

**FOREST MANAGEMENT PLAN**  
Bay Mills Indian Community  
Chippewa County, Michigan  
Department of the Interior Bureau of Indian Affairs

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## Chapter 1. INTRODUCTION

This Forest Management Plan (FMP) establishes management standards and guidelines for the Bay Mills Indian Community's (BMIC) forestland. The FMP has been developed based upon a resource-specific management policy. This plan applies to all lands within the BMIC that are

- a) at least one acre in size, including timberland and woodland which
- b) is characterized by a more or less dense and extensive tree cover
- c) contains, or once contained, at least ten percent tree crown cover, and
- d) is not developed or planned for exclusive non-forest use.

The reservation land base is small thus limiting forest management opportunities to invasive species control; threatened and endangered species habitat; fuels reduction; recreation enhancement and forest enhancement (primarily on Sugar Island). The Bay Mills Indian Community aims to manage their forestland for the benefit of all beings (relatives). Site-specific goals and objectives will be addressed in detail in [Chapter 6](#). The vision for the sustainable management of forestland has the following characteristics:

1. Will inventory forest resources and monitor for impacts to other resources.
2. Will support management goals and objectives of other natural resources management plans as opportunities arise, especially when they enhance *nibi* (water) quality and fish nursery habitat.
3. Will offer habitat for non-timber forest products as available and appropriate.
4. Will favor or restore native beings that are expected to do well under future conditions and that can help meet future needs. These may include adaptive measures to create a more-resilient forest in the face of climate change. These may also include tree planting that supports food sovereignty.
5. Will respond to weather events, such as wind-throw, flooding, fire, or disease, and plant new trees when suitable.
6. Will be sensitive to cultural significance of the forestland in all aspects of the community.
7. Will maintain or improve the ability of forest communities to balance the effects of *manidoosag* (little spirits/ forest pests and pathogens).
8. Will maintain or improve the ability of forest communities to balance the effects of *bakaan ingoji ga-ondaadag* (non-local beings).
9. Management of BMIC lands will be according to accepted Best Management Practices. Standards will be maintained and improved by implementation and review of codes of practices, management guidelines, prescriptions, licensing, and regulations of vegetation manipulation on reservation land.
10. Will encourage and facilitate suitable use of forestland for recreation and tourism.

This FMP has been developed in accordance with the requirements of 53 Indian Affairs Manual (IAM) Chapter 2, Forest Management Planning, Release #128, September 1, 2006.

## 1.1 Purpose of Management Plan

The key aim of this FMP is to ensure that forestlands on the BMIC are managed in an environmentally sensitive, culturally-sensitive, sustainable, and economically viable manner. In addition, this FMP is aimed to ensure that planning is a continuing process, responsive to changing community expectations, and expanding knowledge of the forest ecosystem. To achieve this aim, this FMP proposes the use and management of forestland that will be in harmony and balance with the conservation of natural, aesthetic, and cultural values across the whole reservation.

## 1.2 Need for Management Plan

According to 53 IAM Section 2.4:

*“All forested reservations, as categorized in 53 IAM 2.8A, in trust or restricted status, shall have a current Forest Management Plan (FMP) which satisfies 25 CFR 163.11 prior to the authorization of activities or expenditure of funds for forest management activities, except as provided for under 53 IAM 2.7. FMPs shall be covered by an appropriate environmental document in accordance with the National Environmental Policy Act (NEPA).”*

There are only six activities that can occur on trust or restricted lands without an FMP, including the following:

1. Preparation of an FMP (25 CFR 163.11);
2. Emergency sale of timber on allotted lands (25 CFR 163.14(b));
3. Free use cutting without permit (25 CFR 163.27);
4. Fire management measures (25 CFR 163.28(a), (b) and (c));
5. Trespass protection and prosecution (25 CFR 163.29); and
6. Insect and disease control (25 CFR 163.31(b)).

## 1.3 Scoping of Plan and Stakeholder Involvement

Stakeholders are an integral part of the forest-management process. Therefore, contacting stakeholders should be a priority during the development of the BMIC Forest Management Plan. Target audiences will include:

1. Bay Mills Tribal Members
2. Residents
3. Government Agencies including other local tribes
4. Local Organizations/Societies
5. Businesses and Industries
6. Farmers
7. Municipalities
8. Developers & Construction Entities

A stakeholder meeting will be held prior to the submission of the BMIC Forest Management Plan in order to address any and all concerns held by the stakeholder community which are not addressed in the original draft. Upon completion of the initial draft of this document, comments will also be sought during a 30-day

public-comment period. Following the public comment period, the FMP writing team will compile all comments and decide which comments need to be incorporated into the plan.

Stakeholders have also communicated their natural resources wishes and priorities through the following initiatives:

- Waishkey River Watershed Management Plan—desired uses survey and public outreach meeting
- BMIC 2019-2023 Recreation Plan and related surveys
- BMIC Trails committee
- Invasive species survey
- BMIC Conservation Committee
- Direct communication during the scotch pine removal project
- BMIC 2021 community survey of desired forest uses

## Chapter 2. THE HUMAN ENVIRONMENT

### 2.1 Reservation Setting and Core Forest Management Areas

The Bay Mills Indian Community is a federally recognized Indian Tribe located in Chippewa County, Michigan. The people of the Bay Mills Indian Community have for thousands of years relied on the terrestrial and aquatic resources of what is now the eastern Upper Peninsula of Michigan. This tradition continues today with commercial and subsistence fishing playing a vital economic and cultural role in the community. Inland aquatic resources also provide opportunities for gathering, hunting and trapping, and sport fishing.

Current Tribal enrollment is 2,208. At least half of these people (1,036) live in Chippewa County. At least 828 Tribal members live on reservation and demand for housing is increasing. The BMIC Enrollment Department characterizes membership population is comparatively young, for the region and state.

The reservation is located in Chippewa County within two separate areas. The majority of the reservation, 3,390.36 acres, lies northwest of Brimley, Michigan, in the eastern parts of Bay Mills Township and Superior Township, while the remainder of the reservation, 660.67 acres, lies on Sugar Island in the St. Mary's River. BMIC sits within the boundaries of Chippewa County, in the North West quadrant. The main road, West Lakeshore Drive, follows the shoreline and extends through much of the community's lands, while S. Red Pine, W. Spectacle Lake, W. Tower Road, S. Pine Village Road, all lead west to neighborhoods and residential areas. Beyond transportation by car, there are hundreds of miles off-road trails.

The land area of the Bay Mills Indian Community Reservation is comprised of 3,390.36 acres held in trust by the federal government. Of this, 607.75 acres are located on the west side of Sugar Island along the shore of the Saint Mary's River; 566 of these acres are forest or forested wetland. The major land base is located northwest of Brimley, Michigan, a large portion of which is on the shores of the Upper Saint Mary's River within the St. Mary's River Area of Concern (AOC). The Tribe also claims a 77,170 acre reserve in Whitefish Bay in Lake Superior that includes Waishkey Bay in what is considered the Upper Saint Mary's River. This reserve is bounded by a line running due north from the mouth of the Waishkey River to the international boundary then northwest along the international boundary and then due west to the mouth of the Tahquamenon River. There are 72.5 acres of inland lakes within reservation lands, 5 miles of streams, 5.16 miles of lake shoreline, and 1,085 acres of wetland.

**\*\*NOTE:** The number of reservation acres described in this FMP is according to values representative of the reservation at the time the FMP was prepared. However, these acres are subject to change as land is acquired and put into trust; changed due to Tribal decisions (such as development plans); and changed due to any other unforeseen reasons why acreages may increase or decrease. Approximately 120 acres are in the process of being converted from "fee" to "trust" lands and will be included in this management plan. The majority of land in the reservation is used for housing, commercial ventures, and governmental uses.

