

4.26 MA 26 – Sage Truck Trail Management Area

Summary of Use and Management

Management in the Sage Truck Trail management area (MA) (Figure 4.26.1) will provide a variety of timber products, maintain or enhance wildlife habitat and provide for forest-based recreational uses. The Sage Truck Trail area is noted for karst features which offer unique plant habitat and recreational opportunities. Features such as caves and sinkholes occur in the Fiborn Quarry area. Timber management will emphasize balancing the age classes of aspen and uneven-aged management of hardwoods. Management activities may be significantly constrained by poor access in the lowland areas. Due to site conditions, winter harvesting is common. Expected issues in this 10-year planning period include introduced pests and diseases and the difficulty of regenerating cedar and other lowland conifer types.

Introduction

The Sage Truck Trail management area is located in the central portion of the eastern Upper Peninsula in Luce, Chippewa and Mackinac Counties. It has 37,760 acres of state-owned land. The primary attribute is timber harvesting. Additional attributes which were important in identifying this management area include:

- The management area falls within both the Niagaran Escarpment and Lake Plain subsection 8.1, and the Luce subsection 8.2 of the eastern Upper Peninsula ecoregion (Albert, 1995).
- Landforms in this management area consist of glacial moraine fragments, lacustrine lowlands, limestone escarpment, morainal lake bed complex and glacial outwash features. Much of this area was flooded at one time (see the Tahquamenon River assessment).
- This management area has limestone bedrock influenced vegetation with areas of limestone exposed at the surface and Karst features including caves.
- This area contains some hardwood knolls with closely associated wetlands to include large bog expanses, black spruce/tamarack forested wetlands and northern white cedar.
- Aspen and hardwood stands make up over one third of the acres in this management area and are managed rather intensively. There is also intensive management of red pine in planted stands occurring along the Dinkey Line Road.
- Much of the coniferous lowland within the management area is managed for closed canopy winter deer habitat; there are deer wintering complex special conservation areas. In addition, this management area provides excellent moose, wolf and bear habitat.
- There are several known archeological sites in the management area including an old homestead and many narrow gauge railroad beds.
- Recreational activities include: snowmobiling, motorcycle and ORV (off-road vehicle) riding and grouse, bear and deer hunting.

The headwaters of the Sage and Hendrie River systems are in this management area. This management area does not contain any significant surface lakes.

The active Hendricks Gravel Quarry and the retired Fiborn Quarry are located in this management area. The Michigan Karst Conservancy owns the 480 acre Fiborn Karst Preserve in the southeast part of this management area which includes an extensive and nearly complete karst drainage system with sinkholes, caves and disappearing streams. A small portion of this system extends onto state owned land.

The state land in this management area is fairly concentrated with some private parcels interspersed within. The Sage Truck Trail management area is within the Newberry and Sault forest management units.

