4.15 Green Bay Lake Plain Management Area

Summary of Use and Management

Vegetative management in the Green Bay Lake Plain management area (MA) (Figure 4.15.1) 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; regeneration of hemlock and cedar where appropriate; 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 will be to address the habitat requirements identified for the following featured species: blackburnian warbler, red shoulder hawk, white-tailed deer, wild turkey, ruffed grouse and wood duck. Balancing age classes, potential insect (emerald ash borer) and disease (beech bark disease) infestations and regeneration of lowland conifer cover types will be issues for this 10-year planning period.

Introduction

The Green Bay Lake Plain management area is on a Lake Plain in eastern Menominee and southwestern Delta Counties. The state forest covers 68,630 acres and is mostly contiguous. The major ownerships in this vicinity are non-industrial private. The management area is dominated by cedar, aspen and northern hardwood cover types. Other attributes that played a role in the definition of this management area include:

- Dominated by three natural communities: poor conifer swamp, rich conifer swamp and dry mesic northern forest;
- Low-range in site quality;
- Proximity of the communities of Escanaba, Gladstone and Menominee, this area is heavily used for hunting, motorized and non-motorized forest recreation;
- · Provides multiple benefits including forest products and dispersed recreational activities; and
- Provides a variety of fish and wildlife habitats.
- This management area contains one of the western Upper Peninsula Grouse Enhanced Management Systems
 areas. This area plan will emphasize balanced age classes of aspen for timber production which will have habitat
 benefits for a number of the featured species including ruffed grouse and deer. The boundaries of Grouse
 Enhanced Management Systems areas will be delineated and an operational plan will be developed during this
 planning period by the local biologist in collaboration with the Forest Resources Division unit manager and
 integrated into the plan through the revision process.

The management priority in this area is to continue to provide these multiple benefits while minimizing user conflicts. Additional priorities include regenerating hemlock and cedar where appropriate. The predominant cover types, composition and projected harvest areas for the Green Bay Lake Plain management area are shown in Table 4.15.1.

Table 4.15.1. Summary of cover types, composition, limiting factor area, manageable area and projected harvest area for the Green Bay Lake Plain management area (2012 Department of Natural Resources inventory data).

								-	,
			Hard Factor				Projected		
		Current	Limited	Manageable	10 Year Projected Harvest (Acres		Acreage in 10)	Desired Future Harvest (Acres)	
Cover Type	Cover %	Acreage	Acres	Acres	Final Harvest	Partial Harvest	Years	Final Harvest	Partial Harvest
Cedar	22%	15,283	490	14,793	0	0	15,283	925	0
Aspen	17%	11,545	329	11216	2,034	0	11,545	1,869	0
Northern Hardwood	11%	7,268	565	6703	0	2,334	7,268	0	2,802
Lowland Deciduous	8%	5,709	1,746	3963	440	0	5,709	440	0
Lowland Spruce/Fir	4%	2,963	1,456	1507	244	0	2,963	167	0
Lowland Conifers	4%	2,736	884	1852	224	0	2,736	206	0
Hemlock	4%	2,463	147	2316	0	0	2,463	0	447
Upland Open/Semi-Open Lands	1%	854	0	854	0	0	854	0	0
Lowland Open/Semi-Open									
Lands	14%	9,404	0	9404	0	0	9,404	0	0
Misc Other (Water, Local,									
Urban)	1%	877	0	877	0	0	877	0	0
Others	14%	9,528	1,663	7865	1,128	523	9,528	1,059	1,000
Total		68,630	7,280	61,350	4,069	2,857	68,630	4,666	4,249



Figure 4.15.1. A map of the Green Bay Lake Plain management area (dark green boundary) in relation to surrounding state forest lands and other ownerships.

4.15.1 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 Green Bay Lake Plain management 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 (i.e., 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 with dominant canopy coverage.

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.

