

4.7 MA 7 – Cusino Complex Management Area

Summary of Use and Management

Vegetative management in the Cusino Complex management area (MA) (Figure 4.7.1) will provide various timber products; maintain or enhance wildlife habitat; protect unique areas and threatened, endangered, and special concern species; and provide many recreational opportunities. Uneven-aged management of the high quality hardwood stands in this management area provides valuable veneer and sawlog products. The Petrel Deer Wintering Complex is managed for winter habitat for deer using the Petrel Deer Wintering Complex Plan. This management area also contains an intensive ruffed grouse management area.

Cusino Complex

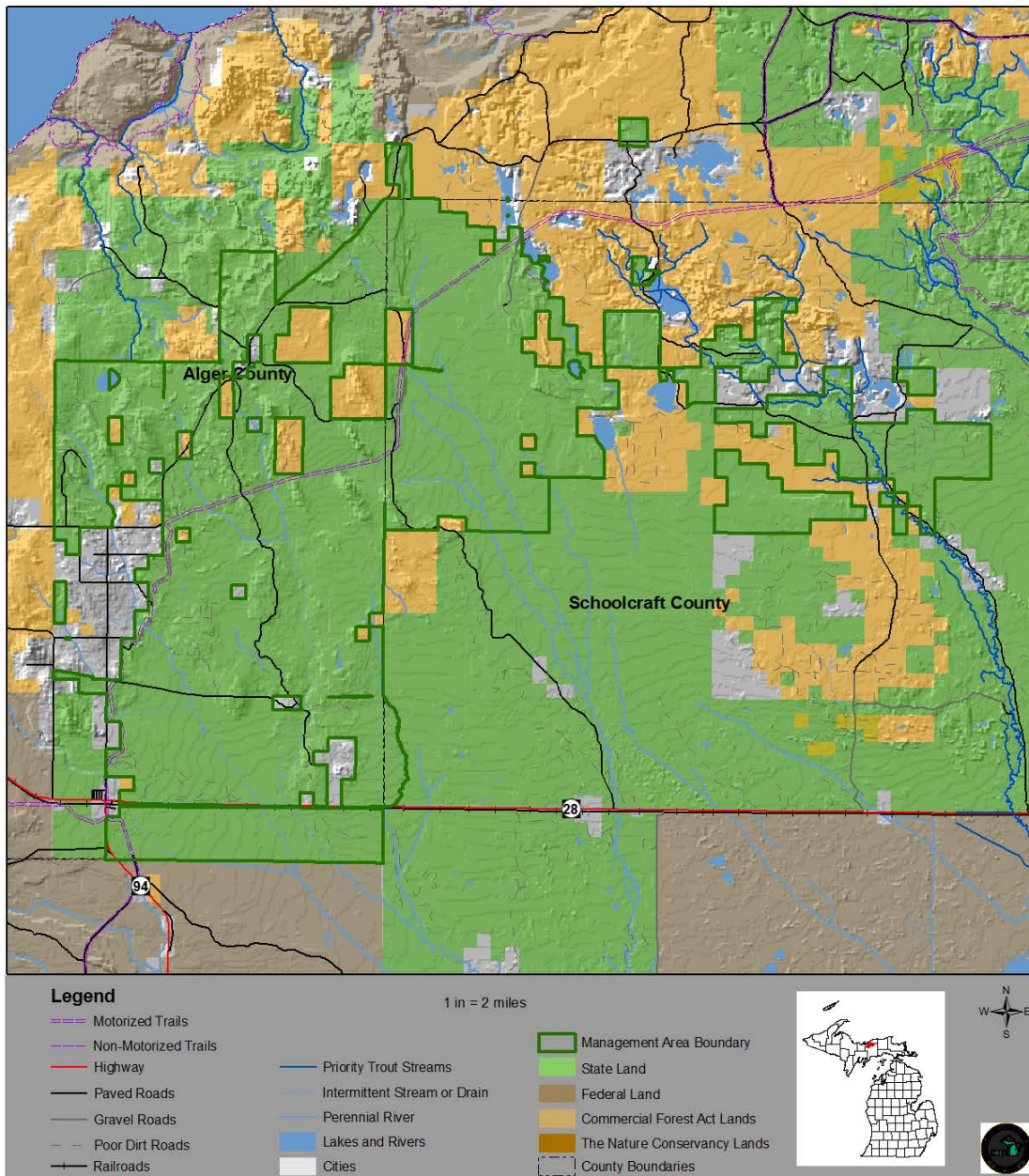


Figure 4.7.1. Location of the Cusino Complex management area (dark green boundary) in relation to surrounding state forest lands other ownerships and the town of Shingleton within Alger and Schoolcraft counties.

Introduction

The Cusino Complex management area is located in the western part of the eastern Upper Peninsula in Alger and Schoolcraft Counties. It includes 49,336 acres of state-owned land. Timber management of northern hardwoods and winter deer habitat management are the primary attributes in this management area. Additional attributes which were important in identifying this management area include:

- The management area falls within the Luce subsection 8.2 of the eastern Upper Peninsula ecoregion (Albert, 1995).
- The dominant landform consists of end moraines of medium textured till, glacial outwash sand and peat and muck.
- This management area is intensively managed for northern hardwoods. There are also large blocks of cedar and other lowland conifers.
- Significant recreational activities include: camping, snowmobiling, hunting and fishing.
- This management area contains one of the eastern Upper Peninsula Grouse Enhanced Management Systems areas near Melstrand. 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 deer. 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.
- Special features including: a patterned fen ecological reference area and a special conservation area deer wintering area.

