4.5 MA 5 – Cheboygan Lake Plain Management Area

Summary of Use and Management

Management in the Cheboygan Lake Plain management area (MA) will emphasize balanced age classes of aspen, red pine, jack pine and lowland poplar and regenerating the aging oak resource. Management will strive to sustainably produce various forest products, enhance game and non-game wildlife habitat, protect areas of unique character and provide for forest-based recreational uses. Management activities may be constrained by poor access in the swampy (21% lowland) portions of this area. Expected trends within this 10-year planning period are increased recreational pressure, especially near the large lakes in the area, introduced pests and diseases and the restoration of the barrens community southwest of Black Lake.

Introduction

This management area is located near the northern tip of the northern Lower Peninsula in Cheboygan and Presque Isle counties and contains 61,004 acres of state forest (Figure 4.5.1). The primary attributes which identify the Cheboygan Lake Plain management area include:

- The management area falls mostly within Albert's Onaway sub-region (Albert, 1995).
- The historic cover types were dominated by red pine and jack pine with little aspen. The current vegetation composition is mostly aspen, red pine, jack pine and oak with 21% of the area being in relatively inaccessible lowland types.
- The dominant landform consists of rolling to moderately sloping ground moraines topography. Drumlins are common and are typically separated by poorly drained outwash.
- This management area's proximity to and use-demand by population centers along Burt, Mullett and Black lakes and the town of Onaway. The forest resources contribute social and economic values to the area due to the proximity of this management area to the population centers.
- Department of Natural Resources recreation facilities in this management area include nearby Burt Lake, Onaway and Aloha state parks and Ocqueoc River state forest campground.
- Snowmobile and off-road vehicle trails, the Northeast State Trail and the High Country Pathway cross this management area.
- Surveys have located the several threatened, endangered or special concern species including red-shouldered hawk, common loon, secretive locust, Hill's thistle and Alleghany plum.
- Much of the topography in this management area was sculpted by re-advancing glaciers that left drumlin fields interspersed with poorly drained outwash. During the early Algonquin period when Lake Huron was receding, the drumlins and moraines were islands. Small areas of exposed limestone bedrock are common and karst topography is present.

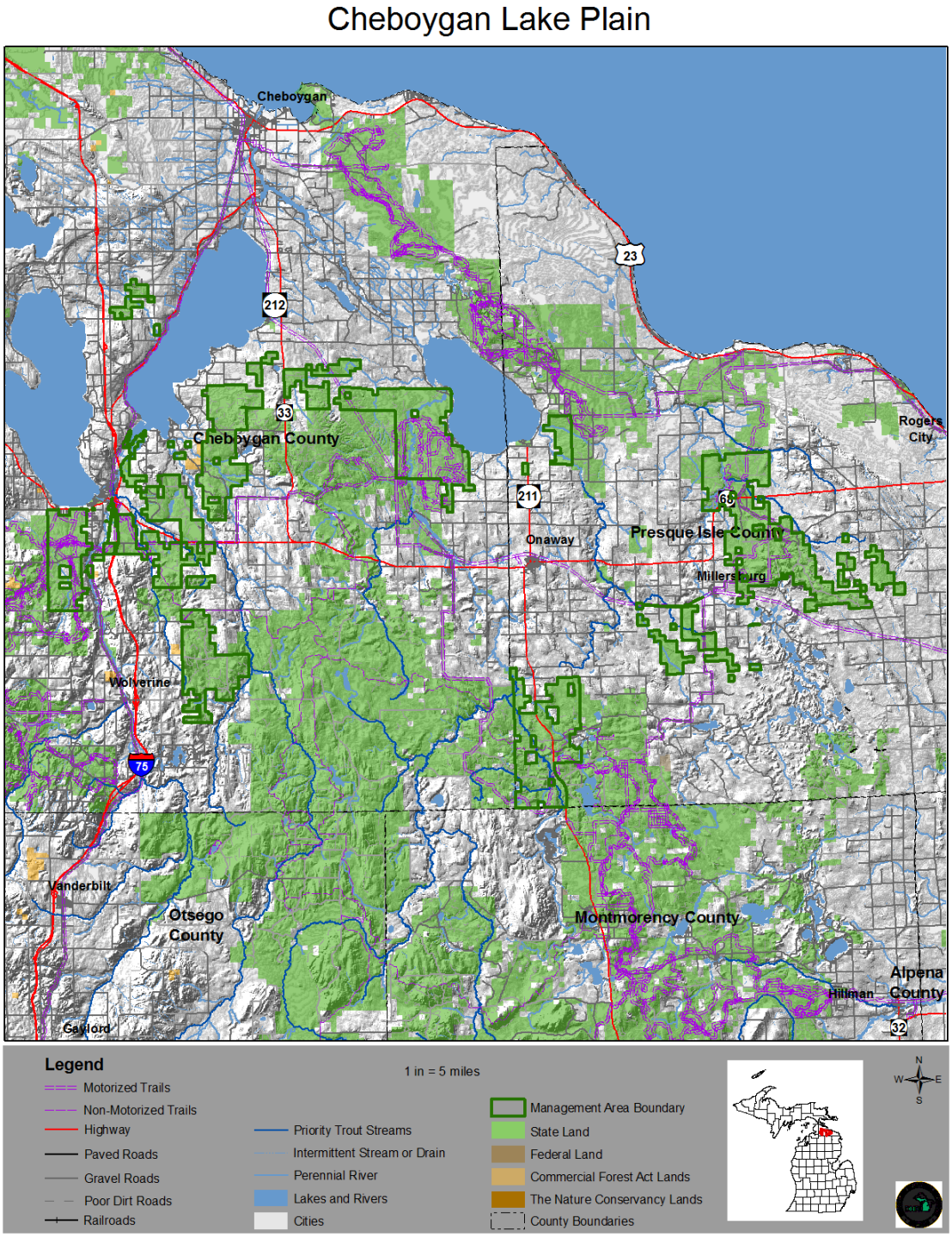

Figure 4.5.1. A map of the Cheboygan Lake Plain management area (dark green boundary) in relation to state forest and other lands in Cheboygan and Presque Isle counties, Michigan.

