

Management Plan
Beckwith Preserve

June 2010



LEGACY LAND CONSERVANCY



Management Plan for the Beckwith Preserve

Village of Stockbridge, Ingham County, Michigan

Prepared by Elizabeth Durfee

June 2010

This document contains a description of the Preserve, management objectives, and management actions. Management actions are broken down into short term (0-3 years), mid term (3-8 years), and long term goals (8 years or more), as well as immediate and annual needs. Where possible the personnel, time, and cost needed to implement specific management actions are estimated and additional resources and references are suggested.

Thank you to Dana Wright of Legacy Land Conservancy for her assistance with the preparation of this document.

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INTRODUCTION

Legacy Land Conservancy Preserves

Legacy Land Conservancy (Legacy) seeks to preserve land that ranges in location and represents a variety of functions and ecosystem types. The specific characteristics of the property and availability of assets and resources, such as funding or a Preserve Adopter, also influence the selection of properties to preserve.

General Property Description

The Beckwith Preserve is a 30.56 acre parcel located off M-106/Main street/Morton Road in Section 23 of the Village of Stockbridge, in Ingham County, Michigan. The parcel is located on the north side of M-106 just east of Maple Road (Map 1). The Preserve has over 800 feet of frontage on Portage Creek. It is irregular in shape and is comprised of wetland, meadow, planted pine forest, woodland, and a creek.



Land Use History

Originally settled in the 1830's and used for cultivating corn and raising cattle, the property was later abandoned because its sandy soil was unproductive. The land was purchased by Dr. Sidney Beckwith and Harriet Beckwith in 1948 and later inherited by Frances Laird (daughter of Sidney and Harriet).

Presence of large open-grown white oaks in open area between the plantation and the deciduous creek side woods suggests a previous open-woods character. Vegetation maps circa 1800 indicate that pre-settle vegetation consisted of oak hickory forest and wet-prairie (MSU Extension). Abundance of hoptree (*Ptelea trifolia*) also indicates that the site may have formerly been open oak savanna before European settlement and agricultural conversion. A mature planted pine forest occupies much of the Preserve.

Acquisition

The property was donated to the Legacy Land Conservancy (then Washtenaw Land Trust) by Campell and Frances Laird in two undivided half interests, the second of which occurred on 6 January 1999, in honor of Mrs. Laird's parents, Sidney and Harriet Beckwith and her elder sister, Irene Beckwith Hunting.

Surrounding Uses

The Preserve is located just east of the Village of Stockbridge in an area dominated by agriculture, rural residential, and patches of forest.

Connectivity

Adjacent land uses include: agricultural fields buffered by contiguous forest to the north; agriculture to the northwest; rural residential to the south southwest; M-106 to the south, and agriculture to the east (Map 2).

The Beckwith Preserve's trail is part of the Lakelands Trail State Park, a 20 mile long linear park that traverses Stockbridge. It is located approximately 5 miles north west of the Unadilla State Wildlife area. The Preserve is downstream from Nichols Lake and upstream of Maconachie Lake. See Appendix A for Stockbridge trail system map.

Existing Resources/Assets

The Friends of the Beckwith Conservancy was created to support the nature preserve. The group has 2 roles: to establish neighbors as stewards of the land to help watch over it and to help raise fund to establish an endowment fund and cover the costs of trail development, signs, and parking.

Classification

The Beckwith Preserve is open to the public for quiet recreational uses such as hiking, cross country skiing and bird watching. No motorized vehicles or bicycles are allowed on the property. The primary management objective for the Beckwith Preserve is to protect the land as a park and nature preserve for visitors and residents of the village of Stockbridge, Michigan to enjoy.

The table below summarizes the selection criteria and the role the Beckwith Preserve fulfills within the broader framework:

Preserve: Beckwith

Location: Village of Stockbridge, Ingham County

<i>Assets/ Characteristics</i>	High Quality	Low Acquisition Costs	Low Stewardship Costs	Preserve Adopter Potential	Size			
<i>Function</i>	Teaching Tool/ Educational Opportunity	Research Potential	Urban Preserve	Proximity to other Protected Land	Community Use			
<i>Ecosystem</i>	Prairie	Woodland	River Corridor	Fen	Bog	Marsh	Farmland	Organic Farmland

Purpose of the Plan

The purpose of this management plan is to provide a framework to guide management of the Beckwith Preserve. The plan provides current and future land managers, stewards, and the community at large with information about the Preserve to aid in ensuring long term protection.

The primary management objective for the Beckwith Preserve is to protect the land as a park and nature preserve for visitors and residents of the village of Stockbridge, Michigan to enjoy.

SITE DESCRIPTION

Soils

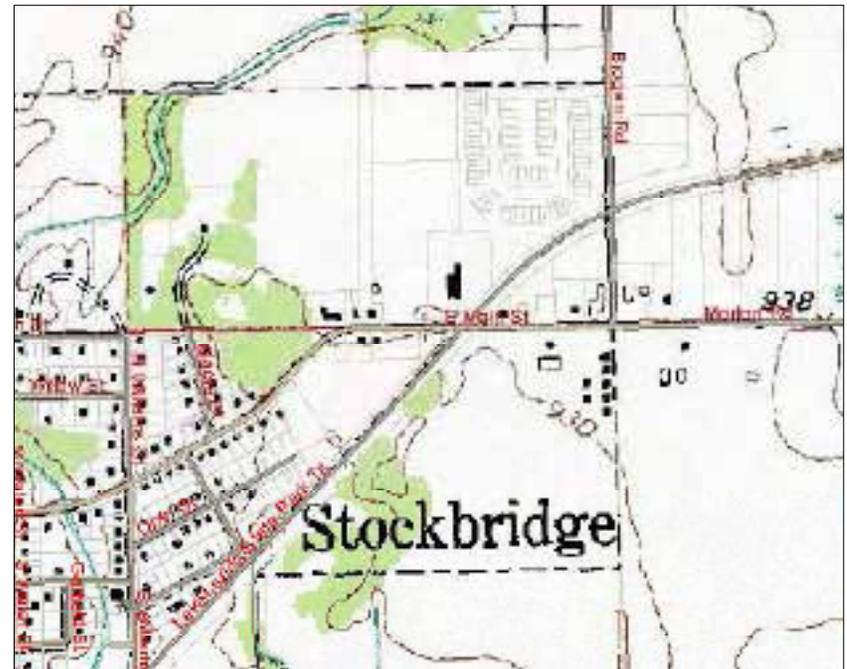
For a relatively small area, there are many different soil types on this preserve ranging from very poorly drained to well drained. A detailed soil report by type and location can be found in Appendix D.

