4.30 MA 30 – Tahquamenon River Patterned Fens Management Area

Summary of Use and Management

Vegetative management in the Tahquamenon River Patterned Fens management area (MA) will emphasize protection of the unique character of the area and the biodiversity attributes, threatened and endangered habitats and natural communities while providing recreational opportunities, timber products and wildlife habitat. The management area contains patterned fen ecological reference areas and the McMahon Lake Strangmoor non-dedicated natural area special conservation area. Timber management activities include improving the age class diversity of even-aged types such as jack pine, lowland spruce and lowland conifers. Expected issues in this 10-year planning period are increased recreational pressure, introduced pests and diseases including beech bark disease, emerald ash borer and non-native invasive species.

Introduction

The Tahquamenon River Patterned Fens management area is located in the north central portion of the eastern Upper Peninsula in Luce County. It has 29,577 acres of state-owned land. The primary attribute for this management area are the unique ecological features found here such as the patterned fens. 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 in this management area is the Two Hearted Lowlands, a sand lake plain that contains the largest expanses of wetland in the state.
- Vegetation is primarily non-forested peatland complexes with pine ridges surrounded by forested landscapes.
- Some of the forested cover types are not actively managed due to lack of access and high ecological values. Harvests have occurred on accessible sand ridges with jack pine, red pine and aspen.
- Recreational opportunities including hunting, fishing, berry and morel mushroom gathering and bird watching.
- The Sleeper Lakes fire in 2007 burned in the patterned fen and muskeg natural communities. A unique assemblage of native plants and animals use these peatlands. Subsequent to the Sleeper Lake wildfire there has been an increase in use by the uncommon black-backed woodpecker.

This management area contains a large block of contiguous state forest land. The Nature Conservancy's McMahon Lake Preserve and Two-Hearted reserve are adjacent to this management area at the north. The Tahquamenon River Patterned Fens management area falls within the Newberry Forest Management Unit. The current predominant cover types, acreages and projected harvest acres for the management area are shown in Table 4.30.1.

