

4.4 MA 4 – Carp River Red Pine Management Area

Summary of Use and Management

Vegetative management in the Carp River Red Pine management area (MA) (Figure 4.4.1) will emphasize management of the red pine resource, balancing the age classes of aspen and selective management of northern hardwoods. Management will strive to produce sustainable yields of various timber products, enhance wildlife habitat, protect areas of unique character, and provide for forest-based recreational uses. Expected issues within this 10-year planning period include introduced pests and diseases and increased recreational pressure.

Introduction

The Carp River Red Pine management area is located in the south central portion of the eastern Upper Peninsula (EUP), in Mackinac and Chippewa Counties. It has 20,718 acres of state-owned land. The intensively managed red pine is the primary attribute of this management area. Additional attributes which were important in identifying this management area include:

- The management area falls within the Niagaran Escarpment and Lake Plain subsection 8.1 of the EUP ecoregion (Albert 1995).
- Various landforms of glacial lacustrine origin characterize the sub-subsection, including flat lake bed, deltaic deposits of sand, with cold water trout streams, parabolic dune fields and shallow embayments containing transverse dunes.
- Current cover types of red pine, aspen and northern hardwood are a result of disturbance after the 1800's logging era. Mixed pine stands were planted by members of the Rexton Civilian Conservation Corps (CCC) camp, after the failure of pre-depression era farms.
- Recreation including snowmobiling, motorcycling, hunting and fishing.
- Special features include three natural community ecological reference areas (ERAs).

The Carp River system was used as a pre-historic transportation route and historically for log transportation.

State-owned land in this management area is consolidated and falls within the Sault Ste. Marie Forest Management Unit. The Hiawatha National Forest borders the east side of the management area. The predominant cover types, acreages and projected harvest acres in the management area are shown in Table 4.4.1.

Table 4.4.1 Current cover types, acreages, projected harvest acres and projected ten-year cover type acreage for the Carp River 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
Red Pine	23%	4,809	25	4,784	0	1,437	4,809	532	1,615
Aspen	15%	3,034	161	2,873	137	0	3,034	479	0
Northern Hardwood	11%	2,377	4	2,373	0	1,002	2,377	0	1,002
Lowland Open/Semi-Open Lands	11%	2,210	0	2,210	0	0	2,210	0	0
Upland Open/Semi-Open Lands	7%	1,380	0	1,380	0	0	1,380	0	0
Lowland Conifers	5%	1,057	406	651	72	0	1,057	72	0
Cedar	4%	920	0	920	58	0	920	58	0
Jack Pine	4%	851	0	851	83	0	851	122	0
Lowland Spruce/Fir	3%	641	285	356	14	0	641	40	0
Mixed Upland Deciduous	3%	622	10	612	206	241	622	87	241
Misc Other (Water, Local, Urban)	0%	79	0	79	0	0	79	0	0
Others	13%	2,738	421	2,317	305	306	2,738	242	471
Total	100%	20,718	1,312	19,406	875	2,986	20,718	1,632	3,329

