Management Plan

Creekshead Preserve

June 2010

LEGACY LAND CONSERVANCY

LEGACY Land Conservancy

Protecting and Preserving Southern Michigan

Management Plan for Creekshead Preserve

Salem Township, Washtenaw County, Michigan

Prepared by Elizabeth Durfee

June 2010

This document expands on the research and recommendations provided in the management plan prepared by Catherine Maquart in June 2007. The plan contains a description of the Preserve, management objectives, and management actions. Management actions are broken down into short term (0-3 years), mid term (3-8 years), and long term goals (8 years or more), as well as immediate and annual needs. Where possible, the personnel, time, and cost needed to implement specific management actions are estimated and additional resources and references are suggested.

Thank you to Dana Wright and the Legacy Land Conservancy Staff as well as stewards Matt Demmon and David Read for their assistance with the preparation of this document.

Table of Contents

INTRODUCTION

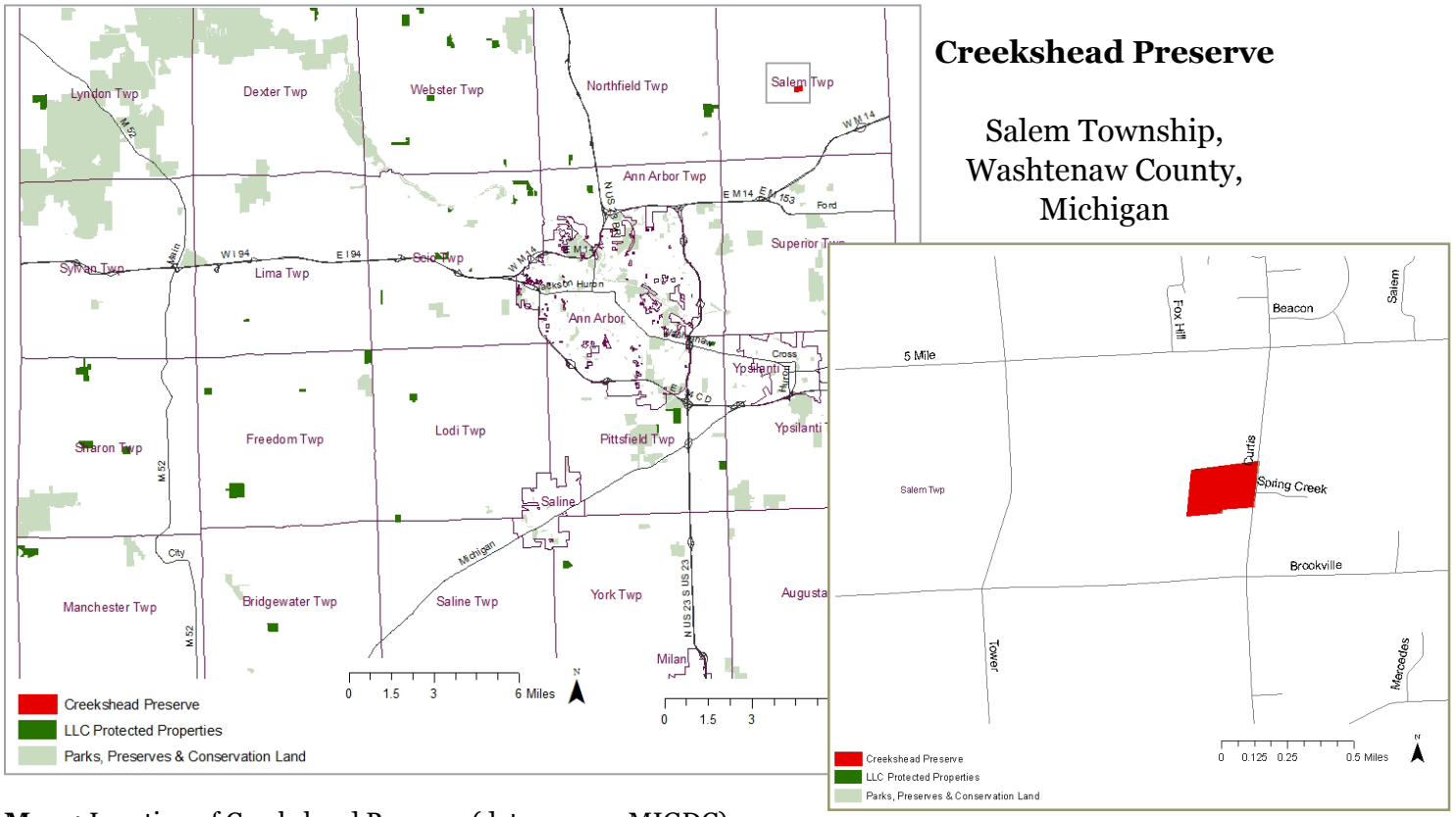
Legacy Land Conservancy Preserves

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

General Property Description

Creekshead Preserve is located off Curtis Road, between Brookville Road (approximately 0.27 miles north of Brookville Road) and 5 Mile Road and across from Spring Creek Lane, in Salem Township in Washtenaw County, Michigan. The Preserve is 27.12 acres, rectangular in shape, and has approximately 905 feet of frontage along Curtis road (Map 1). Access to the Preserve consists of a trail off Curtis Road (see Appendix A).

The Preserve is a high quality beech-maple-basswood forest that is ecologically diverse. The Preserve is characterized by spring wildflowers, vernal pools and hardwood swamp, and very few invasive species. Property boundaries are marked by signs. Creekshead Preserve is the only publicly-accessible natural area in Salem Township.



Map 1 Location of Creekshead Preserve (data source: MIGDC)

Land Use History

Pre-settlement vegetation consisted of beech-sugar maple forest (Map 2). Historically, most of the township was cultivated or used as pasture for livestock.

Acquisition

The property was donated by Michael H. and Meroe Allen Kaericher on December 28, 1995.

Surrounding Uses

Surrounding land uses include rural residential, forest, and agricultural land. Adjoining uses include: a greenhouse and nursery to the north; fields and farmland to the south and west; and Curtis road then patchy forest and rural residential to the east (Map 2).

Connectivity

Creekshead Preserve is located within the Ann Arbor Greenbelt. The beech-maple forest continues to the northwest of the Preserve. A forested corridor extends west of the Preserve and patches of forest are present throughout Salem Township.

Creekshead Preserve

Salem Township,
Washtenaw County,
Michigan

SURROUNDING
LAND USE

Map 2 Aerial Image of Creekshead Preserve and surrounding land use (data source: MI DTMB)

Classification and Purpose

Creekshead Preserve use is limited to quiet, passive, pedestrian recreation. Access is limited and the trail head can be accessed from Curtis Road. Trails are rudimentary. Increasing visibility of the Preserve's sign and making trail improvements, such as a constructing a boardwalk, may increase use of the Preserve.

