4.8 MA 8 – Pigeon River Country Management Area

Summary of Use and Management

The Pigeon River Country management area (MA) has been a "special management unit" since 1919 with a goal of protecting its wild character from overuse by restricting development and access. Management in the Pigeon River Country management area will be in accordance with the Concept of Management plan (updated 2007) which emphasizes the protection of natural features while providing for cover type management on suitable sites in order to enhance game and non-game wildlife habitat, sustainably produce various timber products, protect areas of unique character, and provide for forest-based recreational uses.

Expected trends within the next decade are increased recreational pressure, introduced pests and diseases, especially beech bark disease and emerald ash borer (beech and ash are significant species in northern hardwood stands). Pigeon River Country is the heart of Michigan's elk range.

Introduction

The Pigeon River Country management area, designated as a "special management unit" (now classified as a forest management unit) by the Department of Natural Resources early in the 20th century, has 105,695 acres of state forest land. The Pigeon River Country is centrally located between the communities of Gaylord, Indian River, Onaway and Atlanta. The primary attributes which identify the Pigeon River Country management area include:

- The Pigeon River Country management area straddles Albert's Onaway and Vanderbilt Moraines sub-regions (Albert, 1995).
- The Onaway sub-region landform features drumlin fields on course-textured ground moraines and the Vanderbilt Moraines landform features steep sandy ground moraine ridges.
- Pre-settlement and current vegetation of both sub-regions featured northern hardwoods with swamps between the morainal areas and conifers in the drier areas.
- The state forest land in the Pigeon River Country management area is very concentrated, with only 7,450 acres of private land in-holdings.
- The state forest land in the Pigeon River Country management area was acquired over time through Game and Fish Fund purchases, Michigan Natural Resources Trust Fund purchases, tax reversion, private and government exchanges and through various grants. Over 53,000 acres of the management area have been acquired through Pittman-Robertson Act related funds.
- A major oil and gas discovery in the Pigeon River Country was made in 1970 resulting in associated industrial activity that caused concern about undesirable changes to the area. Oil and gas development was eventually restricted to the southern third of the management area. The oil and gas development led to the creation of the Kammer Land Trust Fund (now the Michigan Natural Resources Trust Fund) where royalties from state-owned lands would be used to purchase new recreational lands for public use.
- Management is guided by the "concept of management" document which lists the primary objectives of the forest, most of which are related to wildlife management.
- The Pigeon River Country Forest Management Unit has an advisory council whose responsibilities include advising the DNR director on plans, programs, activities and proposed management conducted within or affecting the Pigeon River Country.
- Pigeon River Country is the heart of Michigan's elk population.
- Recreational developments are present including eight state forest campgrounds. Equestrian, cycling and hiking trails cross the area including a portion of the High Country Pathway.
- There are three nominated natural areas in this management area:
    - Dog Lake Special management area (680 acres) features dry-mesic northern forest and northern wet meadow communities;
    - Grindstone Creek (53 acres) features mesic northern forest community; and
    - Pigeon River Pines (220 acres) features dry-mesic northern forest, poor conifer swamp and rich conifer swamp communities.

- This management area contains one or more of the Northern Lower Peninsula Grouse Enhanced Management Systems areas. This area plan will emphasize balanced age classes of aspen for timber production which will have habitat benefits for a number of the featured species including ruffed grouse and elk. The boundaries of Grouse Enhanced Management Systems areas will be delineated and an operational plan will be developed during this planning period by the local biologist in collaboration with the Forest Resources Division unit manager and integrated into the plan through the revision process.

