4.12 MA 12 – Alpena Lake Plain Management Area

Summary of Use and Management

Management in the Alpena Lake Plain management area (MA) emphasizes balancing age classes of aspen and lowland poplar and regenerating the aging swamp hardwood and conifer resource where possible. Management will strive to sustainably produce various forest products; enhance game and non-game wildlife habitat; protect areas of unique character, such as archeological sites in the Devil's Lake/Indian Reserve Recreation Area; and provide for forest-based recreational uses. Management activities are severely constrained by poor access in the swampy (78% lowland) portions of this management area. Expected trends within this 10-year planning period are increased recreational pressure, especially near Alpena, introduced pests and diseases and difficulty in regenerating swamp types.

Introduction

The Alpena Lake Plain management area is located in the extreme northeast corner of the northern Lower Peninsula in Alpena and Presque Isle counties and contains 53,805 acres of state forest (Figure 4. 1). The primary attributes which identify the Alpena Lake Plains management area include:

- The management area falls within Albert's Onaway and Cheboygan sub-regions (Albert, 1995).
- The historic and current predominant wetland types with isolated red pine on the higher elevations mixed with jack pine. Aspen is currently more predominate than historically. The Alpena Lake Plain is 78% swampy.
- The dominant landforms of sandy lake plain over limestone bedrock near the surface. Much of the topography is a series of beach ridges and adjacent swales. There are several large wetland complexes in this management area.
- Due to the proximity of this management area to the population centers of Alpena and Rogers City, the forest resources contribute social and economic values to the area.
- A snowmobile trail crosses through part of the area as well as the Ossineke State Forest Campground, off-road vehicle trails (such as the Devil's Lake Off-Road Vehicle Trail) and the Northeast State Trail.

Much of the topography of this management area is dominated by a series of beaches and swales extending inland several miles. Further inland the wet areas between beaches become better drained and in some cases are excessively drained. Early logging greatly changed the composition of the upland forests of this management area, particularly those originally dominated by white pine, red pine and hemlock. While most of the wetlands have also been logged, wetland types have remained the same as they were circa-1800.

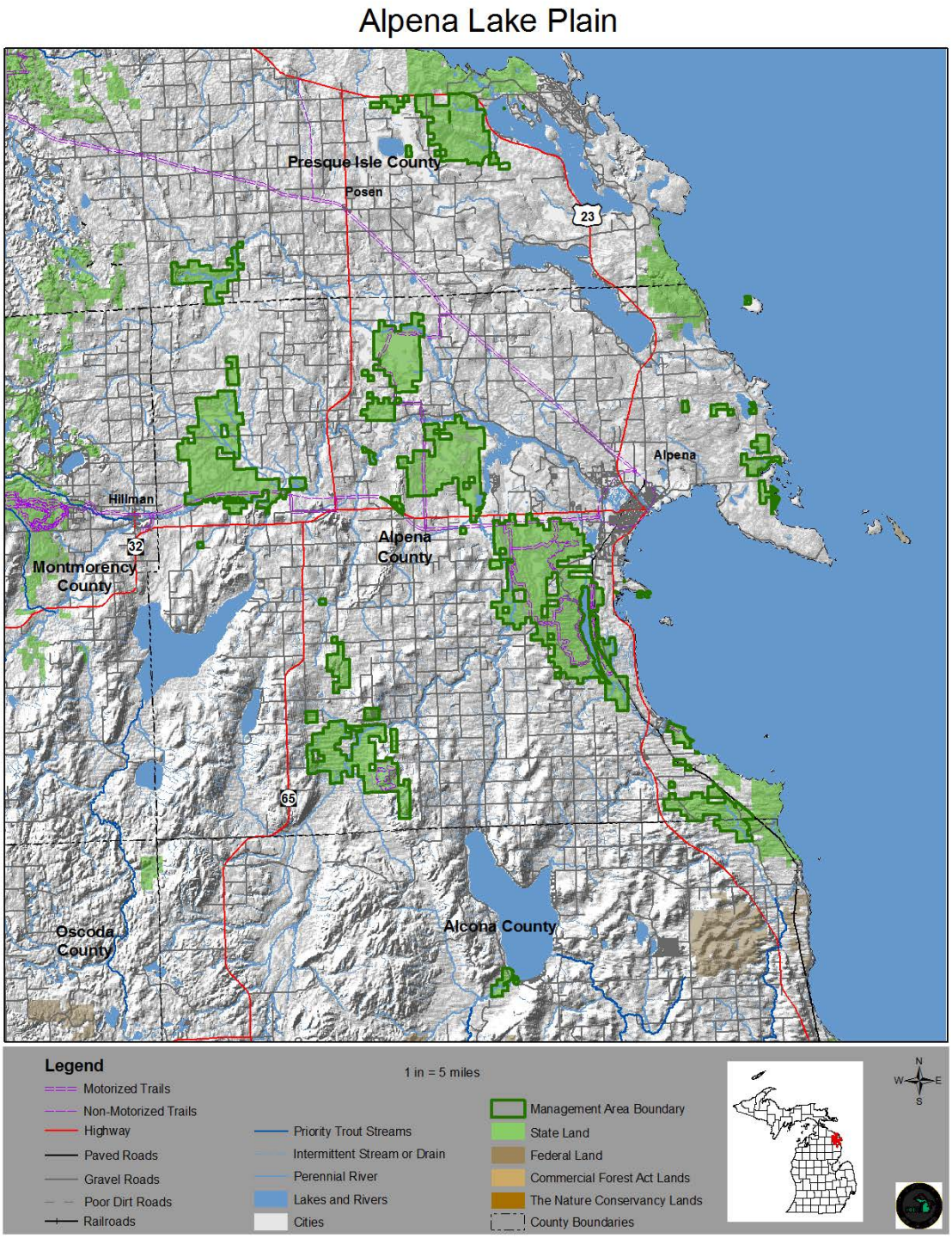

Figure 4.12.1. A map of the Alpena Lake Plain management area (dark green boundary) in relation to surrounding state forest and other lands in Alpena and Presque Isle counties, Michigan.

Table 4.12.1. Current cover types, acreages, projected harvests and projected acreages at the end of this ten-year planning period for the Alpena Lake Plain management area, northern Lower Peninsula ecoregion (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
Lowland Deciduous	17%	9,011	6,308	2,703	302		9,011	302	
Lowland Aspen/Balsam Poplar	16%	8,598	4,299	4299	717		8,598	717	
Cedar	14%	7,472	7,472		0		7,472	1	
Aspen	12%	6,257	410	5847	1,251		6,257	974	
Lowland Conifers	6%	3,093	2,474	619	69		3,093	69	
Lowland Spruce/Fir	2%	990	792	198	22		990	22	
Upland Open/Semi-Open Lands	2%	1,234		1234			1,234		
Lowland Open/Semi-Open Lands	14%	7,540		7540			7,540		
Misc Other (Water, Local, Urban)	1%	545		545			545		
Others	9%	4,651	1,222	3429	655	995	4,651	322	1,023
Total		53,805	24,628	29,177	3,789	1,590	53,805	2,720	2,379

4.12.1 Forest Cover Type Management Direction

The following sections contain information on vegetation management direction in the form of Desired Future Conditions, 10-Year Management Objectives and Long-Term Management Objectives for each of the major cover types or forest communities within the management area. This information applies to those portions of the forest where active management (e.g., timber harvest, prescribed fire, planting or mowing) will be conducted. In other portions of the state forest, natural succession will achieve ecological objectives. While most stands have a variety of trees species and other vegetation, stands or communities are classified by the species which has the dominant canopy coverage.