The management area includes the former site of Cusino Civilian Conservation Corps camp. The Cusino Wildlife Research Station and former Cusino Correctional Facility sit adjacent to the management area. The site of the pens used during the moose translocation from Isle Royal is in this management area.

This management area has a long history of management for research in the Petrel and the Old Cusino deer wintering areas. The former old Cusino deer wintering area was at one time very large. The Petrel Deer Wintering Complex, which is a remnant of the old Cusino complex, still holds significant numbers of deer in this deep snow area. The Petrel Wintering Complex is now the area of focus for management to sustain deer wintering habitat. The Petrel Wintering Complex consists of approximately 29,000 acres of primarily state owned land.

The foundation of a former one room schoolhouse is located on land owned and managed by Munising Public Schools near Melstrand. Remains of several old logging camps are also found in this management area.

The state land in this management area is fairly concentrated, though interspersed with private parcels. The Cusino Complex management area is within the Shingleton Forest Management Unit. The predominant cover types, acreages and projected harvest acres for the management area are shown in Table 4.7.1.

Table 4.7.1. Current cover types, acreages, projected harvest acres and projected ten-year cover type acreage for the Cusino Complex management area, eastern Upper 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
Northern Hardwood	37%	18,230	95	18,135	0	5,942	18,230	0	8,633
Cedar	21%	10,332	199	10,133	633	0	10,332	633	0
Lowland Conifers	11%	5,653	1,145	4,508	501	0	5,653	501	0
Lowland Open/Semi-Open Lands	11%	5,237	0	5,237	0	0	5,237	0	0
Aspen	4%	1,855	2	1,853	52	0	1,855	309	0
Lowland Deciduous	4%	1,855	290	1,565	174	0	1,855	174	0
Lowland Spruce/Fir	3%	1,523	249	1,274	81	0	1,523	142	0
Upland Open/Semi-Open Lands	2%	1,200	0	1,200	0	0	1,200	0	0
Misc Other (Water, Local, Urban)	1%	450	0	450	0	0	450	0	0
Others	6%	3,001	347	2,654	373	258	3,001	296	369
Total	100%	49,336	2,327	47,009	1,814	6,200	49,336	2,055	9,002

Others include: lowland spruce/fir, jack pine, lowland mixed forest, upland spruce/fir, white pine, hemlock, upland mixed forest, paper birch, lowland aspen/balsam poplar, red pine, mixed upland deciduous, upland conifers and tamarack.

4.7.1 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 (i.e., timber harvest, prescribed fire, planting and mowing) will be conducted. In other portions of the state forest, passive management resulting in natural succession will achieve ecological objectives. While most stands have a variety of tree species and other vegetation, they are classified by the predominant canopy species.

All of the following cover types are valued commercially for their timber products; ecologically as sources of habitat for numerous species; and for the variety of recreational opportunities. Harvesting these cover types will provide for a continuous flow of forest products, a variety of wildlife habitat and numerous recreational opportunities.

Section 4.7.1.1 Forest Cover Type Management – Northern Hardwoods

Current Condition

Northern hardwoods occur on 18,230 acres (37%) of the management area (Table 4.7.1). Northern hardwoods are distributed throughout the management area on ground moraines, disintegration moraines, outwash plains, and pitted outwash plains with Kotar habitat types of AFOAs, AFPo and ATFD (see Appendix E). These mesic medium to rich sites have high potential to grow quality trees and include some of the best sites in the area. The majority of the stands are composed of high-quality sugar maple, with lesser amounts of other species including beech, ironwood, red maple, basswood and black cherry. Most of the stands have been managed since the 1930s as uneven-aged, with trees of varying ages and sizes. Selection harvests are scheduled when basal area is over 120 square feet per acre. Where site quality is poor, shelterwood and other even-aged harvesting systems are considered. There is a small amount of acres that were harvested using even-aged systems and are shown in the immature column in figure 4.7.2. Hardwood stands that are within the Petrel Wintering Complex will be harvested primarily in the winter as an ancillary benefit to deer management.

Beech bark disease is found throughout the management area, and salvage of affected beech is ongoing. Northern hardwood stands that had a component of beech now have decreased stocking levels due to beech bark disease mortality and salvage harvesting. Further selection harvesting will be delayed, due to resultant lower than normal residual basal area.

Currently, 5,666 acres have a partial harvest cut assigned, and 37 acres of northern hardwood have a final harvest prescribed (Figure 4.7.2). There are 95 acres of northern hardwood that have site conditions limiting their harvest at this time. These hard factor limited acres have been removed from harvest calculations.