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

Carp River Red Pine

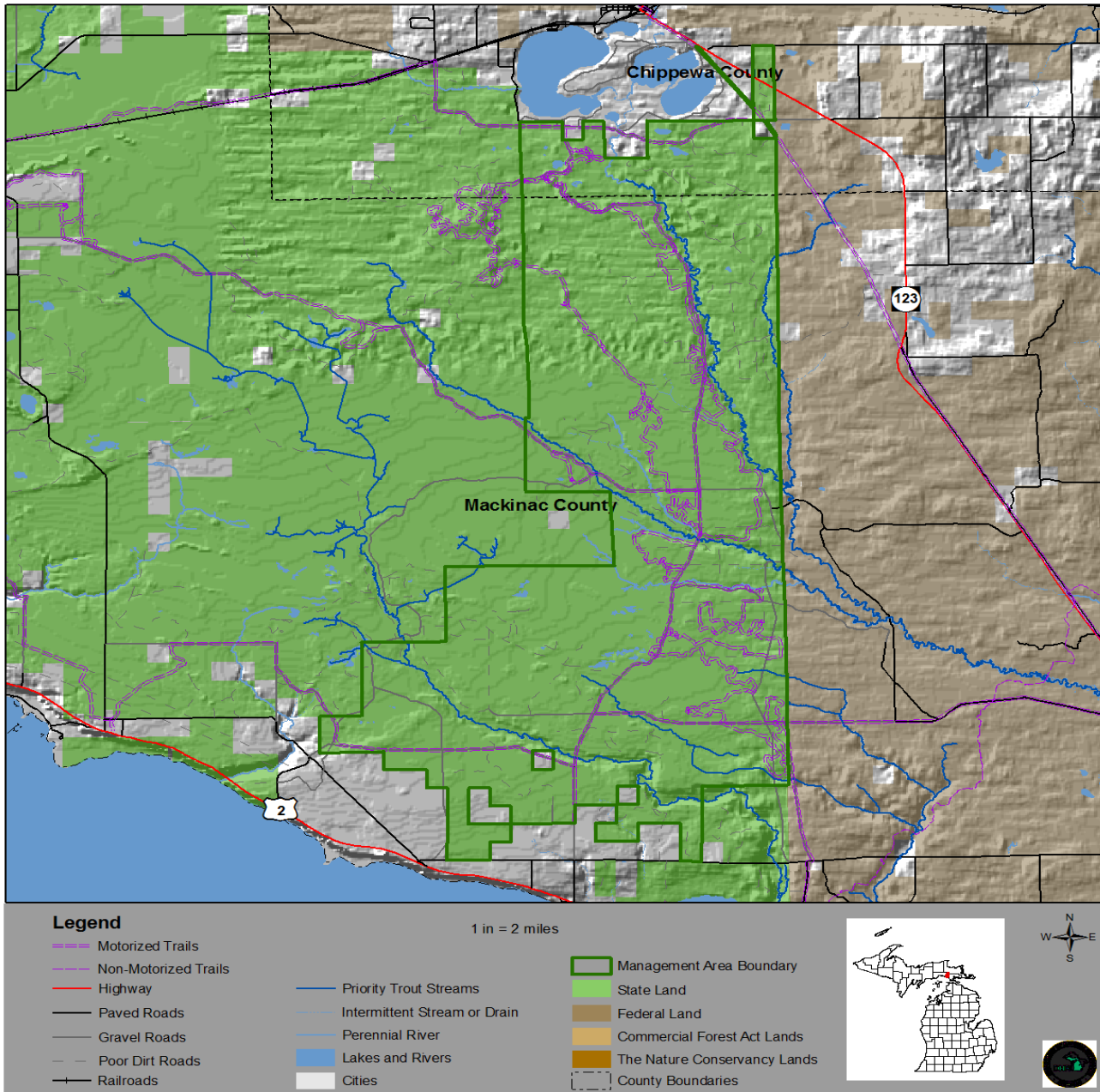


Figure 4.4.1 Location of the Carp River management area (dark green boundary) in relation to surrounding state forest lands other ownerships and Lake Michigan.

4.4.1 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 Final Draft EUP MA 4 Carp River Red Pine

management (e.g., timber harvest, prescribed fire, planting, 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.

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 4.4.1.1 Forest Cover Type Management – Red Pine

Current Condition

Red pine occurs on 4,809 acres (23%) of the management area (Table 4.4.1). Red pine stands are distributed throughout the management area on sandy and loamy soils of outwash plains and moraines with Kotar habitat types of PARVAa, ATFD and AFPO (see Appendix E). These are dry to mesic sites with high potential to grow quality stems. The majority of the red pine stands within the management area were planted in the 1930's by CCC workers. Red pine stands on these high quality sites are usually thinned every 10 years, reducing basal area (BA) to approximately 120 square feet, until replacement harvest age at 80. Regeneration harvests in many of these stands, followed by re-planting, have resulted in a large number of stands in younger age classes. As most of the planted red pine stands are on very productive sites, prescribed burning or the use of herbicide may be necessary to control competing vegetation, thus ensuring successful regeneration.

Currently, there are 465 acres prescribed with for final harvest, and 997 acres are prescribed for partial harvest or thinning (Figure 4.4.2). There are 25 acres of red pine 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. Red pine in inaccessible or sensitive areas may remain through biological maturity.

Desired Future Condition

- Red pine stands will be maintained and managed through thinning until stand replacement harvest at approximately age 80. Balancing acres between 0-89 years of age will provide for continual harvesting, wildlife habitat represented by the featured species and recreational opportunities.

10-Year Management Objectives

- The 10-year projected harvest is for approximately 1,437 acres of partial harvest or thinning; and
- Due to the current age-class structure of red pine with no stands between 50 and 69 years of age, there are no final harvests projected this decade.

Long-Term Management Objectives

- Balance the age-class distribution of red pine providing a regulated rotation harvest of approximately 532 acres of red pine for final harvest per decade (red line on Figure 4.4.2); and
- Stands will be periodically thinned until final harvest when they meet silvicultural criteria.

