Witch-Lake Moraine Management Area
Preliminary DRAFT Example 8-03-07

The following provides an example of how Management Areas (MAs) will be applied in the Western Upper Peninsula (WUP) Regional State Forest Management Plan to provide direction to field level decisions regarding cover type management.

Witch-Lake Moraine Descriptive Narrative

The Witch-Lake Moraine MA (Figure 1) consists of the relatively common WUP landforms of bedrock-controlled ground and disintegration moraines. Bedrock granite and quartzite lies close to the surface of thick glacial deposits and is frequently exposed as steep knobs. Soils in this area are variable, ranging from

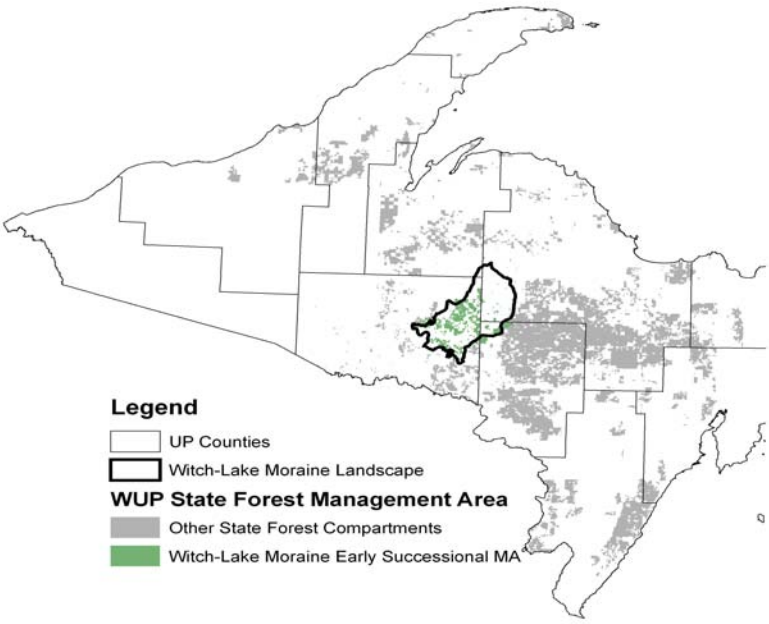

Figure 1. Location of draft example of the Witch-Lake Moraine Management Area in relation other MDNR State Forest lands in the Western U.P. Eco-region.

well-drained Amasa soils and moderately well-drained Champion soils, to peat deposits in lowland depressions. The landscape lies between the low and mid snowfall zones for the Upper Peninsula (UP).

Uplands were historically dominated by mesic northern forest with sugar maple-yellow birch as the dominant tree species with a significant upland cedar component. Lowlands occupied small glacial depressions and were historically dominated by poor conifer swamp communities.

The majority of the uplands in this system were harvested during the late 1800s and early 1900s, with white pines initially selectively harvested followed by even-age hardwood management. Past iron ore mining and three of the U.P.'s largest fiber consumers currently exist within 30 miles of the MA, and continue to significantly influence the area's timber resource. Large hydrologic power generation projects have resulted in significant impoundments in the MA, such as the Michigamme Reservoir which occupies 3% of a landscape. Two-thirds of the reservoir basin was historically mixed conifer swamp and sugar maple-hemlock forest while another 16% was yellow birch-hemlock forest.

MA Selection Criteria Used

<u>Ownership Criteria</u>

- Level of fragmentation of DNR State Forest Ownership
- Adjacency to other ownerships (Fed, DNR, Private)
- Percentage of landscape in different public and private ownerships

<u>Social/Economic Criteria</u>

- Proximity wood product markets
- Proximity to population areas and major transportation arteries to satisfy recreational demands

<u>Ecological Criteria</u>

- Historic vegetative composition
- Current vegetative composition and structure
- Wildlife species distribution patterns for select species
- Existing forest connectivity or fragmentation
- Analyses by Ecological Classification System

Witch Lake Moraine Management Area Characterization:

This management area has a small percentage of relatively fragmented public land. Upland species composition, structure and age class diversity have all been significantly altered from the original condition of this mesic northern forest landscape. There are no known occurrences of exemplary natural communities within the MA.