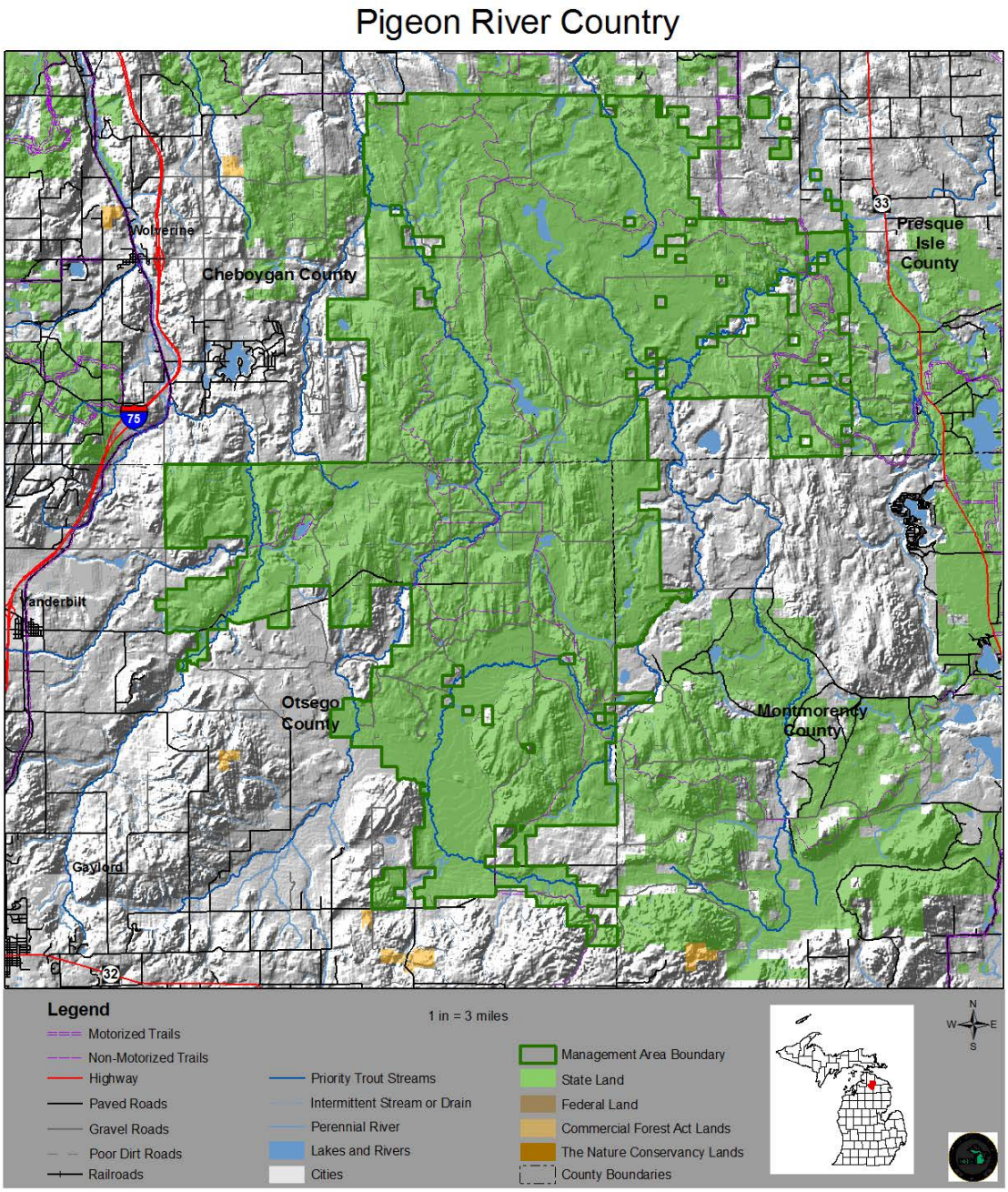

Figure 4.8.1. A map of the Pigeon River Country management area (dark green boundary) in relation to surrounding state forest and other lands in Otsego and Cheboygan counties, Michigan.

Table 4.8.1. Current cover types, acreages, projected harvests and projected acreages at the end of the ten-year planning period for the Pigeon River Country 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%	28,311	974	27,337	8,926		28,311	4,556	
Northern Hardwood	16%	17,092	1,187	15905		7,122	17,092		7,122
Red Pine	10%	10,545	2,130	8415	3,587		10,545	935	3,850
Lowland Conifers	10%	10,248	8,162	2086	647		10,248	232	
Cedar	6%	6,223	6,223				6,223		
White Pine	5%	4,878	424	4454	1,073	1,270	4,878	405	1,691
Jack Pine	4%	4,476	286	4190	600		4,476	599	
Oak	3%	3,507	708	2799	944	619	3,507	311	982
Lowland Deciduous	2%	2,012	1,419	593	224		2,012	66	
Upland Open/Semi-Open Lands	5%	5,632		5632			5,632		
Lowland Open/Semi-Open Lands	5%	5,486		5486			5,486		
Misc Other (Water, Local, Urban)	1%	1,146	3	1143			1,146		
Others	6%	6,139	2,004	4135	682	574	6,139	469	577
Total		105,695	23,519	82,176	16,684	9,585	105,695	7,573	14,222

4.8.1 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, they stands or communities are classified by the species which has the dominant canopy coverage.

4.8.1.1 Forest Cover Type Management – Aspen

Current Condition

Aspen acres total 28,311 or 27% of the management area (Table 4.8.1). Aspen is found throughout the MA on habitat types AFOCa, AFO, PArVVb and PArVHa (see Appendix E). Forest communities dominated primarily by aspen in this MA are valued ecologically as sources of habitat for numerous species of wildlife including elk, 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. Most of the aspen in this management area is younger than the 50-year rotation age (Figure 4.8.2) as accessible aspen has been consistently harvested over the last 50 years. There are 974 acres of aspen have met harvest criteria, but have site conditions that limit harvest (hard factor limited acres). There are 2,430 acres that have a final harvest pending and these acres are included in the regeneration prescription class.

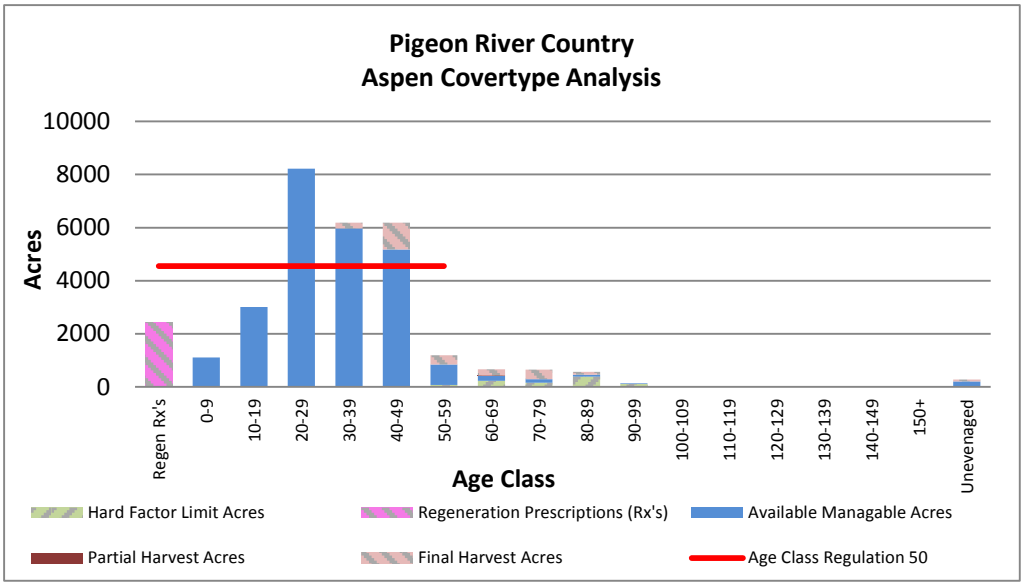

Figure 4.8.2. Age-class distribution for aspen in the Pigeon River Country management area (2012 Department of Natural Resousces inventory data).

Desired Future Condition

- Aspen-dominated forest communities will be maintained at or above the current level through even-aged management with acres balanced between 0 and 59 years of age to provide for wildlife habitat and recreational opportunity while providing forest products.

10-Year Management Objectives

- Conduct regeneration harvests on a projected 8.926 acres; and
- Where necessary and feasible, consider harvesting stands below the rotation age to expedite the balancing of age-class distributions.
- Aspen within the identified Grouse Enhanced Management Systems area may be managed differently than the rest of the aspen within the management area, with a shorter rotation age**,** small patch cuts and carefully considered stand adjacency.

Long-Term Management Objectives

- Future management decisions will need to consider that the trend towards fewer elk will lessen the impact on aspen regeneration; and
- Desired future harvest levels for final harvest are projected at 4,556 acres per 10-year period.

4.8.1.2 Forest Cover Type Management – Northern Hardwood

Current Condition

Northern hardwoods acres total 17,092 or 16% of the management area (Table 4.8.1). Northern hardwoods in this management area are valued ecologically as sources of habitat for numerous species of wildlife including elk, bear, white-tailed deer, marten and various song birds, commercially for pulp and saw logs and for a wide range of forest recreation. Almost all stands are accessible for treatment. There are 1,187 acres of northern hardwood that have met harvest criteria, but have site conditions that limit harvest (hard factor limited acres). There are 2,839 acres with a partial harvest pending and these acres are included in their current basal area range (Figure 4.8.3).

