

Beckwith Preserve

Management Plan

June 2017



LEGACY Land Conservancy

Protecting and Preserving Southern Michigan

Management Plan for the Beckwith Preserve

Village of Stockbridge, Ingham County, Michigan

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This document contains a description of the Beckwith Preserve, management objectives, and management actions. Management actions are broken down into ongoing, short term (0-3 years), mid term (3-8 years), and long term (8 years or more) goals, 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.

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Introduction

Legacy Land Conservancy Preserves

Legacy Land Conservancy (Legacy) seeks to preserve land that represents a range of locations and a variety of functions and ecosystem types. The specific characteristics of the property and availability of assets and resources, such as funding or an Eco Steward, also influence the selection of properties to preserve.

General Property Description

The Beckwith Preserve (Preserve) is made up of a 30.56-acre parcel located immediately north of M-106/Main Street/Morton Road and east of Maple Road in Section 23 of the Village of Stockbridge, in Ingham County, Michigan. An additional 1.75 acre parcel (Access Improvement Parcel) was acquired in May 2017 (Appendix A, Figure 1). The Preserve has over 800 feet of frontage on Portage Creek. The Preserve is irregular in shape and is comprised of wetland, meadow, planted pine forest, woodland, with a riparian corridor along Portage Creek. The Access Improvement Parcel forms the new southeast corner of the Preserve and will serve as trail head and parking area for visitors to the Preserve.

Land Use History

Historically, fires caused by lightning or intentionally set by Native Americans were prevalent across the landscapes of southeastern Michigan. Native Americans often used fire as a tool to clear land for agriculture, encourage the growth of forage for game species, maintain an open understory to ease travel, and enrich the soil. Prairies, woodlands, and wetlands were likely frequently disturbed by fire, and it was in this dynamic environment that many of southeastern Michigan's native plant communities evolved to become fire-dependent. Vegetation maps circa 1800 indicate that prior to European settlement the Beckwith Preserve consisted of oak-hickory forest and wet prairie (Appendix A, Figure 2). Following European settlement of the region in the 1830's, fire was largely suppressed as the surrounding landscape was converted to agricultural use. "Settled" with intention to cultivate corn and raise cattle, row crop agriculture was later abandoned on the Preserve because its sandy soil proved unproductive. Portions of the Beckwith Preserve were subsequently maintained as an apple orchard, while other areas were planted with Norway spruce, white pine, and jack pine, or abandoned altogether.



The land was purchased by Dr. Sidney Beckwith and Harriet Beckwith in 1948 and later inherited by their daughter Frances Laird. Today, the Beckwith Preserve's more recent land use history is reflected in the plant communities it supports. The presence of large, open-grown white oaks and the abundance of hoptree (*Ptelea trifolia*) suggest the Preserve previously exhibited an open-woods character typical of a fire maintained landscape. Remnant oak hedgerows demarcate the boundaries of abandoned farm fields and a few apple trees remain in what was once an orchard. The eastern portion of the Preserve is dominated by a mature planted pine forest with the remaining portions of the Preserve characterized by emergent wetlands and oak-hickory woodlands.

Acquisition

The property was donated to Legacy Land Conservancy (then Washtenaw Land Trust) by Campbell 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. Legacy purchased the Access Improvement Parcel on 22 May 2017.



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 are allowed on the property with the exception of battery or electric power driven devices operated by a person with a mobility disability. The primary management objective for the Beckwith Preserve is to protect the land as a 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 Legacy's broader framework:

Preserve: Beckwith

Location: Village of Stockbridge, Ingham County, Michigan

<i>Assets/ Characteristics</i>	High Quality	Low Acquisition Costs		Low Stewardship Costs		Eco Steward 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	



Site Description

Surrounding Uses and Connectivity

The Preserve is located just east of the Village of Stockbridge in an area dominated by agriculture, rural residential area, and patches of forest. 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 (Appendix A, Figure 3). Beckwith Preserve's trails are contiguous with the Stockbridge Community Pathways trail network. The Preserve is in close proximity to the Lakelands Trail State Park, a 26-mile-long linear park which passes through Stockbridge (Appendix A, Figure 4), and located approximately 5 miles northwest of the Unadilla State Wildlife area. The stretch of Portage Creek which passes through the Preserve is downstream from Nichols Lake and upstream of Maconachie Lake.

Existing Resources/Assets

Beckwith Preserve has two Eco Stewards, Fran and Campbell Laird have stayed involved in the care of the property consistently since they donated it. They put in many direct hours stewarding the property as well as involving neighbors and friends to help.

Soils

The Natural Resources Conservation Service soil survey of Ingham County indicates that seven soil types are found within the Preserve (Appendix A, Figure 5). Detailed soil descriptions are below:

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.

Ecology

The Preserve is dominated to the east by a stand of planted Norway spruce (*Picea abies*), white pine (*Pinus strobus*), and jack pine (*Pinus banksiana*). A lack of sunlight due to the high density of planted trees has limited the development of herbaceous, shrub, and sapling layers. However, in open areas where evergreens have died or are not as densely planted, sunlight is more plentiful, allowing American elm (*Ulmus americana*) and black cherry (*Prunus serotina*) saplings to establish. Invasive species in this area are increasing, with patches of autumn olive (*Elaeagnus umbellata*), honeysuckle (*Lonicera spp*), and garlic mustard (*Alliaria petiolate*) present.

Portions of the Preserve are regularly mowed and maintained as a meadow dominated by brome (*Bromus sp.*) and spotted knapweed (*Centaurea stoebe*). Autumn olive surrounds the edges of the meadow, but mowing has limited its spread. Poison ivy (*Toxicodendron radicans*) is also present.

The riparian zone adjacent to Portage Creek is dominated by Canada wild rye (*Elymus canadensis*), bottlebrush grass (*Elymus hystrix*), white snakeroot (*Ageratina altissima*), black-eyed Susan (*Rudbeckia hirta*), foxglove beard-tongue (*Penstemon digitalis*), and tall bellflower (*Campanulastrum americanum*) on its western bank, which was seeded with native grass and forb species in December 2014. The eastern creek bank is dominated by invasive species including black locust (*Robinia pseudoacacia*), Japanese barberry (*Berberis thunbergii*), dame's rocket (*Hesperis matronalis*), Oriental bittersweet (*Celastrus orbiculatus*) and tree-of-heaven (*Ailanthus altissima*).

In addition to the communities described above, the following natural communities, as characterized by the Michigan Natural Features Inventory (MNFI), are located within the Preserve:

Dry-mesic southern forest: a fire-dependent, oak or oak-hickory forest type generally associated with dry-mesic sites and found south of the climatic tension zone in southern Lower Michigan. Frequent fires maintain semi-open conditions, promoting oak regeneration and ground and shrub layer diversity. The Preserve's dry-mesic southern forests are characterized by black oak (*Quercus velutina*), white oak (*Quercus alba*), black cherry and American elm, as well as a large clone of gray dogwood (*Cornus foemina*). Some portions of the Preserve's forests are more heavily invaded by non-native species than others. Tree-of-heaven (*Ailanthus altissima*), autumn olive, honeysuckle, black locust, burning bush (*Euonymus alatus*), Oriental bittersweet (*Celastrus orbiculatus*), Japanese barberry, dame's rocket, Japanese hedge parsley (*Torilis japonica*), and garlic mustard are all present in varying densities throughout the forest.



Southern hardwood swamp: a minerotrophic forested wetland occurring in southern Lower Michigan on mineral or occasionally organic soils dominated by a mixture of lowland hardwoods. Conifers are absent or local. The community occupies shallow depressions and high-order stream drainages on a variety of landforms. Within the Preserve, native species diversity is low. The canopy contains silver maple (*Acer saccharinum*), cottonwood (*Populus deltoides*), box elder (*Acer negundo*), and American elm (*Ulmus americana*), and the shrub layer is mostly comprised of elderberry (*Sambucus canadensis*), nannyberry (*Viburnum lentago*), and gray dogwood. Although the area is not heavily invaded by non-native species, Canada thistle, dame's rocket, and Japanese hedge parsley are present, as well as scattered honeysuckles.

The above community types are described in more detail in Appendix B.

In 2006, Andrew Laird identified seven community types and eleven management sections. These sections are described in Appendix C.

Topography

The United States Geological Survey Topographic Map (Stockbridge Quadrangle) indicates that elevation ranges from approximately 920 - 940 feet above sea level (Appendix A, Figure 6).

Hydrology

Approximately 800 linear feet of Portage Creek flow through the northwestern portion of the Preserve. This portion of the creek is maintained by the Ingham County Drain Commission and serves as a drain to surrounding farms (also called the Lowe Lake Drain). Most recent maintenance of the drain (dredging) was performed in the fall of 2014. To our knowledge, no drain tiles exist within the Preserve. In addition, the southern portion of the Preserve is wetland (Appendix A, Figure 7). The property is in the Upper Portage Creek sub-watershed of the Portage Creek watershed, which is within the Huron River watershed. Therefore, rainfall falling on the Beckwith Preserve eventually flows into Lake Erie.

Management Background

Purpose of the Plan

The purpose of this management plan update is to maintain its relevancy in guiding management of the Beckwith Preserve in light of changing conditions within the Preserve as well as resource availability. 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.

Donor Intent

The donor intended that public use be limited to passive recreation including, but not limited to, walking, nature education, and cross-country skiing. The Beckwith Preserve will be managed for wildlife, water quality, and low-impact recreation. The following activities 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)

Furthermore, the donor made the following requests:

- The Preserve remains in its wooded state,
- Limited public access is provided by creating a trail system and parking area at the southeast corner along M-106 (E. Main Street)
- 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's management obligation is to the community this Preserve was protected to serve, and to the donors' wishes. Legacy will maintain access for the public to the Preserve, and establish Eco Stewards for volunteer-oversight and maintenance of the Preserve. Legacy will also work to improve the health of the land and the ecosystems it supports in conjunction with Eco Stewards.

Management Status

In the time since Legacy acquired the Preserve, a trail network has been established and connected with the Village of Stockbridge trail system, which has increased the Preserve's use and value to the local community. In addition, benches have been installed near the creek and meadow, and a bridge was constructed over the creek in 2006. The trail along the eastern side of the creek has been relocated. The creek banks were seeded/planted with native species to reduce erosion in spring 2012. In fall 2014 the Ingham County Drain Commission undertook dredging of the Creek, which is also a county drain. Damage to the riparian area was limited primarily to the west side of the Creek, and the area was seeded with native grasses and forbs in winter 2014. Invasive species removal has been an ongoing effort within the Preserve, with particular attention given to the area west of the creek and along the trails. A set of photopoints has been established on the Preserve to more closely monitor the effects of invasive species management efforts and prescribed burns. Per the donor's request, the Preserve is open to the public for quiet recreational uses such as hiking, cross country skiing and bird watching, and no motorized vehicles are allowed on the property.

Management Objective and Goals

Overarching Objective

Maintain and enhance the value of the Preserve as a natural area for residents and visitors of Stockbridge to enjoy while supporting ecosystem health.

