Lapham Addition

Management Plan

August 2017

LEGACY Land Conservancy

Protecting and Preserving Southern Michigan

Management Plan for the Lapham Family Addition to the Reichert Nature Preserve

Dexter Township, Washtenaw County, Michigan

Prepared by Walker Stinnette - August 2017

This document contains a description of the Lapham Family Addition to the Reichert Nature 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 with additional resources and references suggested.

Thank you to Dana Wright and Allene Smith of Legacy Land Conservancy for their 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 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 Lapham Family Addition to the Reichert Nature Preserve (Addition or Lapham Addition) is a 16.73 acre parcel located southeast of the intersection of Toma Road and Winterset Road in Dexter Township, Washtenaw County, Michigan (Appendix A, Figure 1). The Addition is contiguous with the Reichert Nature Preserve, which is located immediately east on the opposite bank of the Portage River. Three vegetative communities - southern wet meadow, dry southern forest, and inundated shrub swamp - are located within the Addition, which has just over 600 feet of frontage on the Portage River. An approximately 395' x 180' building envelope is located along Toma Road in the western portion of the Addition and will serve as a site for a parking lot for visitors to the Addition.

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 Addition consisted of mixed oak 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. While upland portions of the Addition were farmed, other areas that were too wet for agriculture have remained relatively unaltered. Because the Addition's sandy soil proved unproductive, row crop agriculture was abandoned by the middle of the 20th century, and the site reforested through natural succession.

The land was acquired by the Lapham family in the 1940s and maintained as a vacation and recreation property. Ownership passed through several generations of the family before being inherited by sisters Jeannine Thomas and Sandra Brinkman. Today, the Addition primarily supports three vegetative communities: southern wet meadow, inundated shrub swamp, and dry southern forest. The southern wet meadow associated with the Portage River floodplain as well as the inundated shrub swamp located within two depressional wetlands are likely similar to pre-European settlement conditions. Dry southern forest has returned to upland areas that were once farmed, although the forest no longer exhibits an open-woods character typical of a fire maintained landscape.

Acquisition

After Jeannine Thomas and Sandra Brinkman explored the option of selling their property to developers, their realtor contacted Legacy about the possibility of acquisition. Robert (Bob) Nester, a neighbor with a Legacy-held conservation easement on his own property, had expressed interest in purchasing the sisters' property. On September 8, 2016 Mr. Nester purchased land from the Sandra Lee Brinkman Trust and the Jeannine J. Thomas Trust. Legacy Land Conservancy put a conservation easement over 36.56 acres of Mr. Nester's newly-acquired land. Legacy purchased in fee from Mr. Nester the remaining 16.73-acre parcel on which Washtenaw County Parks and Recreation holds a conservation easement. This conserved parcel came to be known as the "Lapham Addition." This collaborative agreement between multiple parties fulfilled the Lapham family's desire to have their land protected, while increasing the protected lands adjacent to the Portage River and the size of Legacy's Reichert Nature Preserve.

Classification

Like the Reichert Preserve, the Addition 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 with the exception of battery or electric power driven devices operated by a person with a mobility disability.

The table below summarizes the selection criteria and the role the Lapham Addition fulfills within Legacy's broader framework:

Preserve: Lapham Addition to the Reichert Nature Preserve

Location: Dexter Township, Washtenaw County, Michigan

Assets/ Characteristics	High Quality	Low Acquisition Costs	Low Stewardship Costs	Eco Steward Potential	Size
Ecosystem	Prairie	Woodland	River Corridor	Fen	Bog	Marsh	Farmland	Organic Farmland

Site Description

Surrounding Uses and Connectivity

The Addition is located approximately 1.5 miles south of the Village of Pinckney in a rural residential area with large lot sizes and patches of forest. Adjacent land uses include: undeveloped wetlands associated with the Portage River, forest patches and residential properties to the north, the Portage River and Reichert Nature Preserve to the east, contiguous undeveloped forest and residential properties to the south, and forest patches and residential properties to the west. (Appendix A, Figure 3).

The Reichert Nature Preserve is within two miles of the 11,000 acre Pinckney State Recreation Area which, along with the Waterloo and Brighton State Recreation Areas, provides protection to the unique complex of hundreds of kettle lakes that form an arc from Adrian and Jackson in the southwest to Bloomfield Hills in the northeast. The Addition extends the green corridor of Waterloo and Pinckney Recreation Areas toward Brighton Recreation Area. The Portage River flows through the property to Little Portage Lake before joining the Huron River. Given its proximity to the Portage River, the property is connected hyrdologically to lands upstream in Waterloo and Pinckney. Efforts to acquire additional land adjacent to the Reichert Nature Preserve and the Portage River are important in protecting the water quality in the Huron River Watershed.

Existing Resources/Assets

Robert Nester, from whom Legacy purchased the Addition, retains ownership of the property immediately to the north. Not only does Legacy's relationship with Mr. Nester minimize instances of encroachment onto the Addition, it also serves as an added level of security and monitoring. In addition, at the time of Legacy's purchase, a network of trails was already present on the property. Mr. Nester has graciously agreed that existing trails that meander the Addition's northern border, passing temporarily onto his private property, can remain. Legacy and Mr. Nester plan to coordinate management of the properties and their trails, when and where appropriate, for recreational and educational opportunities.

Soils

The Natural Resources Conservation Service soil survey of Washtenaw County indicates that four soil types can be found within the Addition (Appendix A, Figure 5). Detailed soil descriptions are below:

Boyer loamy sand (BnC), 6-12 percent slope: Well drained soils formed on outwash plains, valley trains, kames, beach ridges, river terraces, lake terraces, deltas, and moraines. The depth to the seasonal high water table is greater than 6 feet and permeability is moderately rapid in the solum and very rapid in the substratum.

Boyer loamy sand (BnF), 25-50 percent slopes: Well drained soils formed on outwash plains, valley trains, kames, beach ridges, river terraces, lake terraces, deltas, and moraines. The depth to the seasonal high water table is greater than 6 feet and permeability is moderately rapid in the solum and very rapid in the substratum.

Houghton muck (Hn), 0-2 percent slopes: Very deep, very poorly drained soils formed in herbaceous organic materials in depressions and drainage ways on lake plains, outwash plains, ground moraines, end moraines, till plains, and floodplains. The depth to the seasonal high water table ranges from two feet above the soil surface to one foot below the surface. Permeability is moderately slow to moderately rapid.

Wawasee loam (WawabC), 6-12 percent slopes: Soils are very deep, well drained, and are formed in till on moraines and till plains. Soils have moderate permeability.

Ecology

The Addition is part of the kettle-kame complex found in the interlobate region of southeastern Michigan, with dry oak forest on the kames and a vast wetland complex in floodplains and depressional areas. The property's rolling, wooded terrain, depressional ponds, and frontage along the Portage River support three natural vegetative communities that were once prevalent across southeastern Michigan. These communities are characterized by the Michigan Natural Features Inventory (MNFI) as:

Dry-mesic southern forest: 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. The Addition's dry-mesic southern forests are characterized by black oak (*Quercus velutina*), red oak (*Quercus rubra*), and red maple (*Acer rubrum*), with saplings such as sassafras (*Sassafras albidum*) and black cherry (*Prunus serotina*) filling canopy gaps. The understory typically consists of shrub species such as lowbush blueberry (*Vaccinium angustifolium*), ground juniper (*Juniperus communis*), prickly gooseberry (*Ribes cynosbati*), and northern dewberry (*Rubus flagellaris*), among others. Herbaceous species include, but are not limited to, Pennsylvania sedge (*Carex pensylvanica*), big-leaved aster (*Aster macrophyllus*), hog peanut (*Amphicarpaea bracteata*), and whorled yellow loosestrife (*Lysimachia quadrifolia*). Some portions of the Addition's forests are more heavily invaded by non-native species than others. While the sub-canopy of the dry southern forest is relatively open, the forest west of the depressional wetlands is dense with non-native shrubs, namely honeysuckle (*Lonicera spp.*), multiflora rose (*Rosa multiflora*), and autumn olive (*Elaeagnus umbellata*), with pockets of oriental bittersweet (*Celastrus orbiculatus*). Overall, invasive herbaceous species are not a pervasive problem, although species such as dame's rocket (*Hesperis matronalis*), garlic mustard (*Alliaria petiolate*), and Japanese hedge parsley (*Torilis japonica*) are present in small populations near the building envelope in the western portion of the dry-mesic southern forest.