Table 1. Resources of the Bay Mills Indian Community

Resources of the Bay Mills Indian Community		
Reservation	3,791.89 acres total	
Trust land/ fee land	3,390.36 acres trust	401.5 acres fee
Brimley area	2728.72 acres trust	401.5 acres fee
Sugar Island	660.67 acres trust	0 acres fee
Whitefish Reserve	77,170 acres	
1836 Ceded Territory	13.8 million acres	

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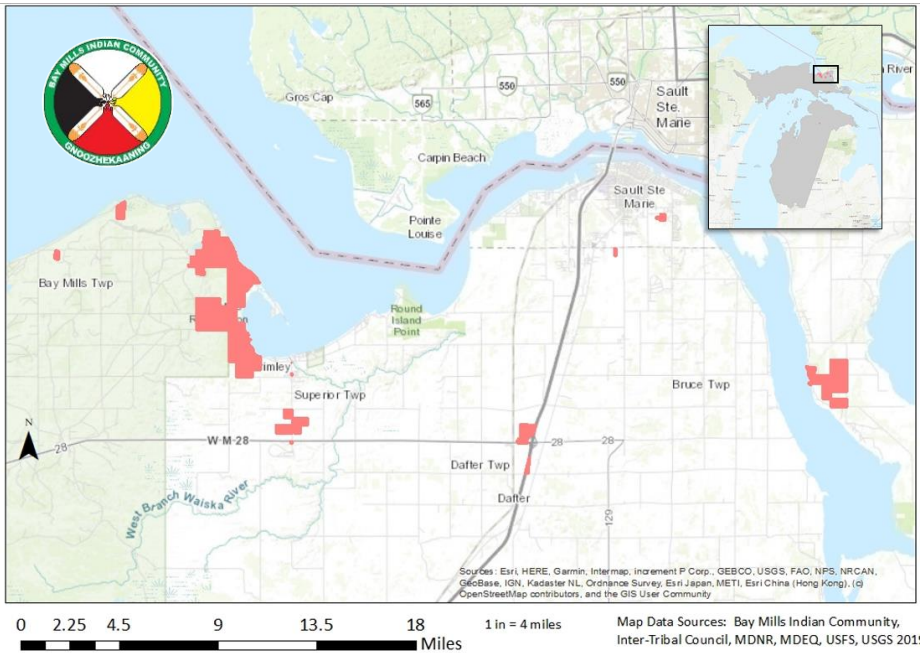


Figure 1. Map of Bay Mills Indian Community lands (trust and fee) Chippewa County extent.

The BMIC reservation is already quite developed and demand for on-reservation housing is growing. Additional developments for housing or other community facilities are planned and frequently adjusted. A Land Use Plan is currently being written. Contact BMIC Tribal Administration, Lands Office for updates on planning development, zoning, and ordinances 906-248-8100.

Therefore this FMP will focus its goals and objectives on trust and soon-to-be trust lands not likely to be developed in the near future (see map). These Core Areas for Forest Management will be referred to as Sugar Island, the Great Wetland Preserve, the Greater Gumshoes Wetland, Spectacle Lake, Chief



Table 2. Land Uses at the Bay Mills Indian Community

Land Use	Acreage
Other Uses (residential, commercial, administrative)	1184.87
Parks and Recreation (forests, wetlands, lakes)	553.12
Open Spaces (forests, wetlands, lakes)	2053.87
	3,791.89 acres total

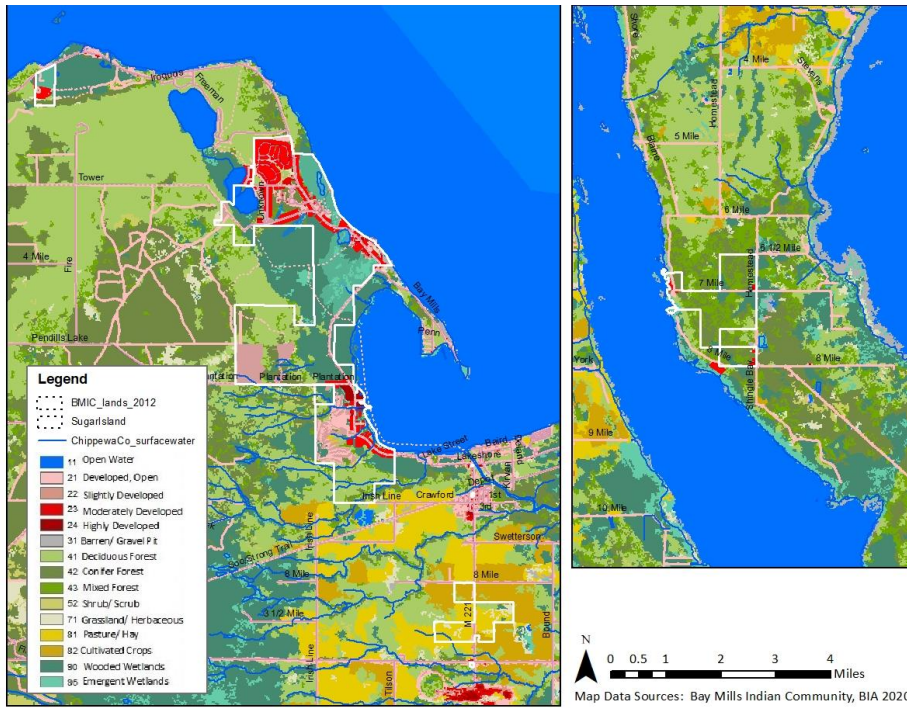


Figure 3. Current land use on Bay Mills trust lands and surrounding area.

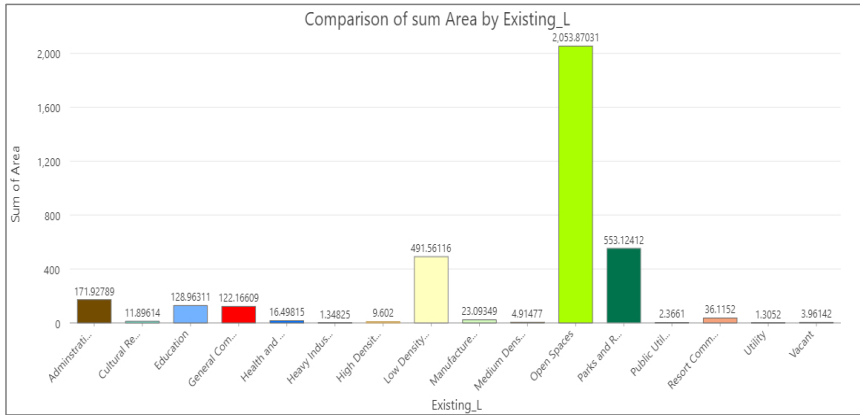


Figure 4. Current land use on Bay Mills trust lands.

### 2.2.i BIA Land Classification

As part of the preparation of this Plan, the Tribe’s trust forest lands were allocated into different land classifications consistent with requirements in 25 CFR 163 and the BIA Indian Affairs Manual, 53 IAM 2.8 (D) Forest Land Classification. BIA land classifications are shown for the Tribe’s forested parcels in Appendix 2. The estimated acres of forest land (land which supports 10% or more crown cover of trees) can be subdivided into reserved and unreserved acres, timberland or woodland acres, commercial or non-commercial, and productive or non-productive. The classification of Commercial implies that forest products of value can reasonably be harvested for sale or personal use. The BIA classification of Reserved applies to lands which are set aside for specific uses and where any harvest operations would have to conform to the use for which the lands were reserved.