Ecology

In 2006, Andrew Laird identified seven community types in eleven management sections. These sections are described in Appendix F. Where applicable, invasive species are also noted.

Topography

Topography is flat. Elevation ranges from approximately 940-950 feet above sea level (Map 3).



Map 3 Topographic map of the Village of Stockbridge (data source: USGS)

Hydrology

Portage Creek flows south across the northwestern portion of the site. The southern portion of the site is wetland.



Figure 1 View of Portage Creek

MANAGEMENT OBJECTIVES

Overview of Objectives

The primary management goals for the Beckwith Preserve include:

- **Maintain and enhance the value of the Preserve as a natural area for residents and visitors of Stockbridge to enjoy**
- **Prevent and mitigate erosion of creek bank**
- **Connect the trail system to Stockbridge's trail system**
- **Organize workdays to remove invasive species**
- **Improve the quality of the woodland adjacent to the river**
- **Monitor the planted pine forest and allow it to open up as trees die over time**
- **Identify a 'Preserve Adopter' to lead stewardship activities**
- **Identify and secure source(s) of long term funding for the Preserve**

Donor Intent

The donor's intent is that public use is limited to walking, nature education, and cross-country skiing. The Beckwith Conservancy will be managed for wildlife, water quality, and low-impact recreation. The following are not allowed: motorized vehicles, hunting or shooting, campfires, unauthorized cutting of trees or removing plants or other natural materials, military-style games (such as paint-ball, etc). Camping will be allowed by permission of Legacy. The donor requests: that property remain in its wooded state, limited public access be provided by creating a trail system and parking area at the southeast corner along M-106 (E. Main Street), and that a Friends of the Beckwith Conservancy (of which at least one member of the Beckwith family will serve on the board of) is established. Invasive species removal and native species planting is desired.

Management Obligation

Legacy is responsible for laying out trails, building bridges, seeing that the signs and trail are maintained, organizing the Friends of the Beckwith Conservancy, and routine administrative duties. The routine maintenance work of the Beckwith Conservancy will be carried out by the Friends of the Beckwith Conservancy.

Management Status

Some invasive species have been removed. A trail has been established and benches have been installed near the creek and meadow. A bridge was constructed over the creek in 2006.

The land is open to the public for quiet recreational uses such as hiking, cross country skiing and bird watching. No motorized vehicles or bicycles are allowed on the property. Connecting the trail systems from the Beckwith Preserve and Village of Stockbridge will increase use and value of the Preserve.

Management Objectives

Trails should be maintained and improved to accommodate quiet recreational use. Felled trees and limbs that obstruct the path should be removed and additional paint marks should be added to increase the accessibility of trails. The trail along the creek could be relocated to reduce erosion (Figure 6). Planks have been installed through the lowland area at the Preserve entrance. At minimum, this boardwalk should be checked annually and grasses should be trimmed back to widen the path. A more official boardwalk could be constructed to allow for wheelchair access.

A parking area along the north side of E M 106/E Main Street/ Morton Road would increase the accessibility and visibility of the Preserve.



Figure 6 View of trail along Portage Creek.



Figure 7 Garlic Mustard along trail through pine forest

Invasive Species Control

Invasive species are prevalent throughout the Preserve. Areas that should be targeted for invasives control include the wooded area across the river (Unit A), the creek corridor (Unit B), and the wetland (Unit D), followed by the oak forest between the pine forest and meadow (Unit C). Garlic mustard and other herbaceous invasives should be removed from the trail to help prevent spread (Figure 7). Priority should be placed on removing barberry, dames rocket, and privet (Unit A.) Establishing regular workdays for removal of invasive species is recommended.

Restoration

The site is heavily modified and ecological restoration to pre-settlement vegetation is not likely the optimal goal for this Preserve. The highest quality area of the Preserve is across the river (Unit A). Efforts to remove invasive species should focus on this portion of the Preserve.

Management Units

Five units have been created to facilitate management of the Preserve:

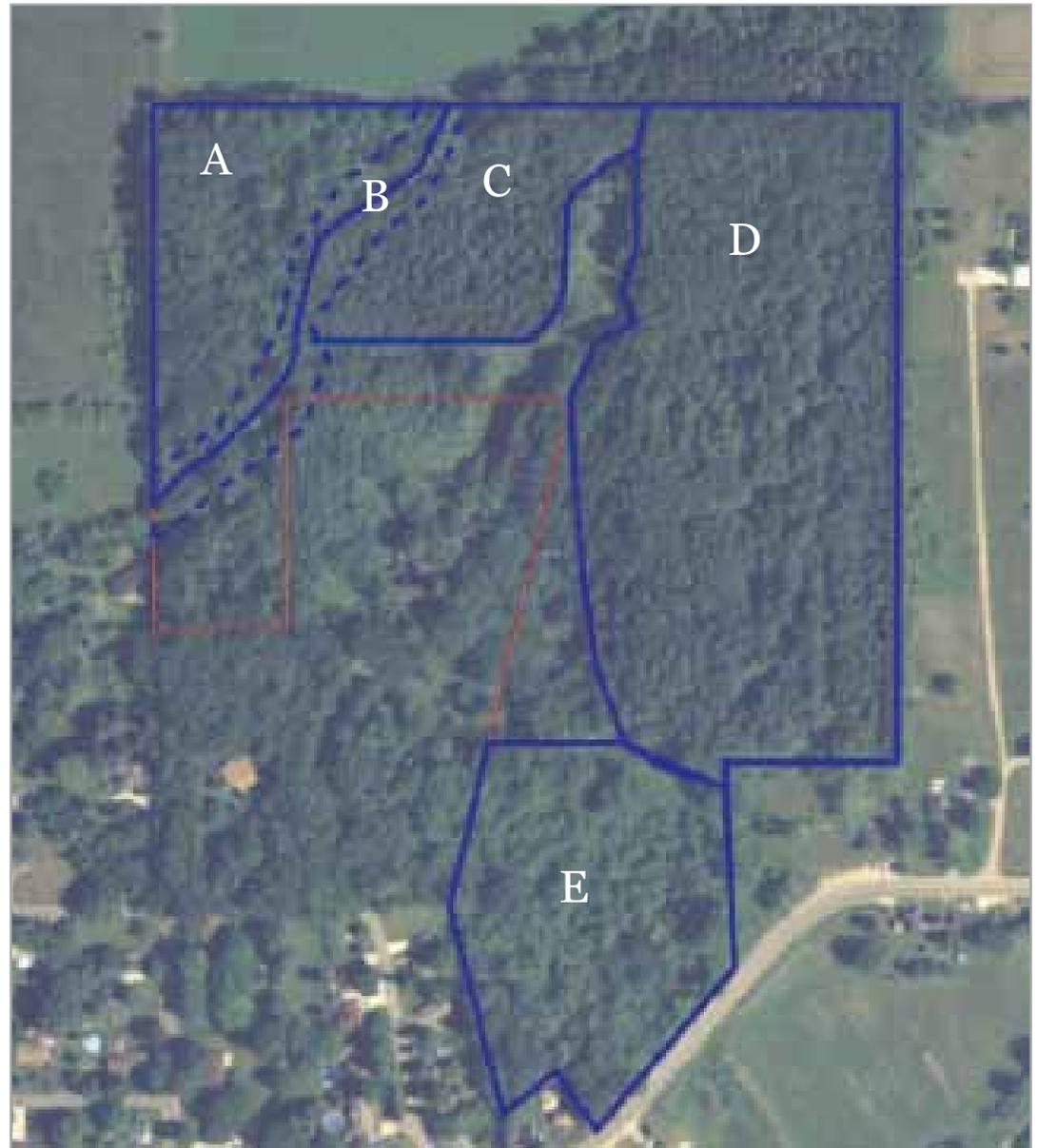
Unit A - Woodland on the northwest side of the stream