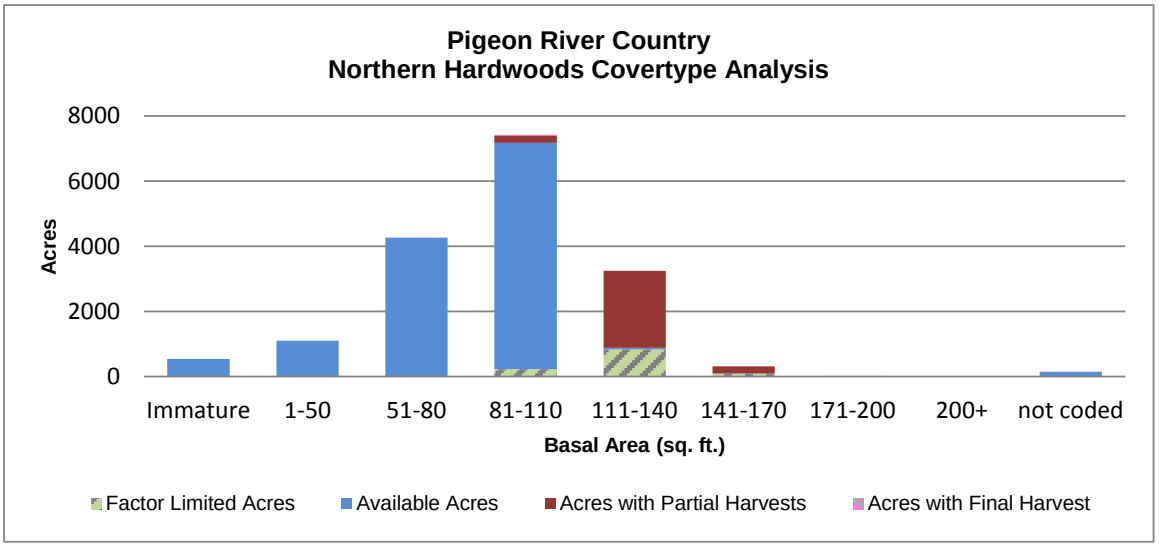

Figure 4.8.3. Basal area distribution for northern hardwood in the Pigeon River Country management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

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

10-Year Management Objectives

- Conduct partial harvests on a projected 7,122 acres of northern hardwood characterized as having a basal area of 111 square feet or greater; and
- Where necessary and feasible, consider harvesting stands with lower basal areas to expedite the balancing of basal area distributions.

Long-Term Management Objectives

- Continue to conduct salvage harvests of beech affected by beech bark disease and ash where present and affected by emerald ash borer, in northern hardwood stands, using Beech Bark Disease Management Guidelines and Emerald Ash Borer Guidelines;
- Consider the need to delay further selection harvesting due to resultant lower than normal residual basal area in post-salvage harvest stands.; and
- As beech and ash species decline in the northern hardwood stands, consider introducing oak for mast in stands without oak.

4.8.1.3 Forest Cover Type Management – Red Pine

Current Condition

Red pine acres total 10,545 or 10% of the management area (Table 4.8.1), with most being 70-89 years old. Red pine is found on AFO, PArVVb and PArVHa habitat class sites. Red pine in this management area is commercially valued for pulp, saw logs and utility poles. Approximately 70% of the pine is of Civilian Conservation Corps-era planted origin. There are 2,130 acres of red pine that have met harvest criteria, but have site conditions that limit harvest (hard factor limited acres). There are 1,609 acres that have a partial harvest pending are included in the current age classes (Figure 4.8.4). Figure 4.8.4 includes the projected number of acres converted to red pine as a result of final harvests of another type and planting to red pine. These acres are included in the regeneration prescription class.

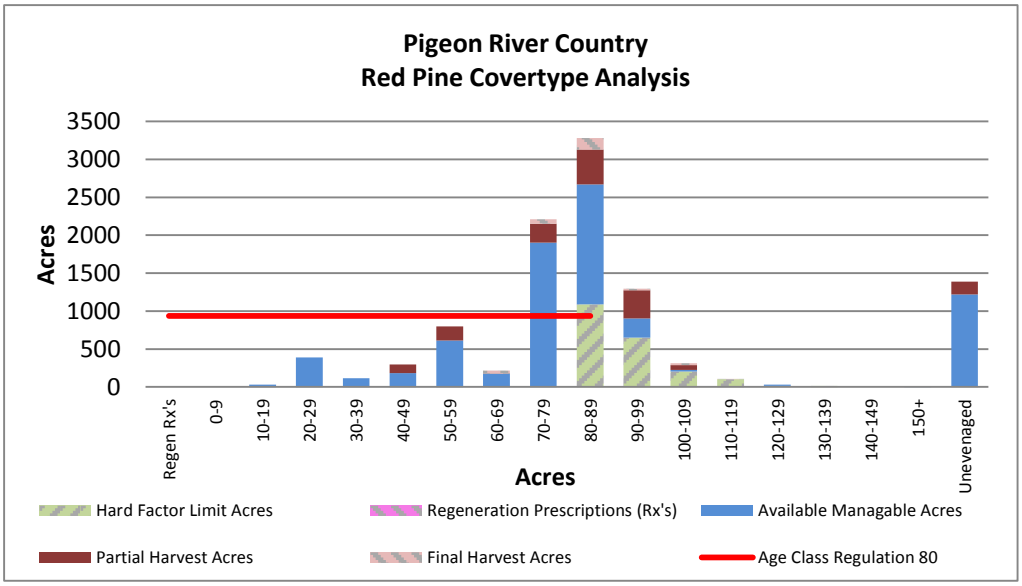

Figure 4.8.4. Age-class distribution for red pine in the Pigeon River Country management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Red pine stands between 0 and 89 years of age will be located on mesic sites lacking high-quality natural hardwood regeneration.; and
- Red pine on sites more suitable for northern hardwoods will be allowed to convert, with a residual component of red pine to provide vertical structure.

10-Year Management Objectives

- Follow the Red Pine Management Guidelines, which recommends growing red pine on suitable sites and balancing the age-class distribution;
- Conduct regeneration harvests on a projected 3,587 acres beginning with the oldest age-classes; and
- Consider whether to allow natural hardwood conversion on sites more suitable for hardwoods.