4.12.1.1 Forest Cover Type Management – Lowland Deciduous

Current Condition

Lowland deciduous acres total 9,011 or 17% of the management area (Table 4.12.1) and are located on PArVCo or unclassified wetland habitat class sites (see Appendix E). Forest communities dominated primarily by lowland deciduous species in this management area are valued ecologically as sources of habitat for numerous species of wildlife including woodcock, bobcats, bears and various song birds and commercially for pulp. Most of the acres are in the age classes above the age of 60 (Figure 4.12.2). There are approximately 6,308 acres factor-limited that are not available for harvest, often because the sites are too wet or due to other site factors. There are 96 acres with a current final harvest prescription and these acres are shown in the regeneration prescription class. Lowland deciduous stands may be managed as even-aged stands on drier sites. On wetter sites, uneven-aged management is preferred. The residual trees keep the sites from becoming even wetter, resulting in a conversion to marsh.

Tip-overs and windthrow may also be an issue in stands that have been reduced below a residual basal area of 80 square feet per acre. Green ash, red maple and aspen are frequent components of lowland deciduous stands and treatments on more mesic sites may convert lowland deciduous stands to aspen or red maple.

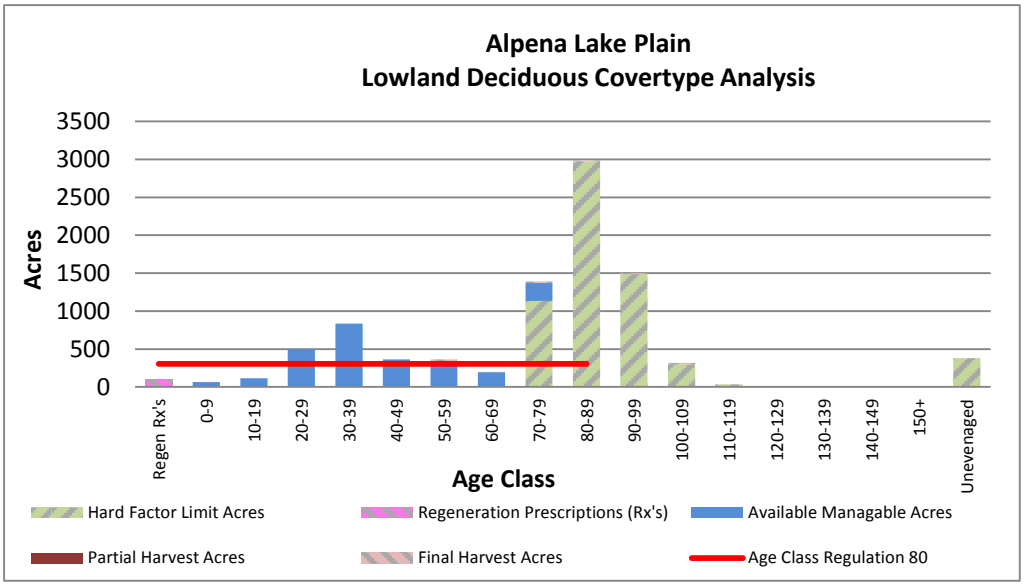

Figure 4.12.2. Age-class distribution for lowland deciduous in the Alpena Lake Plain management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Lowland deciduous stands will be located on suitable sites in a compositionally diverse forest which contains coarse woody debris, scattered large trees and scattered snags;
- These final harvests may be in the form of an overstory removal, which leaves understory trees to keep stands from becoming too wet and to minimize windthrow; and
- These lowland types will provide a sustainable level of forest products along with wildlife habitat and recreational opportunity.

10-Year Management Objectives

- Conduct final (regeneration) harvests on a projected 302 acres.

Long-Term Management Objectives

- Continue to manage lowland deciduous stands final harvests to produce a sustainable level of forest products and wildlife habitat;
- Consider the need to delay further selection harvesting due to resultant lower than normal residual basal area in post-salvage harvest stands; and
- Desired future harvests are projected to be 302 acres of final harvests per 10-year period.

4.12.1.2 Forest Cover Type Management – Lowland Aspen/Balsam Poplar

Current Condition

Lowland aspen/balsam poplar (Figure 4.12.3) (primarily balsam poplar, swamp aspen and swamp white birch) acres total 8,598 acres or 16% of the management area (Table 4.12.1). Forest communities dominated primarily by lowland poplar in this management area are valued ecologically as sources of habitat for numerous species of wildlife including bear, woodcock, white-tailed deer and various song birds and commercially for pulp. There are 4,299 acres of lowland aspen/balsam poplar in this management area considered inaccessible or otherwise unavailable for harvest (hard factor limit acres). There are currently 174 acres with a final harvest prescription and these acres are shown in the regeneration prescription class.

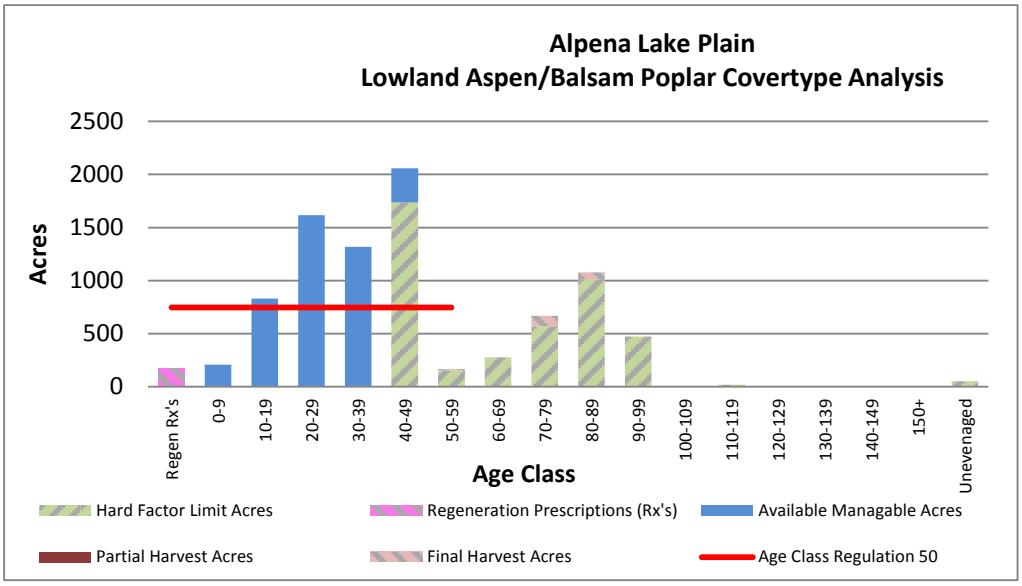

Figure 4.12.3. Age-class distribution for lowland aspen/balsam poplar in the Alpena Lake Plain management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Lowland aspen/balsam poplar-dominated forest communities will be maintained on operable sites through even-aged management with acres balanced between 0 and 59 years of age to provide for a sustainable harvest, available wildlife habitat and to contribute to the preservation of regional biodiversity.

10-Year Management Objectives

- Conduct regeneration harvests on a projected 717 acres.

Long-Term Management Objectives

- It is acceptable that the older lowland poplar, much of it inaccessible to human management, will continue to experience natural processes (wind throw, flooding and senescence) resulting in black ash and other species coming into the under story;
- Consider the loss of ash due to emerald ash borer in future management decisions;
- Continue to harvest lowland aspen/balsam poplar to balance age-class distributions where operations will not adversely impact wetland soils; and
- Desired future harvest levels are projected to be 717 acres of lowland aspen/balsam poplar for final harvest per 10-year period.

4.12.1.3 Forest Cover Type Management – Cedar and Lowland Conifers

Current Condition

Cedar acres total 7,472 or 14% of the management area and lowland conifer acres total 3,093 acres (Table 4.12.1). Cedar (Figure 4.12.4) and lowland conifers (Figure 4.12.5) are primarily located on unclassified lowlands (lowlands have not been assessed for habitat classification) throughout the management area.