Sage Truck Trail

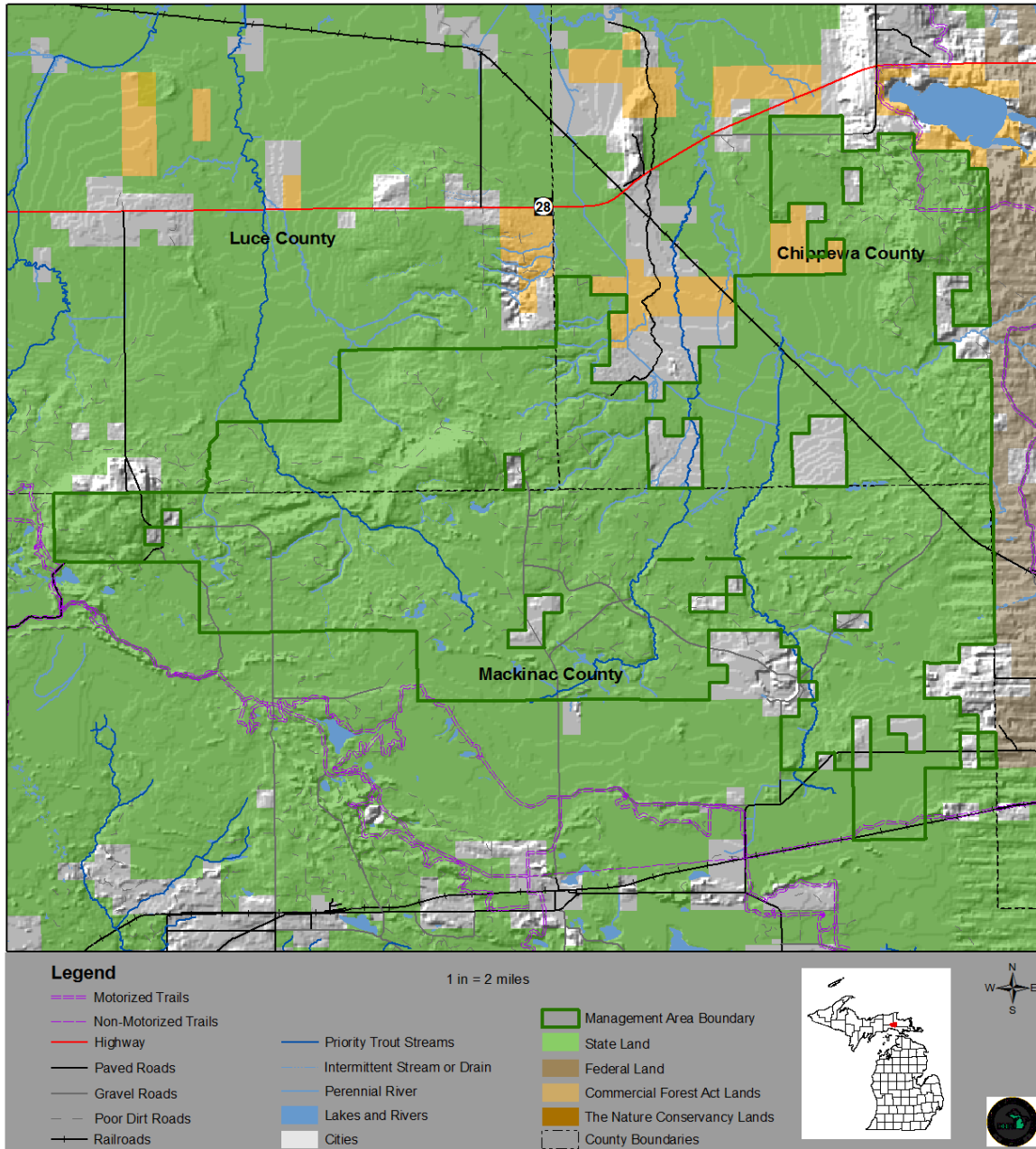


Figure 4.26.1. Location of the Sage Truck Trail management area (dark green boundary) in relation to surrounding State Forest Lands and other ownerships.

The predominant cover types, acreages and projected harvest acres for the management area are shown in Table 4.26.1.

Table 4.26.1. Current cover types, acreages, projected harvest acres and projected ten-year cover type acreage for the Sage Truck Trail 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
Aspen	20%	7,668	517	7,151	192	0	7,668	1,192	0
Lowland Open/Semi-Open Lands	16%	5,924	0	5,924	0	0	5,924	0	0
Northern Hardwood	15%	5,847	638	5,209		2,601	5,847	0	2,501
Cedar	14%	5,236	27	5,209	100	0	5,236	326	0
Lowland Conifers	9%	3,445	995	2,450	272	0	3,445	272	0
Lowland Spruce/Fir	4%	1,491	601	890	99	0	1,491	99	0
Red Pine	3%	1,077	35	1,042	0	315	1,077	116	315
Upland Open/Semi-Open Lands	3%	1,017	0	1,017	0	0	1,017	0	0
Misc Other (Water, Local, Urban)	1%	317	0	317	0	0	317	0	0
Others	15%	5,738	1,252	4,486	896	681	5,738	542	973
Total	100%	37,760	4,065	33,695	1,559	3,597	37,760	2,547	3,789

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

4.26.1 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 4.26.1.1 Forest Cover Type Management - Aspen

Current Condition

Aspen occurs on 7,668 acres (20%) of the management area (Table 4.26.1). Aspen stands are distributed throughout the management area on a variety of sites from very dry-poor nutrient to mesic-medium nutrient. Kotar habitat types include PARv, PARVAa, ATFD, AFPo and AFOAs (see appendix E). Aspen stands have been successfully harvested and regenerated in recent years resulting in over 70% of the aspen acres being less than 30 years old (Figure 4.26.2).

There are currently 458 acres of aspen prescribed for regeneration harvest. There are some stands of aspen that are expected to convert to other types after harvest and some stands in other types that are expected to convert to aspen after harvest. These acres are shown in Figure 4.26.2 in the regeneration prescriptions column. There are 517 acres of aspen 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. Inaccessible stands of aspen will eventually succeed to late successional species.