Cedar Cover Type

Current Condition

Cedar occurs on 15,283 acres (22%) of the management area (Table 4.15.1). This cover type occurs on poorly drained sites consisting of mostly cedar mixed with black spruce, lowland hardwoods or balsam fir. Cedar is poorly distributed across the age-class distribution (Figure 4.15.2). Most of the stands are over 100 years of age. Little harvesting has been done in this type over the past 60 years. Regeneration of cedar stands has been problematic. At this time there are 490 acres of cedar with site conditions limiting their harvest.

Although there will be no harvesting of cedar within deer wintering complexes, there is a need to address future cedar cover. Limited cedar harvests will occur outside the wintering complexes recognizing that cedar takes many years to regenerate and escape deer browsing. Reliable and timely regeneration of cedar is a concern from both wildlife and forest management perspectives.



Figure 4.15.2. Graph of the age-class structure for the cedar cover type on the Green Bay Lake Plain management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Closed canopy stands interspersed with patches of all age classes; and
- Sustainable regeneration and recruitment of seedlings and saplings.

Long-Term Management Objectives

- Maintain cedar cover type on the landscape; and
- Regenerate stands to species mixes similar to the pre-harvest conditions.

10-Year Management Objectives

- No harvests are planned for this area in this 10-year planning period; and
- Allow limited experimental cedar regeneration and thinning trials coordinated at the district level with an adaptive management component.

Aspen Cover Type

Current Condition

The aspen cover type covers 11,545 acres (17%) of state forest land in this management area (Table 4.15.1). Aspen is distributed across age-classes with the majority of acres occurring in the 0-39 year age classes (Figure 4.15.3). There are 329 acres of aspen that have harvest limitations at this time. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations.



Figure 4.15.3. Graph of the age-class structure for the aspen cover type on the Green Bay Lake Plain management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Balanced acres in each age class up to 50 years;
- Provide an even supply of forest products;
- Provide a balanced mix of habitat conditions for a variety of wildlife; and
- Provide a variety of hunting-type opportunities.

Long-Term Management Objectives

- · Harvest and regenerate aspen stands using a 50-year rotation length; and
- Regenerate approximately 1,869 acres each decade.

10-Year Management Objectives

- Harvest stands of 60-90 year old aspen that are in decline;
- Two-aged stands with mature aspen over younger stands should be identified and scheduled for harvest;
- Aspen within the identified Grouse Enhanced Management Systems area may be managed differently than the
 rest of the aspen within the management area, with a shorter rotation age, small patch cuts and carefully
 considered stand adjacency;
- The projected 10-year harvest is 2,034 acres; and
- Identify low quality off-site aspen stands for conversion to more ecologically appropriate cover types.

Northern Hardwoods Cover Type

Current Condition

Northern hardwood stands make up 7,268 acres (11%) of state forest land in this management area (Table 4.15.1). They occur on good-quality sugar maple sites mixed with wetland sites. While most stands have been managed using the selection harvest system, there are some acres in the immature category showing that they were managed using even aged harvesting (Figure 4.15.4). There are 565 acres that have limiting factors. These hard factor limited acres have been

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removed from the total number of manageable acres available for harvest calculations. Many stands have a sedge understory with little tree regeneration, shrub or herbaceous plant communities.



Figure 4.15.4. Graph of the basal area distribution for the northern hardwood cover type on the Green Bay Lake Plain management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

• The desired future condition is sustainable regeneration and recruitment of upland hardwood species developing an all-age structure.

Long-Term Management Objectives

- Selective harvest high-quality northern hardwood stands on a 20-year cycle; and
- Low quality hardwood stands will be managed on an even-aged system with an 80-year rotation.

10-Year Management Objectives

- Approximately 2,334 acres should be harvested in the next decade; and
- Maintain hemlock, white pine and upland cedar where possible in stands that are harvested.

