4.7 Central Keweenaw Management Area

Summary of Use and Management

Vegetative management in the Central Keweenaw management area (MA) (Figure 4.7.1) will provide a variety of forest products; maintain or enhance wildlife habitat; protect areas with unique characteristics; and provide for forest based recreational uses. Timber management objectives for the 10-year planning period include the management priority for this area is the production of timber products, while maintaining habitat qualities for wildlife species dependent on the northern hardwood communities in this area; maintaining the presence of minor cover types on the landscape; and maintaining non-forest vegetation types. Wildlife management objectives include providing thermal cover in the 5 Mile Point and Jacobsville deer wintering complexes. Management activities may be constrained by site conditions and the small scattered parcels in the area. Management access will be an issue for the next 10-year planning period.

Introduction

The Central Keweenaw management area is mostly on beach ridge and dunes in northern Houghton and southern Keweenaw Counties. The state forest covers 3,679 acres and is in small-scattered parcels. The management area is dominated by the upland spruce/fir, cedar and aspen. Other attributes that played a role in the definition of this management area include:

- Dominated by the mesic northern forest natural community;
- Mid-range in site quality; and
- Major ownerships in this vicinity are non-industrial private and forest industry.

The management priority for this area is the production of timber products, while maintaining habitat qualities for wildlife species dependent on the northern hardwood communities in this area.

The predominant cover types, composition and projected harvest areas for the Central Keweenaw management area are shown in Table 4.7.1.

Table 4.7.1 Summary of cover types, composition, limited factor area, manageable area and projected harvest area for the Central Keweenaw management area (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
Upland Spruce/Fir	19%	696	431	265	0	0	696	29	0
Cedar	8%	295	69	226	0	0	295	14	0
Aspen	7%	246	19	227	0	0	246	32	0
Northern Hardwood	6%	216	0	216	0	102	216	0	108
Lowland Spruce/Fir	6%	205	122	83	32	0	205	9	0
Lowland Conifers	5%	186	67	119	46	0	186	13	0
Upland Open/Semi-Open Lands	1%	54	0	54	0	0	54	0	0
Lowland Open/Semi-Open Lands	25%	922	0	922	0	0	922	0	0
Misc Other (Water, Local, Urban)	6%	215	0	215	0	0	215	0	0
Others	18%	644	122	522	179	129	644	68	139
Total		3,679	830	2,849	256	231	3,679	165	247

