4.33 SLP MA 1 – Midland-Isabella Management Area

Summary of Use and Management

Vegetation management in the Midland-Isabella management area (MA) (Figure 4.33.1) will provide forest products; maintain or enhance wildlife habitat; protect areas of unique character including the Kawkawlin Creek Flooding; threatened, endangered and special concern species; and provide for forest-based recreational uses. A significant portion of the management area is swampy and therefore relatively inaccessible. Timber management for this 10-year planning period will focus on balancing the age-class distributions for aspen and oak. Wildlife habitat management objectives include perpetuating early-successional communities for species adapted to young forests for hunting and other wildlife-related recreation opportunity. Expected trends in this 10-year planning period will be the continued need to address illegal off-road vehicle use and trash dumping.

Introduction

The Midland-Isabella management area is primarily located in the Tittabawassee River watershed in Midland and Isabella Counties and contains 45,258 acres of state forest land (Figure 4.33.1). The primary attributes which identifies the Midland-Isabella management area include:

- The dominant lake plain landform which consists of poorly drained flat clay plains with broad sand channels.
- This area is also in a unique ecological transition zone between the southern and northern forest types of Michigan.
- This area falls within the Saginaw Bay Lake Plain Region of the southern Lower Peninsula ecoregion as classified by Albert (1995).
- This area is in close proximity to the cities of Midland to the east and Mt. Pleasant to the west and as such, there is a high level of dispersed recreation.
- Illegal off-road vehicle activities and trash dumping are significant issues.
- The Kawkawlin Creek Flooding which is a dedicated management area provides wetland habitat and hunting opportunities.
- These social uses combined with a moderate amount of oil/gas sites and the quantity and availability of wood fiber contributes significant social and economic values to the area.
- Threatened, endangered or species of special concern located by surveys include bald eagle, great blue heron heronries, black tern, red-shouldered-hawk, broad-leaved puccoon and beak grass.