Unit B - River corridor

Unit C - Wooded area between the river and the meadow

Unit D - Pine Forest

Unit E - Wetland near the southern entrance of the Preserve



Map 2 Beckwith Preserve management units (note: boundaries are approximate) (data source: MI DTMB)

IMPLEMENTATION

Management Actions

1. Conduct a detailed biological survey of plants and animals. In order to identify all species present within an area it is necessary to conduct a survey at least 3 times, during different seasons. The time required to conduct a survey is variable by plant community, travel time, size, accessibility of the site, and surveyor. An inventory of 10 acres would take approximately 2 hours, times 3 visits would amount to approximately 30-40 minutes/acre. The Beckwith Preserve is approximately 30 acres and would require approximately 18 hours to survey over 3 visits. Approximately 30% additional time would be required for office work. The cost to contract a professional is also variable and may range from \$60-100/hour. In total, an investment of approximately 24 hours and \$1410-\$2,400 may be required for a professional plant inventory.

2. Identify a Preserve Adopter and establish a regular stewardship group to assist Legacy with managing volunteer work days and monitoring of the Preserve.

Time Frame:	Immediately
Personnel Needed:	Contract professional or Professional Volunteer
Estimated Cost:	\$1,400 - \$2,400
Approximate Time:	24 Hours
Resources:	Greg Vaclavek, Native Plant Nursery LCC 734-677-5860 plants@nativeplant.com; David Mindell PlantWise 734-665-7168 Plantwise@aol.com

Time Frame:	Immediately
Personnel Needed:	Staff

3. Install new Legacy Land Conservancy Preserve sign. Current sign reads Washtenaw Land Trust.

4. Investigate opportunity to purchase the small parcel that borders the southeast corner of the Preserve.

5. Maintain and update a species list on the website to track species and attract visitors to the Preserve.

Time Frame:	Immediately
Personnel Needed:	Staff
Estimated Cost:	\$175
Approximate Time:	1-2 hours to install, plus time for designing and ordering
Time Frame:	Immediately
Personnel Needed:	Staff
Time Frame:	Within 0-3 years
Personnel Needed:	Staff or volunteer
Approximate Time:	2-3 hours to create, 1 hour per year to update

6. Maintain and improve trail system. Trails should be improved to accommodate increased access that will result from the connection with the Lakelands State Park trail system. Trails require annual maintenance.

Time Frame:	Initiate immediately, complete within 5 years
Personnel Needed:	Staff and volunteers
Approximate Time:	30 hours total for improvements

Immediate trail needs:

a) Clear and mark existing trail. Felled trees and limbs obstructing the trail in the wetland and west of the meadow should be removed with a chainsaw. This would take approximately 2 hours for one person to complete yearly. To aid visitors with navigating the Preserve, additional paint marks could be applied to trees and fallen limbs place along trial edges, particularly in the wooded areas of Units C & D where the trail is more ambiguous. This could be completed in approximately 1-2 hours by staff or a volunteer and needs to be maintained on a yearly basis. Connecting the trail to existing Stockbridge trail systems would increase use and accessibility of the Preserve.

Time Frame:	Immediately, annually
Personnel Needed:	Staff or volunteer
Approximate Time:	3-4 hours for immediate maintenance needs
Tools:	Chainsaw, handsaw, paint

b) To prevent sedimentation in the creek, mitigating erosion along the creek should be prioritized. Vegetation can be used to stabilize the bank; native herbaceous grass and forb seed or seedlings should be planted along the creek bank and native shrub growth should be encouraged by planting live stakes. This would be a suitable activity for a 1-day volunteer workday. Precaution should be taken to prevent work crew from exacerbating erosion.

Lining the creek side of the trail with logs and large limbs secured by stakes or rebar is another strategy to reduce erosion along the trail and encourage visitors to stay on the established path. The time and cost of this project is variable; utilizing downed logs or invasive or non native species that are being removed for staking would be less costly but more time intensive than purchasing stakes or rebar. Stakes or recycled lumber could also be solicited. A crew of 3-4 volunteers could augment portions of the approximately 550' of trail adjacent to Portage Creek in 20-30' increments, as necessary. Assuming stakes and logs were on hand, 3-4 volunteers could line a portion of the trail with logs and install stakes in 2-4 hours.

Alternatively, the trail could be relocated at least ten feet from the creek. As the undergrowth is heavy in places along the trail, this would likely require shrub removal.