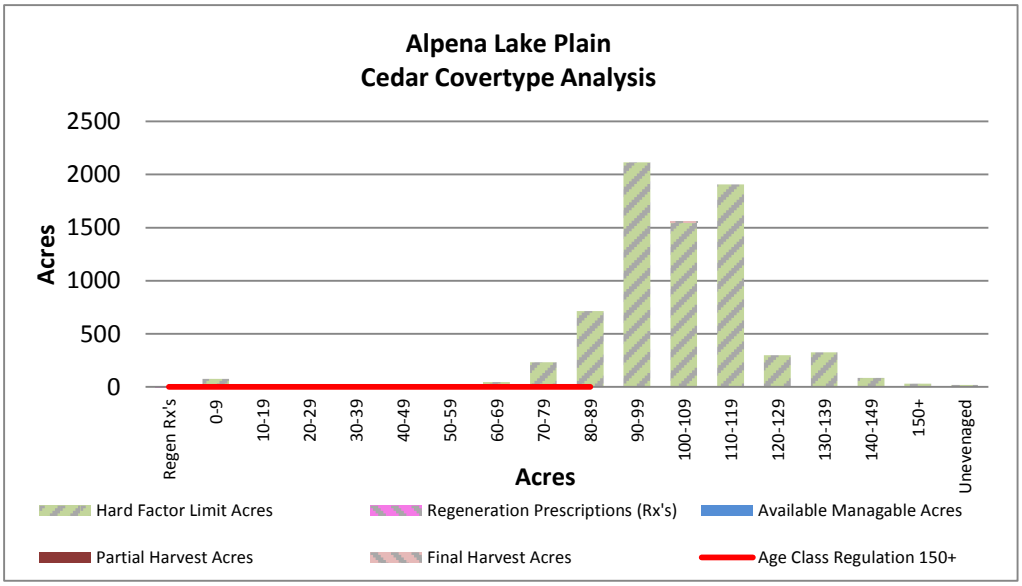

Figure 4.12.4. Age-class distribution for cedar in the Alpena Lake Plain management area (2012 Department of Natural Resources inventory data).

Forest cover types dominated primarily by cedar and lowland conifer in this management area are valued ecologically as sources of habitat for numerous species of wildlife including bear, white-tailed deer, hare and various song birds and commercially for pulp. The age-class distribution for cedar is heavily skewed toward the older age classes (70 and above) and there has been virtually no regeneration in the last 70 years.

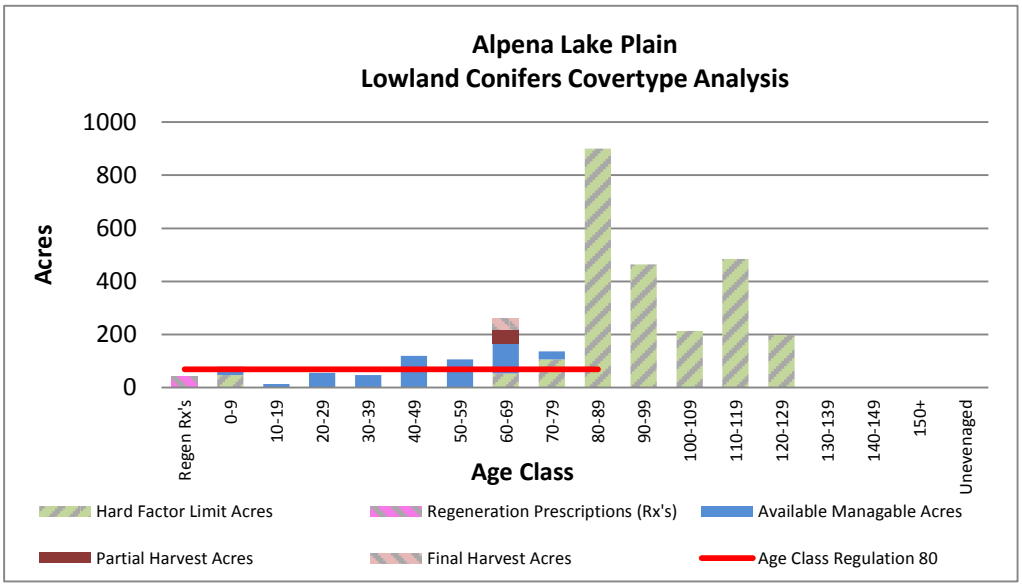

Figure 4.12.5. Age-class distribution for lowland conifers in the Alpena Lake Plain management area (2012 Department of Natural Resources inventory data).

All cedar acres (7,472) and 2,474 acres of lowland conifer have been assigned a hard factor limit due to access or issues with operability that may limit the ability to commercially harvest these lowland types.

Desired Future Condition

- These coniferous lowland cover types will be maintained on operable sites through even-aged management with acres balanced between 0 and 159 for cedar and 0 and 89 for lowland conifer to provide for regulated harvest and to contribute to the preservation of regional biodiversity by providing habitat for a unique suite of plants and wide variety of animal species; and
- By storing high levels of sequestered carbon and serving as carbon sinks, coniferous lowland types will play an important role in global geochemical cycles.

10-Year Management Objectives

- Conduct regeneration harvests on a projected 69 acres of lowland conifer if it can be done in a manner that will not adversely impact wetland soils;
- Additional opportunities to increase harvest prescriptions in lowland forest types will be assessed, both in and outside (due to forest health issues) of normal years-of-entry; and
- Consider methods to ensure cedar and lowland conifer regeneration.

Long-Term Management Objectives

- It is acceptable that over the next several planning perios, the older cedar stands, much of it inaccessible for harvest, will continue to experience natural processes (fire, windthrow, insect defoliation and beaver flooding) resulting in the formation of a range of successional stages; and
- Desired future harvest levels are projected to be 69 acres of lowland conifers for final harvest per 10-year period.

4.12.1.4 Forest Cover Type Management – Aspen

Current Condition

Aspen acres total 6,257 or 12% of the management area. Aspen is found throughout the management area on PArVVb/AFO, PArVVb, PArVHa and PVCd habitat sites. Forest communities dominated primarily by aspen in this management area are valued ecologically as sources of habitat for numerous species of wildlife including ruffed grouse, hare, woodcock, bear, white-tailed deer and various song birds; commercially for pulp and saw logs; and for a wide range of forest recreation.

Most of the aspen in this management area is younger than the 60-year rotation. Approximately 410 acres of aspen have met harvest criteria (Figure 4.12.6), but have site conditions that limit harvest (hard factor limited acres).

There are 831 acres of stands that have regeneration harvest pending and these acres are included in the regeneration prescription class.

Desired Future Condition

- Aspen-dominated forest communities will be maintained on operable sites through even-aged management with acres balanced between 0 and 59 years of age to provide for a sustainable harvest, wildlife habitat and recreation opportunity.

10-Year Management Objectives

- Conduct regeneration harvests on a projected 1,251 acres;
- Concentrate on the oldest acres first; and
- Where necessary and feasible, consider harvesting stands below the rotation age (50 years) to expedite the balancing of age-class distributions.

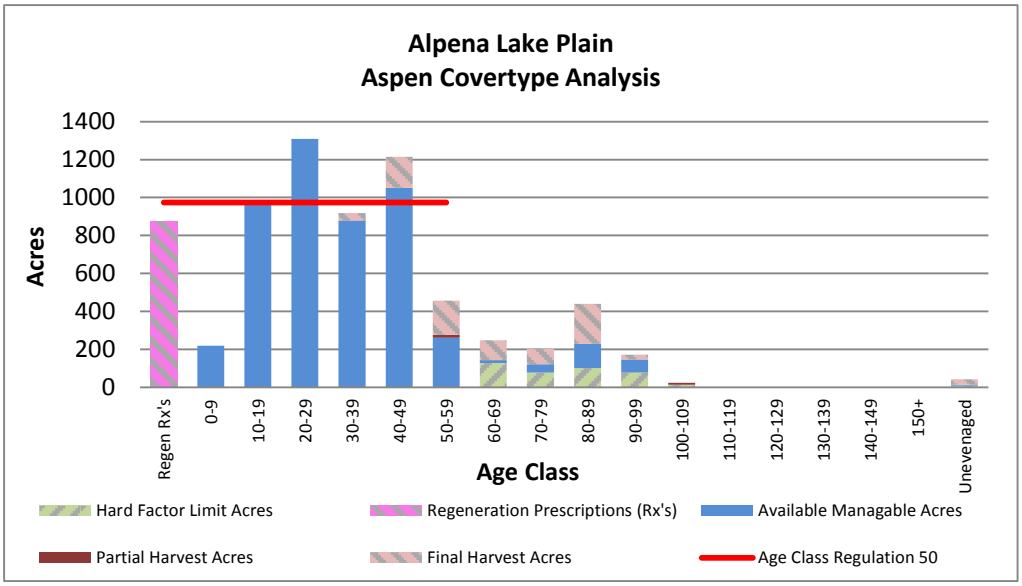

Figure 4.12.6. Age-class distribution for aspen in the Alpena Lake Plain management area (2012 Department of Natural Resources inventory data).