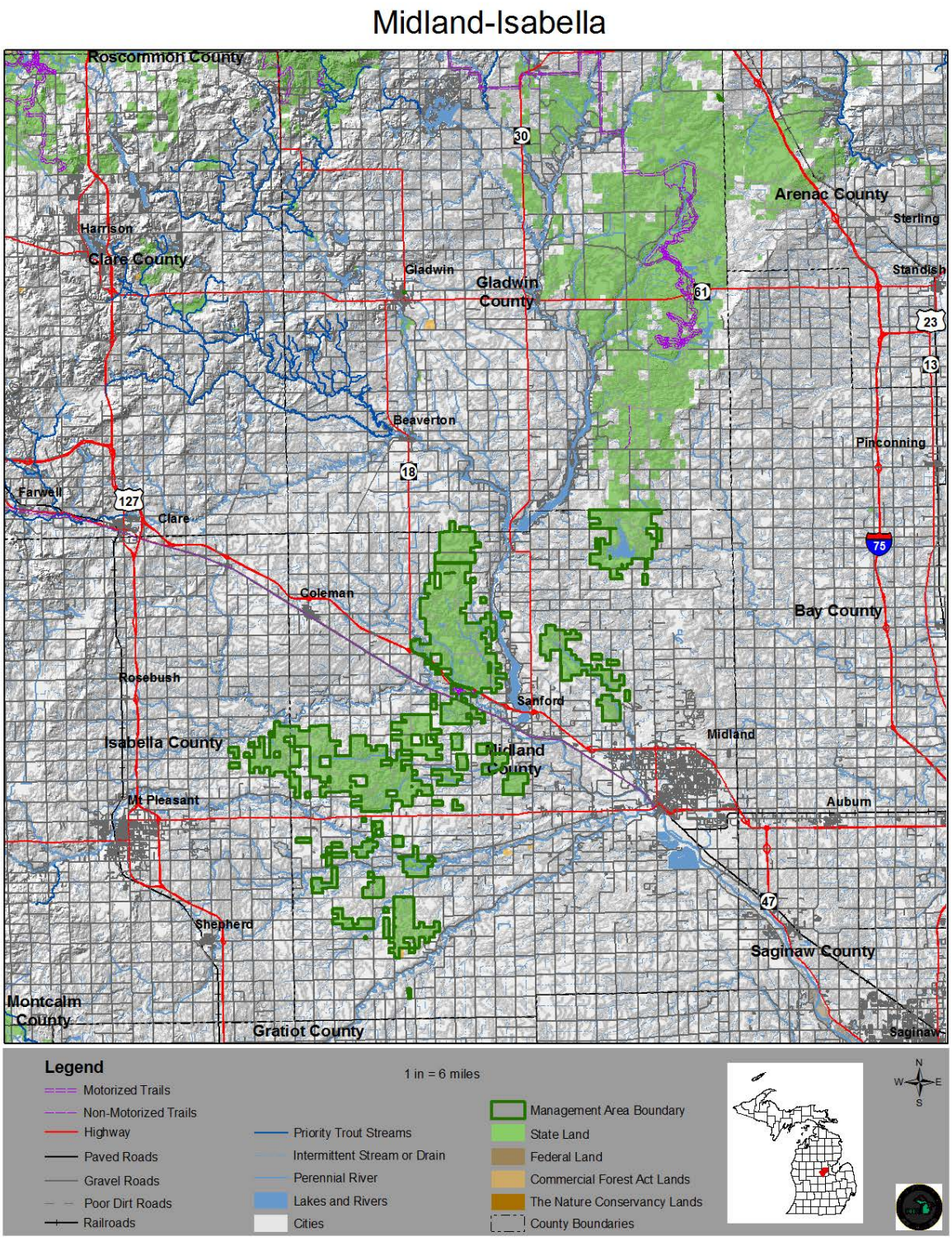

Figure 4.33.1. Location of the Midland-Isabella management area (dark green boundary) in Midland and Isabella Counties, MI.

Table 4.33.1. Current cover types, acreages, projected harvests and projected acreages at the end of this ten-year planning period for the Midland-Isabella 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	35%	15,857	520	15,337	5,665		15,857	3,067	
Lowland Deciduous	24%	10,933	7,705	3228	90	269	10,933	359	
Oak	11%	4,810	891	3919	53	664	4,810	435	664
Lowland Aspen/Balsam Poplar	4%	1,603	829	774	129		1,603	129	
Mixed Upland Deciduous	3%	1,339	51	1288	294	6	1,339	184	208
Northern Hardwood	3%	1,140		1140		291	1,140		291
Upland Open/Semi-Open Lands	2%	927		927			927		
Lowland Open/Semi-Open Lands	15%	6,575		6575			6,575		
Misc Other (Water, Local, Urban)	2%	1,083		1083			1,083		
Others	2%	1,009	220	789	70	194	1,009	75	206
Total		45,276	10,215	35,061	6,300	1,424	45,276	4,249	1,369

4.33.1 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 (i.e., 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.

Section 4.33.1.1 Forest Cover Type Management - Aspen

Current Condition

Aspen acres total approximately 15,857 or 35% of the management area (Table 4.33.1). Aspen is distributed throughout the management area and it should be noted that no habitat classifications have been done for this area in the Southern Lower Peninsula region. The age-classes of aspen are somewhat imbalanced (Figure 4.33.2), with spikes in the 10-19, 20-29 and 30-39 year-old age classes. There are 520 acres of aspen have met harvest criteria but have site conditions that limit (hard factor limited acres). There are 631 acres that have regeneration harvest pending and these acres are included in the regeneration prescription class.

Desired Future Condition

- Aspen will be located on suitable sites with acres balanced within the 0-49 year age class rotation; and
- Aspen acres will be maintained on currently operable sites to provide early successional habitat for species viability, while also providing a sustainable level of wood fiber.

10-Year Management Objectives

- Conduct stand regeneration harvests on a projected 5,665 acres during this 10-year planning period;
- Concentrate harvests on 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.