Southern wet meadow: an open, groundwater-influenced, sedge-dominated wetland. Open conditions are maintained by seasonal flooding, beaver-induced flooding, and fire. Sedges in the genus Carex, in particular tussock sedge (*Carex stricta*), dominate the community. Southern wet meadow occurs on glacial lakebeds, lakeplains, and in depressions on glacial outwash and moraines. The community frequently occurs along the margins of lakes and streams, where flooding is common. Within the Addition's wet meadow, swamp thistle (*Cirsium muticum*), common boneset (*Eupatorium perfoliatum*), southern blue flag (*Iris virginica*), great water dock (*Rumex orbiculatus*), sensitive fern (*Onoclea sensibilis*), and marsh fern (*Thelypteris palustris*) were identified. Glossy buckthorn (*Frangula alnus*), an invasive shrub species, has been identified in the area.

Inundated shrub swamp: a shrub-dominated community characterized by poor drainage, nearly continuous inundation or saturation, and dominance by buttonbush (*Cephalanthus occidentalis*), which typically represents more than 50% of the shrub cover. The community typically exhibits a scattered shrub-dominated overstory and sparse herbaceous cover. This community occupies kettleholes in ice-contact topography and moats around bogs, and is occasionally found in wetland depressions on outwash and sandy lakeplains. Inundated shrub swamp typically occurs in isolated depressions (i.e., ice-block depressions) surrounded by forested uplands of mesic southern forest, dry-mesic southern forest, or dry southern forest. In addition to a large community of buttonbush, Michigan holly (*Ilex verticillata*) is abundant within the Addition's inundated shrub swamp, while the canopy is dominated by silver maples (*Acer saccharinum*) at the swamp's periphery. To date, no invasive species have been identified within these areas.

These three community types are described in more detail in Appendix B.

Topography

The United States Geological Survey Topographic Map (Pinckney Quadrangle) indicates that elevation ranges from approximately 860 - 900 feet above see level (Appendix A, Figure 6).

Hydrology

Approximately 600 linear feet of the Portage River flow along the eastern boundary of the Addition. After leaving the property, the Portage River flows into Little Portage Lake before continuing on to the Huron River. In addition, wetlands classified as southern wet meadow are associated with the floodplain of the Portage River, whereas depressional wetlands classified as inundated shrub swamp are centrally located within the Addition (Appendix A, Figure 7). The property is in the Lower Portage Creek sub-watershed of the Portage Creek watershed, which is within the Huron River watershed. Therefore, rainfall falling on the Lapham Addition eventually flows into Lake Erie.

Management Background

Purpose of the Plan

The purpose of this management plan is to provide a framework to guide management of the Lapham Addition in light of changing conditions within the Addition as well as resource availability. The plan provides current and future land managers, stewards,and the community at large with information about the Addition to aid in ensuring long term protection.

Family Intent

Jeannine Thomas and Sandra Brinkman intended that public use be limited to passive recreation including, but not limited to, walking, nature education, and cross-country skiing. The Addition 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)

Invasive species removal and native species planting is desired.

Management Obligation

Legacy's management obligation is to the community this Addition was protected to serve. Legacy will maintain access for the public to the Addition, and establish Eco Stewards as volunteer-oversight and maintenance of the Addition. Legacy will also work to improve the health of the land and the ecosystems it supports in conjunction with Eco-Stewards.

Management Status

Prior to Legacy's acquisition of the Addition, the Lapham family maintained the property in a natural, forested state for recreational purposes, with little management beyond trail maintenance. In the time since Legacy acquired the Addition, management activities have focused on reintroducing fire to restore natural ecosystem processes, invasive species removal, and trail maintenance. An initial prescribed burn was conducted in April 2017 to control invasive species, recycle woody debris and leaf litter, and foster the growth of native vegetation. In addition to returning fire to the landscape, invasive species management has mainly consisted of hand pulling the small populations of invasive herbaceous species in the western portions of the dry-mesic

southern forest while monitoring the eastern portions. In addition, Legacy has performed trail maintenance including removing felled trees and limbs that obstruct the trails and using felled trees and limbs to obstruct trails leaving the Addition in order to prevent visitors from venturing onto private property. The Addition 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.

Because oak wilt has been identified and is being managed on the adjacent Reichert Nature Preserve, the Addition will be monitored regularly for oak wilt activity.

Management Objective

Overarching Objective

The primary management goals for the Lapham Addition to the Reichert Nature Preserve involve balancing restoration and maintenance of the natural areas with education and public access.

Specific Objectives

The primary management goals for the Lapham Addition are as follows:

1. Develop a parking lot within the building envelope located in the western portion of the Addition to increase accessibility and visibility of the Reichert Preserve
2. Connect the Addition's trail system with the Reichert Preserve's trail system
3. Maintain the stability of the Portage River bank and the areas surrounding wetlands; monitor for erosion and mitigate as necessary
4. Manage and, where possible, eradicate invasive species and restore native species, while recognizing that portions of the Addition have been heavily modified and ecological restoration to a condition similar to that of pre-settlement vegetative community assemblages is not feasible
5. Maintain and improve the Addition's trail system to accommodate quiet recreational use
6. Identify and catalog the plant and animal species present within the Addition
7. Intensify evaluation of management efficacy through detailed record keeping to better allocate staff/volunteer time and financial resources and to adaptively manage invasive species
8. Cultivate long-term relationships with local organizations and/or individuals
9. As required, continue to monitor the Addition at the established precise monitoring points on an annual basis in order to characterize changes in the vegetative communities over time
10. Update the Addition's management plan every 7 to 10 years or as necessary

Implementation

Management Units

The Addition has been divided into four management units consistent with those present at the Reichert Preserve where applicable. The assigned units reflect the varied vegetative communities and management needs within the property (Appendix A, Figure 8). Each management unit has been given a priority level according to the criteria outlined below:

- Unit A - southern wet meadow in the floodplain of the Portage River along the Addition's eastern boundary
- Unit B - dry southern forest that has been heavily invaded by non-native species in the western portion of the Addition
- Unit C - dry southern forest located between the Portage River floodplain to the east and the more degraded dry southern forest to the west
- Unit F - inundated shrub swamp located in two separate depressional wetlands centrally located within the Addition
- Unit J - building envelope located in the western portion of the Addition, heavily invaded by invasive species

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 3
- Unit C - Priority 2
- Unit F - Priority 2
- Unit J - 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 lot within the building envelope located in the western portion of the Addition to increase accessibility and visibility of the Reichert Preserve

- Determine a suitable location for a parking lot, taking into consideration topography, proximity to existing roads and trails, and necessary approvals from road commission.
- Remove trees and shrubs, grade, and gravel the parking lot area, making it suitable for parking and providing convenient and safe access to the Addition.
- Install Legacy signage along Toma Road at the parking lot entrance to improve visibility.
- Install information kiosk, which includes a trail map, natural history, land use history, invasive species information, etc.
- Install boot brushes at the trailhead.
- Install a barrier to define parking lot area.
- Perform regular maintenance of the parking area.

Goal 1	
Prioritization	***Short term/ongoing***
Personnel	***Staff/crew, volunteers, contractor***
Time	***50 hrs to install, est. 4 hrs annual maintenance***
Equipment	***Chainsaw/personal protective equipment (PPE), herbicide/applicator, flagging, post-hole digger, mallet, lumber, drill/screws***
Estimated Cost	***$20,000***
Resources Available	***All equipment listed above except lumber; WCPARC, Bob Nester, EQIP***

Goal 2: Connect the Addition's trail system with the Reichert Preserve's trail system

- Explore options for constructing a bridge spanning the Portage River to increase use and accessibility of the Addition by connecting its trail system with the adjacent Reichert Preserve.

Goal 2	
Prioritization	***Long term***
Personnel	***Staff, volunteers, contractor***
Time	***40 hrs***
Equipment	***TBD***
Estimated Cost	***Dependent on personnel***
Resources Available	***WCPARC, Neal Billetdeaux/JJR, EQIP***

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

- If/when a bridge is constructed spanning the Portage River, plan, monitor, and manage the area to mitigate erosion including seeding and planting with live stakes as necessary.

Goal 3	
Prioritization	***Long term/Ongoing***
Personnel	***Staff/crew, volunteers***
Time	***5 hrs annually***
Equipment	***None***
Estimated Cost	***TBD***
Resources Available	***Dependent on needs***

Goal 4: 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.

