4.6 MA 6 – County Line Hardwoods Management Area

Summary of Use and Management

Management in the County Line Hardwoods management area (MA) (Figure 4.6.1) will strive to sustainably produce various timber products, enhance wildlife habitat and provide for forest-based recreational uses. The area is noted for high quality hardwood and red pine sawlogs; intensive management of these stands will continue. Joint fisheries and wildlife management occurs in conjunction with the Black Creek flooding and Millecoquins trout pond. As this management area is located between Newberry and Curtis, recreation use is very high. Expected issues in this 10-year planning period include: increased recreational pressure, introduced pests and diseases and the difficulty of regenerating cedar stands.

Introduction

The County Line Hardwoods management area is located in the central portion of the eastern Upper Peninsula in Luce and west Mackinac Counties. It has 26,833 acres of state-owned land. The primary attribute for this management area is the intensive timber production, particularly for hardwoods and red pine. Additional attributes which were important in identifying this management area include:

- The management area falls within St. Ignace Lake Plain sub-section of the eastern Upper Peninsula ecoregion (Albert, 1995).
- The dominant landform consists of moraine lake bed complex, outwash plain and moraine.
- The dominant species in both the historic and current northern hardwoods are sugar maple and American beech. Hemlock was a more common component circa 1800 than it is today.
- In some areas of the management area, there remains evidence of old farms on former homesteads after the logging era.
- Recreational opportunities include: snowmobiling, motorcycle riding, horse riding, boating and cross country skiing. Deer hunting, waterfowl hunting, bird watching, trapping and fishing are other common uses of the resources in this management area.
- Special conservation areas within this management area include the Black Creek Flooding Wildlife Management Area and deer critical wintering habitat areas.

The ownership is in a relatively contiguous block of state forest land, with good proximity to wood product markets for intensive hardwood management. The management area is within both the Sault Ste. Marie and Newberry Forest Management Units. The predominant cover types, acreages and projected harvest acres in the management area are shown in Table 4.6.1.

Table 4.6.1. Current cover types, acreages, projected harvest acres and projected ten-year cover type acreage for the County Line Hardwoods management area, eastern Upper Peninsula ecoregion (2012 Department of Natural Resources inventory Data).

Cover Type	Cover %	Current Acreage	Hard Factor Limited Acres	Manageable Acres	10 Year Projected Harvest (Acres)		Projected Acreage in 10 Years	Desired Future Harvest (Acres)	
					Final Harvest	Partial Harvest		Final Harvest	Partial Harvest
Northern Hardwood	43%	11,412	842	10,570	0	5,408	11,412	0	5,068
Aspen	19%	5,150	527	4,623	224	0	5,150	771	0
Cedar	7%	2,007	0	2,007	0	0	2,007	125	0
Lowland Open/Semi-Open Lands	6%	1,736	0	1,736	0	0	1,736	0	0
Red Pine	4%	1,150	0	1,150	128	720	1,150	128	720
Upland Open/Semi-Open Lands	3%	866	0	866	0	0	866	0	0
Lowland Conifers	3%	804	309	495	153	0	804	55	0
Lowland Spruce/Fir	3%	796	127	669	174	0	796	74	0
Lowland Aspen/Balsam Poplar	2%	436	72	364	48	0	436	61	0
Misc Other (Water, Local, Urban)	1%	271	0	271	0	0	271	0	0
Others	8%	2,205	292	1,913	271	211	2,205	223	281
Total	100%	26,833	2,168	24,665	998	6,339	26,833	1,437	6,069

Others include: lowland mixed forest, lowland deciduous, upland mixed forest, white pine, upland conifers, mixed upland deciduous, tamarack, paper birch, hemlock, jack pine, natural mixed pines and planted mixed pines.