Specific Goals

The primary management goals for the Beckwith Preserve are:

1. Maintain the stability of the Portage Creek bank; monitor for erosion and mitigate as necessary
2. Identify and catalog the plant and animal species present within the Preserve
3. Manage and, where possible, eradicate invasive species and restore native species with the understanding that the Preserve has been heavily modified and complete ecological restoration to pre-settlement vegetative community assemblages is likely not feasible
4. Connect the Preserve's trail system with the Lakelands Trail State Park/Iron Belle Trail system
5. Develop a parking area on the newly acquired Access Improvement Parcel in the southeastern portion of the Preserve to increase accessibility and visibility
6. Maintain and improve the Preserve's trail system to accommodate quiet recreational use
7. Cultivate long-term relationships with local organizations and/or individuals
8. Evaluate the efficacy of management strategies through detailed record keeping to better allocate staff/volunteer time and financial resources and to adaptively manage invasive species
9. As required, continue to photo monitor the Preserve at the established monitoring points on an annual basis in order to characterize changes in the vegetative communities over time
10. Update the Preserve's management plan every 7 to 10 years or as necessary



Implementation

The management plan goals will be achieved through the implementation of specific management actions associated with each goal. Implementation is prioritized into ongoing, short-term, mid-term, and long-term actions along with the expected resource and personnel needs, estimated cost, and time requirements.

Management Units

The Preserve has been divided into six management units that reflect the varied vegetative communities and management needs within the Preserve (Appendix A, Figure 8). Each management unit has been given a priority level according to the criteria outlined in the following section.

- Unit A - woodland west and south of Portage Creek along the western boundary of the Preserve, and north of the trail in the north-central portion of the Preserve
- Unit B - corridor on either side of Portage Creek
- Unit C - wetland in the southern portion of the Preserve
- Unit D - woodland east of Portage Creek and west of the meadow
- Unit E - planted jack pine, white pine, and Norway spruce stand in the eastern portion of the Preserve
- Unit F - meadow in the central portion of the Preserve and open area in the southeast corner of the Preserve (Access Improvement Parcel)

Prioritizing Management

Management and restoration activities require significant investment of Legacy's staff/volunteer time and financial resources. For this reason, Legacy prioritizes management needs and restoration opportunities within and among each of its preserves to guide the allocation of time and resources. Prioritization is grounded in an assessment of the ecological quality of a management unit, taking into consideration the presence/absence of invasive species, the level and progression of invasion, the diversity of native species, and the rarity of the vegetative community. Relatively un-invaded management units with higher native species diversity are given a higher priority, while areas of lower ecological quality are lower priority. Legacy allocates time and resources to higher priority areas first before focusing management and restoration efforts on lower priority areas. According to these criteria, each of the management units described in the previous section has been given a priority level:

- Unit A - Priority 2
- Unit B - Priority 2
- Unit C - Priority 3
- Unit D - Priority 3
- Unit E - Priority 4
- Unit F - Priority 4



Management Actions

The management plan goals will be achieved through the implementation of specific management actions associated with each goal. Implementation is prioritized into ongoing, short term, mid term, and long term management actions along with the expected resources and personnel needed and estimated cost and time requirements. Note that costs are approximate and are only intended to inform budgetary planning.

Goal 1: Develop a parking area on the Access Improvement Parcel to increase accessibility and visibility.

- Grade and gravel a portion of the Parcel and install a barrier to define the parking area, making it suitable for parking and providing convenient and safe access to the Preserve.
- Install Legacy signage along E M-106/E Main Street/Morton Road at the parking lot entrance to improve visibility.
- Install information kiosk that will include a trail map, natural history, land use history, invasive species information, etc.
- Install boot brushes at the trailhead.
- Perform regular maintenance of the parking area.

Goal 2: Manage and, where possible, eradicate invasive species and restore native species, while recognizing that the Preserve has been heavily modified and complete ecological restoration to pre-settlement vegetative community assemblages is likely not feasible

Management Unit A

- Maintain the quality of the woodland north and west of the creek.
- Continue removing dame's rocket (*Hesperis matronalis*), garlic mustard (*Alliaria petiolata*), Japanese hedge parsley (*Torilis japonica*), Japanese barberry (*Berberis thunbergii*), privet

Goal 1 - High Priority	
Prioritization	Short term
Personnel	Staff, contractors, volunteers
Time Required	24 hrs to install, est. 8 hrs annual maintenance
Equipment	Post-hole digger, chainsaw/ personal protective equipment (PPE), mallet, herbicide/appliator
Estimated Cost	\$22,900 for contract work/materials); \$12,400 for staff time
Resources Available	All equipment listed above; Eco Stewards

Goal 2	
Prioritization	Ongoing
Personnel	Staff/crew, volunteers
Time Required	Approx. 175 hrs annually
Equipment	Handsaws, loppers, chainsaw/ PPE, brushblade, herbicide/appliator, plastic bags
Estimated Cost	\$150 annually for herbicide, tool maintenance/replacement; \$2,500 per burn; \$4,375 for staff time
Resources Available	All equipment listed above



(*Ligustrum vulgare*), and burning bush (*Euonymus alata*).

- Herbaceous species should be hand pulled. Large shrubs should be cut and treated with herbicide, while shrub seedlings can be sprayed with herbicide.
- Conduct controlled burns in the early spring every 2 to 3 years or as resources are available to promote oak regeneration and to inhibit the growth of invasive species.
- Woody debris piles from felled trees are difficult to access and have begun to harbor invasive species. These piles should be cut up and/or mulched to speed decomposition.

Management Unit B

- Monitor native plantings along the stream bank and continue to control invasive species as they appear using the methods described for Unit A.

Management Unit C

- Remove box elder (*Acer negundo*), beginning with those in the powerline easement, by treating with wetland-approved herbicide.
- Control dame's rocket, Canada thistle (*Cirsium arvense*), garlic mustard, and other invasive herbaceous species using the same methods described for Unit A.
- Given the currently low diversity of native wetland grasses and forbs, consider planting native species to increase biodiversity and ecological quality.

Management Unit D

<u>Goal 2: Management Unit A</u>	
Prioritization	1 of 6
Personnel	Staff/crew, volunteers, prescribed burn contractor
Time Required	20 hrs for woody debris, 100 hrs annually
Equipment	Plastic bags, loppers, hand-saws, pruners, herbicide/appliator, chainsaw/PPE
Estimated Cost	\$500 for staff time in addition to Goal 2 base cost
Resources Available	All equipment listed above

<u>Goal 2: Management Unit B</u>	
Prioritization	2 of 6
Personnel	Staff/crew, volunteers
Time Required	10 hrs annually
Equipment	Plastic bags, handsaws, loppers, pruners, herbicide/appliator
Estimated Cost	See Goal 2 base cost
Resources Available	All equipment listed above

<u>Goal 2: Management Unit C</u>	
Prioritization	3 of 6
Personnel	Staff/crew, volunteers
Time Required	20 hrs annually
Equipment	Chainsaw/PPE, plastic bags, herbicide/appliator, wetland seed mix
Estimated Cost	See Goal 2 base cost
Resources Available	All equipment listed above except seeds

- Although it is currently invaded by autumn olive (*Elaeagnus umbellata*), tree of heaven (*Ailanthus altissima*), and Oriental bittersweet (*Celastrus orbiculatus*), there is potential for this area to more closely resemble Unit A with increased management activities.
- Invasive trees should be girdled while invasive herbaceous and shrub species should be controlled using the same methods described for Unit A.
- Due to Oriental bittersweet's tendency to increase when burned, this species (as in all areas of the Preserve in which it is found) should be a high priority for removal.

Management Unit E

- Continue controlling garlic mustard and other invasive species as they appear within 3 feet of the trail to prevent spread to other areas of the Preserve.
- Invasive species such as autumn olive and invasive honeysuckle species (*Lonicera spp.*) are establishing in openings as pines and spruces die off. These species should be controlled with herbicide to allow seeding and/or planting of native species in the openings.

Management Unit F

- Continue mowing to prevent encroachment of invasive shrub species, namely autumn olive.
- Consider conducting controlled burns with recognition of the fire management hazard posed by the spruce forests on either side of the unit.

<u>Goal 2: Management Unit D</u>	
<i>Prioritization</i>	<i>4 of 6</i>
<i>Personnel</i>	<i>Staff/crew</i>
<i>Time Required</i>	<i>30 hrs annually</i>
<i>Equipment</i>	<i>Chainsaw/PPE, handsaws, loppers, plastic bags, herbicide/applicator</i>
<i>Estimated Cost</i>	<i>See Goal 2 base cost</i>
<i>Resources Available</i>	<i>All equipment listed above</i>

<u>Goal 2: Management Unit E</u>	
<i>Prioritization</i>	<i>5 of 6</i>
<i>Personnel</i>	<i>Staff/crew</i>
<i>Time Required</i>	<i>10 hrs annually</i>
<i>Equipment</i>	<i>Plastic bags, handsaws, loppers, herbicide/applicator</i>
<i>Estimated Cost</i>	<i>See Goal 2 base cost</i>
<i>Resources Available</i>	<i>All equipment listed above</i>

<u>Goal 2: Management Unit F</u>	
<i>Prioritization</i>	<i>6 of 6</i>
<i>Personnel</i>	<i>Staff, PlantWise</i>
<i>Time Required</i>	<i>5 hrs annually</i>
<i>Equipment</i>	<i>Mower</i>
<i>Estimated Cost</i>	<i>See Goal 2 base cost</i>
<i>Resources Available</i>	<i>Eco Steward</i>



Goal 3: Maintain the stability of the Portage Creek bank; monitor for erosion and mitigate as necessary.

- Reduce erosion along trails that are immediately adjacent to Portage Creek by lining the trails with logs/large limbs or stakes and rope to encourage visitors to stay on established paths.
- Monitor native grasses and forbs seeded along the creek bank and reseed or plant with live stakes as necessary to continue preventing erosion and sedimentation within the creek.

Goal 3	
Prioritization	Ongoing
Personnel	Staff/crew, volunteers
Time Required	10 hrs annually
Equipment	Stakes, rope, seeds/plants as needed
Estimated Cost	\$250 annually for staff time
Resources Available	All equipment listed above except seeds/plants

Goal 4: Maintain and improve the Preserve's trail system to accommodate quiet recreational use.

- Perform annual trail maintenance including removing felled trees and limbs that obstruct the trails and using them to demarcate ambiguous portions of the trail (e.g. in the wooded areas of Units C and D) and trimming grasses and shrubs that encroach on trails.
- Once the new parking lot is developed, install a trailhead at the northern end of the parking lot and connect it with the existing trail network.
- Install signage encouraging the use of fallen limbs and other natural materials to build forts within Unit E.
- Increase trail accessibility by:
 1. Widening the trail east of Portage Creek. Given that the undergrowth is heavy along the trail, shrub removal will be required.
 2. Given that the boardwalk trail in Unit C will no longer serve as an entrance, terminate the boardwalk with a viewing platform and/or

Goal 4	
Prioritization	Ongoing/Short term
Personnel	Staff/crew, volunteers
Time Required	30 hrs, 10 hrs annually
Equipment	Chainsaw/PPE, scythe, post-hole digger, loppers, handsaws, herbicide/applicator, lumber, drill/screws
Estimated Cost	\$800 for materials; \$750 + \$250 annually for staff time
Resources Available	All equipment listed above except lumber



seating area.

Goal 5: Identify and catalog the plant and animal species present within the Preserve.