Goal 4	
Prioritization	***Ongoing***
Personnel	***Staff/crew, volunteers, Plant-Wise***
Time	***Approx. 100 hrs annually***
Equipment	***Handsaws, loppers, chainsaw/ PPE, brushblade, herbicide/ applicator, plastic bags***
Estimated Cost	***$80 annually (herbicide, tool maintenance/replacement shared among all preserves)***
Resources Available	***All equipment listed above***

Management Unit A

- Glossy buckthorn (*Frangula alnus*) has been identified in the area and will be eradicated using the cut and treat technique with herbicide approved for wetland use.
- Conduct controlled burns in the early spring every 2 to 4 years or as resources are available to inhibit the growth of invasive species and to promote the growth and regeneration of native community assemblages.
- If invasive herbaceous species are identified, they will be managed by hand pulling. Additional invasive shrub seedlings should be sprayed with herbicide approved for wetland use.

Goal 4: Management Unit A	
Prioritization	***1 of 5***
Personnel	***Staff/crew, volunteers, Plan-Wise***
Time	***20***
Equipment	***Plastic bags, loppers, hand-saws, pruners, herbicide/applicator***
Estimated Cost	***See Goal 4 base cost***
Resources Available	***All equipment listed above***

Management Unit B

- Although it is currently invaded with honeysuckle (*Lonicera spp.*), multiflora rose (*Rosa multiflora*), autumn olive (*Elaeagnus umbellata*), dame's rocket (*Hesperis matronalis*), garlic mustard (*Alliaria petiolata*), Japanese hedge parsley (*Torilis japonica*) , and Oriental bittersweet (*Celastrus orbiculatus*), there is potential for this area to more

Goal 4: Management Unit B	
Prioritization	***4 of 5***
Personnel	***Staff/crew, volunteers, Plant-Wise***
Time	***35 hrs annually***
Equipment	***Plastic bags, loppers, hand-saws, pruners, herbicide/applicator***
Estimated Cost	***See Goal 4 base cost***
Resources Available	***All equipment listed above***

closely resemble Unit A with increased management activities.

- Invasive species will be eradicated following the methods described for Management Unit A.
- Conduct controlled burns following the methods described for Management Unit A. However, due to Oriental bittersweet's tendency to increase when burned, this species (as in all areas of the Addition in which it is found) should be a high priority for removal.
- Monitor twice annually for oak wilt activity.

Management Unit C

- Maintain the high ecological quality of the southern dry forest by annually monitoring for invasive species and completely eradicating them as they are identified.
- 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 following the methods described for Management Unit A.
- Monitor twice annually for oak wilt activity.

Goal 4: Management Unit C	
Prioritization	*3 of 5*
Personnel	*Staff/crew, volunteers, Plant-Wise*
Time	*35 hrs annually*
Equipment	*Plastic bags, loppers, hand-saws, pruners, herbicide/applicator*
Estimated Cost	*See Goal 4 base cost*
Resources Available	*All equipment listed above*

Management Unit F

- While no invasive species have been identified in these areas, annual monitoring, specifically for purple loosestrife (*Lythrum salicaria*) and glossy buckthorn, will be conducted.
- If invasive species are identified, they will be eradicated following the methods described for Management Unit A using herbicide approved for wetland use.

Goal 4: Management Unit F	
Prioritization	*2 of 5*
Personnel	*Staff/crew, volunteers, Plant-Wise*
Time	*10 hrs annually*
Equipment	*Plastic bags, loppers, hand-saws, pruners, herbicide/applicator*
Estimated Cost	*See Goal 4 base cost*
Resources Available	*All equipment listed above*

- Conduct controlled burns following the methods described for Management Unit A.

Management Unit J

- Given that much of this unit will be converted to a parking area, management activities will be limited.

Goal 4: Management Unit J	
Prioritization	*5 of 5*
Personnel	*Staff/crew, volunteers*
Time	*None projected at this time*
Equipment	*None*
Estimated Cost	*See Goal 4 base cost*
Resources Available	*NA*

Goal 5: Maintain and improve the Addition'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 and trimming grasses and shrubs that encroach on trails.
- Once the new parking lot is developed, install a trailhead and connect it with the existing trail network.

Goal 5	
Prioritization	*Short term/ongoing*
Personnel	*Staff/crew, volunteers*
Time	*20 hrs, 10 hrs annually*
Equipment	*Chainsaw/PPE, handsaws, herbicide/applicator, loppers*
Estimated Cost	*None*
Resources Available	*All equipment listed above*

Goal 6: Identify and catalog the plant and animal species present within the Addition

- Conduct a detailed biological survey of the Addition'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 Addition.
- 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 Reichert Preserve.

Goal 6	
Prioritization	*Long term*
Personnel	*Staff, contractor, volunteers*
Time	*5 hrs, 1 hr annually*
Equipment	*None*
Estimated Cost	*Dependent on personnel*
Resources Available	*Bev Walters, Greg Vaclavek, David Mindell, Daniel Winfield, David Mifsund, Bot Club*

Goal 7: 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 7	
Prioritization	***Long term/Ongoing***
Personnel	***Staff/crew, intern, volunteer***
Time	***40 hrs annually***
Equipment	***TBD***
Estimated Cost	***None***
Resources Available	***Crew log, Landscape, UM/ EMU, LTA Stewardship List-serv***

Goal 8: Cultivate long-term relationships with local organizations and/or individuals

- Increase collaborative management of the Preserve between Legacy, the Washtenaw County Parks and Recreation Commission, and organizations and/or individuals from the local community.
- Identify a dedicated Eco-Steward(s) 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 Addition and to serve as added level of monitoring.

Goal 8	
Prioritization	***Long term/Ongoing***
Personnel	***Staff, volunteer ambassadors***
Time	***10 hrs annually***
Equipment	***None***
Estimated Cost	***None***
Resources Available	***Bob Nester***

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

- Establish an additional set of photo monitoring points to characterize the effects of controlled burns

Goal 9	
Prioritization	***Ongoing***
Personnel	***Staff, volunteers***
Time	***2 hrs annually***
Equipment	***Camera, tablet***
Estimated Cost	***None***
Resources Available	***Photomonitoring volunteers, cameras, tablets***

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

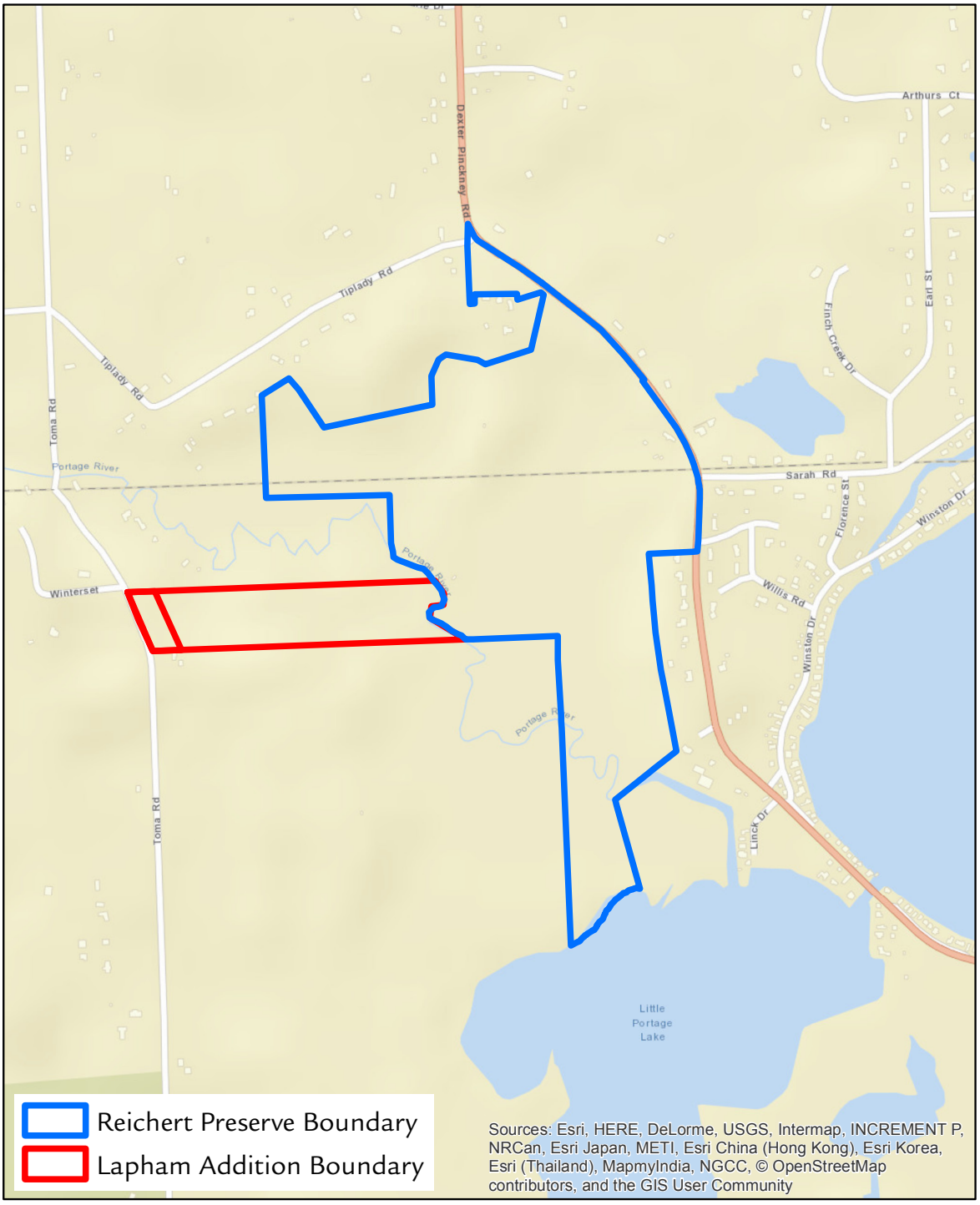
Goal 10	
Prioritization	***Long term/Ongoing***
Personnel	***Staff, intern/workstudy***
Time	***50 hrs every 7-10 yrs***
Equipment	***Workstation***
Estimated Cost	***None***
Resources Available	***Stewardship staff, previous mgmt plans, best practices***