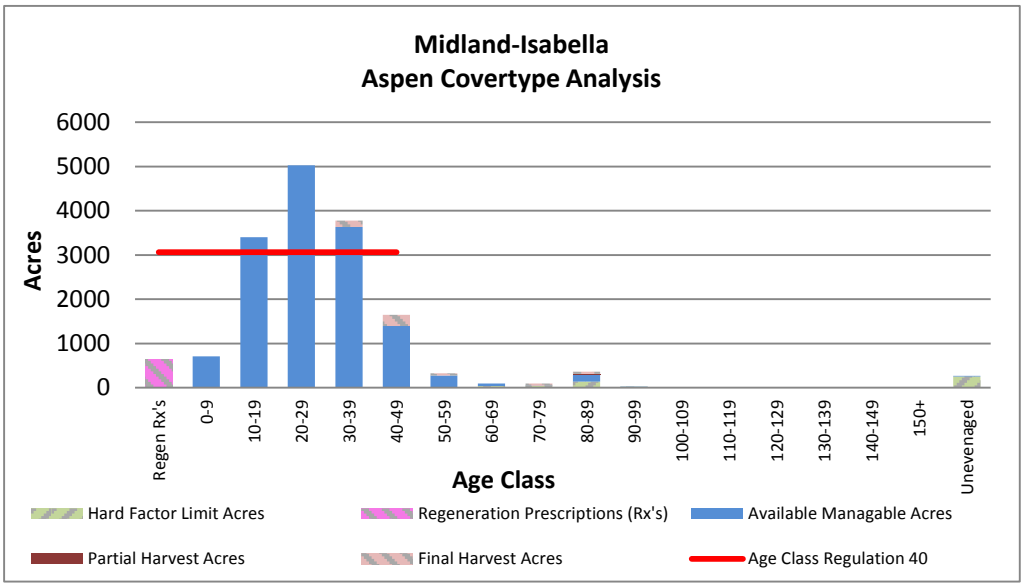

Figure 4.33.2. Age-class distribution for aspen in the Midland-Isabella management area (2012 Department of Natural Resources inventory data).

Long-Term Management Objectives

- Continue to manage aspen for regeneration to balance the age-class distributions; and
- A desired future harvest level is projected at 3,067 acres for final harvest per 10-year period.

Section 4.33.1.2 Forest Cover Type Management – Lowland Deciduous

Current Condition

Lowland deciduous acres total 10,933 or 24% of the management area (Table 4.33.1 and Figure 4.33.3). Uneven-aged management is the preferred method for regeneration, which replicates the natural disturbance regime and provides the opportunity to manage for high-quality sawtimber. Lowland deciduous stands have been managed as even-aged stands where quality stems were not present. Stands on the drier end of the spectrum were successfully restarted with even-aged management, while wetter stands converted to non-forest types. On these lowland sites, uneven-aged management reduces the potential for conversion. The residual stand keeps the sites from becoming even wetter, preventing a conversion to marsh. Excessive tip-overs and windthrow can become an issue in stands that have been reduced below a residual basal area of 80 square feet per acre. There are 7,705 acres hard factor limited due to accessibility or operability.

Desired Future Condition

- Lowland deciduous stands will contain coarse woody debris, scattered large trees and scattered snags; and
- Lowland deciduous stands will be located on suitable sites and will produce a sustainable level of forest products along with wildlife habitat and recreation opportunities.

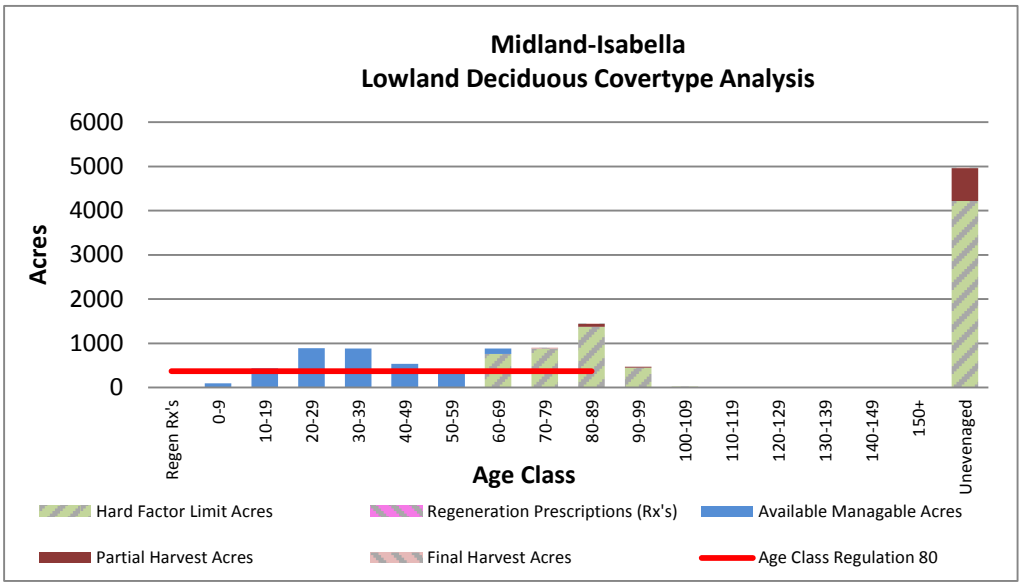

Figure 4.33.3. Age-class distribution for the lowland deciduous cover type in the Midland-Isabella management area (2012 Department of Natural Resources inventory data).