Time Frame:	Immediately
Personnel Needed:	3-4 Volunteers
Estimated Cost:	Rebar - \$4/each, stakes - \$10-\$20/12 stakes
Approximate Time:	2-4 hours
Tools and Materials:	Handsaws, mallet, stakes or rebar, limbs and logs
Resources:	NH trail construction guide, http://atfiles.org/files/pdf/BMPmanual2004.pdf

c) Improve trail through wetland. The existing plank installation at the beginning of the trail serves to keep visitors out of the low lying wetland. The wetland portion of the trail is approximately 500' long. Vegetation along the trail should be trimmed back annually with a machete or string trimmer to allow for safe travel along the planks. Two or three individuals with machetes or one individual with a string trimmer could complete this yearly maintenance in approximately 2 hours. Planks will likely require repair every 2-5 years. Widening the trail and constructing a more formal pathway would allow visitors in wheelchairs to access and enjoy the Preserve. Constructing a boardwalk would require more investment of resources; however, it would likely require less maintenance and would last longer. Utilizing a volunteer crew for construction would reduce cost. Installing 2 adjacent 8" planks over 200 ft of the lowest portions of the trail may cost \$500 (2"x8"x8' treated boards at \$10/each). It is likely that recycled lumber could be solicited to defray this cost.

Time Frame:	Immediately
Personnel Needed:	2-3 Staff or volunteers for clearing trail
Estimated Cost:	200 ft planks - \$500
Approximate Time:	2 hours string trimming, 3-4 hours laying planks
Tools:	Wood planks, string trimmer or machetes
Resources:	Boardwalk Design Guideline http://www.actontrails.org/BoardwalkDesign.pdf

Additional trail needs:

a) Construct new trail from Main Street north through the field that currently borders the southeast corner of the Preserve. Note: this is contingent on purchase of the available parcel.

b) Walk trails at least once or twice a year to check for maintenance needs. A site walk could be conducted in approximately 1 hour.

7. Collect GPS points to map out:

- Management zones (2-3 hours)
- General location of invasive species (2-3 hours)
- Rare species (1-2 hours)
- Trail system (1-2 hours)

Time Frame:	Within 5 years
Personnel Needed:	Staff or volunteers
Approximate Time:	1-3 hours
Tools and Materials:	Mower, string trimmer, trail markers
Time Frame:	Annual
Personnel Needed:	Staff or volunteer
Approximate Time:	1 hour
Time Frame:	Within 0-2 years
Personnel Needed:	Staff or volunteer
Estimated Cost:	\$50 - \$200+ for GPS unit
Approximate Time:	6-10 hours total
Tools:	GPS equipment

8. Restoration and invasive species removal. Restoration prioritization should be given to the higher quality area across the river (Unit A), the stream banks (Unit B), and then the wetland (Unit E). See Map 2 on page 15.

- Remove barberry, dame’s rocket, and privet from Unit A. Shrubs should be sprayed with herbicide. Dame’s rocket should be removed in early spring when it is flowering and easiest to identify.
- Remove invasive shrubs from the stream banks. Late fall or early winter, when the ground is frozen, may be the best time to hold workdays along the creek to minimize further erosion. Native species could be planted to help stabilize the bank.
- Remove dame’s rocket, Canada thistle, garlic mustard, and other invasives from the wetland. Gray dogwood could be thinned. The wetland contains minimal native grasses and forbs; planting native wetland species would increase biodiversity and ecological quality.
- Garlic mustard should be removed from the trail and areas within a 3 foot buffer of the trail to reduce spread.

See notes from Andrew Laird’s management needs by section in Appendix G.

Time Frame:	Within 0-2 years
Personnel Needed:	Staff , 4-5 volunteers
Approximate Time:	3-5 Workdays
Tools:	Handsaws, loppers, herbicide
Time Frame:	Within 3-5 years
Personnel Needed:	Staff, 3-4 volunteers
Approximate Time:	2-3 Workdays
Tools:	Handsaws, loppers, herbicide
Time Frame:	Within 3-5 years
Personnel Needed:	Staff, 3-4 volunteers
Approximate Time:	2-3 Workdays
Tools & Materials	Handsaws, loppers, herbicide, wetland seed mix, plastic bags
Time Frame:	Annually
Personnel Needed:	Staff, 1-3 volunteers
Approximate Time:	2-4 Hours
Tools:	Plastic bags

7. Photo monitor. Legacy is required to photo monitor annually. This will allow changes in the Preserve to be monitored over time. Photo monitoring points have been established.

8. Install a trail map and educational sign at Preserve entrances. A sign with a map of the Preserve, trails, and adjacent trail systems should be installed to aid visitors in navigating the Preserve. Additionally, an educational sign with information about the Preserve and its ecosystems, invasive, rare or notable species to be on the look out for, as well as information about Legacy would enhance the visitor’s experience and provide additional publicity for Legacy.

Time Frame:	Annual
Personnel Needed:	Staff or volunteer
Approximate Time:	2-3 hours
Time Frame:	3-8 years
Personnel Needed:	Staff, volunteer or student to design
Estimated Cost:	\$200
Approximate Time:	1-2 hours to install