Conclusion

In recognition of its natural beauty as well as the ecosystem services and recreational opportunities it provides, the Lapham family has sought to protect their property through the establishment of the Lapham Addition to the Reichert Nature Preserve. In so doing, the Lapham Addition significantly increases the size of the Reichert Nature Preserve, while preserving a variety of ecosystems and vegetative communities and providing an opportunity to develop a parking area for improved access. Managing the Addition for public use, developing relationships with the local community, establishing a dedicated parking area, and connecting the Addition's trail system to that of the Reichert Preserve will increase community use and engagement. In addition, continuing to maintain the higher quality areas of the dry southern forest, while expanding restoration efforts into more heavily invaded areas of the property will further increase overall ecological value. In this way, this management plan, and the specific actions discussed herein, will ensure the Lapham Addition's long term protection and maintenance as an asset for the local community and beyond.

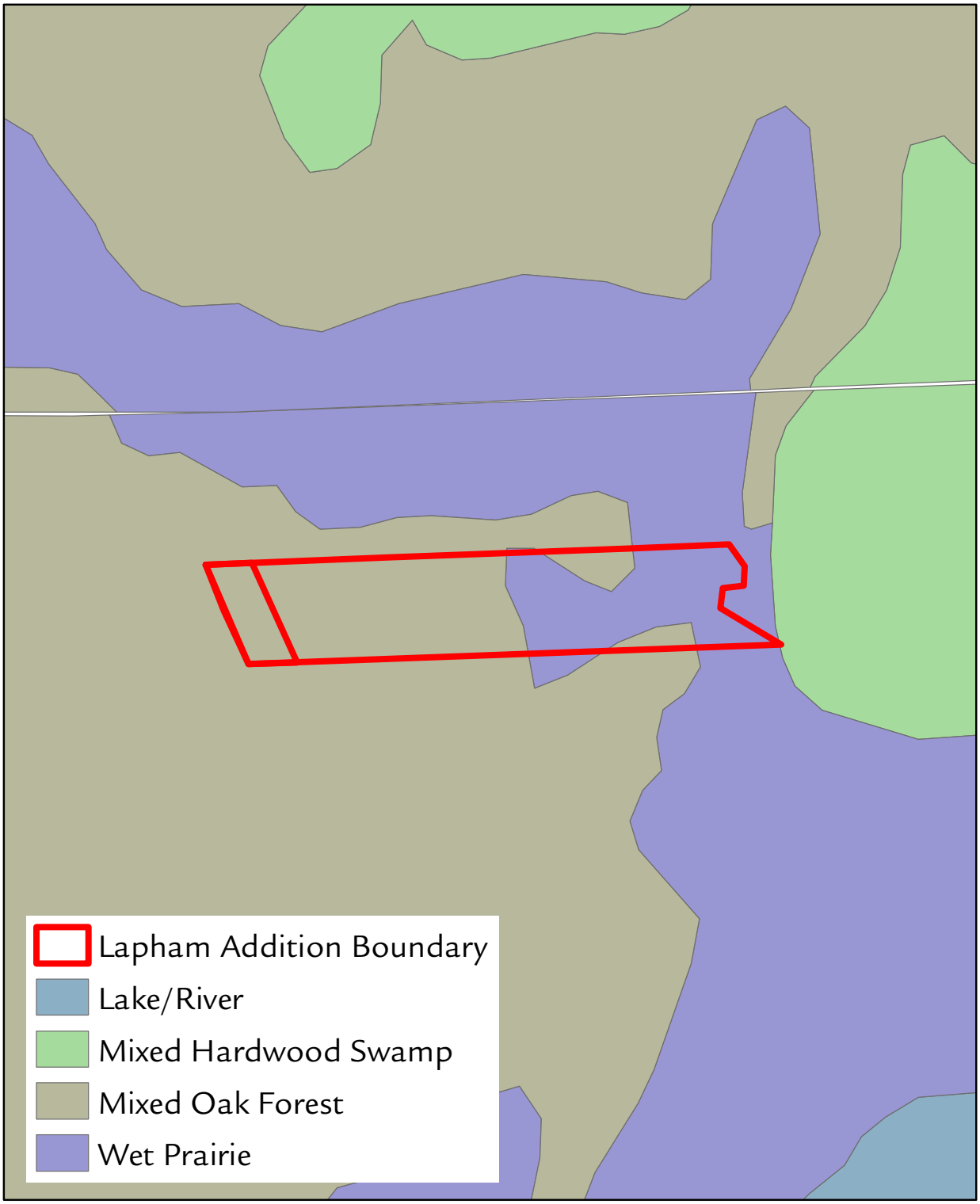
Appendix A

Figures



Reichert Preserve
Figure 1. Site Location

LEGACY Land Conservancy



Lapham Addition

Figure 2. Circa 1800 Vegetation

LEGACY Land Conservancy

Lapham Addition
Figure 3. Aerial

LEGACY Land Conservancy

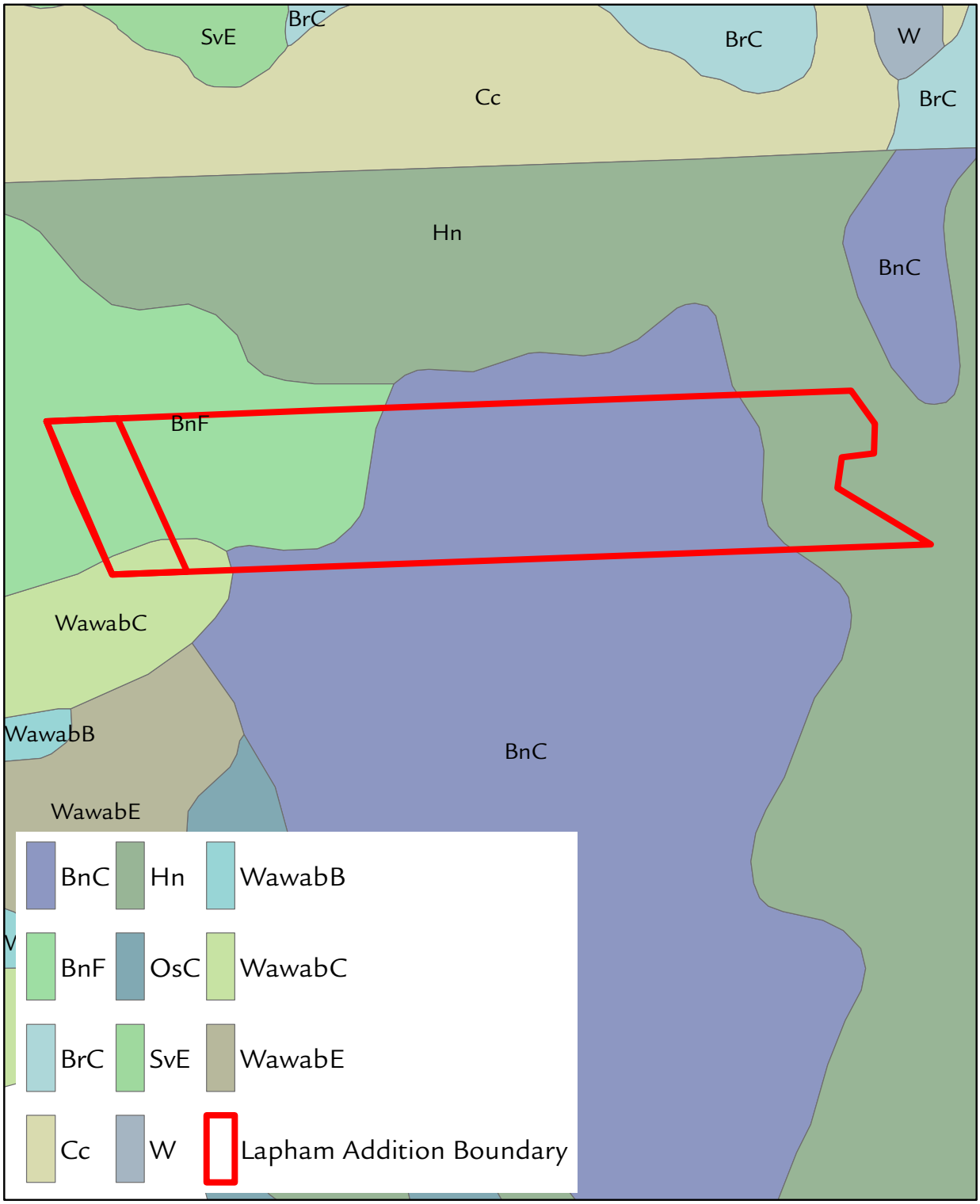
Lapham Addition

Figure 4. Trail Network

0 0.03 0.06 0.12 Miles

N
W E
S

LEGACY Land Conservancy



Lapham Addition
Figure 5. Soils

0 0.03 0.06 0.12 Miles

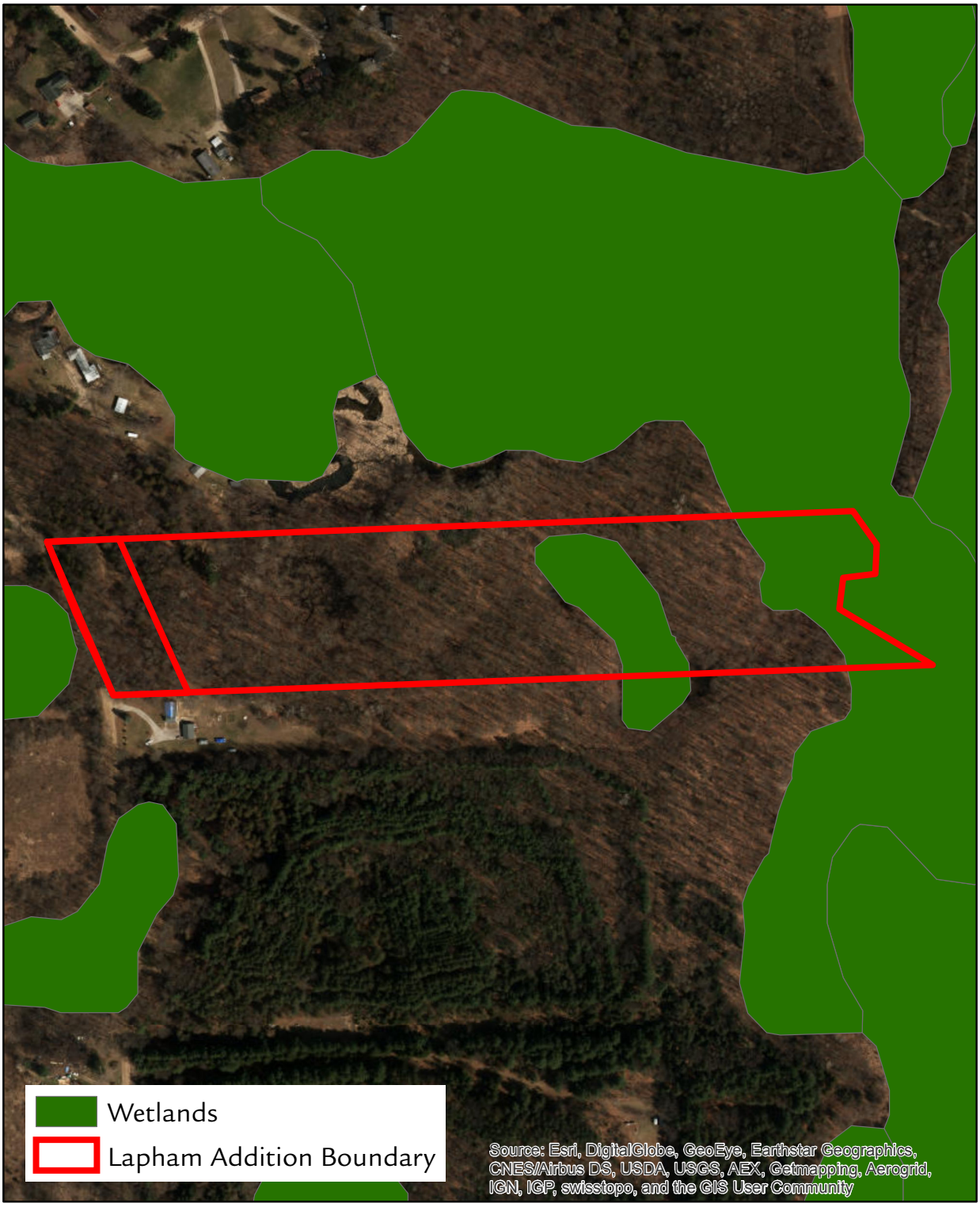
N
W E
S

LEGACY Land Conservancy

Lapham Addition

Figure 6. Topography

LEGACY Land Conservancy

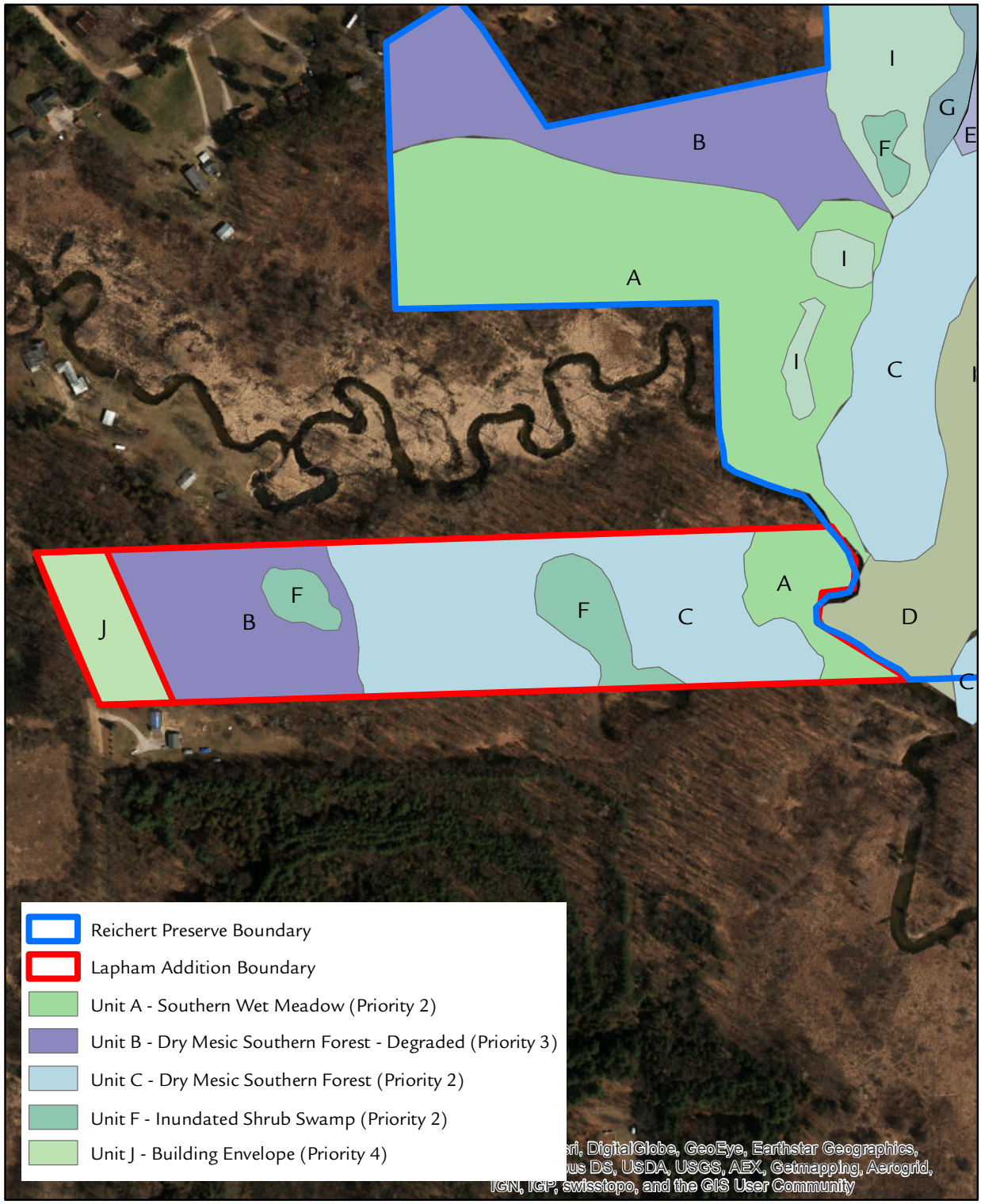


Lapham Addition
Figure 7. Wetlands

0 0.03 0.06 0.12 Miles

N
W E
S

LEGACY Land Conservancy



Lapham Addition

0 0.0425 0.085 0.17 Miles

Figure 8. Management Units

N
W E
S

LEGACY Land Conservancy

Appendix B

The Lapham Addition'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.