The purpose of this management plan is to provide a framework to guide management of Creekshead Preserve. The plan provides current and future land managers, stewards, and the community at large with information about the Preserve to aid in ensuring long term protection. It serves to communicate management objectives and prioritize actions to maximize the Preserve's ecological integrity as well its value to the community.

The primary management objectives for Creekshead Preserve include protecting the ecological integrity of the Preserve and maintaining the property as an invasive-free site.

Preserve: Creekshead
Location: Salem Township, Washtenaw County

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

SITE DESCRIPTION

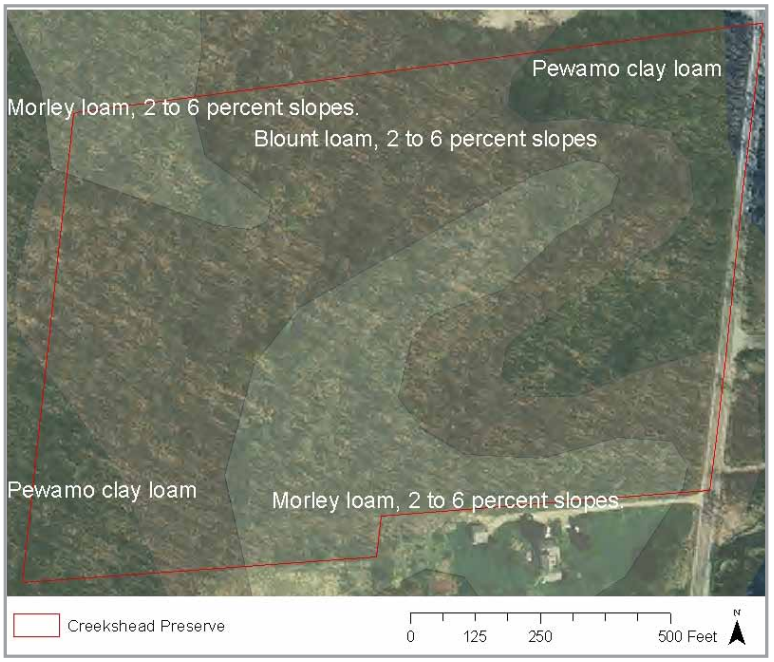
Soils

The site is composed of 3 soil types (Map 3):

BbB: Blount Loam, 2 to 6 percent slopes: Poorly drained soils with moderately high water capacity. Soils are nearly level and formed in loamy textured glacial till.

MoB Morley Loam, 2 to 6 percent slopes: Well drained soils located on knoll on moraines and till plains. Soils have moderate water capacity.

Pe Pewamo Clay Loam, 0-2 percent slopes: Poorly drained and located on depressions on moraines, till plains, and lake plains. Soils have high water capacity.



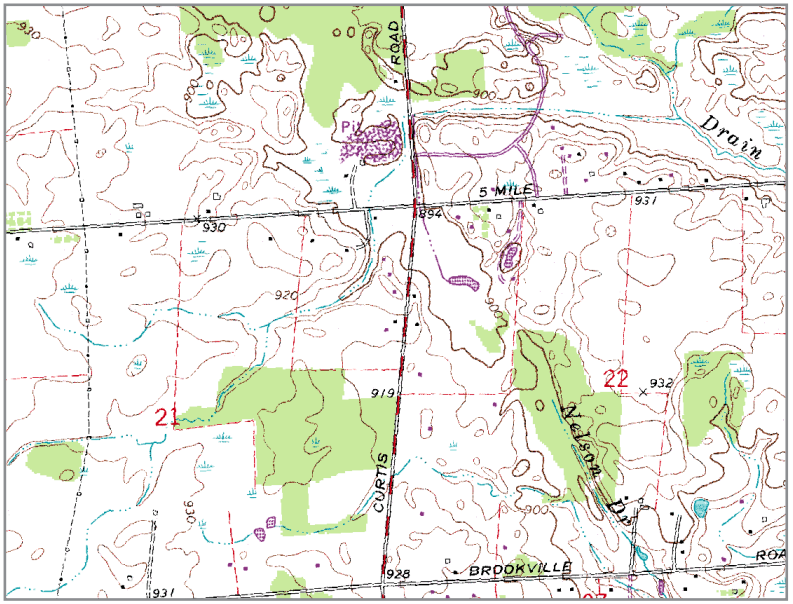
Map 3 Creekshead Preserve Soil Types (data sources: USGS, MI DTMB)

Topography

Topography is generally flat with pits and mounds. Small gullies surround the creek and portions of the Preserve adjacent to Curtis Road. Elevation ranges from 920 to 930 meters above sea level (Maps 4).

Hydrology

A small creek runs roughly west to east across the northern portion of the Preserve. Low lying areas of the Preserve have vernal pools.



Map 4 Salem Township topographical map clip

Ecology

Ecosystem Types

Creekshead Preserve is a high quality southern mesic forest characterized by mature beech-maple-basswood forest, wooded wetland, and seasonal water courses. Once abundant in southeastern Michigan, much of this forest community, which occurs on nutrient rich, well-drained soils, has since been cleared for agriculture, as well as development and logging. Fragmented patches that remain are often 40 acres or less. Mesic forests are typically characterized by frequent small-scale wind or ice disturbance and as a result approximately 1% of the total area of this forest type consists of gaps less than one year old.

The southern mesic forest typically hosts a diverse plant community. In addition to the dominant species, beech and sugar maple, a number of mature associate species including bitternut hickory (*Carya cordiformis*), tulip tree (*Liriodendron tulipifera*), red oak (*Quercus rubra*) and basswood (*Tilia americana*) require the rich, well drained soils of mesic forests. Species more typical for a hardwood swamp community, such as silver maple (*Acer saccharinum*) and red ash (*Fraxinus pennsylvanica*) are found in depressions and adjacent to the small, seasonal creek that flows through the property. The mature ash have been killed by the emerald ash borer. The Preserve is also home to a variety of herbaceous species (Figure 2). A hard copy list of species identified in the Preserve is available on file at Legacy.

Figure 2 Image of sedges, forbs, and hardwoods in Creekshead Preserve

Notable Species

The Preserve supports a number of native herbaceous species such as wild geranium (*Geranium maculatum*), jack in the pulpit (*Arisaema triphllum*) (Figure 3), moonseed (*Menisperm aceae canadense*), zig zag goldenrod (*Solidago flexicaulis*), rattlesnake root (*Prenanthes serpentaria*), and spring beauty (*Claytonia virginica*). Woody species including white walnut (*Juglans cinerea*), black maple (*Acer nigrum*) were also observed in 2002.