Long-Term Management Objectives

- Continue to conduct stand-replacement harvests as stands reach the silvicultural rotation (80 years) for natural regeneration on sites lacking high-quality natural hardwood regeneration;
- On sites being converted to hardwoods, consider leaving a scattering of a few pine trees per acre to provide a super-canopy of red pine and vertical structure for various wildlife species;
- Seek opportunities to manage red pine to a biological rotation of 200+ years; and
- Desired future harvest levels are projected at 935 acres of final harvest and 3,850 acres of partial harvest per 10-year period.

4.8.1.4 Forest Cover Type Management – Cedar and Lowland Conifers

Current Condition

Cedar acres total 6,223 or 6% of the management area and lowland conifer acres total 10,248 or 10% of the management area (Table 4.8.1). Cedar and lowland conifer are primarily located on unclassified lowlands (lowlands have not been assessed for habitat classification) throughout the management area. The age classes for both cover types (Figures 4.8.5 and 4.8.6) are heavily skewed toward the older age classes above 70 years of age and there has been virtually no regeneration.

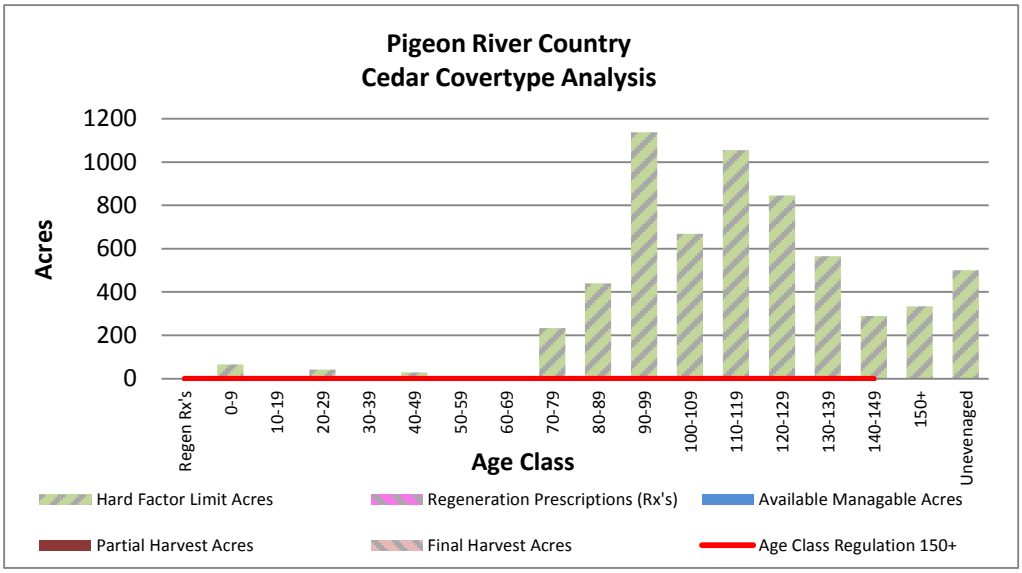

Figure 4.8.5. Age-class distribution for cedar in the Pigeon River Country management area (2012 Department of Natural Resources inventory data).

Forest cover types dominated primarily by cedar and lowland conifers 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.

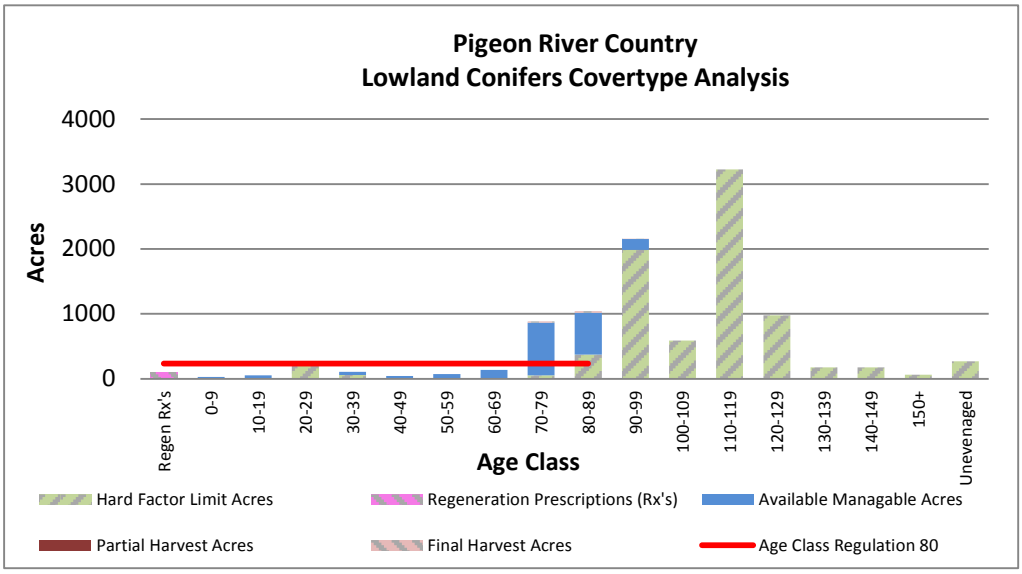

Figure 4.8.6. Age-class distribution for lowland conifer in the Pigeon River Country management area (2012 Department of Natural Resources inventory data).

All of the 6,223 acres of cedar and 8,162 acres of lowland conifers have site conditions that may limit the ability to commercially harvest (hard factor limited acres).

Desired Future Condition

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

10-Year Management Objectives

- If harvests can be done in a manner that will not impact wetland soils, conduct regeneration harvests on a projected 232 acres of lowland conifer;
- Additional opportunities to increase harvest prescriptions in lowland forest types will be assessed, both in and outside (due to forest health issue) of normal years-of-entry; and
- Consider methods to ensure adequate regeneration of cedar and lowland conifer.

Long-Term Management Objectives

- It is acceptable that over the next several decades, the older cedar and lowland conifer, 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
- The desired future harvest level for final harvest of lowland conifer (232 acres) is projected per 10-year period.

4.8.1.5 Forest Cover Type Management – White Pine

Current Condition

White pine acres total 4,878 acres or 5% of the management area (Table 4.8.1) with most being 70-99 years old (Figure 4.8.7) White pine is found on AFO and PArVVb habitat class sites. White pine in this management area is commercially valued for pulp and saw logs. There are 424 acres of white pine that have met harvest criteria, but have site conditions that limit harvest (hard factor limited acres).