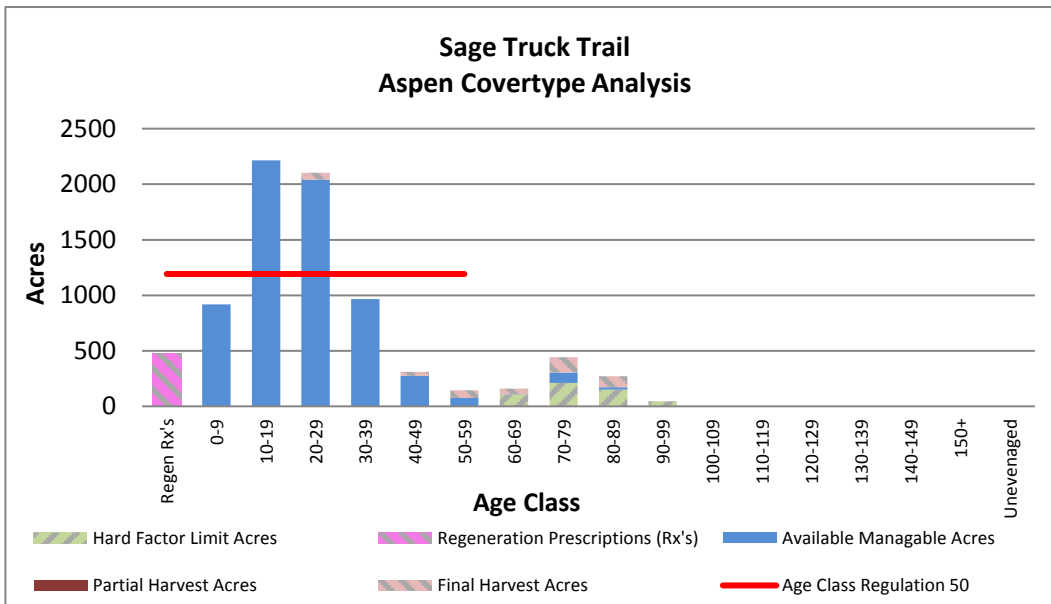


Figure 4.26.2. Age-class distribution of aspen in Sage Truck Trail management area (2012 Department of Natural Resources inventory data).

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 192 acres with a reduction from the regulated amount due to the current age-class structure where most of the acres are not yet merchantable.

Long-Term Management Objectives

- Balance the age classes of accessible aspen providing for a regulated harvest of approximately 1,192 acres per decade (red line in Figure 4.26.2).

Section 4.26.1.2 Forest Cover Type Management – Lowland Open/Semi-Open Lands

Current Condition

Lowland open/semi-open lands occur on 5,924 acres (16%) of the management area (Table 4.26.1). This category is a combination of lowland shrub (4,902 acres), marsh (505 acres), treed bog (435 acres) and bog (82 acres). These wet areas provide important habitat for a large number of wildlife species including moose and songbirds.

Desired Future Condition

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

Long-Term Management Objectives

- In general, these stands will be maintained without active management to protect their ecological values.

Section 4.26.1.3 Forest Cover Type Management – Northern Hardwoods

Current Condition

Northern hardwood stands occur on 5,847 acres (16%) of the management area (Table 4.26.1). The majority of these hardwood stands have been managed as uneven-aged. Stand density, described as basal area (square feet per acre) is used to measure stand condition. Northern hardwoods in this management area are found on a range of sites from dry-mesic poor nutrient to mesic-medium nutrient. Kotar habitat types include PARVAa, ATFD and AFPo. The majority of these sites have high potential to grow quality stems.

Most stands will be harvested using individual tree selection harvests when basal area is over 120 square feet per acre usually about every 20 years. Where site quality is poor shelterwood and other even-aged harvesting systems will be considered.

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

Currently 1,379 acres of northern hardwood have a selection harvest prescription assigned and there are 35 acres with a final harvest prescribed (Figure 4.26.3). There are 638 acres of northern hardwood that have site conditions limiting their harvest. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations.

