4.1 Amasa Plains Management Area

Summary of Use and Management

Vegetative management in the Amasa Plains management area (MA) (Figure 4.1.1) will provide a variety of forest products; maintain or enhance wildlife habitat; protect areas with unique characteristics; and provide for forest based recreational uses. Timber management objectives for the 10-year planning period include improving the age-class distribution of aspen and upland spruce; maintaining the conifer component in northern hardwood stands; maintaining the presence of minor cover types on the landscape; and maintaining non-forest vegetation types. Wildlife management objectives include providing winter deer habitat; maintaining or enhancing the oak component in hardwood stands; maintaining early successional habitat; and the retention of large living trees and snags for cavity nesters. Management activities may be constrained by site conditions and the skewed age-class distributions. Balancing age classes and potential insect (emerald ash borer) and disease (beech bark disease) infestations will be issues for this 10-year planning period.

Introduction

The Amasa Plains management area is located in Iron County just north of Crystal Falls and is situated on an outwash plain. The management area covers about 8,600 acres, is mostly contiguous and is surrounded mostly by private industrial forest land. The management area is dominated by the aspen, northern hardwoods and lowland conifer cover types. Other attributes that played a role in the definition of this management area include:

- Domination by two natural communities: Mesic northern forest and poor conifer swamp;
- Mid-range in site quality;
- Provides multiple benefits including forest products and dispersed recreational activities; and
- Provides a variety of fish and wildlife habitats.

The management priority in this area is to continue to provide these multiple benefits while minimizing user conflicts.

The predominant cover types, composition and projected harvest areas for the Amasa Plains management area are shown in Table 4.1.1.

Table 4.1.1. Summary of cover types, composition, limited factor area, manageable area and projected harvest areas for the Amasa Plains management area (2012 Department of Natural Resources inventory data).

| Cover Type	Cover %	Current Acreage	Hard Factor Limited Acres	Manageable Acres	10 Year Projected Harvest (Acres)		Projected Acreage in 10 Years	Desired Future Harvest (Acres)	
					Final Harvest	Partial Harvest		Final Harvest	Partial Harvest
Aspen	49%	4,178	128	4,050	1,376	0	4,178	675	0
Northern Hardwood	11%	952	5	947	0	469	952	0	469
Lowland Conifers	10%	834	263	571	63	0	834	63	0
Upland Spruce/Fir	6%	486	262	224	106	0	486	32	0
Lowland Spruce/Fir	4%	362	117	245	83	0	362	27	0
Upland Open/Semi-Open Lands	2%	133	0	133	0	0	133	0	0
Lowland Open/Semi-Open Lands	12%	1,068	0	1068	0	0	1,068	0	0
Misc Other (Water, Local, Urban)	2%	151	0	151	0	0	151	0	0
Others	5%	395	176	219	62	48	395	21	48
Total		8,559	950	7,609	1,689	517	8,559	818	517