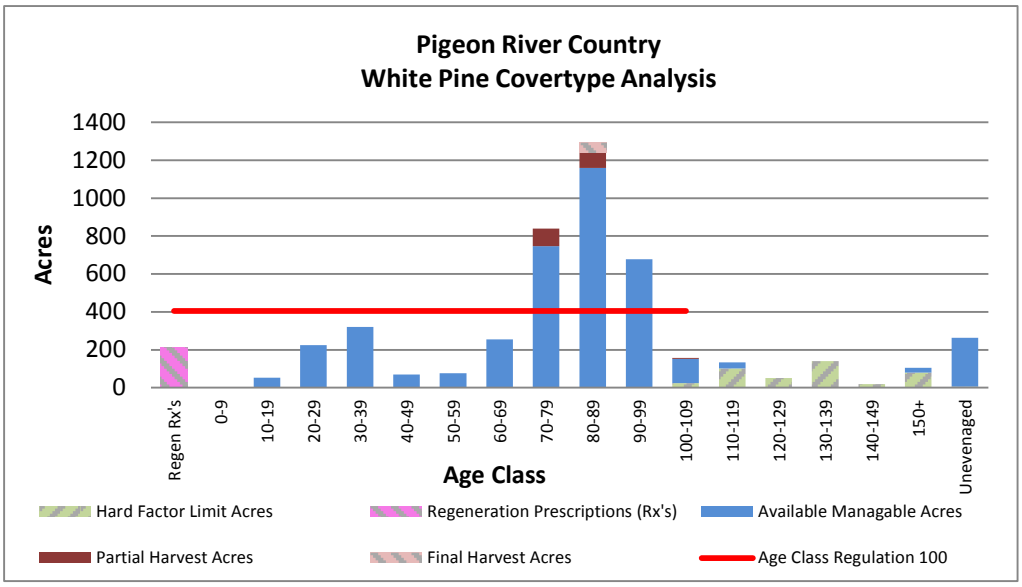

Figure 4.8.7. Age-class distribution for white pine in the Pigeon River Country management area (2012 Department of Natural Resources inventory data).

The graph includes the projected number of acres converted to the cover type as a result of treatments that remove an overstory species resulting in release of white pine or final harvests and planting to white pine. These acres are included in the regeneration prescription class.

Desired Future Condition

- White pine will be managed with a thinning regime until 100 years of age;
- Stands on mesic sites will be managed to economic maturity, while allowing natural hardwood conversion on sites more suitable for hardwoods;
- White pine will be regenerated on sites lacking high quality northern hardwood regeneration; and
- On sites being converted to hardwoods, a scattering of a few pine trees per acre will be retained providing a super-canopy of white pine and providing vertical structure for various wildlife species.

10-Year Management Objectives

- Conduct final harvests on a projected 1,073 acres beginning with the oldest age classes and with a concentration on stands with less potential for a higher product value; and
- Conduct partial harvests on a projected 1,270 acres.

Long-Term Management Objectives

- Continue thinning white pine in the 40-99 year age classes;
- It is acceptable that some white pine stands may become mixed stands through partial removal of the white pine over story and allowing natural regeneration of other species;
- Continue to seek opportunities to maintain or expand super-canopy white pine as a component of stands throughout the management area; and
- Desired future harvest levels are projected at 405 acres for final harvest and 1,691 acres of partial harvest per 10-year period.

4.8.1.6 Forest Cover Type Management – Jack Pine

Current Condition

Jack pine acres total 4,476 or 4% of the management area (Table 4.8.1). Age classes are well distributed in the 0-69 age-classes, (Figure 4.8.8). Data show that 286 acres of jack pine have met harvest criteria, but have site conditions that preclude harvest (hard factor limited acres). There are 426 acres of stands that have regeneration harvest pending and these acres are included in the regeneration prescription class.

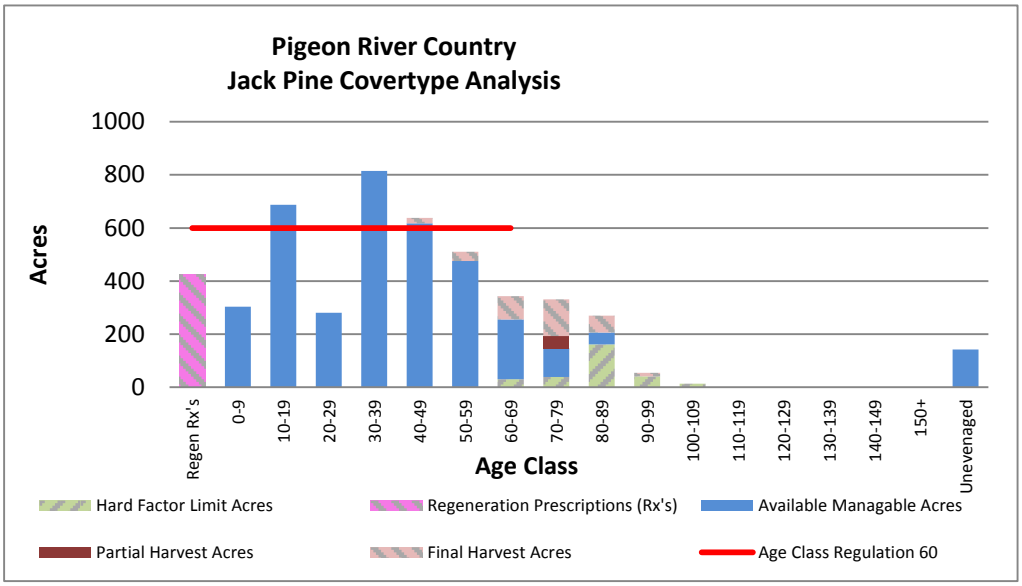

Figure 4.8.8. Age-class distribution for jack pine in the Pigeon River Country management area (2012 Department of Natural Resources inventory data).

Jack pine is managed for timber products with the objective of balancing the age-class distribution and managing jack pine on suitable sites. Jack pine budworm outbreaks may result in increased mortality in older age classes and work continues to reduce the number of acres in the older age classes.

Desired Future Condition

- Jack pine will have balanced age classes between zero and 69 years of age to provide a sustainable timber production and wildlife habitat which will provide recreational opportunities.

10-Year Management Objectives

- Conduct stand final harvests on a projected 600 acres concentrating on stands older than 60 years to reduce the risk of jack pine budworm in older age classes.