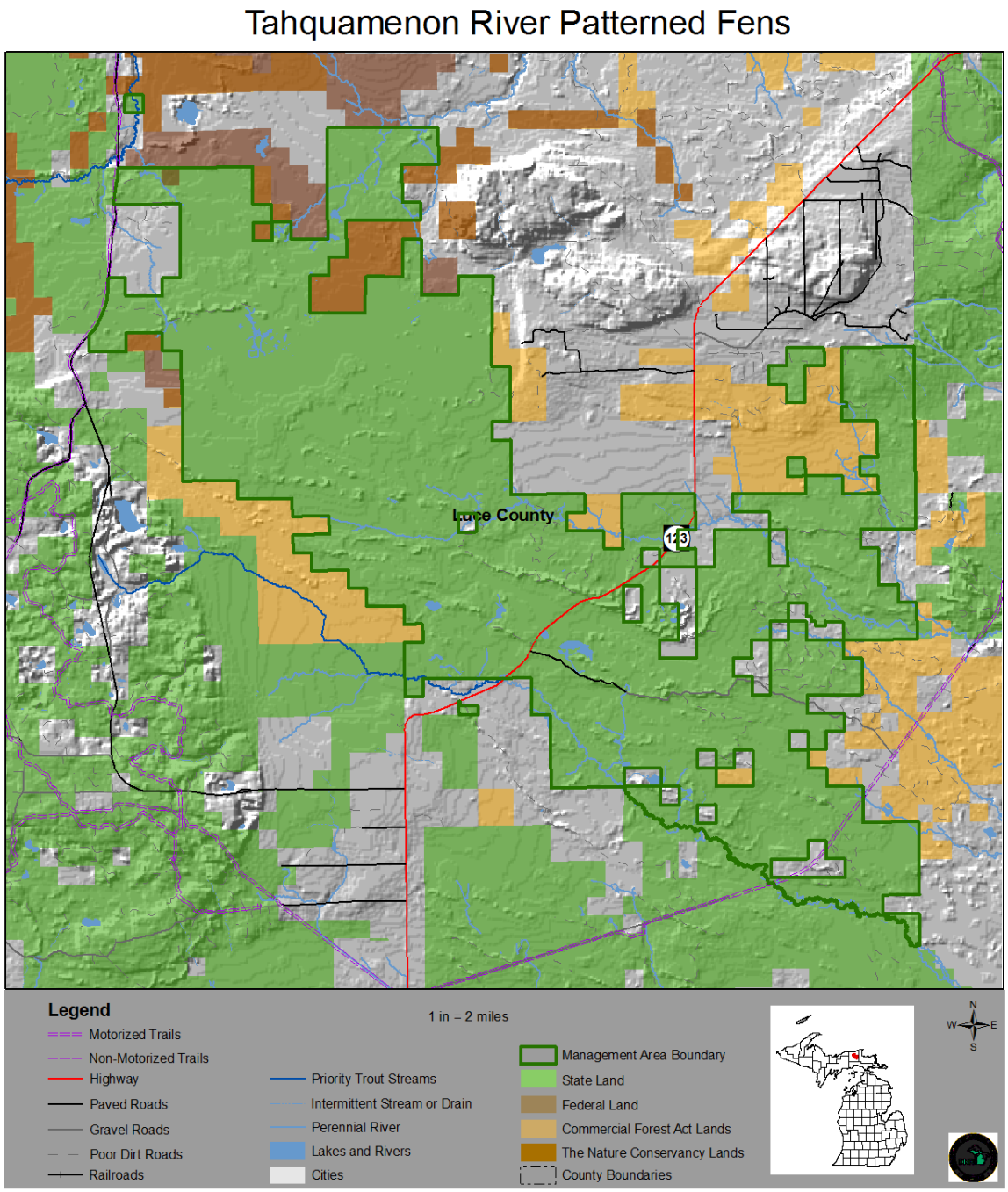

Figure 4.29.1. Location of Tahquamenon River Patterned Fens management area (dark green boundary) in relation to surrounding state forest lands and other ownerships.

Table 4.30.1. Current cover types, acreages, projected harvest acres and projected ten-year cover type acreage for the Tahquamenon River Patterned Fens 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
Lowland Open/Semi-Open Lands	66%	19,480	0	19,480	0	0	19,480	0	0
Jack Pine	8%	2,331	980	1,351	349	0	2,331	193	0
Lowland Conifers	6%	1,848	676	1,172	442	0	1,848	130	0
Lowland Spruce/Fir	5%	1,431	207	1,224	256	0	1,431	136	0
White Pine	3%	832	121	711	213	225	832	65	314
Red Pine	3%	769	312	457	173	18	769	51	280
Upland Open/Semi-Open Lands	0%	43	0	43	0	0	43	0	0
Misc Other (Water, Local, Urban)	1%	305	0	305	0	0	305	0	0
Others	9%	2,538	908	1,630	52	161	2,538	117	165
Total	100%	29,577	3,204	26,373	1,486	404	29,577	692	759

Others include: northern hardwood, cedar, tamarack, lowland deciduous, aspen, hemlock, paper birch and lowland aspen/balsam poplar.

4.30.1 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 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 they provide. Harvesting these cover types will provide for a continuous flow of forest products and values.

Section 4.30.1.1 Forest Cover Type Management – Lowland Open/Semi-Open Lands

Current Condition

The management area contains a large amount of lowland open/semi-open lands totaling approximately 19,480 acres (66%) (Table 4.30.1). This category is a combination of treed bog (9,169 acres), marsh (8,394 acres), lowland shrub (1,733 acres) and bog (184 acres). The patterned fen ecological reference areas are primarily found within the marsh cover type. Much of the muskeg element occurrence is in the treed bog cover type. Many of these non-forested stands are found in association with streams and rivers and contribute to access issues within the management area. A large portion of these cover types in the center of the management area is roadless. Some of the large marshes in this area may be seasonally dry. The large marshes are often used by wildlife species including moose and migrating birds.

Desired Future Condition

- Lowland open/semi-open lands will be retained in their large, roadless state to provide wildlife habitat and recreational opportunities while protecting the ecological values found in these cover types.

Long-Term Management Objectives

- In general, these stands will be maintained without active management.

Section 4.30.1.2 Forest Cover Type Management – Jack Pine

Current Condition

Jack pine stands occur on 2,331 acres (8%) of the management area (Table 4.30.1). Jack pine is found on beach ridges, dunes and lake plains on dry, poor-nutrient sandy soils with a Kotar habitat class of PVE (see appendix E) and in wetland areas. The large peatland complex contains many jack pine ridges. The muskeg element occurrence area contains a lot of acres of poorly stocked jack pine. The jack pine stands in this management area are generally of natural origin and often have other pine species or spruce mixed in. Following harvest, natural regeneration using scarification or prescribed burning is used to regenerate stands followed by planting where necessary. Due to the large wetland areas access for timber harvest is sometimes limited.

Currently there are 84 acres of jack pine prescribed with a final harvest (Figure 4.30.2). There are 980 acres of jack pine that 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. Jack pine in areas that are inaccessible or otherwise restricted from harvest will remain until biological maturity, eventually succeeding to late successional species.