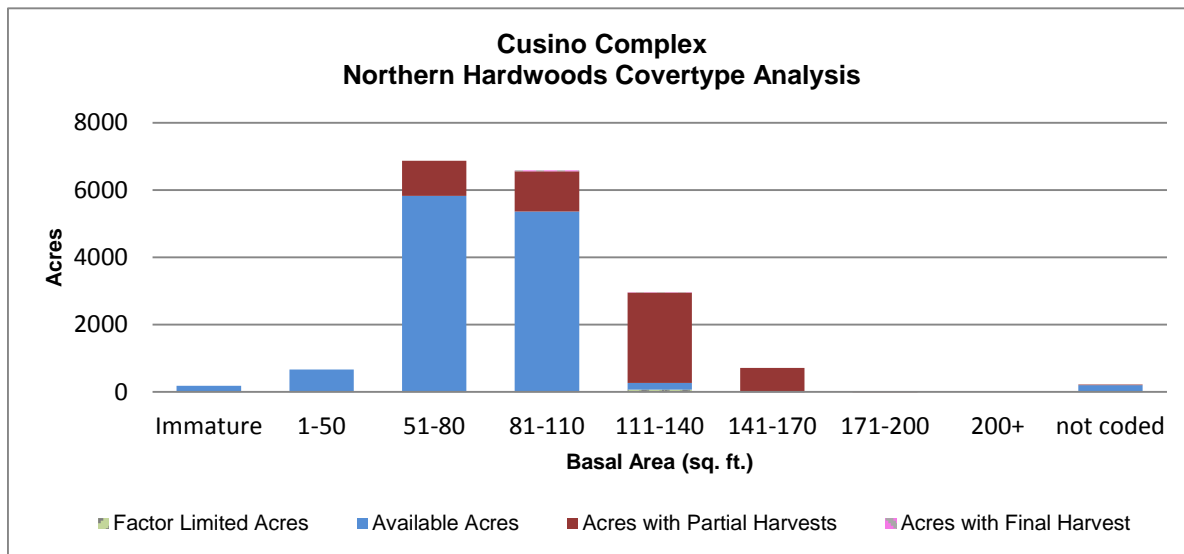


Figure 4.7.2. Basal area distribution of northern hardwood in the Cusino Complex management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Northern hardwoods will be maintained on operable sites generally using selection harvests to provide uneven-aged compositionally and structurally diverse stands. This will provide for a continuous supply of timber, available wildlife habitat and recreational opportunities.

10-Year Management Objectives

- The 10-year projected partial or selection harvest is 5,942 acres of northern hardwood.
- Continue salvage harvests of beech affected by beech bark disease using Beech Bark Disease Management Guidelines.
- Track beech regeneration in these stands and evaluate stands previously dominated by beech to determine the impact of beech bark disease on regeneration.
- To favor regeneration of hardwood other than beech, consider herbicide applications on beech regeneration and the planting of hard mast producing trees, including oak and disease resistant beech.

Long-Term Management Objectives

- Select harvest northern hardwood stands on a 20-year cycle.

Section 4.7.1.2 Forest Cover Type Management - Cedar

Current Condition

Cedar stands cover 10,322 acres (21%) of the management area (Table 4.7.1). Of this 2,174 acres are located within the Petrel Wintering Complex and will be managed for thermal refugia and food availability, in accordance with the Petrel Wintering Complex Plan. Following a deer management strategy, winter harvesting of approximately 20 acres of cedar per year will occur in the Petrel Deer Wintering Complex. This cutting regime and management strategy encourages deer to browse on cedar tops within the active harvest area. The deep snows that occur at this location discourage browsing on nearby cedar seedlings and saplings allowing regeneration to be successful (Figure 4.7.3). This management strategy has also allowed the deer wintering habitat to be sustained. Cedar is being regenerated using combinations of prescribed burning, seeding and natural regeneration. Outside of the Petrel Wintering Complex, cedar management is more traditional with less of an emphasis on wintering deer. Two cedar stands in this management area have been identified as rich conifer swamps by Michigan Natural Features Inventory.

Currently, there are 283 acres prescribed for final harvest. In addition, there are 33 acres prescribed in a different cover type that are expected to convert to cedar after harvest. There are 199 acres with site conditions limiting their harvest at this time. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations.

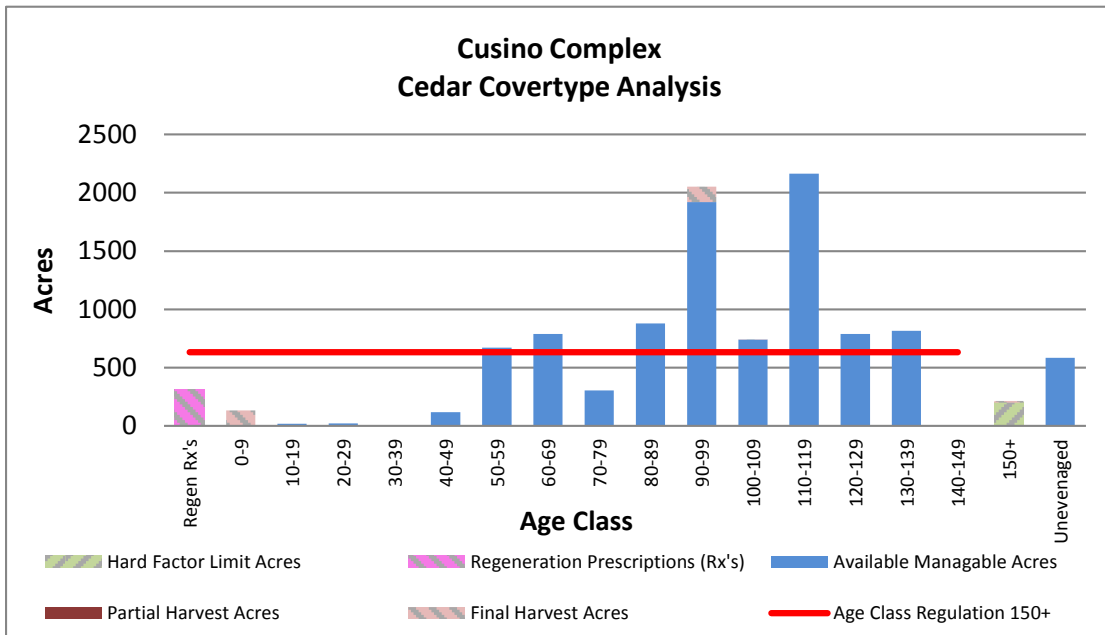


Figure 4.7.3. Age-class distribution of cedar in the Cusino Complex management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Cedar trees are very long lived and generally provide excellent closed canopy habitat for wildlife. Where deer wintering activities are not a concern, cedar will be maintained on operable sites through even-aged management where recruitment exists.