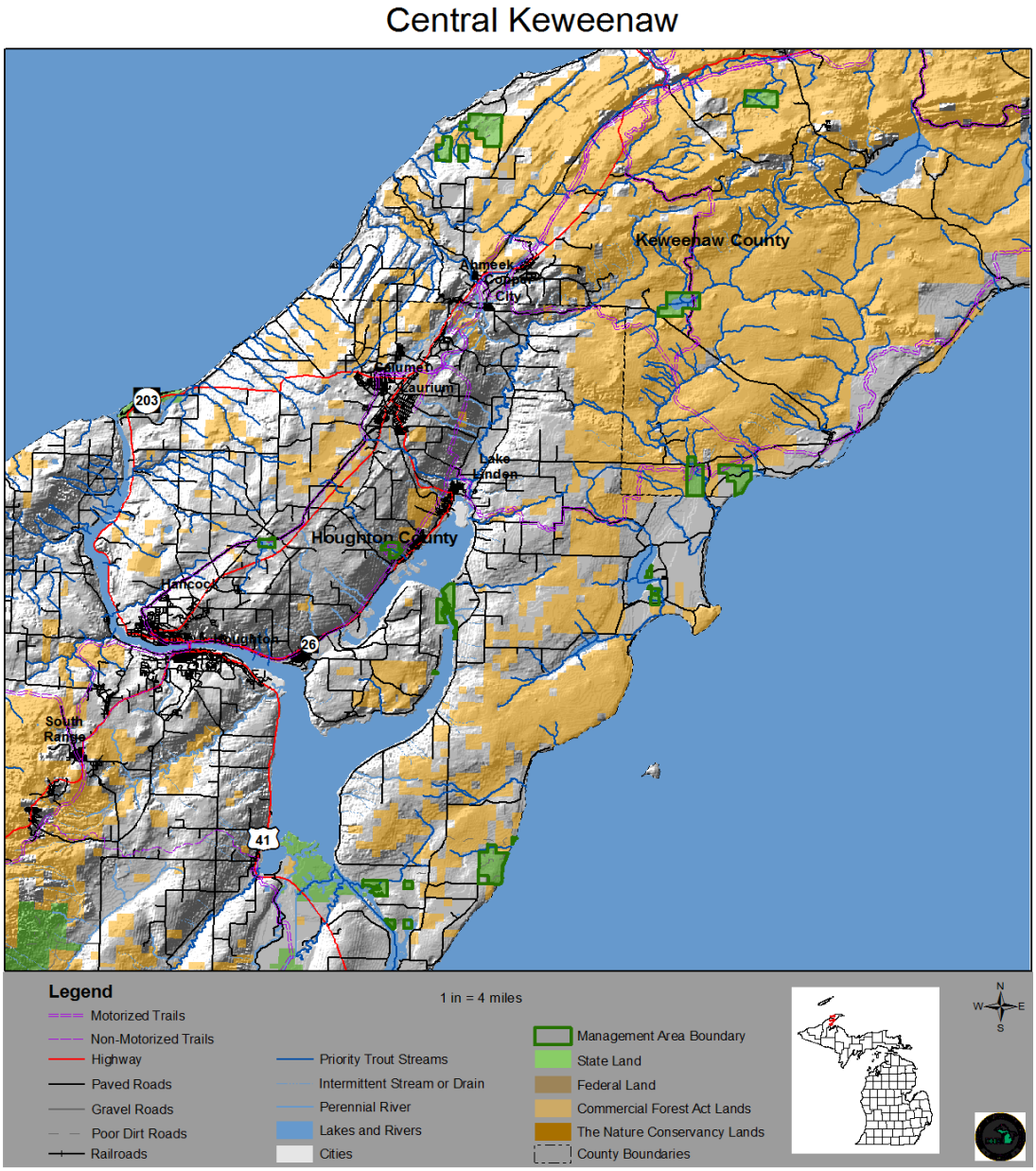

Figure 4.7.1. A map of the Central Keweenaw management area (dark green boundary) in relation to the surrounding state forest and other lands in Houghton and Keweenaw Counties, Michigan.

4.7.1 Forest Cover Type Management Direction

The following sections contain information on vegetation management for each of the major cover types, a grouping of minor cover types and important non-forested vegetation types for the Central Keweenaw management area in the form of Desired Future Condition, 10-Year Management Objectives and Long-Term Management Objectives. 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, the natural processes of succession and disturbance will provide ecological benefits. While most stands have a variety of tree species and other vegetation, they are classified by the species with dominant canopy coverage.

The following cover types are valued commercially for their timber products; ecologically as sources of habitat for numerous wildlife species; and for the variety of recreational opportunities they provide. Harvesting and regenerating these cover types will provide for a continuous flow of forest products and will help to ensure (or provide) wildlife habitat.

Upland Spruce/Fir Cover Type