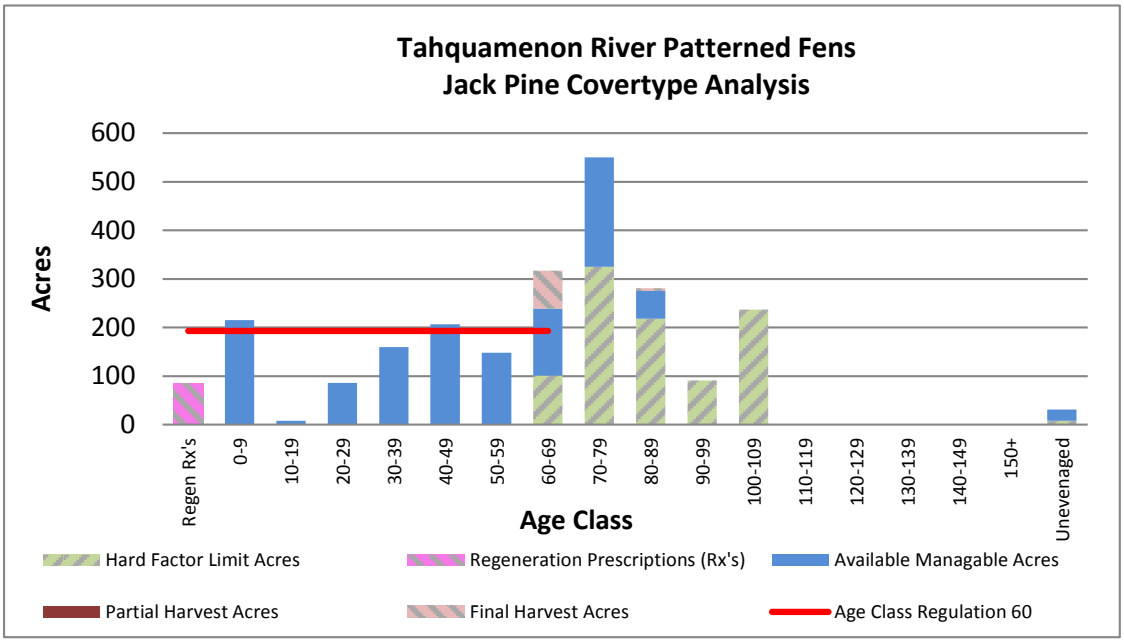

Figure 4.30.2. Age-class distribution of jack pine in the Tahquamenon River Patterned Fens management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Jack pine will be maintained on operable sites through even-aged management with acres balanced between 0-69 years of age to provide for continual harvesting, wildlife habitat and recreational opportunities.

10-Year Management Objectives

- The projected 10-year final harvest of jack pine is for 349 acres. The increase from the regulated amount is due to the current age-class structure where many stands are over rotation age.

Long-Term Management Objectives

- Maintain a lower acreage of over-mature stands to lessen the prevalence and severity of jack pine budworm outbreaks; and
- In accessible areas, balance the age classes of jack pine providing for a regulated harvest of approximately 193 acres per decade.

Section 4.30.1.3 Forest Cover Type Management – Lowland Conifer

Current Condition

Lowland conifers occur on 1,848 acres (6%) in this management area (Table 4.30.1). The majority of the lowland conifer stands are in the east portion of the management area. Some harvest and regeneration work was done in the past, but there has been no recent activity (Figure 4.30.3). Where past harvests occurred natural regeneration was successful. Almost 25% of the stands have been classified as uneven-aged reflecting the multi-storied stands found in inaccessible unmanaged areas.

Currently there are 13 acres of lowland conifers with a final harvest prescribed. There are 676 acres of lowland conifers 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. Lowland conifer stands in areas unavailable for harvest will be subject to natural processes, resulting in a range of successional stages.