10-Year Management Objectives

- Conduct final harvests on a projected 90 acres with a concentration on stands with poor stem quality, multi-stemmed trees and low basal area; and
- Conduct partial harvests on a projected 269 acres with a concentration on stands with good quality stems and high basal area.

Long-Term Management Objectives

- Lowland deciduous stands will continue to be managed with using multi-aged regeneration and final harvests where necessary to produce a sustainable level of forest products and wildlife habitat;
- Desired future harvests levels are projected at 359 acres for final and partial harvests per 10-year period;
- If needed, consider final harvests in poor-quality stands; and
- Consider the impact of emerald ash borer on ash in future management decisions.

Section 4.33.1.3 Forest Cover Type Management – Oak

Current Condition

Oak acres total 4,810 or 11% of the management area (Table 4.33.1). 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, deer, squirrels and various birds and commercially for firewood and industrial lumber. There are 891 acres of oak have met harvest criteria (Figure 4.33.4), but have site conditions that limit harvest (hard factor limited acres). There are 344 acres that have regeneration harvest pending and these acres are included in the regeneration prescription class. There are 289 acres with a partial harvest pending and these acres are included in their current age class.

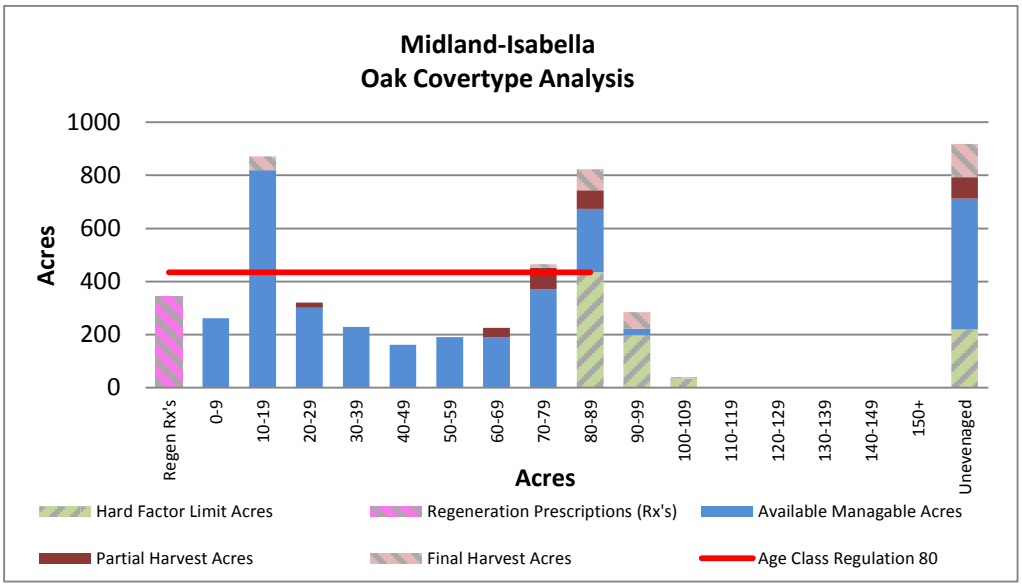

Figure 4.33.4. Age-class distribution for oak in the Midland-Isabella management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Oak will be evenly distributed in the 0-89 year age classes and continue to provide mast for wildlife species and a sustainable level of timber production.

10-Year Management Objectives

- Conduct partial harvests on a projected 664 acres concentrating on stands that have not been previously harvested or those stands that have a sufficient basal area for a partial harvest; and
- Conduct final harvests on a projected 53 acres.

Long-Term Management Objectives

- Where the expense and difficulty of controlling red maple is prohibitive, consider allowing oak stands with a significant red maple understory to succeed to red maple dominated stands where oak will remain a component of the stand for wildlife mast production; and
- A desired future harvest level is projected at 435 acres for final harvest and 664 acres for partial harvest per 10-year period.