Table 4.5.1. Current cover types, acreages, projected harvests and projected acreages at the end of the ten-year planning period for the Cheboygan Lake Plains 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
Aspen	27%	16,386	993	15,393	2,737		16,386	2,566	
Red Pine	13%	7,924	1,078	6846	2,298	2,890	7,924	761	3,863
Jack Pine	12%	7,409	498	6911	93		7,409	1,152	
Oak	8%	4,742	1,673	3069	44	590	4,742	384	611
Cedar	7%	3,974	3,974				3,974		
Lowland Conifers	5%	3,343	2,674	669	77		3,343	77	
Lowland Deciduous	3%	1,952	1,394	558	62		1,952	62	
Lowland Aspen/Balsam Poplar	3%	1,710	855	855	143		1,710	143	
Northern Hardwood	2%	1,447	69	1378		638	1,447		638
Upland Open/Semi-Open Lands	3%	1,617		1617			1,617		
Lowland Open/Semi-Open Lands	6%	3,934		3934			3,934		
Misc Other (Water, Local, Urban)	1%	890		890			890		
Others	9%	5,676	1,051	4625	210	973	5,676	495	973
Total		61,004	14,258	46,746	5,665	5,091	61,004	5,640	6,085

4.5.1 Forest Cover Type Management Direction

The following sections contain information on the management direction in the form of **Current Forest Condition, 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 tree species and other vegetation, stands or communities are classified by the species which has the dominant canopy coverage.

4.5.1.1 Forest Cover Type Management – Aspen

Current Condition

Aspen acres total 16,386 or 27% of the management area (Table 4.5.1). Aspen is distributed throughout the management area on habitat classes ParVHa, PVCd, ParVCo, and AFO/AFOCa (see Appendix E). 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. Aspen occurs throughout the area. Accessible aspen has been consistently harvested over the last 40 years.

There are 993 acres of aspen (Figure 4.5.2) have met harvest criteria, but have site conditions that limit harvest (hard factor-limited acres). There are 1,615 acres that have a final harvest pending and these acres are shown 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 balanced harvest of forest products and a balanced amount of wildlife habitat.

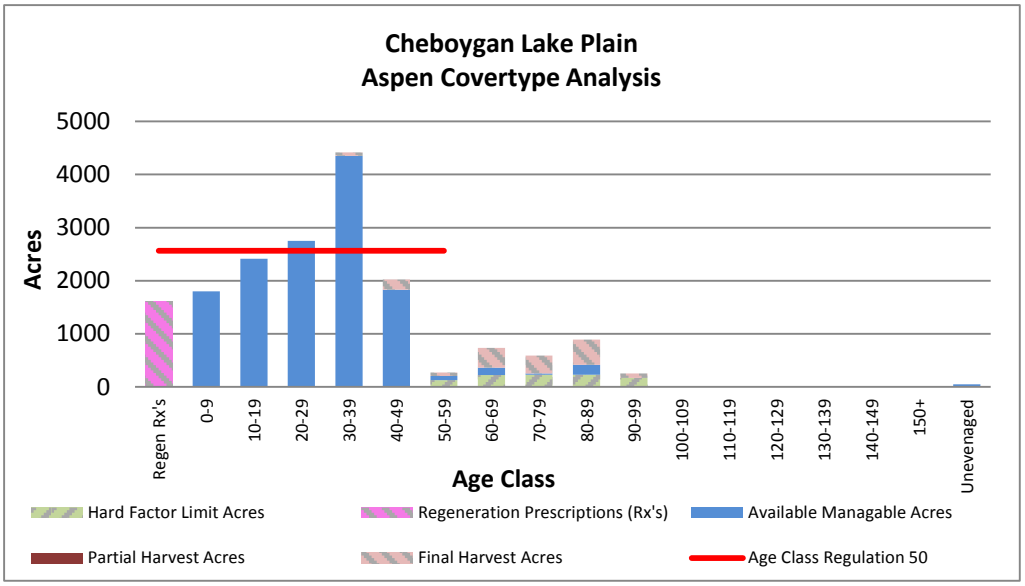

Figure 4.5.2. Age-class distribution for aspen in the Cheboygan Lake Plain management area (2012 Department of Natural Resources inventory data).

10-Year Management Objectives

- Conduct final harvests on a projected 2,737 acres of aspen in this 10-year planning period targeting the oldest age classes first; and
- Where necessary and feasible, consider harvesting stands below the rotation age to expedite the balancing of age-class distributions.

Long-Term Management Objectives

- A desired future harvest level is projected at 2,566 acres per 10-year period which is an increase over projected final harvest acres in this 10-year planning period; and
- This will continue management to balance age class distributions.

4.5.1.2 Forest Cover Type Management – Red Pine

Current Condition

Red pine acres total 7,924 acres or 13% of the management area (Table 4.5.1), with most being 50-59 or 70-79 years old (Figure 4.5.3). Most of the red pine in this management area is concentrated in Presque Isle County and southwest of Black Lake in the barrens restoration area where it is performing poorly. Red pine is found on coarse textured sands and level plains and gentle slopes associated with glacial outwash plains, sandy beach ridges and coarse textured moraines (habitat classes: PVCd, ParVHa, PArVVb).

Red pine in this management area is commercially valued for pulp, saw logs and utility poles. There are 1,078 acres of red pine have met harvest criteria, but have site conditions that limit harvest. There are 884 acres with a partial harvest pending (partial harvest acres) and these acres are included in the same age class.

Desired Future Condition

- Red pine on dry-mesic sites (PArVVb) will be maintained and managed with a thinning regime until stand replacement harvest at economic maturity with acres balanced between 0 and 89 years of age to provide for continual harvest and a balanced amount of wildlife habitat.

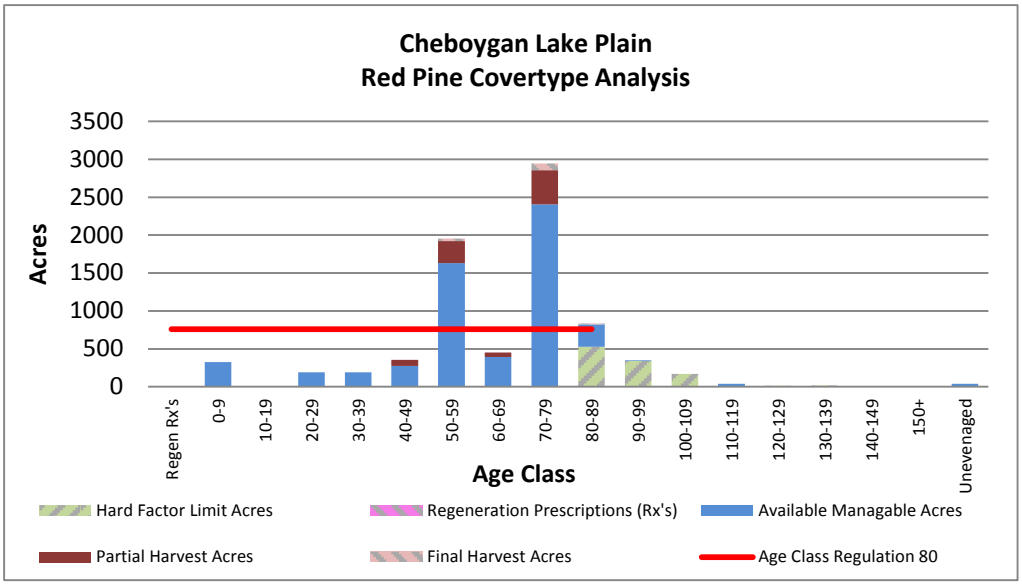

Figure 4.5.3. Age-class distribution for red pine in the Cheboygan Lake Plain management area (2012 Department of Natural Resources inventory data).