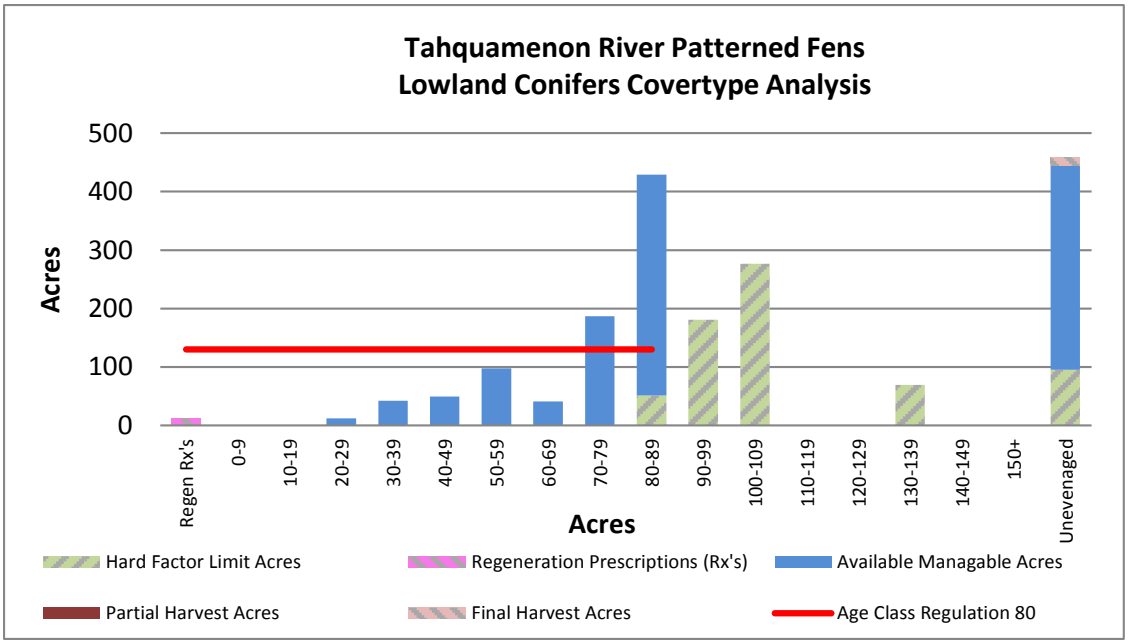

Figure 4.30.3. Age-class distribution of lowland conifers in the Tahquamenon River Patterned Fens management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Lowland conifer stands will be maintained on operable sites through even-aged management with acres balanced between 0-89 years of age to provide for continual harvest, wildlife habitat and recreational opportunities.

10-Year Management Objectives

- The 10-year projected final harvest of lowland conifers is 442 acres. This increase from the regulated amount is due to the current age-class structure with very few young stands present.

Long-Term Management Objectives

- Balance the age-class structure of accessible stands providing for a regulated harvest of 130 acres per decade.

Section 4.30.1.4 Forest Cover Type Management – Lowland Spruce/Fir

Current Condition

Lowland spruce/fir stands are found on 1,431 acres (5%) of the management area (Table 4.30.1). Lowland spruce/fir stands have been successfully harvested and regenerated in the past resulting in stands in several age classes (Figure 4.30.4). A number of the stands are inaccessible due to their location within the large marsh complexes or are unavailable for intensive management due to special concerns.

Currently there are no acres of lowland spruce/fir prescribed for harvest. There are 207 acres of lowland spruce/fir that 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. Lowland spruce/fir stands in areas unavailable for harvest at this time will be subject to natural processes, resulting in a range of successional stages.