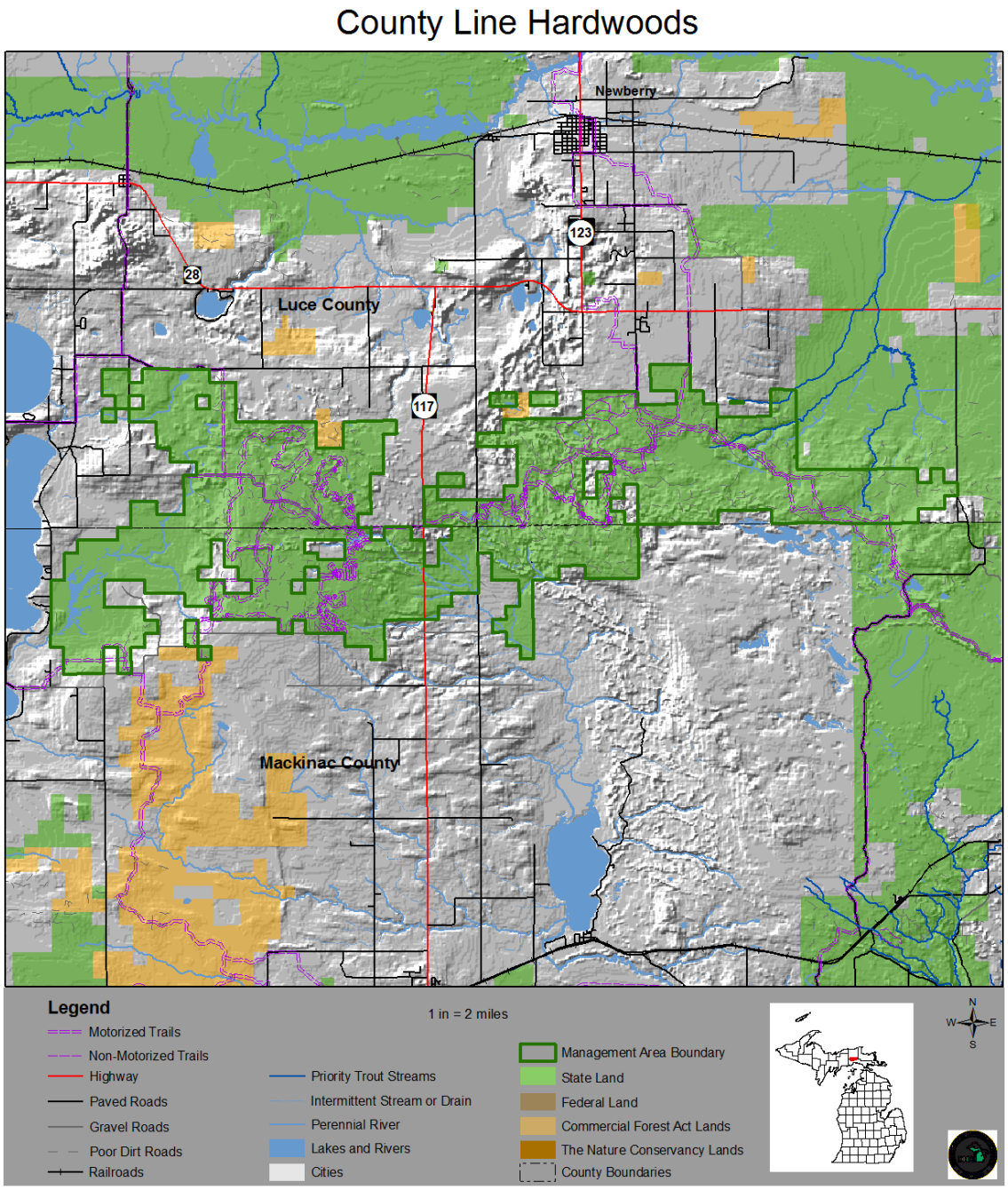

Figure 4.6.1. Location of the County Line Hardwoods management area (dark green boundary) in relation to surrounding state forest lands and other ownerships.