Current Condition

There are 696 acres (19%) of upland spruce-fir in this management area (Table 4.7.1). Upland spruce/fir typically occurs as small stands occupying the transition zone between larger upland types (aspen and northern hardwood) and lowlands. Upland spruce/fir stands are generally short-lived reaching maturity in 60-70 years. Left unmanaged they may experience insect (spruce budworm) and/or windthrow mortality will be followed by natural regeneration of spruce/fir and/or aspen. Alternatively, they may succeed to shade tolerant hardwoods like red maple. Upland spruce/fir stands in this management area are poorly distributed by age class (Figure 4.7.2). While there has been recent harvesting in this cover type, most of the stands in this area are over 80 years of age. There are 431 acres of upland spruce/fir that have 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.

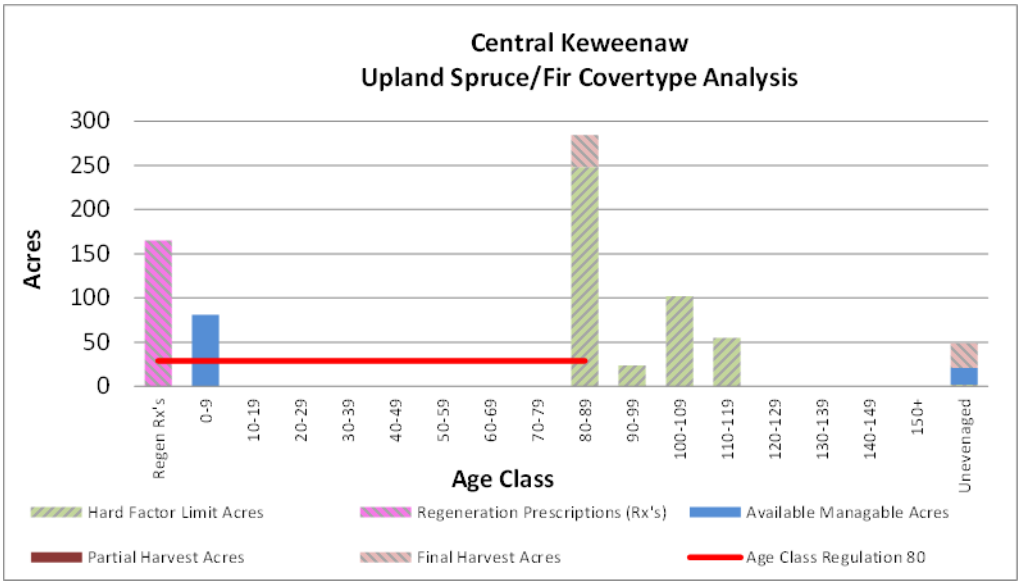

Figure 4.7.2. Graph of the age-class structure for the upland spruce-fir cover type on the Central Keweenaw management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Maintain existing cover type although an increase in spruce-fir acreage is expected as factor limited paper birch stands succeed to spruce-fir stands.