Lowland Deciduous Cover Type

Current Condition

Currently there are 5,709 acres (8%) of the lowland hardwoods type in the management area (Table 4.15.1). This cover type is often found in association with mixed lowland conifer and cedar cover types. There are 1,746 acres that have factor limits due to wet conditions or for riparian corridors. Due to the wet site conditions, they are more susceptible to rutting damage from logging equipment and present difficult operating conditions for harvesting. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations. While lowland hardwoods in this management area are found in all age classes, they do not have a well-balanced age-class distribution (Figure 4.15.5).



Figure 4.15.5. Graph of the age-class structure for the lowland deciduous cover type on the Green Bay Lake Plain management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

• Maintain the current level of the lowland hardwood type with stands representing a variety of age classes.

Long-Term Management Objectives

- Harvest stands without limiting factors on an 80-year rotation allowing for approximately 440 acres to be harvested per decade; and
- Regenerate stands to species mixes similar to the pre-harvest conditions.

10-Year Management Objectives

• Harvest about 440 acres over this 10-year planning period.

Lowland Spruce/Fir Cover Type

Current Condition

Currently there are 2,963 acres (4%) of the lowland spruce/fir cover type in the management area (Table 4.15.1). Lowland spruce/fir is often found in association with lowland conifer, cedar and tamarack types. While lowland spruce/fir in this management area is found in all age classes, it does not have a well-balanced age-class distribution spiking in the 80-89 and 100-109 age classes (Figure 4.15.6). There are 1,456 acres of lowland spruce/fir that have limiting factors. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations.



Figure 4.15.6. Graph of the age-class structure for the lowland spruce-fir cover type on the Green Bay Lake Plain management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

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

Long-Term Management Objective

• Regenerate mature lowland spruce/fir cover types on an 80-year rotation allowing for 167 acres to be harvested per decade.

10-Year Management Objectives

- Harvest about 244 acres in the next decade; and
- More aggressive harvesting in this type maybe needed in this 10-year planning period to reduce mortality losses in the older stands.

Lowland Conifers Cover Type

Current Condition

Lowland conifers occur on 2,736 acres (4%) of the management area (Table 4.15.1). This cover type occurs on poorly drained sites supporting mixed stands of cedar, black spruce, tamarack, balsam fir, white birch and balsam poplar. There are 884 acres that have factor limits due to wet conditions or for riparian corridors. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations. Due to the wet site conditions, they are more susceptible to rutting damage from logging equipment and present difficult operating conditions for harvesting. Lowland conifers are distributed across all age classes, though the distribution is not even (Figure 4.15.7).



Figure 4.15.7. Graph of the age-class structure for the lowland conifer cover type on the Green Bay Lake Plain management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- · Mostly closed canopy stands interspersed with patches of all age classes; and
- Maintain the closed canopy structure to provide important winter deer habitat.

Long-Term Management Objectives

- Manage stands on an 80-year rotation allowing for 206 acres to be harvested per decade;
- Regenerate stands to species-mix similar to the pre-harvest conditions with preference for cedar, black spruce, hemlock and balsam fir.

10-Year Management Objectives

• Harvest about 224 acres over this 10-year planning period.

Hemlock Cover Type

Current Condition

Hemlock stands make up 2,463 acres (4%) of state forest land in this management area (Table 4.15.1). This cover type is important to wildlife as a source of thermal cover. Due to deer numbers in this area, there are problems with herbivory and most areas do not regenerate successfully. Hemlock is often managed using an uneven-aged harvest system based on basal area rather than age prior to final harvest at rotation age (Figure 4.15.8). There are 147 acres of hemlock that have site conditions limiting harvest at this time. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations.



Figure 4.15.8. Graph of the basal area distribution for the hemlock cover type on the Green Bay Lake Plain management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Uneven-aged hemlock stand structure;
- A full complement of tree seedlings recruiting into the overstory; and
- Well-developed shrub and herbaceous layers.

Long-Term Management Objective

• Maintain the hemlock cover type in this management area.