Long-Term Management Objectives

- Continue to balance the age-class distributions through regeneration harvests; and
- Desired future harvest levels are projected to be 974 acres of aspen for final harvest per 10-year period.

4.12.1.5 Forest Cover Type Management – Upland Open/Semi-Open Lands

Current Condition

Upland open/semi-open acres total 1,234 acres or 2% of the management area (Table 4.12.1). This category is a combination of the following non-forested land cover types: herbaceous open land, upland shrub, low-density trees and bare/sparsely vegetated. These non-forested areas are a result of natural processes of fire, frost or other disturbances which create openings in the forest canopy along with the past management practices to maintain these areas. These communities are valued ecologically as sources of open land habitat for numerous species of wildlife.

Desired Future Condition

- The amount of upland open/semi-open lands will be at or above the current level to provide habitat for species which use openings.

10-Year Management Objectives

- Consider management to maintain upland open/semi-open lands.

Long-Term Management Objectives

- Continue management to maintain upland open/semi-open lands at or above current levels;
- Continue to protect stands from illegal off-road vehicle use; and
- Where feasible and necessary, use control methods on invasive non-native species.

4.12.1.6 Forest Cover Type Management – Lowland Open/Semi-Open Lands

Current Condition

Lowland open/semi-open lands (lowland shrub, marsh, treed bog and bog) communities in this management area are valued ecologically as sources of habitat for numerous species of wildlife. Lowland open/semi-open acres total 7,540 acres or 14% of the management area (Table 4.12.1).

Desired Future Condition

- Lowland open/semi-open lands sites will be maintained at or above current levels to ensure an adequate level of wildlife habitat.

10-Year Management Objectives

- Management in lowland open/semi-open lands will be minimal. What little maintenance that will be done will be to maintain the hydrology and open characteristics.

Long-Term Management Objectives

- Continue management to maintain upland open/semi-open lands at or above current levels;
- Continue to protect stands from illegal off-road vehicle use; and
- Where feasible and necessary, use control methods on invasive non-native species.

4.12.1.7 Forest Cover Type Management – Other Types

Individual cover types which may cover less than 5% of the management area include: red pine, 2,227 acres (4% of the management area), oak, 1,294 acres (2%), lowland spruce fir, 990 acres (2%) and tamarack, 893 acres (2%). Other types including non-forested cover types total 4,651 acres (9%) and are scattered in small stands throughout the management area. All of the timbered and non-timbered communities have important ecological values and are important habitat for numerous wildlife species.

Desired Future Condition

- These communities will be managed on operable sites, contributing to the compositional diversity of the landscape while providing for continual harvest and to contribute to the preservation of regional biodiversity by providing habitat for a unique suite of plants and wide variety of animal species.

10-Year Management Objectives

- Seek opportunities to harvest, where appropriate, the scattered acreages of upland and lowland minor types where access and operability will not adversely impact sensitive areas;
- The following species are projected for regeneration harvests: red pine, 378 acres, oak 369 acres, white pine 207 acres, lowland spruce/fir 22 acres, upland spruce/fir 81 acres, mixed upland deciduous 95 acres, jack pine 119 acres, upland mixed forest 129 acres and paper birch 24 acres; and
- Partial harvests are projected for 595 acres of red pine, 265 acres of northern hardwood, 325 acres of white pine, 160 acres of mixed upland deciduous and 153 acres of upland mixed forest.

Long-Term Management Objectives

- Continue regeneration harvests to regenerate lowland types where feasible and to balance the age-class distributions of the remaining types.

4.12.2 – Featured Wildlife Species

Each of the featured species outlined below includes recommended practices with regard to forest and/or wetland management.

The following have been identified as featured species for this management area during this 10-year planning period:

- American woodcock
- Beaver
- Black bear
- Eastern Massasauga rattlesnake
- Golden-winged warbler
- Mallard
- Pileated woodpecker
- Red-headed woodpecker
- Ruffed grouse

- Snowshoe hare
- Wild turkey
- White-tailed deer
- Wood duck

The primary focus of wildlife habitat management in the Alpena Lake Plain management area will be to address the habitat requirements identified for the listed featured species. Based on the selected featured species, some of the most significant wildlife management issues in the management area are the maintenance of young forest and large open grassland complexes; the retention of large, over-mature trees and snags; and the maintenance and expansion of hard mast and mesic conifer components.

A more detailed overview of featured species is included in Section 3.

American Woodcock

The goal for American woodcock in the northern Lower Peninsula is to maintain or increase available habitat. American woodcock use young aspen stands having stem densities ranging from 6,000-20,000 stems/acre for feeding, nesting and brood-rearing. State forest management should address the maintenance of adequate early successional habitat to provide feeding, nesting and brood-rearing habitat and opportunity for hunting.

Wildlife Habitat Specifications:

- Maintain the aspen cover type and the aspen component in mixed stands within the management area.
  - Implementation of 10-year management direction for aspen, lowland aspen and lowland deciduous will be sufficient to meet this American woodcock habitat specification.
- Move to balance the age-class distribution of aspen and continue management to regenerate oak to maintain young forests across the management area.
  - Implementation of 10-year management direction for aspen, lowland aspen and lowland deciduous will be sufficient to meet this American woodcock habitat specification.
- Identify commercial and non-commercial treatment opportunities in aspen and alder stands associated with non-high priority trout stream riparian zones or forested wetlands.

Beaver

The goal for beaver in the northern Lower Peninsula is to maintain available habitat. Consideration will be given to best management practices, trout stream management and trends in beaver nuisance permits issued. State forest management for the species should focus on providing favorable food within 100 feet of streams that are not designated high priority trout streams.

Wildlife Habitat Specifications:

- Maintain or promote alder, aspen, birch, maple or willow cover types within 100 feet of non-high priority trout streams with gradients of less than 15% and other inland bodies of water.
  - Implementation of the Dingman Marsh and French Farm Flooding master plans and the 10-year management direction for aspen, lowland aspen and lowland deciduous will be sufficient to meet this habitat specification.

Black Bear

The goal for black bear in the northern Lower Peninsula is to maintain or improve habitat. Black bears have large home ranges and require large contiguous tracts of diverse forests with a mixture of cover types. They tend to use forested riparian corridors in their movements (which can be extensive). Hard mast is critical in the fall for bears to achieve adequate weight gains before denning. State forest management for the species should focus on improving existing habitat by minimizing forest fragmentation and maintaining oak to offset potential population declines due to changes in land-use.

Wildlife Habitat Specifications:

- Identify, maintain, develop or restore forested corridors that connect larger forested tracts, paying particular attention to riparian zones.
  - Implementation of riparian guidance (best management practices) will be sufficient to meet the black bear habitat specifications related to preventing fragmentation and maintaining corridors.
- Conduct silvicultural practices that maintain or increase oak-dominated stands and the oak component of mixed stands.
  - Implementation of the 10-year management direction for oak will be sufficient to meet black bear habitat specifications.