Section 4.33.1.4 Forest Cover Type Management – Upland Open/Semi-Open Lands

Current Condition

Upland shrub/herbaceous acres total 927 acres or 2% of the management area (Table 4.33.1). Upland open/semi-open lands communities in this management area are valued ecologically as sources of habitat for numerous species of wildlife and recreationally for hunting, wildlife viewing and camping. This category is a combination of the following non-forested land cover types: herbaceous open land, upland shrub, low-density trees and bare/sparsely vegetated. These non-forested areas are a result of natural processes of fire, frost or other disturbances which create openings in the forest canopy along with the past management practices to maintain these areas.

Desired Future Condition

- Upland open/semi-open lands will be maintained at or above current levels on sites that are natural openings due to frost or low soil fertility/moisture and on sites that have been historically been maintained as openings to provide habitat for species that use openings.

10-Year Management Objectives

- Where necessary and feasible, consider methods to maintain upland open/semi-open lands during this management cycle.

Long-Term Management Objectives

- Continue to maintain herbaceous open land and upland shrub openings at or above current levels in order to promote wildlife values and recreational opportunity;
- Continue to protect stands from illegal off-road vehicle use; and
- Where feasible and necessary, use control methods on invasive non-native species.

Section 4.33.1.5 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 6,575 acres or 15% of the management area (Table 4.33.1).

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.

Section 4.33.1.6 Forest Cover Type Management – Other Types

Current Condition

Individual cover types which may cover less than 5% of the management area include: lowland aspen/balsam poplar 1,603 acres or 4% of the management area, mixed upland deciduous 1,339 acres (3%) and northern hardwood 1,140 acres (3%). Other forested and non-forested communities total 1,009 acres or 2% of the management area and are spread across 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 cover types will be maintained on suitable sites and contribute to the compositional species diversity of the landscape.

10-Year Management

- 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;
- Regeneration harvests are projected for 129 acres of lowland aspen/balsam poplar, 294 acres of mixed upland deciduous, 33 acres of white pine and 36 acres of natural mixed pines; and
- The following species are projected for partial harvests: 291 acres of northern hardwood, 26 acres of red pine, 74 acres of white pine, 60 acres of natural mixed pines and 25 acres of upland mixed forest.

Long-Term Management

- Continue to manage lowland types for forest products and wildlife habitat.

4.33.2 Featured Wildlife Species

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

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

- American woodcock
- Beaver
- Golden-winged warbler
- Pileated woodpecker
- Red-headed woodpecker
- Ruffed grouse
- White-tailed deer

The primary focus of wildlife habitat management in the Midland-Isabella 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; the retention of large over-mature trees and snags; the maintenance and expansion of hard mast; and mesic conifer components.

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

American Woodcock

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

Wildlife Habitat Specifications:

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

Beaver

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

Wildlife Habitat Specifications:

- Maintain or promote alder, aspen, birch, maple or willow cover types within 100 feet of non-high priority trout streams with gradients of less that 15% and other inland bodies of water.
  - Implementation of the10-year management direction for aspen, lowland aspen and lowland deciduous will be sufficient to meet this habitat specification.

Golden-winged Warbler

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

Wildlife Habitat Specifications:

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

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 in diameter at breast height) at the landscape scale.

Wildlife Habitat Specifications:

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

Red-headed Woodpecker

The goal for red-headed woodpecker in the northern Lower Peninsula is to maintain or increase available habitat. Red-headed woodpecker are limited by the availability of snags for nesting, roosting and feeding and prefer areas with groupings of snags caused by beaver girdling, flooding, fire, disease or insect outbreaks. Preferred sites are greater than 5 acres in size with a savannah-like dispersion of large trees (< 50% canopy cover) with open under story and include tall trees or snags of large (> 12 inches) diameter at breast height. State forest management for the species should focus on the maintenance of snags in timber sales and salvage in priority landscapes.

Wildlife Habitat Specifications:

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

Ruffed Grouse

The goal for grouse in the northern Lower Peninsula is maintain available habitat. Ruffed grouse prefer young (6-15 year old) even-aged deciduous stands that typically support 8,000-10,000 woody stems per 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 ten 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 and oak will be sufficient to meet this 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 and oak will be sufficient to meet this 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.

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.