10-Year Management Objectives

- No harvests are planned for this area in this 10-year planning period; and
- Allow limited experimental hemlock regeneration and thinning trials coordinated at the district level with an adaptive management component.

Other Forested Cover Types

Current Condition

Other forested cover types make up 9,528 acres and are made up of lowland poplar (2,177 acres), upland spruce/fir (1,947 acres), red pine (1,763 acres), white pine (1,342 acres), tamarack (790 acres), mixed upland deciduous (569 acres), upland mixed forest (411 acres), upland conifers (224 acres), lowland mixed forest (203 acres), paper birch (61 acres), Natural mixed pines (39 acres) and oak (two acres). Together these types make up about 14% of the management area (Table 4.15.1).

Approximately 1,663 acres of these other minor cover types have site conditions limiting their harvest this decade. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations.

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; and
- Featured species habitat requirements will be taken in to consideration.

10-Year Management Objectives

- Harvest those stands without harvest limitations adjacent to other planned harvest activities and where stand conditions indicate that harvesting is appropriate; and
- The projected ten-year final harvest in these cover types is 1,128 acres and the projected partial harvest is 523 acres.

Other Non-forested Cover Types

Current Condition

The following non-forested cover types are found on this management area: upland open/semi- open lands (854 acres – 1%), lowland open/semi-open lands (9,404 acres – 14%) and other (water, local, urban) (877 acres – 1%) (Table 4.15.1).

Desired Future Condition

• The desired future condition of the grass types is an open sedge/grass community populated with native grass, soft mast shrubs and other herbaceous species.

Long-Term Management Objective

• Permanent grass openings may be maintained as needed.

10-Year Management Objective

• Grass-types may be treated for opening maintenance this 10-year planning period as needed.

4.15.2 – Featured Wildlife Species Management

The Green Bay Lake Plain management area demonstrates a natural propensity to grow white pine and balsam fir (both are common in the understory of many aspen and maple stands within the management area). These conifer species will be encouraged, where appropriate. Cedar and hemlock provide important wildlife habitat, but unfortunately, regeneration of both species is difficult. This management area represents more than 25% of the hemlock resource and almost 20% of the cedar resource on state forest land in the western Upper Peninsula. Management of cedar or hemlock types should be avoided unless regeneration of these cover types can be assured. However, this area provides an excellent opportunity to conduct some well-planned and monitored experimental treatments to help clarify the factors that impact regeneration of these cover types.

The primary focus of wildlife habitat management will be to address the habitat requirements identified for the following featured species: blackburnian warbler, red shoulder hawk, ruffed grouse, white-tailed deer, wild turkey and wood duck. Some of the most significant wildlife management issues in the management area are: within-stand diversity; mesic conifer; mature forest; habitat fragmentation; mast; forest openings; mast (hard); retain or, if absent, develop large living and dead standing trees (for cavities, especially near water); deer wintering complexes; and mature forest. Corridors of mature or old forest will be maintained along some watercourses for wildlife that are associated with mature forest conditions. During this 10-year planning period, additional analyses to better define the spatial extent of priority areas for featured species will be performed.

This management area will include one of the western Upper Peninsula Grouse Enhanced Management System areas. The boundaries will be delineated during this planning period by the local biologist in collaboration with the Forest Resources Division unit manager. Aspen stands that fall within the boundary may be managed to enhance habitat and hunting opportunities for ruffed grouse, deer, and turkey. Habitat treatments may include managing aspen on a shortened rotation with multiple age classes and smaller stand sizes.

Blackburnian Warbler

The goal for blackburnian warbler is to maintain suitable breeding habitat. Management efforts for blackburnian warblers should focus on within stand diversity, discouraging habitat fragmentation and maintaining mature forest with a conifer component in priority landscapes. Specifically, increase mesic conifer cover types (i.e., hemlock, white pine, red pine, upland spruce-fir) and allow some to mature beyond standard rotation ages, retain a larger percentage of mesic conifer during harvests, employ silvicultural practices that encourage the regeneration of mesic conifers and where feasible, under plant hemlock, white pine and white spruce in hardwood-dominated stands.

