



Interim Forest Management Plan

Property Identifiers

Property Name and Designation: **Skunk and Foster Lakes State Natural Area**

County(ies): **Waupaca** Property Acreage: **266**

Forestry Property Code(s): **6916** Master Plan Date: (if property has one): **None**

Part 1: Property Assessment (1-2 pages maximum)

General Property Description

Landscape and regional context

Skunk and Foster Lakes SNA (SNA) is located in the SE corner of the *Forest Transition* Ecological Landscape (EL) in the central and western part of the state, lying along the northern border of Wisconsin's *Tension Zone*. While the central portion of the Forest Transition lies primarily on a glacial till plain deposited by glaciation between 25,000 and 790,000 years ago, the eastern and western portions are on moraines of the Wisconsin glaciation from 14,000 to 18,000 years ago. The growing season in this part of the state is long enough that agriculture is viable, although climatic conditions are not as favorable as in southern Wisconsin. Soils are diverse, ranging from sandy loam, to loam or shallow silt loam, and from poorly to well-drained.

The historic vegetation of this EL was primarily northern hardwood and hemlock hardwood forests. These mesic forests were dominated by sugar maple and hemlock, and contained some yellow birch, red pine, and white pine. Currently, 44% of this ecological landscape is forested compared to 86% before Euro-American settlement. Forested areas now consist primarily of northern hardwoods and aspen, with smaller amounts of oak and lowland hardwoods. Conifer and deciduous swamps are scattered throughout the ecological landscape and are often found near the headwaters of streams, and associated with lakes in kettle depressions on moraines. The eastern portion of the ecological landscape differs from the remainder being primarily forested and including numerous ecologically significant areas, some of which are extensive. The ecological landscape's flora shows characteristics of both northern and southern Wisconsin, corresponding to its position along the north side of the Tension Zone (Curtis 1959).

Skunk and Foster Lakes are located in the center of what was an oak-dominated corner of this largely northern mesic forest Ecological Landscape prior to European settlement. The soils are classified as forested loams, forming the southern end of a large block of this soil type that proceeds north/northeast. With respect to cover type, however, it is actually more consistent with the adjacent Central Sand Hills EL to the south. Classified as the *Amherst-Waupaca Moraine Complex* Land-type Association (LTA), this area was dominated by black, white and some bur oak prior to European settlement (making up 80% of the LTA), with a moderate to relatively low canopy cover.

The original surveyor's notes of 1851 bear much of this out. The upland portions of the site were dominated by oaks (white, black, and bur), ranging in tree density from savanna (i.e., oak opening, oak barrens; ~22 trees/acre) in the northwest, to forest (104 trees/acre) in the southwest portion of the SNA. The low riparian corridors were dominated by tamarack, with occasional scattered aspen and birch, and an alder understory.

Currently, the SNA features a cluster of five undeveloped glacial pothole lakes located in pitted outwash moraine topography surrounded by second-growth forest of aspen, paper birch, white pine, red maple



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(some sugar, especially on the west side of Skunk), elm, and white and red oak. A small amount of tamarack is also present along the lowland edges of the lakes, as well as a thin marsh edge of red osier dogwood, alder, and sedge-cat-tail community. Some open hilltop areas contain remnant prairie species. The 11-acre Skunk Lake is a deep, hard water marl lake with very clear water fed by seepages and springs. A wetland dominated by cattails and bulrush surrounds the lake and a navigable channel connects it to Foster Lake, a 7-acre shallow, hard water, muck-bottom lake. The lake is ringed with cat-tails and arrowhead with numerous submerged aquatics. Surrounding the lakes is second-growth dry-mesic forests with components of both the northern and southern types, including red maple, red oak, big-tooth aspen, paper birch, white oak and bur oak in the overstory. The mix of groundlayer plants includes large-flowered bellwort, tick-trefoils, sweet-cicely, lions-foot, spikenard, blueberry, partridge berry, pipsissiwa, and large-leaved aster. The topography is uneven with numerous glacial erratics strewn about. Grenlie Lake is a small, clear, hard water lake fed by seepage and springs and a small inlet from an adjacent marsh. The south side of the lake has a shallow bay with a small island and a small bog is also present. Aquatic flora of the lakes includes common and Illinois pondweed, northern water-nymph, white water-lily, and common bladderwort. Aquatic fauna includes soft-shell turtle, bluegill, pumpkinseed, northern pike, perch, and largemouth bass.

