouded Sulfur | Colias philodice | North Field | 4 | 6/26/2015 |
| Cabbage White | Pieris rapae | North Field | 8 | 6/26/2015 |
| Monarch | Danaus plexippus | North Field | 1 | 6/26/2015 |
| Banded Hairstreak | Calycopis cecrops | Woods | 11 | 6/26/2015 |
| Eastern Comma | Polygonia comma | Woods | 3 | 6/26/2015 |
| Great Spangled Fritillary | Speyeria cybele | North Field | 6 | 7/21/2015 |
| Little Glassywing Skipper | Pompeius verna | North Field | 1 | 7/21/2015 |
| Dun Skipper | Euphyes vestris | North Field | 1 | 7/21/2015 |
| Monarch | Danaus plexippus | Center Field | 1 | 7/21/2015 |
| Great Spangled Fritillary | Speyeria cybele | Center Field | 1 | 7/21/2015 |
| Pearl Crescent | Phyciodes tharos | Center Field | 2 | 7/21/2015 |
| Clouded Sulfur | Colias philodice | Center Field | 1 | 7/21/2015 |
| Summer Azure | Celastrina neglecta | Center Field | 1 | 7/21/2015 |
| Banded Hairstreak | Calycopis cecrops | Woods | 1 | 7/21/2015 |
| Eastern Comma | Polygonia comma | Woods | 1 | 7/21/2015 |
| Mourning Cloak | Nymphalis antiopa | Woods | 2 | 7/21/2015 |
| Question Mark | Polygonia interrogationis | Woods | 1 | 7/21/2015 |
| Great Spangled Fritillary | Speyeria cybele | North Field | 1 | 9/9/2015 |
| Cabbage White | Pieris rapae | North Field | 11 | 9/9/2015 |
| Clouded Sulfur | Colias philodice | North Field | 9 | 9/9/2015 |
| Orange Sulfur | Colias eurytheme | North Field | 3 | 9/9/2015 |
| Pearl Crescent | Phyciodes tharos | North Field | 10 | 9/9/2015 |
| Eastern Tailed Blue | Cupido comyntas | North Field | 20 | 9/9/2015 |
| Gray Hairstreak | Strymon melinus | North Field | 1 | 9/9/2015 |
| Monarch | Danaus plexippus | North Field | 1 | 9/9/2015 |
| Clouded Sulfur | Colias eurytheme | Center Field | 10 | 9/9/2015 |
| Pearl Crescent | Phyciodes tharos | Center Field | 40 | 9/9/2015 |
| Mourning Cloak | Nymphalis antiopa | Center Field | 1 | 9/9/2015 |

Denotes focal species