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Wildlife habitat specifications:

- Increase the mesic conifer (e.g., hemlock, white pine, natural red pine and upland spruce-fir) component on state forests by: a) Retaining a larger percentage of mesic conifer during harvests; b) Using silvicultural practices that encourage the regeneration of mesic conifer; and c) Where desired/feasible, under planting hemlock, white pine and white spruce in hardwood-dominated stands on suitable sites without a seed source.
- Provide for late successional mesic conifer-dominated, particularly hemlock, stands in the management area by
 extending the economically based rotation length for white spruce and balsam fir cover types to 80 years and not
 harvesting hemlock in this management area.

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 the Integrated Forest Monitoring Assessment and Prescription Geographic Decision Support Environment. Confirmed red-shouldered hawk nests are to be documented in accordance with the "DNR's Approach to the Protection of Rare Species on State Forest Lands" (IC4172) and included in the Integrated Forest Monitoring Assessment and Prescription Geographic Decision Support Environment. For red-shouldered hawks, 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 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.

Wildlife habitat specifications:

- 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.
- Manage the aspen cover type for smaller patch size, a shorter rotation and a more deliberate habitat configuration within the designated Grouse Enhanced Management Systems areas where appropriate.
- 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:
 - o There is reasonable confidence of successful recruitment/regeneration of the cover types; or
 - o There is a forest health issue (e.g., hemlock wooly adelgid); or
 - o 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.

Wild Turkey

The western Upper Peninsula goal for turkey is to provide sufficient habitat in order to continue to provide recreational opportunity to see and harvest turkey. Management should focus on providing natural winter food, maintaining and regenerating the oak component and maintaining brood-rearing openings to improve brood-production and winter survival to offset anticipated habitat losses.

Wildlife habitat specifications:

- Provide sources of winter food that are accessible above the snow (food plots, annual grains, fruit-bearing trees or shrubs);
- Conserve the oak component in forest stands, promote oak regeneration and where absent, plant oak on appropriate sites;
- Maintain and increase the number of brood-rearing forest openings (forest openings, savannas, barrens, hayfields, etc.); and
- Promote/enhance small dense mature confer stands for winter thermal cover/roosting sites.

Wood Duck

The western Upper Peninsula goal for wood duck is to maintain or increase suitable habitat. Management should focus on the protection of forest wetland, riparian corridors, providing large cavity trees, mast and the management of priority wildlife management areas with suitable habitat.

Wildlife habitat specifications:

- In landscapes that contain streams, beaver ponds and other potential habitat for wood ducks, provide potential nesting sites by providing mature forest and/or big-tree silviculture near water.
- Retain some large diameter over-mature cavity trees within 300 feet of water bodies for cavities in lowland and upland hardwoods. Where adjacent forest is young or cavities limited, nest trees should be promoted.

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- Where appropriate, manage for mast in riparian areas.
- Increase potential riparian buffers to 300+ feet, where desired, instead of the standard 100 foot best management practice.

4.15.3 – 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 eighteen listed species and no natural communities of note occurring in the management area as listed in Table 4.15.2. 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.

The Portage Marsh and the Hayward (North) Lake Wetland Complex are state wildlife management areas are special conservation areas within this management area as shown in Figure 4.15.9.

Approximately 2,087.6 acres of potential old growth have been identified within the Green Bay Lake Plain 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 is only one high conservation value area in the management area and that is the 147 acre Green Bay Lake Plain coastal environmental area (Figure 4.15.9). There are no ecological reference areas identified in the management area.

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.

Table 4.15.2. Occurrence information for special concern, rare, threatened and endangered communities and species for the Green Bay Lake Plain management area.