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

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

Section 4.6.1.1 Forest Cover Type Management – Northern Hardwoods

Current Condition

Northern hardwoods occur on 11,412 acres (43%) of the management area (Table 4.6.1). Northern hardwoods are distributed throughout the management area on outwash plains, disintegration moraines and ground moraines with Kotar habitat classes of ATFD, AFPo and AFOAs (see Appendix E). These are mesic poor to medium rich nutrient sites with high potential to grow quality trees. The majority of the stands have been managed as uneven-aged, with trees of varying ages and sizes. Sugar maple is most common, with a variety of other trees species including red maple, basswood, black cherry and beech. Hardwood stands in this management area will continue to be intensively managed as uneven-aged stands, with selection harvests where basal area is over 120 square feet per acre. In general, this will allow most hardwood stands to be select harvested every 20 years. Where site quality is poor, consider shelterwood and other even-aged harvesting systems. A small portion of the northern hardwood stands have been harvested using even-aged management and those acres are shown in the immature column in Figure 4.6.2.

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

Currently, there are 1,775 acres of northern hardwood with a partial harvest prescription assigned (Figure 4.6.2), and 13 acres with a final harvest prescribed. There are 842 acres of northern hardwood 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.

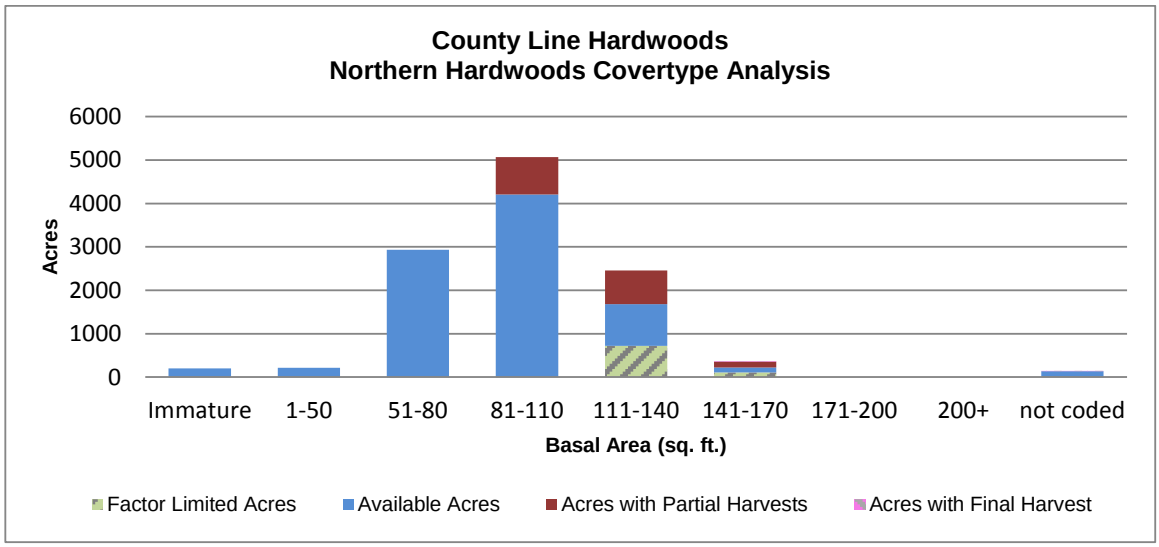

Figure 4.6.2. Basal area distribution of northern hardwood in the County Line Hardwoods management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Northern hardwoods will be maintained on operable sites, generally by using individual tree selection harvesting to provide uneven-aged composition and structurally diverse stands. Harvesting will 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 harvest of northern hardwood is 5,408 acres of partial or selection harvest;
- Evaluate stands that had a component of beech to determine the impact of beech bark disease on regeneration;

- Track beech regeneration in these stands;
- Consider herbicide application of beech regeneration to promote regeneration of other species; and
- In areas that are losing beech to beech bark disease, consider planting oak or disease resistant beech to increase the availability of hard mast producing trees.

Long-Term Management Objectives

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

Section 4.6.1.2 Forest Cover Type Management - Aspen

Current Condition

Aspen occurs on 5,150 acres (19%) of the management area (Table 4.6.1). Aspen stands are distributed throughout the management area on outwash plains, disintegration moraines and ground moraines with Kotar habitat classes of ATFD, AFPo, AFOAs and PArVAa (see Appendix E). These sites have sandy, loamy soils of dry-mesic to mesic-poor to medium-rich nutrient, with good potential to grow quality trees. Accessible aspen has been consistently harvested, resulting in stands in all age classes (Figure 4.6.3).