Long-Term Management Objectives

- Harvest and regenerate upland spruce-fir stands using a 60-year rotation length (this would allow approximately 29 acres to be harvested per decade).

10-Year Management Objectives

- No harvest is planned for this cover type in this planning period; and
- Evaluate the oldest stands with factor limits to determine which stands should be permanently withdrawn from timber production and which stands are only temporarily limited.

Cedar Cover Type

Current Condition

Cedar occurs on 295 acres (8%) of the management area (Table 4.7.1). Poorly drained sites supporting stands of mostly cedar mixed with black spruce, tamarack and balsam fir characterize the cedar cover type. Due to the wet site conditions, they are more susceptible to rutting damage from logging equipment and present difficult operating conditions for harvesting. Cedar cover types are poorly distributed across the age-class distribution (Figure 4.7.3). Most of the stands are over 120 years of age. Little harvesting has been done in this cover type over the past 80 years. There are 69 acres of cedar with site conditions limiting their harvest.

Although there will be no harvesting of cedar within deer wintering complexes, there is a need to address future cedar cover. Limited cedar harvests will occur outside the wintering complexes recognizing that cedar takes many years to regenerate and escape deer browsing. Reliable and timely regeneration of cedar is a concern from both wildlife and forest management perspectives.

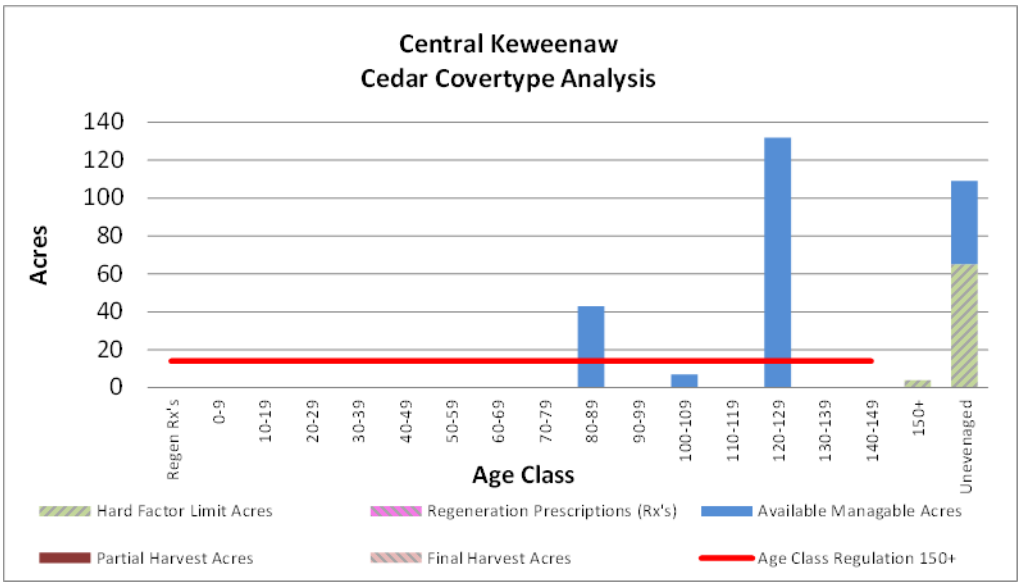

Figure 4.7.3. Graph of the age-class distribution of the cedar cover type on the Central Keweenaw management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Closed canopy stands interspersed with patches of all age classes;
- Sustainable regeneration and recruitment of cedar seedlings and saplings;
- Maintain the closed cedar canopy structure in many stands for winter deer habitat.

Long-Term Management Objectives

- Maintain cedar cover type on the landscape; and
- Regenerate stands to species mixes similar to the pre-harvest conditions.

10-Year Management Objective

- While no cedar harvests are planned for this area in the next decade, limited harvesting may occur to test methods of cedar regeneration.

Aspen Cover Type

Current Condition

About 246 acres (7%) of state forest land in this management area are in the aspen cover type (Table 4.7.1). Aspen is poorly distributed across age-classes with a spike occurring in the 10-19 year age class (Figure 4.7.4). There are 19 acres

of aspen that have harvest limitations at this time. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations.

