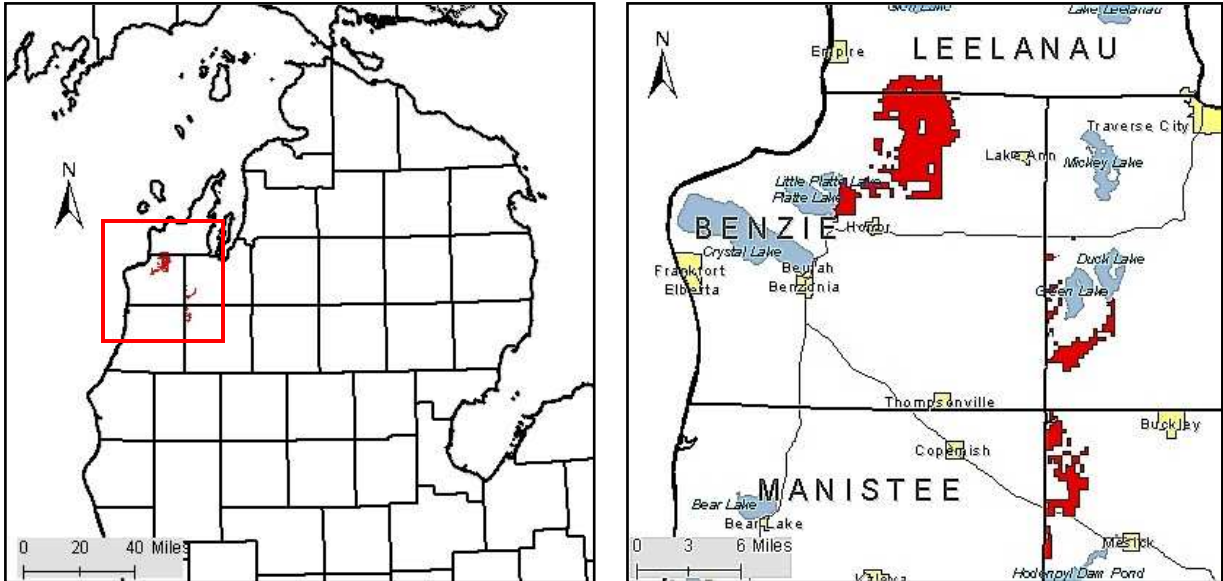


Benzie Moraines Management Area



Attributes

The Benzie Moraines Management Area management area is located in the northwest corner of Benzie County just east of Frankfort and has approximately 25,200 acres of State Forest land. The primary attributes which were important in identifying this MA include:

- Ecological Classification - The MA falls mostly within the Newaygo Outwash Plain Sub-region of the NLP Ecoregion as classified by Albert (1994).
- Cover Types – Historically this area has been American beech- sugar maple. Currently, upland hardwoods, aspen and red pine cover the majority of the area.
- Landforms – Moraine ridges, moraines or till account for 53% of the landforms within the management area.
- Social and Economic – Dispersed recreation in the form of hunting and mushroom hunting, as well as concentrated recreation on the North Country, Platte River and Maple City Trails is significant. Garey Lake Trail Camp is also located within the management area.
- Ownership size and connectivity – The majority of the state land in this area is in one large block. However, there are also several other clusters of individual compartments as well as isolated compartments.

Major Cover Types

- Northern Hardwoods/Upland Hardwoods – Upland hardwoods cover more than 9,600 acres on moraine ridges. Nearly half of the upland hardwood acres are in stands with a basal area between 81-110 square feet indicating recent selection harvesting. Another 2,068 acres of upland hardwood can be found in denser stands of 111-170 square feet of basal area.
- Aspen - Aspen is distributed throughout the area on dry to mesic sites and poor to rich nutrient sites. Aspen (most commonly bigtooth aspen) totals approximately 5,100 acres with

one large spike of over 1,500 acres in the 30-39 year old age class and over 700 acres that are greater than 80 years old.