- Conduct a detailed biological survey of the Preserve's plants and animals. The survey will be repeated at least three times during different seasons in order to identify all species present with the Preserve.
- Create and annually update a species list on the Legacy website. This list will feature notable native species as well as invasive species and will serve the dual purpose of highlighting Legacy's restoration efforts and attracting visitors to the Preserve.

Goal 5	
Prioritization	<i>Long term</i>
Personnel	<i>Staff or contractor, or a volunteer</i>
Time Required	<i>5 hrs, 1 hr annually</i>
Equipment	<i>None</i>
Estimated Cost	<i>Project cost dependent on personnel</i>
Resources Available	<i>Bev Walters, Greg Vaclavek, David Mindell, Daniel Winfield, David Mifsund, Bot Club</i>

Goal 6: Intensify evaluation of management efficacy through detailed record keeping to better allocate staff/volunteer time and financial resources and to adaptively manage invasive species.

- Use quantitative and qualitative metrics (e.g. biomass, percent land cover, photologs, acreage, etc.) to quantify invasive species removal and subsequent recovery of native species.
- Record staff and volunteer hours as well as Legacy resources devoted to invasive species removal efforts.
- Critically assess invasive species management strategies in terms of efficacy and resources required and adapt management as necessary.

Goal 6	
Prioritization	<i>Long term/Ongoing</i>
Personnel	<i>Staff/crew, intern, volunteer</i>
Time Required	<i>40 hrs annually</i>
Equipment	<i>TBD</i>
Estimated Cost	<i>\$1,000 annually for staff time</i>
Resources Available	<i>Crew log, Landscape, UM/EMU, LTA Stewardship Listserv</i>

Goal 7: Cultivate long-term relationships with local organizations and/or individuals.

- Increase collaborative management of the Preserve between Legacy, the Village of Stockbridge, Stockbridge Community Schools, the 5 Healthy Towns Foundation, and other



organizations and/or individuals from the local community.

- Remain involved as Stockbridge High School develops and implements restoration and management plans for the fields northwest of the Preserve.
- Continue to identify Eco Stewards to assist Legacy with ongoing management activities including monitoring, invasive species control, trail maintenance, litter removal, etc.
- Continue to develop relationships with residential neighbors to minimize instances of encroachment onto the Preserve and to serve as an added level of monitoring.

Goal 8: Connect the Preserve's trail system with the Lakelands Trail State Park/Iron Belle Trail system.

- Increase use and accessibility of the Preserve by connecting its trail network with the nearby Lakelands Trail State Park/Iron Belle Trail system.
- Explore options for trail connections in collaboration with the Michigan Department of Natural Resources and the 5 Healthy Towns Foundation including installation of a sidewalk along E M-106/E Main Street/Morton Road and/or acquiring nearby parcels.

Goal 9: As required, continue to photo monitor the Preserve at the established monitoring points on an annual basis in order to characterize changes in the vegetative communities over time

Goal 10: Update the Preserve's management plan every 7 to 10 years or as necessary

Goal 7	
Prioritization	<i>Long term/Ongoing</i>
Personnel	<i>Staff, volunteer ambassadors</i>
Time Required	<i>10 hrs annually</i>
Equipment	<i>None</i>
Estimated Cost	<i>\$250 annually for staff time</i>
Resources Available	<i>Stockbridge Wellness Coalition, the Lairds, Jo Mayer, Matt Pegouski, Stockbridge Community Schools</i>

Goal 8	
Prioritization	<i>Long term</i>
Personnel	<i>Staff</i>
Time Required	<i>10 hrs annually</i>
Equipment	<i>TBD</i>
Estimated Cost	<i>\$250 annually for staff time; project cost dependent on course of action</i>
Resources Available	<i>SWC, the Lairds, Jo Mayer, Matt Pegouski, Nikki Van Bloem (DNR)</i>

Goal 9	
Prioritization	<i>Ongoing</i>
Personnel	<i>Staff, volunteers</i>
Time Required	<i>2 hrs annually</i>
Equipment	<i>Camera, tablets</i>
Estimated Cost	<i>\$50 annually for staff time</i>
Resources Available	<i>Photomonitoring volunteers, cameras, tablets</i>

Goal 10	
Prioritization	<i>Long term/Ongoing</i>
Personnel	<i>Staff, intern/workstudy</i>
Time	<i>50 hrs every 7-10 yrs</i>
Equipment	<i>Workstation</i>
Estimated Cost	<i>\$1,250 for staff time per update</i>
Resources Available	<i>Stewardship staff, previous mgmt plans, best practices</i>



Conclusion

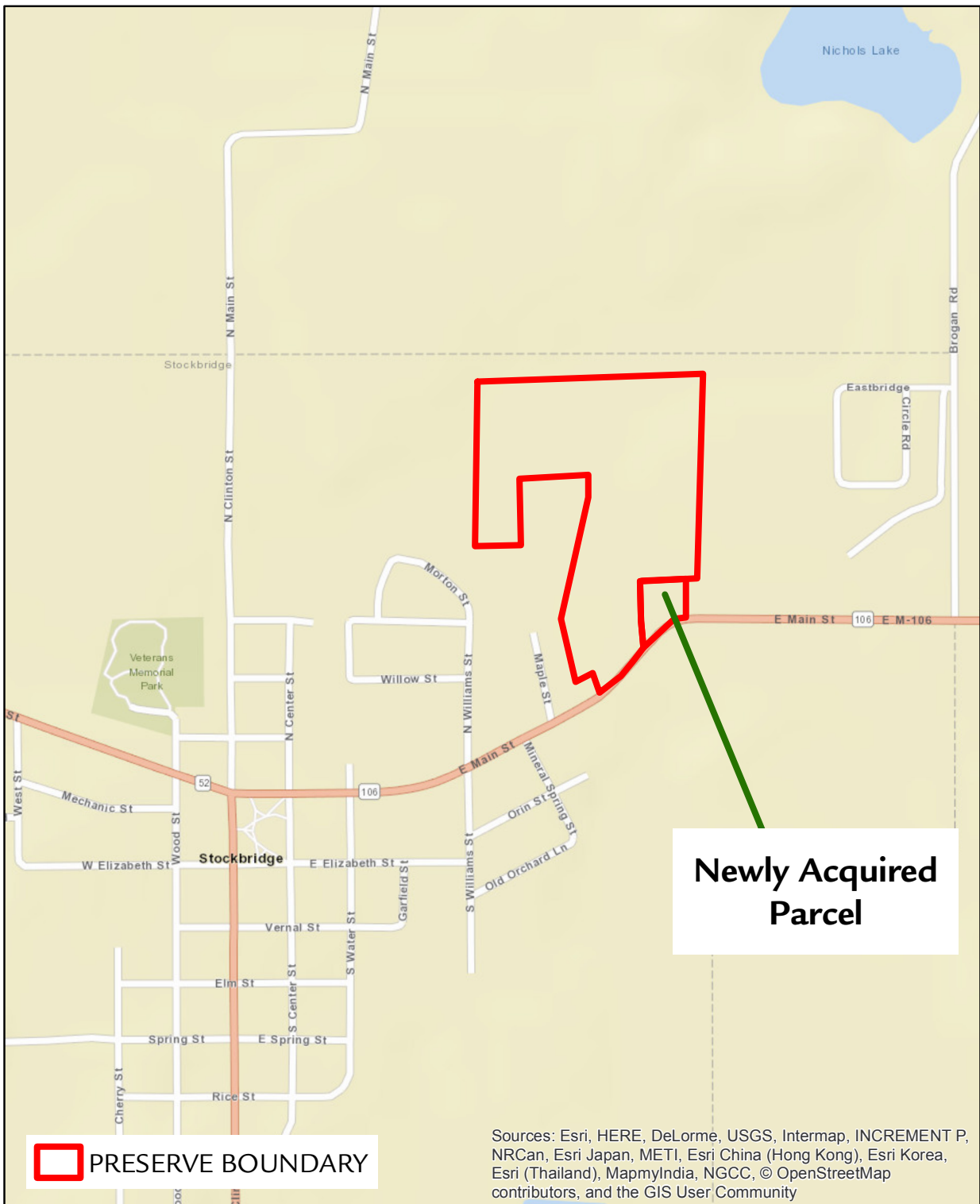
The Beckwith Preserve contains a variety of ecosystems and vegetative communities and is valued by the local community for its natural beauty as well as the ecosystem services and recreational opportunities it provides. As an urban preserve, it represents an opportunity for Legacy to directly engage the public in environmental education and landscape management/restoration activities. To that end, managing the Preserve for public use, developing relationships with the local community, establishing a dedicated parking area, and connecting the Preserve's trail system to that of the greater regional trail network will further increase community use and engagement. In addition, continuing to maintain the higher quality area northwest of Portage Creek while expanding restoration efforts to other areas of the Preserve will further increase overall ecological value. In this way, this management plan and the specific actions discussed herein will ensure the Beckwith Preserve's long term protection and maintenance as an asset for the local community and beyond.