History of land use and past management:

Given the prevalence of dairy in the area, the property was probably grazed, with limited row crops on the flat top of the moraines probably beginning around the turn of the century. Most of these croplands were subsequently planted to pine after the 1930s dustbowl era (1941, 1955, 1982), with some stands having since been thinned as many as three times, beginning sometime after 1965. The most recent thinning in 2009 removed 430 cords of product.

Much of the first growth, or original timbered land, was probably subjected to harvests. The oldest second growth stand in the southwest corner of the project has an estimated 1905 origin, where there has been no detectable timber management since. The rest of the stands are younger, and thus, have had more recent timber management. Average age of the oak stand is 82 years; ranging from 1924 (90 yrs.) to 1950 (64 yrs.) estimated origin.

Native community management has included invasive species control of Japanese Hedge Parsley and Japanese Knotweed.

Site Specifics

- Current forest types, size classes and successional stages:

| Forest Type | # of Stands | Acres | Acres by Age Classes in 2013 | | |
|-------------|-----------------------|-------|------------------------------|--------|------|
| | | | 0-50 | 50-100 | 100+ |
| Oak | 2, 11, 14, 15, 16, 17 | 113 | 0 | 113 | 0 |
| Red Maple | 1, 18 | 16 | 0 | 16 | 0 |
| Aspen | 3, 12 | 27 | 0 | 27 | 0 |
| White Pine | 4, 13 | 22 | 0 | 8 | 14 |
| Red Pine | 8, 9 | 22 | 5 | 17 | 0 |



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|-----------------|------------------|------------------|-----------------|------------------|-----------------|
| Tamarack | 7 | 8 | 8 | 0 | 0 |
| Non Forest Type | 5, 6, 10 | 55 | N/A | N/A | N/A |
| Total | 18 stands | 263 acres | 13 acres | 181 acres | 14 acres |

- State Natural Area designations: Designated in 1996
- High Value Conservation Forests (HCVF) or other resources/natural community types limited in the landscape: Aquatic Preserve, Wetland Protection Area, and Oak Savanna and Dry-Mesic Forest Ecological Reference Areas.
- Biotic Inventory status: No formal recent biological inventories. A recent “Botany Blitz” (2011) was conducted by the Botany Club of WI. The subsequent plant lists is available.
- Deferral/consultation area designations: none
- Rare species: There are three rare herptiles in or near the SNA, including 1 frog and 2 turtles.
- Invasive species: There are *exotic* invasive species of concern on the site, with the most significant being the localized populations of both Japanese Hedge Parsley and Japanese knotweed. Other species include: Japanese barberry, Eurasian bush honeysuckle, black locust, creeping Charlie, and common speedwell. The former home site contains lily of the valley, Japanese hedge parsley, autumn olive, buckthorn, spotted knapweed and carpet bugle (*Ajuga*). Notably, no garlic mustard or celandine was found on the site during a 2013 inspection, although both are reported to exist here. Many areas have dense populations of briars, and red maple at undesirable levels. These are both native, but potentially invasive in the absence of management in certain community types.
- Soils: At 37% of the total SNA (including wetland areas), the Elderon-Rosholt soil complex (12-30% slopes) dominates the project area. This soil is characterized as excessively drained with very low available water capacity, with a parent material of coarse-loamy glaciofluvial deposits over gravely outwash. The next highest percent (13%) is the Rosholt sandy loam (2-6% slopes), which is considered well drained, having low water carrying capacity, and with a parent material of coarse-loamy glaciofluvial deposits over sandy and gravely outwash. This dominance is especially true when only compared to the upland soils.