Photo by Adrienne L. Bozic

Landscape Context

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

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 brome (*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 (bluets, 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.* x*bella*, 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

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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

Kost, M.A., D.A. Albert, J.G. Cohen, B.S. Slaughter, R.K. Schillo, C.R. Weber, and K.A. Chapman. 2007. Natural Communities of Michigan: Classification and Description. Michigan Natural Features Inventory, Report No. 2007-21, Lansing, MI.

Page updated on 03-06-2008

All Communities

Michigan's Natural Communities

Southern Wet Meadow

State Rank: S3

Global Rank: G4?

Overview

Southern wet meadow is an open, groundwater-influenced (minerotrophic), sedge-dominated wetland that occurs in central and southern Lower Michigan. Open conditions are maintained by seasonal flooding, beaver-induced flooding, and fire. Sedges in the genus *Carex*, in particular tussock sedge (*Carex stricta*), dominate the community. Southern wet meadow, commonly referred to as sedge meadow, also occurs in Iowa, Illinois, Indiana, Minnesota, North Dakota, Wisconsin, and Ontario.

Photo by Joshua G. Cohen

Landscape Context

Southern wet meadow occurs on glacial lakebeds, lakeplains, and in depressions on glacial outwash and moraines. The community frequently occurs along the margins of lakes and streams, where seasonal flooding or beaver-induced flooding is common.

Soils

Southern wet meadow typically occurs on neutral to strongly alkaline organic soils (i.e., sapric to hemic peat), but saturated mineral soil may also support the community. Because of the calcareous nature of the glacial drift in the regions where southern wet meadow occurs, its soils typically contain high levels of calcium and magnesium.

Natural Processes

Water levels in southern wet meadow may fluctuate seasonally, reaching their peak in spring and lows in late summer, but typically remain at or near the soil's surface throughout the year. The structure of southern wet meadow is largely influenced by tussock sedge, which forms large tussocks up to 0.5 m high on which many additional species successfully establish above the zone of seasonal inundation. Community structure may depend on a consistently high water table as the tussocks of *Carex stricta* rapidly decompose when water levels are reduced by tiling. In addition to seasonal flooding, beaver-induced flooding also maintains open conditions by killing encroaching trees and shrubs.

Southern wet meadow is a fire-dependent natural community. By reducing leaf litter and allowing light to reach the soil surface and stimulate seed germination, fire can play an important role in maintaining southern wet meadow seed banks. Fire plays a critical role in maintaining species richness by creating open

microsites for small species. Another critically important attribute of fire is its ability to temporarily reduce shrub and tree cover.

In the absence of fire or beaver-induced flooding, all but the wettest sedge meadows typically convert to shrub-carr and eventually swamp forest. Prolonged flooding may also create new southern wet meadows by killing trees and shrubs of swamp forests and shrub-carrs, thus allowing shade-intolerant wet meadow species such as tussock sedge to become established.

Vegetation

Southern wet meadow is typically dominated by tussock sedge. Because its roots form large hummocks or tussocks, the species is responsible for the community's hummock and hollow structure. As the shaded areas between tussocks are often covered with standing water and leaf litter, many of the shorter species inhabiting sedge meadows grow almost exclusively from the sides or tops of *Carex stricta* tussocks. Additional common sedges include *Carex aquatilis*, *C. comosa*, *C. bebbii*, *C. hystericina*, *C. lacustris*, *C. pellita*, *C. lasiocarpa*, *C. prairea*, *C. rostrata*, *C. sartwellii*, *C. stipata*, and *C. vulpinoidea*. The most dominant grass species in southern wet meadow is bluejoint grass (*Calamagrostis canadensis*), sometimes occurring as a codominant with tussock sedge. Other common grasses include fringed brome (*Bromus ciliatus*), fowl manna grass (*Glyceria striata*), marsh wild timothy (*Muhlenbergia glomerata*), leafy satin grass (*M. mexicana*), and fowl meadow grass (*Poa palustris*). A wide variety of wetland forbs and several ferns occur in southern wet meadow, including swamp milkweed (*Asclepias incarnata*), swamp aster (*Aster puniceus*), smooth swamp aster (*A. firmus*), marsh bellflower (*Campanula aparinoides*), water hemlock (*Cicuta bulbifera*), swamp thistle (*Cirsium muticum*), joe-pye-weed (*Eupatorium maculatum*), common boneset (*Eupatorium perfoliatum*), rough bedstraw (*Galium asprellum*), marsh pea (*Lathyrus palustris*), northern bugle weed (*Lycopus uniflorus*), tufted loosestrife (*Lysimachia thyrsiflora*), clearweed (*Pilea pumila*), water smartweed (*Polygonum amphibium*), Virginia mountain mint (*Pycnanthemum virginianum*), great water dock (*Rumex orbiculatus*), common arrowhead (*Sagittaria latifolia*), common skullcap (*Scutellaria galericulata*), Canada goldenrod (*Solidago canadensis*), late goldenrod (*S. gigantea*), swamp goldenrod (*S. patula*), purple meadow rue (*Thalictrum dasycarpum*), marsh St. John's-wort (*Triadenum fraseri*), marsh fern (*Thelypteris palustris*), and sensitive fern (*Onoclea sensibilis*).

Noteworthy Animals

Muskrat (*Ondatra zibethicus*) commonly build lodges in southern wet meadows, which when abandoned are used by Canada geese (*Branta canadensis*) as nesting sites. Sandhill cranes (*Grus canadensis*) and marsh wrens (*Cistothorus palustris*, state special concern) also use the community for nesting habitat. Beaver help maintain open conditions through dam building and subsequent flooding and also through herbivory of shrubs and trees.

Rare Plants

Gentianella quinquefolia (stiff gentian, state threatened)
Mimulus alatus (wing-stemmed monkey flower, presumed extirpated from Michigan)
Pycnanthemum muticum (broad-leaved mountain mint, state threatened)

Rare Animals

Acris crepitans blanchardi (Blanchard's cricket frog, state special concern)
Ambystoma texanum (smallmouth salamander, state endangered)
Asio flammeus (short-eared owl, state endangered)

Botaurus lentiginosus (American bittern, state special concern)
Calephelis mutica (swamp metalmark, state special concern)
Circus cyaneus (northern harrier, state threatened)
Cistothorus palustris (marsh wren, state special concern)
Clonophis kirtlandii (Kirtland's snake, state endangered)
Emydoidea blandingii (Blanding's turtle, state special concern)
Euphyes dukesi (Dukes' skipper, state threatened)
Meropleon ambifusca (Newman's brocade, state special concern)
Neoconocephalus lyrists (bog conehead, state special concern)
Neoconocephalus retusus (conehead grasshopper, state special concern)
Neonympha m. mitchellii (Mitchell's satyr, federal/state threatened)
Nerodia erythrogaster neglecta (copperbelly watersnake, federal threatened and state endangered)
Oarisma poweshiek (Poweshiek skipperling, state threatened)
Orchelimum concinnum (red-faced meadow katydid, state special concern)
Orchelimum delicatum (delicate meadow katydid, state special concern)
Papaipema cerina (golden borer, state special concern)
Papaipema maritima (maritime sunflower borer, state special concern)
Papaipema speciosissima (regal fern borer, state special concern)
Paroxya hoosieri (Hoosier locust, state special concern)
Phalaropus tricolor (Wilson's phalarope, state special concern)
Rallus elegans (king rail, state endangered)
Sistrurus c. catenatus (eastern massasauga, federal candidate species and state special concern)
Spartiniphaga inops (spartina moth, state special concern)
Speyeria idalia (regal fritillary, state endangered)

Biodiversity Management Considerations

Because restoration of degraded southern wet meadows can be difficult in the absence of favorable hydrology, intact organic soils, and a viable seed source for *Carex stricta*, conservation efforts should focus on protecting and managing existing southern wet meadows. Maintaining the natural hydrology of southern wet meadow is imperative for the community's continued existence. This may include avoiding surface water inputs to the meadow from drainage ditches and agricultural fields, and protecting groundwater recharge areas by maintaining native vegetation types in the uplands around the community. Management for southern wet meadows should include the use of prescribed fire to help reduce litter, stimulate seed germination, promote seedling establishment and plant growth, limit shrub and tree encroachment, and control invasive species. Ideally, prescribed fire management of southern wet meadows would be orchestrated with that of surrounding fire-dependent wetland and upland communities. If prescribed burning is not feasible, mowing can be used to reduce woody plant cover but should be restricted to the winter, when ground frost will reduce disturbance to soils, herbaceous plants, and hydrology, or late summer and fall when meadows are dry. Because most wetland shrubs are capable of resprouting when cut (or burned), the application of herbicides to recently cut stumps may be required to maintain open conditions.

