4.10 MA 10 – Drummond Island MA

Summary of Use and Management

Vegetative management in the Drummond Island management area (MA) (Figure 4.10.1) will emphasize protecting the unique character of the area and the threatened, endangered and special concern species found within while providing timber products, recreational opportunities and wildlife habitat. Timber management objectives will include improving the age-class diversity of aspen, lowland poplar and other species managed through even-aged harvesting; and providing for regeneration of cedar. The management area contains several ecological reference areas and provides habitat for several rare and threatened plants and animals. Many forms of recreation are popular here and management reflects these uses. The DNR is working with Drummond Island stakeholders on a management planning process for the island. Recommendations have been formed based on stakeholder input and were presented to the Natural Resource Commission. The purpose of the process is to create a comprehensive plan for the island which will provide for the wise use and enjoyment of the island's wildlife, forests and related natural resources while preserving and protecting the values of the resources including the island's rare and unique features.

Introduction

The Drummond Island management area, located in Chippewa County, consists of 43,771 acres of state-owned land. The primary attribute of this management area is the social and economic considerations associated with the island landform. Additional attributes which were important in identifying this management area include:

- The management area falls within the Niagaran Escarpment and Lake Plain subsection of the eastern Upper Peninsula ecoregion (Albert, 1995).
- Drummond Island is part of the Niagaran Escarpment spanning Lake Michigan and Lake Huron. Karst features include sinkholes, rock bluffs and alvar. Underlying limestone bedrock is typically less than 50 feet below the surface and is exposed in many places, especially along the coastline. This southern portion of Drummond Island has deeper soil over the limestone substrate and less area of alvar as compared to the north part of the island known as Maxton Plains.
- Recreational opportunities are numerous and include: hunting, trapping, fishing, boating, kayaking and snowmobiling and off-road vehicle (ORV) riding.
- There are several ecological reference areas, high conservation value areas and special conservation area in the management area. The coastal zone is habitat for several rare, threatened and endangered Great Lakes endemic species. Use by neotropical migratory birds is heavy along the southern coast.
- The Potagannissing Wildlife Flooding Area lies within the management area. It is managed primarily for waterfowl, marsh birds and aquatic furbearing species.
- This management area contains one of the eastern Upper Peninsula Grouse Enhanced Management Systems (GEMS) 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.

Drummond Island is the site of historic Fort Drummond, used by British Forces, circa 1812. There was a large Indian village on the island before the fort was built and there are many additional known archeological sites within this management area.

The state forest land is confined to Drummond Island, in both small and large parcels, interspersed with private ownerships. A large portion of this ownership was purchased using state game fund dollars. The Drummond Island management area falls within the Sault Ste. Marie Forest Management Unit. The predominant cover types, acreages and projected harvest acres for the management area are shown in Table 4.10.1.

Table 4.10.1. Current cover types, acreages, projected harvest acres and projected ten-year cover type acreage for the Drummond Island 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	26%	11,215	3,773	7,442	81	0	11,215	1,240	0
Cedar	17%	7,554	274	7,280	30	0	7,554	455	0
Northern Hardwood	15%	6,624	113	6,511	0	2,739	6,624	0	3,026
Lowland Open/Semi-Open Lands	6%	2,787	0	2,787	0	0	2,787	0	0
Upland Open/Semi-Open Lands	5%	2,347	0	2,347	0	0	2,347	0	0
Lowland Aspen/Balsam Poplar	4%	1,966	1,104	862	0	0	1,966	144	0
Lowland Deciduous	4%	1,759	906	853	42	0	1,759	95	0
Upland Conifers	4%	1,541	0	1,541	483	200	1,541	171	717
Lowland Conifers	3%	1,371	325	1,046	116	0	1,371	116	0
Upland Mixed Forest	3%	1,234	0	1,234	137	365	1,234	137	365
Misc Other (Water, Local, Urban)	5%	2,105	0	2,105	0	0	2,105	0	0
Others	7%	3,268	565	2,703	386	357	3,268	342	375
Total	100%	43,771	7,061	36,710	1,275	3,661	43,771	2,700	4,483

Others include: lowland deciduous, lowland conifers, upland conifers, upland mixed forest, upland spruce/fir, lowland mixed forest, paper birch, mixed upland deciduous, white pine, tamarack, red pine, natural mixed pines, lowland spruce/fir and oak.

4.10.1 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 canopy species.