9. Organize a stewardship campaign to raise funds for preserve management.

10. Evaluate effectiveness of management strategies

11. Monitor preserve use

12. Update management plan every 3-5 years or as necessary.

CONCLUSION

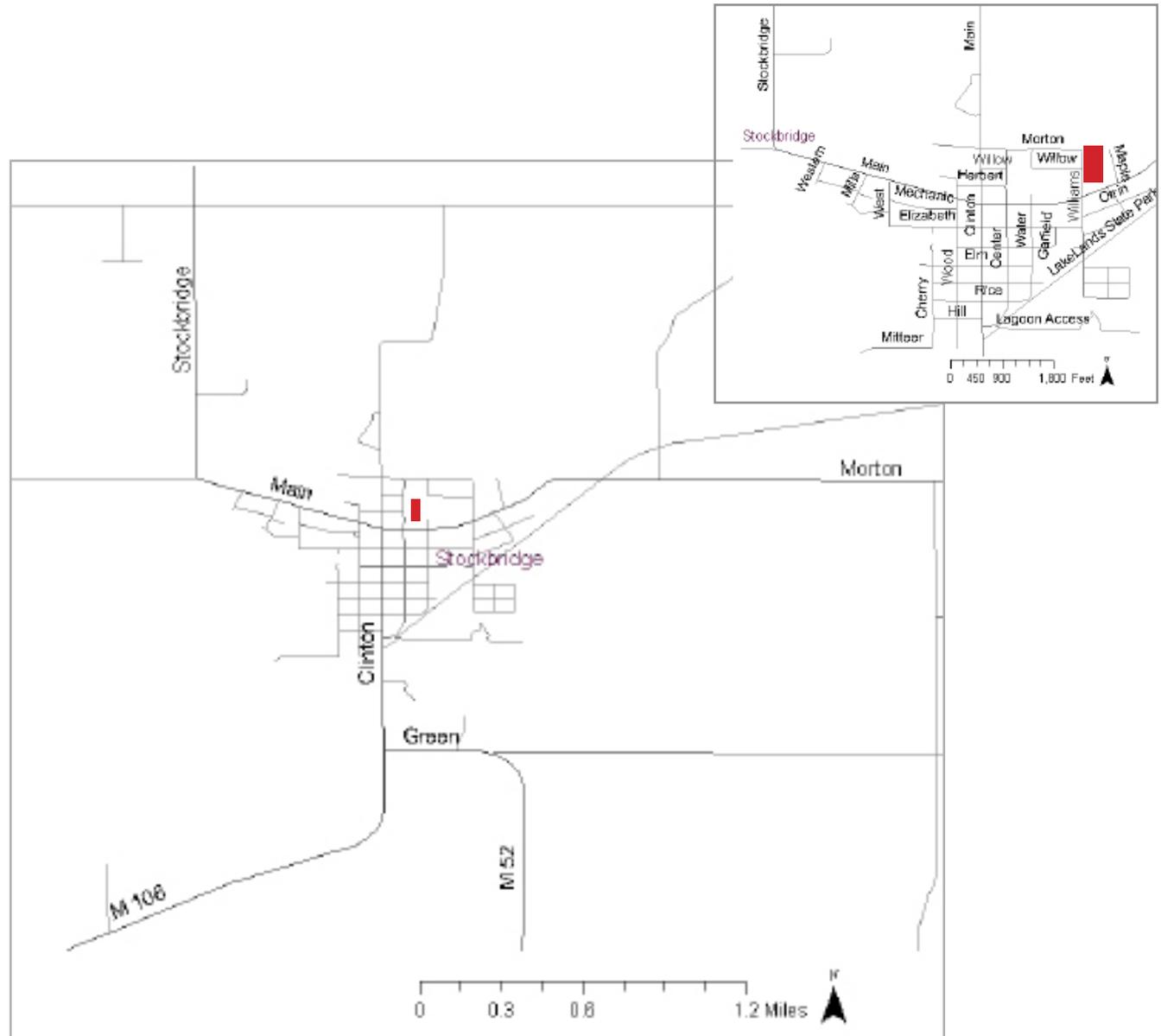
The Beckwith Preserve contains a variety of ecosystems and is an amenity to the surrounding community. Managing the Preserve for public use and restoring the higher quality area northwest of the creek will increase the use and ecological value of the Preserve. As an urban preserve, it provides an opportunity to engage the public in educational and restoration-related opportunities locally. Expanding the Beckwith Preserve's trail system to connect to that of the greater, regional community will increase the use of the Preserve, aid in ensuring its long term maintenance and protection, and potentially increase opportunities to generate funding for the Preserve.



APPENDIX A

Directions:

From 94, take exit 159 to Route 52. Follow 52 North approximately 14 miles. Turn right at South Clinton Street, follow for just under 1 mile, then turn right at S Clinton Street/E M 106/E Main Street/Morton Road. Follow for approximately 1/2 mile, the Preserve will be on the left. Visitors should park along the north side of M-106 just east of Maple Street at the east end of the woods.



Map 1 Location of the Beckwith Preserve (note: boundaries are approximate)
(data source: MIGDL)

APPENDIX B

Legal Description

Part of the Southwest $\frac{1}{4}$ of Section 23 and part of the Northwest $\frac{1}{4}$ of Section 26, Town 1 North, Range 2 East, Stockbridge Township, Ingham County, Michigan, more particularly described as follows: Commencing at the South $\frac{1}{4}$ corner of said Section 23; thence along the South line of said Section 23, also being the North line of said Section 26, South 89°55'42" West 213.55 feet; thence along the centerline of M-106 (Main Street) (66 foot wide right of way), South 41°25'15" West, 250.30 feet to the point of beginning of the parcel to be described; thence continuing along the centerline of said M-106, South 41°25'15" West, 237.20 feet; thence continuing along the centerline of said M-106, Southwest on an arc right, having a length of 119.11 feet, a radius of 555.00 feet, a central angle of 120°17'47" and a long chord which bears South 47°34'08" West, 118.88 feet; thence along the East line of Lindsay Addition to the Village of Stockbridge, a subdivision as recorded in Liber 2 of Plats on Page 17 of the Ingham County Records, North 110°10'29" West (platted as North 110 West) 166.64 feet; thence continuing along the East line of said Lindsay Addition, South 61°51'54" West (platted as South 62° West), 132.00 feet; thence continuing along the East line of said Lindsay Addition, North 110°10'29" West (platted as North 110 West), 350.39 feet; thence North 19°05'31" East, 483.70 feet; thence North 13°02'53" East, 266.57 feet thence due North, 103.00 feet; thence due West, 459.08 feet; thence due South 370.45 feet; thence North 89°43'11" West, 250.13 feet (previously recorded as due West); thence along the West line of the Southeast $\frac{1}{4}$ of the Southwest $\frac{1}{4}$ of said Section 23, North 0°03'25" West, 873.51 feet; thence along the North line of the Southeast $\frac{1}{4}$ of the Southwest $\frac{1}{4}$ of said Section 23; North 89°58'40" East, 1282.76 feet; thence along a line lying 50 feet West of and parallel to the North-South $\frac{1}{4}$ line of said Section 23; thence South 04°22'44" East, 188.02 feet to the point of beginning; containing 30.56 acres, more or less.