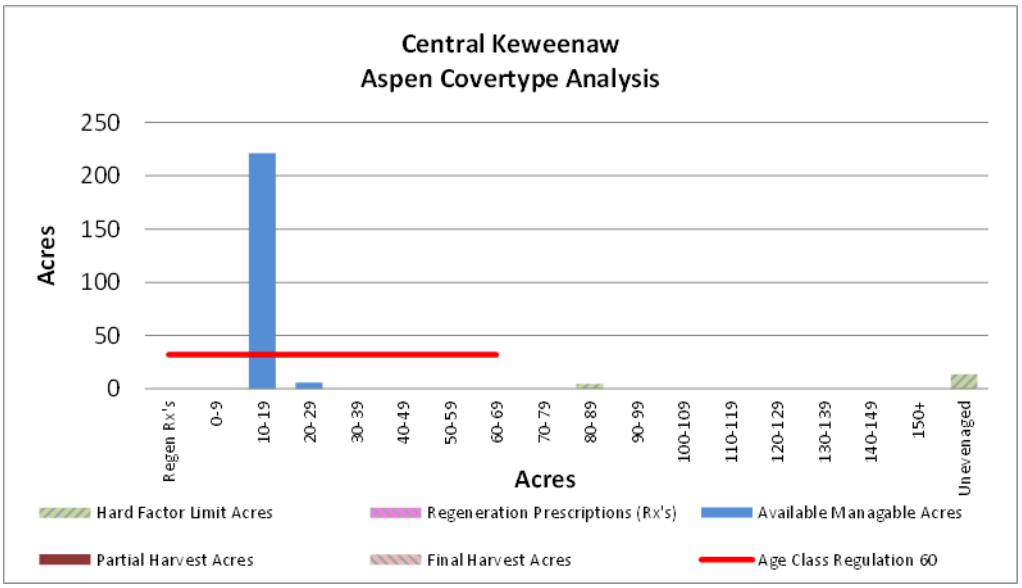

Figure 4.7.4. Graph of the age-class distribution of the aspen cover type for the Central Keweenaw management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Provide a supply of forest products and a mix of habitat conditions for a variety of wildlife; and
- Provide a variety of hunting-type opportunities.

Long-Term Management Objective

- Harvest and regenerate aspen stands using a 60-year rotation length allowing approximately 32 acres of aspen to be harvested per decade.

10-Year Management Objectives

- No harvest of aspen over this 10-year planning period.

Northern Hardwood Cover Type

Current Condition

Northern hardwood stands occur on 216 acres (6%) of state forest land in this management area (Table 4.7.1). Most stands have been managed using the selection harvest system. Due to low deer numbers in this area, there are few problems with herbivory and most areas regenerate successfully. Northern hardwood is typically managed using an uneven-aged harvest system based on basal area rather than age. Figure 4.7.5 shows the current basal area distribution for the management area.

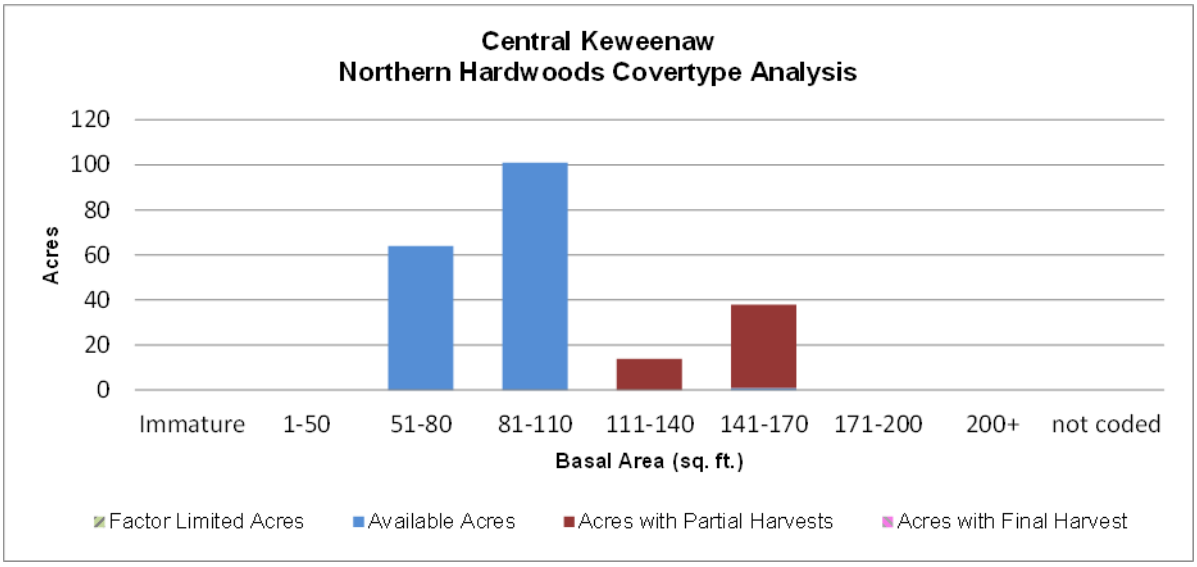

Figure 4.7.5. Graph of the basal area distribution for the northern hardwood cover type of the Central Keweenaw management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Manage for uneven-aged northern hardwood stand structure promoting high-value sugar maple sawlogs;
- Provide a full complement of tree seedlings recruiting into the overstory; and
- Provide well-developed shrub and herbaceous layers.