Currently, there are 419 acres with a final or regeneration harvest prescribed. There are 35 acres prescribed for harvest in a different cover type that are expected to convert to aspen. These acres are included in Figure 4.6.3 in the regeneration prescriptions column. There are 527 acres of aspen that have site conditions limiting their harvest at this time. These hard factor limited acres provide mature aspen for ruffed grouse. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations.

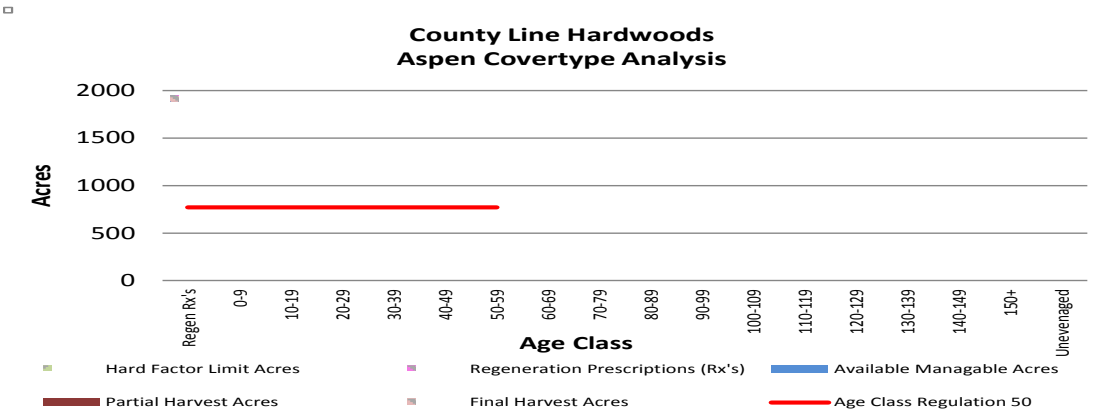

Figure 4.6.3. Age-class distribution of aspen in the County Line Hardwoods management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

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

10-Year Management Objectives

- The projected 10-year final harvest of aspen is 224 acres. The decrease from the regulated harvest amount is due to the current age-class structure where there are not many available acres over 40 years of age.

Long-Term Management Objectives

- Balance the age-class structure of accessible aspen stands. A regulated harvest would allow approximately 771 acres to be harvested per decade (red line in Figure 4.6.3).

Section 4.6.1.3 Forest Cover Type Management – Cedar

Current Condition

Cedar dominated communities occur on 2,007 acres (7%) of the management area (Table 4.6.1). Young age classes of cedar are non-existent in this management area (Figure 4.6.4). Cedar stands within the deer wintering special conservation areas will be managed to maintain wintering habitat for deer and to retain this forest type in the landscape. Maintaining a closed canopy structure provides important cover for deer, reducing snow depths within the stands.

Although there may not be harvesting of cedar within deer wintering complexes, there is a need to address future cedar cover. Limited cedar harvests may occur outside the deer wintering complexes. Reliable and timely regeneration of cedar is a concern from both wildlife and forest management perspectives.

Currently, there are no acres prescribed for harvest. Also, there are no hard factor limited acres at this time. Cedar stands in areas inaccessible for harvest will be subject to natural processes, resulting in a range of successional stages.

