4.21 Michigamme Reservoir Management Area

Summary of Use and Management

Vegetative management in the Michigamme Reservoir management area (MA) (Figure 4.21.1) 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; 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 address the habitat requirements identified for the following featured species: American woodcock, black bear, pileated woodpecker, northern goshawk, ruffed grouse and white-tailed deer. Management activities may be constrained by site conditions and the skewed age-class distributions. Balancing age classes and will be an issue for this 10-year planning period.

Introduction

The Michigamme Reservoir management area is on a disintegration moraine in eastern Iron County. The state forest covers 37,592 acres and is in scattered blocks. The major ownerships in this vicinity are forest industry and non-industrial private. The management area is dominated by aspen, northern hardwood and lowland conifer cover types. Other attributes that played a role in the definition of this management area include:

- Dominated by two natural communities: mesic northern forest and poor conifer swamp;
- Mid-range in site quality;
- 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 benefits while minimizing user conflicts.

The predominant cover types, composition and projected harvest areas for the Michigamme Reservoir management area are shown in Table 4.21.1.

Table 4.21.1. Summary of cover types, composition, limited factor area, manageable area and projected harvest area for the Michigamme Reservoir 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	49%	18,239	1,058	17,181	2,988	0	18,239	2,867	0
Northern Hardwood	16%	6,181	119	6062	0	2,975	6,181	0	2,975
Lowland Conifers	10%	3,910	2,049	1861	207	0	3,910	207	0
Upland Open/Semi-Open Lands	1%	319	0	319	0	0	319	0	0
Lowland Open/Semi-Open Lands	8%	2,841	0	2841	0	0	2,841	0	0
Misc Other (Water, Local, Urban)	2%	838	0	838	0	0	838	0	0
Others	14%	5,264	1,898	3366	461	354	5,264	339	438
Total		37,592	5,125	32,467	3,655	3,329	37,592	3,413	3,413