4.33.3 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 six listed species and no natural communities of note occurring in the management area as listed in Table 4.33.2. Colonies of great blue herons has also been identified. Any established management guidelines will be followed. Further surveys for special species and natural communities will be carried out as a matter of course during the inventory process and opportunistically for special more focused surveys.

Table 4.33.2. Occurrence information for special concern, rare, threatened and endangered communities and species for the Midland-Isabella management area.

Common Name	Scientific Name	Status	Status in Management Area	Climate Change Vulnerability Index (CCVI)	Confidence	Natural Community Association	Probable Cover Types	Successional Stage
Natural Communities								
Oak-Pine barrens		S2/G3	Confirmed				Oak	Mid
Birds								
Northern goshawk	*Accipiter gentilis*	SC/G5/S3	Confirmed	PS	Very High	Mesic northern Forest	Northern Hardwood	Late
						Hardwood-conifer swamp	Lowland Mixed	Mid
						Northern hardwood swamp	Black Ash	Late
						Floodplain forest	Lowland mixed	Mid
						Dry northern forest	Jack Pine, Red Pine	Late
						Dry-mesic northern forest	White Pine	Late
						Boreal forest	Upland & Lowland Sp/F	Mid
Red-shouldered hawk	*Buteo lineatus*	T/G5/S3-4	Confirmed	PS	Very High	Floodplain forest	Lowland mixed	Mid
						Dry-mesic northern forest	White Pine	Late
						Mesic northern Forest	Northern Hardwood	Late
Black tern	*Chlidonias niger*	SC/G4/S3	Confirmed	MV	Very High	Great Lakes marsh	Lowland open/semi-open	N/A
						Coastal plain marsh	Lowland open/semi-open	N/A
						Emergent Marsh	Lowland open/semi-open	N/A
Common tern	*Stema hirundo*	T/G5/S2	Confirmed	MV	Moderate	Sand & gravel beach	Upland open/semi-open	N/A
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
Plant								
Broad-leaved puccoon	*Lithospermum latifolium*	SC/G4/S2S3	Confirmed			Floodplain forest	Lowland mixed	Mid

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

The Kawkawlin Creek Flooding is a dedicated management area that is also a high conservation value area (Figure 4.32.5) in the Midland-Isabella management area.

There are no ecological reference areas identified for the Midland-Isabella management area.

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.

Future development and recreational pressure associated with expected population growth in the vicinity of this management area will be primary challenge to successful management for rare fish, wildlife and plants.

