

III. WILDLIFE CONSERVATION PLAN UNIT 1
Updated April 30, 2023

Revision/Review History

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 Updated by Ron Hoffman June 1, 2017, April 30,2023

Reference Accomplishments at this [LINK](#) (filename="Unit 1 Accomplishments")

Location: Unit 1 is located in the SW1/4 of SW1/4 of Section 2, T2S, R1E, southeast of Eagle Lake. Seymour Road forms the south boundary, Judy Cory property is to the west, the north boundary is an arbitrary line extending from the east side of Eagle Lake to where the stream enters Mud Lake Marsh, and the inlet stream is the east boundary. Northeast corner is 42.32535°N and 84.28363°W, northwest corner in Eagle Lake is 42.32535°N and 84.28956°W, southwest corner in Seymour Rd. is 42.32109°N and 84.28358°W and the southeast corner is the Seymour Rd. bridge 42.31990°N and 84.28228°W.

Size: ~ 65 acres

Soil Types: See Figure 1. Soil Map for Unit 1.

Symbol and Soil Name	Acres	Percent
11 Boyer-Oshtemo, sandy loam	1.5	2.4
14B & CSpinks, sand	12.0	19.1
18 Gilford-Colwood complex	1.3	2.1
20 Houghton Muck deep layer of muck	2.6	4.2
30 Edwards Muck, ~28" layer muck over marl	10.3	16.5
35B & C Arkport-Okee, loamy fine sand	11.4	18.7
37 Palms Muck, deep muck	3.2	5.1
43A Dixboro, loamy sand	5.2	8.4
45 Martisco muck, ~8" top layer of muck over marl	0.9	1.5
47 Histosols and Aquepts, ponded	11.9	19.1
W Water	1.9	3.0
total	62.5	100

Presettlement Vegetation: (see Presettlement Vegetation Map in *A Conservation Assessment of the Phyllis Haehnle Memorial Sanctuary*)

- Oak Barrens
- Inland Wet Prairie

Vegetation:

Cover Type	Acres	Percent
Emergent Marsh	13	21
Oak Forest	13	21
Upland Grass	12	19
Wetland Shrub	13	21
Wetland Forest	8	13
Eagle Lake	2	3
Developed	2	3
Total	65	101

Management:

Three main goals are the basis for managing the sanctuary. They are conservation, education and research. The terms goals, objectives and actions are defined as:

- Goal - a general, broad outcome that is not measurable.
- Objective - a subset of the goals that reflect the results needed to achieve a goal. Objectives are measurable.
- Action - activities and policies required to fulfill objectives.

The hierarchy of goals, objective, and actions is indicated by a numbering system. The goal number (1-3) is first, followed by a period then the objective number e.g. 3.02 is goal 3 and 02 is objective 2. Actions and policies are indicated with lower case letters e.g. a, b, etc. The same goal and objective numbers are used in all management units, but actions are not.

Sound management of natural resources depends on accurate information. Records of monitoring and management actions are listed in the document, *Wildlife Management Records of Accomplishments and Monitoring Unit 1*.

Unit 1 is divided into 14 management units (See Figure 2. Unit 1 Management Units) based on cover types found in 2012. Some of the management units are subdivided based on different management actions within the unit.

Human Impacts: Main features include a parking lot, Harold Wing Observation Site, nature trail, mowed paths, several signs, three large stone piles, nest boxes, two abandoned cistern wells, and the remains of two building foundations. The observation site consists of a kiosk, brochure dispenser, and benches. A panoramic view of Mud Lake Marsh greets visitors at the observation site. Mowed walking paths followed the perimeter of the native grassland and a vehicle access drive bisects the unit. Several thousand people visit the sanctuary every fall to view cranes and enjoy this part of sanctuary.

Goals and Objectives for Unit 1

- 1.00 Conserve the native flora and fauna at the sanctuary, especially Sandhill Cranes.
 - 1.04 Restore, enhance and maintain native biotic communities.
 - 1.05 Manage individual native plant and animal species.
 - 1.07 Reduce invasive plants and animals.
- 2.00 Increase public understanding of the sanctuary, its wildlife and their environment.
 - 2.02 Provide educational materials.
 - 2.03 Provide opportunities for self-guided wildlife viewing.
- 3.00 Increase scientific knowledge of wildlife and their environment through research.
 - 3.02 Permit scientific studies of wildlife.

