4.20 Menominee End Moraine Management Area

Summary of Use and Management

Vegetative management in the Menominee End Moraine management area (MA) (Figure 4.20.1) will provide a variety of forest products; maintain or enhance wildlife habitat; protect areas with unique characteristics; and provide for forest based recreational uses. Timber management objectives for the 10-year planning period include improving the age-class distribution of aspen and lowland conifers; maintaining the conifer component in northern hardwood stands; maintaining the presence of minor cover types on the landscape; and maintaining non-forest vegetation types. Wildlife management objectives include will be to address the habitat requirements identified for the following featured species: black bear, eastern bluebird and ruffed grouse. Management activities may be constrained by site conditions and the skewed age-class distributions. Balancing age classes and potential insect (two-line chestnut bore) and disease infestations (oak wilt) will be issues for this 10-year planning period.

Introduction

The Menominee End Moraine management area is on an end moraine in western Menominee County. The state forest covers about 22,410 acres and is in scattered blocks. The major ownership in this vicinity is non-industrial private. The management area is dominated by the aspen, oak and cedar cover types. Other attributes that played a role in the definition of this management area include:

- Dominated by the following natural communities: mesic northern forest, poor conifer swamp and barrens;
- Mid-range in site quality;
- This is a popular hunting and recreation area near the communities of Menominee, Iron Mountain and Escanaba;
- Provides multiple benefits including forest products and dispersed recreational activities; and
- Provides a variety of fish and wildlife habitats.

The management priority in this area is to continue to provide these multiple benefit in a sustainable manner while minimizing user conflicts. Additional priorities include the maintenance of the oak cover type and oak/pine barrens found in this area.

The predominant cover types, composition and projected harvest areas for the Menominee End Moraine management area are shown in Table 4.20.1.

Table 4.20.1. Summary of cover types, composition, limited factor area, manageable area and projected harvest area for the Menominee End Moraine management area (2012 Department of Natural Resources inventory data).

Cover Type	Cover %	Current Acreage	Hard Factor Limited Acres	Manageable Acres	10 Year Projected Harvest (Acres)		Projected Acreage in 10 Years	Desired Future Harvest (Acres)	
					Final Harvest	Partial Harvest		Final Harvest	Partial Harvest
Aspen	39%	8,668	221	8,447	774	0	8,668	1,409	0
Oak	11%	2,513	857	1656	193	171	2,513	184	389
Cedar	10%	2,185	0	2185	0	0	2,185	137	0
Northern Hardwood	8%	1,846	190	1656	0	736	1,846	0	736
Lowland Conifers	8%	1,708	408	1300	144	0	1,708	144	0
Upland Open/Semi-Open Lands	4%	934	0	934	0	0	934	0	0
Lowland Open/Semi-Open Lands	3%	780	0	780	0	0	780	0	0
Misc Other (Water, Local, Urban)	1%	154	0	154	0	0	154	0	0
Others	16%	3,623	830	2793	255	299	3,623	307	420
Total		22,411	2,506	19,905	1,365	1,206	22,411	2,181	1,545