Appendix A

Figures

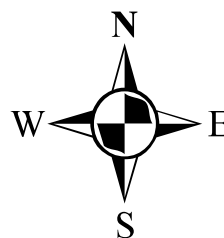


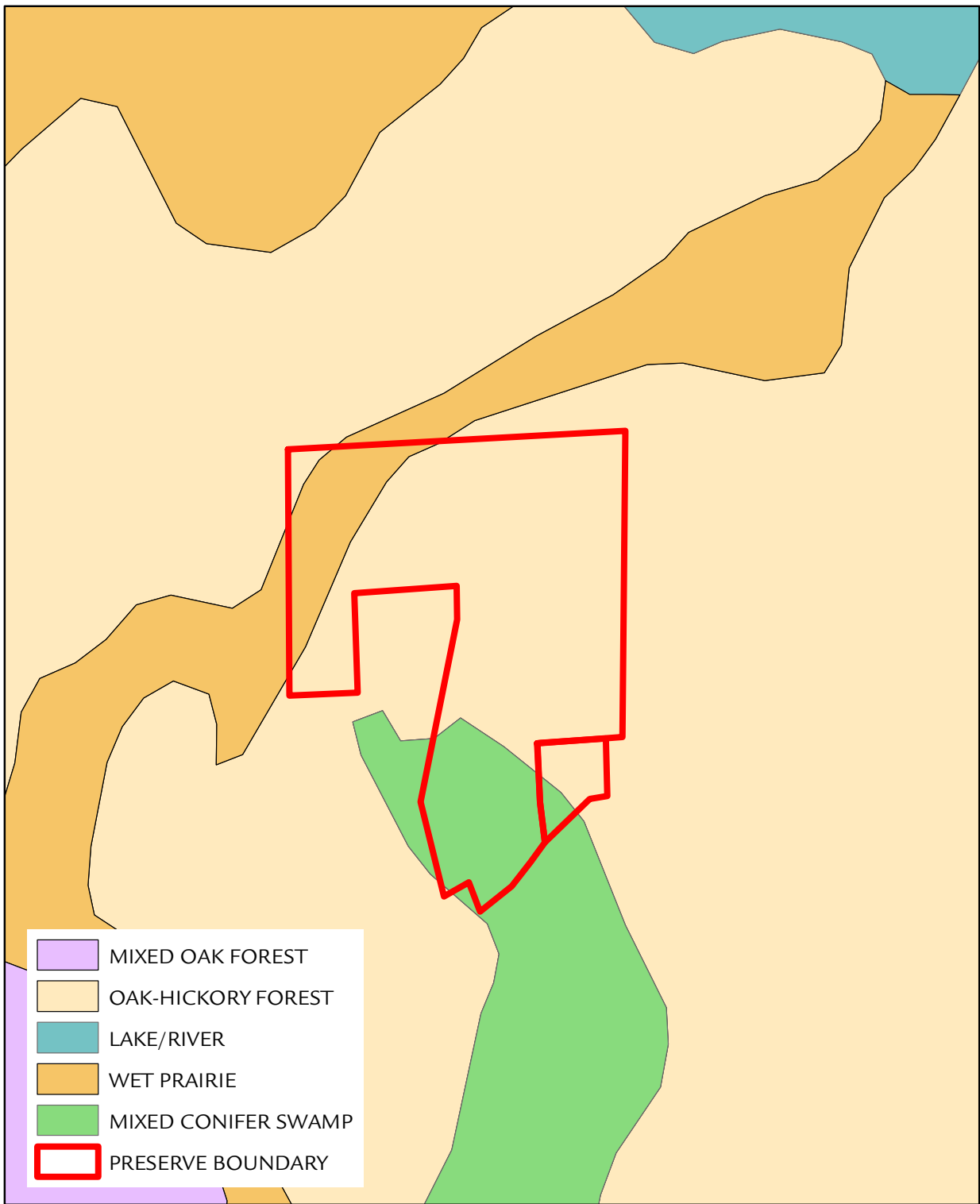


Beckwith Preserve

Figure 1. Site Location

LEGACY Land Conservancy

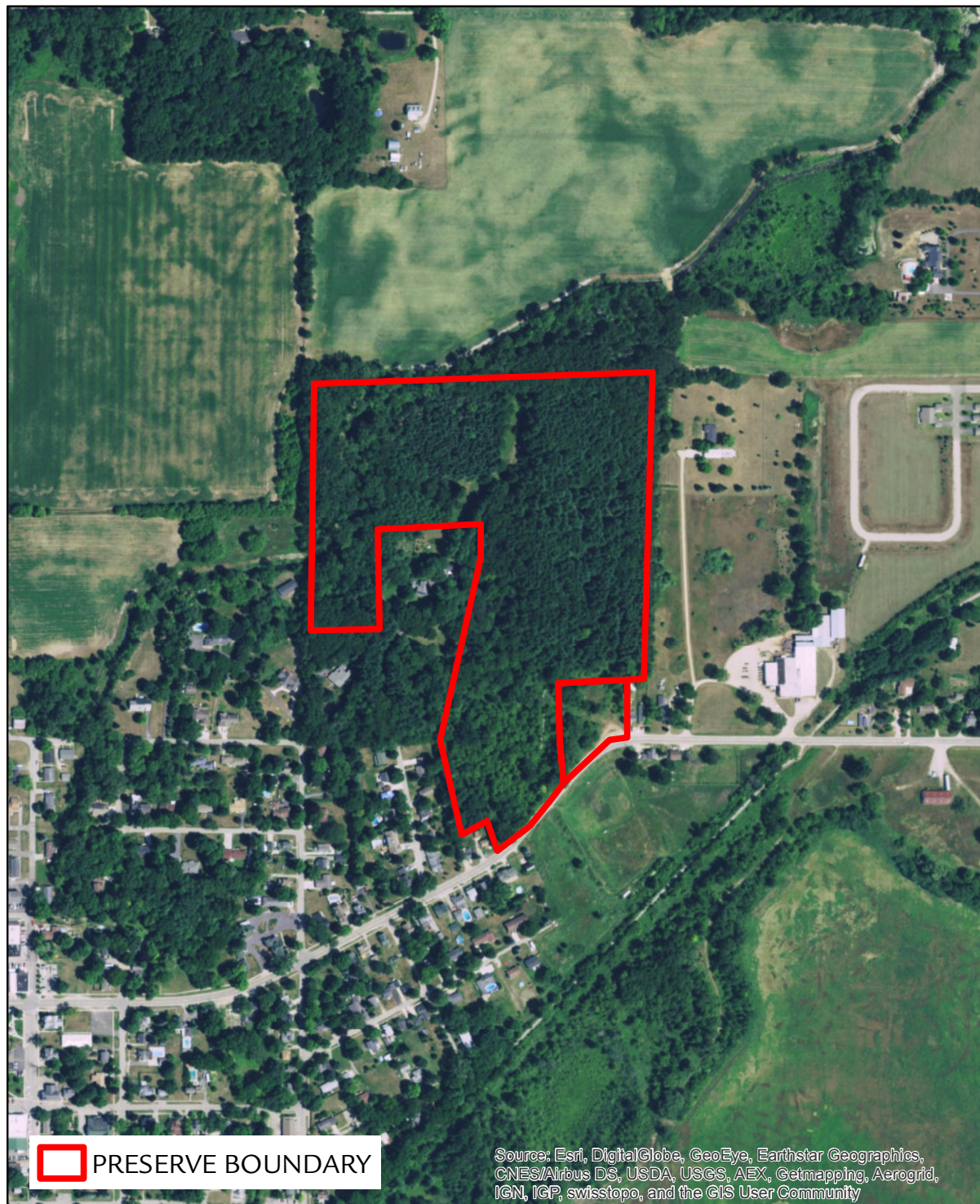




Beckwith Preserve

Figure 2. Vegetation Circa 1800

LEGACY Land Conservancy

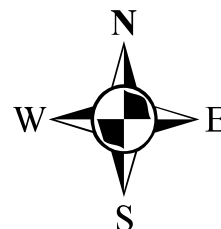


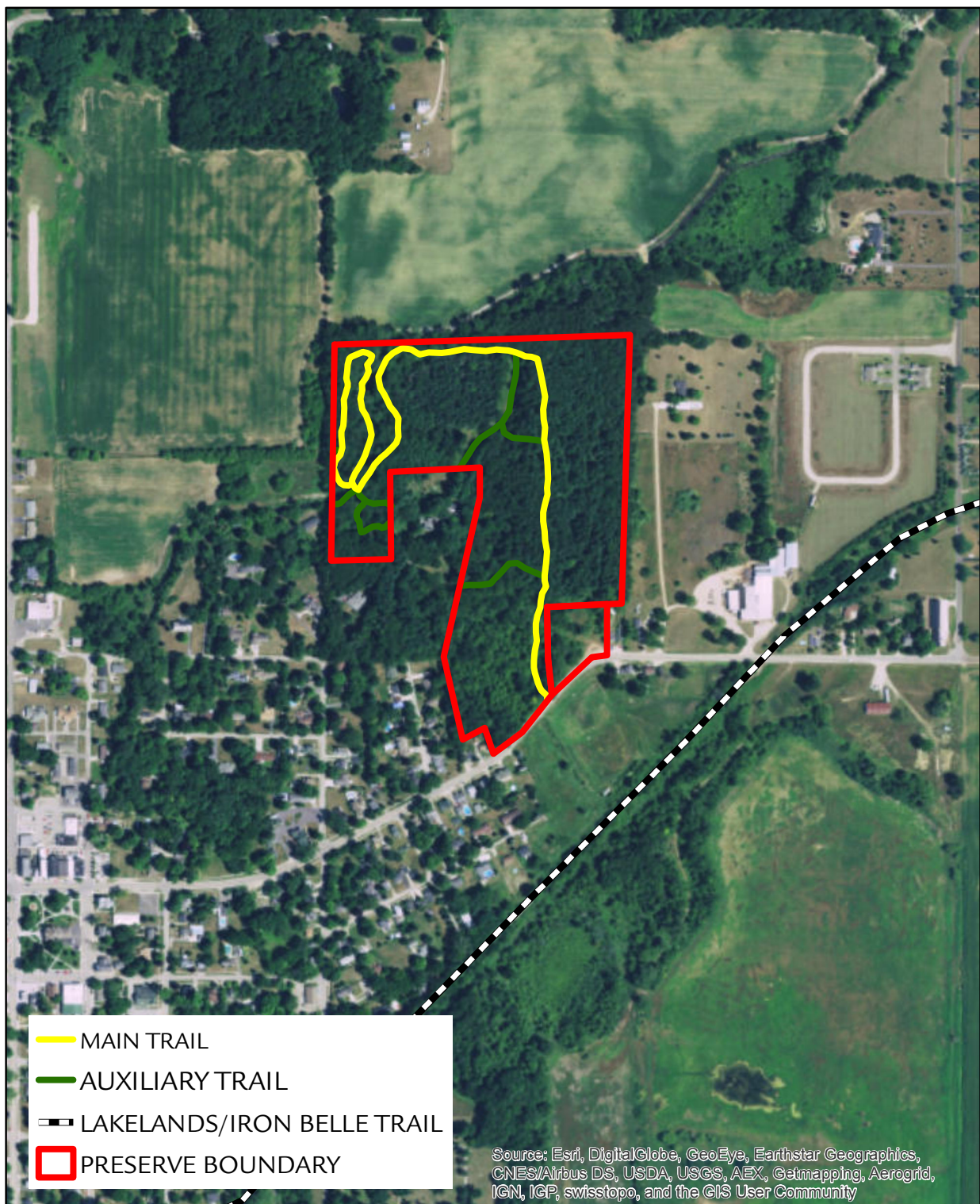
Beckwith Preserve

Figure 3. Aerial

LEGACY Land Conservancy

0 0.05 0.1 0.2 Miles

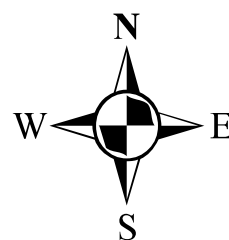


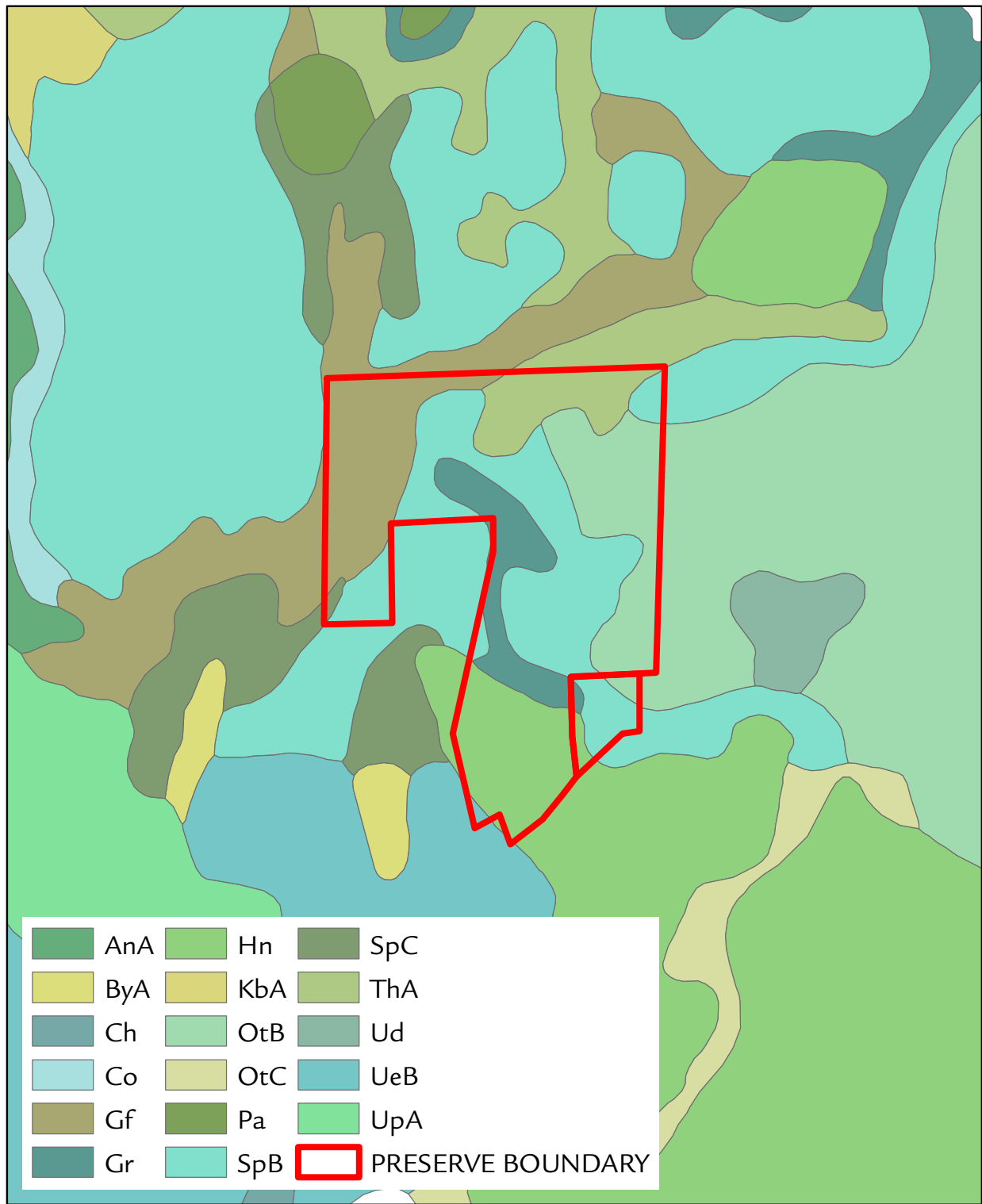


Beckwith Preserve

Figure 4. Trail Network

LEGACY Land Conservancy



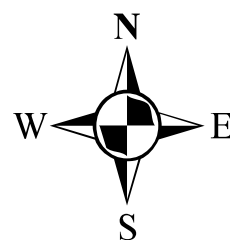


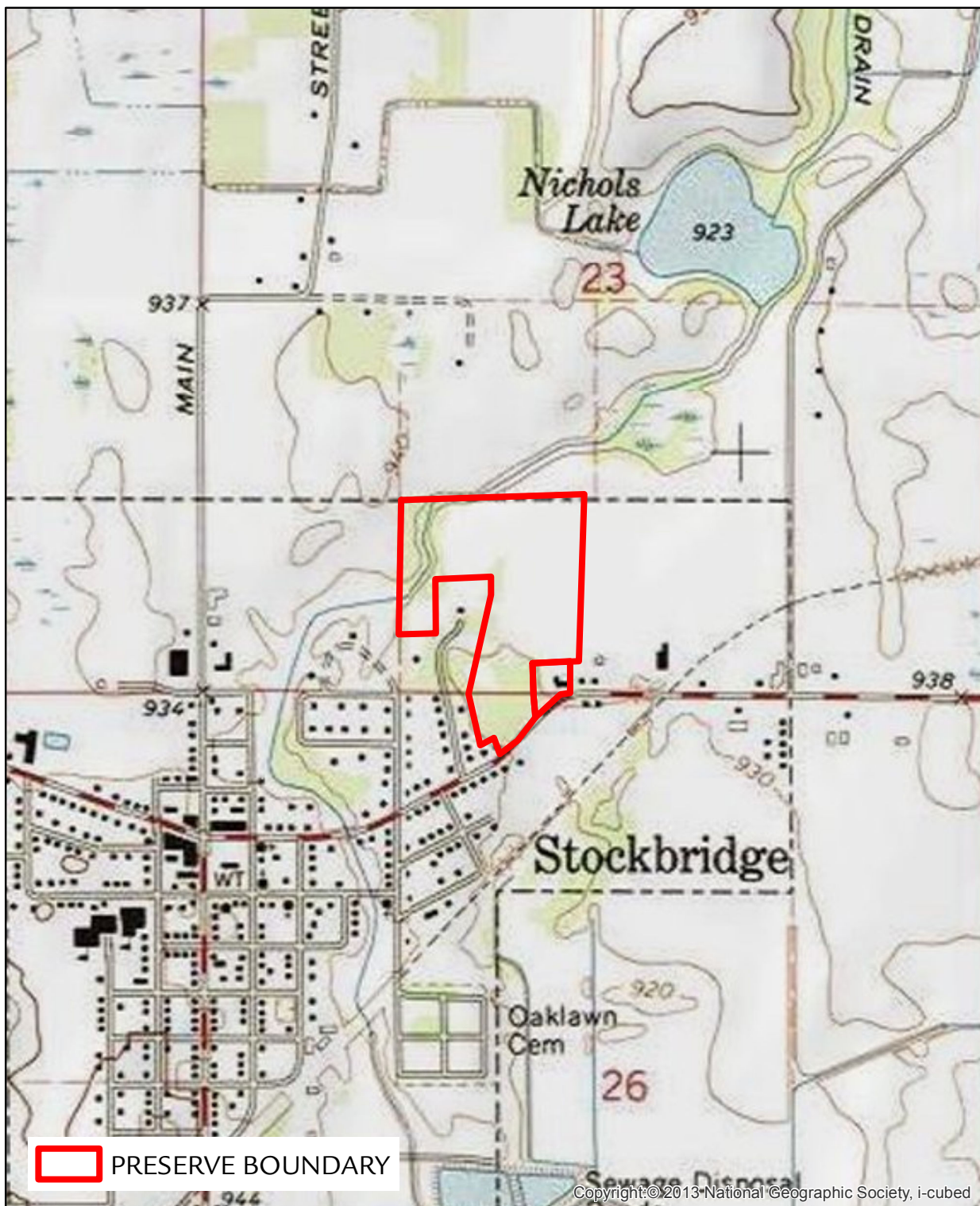
Beckwith Preserve

Figure 5. Soils

LEGACY Land Conservancy

0 0.05 0.1 0.2 Miles

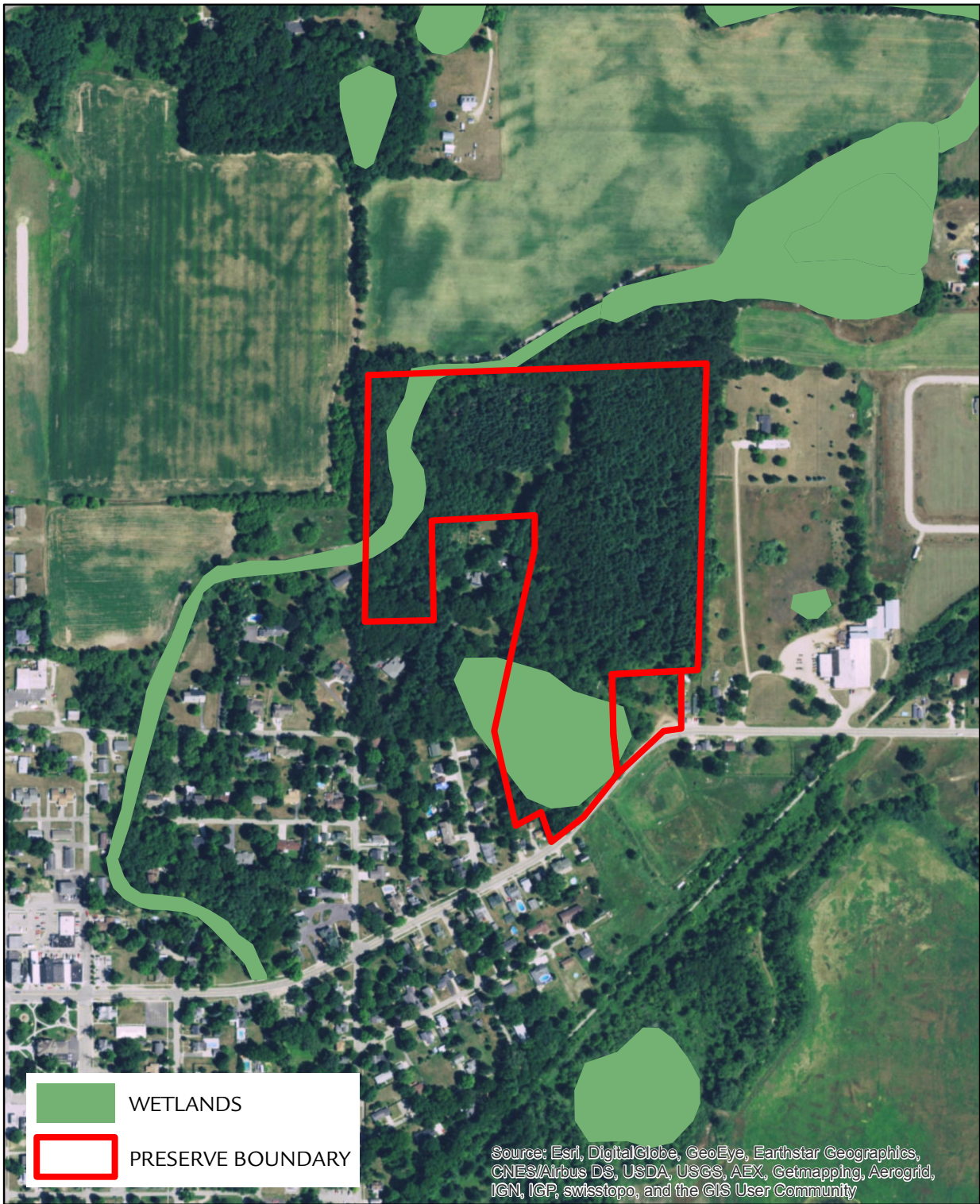




Beckwith Preserve

Figure 6. Topography

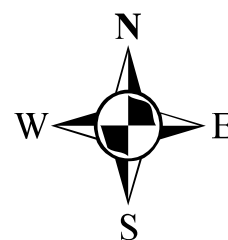
LEGACY Land Conservancy

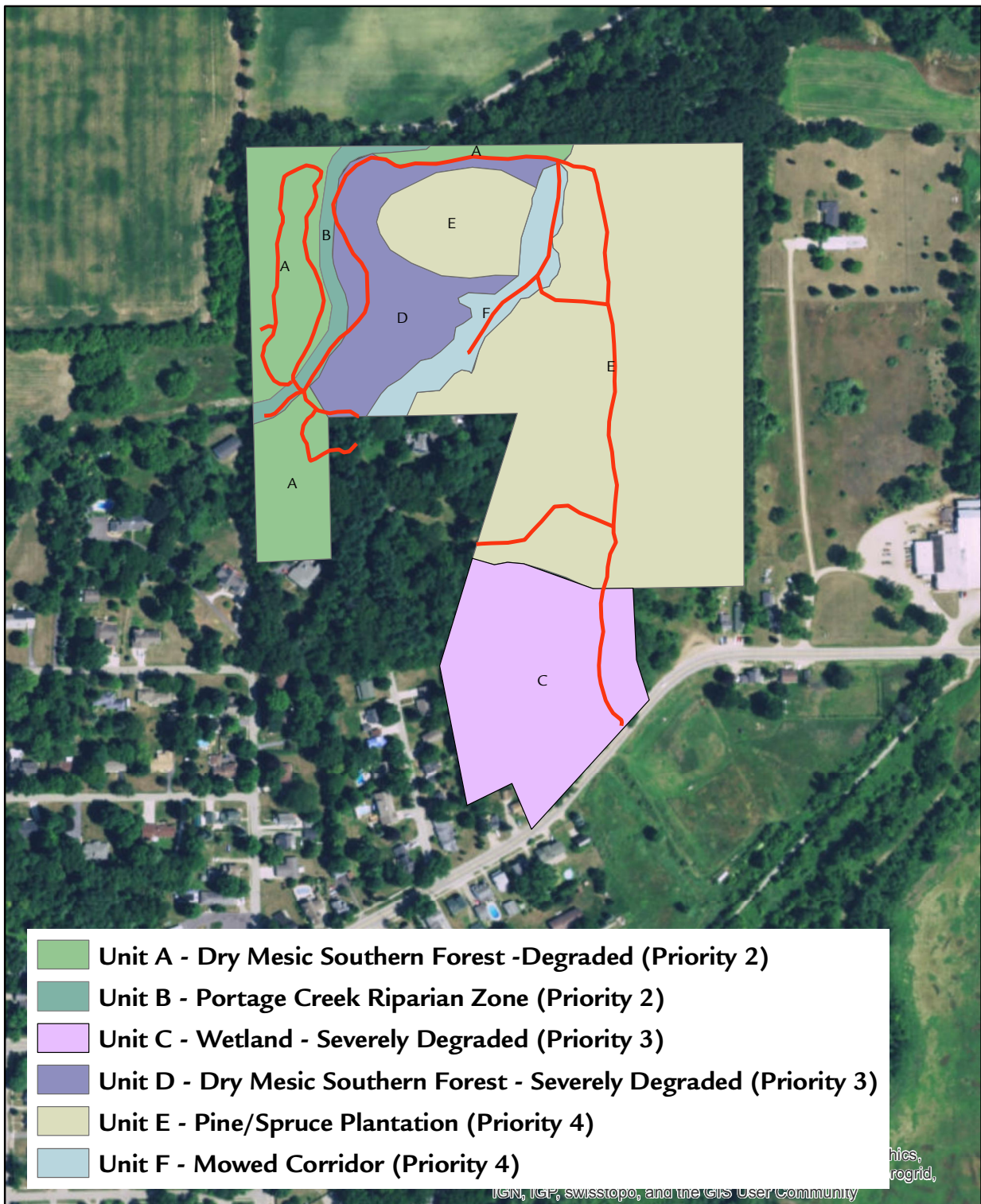


Beckwith Preserve

Figure 7. Wetlands

LEGACY Land Conservancy

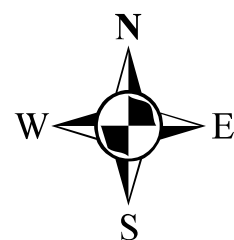




Beckwith Preserve

Figure 8. Management Units

LEGACY Land Conservancy



Appendix B

The Beckwith Preserve's

Natural Communities

MNFI



[All Communities](#)

Michigan's Natural Communities

Dry-mesic Southern Forest

State Rank: S3

Global Rank: G4

Overview

Dry-mesic southern forest is a fire-dependent, oak or oak-hickory forest type on generally dry-mesic sites found south of the climatic tension zone in southern Lower Michigan. Frequent fires maintain semi-open conditions, promoting oak regeneration and ground and shrub layer diversity.

Landscape Context

This natural community occurs principally on glacial outwash, coarse-textured moraines, sandy glacial lakeplains, kettle-kame topography, and sand dunes.



Photo by Adrienne L. Bozic

Soils

Soils are typically sandy loam or loam and slightly acid to neutral in pH.

Natural Processes

Fire, windthrow, and insect outbreaks and pathogens associated with oak defoliation and decline are the prevalent natural disturbance factors influencing dry-mesic southern forest. Historically, frequent, low-intensity surface fires generated conditions suitable for sustaining advanced oak regeneration and helped keep oak pathogens and invertebrate acorn predators at low levels. Tree density in circa 1800 oak forests was likely lower than that observed today under conditions of fire suppression, and helped limit root-grafting and the spread of several oak pathogens. Frequent small-scale wind disturbance or gap-phase dynamics allows for growth of suppressed oak saplings and canopy ascension of understory oaks. Prolonged periods of fire suppression in oak openings can result in the succession to closed-canopy dry-mesic southern forest and likely accounts for the existence of many oak forests observed today.

Vegetation

The canopy layer generally is dominated or codominated by white oak (*Quercus alba*) and black oak (*Quercus velutina*), with white oak being the more frequent dominant. Red oak (*Q. rubra*) can occur as a canopy codominant, especially where soils and topographic position favor less droughty conditions such as north- to east-facing slopes and footslopes. Hickories such as pignut hickory (*Carya glabra*), shagbark hickory (*C. ovata*), and bitternut hickory (*C. cordiformis*) are often canopy codominants. Prevalent