Eastern Massasauga Rattlesnake

The goal for eastern massasauga rattlesnake in the management area is to maintain available habitat and provide for the long-term persistence of the rattlesnake population. Eastern massasauga rattlesnakes inhabit open wetlands for over-wintering as well as adjacent upland open cover types that support gestation and parturition. Populations in northern Michigan will often use lowland coniferous forests, such as cedar swamps, as well as open wetlands. Upland sites may range from forest openings to old fields, agricultural lands and prairies. State forest management for the species should focus on maintaining suitable habitat on dedicated managed lands in accordance with the approved Candidate Conservation Agreement with Assurances. As of August 2013, the Candidate Conservation Agreement is in the initial stages of approval and as a result is subject to change. Refer to approved Candidate Conservation Agreement for final managed land boundaries and habitat management guidelines. Approximately 6,300 acres of state forest land in the Rattlesnake Hills management area are proposed for designated as eastern massasauga rattlesnake managed lands per the raft Candidate Conservation Agreement.

Wildlife Habitat Specifications:

- At occupied sites maintain ≤50% canopy from trees and shrubs in wetland and upland vegetation types, maintain patches of suitable habitat at greater than 250 acres, restrict mowing and burning to November to March when eastern massasauga rattlesnake are in hibernation, and refrain from manipulating water levels between November and March at sites where eastern massasauga rattlesnake are known to occur.
  - Implementation of eastern massasauga rattlesnake Candidate Conservation Agreement in appropriate management areas will be sufficient to meet eastern massasauga rattlesnake wildlife habitat specifications in this management area.

Golden-winged Warbler

The goal for golden-winged warbler in the northern Lower Peninsula is to maintain or increase available habitat. Golden-winged warbler nest in a variety of shrubby and early-successional forest sites including moist woodlands, willow and alder thickets and young forests of sapling aspen and fire cherry. Habitat tracts of 25-125 acres can support several pairs and are preferred over both smaller and larger areas. State forest management should focus on the maintenance of young aspen (0-10 years old) in association with lowland shrub and grasslands in priority landscapes.

Wildlife Habitat Specifications:

- Identify commercial and non-commercial treatment opportunities in aspen and alder adjacent to or within lowland shrub and grassland. Treatment areas 25-125 acres are preferred.
  - Implementation of 10-year management direction for aspen, lowland aspen and lowland deciduous will be sufficient to meet this golden-winged warbler habitat specification.
- Within management area, maintain 20% of aspen associated with lowland shrub and grasslands in the 0-10 year age class.

Mallard

Mallards prefer complexes of grassland and shallow seasonal or semi-permanent marshes in association with permanent hemi-marshes for pair bonding, nesting and brood rearing. Mallard pair-bonding wetlands are typically 0.25 to 20 acres in size and brood rearing wetlands are typically 1.2 to 30 acres in size. Optimal hemi-marsh sites are >2.5 acres with open water portions having extensive portions less than three feet deep and 4:1 area ratio of adjacent grasslands to hemi-marsh. Mallards nest on upland sites, normally within ~200 yards from water.

Wildlife Habitat Specifications:

- Maintain priority wetlands in hemi-marsh condition, with 50/50 open water to emergent marsh, for both breeding and non-breeding habitat.
  - Implementation of the wildlife management area master plan for Hubbard Lake State Wildlife Management Area and application of the beaver wildlife habitat specifications will be sufficient to meet this mallard habitat specification.
- Maintain stable water levels at managed floodings from April through August.

Pileated Woodpecker

The goal for pileated woodpecker in the northern Lower Peninsula is to maintain available habitat. Pileated woodpeckers prefer stands greater than 40 years old for foraging and greater than 70 years old for nesting and roosting and abundance is positively related to the density of trees greater than12 inches in diameter at breast height. State forest management should focus on the maintenance of a component of large diameter trees (>12 inches in diameter at breast height) at the landscape scale.

Wildlife Habitat Specifications:

- Maintain a component of large diameter trees greater than 12 inches in diameter at breast height.
  - Implementation of Within-Stand Retention Guidance, factor-limited acres, uneven-aged management in the northern hardwoods type, special conservation areas with objectives for big tree management and continued mortality from insect and disease will be sufficient to meet the pileated woodpecker habitat specifications for large trees in this management area.

Red-headed Woodpecker

The goal for red-headed woodpecker in the northern Lower Peninsula is to maintain or increase available habitat. Red-headed woodpecker are limited by the availability of snags for nesting, roosting and feeding and prefer areas with groupings of snags caused by beaver girdling, flooding, fire, disease or insect outbreaks. Preferred sites are greater than five acres in size with a savannah-like dispersion of large trees (<50% canopy cover) with open understory and include tall trees or snags of large diameter (>12 inches in diameter at breast height). State forest management for the species should focus on the maintenance of snags in timber sales and salvage in priority landscapes.

Wildlife Habitat Specifications:

- Retain patches of dead wood left by beaver floodings, fire, disease and insect outbreaks by minimizing salvage cuts within the management area with preference for snags greater than 12 inches in diameter at breast height.
  - Implementation of beaver wildlife habitat specifications, Within-Stand Retention Guidance, factor-limited acres, and continued mortality from insect and disease will be sufficient to meet the red-headed woodpecker habitat specifications for snags in this management area.

Ruffed Grouse

The goal for grouse in the northern Lower Peninsula is maintain available habitat. Ruffed grouse prefer young (6-15 year-old), even-aged deciduous stands that typically support 8,000-10,000 woody stems/acre. Although ruffed grouse use many different forest types (aspen, birch, oak-hickory) aspen can support higher densities than those attained in other forest types. The juxtaposition of different age classes allows for different life history requirements to be met within a small area and promotes higher grouse densities. Ideal aspen stands will be of 40-160 acres under a 40-year rotation with staggered harvests of 25% every 10 years in 10-40 acre harvest units. Larger harvest units should have irregular boundaries and include one or two, 1-3-acre unharvested inclusions. State forest management should focus on maintaining and balancing the age-class distribution for aspen and oak cover types in priority landscapes.

Wildlife Habitat Specifications

- Maintain the aspen cover type and the aspen component in mixed stands within the management area.
  - Implementation of 10-year management direction for aspen, lowland aspen and lowland deciduous will be sufficient to meet this ruffed grouse habitat specification.

- Move to balance the age-class distribution of aspen and continue management to regenerate oak to maintain young forests across the management area.
    - Implementation of 10-year management direction for aspen, lowland aspen, lowland deciduous and oak will be sufficient to meet this ruffed grouse habitat specification.
- Maintain the upland shrub cover type specifically juneberry, hawthorn, cherry and other mast producing shrub components.
    - Implementation of 10-year management direction for upland brush will be sufficient to meet this grouse habitat specification.

Snowshoe Hare

The goal for snowshoe hare in the northern Lower Peninsula is to maintain or increase available habitat. Hare populations use areas of dense, young (sapling/pole) forest and shrub communities and prefer alder and coniferous swamps. Dense understory cover is the primary limiting factor as escape/thermal cover is more important than food availability. In mature forests, hare are associated with beaver ponds and aspen harvests, feeding upon available cuttings and finding cover in the resulting re-vegetation. State forest management should focus on maintaining young aspen adjacent to lowlands, maintaining jack pine, retaining slash, increasing mesic conifer components and increasing beaver.

Wildlife Habitat Specifications:

- Maintain young aspen and lowland shrub (alder or willow) communities that have a conifer understory or young aspen stands that are adjacent to lowland/swamp conifer and mesic conifers. Conduct silvicultural practices that maintain or increase mesic conifer components in aspen stands.
    - Implementation of beaver wildlife habitat specifications and the 10-year management direction for aspen, lowland aspen and lowland deciduous will be sufficient to meet this hare habitat specification.
- When conducting site-prep herbicide treatments, encourage more diverse stands by using application-skips in pockets or along stand edges.
- In snowshoe hare habitat, limit biomass harvesting and whole-tree chipping operations, retain slash and create brush piles.