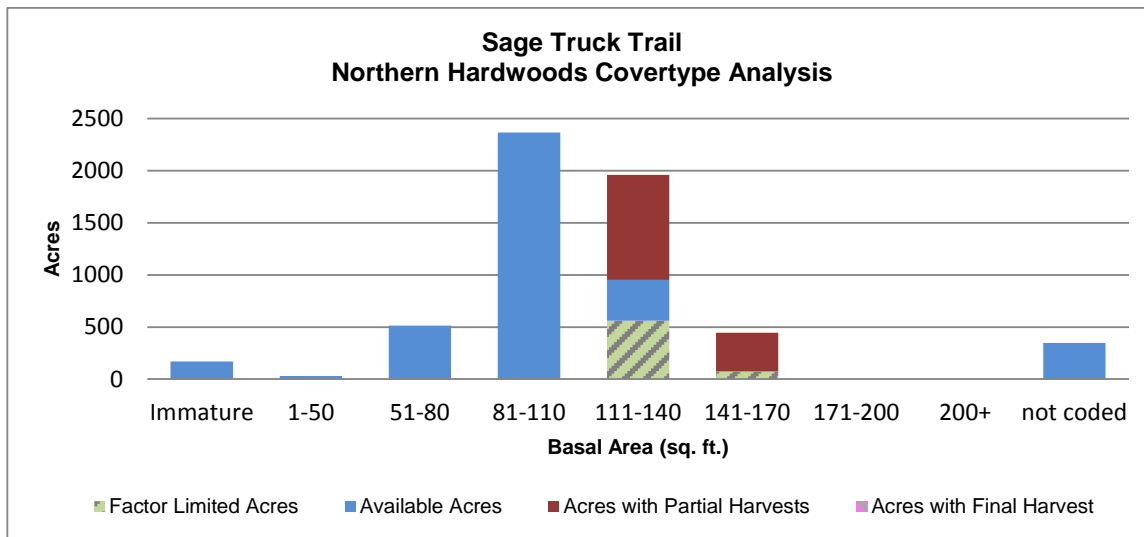


Figure 4.26.3. Basal area distribution of northern hardwoods in the Sage Truck Trail management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Northern hardwood will be maintained on operable sites generally using selection harvests to provide uneven-aged compositionally and structurally diverse stands;
- Some hardwood stands found on poor sites may be managed as even-aged; and
- 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 partial harvest of northern hardwood is 2,601 acres;
- Continue salvage harvests of beech affected by beech bark disease using Beech Bark Disease Management Guidelines;
- Evaluate stands previously dominated by beech to determine the impact of beech bark disease on regeneration;
- Track beech regeneration in these stands; and

- To favor regeneration of hardwood other than beech, consider herbicide applications on beech regeneration and the planting of hard mast producing trees including oak and disease resistant beech.

Long-Term Management Objectives

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

Section 4.26.1.4 Forest Cover Type Management – Cedar

Current Condition

Cedar occurs on 5,236 acres (14%) of the management area (Table 4.26.1). There are several deer wintering habitat special conservation areas in this management area. Cedar stands will be managed to maintain winter habitat for deer and to retain this forest type in the landscape. Maintaining a closed canopy structure provides important cover for deer and reducing snow depth within the stands. There has not been any recent harvesting and regeneration of this cover type in this management area (Figure 4.26.4).

At this time, there is no cedar scheduled for upcoming harvest. There are 27 acres of cedar 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. Cedar stands in inaccessible areas will be subject to natural processes resulting in a range of successional stages.

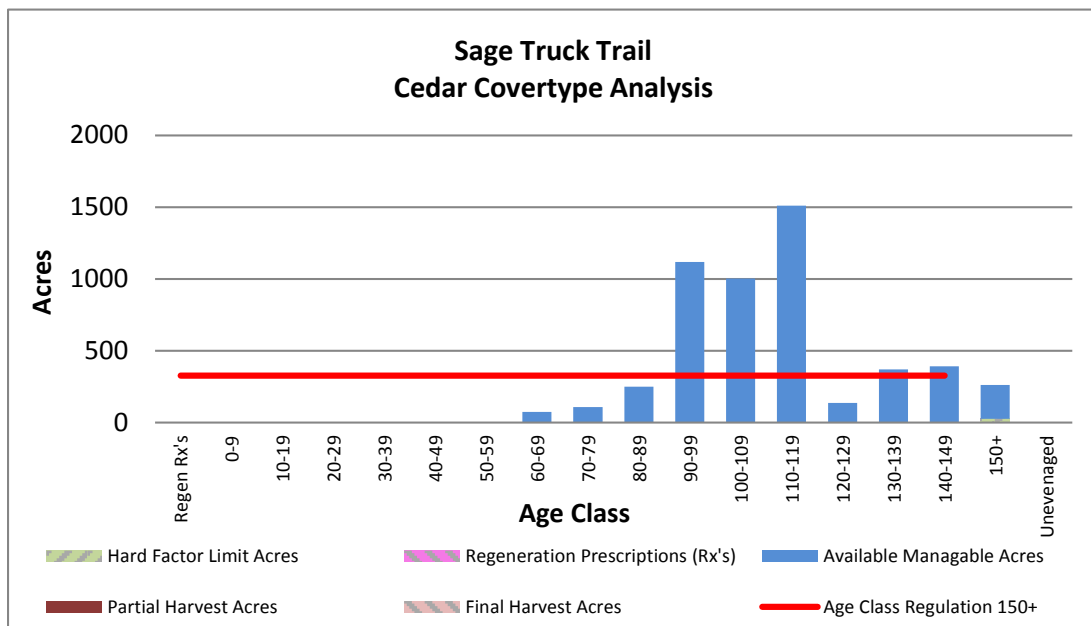


Figure 4.26.4. Age-class distribution of cedar in the Sage Truck Trail management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- In areas where deer browse is a concern stands may not be actively harvested at this time;
- Outside the deer wintering areas, cedar stands will be maintained on operable sites through even-aged management with acres balanced between 0-159 years of age providing for continual harvesting, wildlife habitat and recreational opportunities.