Figure 3 Patches of jack-in-the-pulpit along the trail

Invasive Species

Very few invasive species are present in the Preserve. Patches of older buckthorn and saplings are present along the southern boundary of the Preserve. This area also contains a number of multiflora rose (*Rosa multiflora*). Garlic mustard (*Alliaria petiolata*) is not a significant problem within the Preserve; however, several young plants were observed along Curtis Road (in 2007) and one individual was pulled from approximately 20 feet into the Preserve near the trailhead in June 2010. Poison ivy is present near the trailhead and in patches along the southern boundary of the Preserve (Figure 4).

Figure 4 Poison ivy at Creekshead Preserve trail head

MANAGEMENT OBJECTIVES

Overview of Goals

The primary objective for Creekshead Preserve is to continually monitor for the presence of invasive species and to eradicate them before they spread. Increasing the accessibility of the Preserve by improving the trail is also important. The high ecological quality of this preserve makes it amenable for educational purposes.

Donor Intent

The property was donated to ensure the land would remain in its natural state. The Preserve is to be used and perpetually maintained as a nature preserve. Anthropogenic activity is limited to passive, quiet, non-vehicular uses. Development is limited to an unpaved pedestrian trail system and a small parking area.

Management Obligations

Legacy Land Conservancy is required to monitor the Preserve annually. Photo monitoring points have been created for this purpose. Per the request of the donor, and to accommodate quiet recreational use, trail maintenance and improvements, such as wood chips, boardwalks, dead limb and tree removal, and a parking area are also required.

Management Status

The property has few invasive species but should be monitored to retain the quality and diversity of native species.

A loop trail was completed in the fall of 2001 by volunteers from Domino's as part of United Way Day of Caring, and trail markers have been placed on trees.
Improvements, including a corduroy boardwalk, have been made since then.

Improvements

Additional improvements such as the installation of a boardwalk, and placement of interpretive and way finding signs, are recommended. Regular trail maintenance is required, particularly after storm events (Figure 5).

Creating trails in Creekshead Preserve is an important component of restoration. Trails create recreational, educational and physical fitness opportunities for residents while also keeping people in specific areas and reducing distrubance in sensitive areas.

Currently, the existing trail is marked by logs and tree limbs and is partially indistinguishable. In addition, low lying areas of the trail experience flooding. A boardwalk would increase year-round accessibility and use. Native herbaceous species that lie on the trail should be transplanted.

Figure 5 Image of downed trees and limbs after a storm event in Creekshead Preserve.

Invasive Species Control

Invasive species are minimal and the Preserve should be monitored regularly for species introduction. Garlic mustard (*Alliaria petiolata*) has not been found within the Preserve; however, several young plants were observed along Curtis Road. Tractors mowing along roadsides, animals, and human shoes or clothing often cary and spread seeds of invasive species. Deer paths and foot trails should be monitored carefully. Other herbaceous species that were not observed but could become established include dame's rocket (*Hesperis matronalis*) and narrowleaf bittercress (*Cardamine impatiens*).

Woody invasive species including buckthorn (*Rhamnus cathartica and Rhamnus frangula*) and Multiflora rose (*Rosa multiflora*) have been identified in the Preserve. Other woody species that are likely to invade the Preserve include honeysuckle (*Lonicera spp.*) and autumn olive (*Elaeagnus umbellata*).

Restoration

At this time, maintaining the Preserve's high quality ecosystem requires minimal but regular maintenance. The Preserve's forest has generally reached a climax beech-maple community and few invasive species are present.

Ecological restoration management strategies may include:

- Burning to benefit the Preserve's wildflowers.
- Allowing natural disturbances that create gaps to promote old growth uneven-aged stands.
- Limiting anthropogenic disturbance by encouraging visitors to stay on trails and avoiding sensitive areas to enhance the ecological value of the Preserve.
- Monitoring beech trees for Beech Bark Disease.

IMPLEMENTATION

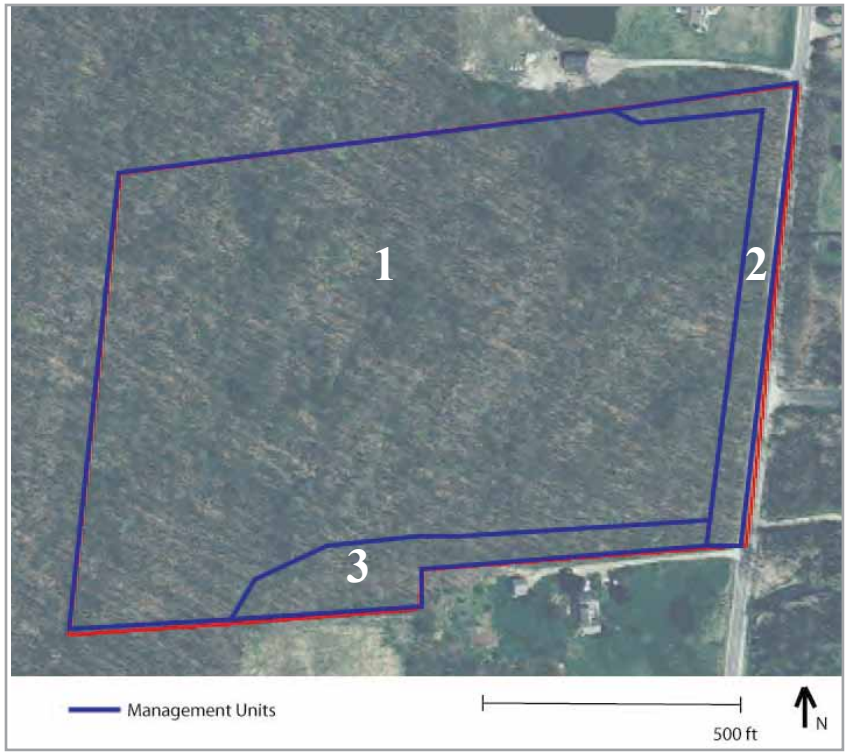
Management Units

To facilitate management, Creekshead Preserve is divided into three management units that reflect invasive species removal and monitoring needs (Map 4).

Unit 1: Western and northern borders and center of the Preserve.