Amasa Plains
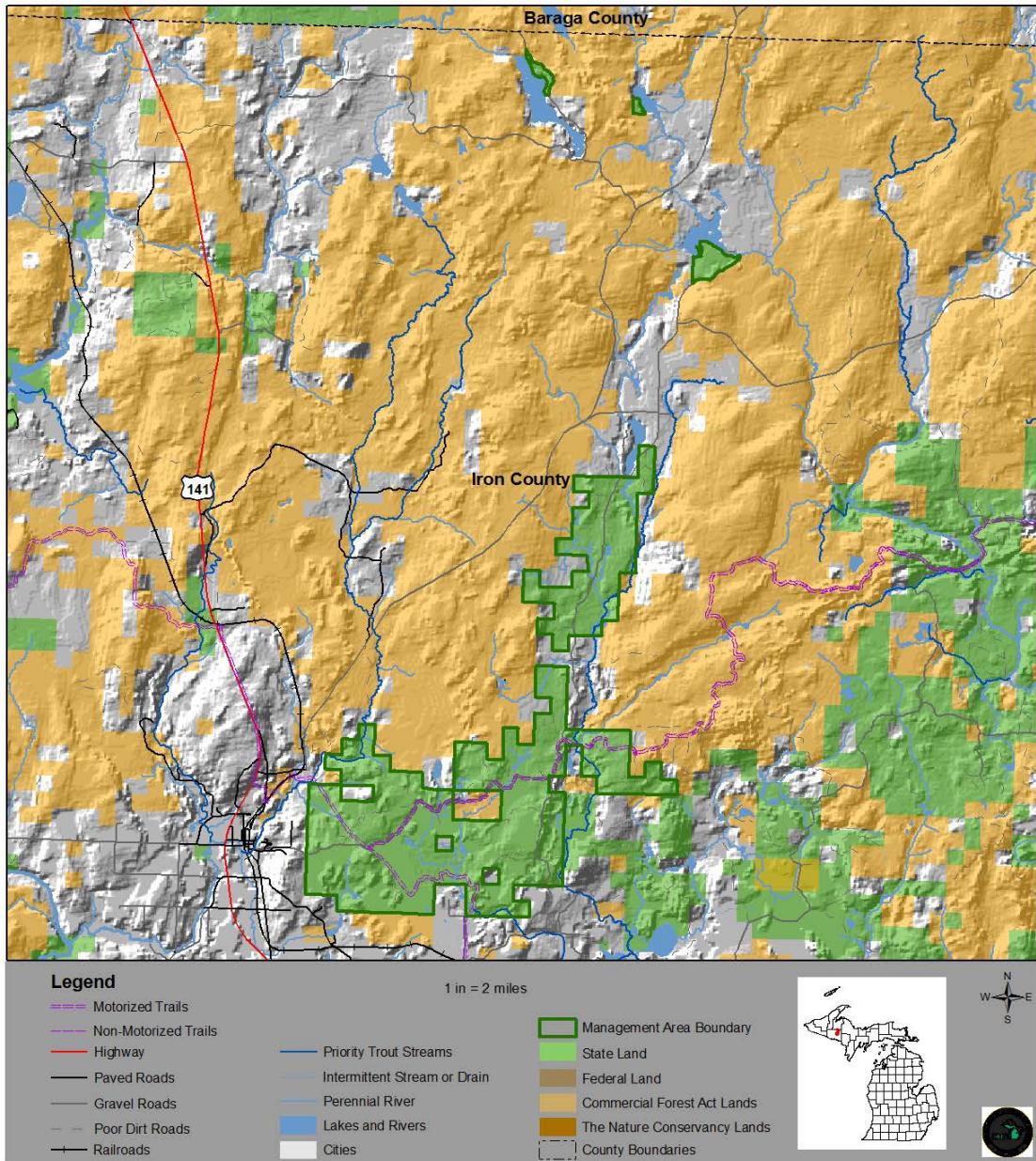
Figure 4.1.1. A map of the Amasa Plains management area (dark green boundary) in relation to surrounding state forest lands in Iron County, Michigan.

4.1.1 Forest Cover Type Management Direction

The following sections contain information on vegetation management for each of the major cover types, a grouping of minor cover types and important non-forested vegetation types for the Amasa Plains management area in the form of Desired Future Condition, 10-Year Management Objectives and Long-Term Management Objectives. This information applies to those portions of the forest where active management (e.g., timber harvest, prescribed fire, planting or mowing) will be conducted. In other portions of the state forest, the natural processes of succession and disturbance will provide ecological benefits. While most stands have a variety of tree species and other vegetation, they are classified by the species that dominant the canopy.

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

Aspen Cover Type

Current Condition

The aspen cover type covers 4,178 acres (49%) of the management area (Table 4.1.1) and is poorly distributed across age classes (Figure 4.1.2). Aspen in this management area is growing on sandy loam sites, about half with shallow water tables and the balance typically on well-drained soils. The age-class structure contains a spike in the 30-39 year old age class (Figure 4.1.2) and there are few acres available for harvest beyond 60 years old. There are relatively few factor limited acres and they are in the older age classes.

Harvesting over the past decade has not been able to convert older stands to regenerating young stands because mature aspen is in very limited supply. This condition will persist at least into the next decade.
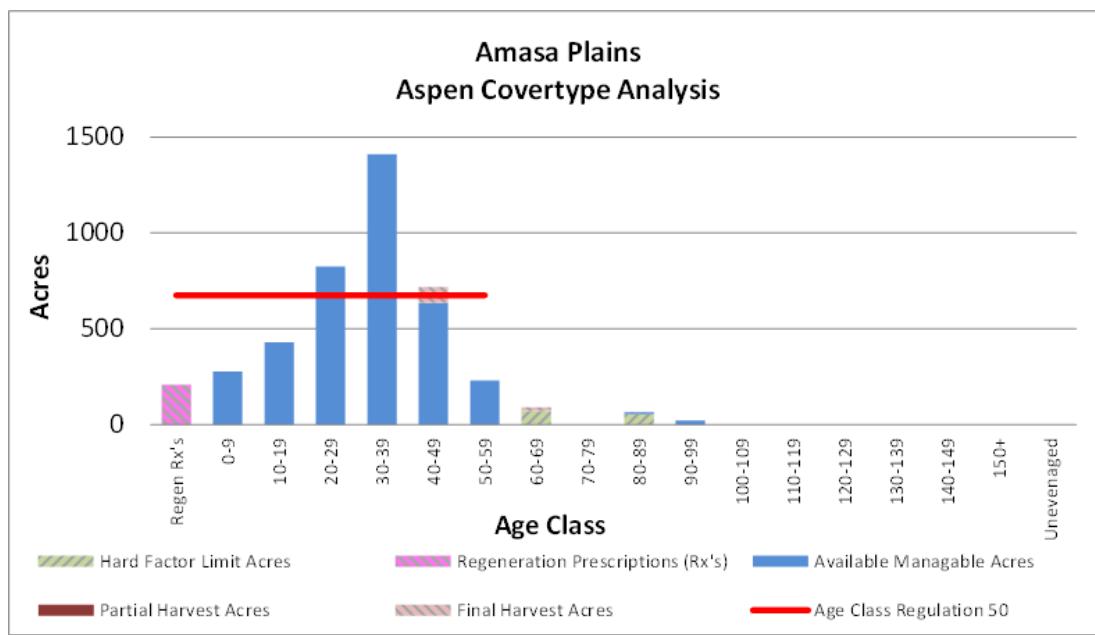