10-Year Management Objectives

- The 10-year projected final harvest of cedar is 100 acres with the reduction from the regulated amount due to the deer wintering complexes;
- Ensure that cedar and/or hemlock recruitment/regeneration is reliable if harvesting in this cover type.

Long-Term Management Objectives

- In accessible areas outside of the deer wintering areas balance the age-class structure providing for a regulated harvest of approximately 326 acres per decade.

Section 4.26.1.5 Forest Cover Type Management – Lowland Conifers

Current Condition

Lowland conifers occur on 3,445 acres (9%) of the management area (Table 4.26.1). There has been some recent harvesting of lowland conifers in this management area (Figure 4.26.5). The majority of stands are over rotation age and a small portion of the lowland conifer stands have been classified as uneven-aged as a result of natural processes. Access to lowland conifer stands in this area is difficult.

Currently there are 121 acres of lowland conifers with a final harvest prescribed. There are 995 acres of lowland conifers 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 conifer stands in inaccessible areas will be subject to natural processes (fire, windthrow, insect defoliation and beaver flooding) resulting in a broad range of successional stages.

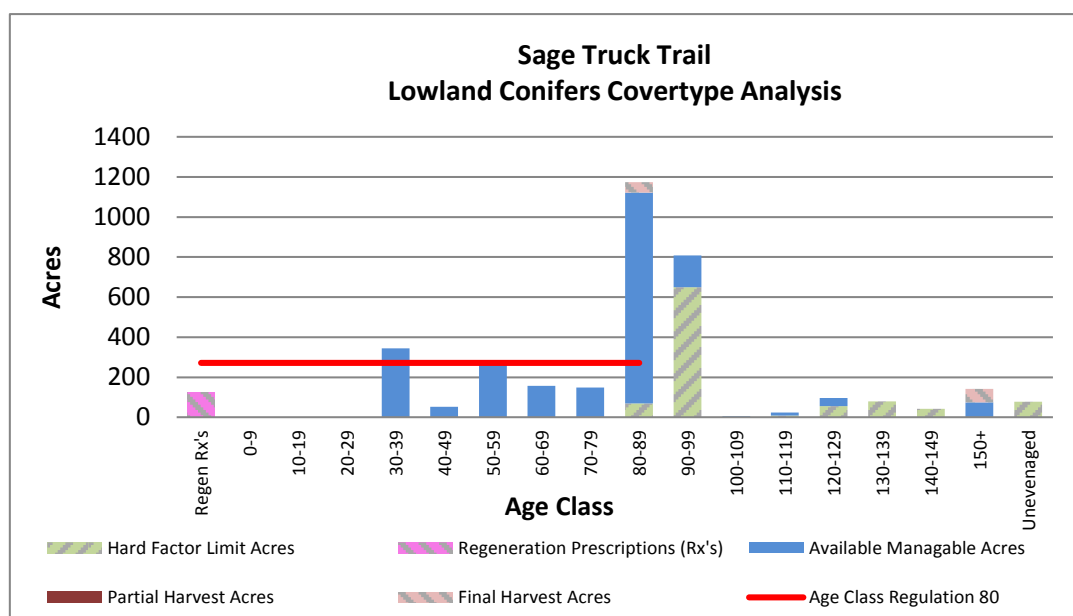


Figure 4.26.5. Age-class distribution of lowland conifers in the Sage Truck Trail management area (2012 Department of Natural Resources inventory data).

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 regulated harvest, wildlife habitat and recreational opportunities.

10-Year Management Objectives

- The 10-year projected final harvest of lowland conifers is 272 acres.

Long-Term Management Objectives

- Balance the age-class structure of accessible lowland conifer stands providing for a regulated harvest of approximately 272 acres per decade.

Section 4.26.1.6 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 4.26.1). Lowland spruce/fir (1,491 acres or 4%), red pine (1,077 acres or 3%) and upland open/semi-open lands (1,017 acres or 3%) are the largest. Other types total 5,738 acres (15%) and are spread across the management area. This category is made up of forested cover types with 2% or less of the management area acres. They include: upland conifers (826 acres), mixed upland deciduous (662 acres), lowland deciduous (620 acres), upland mixed forest (578 acres), lowland aspen/balsam poplar (561 acres), tamarack (549 acres), lowland mixed forest (523 acres), upland spruce/fir (488 acres), paper birch (377 acres), white pine (228 acres), hemlock (187 acres) and natural mixed pines (139 acres). Miscellaneous other stands total 317 acres, and comprises water, roads and soil/sand.

Most of these cover types will be managed as even-aged stands using natural regeneration after harvest. Attempt to balance age classes where possible. Mixed cover types with high basal area may be thinned prior to final harvest.

There are 1,888 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. Stands that are inaccessible for harvesting will be subject to natural succession.