10-Year Management Objectives

- The 10-year projected harvest of cedar is approximately 633 acres representing approximately 200 acres of harvest within the Petrel Wintering Complex, and the remainder outside of the Petrel Wintering Complex.

Long Term-Management Objectives

- Focus cedar management within the Petrel Wintering Complex on winter habitat for deer.
- Outside of the current Petrel Wintering Complex boundary, management strategies should maintain the option of expanding winter deer habitat.
- Strive toward maintaining the cedar cover type through establishment of younger age classes where recruitment is expected. A regulated harvest using a 150-year rotation age would allow 633 acres to be harvested and regenerated per decade (red line in Figure 4.7.3).

Section 4.7.1.3 Forest Cover Type Management – Lowland Conifer

Current Condition

Lowland conifer stands occur on 5,653 acres (11%) of this management area (Table 4.7.1). Lowland conifer stands in the management area have been successfully harvested and regenerated, through natural regeneration, resulting in stands in all age classes (Figure 4.7.4). Lowland conifer stands that are within deer wintering areas will be managed according to the Petrel Wintering Complex plan. Access to some stands is limited due to the wet sites and the small creeks that are often found in these cover types.

Currently, there are 181 acres with a final harvest prescribed and 77 acres with a partial harvest prescribed. There are 1,145 acres of lowland conifer that have site conditions limiting their harvest this entry period. These hard factor limited acres have been removed from harvest calculations. Lowland conifer stands in areas inaccessible for harvest will be subject to natural processes, resulting in a range of successional stages.

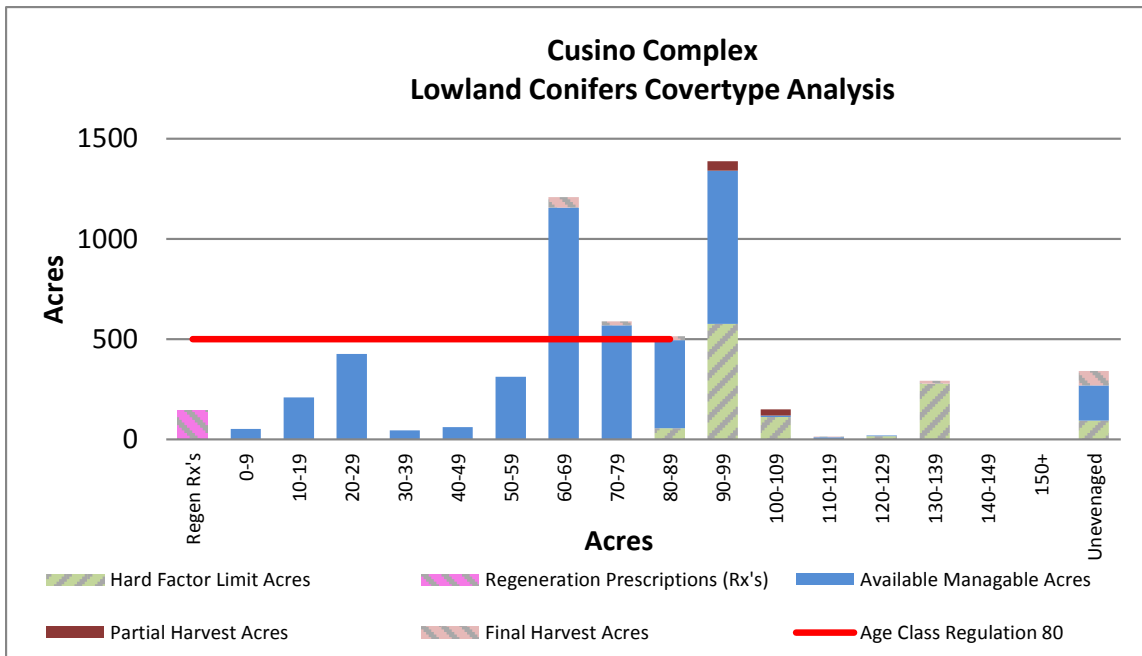


Figure 4.7.4. Age-class distribution of lowland conifers in the Cusino Complex management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Lowland conifer stands will be maintained on operable sites through even-aged management, balancing the acres between 0-89 years of age. This will provide a continuous supply of timber, available wildlife habitat and recreational opportunities.

10-Year Management Objectives

- The 10-year projected final harvest of lowland conifer is 501 acres.

Long-Term Management Objectives

- Within lower quality stands, where applicable bolster cedar regeneration through harvest and seeding.
- Within deer wintering areas, manage lowland conifer stands in conjunction with the Petrel Wintering Complex management plan.
- Balance the age-class distribution of accessible lowland conifers providing a regulated harvest of approximately 501 acres of lowland conifer to be harvested each decade.

Section 4.7.1.4 Forest Cover Type Management – Lowland Open/Semi-Open Lands

Current Condition

Lowland open/semi-open lands occur on 5,237 acres (11%) (Table 4.7.1) This category is a combination of lowland shrub (3,783 acres), marsh (756 acres), treed bog (520 acres) and bog (178 acres). These cover types function ecologically as sources of habitat for numerous species of wildlife. Many of these stands are found in association with creeks, rivers and lowland forested stands.

Desired Future Condition

- Lowland open/semi-open lands will be retained in their current state to ensure an adequate level of wildlife habitat and recreational opportunity.

