



Interim Forest Management Plan

Property Identifiers

Property Name and Designation (multiple small properties can be grouped): **Observatory Hill State Natural Area**

County: **Marquette**

Property Acreage: **178.5**

Forestry Property Code): **3945 – compartment 105**

Master Plan Date: **A Non-NR44 compliant Management Plan approved March 4, 1996**

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

The following items should be considered during the property assessment. Not all sections may be relevant for all properties.

General Property Description

- Landscape and regional context

Observatory Hill is located in the Central Sand Hills Ecological Landscape and Landtype Association 222Kd08 French Creek Moraine. It is not found within a Conservation Opportunity Area or an Important Bird Area. The highest point in Marquette County is Observatory Hill, an isolated outcropping of porphyritic rhyolite rising 300 feet above the surrounding landscape. The fine-grained rhyolite, an igneous rock embedded with feldspar crystals, is highly resistant to erosion and has been dated to 1.76 billion years ago. On the exposed rocks at the summit are polished rock surfaces with grooves, striations, and chatter marks created by the passage of the glacial Cary ice sheet 12,000 years ago. The slopes are covered with a southern dry forest community dominated by red and white oak, basswood and shagbark hickory and much of the area is now being restored to oak woodland – an imperiled vegetation community in Wisconsin. Near the top of the hill, bedrock is exposed or close to the surface creating acidic conditions where a specialized glade community has developed. Red cedar dominates the glade and the thin soils support a sparse ground cover of mosses, ferns, and lichens. Two state-threatened plants are found on the site and the location data is withheld to protect these plants. Seeps emanating from the rocks and an intermittent stream on the east side are the only water resources.

- History of Land Use and Past Management

The site was visited by John Muir and subsequently written about in his journals regarding his boyhood. Many landowners pastured and managed the oak forest over the next 150 years. This management also included permitting visitors to climb to the summit to view the surrounding landscape. The site was legally dedicated by Governor Thompson in 1998.

Site Specifics

Observatory Hill SNA is 175 acres of primarily upland oak and central hardwoods, with a component of red cedar and red pine. The majority of the area is oak (133 acres), followed by red cedar (29 acres), a few grass openings (10 acres), and a red pine plantation (3 acres) on the north side of the property.



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Oak:

There are currently 133 acres of oak timber type. Based on an inventory in 2008, 125 acres of oak is approximately 107 years of age. The remaining 8 acres of oak is approximately 33 years of age. The majority of the oak areas are dominated by white oak and red oak with a component of central hardwoods species like black cherry, red maple, hickory, walnut, elm, basswood, and locust present. The originally scheduled rotation age for the oak is 110 years, but based on the rapidly declining condition of the oak, most likely due to a gypsy moth infestation in 2008, and the fact that invasive species like buckthorn, garlic mustard, and honeysuckle are beginning to take over the understory, the scheduled harvest date has been accelerated to 2012. The oak areas will be converted from oak forest to oak woodland through the anticipated 2012-2013 timber harvest.

Red Cedar:

There are currently 29 acres of miscellaneous conifer (red cedar) timber type. Based on a 2008 inventory, the current stand age is approximately 36 years of age. This stand of timber is located on the top of Observatory Hill and historically has been documented to be present prior to European Settlement. Due to fire suppression and prevention efforts in recent history, the red cedar has become very dense. This stand is growing on fairly thin soils due to the rock outcrops where the stand is located. The management objective is to maintain a component of red cedar in this stand, but decrease the density of red cedar within the stand.

Red Pine:

There are 3 acres of red pine timber type. This is a red pine plantation that originated in 1947. This stand has been thinned at least 2 times as of 2012. The stand will be managed on a 90 year rotation and re-evaluated at that time to determine if it will be maintained as a red pine stand following a regeneration harvest or if it will be converted to a different forest type.

State Natural Area designations

The entire area is a dedicated State Natural Area

- High Value Conservation Forests (HCVF) or other resources/natural community types limited in the landscape - NO
- Biotic Inventory status. Master plan biotic inventory not complete, however, the Natural Area County Inventory (the precursor to NHI) completed an inventory in 1982,
- Deferral/consultation area designations (refer to the following website): No
- Rare species – two state-threatened plant species.
- Invasive species
 - Garlic mustard is prevalent throughout the property.
 - Bush honeysuckle, black locust and common buckthorn are scattered in small population mostly on the north-facing slope.
- Soils – Sandy and sandy loam soils of variable particle sizes predominate on the slopes and flat areas. The summit has thin or no soil over bedrock.

Cultural and Recreational Considerations

- Cultural and archeological sites (including tribal sites)

Recently, scientists have discovered the existence of petroglyphs on the hill's rock outcroppings, which may be part of a larger prehistoric petroform found in Marquette County.

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

Management Objectives (Outline primary forest management objectives): Manage the site as an oak barrens, oak woodland and cedar glade ecological reference area in the long-term. The



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site is not currently functioning as an ecological reference area and needs to be restored to that function.

- 1) Oak Barrens
 - a. Restore an oak barrens community on the lower north-facing sandy slopes.
 - b. Promote replacement trees to maintain canopy densities.
 - g. Possibly convert pine plantation to oak barrens.
- 2) Oak Woodland
 - a. Restore the dense oak forest to a more open oak woodland community that persisted at this site for many centuries.
 - b. Promote replacement trees to maintain canopy densities.
 - c. Restore ground layer composition by remove invasive shrubs and augmenting the ground layer with oak woodland species.
- 3) Cedar Glade
 - a. Restore a cedar glade community with numerous red cedar and abundant grasses and wildflowers growing under the red cedars.
 - b. Closely monitor management operations for invasion by invasive species.

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):

Oak – Conduct a harvest to convert the oak forest to oak woodland tree density. Mark trees for whole tree utilization in order to facilitate post-harvest prescribed burns and invasive species management. After several burn cycles needed for control of invasive ground layer species and development of advanced root system development of seeded in oaks, fire will be greatly curtailed to permit rapid growth and development of replacement trees for the canopy. Additional thinning of canopy trees could occur when replacement trees are vigorous. BMPs for water quality would be used near any seeps and the intermittent stream.

Miscellaneous conifer (Red Cedars) – These conifers growing near the summit on extremely thin soils current are so dense that little grows on the forest floor. The red cedars need thinning to promote a diverse ground layer characteristic of cedar glades. The steep rock terrain along with the presence of archaeological features prohibits heavy mechanical equipment.

Pine plantation – Thin using order of removal and timing found in the silviculture handbook. Upon last entry to remove the final trees, decide whether to convert of oak barrens or replant to pines.

Oldfield – Utilize as landing area during the initial harvest. Thereafter permit natural seeding to fill in with trees. Control of scattered black locust via herbicide application will be necessary utilizing FSC approved pesticides.



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Approvals:

District Ecologist Date

Forester Date

Property Manager Date

Area/Team Supervisor Date