canopy associates may include red maple (*Acer rubrum*), white ash (*Fraxinus americana*), black cherry (*Prunus serotina*), scarlet oak (*Quercus coccinea*), basswood (*Tilia americana*), and sassafras (*Sassafras albidum*). Prevalent species of the subcanopy include red maple, hickories, alternate-leaved dogwood (*Cornus alternifolia*), flowering dogwood (*Cornus florida*), ironwood (*Ostrya virginiana*), cherries (*Prunus* spp.), and sassafras (*Sassafras albidum*). Characteristic shrubs include serviceberries (*Amelanchier* spp.), witch hazel (*Hamamelis virginiana*), and choke cherry (*Prunus virginiana*). In fire-suppressed systems, mesophytic trees and shrubs are often dominant in the subcanopy and shrub layers. Typical herbaceous species include doll's eyes (*Actaea pachypoda*), hog peanut (*Amphicarpaea bracteata*), jack-in-the-pulpit (*Arisaema triphyllum*), bearded shorthusk (*Brachyelytrum erectum*), hairy woodland broom (*Bromus pubescens*), white bear sedge (*Carex albursina*), rosy sedge (*C. convoluta*), enchanter's nightshade (*Circaea lutetiana*), spotted coral-root (*Corallorhiza maculata*), pointed-leaf tick-trefoil (*Desmodium glutinosum*), naked-flower tick-trefoil (*D. nudiflorum*), fragrant bedstraw (*Galium triflorum*), black snakeroot (*Sanicula marilandica*), bristly greenbrier (*Smilax tamnoides*), large-flowered bellwort (*Uvularia grandiflora*), and downy yellow violet (*Viola pubescens*).

Noteworthy Animals

The now extinct passenger pigeon (*Ectopistes migratorius*) was likely a keystone species in oak ecosystems, roosting in oak forests by the thousands.

Rare Plants

Agrimonia rostellata (beaked agrimony, state special concern)
Arabis missouriensis var. *deamii* (Missouri rock-cress, state special concern)
Aristolochia serpentaria (Virginia snakeroot, state threatened)
Baptisia leucophaea (cream wild indigo, state endangered)
Castanea dentata (American chestnut, state endangered)
Dennstaedtia punctilobula (hay-scented fern, state threatened)
Eupatorium sessilifolium (upland boneset, state threatened)
Geum virginianum (pale avens, state special concern)
Houstonia caerulea (bluebells, state special concern)
Linum virginianum (Virginia flax, state threatened)
Liparis liliifolia (purple twayblade, state special concern)
Quercus shumardii (Shumard's oak, state special concern)
Scutellaria elliptica (hairy skullcap, state special concern)
Silene stellata (starry campion, state threatened)
Silene virginica (fire pink, state threatened)
Triphora trianthophora (three-birds orchid, state threatened)
Viburnum prunifolium (black haw, state special concern)

Rare Animals

Accipiter cooperii (Cooper's hawk, state special concern)
Ambystoma opacum (marbled salamander, state threatened)
Anguispira kochi (banded globe, state special concern)
Battus philenor (pipevine swallowtail, state special concern)
Buteo lineatus (red-shouldered hawk, state threatened)
Catocala dulciola (quiet underwing, state special concern)