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

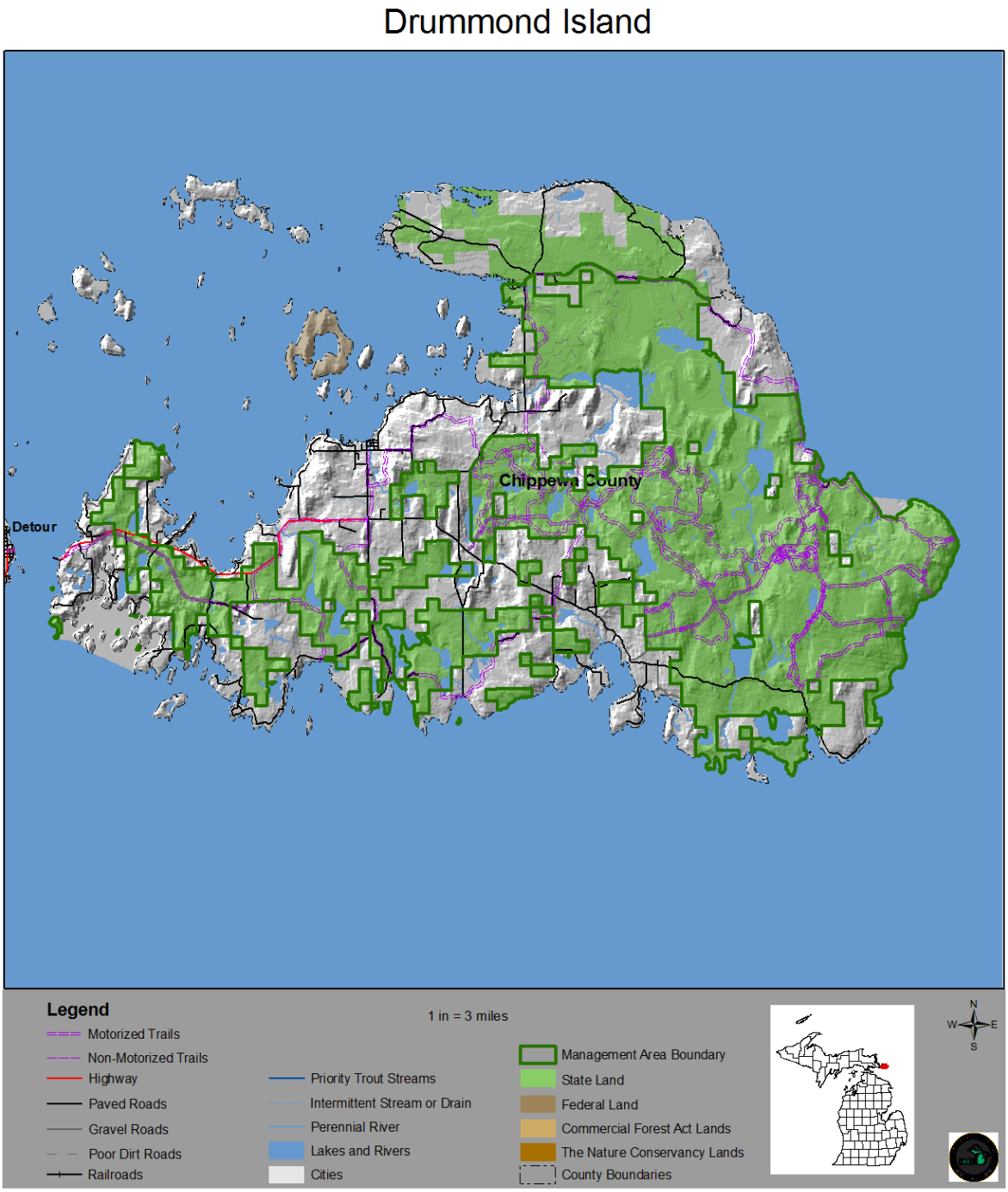

Figure 4.10.1. Location of the Drummond Island management area (dark green boundary) in relation to surrounding state forest lands other ownerships and Lake Huron.

Section 4.10.1.1 Forest Cover Type Management - Aspen

Current Condition

Aspen occurs on 11,772 acres (27%) of the management area (Table 4.10.1). Aspen stands are distributed on sites with Kotar habitat types of PArVAa, ATFD and AFPo (see Appendix E). These are dry-mesic to mesic sites with high potential to grow quality trees. Aspen has been consistently harvested and regenerated since markets improved on the mainland and ferry service was improved. Much of the aspen is growing in association with northern white cedar. Aspen within the Drummond Grouse Enhanced Management System area may be managed slightly different than the rest of the aspen within the management area through shorter rotations and smaller harvest block size.

Currently, there are 1,039 acres prescribed for final harvest (Figure 4.10.2). There are some stands in other cover types with harvest prescriptions that are expected to convert to aspen after harvest. These acres are shown in Figure 4.10.2 in the regeneration prescriptions column.

There are 3,774 acres of aspen 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. Inaccessible stands of aspen will eventually succeed to late successional species.

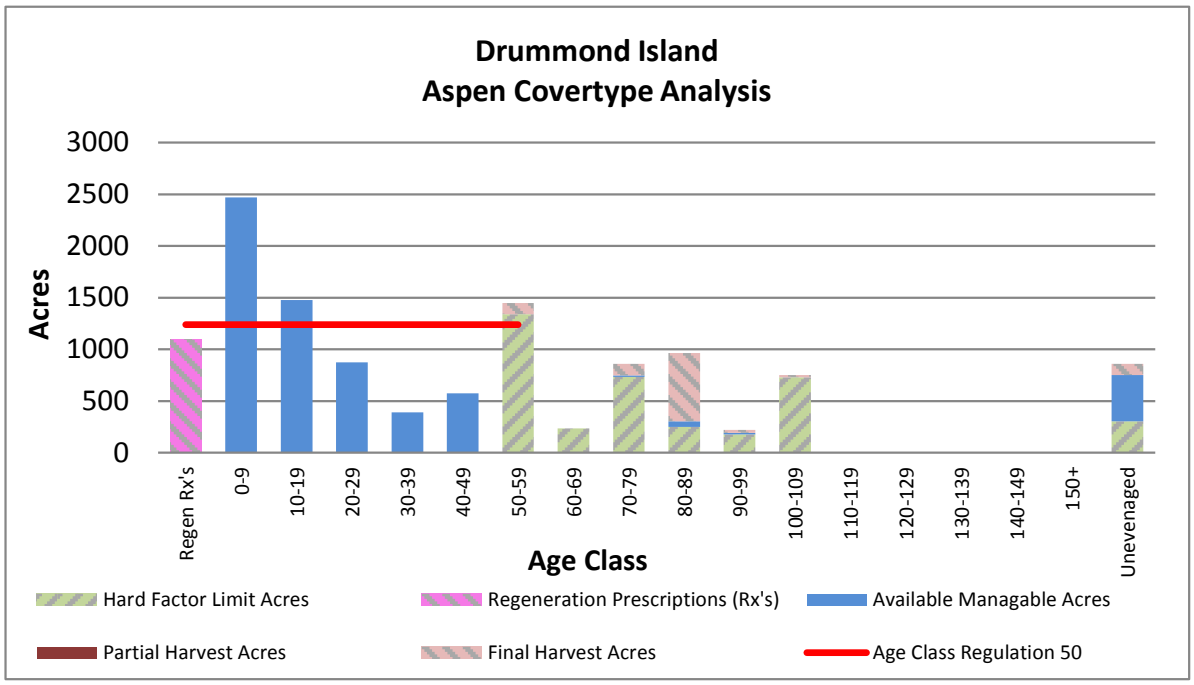

Figure 4.10.2. Age-class distribution of aspen in the Drummond Island management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

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

10-year Management Objectives

- The 10-year projected final harvest is 81 acres of aspen, which is lower than the regulated amount due to the current age-class structure having a large number of stands in the 0-9 age class and the regeneration prescriptions column; and
- 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.

Long-Term Management Objectives

- Balance the age classes of available aspen providing a regulated harvest of approximately 1,140 acres for final harvest per decade (red line in Figure 4.10.2).

Section 4.10.1.2 Forest Cover Type Management - Cedar

Current Condition

Cedar stands occur on 7,554 acres (17%) of the management area (Table 4.10.1). Cedar stands in this area often have a component of large, old super-canopy aspen. A large number of cedar stands in this management area have been coded as uneven-aged, having trees of various sizes and ages (Figure 4.10.1). Some of these stands are within deer wintering areas. Maintaining a closed canopy provides important cover for deer and reduces snow depth within the stands. Cedar is a preferred winter food species of deer and deer browsing has limited cedar regeneration in some areas. There is a need to address future cedar cover within deer wintering complexes. Timely regeneration of cedar is a concern from both wildlife and forest management perspectives. It is important to ensure that cedar and/or hemlock recruitment/regeneration is reliable when harvesting in this cover type.