Figure 4.1.2. Graph of the age-class structure for the aspen cover type on the Amasa Plains management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Balanced acres in each age class over a 50-year rotation; and
- Provide an even supply of forest products and a balanced mix of habitat conditions for a variety of wildlife as well as a variety of hunting-type opportunities.

Long-Term Management Objective

- Balance the age-class distribution by harvesting and regenerate approximately 675 acres each decade (red line on Figure 4.1.2).

10-Year Management Objectives

- Harvest and regenerate 1,376 acres over the next decade (higher than the long-term management model indicates because of unbalanced age classes);
- With a lack of older age classes, identify some younger aspen stands on higher quality sites that could be available for early harvest; and
- Two-aged stands with mature aspen over younger stands should be identified and scheduled for harvest.

Northern Hardwood Cover Type

Current Condition

The northern hardwood stands within this cover type make up 834 acres (11%) of the management area and occur on medium-to high-quality sugar maple sites. Most stands have been managed on an uneven-aged basis using the selection harvest system. Uneven-aged management features basal area, rather than a rotation age to guide harvesting decisions. Most stands within the management area are in good condition.
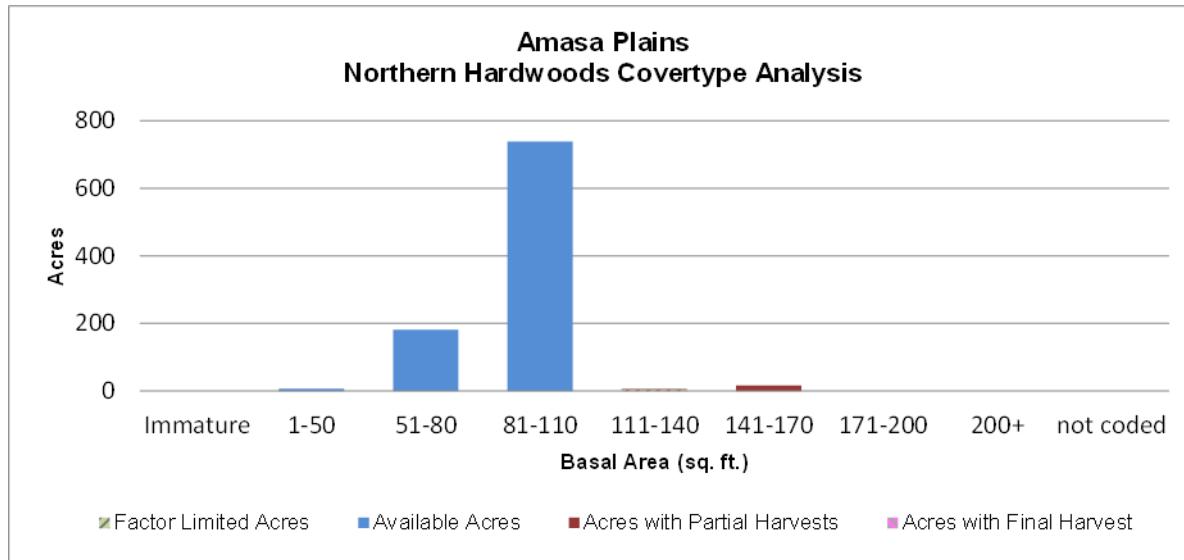

Figure 4.1.3. Graph of the basal area structure for northern hardwoods cover type on the Amasa Plains management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Uneven-aged northern hardwood stand-structure promoting high-value sugar maple sawlogs and veneer on good sites.

Long-Term Management Objective

- Selectively harvest northern hardwood stands on a 20-year cycle. Optimize the harvest cycle to maintain high growth rates and minimize stagnant growth periods.

10-Year Management Objectives

- Approximately 469 acres should be harvested in the next decade, using the selection harvest system; and
- Maintain hemlock, white pine and upland cedar in stands that are harvested.