- **Red Pine** – Red pine is located on high quality moraines of dry to medium moisture and poor to rich nutrients. Of the approximately 3,300 acres of red pine over 2,800 acres is in the 40-69 year age classes. There has been very little regeneration for the past 40 years, and there is very little representation in older age classes.
- **Upland Brush/Grass** - Grass and upland brush totals approximately 2,000 acres. This is a result of the past management practices or natural processes of fire, frost or other disturbances which create openings in the forest canopy along with maintenance treatments to keep areas open.
- **White Pine** - White pine is predominantly in poor quality plantations (989 acres) that have been affected by white pine weevil. The age distribution is concentrated between the ages of 40-59 years which coincided with an active period of planting. There is some mature white pine scattered in hardwood stands.
- **Oak** – There are isolated areas of red oak totaling 720 acres in the management area. The age distribution is heavily skewed towards the older age classes and there has been almost no oak regeneration for 70 years.

Benzie Moraines			Age Class (Years)											Uneven Aged
Cover Type	Total Acres	%	0-9 Yrs	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	
Upland Hardwoods	9665	38%	20	75	93	130	124	80	504	200	1664	1553	265	4957
Aspen	5129	20%	283	741	707	1502	419	174	253	294	512	30	0	214
Red Pine	3362	13%	0	170	285	24	674	1144	1003	0	8	54	0	0
Grass	1231	5%	0	0	0	0	0	0	0	0	2	0	0	0
White Pine	989	4%	0	0	0	0	221	737	0	0	0	10	6	15
Oak	720	3%	0	0	0	10	5	0	0	281	114	142	168	0
Upland Brush	711	3%	0	0	27	241	0	0	0	0	0	0	0	0
Other Types	3417	14%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Totals	25,244													

Other Types include: Mixed Swamp Conifer, Tamarack, Swamp Hardwoods, Lowland Brush, Cedar, Jack Pine, Water, Upland Mixed Deciduous, Lowland Mixed, Lowland Poplar, Local Name, Non-Stocked, Upland Mixed, Marsh, Hemlock, Spruce Fir, Paper Birch, Upland Mixed Conifer, Bog or Marsh.

Concepts of Management

- **Upland Hardwood (38% of the MA)** – Where suitable, harvest through selection cuts almost all of the stands of greater than 111 square feet of basal area. Utilize selection harvests on some stands in the 81-110 basal area range. This is essentially a maintenance condition and will allow continued management through selective harvesting as dictated by growth.
- **Aspen (20% of the MA)** – Mimic historical natural disturbance patterns which were primarily fire events that resulted in small pockets of aspen interspersed between large blocks of upland hardwoods. Although it will take several rotations to balance the 0-59 year age class distribution, target harvests for aspen age class spikes. Some aspen is most likely inoperable due to steep slopes or other constraints and should be allowed to succeed to upland hardwoods or other types based on habitat type suitability. Where aspen is accessible in the 60-89 year age classes, it should be targeted for harvest.

- Red Pine (13% of the MA) – Following the Red Pine Management Guidelines, address the age class spike of red pine and trough of regeneration. Harvest aggressively in the age class spikes between 40-69 years and regenerate suitable red pine areas through planting or prescribed fire to encourage natural regeneration. Allow selected areas of managed red pine to reach biological maturity. Following the Within Stand Retention Guidelines allow selected individual red pines in other cover types to become super canopy trees.
- Upland Brush/Grass (7% of the MA) - Continue opening maintenance by prescribed burning and brush removal to maintain upland brush/grass at a level suitable for wildlife.
- White Pine (4% of the MA) – Based on habitat type or current composition, either thin white pine plantations and allow conversion to mixed pine/hardwood stands or final harvest and replant to red pine. Continue to manage scattered white pine in hardwoods in order to maintain a conifer component.
- Oak (3% of the MA) – Manage better quality red oak sites to encourage regeneration through shelterwood harvests, prescribed burning or planting of a conifer component to shelter the oak.