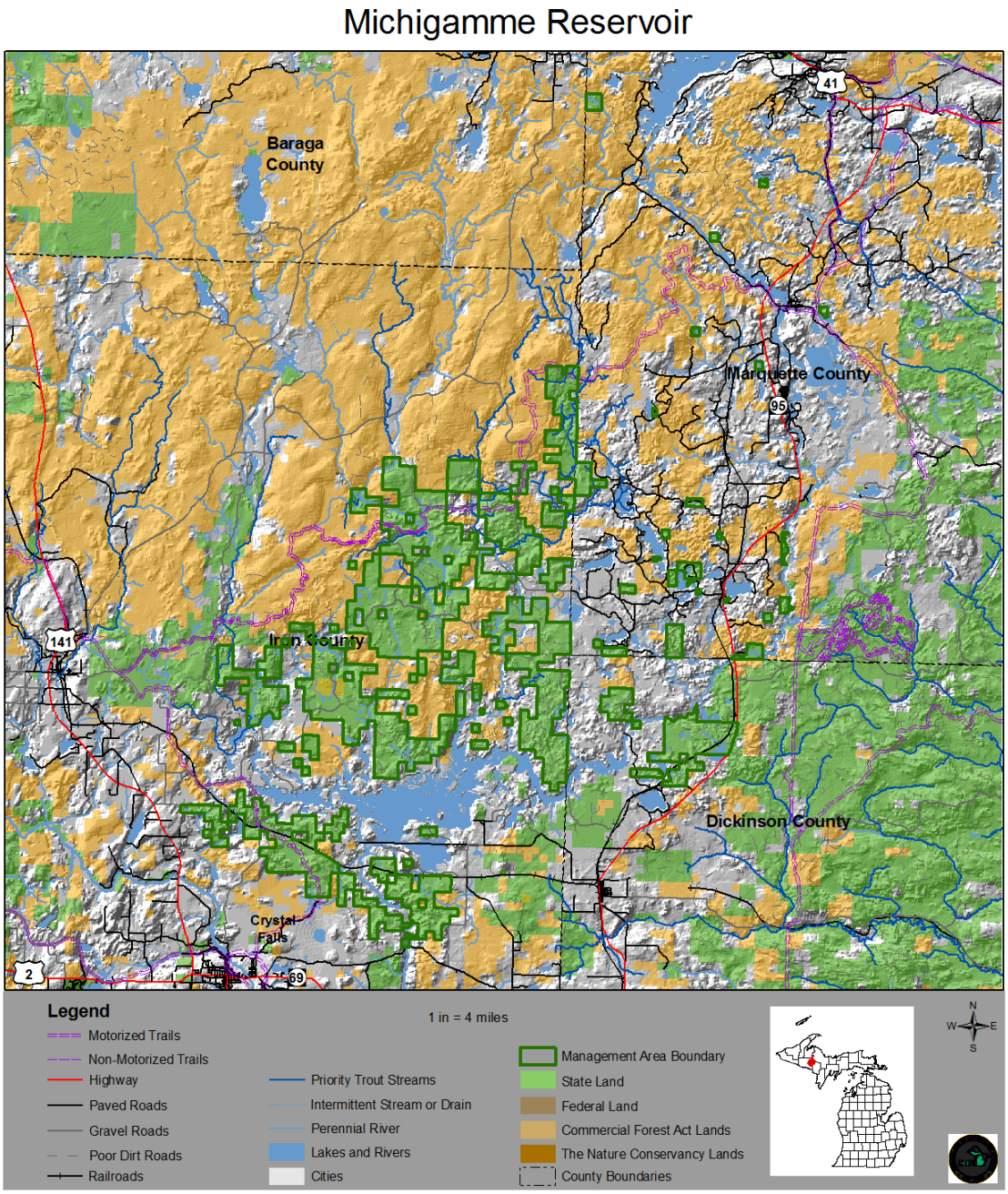

Figure 4.21.1. A map of the Michigamme Reservoir management area (dark green boundary) in relation to surrounding state forest and other land in Iron County, Michigan.

4.21.1 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 Michigamme Reservoir 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 18,239 acres (49%) of this management area are (Table 4.21.1). Aspen is relatively well distributed across age classes with a spike occurring in the 20-29 year age class. Few acres of aspen have limiting factors on them. Many of these limited factor acres will succeed to upland spruce/fir.

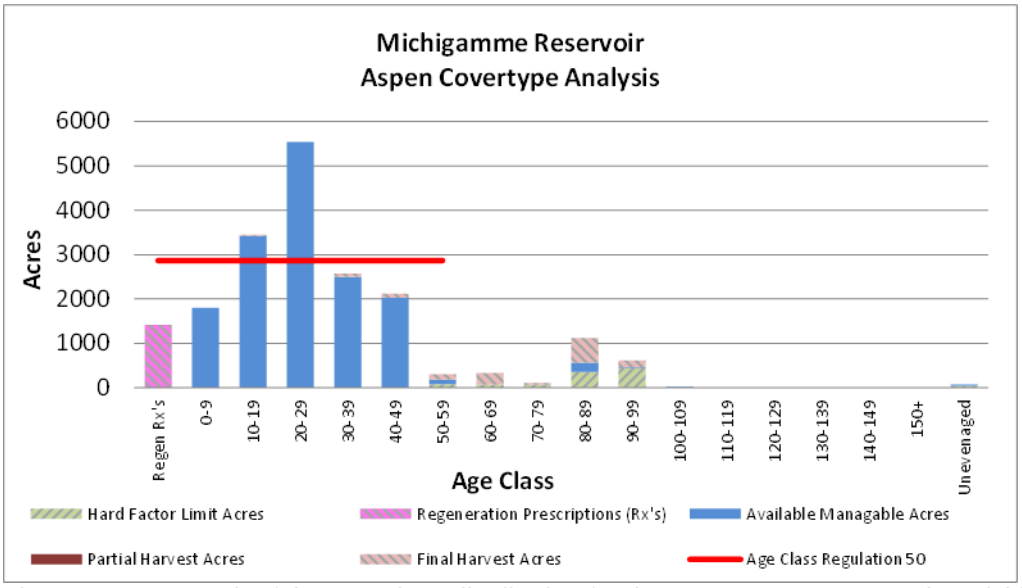

Figure 4.21.2. Graph of the age-class distribution for the aspen cover type on the Michigamme Reservoir management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Balanced acres in each age class using a 50-year rotation; and
- Provide an even supply of forest products.