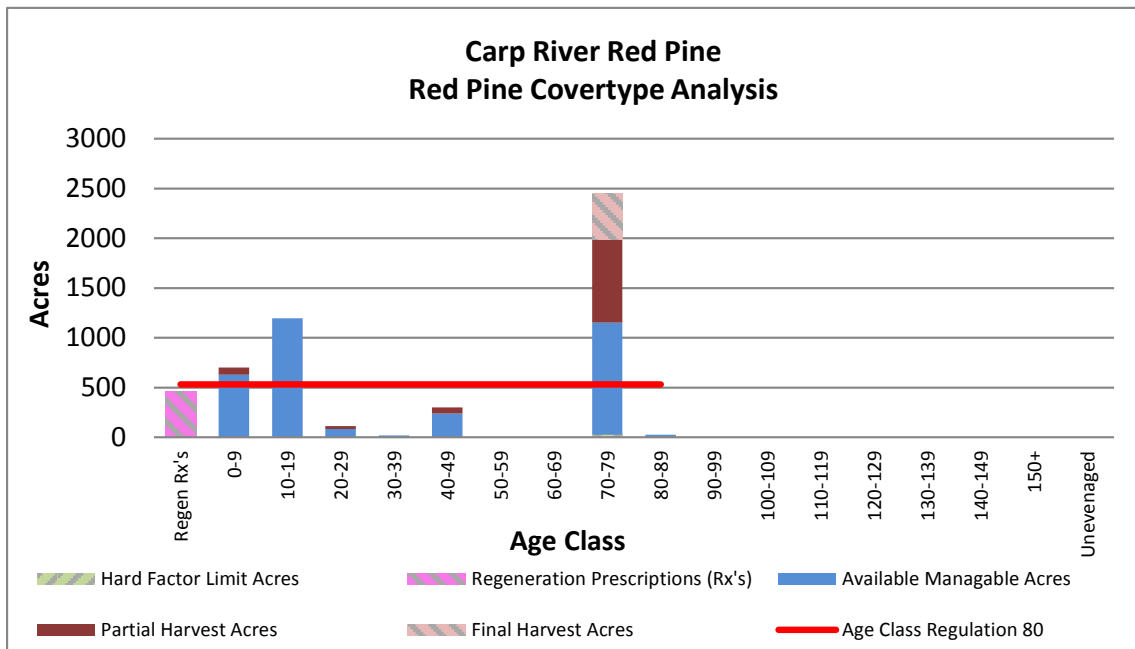


Figure 4.4.2 Age-class distribution of red pine in the Carp River management area (2012 Department of Natural Resources inventory data).

Section 4.4.1.2 Forest Cover Type Management - Aspen

Current Condition

Aspen occurs on approximately 3,034 acres (15%) of the management area (Table 4.4.1). Aspen stands are distributed across the management area on sandy soils with a range of Kotar habitat types including: PVE, PArV, PArVAa, ATFD and AFPo (see Appendix E). Aspen has been consistently harvested and regenerated in recent years, resulting in about 68% of the aspen acreage being in the 0-29 year age classes (Figure 4.4.3).

There are currently 214 acres prescribed for regeneration harvest. In addition, there are 56 acres prescribed for harvest in other cover types that are expected to convert to aspen after harvest. These acres are shown in Figure 4.4.3 in the regeneration prescriptions column. There are 161 acres of aspen that have site conditions limiting their harvest at this time. These hard factor limited acres have been removed from harvest calculations. Inaccessible stands of aspen will eventually succeed to late successional species.

Desired Future Condition

- Aspen will be maintained on operable sites through even-aged management with acres balanced between 0-59 years of age providing for regulated harvest, wildlife habitat and recreational opportunities.

10-Year Management Objectives

- The projected 10-year final harvest of aspen is 137 acres. Due to the current age-class structure where the majority of the aspen is in the 10-29 year age classes, the projected 10-year final harvest is considerably less than the regulated amount.