Unit 1.01 Parking Lot and Harold Wing Viewing Area

Size: 2 acres

Soil: Arkport-Okee loamy fine sands

Vegetation: Mowed grass. A bur oak was planted in memory of David Wing.

Human Impacts: Four signs, two rail fences, gate, kiosk, benches, and portable toilet during the fall are found in the unit.

Objectives, and Actions

- 2.02 Provide educational materials.
 - 2.02a Provide educational pamphlets at the kiosk. Ongoing
- 2.03 Provide opportunities for self-guided wildlife viewing.
 - 2.03a Replace the educational display at the Harold Wing Observation Site with a kiosk. Completed 2009
 - 2.03b Maintain the observation site kiosk, benches, etc. Ongoing

- 2.03c Provide adequate parking for vehicles. Ongoing
- 2.03d Construct and maintain a fence that will restrict vehicles from leaving the parking area.
Completed 2012
- 2.03e Develop and update educational displays at the kiosk. Ongoing
- 2.03f Provide and maintain signage for parking, use restrictions, directions to Observation Site.
Ongoing
- 2.03g Rent a portable toilet in fall. Ongoing
- 2.03h Plow snow in part of the lot when snow depth exceeds 4". Ongoing
- 3.02 Permit scientific studies of wildlife.
 - 3.02a Conduct weekly counts during the fall of cranes roosting Mud Lake Marsh. Ongoing

Unit 1.02 Oak Forest

Size: total of 6 acres is divided into two subunits:

- Unit 1.02 - area along west sanctuary boundary and north of Unit 1.03, about 4 acres
- Unit 1.02.1 -area north of the parking lot, about 2 acres

Soil: Arkport-Okee loamy fine sands

Vegetation: Red and white oak co-dominant, sassafras, honeysuckle, autumn olive are common. Little remains of Jack Pine planted in the late 1960s.

Human Impacts: A mowed walking trail is the east border of the Unit 1.02. A large stone pile remains from when the property was farmed.

Objectives and Actions:

- 1.04 Restore, enhance and maintain oak barrens biotic community.
 - 1.04a Conduct a prescribed burn every 3-5 years.
 - 1.04b Cut and chemically treat invasive shrubs.
 - 1.04c Use transects to monitor and evaluate vegetation. Ongoing
- 1.05 Manage individual native plant and animal species.
 - 1.05a Preserve stone pile for snakes. No active management needed at this time.
- 2.03 Provide opportunities for self-guided wildlife viewing.
 - 2.03a Identify and label common trees along the trail. Completed 2006, missing labels need replacement.
 - 2.03b Mow nature trail several times every year. Ongoing
 - 2.03c Cut and spray brush encroaching on the trail. Ongoing

Unit 1.02.1 Oak Forest

Location: A subdivision of Unit 1.02

Size: 2 acres

Objectives and Actions:

- 1.04 Restore, enhance and maintain oak barrens biotic community.
 - 1.04a Conduct a prescribed burn every 3-5 years. Ongoing
 - 1.04b Cut and chemically treat invasive shrubs. Ongoing
 - 1.04c Plant species native to an oak barrens community. Ongoing

Unit 1.03 Native Grassland (Whipfler South Grassland)

Size: Total of 11 acres was divided February, 2016 into subunits as follows:

- Unit 1.03.1 East Section Tall Grass – east of drive leading to Eagle Lake, 3.5 ac.
- Unit 1.03.2 Short Grass – south end of East Section ~0.3 ac.
- Unit 1.03.3 West Central Section – west of trail leading to Eagle Lake, 2.8 ac.
- Unit 1.03.4 West Section (Pollinator) -east of Unit 1.02, 4 ac.

Soil: Spinks sand, Arkport-Okee loamy fine sand

Vegetation: Big bluestem and Indian grass are dominant. Little bluestem, switchgrass, dewberry, goldenrod, grey dogwood, oaks saplings and various forbs are common.