10-Year Management Objectives

- Follow the Red Pine Management Guidelines, which recommends growing red pine on suitable sites and balancing age-class distribution;
- Conduct partial harvests on a projected 2,890 acres, concentrating on stands of better quality red pine with the potential for a higher product value in larger size classes; and
- Conduct stand replacement harvests on projected on a projected 2,298 acres, beginning with the oldest age classes and with a concentration on stands with less potential for a higher product value.

Long-Term Management Objectives

- In identified special conservation areas, consider management of red pine to a biological rotation of 200+years;
- Consider allowing red pine on very dry sites (PVCd) to convert to jack pine;
- Over the next several decades, continue thinning red pine that are currently in the 40-69 year age classes. For most stands at age 80, conduct stand replacement harvests for either natural or planted regeneration;
- Desired future harvest acres are projected at 761 acres per 10-year period which is a decrease over projected final harvest acres in this 10-year planning period;
- This will continue management to balance age-class distributions;
- A desired future harvest level is projected at 3,863 acres per 10-year period which is an increase over the projected partial harvest acres in this 10-year planning period; and
- This represents management to increase the value of the older red pine in preparation for future final harvests.

4.5.1.3 Forest Cover Type Management – Jack Pine

Current Condition

Jack pine acres total 7,409 acres or 12% of the management area (Table 4.5.1). Jack pine is found on level plains and gentle slopes, associated with glacial outwash plains, sandy beach ridges and coarse textured moraines, poorly drained outwash sands and sandy outwash plains (habitat classes: PArVHa, PArVCo and PVCd). Forest communities dominated primarily by jack pine in this management area are valued ecologically as sources of habitat for numerous species of wildlife including 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 jack pine occurs in Presque Isle County and in the delta outwash area southwest of Black Lake.

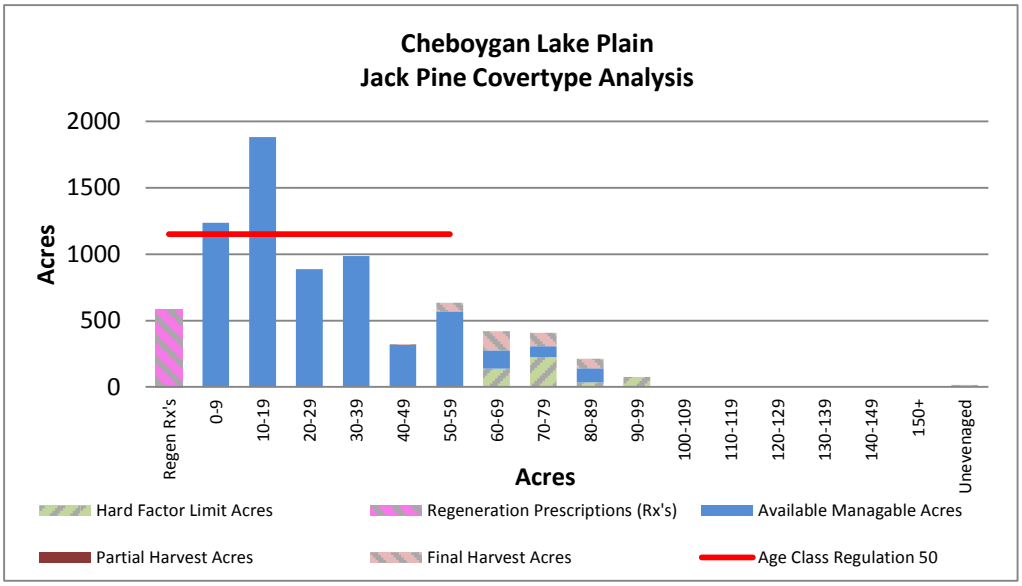

Figure 4.5.4. Age-class distribution for jack pine in the Cheboygan Lake Plain management area (2012 Department of Natural Resources inventory data).

There are 498 acres of jack pine (Figure 4.5.4) that have met silvicultural harvest criteria, but have site conditions that limit harvest. There are 585 acres that have final a harvest pending and these acres are included in the regeneration prescription class. The graph displays the projected number of acres converted to the cover type as a result of final harvests of another type and replanting with jack pine. These acres are included in the regeneration prescription class.

Desired Future Condition

- Jack pine will be maintained on operable sites through even-aged management with acres balanced between 0 and 59 years of age to provide for continual harvest, wildlife habitat and recreation opportunity.

10-Year Management Objectives

- Conduct stand replacement harvests on a projected 93 acres of jack pine currently age 50 and older.

Long-Term Management Objectives

- Continue management of jack pine on appropriate sites with an emphasis on reducing over mature stands to minimize losses from jack pine budworm and associated risks due to increased fuel loads; and

- A desired future harvest level is projected at 1,152 acres for final harvest which is an increase over projected final harvest acres in this 10-year planning period. This will continue management to balance age-class distributions and reduce over-mature acres.

4.5.1.4 Forest Cover Type Management – Oak

Current Condition

Oak acres total 4,742 or 8% of the management area (Table 4.5.1). Oak is found throughout the management area on sandy outwash plains, level plains and gentle slopes associated with glacial outwash plains, sandy beach ridges and coarse textured moraines and beach ridges along Lake Huron (habitat classes: PVCd, ParVHA and PArVVb).

Oak quality is highly variable across the management area. Forest communities dominated primarily by oak in this management area are valued ecologically as sources of habitat and mast for numerous species of wildlife including bear, white-tailed deer, squirrels and various birds; commercially for firewood; and industrial lumber.