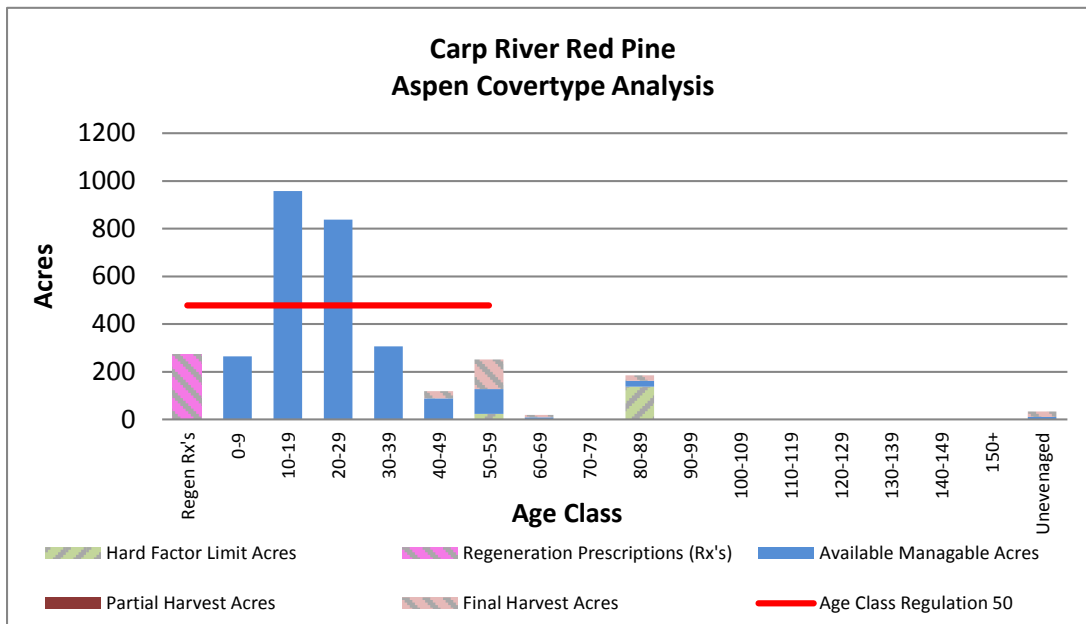


Figure 4.4.3 Age-class distribution of aspen in the Carp River management area (2012 Department of Natural Resources inventory data).

Long-Term Management Objectives

- Balance the age-class structure of accessible aspen stands providing a regulated harvest of approximately 479 acres for harvest per decade.

Section 4.4.1.3 Forest Cover Type Management – Northern Hardwoods

Current Condition

Northern hardwood stands occur on approximately 2,377 acres (11%) of the management area (Table 4.4.1). Northern hardwoods are distributed on loam and sand soils of moraines and outwash plains with Kotar habitat types of PARVAa, ATFD and AFPo (see Appendix E). These dry to mesic sites have high potential to grow quality stems. The majority of the stands have been managed using single tree selection to work toward an uneven-aged state, thereby having trees of varying ages and sizes. In most stands where BA is 120 or higher, individual tree selection harvests are prescribed that will decrease stocking levels to a BA of approximately 80 square feet.

The northern hardwood stands on poor soils are generally of lower quality, and some of these stands are being managed using even-aged systems. Recent regeneration harvests are shown as immature in Figure 4.4.4. Where site quality is poor, shelterwood and other even-aged harvesting systems will be considered.

Beech bark disease (BBD) is prevalent in this management area. The killing front of BBD has been through this area, and salvage of affected beech is ongoing. Northern hardwood stands that had a component of beech now have decreased stocking levels due to BBD mortality and salvage harvesting. Further selection harvesting will be delayed, due to resultant lower than normal residual BA.

Currently, 292 acres have a partial harvest or selection cut assigned (Figure 4.4.4). In addition, 39 acres currently are prescribed for final harvest. There are four 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.