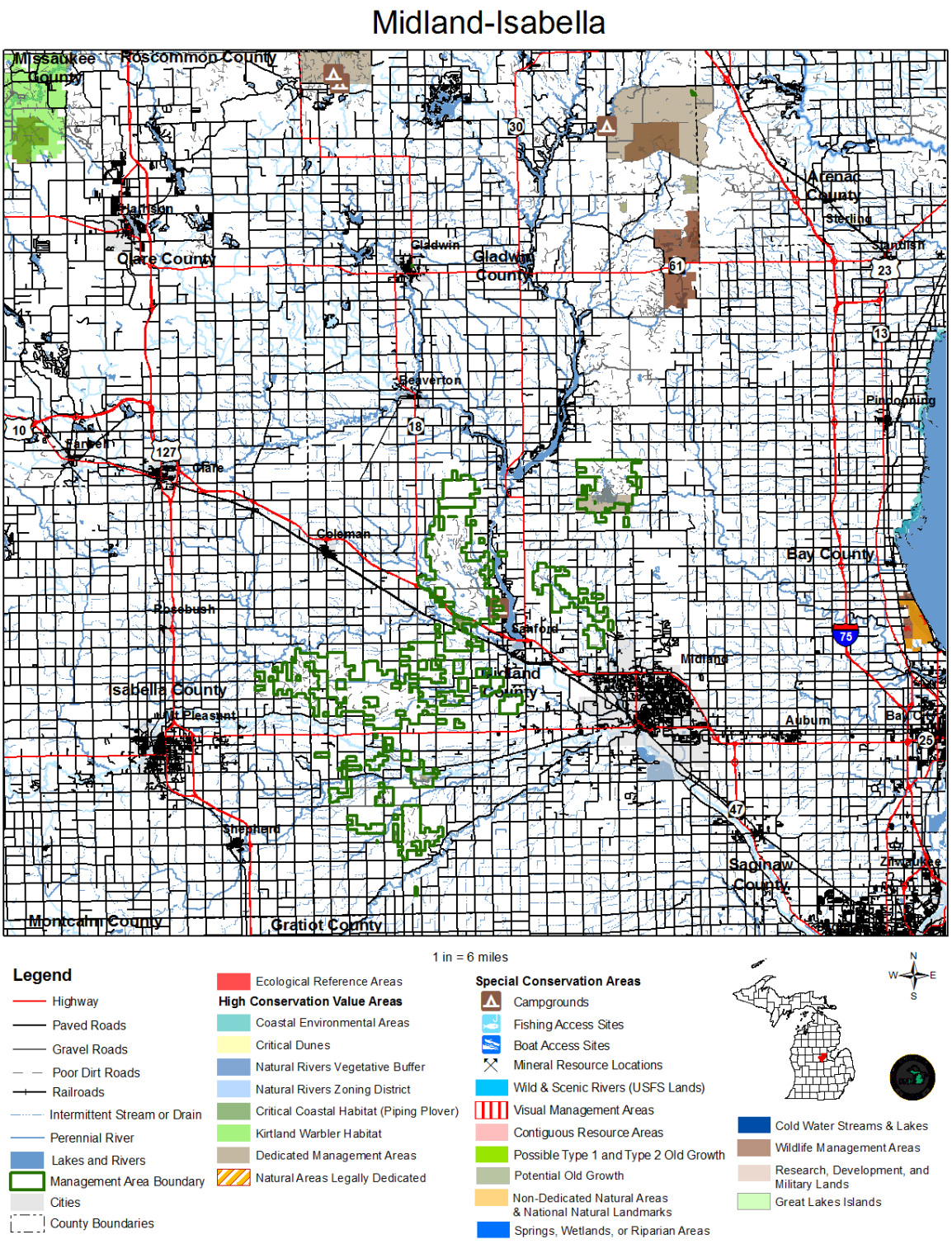

Figure 4.33.5. A map of the Midland-Isabella management area showing the special resource areas.

4.33.4 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. However, there are no significant forest health issues in this management area.

Invasive Species

Invasive species pose a major threat to forest resources. They impact timber production, wildlife habitat and recreational access. Currently there are no invasive species mapped in the management area or within a five-mile buffer of the management area. 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 should be used to inform of 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.

4.33.5 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 Practice 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 4.33.1 and listed in Appendix F.

4.33.6 Fire Management

Lowland deciduous stands which have historically been a major component of this management area are rarely impacted by natural fire regimes.

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:

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

4.33.7 Public Access and Recreation

Access for management and/or recreation is generally poor throughout this management area as a significant portion of the management area is swampy and inaccessible. 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.

The following trails and recreation facilities are located in this management area:

State Forest Campground (Figure 4.33.5)

- Black Creek State Forest Campground

Non-Motorized Trails (Figure 4.33.1)

- Midland to Mackinaw Boy Scout Trail
- Pere Marquette Rail-Trail

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 Guidelines.

4.33.8 Oil, Gas and Mineral Development

Surface sediments consist of lacustrine (lake) sand, gravel, clay and silt and dune sand. The glacial drift thickness varies between 100 and 400 feet. Sand and gravel pits are located in this management area and there is potential for additional pits.

The Jurassic Red Beds and Pennsylvanian Saginaw Formation sub-crop below the glacial drift. The Saginaw is quarried for clay in brick making elsewhere in the state. Isabella and the western part of Midland County have been leased for nonmetallic mineral potash exploration. The only solution potash production in the state comes from the Hersey area in Osceola County.

Exploration and development for oil and gas from the shallow Mississippian Stray Sandstone to the deep Ordovician Prairie du Chien has occurred in and around this management area. Well spacing ranges from 40 acres up to 640 acres for the deeper formations. There is potential for additional development for these formations and most of the lands are currently leased in this management area. This is the very southern end of the Collingwood Formation and it may not have much potential in this management area.

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

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

Lease classification of state lands is guided by DNR Oil and Gas Lease Classification Procedure No. 27.23-15. Contained within each DNR Oil and Gas Lease Agreement are environmental terms which detail requirements for permits to drill issued by the Department of Environmental Quality, supervisor of wells pursuant to Part 615, 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. In 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 that all pipelines are to be buried below plow depth. 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.