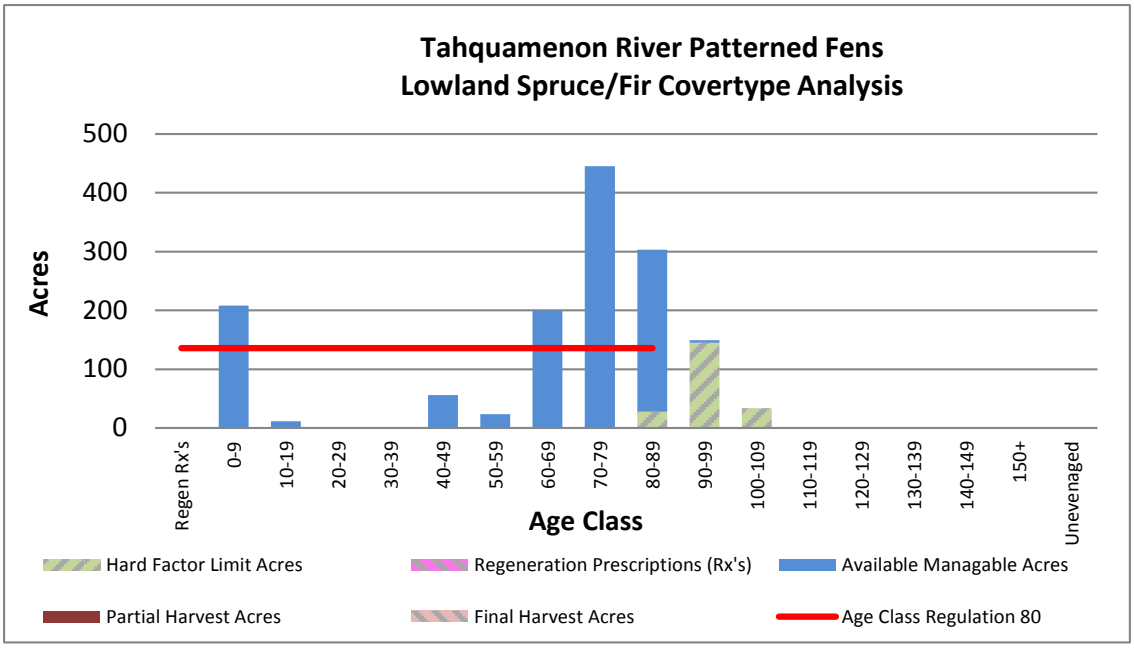

Figure 4.30.4. Age-class distribution of lowland spruce/fir in the Tahquamenon River Patterned Fens management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Lowland spruce/fir stands will be maintained on operable sites through even-aged management with acres balanced between 0-89 years of age to provide for a continuous flow of timber products and a variety of wildlife habitat and recreational opportunities.

10-Year Management Objectives

- The 10-year projected final harvest is 256 acres of lowland spruce/fir. The increase from the regulated amount is due to the current age-class structure.

Long-Term Management Objectives

- Balance the age classes of available stands providing for a regulated harvest of approximately 136 acres of lowland spruce/fir per decade.

Section 4.30.1.5 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 management area acres (Table 4.30.1). White pine (832 acres) and red pine (769 acres) each have 3% of the total acres. “Other types” is made up of forested cover types with 2% or less of the total acres and includes: northern hardwoods (732 acres), cedar (482 acres), tamarack (467 acres), lowland deciduous (444 acres), aspen (189 acres), hemlock (128 acres), paper birch (50acres) and lowland aspen/balsam fir (46 acres).

Following general timber management guidelines, thin red and white pine stands until economic maturity followed with a seed tree or shelterwood harvest to provide for natural regeneration where possible. For northern hardwood stands use individual tree selection where quality warrants and even aged management on poor quality sites. Most other cover types are managed following even-aged guidelines for harvest. Mixed cover types with high basal area may be thinned prior to final harvest depending on the species composition.

Beech bark disease is found throughout the management area and salvage of affected beech is ongoing. 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.

There are 1,341 acres of these other minor cover types 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. Some acres of cover types found on low, wet ground may be inaccessible for harvesting and will be subject to natural succession.

Upland open/semi-open lands contain 43 acres of bare/sparsely vegetated lands. In addition there are 305 acres (1%) of "miscellaneous other" stands, which includes water, sand/soil and roads.

Desired Future Condition

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

10-Year Management Objectives

- The projected 10-year final harvest is 213 acres of white pine, 173 acres of red pine and 52 acres of other types; and
- The projected 10-year partial harvest is 225 acres of white pine, 18 acres of red pine and 161 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.

4.30.2- Featured Wildlife Species

The ridges of red and jack pine found within the expansive wetland areas have very high biodiversity values. Wildlife management objectives for the following featured species include the retention of mesic conifers, hard and soft mast and forest structure within harvested stands; the preservation of pine ridges in the peatland complexes and early successional browse where it can be created adjacent to lowlands.

Blackburnian Warbler

The goal for blackburnian warbler is to maintain suitable breeding habitat. State forest management for the species should focus on within stand diversity, habitat fragmentation and conifer components in this management area.

Wildlife habitat specifications:

- Increase the mesic conifer (e.g., hemlock, white pine, red pine and upland spruce-fir) component on state forests by: a) Retaining a larger percentage of mesic conifer during harvests; b) Using silvicultural practices that encourage the regeneration of mesic conifer; and c) Where desired/feasible, underplanting hemlock, white pine and white spruce in hardwood-dominated stands on suitable sites without a seed source.

- Provide more older mesic conifers, particularly hemlock, in the landscape by: a) Allowing some actively managed stands of mesic conifer to grow beyond standard rotation ages; b) Including mature mesic conifers as within-stand structure retained during harvests by following Within-Stand Retention Guidance during harvests; and c) Maintaining mature mesic conifer stands within travel corridor and riparian zone or Type 1 or Type 2 old growth special conservation areas.

- Only allow harvest in hemlock stands or where hemlock is a component in other cover types where successful hemlock recruitment has been clearly demonstrated.