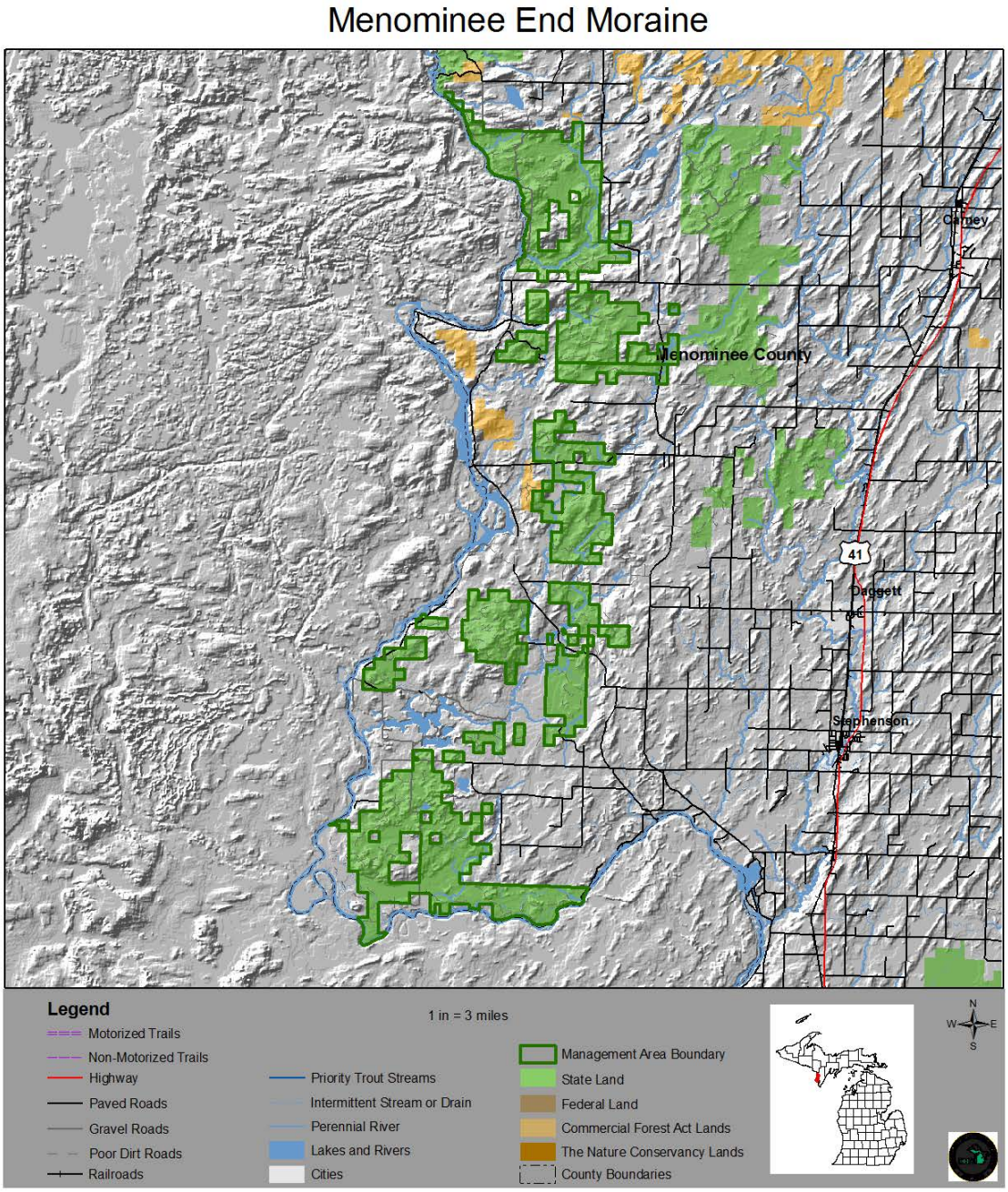

Figure 4.20.1**.** A map of the Menominee End Moraine management area (dark green boundary) in relation to surround state forest and other lands in Menominee County, Michigan.

4.20.1 Forest Cover Type Management Direction

The following sections contain information on vegetation management for each of the major cover types, a grouping of minor cover types and important non-forested vegetation types for the Menominee End Moraine management area in the form of Desired Future Condition, 10-Year Management Objectives and Long-Term Management Objectives. This information applies to those portions of the forest where active management (i.e., timber harvest, prescribed fire, planting

or mowing) will be conducted. In other portions of the state forest, the natural processes of succession and disturbance will provide ecological benefits. While most stands have a variety of tree species and other vegetation, they are classified by the species with dominant canopy coverage.

The following cover types are valued commercially for their timber products; ecologically as sources of habitat for numerous wildlife species; and for the variety of recreational opportunities they provide. Harvesting and regenerating these cover types will provide for a continuous flow of forest products and will help to ensure (or provide) wildlife habitat.

Aspen Cover Type

Current Condition

The aspen cover type covers 8,668 acres (39%) of this management area (Table 4.20.1). Most of the aspen cover type in this management area is found on medium productive sites. Aspen is fairly well distributed across age classes (Figure 4.20.2). A few acres of aspen have limiting factors on them. Many of these acres will succeed to upland spruce/fir.

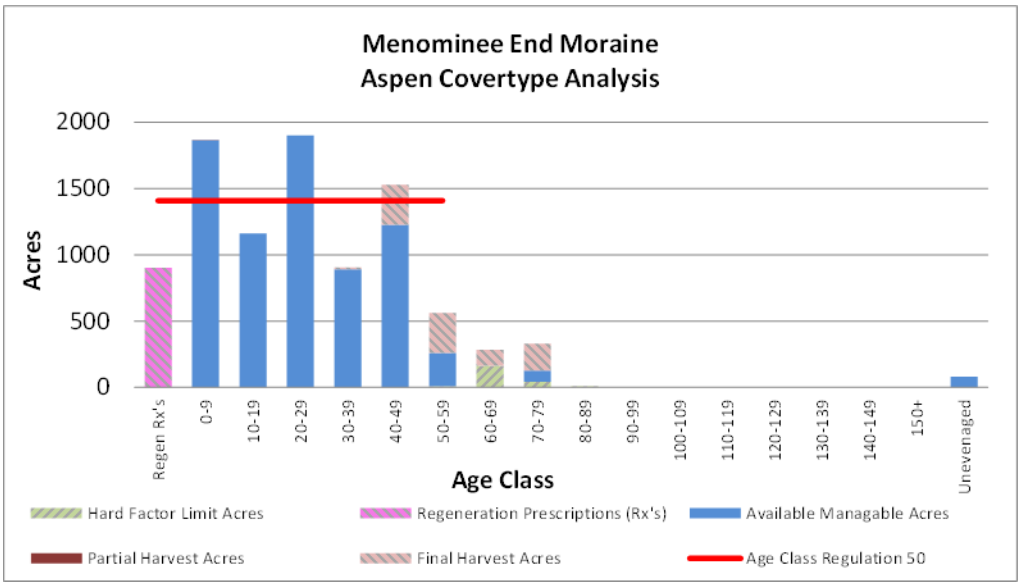

Figure 4.20.2. Graph of the age-class distribution for the aspen cover type on the Menominee End Moraine management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Balanced acres in each age class over a 50-year rotation;
- Provide a supply of forest products;
- Provide a balanced mix of habitat conditions for a variety of wildlife; and
- Provide a variety of hunting-type opportunities.

Long-Term Management Objective

- Regenerate approximately 1,409 acres each decade.

10-Year Management Objectives

- Harvest 774 acres mostly from the 40-49 year and older age classes; and
- As biomass markets improve opportunities to harvest from the younger age-classes will be explored.

Oak Cover Type

Current Condition

Oak is present on 2,513 acres (11%) in this management area (Table 4.20.1) and is important to wildlife for mast production. Most of the oak is over 60 years old and many of the stands are in decline. Oak in this management area consists of pin oak, a scrubby oak of poor timber quality and fair-quality red oak.