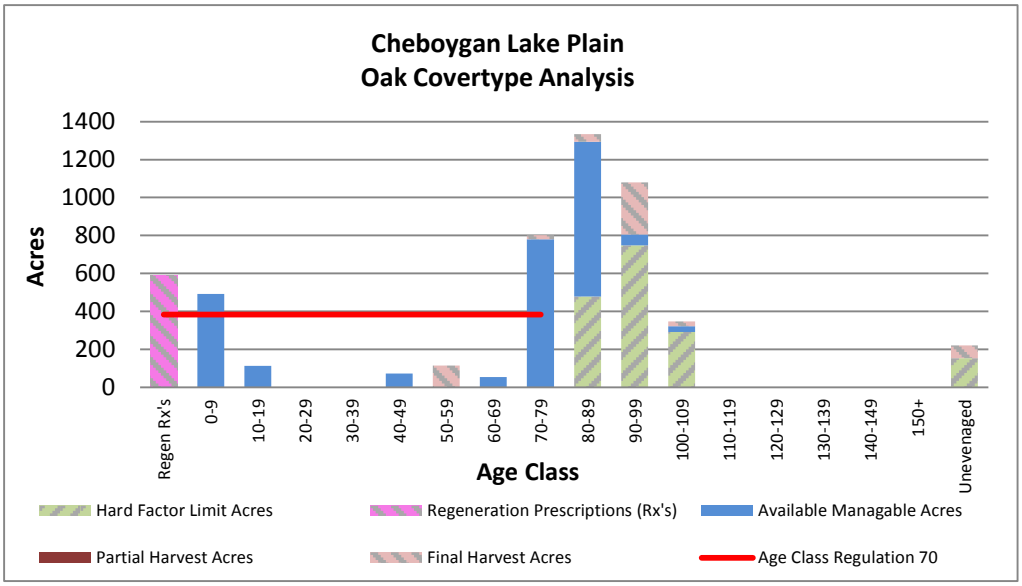

Figure 4.5.5. Age-class distribution for oak in the Cheboygan Lake Plain management area (2012 Department of Natural Resources inventory data).

The age-class distribution (Figure 4.5.5) is heavily skewed toward the older age classes 70 and above. A total of 1,673 acres of oak have met harvest criteria, but have site conditions that limit harvest. There are 587 acres of stands that have a final harvest pending (final acres) and these acres are included in the regeneration prescription class. Figure 4.5.5 includes the projected number of acres converted to oak as a result of treatments that remove an overstory species resulting in release of understory oak. These acres are included in the regeneration prescription class.

Desired Future Condition

- Oak in stands and as a component in stands throughout the management area will be maintained through management to provide for timber products, wildlife habitat and recreational opportunities.

10-Year Management Objectives

- Conduct partial harvests on a projected 590 acres;
- Conduct final harvests on a projected 44 acres; and
- Maintain or expand oak as a component in stands throughout the management area through retention and management for natural regeneration on other cover types.

Long-Term Management Objectives

- Continue work towards maintaining oak as the predominant species in selected stands through final harvests;
- It is acceptable that some oak stands may become mixed stands through partial removal of an oak overstory, planting pine in oak stands or through natural regeneration of other species;
- Continue to seek opportunities to maintain or expand oak as a component of stands throughout the management area;
- A desired future harvest level is projected at 384 acres per 10-year period which is an increase over projected final harvest acres in this 10-year planning period. This will continue management to balance age-class distributions and to maintain oak on the landscape through regeneration of older oak acres; and
- A desired future harvest level is projected at 611 acres for partial harvest per 10-year period, which is a slight increase over the projected partial harvest acres in the current 10-year planning period.

4.5.1.5 Forest Cover Type Management – Cedar and Lowland Conifer

Cedar (Figure 4.5.6) acres total 3,974 or 7% of the management area (Table 4.5.1) and lowland conifers (Figure 4.5.7) acres total 3,343 or 5% of the management area (Table 4.2.1), constituting a significant portion of the management area. However, all 3,974 acres of cedar and 2,674 acres of lowland conifers are factor limited due to access and operability issues. These lowland species may offer only limited opportunities for management.

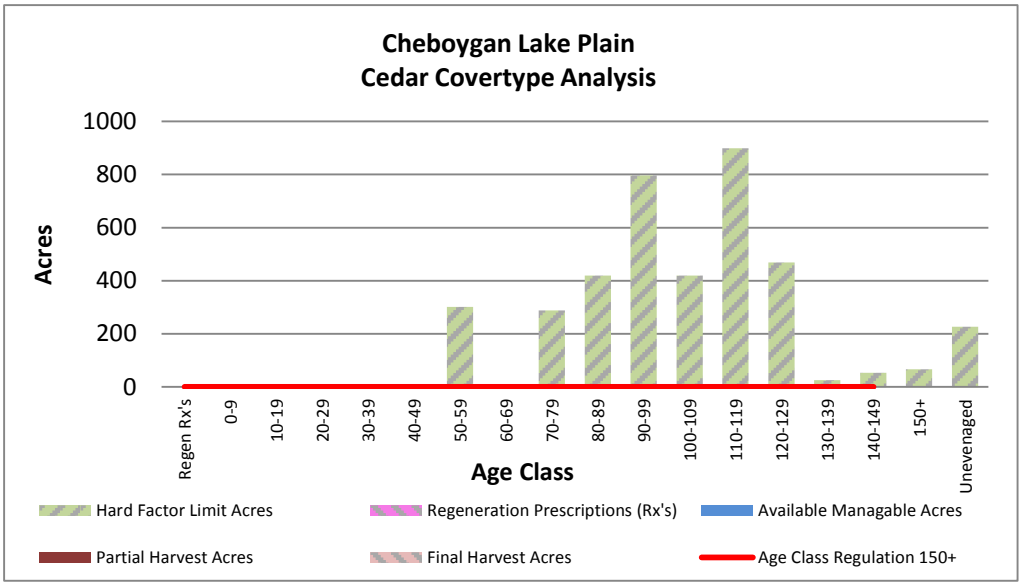

Figure 4.5.6. Age-class distribution for cedar in the Cheboygan Lake Plain management area (2012 Department of Natural Resources inventory data).