Lowland Conifers Cover Type

Current Condition

There are 834 acres (10%) of the management area in this cover type. Lowland conifer sites tend to be poorly drained sites supporting mixed stands of cedar, black spruce, tamarack, balsam fir, white birch and balsam poplar. Due to the wet site conditions, they are more susceptible to damage from rutting by logging equipment and present difficult operating conditions for harvesting. Lowland conifers are poorly distributed across age classes, with almost all stands over 60 years of age. Most of the acreage more than 80 years old is factor limited. Very little harvesting has been done in this type over the past 30 years; however, some young age classes may be classified as uneven-aged as shown in Figure 4.1.4. Lowland conifer stands provide important winter habitat for deer. It is desirable to maintain the closed canopy structure in many stands for that purpose. These stands will become susceptible to attacks by insects and diseases as they age.
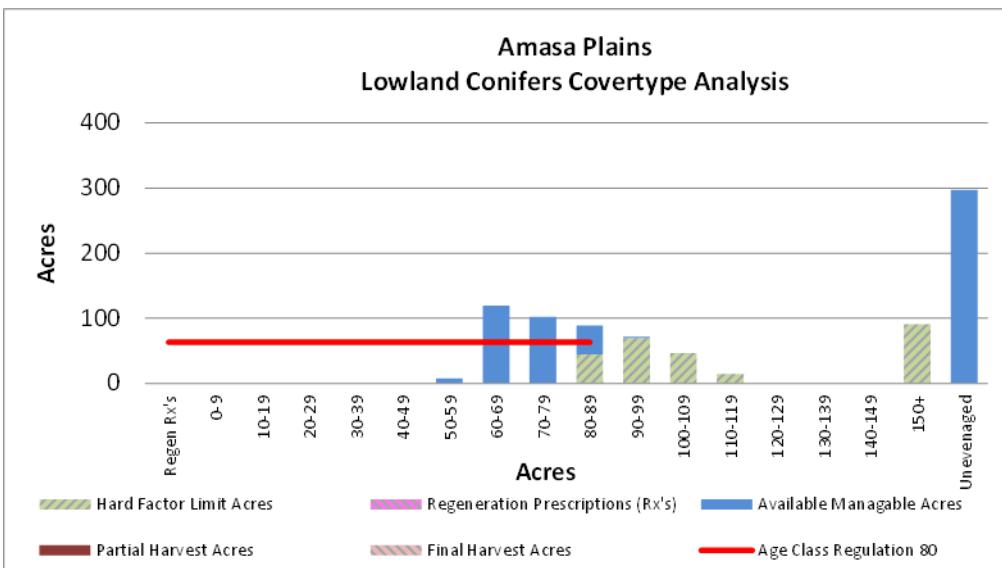
Figure 4.1.4. Graph of the age-class distribution for the lowland conifer cover type on the Amasa Plains management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Closed canopy stands interspersed with patches of all age classes;
- Sustainable regeneration and recruitment of seedlings and saplings;
- Maintain the closed canopy structure to provide important winter deer habitat; and
- Plan to harvest the oldest available stands to regenerate them before widespread mortality occurs.

Long-Term Management Objectives

- Manage stands on an 80-year rotation, and;
- Regenerate stands to species mixes similar to the pre-harvest conditions with preference for cedar, black spruce and balsam fir.

10-Year Management Objectives

- Harvest about 63 acres (red line on Figure 4.1.4) over the next decade focusing on the use of "low impact" harvesting systems and successful, reliable regeneration techniques;
- Use appropriate silvicultural techniques to assure adequate regeneration; and
- Monitor harvested sites.