The current state forest land cover type distribution in the management area is shown in Table 1. Sugar maple has remained stable, while cedar and yellow birch have declined significantly since the mid-1800s (Table 2). Aspen historically represented 1% of the landscape, but is now the dominant species, representing 32% of species across all ownerships (Table 2). The cover type is even more dominant on State Forest Ownership, representing 48% of the MA (Table 1). The age-class distribution for aspen in the MA (Figure 2) is heavily skewed toward younger classes due to intensive timber harvests over the past few decades.

Seventy-eight percent of the MA is privately owned, with 30% being corporate and 48% being private, non-corporate. Twenty-two percent is publicly owned, all of which is state forest. The MA is unusual for the WUP because so little land is publicly owned and the nominal amount of public land occurs in small, fragmented blocks (Figure 3).

Table 1. Present state forest cover type distribution in the management area, (2006 DNR Data).

Cover Type	Acres	Percent of State Forest
Aspen	25,123	48%
Northern Hardwood	7,747	15%
Mixed Swamp Conifer	4,552	9%
Lowland Brush	3,075	6%
Spruce-Fir	1,744	3%
Spruce	1,555	3%
Rock	1,514	3%
Cedar	1,408	3%

Table 2. Relative abundance of tree species circa 1800 and at present. (Historic data from WUP analyses of GLO line tree data, contemporary data from WUP analyses U.S.F.S. FIA Data)

Species	**Historic Percent**	**Contemporary Percent**
Aspen	1%	32%
Balsam Fir	16%	11%
Northern White Cedar	17%	2%
Spruce	13%	9%
Sugar Maple	15%	16%
White Pine	8%	2%
Yellow Birch	13%	2%