Currently, there are no acres prescribed for harvest (Figure 4.10.3). There are 274 acres with site conditions limiting harvest this entry period. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations.

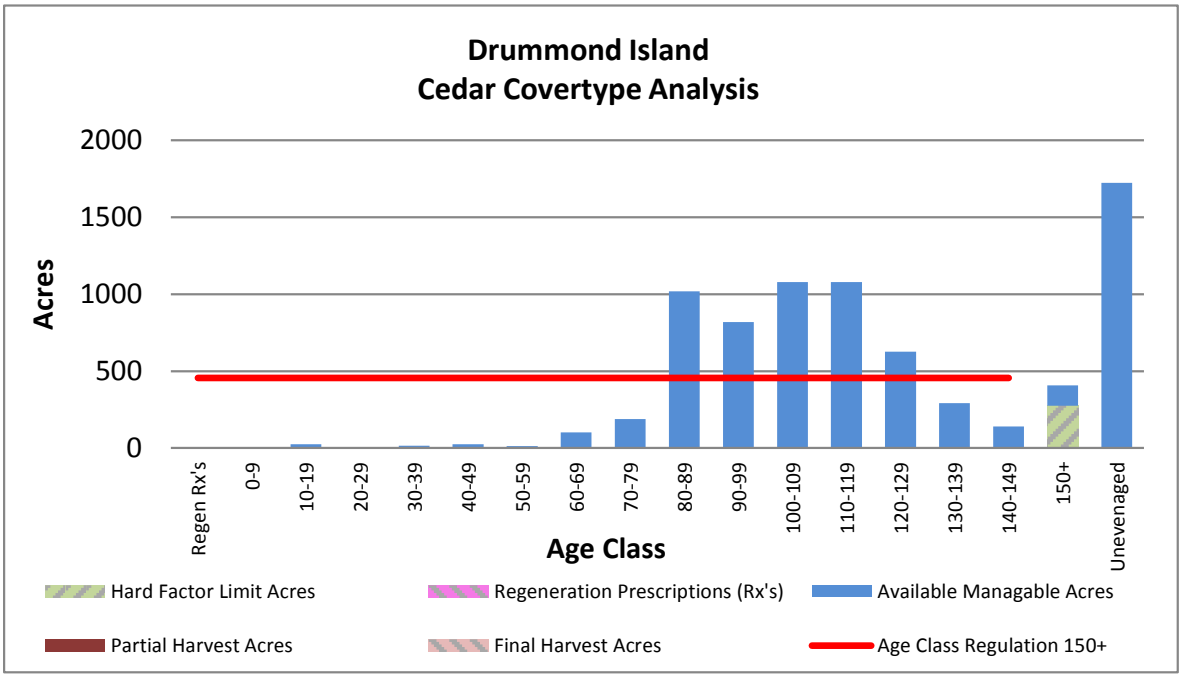

Figure 4.10.3. Age-class distribution of cedar in the Drummond Island management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Where deer wintering activities are not a concern, cedar will be maintained on operable sites through even-aged management.

10-year Management Objectives

- The 10-year projected harvest of cedar is approximately 30 acres with the projected harvest amount being significantly lower than the regulated amount due to deer wintering habitat. However, harvest of this type, if it occurs, may vary widely from the projected harvest, in order to meet the long-term management objectives.

Long-Term Management Objectives

- Develop a comprehensive deer wintering complex management plan focusing on cedar management for winter deer habitat.
- Look for opportunities to test different methods of regenerating cedar, especially outside of the deer wintering areas.
- A regulated harvest provides approximately 455 acres of cedar for final harvest per decade.

Section 4.10.1.3 Forest Cover Type Management – Northern Hardwoods

Current Condition

Northern hardwood occurs on 6,624 acres (15%) of the management area (Table 4.10.1). Northern hardwood stands in this area have a range of Kotar habitat classes including PArVAa, ATFD, AFPo and AFOAs (see Appendix E). Much of the hardwood was cut over in the 1920s. Since then, the majority of the stands have been managed using single tree selection harvesting to work toward an uneven-aged state thereby having trees of varying ages and sizes. Hardwoods are somewhat slow growing on the shallow soils found here. Maple regeneration is sparse in some areas and beech regeneration has become predominant in the understory. Where stand quality warrants, selection harvests will occur in stands with a basal area over 120 square feet per acres, decreasing stocking levels to approximately 80 square feet per acre. In general this will allow most hardwood stands to be select harvested every 20 years. Where site quality is poor shelterwood and other even-aged harvesting systems will be considered.

Beech bark disease is found throughout the management area and salvage of 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 the lower than normal residual basal area.

Currently, there are 1,177 acres with a partial or selection harvest prescribed (Figure 4.10.4). There are 113 acres of northern hardwood that have site conditions limiting their harvest at this time. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations.

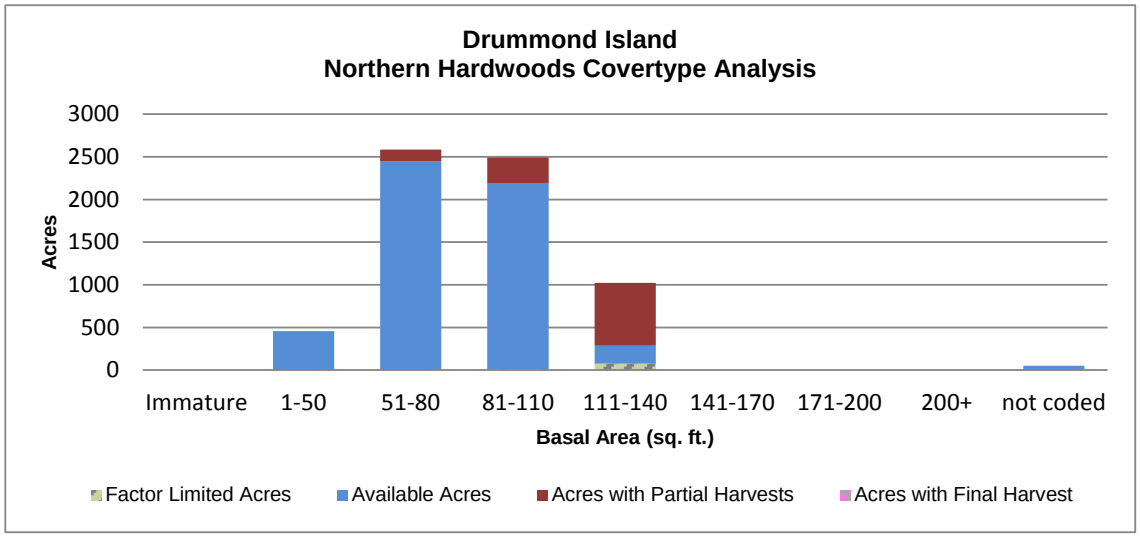

Figure 4.10.4. Basal area distribution of northern hardwood in the Drummond Island management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Northern hardwood stands will be maintained on operable sites, generally using individual tree selection harvesting to provide uneven-aged composition and structurally diverse stands.
- Harvesting will provide for a continuous flow of timber products and a variety of wildlife habitat and recreational opportunities.