Upland Spruce/Fir Cover Type

Current Condition

There are 486 acres (6%) of upland spruce/fir on state forest land in the Amasa Plains management area. Most of the acres are 60 years old. Upland spruce-fir stands are generally short-lived reaching maturity in 60-70 years (Figure 4.1.5). They tend to convert to shade tolerant hardwoods like red maple if left undisturbed. The upland spruce/fir cover type in the Amasa Plains management area does not have a well-balanced age-class distribution (Figure 4.1.5). It typically occurs as the transition between upland types like aspen and northern hardwood and the lowlands. These transitions have important wildlife values. Most of the older age classes have hard factor limits.
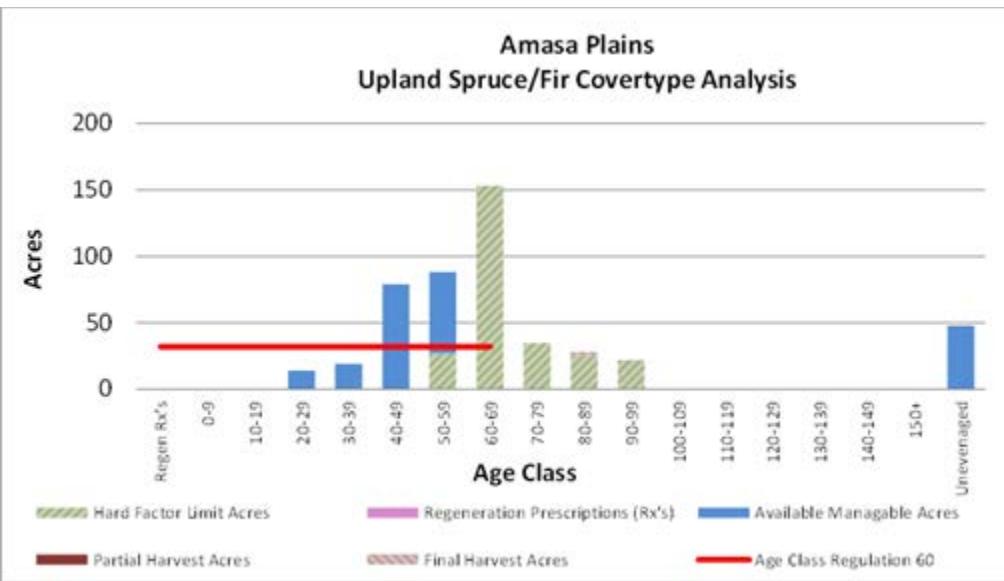
Figure 4.1.5. Graph of the age-class distribution for the upland spruce/fir cover type on the Amasa Plains management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Maintain approximately the current level of upland spruce/fir acreage; and
- Balance age classes on a 60 year rotation.

Long-Term Management Objective

- Once age classes are balanced, harvest and regenerate about 32 acres per decade.

10-Year Management Objectives

- Harvest and regenerate 106 acres of upland spruce/fir in the next decade (this is above the long-term management, but is necessary due to the imbalanced age-class structure); and
- Try to mitigate the factor limitations in the older age classes to improve age-class structure.

Lowland Spruce/fir Cover Type

Current Condition

Currently there are 362 acres (4%) of the lowland spruce/fir type in the Amasa Plains management area. Lowland spruce/fir is often found in association with lowland conifer, cedar and tamarack cover types. Lowland spruce/fir on the Amasa Plains management area does not have a well-balanced age-class distribution, with most stands over 80 years old having a factor limitation (Figure 4.1.6). There are also a large number of acres classified as uneven-aged. These stands become increasingly susceptible to insect and disease problems as they age.
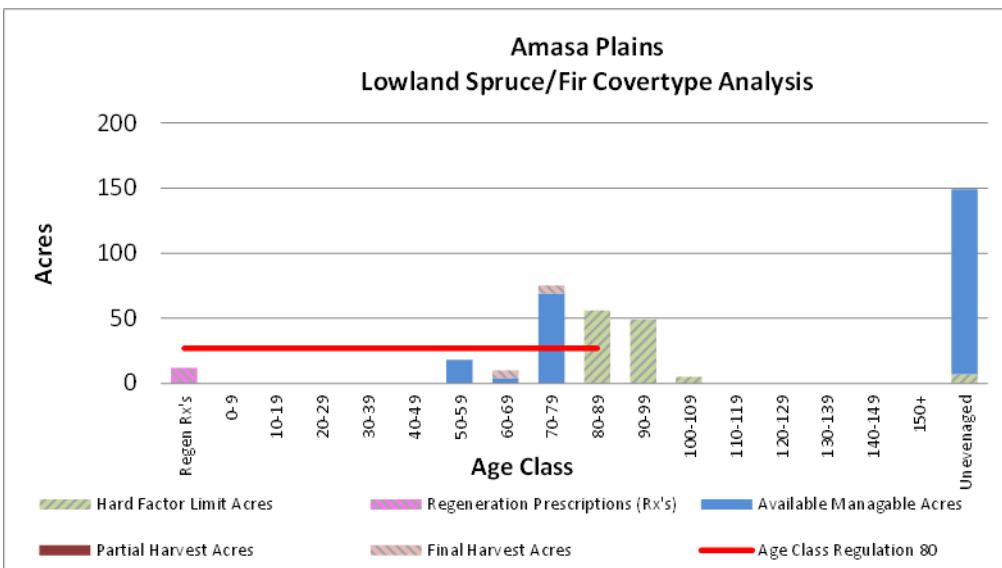
Figure 4.1.6. Graph of the age-class distribution for the lowland spruce/fir cover type on the Amasa Plains management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

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

Long-Term Management Objectives

- Manage mature lowland spruce/fir cover types on an 80-year rotation, leading to harvesting 27 acres per decade once age classes are balanced; and
- Lowland conifer stands in areas inaccessible for harvest will be subject to natural processes, resulting in a range of successional stages.