Long-Term Management Objectives

- Within these stands allow natural processes to occur while protecting their ecological values from man-made disturbances.
- Lowland shrub stands may be managed for wildlife habitat and/or for biomass, if markets materialize.

Section 4.7.1.5 Forest Cover Type Management – Other Types

Current Condition

There are many other cover types spread across the management area that have less than 5% of the total acres (Table 4.7.1). Aspen (1,855 acres or 4%), lowland deciduous (1,855 acres or 4%) and lowland spruce/fir (1,523 acres or 3%) are the largest forested types. Upland open/semi-open lands (1,200 acres or 2%) is composed of herbaceous openland, low-density trees, bare/sparsely vegetated and upland shrub.

The “other types” category (3,001 acres or 6%) is composed of forested cover types with less than 2% of the total acres, and includes: jack pine, lowland mixed forest, upland spruce/fir, white pine, hemlock, upland mixed forest, paper birch, lowland aspen/balsam poplar, red pine, mixed upland deciduous, upland conifers and tamarack. In addition, there are 450 acres (1%) of “miscellaneous other” which includes water, roads and sand/soil.

With the exception of white pine and red pine these cover types will be managed as even-aged. Natural regeneration of species currently on site is expected. Mixed cover types with high basal area may be thinned, depending on the species composition, before final regeneration harvest.

Within the grouse management area the rotation age of aspen may be reduced to provide optimum habitat for grouse.

Approximately 888 acres of these other minor cover types have site conditions limiting their harvest this entry period. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations.

Desired Future Condition

- These cover types may be managed on operable sites, contributing to the compositional diversity of the landscape while providing for continual harvest, available wildlife habitat and recreational opportunity.

10-Year Management Objectives

- The projected 10-year final harvest is 52 acres of aspen, 174 acres of lowland deciduous, 81 acres of lowland spruce/fir and 373 acres of other types.
- The projected 10-year partial harvest is 258 acres of other types.

Long-Term Management Objectives

- Continue management of these other cover types to provide a sustainable yield of forest products and wildlife habitat.
- Upland open land within the Petrel Wintering Complex will be intensively managed as breakout areas (forage areas available to deer in early spring).
- Follow guidelines to minimize the risk of beech bark disease, jack pine budworm and emerald ash borer in these stands.

4.7.2 – Featured Species Management

Cusino Complex management area has high biodiversity values whose maintenance should be a primary focus. Within the large northern hardwood stands, the maintenance of mature trees, coarse woody debris, forest structure, hard and soft mast and mesic conifers for the multiple species that depend upon them should be a priority. The Petrel deer wintering complex is within this management area, and is managed for thermal refugia and food availability. Regeneration of young aspen stands for browse and within-stand retention of boreal forest types will be a focus within this planning period.

This management area will include one of the eastern Upper Peninsula Grouse Enhanced Management System areas. The boundaries will be delineated during this planning period by the local biologist in collaboration with the Forest Eastern Upper Peninsula Regional State Forest Management Plan MA 7 Cusino Complex

Resources Division unit manager. Aspen stands that fall within the boundary may be managed to enhance habitat and hunting opportunities for ruffed grouse and deer. Habitat treatments may include managing aspen on a shortened rotation with multiple age classes and smaller stand sizes.

American Marten

The goal for marten in the eastern Upper Peninsula is to maintain or increase suitable habitat and strive to identify, maintain and connect known populations to facilitate genetic exchange. Management should address the maintenance and improvement of corridors, dead wood and conifer components in priority landscapes.

Wildlife habitat specifications:

- Identify key stands that provide linkages between habitat areas. In these stands, maintain a minimum of 30% canopy cover, as marten tend to avoid stands with less canopy cover.
- Identifying and maintaining corridors between large forested tracts.
- Where coarse woody debris is lacking, increase both standing dead and down dead wood, by leaving at least three secure large diameter (>14 inches in diameter at breast height) live trees to serve as future den trees, snags and coarse woody debris logs on the ground per acre in harvested stands.
- Increase the within-stand component of mesic conifers in mixed stands. Consider under-planting on suitable sites where a seed source is absent.
- Limit biomass harvesting and whole tree harvesting in key marten areas.

Moose

The goal for moose in the eastern Upper Peninsula is to maintain or increase suitable habitat. Management for moose should focus on providing early successional browse adjacent to lowland conifer complexes, the maintenance of within-stand hemlock and protecting willow, a valuable food source, along riparian and wetland edges.

Wildlife habitat specifications:

- Encourage early successional hardwood browse (in the 0-9 and 10-19 year-old age classes) in close proximity to closed canopy lowland conifer swamps.
- Balance aspen age-class distribution to ensure a more sustainable supply of browse.
- Maintain or promote thermal refugia in harvested stands by retaining hemlock and other conifers.

Black Bear

The goal for black bear in the eastern Upper Peninsula is to maintain or improve habitat. Management should focus on improving existing habitat (minimizing fragmentation and maintaining hard and soft mast) to offset potential population declines due to changes in land use.

Wildlife habitat specifications:

- Attempt to replace the hard mast component of hardwood forests in this management area, to offset the loss of beech due to beech bark disease, by planting disease resistant beech and red oak where appropriate.
- Beech trees with bear claw scars on the bark are generally good mast producers and should be retained wherever possible.
- Retain some representation of black cherry and ironwood. Maintain or increase mast by providing forest clearings that promote food sources such as pin cherry, juneberry/serviceberry, hazel, raspberry, blackberry and blueberry.

Gray Jay

The goal for gray jay in the eastern Upper Peninsula is to maintain or increase suitable habitat. Management should focus on maintaining representation of older age classes of appropriate cover types, as well as retention of important structural features within harvested stands in priority areas.