Common Name	Scientific Name	Status	Status in Management Area	Climate Change Vulnerability Index (CCVI)	Confidence	Natural Community Association	Probable Cover Types	Successiona Stage
Birds Northern goshawk American bittern	Accipiter gentilis	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 Dry northern forest	Lowland mixed Jack Pine, Red Pine	Mid Late
						Dry-mesic northern forest	White Pine	Late
						Boreal forest	Upland & Lowland Sp/F	Mid
	Botaurus lentiginosus	SC/G4/S3-4	Confirmed	MV	Very High	Great Lakes marsh	Lowland open/semi-open	N/A
						Emergent marsh	Lowland open/semi-open	N/A
						Coastal plain marsh	Lowland open/semi-open	N/A
						Northern wet meadow	Lowland open/semi-open	N/A
						Southern wet meadow	Lowland open/semi-open	N/A
						Lakeplain wet prairie	Lowland open/semi-open	N/A
						Lakeplain wet-mesic prairie	Lowland open/semi-open	N/A
						Wet-mesic sand prairie	Lowland open/semi-open	N/A
						Wet prairie Northern fen	Lowland open/semi-open Lowland open/semi-open	N/A N/A
						Poor fen	Lowland open/semi-open	N/A
						Coastal fen	Lowland open/semi-open	N/A
Red-shouldered hawk	Buteo lineatus	T/G5/S3-4	Confirmed	PS	Very High	Floodplain forest	Lowland mixed	Mid
Red-shouldered hawk				1		Dry-mesic northern forest	White Pine	Late
						Mesic northern Forest	Northern Hardwood	Late
Northern harrier	Circus cyaneus	SC/G5/S3	Confirmed	MV	Moderate	Emergent marsh	Lowland open/semi-open	N/A
						Great Lakes marsh	Lowland open/semi-open	N/A
						Coastal plain marsh	Lowland open/semi-open	N/A
						Northern wet meadow	Lowland open/semi-open	N/A
						Lakeplain wet prairie	Lowland open/semi-open	N/A
						Lakeplain wet-mesic prairie	Lowland open/semi-open	N/A
	+					Wet prairie	Lowland open/semi-open	N/A
March uman						Wet-mesic sand prairie	Lowland open/semi-open Lowland open/semi-open	N/A
	Cistothorus palustris	SC/G5/S3S4	Confirmed	PS	Very High	Mesic prairie Great Lakes marsh	Lowland open/semi-open	N/A N/A
Marsh wren	cistotnorus pulustris	30/03/3334	comme	гэ	veryriigii	Coastal plain marsh	Lowland open/semi-open	N/A
						Emergent Marsh	Lowland open/semi-open	N/A
ellow rail	Cotumicops noveboracensis	T/G4/S1S2	Confirmed	MV	Very High	Northern wet meadow	Lowland open/semi-open	N/A
Common loon	Falco columbarius	T/G5/S1S2	Confirmed	PS	Very High	Boreal forest	Upland & Lowland Sp/F	Mid
						Great Lakes barrens	Upland open/semi-open	N/A
	Gavia immer	T/G5/S3-4	Confirmed	HV	Very High	Emergent Marsh	Lowland open/semi-open	N/A
Baid eagle						Bog	Lowland open/semi-open	N/A
	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 Dry-mesic northern forest	Jack Pine, Red Pine White Pine	Early Late
						Mesic northern Forest	Northern Hardwood	Late
Least bittern Black-crowned night-heron Osprey	Ixobrychus exilis	T/G5/S2	Confirmed	MV	Very High	Great Lakes marsh	Lowland open/semi-open	N/A
	inobi yenus exilis	17 03/32	conned		verymgn	Coastal plain marsh	Lowland open/semi-open	N/A
						Emergent Marsh	Lowland open/semi-open	N/A
	Nycticorax nycticorax	SC/G5/S2S3	Confirmed	IL	Moderate	Great Lakes marsh	Lowland open/semi-open	N/A
						Emergent marsh	Lowland open/semi-open	N/A
						Coastal plain marsh	Lowland open/semi-open	N/A
						Inundated shrub swamp	Lowland open/semi-open	N/A
	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
Caspian tern	Channel and In	TICTICS	Confirm			Hardwood-conifer swamp	Lowland Mixed	Mid
	Sterna caspia	T/G5/S2	Confirmed	MV	Moderate	Sand & gravel beach	Lowland open/semi-open	N/A
Common tern	Sternia hirundo	T/G5/S2	Confirmed	MV	Moderate	Sand & gravel beach	Upland open/semi-open	N/A
Mullusk Slippershell mussel	Alasmidonta viridis	T/G4G5/S2S3	Confirmed	EV	Very High	Headwater Stream	Aquatic	N/A
		., 5-10-5/32-33		L *	• cry ringri	Mainstem streams	Aquatic	N/A N/A
	1	1				Inland lake	Aquatic	N/A
inail			İ	İ				.,
herrystone drop snail	Hendersonia occulta	T/G4/S1	Confirmed	EV	Low	Limestone cliff	Upland open/semi-open	N/A
						Mesic northern forest	Northern Hardwood	Late
eptile								
Wood turtle	Glyptemys insculpta	SC/G4/S2S3	Confirmed	MV	Moderate	Northern wet meadow	Lowland open/semi-open	N/A
						Bog	Lowland open/semi-open	N/A
						Rich conifer swamp	Tamarack	Late
						Hardwood-conifer swamp	Lowland Mixed	Mid
						Northern shrub thicket	Upland open/semi-open	N/A
1						Mesic northern forest	Northern Hardwood	Late
lant	Column halles	TICTICS	Confirme 1			Disk and fee as	Touronal	, .
Calypso or fairy-slipper	Calypso bulbosa	T/G5/S2	Confirmed			Rich conifer swamp	Tamarack	Late
	-	-				Boreal forest	Upland & Lowland Sp/F	Mid
	+					Limestone bedrock glade	Upland open/semi-open Upland open/semi-open	N/A
	+					Volcanic bedrock lakeshore Wooded dune & swale complete		N/A N/A
	+					Dry northern forest	Jack Pine, Red Pine	N/A Late
		1				Dry-mesic northern forest	White Pine	Late
		1		1	1	by mesic nor dien i orest	winterine	Late
						Great Lakes barrens	Upland 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.