Human Impacts:

This area was farmed until about 1960. After Michigan Audubon acquired the property in 1963 from Charles Whipfler, a 5-acre wildlife food plot was maintained by Henry Smith and Sons 1974-79, Don O'Dell 1978, Earl Brumbaugh 1979, and Eric Walz 1985 and 1987. Planting corn to attract Sandhill Cranes was unsuccessful because of poor soil and deer. After 1987, the abandon field went from a grassland to the shrub stage of plant succession. Autumn olive and dewberry became common.

Mowed walking paths follow the perimeter of the open area and a vehicle access drive bisects the unit. Benches, two large stone piles, nature trail interpretation stations, and 8 bluebird boxes were present in 2016. Several thousand people visited the sanctuary in the fall to view cranes and frequent this part of sanctuary.

Objectives and Actions

1.04 Restore, enhance and maintain native grassland biotic community.

1.04a Prepare the area for planting native grasses and forbs. Completed 2001

1.04b Plant native warm season grasses and forbs. Completed 2001, 2005

1.04c Burn half of the unit every 3 – 5 years, or as needed to control woody plant invasion.

Ongoing

1.04d Spray spotted knapweed and invasive woody plants with a herbicide (*Garlon, Crossbow, Transline, etc.*). Ongoing

1.04e Cut trees at the stone pile north of observation site. Needs to be implemented

1.04f Use transects to monitor and evaluate vegetation. Ongoing

1.04g Use point counts to monitor and evaluate bird abundance. Ongoing

1.05 Manage individual native plant and animal species.

1.05a Place and maintain nest boxes for birds and bats. Ongoing

1.05b Maintain a record of use and nesting success of birds using boxes. Ongoing

1.05c Preserve the stone piles for snakes. No active management needed at this time.

2.03 Provide opportunities for self-guided wildlife viewing.

2.03a Establish and maintain a self-guided nature trail stations. Completed 2006

2.03b Mow nature trail several time a year. Ongoing

2.03c Cut and chemically treat woody plants that encroaches on the trail. Ongoing

Unit 1.03.1 Native Grassland

Location: Subdivision of Unit 1.03 located east of trail bisecting Unit 1.03.

Size: 3.5 acres

Unit 1.03.2 Native Grassland

Location: Subdivision of Unit 1.03 located east of trail bisecting Unit 1.03 and north of benches

Size: 0.3 acres

Unit 1.03.3 Native Grassland

Location: Subdivision of Unit 1.03 located west of trail bisecting Unit 1.03.

Size: 2.5 acres

Unit 1.03.4 Native Grassland (Pollinator Plot) Steward Robinovitz Memorial Plot

Location: Management Unit 1.03.4 was designated a subdivision of Unit 1.03 in 2016 based on proposed management actions that will emphasis pollinators. Unit 1.03.4 is located in the west part of Unit 1.03.

Size: 4 acres

Soil: 35 B & C Arkport-Okee loamy fine sand and 14C Spinks sand

Vegetation: Big bluestem and Indian grass are dominant in most of the unit, but goldenrod dominates about one acre along the southern edge. Native forbs are scattered throughout the northern and eastern parts of the unit.

Human Impacts: See Unit 1.03 above.

Objectives and Actions:

1.04 Restore, enhance and maintain a native grassland biotic community with an emphasis on establishing flowering plants for native bees and honey bees.

1.04a Spray herbicide

- 1 acre dominated by goldenrod and non-target species - use a high concentration of glyphosate to kill all vegetation. - late summer 2017
- 3 acres where warm season grasses and some forbs are present - use a lower concentration of herbicide to reduce grass density. Alternative would be light disking of the 3 acres. - late summer 2017
- If needed, again spray areas dominated by goldenrod and non-native plants - spring 2018

1.04b Burn area before planting to reduce leaf litter.

1.04c Plant a mixture high in native wildflowers and lesser amounts of short stature warm season grasses after area is burned - spring 2018

1.04d Burn Unit 1.03.4 every 3–5 years, or as needed to control woody plant invasion. Burning should be scheduled in years when other parts of Unit 1.03 are not burned. Ongoing

1.04e Spot spray invasive woody plants (e.g. autumn olive, honeysuckle and multi-flora rose) with a herbicide (e.g. *Garlon*, *Crossbow*). Ongoing

1.05 Manage individual native plant and animal species.

1.05a Maintain nest boxes for bluebirds - ongoing

1.05b Preserve the stone pile for snakes. No active management needed at this time.