Unit 2: Eastern border of the Preserve

Unit 3: Southern border of the Preserve



Map 4 Creekshead Preserve management units
(data source: MI DTMB)

Management Actions

1. **Conduct a biological survey of plants and animals**. In order to identify all species present within an area, a survey should be conducted at least 3 times during spring, summer, and fall. The time required to conduct a survey varies depending on plant community, travel time, size, accessibility of site, and surveyor. An inventory of 10 acres would average about 2 hours, times 3 visits would amount to approximately 30-40 minutes/ acre. It would take an estimated 15 hours, or less, over 3 visits, plus approximately 4 hours in the office to conduct a plant survey at the 27 acre Creekshead Preserve. The cost to contract a professional is also variable and may range from $60-100/hour. In total, an investment of just under 20 hours and $1000-2000 and may be required for a professional plant inventory.

Time Frame:	**Immediate**
Personnel Needed:	**Contract Professional**
Estimated Cost:	**$1000 - $2000**
Approximate Time:	**20 Hours**
Resources:	**Greg Vaclavek,** **Native Plant Nursery LCC** **734-677-5860** **plants@nativeplant.com;** **David Mindell** **PlantWise** **734-665-7168** **Plantwise@aol.com**

2. **Identify a preserve adopter** and establish a regular steward group to assist Legacy with managing volunteer work days and monitoring of the preserve.

Time Frame:	**Immediate**
Personnel Needed:	**Staff**

3. Install new Preserve sign. Current sign reads Washtenaw Land Trust. Installing the sign closer to the road will increase visibility.

Time Frame:	**Immediately**
Personnel Needed:	**Staff**
Estimated Cost:	**$175**
Approximate Time:	**1-2 hours to install, plus time for designing**

4. Remove invasive species. The preserve is relatively free of invasive species; removing the few invasive species found in the preserve now is the best method to control the spread of these species.

Time Frame:	**Immediate**
Personnel Needed:	**2-4 Volunteers**
Approximate Time:	**12-18 Hours total**
Tools:	**Handsaws, loppers, chainsaw, herbicide**

Immediate invasive species removal needs (Map 5):	Estimated workday:
a) Remove multi-flora rose from Unit 3, along the southern, central boundary of the preserve.	4-6 hours with 2-4 volunteers with handsaws and herbicide
b) Remove buckthorn from Unit 3, along the southern, central boundary of the preserve.	6-8 hours for 2-4 volunteers with handsaws and herbicide. A chain saw is necessary for removing larger individuals.
c) Remove buckthorn from Unit 2, the eastern, central boundary of the preserve.	1-2 hours, with 2 volunteers with handsaws, herbicide, and a chainsaw.
d) Remove poison ivy from the trail head in Unit 2, the eastern boundary of the preserve.	1-2 hours, 2 volunteers or staff, herbicide application or black plastic.

Map 5 Approximate Location of existing invasive species (data source: MI DTMB)

5. **Conduct regular site walks to check for invasive species** including garlic mustard, dames rocket, buckthorn, and multiflora rose. Remove invasive species as necessary. Staff or volunteers should conduct an annual site walk focusing on the eastern border along Curtis Road in Unit 2, the southern border where buckthorn and multiflora rose are present in Unit 3, and the north border of the preserve in Units 1 & 2. Currently (May 2010) invasive species are not present near the northern boundary of the preserve; however, due to the adjacent, disturbed land uses and potential for birds to spread seeds near the edge, this area is more susceptible to invasive species than the interior.

a) Buckthorn and other woody invasives should be cut and herbicide should be applied to stumps. Handsaws and loppers are sufficient for the smaller trees; a chainsaw may be necessary for larger trees. This work can take place from August through February.

b) Garlic mustard is most visible in May when it is in flower. The seeds generally mature and release in June, but the plant is harder to see once it is no longer in flower. Any plants should be pulled, bagged and removed from the preserve so that the seeds do not have a chance to germinate.

c) A foliar application of herbicide may be most effective for controlling multiflora rose. Glyphosate is most effective as a foliar treatment during the plant's growing season from April to September. Repeated treatment may be necessary.

d) Other potential invasives include dame's rocket and narrow-leaf bittercress. These species should also be pulled, bagged, and removed from the preserve if they are found. Both flower and go to seed in April, May and June.

Time Frame:	**Within 0-2 years, annually**
Personnel Needed:	**Staff or Volunteers**
Approximate Time:	**1-2 Hours for site walk**

6. Conduct annual photo monitoring.

Time Frame:	**Annual**
Personnel Needed:	**Staff or volunteer**
Approximate Time:	**1-2 Hours**

7. Collect GPS points to map out:

a) Plant communities (2-4 hours)
b) Rare species (1-2 hours)
c) Trail system (1-2 hours)
d) Management zones (1-2 hours)

Time Frame:	**Within 0-2 years**
Personnel Needed:	**Staff or volunteer**
Estimated Cost:	**$50-$200 for GPS equipment**
Approximate Time:	**5-10 Hours total**
Tools:	**GPS unit**
Resources:	**http://www.thegpsstore.com/Garmin-BirdsEye-Satellite-Imagery-Card-P2330.aspx, http://www.thegpsstore.com/Handheld-GPS-C2.aspx**

8. Maintain and improve existing trail.

Top priority is to clear the trail of debris, then to improve upon the current demarcation of the trail by lining the trail with branches and small logs, as well as by installing more trail markers on trees.

Immediate Trail Needs:

a) Currently (June 2010), substantial clearing of felled trees, limbs and logs is necessary. Significant portions of the trail are muddy and/or inundated. At least one full workday with 3-5 people may be necessary to clear woody debris obstructing the trail. Additional trail markers are needed.

Time Frame:	**Immediately**
Personnel Needed:	**3-5 Volunteers**
Estimated Cost:	**$2500 ($10/sq yd, 3"x 3' layer along the entire trail, approximately 250 sq yds)**
Approximate Time:	**8 Hours**
Tools:	**Handsaws, loppers, chainsaw,**
Resources:	**City of Ann Arbor**

b) Regular, annual debris removal could likely be completed with 1 or 2 full volunteer workdays, with a crew of 5-8 people and a chainsaw. Annual maintenance needs include pruning, trail liners, and checking signs for repair needs. Trails should also be checked for downed trees and limbs following storm events. Defining the trail with substantial liners would require 1-2 workdays with at least 5 volunteers to complete the entire trail. Caution should be taken to transplant native herbaceous plants that are present on existing or proposed trails. Accessible trails should be between 5-7 feet.

Time Frame:	**Annual**
Personnel Needed:	**5-8 Volunteers**
Approximate Time:	**1-2 Workdays**
Tools:	**Handsaws, loppers, chainsaw, mulch**

9. Construct a boardwalk to enable visitors to traverse seasonally wet patches.

Assembling logs and limbs to create a corduroy boardwalk can aid in providing a safe, dry, path for visitors and encourage individuals to stay on the trail. However a more substantial boardwalk is necessary for sections of the trail that traverse the especially wet areas near the start of the trail loop.