Monitoring and control efforts to detect and remove invasive species are critical to the long-term viability of southern wet meadow. Invasive species that threaten the diversity and community structure include purple loosestrife (*Lythrum salicaria*), reed canary grass (*Phalaris arundinacea*), reed (*Phragmites australis*), narrow-leaved cat-tail (*Typha angustifolia*), hybrid cat-tail (*Typha* x*glauca*), glossy buckthorn (*Rhamnus frangula*), and multiflora rose (*Rosa multiflora*).

Variation

Community structure and plant diversity can vary significantly among southern wet meadows depending on

the dominant species of sedge. Wet meadows dominated by tussock sedge have complex microtopography, which fosters high levels of forb diversity. Wet meadows dominated by lake sedge typically have little microtopographic complexity and low forb diversity.

Similar Natural Communities

Emergent marsh, northern wet meadow, poor fen, prairie fen, wet prairie, lakeplain wet prairie, Great Lakes marsh, and southern shrub-carr.

Relevant Literature

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Peach, M., and J.B. Zedler. 2006. How tussocks structure sedge meadow vegetation. Wetlands 26(2): 322-335.
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For a full list of references used to create this description, please refer to the natural community abstract for southern wet meadow.

More Information

Southern wet meadow natural community abstract

Page Citation

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All Communities

Michigan's Natural Communities

Inundated Shrub Swamp

State Rank: S3

Global Rank: G4

Overview

Photo by Michael A. Kost

Inundated shrub swamp is a shrub-dominated community characterized by poor drainage, nearly continuous inundation or saturation, and dominance by buttonbush (*Cephalanthus occidentalis*). The community typically exhibits a scattered shrub-dominated overstory and sparse herbaceous cover.

Landscape Context

This community occupies kettleholes in ice-contact topography and moats around bogs, and is occasionally found in wetland depressions on outwash and sandy lakeplains. Inundated shrub swamp typically occurs in isolated depressions (i.e., ice-block depressions) surrounded by forested uplands of mesic southern forest, dry-mesic southern forest, or dry southern forest.

Soils

Soils are typically shallow muck over gleyed clay, silty clay, or sandy clay. Soil pH ranges from strongly acid to moderately alkaline, with organic portions of the soil profile being more acidic than mineral portions. Although soil typically remains inundated throughout the year due to the underlying impermeable clay, the upper soil layers may become dry in mid to late summer and during periods of persistent drought.

Natural Processes

Inundated shrub swamp is successionally intermediate between open emergent marsh and swamp forest. The community becomes established as shrubs tolerant of prolonged, inundated conditions invade open wetlands. Frequent disturbances such as seasonal hydrologic cycling and prolonged flooding allow inundated shrub swamp to persist rather than succeed to swamp forest. Water often pools for prolonged periods of time due to the impermeable clay layer in the soil profile, which limits tree establishment and growth. Additionally, beaver herbivory can limit tree longevity and help maintain inundated shrub swamp. While major flood events and beaver flooding kill invading trees, contributing to the persistence of inundated shrub swamp, extended periods of drought or hydrologic changes that lower the water table foster tree establishment and conversion to swamp forest.

Vegetation

Inundated shrub swamps are characterized by dominance of buttonbush, which typically represents more than 50% of the shrub cover. Buttonbush is well adapted to fluctuating water tables, constant inundation, and a broad range of pH levels, allowing it to outcompete many other tree and shrub species. Research suggests a minimum water depth of 0.5 m (20 in) is needed for successful maintenance of buttonbush populations, and the species is typically restricted to emergent or inundated zones. Although buttonbush responds favorably to increased light levels, high light levels are not critical for its establishment.

In addition to buttonbush, other common species in the shrub layer of inundated shrub swamps include willows (i.e., *Salix bebbiana* and *S. discolor*), red-osier dogwood (*Cornus stolonifera*), silky dogwood (*C. amomum*), winterberry (*Ilex verticillata*), black chokeberry (*Aronia prunifolia*), swamp dewberry (*Rubus hispidus*), and swamp rose (*Rosa palustris*). Shrub cover can range from 40 to 90%, with an average of 70%. Often a scattered tree canopy is also present and may include maples (i.e., *Acer rubrum*, *A. saccharinum*, and *A. saccharum*), yellow birch (*Betula alleghaniensis*), musclewood (*Carpinus caroliniana*), ashes (i.e., *Fraxinus nigra* and *F. pennsylvanica*), black walnut (*Juglans nigra*), oaks (i.e., *Quercus bicolor* and *Q. palustris*), black willow (*Salix nigra*), and American elm (*Ulmus americana*). In a survey of 13 inundated shrub swamps in southern Michigan, tree overstory cover ranged from 5 to 60%, with an average cover of 23%.

Although the amount of ground cover can vary greatly both within and among inundated shrub swamps, the herbaceous layer is typically fairly sparse due to frequent and prolonged flooding. The ground flora may contain species such as short-awned foxtail (*Alopecurus aquatilis*), swamp milkweed (*Asclepias incarnata*), common beggar ticks (*Bidens frondosus*), false nettle (*Boehmeria cylindrica*), sedges (*Carex stricta*, *C. intumescens*, *C. rostrata*, *C. radiata*, *C. lacustris*, and *C. crinita*), water hemlock (*Cicuta bulbifera*), goldthread (*Coptis trifolia*), spinulose wood fern (*Dryopteris carthusiana*), jewelweed (*Impatiens capensis*), southern blue flag (*Iris virginica*), rattlesnake grass (*Glyceria canadensis*), small duckweed (*Lemna minor*), common water horehound (*Lycopus americanus*), northern bugle weed (*L. uniflorus*), tufted loosestrife (*Lysimachia thyrsiflora*), Canada mayflower (*Maianthemum canadense*), sensitive fern (*Onoclea sensibilis*), cinnamon fern (*Osmunda cinnamomea*), Virginia chain-fern (*Woodwardia virginica*), reed canary grass (*Phalaris arundinacea*), clearweed (*Pilea pumila*), puccinellia (*Puccinellia pallida*), mad-dog skullcap (*Scutellaria lateriflora*), water parsnip (*Sium suave*), bur-reeds (*Sparganium* spp.), skunk cabbage (*Symplocarpus foetidus*), and starflower (*Trientalis borealis*).

Noteworthy Animals

The community provides critical breeding habitat to amphibians and aquatic invertebrates. Snakes utilize the community for foraging habitat. In particular, the northern water snake and copperbelly watersnake (*Nerodia erythrogaster neglecta*, federal threatened and state endangered) feed on frogs that utilize the inundated shrub swamp.

Rare Plants

Wolffia papulifera (water-meal, state threatened)

Rare Animals

Acris crepitans blanchardi (Blanchard's cricket frog, state special concern)
Ambystoma texanum (smallmouth salamander, state endangered)
Clemmys guttata (spotted turtle, state threatened)
Emydoidea blandingii (Blanding's turtle, state special concern)
Heteropacha rileyana (Riley's lappet moth, state special concern)
Heterocampa subrotata (small heterocampa, state special concern)

Nerodia erythrogaster neglecta (copperbelly water snake, federal threatened and state endangered)
Nycticorax nycticorax (black-crowned night-heron, state special concern)
Papaipema speciosissima (regal fern borer, state special concern)
Terrapene c. carolina (eastern box turtle, state special concern)
Williamsonia fletcheri (ebony boghaunter, state special concern)

Biodiversity Management Considerations

Anthropogenic hydrologic alterations caused by dams, road-building, draining and ditching, agriculture, logging, and urban development can stabilize or permanently change water tables, thereby threatening the ecological integrity of inundated shrub swamps. Additionally, incompatible land uses in the surrounding landscape can result in excess nutrients, sediments, and chemicals entering the community, where they can alter nutrient cycles and species composition. A well-established buffer of natural communities helps maintain natural hydrology and reduce nutrient-loading.