10-year Management Objectives

- The 10-year projected harvest is 2,739 acres of partial or selection harvest in northern hardwoods.
- Evaluate stands previously dominated by beech to determine the impact of beech bark disease on regeneration.
- Track beech regeneration in these stands.
- Consider herbicide applications on beech regeneration to promote regeneration of other species.
- In areas that are losing beech to beech bark disease, consider 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 4.10.1.4 Forest Cover Type Management – Lowland Open/Semi-Open Lands

Current Condition

The management area contains a large amount of lowland open/semi-open lands totaling 2,787 acres (6%) (Table 4.10.1) This category is a combination of marsh (1,362 acres), lowland shrub (1,425 acres), treed bog (zero acres) and bog (zero acres). These cover types function ecologically as sources of habitat for numerous species of wildlife. In this management area, several ecological reference areas and natural communities of note are found within these cover types (see sub-section 4.10.3).

Desired Future Condition

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

Long-Term Management Objectives

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

Section 4.10.1.5 Forest Cover Type Management – Upland Open/Semi-Open Lands

Current Condition

Upland open/semi-open lands occur on 2,347 acres (5%) of the management area (Table 4.10.1). This category is a combination of the following non-forested land cover types: herbaceous open land (1,572 acres), upland shrub (437 acres), low-density trees (336 acres) and bare/sparsely vegetated (two acres). These communities are valued ecologically as sources of open land habitat for numerous species of wildlife. Several ecological reference areas and natural communities of note are found within these cover types (see sub-section 4.10.3).

Desired Future Condition

- The large upland openings will be maintained to benefit a variety of wildlife species, provide recreational opportunities and protect and maintain ecological values.

Long-Term Management Objectives

- Continue to maintain large upland openings through timber sales and forest treatment proposals.
- Work on decreasing the amount of spotted knapweed and other invasive plants in the large opening complexes using biological and mechanical treatments.

Section 4.10.1.6 Forest Cover Type Management – Other Types

Current Condition

There are many cover types that make up less than 5% of the total management area acres (Table 4.10.1), including: lowland aspen/balsam poplar (1,966 acres or 4%), lowland deciduous (1,759 acres or 4%), upland conifers (1,541 acres or 4%), lowland conifers (1,371 acres or 3%) and upland mixed forest (1,234 acres or 3%).

The “other types” category (3,268 acres or 7%) is a combination of the forested cover types in the management area with 2% or less of the total acres and includes: lowland mixed forest, upland spruce/fir, paper birch, mixed upland deciduous, white pine, tamarack, red pine, natural mixed pines, lowland spruce/fir and oak. The “miscellaneous other” category is a combination of non-forested stands including water, roads, rock and sand/soil.

Following general timber management guidelines, most of these cover types will be managed as even-aged stands balancing age classes where possible. Natural regeneration is expected after harvest. Mixed cover types with high basal area may be thinned depending on the species composition prior to final harvest.

Many of these minor cover types currently have harvests prescribed. Approximately 2,900 acres of these other minor cover types 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. Some stands may be inaccessible for harvesting, and will be subject to succession.

Desired Future Condition

- These cover types may be managed on operable sites contributing to the compositional diversity of the landscape while providing for continual harvest, available wildlife habitat and recreation opportunity.

10-year Management Objectives

- The projected 10-year final harvest is 483 acres of upland conifers, 116 acres of lowland conifers, 137 acres of upland mixed forest and 386 acres of other types.
- The projected 10-year partial harvest is 200 acres of upland conifers, 365 acres of upland mixed forest and 357 acres of other types.

Long-Term Management Objectives

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

4.10.2 – Featured Species Management

Much of the land in this management area was purchased specifically for the purpose of wildlife restoration. Within the aspen and northern hardwood cover types, regeneration of aspen for game species, and maintaining within-stand vegetative structure, are key goals, especially adjacent to lowland conifer and cedar cover types. Closed canopy cedar stands in the southern half of the island are critical wintering habitat for white-tailed deer. Trees along the edge of the shoreline are important foraging areas for neotropical migrants.

This management area will include one of the eastern 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 hare. Habitat treatments may include managing aspen on a shortened rotation with multiple age classes and smaller stand sizes.

Black Bear

The goal for black bear in the eastern Upper Peninsula is to maintain or improve habitat. Bear on Drummond Island are closely monitored and very few bears are allowed to be harvested each season. Hard mast is critical in the fall for bears to achieve adequate weight gains before denning. 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 tree species that provide mast including beech, oak, black cherry and ironwood.
- Beech trees with bear claw scars on the bark are generally good mast producers and should be retained wherever possible.
- Retain some large diameter white pine and hemlock for bear 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, use and management activities that facilitate fragmenting state lands within the management area.

Northern Goshawk

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

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

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.
- 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.
- Evaluate the conifer component in aspen stands, holding or increasing where desirable. Leave conifer under four-inch diameter at breast height in mixed stands and aspen types as immediate residual escape cover and to promote corridors.
- Maintain cherry production for soft mast.

Sharp-tailed Grouse

In the eastern Upper Peninsula, the goal for sharp-tailed grouse is to maintain or improve suitable habitat. Management should focus on enhancing large opening complexes so there is an increase of available habitat.

Wildlife habitat specifications:

- Maintain or expand herbaceous open lands where existing leks occur.
- Manage adjacent forest to maintain young regenerating forest adjacent to permanent openings to maximize use by sharp-tailed grouse.
- Consolidate grass openings and planted red pine to increase the stand size of both cover types.
- Use prescribed fire where appropriate to maintain openings and manage pine types.
- Within open land complexes, maintain connectivity across the landscape.