Wild Turkey

The goal for turkey in the northern Lower Peninsula is maintain available habitat. In northern Lower Peninsula, snow depth is the primary limiting factor that restricts turkey population expansion as deep snow limits access to winter food. The availability of acorns can help mediate the impacts of deep snow. A secondary limiting factor throughout their range is good brood cover. Openings with grasses and forbs and little or no overstory trees are preferred. State forest management should focus on providing natural winter food, maintaining and regenerating oak, and maintaining brood-rearing openings to improve brood-production and winter survival.

Wildlife Habitat Specifications:

- Maintain and increase the number of brood-rearing openings (forest openings, savannas, barrens, hayfields, etc.).
    - Implementation of 10-year management direction for upland open land will be sufficient to meet this turkey habitat specification.
- Through opening maintenance, planting and pruning, provide sources of winter food that are accessible above the snow (food plots, annual grains, fruit-bearing trees or shrubs).
    - Implementation of 10-year management direction for upland open land will be sufficient to meet this turkey habitat specification.
- Conduct silvicultural practices that conserve the oak component in forest stands and promote oak regeneration.
    - Implementation of 10-year management direction for oak will be sufficient to meet this turkey habitat specification.

White-tailed Deer

The goals for white-tailed deer habitat in the northern Lower Peninsula are to: 1) Maintain spring and summer forage and improve recreational access through openings management; 2) Maintain the overall proportion of potential woody browse such as aspen; 3) Maintain or increase the oak component in forest stands and promote oak regeneration; and 4) Maintain and promote functional shelter in wintering complexes.

Wildlife Habitat Specifications

- Annual manage at least 3,000 acres of forest openings across the ecoregion to provide spring and summer forage and recreational opportunities.
  - Implementation of 10-year management direction for upland open land and upland shrub will be sufficient to meet this deer habitat specification.
- Maintain the aspen cover type and the aspen component in mixed stands within the management area.
  - Implementation of 10-year management direction for aspen, lowland aspen and lowland deciduous will be sufficient to meet this deer habitat specification.
- Move to balance the age-class distribution of aspen and continue management to regenerate oak to maintain young forests across the management area.
  - Implementation of 10-year management direction for aspen, lowland aspen, lowland deciduous and oak will be sufficient to meet this deer habitat specification.
- Conduct silvicultural practices that conserve the oak component in forest stands and promote oak regeneration.
  - Implementation of 10-year management direction for oak will be sufficient to meet this deer habitat specification.
- Manage cedar and hemlock with the main objectives of regeneration and providing future functional cover.
  - Implementation of 10-year management direction for cedar and lowland conifer will be sufficient to meet this deer habitat specification.
- Promote hemlock on appropriate sites using silviculture to increase within-stand hemlock components.

Wood Duck

The goal for wood duck in the northern Lower Peninsula is to maintain or increase available habitat. Wood duck are most limited by available nesting and brood rearing habitat. Wood duck nest in tree cavities near rivers, streams, swamps, beaver ponds and marshes. Nests require mature hardwood trees with 10 inches in diameter at breast height or larger. Brood-rearing habitat is composed of wetland areas such as forested wetlands, shrub-scrub wetlands and emergent marshes that maintain adequate water through the brood rearing period. Hemi-marshes with nearby shrub-scrub or forest are important, where marshes are typically within 100 yards of woody cover. Optimal breeding habitat includes 1.25 acres or larger hemi-marsh and/or swamp (forested and shrub-scrub wetlands) located within 1,100 yards of mature hardwood forest. State forest management should focus on the protection of forest wetlands and adjacent snags and the management of priority state wildlife management areas with suitable habitat.

Wildlife Habitat Specifications:

- Maintain priority wetlands in hemi-marsh condition, with 50/50 open water to emergent marsh, for both breeding and non-breeding habitat.
  - Implementation of the wildlife management area master plan for Hubbard Lake State Wildlife Management Area and application of the beaver wildlife habitat specifications will be sufficient to meet this wood duck habitat specification.
- Maintain stable water levels at managed floodings from April through August.

4.12.3 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 or past surveys have indicated a possibility of their presence.

Past surveys have noted and confirmed fourteen listed species and seven natural communities of note occurring in the management area as listed in Table 4.12.2. A colony of great blue herons has also been identified. 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.

As shown in Figure 4.12.7, there is one potential Type 2 old growth area (37 acres) at the Besser Natural Area representing the dry-mesic northern forest natural community type which is a special conservation area.

Although there are no high conservation value areas, there are five ecological reference areas (Figure 4.12.7) that are partially or mostly on state land. The ecological reference areas represent the following natural communities: coastal fen (7.05 acres), Great Lakes marsh (1.03 acres), limestone bedrock glade (104.5 acres), sinkhole (46.36 acres) and wooded

dune and swale complex (485.3 acres). These ecological reference areas will be managed to enhance and protect their natural vegetative and associated wildlife communities as directed by an ecological reference area-specific management plan. These individual management plans will be developed over the life of this planning period.

Management goals during this planning period:

- Document occurrences of rare, threatened, endangered and special concern species and natural communities for the management area through the inventory process or with occasional focused surveys.
- Evaluate all potential Type 1, potential Type 2 and potential old growth areas to determine their status as a special resource area.
- Develop and maintain management and monitoring plans for ecological reference areas on state forest land.