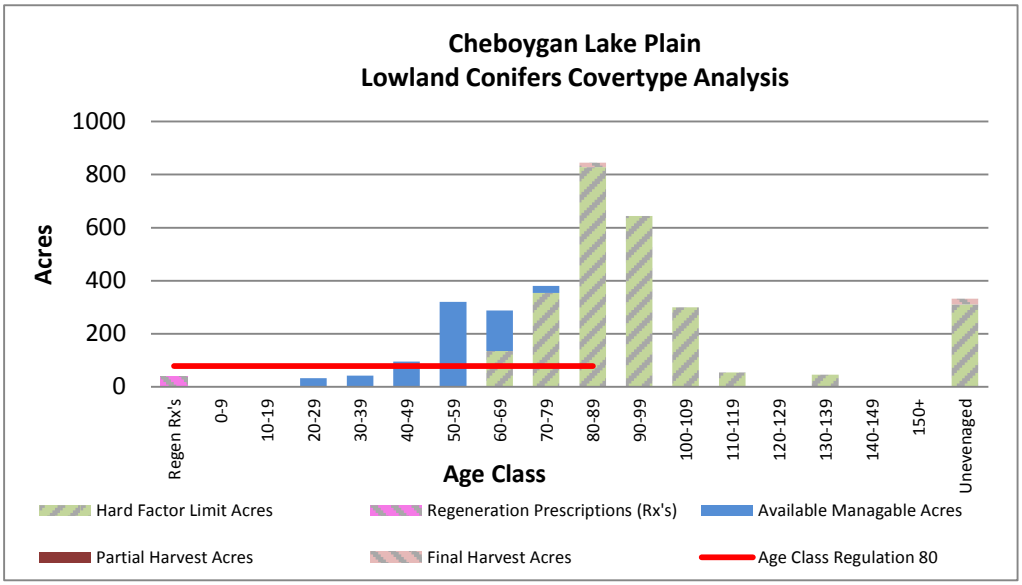

Figure 4.5.7. Age-class distribution for lowland conifers in the Cheboygan Lake Plain management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- These cover types will contribute to the compositional diversity of the landscape and wildlife habitat while providing forest products.

10-Year Management Objectives

- Conduct regeneration harvests on a projected 77 acres of lowland conifers;
- 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 adequate regeneration of cedar and lowland conifer.

Long-Term Management Objectives

- Continue efforts to regenerate lowland types where feasible; and
- The desired future harvest level of 77 acres for final harvest of lowland conifer is projected per 10-year period.

4.5.1.6 Forest Cover Type Management - Lowland Deciduous

Current Condition

Lowland deciduous forests are characterized by areas that show evidence of flooding in the past five years or support lowland indicator plants. The lowland type is typically a mixture of ash, red maple, birch, lowland aspen/balsam poplar, oak and other minor species. Lowland deciduous acres total 1,952 acres or 3% of the management area (Table 4.5.1). A large portion of the lowland deciduous cover type is in predominantly older age classes above 70 years (Figure 4.5.8).

There are 1,394 acres that have a site condition that precludes harvest, most frequently due to a lack of accessibility in wet areas. Currently, 50 acres have a final harvest pending and these acres are included in the regeneration prescriptions (Rx's) class. The ash component has been heavily impacted by the emerald ash borer.

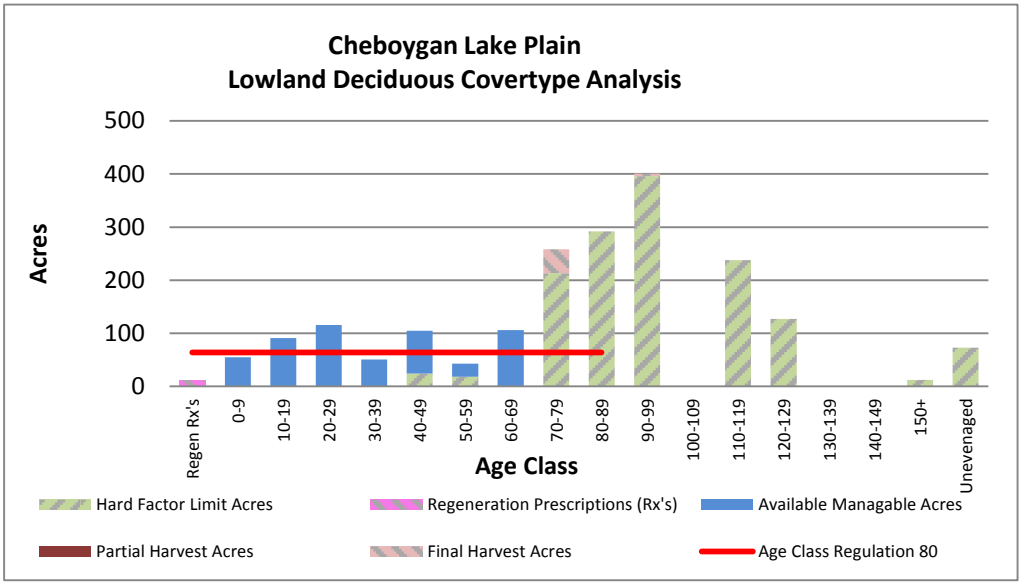

Figure 4.5.8. Age-class distribution for lowland deciduous in the Cheboygan Lake Plain management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Lowland deciduous types will be sustainably managed with acres balanced between 0 and 89 years for a continuous supply of forest products and as a source of mast and habitat for wildlife.

10-Year Management Objectives

- Seek opportunities to harvest where it can be done in a manner that will not adversely impact wetland soils;
- Conduct regeneration harvests on a projected 62 acres to begin the process of producing multiple age classes;
- Follow the Emerald Ash Borer Guidelines for managing ash in lowland deciduous stands; and
- Consider opportunities to conduct non-commercial harvests to manage for habitat and a balanced age-class distribution.

Long-Term Management Objectives

- Where feasible, continue to seek opportunities to conduct regeneration harvests;
- It is acceptable that due to the emerald ash borer the amount of ash in lowland deciduous forests will decrease significantly and will be replaced by other lowland species; and
- Desired future harvest levels for final harvest are projected at 62 acres per 10-year period.

4.5.1.7 Forest Cover Type Management – Lowland Aspen/Balsam Poplar

Current Condition

Lowland aspen/balsam poplar (Figure 4.5.9) (primarily balsam poplar, swamp aspen and swamp white birch) acres total 1,710 or 3% of the management area.