Catocala robinsoni (Robinson's underwing, state special concern)
Dendroica cerulea (cerulean warbler, state special concern)

Elaphe o. obsoleta (black rat snake, state special concern)
Emydoidea blandingii (Blanding's turtle, state special concern)
Erynnis baptisiae (wild indigo duskywing, state special concern)
Fixsenia favonius ontario (northern hairstreak, state special concern)
Mesomphix cupreus (copper button, state special concern)
Microtus pinetorum (woodland vole, state special concern)
Neoconocephalus retusus (conehead grasshopper, state special concern)
Nerodia erythrogaster neglecta (copperbelly watersnake, federal threatened and state endangered)
Nicrophorus americanus (American burying beetle, federal/state endangered)
Oecanthus pini (pinetree cricket, federal/state endangered)
Papaipema cerina (golden borer, state special concern)
Pygarctia spraguei (Sprague's pygarctia, state special concern)
Sistrurus c. catenatus (eastern massasauga, federal candidate species and state special concern)
Terrapene c. carolina (eastern box turtle, state special concern)
Vallonia albula (land snail, state special concern)
Wilsonia citrina (hooded warbler, state special concern)
Xolotrema denotata (velvet wedge, state special concern)

Biodiversity Management Considerations

Fire is the single most significant factor in preserving oak ecosystems. The use of prescribed fire is an imperative management tool for promoting oak regeneration, deterring the succession of shade-tolerant species, and reducing the encroachment by invasive shrubs such as honeysuckles and autumn olive. Fire management should be orchestrated in conjunction with the management of fire-dependent communities such as oak barrens, dry sand prairie, prairie fen, and coastal plain marsh. Many current dry-mesic southern forests are degraded oak openings that have been long deprived of fire. Open canopy conditions can be restored by mechanical thinning or girdling. Restored sites will need to be maintained by periodic prescribed fire and may require investment in native plant seeding where seed and plant banks are inadequate. Herbicide application to stumps is likely necessary where woody invasive species or red maple are well established.

Monitoring and control efforts to detect and remove invasive species are critical to the long-term viability of dry southern forest. Invasive species that threaten the diversity and community structure include garlic mustard (*Alliaria petiolata*), black swallow-wort (*Vincetoxicum nigrum*), white swallow-wort (*V. rossicum*), Oriental bittersweet (*Celastrus orbiculatus*), common buckthorn (*Rhamnus cathartica*), autumn olive (*Elaeagnus umbellata*), Eurasian honeysuckles (*Lonicera morrowii*, *L. japonica*, *L. maackii*, *L. sempervirens*, *L. tatarica*, *L. xbella*, and *L. xylosteum*), multiflora rose (*Rosa multiflora*), and Norway maple (*Acer platanoides*).

Variation

Red oak can occur as a codominant on moister soils. Toward the transition zone, white pine (*Pinus strobus*) becomes a canopy associate.

Similar Natural Communities

[Dry southern forest](#), [dry-mesic northern forest](#), [mesic southern forest](#), and [oak openings](#).