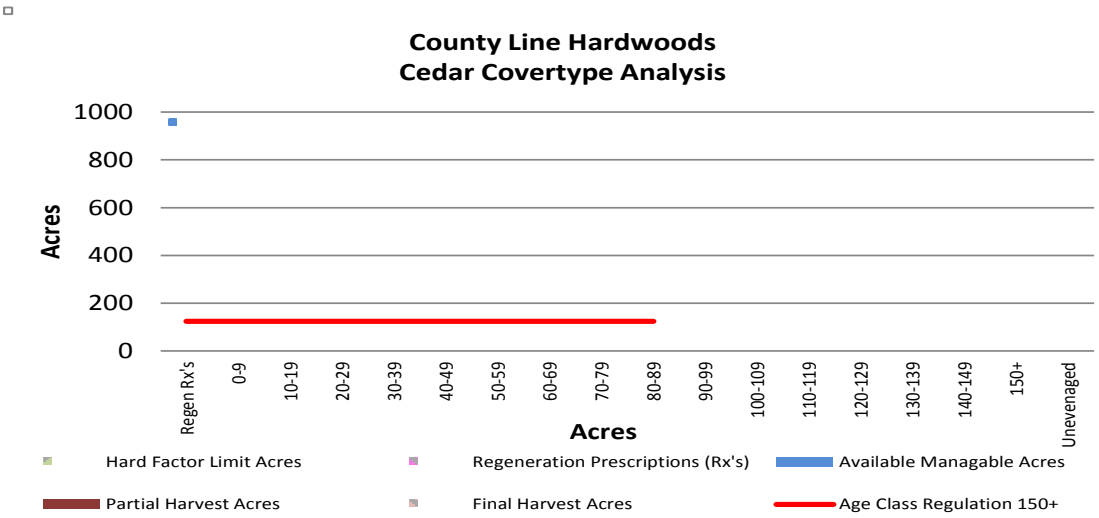

Figure 4.6.4. Age-class distribution of cedar in the County Line Hardwoods (2012 Department of Natural Resources inventory data).

Desired Future Condition

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

10-Year Management Objectives

- The 10-year projected harvest is zero acres of cedar due to the use of cedar stands by wintering deer; and
- Outside of the deer wintering complexes, consider harvesting of cedar and ensure that cedar and/or hemlock recruitment/regeneration is reliable, if harvesting in this cover type.

Long-Term Management Objectives

- Develop a comprehensive deer wintering area management plan focusing cedar management on winter habitat for deer;
- Look for opportunities to test different methods of regenerating cedar, especially outside of the deer wintering areas; and
- Consider harvest of cedar before rotation age to begin to diversify the age classes. Using a 150-year regulated rotation would allow approximately 125 acres to be final harvested per decade.

Section 4.6.1.4 Forest Cover Type Management – Lowland Open/Semi-Open Lands

Current Condition

Lowland open/semi-open lands occur on 1,736 acres (6%) of the management area (Table 4.6.1). This category is a combination of treed bog (624 acres), lowland shrub (631 acres), marsh (324 acres) and bog (157 acres). These cover types function ecologically as sources of habitat for numerous species of wildlife. Most of these stands are found in association with streams, rivers and lowland forested stands.

Desired Future Condition

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

Long-Term Year Management Objectives

- Continue to maintain this habitat type for wildlife and other ecological concerns, primarily through passive management, allowing natural processes to occur.

Section 4.6.1.5 Forest Cover Type Management – Other Types

Current Condition

There are many other forest cover types spread across the management area that have less than 5% of the total acres (Table 4.6.1). Red pine (1,150 acres or 4%), lowland conifers (804 acres or 3%), lowland spruce/fir (796 acres or 3%) and lowland aspen/balsam poplar (436 acres or 2%) are the larger ones. Upland open/semi-open lands (866 acres or 3%) is made up of herbaceous openland, upland shrub, low-density trees and bare/sparsely vegetated lands.

The “other types” category (2,205 acres or 8%) is made up of cover types with less than 2% of the total management area acres, including: lowland mixed forest (337 acres), lowland deciduous (249 acres), white pine (226 acres), upland conifers (117 acres), mixed upland deciduous (110 acres), tamarack, paper birch, hemlock, jack pine, natural mixed pines and planted mixed pines. There are also 271 acres (1%) of “miscellaneous other” which includes water, roads and sand/soil.

With the exception of red pine and white pine, following general timber management guidelines, these cover types are managed as even-aged. Attempt to balance the age classes where possible. Natural regeneration of species currently on site is expected. Mixed cover types with high basal area may be thinned, depending on the species composition, before final regeneration harvest.