Table 4.12.2. Occurrence information for special concern, rare, threatened and endangered communities and species for the Alpena Lake Plain 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 Communities								
Coastal fen		S2/G1G2	Confirmed				Lowland open/semi-open	N/A
Floodplain forest		S3/G3?	Confirmed				Lowland mixed	Mid
Great Lakes marsh		S3/G2	Confirmed				Lowland open/semi-open	N/A
Limestone bedrock glade		S2/G2G4	Confirmed				Upland open/semi-open	N/A
Limestone cliff		S2/G4G5	Confirmed				Upland open/semi-open	N/A
Sinkhole		S2/G3G5	Confirmed				Special Feature	N/A
Wooded dune and swale complex		S3/G3	Confirmed				Upland open/semi-open	N/A
Birds								
Red-shouldered hawk	*Buteo lineatus*	T/G5/S3-4	Confirmed	PS	Very High	Floodplain forest	Lowland mixed	Mid
						Dry-mesic northern forest	White Pine	Late
						Mesic northern Forest	Northern Hardwood	Late
Black tern	*Chlidonias niger*	SC/G4/S3	Confirmed	MV	Very High	Great Lakes marsh	Lowland open/semi-open	N/A
						Coastal plain marsh	Lowland open/semi-open	N/A
						Emergent Marsh	Lowland open/semi-open	N/A
Osprey	*Pandion haliaetus*	SC/G5/S2-3	Confirmed	PS	Low	Coastal fen	Lowland open/semi-open	N/A
						Northern hardwood swamp	Black Ash	Late
						Floodplain forest	Lowland Mixed	Mid
						Hardwood-conifer swamp	Lowland Mixed	Mid
Common tern	*Stema hirundo*	T/G5/S2	Confirmed	MV	Moderate	Sand & gravel beach	Upland open/semi-open	N/A
Fish								
Channel darter	*Percina capelandi*	E/G4/S1S2	Confirmed	HV	Moderate	Rivers	Aquatic	N/A
						Mainstem streams	Aquatic	N/A
						Inland lake	Aquatic	N/A
Dragonfly								
Hine's emerald dragonfly	*Somatochlora hineana*	E/LE/G2G3/S1	Confirmed	EV	Very High	Headwater Stream	Aquatic	N/A
						Bog	Lowland open/semi-open	N/A
						Northern fen	Lowland open/semi-open	N/A
						Patterned fen	Lowland open/semi-open	N/A
						Poor fen	Lowland open/semi-open	N/A
						Emergent marsh	Lowland open/semi-open	N/A
						Great Lakes marsh	Lowland open/semi-open	N/A
						Rich conifer swamp	Tamarack	Late
						Coastal fen	Lowland open/semi-open	N/A
Insect								
Secretive locust	*Appalachia arcane*	SC/S2S3/G2G3	Confirmed	MV	Very High	Bog	Lowland open/semi-open	N/A
						Pine barrens	Jack Pine	Early
						Wet-mesic sand prairie	Lowland open/semi-open	N/A
						Intermittent wetland	Lowland open/semi-open	N/A
						Dry northern forest	Jack Pine, Red Pine	Late
Reptile								
Eastern Massassauga rattlesnake	*Sistrurus catenatus catenatus*	C/SC/G3G4T3T4Q/S3S4	Confirmed	HV	High	Coastal fen	Lowland open/semi-open	N/A
						Dry-mesic prairie	Upland open/semi-open	N/A
						Dry sand prairie	Upland open/semi-open	N/A
						Poor conifer swamp	Tamarack	Late
						Bog	Lowland open/semi-open	N/A
						Emergent marsh	Lowland open/semi-open	N/A
						Northern wet meadow	Lowland open/semi-open	N/A
						Intermittent wetland	Lowland open/semi-open	N/A
						Coastal plain marsh	Lowland open/semi-open	N/A
						Wet-mesic sand prairie	Lowland open/semi-open	N/A
						Wet prairie	Lowland open/semi-open	N/A
						Prairie fen	Lowland open/semi-open	N/A
						Northern fen	Lowland open/semi-open	N/A
						Rich conifer swamp	Tamarack	Late
						Northern hardwood swamp	Black Ash	Late
						Floodplain forest	Lowland mixed	Mid
						Northern shrub thicket	Upland open/semi-open	N/A
						Mesic northern forest	Northern Hardwood	Late
						Oak-pine barrens	Oak	Mid
						Pine barrens	Jack Pine	Early
						Mesic prairie	Upland open/semi-open	N/A
						Mesic sand prairie	Upland open/semi-open	N/A
						Hardwood-conifer swamp	Lowland Mixed	Mid
Plants								
Cooper's milk vetch	*Astragalus neglectus*	SC/G4/S3	Confirmed			Alvar	Upland open/semi-open	N/A
						Boreal forest	Upland & Lowland Sp/F	Mid
						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
						Mesic sand prairie	Upland open/semi-open	N/A
						Oak-pine barrens	Oak	Mid
Pitcher's thistle	*Cirsium pitcheri*	LT/T/G3/S3	Confirmed			Open dunes	Upland open/semi-open	N/A
						Wooded dune & swale complex	Upland open/semi-open	N/A
						Great Lakes barrens	Upland open/semi-open	N/A
						Sand and gravel beach	Upland open/semi-open	N/A
Douglas's hawthorn	*Crataegus douglasii*	SC/G5/S3S4	Confirmed			Volcanic bedrock glade	Upland open/semi-open	N/A
						Volcanic bedrock lakeshore	Upland open/semi-open	N/A
						Boreal forest	Upland & Lowland Sp/F	Mid
						Mesic northern forest	Northern Hardwood	Late
						Northern bald	Upland open/semi-open	N/A
						Open dunes	Upland open/semi-open	N/A
						Sand and gravel beach	Upland open/semi-open	N/A
						Sandstone bedrock lakeshore	Upland open/semi-open	N/A
						Volcanic cliff	Upland open/semi-open	N/A
						Volcanic cobble shore	Upland open/semi-open	N/A
						Volcanic lakeshore cliff	Upland 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.

Table 4.12.2. Occurrence information for special concern, rare, threatened and endangered communities and species for the Alpena Lake Plain management area (Continued).

Common Name	Scientific Name	Status	Status in Management Area	Climate Change Vulnerability Index (CCVI)	Confidence	Natural Community Association	Probable Cover Types	Successional Stage
Plants (Cont'd)								
Ram's head lady's-slipper	*Cypripedium arietinum*	SC/G3/S3	Confirmed			Rich conifer swamp	Tamarack	Late
						Boreal forest	Upland & Lowland Sp/F	Mid
						Volcanic bedrock lakeshore	Upland open/semi-open	N/A
						Hardwood-conifer swamp	Lowland Mixed	Mid
						Poor fen	Lowland open/semi-open	N/A
						Wooded dune & swale complex	Upland open/semi-open	N/A
						Dry northern forest	Jack Pine, Red Pine	Late
						Dry-mesic northern forest	White Pine	Late
						Great Lakes barrens	Upland open/semi-open	N/A
						Limestone bedrock glade	Upland open/semi-open	N/A
						Volcanic bedrock glade	Upland open/semi-open	N/A
						Granite bedrock glade	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
Pine-drops	*Pterospora andromedea*	T/G5/S2	Confirmed			Boreal forest	Upland & Lowland Sp/F	Mid
						Dry-mesic northern forest	White Pine	Late
						Dry northern forest	Jack Pine, Red Pine	Late
						Granite bedrock glade	Upland open/semi-open	N/A
						Wooded dune & swale complex	Upland open/semi-open	N/A
Houghton's goldenrod	*Solidago houghtonii*	LT/T/G3/S3	Confirmed			Open dunes	Upland open/semi-open	N/A
						Alvar	Upland open/semi-open	N/A
						Limestone bedrock lakeshore	Upland open/semi-open	N/A
						Interdunal wetland	Lowland open/semi-open	N/A
						Coastal fen	Lowland open/semi-open	N/A
						Limestone cobble shore	Upland open/semi-open	N/A
						Wet-mesic sand prairie	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.