Three sections of the trail, approximately 40, 75, and 100' in length are regularly flooded. Rerouting the existing trail that runs north from the loop intersection to extend slightly farther south and west would reduce the amount of boardwalk required to traverse the wet portions of the trail as well as reduce disturbance to sensitive wet areas.

Per linear foot costs of boardwalks can range from less than $20 to greater than $100. Constructing a 4' wide pressure treated boardwalk with 8' sections and 2x4" pilings, 2x8" rafters, and 2x8" decking and a 2-rail railing costs significantly less than constructing a 6' wide boardwalk using composite materials with 8' sections and 6x6" pilings, 2x10" rafters, and 2x8" decking and a 3-rail railing. Costs can be reduced by using volunteers for construction, reducing the height or length of the boardwalk, and soliciting donated materials. An architect or engineer should be contacted to determine load bearing capacities for elevated boardwalks.

A boardwalk supported on the ground every 4' with lateral 6" x 6" or 4" x 4" (depending on depth of water) beams cut in 2" sections with two side by side 2" x 6" forming the walking surface would be appropriate for Creekshead Preserve.
A range of materials are used for boardwalks including:

- Lumber pressure treated with water sealant
- ACQ (Alkaline-Copper-Quat) pressure treated lumber
- Fiberglass reinforced plastic (FRP) lumber
- recycled plastic

Plastic composites may be environmentally safer, however they are typically more expensive and can become brittle in the cold.
If wood is used, rough sawn lumber is less slippy when wet.

Time Frame:	**Within 0-3 years**
Personnel Needed:	**Staff, 5-7 Volunteers**
Estimated Cost ACQ Pressure treated lumber:	**$10 per linear foot x 200 feet= $2000**
Recycled plastic from Bear Board:	
Approximate Time:	**2-3 Workdays per boardwalk section**
Tools and Material:	**Saws, lumber,screws and cordless drills, shovels, pickaxe**
Resources:	http://www.actontrails.org/BoardwalkDesign.pdf http://atfiles.org/files/pdf/BMPmanual2004.pdf

10. Maintain and update a species list on the website to track species and attract visitors to the Preserve. A list of species identified within the Preserve could be maintained and publicly available. Once established, this list could easily be updated as necessary by a staff member, office volunteer, or an intern.

Time Frame:	**Within 3-8 years**
Personnel Needed:	**Staff or volunteer**
Approximate Time:	**2-3 Hours to create, 1 hour/ year to update**

11. Create interpretive sign with trail map. Interpretive signs increase the educational experience of preserve users and help visitors learn about local flora, fauna, ecosystems, specific projects, demonstrations or restoration activities, or potentially hazardous conditions. A small kiosk or sign and trail map at the entrance can convey important information to visitors including maps, information about Legacy and the Preserve, and unique species or hazards (such as poison ivy) to be aware of, a listing of emergency phone numbers, and a donation box.

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

12. Determine desired forest community; burn as necessary. The Preserve could be burned to reduce leaf litter, promote fire dependant species, and control potential invasive species. Half of the Preserve should be burned at a time on a 7-10 year cycle.

Depending on the nature of the site and prep time required, burning can take less than an hour or up to an entire day plus travel time, setup, and time to acquire permits. Wooded sites with steep terrain, limited or no vehicular or water access, and many downed logs are more expensive, while flat prairies are less expensive.

Time Frame:	**Within 3-8 years**
Personnel Needed:	**Professional burn crew**
Approximate Time:	**4-8 Hours**
Resources	**David Borneman, LLC** **734-994-3475** **david@Restoring NatureWithFire.com**

12. Monitor for deer. Deer are a potential threat to the quality and diversity of the Preserve and long term monitoring and management to control browsing and maintain a low density of deer may be necessary. As of 2007, there was a healthy shrub population, consisting of mainly spicebush (*Lindera bezoin*), and a diverse herbaceous layer, both of which could be affected by deer browsing. Deer overpopulation can only be managed through hunting and/or the erection of a deer fence, both of which may be impossible for this type of preserve. Evidence of deer and browsing, though minimal, was observed in May 2010.

Time Frame:	**Annual**
Personnel Needed:	**Staff or volunteer**
Approximate Time:	**1-2 Hours for monitoring**

13. Establish a relationship with adjacent landowners who can increase the effectiveness of management strategies and potentially assist with stewardship.

Time Frame:	**Within 0-2 years**
Personnel Needed:	**Staff**

14. Investigate the potential to acquire adjacent land. The 27 acre preserve is sizable enough to sustain the regeneration of the plant community; however larger corridors of land are beneficial to maintaining diversity. The southern mesic forest extends to the adjacent properties to the north west; a good relationship with the neighbors to help preserve the adjacent forests will be important for the future of the Preserve. Protecting adjacent properties could add 25 acres of woods and stream channels and would buffer future land development impact, as well as provide wildlife habitat and water quality benefits to the surrounding community.

Time Frame:	**Within 3-8 years**
Personnel Needed:	**Staff**

15. Offer guided educational walks along trails when spring wildflowers are in bloom.

Time Frame:	**Within 3-8 years**
Personnel Needed:	**Staff**
Approximate Time:	**2-3 Hours**
Tools:	**Outreach, educational material**

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

Time Frame:	**Within 3-8 years**
Personnel Needed:	**Staff**

17. **Monitor beech trees for beech bark disease.** Long term monitoring for signs of beech bark disease is recommended. Beech bark disease is caused by sap-feeding scale insects and species of Nectri fungi. The scale insect was introduced in Nova Scotia on beech from Europe in 1890 and was first seen in Michigan in 2000. The insects and fungal spores are transported by wind, birds, and humans (via firewood). Signs of infestation include a layer of wax that looks like white wool and has yellow crowns. Symptoms of Nectria fungus include tarry spots on bark and raggedy crowns. Cold winters, heavy rain events, and natural predators, including the twice-stabbed ladybird beetle (*Chilocorus stigma*), reduce populations but do not cause enough mortality to control the scale insects. Beech scale weakens trees, however beech bark disease and mortality typically occur only after Nectria invasion, 3-6 years after scale insects infest an area. Most trees affected by beech bark disease will die and those that survive are highly defective. Trees with a DBH greater than 8 inches are more susceptible to the disease. Some American beech may be resistant.