Black Bear

The goal for black bear in the eastern Upper Peninsula is to maintain or improving habitat. State forest management for the species 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:

- Maintain or increase tree species that provide mast including beech, oak, black cherry and ironwood.
- Beech trees with bear claw scars on the bark are generally good mast producers and should be retained wherever possible.
- Retain some large diameter white pine or hemlock as refuge trees.
- Plant disease resistant beech and red oak where appropriate.
- 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 this resource.
- Discourage land transactions and management activities that facilitate further fragmentation of state lands within the management area.

Moose

The goal for moose in the eastern Upper Peninsula is to maitain or increase suitable habitat. Management for moose should focus on providing early successional browse adjacent to lowland conifer complexes, the maintenance of hemlock within stands 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 class) 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.
- Increase mesic conifer (e.g., hemlock, white pine, red pine and upland spruce-fir) component on state forests by: a) Retaining a larger percentage of mesic conifer during harvests; b) Using silvicultural practices that encourage the regeneration of mesic conifer; and c) Where desired/feasible, under planting hemlock, white pine and white spruce in hardwood-dominated stands on suitable sites without a seed source. Increase the percentage of mesic conifers, where suitable, across the landscape by 10% during this planning cycle.
- Willow is an important browse species, as are submergent and emergent aquatic vegetation associated with summer feeding areas. Ensure sustainable supplies of each.

Red Crossbill

In the eastern Upper Peninsula, the goal for red crossbill is to maintain or increase suitable habitat. Management should focus on maintaining mature and over-mature seed producing trees in priority areas.

Wildlife habitat specifications:

- Maintain a minimum of 15% of the total acres of appropriate cover types (upland spruce/fir, upland conifers, natural mixed pine and natural red and white pine) in the management area for red crossbill in a mature forest condition (i.e., >150 years for red pine, > 130 years for white pine and > 80 years for white spruce). This can be accomplished with existing factor-limited stands or alternatively by extending the rotation length of these types to 150, 130 and 80 years respectively. In this management area older age classes for red crossbill habitat are being met by a large number of stands with site conditions that limiting harvesting.
- Retain large mature and over mature red pine, white pine and white spruce in shelter-wood and seed tree cuts.
- Evaluate the management area for the establishment of core tracts of old (greater than 100 years old) pine stands in biodiversity stewardship areas or Type 1 or Type 2 old growth.

Snowshoe Hare

The goal for snowshoe hare in the eastern Upper Peninsula is to increase available habitat in the ecoregion. In priority landscapes, state forest management should focus on maintaining young aspen adjacent to lowlands, maintaining jack pine, retaining slash, increasing mesic conifer components and increasing beaver abundance.

Wildlife habitat specifications:

- Maintain young aspen and lowland shrub communities such as alder or willow that have a conifer understory or young aspen stands that are adjacent to lowland/swamp conifer and mesic conifers. Hold or increase the conifer component in aspen stands; leave conifers under four inch diameter at breast height.

- Regenerate black spruce stands to young, dense stocking adjacent to uplands.
- Maintain young dense jack pine stands.
- In hare habitat, discourage biomass harvesting and chipping operations in this management area.
- Retain down coarse woody debris slash already present (before cutting), and resulting from incidental breakage of tops and limbs in the general harvest area, except on skid trails and landings, to the extent feasible. Retain slash, and create brush piles within timber sales associated with hare habitat. In biomass timber sales, apply Michigan Biomass Harvesting Guidance and retain the maximum residual amount.

Spruce Grouse

The goal for spruce grouse in the eastern Upper Peninsula is to maintain or improve habitat. Management should focus on retention of mixed conifers on riparian/lowland edges, the increase of in stand species diversity, and landscape level planning to ensure populations are not isolated.

Wildlife habitat specifications:

- In jack pine harvests leave mixed conifer and/or jack pine retention strips of mature trees along riparian corridors and lowland margins as well as along upland edges.
- Maintain spruce seed trees through retention, especially at lowland margins.
- Maintain or increase diversity of conifer stands by implementing seed tree/shelterwood prescriptions and limiting the use of herbicides, especially along lowland edges.
- Large clearcuts may isolate populations of spruce grouse so landscape level planning must take into account this species need for low-density mixed-conifer travel corridors to connect suitable stands.
- Ensure black spruce recruitment/regeneration is reliable where harvested. Monitoring should be required to ensure we are getting desired results from management.