Wildlife habitat specifications:

- The primary goal is to maintain appropriate cover types (birch, lowland deciduous, fir, lowland conifer, lowland spruce/fir, tamarack and bogs) in the management area in a variety of age classes. Maintain 15% of the total acres in relevant cover types in older age classes (at least 20 years beyond “normal” rotation length for the cover type).
 - This can be accomplished either with stands that are already factor limited or by extending the rotation age. In this management area, older age classes (greater than 100 years) for gray jay habitat are being met by the large number of stands with site conditions that limiting harvesting.
- Patches are preferred over single trees within timber harvest sale boundaries, though it is beneficial to have both.
- Offset salvage harvests deemed necessary due to insect, disease or fire within the same cover type and age class (within the compartment, management area or eastern Upper Peninsula ecoregion), to minimize impacts on gray jay habitat. Total allowable harvest in these situations will be evaluated on a case-by-case basis.

Northern Goshawk

The goal for northern goshawk in the eastern Upper Peninsula is to maintain or improve suitable habitat. Management should focus on maintaining contiguous blocks of suitable habitat, providing structural diversity within stands and limiting disturbance to nesting birds in priority areas.

Wildlife habitat specifications:

- All known woodland raptor nests should be reported to local wildlife staff and included in the Integrated Forest Monitoring Assessment and Prescription Geographic Decision Support Environment. For northern goshawk nests, 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 until the workgroup has completed the guidance that will permanently replace the interim guidelines.

Ruffed Grouse

The goal for ruffed grouse in the eastern Upper Peninsula is to maintain or improve habitat. Management should focus on maintaining and balancing the age-class distribution for aspen in priority landscapes during this planning cycle.

Wildlife habitat specifications:

- Maintain the aspen cover type and increase the aspen component in mixed stands within the management area.
- Balance the age-class distribution of aspen and birch cover type to maintain young forests across the management area.
- Ideal aspen stands will be of 40-160 acres under a 50-60 year rotation. Larger harvest units should have irregular boundaries and include one or two 1-3 acre unharvested inclusions for every 40 acres exceeding 40 acres in size.
- Manage the aspen cover type for smaller patch size, a shorter rotation and a more deliberate habitat configuration within the designated Grouse Enhanced Management Systems areas where appropriate.
- Evaluate the conifer component in aspen stands, holding or increasing where desirable. Leave conifer under four inch diameter at breast height in mixed stands and aspen types as immediate residual escape cover and to promote corridors.
- Maintain cherry production for soft mast.

White-tailed Deer

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

Wildlife habitat specifications for deer wintering complexes:

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

4.7.3 – Rare Species and Special Resource Area Management

All forest operations must be reviewed for potential conflicts with rare species, in accordance with guidance found in the DNR's *Approach to the Protection of Rare Species on State Forest Lands* (IC4172). This is especially important when listed species are present, past surveys have indicated a possibility of their presence, or when appropriate habitat is available and the species is known to occur in the general region.

Past surveys have noted and confirmed twelve listed species as well as three natural communities of note occurring in the management area as listed in Table 4.7.2. Any established management guidelines will be followed.

The Petrel Deer Wintering Complex is a special conservation area (obligate deer winter range). Other special conservation areas include potential old growth areas and several cold water streams (Figure 4.7.5) and high priority trout streams (Figure 4.7.1).

There are two large patterned fen natural communities (one of 871 acres and one of 330 acres) that are ecological reference areas shown in Figure 4.7.5. Both of these extend south into the Seney Manistique Swamp management area. These ecological reference areas will be managed to protect and enhance their natural vegetative and wildlife communities as directed by an ecological reference area-specific management plan.

Management goals during this planning period are:

- 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.

4.7.4 – 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 by major cover type include:

- Northern hardwoods: beech bark disease (BBD);
- Aspen: white trunk rot, *Hypoxylon* canker; and
- Lowland conifers: spruce budworm, eastern larch beetle and larch casebearer.

Further information on forest health can be found in Section 3.