    Management strategies for beech bark disease depends on the stage of the disease. Currently unaffected stands that are dominated by large, older beech (over 50% of basal area) are highly vulnerable. Preventative management actions in Creekshead Preserve could include increasing tree species diversity to reduce beech dominance, identifying potentially resistant trees such as vigorous trees with smooth bark, surveying stands to check for infestation, and controlling beech regeneration to favor other species.

    If a beech stand is within 6 miles of an infestation it is considered to be in the 'Advancing Front Stage' of the disease. Other stages include the 'Killing Stage' and 'Aftermath Stage'; Alternative management strategies are required in each of these stages. See http://michigansaf.org/ForestInfo/Health/BBdisease.htm for additional information.

18. **Evaluate** effectiveness of management strategies.

19. **Update management plan** every 3-5 years or as needed to reflect ecosystem change.

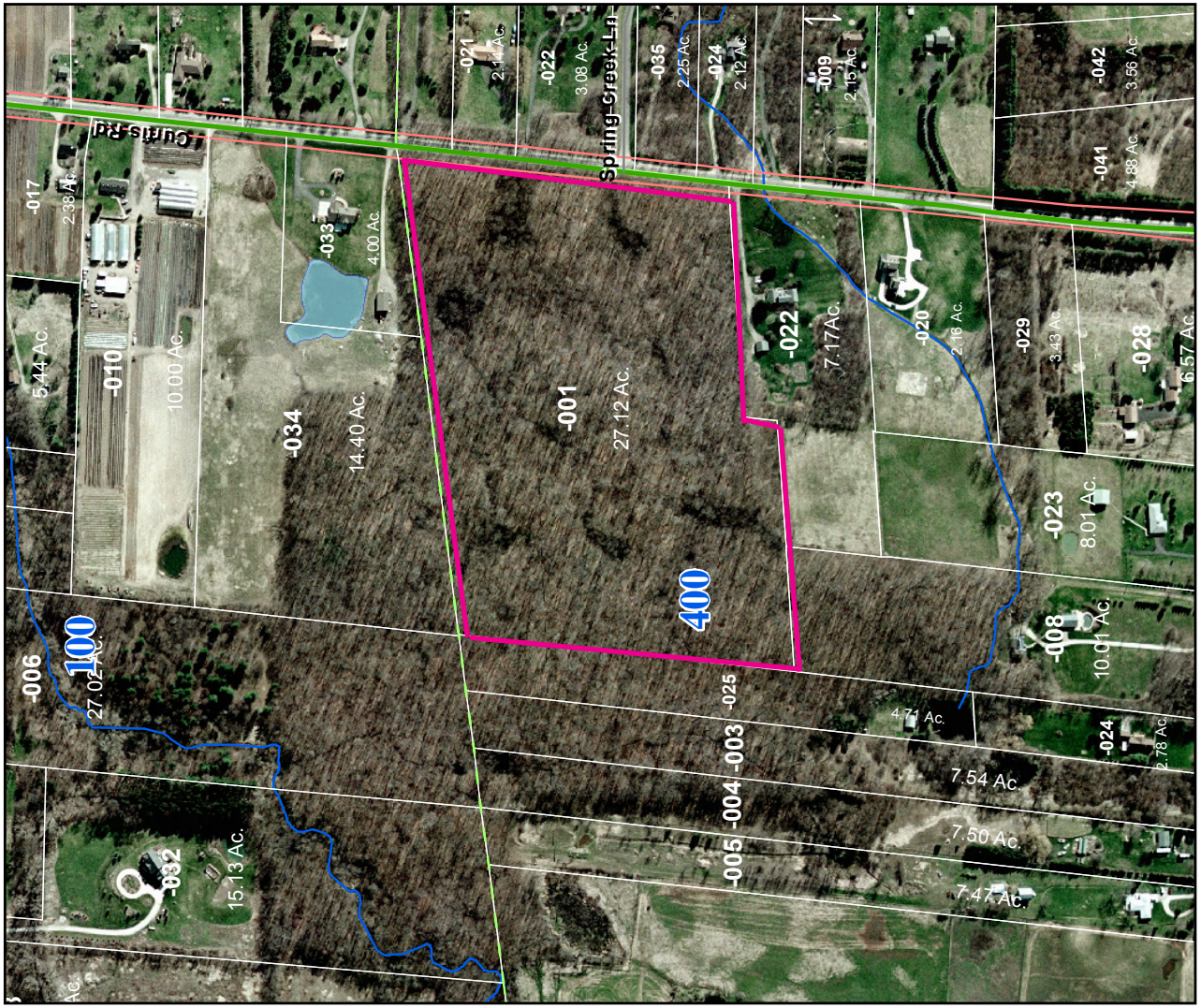
CONCLUSION

Creekshead Preserve is comprised of high quality southern mesic forest dominated by beech, sugar maple, and basswood. The primary management objective for this preserve is to maintain the ecological quality and invasive-free nature of the site. Additionally, the Preserve's trail should be maintained to allow visitors safe and enjoyable access to view the Preserve's forest and spring wildflowers.

APPENDIX A

Directions to the Preserve

From Ann Arbor (east): Take US-23 North to MI-14 East. Take Exit 10 to merge onto MI-153 East. Make a slight left at Plymouth Road, then turn left at Curtis Road. Follow Curtis road approximately 2.3 miles to Creekshead Preserve on the left (park on side of road).



APPENDIX B

Legal Documentation

The legal description (Tax Parcel I.D. No.: 01-21-400-001) is as follows:

PARCEL D-2, part of the east 1/2 of the SE fractional 1/4 of Section 21, T1S, R7E, Salem Township, Washtenaw County, Michigan, being more particularly described as: Beginning at a point on the east line of Section 21, distant north 7°14'55" east, 1392.65 feet from the SE corner of said section; thence proceeding along said east line, north 7°14'55" east, 904.47 feet to the east 1/4 corner of Section 21; thence along the east and west 1/4 line of said section, south 83°35'28" west, 1337.76 feet; thence south 7°04'25" west, 911.51 feet; thence north 87°03'10" east, 680.0 feet; thence north 7°04'25" east, 90.32 feet; thence north 87°07'12" east 658.10 feet to the point of beginning.

Restrictions on Use:

Formal restrictions on the sale and division of the property were established September 13, 2005:

"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)."