### 2.3 Recreation and Subsistence Use

BMIC embraces four seasons of outdoor recreational opportunities including but not limited to: hunting, fishing, gathering, hiking, camping, motorized and non-motorized trails, and golf. Table 3 describes the developed recreational opportunities of Bay Mills. Additionally, subsistence use occurs on non-developed lands as seen in Table 4. Non-timber forest products, used traditionally, are of special importance. Specific plant and animal beings for special cultural consideration in forest management are described in [Chapter 3.8](#). The Bay Mills Indian Community recreation plan 2019-2023 addresses many of these recreational interest.

Table 3. Recreational Sites of Bay Mills Indian Community.

Asset Name	Location	Size	Purpose/Use
Bay Mills Resort & Casino amenities; Wild Bluff Golf Course	46.422552, -84.602519	180 acres	The Resort provides water access to the community with a boat launch, boat mooring area, and kayak launch area. RV for 117 trailers. 18-hole golf course.
The Farms/Memorial Park walking path & playground	46.416685, -84.604668	10 acres	Large field with playground equipment and paved walking path.
Gumshoes Campground	46.460803, -84.610306	3 acres	Primitive campsites.
Ice Rink/Basketball Courts	46.4665772, -84.6254908	2 acres	Centered in the residential area.
Residential Area Playgrounds	Various	< 2 acres each	Several playgrounds are located in central areas in the housing developments.
Bay Mills Riverview Campground	46.422707, -84.604803	4 acres	Approximately 17 campsites
Bay Mills Riverview Ball Diamond and Horseshoes	46.450315, -84.599637	4 acres	Ball fields, dugouts, horseshoe pits, and picnic area on their way to a sandy beach.
Spectacle Lake Day-Use Area	46.454864, -84.632312	2 acres	This popular fishing spot is surrounded by multi-use trails.
Spectacle Lake Overlook/Mission Hill	46.4687759, -84.6403050		This property is owned and managed by the USFS. Lake Superior, the Saint Mary's River, Spectacle Lake, the western shore of Canada, and the intervening dense forest are all viewable from the overlook.

Table 4. Locations of Subsistence Use on Bay Mills Lands (results from BMIC Forest Desired Uses Survey)

Subsistence Location	Size	Purpose/Use
Chief Hardwoods forest management area	180 acres	Hunting, trapping, gathering
Greater Gumshoes wetland management area	106 acres	Hunting, trapping, gathering, swimming; fishing/boating access
Greater Wetland Preserve management area	540 acres	Hunting, trapping, gathering
Little Waiska Headwaters (the Farms) forest management area	221 acres	Hunting, trapping, gathering
Spectacle Lake forest management area	11 acres	Hunting, trapping, gathering; fishing access to lake
Sugar Island forest management area	635 acres	Hunting, trapping, gathering

## 2.4 Community History

### PRE-COLONIAL SETTLEMENT

Humans have occupied the Waishkey River and St. Marys River area for 11,000 years, and evidence of permanent settlements along the river date back to 5,000 years ago when the people of the upper Great Lakes began to utilize spring spawning fish as a subsistence food source. For 4,500 years, the St. Marys River has been the cultural heart of the Ojibwe or Anishinaabe people (Sault Ste. Marie Region Conservation Authority). Historically, there were four rapids areas in the St. Marys River: the main rapids, the Little Rapids (near Sugar Island), the East Neebish rapids, and the West Neebish Rapids. The Inside Passage was a travel route starting at the mouth of the Waishkey River, continuing up the West Branch of the Waishkey River. After a short portage southward, travelers connected with the headwaters of the Pine River; from there they could travel on to Mackinac Island and the Straits. This route was especially favored in winter. (Chapman, 1939). Today, many of the inhabitants of the region are descendants of the Ojibwe and belong to the Bay Mills Indian Community and Sault Ste. Marie Tribe of Chippewa Indians.

### COLONIAL SETTLEMENT

The first Europeans encountered the St. Marys River rapids and Lake Superior in the early 1600s. The St. Marys River became the center of French activity in the Upper Great Lakes soon thereafter. Trade, maple-sugaring, and the whitefish fishery encouraged settlement and led to the establishment of the European settlement of Sault Ste. Marie in 1668 (Arbic 2004, Duffy et al. 1987). In the early 18th century, Great Britain extended its influence in the St. Marys River region, drawn by the profitable fur trade. However, depletions in beaver populations in the early 1800s caused a shift in the focus of commerce from the fur trade to Lake Superior's fisheries, surrounding forest lands, and mineral deposits for export.

The beginning of the Bay Mills Point area around the mouth of the Waishkey River was due largely to efforts of missionaries. The 1840s proved hard for Sault Ste. Marie area economy, as a crash in the international fur market and decline in population. In 1875 a lumber mill was built on what is now Bay Mills Point across the bay from the mouth of the river. Soon two other mills were added, and a lumber town grew up. By 1895 a pulp and paper mill and a sash and blind factory were in operation. A railroad trestle linked Bay Mills Point and Brimley. The pilings are still visible today. Almost two-thousand non-natives settled at this site, where houses, two churches, and a post office were established. It was the establishment of these mills that the area name Bay Mills was derived. In 1904 most of the lumber mill complex burned. By 1909, the forests had been cut-over and the mills on Bay Mills Point were abandoned.

### RESOURCE USE IN THE REGION: FISHERIES, FORESTRY, AGRICULTURE, MINING

In pre-colonial times, thousands of Ojibwe gathered at the St. Marys Rapids and lived primarily on whitefish and sturgeon. Calculations by Cleland (1982) indicate that fish supplied 66% of the meat obtained by Ojibwe (Cleland 1982). During European settlement, the St. Marys River supported sport and commercial fisheries. However, by the late 1800s, concerns over the sport fishery led to greater restrictions of the commercial fishing industry and its eventual closure (Gebhardt et al. 2002). A

commercial whitefish industry still exists in Whitefish Bay, the headwaters of the St. Marys River. Native American and First Nation tribes also have fishing rights throughout the St. Marys River.

Commercial timber harvesting in the eastern Upper Peninsula of Michigan developed into a successful industry by the late 1800s. White pine was the primary source of timber extracted due to its abundance and the low density of the wood, which floated easily and facilitated transport by river. At the end of 19th century, during the height of this period, a single sawmill at Bay Mills could produce 31 million board feet of white pine (Duffy et al. 1987). By the beginning of the 1900s, the white pine forests of the region were depleted and the timber industry shifted its emphasis to hardwood species. Today, pulp woods including spruce, balsam fir, tamarack, aspen, and jack pine are the primary timber species in the region.



Figures 5, 6, 7, 8. Logging along Waishkey River. Timber staged for transport to saw mill. Bay Mills Point mills as seen from Brimley. Hall and Munson Saw Mill. Photos courtesy of Bay Mills History

Agricultural development of the Waishkey River region followed the growth of the timber industry during the latter half of the 1800s. Hay and grain were needed since logging operations depended heavily on horses, and logging camps required a supply of beef and pork. Sugar Island saw similar land use, exporting hay, maple sugar, lumber, and other materials from the island (Arbic, 1992).

Regional agriculture is limited to an average growing season of 4.5 months. Agriculture is also constrained by the shallow, poorly drained soils of the region. Current agricultural practices are focused primarily on dairy and beef production. Hay is the major crop in the region.

Historically, quarries in the Eastern Upper Peninsula produced large amounts of dolomite. In recent years, however, production has declined significantly. Currently, small gravel mining operations exist in the upper river St Marys River, providing a minor contribution to the local economy (The Nature Conservancy 2008).

With the passage of the Indian Reorganization Act (IRA) of 1934, the Bay Mills Indian Community became one of the four original reservations established in Michigan. In 1937, land was purchased for the Tribe; these lands include the original Bay Mills Mission and a small area on Sugar Island, the majority of the current reservation land holdings in Chippewa County.