APPENDIX C

Restrictions on Sale/Division:

The Property shall not be divided nor sold in whole or in part; provided, however, if the Trust shall cease to exist or if it fails to be a “qualified organization” for purposes of Internal Revenue Code Section 501(c)(3), or if the Trust is no longer authorized to acquire and hold conservation easements, this restriction on sale shall not be deemed to restrict or prohibit the transfer of the Property by conveyance or otherwise, from the Trust to another non-profit qualified organization tax exempt under the provisions of Section 501 (c)(3) of the Internal Revenue Code and, in the opinion of the Trust, with substantially similar conservation purposes as those of the Trust.

Use Restrictions:

The property shall be used and perpetually maintained solely for the purpose of a wildlife and nature preserve, limited to passive, quiet, non-vehicular uses, with no development other than a pedestrian trail system and a small vehicular parking area, or for other charitable purposes similar or related to the foregoing purposes served by the Trust as a public charity exempt from taxation under IRC 501(c)(3).

Name and Location of Key Documents:

Warranty deed, environmental assessment, title insurance, and aerial photos are on hand at Legacy’s office in the Beckwith Preserve hard folder and on the server in the folder: \\Npserv-llc\sharedfiles\Land\PRESERVES\Beckwith Preserve-Laird.

APPENDIX D

Soils

Soils found in the Beckwith Preserve include (Map 4):

Gilford sandy loam (Gf), 0-2 percent slope: Very poorly drained soils formed in glacial drainage channels. Soils have a moderate water capacity and permeability is moderately rapid.

Granby loamy fine sand (Gr), 0-2 percent slopes: Very poorly drained. Soils have low available water capacity and rapid permeability. Formed on outwash plains and depressions.

Houghton muck (Hn), 0-2 percent slopes: Soils are very poorly drained and have a very high water capacity. Located on depressions and outwash plains. Soils have moderately rapid permeability.

Oshtemo-Spinks loamy sands (OtB), 0 to 6 percent slopes: Oshtemo - Well drained soils formed in outwash plains, valley trains, moraines, and beach ridges. Soils have moderate water capacity and moderately rapid permeability.

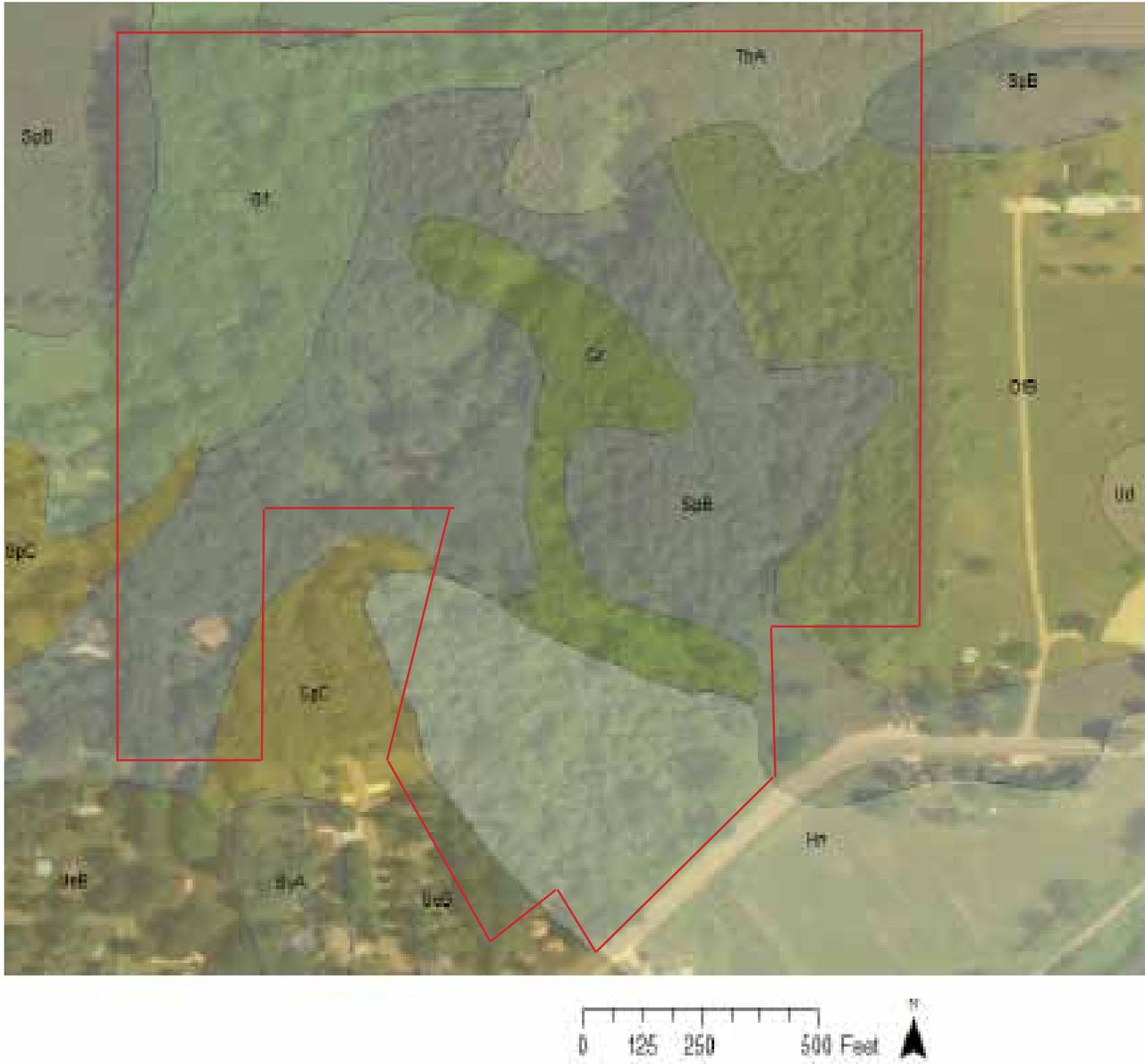
Spinks - Well drained soils formed in dunes, moraines, till

plains, outwash plains, beach ridges, and lake plains Soils have low available water capacity and moderately rapid permeability.

Spinks loamy sand (SpB), 0 to 6 percent slopes: Well drained soils formed in dunes, moraines, till plains, outwash plains, beach ridges, and lake plains Soils have low available water capacity and moderately rapid permeability.