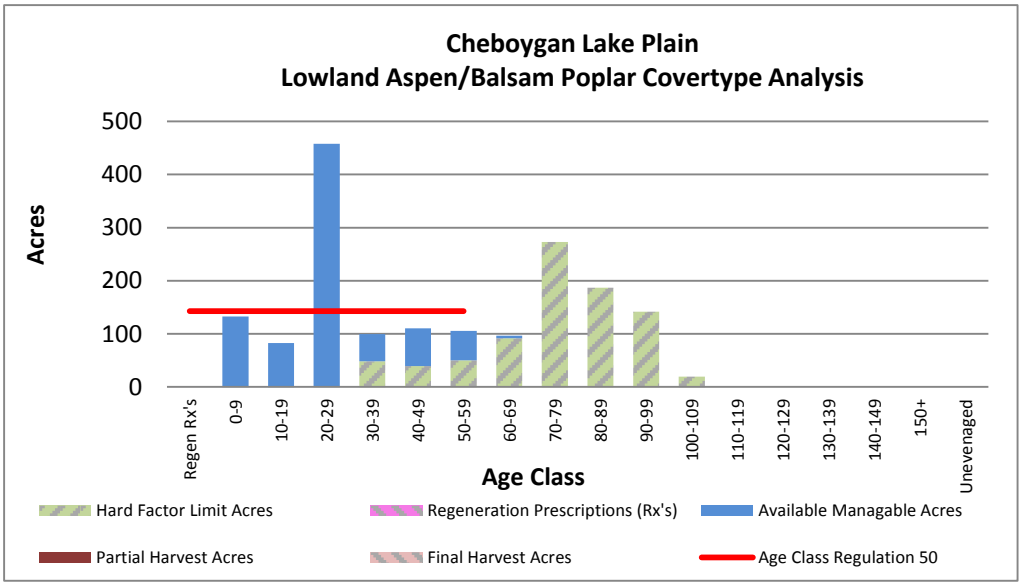

Figure 4.5.9. Age-class distribution for lowland aspen/balsam poplar in the Cheboygan Lake Plain management area (2012 Department of Natural Resources inventory data).

Forest communities dominated primarily by lowland aspen/balsam poplar in this management area are valued ecologically as sources of habitat for numerous species of wildlife including woodcock, ruffed grouse, bear, white-tailed deer (a featured species in this management area) and various song birds; and commercially for pulp. Data show that 855 acres of lowland poplar have met harvest criteria, but have site conditions that limit harvest.

There is a spike of acres above the regulation level in the 20-29 year age class. There are few acres available above the 50-year age class regulation target and consideration should be given to harvesting from younger age classes to expedite balancing the age-class distribution.

Desired Future Condition

- Lowland poplar-dominated forest communities will be maintained on operable sites through even-aged management with acres balanced between 0 and 69 years of age to provide for a regulated and sustainable harvest, wildlife habitat and to contribute to the preservation of regional biodiversity.

10-Year Management Objectives

- Conduct final harvests on a projected 143 acres of lowland aspen/balsam poplar, if it can be done in a manner that will not adversely impact wetland soils; and
- Where necessary and feasible, consider harvesting stands below the rotation age to expedite balancing of age-class distributions.

Long-Term Management Objectives

- It is acceptable that the older lowland poplar, much of it inaccessible for commercial harvest, will continue to experience natural processes (windthrow, flooding and senescence);
- Consider alternatives to managing ash in lowland areas due to impacts from the emerald ash borer; and
- A desired future harvest level is projected at 143 acres for final harvest per 10-year period which is a decrease from the current planning period. This reflects continued management to balance the age-class distribution.

4.5.1.8 Forest Cover Type Management – Northern Hardwoods

Current Condition

Northern hardwoods acres (Figure 4.4.2) total 19,294 or 54% of the management area (Table 4.4.1). Northern hardwoods are distributed throughout the management area, including coarse textured end moraines, ground moraines, drumlins and outwash plains, till plains and undifferentiated end moraine-ground moraine complexes (habitat classes: AFOCa and AFO (see Appendix E)).

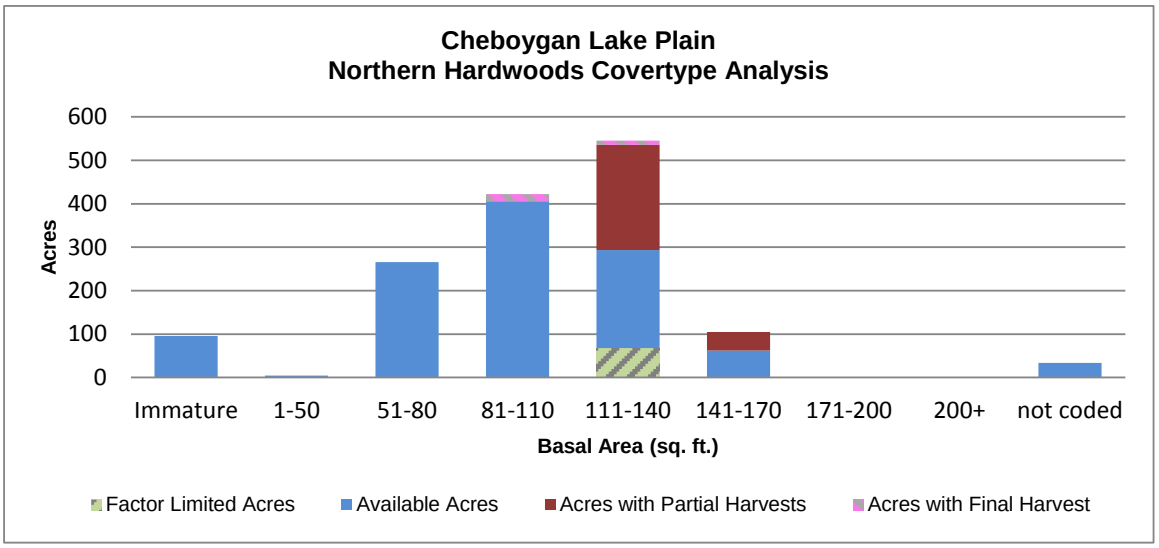

Figure 4.5.10. Basal area distribution for northern hardwoods in the Cheboygan Lake Plain management area (2012 Department of Natural Resources inventory data).

Forest communities dominated by northern hardwoods in this management area are valued ecologically as sources of habitat for numerous species of wildlife including bear, white-tailed deer, marten and various song birds; commercially for pulp and saw logs; and for a wide range of forest recreation. Many of the stands have portions that are located on steep slopes or have seeps that may limit treatment options. There are 69 acres of northern hardwoods have met harvest criteria, but have site conditions that limit harvest (hard factor limited acres). There are 275 acres with a partial harvest pending and 26 acres with a final harvest pending and these acres are included in their current basal area range.

Desired Future Condition

- Northern hardwoods-dominated forest communities will be maintained on operable sites through selective harvesting to achieve an uneven-aged stand structure, to provide for a continuous supply of timber products, wildlife habitat and recreational opportunity.

10-Year Management Objectives

- Conduct partial harvests on a projected 638 acres of northern hardwood from the higher basal area ranges; and
- Consider harvesting stands in lower basal area ranges to expedite the balancing of basal area distributions.