Invasive Species

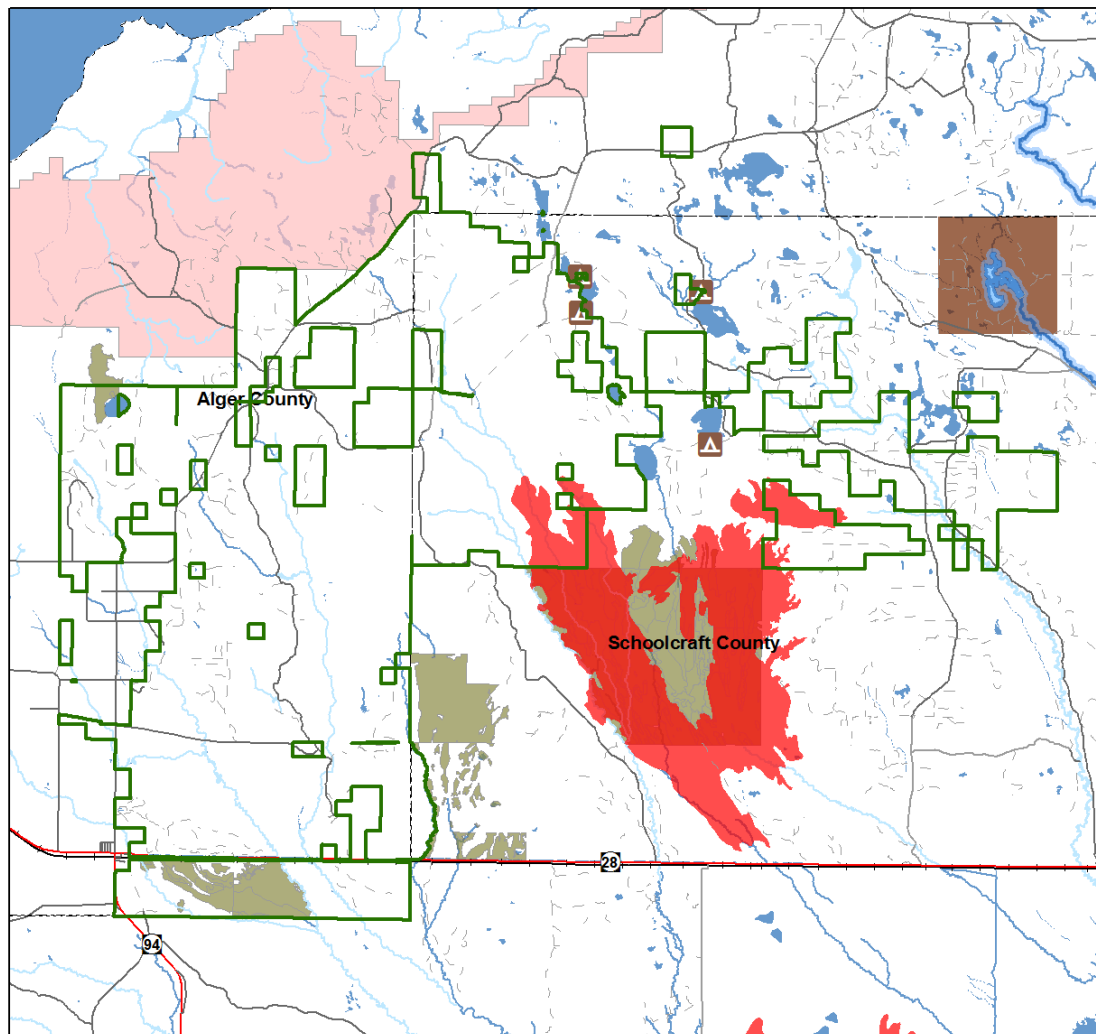
Invasive exotic species, specifically plants, may pose a forest health threat to forested and non-forested areas throughout the management area. The statewide database of invasive plant species does not document any known species or locations within or surrounding the management area. Absence of data is likely due to lack of surveys and it should not be assumed there are no species present. Monitoring efforts should specifically look for new populations of the 10 priority invasive plant species identified in Section 3 of this plan. Prescribe eradication treatments to any new populations of priority invasive plant species found in the management area.

Table 4.7.2. Occurrence information for special concern, rare, threatened and endangered communities and species for the Cusino Complex 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								
Dry-mesic northern forest		S3/G4	Confirmed				White Pine	Late
Patterned fen		S2/GU	Confirmed				Lowland open/semi-open	N/A
Rich conifer swamp		S3/G4	Confirmed				Tamarack	Late
Birds								
American bittern	<i>Botaurus lentiginosus</i>	SC/G4/S3-4	Confirmed	MV	Very High	Great Lakes marsh	Lowland open/semi-open	N/A
						Emergent marsh	Lowland open/semi-open	N/A
						Coastal plain marsh	Lowland open/semi-open	N/A
						Northern wet meadow	Lowland open/semi-open	N/A
						Southern wet meadow	Lowland open/semi-open	N/A
						Lakeplain wet prairie	Lowland open/semi-open	N/A
						Lakeplain wet-mesic prairie	Lowland open/semi-open	N/A
						Wet-mesic sand prairie	Lowland open/semi-open	N/A
						Wet prairie	Lowland open/semi-open	N/A
						Northern fen	Lowland open/semi-open	N/A
						Poor fen	Lowland open/semi-open	N/A
						Coastal fen	Lowland open/semi-open	N/A
Yellow rail	<i>Coturnicops noveboracensis</i>	T/G4/S1S2	Confirmed	MV	Moderate	Northern wet meadow	Lowland open/semi-open	N/A
Common loon	<i>Gavia immer</i>	T/G5/S3-4	Confirmed	HV	Very High	Emergent Marsh	Lowland open/semi-open	N/A
						Bog	Lowland open/semi-open	N/A
Osprey	<i>Pandion haliaetus</i>	SC/G5/S2-3	Confirmed	PS	Low	Coastal fen	Lowland open/semi-open	N/A
						Northern hardwood swamp	Black Ash	Late
						Floodplain forest	Lowland Mixed	Mid
						Hardwood-conifer swamp	Lowland Mixed	Mid
Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>	SC/G5/S4	Confirmed	PS	Moderate	Pine barrens	Jack Pine	Early
						Oak-pine barrens	Oak	Mid
						Dry sand prairie	Upland open/semi-open	N/A
						Wet-mesic sand prairie	Upland open/semi-open	N/A
						Northern shrub thicket	Upland open/semi-open	N/A
Butterflies								
Northern blue	<i>Lycaeides idas nabakovi</i>	T/G5TU/S2	Confirmed	HV	Very High	Dry northern forest	Jack Pine, Red Pine	Late
						Pine barrens	Jack Pine	Early
						Oak-pine barrens	Oak	Mid
Tawny crescent	<i>Phyciodes batesii</i>	SC/G4/S4	Confirmed	PS	Low	Coastal fen	Lowland open/semi-open	N/A
						Northern fen	Lowland open/semi-open	N/A
						Northern wet meadow	Lowland open/semi-open	N/A
						Dry sand prairie	Upland open/semi-open	N/A
						Oak-pine barrens	Oak	Mid
						Mesic sand prairie	Upland open/semi-open	N/A
						Mesic prairie	Upland open/semi-open	N/A
Plants								
American shore-grass	<i>Littorella uniflora</i>	SC/G5/S2S3	Confirmed			Submergent marsh	Lowland open/semi-open	N/A
Farwell's water milfoil	<i>Myriophyllum farwellii</i>	T/G5/S2	Confirmed			Emergent marsh	Lowland open/semi-open	N/A
Alga pondweed	<i>Potamogeton confervoides</i>	SC/G4/S3	Confirmed			Submergent marsh	Lowland open/semi-open	N/A
						Emergent marsh	Lowland open/semi-open	N/A
Dwarf raspberry	<i>Rubus acaulis</i>	E/G5T5/S1	Confirmed			Northern fen	Lowland open/semi-open	N/A
						Patterned fen	Lowland open/semi-open	N/A
						Poor fen	Lowland open/semi-open	N/A
Dwarf bilberry	<i>Vaccinium cespitosum</i>	T/G5/S1S2	Confirmed			Dry sand prairie	Upland open/semi-open	N/A
						Volcanic bedrock lakeshore	Upland open/semi-open	N/A
						Sandstone lakeshore cliff	Upland open/semi-open	N/A
						Sandstone cliff	Upland open/semi-open	N/A
						Dry northern forest	Jack Pine, Red Pine	Late