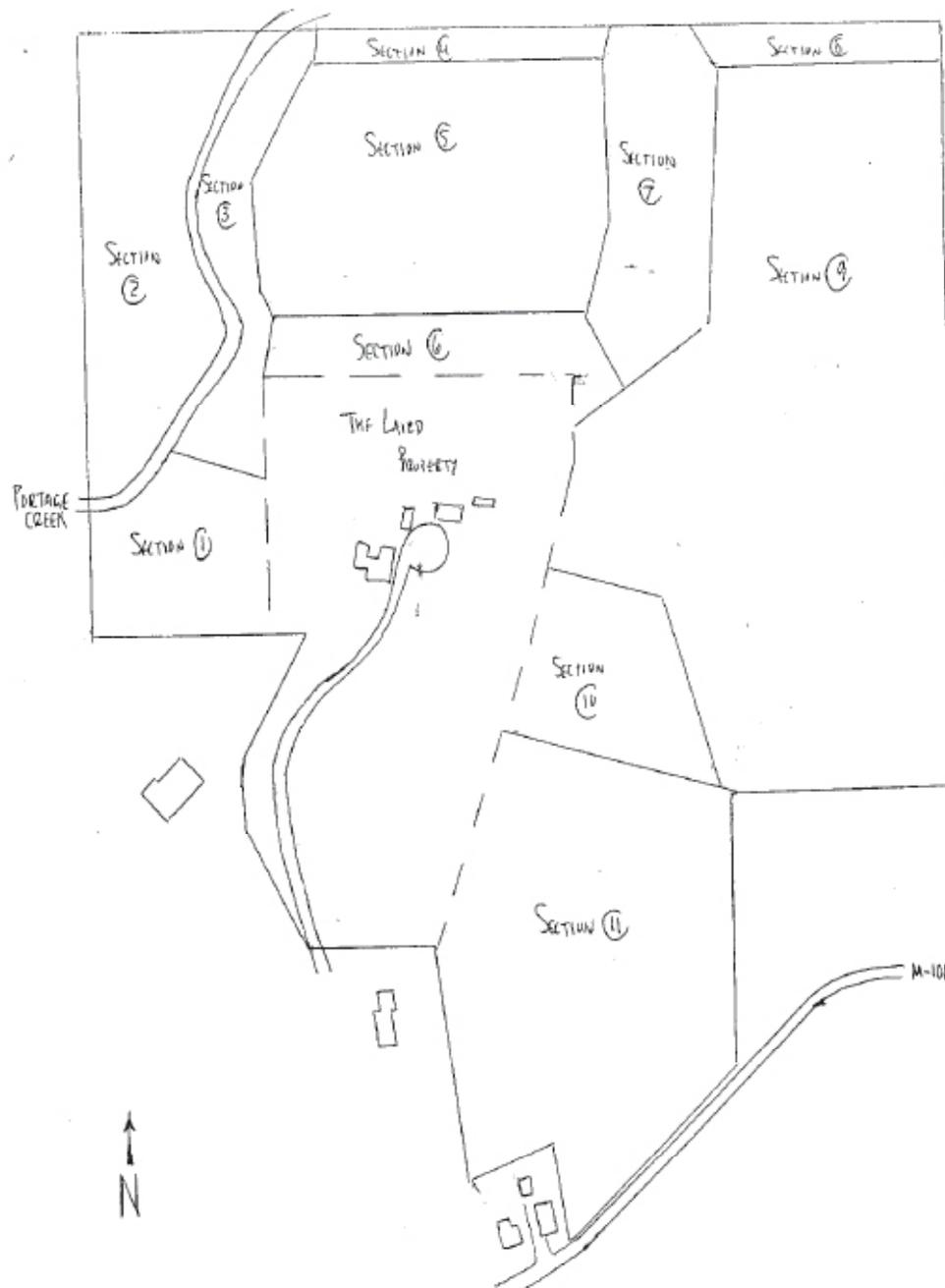
Thetford loamy sand (ThA), 0 to 3 percent slopes: Somewhat poorly drained soils formed in outwash plains. Soils have low available water capacity and moderately rapid permeability.

Urban land-Boyer-Spinks complex (UeB), 0 to 10 percent slopes: Well drained soils formed on outwash plains, moraines, and eskers. Soils have moderate available water capacity.



Map 4 Soil types in the Beckwith Preserve (note: boundaries are approximate) (data source: NRCS)

APPENDIX E



APPENDIX F

Ecology Types - Andrew Laird

Section 1 The Old Orchard

A few specimens from the former apple orchard remain in the now white pine-dominated portion of this section. The western portion of Section 1 consists of second growth woodland, with black oak, white pine, black cherry and American elm, as well as a large clone of gray dogwood. Invasive species including autumn olive and honeysuckle are present in the western part of the section. The fence line adjoining the property to the north has significant honeysuckle. In the eastern portion of Section 1, black locust, honeysuckle, and autumn olive are present. Periwinkle and hop tree were also found. Some honeysuckle, black locust, burning bush, and box elder have been cleared.

Section 2 Black & White Oak Forest

Section 2 is a remnant wood lot from the original farm. The canopy is dominated by black cherry, white oak and black oak. One sugar maple was identified. The understory is sparse, consisting primarily of black cherry and American elm. Eastern cottonwood is present along the bank of the stream. This section contains few native herbaceous

plants. Garlic mustard and Japanese barberry are the most prevalent invasive species in Section 2.

Section 3 Portage Creek Side

Section 3 comprises the eastern bank of Portage Creek. Historically dominated by American elm, the area is now overrun by invasive species including black locust, tree-of-heaven, Norway maple, and mulberry. The native herbaceous flora along Portage Creek is diverse and contains Jack-in-the-pulpit, starry false Solomon's seal, wild sarsaparilla, rattlesnake fern, hairy sweet-cicely, red baneberry, and rue anemone. Invasive species including Japanese barberry and Tartian honeysuckle dominate the shrub layer of this section. Poison ivy is also common.

Section 4 Black Oak Forest

Section 4 is characterized by regenerating black oak, bigtooth aspen in the understory, and eastern red-cedar, which is dying off as the canopy closes. Invasive species present in this section include autumn olive and some buckthorn.