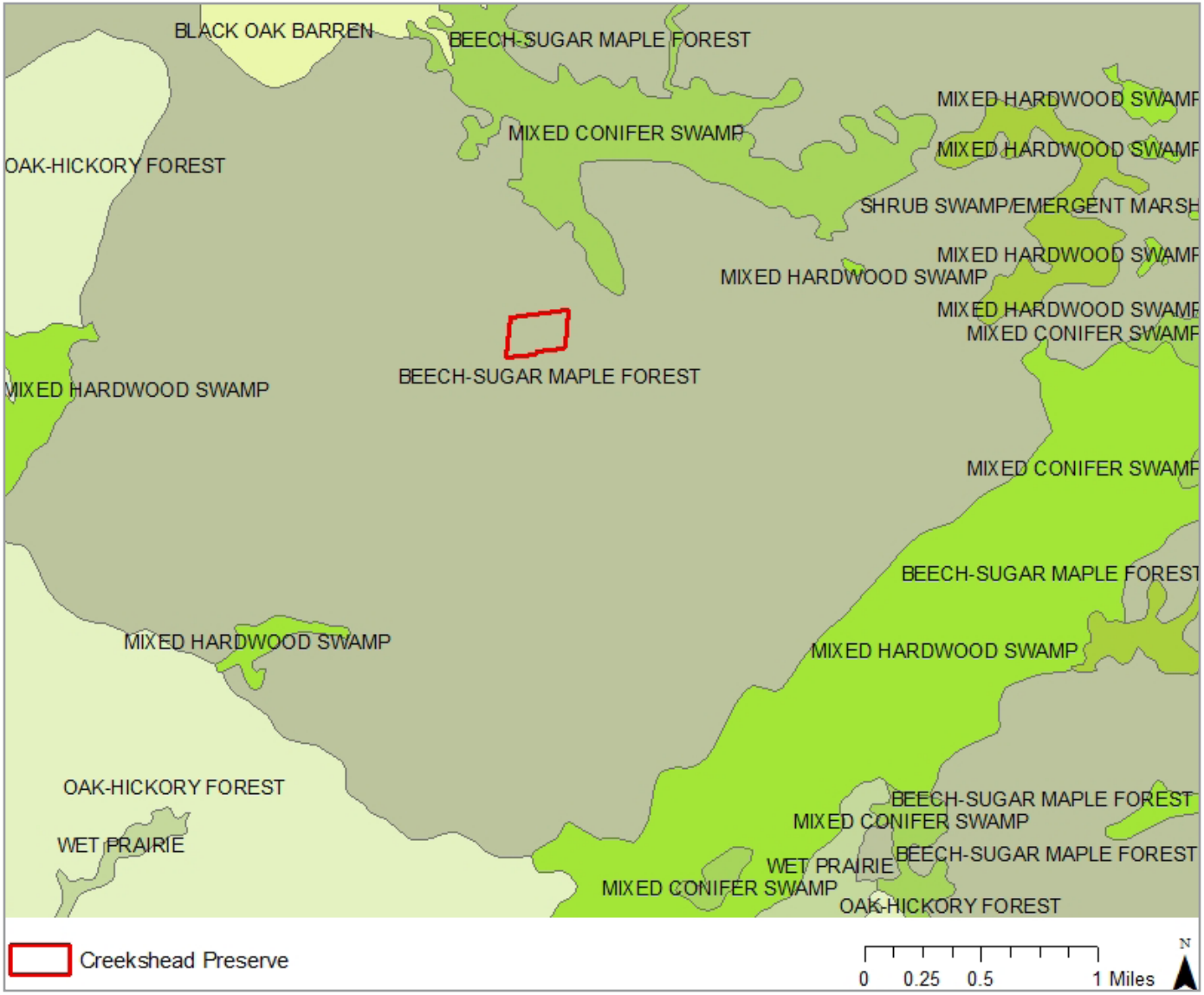
Restrictions on Sale/Division:

Formal restrictions on the sale and division of the property were established September 13, 2005: "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."

Name and Location of Key Documents:

Warranty deed, environmental assessment, management plan, title insurance, aerial photos are on hand at the Legacy office in Creekshead hard-copy folder, and on the server in folder: S:\Land\PRESERVES\Creekshead Preserve-Kaericher.

APPENDIX C



Map 6 Historic land cover circa 1800 (data source: SEMCOG)

APPENDIX D

Washtenaw Land Trust Creekshead Preserve Management Plan

by

Catherine Marquardt

June 12, 2007

Property Description

The Creekshead Preserve is a high quality southern mesic forest, dominated by beech and sugar maple. This natural community was once abundant in southeastern Michigan, but since these forests were known to occur on nutrient-rich, well-drained soils, most large tracts were cleared for agriculture. The forest of the Creekshead Preserve has a nice diversity of plant species, and few invasive species. The main objective for management of this preserve should be to monitor and maintain the quality of this natural area.

The southern mesic forest is usually host to a diverse plant community due to the nutrient-rich, well-drained soils. Besides the dominant species of beech and sugar maple, there are a number of mature associate species which require this type of soil, including bitternut hickory (*Carya cordiformis*), tulip tree (*Liriodendron tulipifera*), red oak (*Quercus rubra*), and basswood (*Tilia americana*). In depressions and adjacent to the small, seasonal creek which flows through the property, one finds species more typical for a hardwood swamp community, such as silver maple (*Acer saccharinum*) and red ash (*Fraxinus pennsylvanica*). The mature ash, however, have been killed by the emerald ash borer. The preserve is also home to a variety of herbaceous species, listed in the attached species list.

Landowner objectives

The most important management objective for this property will be to continually monitor for the presence of invasive species, and to eradicate them before they spread. Because invasive species are present in all parts of the county and are easily dispersed, annual monitoring will be essential.

Garlic mustard (*Alliaria petiolata*) has not been found within the preserve; however, several young plants were observed along Curtis Road. Tractors which mow the roadsides frequently carry seeds of invasive species, so this will be a likely place for this species to become established. Garlic mustard is also frequently spread by animals, as well as humans carrying seeds in on their shoes. For this reason, any regular deer paths as well as along the main foot trail should be monitored annually. Volunteers could conduct annual sweeps to inspect the entire preserve, but if resources are limited, the above places (roadside, foot paths, and deer trails) should be prioritized for

monitoring. Garlic mustard is most visible in May when it is in flower. The seeds generally mature and release in June, but the plant is harder to see once it is no longer in flower. Any plants should be pulled, bagged and removed from the preserve so that the seeds do not have a chance to germinate.

Other herbaceous species which were not observed, but could become established include dame's rocket (*Hesperis* matronalis) and narrowleaf bittercress (*Cardamine impatiens*). These species should also be pulled, bagged, and removed from the preserve, if they are found. Both of them flower and go to seed in April, May and June. Attached are information sheets from the City of Ann Arbor's Natural Area Preservations division which should be distributed to WLT staff and volunteers so they know how to identify these invasive species.