Invasive species documented from inundated shrub swamps in Michigan include glossy buckthorn (*Rhamnus frangula*), multiflora rose (*Rosa multiflora*), autumn olive (*Elaeagnus* umbellata), reed canary grass, garlic mustard (*Alliaria petiolata*), Canada thistle (*Cirsium arvense*), moneywort (*Lysimachia nummularia*), curly dock (*Rumex crispus*), horse nettle (*Solanum carolinense*), and bittersweet nightshade (*Solanum dulcamara*). Given the potential for invasive species to outcompete native vegetation and alter community structure, monitoring and control efforts to detect and remove invasive species are a crucial component of protecting high quality inundated shrub swamp communities.

Variation

Community size, basin morphology, presence and depth of water, and species composition can all vary significantly among inundated shrub swamps, even where they occur in close proximity to one another.

Similar Natural Communities

Emergent marsh, northern shrub thicket, and southern shrub-carr.

Relevant Literature

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For a full list of references used to create this description, please refer to the natural community abstract for inundated shrub swamp.

More Information

Inundated shrub swamp natural community abstract

Page Citation

Kost, M.A., D.A. Albert, J.G. Cohen, B.S. Slaughter, R.K. Schillo, C.R. Weber, and K.A. Chapman. 2007. Natural Communities of Michigan: Classification and Description. Michigan Natural Features Inventory, Report No. 2007-21, Lansing, MI.

Page updated on 03-06-2008

Appendix C

Legal Description

Lapham Addition to the Reichert Preserve

A part of the Northwest 1/4 of Fractional Section 2 and the Northeast 1/4 of Fractional Section 3, Town 1 South, Range 4 East, Dexter Township, Washtenaw County, Michigan described as: BEGINNING at the East 1/4 Corner of said Section 3; thence along the Centerline of Toma Road North 22°39'42" West (recorded as North 20°35' West) 400.30 feet; thence North 87°59'18" East (recorded as South 89°56' East) 140.69 feet to a point on the East line of said Section 3 and the West line of said Section 2, said point being located North 02°05'07" West from the POINT OF BEGINNING; thence continuing North 87°59'18" East (recorded as South 89°56' East) 1792.18 feet to the center of the Portage River; thence along said river in the following five (5) courses: South 33°49'29" East 100.47 feet, South 04°31'14" West 71.60 feet, South 82°52'31" West 76.71 feet, South 07°07'53" West 76.68 feet, and South 58°39'34" East 286.86 feet to the East-West 1/4 line of said Section 2; thence South 88°37'40" West 1987.67 feet to the POINT OF BEGINNING, containing 16.763 acres of land, more or less.

Appendix D

Prohibited Actions and File Locations

Prohibited Actions

Any activity on, or use of, the Property that is inconsistent with the Purposes or that is detrimental to the Conservation Values is expressly prohibited. By way of example, but not by way of limitation, the following activities and uses are explicitly prohibited:

A. Subdivision. The legal or defacto subdivision of the Property, including any subdivision, short subdi vision, platting, binding site plan, testamentary division, creation of a site condominium or other submission of the Property to a condominium form of ownership, or other process by which the Property is divided into lots or in which title to different portions of Property are held by different owners is prohibited.

B. Commercial Activities. Any commercial activity on the Property is prohibited, except for de minimus commercial recreational activity as such term is referenced in Internal Revenue Code Section 2031(c)(8)(B). Such activity shall be i) consistent with the purposes of this Conservation Easement, ii) shall not involve the construction of any improvement on the Property, whether at or above the surface of the property, iii) shall not adversely impact the soils and/or agricultural operations of the Property, iv) shall not impair any of the Conservation Values, all as determined solely by the Grantee, and v) shall be passive in nature.

C. Industrial Activities. Any industrial activity on the Property is prohibited.

D. Construction. The placement or construction of any human-made modifications, including structures, buildings, fences, roads, and parking lots is prohibited, except as indicated in Section 5.B and 5.C.

E. Cutting Vegetation. Except as described in a Management Plan as described in Section 9, any alteration of trees or vegetation, including pruning or trimming, is prohibited, except for the cutting or removal of trees or vegetation that are (i) a threat to human life or property, or (ii) generally accepted as diseased or (iii) an invasive species as designated by the Michigan Department of Natural Resources, or other similar conservation body.

F. Alteration of Land. Except as described in the Management Plan, or as part of a recognized treatment for the removal and control of invasive species or plant diseases, the alteration of the surface of the land, including the excavation or removal of soil, sand, gravel, rock, peat, or sod is prohibited. Recognized treatments not requiring County approval shall be conducted pursuant to guidelines promulgated by the Michigan Department of Natural Resources or similar conservation body.

G. Mining. There shall be no exploration for or extraction of minerals from the surface of the property.

H Oil and Gas Extraction. Oil and gas extraction is prohibited, except that the Owner retains the right to enter into a non-developmental lease for the commercial extraction of oil, gas, hydrocarbons and petroleum, if said lease is part of a pool which solely permits the extraction of oil, gas, hydrocarbons, or petroleum. Extraction shall not involve any surface alteration of the Property or construction or placement of any structures, including pipelines, on, over, across, or under the Property. Prior to entering into such lease, Owner shall provide County with a copy of the proposed lease via registered mail. Financial details shall be redacted.

I. Dumping. Except as allowed in Section 5.B, processing, storage, dumping, or disposal of liquid, solid, natural or man-made waste, refuse, or debris on the Property is prohibited.

J. Water Courses, Ground Water. Natural water courses, lakes, wetlands, or other bodies of water may not be altered and water from ground or surface sources may not be diverted. Water courses may be restored to their natural state in accordance with the Management Plan.

K. Off-Road Recreational Vehicles. Motorized off-road vehicles such as, but not limited to, snowmobiles, dune buggies, all-terrain vehicles, and motorcycles may not be operated on the Property, as described in the Baseline Document, except as required for maintenance of roads, trails and bridges.

L. Signs and Billboards. Billboards and signs are prohibited other than signs that are in compliance with applicable zoning and other laws, and that are displayed to state:

1) The name and address of the Protected Property or the Owner's name, including those identifying the Rudolph Reichert Nature Preserve

2) Signage designed to provide interpretive and directional information on the Property.

3) That the area is protected by a Conservation Easement;

4) Prohibit any unauthorized entry or use;

M. Utilities. Installation of new utilities is prohibited, except that the Owner may install utilities (i) as permitted by, but strictly in accordance with, Section 5.B or 5.C, or (ii) necessary for other permitted uses of the Protected Property, as long as such installation is not inconsistent with the purposes of this Conservation Easement and is done only after written notice to County thirty (30) days in advance of any recording of a utility agreement. Installation of permitted utilities shall be completed in such a manner as to minimize to the greatest extent possible impact on prime, unique and important soils. Under no circumstances may the topography be altered permanently. All earth movement must occur within a specified time frame, as determined by the County, and the topography must be returned to pre-existing conditions in accordance with the baseline documentation. Future easements shall be expressly subordinate to this Conservation Easement. Prior to granting such an easement, Owner shall notify and obtain approval from the County of proposed easements via registered mail.

N. Density. No portion of the Protected Property may be used to satisfy land area requirements for other property not subject to this Agreement for purposes of calculating building density, lot coverage or open space under otherwise applicable laws, regulations or ordinances controlling land use. No development rights that have been encumbered or extinguished by this Easement may be transferred to any other property.

O. Roads and Trails. Existing roads may be maintained or improved but may not be widened or relocated without the prior written approval of the County. A driveway, constructed to the minimum standards required by Dexter Township, may be built to access the parking area as described in Section 5.B and the Baseline Documentation. Unpaved paths or foot trails may be established on the Protected Property for non-motorized recreational uses. Such trails shall not exceed 10 feet in width.

Name and Location of Key Documents

Warranty deed, environmental assessment, title insurance, aerial photos, and a copy of the easement encumbering the property are on hand at Legacy's office in the Reichert Preserve hard folder and on the server in the folder: \\Npserv-llc\sharedfiles\Land\Properties\PRESERVES\Reichert Nature Preserve\Reichert Lapham Family Addition 129