Long-Term Management Objective

- Harvest and regenerate aspen stands using a 50-year rotation length leading to the regeneration of approximately 2,867 acres each decade.

10-Year Management Objectives

- Over the next 10 years, few acres over the age of 50 will be available for harvest. Identify some of the younger aspen on better sites that could be available for early harvest; and
- Two-aged stands with mature aspen over younger stands should be identified as well and scheduled for harvest.

Northern Hardwoods Cover Type

Current Condition

Northern hardwood stands make up about 6,181 acres (16%) of this management area. They occur on medium-quality sites. Most stands have been managed on a selection harvest basis but regeneration success has been limited.

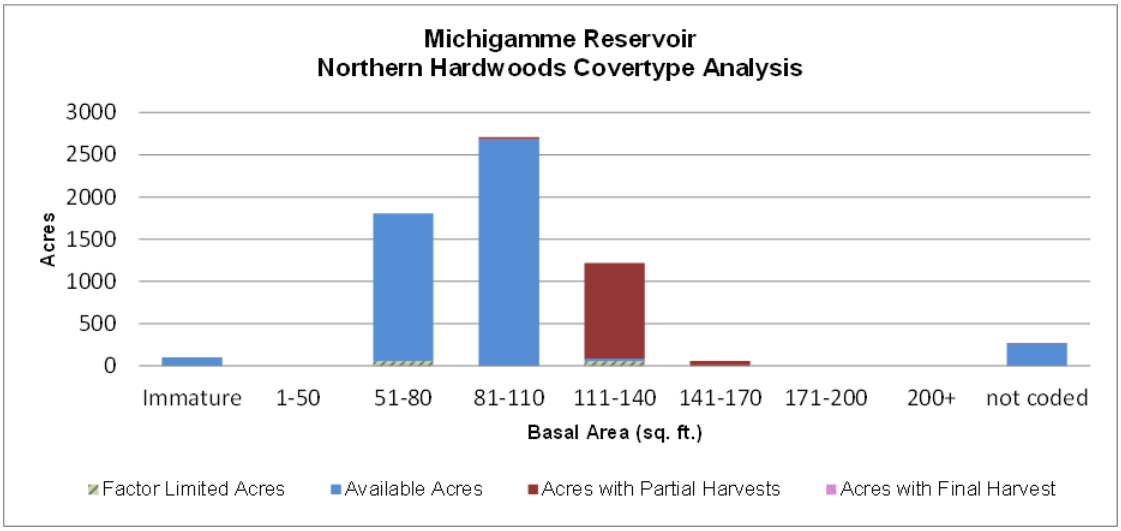

Figure 4.21.3. Graph of the basal area distribution for the northern hardwood cover type on the Michigamme Reservoir management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

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

Long-Term Management Objectives

- Using an uneven-aged system, selectively harvest stands on a 20-year cutting cycle to promote high-value sugar maple sawlogs resulting in a harvest of 2,975 acres each decade;
- Provide a full complement of tree seedlings recruiting into the overstory;
- Provide well-developed shrub and herbaceous layers; and
- Work to increase hardwood regeneration through the use of scarification and herbicide.

10-Year Management Objectives

- Selectively harvest 2,975 acres during this 10-year planning period;
- Maintain white pine, hemlock, oak and upland cedar where they occur in stands that are cut; and
- Monitor hardwood regeneration.

Lowland Conifers Cover Type

Current Condition

Lowland conifers cover 3,910 acres (10%) in this management area. 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 80-89 year age classes (Figure 4.21.4). Little harvesting has been done in this type over the past 60 years.