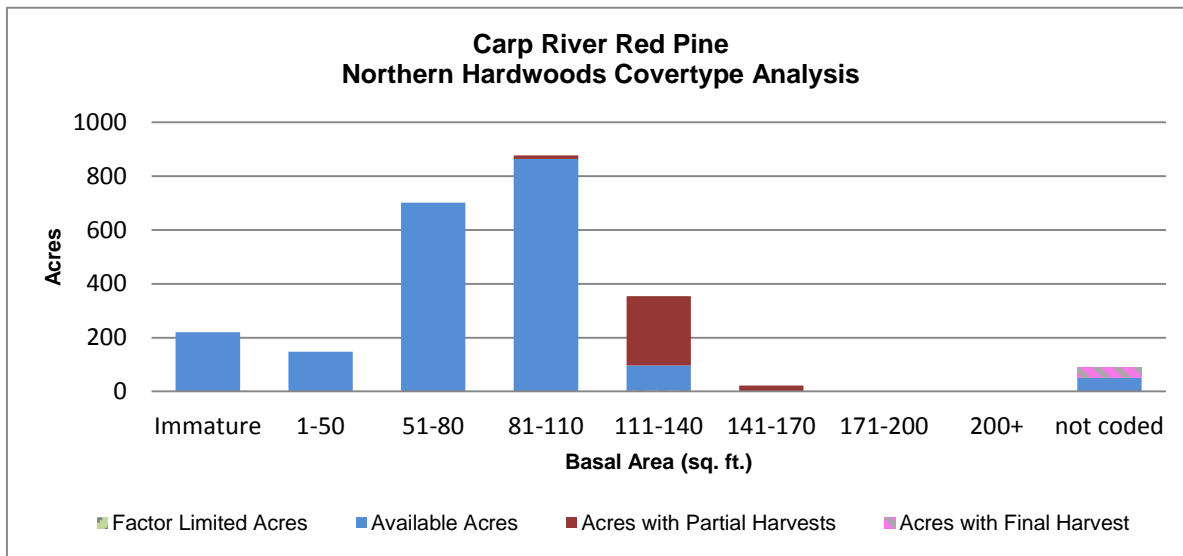


Figure 4.4.4 Basal area distribution of northern hardwood in the Carp River management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Northern hardwood will be maintained on operable sites, generally by using individual tree selection harvesting to provide uneven-aged composition 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 harvest is for 1,002 acres of partial or selection harvest of northern hardwoods;
- Evaluate stands previously dominated by beech to determine the impact of BBD on regeneration;
- Track beech regeneration in these stands;
- Consider herbicide applications on beech regeneration to promote regeneration of other species; and
- In areas that have lost beech to BBD, consider planting disease resistant beech or oak to increase the availability of hard mast.

Long-Term Management Objectives

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

Section 4.4.1.4 Forest Cover Type Management – Lowland Open/Semi-Open Lands

Current Condition

Lowland open/semi-open lands occur on approximately 2,210 acres (11%). This category is a combination of lowland shrub (1,699), marsh (392 acres), bog (56 acres) and treed bog (63 acres). These cover types function ecologically as sources of habitat for numerous species of wildlife. Lowland open/semi-open lands generally occur in association with creeks, rivers and lowland forested stands. Some of the ERAs and communities of note in this management area are found within these cover types.

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. Maintain and protect the ERA values found in these cover types.

Long-Term Year Management Objectives

- Within these stands allow natural processes to occur while protecting their ecological values from man-made disturbances.

Section 4.4.1.5 Forest Cover Type Management – Upland Open/Semi-Open Lands

Current Condition

Upland open/semi-open lands occur on approximately 1,380 acres (7%) of the management area. This category is a combination of the following non-forested land cover types: herbaceous open land (841 acres), low-density trees (393 acres) and upland shrub (146 acres). These communities are valued ecologically as sources of open land habitat for numerous species of wildlife.

Desired Future Condition

- Maintain the herbaceous openland, low-density trees and upland shrub communities in the area to provide wildlife habitat, and recreational opportunities.

Long-Term Management Objectives

- Within herbaceous open land stands, conduct opening maintenance, as necessary to maintain this cover type.

Section 4.4.1.6 Forest Cover Type Management – Lowland Conifer

Current Condition

Lowland conifer stands occur on 1,057 acres (5%) of this management area (Table 4.4.1). Lowland conifer stands in the MA have been successfully harvested and regenerated in recent years, resulting in a large number of acres in the 0-9 age classes. Some of the lowland conifer stands are found in riparian zones and are unavailable for harvest at this time. 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 69 acres with a final harvest prescribed (Figure 4.4.5). There are 18 acres in a different cover type prescribed for final harvest that are expected to convert to lowland conifers upon harvest. These acres are shown in Figure 4.4.5 in the regeneration prescriptions column. There are 406 acres of lowland conifer that have site conditions limiting their harvest at this time. Lowland conifer stands in areas inaccessible for harvest will be subject to natural processes, resulting in a range of successional stages.