Long-Term Management Objectives

- Using an uneven-aged system, selectively harvest northern hardwood stands on a 20-year cycle; and
- Maintain and encourage minor species to increase in-stand diversity.

10-Year Management Objectives

- Approximately 102 acres will be selectively cut in the next decade;
- Maintain and regenerate white pine, oak, hemlock and upland cedar where they occur in stands that are harvested;
- Favor oak as a retention species; and
- Work to regenerate hemlock components in stands lacking that species.

Lowland Spruce/fir Cover Type

Current Condition

Currently there are 205 acres (6%) of the lowland spruce/fir cover type in the management area (Table 4.7.1). Lowland spruce/fir is often found in association with lowland conifer, cedar and tamarack cover types. Lowland spruce/fir in this management area does not have a well-balanced age-class distribution spiking in the 100-109 age class (Figure 4.7.6). A large portion of the lowland spruce/fir stands have been coded as uneven-aged, having trees of all sizes and ages. There are 122 acres of lowland spruce/fir that have 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.

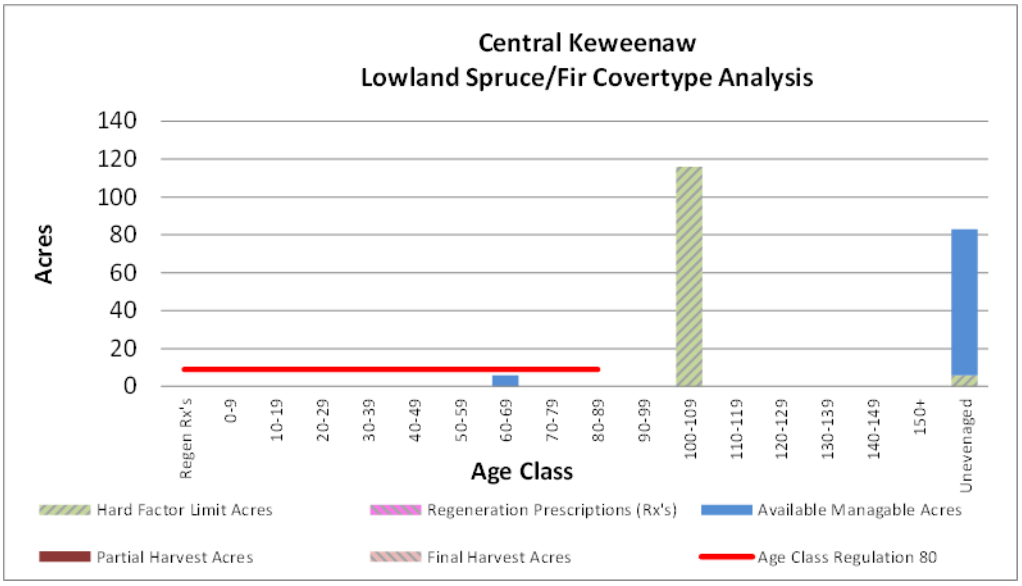

Figure 4.7.6. Graph of the age-class distribution for the lowland spruce/fir cover type on the Central Keweenaw management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Maintain approximately the current acreage of lowland spruce-fir cover type with stands representing a variety of age classes.

Long-Term Management Objective

- Regenerate mature lowland spruce/fir cover types on an 80-year rotation allowing for nine acres to be harvested per decade.

10-Year Management Objectives

- Harvest 32 acres in the next decade (this number is higher than the regulated amount due to the current age-class structure where there are no stands in young age classes;
- Monitor harvested sites to assure regeneration; and
- More aggressive harvesting in this type maybe needed in the next 10-year planning period to reduce mortality losses in the older stands.

Other Forested Cover Types

Current Condition

Other forested types make up 830 acres and are made up of lowland conifer (186 acres), mixed upland deciduous (146 acres), upland conifer (114 acres), paper birch (136 acres), upland conifers (114 acres), tamarack (69 acres), red pine (47 acres), upland mixed forest (44 acres), lowland deciduous (39 acres), lowland mixed forest (25 acres), white pine (16 acres) and oak (eight acres). Together these types make up about 23% of the management area (Table 4.7.1).

Approximately 122 acres of these other minor cover types have site conditions limiting their harvest this decade. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations.

Desired Future Condition

- Maintain similar proportions of minor cover types within the management area.

Long-Term Management Objectives

- Manage minor cover types to maintain representation using appropriate silvicultural methods;

- Harvest as opportunities arise in conjunction with other management activities; and
- Monitor to assure adequate regeneration.

10-Year Management Objectives

- Harvest those stands without harvest limitations adjacent to other planned harvest activities and where stand conditions indicate that harvesting is appropriate; and
- The projected 10-year harvest is 225 acres of final harvest and 129 acres of partial harvest distributed across these cover types.

Other Non-forested Cover Types

Current Condition

Non-forested cover types found on this management area include: upland open/semi-open lands (54 acres – 1%), lowland open/semi-open lands (922 acres – 25%) and other (water, local, urban) (215 acres – 6%) (Table 4.7.1).