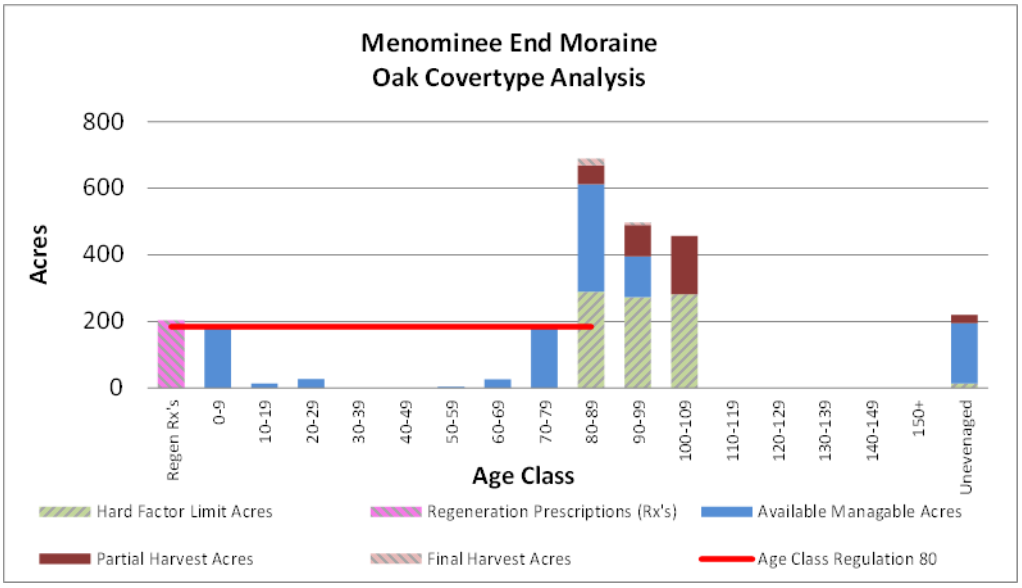

Figure 4.20.3. Graph of the age-class distribution for the oak cover type on the Menominee End Moraine management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Maintain a component of oak in mixture with natural red and white pine; and
- Some oak and aspen mixed stands will be maintained where opportunities exist.

Long-Term Management Objectives

- Regenerate approximately 184 acres of oak per decade;
- Pin oak stands will be regenerated on an 80-year rotation whereas higher quality red oak will be managed on a longer rotation length;
- Thin approximately 389 acres of oak per decade;
- Maintain oak as a component of mixed upland types through harvesting; and
- Monitor oak stands for oak wilt.

10-Year Management Objectives

- Thin up to 171 acres this decade of oak in this 10-year planning period to increase hard mast production;
- Harvest and regenerate 193 acres of oak; and
- In oak stands affected by oak wilt, convert to pine types or oak barrens.

Cedar Cover Type

Current Condition

The cedar cover type covers 2,185 acres (10%) are in this management area (Table 4.20.1). These are poorly drained sites supporting stands of mostly cedar mixed with black spruce, tamarack and balsam fir. The cedar type is poorly distributed across age classes (Figure 4.20.4). Most of the stands are over 80 years of age. Little harvesting has been done in this type over the past 60 years.

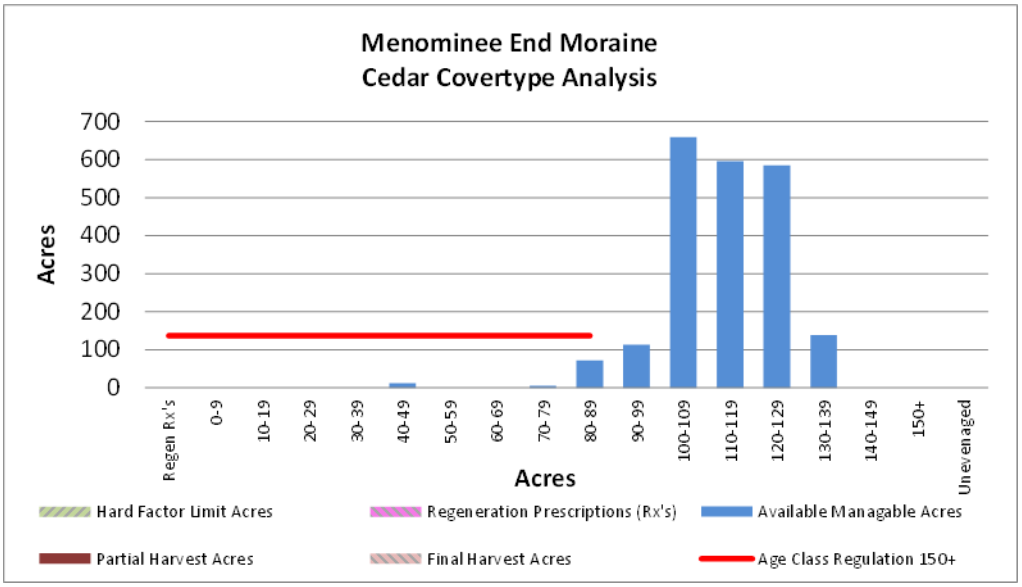

Figure 4.20.4. Graph of the age-class distribution for the cedar cover type on the Menominee End Moraine management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Closed canopy stands interspersed with patches of all age classes; and
- Sustainable regeneration and recruitment of seedlings and saplings.

Long-Term Management Objectives

- Maintain cedar cover type on the landscape; and
- Regenerate 137 acres per decade to a species-mix similar to the pre-harvest conditions.

10-Year Management Objectives

- While no active management activities are planned in this type in this 10-year planning period, limited harvesting may occur to test methods of cedar regeneration.

Northern Hardwoods Cover Type

Current Condition

Northern hardwood stands make up about 1,846 acres (8%) of this management area (Table 4.20.1) and occur on medium-quality sites. Most stands have been managed on a selection harvest basis, but regeneration success has been limited. Some stands have well-established sedge understory with little tree regeneration, shrub or herbaceous plant communities present.