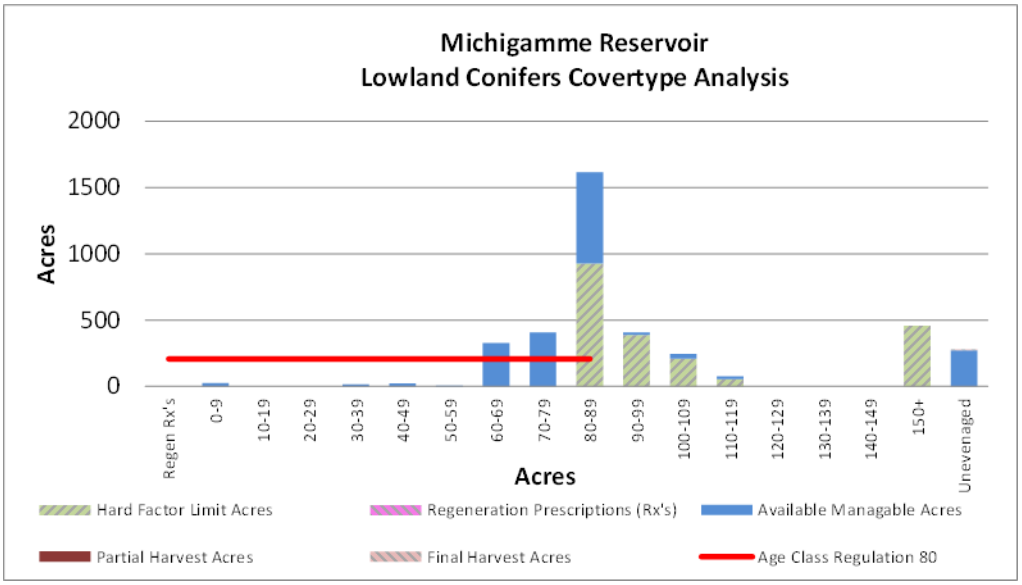

Figure 4.21.4. Graph of the age-class distribution for the lowland conifer cover type on the Michigamme Reservoir management area (2012 Department of Natural Resources inventory data).

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 Objectives

- Manage stands on an 80-year rotation, leading to the harvest of 207 acres each decade;
- Regenerate stands to species mixes similar to the pre-harvest conditions favoring cedar, hemlock, black spruce and balsam fir; and
- Harvesting will be done using small clearcuts or strips with clumped retention.

10-Year Management Objectives

- Harvest 207 acres over this 10-year planning periods focusing on the use of “low impact” harvesting systems and successful, reliable regeneration techniques.

Other Forested Cover Types

Current Condition

Other forested types make up 5,264 acres and are made up of lowland spruce/fir (1,245 acres), upland spruce/fir (976 acres), cedar (926 acres), lowland deciduous (688 acres), upland mixed forest (288 acres), red pine (279 acres), white pine (256 acres), paper birch (210 acres), oak (74 acres), natural mixed pines (72 acres), upland conifers (72 acres), tamarack (55 acres), mixed upland deciduous(48 acres), lowland poplar (31 acres), hemlock (29 acres) and lowland mixed forest (15 acres). Together these types make up about 14% 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;
- Featured species habitat requirements will be taken in to consideration; and
- Maintain hemlock as it occurs.

10-Year Management Objectives

- Harvest those stands without harvest limitations adjacent to other planned harvest activities and where stand and habitat conditions indicate that harvesting is appropriate; and
- Expected harvests in these types will be less than 815 acres during this 10-year 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 (319 acres – 1%), lowland open/semi-open lands (2,841 acres – 8%) and miscellaneous other (water, local, urban) (838 acres – 2%).

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.

4.21.2 – Featured Wildlife Species Management

The main feature in the Michigamme Reservoir management area is a large reservoir complex maintained for hydro electrical power production by Wisconsin Electric. The Deerfoot Lodge deer wintering complex makes up a large part of the state forest lands in the management area and is one of the most important wintering areas in Iron County. Every effort should be made to protect lowland conifer stands and enhance upland conifer in hardwood stands. It is desirable to distribute aspen cover types in 6-8 age classes present in equal acreages to provide multiple benefits to a wide variety of species, including wintering deer. The primary focus of wildlife habitat management in the Michigamme Reservoir management area will be to address the habitat requirements identified for the following featured species: American woodcock, black bear, pileated woodpecker, northern goshawk, ruffed grouse and white-tailed deer. Some of the most significant wildlife management issues in the management area are: deer wintering complex; mast (hard and soft); habitat fragmentation; coarse woody debris; early successional forest; mature forest; and retention or development of large living and dead standing trees (for cavities). During this 10-year planning period, additional analyses to better define the spatial extent of priority areas for featured species will be performed.