For planted red pine, thinning occurs approximately every 10 years starting about age 40, continuing until stand replacement harvest at economic maturity. Maintain red pine after final harvest through replanting. Prescribed fire or herbicides may be necessary for site preparation to control competition. For natural red pine stands, try to encourage natural regeneration, and retain some large trees to improve structural diversity. Red pine stands in this management area are generally of high quality with high site indexes.

Approximately 800 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. Stands that are inaccessible for harvest will be subject to natural processes, resulting in a range of successional stages, thus slightly changing the cover type distribution.

Desired Future Condition

- Harvesting and regenerating these cover types will contribute to the compositional diversity of the landscape while providing for continual harvest, available wildlife habitat and recreational opportunity.

10-Year Management Objectives

- The projected 10-year final harvest is 128 acres of red pine, 153 acres of lowland conifers, 174 acres of lowland spruce/fir, 48 acres of lowland aspen/balsam poplar and 271 acres of other types; and
- The projected 10-year partial harvest is 720 acres of red pine and 211 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.

4.6.2 – Featured Species Management

Within this management area, there are very high biodiversity values which should be a primary focus for wildlife management. The maintenance of mature forest conditions, soft mast and forest structure are important in the northern hardwoods cover type. Important key management concepts are the retention of mesic conifers and woody debris in aspen and woody debris and dense understory in some lowland conifer stands. The Black Creek Wildlife Flooding is primarily passively managed for waterfowl, marsh birds and aquatic furbearers. White-tailed deer use some stand of cedar and lowland conifers adjacent to the flooding as critical deer wintering areas.

Black Bear

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

Wildlife habitat specifications:

- 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 fragmenting state lands within the management area.

Northern Goshawk

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

Wildlife habitat specifications:

- All known woodland raptor nests should be reported to local wildlife staff and included in the Integrated Forest Monitoring Assessment and Prescription Geographic Decision Support Environment. For northern goshawk nests, the wildlife habitat specifications contained within Michigan DNR's *Interim Management Guidelines for Red-Shouldered Hawks and Northern Goshawk on State Forest Lands* (August 2012) will be followed until the workgroup has completed the guidance that will permanently replace the interim guidelines.

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 of mesic northern forest with the appropriate level of large diameter trees in priority landscapes.

Wildlife habitat specifications:

- All known woodland raptor nests should be reported to local wildlife staff and included in Integrated Forest Monitoring Assessment and Prescription. Confirmed red-shouldered hawk nests are to be documented in accordance with the DNR Approach to the Protection of Rare Species on State Forest Lands (IC 4172) and included in the Integrated Forest Monitoring Assessment and Prescription Geographic Decision Support System.

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 eastern Upper Peninsula is to maintain or improve habitat. Management should focus on maintaining and balancing the age-class distribution for aspen in priority landscapes.

Wildlife habitat specifications:

- Maintain the aspen cover type and increase the aspen component in mixed stands within the management area;
- Move to balance the age-class distribution of aspen and birch cover types to maintain young forests across the management area;
- Ideal aspen stands will be of 40-160 acres under a 50-60 year;
- Larger harvest units should have irregular boundaries and include one or two, 1-3-acre un-harvested inclusions for every 40 acres exceeding 40 acres in size;
- Evaluate the conifer component in aspen stands, holding or increasing where desirable. Leave conifer under four inch diameter at breast height in mixed stands and aspen types as immediate residual escape cover and to promote corridors; and
- Maintain cherry production for soft mast.

Snowshoe Hare

The goal for snowshoe hare in the eastern Upper Peninsula 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:

- 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.
- 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.
- 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 the Michigan Biomass Harvesting Guidance and retain the maximum residuals.

White-tailed Deer

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

Wildlife habitat specifications for deer wintering complexes:

- Strive to maintain > 50% of the land area within 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.

4.6.3 - 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, 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 four listed species occurring in the management area as shown in Table 4.6.2. A colony of great blue herons has also been identified. Any established management guidelines will be followed.