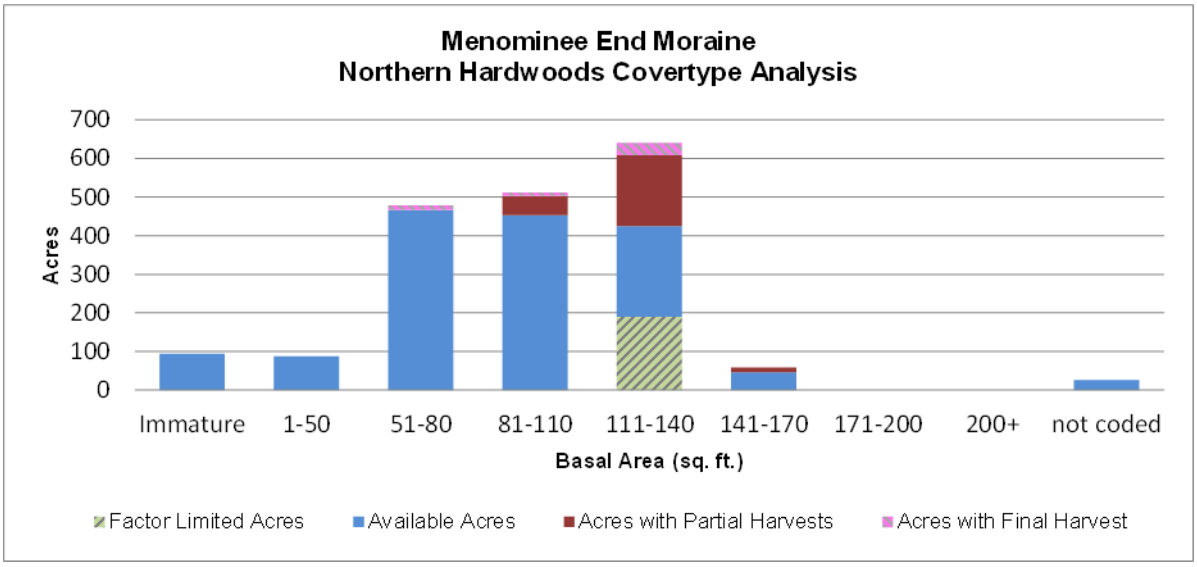

Figure 4.20.5. Graph of the basal area distribution for the northern hardwood cover type on the Menominee End Moraine management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Sustainable regeneration and recruitment of northern hardwood species leading to an all-age structure.

Long-Term Management Objectives

- Selectively harvest high quality northern hardwood stands on a 20-year cycle, resulting in 736 acres being harvested each decade;
- Low quality hardwood stands dominated by red maple will be managed on an even-aged basis using an 80-year rotation; and
- Maintain and encourage minor species to increase within-stand diversity.

10-Year Management Objectives

- Selectively harvest 736 acres during this 10-year planning period;
- Maintain a component of white pine, oak, hemlock and upland cedar where they occur in stands that are harvested;
- Experiment with mechanical and chemical treatments of the sedge understory to establish hardwood regeneration and improve understory diversity; and
- Monitor even-aged hardwood regeneration.

Lowland Conifers Cover Type

Current Condition

The lowland conifer cover type covers 1,708 acres (8%) of the management area (Table 4.20.1). These are poorly drained sites supporting mixed stands of cedar, black spruce, tamarack, balsam fir, white birch and balsam poplar. Due to the wet site conditions, they are more susceptible to rutting damage from logging equipment and present difficult operating conditions for harvesting. Mixed lowland conifers are poorly distributed across age classes, spiking in the 70-89 year age classes (Figure 4.20.6). Some harvesting has been done in this type over the past 70 years.

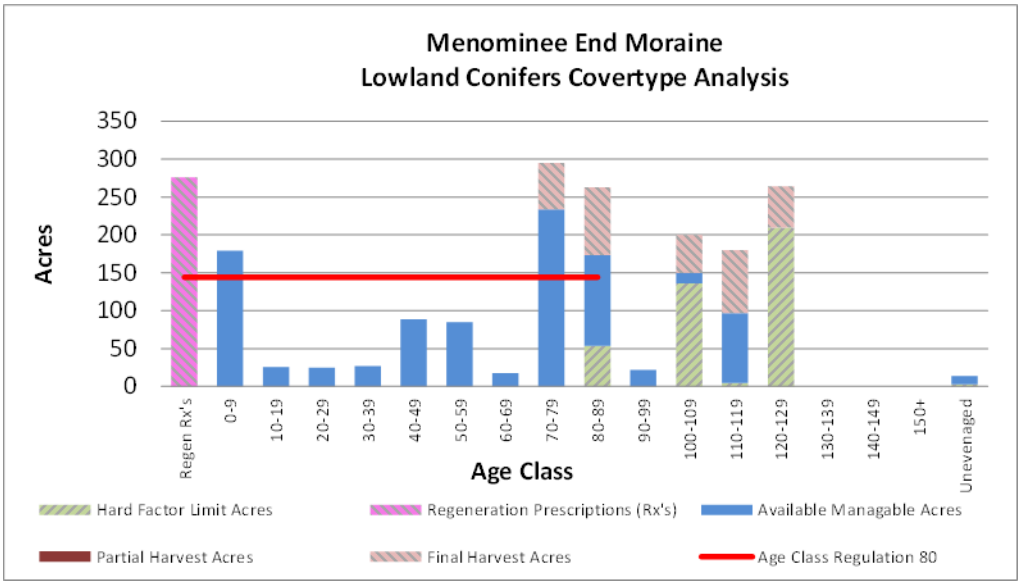

Figure 4.20.6. Graph of the age-class distribution for the lowland confiers cover type on the Menominee End Moraine management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Closed canopy stands interspersed with patches of all age classes;
- Sustainable regeneration and recruitment of seedlings and saplings;
- Mixed lowland conifer stands provide important winter habitat for deer and it is necessary to maintain the closed canopy (>70%) structure in many stands for that purpose; and
- Harvesting will be planned to regenerate stands before widespread mortality occurs.