#### THE CCC ERA

Shortly after the establishment of the Civilian Conservation Corps (CCC), the counterpart Indian Emergency Conservation Work (IECW) program was established. A camp was setup near Eckerman, MI in 1935 and housed 153 enrollees—many from Bay Mills. Among their projects were forest restoration, stream restoration, and road building. Many red pine were planted in plantation rows from the Racine Plains east towards the reservation. In the 1970s a YCC crew of tribal youth planted much of the scotch pine. For more information on the CCC Camp Marquette, contact the Bay Mills Ojibwe History Department.

## 2.5 Cultural Resources relating to BMIC Forest Management Plan

Cultural resources are the physical remains of past human activity, occupation, and use. Such resources include sites, buildings, structures, objects, districts, and traditional cultural properties (sacred sites). Cultural resources can be either historic or prehistoric in age. Historic properties, as regulated under the National Historic Preservation Act (NHPA), are cultural resources that meet both the criteria for significance and integrity, established by the Secretary of Interior for listing (36 CFR 60.4), or are eligible for listing on the National Register of Historic Places. Any forest management projects should be reviewed by the Bay Mills Tribal Historic Preservation Officer (THPO).

#### TRAIL MARKER TREES

Trail marker trees are hardwood trees throughout North America that Native Americans intentionally shaped with distinctive characteristics. These culturally-altered, living landmarks appeared in several forms, each conveying a distinctive message. Their uses varied from pointing out a fresh water source off a main route, to indicating mineral resources. This system was also used to exit rivers and creeks at portage points or link them to other major trails. A trail marker tree high on a river bank was easily visible, even during floods, which occurred often. Native Americans chose trees mainly from the hardwood family in their region. They most commonly shaped oak and maple trees. These trees may be present

near BMIC forests and should be preserved and protected from timber harvest.



Figure 9. Trail Marker Tree located in near Bay Mills Indian Community (sugar maple). Photo by Bay Mills Biological Services Department.

#### FOREST SPECIES OF CULTURAL SIGNIFICANCE

Native American culture is closely tied to the land, and the plant and animal inhabitants in the natural setting. Many of these species have always been and are still important culturally to the Bay Mills Indian Community. Some of these species are processed for medicinal uses, while other are considered sacred and play a role in ceremonies and other community functions. Refer to [section 3.8 Species of Cultural Significance](#).

## Chapter 3. THE NATURAL ENVIRONMENT

### 3.1. Climate

The BMIC experiences extremely cold winters and moderately warm summers. The average temperature during the winter months is 15 degrees Fahrenheit (°F), with the average daily minimum temperature at 7 °F. Precipitation during the winter typically consists of snowstorms, with the average seasonal snowfall approximately 115 inches. On average, 135 days have at least 1 inch of snow on the ground in each year. However, the number of such days varies greatly from year to year.

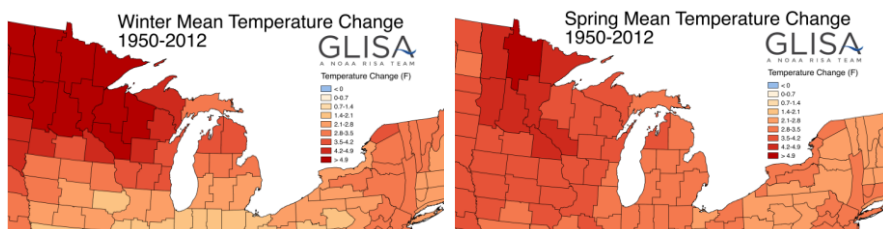
During summer, the average temperature is 61 °F and the average daily maximum temperature is 74 °F. The sun shines approximately 60 percent of the time in the summer and 36 percent of the time in the winter.

The total annual precipitation at the BMIC is approximately 33 inches. Of this, approximately 19 inches falls in April through September. In addition, the growing season for most crops falls within this period. Thunderstorms occur on approximately 27 to 29 days each year.

The average relative humidity in mid-afternoon is approximately 67 percent. The humidity is higher at night, with the average at dawn approximately 85 percent. The prevailing wind is from the west-northwest and the average wind speed is at its highest during April (approximately 11 miles per hour).

#### 3.1.i Climate Change

The Waishkey River watershed and the Great Lakes region has observed noticeable changes in weather in recent years. These changes have been measured in mean season temperatures, percentage of ice cover, frequency of severe storms and many other parameters. Since 1950 the mean temperatures in winter and spring more in the northern Great Lakes than in other areas. Figure 10 shows the Eastern Upper Peninsula has witnessed warmer winters and warmer springs. Warmer winters change survival outcomes for wildlife such as deer as well as pests such as ticks.



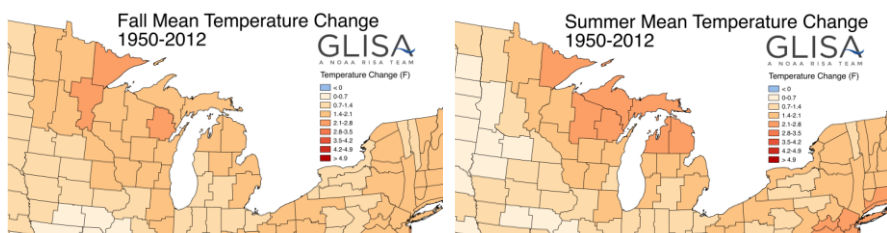


Figure 10. Great Lakes Region Mean Temperature Changes by Season (Inter-Tribal Council of Michigan, 2016).

Not surprisingly, changes in ice cover have also been observed on the Great Lakes over time. According to a report by Inter-Tribal Council of Michigan, ice cover declined in all five Great Lakes by 71% from 1973 to 2010. Ice has declined in Lake Erie by 50%, Lake Huron by 62%, Lake Michigan by 77%, Lake Superior by 79%, and Lake Ontario by 88% (ITCMI, 2016). “At the current rate of ice cover decline, Lake Superior may have little to no open lake ice cover by mid-century (ITCMI, 2016).” Ice cover is important for ecological, economical, and climatic reasons. Ice cover protects fragile whitefish eggs from destructive wind and wave action. Ice cover with little or no snow cover allows light penetration at the surface to promote algae growth which supports the food web including valuable commercial and sportfish species (NOAA GLERL, 2017). Stable ice also protects wetlands and the shoreline from erosion. Heavy ice cover can reduce the amount of evaporation from the Great Lakes in winter, thus contributing to higher water levels and benefiting those who spend millions to dredge boat slips, channels, and harbors when lake levels are low (NOAA GLERL, 2017). Ice cover also controls lake effect snow.

The frequency and intensity of storms in the Great Lakes region has also changed in the last fifty years. GLISA reported that precipitation from 1981-2010 is 5.1% more intense and frequency has increased 23.6% when compared to 1951-1980 (GLISA, Extreme Precipitation, 2015). Severe or intense precipitation has numerous consequences that are cause for concern. Flooding and storm water runoff are priority concerns, as rain from extreme participation events has inadequate time to infiltrate the soil. Instead, it erodes land surfaces, infiltrates and damages infrastructure, and carries soils, nutrients, and/or contaminants directly to surface waters (ITCMI, 2016). Storm water runoff has the potential to impact natural and manmade systems and structures (ITCMI, 2016).

#### SPECIES VULNERABLE TO CLIMATE CHANGE

Changing weather patterns naturally impacts the flora and fauna exposed to it. Warmer temperatures and reduced snow pack indicate good overwinter survival for mammals. According to Angie Gupta, this could mean high birth rates this spring which can lead to greater forest herbivory and significantly browsed trees and forest plants. But changes beneficial to some are detrimental to others. Common themes effecting vulnerability of the below species was ability to adapt to changing water quantity/quality, habitat connectivity to move to better habitat, temperature.