Special conservation areas include the Black Creek wildlife flooding (a large wetland complex), obligate deer winter range near the flooding and in the northeast part of the management area, several cold water lakes and cold water streams (all shown in Figure 4.6.5) and high priority trout streams as shown in Figure 4.6.1.

There have been no high conservation value areas or ecological reference areas identified in this management area.

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.

Table 4.6.2. Occurrence information for special concern, rare, threatened and endangered communities and species for the County Line Hardwoods 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
Birds								
Red-shouldered hawk	*Buteo lineatus*	T/G5/S3-4	Confirmed	PS	Very High	Floodplain forest	Lowland mixed	Mid
						Dry-mesic northern forest	White Pine	Late
						Mesic northern Forest	Northern Hardwood	Late
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
Plants								
Goblin moonwort	*Botrychium mormo*	T/G3/S2	Confirmed			Mesic northern forest	Northern Hardwood	Late
						Boreal forest	Upland & Lowland Sp/F	Mid

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

4.6.4 – Forest Health Management

Although forest health issues span the entire landscape, some specific threats are more important in this management area, due to the species composition, site quality or other factors. Some of the more important forest health pests in this management area by major cover type include:

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

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. Reed canary grass, spotted knapweed and wild parsnip have been documented within the management area. Purple loosestrife has been documented within a five-mile buffer of the management area (Table 4.6.2) and monitoring efforts should specifically look for new populations of these species. Evaluate eradication treatments of any new populations of invasive plant species found in the management area. 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.