Long-Term Management

- Manage stands on an 80-year rotation resulting in the harvest of 144 acres each decade.
- Regenerate stands to species mixes similar to the pre-harvest conditions favoring cedar, black spruce, hemlock and balsam fir; and
- Harvesting will be done using the appropriate silvicultural techniques.

10-Year Management

- Harvest 144 acres during this 10-year planning period.

Other Forested Cover Types

Current Condition

Other forested types make up 3,623 acres and are made up of white pine (874 acres), lowland deciduous (633 acres), tamarack (400 acres), upland spruce/fir (370 acres), red pine (204 acres), mixed upland deciduous (194 acres), lowland mixed forest (186 acres), lowland poplar (171 acres), upland mixed forest (169 acres), lowland spruce/fir (161 acres), natural mixed pine (92 acres), upland conifers (81 acres), jack pine (77 acres) and paper birch (11 acres). Together these types make up about 16% of the management area.

Desired Future Condition

- Maintain the presence of the minor cover types within the management area.

Long-Term Management Objectives

- Manage minor cover types to maintain representation using appropriate silvicultural methods; and
- Featured species habitat requirements will be taken in to consideration.

10-Year Management Objectives

- Harvest those stands without harvest limitations adjacent to other planned harvest activities and where stand conditions indicate that harvesting is appropriate; and
- Expected harvests in these types will be less than 554 acres during this 10-year planning period.

Other Non-forested Cover Types

Current Condition

The following non-forested cover types are found on this management area: upland open/semi- open lands (934 acres – 4%), lowland open/semi-open lands (780 acres – 3%) and miscellaneous other (water, local, urban) (154 acres – 1%).

Desired Future Condition

- These areas will be maintained in the current condition.

Long-Term Management Objective

- Grass will be burned or mowed to prevent forest encroachment.

10-Year Management Objective

- Grass-types will be treated for opening maintenance as needed.

4.20.2 – Featured Wildlife Species Management

The Menominee End Moraine management area contains forest types that are adapted to sandy outwash plain conditions. Most of the western Upper Peninsula oak resource on state forest is located here and the enhancement of this cover type is a high priority for wildlife. The presence of oak wilt disease increases the urgency to find management solutions to oak regeneration challenges. There are also opportunities to expand and link forest openings and upland brush habitats through the use of prescribed burns and mechanical treatments. Another high priority is restoration of oak-pine barrens savanna in Compartment 109.

The primary focus of wildlife habitat management in the Menominee End Moraine management area will be to address the habitat requirements identified for the following featured species: black bear, eastern bluebird and ruffed grouse. Based on the selected featured species, some of the most significant wildlife management issues in the management area are: early successional forest; mast (hard and soft); large open land complexes (with snags in open lands); and retention of patches of dead trees left by fire, disease and insect outbreaks. During this 10-year planning period, additional analyses to better define the spatial extent of priority areas for featured species will be performed.

Black Bear

The western Upper Peninsula black bear goal is to maintain or improve habitat. Management for bear should focus on improving existing habitat (e.g., maintaining corridors, mast and refuge trees) in this management area.

Wildlife habitat specifications:

- Maintain or increase the oak cover type and within stand oak component of hardwood forests within the management area;
- Maintain or increase mast by providing forest clearings that promote food sources such as pin cherry, juneberry/serviceberry, hazel, raspberry, blackberry and blueberry;
- Minimize herbicide use that would be detrimental to mast production;
- Maintain lowland conifer and hardwoods along and around drainages, vernal pools and forested wetlands; and
- Maintain refuge tree species with rough bark for cubs to escape (e.g., white pine and hemlock).

Eastern Bluebird

The western Upper Peninsula goal for bluebirds is to maintain or improve habitat. State forest management efforts during this planning period will focus on maintaining or expanding open land conditions, protection of snags or dying standing trees associated with openings and managing opening complexes/ savanna with prescribed fire.

Wildlife habitat specifications:

- Maintain herbaceous open-land complexes within the management area using prescribed burns or mowing and consider the spatial arrangement.
- Protect snags or dying standing trees within the open-lands. If nest cavities are not present, consider: leaving standing live trees (e.g., aspen) trees in final harvest timber sales; and/or planting scattered oak.
- Leave a ½-chain buffer around openings to limit aspen encroachment following timber harvest.

Ruffed Grouse

The western Upper Peninsula goal for ruffed grouse is to maintain or improve habitat. Management during this planning period will focus on early successional forest in priority landscapes, balancing age-class distribution and provision of soft browse.

Wildlife habitat specifications:

- Maintain aspen acres in the management area and balance the age-class distribution of aspen cover types.
- Stand size for grouse: Ideal aspen stands will be irregularly shaped 10-40 acres to maximize juxtaposition or edge avoiding extensive single age final harvests. Larger harvest units should have irregular boundaries, provide one 1-3 acre unharvested clumped inclusion for every 40 acres harvested.
- Hold or increase the conifer component in aspen stands. Leave conifers under four-inch diameter at breast height in mixed stands and aspen types as immediate residual escape cover and to promote corridors.
- Maintain cherry production for soft mast and oak component in stands with oak and emphasize areas with a hazel understory.