American Woodcock

The western Upper Peninsula goal for woodcock is to maintain or increase woodcock habitat. In priority areas, management should focus on balancing the age-class distribution and provision of display, feeding, nesting and brood-rearing habitat via upland brush, opening and poorly stocked stand management.

Wildlife habitat specifications:

- Maintain aspen cover types within the management area, especially where associated with alder, riparian zones, or forested wetlands;
- Balance aspen age-class distribution within the management area;
- Use silvicultural practices that encourage the aspen component in mixed stands associated with alder, riparian zones or forested wetlands; and
- Maintain or create rough openings associated with alder, riparian zones, regenerating aspen or forested wetlands within the management area.

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).

Northern Goshawk

The goal for northern goshawk is to maintain suitable habitat. Management at the stand scale should focus on protection of nest trees, the provision of coarse woody debris and addressing fragmentation. Landscape scale management should provide mature and old aspen stands in the 60-69 year-old age class.

Wildlife habitat specifications:

- Maintain a minimum of 15% of the state forest aspen resource above age of 60 in this management area (this can be accomplished using factor limited stands, special conservation areas, etc…). All known woodland raptor nests should be reported to local wildlife staff and documented in the Integrated Forest Monitoring Assessment and Prescription comments. If the species is known the common name should be included in those comments. For northern goshawk nests, the wildlife habitat specifications contained within Michigan DNR's *Interim Management Guidance for Red-Shouldered Hawks and Northern Goshawk on State Forest lands* (August 2012) will be followed until the workgroup has completed the guidance that will permanently replace the interim guidelines.

Pileated Woodpecker

The western Upper Peninsula goal for pileated woodpeckers is to maintain or improve habitat. State forest management for the species should address mature forest and retention or development of large living and dead standing trees (for cavities) in this management area. Focusing such efforts on riparian and animal movement corridors will benefit additional species.

Wildlife habitat specifications:

- Identify and retain as many existing large (>15 inches in diameter breast height) snags and cavity trees, coarse woody debris and reserve green trees, as possible to ensure a sustainable supply of future cavity/foraging trees and associated coarse woody debris. Poorly formed trees and those damaged by natural disturbance or earlier harvests, particularly deciduous trees, are good candidates for future snags and cavity trees. Large diameter aspen and other soft hardwoods are preferred.
- Even-aged managed stands: Leave scattered retention patches around some 18 inches in diameter breast height or greater (if unavailable, identify future potential 18 inch secure trees) to be recruited as a nucleus, using the upper end of the retention guidelines.
- Uneven-aged managed stands: Retain a minimum of three secure cavity or snags per acre with one exceeding 18" diameter breast height. If snags or cavity trees are lacking, leave trees with defects of the maximum available size that will likely develop and be recruited as cavity trees.
- Offset salvage harvests deemed necessary due to insect or disease or fire within the same cover type and age class (within the compartment, management area or WUP ecoregion), to minimize impacts on pileated woodpecker habitat. Total allowable harvest in these situations will be evaluated on a case-by-case basis.

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, and include at least four age classes in close proximity to one another.
- 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.

White-tailed Deer

The western Upper Peninsula goals for white-tailed deer are to: 1) Maintain existing deer wintering complexes and 2) Expand the extent of areas suitable as winter deer habitat, especially in the medium and high snowfall zones. Management should focus on maintaining habitat quality in priority wintering complexes. DNR department procedure 32.22-07 states “Coniferous swamps are important as winter deeryards and shall be managed primarily for deer. The objective shall be to maintain them for this purpose and through commercial cuttings and silvicultural practices, improve these areas to provide winter cover and food for deer.” There is a complex relationship between deer abundance; available summer and winter habitat; timber management; and regeneration tree species, particularly white cedar and hemlock. It is recognized that meeting both timber management and deer goals presents challenges for the department and our stakeholders. Information on deer wintering complexes is currently being updated and new management guidelines are being developed. When completed, these will provide additional direction for managing these critical areas for white-tailed deer.