Table 5: Selected plant, wildlife, and fish species determined vulnerable by Climate Change Vulnerability Index

Common Name	Scientific Name	Vulnerability Rating
PLANT SPECIES		
Bog Rosemary	<i>Andromeda polifolia</i>	Extremely Vulnerable
Paper Birch	<i>Betula papyrifera</i>	Highly Vulnerable
Yellow Lady's Slipper	<i>Cypripedium parviflorum</i>	Highly Vulnerable
Black Ash	<i>Fraxinus nigra</i>	Highly Vulnerable
Labrador Tea	<i>Ledum groenlandicum</i>	Highly Vulnerable
Partridge Berry	<i>Mitchella repens</i>	Highly Vulnerable
Black Spruce	<i>Picea mariana</i>	Highly Vulnerable
Northern White Cedar	<i>Thuja occidentalis</i>	Highly Vulnerable
Large Cranberry	<i>Vaccinium macrocarpon</i>	Highly Vulnerable
Southern Wild Rice	<i>Zizania aquatica</i>	Highly Vulnerable
Northern Wild Rice	<i>Zizania palustris</i>	Highly Vulnerable
Balsam Fir	<i>Abies balsamea</i>	Moderately Vulnerable
Sugar Maple	<i>Acer saccharum</i>	Moderately Vulnerable
Sweetflag	<i>Acorus americanus</i>	Moderately Vulnerable
Swamp Milkweed	<i>Asclepias incarnata</i>	Moderately Vulnerable
Ladyfern	<i>Athyrium filix-femina ssp. Angustum</i>	Moderately Vulnerable
Yellow Birch	<i>Betula alleghaniensis</i>	Moderately Vulnerable
Pink Lady's Slipper	<i>Cypripedium acaule</i>	Moderately Vulnerable
American Beech	<i>Fagus grandifolia</i>	Moderately Vulnerable
Sweetgrass	<i>Hierochloe odorata</i>	Moderately Vulnerable
Tamarack	<i>Larix laricina</i>	Moderately Vulnerable
Sweetgale	<i>Myrica gale</i>	Moderately Vulnerable
White Pine	<i>Pinus strobus</i>	Moderately Vulnerable
Broadleaf Arrowhead	<i>Sagittaria latifolia</i>	Moderately Vulnerable
Common Trillium	<i>Trillium grandiflorum</i>	Moderately Vulnerable
Hemlock	<i>Tsuga canadensis</i>	Moderately Vulnerable
Lowbush Blueberry	<i>Vaccinium angustifolium</i>	Moderately Vulnerable
Small Cranberry	<i>Vaccinium oxycoccos</i>	Moderately Vulnerable
WILDLIFE SPECIES		
Moose	<i>Alces alces</i>	Extremely Vulnerable
Snowshoe Hare	<i>Lepus americanus</i>	Extremely Vulnerable
American Beaver	<i>Castor canadensis</i>	Moderately Vulnerable
Spruce Grouse	<i>Falcapennes canadensis</i>	Moderately Vulnerable
Common Loon	<i>Gavia immer</i>	Moderately Vulnerable
American Marten	<i>Martes americana</i>	Moderately Vulnerable
Fisher	<i>Martes pennanti</i>	Moderately Vulnerable
FISH SPECIES		
Lake Sturgeon	<i>Acipenser fulvescens</i>	Extremely Vulnerable
Cisco/Lake Herring	<i>Coregonus artedi</i>	Moderately Vulnerable
Whitefish	<i>Coregonus clupeaformis</i>	Moderately Vulnerable
Burbot/ Loche	<i>Lota lota</i>	Moderately Vulnerable
Brook Trout	<i>Salvelinus fontinalis</i>	Moderately Vulnerable
Lake Trout	<i>Salvelinus namaycush</i>	Moderately Vulnerable
Walleye	<i>Sander vitreus</i>	Moderately Vulnerable

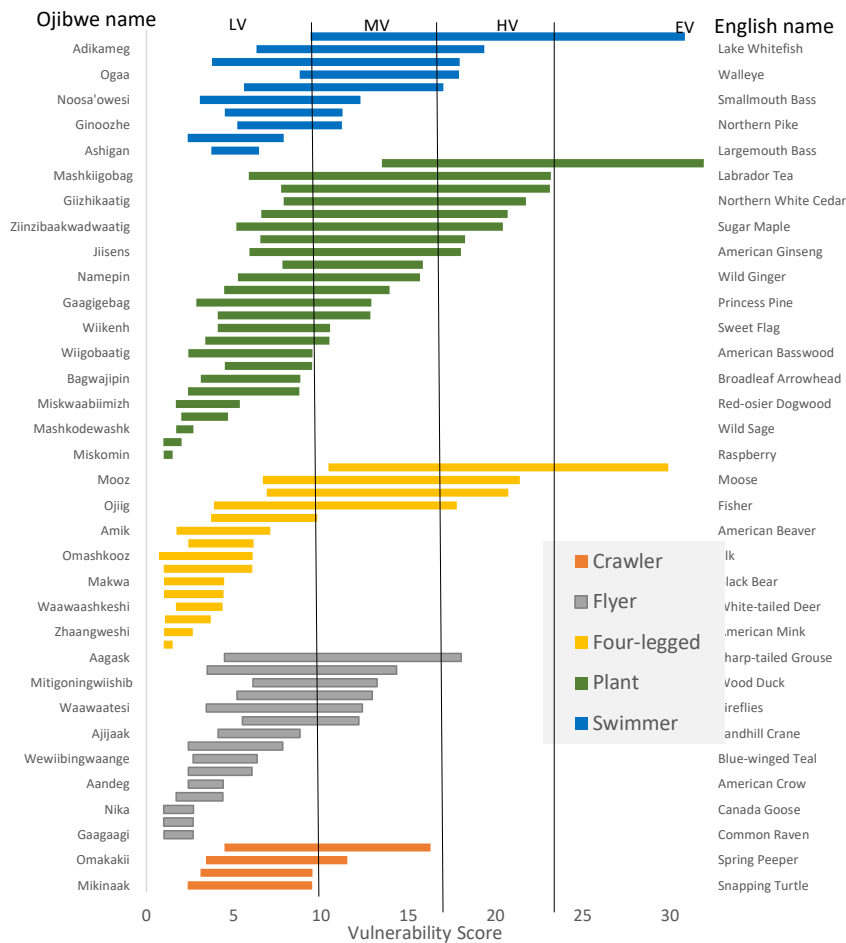


Figure 11. Vulnerability of 68 beings, grouped by category, in the best case (MRI-CGCM3 model, RCP8.5; left side of bar) and worst case (MIROC5 model, RCP8.5; right side of bar) scenario. LV (less vulnerable) indicates available evidence does not suggest abundance and/or range extent within geographic area assessed will change substantially; MV (moderately vulnerable) indicates abundance and/or range extent within geographic area assessed is likely to decrease; HV (highly vulnerable) indicates abundance and/or range extent within geographic area assessed is likely to decrease significantly; and EV (extremely vulnerable) indicates abundance and/or range extent within geographic area assessed is extremely likely to substantially decrease or disappear, all by 2050. (GLIFWC Climate Change program, 2020).

## ECONOMIC CONCERNS

Forest management through timber harvest also occurs in Chippewa Co. The impacts of warmer spring and winter temperatures and reduced snow pack can also be economically challenging. A warm winter can mean challenging conditions for logging operations. Without a hard frost, loggers can find it difficult to bring equipment into the woods to harvest. Road restrictions also makes moving timber out of the woods a challenge. All this combines to make a very short harvesting window in the watershed. Herbivory is another concern for forests. Good overwinter survival for herbivores like deer and rabbits could mean high birth rates in spring. This can lead to greater browsing on trees and seedlings. Commercial forests trying to regenerate trees for the future could see decreased survival on both natural and planted tree seedlings. Warmer springs also correlate to higher spring fire danger.