4.30.3 – Rare Species and Special Conservation Area Management

All forest operations must be reviewed for potential conflicts with rare species 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 seven listed species as well as two natural communities of note occurring in the management area as listed in Table 4.30.2. A colony 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 4.30.2. Occurrence information for special concern, rare, threatened and endangered communities and species for the Tahquamenon River Patterned Fens 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								
Muskeg		S3/G4G5	Confirmed				Lowland open/semi-open	N/A
Patterned fen		S2/GU	Confirmed				Lowland open/semi-open	N/A
Birds								
Yellow rail	*Cotumicops noveboracensis*	T/G4/S1S2	Confirmed	MV	Moderate	Northern wet meadow	Lowland open/semi-open	N/A
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
Butterfly								
Frigga fritillary	*Boloria frigga*	SC/G5/S3S4	Confirmed	HV	Low	Bog	Lowland open/semi-open	N/A
						Patterned fen	Lowland open/semi-open	N/A
Plants								
Panicled screwstem	*Bartonia paniculata*	T/G5/S2	Confirmed			Inermittent wetland	Lowland open/semi-open	N/A
						Coastal plain marsh	Lowland open/semi-open	N/A
						Patterned fen	Lowland open/semi-open	N/A
						Bog	Lowland open/semi-open	N/A
						Poor fen	Lowland open/semi-open	N/A
						Wet-mesic sand prairie	Lowland open/semi-open	N/A
Farwell's water milfoil	*Myriophyllum farwelii*	T/G5/S2	Confirmed			Emergent marsh	Lowland open/semi-open	N/A
Alga pondweed	*Potamogeton confervoides*	SC/G4/S3	Confirmed			Submergent marsh	Lowland open/semi-open	N/A
						Emergent marsh	Lowland open/semi-open	N/A

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

Special conservation areas in the management area include: the Tahquamenon Scenic Heritage Route (M-123 shown in Figure 4.30.5), cold water lakes and streams, high priority trout streams (Figure 4.30.1) and the McMahon Lake Strangmoor non-dedicated natural area (3,928 acres) shown in Figure 4.30.5. In addition, approximately 7,500 acres were identified as potential old growth and these stands are also special conservation areas until they are evaluated.

The East Branch of the Two-Hearted River is a state designated natural river and along with its corridor is a high conservation value area (Figure 4.30.5). The Two-Hearted River Natural River Plan (DNR, Dec. 1973) guidelines will be followed for management activities within this area.

There are two patterned fen ecological reference areas (1,399 and 1,375 acres) occurring within this management area (Figure 4.30.5). Ecological reference areas will be managed to protect and enhance their natural vegetative and wildlife communities as directed by ecological reference area-specific management plans.

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.

4.30.4 – 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:

- Jack pine: jack pine budworm and pine engraver; and
- Lowland conifers and lowland spruce/fir: spruce budworm, eastern larch beetle and larch casebearer.

For further information on forest health refer to Section 3.

Invasive Species

Invasive exotic species, specifically plants, may pose a significant forest health threat to forested and non-forested areas throughout the management area. The statewide database of invasive plant species does not yet 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.

Scotch pine has been identified as an invasive species to remove in this area. Continue removal of Scotch pine through timber sales and forest treatment proposals followed by planting of other native species.

4.30.5 – Fire Management

This management area is composed largely of a single, continuous peatland. As evidenced by the 2007 Sleeper Lake fire, periodic fires associated with summer drought probably burned much of the area in single events or a single season. Sufficient drought, coupled with ignition, may occur at least every 100 years, with conditions that supported the 1976 Seney fire only 31 years earlier.

This management area falls within the DNR Newberry protection area. All wildfires are subject to appropriate initial attack response. Modified suppression tactics may be necessary in this management area because of the wet soils.

The Sleeper Lake fire burned most of the management area west of M-123. An effort was made after the Sleeper Lake Fire to restore proper ecological function to areas that had fire control lines. A survey was conducted by Michigan Natural Features Inventory in the summer of 2008 to determine fire effects on vegetation and to evaluate the effect of the fire control lines on hydrology.