Long-Term Management Objectives

- Seek opportunities to collect more detailed quantitative data to assess impacts of loss of ash and beech due to insect and disease;
- Management may need to take into consideration the impacts of emerald ash borer and beech bark disease on northern hardwood stand compositions in this management area;
- Consider delaying treatments where ash and beech have been salvaged resulting in reduced basal area;
- As these species lessen in the northern hardwood stands, consider managing for other mast producing species where available;
- A desired future harvest level is projected at 638 acres for partial harvest per 10-year period; and
- This reflects continued management to produce uneven-aged northern hardwood stands.

4.5.1.9 Lowland Open/Semi-Open Lands

Current Condition

Lowland open/semi-open lands (lowland shrub, marsh, treed bog, bog) communities in this management area are valued ecologically as sources of habitat for numerous species of wildlife. Lowland open/semi-open lands acres total 3,934 or 6% of the management area (Table 4.5.1).

Desired Future Condition

- Lowland open/semi-open lands sites will be maintained at or above current levels to provide 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.

4.5.1.10 Upland Open/Semi-Open Lands

Current Condition

Upland open/semi-open lands occur on approximately 1,617 acres (3%) of the management area. This category is a combination of the following non-forested land cover types: herbaceous open land, upland shrub and bare/sparsely vegetated and low density trees. 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

- Maintain upland open/semi-open lands at or above the current level to provide habitat for species which use openings.

10-Year Management Objectives

- Consider management, if necessary, to maintain upland open/semi-open lands at or above current levels.

Long-Term Management Objectives

- Continue 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.

4.5.1.11 Forest Cover Type Management – Other Types

Individual cover types which may cover less than 5% of the management area include: cedar with 3,974 acres (6% of the management area) and lowland conifer with 3,343 acres (5%) as a significant portion of the other types and may offer limited opportunities for management. All of the timbered and non-timbered communities have important ecological values and are important habitat for numerous wildlife species.

Desired Future Condition

- These cover types will contribute to the compositional diversity of the landscape in addition to providing wood products, wildlife habitat and recreational opportunities.

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;
- 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;
- Consider methods to ensure cedar and lowland conifer regeneration;
- Conduct final harvests on a projected 165 acres of planted mixed pines, 17 acres of lowland mixed forest and 34 acres of upland conifers; and
- Conduct partial harvests on a projected 281 acres of natural mixed pines, 184 acres of upland mixed forest, 213 acres of white pine, 85 acres of mixed upland deciduous, 281 acres of natural mixed pines and 37 acres of upland conifers.

Long-Term Management Objectives

- Continue efforts to regenerate lowland types where feasible; and
- Desired future harvest levels for lowland conifer (77 acres) and lowland deciduous (62 acres) are projected remain steady to reflect continued management to regenerate lowland types.

4.5.2 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 are during this 10-year planning period:

- Elk
- Pileated woodpecker
- Red-shouldered hawk
- Ruffed grouse
- Wild turkey
- White-tailed deer.

The primary focus of wildlife habitat management in the Cheboygan 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.

Elk

The goal for elk in the northern Lower Peninsula is to maintain the population at 500-900 animals as measured in the biennial aerial survey. Elk prefer open areas and regenerating deciduous forest. Mast crops, especially acorns, are important sources of food in fall and winter. State forest management should focus on maintaining/increasing early successional, opening and hard mast habitat components at/to desired levels in priority landscapes.

Wildlife Habitat Specifications:

The goals of habitat management in the elk range are described in the 2007 Pigeon River Country Concept of Management:

- Maintain 7-8% of the forest cover types managed by even-aged management in the 0-9 year-old age class;
- Maintain the existing aspen component;
- Increase the amount of opening and upland brush to 6-7 percent of the range; and
- Maintain the existing component of mast producing trees (red oak, white oak, northern pin oak and beech).

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 >12 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-shouldered Hawk

The goal for red-shouldered hawk in the northern Lower Peninsula is to maintain available habitat. Red-shouldered hawks nest in contiguous, mature, closed canopy, hardwood forests. Nesting habitat consists primarily of well-stocked pole or sawtimber stands (stocking densities 6 and 9) with a closed canopy (80-100%) and basal area of at least 98 square feet per acre. Nests are usually found in deciduous trees with a mean 23 inches in diameter at breast height. State forest management activities should focus on the maintenance of large blocks (>385 acres) of mesic northern forest with the appropriate level of large diameter trees in priority landscapes.

Wildlife Habitat Specifications:

- All suspected red-shouldered hawk nests are to be reported to local wildlife staff and confirmed nests documented in accordance with the DNR Approach to the Protection of Rare Species on State Forest Lands (CI 4172) and included in Integrated Forest Monitoring, Assessment and Prescriptions Geographic Decision Support System when there is an expected operational impact. For red-shouldered hawk, the wildlife habitat specifications contained within Michigan DNR's *Interim Management Guidelines for Red-Shouldered Hawks and Northern Goshawk on State Forest Lands* (August 2012) will be followed.

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.

Wild Turkey

The goal for turkey in the northern Lower Peninsula is maintain available habitat. In the 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.

4.5.3 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 nine listed species and no natural communities of note occurring in the management area as listed in Table 4.5.2. 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.

There are no high conservation value areas or ecological reference areas identified for the Cheboygan Lake Plain management area as illustrated in Figure 4.5.11.

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 4.5.2. Occurrence information for special concern, rare, threatened and endangered communities and species for the Cheboygan 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
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**
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**
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**
Insect								
Hungerford's crawling water beetle	***Byrchius hungerfordi***	**LE/E/G1/S1**	**Confirmed**	**MV**	**Very High**	**Northern shrub thicket**	**Upland open/semi-open**	**N/A**
						Northern wet meadow	**Lowland open/semi-open**	**N/A**
						Rich conifer swamp	**Tamarack**	**Late**
						Floodplain forest	**Lowland mixed**	**Mid**
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								
Wood turtle	***Glyptemys insculpta***	**SC/G4/S2S3**	**Confirmed**	**MV**	**Moderate**	**Northern wet meadow**	**Lowland open/semi-open**	**N/A**
						Bog	**Lowland open/semi-open**	**N/A**
						Rich conifer swamp	**Tamarack**	**Late**
						Hardwood-conifer swamp	**Lowland Mixed**	**Mid**
						Northern shrub thicket	**Upland open/semi-open**	**N/A**
						Mesic northern forest	**Northern Hardwood**	**Late**
Plants								
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**
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**