## 3.2 Topography and Glaciation

The BMIC is located within the Northern Lakes and Forests Ecoregion. The Northern Lakes and Forests Ecoregion is an area of nutrient-poor glacial soils, coniferous and northern hardwood forests, undulating till plains, morainal hills, broad lacustrine basins, and extensive sandy outwash plains.

The physical environment within and around the Bay Mills Indian Community was formed through a number of geological processes. The sedimentary bedrock underlying the area consists of red sandstone (Cambrian period) and sandstone and sandy dolomite (Upper Cambrian and Lower Ordovician periods). Deposits overlying bedrock consist of several sedimentary rock units formed between 230 and 620 million years ago when warm, shallow seas covered Michigan. During the Pleistocene Epoch, Chippewa County was completely covered by a series of glaciers. The current topography seen at the reservation is a result of the glacial deposits of the Wisconsin Glacier, which melted approximately 10,000 to 12,000 years ago. The advance and retreat of glaciers during four major glacial periods that followed formed the current physiographic features of the area. The area within the BMIC lies near the coast of Whitefish Bay, between the larger Lake Superior, and the St. Mary's River. As the glaciers retreated at the end of the last glacial period, lake water levels fluctuated widely which, in turn, and coupled with wind and wave action, is responsible for much of the physical appearance of the area at present.

The majority of the land within the BMIC consists of glacial deposits and generally low, level terrain with a slope of 10 percent or less at a mean elevation between 600 and 700 feet above sea level. The exception to this is Mission Ridge, which extends along the western reservation boundary. This substantial bluff runs north to south through the main reservation; the trust lands on Sugar Island are generally flat and low-lying, adjacent to the St Marys River. Another small ridge covers the northeast portion of the reservation near North Pond (aka Gumshoes Lake). Both ridges have variable slopes between 30 and 180 percent. Mission Ridge, near Spectacle Lake, has a slope between approximately 120 and 180 percent and rises 300 to 400 feet above the surrounding reservation land (BMIC 2012).

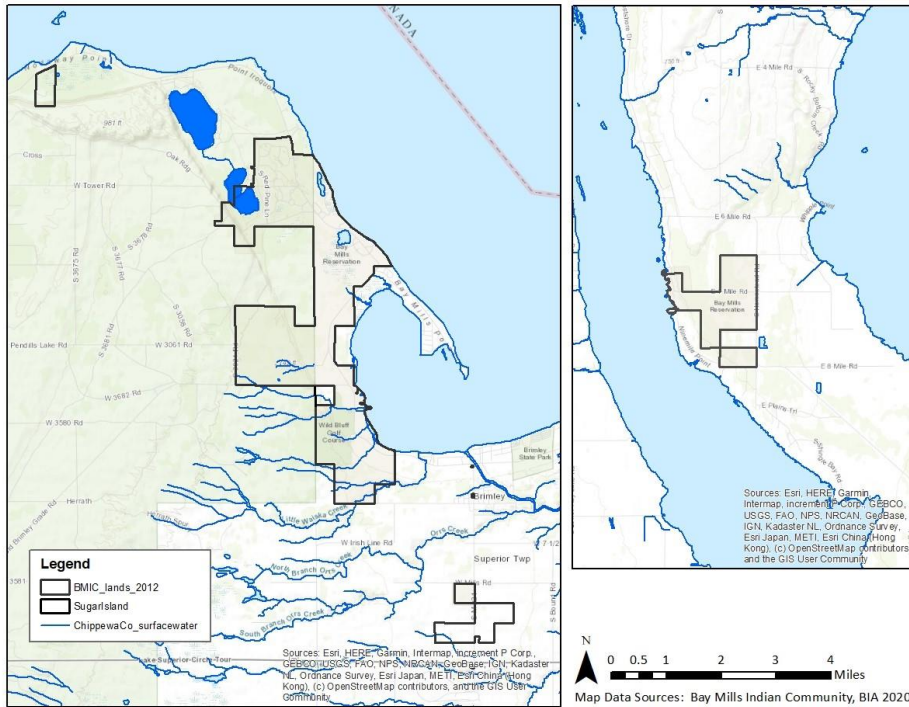


Figure 12. Map of Water Features in and around Bay Mills Indian Community.

### 3.3 Soils and Infiltration

Several soil types, many of them hydric, overlie the BMIC reservation (Table 6). Much of the Bay Mills forest is part of the Clay Lake Plain Complex in the Eastern Upper Peninsula (Figure 13). The clay was laid at the bottom of the large proglacial lakes, Algonquin and Minong (Schaetzl, 2012). The highly permeable soils of Mission Hill influence high levels of hydrostatic pressure, and hence, groundwater recharge at the lower levels along the base of the hill (which, incidentally, comprises the majority of the main reservation). The excessive hydrostatic pressure leading to high groundwater recharge rate here is responsible for a large number of flowing wells on the reservation, and, generally, is a primary reason for the high proportion of wetlands within the tribal land base (BMIC 2012).

Table 6. Soil types occurring within the Bay Mills Indian Community reservation (mainland and Sugar Island). Source: U.S.D.A. Natural Resource Conservation Service, Soil Survey of Chippewa County, Michigan. 1991.

USDA NRCS map symbol	Soil map unit name	National hydric soil type	Local hydric soil type?
<i>Mainland reservation</i>			
10F	Ontonagon silt loam, 6-15 percent slope	no	no
12	Pickford silty clay loam	no	yes
14A	Gaastra silt loam, 0-3 percent slope	no	no
15D	Rousseau fine sand, dark subsoil, 6-15 percent slope	no	no
17D	Deer Park fine sand, 0-15 percent slope	no	no
18B	Rubicon sand, 0-6 percent slope	no	no
18D	Rubicon sand, 6-15 percent slope	no	no
18E	Rubicon sand, 15-35 percent slope	no	no
21A	Au Gres sand, 0-3 percent slope	no	no
22	Kinross muck	yes	yes
23	Roscommon muck	yes	yes
35	Histosols and Aquents, ponded	yes	yes
36	Markey and Carbondale mucks	yes	yes
37	Dawson and Loxley peats	yes	yes
61A	Halfaday sand, 0-3 percent slope	no	no
89A	Kinross-Au Gres complex, 0-3 percent slope	no	Kinross-yes, Au Gres-no
92A	Biscuit very fine sandy loam, 0-3 percent slope	no	Biscuit-no, Gogomain-yes
94A	Markey-Kinross-Au Gres complex, 0-3 percent slope	no	Markey-yes, Kinross-yes
97A	Wega very fine sandy loam, 0-3 percent slope	no	Ermatinger inclusion-yes
98A	Ermatinger silt loam	no	yes
132	Sugar very fine sandy loam, 0-6 percent slope	no	no
<i>Sugar Island reservation</i>			
52A	Ingalls loamy sand, 0-3 percent slope	no	Ingalls-no, Pickford-yes
68	Pinconning mucky loamy sand	yes	yes
98	Ermatinger silt loam	no	yes
107B	Oldman stony fine sandy loam, 2-6 percent slope	no	no
126	Pickford silt loam	yes	yes
136	Westbury-Gay complex, 0-3 percent slope	no	Westbury-no, Gay-yes, Pickford inclusion-yes