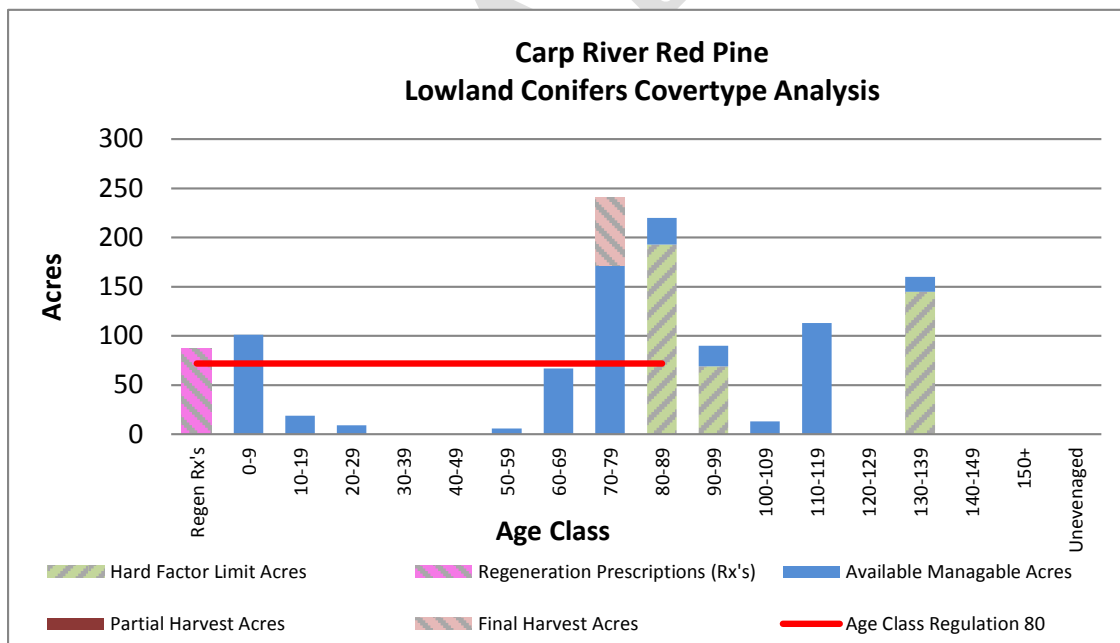


Figure 4.4.5 Age-class distribution of lowland conifers in the Carp River management area (2012 Department of Natural Resources inventory data).

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 providing for a continuous supply of timber, available wildlife habitat and recreational opportunities.

10-Year Management Objectives

- The 10-year projected final harvest of lowland conifers is 72 acres.

Long-Term Management Objectives

- Balance the age-class distribution of accessible lowland conifers providing a regulated harvest of approximately 72 acres of lowland conifers for harvest each decade.

Section 4.4.1.7 Forest Cover Type Management – Other Types

Current Condition

There are many other forest cover types spread across the management area (Table 4.4.1) that have less than 5% of the total management area acres. Cedar (920 acres or 4%), lowland spruce/fir (641 acres or 3%), mixed upland deciduous (622 acres or 3%), upland conifers (595 acres or 3%) and upland spruce/fir (553 acres or 3%) are the largest types. The “others” category totals approximately 2,441 acres (12%) and includes: upland mixed forest, hemlock, white pine, lowland aspen/balsam poplar, natural mixed pines, lowland deciduous, tamarack, lowland mixed forest, paper birch and planted mixed pines. Each of the other types has less than 2% of the total acres. The management area also has 79 acres of “miscellaneous other” types, which includes water, sand/soil and roads.

Following general timber management guidelines, the majority of these cover types have been managed as even-aged stands, using natural regeneration after harvest. Attempt to balance the age classes where possible. Some of the mixed cover types with high BAs may be thinned, depending on their species composition, prior to final harvest.

Over 700 acres of these other minor cover types 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. Where stands are inaccessible, early successional cover types will be changed through natural succession.

Desired Future Condition

- These cover types will be maintained on suitable sites and will contribute to the compositional diversity of the landscape while providing forest products, wildlife habitat and recreational opportunities.

10-Year Management Objectives

- The projected 10-year final harvest is 58 acres of cedar, 206 acres of mixed upland deciduous, 50 acres of upland conifers and 305 acres of other types; and
- The projected 10-year partial harvest is 241 acres of mixed upland deciduous, 131 acres of upland conifers and 306 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.

4.4.2 – Featured Wildlife Species

While planted red pine is generally low quality wildlife habitat, those stands with a hardwood understory tend to provide more desirable habitat elements and some of the more mature stands occasionally provide breeding sites for woodland raptors. The majority of wildlife management in this management area will focus on the aspen and northern hardwood cover types for this next 10-year period. Increasing and/or maintaining mesic conifers and forest structure will be important for the featured and other associated wildlife species in this management area.

Blackburnian Warbler

The goal for blackburnian warbler is to maintain suitable habitat in priority landscapes. Management should focus on within-stand diversity, habitat fragmentation and conifer components in this management area.

Wildlife habitat specifications:

1. 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.
2. 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 corridors and riparian zones, or Type 1 or Type 2 old growth special conservation areas (SCAs).
3. Use silvicultural practices that retain, recruit, and expand multi-story hemlock stands and hemlock inclusions within hardwood complexes through group selection, scarification and/or direct planting.

Red-shouldered Hawk

The goal for red-shouldered hawk is to maintain or improve suitable habitat in the ecoregion. Management activities should focus on the maintenance of large blocks (>385 acres) of mesic northern forest with the appropriate level of large diameter trees in priority landscapes.

Wildlife habitat specifications:

1. All known woodland raptor nests should be reported to local wildlife staff and included in the Integrated Forest Monitoring Assessment and Prescription (IFMAP) Geographic Decision Support Environment (GDSE). Confirmed red-shouldered hawk nests are to be documented in accordance with the "DNR's Approach to the Protection of Rare Species on State Forest Lands" (IC4172) and included in the IFMAP GDSE.
2. For red-shouldered hawk 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 EUP is to maintain and improve habitat. Management should focus on maintaining and balancing the age class distribution for aspen in priority landscapes.