4.20.3 – Rare Species and Special Resource Area Management

All forest operations must be reviewed for potential conflicts between rare species and proposed forest operations following the guidance in "*DNR's Approach to the Protection of Rare Species on State Forest Lands*" (IC4172). This is especially important when listed species are present, when past surveys have indicated a possibility of their presence, or when appropriate habitat is available and the species is known to occur in the general region.

Past surveys have noted and confirmed seventeen listed species as well as two natural communities of note occurring in the management area as listed in Table 4.20.2. Any established management guidelines will be followed. Further surveys for special species and natural communities will be carried out as a matter of course during the inventory process and opportunistically for special more focused surveys.

The Shaky Lakes natural area is a 1,527 acre special conservation area as shown in Figure 4.20.7.

Approximately 537.1 acres of potential old growth have been identified within the Menominee End Moraine management area. These stands were identified for a broad range of reasons and were coded in the Operations Inventory database as Stand Condition 8. These stands area also special conservation areas until they are evaluated.

The Menominee River Natural Resources Area (2,539 acres) is a dedicated management area that is a high conservation value area found within this management area. There are also two ecological reference areas as shown in Figure 4.20.7. The ecological reference areas represent the hillside prairie natural community (1.3 acres) and the oak-pine barrens natural community (1,559 acres).

Table 4.20.2. Occurrence information for special concern, rare, threatened and endangered communities and species for the Menominee End Moraine management area.

Common Name	Scientific Name	Status	Status in Management Area	Climate Change Vulnerability Index (CCVI)	Confidence	Natural Community Association	Probable Cover Types	Successional Stage
Natural Communites								
Hillside prairie		S1/G3	Confirmed				Upland open/semi-open	N/A
Oak-Pine barrens		S2/G3	Confirmed				Oak	Mid
Birds								
Northern goshawk	*Accipiter gentilis*	SC/G5/S3	Confirmed	PS	Very High	Mesic northern Forest	Northern Hardwood	Late
						Hardwood-conifer swamp	Lowland Mixed	Mid
						Northern hardwood swamp	Black Ash	Late
						Floodplain forest	Lowland mixed	Mid
						Dry northern forest	Jack Pine, Red Pine	Late
						Dry-mesic northern forest	White Pine	Late
						Boreal forest	Upland & Lowland Sp/F	Mid
Bald eagle	*Haliaeetus leucocephalus*	SC/G5/S4	Confirmed	IL	Moderate	Bog	Lowland open/semi-open	N/A
						Hardwood-conifer swamp	Lowland Mixed	Mid
						Northern hardwood swamp	Black Ash	Late
						Poor conifer swamp	Tamarack	Late
						Rich Tamarack swamp	Tamarack	Late
						Floodplain forest	Lowland mixed	Mid
						Dry northern forest	Jack Pine, Red Pine	Early
						Dry-mesic northern forest	White Pine	Late
						Mesic northern Forest	Northern Hardwood	Late
Fish								
Lake sturgeon	*Acipenser fulvescens*	T/G3G4/S2	Confirmed	HV	Moderate	Great Lakes	Aquatic	N/A
						Rivers	Aquatic	N/A
						Mainstem streams	Aquatic	N/A
Beetle								
American burying beetle	*Nicrophorus americanus*	X/LE/SH/G2G3	**Unconfirmed**	N/A	N/A	Dry-mesic prairie	Upland open/semi-open	N/A
						Bur oak plains	Oak	Mid
						Mesic prairie	Upland open/semi-open	N/A
						Dry-mesic northern forest	White Pine	Late
						Mesic northern forest	Northern Hardwood	Late
Mullusks								
Elktoe	*Alasmidonta marginata*	SC/G4/S2S3	Confirmed	HV	Low	Mainstem streams	Aquatic	N/A
Slippershell mussel	*Alasmidonta viridis*	T/G4G5/S2S3	Confirmed	EV	Low	Headwater Stream	Aquatic	N/A
						Mainstem streams	Aquatic	N/A
						Inland lake	Aquatic	N/A
Black sandshell	*Ligumia recta*	E/G5/SNR	Confirmed	?	?	Unknown		
Hickorynut	*Obovaria olivaria*	E/G4/S2S3	Confirmed	MV	Low	Rivers	Aquatic	N/A
Round pigtoe	*Pleurobema sintoxia*	SC/G4G5/S2S3	Confirmed	HV	Low	Mainstem streams	Aquatic	N/A
						Rivers	Aquatic	N/A
Plant								
Western mugwort	*Artemisia ludoviciana*	T/G5/S1	Confirmed			Oak barrens	Oak	Mid
						Oak-pine barrens	Oak	Mid
						Hillside prairie	Upland open/semi-open	N/A
Dwarf milkweed	*Asclepias ovalifolia*	E/G5?/S1	Confirmed			Oak-pine barrens	Oak	Mid
						Dry northern forest	Jack Pine, Red Pine	Late
Cooper's milk vetch	*Astragalus neglectus*	SC/G4/S3	Confirmed			Alvar	Upland open/semi-open	N/A
						Oak barrens	Oak	Mid
						Boreal forest	Upland & Lowland Sp/F	Mid
						Hillside prairie	Upland open/semi-open	N/A
						Lakeplain oak openings	Upland open/semi-open	
						Limestone bedrock glade	Upland open/semi-open	N/A
						Limestone bedrock lakeshore	Upland open/semi-open	N/A
						Limestone cobble shore	Upland open/semi-open	N/A
						Mesic sand prairie	Upland open/semi-open	N/A
						Oak-pine barrens	Oak	Mid
Richardson's sedge	*Carex richardsonii*	SC/G4/S3S4	Confirmed			Alvar	Upland open/semi-open	N/A
						Northern fen	Lowland open/semi-open	N/A
						Boreal forest	Upland & Lowland Sp/F	Mid
						Dry-mesic prairie	Upland open/semi-open	N/A
						Dry-mesic northern forest	White Pine	Late
						Hillside prairie	Upland open/semi-open	N/A
						Limestone bedrock glade	Upland open/semi-open	N/A
						Limestone bedrock lakeshore	Upland open/semi-open	N/A
						Limestone cobble shore	Upland open/semi-open	N/A
						Volcanic cliff	Upland open/semi-open	N/A
						Volcanic lakeshore cliff	Upland open/semi-open	N/A
Hill's thistle	*Cirsium hillii*	SC/G3/S3	Confirmed			Alvar	Upland open/semi-open	N/A
						Oak-pine barrens	Oak	Mid
						Pine barrens	Jack Pine	Early
						Boreal forest	Upland open/semi-open	N/A
						Dry northern forest	Upland open/semi-open	N/A
						Dry sand prairie	Upland open/semi-open	N/A
						Dry-mesic northern forest	Upland open/semi-open	N/A
						Dry-mesic prairie	Upland open/semi-open	N/A
						Limestone bedrock glade	Upland open/semi-open	N/A
						Mesic prairie	Upland open/semi-open	N/A
						Mesic sand prairie	Upland open/semi-open	N/A
						Open dunes	Upland open/semi-open	N/A
Dwarf lake iris	*Iris lacustris*	LT/T/G3/S3	Confirmed			Open dunes	Upland open/semi-open	N/A
						Alvar	Upland open/semi-open	N/A
						Wooded dune & swale complex	Upland open/semi-open	N/A
						Boreal forest	Upland & Lowland Sp/F	Mid
						Limestone bedrock glade	Upland open/semi-open	N/A
						Limestone cobble shore	Upland open/semi-open	N/A
						Limestone bedrock lakeshore	Upland open/semi-open	N/A
Vasey's rush	*Juncus vaseyi*	T/G5?/S1S2	Confirmed			Intermittent wetland	Lowland open/semi-open	N/A
						Lakeplain wet prairie	Lowland open/semi-open	N/A
						Lakeplain wet-mesic prairie	Lowland open/semi-open	N/A
Torrey's bulrush	*Scripus torreyi*	SC/G5?/S2S3	Confirmed			Intermittent wetland	Lowland open/semi-open	N/A