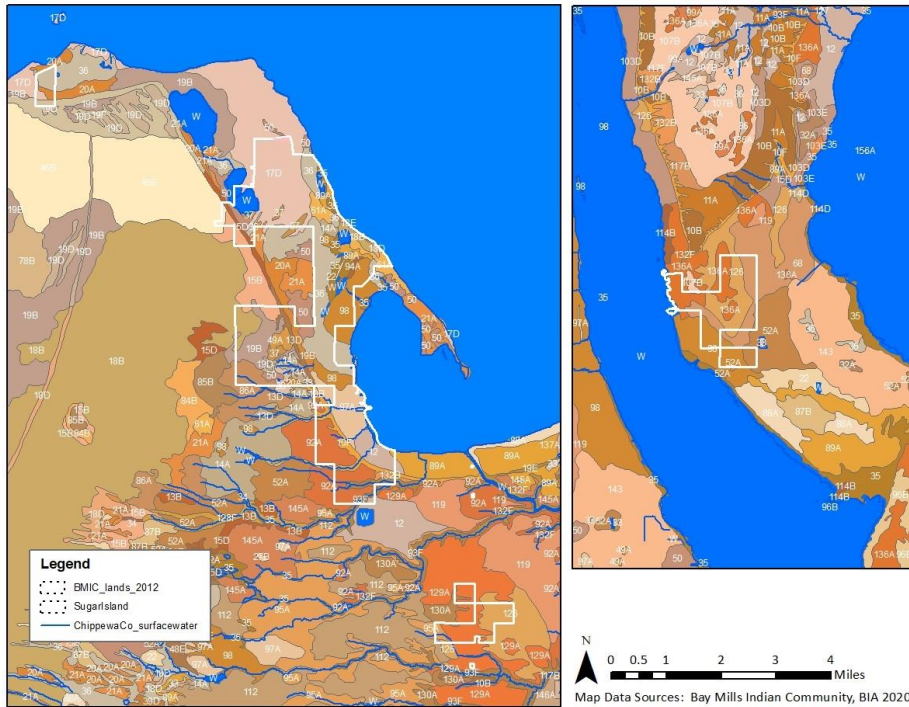


Figure 13. Map of soil types on BMIC lands and surrounding area.

### 3.4 Streams, Ponds, Wetlands, and Other Aquatic Resources

The Bay Mills Indian Community has a variety of water resource types which include wetlands, streams, inland ponds and an inland lake, as well as Lake Superior and the St. Marys River (Table 7; Figure 14). The Tribe also claims a 77,170 acre reserve in Whitefish Bay in Lake Superior that includes Back (Waiskey) Bay in what is considered the upper St. Marys River. This reserve is bounded by a line running due north from the mouth of the Waiskey River to the international boundary then northwest along the international boundary and then due east to the mouth of the Tahquamenon River.

There are 72.5 acres of inland lakes within reservation lands, 5 miles of perennial riverine systems, 5.16 miles of lake shoreline, and 1,085 acres of palustrine wetland systems (including several small ponds that are 40 acres or less in area). Other factors contribute to the high proportion of wetlands on the reservation: beavers, through construction of dams, have increased the occurrence of areas of open water. Considered a nuisance by some, the actions of these animals have generally increased the value of wetlands in the area in regards to their enhanced potential for fish and wildlife habitat.

The waters of the Reservation play an important role in the community, both culturally and economically. The people of the community and tourists use offshore and inland waters for commercial and sport fishing, rearing culturally significant plants, boating, swimming, birding, and hiking along the shoreline. Refer to Section 4.1 for information on regulations regarding wetlands and other aquatic resources.

Table 7. Water Resources of the Bay Mills Indian Community

Water Resources of the Bay Mills Indian Community	
Reservation	3,791.89 acres total
Whitefish Bay Reserve	77,170 acres
Inland Lakes	72.5 acres
Streams/Rivers	5 miles
Wetlands	1,085 acres
Shoreline (Great Lakes & inland)	5.16 miles

### 3.4.i Wetland Preserves

The Bay Mills Indian Community established a wetland preserve on trust lands in 1996 with Resolution No 96-10-14. The establishment of the area protects these Great Lakes coastal wetlands and forested wetlands from development (pressure is high in the area). The Wetland Preserve is currently 460 acres of emergent, scrub/shrub, and lowland swamp conifer. Since then, other wetland areas have been placed into preserve status for various reasons.

Refer to [Section 4.1](#) for management implications.

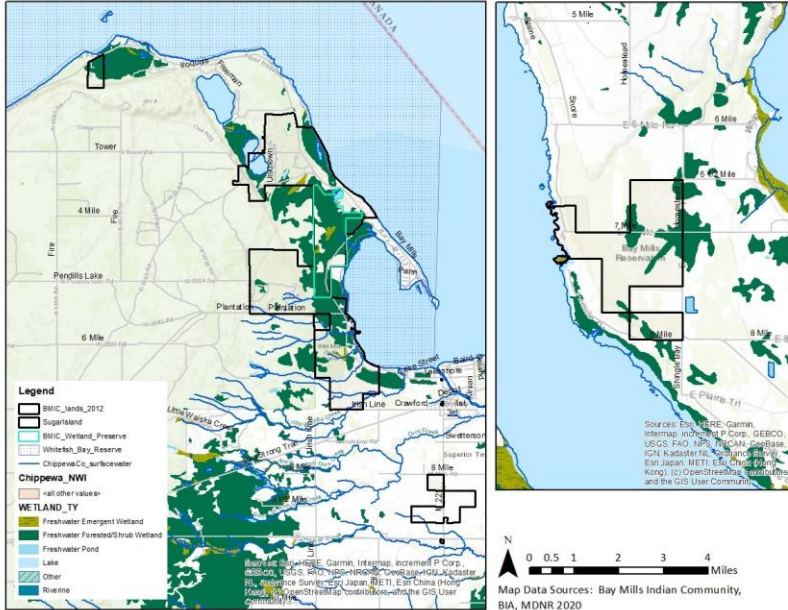


Figure 14. Map of Wetland Types in and around Bay Mills Indian Community.

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### 3.5 Vegetation Cover Types

Forest habitat types are based on the vegetation potential of various sites and depend on soil characteristics and past disturbance events. Each habitat type has potential climax species, associated understory species, and potential productivity. According to the BMIC Forest Inventory Analysis Report (1997), there are ten major forest habitat types on the reservation near Brimley, Michigan, and seven forest habitat types on the reservation in Sugar Island (Table 8).

Table 8. Forest Habitat Types at the Bay Mills Indian Community

Habitat Type	Brimley Area		Sugar Island	
	Acres	Percent	Acres	Percent
Acer-Tsuga-Dryopteris (ATD)	27	3.0%	20	4.5%
Acer-Viola-Osmorhiza (AVO)	14	1.6%	---	---
Fraxinum-Eupatorium (FE)	145	16.3%	6	1.4%
Fraxinus-Impatiens (FI)	225	25.3%	11	2.5%
Fraxinus-Mentha-Carex (FMC)	70	7.9%	121	27.4%
Quercus-Acer-Epigea (QAE)	33	3.7%	71	16.1%
Tsuga-Acer-Mitchella (TAM)	167	18.7%	---	---
Tsuga-Maianthemum (TM)	92	10.3%	111	25.1%
Tsuga-Maianthemum-Coptis (TMC)	76	8.5%	102	23.1%
Tsuga-Thuja-Sphagnum (TTS)	42	4.7%	---	---

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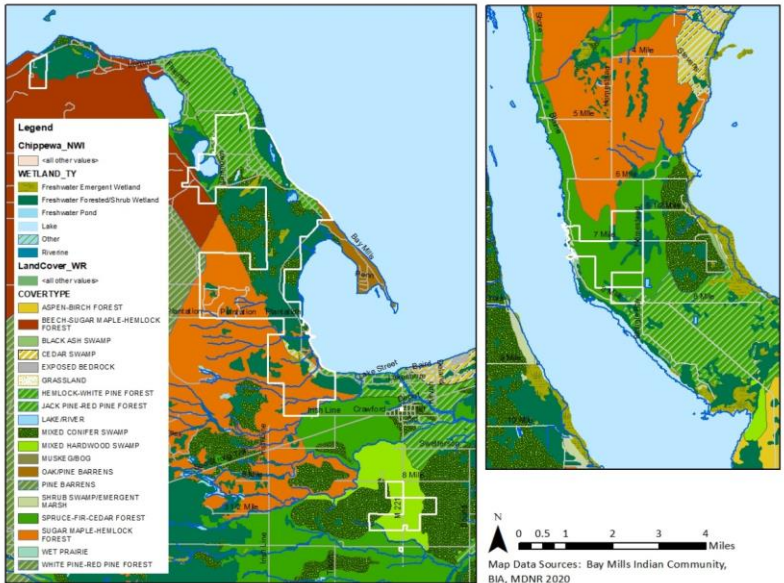


Figure 15. Forest cover types as of 1800.