Wildlife habitat specifications for deer wintering complexes:

- Strive to maintain > 50% of the land area within deer wintering complexes in mixed or pure stands of cedar, hemlock, white and black spruce, white and natural red pine, balsam fir, mixed swamp conifer and mixed upland conifer-hardwood.
- In northern white cedar and hemlock cover types that are commonly occupied by deer during severe winters, especially in medium and high snowfall zones, maintain canopy closure of >65%.
- In deer wintering complexes in low snowfall areas, and within ¼-mile of severe-winter cover in the higher snowfall zones, write prescriptions that strive to maintain canopy closure of 40-65%, favoring cedar, hemlock, white spruce, black spruce, balsam fir and white pine.
- Provide winter forage in deer wintering complexes through stands of regenerating hardwood or brush, including preferred species of red maple, sugar maple, aspen, yellow birch, ashes, oaks, dogwood, crabapple, elderberry, high-bush cranberry, sumac and hazel.
- Enhance accessibility to winter browse within deer wintering complexes by maintaining mature mesic conifer components within upland hardwood stands or by maintaining or enhancing sheltered travel corridors between areas of conifer cover and browse.
- Provide spring break out areas by maintaining open hardwood stands on southern exposures and herbaceous openings adjacent to deer wintering complexes.
- When possible, timber harvests within deer wintering complexes should be carried out only during winter months and tops should be left. Chipping of non-bole wood and whole-tree harvesting in the deer wintering complexes should be avoided, but will be discussed on a case-by-case basis through the compartment review process.
- Harvests of cedar and hemlock may only be conducted when:
    - There is reasonable confidence of successful recruitment/regeneration of the cover types; or
    - There is a forest health issue (e.g., hemlock wooly adelgid); or
    - Part of an approved research project; or
    - Removal of selected trees will facilitate a reduction of harvest trails, landings, etc. to minimize soil sedimentation and possible soil compaction issues.

- Provide fall foods in the form of hard and soft mast and provide dense escape cover or bedding areas in the form of early successional forests, brush and warm-season grasses that will encourage fall deer use in areas open to public hunting. Where habitat types are appropriate, increase diversity of hard mast by planting oak.

4.21.3 – 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 three listed species and no natural communities of note occurring in the management area as listed in Table 4.21.2. 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 Michigamme Reservoir Flooding is a state wildlife management area and is a special conservation area within this management area as shown in Figure 4.21.5.

Approximately 284.4 acres of potential old growth have been identified within the Michigamme Reservoir 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.

Table 4.21.2. Occurrence information for special concern, rare, threatened and endangered communities and species for the Michigamme Reservoir 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
Birds								
Common loon	*Gavia immer*	T/G5/S3-4	Confirmed	HV	Very High	Emergent Marsh	Lowland open/semi-open	N/A
						Bog	Lowland open/semi-open	N/A
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
						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
Plant								
Alternate-leaved water-milfoil	*Myriophyllum alterniflorum*	SC/G5/S2S3	Confirmed			Submergent marsh	Lowland open/semi-open	N/A
						Emergent marsh	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

There are no high conservation value areas or ecological reference areas identified in this management area as illustrated in Figure 4.21.5.

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.