1.05c Place and maintain honey bee hives within one mile of Unit 1.03 - spring 2016 and ongoing

2.03 Provide opportunities for self-guided wildlife viewing.

2.03a Establish an interpretative station with a bench explaining management for pollinators. Need to implement.

Unit 1.04 Oak Forest

Size: total of 7 acres is divided into subunits based on recommended management actions:

Unit 1.04.1 subunit of 1.04 proposed for active management in 2016, 1 acre.

Soil: Arkport-Okee loamy fine sands

Vegetation: Pole size (DBH 5-10") boxelder and honeysuckle co-dominant. It is degraded by invasive honeysuckle.

Human Impact: The cement foundation of what was once a house and outbuilding remains. A cistern well is located at 42.32111 ° and 84.28722 °. The well was capped and the hole filled with dirt in early 2000s.

Objectives, and Actions:

1.04 Restore, enhance and maintain an oak barrens biotic community.

1.04a Conduct a prescribed burn every 3-5 years. Ongoing

1.04b Cut and/or chemically treat invasive shrubs. Ongoing

Unit 1.05 Grassland

Size: 1 acre

Soil: Arkport-Okee loamy fine sands

Vegetation: Brome grass and dewberry common. This area is evolving from a grassland to shrub stage of plant succession. Dewberry is common.

Human Impact: This area was once farmed.

Objectives and Actions

- 1.04 Restore, enhance and maintain oak barrens biotic community.
 - 1.04a Conduct a prescribed burn every 3-5 years along with Unit 1.04. Needs to be implemented
 - 1.04b Cut and/or chemically treat invasive shrubs. Needs to be implemented
 - 1.04c Use transect to monitor and evaluate vegetation. Needs to be implemented

Unit 1.06 Emergent Marsh

Location: Borders the shoreline of Eagle Lake

Size: less than 1/2 acre

Soil: Gilford-Colwood complex

Vegetation: Cattail and sedges co-dominant that form the edge of Eagle Lake.

Human Impact: none

Objectives and Actions

- 1.04 Restore, enhance and maintain emergent marsh biotic community.
 - 1.04a. No active management is recommended.

Unit 1.07 Eagle Lake

Size: 2 acres of Eagle Lake is in Unit 1

Soil: n/a

Vegetation: Few submergent and floating plants.

Human Impact: Fishing is permitted if access is obtained from other landowners.

Objectives and Actions

- 1.04 Restore, enhance and maintain lake biotic community.
 - 1.04a. No active management is needed currently.
- 1.05 Manage individual native plant and animal species.
 - 1.05a Place and maintain nest box for wood ducks. Ongoing

Unit 1.08 Wetland Forest

Size and Location: Total of 7 acres was divided December 2015 into two subunits based on management actions.

- Unit 4 area west of drive and east of Eagle Lake, 5 acres
- Unit 1.08.1 east of drive proposed for active management in 2016, 2 acres

Soil: Gilford-Colwood complex and Palms Muck

Vegetation: Elm, ash, glossy buckthorn, willow, buttonbush, multi-flora rose, red maple, aspen, gray dogwood, silky dogwood

Human Impact:

An old trail apparently once paralleled the east shore of Eagle Lake. Dirt was placed over small rocks, slightly elevating it above the surrounding ground. Now it is overgrown with shrubs and trees.

Sometime prior to 1978, a two-track drive was built that extends from Unit 1.03 to the upland on the northeast side of Eagle Lake. An earthmover took dirt from Unit 1.03 to construct the drive. Two culverts were placed in the trail to allow water to flow into Mud Lake Marsh from Eagle Lake.

Objectives and Actions:

- 1.04 Restore, enhance and maintain as a wetland forest biotic community.
 - 1.04a No management is needed at this time.
- 2.03 Provide opportunities for self-guided wildlife viewing.
 - 2.03a Mow drive several times every year. Ongoing
 - 2.03b Cut and chemically treat brush encroaching on drive. Ongoing

Unit 1.08.1 Wetland Shrub

Location: This is a sub-division of Unit 1.08, east of drive and north of Unit 1.03.1

Size: 2 acres

Soil: Palms Muck

Vegetation: Glossy buckthorn is dominant. American elm; red maple; black cherry; gray, silky and red osier dogwood; willow are present.