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 4 inch diameter at breast height.
- Regenerate black spruce stands to young, dense stocking adjacent to uplands.
- In hare habitat, discourage biomass harvesting and chipping operations in this management area.
- Retain down coarse woody debris slash already present (before cutting) and slash 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 residuals.

White-tailed Deer

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

Wildlife habitat specifications for deer wintering complexes:

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

4.10.3 – Rare Species and Special Resource Area Management

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

Past surveys have noted and confirmed forty-one listed species as well as nine natural communities of note occurring in the management area as listed in Table 4.10.2. 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 4.10.2 Occurrence information for special concern, rare, threatened and endangered communities and species for the Drummond Island 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 Commuities								
Alvar		S1/G2?	Confirmed				Upland open/semi-open	N/A
Boreal forest		S3/GU	Confirmed				Upland & Lowland Sp/F	Mid
Great Lakes marsh		S3/G2	Confirmed				Lowland open/semi-open	N/A
Limestone bedrock glade		S2/G2G4	Confirmed				Upland open/semi-open	N/A
Limestone bedrock lakeshore		S2/G3	Confirmed				Upland open/semi-open	N/A
Limestone cliff		S2/G4G5	Confirmed				Upland open/semi-open	N/A
Limestone cobble shore		S3/G2G3	Confirmed				Upland open/semi-open	N/A
Northern shrub thicket		S5/G4	Confirmed				Upland open/semi-open	N/A
Sinkhole		S2/G3G5	Confirmed				Special Feature	N/A
Birds								
American bittern	*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	Lowland open/semi-open	N/A
						Northern fen	Lowland open/semi-open	N/A
						Poor fen	Lowland open/semi-open	N/A
						Coastal fen	Lowland open/semi-open	N/A
Black tern	*Chlidonias niger*	SC/G4/S3	Confirmed	MV	Very High	Great Lakes marsh	Lowland open/semi-open	N/A
						Coastal plain marsh	Lowland open/semi-open	N/A
						Emergent Marsh	Lowland open/semi-open	N/A
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
						Wet-mesic sand prairie	Lowland open/semi-open	N/A
						Mesic prairie	Lowland open/semi-open	N/A
Marsh wren	*Cistothorus palustris*	SC/G5/S3S4	Confirmed	PS	Very High	Great Lakes marsh	Lowland open/semi-open	N/A
						Coastal plain marsh	Lowland open/semi-open	N/A
						Emergent Marsh	Lowland open/semi-open	N/A
Yellow rail	*Cotumicops noveboracensis*	T/G4/S1S2	Confirmed	MV	Moderate	Northern wet meadow	Lowland open/semi-open	N/A
Merlin	*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
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
Bald eagle	*Haliaeetus leucocephalus*	SC/G5/S4	Confirmed	IL	Moderate	Bog	Lowland open/semi-open	N/A
						Hardwood-conifer swamp	Lowland Mixed	Mid
						Northern hardwood swamp	Black Ash	Late
						Poor conifer swamp	Tamarack	Late
						Floodplain forest	Lowland mixed	Mid
						Dry northern forest	Jack Pine, Red Pine	Early
						Dry-mesic northern forest	White Pine	Late
						Mesic northern Forest	Northern Hardwood	Late
Osprey	*Pandion haliaetus*	SC/G5/S2-3	Confirmed	PS	Low	Coastal fen	Lowland open/semi-open	N/A
						Northern hardwood swamp	Black Ash	Late
						Floodplain forest	Lowland Mixed	Mid
						Hardwood-conifer swamp	Lowland Mixed	Mid
Common tern	*Stema hirundo*	T/G5/S2	Confirmed	MV	Moderate	Sand & gravel beach	Upland open/semi-open	N/A
Sharp-tailed grouse	*Tympanuchus phasianellus*	SC/G5/S4	Confirmed	PS	Moderate	Pine barrens	Jack Pine	Early
						Oak-pine barrens	Oak	Mid
						Dry sand prairie	Upland open/semi-open	N/A
						Wet-mesic sand prairie	Upland open/semi-open	N/A
						Northern shrub thicket	Upland open/semi-open	N/A
Insect								
Leafhopper	*Flexamia delongi*	*SC/GNR/S1S2*	Confirmed	PS	Very High	Lakeplain wet prairie	Lowland open/semi-open	N/A
						Lakeplain wet-mesic prairie	Lowland open/semi-open	N/A
						Alvar	Upland open/semi-open	N/A
						Coastal fen	Lowland open/semi-open	N/A
						Dry sand prairie	Upland open/semi-open	N/A
						Limestone bedrock glade	Upland open/semi-open	N/A
						Limestone bedrock lakeshore	Upland open/semi-open	N/A
						Mesic prairie	Upland open/semi-open	N/A
						Pine barrens	Jack Pine	Early
Dragonfly								
Ebony boghaunter	*Williamsonia fletcheri*	SC/G4/S1S2	Confirmed	MV	Low	Inland lake	Lowland open/semi-open	N/A
						Bog	Lowland open/semi-open	N/A
						Northern fen	Lowland open/semi-open	N/A
						Patterned fen	Lowland open/semi-open	N/A
						Poor fen	Lowland open/semi-open	N/A
						Prairie fen	Lowland open/semi-open	N/A
						Muskeg	Lowland open/semi-open	N/A
						Hardwood-conifer swamp	Lowland Mixed	Mid
						Inundated shrub swamp	Lowland open/semi-open	N/A
						Coastal fen	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.

Table 4.10.2 Occurrence information for special concern, rare, threatened and endangered communities and species for the Drummond Island management area (Continued).