Relevant Literature

Abrams, M.D. 1992. Fire and the development of oak forests. *BioScience* 42(5): 346-353.

- Brewer, L.G., T.W. Hodler, and H.A. Raup. 1984. Presettlement vegetation of southwestern Michigan. *Michigan Botanist* 23: 153-156.
- Curtis, J.T. 1959. The vegetation of Wisconsin. University of Wisconsin Press, Madison, WI. 657 pp.
- Lee, J.G. 2007. Natural community abstract for dry-mesic southern forest. Michigan Natural Features Inventory, Lansing, MI. 15 pp.
- Minc, L.D., and D.A. Albert. 1990. Oak-dominated communities of southern Lower Michigan: Floristic and abiotic comparisons. Michigan Natural Features Inventory, Lansing, MI. Unpublished manuscript. 103 pp.
- Rodewald, A.D. 2003. Decline of oak forests and implications for forest wildlife conservation. *Natural Areas Journal* 23(4): 368-371.

For a full list of references used to create this description, please refer to the [natural community abstract](#) for dry-mesic southern forest.

More Information

Dry-mesic southern forest natural community abstract

Page Citation

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[All Communities](#)

Michigan's Natural Communities

Southern Hardwood Swamp

State Rank: S3

Global Rank: G3

Overview

Southern hardwood swamp is a minerotrophic forested wetland occurring in southern Lower Michigan on mineral or occasionally organic soils dominated by a mixture of lowland hardwoods. Conifers are absent or local. The community occupies shallow depressions and high-order stream drainages on a variety of landforms. The canopy is typically dominated by silver maple (*Acer saccharinum*), red maple (*A. rubrum*), green ash (*Fraxinus pennsylvanica*), and black ash (*Fraxinus nigra*).



Photo by Joshua G. Cohen

Landscape Context

Southern hardwood swamp occurs in poorly drained depressions on glacial lakeplain, outwash plains and channels, end moraines, till plains, and perched dunes. Historically, the Maumee Lake Plain in southeastern Michigan supported large areas of lowland hardwood forest that bordered lakeplain prairie, lakeplain oak openings, wet-mesic flatwoods, and mesic southern forest. In large wetland complexes, southern hardwood swamp is typically associated with a variety of other herbaceous, shrub, and forested wetland communities. Upland communities bordering southern hardwood swamp are usually forested, with mesic southern forest being most common.

Soils

Soils are typically loam or silt loam, sometimes sandy loam or clay loam, of neutral to mildly alkaline pH (sandy substrates are more acidic), and sometimes covered by a thin layer of muck. An underlying impermeable clay lens is often present and allows for prolonged pooling of water. Occasionally the community occurs on deep sapric peat, especially inland, where stands may be associated with conifer or hardwood-conifer, minerotrophic peatlands.

Natural Processes

Water levels fluctuate seasonally, with standing water typically occurring throughout winter and spring. Due to anaerobic conditions associated with prolonged inundation and a high water table, trees are shallowly rooted and prone to frequent blowdown. Windthrow creates a pit and mound microtopography, and variously sized canopy gaps, which promote regeneration of a diverse overstory. In addition, the pit and mound microtopography generates fine-scale gradients of soil moisture and soil chemistry and provides a diversity of microsites for plant establishment. As spring floodwater drains, both the residual mucky pools

and exposed tip-up mounds provide different habitat conditions, fostering high plant diversity. Coarse woody debris, which typically lies above the zone of flooding, remains a continued source of saturated substrate for seed germination and seedling establishment through drier periods. Prolonged flooding, often associated with beaver activity, leads to tree mortality and dominance by light-requiring shrubs and ground flora, typically sedges and grasses. Groundwater seepage affects species composition and structure. Fire is likely rare to infrequent, but may impact some stands in periods of extended drought, particularly in areas characterized by fire-dependent upland natural communities (e.g., oak barrens).

Vegetation

Dominance patterns vary, based largely on substrate characteristics, hydrology, and regional floristic distribution patterns. Sites on mineral soil that experience significant periods of inundation and seasonal water level fluctuation are typically dominated by silver maple and green ash (*Fraxinus pennsylvanica*), with red maple and pin oak (*Quercus palustris*) often as important subdominants. Tree species typical of floodplain forest are often present, including hackberry (*Celtis occidentalis*), sycamore (*Platanus occidentalis*), and cottonwood (*Populus deltoides*). Other associates include sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), black ash (*F. nigra*), tulip tree (*Liriodendron tulipifera*), quaking aspen (*Populus tremuloides*), swamp white oak (*Quercus bicolor*), bur oak (*Q. macrocarpa*), red oak (*Q. rubra*), basswood (*Tilia americana*), and American elm (*Ulmus americana*). Prior to the introduction and spread of Dutch elm disease, American elm was an important canopy constituent, but is now largely relegated to the subcanopy and sapling layers. Other common understory species include saplings of canopy tree species (especially silver and red maple), musclewood (*Carpinus caroliniana*), and witch hazel (*Hamamelis virginiana*). Characteristic shrub species include spicebush (*Lindera benzoin*), elderberry (*Sambucus canadensis*), winterberry (*Ilex verticillata*), and buttonbush (*Cephalanthus occidentalis*). The ground layer is characteristically sparse due to prolonged inundation during the early growing season. Commonly encountered species include false nettle (*Boehmeria cylindrica*), marsh marigold (*Caltha palustris*), spring cress (*Cardamine bulbosa*), pink spring cress (*C. douglassii*), fowl manna grass (*Glyceria striata*), jewelweed (*Impatiens capensis*), swamp buttercup (*Ranunculus hispidus*), bishop's cap (*Mitella diphylla*), wild geranium (*Geranium maculatum*), dwarf raspberry (*Rubus pubescens*), spinulose woodfern (*Dryopteris carthusiana*), cinnamon fern (*Osmunda cinnamomea*), sedges (*Carex gracillima*, *C. intumescens*, *C. radiata*, and *C. stipata*), poison ivy (*Toxicodendron radicans*), and Virginia creeper (*Parthenocissus quinquefolia*).

Sites on saturated organic soil of relatively stable hydrology are typically dominated by red maple and black ash. Common canopy associates include yellow birch (*Betula alleghaniensis*) and American elm; occasional associates include sugar maple, silver maple, American beech (*Fagus grandifolia*), white ash, green ash, tulip tree, quaking aspen, swamp white oak, sycamore, and basswood. Stands associated with hardwood-conifer swamp or rich tamarack swamp may occasionally contain scattered individuals of tamarack (*Larix laricina*), white pine (*Pinus strobus*), hemlock (*Tsuga canadensis*), or northern white-cedar (*Thuja occidentalis*). The subcanopy and tall shrub layers can range from open to closed, depending on canopy closure. The shrub layer is characterized by saplings of canopy species, in addition to musclewood, winterberry, poison ivy, nannyberry (*Viburnum lentago*), silky dogwood (*Cornus amomum*), gray dogwood (*C. foemina*), spicebush, elderberry, smooth highbush blueberry (*Vaccinium corymbosum*), and occasionally buttonbush in the most open and wettest swales. The ground layer ranges from sparse under the dense shade of hardwoods or in areas subject to seasonal inundation to dense in light gaps and openings. Stands are often characterized by the development of moss and litter-covered hummocks that are elevated above the saturated or inundated muck hollows. Characteristic species of hummocks and decomposing wood include spinulose woodfern (*Dryopteris carthusiana*), goldthread (*Coptis trifolia*), bishop's cap, Canada mayflower (*Maianthemum canadense*), and dwarf raspberry. Typical species of hollows and open, mucky flats include skunk cabbage (*Symplocarpus foetidus*), pink spring cress, spring cress, jack-in-the-pulpit (*Arisaema triphyllum*), marsh marigold, fowl manna grass, sedges (*Carex radiata*, *C. intumescens*, *C. stipata*, etc.), northern bugle weed (*Lycopus uniflorus*),

false nettle (*Boehmeria cylindrica*), marsh fern (*Thelypteris palustris*), cinnamon fern, sensitive fern (*Onoclea sensibilis*), jewelweed, and clearweed (*Pilea* spp.) Areas of standing water are sometimes dominated by small duckweed (*Lemna minor*) or in the spring, by golden saxifrage (*Chrysosplenium americanum*).

Noteworthy Animals

Beaver can cause prolonged flooding that substantially alters wetland community structure, converting southern hardwood swamps to a broad range of wetland types, depending on landscape position, soils, and depth and duration of flooding.

Rare Plants

Betula murrayana (Murray birch, state special concern)
Carex lupuliformis (false hop sedge, state threatened)
Carex seorsa (sedge, state threatened)
Carex straminea (straw sedge, state endangered)
Cuscuta glomerata (rope dodder, state special concern)
Cuscuta polygonorum (knotweed dodder, state special concern)
Dryopteris celsa (log fern, state threatened)
Eupatorium fistulosum (hollow-stemmed joe-pye-weed, state threatened)
Fraxinus profunda (pumpkin ash, state threatened)
Galearis spectabilis (showy orchis, state threatened)
Hybanthus concolor (green violet, state special concern)
Hydrastis canadensis (goldenseal, state threatened)
Isotria medeoloides (smaller whorled pogonia, state endangered)
Isotria verticillata (whorled pogonia, state threatened)
Lysimachia hybrida (swamp candles, state special concern)
Panax quinquefolius (ginseng, state threatened)
Panicum microcarpon (small-fruited panic grass, state special concern)
Plantago cordata (heart-leaved plantain, state endangered)
Poa paludigena (bog bluegrass, state threatened)
Polymnia uvedalia (large-flowered leafcup, state threatened)
Populus heterophylla (swamp or black cottonwood, state endangered)
Rudbeckia subtomentosa (sweet coneflower, presumed extirpated from Michigan)
Trillium undulatum (painted trillium, state endangered)
Valerianella umbilicata (corn-salad, state threatened)
Viburnum prunifolium (black haw, state special concern)
Woodwardia areolata (netted chain-fern, presumed extirpated from Michigan)

Rare Animals

Accipiter cooperii (Cooper's hawk, state special concern)
Acrionicta falcata (corylus dagger moth, state special concern)
Ambystoma opacum (marbled salamander, state threatened)
Ambystoma texanum (smallmouth salamander, state endangered)
Basilodes pepita (gold moth, state special concern)
Buteo lineatus (red-shouldered hawk, state threatened)
Catocala illecta (Magdalen underwing, state special concern)
Clemmys guttata (spotted turtle, state threatened)
Clonophis kirtlandii (Kirtland's snake, state endangered)
Emydoidea blandingii (Blanding's turtle, state special concern)

Euphyes dukesi (Dukes' skipper, state threatened)
Gomphus quadricolor (rapids clubtail, state special concern)
Haliaeetus leucocephalus (bald eagle, state threatened)
Heterocampa subrotata (small heterocampa, state special concern)
Heteropacha rileyana (Riley's lappet moth, state special concern)
Incisalia henrici (Henry's elfin, state special concern)
Myotis sodalis (Indiana bat, federal/state endangered)
Nerodia erythrogaster neglecta (copperbelly watersnake, federal threatened and state endangered)
Nycticorax nycticorax (black-crowned night-heron, state special concern)
Pandion haliaetus (osprey, state threatened)
Papaipema cerina (golden borer, state special concern)
Papaipema speciosissima (regal fern borer, state special concern)
Protonotaria citrea (prothonotary warbler, state special concern)
Seiurus motacilla (Louisiana waterthrush, state special concern)
Sistrurus c. catenatus (eastern massasauga, federal candidate species and state special concern)
Terrapene c. carolina (eastern box turtle, state special concern)

Biodiversity Management Considerations

Conservation of wetlands requires management and protection of adjacent upland communities aimed at maintaining hydrology, minimizing inputs of nutrient-rich runoff, and protecting and managing habitat for animal species that require both upland and wetland habitats. Hydrologic alteration associated with agriculture, roads, or other development can alter species composition and structure, and foster establishment of invasive species. Where the primary conservation objective is to maintain biodiversity in southern hardwood swamps, the best management is to leave large tracts unperturbed and allow natural processes such as flooding, windthrow, and senescence to operate unhindered.