Objectives and Actions

1.04 Restore, enhance and maintain prairie fen biotic community.

1.04a Cut (grind) woody plants. Completed Feb. 23, 2016

1.04b Aerial spray sprouts of woody plants. Fall, 2016

1.04c Conduct a prescribed burn every 3-5 years. Winter, 2017

1.04d Monitor and evaluate vegetation. Needs to be implemented

Unit 1.09 Wetland Shrub

Size and Location: Unit 1.09 is west of the stream that flows into Mud Lake Marsh. The unit was divided into two parts in December, 2015 and then divided again May, 2017.

- Unit 1.09 11 acres.
- Unit 1.09.1 was proposed for active management in 2016, 2 acres.
- Unit 1.09.2 proposed for management May 3, 2017, 2.5 acre

Soil: Mostly Edwards muck, and less amounts of Houghton muck, Dixboro sandy loam, and Spinks sand.

Vegetation: A mildly alkaline marl layer lies about 28 inches below the upper layer of black muck in most of the unit. The lack of fire and past drainage probably converted this area from a prairie fen to wetland shrub. Silky and red osier dogwood, willow, American elm, ash are common.

Objectives and Actions

1.04 Restore, enhance and maintain prairie fen biotic community.

1.04a Cut (grind) woody plants. Needs to be implemented.

1.04b. Aerial spray with a herbicide. Needs to be implemented.

1.04c. Conduct a prescribed burn every 3-5 years. Needs to be implemented.

1.04d. Monitor and evaluate vegetation. Needs to be implemented

2.03 Provide opportunities for self-guided wildlife viewing.

Unit 1.09.1 Upland and Wetland Shrub

This is a sub-division of former Unit 1.09

Size: 2 acres

Soil: Mostly Dixboro sandy loam, some Spinks sand, and small area of Edwards muck. Since a mildly alkaline marl layer lies below a shallow layer of muck in the Edwards series, part of the unit may be a degraded fen.

Vegetation: The lack of fire and past drainage probably converted drier parts of this area from oak barrens and prairie fen to upland shrub and wetland shrub. Silky and red osier dogwood, willow, boxelder, black cherry, oak spp. are common.

Objectives and Actions

1.04 Restore, enhance and maintain oak barrens biotic community in Dixboro sandy loam and Spinks sand area and prairie fen in the Edwards muck area.

1.04a Cut woody plants, completed March 16, 2016.

1.04b Mow sprouting woody plants with brush-hog. Summer 2016.

1.04c Aerial spray with a herbicide. Fall 2016

1.04d Plant a rich mixture of forbs and some native grasses to provide nectar for pollinating insects after suppression of woody plants. Needs to be implemented.

1.04e Conduct a prescribed burn every 3-5 years. Needs to be implemented.

1.04f Monitor and evaluate management practice. Begun 2016

Unit 1.09.2 Wetland Shrub

This is a sub-division of former Unit 1.09 was added 5-31-17. It was mistakenly sprayed with Garlon in 2016.

Size: 2.5 acres

Soil: Mostly Edwards muck. Since a mildly alkaline marl layer lies below a shallow layer of muck in the Edwards series, part of the unit may be a degraded fen.

Vegetation: The lack of fire and past drainage probably converted from a prairie fen to wetland shrub. Glossy buckthorn, silky and red osier dogwood, and willow are common.

1.04 Restore, enhance, and maintain oak barrens biotic community in Dixboro sandy loam and Spinks sand area and prairie fen in the Edwards muck area.

1.04a Aerial spray with a herbicide. Fall 2016

1.04b Conduct a prescribed burn every 3-5 years. Needs to be implemented.

1.04c Monitor and evaluate management practice. Begun 2017

Unit 1.10 Emergent Marsh (part of Mud Lake Marsh)

Size: 12 acres

Soil: Histosols and Aquents

Vegetation: Sedges spp., cattail spp., Phragmites and purple loosestrife are common.