Desired Future Condition

- These areas will be maintained in the current condition.

Long-Term Management Objective

- Grass will be burned or mowed to prevent forest encroachment.

10-Year Management Objective

- Grass-types will be treated for opening maintenance as needed.

4.7.2 – Featured Wildlife Species Management

The primary focus of wildlife habitat management in the Central Keweenaw management area will be to protect thermal cover in the 5 Mile Point and Jacobsville deer wintering complexes and address the habitat requirements identified for the following featured species: black bear, northern goshawk and white-tailed deer. Some of the most significant wildlife management issues in the management area are hard and soft mast; habitat fragmentation; mature forest (upland deciduous, especially aspen and mixed forest with little understory); coarse woody debris; and deer wintering complexes. Additional analyses to better define the spatial extent of priority areas (e.g., identify white-tailed deer wintering complexes) for featured species will be performed during this 10-year planning period.

Black Bear

The western Upper Peninsula black bear goal is to maintain or improve habitat. Management for bear should focus on improving existing habitat (e.g., maintaining corridors, mast and refuge trees) in this management area.

Wildlife habitat specifications:

- Maintain or increase the oak cover type and within stand oak component of hardwood forests within the management area;
- Maintain or increase mast by providing forest clearings that promote food sources such as pin cherry, juneberry/serviceberry, hazel, raspberry, blackberry and blueberry;
- Minimize herbicide use that would be detrimental to mast production;
- Maintain lowland conifer and hardwoods along and around drainages, vernal pools and forested wetlands; and
- Maintain refuge tree species with rough bark to provide escape cover for cubs (e.g., white pine and hemlock).

Northern Goshawk

The goal for northern goshawk is to maintain suitable habitat. Management at the stand scale should focus on the protection of nest trees, provision of coarse woody debris and on addressing fragmentation. Landscape scale management should provide mature and old aspen stands in the 60-69 year-old age class.

Wildlife habitat specifications:

- Maintain a minimum of 15% of the state forest aspen resource above age of 60 in this management area (this can be accomplished using factor limited stands, special conservation areas, etc…). All known woodland raptor nests should be reported to local wildlife staff and documented in Integrated Forest Monitoring Assessment and Prescription comments. If the species is known the common name should be included in those comments. The wildlife habitat specifications contained within Michigan DNR's *Interim Management Guidance 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.

White-tailed Deer

The western 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 department 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 department 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 deer wintering complexes 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%.
- In deer wintering complexes in low snowfall areas, and within ¼-mile of severe-winter cover in the higher snowfall zones, write prescriptions that strive to maintain canopy closure of 40-65%, favoring cedar, hemlock, white spruce, black spruce, balsam fir and white pine.
- 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 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, when 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 thirteen 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. 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 4.7.2. Occurrence information for special concern, rare, threatened and endangered communities and species for the Central Keweenaw 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								
Great Lakes marsh		S3/G2	Confirmed				Lowland open/semi-open	N/A
Sandstone lakeshore cliff		S2/G3	Confirmed				Upland open/semi-open	N/A
Wooded dune and swale complex		S3/G3	Confirmed				Upland open/semi-open	N/A
Birds								
Merlin	*Falco columbarius*	T/G5/S1S2	Confirmed	PS	Very High	Boreal forest	Upland & Lowland Sp/F	Mid
						Great Lakes barrens	Upland open/semi-open	N/A
Common loon	*Gavia immer*	T/G5/S3-4	Confirmed	HV	Very High	Emergent Marsh	Lowland open/semi-open	N/A
						Bog	Lowland open/semi-open	N/A
Bald eagle	*Haliaeetus leucocephalus*	SC/G5/S4	Confirmed	IL	Moderate	Bog	Lowland open/semi-open	N/A
						Hardwood-conifer swamp	Lowland Mixed	Mid
						Northern hardwood swamp	Black Ash	Late
						Poor conifer swamp	Tamarack	Late
						Floodplain forest	Lowland mixed	Mid
						Dry northern forest	Jack Pine, Red Pine	Early
						Dry-mesic northern forest	White Pine	Late
						Mesic northern Forest	Northern Hardwood	Late
Osprey	*Pandion haliaetus*	SC/G5/S2-3	Confirmed	PS	Low	Coastal fen	Lowland open/semi-open	N/A
						Northern hardwood swamp	Black Ash	Late
						Floodplain forest	Lowland Mixed	Mid
						Hardwood-conifer swamp	Lowland Mixed	Mid
Fish								
Cisco (lake herring)	*Coregonus artedi*	T/G5/S3	Confirmed	MV	Low	Great Lakes	Aquatic	N/A
						Inland lake	Aquatic	N/A
						Rivers	Aquatic	N/A
Bigmouth shiner	*Notropis dorsalis*	SC/G5/S4	Confirmed	MV	Moderate	Rivers	Aquatic	N/A
Sauger	*Sander canadensis*	T/G5/S1	Confirmed	HV	Low	Rivers	Aquatic	N/A
						Great Lakes	Aquatic	N/A
Mammal								
Tri-colored bat (Eastern pipistrelle)	*Perimyotis subflavus*	SC/G5/S2S3	Confirmed	PS	Very High	Caves	Caves	N/A
Plants								
Northern reedgrass	*Calamagrostis lacustris*	T/G3Q/S1	Confirmed			Sand and gravel beach	Upland open/semi-open	N/A
						Volcanic bedrock lakeshore	Upland open/semi-open	N/A
						Northern fen	Lowland open/semi-open	N/A
						Granite bedrock glade	Upland open/semi-open	N/A
						Volcanic bedrock glade	Upland open/semi-open	N/A
Douglas's hawthorn	*Crataegus douglasii*	SC/G5/S3S4	Confirmed			Volcanic bedrock glade	Upland open/semi-open	N/A
						Volcanic bedrock lakeshore	Upland open/semi-open	N/A
						Boreal forest	Upland & Lowland Sp/F	Mid
						Mesic northern forest	Northern Hardwood	Late
						Northern bald	Upland open/semi-open	N/A
						Open dunes	Upland open/semi-open	N/A
						Sand and gravel beach	Upland open/semi-open	N/A
						Sandstone bedrock lakeshore	Upland open/semi-open	N/A
						Volcanic cliff	Upland open/semi-open	N/A
						Volcanic cobble shore	Upland open/semi-open	N/A
						Volcanic lakeshore cliff	Upland open/semi-open	N/A
Blue wild rye	*Elymus glaucus*	SC/G5/S3	Confirmed			Volcanic bedrock lakeshore	Upland open/semi-open	N/A
						Wooded dune & swale complex	Upland open/semi-open	N/A
						Mesic northern forest	Northern Hardwood	Late
						Open dunes	Upland open/semi-open	N/A
						Volcanic cliff	Upland open/semi-open	N/A
Satiny willow	*Salix pellita*	SC/G5/S2S3	Confirmed			Sand and gravel beach	Upland open/semi-open	N/A
						Volcanic bedrock lakeshore	Upland open/semi-open	N/A
						Emergent marsh	Lowland open/semi-open	N/A
						Northern shrub thicket	Upland open/semi-open	N/A
Torrey's bulrush	*Scripus torreyi*	SC/G5?/S2S3	Confirmed			Intermittent wetland	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.