Cultural and Recreational Considerations

- Cultural and archeological sites (including tribal sites): There is a small archeological site on the SNA, but is of no concern if Forest BMP’s are adhered to (Mark Dudzik – DNR Archeologist).



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Part 2: IFMP Components (1-2 pages maximum)

Management Objectives (Outline primary forest management objectives):

Given its location within the Forest Transition EL, and Wisconsin's vegetative tension zone, this site possesses both northern and southern community features – including southern dry-mesic forest and oak savanna from the south, and northern dry-mesic forest from the north. Therefore, the overarching goal will be to maintain the dry-mesic forest (both northern and southern) and oak savanna community types. Furthermore, given that parts of this site were historically dominated by a relatively thin canopy of oak (i.e., savanna; an indication of what the site is suitable for; see section on the findings from the original surveyors notes above), and given the climate change forecasts that indicate that the tension zone will be moving north over the next century, the long-term primary goal will be to maintain the oak component on the site, especially any white and bur, as the changing climate will be better suited for maintaining the southern community types compared to the northern ones.

1. Oak Savanna Restoration Unit (stand 17)

**Location: Stand 17, east/northeast of Skunk Lake

- a) Primary goal: Restore and maintain oak savanna spectrum
- b) Convert from an oak forest to an oak savanna, with lighter canopy on the north half (~30% closure) and heavier canopy on the south half (oak woodland; ~80% canopy), transitioning to the lower areas on the southwest end of the stand and the passively managed stand 14.
- c) Minimize regeneration to prevent from succeeding to an oak forest

2. Dry-Mesic Forest - Passive Management Area (South half of property)

**Location: south half of property; the north line of this area goes from southwest of the south end of Skunk Lake, incorporates the north, west and south shores of Skunk Lake, and then roughly east to north shore of Grenlie Lake (Stands 4, 5, 6, 7, 14 (south stand), 15, ~south ½ of 16

- a) Primary goal: Passively manage to maintain dry-mesic forests with old-growth characteristics
- b) Restore ground layer composition
- c) Some non-commercial thinning of red maple, bitternut, and small white pine may occur.

3. Dry-Mesic Forest - Active Management Area (North half of property)

**Location: north half of property; (Stands 1, 2, 3, 8, 9, 10, 11, 12, 13, 14 (northeast stand), ~small portion of 16 (north side of E-W lane), 18)

- a) Primary goal: Actively manage to transition to, and maintain, dry-mesic forest with some old-growth characteristics.
- b) Oak (Stands 2, 11, 14 (northeast stand), north portion of 16)
 - These stands will be managed following old-growth/old forest management techniques. Focus will be to keep existing oak on the landscape for as long as possible. Long term, limited timber production may occur.
- c) Aspen (Stands 3, 12)
 - Stand 3: convert to a white pine stand, and to the extent possible, incorporate oak into the stand.
 - Stand 12: convert to a swamp hardwood stand
- d) Red Maple (Stands 1, 18)
 - Short term objective: manage through even-aged management
 - Long term objective: convert to a pine-oak forest type
- e) Red Pine and White Pine (Stands 8, 9, 13)
 - Short term objective: even aged management for timber production



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- Long term objective: Naturally convert to white pine/oak forest
- f) Old Field (Stand 10)
 - Allow for natural successional process
 - Maintain small portions as future landing sites

Property Prescriptions (Identify specific and pertinent prescriptions by area or forest type, including passive management areas, extended rotation, and other information that will help achieve the objectives):

Silvicultural treatments may include stump-treating undesirable harvested species (e.g., red maple), woody and herbaceous invasive species control, thinning from below, enhancing oak and pine regeneration with plantings, and prescribed burning. Prescribed fire will be used to enhance the recruitment and establishment of oak and white pine regeneration by reducing competition (release burn), preparing seedbed (site preparation burn), and controlling invasive species. Regardless of the management unit, large vigorous trees, decadent trees, snags, and downed logs will be retained to enhance structural complexity and provide specialized habitat for numerous species.