Climate Change Vulnerability Index: EV – Extremely Vulnerable; HV – Highly Vulnerable; MV – Moderately Vulnerable; PS – Presumed Stable; and IL – Increase Likely

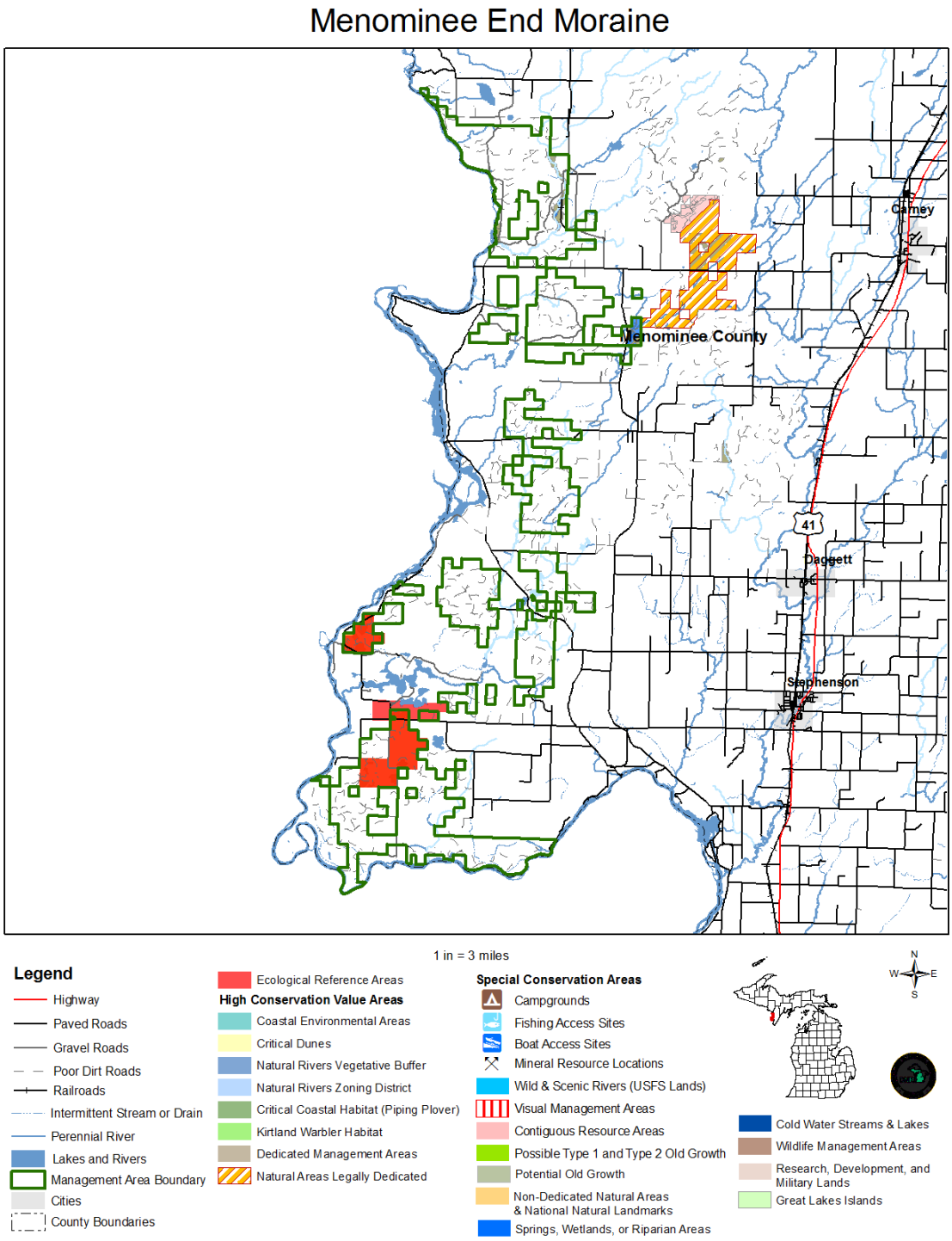

Figure 4.20.7. A map of the Menominee End Moraine management area showing the special resource areas.