4.15.4 - 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 area include:

- White trunk rot of aspen
- Hypoxylon canker
- Spruce budworm
- Emerald ash borer
- Beech bark disease

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:

- Glossy buckthorn
- Japanese barberry
- Japanese knotweed
- Phragmites
- Autumn olive
- Russian olive

4.15.5 – 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 4.5.1.

4.15.6 – Fire Management

Primarily lowland forest with scattered upland forest, this area probably rarely sustained significant fire impacts.

• All wildfires within the management area will be subject to appropriate initial attack response.

4.15.7 – Public Access and Recreation

This area has good public and management access. The Forest Islands Off-Road Vehicle Trail and Route is located in this area as shown in Figure 4.15.1. The Cedar River Pathway (Figure 4.15.1) is also located in this area adjacent to the Cedar River North State Forest Campground.

Specific hunting recreation improvements such as parking lots, gates, trail planting and trail establishment, as well as the preparation and dissemination of specific promotional material, may be made as a result of Grouse Enhanced Management Systems areas planning in this management area.

• Work to expand public and management access as opportunities arise.

4.15.8 - 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 lacustrine (lake) sand and gravel, coarse-textured till, an end moraine of coarse-textured till, peat and muck and glacial outwash sand and gravel and post glacial alluvium. The glacial drift thickness varies between 10 and 50 feet. Sand and gravel pits are located in the management area and there is potential on the uplands for additional pits.

The Ordovician Trenton and Black River Formations subcrop below the glacial drift. The Trenton and Black River are quarried for dolostone/stone near Escanaba.

Metallic mineral exploration is not known to have occurred in the management area in the past. Metallic mineral potential appears to be limited in this area.