Wildlife habitat specifications:

1. Maintain the aspen cover type and increase the aspen component in mixed stands within the management area.
2. Move to balance the age-class distribution of aspen and birch cover types to maintain young forests across the management area.
3. Ideal aspen stands will be of 40-160 acres under a 50-60 year rotation with aspen in at least four age classes in close proximity to one another.
4. Larger harvest units should have irregular boundaries and include one or two, 1-3-acre unharvested inclusions, with the largest cuts having more inclusions following the Within Stand Retention Guidance.

5. Hold or increase the conifer component in aspen stands. Leave conifer under four inch diameter at breast height (DBH) in mixed stands and aspen types as immediate residual escape cover and to promote corridors.
6. Maintain cherry production for soft mast.

Snowshoe Hare

The goal for snowshoe hare in the EUP is to increase available habitat in the ecoregion. In priority landscapes, 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:

1. 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 4 inch DBH.
2. Regenerate black spruce stands to young, dense stocking adjacent to uplands.
3. Maintain young dense jack pine stands.
4. In hare habitat, discourage biomass harvesting and chipping operations in this management area.
5. Retain down coarse woody debris 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, retaining the maximum residues.
6. When using herbicide treatments to prepare sites for planting red and jack pine in snowshoe hare habitat, encourage more diverse stands of pine and aspen by using application skips in pockets or along stand edges.

4.4.3 – 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” (IC 4172). 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 one listed species and six natural community types of note occurring in the management area as shown in Table 4.4.2. Any established management guidelines will be followed.

Special conservation areas (SCAs) in the management area include: potential old growth areas (Figure 4.4.6), several cold water lakes and streams and several high priority trout streams (Figure 4.4.1), including the Brevort and Carp Rivers.

There are currently no identified high conservation value areas in this management area.

There are three ERAs (Figure 4.4.6) for three natural community types. These are the rich conifer swamp (25 acres), poor fen (44 acres) and intermittent wetland (80 acres). The ERAs will be managed to protect and enhance their natural vegetative and wildlife communities as directed by ERA-specific management plans

Table 4.4.2 Occurrence information for special concern, rare, threatened and endangered communities and species for the Carp River Red Pine 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								
Intermittent wetland		S3/G2	Confirmed				Lowland open/semi-open	N/A
Muskeg		S3/G4G5	Confirmed				Lowland open/semi-open	N/A
Northern wet meadow		S4/G4	Confirmed				Lowland open/semi-open	N/A
Poor fen		S3/G3	Confirmed				Lowland open/semi-open	N/A
Rich conifer swamp		S3/G4	Confirmed				Tamarack	Late
Birds								
Red-shouldered hawk	<i>Buteo lineatus</i>	T/G5/S3-4	Confirmed	PS	Very High	Floodplain forest	Lowland mixed	Mid
						Dry-mesic northern forest	White Pine	Late

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

Management goals during this planning period are:

1. 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.
2. Evaluate all potential Type 1, potential Type 2 and potential old growth areas to determine their status as a special resource area.
3. Develop and maintain management and monitoring plans for ecological reference areas on state forest land.

4.4.4 – 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:

- Red pine: red-headed pine sawfly, pine engraver
- Aspen: white trunk rot, *Hypoxyylon* canker
- Northern hardwoods: beech bark disease (BBD)

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

Invasive Plant Species

Invasive exotic species, specifically plants, may pose a significant forest health threat to forested and non-forested areas throughout the management area. While no invasive plant species have yet been documented within or near the management area in the Michigan Invasive Plant Identification Network database, garlic mustard has been observed here. When invasive species are detected, they should be assessed for control measures. Invasive species that merit eradication efforts are those species that threaten sensitive sites, due to their location or growth characteristics and have population levels that may be successfully controlled.