Management goals during this planning period:

Goal 1: To develop and maintain a list of rare, threatened, endangered and special concern species and natural communities for the management area through a continuous inventory and through opportunistic focused inventory surveys.

Objective 1-1: Field staff should be trained and aware of the identification characteristics and natural history of rare, threatened, endangered and special concern species.
Objective 1-2: Occurrences of rare, threatened, endangered and special concern species noted during the inventory process by inventory staff should be verified and added to the body of knowledge for the management area.

Goal 2: To evaluate the potential old growth areas by the end of this 10-year planning period.

Goal 3: To develop and maintain management plans for ecological reference areas on state forest land.
Objective 3-1: Complete ecological reference area planning by the end of this 10-year planning period.

4.20.4 – Forest Health Management

Although forest health issues span the entire landscape, some specific threats are more important in this management area due to the species composition, site quality or other factors. Some of the more important forest health pests in this area include:

- White trunk rot of aspen
- *Hypoxylon* canker
- Two-lined chestnut borer
- Oak wilt.

When forest pests are detected, they are to be reported to the forest health specialist for treatment recommendations. The treatment of large outbreaks of forest pests will be coordinated on a state and regional level.

Several invasive exotic species of plants are thought to be located in the vicinity. When invasive species are detected, they will be reported to the forest health specialist and treatment options will be reviewed. Priority for treatment should be given to those species that threaten sensitive sites due to their location or growth characteristics and have population levels that may be successfully controlled. Following is a list of species of concern that been documented in or near this management area:

- St. Johns-wort
- Common mullein
- Leafy spurge
- Spotted knapweed
- Giant hogweed.

4.20.5 – Aquatic Resource Management

Fisheries Division management unit biologists will review proposed forest management activities using the compartment review process and will consider the potential impact of proposed prescriptions upon riparian and aquatic values. Management prescriptions will be modified to account for riparian and aquatic values by applying the standards and guidance documents listed in the introduction to this plan section to the unique conditions specific to any given forest stand.

Prescription of riparian management zone widths greater than the minimum widths provided in IC4011 (*Sustainable Soil and Water Quality on Forest Land*) must be justified and documented during the compartment review process.

Forested stands adjacent to designated high priority trout streams will specifically be managed to discourage beaver use in accordance with both DNR Policy and Procedure 39.21-20 Beaver Management and IC 4011. Designated high priority trout streams are identified in the Integrated Forest Monitoring Assessment and Prescription Geographic Decision Support Environment. Remove or discourage beaver populations on designated high priority trout streams.

High priority trout streams in this management area are shown in Figure 4.20.1.

4.20.6 – Fire Management

Primarily a mixture of barrens, dry and dry mesic northern forests with imbedded wetlands, this area was adapted to periodic stand replacement fires, with the shortest fire return intervals at the south end.

- All wildfires within the management area will be subject to appropriate initial attack response.
- Included in this area is the Shakey Lakes Zone Dispatch area. Initial attack is pre-planned, based on fire danger level, calling for elevated readiness and aggressive response to reported wildfires during periods of VERY HIGH and EXTREME fire danger.
- The county park at Shakey Lakes, as well as several campgrounds and public access sites along the Menominee River provide numerous opportunities for emphasizing prevention of fires from outdoor recreation activities in the area.
- Properties along the Menominee River and between G-12, CR 356 and the river should be provided with information about Firewise practices and the risks wildland fire poses to their property.
- Maintenance of the oak type and barrens community on state forestland will require practices to discourage aspen and maple reproduction after harvests. Silvicultural systems should incorporate intermediate treatments to discourage advanced maple reproduction and post-harvest practices to both encourage oak seedling sprouting and discourage aspen/maple reproduction.
- Within the zone dispatch area, slash fuel loads may pose ignition potential and control problems. Post-harvest loads should be evaluated and fuel reduction needs coordinated with other prescribed fire needs.

4.20.7 – Public Access and Recreation

This area has good public and management access. There are a number of good quality roads that provide access into a large portion of the state forest land. The department maintains five boating access sites on state forest lands. Three access sites on the Menominee River, one access site on Lake Mary and one that accesses Lake Ann.

- Work to expand public access and recreation facilities as opportunities arise.

4.20.8 – Oil, Gas and Mineral Resources

Exploration and development for oil and gas has been limited to a few wells drilled in the eastern Upper Peninsula. No economic oil and gas production has been found in the Upper Peninsula.

Surface sediments consist of end moraines of coarse and medium-textured tills, glacial outwash sand and gravel and postglacial alluvium and peat and muck. The glacial drift thickness varies between 10 and 100 feet. Sand and gravel pits are located in the management area and there is good potential for additional pits for additional pits.

The Cambrian Trempealeau Formation and Munising Group and Precambrian Quinnesec Formation and Intrusives subcrop below the glacial drift. There is not a current economic use for these rocks.

The “Back Forty” exploration area is located in this management area and state lands are leased. Additional metallic mineral exploration and leasing has occurred in the management area in the past and there may be additional potential.