Figure 2 Pine forest in Beckwith Preserve

Section 5 & 9 White Spruce & Pine Forest

Section 5 is characterized by a plantation forest that was planted in the late 60's and is comprised of white spruce, Norway spruce, and some Scotch pine. A lack of sunlight due to the proximity of the planted trees has resulted in a limited herbaceous plant layer, though garlic mustard is present (Figure 2).

Section 9 contains spruce and pine that were planted in the late 50s and have grown into a dense evergreen forest. Light gaps between the evergreens have allowed a few American elm and black cherry trees to establish. A

double row of jack pine was planted along the eastern edge of the plantation. Herbaceous cover is minimal. Invasive species are sparse and include patches of autumn olive and honeysuckle.

Section 6 Hedgerow

Section 6 is comprised of an old hedgerow that has started to expand into an old farm field. The older portion of the section contains mature black cherry, red oak and open-grown white ash and white oak. Gray dogwood and wild hazelnut grow among the older trees. The younger portion of this section is characterized by oak regeneration, big tooth aspen and black cherry. Black locust dominates the older field. Invasive species including garlic mustard, autumn olive, as well as hoptree (planted as an ornamental), have spread vigorously.



Figure 3 View of meadow in Beckwith Preserve

Section 7 & 10 Meadow

Section 7 consists of a large meadow dominated by brome and spotted knapweed (Figure 3). Autumn olive surrounds the edges of the meadow. Some native trees from the adjacent hedgerow (Section 6) have encroached upon the field.

Section 10 is a meadow. Cottonwood has seeded into the area. Poison ivy covers a large part of the eastern cover of this section.

Section 8 Hedgerow

Section 8 is an old oak hedgerow open-grown field edge forest dominated by oak and black cherry and enclosed by spruce. The eastern edge has a large old clone of bigtooth aspen and sections contain populations of native herbaceous plants like rue anemone. Invasive species in this section include honeysuckle and garlic mustard.

Section 11 Wetland

Section 11 is a remnant wetland that contains a thick shrub layer. Silver maple dominates the northern part of the marsh. The canopy is dominated by cottonwood, box elder, and American elm and the shrub layer is dominated by elderberry, nannyberry, willow and gray dogwood. Invasive species are not a major problem; however, there are scattered honeysuckles and a few Norway maples on the edge of the section, and dame's cress has invaded the north significantly (Figure 4).

b) Invasive species

There are numerous species of aggressive non-native plants that inhibit the growth of a diverse native flora at this site (see previous description by section). The most prominent invasive species include autumn olive, garlic mustard, Japanese barberry, dames rocket, and multiflora rose (Figure 5).



Figure 5 Japanese barberry in northwest of the creek.



Figure 4 Trail through wetland in the southern portion of the Preserve

APPENDIX G

Management Overview - Andrew Laird

Section 1: The Old Orchard

- Remove the black locust, honeysuckle, and autumn olive to open up the area and allow for re-growth.
- Cut and apply herbicide to autumn olive and honeysuckle in the western part of the section.

Section 2: Black & White Oak Forest

- Burn this area to encourage oak regeneration, and the removal of invasive and non-native species.
- Few native herbaceous plants are present; no management of garlic mustard may be the best strategy.
- Cut and apply herbicide to Japanese barberry.
- Girdle Norway maple and tree of heaven.

Section 3: Portage Creek Side

- Cut and treat invasive woody plants with herbicide. Girdle black locust and tree-of-heaven.
- Plant trees including white oak, chinaquapin oak, silver maple, fungus-resistant varieties of American elm, and river birch should be along the creek corridor and protected from deer with wire enclosures. Propagate trees such as eastern cottonwood by live staking. Plant shrubs including

spicebush and witch hazel.

- Hand pull garlic mustard and dames rocket.
- Introduce native species such as trillium and install wire enclosures to aid in protection from deer browsing.
- Manage erosion along the bank shoreline by planting and moving the walking trail back from the edge of the creek.

Section 4

- Remove invasive and non-native species.
- Let area open up by thinning and removing low value trees in thick areas; in addition, burn specific areas to help manage the meadows and shrub areas.

Sections 5& 9: White Spruce & Pine Forest

- Remove invasive and non-native species. Cut and treat autumn olive and honeysuckle with herbicide.
- Thin spruce plantation.
- Remove autumn olive and mutiflora rose around older maple and oaks.
- Long term maintenance needs include monitoring for older trees (100-250 or more years) that are close to the end of life span. As spruce trees die and the canopy opens up,

management needs and opportunities will evolve. Plantation should be monitored for signs of disease. Selective cutting to thin canopy and remove potentially hazardous trees may be necessary. The plantation is susceptible to fire. Precaution should be taken when burning other sections of the Preserve.

Sections 6 & 8: Hedgerows

- Section 8 contains native herbaceous plants and should be prioritized for invasive species management.
- Remove invasive and non-native species. Girdle black locust to allow native trees to become dominant. Cut and treat hop tree with herbicide. Cut and apply herbicide to honeysuckle. Monitor and remove garlic mustard.
- Watch area over the upcoming years to make sure the oaks have room to grow and regenerate and thin as necessary.

Section 7 & 10: Meadow

- Thin cottonwood.
- Remove poison ivy and cut and treat honeysuckle under power lines with herbicide.
- Investigate potential prairie restoration. Trees in the marsh to the south may shade the area too much in the summer.
- Eliminate spotted knapweed by hot repeated burns (divide meadow into 3 burn units, burn northern and southern sections in spring and middle in fall). Caution should be

used to prevent the spruce forest from burning.

- After burning, meadow could then be replanted with prairie grasses and forbs including big blue stem, lupine, Culvers root, spiderwort, black-eyed susan, and purple coneflower.

Section 11 Wetland

- Remove invasive and non-native species. Cut and apply herbicide to honeysuckle. Girdle Norway maples. Thin box elders.
- At the northern edge of the swamp there is a major thicket of Tartian honeysuckle that should be cut and treated to eliminate re-sprouting. This spot would be excellent for planting tulip trees and swamp white oaks.
- Nannyberry, elderberry and willow should be cut and live-staked to propagate the species within the marsh.
- Disease-resistant American elm should be introduced into the swamp, as this area is natural habitat for them.

APPENDIX H

Trail system through the Village of Stockbridge