Common Name	Scientific Name	Status	Status in Management Area	Climate Change Vulnerability Index (CCVI)	Confidence	Natural Community Association	Probable Cover Types	Successional Stage
Snails								
Pleistocene catinella	*Catinella exile*	T/G2/SU	Confirmed	EV	Moderate	Northern fen	Lowland open/semi-open	N/A
						Limestone cobble shore	Lowland open/semi-open	N/A
						Prairie fen	Lowland open/semi-open	N/A
						Interdunal wetland	Lowland open/semi-open	N/A
						Coastal fen	Lowland open/semi-open	N/A
Land snail	*Valloria gracilicosta albula*	E/G4Q/S1	Confirmed	HV	Moderate	Limestone cliff	Upland open/semi-open	N/A
						Mesic northern forest	Northern Hardwood	Late
Delicate vertigo	*Vertigo bollesiana*	T/G4/S2	Confirmed	HV	Moderate	Limestone bedrock lakeshore	Upland open/semi-open	N/A
						Limestone bedrock glade	Upland open/semi-open	N/A
						Limestone lakeshore cliff	Upland open/semi-open	N/A
						Volcanic cliff	Upland open/semi-open	N/A
						Limestone cliff	Upland open/semi-open	N/A
Tapered vertigo	*Vertigo elatior*	SC/G5/S3	Confirmed	HV	Moderate	Northern fen	Lowland open/semi-open	N/A
						Limestone cobble shore	Upland open/semi-open	N/A
						Limestone bedrock glade	Upland open/semi-open	N/A
						Limestone bedrock lakeshore	Upland open/semi-open	N/A
						Rich conifer swamp	Tamarack	Late
						Prairie fen	Lowland open/semi-open	N/A
						Coastal fen	Lowland open/semi-open	N/A
Hubricht's vertigo	*Vertigo hubrichti*	E/G3/S2	Confirmed	EV	Moderate	Alvar	Upland open/semi-open	N/A
						Limestone bedrock glade	Upland open/semi-open	N/A
						Limestone bedrock lakeshore	Upland open/semi-open	N/A
Mystery vertigo	*Vertigo paradoxa*	SC/G4G5Q/S3	Confirmed	HV	Low	Volcanic bedrock lakeshore	Upland open/semi-open	N/A
						Volcanic bedrock glade	Upland open/semi-open	N/A
						Limestone bedrock glade	Upland open/semi-open	N/A
						Rich conifer swamp	Tamarack	Late
						Northern fen	Lowland open/semi-open	N/A
						Mesic northern forest	Northern Hardwood	Late
						Dry-mesic northern forest	White Pine	Late
						Limestone lakeshore cliff	Upland open/semi-open	N/A
Crested vertigo	*Vertigo pygmaea*	SC/G5/S3	Confirmed	MV	Low	Limestone cliff	Upland open/semi-open	N/A
						Granite bedrock lakeshore	Upland open/semi-open	N/A
						Volcanic cliff	Upland open/semi-open	N/A
						Limestone lakeshore cliff	Upland open/semi-open	N/A
						Volcanic lakeshore cliff	Upland open/semi-open	N/A
						Volcanic bedrock cliff	Upland open/semi-open	N/A
Plants								
Climbing fumitory	*Adlumia fungosa*	SC/G4/S3	Confirmed			Sand and gravel beach	Upland open/semi-open	N/A
						Limestone cobble shore	Upland open/semi-open	N/A
						Open dunes	Upland open/semi-open	N/A
						Northern hardwood swamp	Black Ash	Late
						Granite bedrock glade	Upland open/semi-open	N/A
						Limestone bedrock glade	Upland open/semi-open	N/A
						Limestone bedrock lakeshore	Upland open/semi-open	N/A
						Limestone cliff	Upland open/semi-open	N/A
						Limestone lakeshore cliff	Upland open/semi-open	N/A
						Mesic northern forest	Northern Hardwood	Late
						Northern bald	Upland open/semi-open	N/A
						Volcanic bedrock glade	Upland open/semi-open	N/A
Wall-rue	*Asplenium ruta-muraria*	E/G5/S1	Confirmed			Limestone cliff	Upland open/semi-open	N/A
						Limestone lakeshore cliff	Upland open/semi-open	N/A
Cooper's milk vetch	*Astragalus neglectus*	SC/G4/S3	Confirmed			Alvar	Upland open/semi-open	N/A
						Boreal forest	Upland & Lowland Sp/F	Mid
						Hillside prairie	Upland open/semi-open	N/A
						Limestone bedrock glade	Upland open/semi-open	N/A
						Limestone bedrock lakeshore	Upland open/semi-open	N/A
						Limestone cobble shore	Upland open/semi-open	N/A
						Mesic sand prairie	Upland open/semi-open	N/A
						Oak-pine barrens	Oak	Mid
Green spleenwort	*Asplenium trichomanes-ramo*	SC/G4/S3	Confirmed			Mesic northern forest	Northern Hardwood	Late
						Hardwood-conifer swamp	Lowland Mixed	Mid
						Rich conifer swamp	Tamarack	Late
						Boreal forest	Upland & Lowland Sp/F	Mid
						Limestone cliff	Upland open/semi-open	N/A
						Limestone lakeshore cliff	Upland open/semi-open	N/A
						Volcanic cliff	Upland open/semi-open	N/A
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	N/A
						Volcanic bedrock lakeshore	Upland open/semi-open	N/A
						Wooded dune & swale complex	Upland open/semi-open	N/A
						Dry northern forest	Jack Pine, Red Pine	Late
						Dry-mesic northern forest	White Pine	Late
						Great Lakes barrens	Upland open/semi-open	N/A
						Volcanic bedrock glade	Upland open/semi-open	N/A
Richardson's sedge	*Carex richardsonii*	SC/G4/S3S4	Confirmed			Alvar	Upland open/semi-open	N/A
						Oak barrens	Oak	Mid
						Northern fen	Lowland open/semi-open	N/A
						Boreal forest	Upland & Lowland Sp/F	Mid
						Dry-mesic prairie	Upland open/semi-open	N/A
						Dry-mesic northern forest	White Pine	Late
						Hillside prairie	Upland open/semi-open	N/A
						Lakeplain oak openings	Upland open/semi-open	N/A
						Limestone bedrock glade	Upland open/semi-open	N/A
						Limestone bedrock lakeshore	Upland open/semi-open	N/A
						Limestone cobble shore	Upland open/semi-open	N/A
						Volcanic cliff	Upland open/semi-open	N/A
						Volcanic lakeshore cliff	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.

Table 4.10.2 Occurrence information for special concern, rare, threatened and endangered communities and species for the Drummond Island management area (Continued).