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

Cusino Complex



Legend

- Highway
- Paved Roads
- Gravel Roads
- Poor Dirt Roads
- Railroads
- Intermittent Stream or Drain
- Perennial River
- Lakes and Rivers
- Management Area Boundary
- Cities
- County Boundaries

Ecological Reference Areas

High Conservation Value Areas

- Coastal Environmental Areas
- Critical Dunes
- Natural Rivers Vegetative Buffer
- Natural Rivers Zoning District
- Critical Coastal Habitat (Piping Plover)
- Kirtland Warbler Habitat
- Dedicated Management Areas
- Natural Areas Legally Dedicated

Special Conservation Areas

- Campgrounds
- Fishing Access Sites
- Boat Access Sites
- Mineral Resource Locations
- Wild & Scenic Rivers (USFS Lands)
- Visual Management Areas
- Contiguous Resource Areas
- Possible Type 1 and Type 2 Old Growth
- Potential Old Growth
- Non-Dedicated Natural Areas & National Natural Landmarks
- Springs, Wetlands, or Riparian Areas



- Cold Water Streams & Lakes
- Wildlife Management Areas
- Research, Development, and Military Lands
- Great Lakes Islands

Figure 4.7.5. A map of the Cusino Complex management area showing the special resource areas.

4.7.5 – Fire Management

Much of the area is comprised of mesic and lowland soils, which were only very rarely influenced by fire disturbance under natural disturbance regimes. Since 1973, 10 burns including approximately 115 acres have been conducted to prepare seedbed for cedar regeneration.

- Use of prescribed fire to prepare seedbed for regeneration of northern white cedar may be planned for areas as they are harvested.
- No specific fire problems are identified in the management area, due to cedar and hardwood cover types.
- Five Campgrounds within the management area provide opportunities for general fire prevention education.
- Increased fragmentation of private lands in close proximity and within the management area will present more wildland/urban interface challenges to wildfire suppression.

4.7.6 – Public Access and Recreation

State owned land in this management area is interspersed with private parcels and commercial forest act land. The majority of the management area has gravel county and dirt two-track access roads. The large swamp and marsh areas are generally without roads. The town of Shingleton, and communities of Van Meer and Melstrand are within the management area.

The management area includes snowmobile trails (Figure 4.7.1), Gemini Lake Pathway, and five state forest campgrounds (Cusino Lake, Canoe Lake, Ross Lake, North Gemini Lake and South Gemini Lake) that are in or near the management area (Figure 4.7.5). In addition, there are the following boating access sites: North Gemini Lake, South Gemini Lake and Ross Lake.

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.

Deer, grouse and bear hunting, as well as trapping, fishing and mushroom picking are popular within this management area.

4.7.7 - Aquatic Resource Management

Fisheries Division management unit biologists will review proposed forest management activities using the compartment review process and will consider the potential impact of proposed prescriptions upon riparian and aquatic values. Management prescriptions will be modified to account for riparian and aquatic values by applying the standards and guidance documents listed in the introduction to this plan section to the unique conditions specific to any given forest stand.

Prescription of riparian management zone widths greater than the minimum widths provided in IC4011 (*Sustainable Soil and Water Practices on Forest Land*) must be justified and documented during the compartment review process.

Forested stands adjacent to designated high priority trout streams will specifically be managed to discourage beaver use in accordance with both DNR Policy and Procedure 39.21-20 Beaver Management and IC 4011. High priority trout streams in this management area are shown in the Integrated Forest Monitoring Assessment and Prescription Geographic Decision Support System and in Figure 4.7.1.

4.7.8 – Minerals

Surface sediments consist of glacial outwash sand and gravel and postglacial alluvium, peat and muck, an end moraine of medium-textured till and medium and coarse-textured till. There is insufficient data to determine the glacial drift thickness. Sand and gravel pits are located in this management area and there is good potential for additional pits on the uplands.

The Ordovician Black River Formation and Prairie du Chien Group subcrop below the glacial drift. The Black River is quarried for stone/dolostone in the Upper Peninsula.

Exploration and development for oil and gas has been limited to a few wells drilled in the Upper Peninsula (five in Schoolcraft and one mineral well in Alger). No economic oil and gas production has been found in the Upper Peninsula.

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