10-Year Management Objectives

- Because of the large number of uneven-aged acres (Figure 4.1.6) and poor age-class distribution, 83 acres are expected to be harvested and regenerated in the next decade;
- Use appropriate silvicultural techniques to assure adequate regeneration; and
- Monitor harvested sites.

Other Forested Cover Types

Current Condition

Other forested cover types are made up of tamarack (153 acres), white pine (61 acres), cedar (59 acres), hemlock (41 acres), lowland deciduous (40 acres), red pine (26 acres), upland mixed (8 acres), and paper birch (7 acres). These types make up about 5% of the management area in small, scattered stands.

Desired Future Condition

- Maintain the presence of the minor cover types within the management area.

Long-Term Management Objectives

- Manage minor cover types to maintain representation using appropriate silvicultural methods;
- Use appropriate silvicultural techniques to assure adequate regeneration of desired species;
- Monitor harvested sites; and
- Featured species habitat requirements will be taken into consideration.

<u>10-Year Management Objectives</u>

- Harvest those stands without harvest limitations adjacent to other planned harvest activities and where stand and habitat conditions indicate that harvesting is appropriate; and
- Expected harvests in these types will be less than 62 acres over the next decade.

Other Non-forested Cover Types

<u>Current Condition</u>

The following non-forested cover types are found on the Amasa Plains: Upland open/semi-open lands (133 acres – 2%); lowland open /semi-open lands (1,068 acres – 12%); and other (water, local, urban) (151 acres – 2%).

<u>Desired Future Condition</u>

- Maintain current acreage in grasses and other non-forested cover types.

<u>Long-Term Management Objective</u>

- Permanent grass openings will be maintained with frequent low-intensity fires and mechanical treatments allowing native grasses and forbs to dominate.

<u>10-Year Management Objective</u>

- Grass-types will be treated for opening maintenance this decade as needed

4.1.2 Featured Wildlife Species Management

The Amasa Plains management area contains a mix of uplands and lowlands with lowland conifer cover types providing important wintering deer habitat. This resource is of highest priority for most featured species in the management area and should be conserved. A small amount of oak exists in the hardwood stands and should be maintained and enhanced. The following species are featured for this management area during this cycle of state forest planning: American woodcock, black bear, pileated woodpecker, ruffed grouse and white-tailed deer. Some of the most significant wildlife management issues in the area are early successional habitat (both upland and associated with alder, riparian zones or forested wetlands); mast (hard and soft); conservation of deer wintering complexes; and retention or development of large living and dead standing trees (for cavities). During this 10-year planning period, additional analyses to better define the spatial extent of priority areas (e.g., deer wintering complexes) for featured species will be performed.

American Woodcock

The western Upper Peninsula goal for woodcock is to maintain or increase woodcock habitat. In priority areas, management should focus on maintaining early successional habitat associated with riparian zones and forested lowlands.

<u>Wildlife habitat specifications:</u>

- Maintain aspen cover type within the management area where associated with alder, riparian zones or forested wetlands;
- Balance aspen age-class distribution within the management area;
- Use silvicultural practices that encourage the aspen component in mixed stands associated with alder, riparian zones or forested wetlands; and
- Maintain or create rough openings associated with alder, riparian zones, regenerating aspen or forested wetlands within the management area.

Black Bear

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

<u>Wildlife habitat specifications:</u>

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

Pileated Woodpecker

The western Upper Peninsula goal for pileated woodpeckers is to maintain or improve habitat. State forest management for the species should address mature forest and retention or development of large living and dead standing trees (for cavities) in this management area. Focusing such efforts on riparian and animal movement corridors will benefit additional species.

<u>Wildlife habitat specifications:</u>

- Identify and retain large (>15 inches in diameter at breast height (DBH)) snags and cavity trees, coarse woody debris and reserve green trees to ensure a sustainable supply of future cavity and foraging trees and associated coarse woody debris. Poorly formed trees and those damaged by natural disturbance or earlier harvests, particularly deciduous trees, are good candidates for future snags and cavity trees. Large diameter aspen and other soft hardwoods are preferred.
- Even-aged managed stands: leave scattered retention patches around some 18 inches DBH or greater (if unavailable, identify future potential 18 inch secure trees) to be recruited as a nucleus, using the upper end of the retention guidelines.
- Uneven-aged managed stands: Retain a minimum of three secure cavity or snags per acre with one exceeding 18 inches DBH. If snags or cavity trees are lacking, leave trees with defects of the maximum available size that will likely develop and be recruited as cavity trees.
- Offset salvage harvests deemed necessary due to insect or disease, or fire within the same cover type and age class (within the compartment, management area or WUP ecoregion), to minimize impacts on pileated woodpecker habitat. Total allowable harvest in these situations will be evaluated on a case-by-case basis.

Ruffed Grouse

The western Upper Peninsula goal for ruffed grouse is to maintain or improve habitat. Management during this planning period will focus on early successional forest in priority landscapes, balancing age-class distribution and provision of soft browse.