Common Name	Scientific Name	Status	Status in Management Area	Climate Change Vulnerability Index (CCVI)	Confidence	Natural Community Association	Probable Cover Types	Successional Stage
Plants (Cont'd)								
Bulrush sedge	*Carex scirpoidea*	T/G5/S2	Confirmed			Alvar	Upland open/semi-open	N/A
						Northern fen	Lowland open/semi-open	N/A
						Coastal fen	Lowland open/semi-open	N/A
						Limestone bedrock lakeshore	Upland open/semi-open	N/A
						Limestone bedrock glade	Upland open/semi-open	N/A
						Boreal forest	Upland & Lowland Sp/F	Mid
						Limestone cobble shore	Upland open/semi-open	N/A
						Volcanic bedrock lakeshore	Upland open/semi-open	N/A
Hill's thistle	*Cirsium hillii*	SC/G3/S3	Confirmed			Alvar	Upland open/semi-open	N/A
						Oak barrens	Oak	Mid
						Oak-pine barrens	Oak	Mid
						Pine barrens	Jack Pine	Early
						Boreal forest	Upland open/semi-open	N/A
						Dry northern forest	Upland open/semi-open	N/A
						Dry sand prairie	Upland open/semi-open	N/A
						Dry-mesic northern forest	Upland open/semi-open	N/A
						Dry-mesic prairie	Upland open/semi-open	N/A
						Lakeplain oak openings	Upland open/semi-open	N/A
						Limestone bedrock glade	Upland open/semi-open	N/A
						Mesic prairie	Upland open/semi-open	N/A
						Mesic sand prairie	Upland open/semi-open	N/A
						Oak openings	Upland open/semi-open	N/A
						Open dunes	Upland open/semi-open	N/A
Ram's head lady's-slipper	*Cypripedium arietinum*	SC/G3/S3	Confirmed			Rich conifer swamp	Tamarack	Late
						Boreal forest	Upland & Lowland Sp/F	Mid
						Volcanic bedrock lakeshore	Upland open/semi-open	N/A
						Hardwood-conifer swamp	Lowland Mixed	Mid
						Poor fen	Lowland open/semi-open	N/A
						Rich tamarack swamp	Tamarack	Late
						Wooded dune & swale complex	Upland open/semi-open	N/A
						Dry northern forest	Jack Pine, Red Pine	Late
						Dry-mesic northern forest	White Pine	Late
						Great Lakes barrens	Upland open/semi-open	N/A
						Limestone bedrock glade	Upland open/semi-open	N/A
						Volcanic bedrock glade	Upland open/semi-open	N/A
						Granite bedrock glade	Upland open/semi-open	N/A
Tennessee bladder fern	*Cystopteris tennesseensis*	T/G5/S2	Confirmed			Limestone cliff	Upland open/semi-open	N/A
						Mesic northern forest	Northern Hardwood	Late
						Limestone bedrock glade	Upland open/semi-open	N/A
Flattened spike rush	*Eleocharis compressa*	T/G4/S2	Confirmed			Coastal plain marsh	Lowland open/semi-open	N/A
						Lakeplain wet prairie	Lowland open/semi-open	N/A
Limestone oak fern	*Gymnocarpium robertianum*	T/G5/S2	Confirmed			Rich conifer swamp	Tamarack	Late
						Limestone bedrock glade	Upland open/semi-open	N/A
						Limestone lakeshore cliff	Upland open/semi-open	N/A
Dwarf lake iris	*Iris lacustris*	LT/T/G3/S3	Confirmed			Open dunes	Upland open/semi-open	N/A
						Alvar	Upland open/semi-open	N/A
						Wooded dune & swale complex	Upland open/semi-open	N/A
						Boreal forest	Upland & Lowland Sp/F	Mid
						Limestone bedrock glade	Upland open/semi-open	N/A
						Limestone cobble shore	Upland open/semi-open	N/A
						Limestone bedrock lakeshore	Upland open/semi-open	N/A
Purple cliff brake	*Pellaea atropurpurea*	T/G5/S2	Confirmed			Alvar	Upland open/semi-open	N/A
						Volcanic cliff	Upland open/semi-open	N/A
						Limestone cliff	Upland open/semi-open	N/A
						Limestone lakeshore cliff	Upland open/semi-open	N/A
Alaska orchid	*Piperia unalascensis*	SC/G5/S2S3	Confirmed			Boreal forest	Upland & Lowland Sp/F	Mid
						Limestone bedrock glade	Upland open/semi-open	N/A
						Limestone bedrock lakeshore	Upland open/semi-open	N/A
Pine-drops	*Pterospora andromedea*	T/G5/S2	Confirmed			Boreal forest	Upland & Lowland Sp/F	Mid
						Dry-mesic northern forest	White Pine	Late
						Dry northern forest	Jack Pine, Red Pine	Late
						Granite bedrock glade	Upland open/semi-open	N/A
						Wooded dune & swale complex	Upland open/semi-open	N/A
Small skullcap	*Scutellaria parvula*	T/G4/S2	Confirmed			Limestone cobble shore	Upland open/semi-open	N/A
						Alvar	Upland open/semi-open	N/A
						Hillside prairie	Upland open/semi-open	N/A
						Limestone bedrock glade	Upland open/semi-open	N/A
Houghton's goldenrod	*Solidago houghtonii*	LT/T/G3/S3	Confirmed			Open dunes	Upland open/semi-open	N/A
						Alvar	Upland open/semi-open	N/A
						Limestone bedrock lakeshore	Upland open/semi-open	N/A
						Interdunal wetland	Lowland open/semi-open	N/A
						Coastal fen	Lowland open/semi-open	N/A
						Limestone cobble shore	Upland open/semi-open	N/A
						Wet-mesic sand prairie	Lowland open/semi-open	N/A
Prairie dropseed	*Sporobolus heterolepis*	SC/G5/S3	Confirmed			Alvar	Upland open/semi-open	N/A
						Prairie fen	Lowland open/semi-open	N/A
						Mesic sand prairie	Upland open/semi-open	N/A
						Wet-mesic sand prairie	Lowland open/semi-open	N/A
Stitchwort	*Stellaria longipes*	SC/G5/S2S3	Confirmed			Open dunes	Upland open/semi-open	N/A
Downy oat-grass	*Trisetum spicatum*	SC/G5/S2S3	Confirmed			Alvar	Upland open/semi-open	N/A
						Volcanic bedrock lakeshore	Upland open/semi-open	N/A
						Volcanic cobble shore	Upland open/semi-open	N/A
						Volcanic lakeshore cliff	Upland open/semi-open	N/A
						Sandstone lakeshore cliff	Upland open/semi-open	N/A
						Granite bedrock lakeshore	Upland open/semi-open	N/A
						Granite lakeshore cliff	Upland open/semi-open	N/A