Objectives and Actions

1.04 Restore, enhance and maintain emergent marsh biotic community.

1.04a Conduct a prescribed burn if woody plants become established (see Unit 6).

1.07 Reduce invasive, non-native purple loosestrife.

1.07a Black-margined loosestrife beetles (*Galerucella californiensis*) were discovered in 2010 by Gary Siegrist and Mickey Kress. Their effectiveness controlling purple loosestrife should be monitored. Ongoing

Unit 1.11 Wetland Forest

Size: 4 acres

Soil: Dixboro, loamy sand; Edwards muck

Human Impact: An abandoned cistern well is located at 42.3222 ° and 84.28611 °. It might be used by reptiles for hibernation.

Vegetation: Boxelder is dominant. Silky dogwood, honeysuckle, gray dogwood are common. Since a mildly alkaline marl layer lays below a shallow layer of muck in Edwards series, part of the unit may be a degraded fen.

Objectives and Actions

2.03 Provide opportunities for self-guided wildlife viewing

2.03a Cut trees and treat stumps with *Tordon* that interfere with view of Mud Lake Marsh from the Harold Wing Observation Site. Ongoing

Unit 1.12 Oak Forest

Size: 2 acres

Soil: Dixboro, loamy sand

Vegetation: Degraded by glossy buckthorn which is dominant.

Objectives and Actions

1.04 Restore, enhance and maintain native oak forest biotic community.

1.04a. Cut and chemically treat invasive shrubs, especially glossy buckthorn. Needs to be implemented.

Unit 1.13 Emergent Marsh

Size: 1 acre

Soil: Houghton muck

Vegetation: Sedges are dominant.

Objectives and Actions

1.04 Restore, enhance and maintain native emergent marsh biotic community.

1.04a No active management is recommended at this time.

Unit 1.14 Wetland Shrub

Size: 3 acres

Soil: Mostly Edwards muck and smaller amount of Spinks sand

Vegetation: Prior to 2007, Unit 1.14 was primarily wetland shrub except for west edge that was upland grassland. Since a mildly alkaline marl layer lies below a shallow layer of muck in Edwards series, this area may be part of the degraded fen.

Objectives, Actions

1.04 Restore, enhance and maintain native wet prairie fen biotic communities. Turtles will have better access to the upland to lay their eggs when the woody barrier between the marsh and grassland is removed.

1.04a Cut and chemically treat woody plants., especially glossy buckthorn. Completed 2008

1.04b Spot spray woody plants with herbicides (*Garlon*, *Crossbow* etc.). Ongoing

1.04c Burn the units every 3 – 5 years, or as needed to control woody plant invasion. Ongoing

1.04d Monitor and evaluate vegetation, annually.

1.05 Manage individual native plant and animal species.

1.05a Construct a snake hibernation mound for Massasauga Rattlesnakes at 42.32421°N and 84.28754°W. Completed 2000

1.05b Monitor use by snakes. Ongoing

Table 1. Five-year schedule for conducting management actions.