Carp River Red Pine

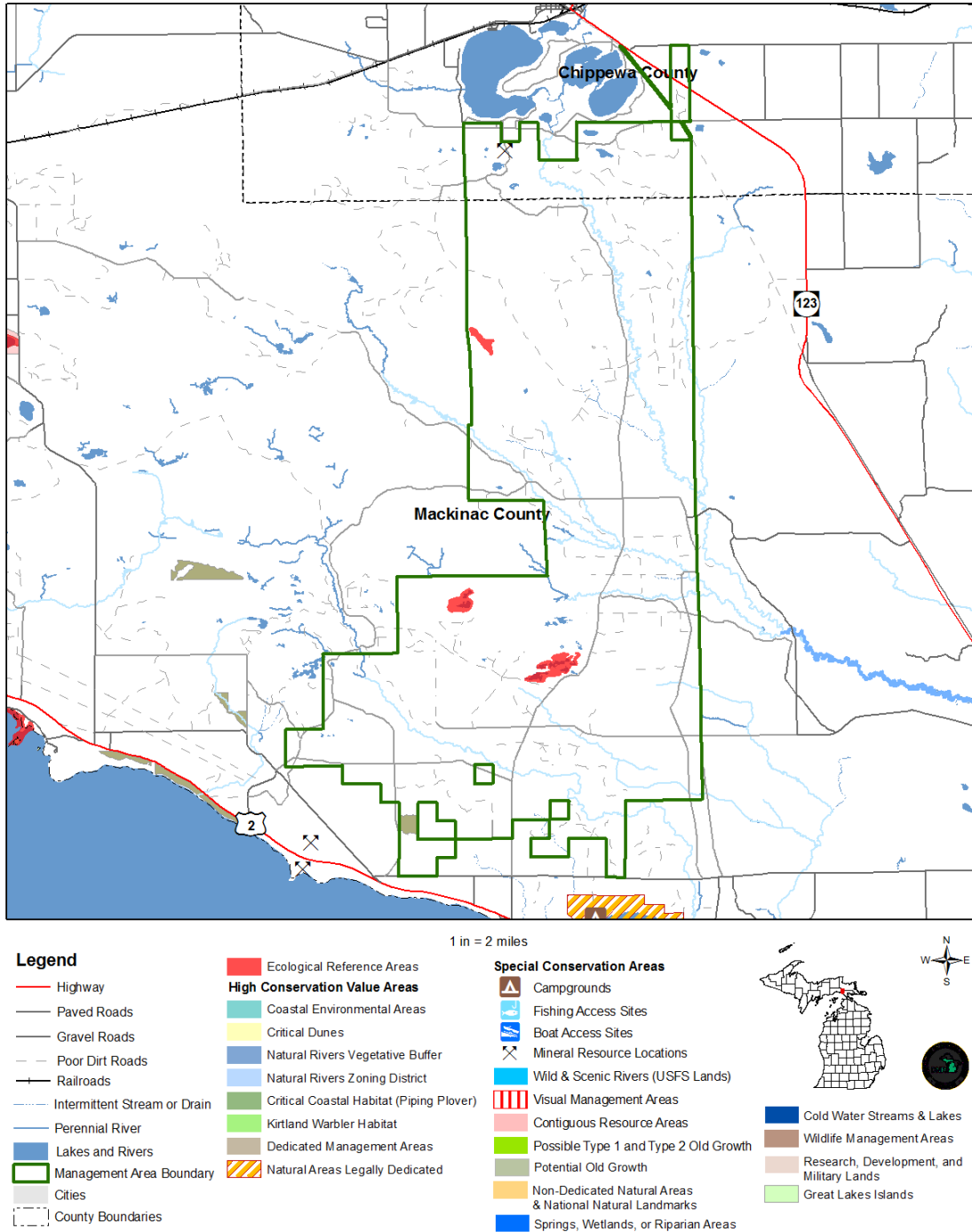


Figure 4.4.6 A map of the Carp River Red Pine management area showing the special resource areas.

4.4.5 – Fire Management

In pre-settlement times, these areas were subjected to periodic high intensity stand replacement fires. Fire return intervals were probably between 75 and 250 years, supporting development into long-lived pine communities. Fire management concepts to be used in this management area include:

- Use of prescribed fire to maintain pine communities and encourage natural regeneration; and
- Use of prescribed fire to reduce fuel loading and/or preparatory to planting.

4.4.6 – Public Access and Recreation

Access for management and recreation is generally good throughout this management area, with the majority of the area accessible by gravel and dirt two-track roads.

Recreational facilities in this management area consist of motorized trails (Figure 4.4.1) and include snowmobile trails the Brevort-Trout Lake Motorcycle Trail and the Brevort-Trout Lake Motorcycle Trailhead. The Brevort-Trout Lake Motorcycle Trail is designated motorcycle use only by Director's Order. Any damage to the 24-inch trail bed must be repaired.

Additional forms of recreation include: blueberry picking, deer, snowshoe hare and ruffed grouse hunting and brook trout fishing.

4.4.7 – 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 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 Brevort and Carp River systems are designated as high priority trout streams in this management area and the details are shown in the Integrated Forest Monitoring Assessment and Prescription Geographic Decision Support Environment and in Figure 4.4.1.

4.4.8 – Minerals

Surface sediments consist of lacustrine (lake) sand and gravel and peat and muck, in place thin and discontinuous. There is insufficient data to determine the glacial drift thickness. Sand and gravel pits are located in the general area, and there may be some potential for additional pits.

The Silurian Engadine, Manistique and Burnt Bluff Groups subcrop below the glacial drift. The Engadine and Burnt Bluff are quarried for stone/limestone in the Upper Peninsula.

Exploration and development for oil and gas has been limited to a few wells drilled in the Upper Peninsula. (primarily in Mackinac and Chippewa Counties). 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.