Desired Future Condition

- These cover types may be managed on operable sites through even-aged management systems; and
- Harvesting and regenerating these cover types will contribute to the compositional diversity of the landscape while providing for continual harvest, wildlife habitat and recreation opportunity.

10-Year Management Objectives

- The projected 10-year final harvest is 99 acres of lowland spruce/fir and 896 acres of other types; and
- The projected 10-year partial harvest is 315 acres of red pine and 681 acres of other types.

Long-Term Management Issues

- Continue management of these other cover types to provide a sustainable yield of forest products and wildlife habitat.

4.26.2 – Featured Wildlife Species

Priorities for wildlife management in this management area include the maintenance of a closed canopy in the large Sage River deer wintering complex. Northern hardwoods in this management area are diverse and mature forest conditions are desirable. This management area receives a fair amount of hunting pressure for grouse and early successional aspen management is a priority.

American Marten

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

Wildlife habitat specifications:

- Maintain a minimum of 30% canopy cover in key even-aged managed stands of northern hardwood and conifer stands as marten tend to avoid stands with less canopy cover. Write prescriptions to minimize potential blowdown.
- Discourage land transactions and management activities that facilitate further fragmenting of marten habitat within the management area by identifying and maintaining corridors between large forested tracts.
- Provide older forest conditions in this management area.

- Retain and limit disturbance to existing downed coarse woody debris and exceed Within-Stand Retention Guidance for its maintenance. Where coarse woody debris is lacking, increase both standing dead and down dead wood by leaving at least three secure large diameter (>14 inches in diameter at breast height) live trees to serve as future den trees, snags and coarse woody debris (logs) on the ground per acre in harvested stands.
- Increase the within-stand component of mesic conifers in mixed stands and enhance mesic conifer forest types by group or gap selective harvest. Consider underplanting on suitable sites where a seed source is absent.
- Limit firewood permits, biomass harvesting, and whole tree harvesting in this management area considering retaining the maximum residues in the Woody Biomass Harvesting Guidelines.

Black Bear

The goal for black bear in the eastern Upper Peninsula is to maintain or improve 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. State forest management for bear should focus on improving existing habitat (minimizing fragmentation and maintaining both hard and soft mast) in this management area.

Wildlife habitat specifications:

- Maintain or increase the beech and oak component of hardwood forests in this management area. Retain representation of 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.

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 rotation.
- Larger harvest units should have irregular boundaries and include one or two, 1-3 acre unharvested inclusions for every 40 acres exceeding 40 acres in size.
- Evaluate the conifer component in aspen stands, holding or increasing the conifer component in aspen stands. Leave conifer under four inch dbh in mixed stands and aspen types as immediate residual escape cover and to promote corridors.
- 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 inches in 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 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.

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 Department procedure 32.22-07 states “Coniferous swamps are important as winter deeryards and shall be managed primarily for deer. The objective shall be to maintain them for this purpose and through commercial cuttings and silvicultural practices, improve these areas to provide winter cover and food for deer.” There is a complex relationship between deer abundance; available summer and winter habitat; timber management; and regeneration tree species, particularly white cedar and hemlock. It is recognized that meeting both timber management and deer goals presents challenges for the department and our stakeholders. Information on deer wintering complexes is currently being updated and new management guidelines are being developed. When completed, these will provide additional direction for managing these critical areas for white-tailed deer.

Wildlife habitat specifications for deer wintering complexes:

- Strive to maintain > 50% of the land area within deer wintering complexes in mixed or pure stands of cedar, hemlock, white and black spruce, white and natural red pine, balsam fir, mixed swamp conifer and mixed upland conifer-hardwood.
- In northern white cedar and hemlock cover types that are commonly occupied by deer during severe winters, especially in medium and high snowfall zones, maintain canopy closure of >65%.
- In deer wintering complexes in low snowfall areas and within ¼-mile of severe-winter cover in the higher snowfall zones, write prescriptions that strive to maintain canopy closure of 40-65%, favoring cedar, hemlock, white spruce, black spruce, balsam fir and white pine.
- Provide winter forage in deer wintering complexes through stands of regenerating hardwood or brush, including preferred species of red maple, sugar maple, aspen, yellow birch, ashes, oaks, dogwood, crabapple, elderberry, high-bush cranberry, sumac and hazel.
- Enhance accessibility to winter browse within deer wintering complexes by maintaining mature mesic conifer components within upland hardwood stands or by maintaining or enhancing sheltered travel corridors between areas of conifer cover and browse.
- Provide spring break out areas by maintaining open hardwood stands on southern exposures and herbaceous openings adjacent to deer wintering complexes.
- When possible, timber harvests within deer wintering complexes should be carried out only during winter months and tops should be left. Chipping of non-bole wood and whole-tree harvesting in the deer wintering complexes should be avoided, but will be discussed on a case-by-case basis through the compartment review process.
- Harvests of cedar and hemlock may only be conducted when:
 - There is reasonable confidence of successful recruitment/regeneration of the cover types; or
 - There is a forest health issue (e.g., hemlock wooly adelgid); or
 - Part of an approved research project; or
 - Removal of selected trees will facilitate a reduction of harvest trails, landings, etc. to minimize soil sedimentation and possible soil compaction issues.
- Provide fall foods in the form of hard and soft mast, and provide dense escape cover or bedding areas in the form of early successional forests, brush and warm-season grasses that will encourage fall deer use in areas open to public hunting. Where habitat types are appropriate, increase diversity of hard mast by planting oak.