Long-Term Management Objectives

- Continue to manage jack pine for a balanced age-class distribution at a projected regulation level of 286 acres over 10 years to produce a sustainable timber supply and wildlife habitat which will provide recreational opportunities;
- Where necessary and feasible, future planning may need to consider harvesting additional acres above the rotation regulation level from younger age classes to expedite the balancing of age class distributions; and
- Desired future harvest levels for final harvest are projected at 599 acres per 10 year period.

Section 4.8.1.7 Forest Cover Type Management – Oak

Current Condition

Oak acres total 3,507 acres or 3% of the management area (Table 4.23.1). The origin of the oak resource was the aftermath of the logging era in the late 1800s and early 1900s when most of the red and white pines were removed. This cutting combined with frequent wildfires resulted in a period of oak regeneration during the late 1800s and early 1900s. There are 708 acres of oak have met harvest criteria, but have site conditions that limit harvest (hard factor limit acres). There are 56 acres of stands that have a final harvest pending and these acres are shown in the regeneration prescription class (Figure 4.8.9). There are 388 acres with a partial harvest pending and these acres are included in their current age class. The graph includes the projected number of acres converted to the cover type as a result of treatments that remove an overstory species resulting in the release of oak. These acres are included in the regeneration prescription class.

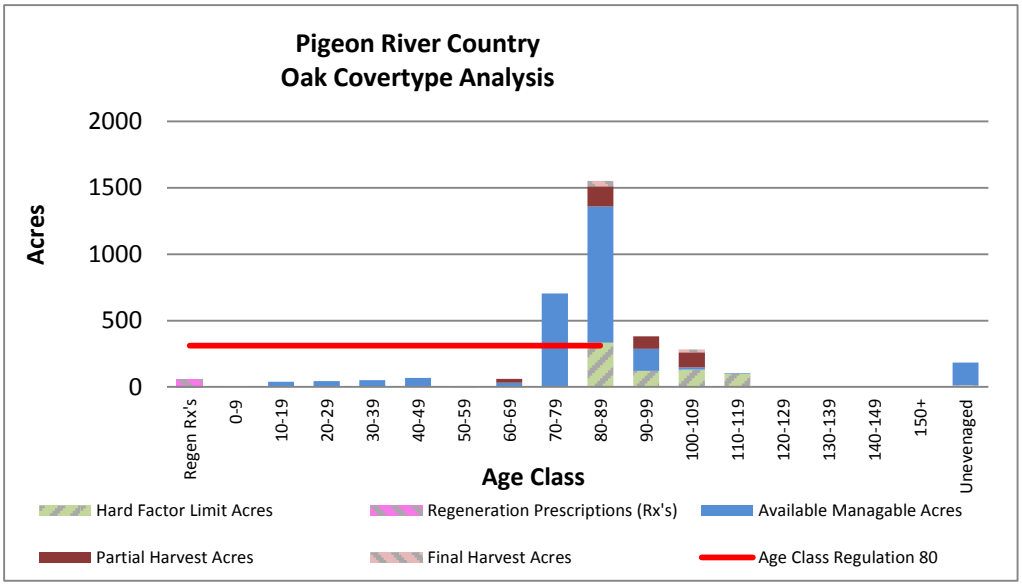

Figure 4.8.9. Age-class distribution for oak in the Pigeon River Country management area (2012 Department of Natural Resources inventory data).

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; and
- Oak will become more valuable as a mast source as a result of beech bark disease which will cause a decline in the amount of beech.

10-Year Management Objectives

- Conduct partial harvests on a projected 619 acres to prepare stands for eventual regeneration harvests;
- Conduct restarting harvests on a projected 944 acres;
- Maintain or expand oak as a component in stands throughout the management area through retention and management for natural regeneration on other cover types; and
- Seek opportunities to manage existing oak for wildlife values and a sustainable yield of wood products in pine and low-quality hardwoods.

Long-Term Management Objectives

- Continue work towards maintaining oak as the predominant species in selected stands through restarting harvests;
- It is acceptable that some oak stands may become mixed stands through partial removal of an oak over story, 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; and
- Desired future harvest levels are projected at 311 acres for final harvest and 982 acres for partial harvest per 10-year period.

4.8.1.8 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 5,486 acres or 5% of the management area (Table 4.8.1).

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.

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

Current Condition

Upland open/semi-open lands acres total 5,632 or 5% of the management area (Table 4.8.1). This category is a combination of herbaceous open land, upland shrub, low-density trees and bare/sparsely vegetated areas. 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.

4.8.1.10 Forest Cover Type Management – Other Types

Individual cover types which may cover less than 5% of the management area include: jack pine, 4,476 acres (4% of the MA), oak, 3,507 acres (3%) and lowland deciduous, 2,012 acres (2%). Other types including non-forested types and small scattered acres total 6,139 acres or 6% of 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 sustainable harvest and to contribute to the conservation 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 manage through 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 restarting or regeneration harvests: upland spruce/fir, 224 acres, upland mixed deciduous 67 acres, lowland aspen/balsam poplar, 95 acres, lowland spruce/fir 19 acres, upland mixed forest 28 acres, paper birch 74 acres, tamarack 6 acres and lowland mixed forest 1 acre; and
- The following species are projected for partial harvests: mixed upland deciduous, 84 acres, upland mixed forest 188 acres, hemlock 64 acres, planted mixed pines 24 acres and natural mixed pines, 210 acres.

Long-Term Management Objectives

- Continue efforts to regenerate lowland types where feasible.

4.8.2 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 cycle of state forest planning:

- American marten
- Black-throated blue warbler
- Elk
- Golden-winged warbler
- Pileated woodpecker
- Red-shouldered hawk
- Ruffed grouse
- Wild turkey
- White-tailed deer
- Wood thrush.

The primary focus of wildlife habitat management in the Pigeon River Country 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, extensive mature forest, large open grassland complexes, and marsh/grassland complexes, the retention of large, over-mature trees and snags and the maintenance and expansion of hard mast, understory shrub and mesic conifer components.

This management area will include one or more Northern Lower Peninsula Grouse Enhanced Management System areas. The boundaries will be delineated during this planning period by the local biologist in collaboration with the Forest Resources Division unit manager. Aspen stands that fall within the Grouse Enhanced Management System area boundary may be managed on a shortened rotation with multiple age classes and smaller stand sizes to enhance hunting opportunities for ruffed grouse, woodcock, deer, turkey and hare. The remainder of the management area (outside the boundary) will be managed based on the direction in the management area write up.