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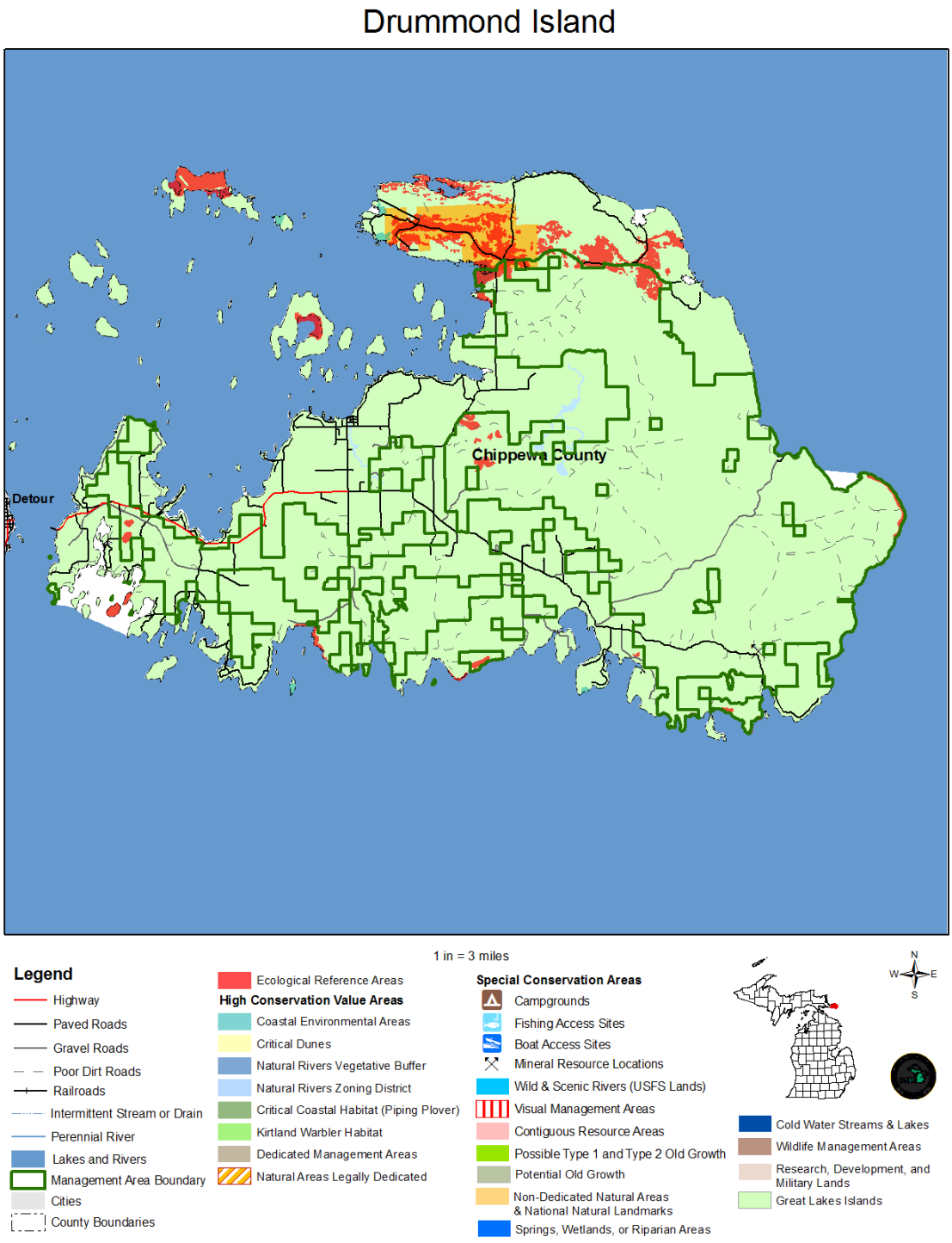

Figure 4.10.5. A map of the Drummond Island management area showing the special resource areas.

The entire Drummond Island management area is a Great Lakes Islands special conservation area. Other special conservation areas include the south edge of the Maxton Plains non-dedicated natural area (Figure 4.10.5), the Potagannissing Flooding which is a major wetland complex and cold water lakes and streams. In addition, approximately 2,000 acres were identified as potential old growth, and these stands are also special conservation areas until they are evaluated.

A coastal environmental area on the north edge of the management area represents the only high conservation value area in the management area (Figure 4.10.5).

There are ten ecological reference areas in the management area (Figure 4.10.5) representing the following natural communities: alvar (two – 245 acres and 39 acres); sinkhole (one at 69 acres); Great Lakes marsh (one at 122 acres); limestone cliff (one at 63 acres); limestone bedrock glade (two – 27 acres and 58 acres) and limestone bedrock lakeshore (three – 12 acres, 9 acres and 26 acres). All ecological reference areas will be managed to protect and enhance their natural vegetative and wildlife communities as directed by an ecological reference area-specific management plan.

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.
- Develop and maintain management and monitoring plans for ecological reference areas on state forest land.

4.10.4 – Forest Health Management

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

- Northern hardwood: beech bark disease
- Aspen and lowland poplar: white trunk rot, *Hypoxylon* canker
- 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. 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.

4.10.5 – Fire Management

The shallow soils in this management area likely produced frequent fires, so that this management area is dominated by fire-adapted communities. Significant areas of alvar are present in this management area.

- Prescribed fire is frequently used in this management area to maintain the open character of these natural communities.
- Many of the natural communities in this management area are very sensitive, due to the shallow soils. Alternative suppression tactics which avoid the use of heavy equipment may be necessary in some portions of this management area.
- High recreation use in this management area provides opportunities for targeted fire prevention messages.

4.10.6 – Public Access and Recreation

Most of the island is accessible by roads and trails. The ferry system was upgraded to allow logging of pulpwood during the late 1980s and 90s.

Recreational facilities consist of motorized trails (Figure 4.10.1) which include snowmobile trails, off-road vehicle trails, an off-road vehicle route as well as the Potagannissing Flooding boat access site (Figure 4.10.3).

There are several full-sized vehicle off-road events held on the island each year under DNR permit. This area is popular for deer, grouse and bear hunting, trapping, fishing and kayaking.

Protect rare and unique resources from excessive or unauthorized use. Continue partnerships and collaborations with Drummond Island stakeholders to ensure recreational activities are compatible with wildlife habitat and resource protection.

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.

4.10.7 – 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. There are no designated high priority trout streams identified in this management area.

4.10.8 – Minerals

Surface sediments consist of primarily thin to discontinuous sediments lacustrine (lake) sand and gravel, clay and silt and peat and muck over bedrock. There is less than 100 feet of glacial drift on the island. Sand and gravel pits are located on the island, including one state lease and there is potential for additional pits.

The Silurian Engadine, Manistique and Burnt Bluff Groups, Cabothead Shale and Manitoulin Formation and Ordovician Queenston Shale subcrop below the glacial drift. The Engadine is quarried for stone on the island.

Exploration and development for oil and gas has been limited to a few wells drilled in the Upper Peninsula (14 in Chippewa County and several on the island). 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.

There is a large limestone mine in this management area.