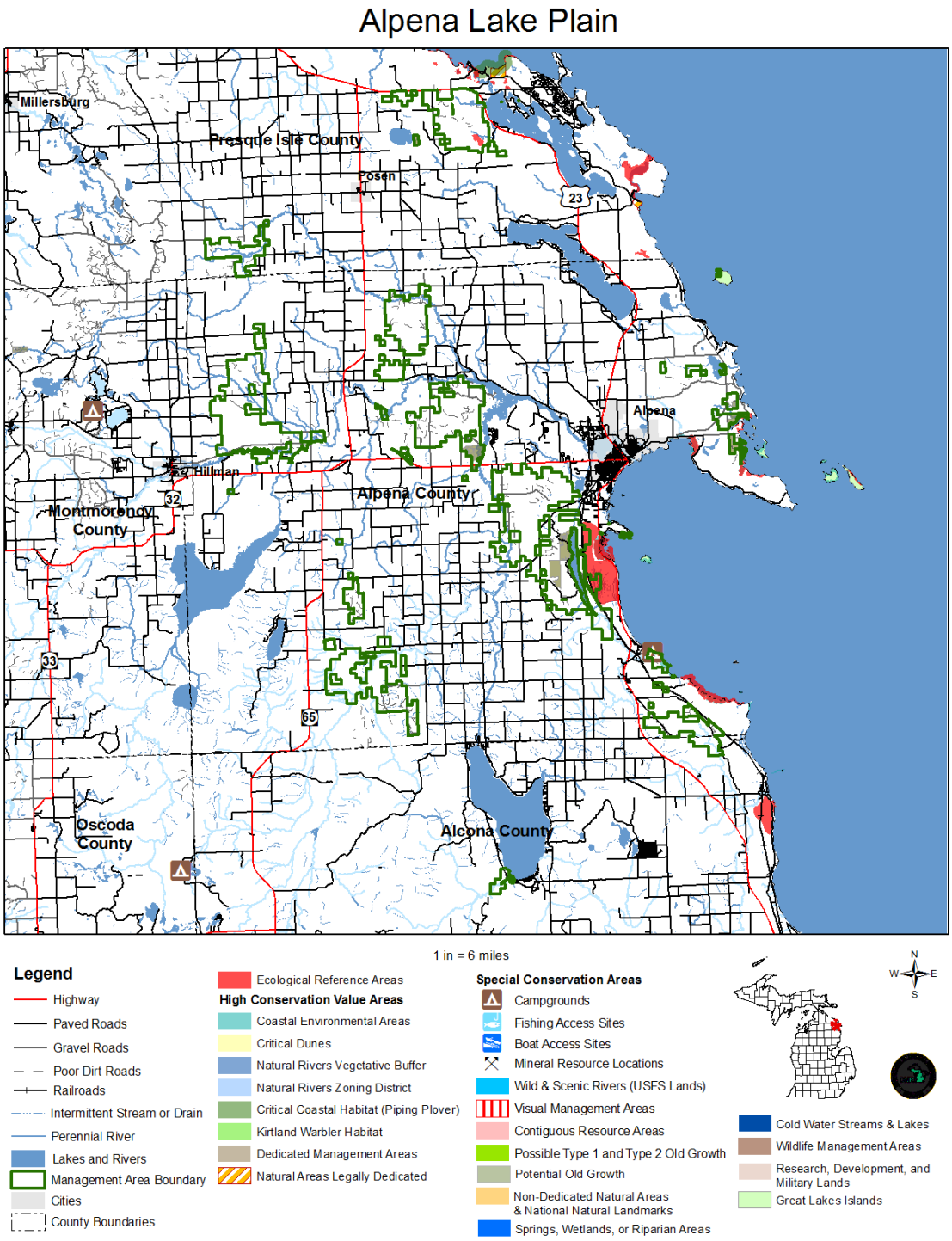

Figure 4.12.7. A map of the Alpena Lake Plain management area showing the special resource areas.

4.12.4 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. Currently, there are no major forest health issues in the management area.

Invasive Species

Invasive species pose a major threat to forest resources. They impact timber production, wildlife habitat and recreational access. Locations of invasive species mapped in and within a five-mile buffer of the management area are summarized in Table 4.12.3 below. This information was compiled from the Midwest Invasive Species Information Network database, but

it should not be considered complete. This information, and other sources that show the extent and location of invasives, will be used to inform the potential for additional sightings that should be documented. Invasives that merit eradication efforts are those species that threaten sensitive sites due to their location or growth characteristics and have population levels that may be successfully controlled.

Table 4.12.3. Locations of invasive species mapped in and within a five-mile buffer of the management area (Midwest Invasive Species Information Network database).

Alpena Lake Plain - FMD MA	Cases within FMD Areas	Cases within 5-Mile Buffer	Total number of cases	Total number of different Invasive Species
	1	98	99	3

Invasive Species within FMD Areas	Occurrences	Invasive Species within 5-Mile Buffer	Occurrences
Japanese Knotweed *Fallopia japonica*	1	Glossy Buckthorn *Rhamnus frangula*	1
-	-	Phragmites (Common Reed) *Phragmites australis*	97

4.12.5 Aquatic Resources

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 for this management area are shown in Figure 4.12.1 and listed in Appendix F.

4.12.6 Fire Management

Swamp types which are a major component of this management area are rarely impacted by natural fire regimes. However, disturbance through fire has played an important role in the initial propagation and maintenance of oak and natural oak/pine types and small inclusions of aspen or grass/upland brush types. The following fire management concepts should be applied in the management area:

- Consider opportunities to re-introduce fire in the oak/pine areas to encourage pine and oak regeneration and to discourage competition;
- Consider opportunities to incorporate fire as a tool to restore or maintain managed openings; and
- Recognize that increased urbanization in close proximity and within the management area will present more wildland/urban interface challenges to wildfire suppression.

4.12.7 Public Access and Recreation

Access for management and/or recreation is generally limited throughout much of this management area due to wet sites and limited access from adjacent landowners. The department will continue to seek access across adjacent private property. In accordance with the department's *Sustainable Soil and Water Quality Practices on Forest Land*, upon completion of harvesting, temporary spur and seasonal roads will be closed and stabilized.

There is an extensive system of trails (Figure 4.12.1) throughout the management area which includes the following:

Brush Creek Off-Road Vehicle Trail
Wah-Was-Tas-See Pathway
Devil's Lake Off-Road Vehicle Trail
Chippewa Hills Pathway
Ossineke Pathway
Norway Ridge Pathway

Although managing recreational opportunities is the primary responsibility of Parks and Recreation Division, timber management activities may impact the quality of recreational opportunities and management modifications will be

considered to minimize these impacts. There is one state forest campground within the management area boundary as shown in Figure 4.12.7.

Management modifications that may minimize possible recreational trail and other infrastructure impacts are agreed upon by recreation staff in Parks and Recreation Division and Forest Resources Division staff through the compartment review process. Public input received through meetings, including the compartment review process and other forums, will also be considered. Trail protection specifications can be applied through the vegetative management system in the design and administration of timber management activities. Guidance for within-stand retention may also be used along trails to minimize impacts which may include modifications to management such as maintaining conifers to shade winter snow trails or retaining trees along single-track off-road vehicle trails to maintain the integrity of narrow trails. Where modifications to management may not be compatible with timber management objectives, opportunities to educate the public on the department's timber management policies may be considered. Specifications and guidance for management around trails may include, but is not limited to: vegetative management system Sections 5.2.39, 5.2.40, 5.2.41 and 5.2.42 and the Department of Natural Resources Within Stand Retention Guidance.

4.12.8 Oil, Gas and Mineral Development

Surface sediments consist of lacustrine (lake) sand and gravel, coarse-textured till, glacial outwash sand and gravel and postglacial alluvium, peat and muck and dune sand. The glacial drift thickness varies between 0 and 400 feet. Sand and gravel pits are located in this management area and there is potential for additional pits.

The Devonian Antrim and Bell Shales,Traverse Formation and Dundee limestone subcrop below the glacial drift. The Traverse and Dundee Limestones have limestone/dolomite potential, especially in areas of thin glacial till.

Part of Alpena County has been developed for gas production from the Antrim Shale. Well spacing is currently 80 acres and most of the area of Antrim potential has already been drilled. The Collingwood Formation may also have oil and gas potential in this area and probably will have a well spacing of 320 to 640 acres per well (or possibly larger). The part of Alpena County already leased and drilled for the Antrim could use existing well sites to drill for the Collingwood Formation. Another portion of Alpena, possibly for the CollingwoodFoamation, is leased and drilling, if sucessful could, expand into the rest of the management area.

Metallic mineral production is not supported by the geology given the depth to known metallic bearing formations.

Administration of oil and gas development on state forest land is provided by both the DNR and Department of Environmental Quality to ensure that minerals shall be developed in an orderly manner to optimize revenue consistent with other public interest and natural resource values.

Lease classification of state lands is guided by DNR Oil and Gas Lease Classification Procedure No. 27.23-15. Contained within each DNR Oil and Gas Lease Agreement are environmental terms which detail requirements for permits to drill issued by the Department of Environmental Quality, supervisor of wells pursuant to Part 615 of 1994 PA 451, as amended. No operations are to take place in a wetland (as defined in Part 303 of 1994 PA 451, as amended), habitat critical to the survival of an endangered species and designated under provisions of Part 365 of 1994 PA 451, as amended, or a site designated by the secretary of state to be of historical or archeological significance, unless a plan to eliminate negative impacts to archeological or historical resources is agreed upon. Areas identified as having special wildlife, environmental, recreational significance and/or state surface require a development plan which will minimize negative impacts and will minimize surface waste while remaining consistent with the spacing requirements established by the supervisor of wells. All pipelines from the well site are required to follow existing well roads or utility corridors and all pipelines are to be buried below plow depth. Forest operations (including harvest and planting trees, prescribed fire and wildfire response) in the management area may require modification to accommodate the presence of pre-existing oil and gas pipelines located at or near the ground surface. Abandoned well sites should be incorporated back into state forest stands as either forest openings or re-forested areas, as determined by the vegetation plan contained in the lease agreement or as subsequently decided in compartment review.