Monitoring and control efforts to detect and remove invasive species are critical to the long-term viability of southern hardwood swamp. Invasive plant species that threaten the diversity and community structure include garlic mustard (*Alliaria petiolata*), reed canary grass (*Phalaris arundinacea*), reed (*Phragmites australis*), autumn olive (*Elaeagnus umbellata*), multiflora rose (*Rosa multiflora*), and glossy buckthorn (*Rhamnus frangula*). Light-requiring invasive plant species such as reed and reed canary grass can establish in canopy gaps and in openings along streams. Emerald ash borer, an invasive insect, has reduced or eliminated ash as an important component of upland and lowland forest types in southeastern Michigan and has the potential to significantly impact ash populations in forested wetlands and uplands throughout the state.

Variation

Dominance patterns among common canopy constituents vary based on site-specific factors. Silver maple and green ash indicate fluctuating hydrology and seasonal inundation, whereas areas dominated by red maple and black ash indicate a more stable hydrology influenced by persistent groundwater seepage. Stands that contain conifers may represent converted hardwood-conifer swamp, rich tamarack swamp, or rich conifer swamp. Conversion of conifer-dominated stands to hardwood dominance is frequently associated with anthropogenic disturbances such as logging, hydrologic alteration, and fire suppression. Small forested seeps embedded in a matrix of dry-mesic and mesic southern forest in southern Lower Michigan are currently placed in this classification, and sometimes include species otherwise absent in mixed hardwood swamp, including Ohio buckeye (*Aesculus glabra*), pawpaw (*Asimina triloba*), blue ash (*Fraxinus quadrangulata*), and hackberry.

Similar Natural Communities

[Hardwood-conifer swamp](#), [northern hardwood swamp](#), [floodplain forest](#), and [wet-mesic flatwoods](#).

Relevant Literature

- Abrams, M.D. 1998. The red maple paradox. *BioScience* 48: 355-364.
- Comer, P.J., D.A. Albert, H.A. Wells, B.L. Hart, J.B. Raab, D.L. Price, D.M. Kashian, R.A. Corner, and D.W. Schuen. 1995. Michigan's presettlement vegetation, as interpreted from the General Land Office surveys 1816-1856. Michigan Natural Features Inventory, Lansing, MI. Digital map.
- Knopp, P.D. 1999. Landscape ecosystems of the Maumee Lake Plain, southeastern Lower Michigan: Interrelationships of physiography, soil, and vegetation. M.S. thesis, University of Michigan, Ann Arbor, MI. 100 pp.
- Lee, J.G. 2005. Landscape ecology of silver maple (*Acer saccharinum* L.) in wetlands of southeastern Michigan. M.S. thesis, University of Michigan, Ann Arbor, MI. 195 pp.
- Merkey, D.H. 2006. Characterization of wetland hydrodynamics using HGM and subclassification methods in southeastern Michigan, USA. *Wetlands* 26: 358-367.
- NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [Web application]. Version 6.1. NatureServe, Arlington, VA. Available <http://www.natureserve.org/explorer>. (Accessed: December 4, 2006.)
- Orr, S.P., J.A. Rudgers, and K. Clay. 2005. Invasive plants can inhibit native tree seedlings: Testing potential allelopathic mechanisms. *Plant Ecology* 181: 153-165.
- Riffell, S., T. Burton, and M. Murphy. 2006. Birds in depression forested wetlands: Area and habitat requirements and model uncertainty. *Wetlands* 26: 107-118.
- Schneider, G.J., and K.E. Cochrane. 1998. Plant community survey of the Lake Erie Drainage. Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Columbus, OH.

For a full list of references used to create this description, please refer to the [natural community abstract](#) for southern hardwood swamp.

More Information

Southern hardwood swamp natural community abstract

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Appendix C

Beckwith Preserve Ecosystems

by Andrew Laird



Section 1 - The Old Orchard

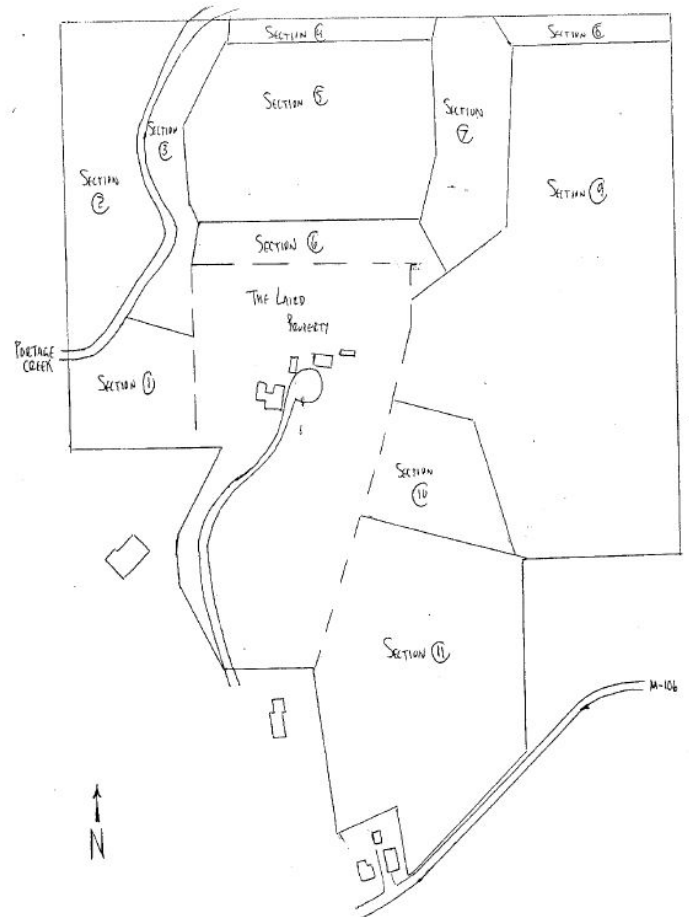
A few specimens from the former apple orchard remain in the now white pine-dominated portion of this section. The western portion of Section 1 consists of second growth woodland, with black oak, white pine, black cherry and American elm, as well as a large clone of gray dogwood. Invasive species including 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 spare, 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 Tartarian 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.

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.

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.

Section 7 & 10 - Meadow

Section 7 consists of a large meadow dominated by brome and spotted knapweed. 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.



Appendix D

Suggested Management Actions

by Andrew Laird



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.

Section 1 - The Old Orchard

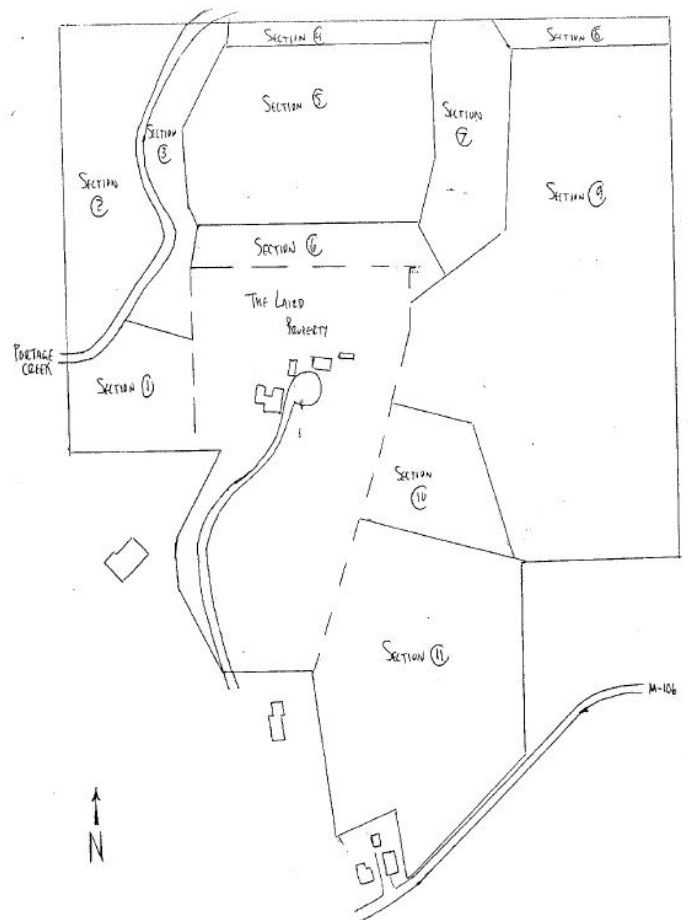
- Remove the black locust, honeysuckle, and autumn olive to open up the area and allow for re-growth.
- Cut and apply herbicide to autumn olive and honeysuckle in the western part of the section.

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, chinquapin 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 - Black Oak Forest

- 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 multiflora 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 Tartarian 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 E

Legal Descriptions



Beckwith Preserve

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 $89^{\circ}55'42''$ West 213.55 feet; thence along the centerline of M-106 (Main Street) (66 foot wide right of way), South $41^{\circ}25'15''$ 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 $41^{\circ}25'15''$ 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 $120^{\circ}17'47''$ and a long chord which bears South $47^{\circ}34'08''$ 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 $11^{\circ}10'29''$ West (platted as North 11° West) 166.64 feet; thence continuing along the East line of said Lindsay Addition, South $61^{\circ}51'54''$ West (platted as South 62° West), 132.00 feet; thence continuing along the East line of said Lindsay Addition, North $11^{\circ}10'29''$ West (platted as North 11° West), 350.39 feet; thence North $19^{\circ}05'31''$ East, 483.70 feet; thence North $13^{\circ}02'53''$ East, 266.57 feet thence due North, 103.00 feet; thence due West, 459.08 feet; thence due South 370.45 feet; thence North $89^{\circ}43'11''$ 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 $00^{\circ}38'25''$ 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 $89^{\circ}58'40''$ 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 $04^{\circ}22'44''$ East, 188.02 feet to the point of beginning; containing 30.56 acres, more or less.

Access Improvement Parcel

Land in the Village of Stockbridge, Ingham County, Michigan, described as: Beginning at a point 149.0 feet West of the South $\frac{1}{4}$ post of Section 23, Town 1 North, Range 2 East, Township of Stockbridge, Ingham county, Michigan; thence North 01° degrees $00'$ minutes East 220.0 feet; thence West 244.5 feet; thence South 402.0 feet to the centerline of Highway M-106; thence Northeast along the centerline 250.3 feet to angle past of highway; thence East on the Section line 71.44 feet to the Place of Beginning.



Appendix F

Restrictions and File Locations



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\Properties\PRESERVES\Beckwith Nature Preserve