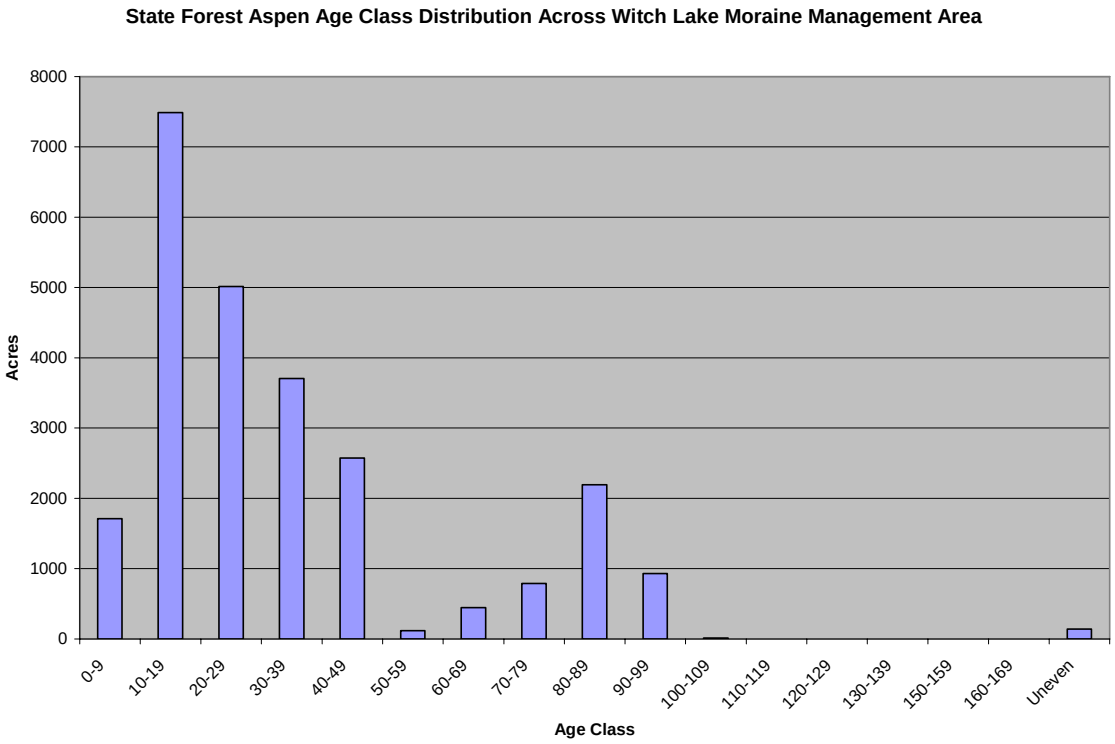

Figure 2. State Forest Aspen Age Class Distribution on the the Witch Lake Moraine MA.

Almost half of the manufacturing jobs in the U.P. are associated with the forest products industry (Leefers, 2007). Three of the U.P.'s largest fiber mills are located in the vicinity of this MA, resulting in a significant demand for early successional aspen. Hunting is also a significant factor in the local economy. The large acreage of aspen in the management area provides recreational hunting opportunities, with some of Michigan's best grouse hunting and critical habitat for woodcock populations. Deer numbers in this moderate snowfall area are relatively high and have been blamed for hardwood regeneration and recruitment failures. Deer populations benefit from the improved summer range of young, early-successional forest and utilize local winter cuttings. Sustainable and consistent harvesting will likely stabilize the local deer herd from the large oscillations in population that have occurred in recent years. Protection of conifer cover may also help carry more deer through severe winters. More experimentation is needed to isolate causal factors and identify silvicultural techniques that can increase the probability of successful hardwood regeneration in the MA.