<u>Wildlife habitat specifications:</u>

- Maintain aspen acres in the management area and balance the age-class distribution of aspen cover types.
- Stand size for grouse: Ideal aspen stands will be irregularly shaped 10-40 acres to maximize juxtaposition or edge avoiding extensive single age final harvests. Larger harvest units should have irregular boundaries, provide one 1-3 acre unharvested clumped inclusion for every 40 acres harvested.
- Hold or increase the conifer component in aspen stands. Leave conifers under four-inch diameter at breast height in mixed stands and aspen types as immediate residual escape cover and to promote corridors.
- Maintain cherry production for soft mast and oak component in stands with oak and emphasize areas with a hazel understory.

White-tailed Deer

The western Upper Peninsula goals for white-tailed deer are to: 1) Maintain existing deer wintering complexes and 2) Expand the extent of areas suitable as winter deer habitat, especially in the medium and high snowfall zones. Management should focus on maintaining habitat quality in priority wintering complexes. DNR department procedure 32.22-07 states "Coniferous swamps are important as winter deeryards and shall be managed primarily for deer. The objective shall be to maintain them for this purpose and through commercial cuttings and silvicultural practices, improve these areas to provide winter cover and food for deer." There is a complex relationship between deer abundance; available summer and winter habitat; timber management; and regeneration tree species, particularly white cedar and

hemlock. It is recognized that meeting both timber management and deer goals presents challenges for the department and our stakeholders. Information on deer wintering complexes is currently being updated and new management guidelines are being developed. When completed, these will provide additional direction for managing these critical areas for white-tailed deer.

Wildlife habitat specifications for deer wintering complexes:

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

4.1.3 Rare Species and Special Resource Area Management

All forest operations must be reviewed for potential conflicts between rare species and proposed forest operations following the guidance in "*DNR's Approach to the Protection of Rare Species on State Forest Lands*" (IC4172). This is especially important when listed species are present, when past surveys have indicated a possibility of their presence, or when appropriate habitat is available and the species is known to occur in the general region.

Past surveys have noted and confirmed one listed species and no natural communities of note occurring in the management area as listed in Table 4.1.2. Any established management guidelines will be followed. Further surveys for special species and natural communities will be carried out as a matter of course during the inventory process and opportunistically for special more focused surveys.

Table 4.1.2. Occurrence information for special concern, rare, threatened and endangered communities and species for the Amasa Plains 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
Bird								
Common loon	*Gavia immer*	T/G5/S3-4	Confirmed	HV	Very High	Emergent Marsh	Lowland open/semi-open	N/A
						Bog	Lowland open/semi-open	N/A

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

Approximately 21.8 acres of potential old growth have been identified within the Amasa Plains management area. These stands were identified for a broad range of reasons and were coded in the Operations Inventory database as Stand Condition 8. These stands area also special conservation areas until they are evaluated.

There have been no high conservation value areas or ecological reference areas identified in the management unit as illustrated in Figure 4.1.7

Management goals during this planning period:

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

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

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

Goal 2: To evaluate the potential old growth areas by the end of this 10-year planning period.