1. Oak Savanna Restoration Unit (Stand 17)

- a) Reduce canopy closure on the north half to ~30%; targeting non-oak species for removal
- b) Reduce canopy closure on the south half (towards southwest) to ~80%; targeting non-oak species for removal
- c) Suppress regeneration through prescribed burning, mechanical and herbicide treatment.

2. Dry-Mesic Forest - Passive Management Area (South half of property)

**Location: south half of property; north line running from the north shore of Skunk Lake to north shore of Grenlie Lake (Stands 4, 5, 6, 7, 14 (south stand), 15, ~south ½ of 16

- a) Passive timber management to achieve old-growth characteristics.
- b) Restore ground layer composition by removal of invasive species, thinning of some overstory (e.g., red maple, bitternut, and small white pine), and the use of prescribed fire.

3. Dry-Mesic Forest - Active Management Area (North half of property)

**Location: north half of property; (Stands 1, 2, 3, 8, 9, 10, 11, 12, 13, 14 (northeast stand), ~north half of 16 (north side of E-W lane), 18)

- a) Transitioning to, and maintenance of, dry-mesic forest with some old-growth characteristics. Rate of transition will be determined via consultations between program staff. Planting of oak and/or pine may be necessary if there is inadequate natural regeneration. Fencing may be necessary to address herbivory concerns.
- b) Oak (Stands 2, 11, 14 (NE stand), ~ N ½ of 16)
 - Stand 14 (NE stand) and ~ N ½ of 16: Thin red maple, bitternut hickory and small white pine, favoring large oaks and white pine for retention.
 - Stands 2 and 11: Maintain stands 2 and 11 as an oak forest by targeting later successional species (such as red maple) for removal. Within these stands, reduce the canopy closure 20-40% (final canopy closure of ~70%) to ensure adequate sunlight will retain the ground layer species representative of this community type. Residual tree characteristics should include large vigorous trees, decadent trees, snags, and downed logs, to enhance structural complexity and provide specialized habitat for numerous species. Residual tree characteristics should include decadent trees and snags. These residual trees will remain on site for additional seed source, aesthetics, legacy trees, old growth characteristics, and as wildlife trees.

- c) Aspen (Stands 3, 12)



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- Stand 3: Convert this aspen stand as rapidly as possible given site conditions and stand age (71 years). Explore the option of thinning the stand to secure some economic benefit from the stand. If thinning is deemed problematic by the forester, especially if follow-up work is costly, we'll simply let the aspen become senescent and fall out of the system. Natural seeding will provide most of the white pine. Where white pine seed trees are not present, under-plant this stand with white pine seedlings (~900 seedlings per acre).
 - Stand 12: This stand has relatively few aspen and invasive species, and a significant amount of other desirable canopy species, making its conversion to a desirable canopy composition more feasible. Therefore, aspen will be girdled in place and/or trees may simply be left alone to let them live out their rotation
- d) Red Maple (Stands 1, 18)
- Short term: manage through even-aged management
 - Long term: these stands are heavier red maple stands that should be managed with the eventual goal of removing red maple from the stand, resulting in a pine-oak forest type. This transition may occur over a number of harvests, and may include under planting with pine and oak if necessary
- e) Red Pine and White Pine (Stands 8, 9, 13)
- Short term objective: even aged management following the normal silvicultural order of removal. Retain white pine and oak to achieve the long term goal.
 - Long term objective: Naturally regenerate the stand with residual white pine/oak overstory.
- f) Old Field (Stand 10)
- Allow for natural successional process. Planting of local genetic stock will remain as a viable alternative.
 - Maintain small portion as future landing sites

Approvals:

Joe Henry _____ 1/28/2015
District Ecologist Date

Mackenzie Siglinsky _____ 2/4/2015
Forester Date

Joe Henry _____ 1/28/2015
Property Manager Date

Jim Woodford _____ 2/6/15
Section Chief Date