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

American Marten

The goal for American marten in the northern Lower Peninsula is to increase available habitat. American marten needs mature mixed forest stands or old conifer-dominated stands, with dead and down material for maintaining a stable and sufficient supply of small mammals as prey. American marten are rarely found outside the forest canopy. This species depends upon live-tree dens, snags and coarse woody debris for loafing (resting) and denning sites. State forest management should address the maintenance and improvement of extensive and mature forest tracts, corridors, dead wood and conifer components in priority landscapes.

Wildlife Habitat Specifications:

- Identify, maintain, develop or restore large forested tracts and forested corridors.
- In even-aged management systems, within-stand retention should focus on large diameter (>15 inches in diameter at breast-height) trees, known cavity trees and/or mesic conifers to maintain/increase denning and loafing sites.
- Where possible, increase both standing-dead and downed-dead wood by:
  - Applying at least the minimum level of within-stand retention to all stands in the management area;
  - Writing harvest specifications to leave slash at the stump or to minimize the removal of slash; and
  - Limiting or prohibiting firewood permits at marten-occupied sites.

Black-throated Blue Warbler

The goal for black-throated blue warbler in the northern Lower Peninsula is to maintain available habitat. Black-throated blue warbler is an area-sensitive species (e.g., densities increase exponentially with increasing patch size) mainly occurring in mesic deciduous forest tracts >50 years in age and >250 acres in size, with a dense understory layer for nesting and foraging. State forest management for the species should focus on maintaining mature, large (>50 years old and >250 acres) mesic deciduous forest tracts with a dense understory layer for nesting and foraging.

Wildlife Habitat Specifications:

- Identify, maintain, develop or restore mesic-deciduous tracts >50 years old and >250 acres in size;
- Maximize forest interior (of northern hardwood stands) within the management area by increasing the portion of forest over 250 acres, minimizing edges (concentrating openings, oil and gas development, roads and pipelines along the forest or stand edge) and providing canopy gaps through single tree and group selection harvest practices; and
- Conduct silvicultural practices to maintain or promote a well-developed shrub understory.

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).

Golden-winged Warbler

The goal for golden-winged warbler in the northern Lower Peninusla 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 the management area, maintain 20% of aspen associated with lowland shrub and grasslands in the 0-10 year age class.

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 than 12 inches in diameter at breast height. State forest management should focus on the maintenance of a component of large diameter trees (>12 inches 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 of 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's *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.
- Manage the aspen cover type for smaller patch size, a shorter rotation and a more deliberate habitat configuration within the designated GEM.

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 are.
  - 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 Thrush

The goal for wood thrush in the northern Lower Peninsula is to maintain available habitat. Wood thrush occur primarily in upland, mesic deciduous and mixed forests with large trees, diverse tree communities, moderate undergrowth and a well-developed litter layer.

Wood thrush is highly susceptible to nest predation and brood parasitism, which increases with forest fragmentation. State forest management for the species should focus on maintaining large (>250 acres) forest tracts, minimizing edge and promoting a dense understory layer for nesting and foraging.

Wildlife Habitat Specifications:

- Identify, maintain, develop or restore mesic-deciduous tracts >50 years old and >250 acres in size;
- Maximize forest interior (of northern hardwood stands) within the management area by increasing the portion of forest over 250 acres, minimizing edges (concentrating openings, oil and gas development, roads and pipelines along the forest or stand edge) and providing canopy gaps through single tree and group selection harvest practices; and
- Conduct silvicultural practices to maintain or promote a well-developed shrub understory.

4.8.3 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 4.8.2. 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.

Table 4.8.2. Occurrence information for special concern, rare, threatened and endangered communities and species for the Pigeon River Country 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								
Northern goshawk	*Accipiter gentilis*	SC/G5/S3	Confirmed	PS	Very High	Mesic northern Forest	Northern Hardwood	Late
						Hardwood-conifer swamp	Lowland Mixed	Mid
						Northern hardwood swamp	Black Ash	Late
						Floodplain forest	Lowland mixed	Mid
						Dry northern forest	Jack Pine, Red Pine	Late
						Dry-mesic northern forest	White Pine	Late
						Boreal forest	Upland & Lowland Sp/F	Mid
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
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
Insect								
Hungerford's crawling water beetle	*Byrchius hungerfordi*	LE/E/G1/S1	Confirmed	HV	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
Hill's pondweed	*Potamogeton hillii*	T/G3/S2	Confirmed			Emergent marsh	Lowland open/semi-open	N/A

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

As shown in Figure 4.8.10, there are three non-dedicated natural areas: Dog Lake wild area (659 acres), Grindstone Creek wild area (160 acres) and Pigeon River Pines (180 acres). There is also one potential Type 2 old growth area (160 acres) at Grindstone Creek representing the mesic northern forest natural community type.

There are no high conservation value areas or ecological reference areas identified for the Pigeon River Country MA as illustrated in Figure 4.8.10.