4.26.3 – 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 five listed species as well as three natural communities of note occurring in the management area as listed in Table 4.25.2. The caves and sink holes are karst features associated with the Fiborn Karst Preserve and the Fiborn Quarry. 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 4.26.2. Occurrence information for special concern, rare, threatened and endangered communities and species for the Sage Truck Trail 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								
Caves		S1/G4?	Confirmed				Special Feature	N/A
Muskeg		S3/G4G5	Confirmed				Lowland open/semi-open	N/A
Sinkhole		S2/G3G5	Confirmed				Special Feature	N/A
Birds								
Northern goshawk	<i>Accipiter gentilis</i>	SC/G5/S3	Confirmed	PS	Very High	Mesic northern Forest	Northern Hardwood	Late
						Hardwood-conifer swamp	Lowland Mixed	Mid
						Northern hardwood swamp	Black Ash	Late
						Floodplain forest	Lowland mixed	Mid
						Dry northern forest	Jack Pine, Red Pine	Late
						Dry-mesic northern forest	White Pine	Late
						Boreal forest	Upland & Lowland Sp/F	Mid
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
						Mesic northern Forest	Northern Hardwood	Late
Mammal								
Moose	<i>Alces alces americana</i>	SC/G5/S4	Confirmed	HV	Very High	Bog	Lowland open/semi-open	N/A
						Emergent Marsh	Lowland open/semi-open	N/A
						Northern wet meadow	Lowland open/semi-open	N/A
						Northern fen	Lowland open/semi-open	N/A
						Patterned fen	Lowland open/semi-open	N/A
						Muskeg	Lowland open/semi-open	N/A
						Rich conifer swamp	Tamarack	Late
						Poor fen	Lowland open/semi-open	N/A
						Poor conifer swamp	Tamarack	Late
						Hardwood-conifer swamp	Lowland Mixed	Mid
						Northern hardwood swamp	Black Ash	Late
						Northern shrub thicket	Upland open/semi-open	N/A
						Boreal forest	Upland & Lowland Sp/F	Mid
						Mesic northern forest	Northern Hardwood	Late
						Dry-mesic northern forest	White Pine	Late
Plants								
Goblin moonwort	<i>Botrychium mormo</i>	T/G3/S2	Confirmed			Mesic northern forest	Northern Hardwood	Late
						Boreal forest	Upland & Lowland Sp/F	Mid
Alga pondweed	<i>Potamogeton confervoides</i>	SC/G4/S3	Confirmed			Submergent marsh	Lowland open/semi-open	N/A
						Emergent marsh	Lowland open/semi-open	N/A

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

Special conservation areas within the management area are cold water streams and lakes, high priority trout streams (Figure 4.26.1) and deer wintering areas (Figure 4.26.6).

There have been no high conservation value areas or ecological reference areas identified for 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.
- Evaluate all potential Type 1, potential Type 2 and potential old growth areas to determine their status as a special resource area.