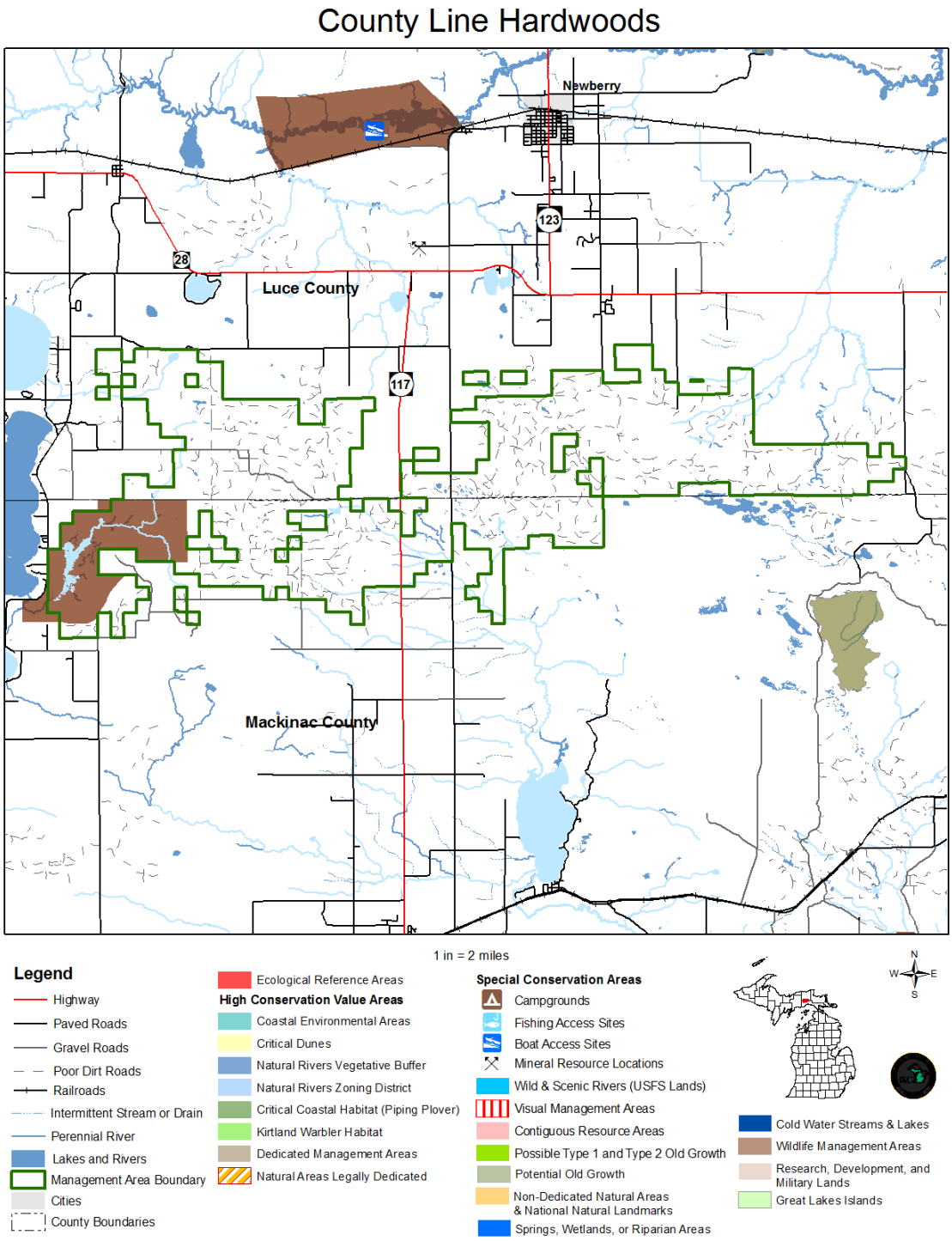

Figure 4.6.5. A map of the County Line Hardwoods management area showing the special resource areas.

Table 4.6.2. Invasive plant species within or near the County Line Hardwoods management area (Data from the Michigan Invasive Plant Identification Network database).

County Line Hardwoods - FRD Management Areas	Cases within FRD Areas	Cases within 5 Mile Buffer	Total number of cases	Total number of different Invasive Species
	6	1	7	4

Invasive Species within FRD Areas	Occurrences	Invasive Species within 5 Mile Buffer	Occurrences
Reed Canary Grass *Phalaris arundinacea*	2	Purple Loosestrife *Lythrum salicaria*	1
Spotted Knapweed *Centaurea stoebe*	2	-	-
Wild Parsnip *Pastinaca sativa*	2	-	-

4.6.5 – Fire Management

With hardwood and lowland conifer communities dominating, significant stand replacement fire disturbance would have been very rare. There is a significant area of dry northern forest where most of the red pine is located. This portion of the management area is much more adapted to periodic fire. The following fire management concepts will be applied to this management area:

- Prescribed fire may be used to maintain pine, encourage natural pine regeneration and discourage competing hardwoods; and
- When conditions allow lowland stands to dry out enough to burn, using fire as a management tool may be considered to accomplish objectives.

4.6.6 – Public Access and Recreation

Access for management and recreation is generally good throughout a large portion of this management area . Due to proximity to local communities, there are some areas with trash dumping problems.

Recreational facilities consist of motorized trails (Figure 4.6.1) that include: a snowmobile trail, the Sandtown motorcycle trail and trailhead and parts of the Newberry-Rexton motorcycle trail. The Canada Lake Ski trail/pathway is a non-motorized trail within the management area (Figure 4.6.1). There is a boat access site on the Upper Millecoquins River just north of the management area (Figure 4.6.5).

The Sandtown and Newberry-Rexton motorcycle trails are designated motorcycle use only by Director's Order. Any damage to the 24-inch trail bed must be repaired. Boat access sites on East Lake and Big Manistique Lake are nearby.

Horse riding, waterfowl hunting, bird watching, mushroom picking, deer and grouse hunting, trapping and fishing are common uses of the resources in this management area. As this management area is close to Newberry, and several other communities, recreation use is very high.

4.6.7 – 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. High priority trout stream in this management area are shown in the Integrated Forest Monitoring Assessment and Prescription Geographic Decision Support System and in Figure 4.6.1.

4.6.8 – Minerals

Surface sediments consist of lacustrine (lake) sand and gravel and clay and silt, peat and muck and coarse-textured till. There is insufficient data to determine the glacial drift thickness. Sand and gravel pits are located in this management area, and there is good potential for additional pits.

The Silurian Manistique, Burnt Bluff Groups and Cabothead Shale subcrop below the glacial drift. The Burnt Bluff is 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 (two in Luce and four in Mackinac). 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.