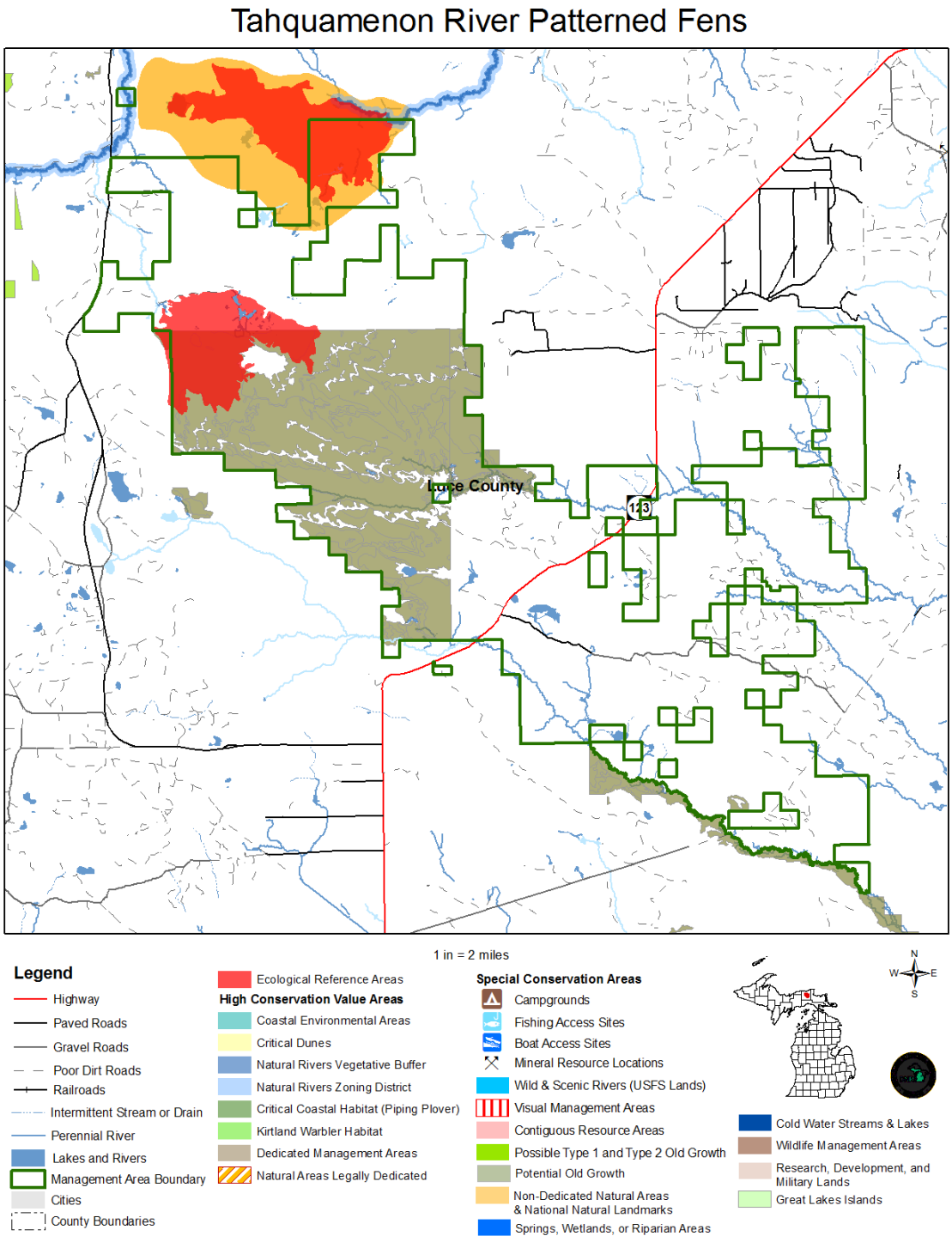

Figure 4.30.5. A map of the Tahquamenon River Patterned Fen management area showing the special resource areas.

4.30.6 – Public Access and Recreation

Currently, road access to much of the management area is limited. New access roads used by firefighters during the Sleeper Lake Fire have been removed or blocked to eliminate access to this sensitive area by conventional vehicles and off-road vehicles. Other road closures will be considered if they are providing unwanted access.

A joint planning effort between The Nature Conservancy and the DNR was begun in the fall of 2009 to identify expected issues. Management activities should be coordinated with The Nature Conservancy where lands are interspersed with their reserve. There is an effort underway to trade parcels so that both the state and The Nature Conservancy can block in ownership.

There are no DNR recreational facilities in this management area. Recreational opportunities include: hunting, fishing, berry and morel mushroom gathering, horse riding and bird watching.

4.30.7 - 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 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. Portions of the Tahquamenon and Two-Hearted River watersheds are designated high priority trout streams in this management area, and they are shown in the Integrated Forest Monitoring Assessment and Prescription Geographic Decision Support Environment and in Figure 4.30.1.

4.30.8 – Minerals

Surface sediments consist of peat and muck, with minor lacustrine (lake) sand, gravel and an end moraine of coarse-textured till. There is insufficient data to determine the glacial drift thickness. Sand and gravel pits are located in the area and there is potential for additional pits on the uplands.

The Ordovician Trenton and Black River Formations and Prairie du Chien Group subcrop below the glacial drift. The Trenton and Black River are 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 (two wells in Luce County). 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.