Woody species which are most likely to invade the preserve include buckthorn *(Rhamnus cathartica* and *Rhamnus frangula*), honeysuckle (*Lonicera spp.*), and autumn olive (*Elaeagnus umbellata*). If these species were found, the plants should be cut and and the stems painted with Round-up. This work can take place any time of year, except in the spring when the sap is running from the roots up into the plant. The plant must be cut within six inches of the ground, and Round-up must be applied within five minutes for this method to be effective.

Multiflora rose (*Rosa multiflora*) is an invasive plant and was added to the species list on May 6, 1997. In a woodland setting, this plant will not spread rapidly, but if the plant is observed, it would be best to remove it.

Another potential threat to the quality and diversity of the preserve would be overbrowsing by deer. To date, there is a healthy shrub population, consisting mainly spicebush (*Lindera bezoin*), and a diverse herbaceous layer, both of which could be affected by deer browsing. This would become apparent by a decrease both in the number of flowering plants and in the regeneration of trees and shrubs. Deer overpopulation can only be managed through hunting and/or the erection of a deer fence, both of which may be impossible for this type of preserve. Nonetheless, it is a threat which should be monitored.

Prescribed burning should not be conducted on this preserve, as beech and sugar maples cannot withstand fire.

A preserve of 27-acres is sizable enough to sustain the regeneration of the plant community, but larger corridors of land are beneficial to maintain diversity. The southern mesic forest extends to the adjacent properties so a good relationship with the neighbors to help preserve the adjacent forests will be important for the future of the preserve.

Trails

The trail which was previously established through the preserve needs improvement in order for visitors to follow it with ease. In addition to the trail markers previously attached to trees, and evidence of logs laid on the outer edges of the trail, flagging tape was tied around trees so that visitors could find the trail. The flagging, however, is meant to be a temporary measure. Most of the trail is flagged in yellow. The blue flagging indicates the point at which the trail splits into a loop, and orange flagging indicates portions of the trail which are seasonally submersed in water and are recommended for future boardwalk construction.

In order to make the trails easily visible and comfortable to walk, a number of actions are recommended.

The first step is to clear the trail of debris. This will require a chain saw for larger logs which have fallen over the trail. The smaller branches and trees can be cleared by hand. This would most efficiently be accomplished with a group of volunteers.

At the same time or at a later date, the smaller logs and branches could be laid on either side of the trail, approximately 5 feet in width so the route is clearly marked. A wider trail is not recommended to reduce damage to the rich plant population. In some places, the trail now passes through a nice colony of plants and could be re-routed slightly to avoid trampling high quality woodland plants, such as blue cohosh (*Caulophyllum thalictroides*).

Additional trail markers should be attached to trees, as some trees have since fallen which originally held markers, and some markers are placed too far apart for the visitor to follow with ease. The current trail markers in use are circular with silver arrows surrounded by red. If the trails are maintained and lined with branches, the arrows are easy to spot, but if these are the only markers of the trail, the red is hard to spot in a woodland which is fully in leaf. If new trail markers were to be ordered, a bright yellow or white background is recommended as these colors are easier to see.

Trail markers should not be attached to beech trees, if possible, as any damage to the bark can invite the invasion of a fungus, which could eventually kill the tree.

Portions of the trail are muddy or even submersed by water, especially during the early spring months. Eventually woodchips could be added to the muddy sections, and several boardwalks constructed over areas where there is standing water in the spring. Woodchips would be useful, especially by the entrance to the preserve, as this area will have the most visitors, and it is quite muddy in the spring. If woodchips were to be added at some point, making the path of woodchips only 3 feet in width would save resources and extend the distance.

Building boardwalks is often too costly for a non-profit organization, but often Eagle Scout troops look for volunteer projects to fulfill badge requirements. A number of organizations have had success with Eagle Scouts building boardwalks, such as the City of Ann Arbor, Washtenaw County Parks, and Safe House (co-organized by Pittsfield Township). Contact with these organizations would be beneficial to learn about the types of boardwalks constructed, the logistics of overseeing such a project, and the cost of materials. The wettest portions of the trail are currently marked with orange flagging tape.

One final issue with the trail is that the trail appears to extend beyond the northern property boundary at one point. This appears to be the case because a boundary sign has been attached to a tree inside the trail. Either the boundary sign was improperly placed or the trail does indeed extend beyond the property boundary. This should be resolved so as not to confuse preserve visitors and create potential questions with the adjacent property owners.

At some point in the future, a second trail extension could be established which takes visitors to the western boundary of the property. The woodland is drier towards the west and is very attractive since the property is not bordered by fence, but by an extension of the southern mesic forest.

Infrastructure Requirements

An informal trail map at the entrance would be helpful to orient preserve visitors to the layout of the preserve and the trail route. These could be drawn by hand, or created digitally using the GPS points tracked by Mark Patrick of WLT during a site visit. To protect the brochures from damage from precipitation, a small roof could be constructed over the preserve's entrance sign. Models for this could be obtained from the Southeast Michigan Land Conservancy's Cherry Hill Preserve or Washtenaw County Parks and Recreation. The roof could also be constructed by volunteers.

Another consideration for improving the infrastructure would be to create a few parking spaces. The only place to park at present is along Curtis Road. Although the shoulder is wide enough for cars to park safely off the road, traffic moves along Curtis Road at high speeds and could be a hazard. If the preserve has a high volume of visitors, a small parking lot to accommodate several cars, may be a consideration.

To estimate the number of visitors to the preserve, a guest book might be left next to the trail maps to have visitors record the date and reason for their visit. This might give WLT an idea of how frequently the preserve is used and whether this preserve might deserve attention to the above recommended projects.

Prioritization of Preserve Projects

Since the Creekshead Preserve is home to a high quality southern mesic forest with only a few observations of invasive species, the first priority should be to monitor the preserve in the spring for the introduction of invasives, especially garlic mustard (*Alliaria petiolata*) and dame's rocket (*Hesperis matronalis*).

To make the preserve enjoyable for visitors, the top priority should be to clear the trail of debris, then improve upon the current demarcation of the trail with existing trail markers and flagging tape by lining the trail with branches and small logs, as well as by installing more trail markers on trees.

Removing debris from the trail would most likely require one full workday with at least five volunteers. (One person will need a chain saw.) The next step of lining the trail with logs and small branches would most likely require three or four workdays with at least five volunteers to complete the entire trail.

The wood chips and boardwalks are secondary priorities and are only recommended to be undertaken with a committed and organized group of volunteers. The wood chips and boardwalks would be highly beneficial in early spring but are not crucial to the enjoyment of the preserve, considering the high cost for materials and the number of labor hours required for installation. In the meantime, a sign could be posted in the spring to warn visitors that the trails are wet and muddy in places.