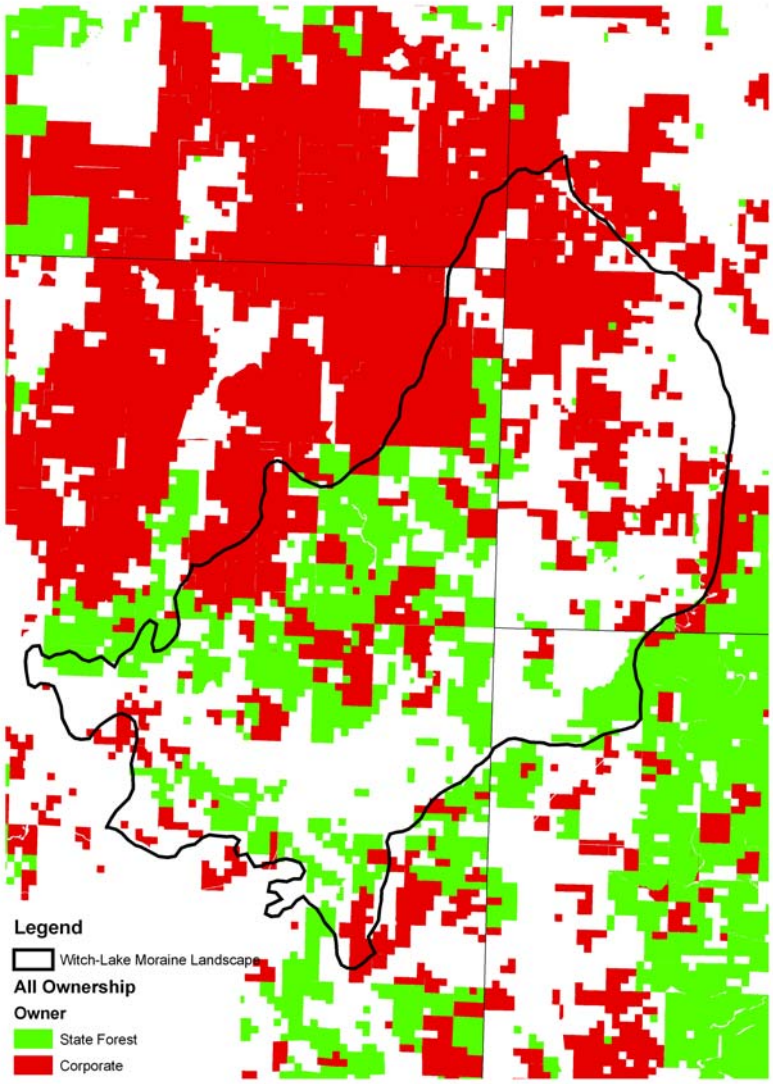

Figure 3. Landscape-Level Ownership Pattern in Witch-Lake Moraine Management Area.

Witch-Lake Moraine Management Area Direction

This section provides management direction for each MA. Local foresters and biologists will use the direction provided herein to guide management decisions that are made during the compartment review process. The management direction for the Witch-Lake Moraine MA is to:

1. Maintain consistent, reliable, and sustainable supply of timber products;

2. Provide habitat for species dependent on early successional conditions and associated societal desires;
3. Provide recreational opportunities associated with condition of the MA;
4. Increase sustainability of wildlife habitat and fiber availability across time by balancing age class distribution for even-aged cover types;
5. Species and societal desires requiring mature forest conditions will be addressed primarily in other management areas, although a nominal portion of this landscape will be maintained in mature conditions through:
   - Recruitment and maintainenance of a few select late successional compartments or stands;
   - Designation of Special Conservation Areas with late successional objectives;
   - Retention of compositional and structural attributes using statewide Within-Stand Retention Guidelines and via Desired Future Conditions by cover type outlined below;
   - Promotion and protection of critical dispersal and migratory corridors.

6. Cover Type Management:

   Aspen
   - Maintain a significant acreage (23,000 acres) of aspen for fiber production and wildlife habitat;
   - Increase the amount of young aspen in the 10-40 age class for wildlife habitat;
   - Move towards a balanced age class distribution by increasing prescriptions in the 30-39 and 40-49 year age classes and managing:
     - 80% of aspen resource on short rotation 40-50 years
     - 20% of aspen resource on 50-70 year rotations;
   - Decrease aspen acreage occurring on up to 2,000 acres of mesic sites (Kotar Types AOCA, ATD, ATD-Hp, and ATM) by allowing natural succession to northern hardwoods and/or mesic conifers, and;
   - Concurrently retain declining aspen trees and other longer-lived species (maples, oaks and pines) to enhance vertical structure.

Northern Hardwoods:
- Foster multiple age classes and improved regeneration through non-traditional management techniques and monitoring:
  - Uniform shelterwood system mesic sites with on poorer nutrient regimes to create large canopy openings;
  - Variable prescriptions in larger stands (i.e.lighter thinnings to 100+ ft^2 residual basal area (BA), standard thinnings to 70-80 ft^2 residual BA w/exclosures around gaps, heavier thinnings to 50-60 ft^2 residual BA);
  - Group selection thinning to create moderate canopy openings up to 0.5 acres in size;

    - Monitor efficacy of alternative methods by clearly documenting non-traditional techniques being utilized and conducting regeneration surveys in the spring and fall for the first three years after treatment to assess the quantity and persistence of regeneration and the impact of fall/winter browse pressure.
- Increase structural diversity by implementing retention guidelines that retain large living trees and snags.
- Promote species diversity by utilizing silvicultural techniques that encourage diversity and species that have declined significantly (e.g. cedar, yellow birch, white pine) and against species that have increased exponentially (e.g. red maple).

Mixed Swamp Conifers and Cedar:

- Treatments in this type should proceed cautiously, utilizing small experimental cuts to determine the ability to regenerate the full compliment of species known to these types and to clearly identify any causes of regeneration failure.