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

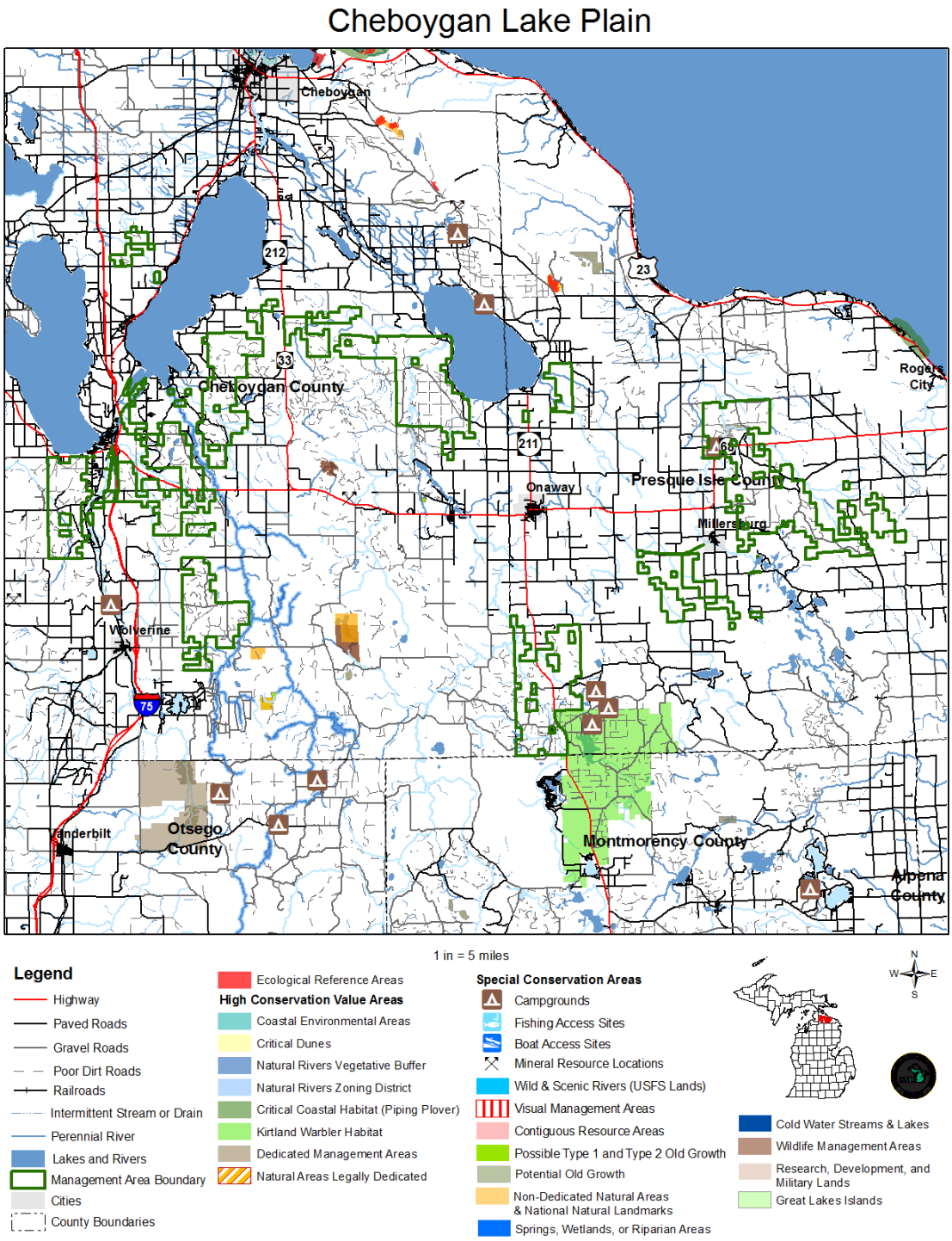

Figure 4.5.11. A map of the Cheboygan Lake Plain management area showing the special resource areas.

4.5.4 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, the area has no significant forest health issues.

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 4.5.3 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 4.5.3. Locations of invasive species mapped in and within a five-mile buffer of the management area (Midwest Invasive Species Information Network database).

Cheboygan Lake Plain - FMD Management Areas	**Cases within FMD Areas**	**Cases within 5-Mile Buffer**	**Total number of cases**	**Total number of different Invasive Species**
	1	**13**	**14**	**5**

Invasive Species within FMD Areas	**Occurrences**	**Invasive Species within 5-Mile Buffer**	**Occurrences**
Tatarian Honeysuckle *Lonicera tatarica*	1	Japanese Knotweed *Fallopia japonica*	2
-	-	Purple Loosestrife *Lythrum salicaria*	3
-	-	Reed Canary Grass *Phalaris arundinacea*	1
-	-	Spotted Knapweed *Centaurea stoebe*	1
-	-	Tatarian Honeysuckle *Lonicera tatarica*	6

4.5.5 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 4.5.1 and listed in Appendix F.

4.5.6 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 Michigan DNR has a prescribed fire program and maintains a well-trained staff to conduct prescribed burns for silviculture, habitat maintenance or habitat restoration. Each year, all burns prescribed on state forests, parks and wildlife game lands are evaluated and ranked, with funding allocated to the highest priority burns. The ability to fund prescribed burns is based on available funding, the total acres prescribed for burning and the prioritized ranking of individual burns. The demand for prescribed burning money frequently exceeds the amount of funding and some recommended burns may not be funded for that fiscal year. Once funded, the ability to implement a burn is dependent on suitable prescribed burning weather, a suitable fuel (vegetation) condition, local staffing and other resources.

The following fire management concepts should be applied in the management area:

- When feasible, seek opportunities to use fire in the oak/pine areas to encourage pine and oak regeneration and to discourage competition;
- When feasible, seek 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.

4.5.7 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. In accordance with the department's *Sustainable Soil and Water Quality Practices of Forest Land*, upon completion of harvesting, temporary spur and seasonal roads will be closed and stabilized.

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.

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.

4.5.8 Oil, Gas and Mineral Development

Surface sediments consist of lacustrine (lake) sand and gravel, dune sand, glacial outwash sand and gravel and postglacial alluvium, ice-contact outwash sand and gravel and coarse-textured till. 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 gravel pits.

The Devonian Antrim Shale, Traverse Group, Bell Shale, and Dundee Limestone subcrop below the glacial drift. Most of the bedrock formations have limestone/dolomite potential, especially in areas of thin glacial till.

Oil and gas production, the Guelph (former Niagaran) reef play, is located in the Presque Isle County part of the management area. The Collingwood Formation may have oil and gas potential in this area and most of the management area is currently leased. If drilling is sucessful for the Collingwood, additional leasing and drilling in the management area could occur.

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 DEQ, 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.