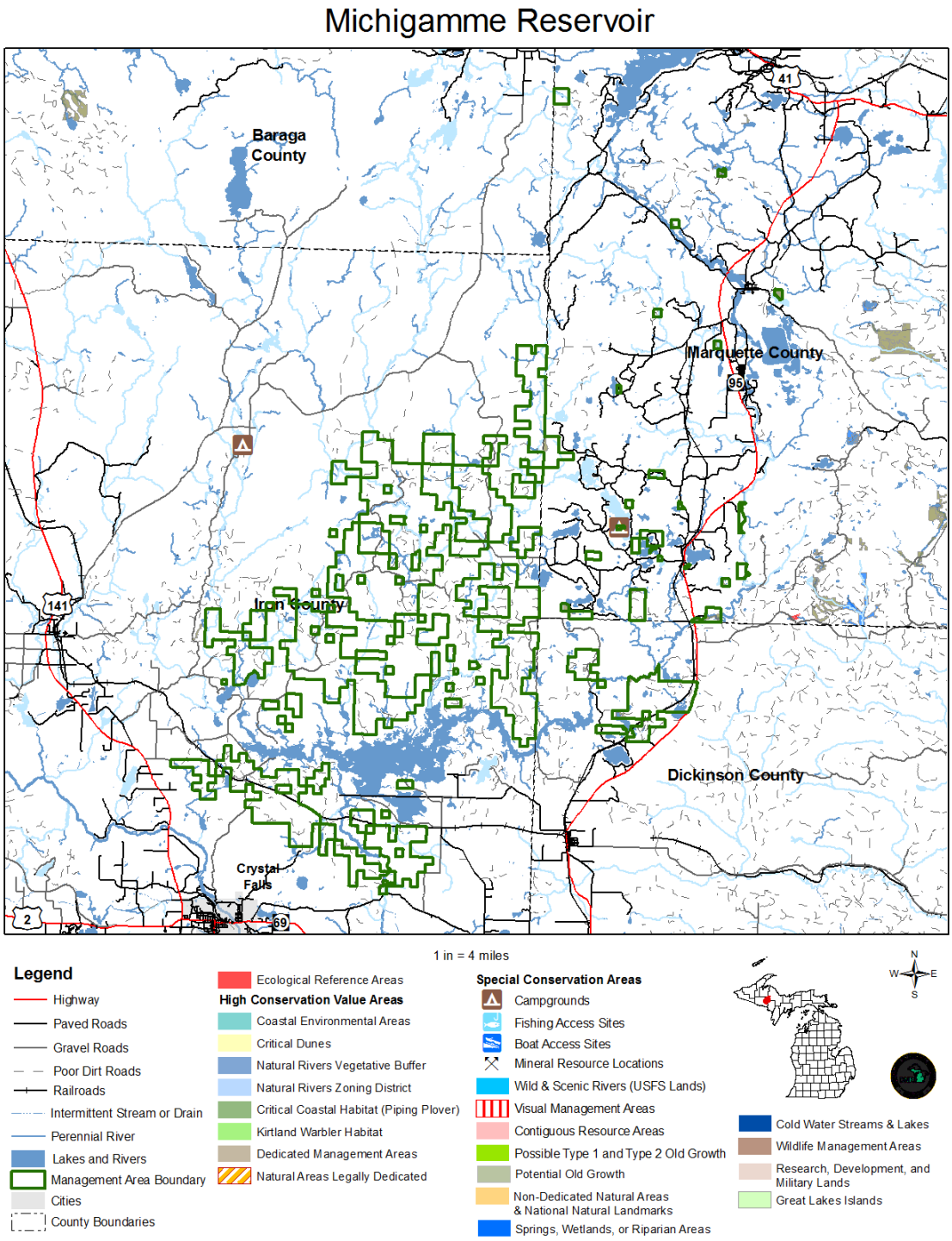

Figure 4.21.5. A map of the Michigamme Reservoir management area showing the special resource areas.

4.21.4 – 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
- Spruce budworm
- Emerald ash borer

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:

- Common buckthorn
- Japanese barberry
- Japanese knotweed

4.21.5 – 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 Practices 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 4.21.1.

4.21.6 – Fire Management

Mixtures of wetland communities in a matrix of mesic hardwoods produced long fire return intervals for much of the area. Significant areas on southeast side of the management area probably supported dry-mesic pine communities with somewhat shorter fire return intervals.

- All wildfires within the management area are subject to appropriate initial attack response.

4.21.7 – Public Access and Recreation

This area has fair public and management access. Two state forest campgrounds are located in this area at Squaw Lake and Horseshoe Lake; both have boating access sites located with them. Additional access sites are located on Lake Edey, Lake Ellen and Silver Lake.

- Maintain current management and public access.

4.21.8 – 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-textured till, coarse-textured till and glacial outwash sand and gravel and postglacial alluvium. The glacial drift thickness varies between 10 and 50 feet. Sand and gravel pits are located in the management area and there is good potential for additional pits.

The Precambrian Michigamme and Hemlock Formations, Randville Dolomite, Archean Granite/Gneiss and Intrusives subcrop below the glacial drift. The Granite/Gneiss sometimes could be used as dimension stone.

Old iron mines are located to the south and north of this management area. Metallic mineral exploration has occurred in the management area in the past and there may be additional potential.