4.1.4 Forest Health Management

Although forest health issues span the entire landscape, some specific threats are more important in this MA due to the species composition, site quality or other factors. Some of the more important forest health pests in this area include:
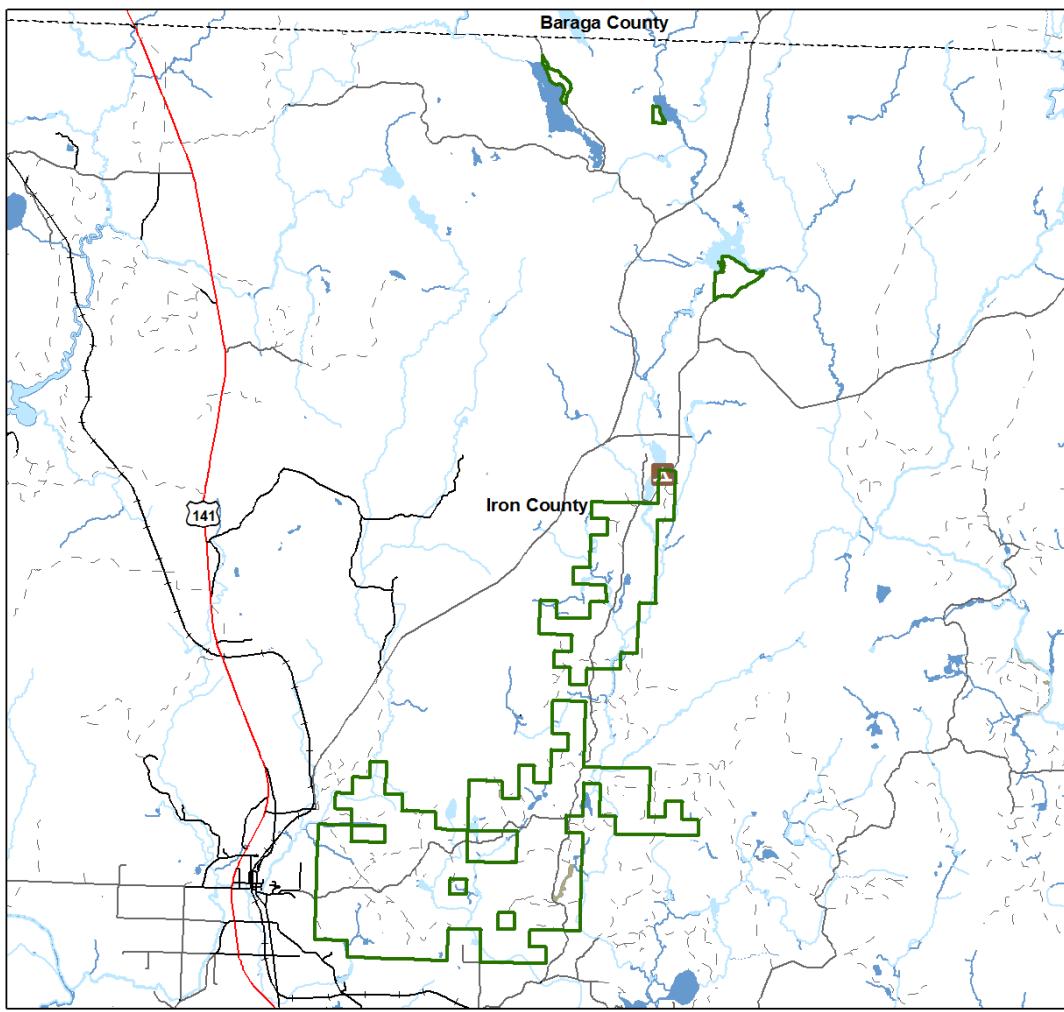
- White trunk rot of aspen
- *Hypoxylon* canker
- Emerald ash borer
- Spruce budworm.

When forest pests are detected, they are to be reported to the forest health specialist for treatment recommendations. The treatment of large outbreaks of forest pests will be coordinated on a state and regional level.

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

- Bell's honeysuckle
- Birdsfoot trefoil
- Common buckthorn
- Dane's rocket
- European swamp thistle
- Japanese knotweed
- Tatarian honeysuckle.

Amasa Plains

Figure 4.1.7. A map of the Amasa Plains management area showing the special resource areas.

4.1.5 Aquatic Resource Management

Fisheries Division management unit biologists will review proposed forest management activities using the compartment review process and will consider the potential impact of proposed prescriptions upon riparian and aquatic values. Management prescriptions will be modified to account for riparian and aquatic values by applying the standards and guidance documents listed in the introduction to this plan section to the unique conditions specific to any given forest stand.

Prescription of riparian management zone widths greater than the minimum widths provided in IC4011 (*Sustainable Soil and Water Quality Practices on Forest Land*) must be justified and documented during the compartment review process. Forested stands adjacent to designated high priority trout streams will specifically be managed to discourage beaver use

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

High priority trout streams in this management area are shown in Figure 4.1.1.

4.1.6 Fire Management

A mix of mesic hardwoods, conifer swamps covers most of the west and central portion of this area. Natural fire regime was probably very long there. Along the east side of the management area, some upland conifers probably had shorter fire return interval, although infrequent stand replacement fires promoted pine as a stand component.

- All wildfires are subject to appropriate initial attack suppression response; and
- The Deer Lake Campground provides an opportunity for fire prevention messages that address forest recreation.

4.1.7 Public Access and Recreation

This area has fair public and management access. Roads are gravel or poor dirt roads with minimal maintenance. There are access issues with undivided interest and crossing privately owned land. A snowmobile trail crosses the southern portion of this area. There is a state forest campground and boating access site at Deer Lake (Figure 4.1.7).

There is a motorized trail through the management area (Figure 4.1.1) and there is a desire to expand public access as opportunities arise.

4.1.8 Oil, Gas and Mineral Resources

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

Surface sediments consist of glacial outwash sand and gravel and postglacial alluvium, an end morine of coarse-textured till, coarse-textured till and minor peat and muck. There is insufficient data to determine the glacial drift thickness. Sand and gravel pits are located in the general area and there is good potential on the uplands.

The Precambriam Hemlock Formation and Intrusives subcrop below the glacial drift. There is no current economic use for these rocks.

Old iron mines are located just to the west of this management area and additional metallic mineral production could occur in or adjacent to this management area. Portions of the management area were previously leased for metallic mineral exploration, but none are active at this time.