Although there are no high conservation value areas, there are four ecological reference areas in the management area (Figure 4.7.7) representing the following natural communities: wooded dune and swale complex (two – 382.6 acres and 20.6 acres), Great Lakes marsh (236.6 acres) and sandstone lakeshore cliff (9.9 acres).

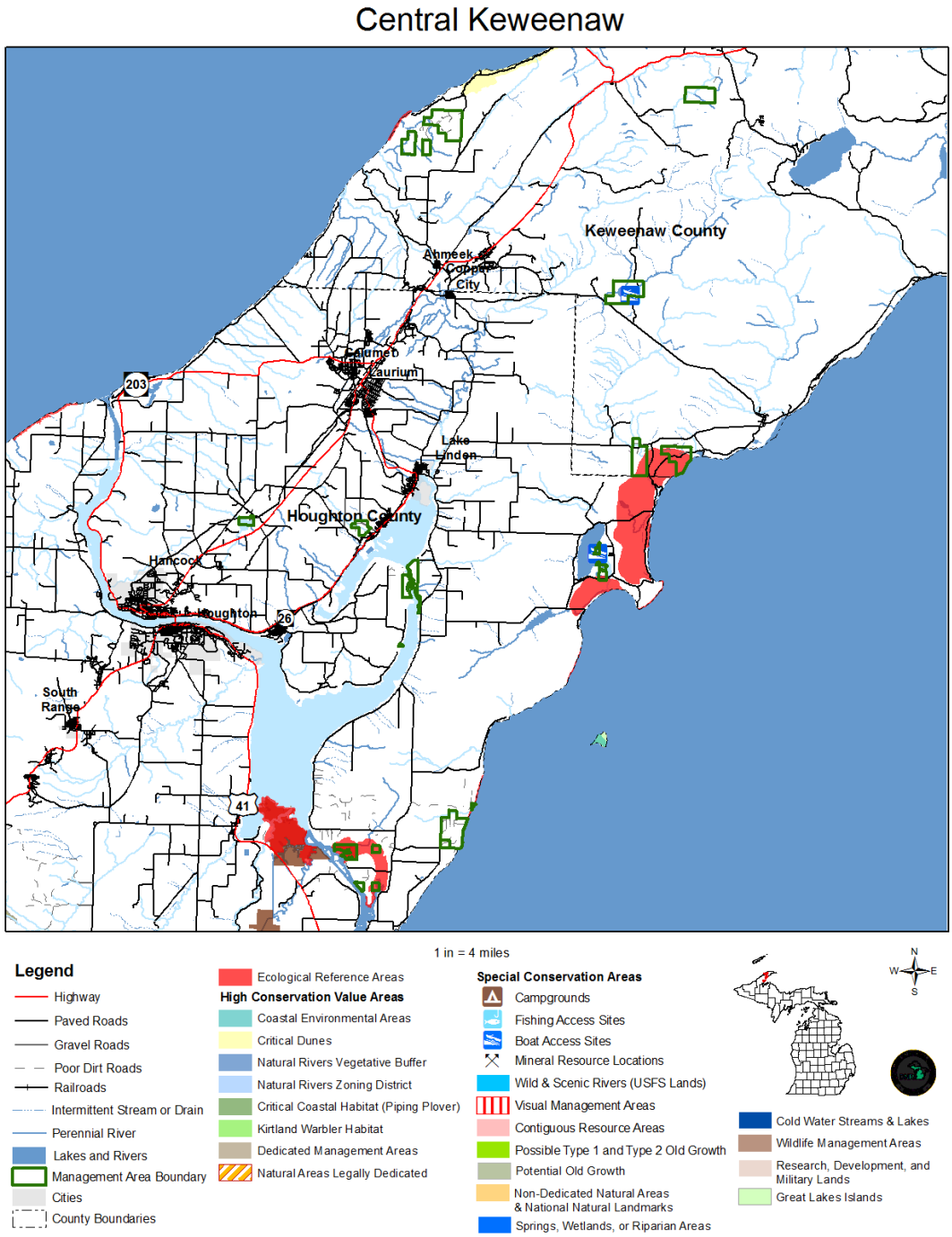

Figure 4.7.7. A map of the Central Keweenaw management area showing the special resource areas.

Management goals during this planning period:

Goal 1: To develop and maintain a list of rare, threatened, endangered and special concern species and natural communities for the management area through a continuous inventory and through opportunistic focused inventory surveys.

Objective 1-1: Field staff should be trained and aware of the identification characteristics and natural history of rare, threatened, endangered and special concern species.

Objective 1-2: Occurrences of rare, threatened, endangered and special concern species noted during the inventory process by inventory staff should be verified and added to the body of knowledge for the management area.

Goal 2: To develop and maintain management plans for ecological reference areas on state forest land.

Objective 2-1: Complete ecological reference area planning by the end of this 10-year planning period.

4.7.4 – Forest Health Management

Although forest health issues span the entire landscape, spruce budworm is the most important pest in this management area due to the species composition, site quality or other factors. When forest pests are detected, they are to be reported to the forest health specialist for treatment recommendations. The treatment of large outbreaks of forest pests will be coordinated on a state and regional level.

Several invasive exotic species of plants are thought to be located in the vicinity. When invasive species are detected, they will be reported to the forest health specialist and treatment options will be reviewed. Priority for treatment should be given to those species that threaten sensitive sites due to their location or growth characteristics and have population levels that may be successfully controlled. Following is a list of species of concern that been documented in or near this management area:

- Canada thistle
- Common buckthorn
- Garlic mustard
- Glossy buckthorn
- Japanese barberry
- Japanese knotweed
- Purple loosestrife
- Reed canary grass
- Spotted knapweed

4.7.5 – 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 Quality Practices on Forest Land*) must be justified and documented during the compartment review process.

Forested stands adjacent to designated high priority trout streams will specifically be managed to discourage beaver use in accordance with both DNR Policy and Procedure 39.21-20 Beaver Management and IC 4011. Designated high priority trout streams are identified in the Integrated Forest Monitoring Assessment and Prescription Geographic Decision Support Environment. Remove or discourage beaver populations on designated high priority trout streams.

High priority trout streams in this management area are shown in Figure 4.7.1.

4.7.6 – Fire Management

This area is dominated by mesic northern forest. Fire impacts were rare, resulting in very long fire return intervals and now all wildfires are subject to appropriate initial attack.

4.7.7 – Public Access and Recreation

This area consists of small isolated parcels with limited public access. There is a network of rail/trails and snowmobile routes (Figure 4.7.1) primarily on private lands. There are boating access sites (Figure 4.7.7) at most of the inland lakes.

- Maintain current management access; and
- Work to expand public access as opportunities arise.

4.7.8 – Oil, Gas and Mineral Resources

Exploration and development for oil and gas has been limited to a few wells drilled in the eastern Upper Peninsula and no economic oil and gas production has been found anywhere in the Upper Peninsula.

Surface sediments consist of coarse-textured till, in places thin to discontinuous and lacustrine sand and gravel. The glacial drift thickness varies between 10 and 100 feet. Sand and gravel pits are located in the management area and there is potential.

The Precambrian Jacobsville Sandstone, Portage lake Volcanics and Copper Harbor Conglomerate subcrop below the glacial drift. The Jacobsville was used as a building stone in the past.

Old copper mines are located in the area of the management area. Metallic mineral exploration has occurred in the management area in the past, and there could be potential.