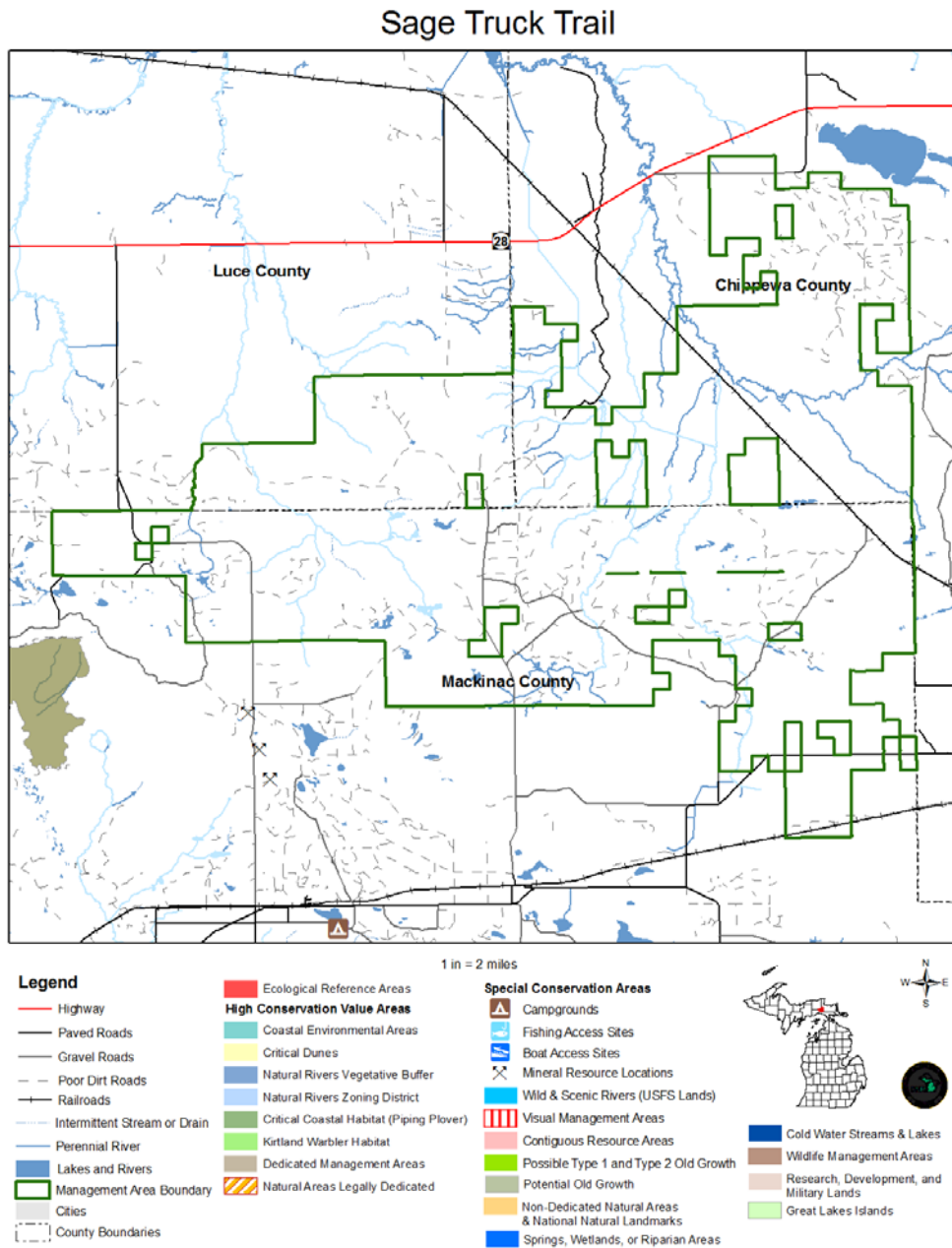


Figure 4.26.6. A map of the Sage Truck Trail management area showing the special resource areas.

4.26.4 – 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:

- Upland mixed: beech bark disease;
- Aspen and lowland aspen/balsam poplar: white trunk rot and *Hypoxylon* canker; and
- Lowland conifers: 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. There are unsubstantiated reports of invasive plant species at the Fiborn quarry. 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.

4.26.5 – Fire Management

Prescribed fire may be used to reduce fuel loads and/or as preparatory to planting pine.

Prescribed fire may also be used to encourage natural red pine regeneration.

Access for fire suppression purposes is very limited in this management area.

4.26.6 – Public Access and Recreation

The County road system only enters the management area around the periphery, and does not extend into the center. Forest trails created for timber sales are also limited to the upland portions. This leaves the north central part of the management area virtually roadless.

Recreational facilities include: a snowmobile trail and the Newberry-Rexton motorcycle trail near the southern edge of the management area (Figure 4.26.1).

Grouse, bear and deer hunting are popular.

4.26.7 – 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 River watershed are designated as high priority trout stream and are shown in the Integrated Forest Monitoring Assessment and Prescription Geographic Decision Support Environment and in Figure 4.26.1.

4.26.8 – Minerals

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

The Silurian Manistique and Burnt Bluff Groups, Cabothead Shale and Manitoulin Formation and Ordovician Queenston Shale Big Hill Dolomite, Stonington Formation and Utica Shale subcrop below the glacial drift. The Burnt Bluff is quarried for stone in the Upper Peninsula.

Exploration and development for oil and gas has been limited to a few wells drilled in the Upper Peninsula (14 in Chippewa, four in Mackinac and two in Luce). 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.

The Hendricks Gravel Quarry is under lease and the road system is gated closed to the public.

The Fiborn Quarry exists along an old railroad corridor. It was one of the first limestone quarries in the eastern Upper Peninsula and is currently closed to operations. These features are all to the south of the management area boundary. There are also Karst features (such as caves and underground streams) associated with the abandoned quarry.