Action	Description	Season of Year				
		2016	2017	2018	2019	2020
Unit 1.01 Parking Lot and Observation Site						
2.02a	Provide educational pamphlets at kiosk	all	all	all	all	all
2.03b	Maintain kiosk, benches	sp f	sp f	sp f	sp f	sp f
2.03c	Provide adequate parking for vehicles	all	all	all	all	all
2.03d	Maintain fence to restrict vehicles to parking area	sp f	sp f	sp f	sp f	sp f
2.03e	Update educational displays at kiosk	sp f	sp f	sp f	sp f	sp f
2.03f	Provide signage for parking, directions, etc.	sp f	sp f	sp f	sp f	sp f
2.03g	Rent port-a-toilet	f	f	f	f	f
2.03h	Plow snow in parking lot when >4"	w	w	w	w	w
3.02a	Conduct weekly crane counts of cranes in MLM	f	f	f	f	f
Unit 1.02 Oak Forest						
1.04a	Unit 1.02.1 Burn unit every 3-5 years	sp				sp
1.04b	Unit 1.02.1 Cut and chemically treat invasive shrubs	sp f	sp f	sp f	sp f	sp f
1.04c	Unit 1.02.1 Use plant transect to monitor vegetation	su	su	su	su	su
1.04d	Unit 1.02.1 Plant species native to oak barrens community	sp		sp		sp
2.03a	Replace missing labels for tree identification	f				
2.03b	Mow nature trail	su	su	su	su	su
2.03c	Cut and chemically treat invasive shrubs along nature trail	sp f	sp f	sp f	sp f	sp f
Unit 1.03 Whipfler South Native Grassland						
1.04c	Unit 1.03.1 and 1.03.2 burn every 3-5 yrs.			sp		
1.04c	Unit 1.03.3 and 1.03.4 burn every 3-5 yrs.		sp			
1.04d	Spot spray spotted knapweed and invasive woody plants	su	su	su	su	su
1.04e	Unit 1.03.1 Cut trees growing in the stone pile	sp				
1.04f	Use plant transect to monitor and evaluate vegetation	su	su	su	su	su
1.04g	Use point count to monitor bird abundance	all	all	all	all	all
1.05a	Maintain nest boxes	sp su	sp su	sp su	sp su	sp su
1.05b	Maintain record of use and nesting success	su	su	su	su	su
2.03a	Maintain educational stations along the nature trail		sp	sp	sp	sp
2.03b	Mow nature trail	su	su	su	su	su
2.03c	Cut and/or chemically treat invasive plants along nature trail	sp f	sp f	sp f	sp f	sp f
Unit 1.03.4 Pollinator Plot						
1.04a	Spray herbicide		f			
1.04b	Unit 1.03.4 Plant wildflowers and native grasses			sp		
1.04c	Unit 1.03.3 and 1.03.4 burn every 3-5 yrs. before 1.04b			sp		

Action	Description	2016	2017	2018	2019	2020
2.03a	Establish interpretative station for pollinator plot			sp		
	Unit 1.04 Oak Forest					
1.04a	Unit 1.04.1 Burn every 3-5 years		sp			sp
1.04b	Unit 1.04.1 Cut and/or chemically treat invasive plants		f	f	f	f
Action	Description	2016	2017	2018	2019	2020
	Unit 1.05 Upland Grassland					
1.04a	Burn every 3-5 years		sp			sp
1.04b	Monitor and evaluate vegetation		su			su
	Unit 1.08 Wetland Forest					
1.04a	Unit 1.08.1 Cut woody plants	w				
1.04b	Unit 1.08.1 Aerial spray herbicide	f				
1.04c	Unit 1.08.1 Burn every 3-5 yrs		w			w
1.04d	Unit 1.08.1 Monitor and evaluate vegetation	su	su	su	su	su
2.03a	Mow nature trail	su	su	su	su	su
2.03b	Cut and/or chemically treat invasive plants along nature trail	sp f	sp f	sp f	sp f	sp f
	Unit 1.09 Wetland Shrub					
1.04a	Cut woody plants and treat stubs with herbicide		sp f			sp f
1.04a	Unit 1.09.1 Cut woody plants	sp				
1.04a	Unit 1.09.1 Mow with brush-hog wood sprouts	su				
1.04b	Unit 1.09.1 Aerial spray herbicide	f				
1.04c	Burn every 3-5 years		sp			sp
1.04d	Unit 1.09.1 Plant native wildflowers and grasses			sp		
1.04e	Monitor and evaluate vegetation		su	su		su
2.03a	Unit 1.09.1 Establish an education station		sp			
1.04a	Unit 1.09.2 Aerial spray herbicide	f				
	Unit 1.10 Mud Lake Marsh					
1.07a	Monitor loosestrife beetles effect on purple loosestrife	su	su	su	su	su
	Unit 1.11 Wetland Forest					
2.03a	Cut trees and treat stumps that obstruct view of marsh		sp f			sp f
	Unit 1.12 Oak Forest					
1.04a	Cut and chemically treated glossy buckthorn			f	f	f
	Unit 1.14 Emergent Marsh					
1.04b	Spot spray woody plants	su	su	su	su	su
1.04c	Burn every 3-5 years	sp			sp	
1.04d	Monitor and evaluate vegetation	su	su	su	su	su
1.05b	Monitor hibernation mound use by snakes	sp f	sp f	sp f	sp f	sp f
	all - all seasons, f - fall, sp - spring, su - summer, w - winter					