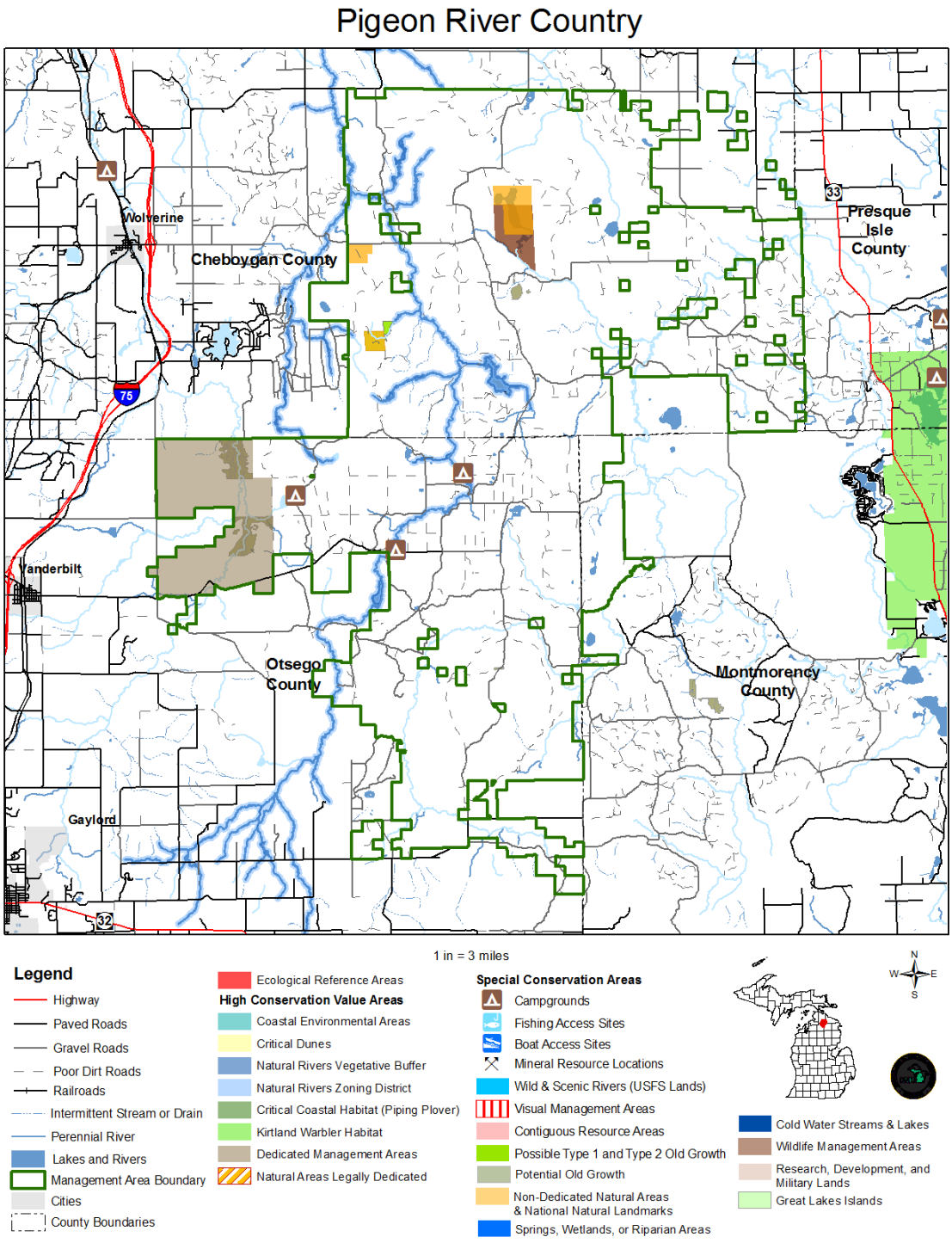

Figure 4.8.10. A map of the Pigeon River Country MA showing the special conservation areas.

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.

4.8.4 Forest Health Management

Although forest health issues span the entire landscape, some specific threats are more important in this management area due to the species composition, site quality or other factors. Some of the more important forest health pests in this management area include emerald ash borer, beech bark disease and oak decline and management should be adapted as follows:

- Full site use (e.g., stocking, desired species and low species diversity) on high-quality northern hardwood sites heavily impacted by beech bark disease and/or emerald ash borer is important;
- Consider planting red or white oaks, white or red pines, black cherry, white spruce, etc. as site conditions and quality allow; and
- Herbicides may be needed to control competing vegetation and/or to reduce density of ash and beech regeneration.

Oak decline is most prevalent on frost-prone, nutrient poor outwash plains. Old age and drought predispose areas to two-lined chestnut borer and *Armillaria* root rot. Shorter rotations will reduce risk of decline.

In addition, invasive exotic species, specifically plants, pose a significant forest health threat to forested and non-forested areas throughout the management area. Although there exists no current list of species that pose the greatest threat and surveys of invasive species are generally incomplete, populations of invasive species detected through regular forest inventory or other means and determined to merit control measures should be assessed and handled on a case-by-case basis.

Invasive Species

Invasive species pose a major threat to forest resources. They impact timber production, wildlife habitat and recreational access. Locations of invasive species are summarized in Table 4.8.3 below. This information was compiled from the Midwest Invasive Species Information Network database, but it should not be considered complete. Local staff has noted the presence of garlic mustard, purple loosestrife, wild parsnip and *Phragmites*. 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 4.8.3. Locations of invasive species (Midwest Invasive Species Information Network database).

Pigeon River Country - FMD Management Areas	Cases within FMD Areas	Cases within 5-Mile Buffer	Total number of cases	Total number of different Invasive Species
	4	4	8	5

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

4.8.5 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 and IC 4011. Designated high priority trout streams for this management area are shown in Figure 4.8.1 and listed in Appendix F.

4.8.6 Fire Management

Historically, disturbance through fire has played an important role in the initial propagation and maintenance of oak and natural oak/pine types, small inclusions of aspen or grass/upland brush types. Wildfire risk and fuel loading is increased in young dense conifer stands and mature jack pine affected by jack pine budworm.

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

4.8.7 Public Access and Recreation

Access in Pigeon River Country is guided by the Concept of Management Plan for the Pigeon River and an access plan. 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.

Equestrian and hiking trails cross the management area including the High Country Pathway as shown in Figure 4.8.1. There is also a motorized vehicle trail through a portion of the western part of the management area (Figure 4.8.1).

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.

Specific hunting recreation improvements such as parking lots, gates, trail planting and trail establishment, as well as the preparation and dissemination of specific promotional material, may be made as a result of Grouse Enhanced Management Systems areas planning in this management area.

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. 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.

4.8.8 Oil, Gas and Mineral Development

Oil, gas and mineral development is regulated by the Pigeon River Country Consent Agreement and other legal agreements. As oil and gas production falls below economically viable levels, surface developmnet and production of oil and gas will be phased out. Mineral development may occur on state and private property for privately held mineral leases. Some portions of the management area outside the Pigeon River Country Consent Agreement may be leasable, but surface development will not be permitted.

Surface sediments consist of coarse-textured till, glacial outwash sand and gravel and postglacial alluvium and dune sand. The glacial drift thickness varies between 10 and 600 feet. Only a few inactive sand and gravel pits are located in this management area.

The Mississippian Coldwater and Sunbury Shales and Devonian Berea Sandstone, Bedford and Antrim Shales and Traverse Group subcrop below the glacial drift. The Traverse Limestone has limestone/dolomite potential, especially in areas of thin glacial till.

Oil and gas production from the Antrim Shale and Guelph (formerly Niagaran) reefs is located in part of this management area. The Collingwood Formation may also have oil and gas potential in this area. Most of the management area is not leased and drilling within the area is unlikely. If drilling is sucessful for the Collingwood, additional leasing and directional drilling along the border of the management area might be allowed to prevent hydrocarbon drainage of state mineral rights.

Metallic mineral production is not supported by the geology given the depth to known metallic bearing formations nor would it be allowed under the Concept of Management.

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.