Figure 1. Unit 1 Soil Map

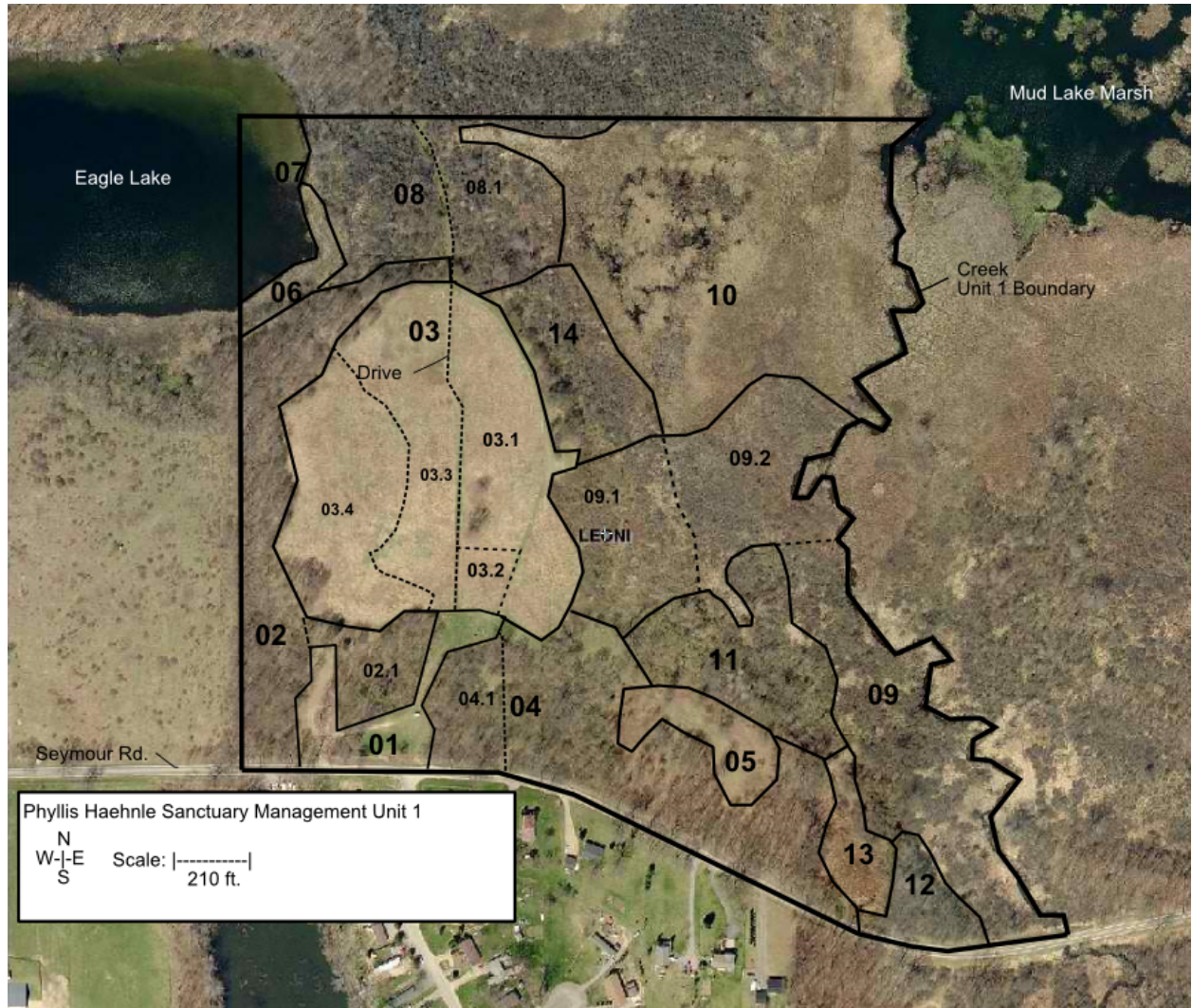


Figure 2. Unit 1 management units.