### 3.6 Wildlife

The Bay Mills Indian Community trust lands are home the typical array of northern Michigan mammals, birds, reptiles, and amphibians. Charismatic megafauna includes black bear, gray wolves, white-tailed deer, and some moose. Active public land management in the region occurs for the following species: American marten, ruffed grouse, sharp-tailed grouse, Kirtland’s warblers, and white-tailed deer. Additionally, the area creates a natural migration corridor for tens of thousands of birds travelling along popular migration routes. Over 330 species of birds have been spotted nearby at the Whitefish Point Bird Observatory, including various species of hawks and owls. Forests also shade and protect numerous streams used as spawning and nursery habitat by many fish species.

Beaver and their lodges have been observed at dozens of points in the area and changed forests. Beavers are nature’s ecosystem engineers, felling trees and building dams, and changing waterways for their own benefit. But they also benefit other species in the process. Their dams help to control the quantity and quality of water downstream, which both humans and animals use. Their ponds and flooded areas create habitat for many plants and animals, such as fish, birds, insects, and amphibians. Beavers dramatically change their environment, and those changes can last for hundreds of years, even after the beaver have moved on.

### 3.7 Threatened and Endangered Species

Numerous threatened and endangered species have been documented within Chippewa County, almost all of which reside within or in close proximity to the Waishkey River watershed. Table 9 lists all of these species with their appropriate designation (USFWS).

Table 9. Threatened & endangered species of Chippewa County

Common Name	Scientific Name	Designation
American Hart’s Tongue Fern	<i>Asplenium scolopendium</i>	Threatened
Rufa Red Knot	<i>Calidris canutus rufa</i>	Threatened
Grey Wolf	<i>Canis lupus</i>	Endangered
Piping Plover	<i>Charadrius melodus</i>	Endangered
Pitcher’s Thistle	<i>Cirsium pitcheri</i>	Threatened
Dwarf Lake Iris	<i>Iris lacustris</i>	Threatened
Canada Lynx	<i>Lynx canadensis</i>	Threatened
Northern Long-Eared Bat	<i>Myotis septentrionalis</i>	Threatened
Kirtland’s Warbler	<i>Setophaga kirtlandii</i>	Endangered
Houghton’s Goldenrod	<i>Solidago houghtonii</i>	Threatened

These species face many threats including, but not limited to, pollution, habitat destruction and fragmentation, climate change, and invasive species. These threats must be minimized or, if possible, eliminated to restore populations of these important species and create a healthy watershed.

### 3.8 Species of Cultural Significance

Many plant and animal species inhabiting forests have always been and are still important culturally to Native American populations today. Some of these are processed for medicinal uses, while others are considered sacred and play a role in ceremonies and other community functions.

There are many species of cultural significance including but not limited to the following:

- Bald Eagle, Sandhill Crane, Common Loon, Sharp-tailed Grouse, Wild Turkey, Raven, Canada Goose, Crow, Mallard, Blue-winged Teal, Trumpeter Swan, Wood Duck
- Lake trout, Whitefish, Tullibee/ Cisco, Walleye, Perch, Sturgeon, Northern pike, Musky, Smallmouth bass, Largemouth bass,
- Fireflies, Ants
- Wolf, Moose, White-tailed Deer, Elk, Snowshoe Hare, Long-tailed Weasel, Mink, Short-tailed/Least Weasels, Otter, Fisher, American Marten, Bobcat, Black Bear, Tree Bats, Cave Bats, Beaver, Muskrat,
- Raspberry, Red-osier Dogwood, Strawberry, Ostrich Fern, Wild Sage, Sweetgrass, Bloodroot, Blueberry, Arrowhead, Sweet Flag, Princess Pine, Wild Leek, Wild Ginger, Ginseng, Labrador Tea, Wild Rice
- Snapping Turtle, Painted Turtle, Wood Turtle, Spring Peeper

Species which will be especially considered during vegetation management planning are further explained below. These species have been the subject of recent community workshops, interviews, and biological studies. Some of these species have also made recent news do to observed population declines.

#### **APAKWAANAAJIINH: CONSIDERATION FOR BATS**

Apakwaanaajinh can be loosely grouped as cave bats or tree bats. With few cave habitats near Bay Mills Indian Community, more focus will be placed on tree bats. “Tree bats” include of the silver-haired, eastern red, northern long-eared, and hoary bats. These beings use a wide variety of habitats. The edges of forests near wetlands and other water bodies are ideal habitats because they generally have a high density of insects for apakwaanaajinh to forage. Some apakwaanaajinh use woodlands adjacent to wetlands exclusively throughout the summer months for roosting. Tree bats migrate south to warmer regions for the winter.

Apakwaanaajinh populations are difficult to monitor, as these beings do not form large colonies and do not typically return to the same roost sites. They also use trees instead of bat houses or other manmade structures. These beings also have slow population growth rates as most have only one pup per year. In general, apakwaanaajinh are susceptible to habitat loss and degradation and drastic drops in population. The northern long-eared bat is federally threatened and additionally beings are special concern in Michigan. According to climate change vulnerability studies by GLIFWC, apakwaanaajinh are moderately vulnerable to climate change.

Tree bats beings are not as affected by white-nose syndrome as they do not roost in large numbers or in caves, where disease transmission may occur. For bat species that are more susceptible to white-nose syndrome, a Lake States Forest Management Bat Habitat Conservation Plan was drafted in 2020 to

address mitigation practices they may be done.

[https://www.fs.fed.us/ne/newtown\\_square/publications/technical\\_reports/pdfs/2002/gtrne292.pdf](https://www.fs.fed.us/ne/newtown_square/publications/technical_reports/pdfs/2002/gtrne292.pdf)

### **BAAPAAGIMAAK: CONSIDERATION FOR BLACK ASH (*Fraxinus nigra*)**

Baapaagimaak are best known for their use in traditional basket-making, an important part of tribal culture. Baapaagimaak grows in wet habitats, such as swamps, bogs, along streams, or other seasonally flooded areas. It can tolerate stagnant water but prefers slowly moving water. It often occupies pure stands, with little regeneration of other beings in the understory. In upland habitats, it can be found mixed with basswood, quaking aspen, white spruce, or maples. Saplings are moderately tolerant of shade. Baapaagimaak is common across the Ceded Territory.

Baapaagimaak is dependent on fairly narrow habitat requirements, and limited by dispersal. It has been significantly impacted by the emerald ash borer locally. BMIC hopes to continue seed saving of remnant baapaagimaak and under-plant impacted stands.

### **BAGWAJI' ZHIGAAGAWINZHIIG: CONSIDERATION FOR WILD LEEKS (*Allium tricoccum*)**

Bagwaji'zhigaagawanzh are native to North America and provide food and medicine for Anishinaabek, other people and animals. Bagwaji'zhigaagawanzh is one of the first beings to come up in the spring. It is considered to be a spring tonic and provides a boost in vitamins and minerals, which are not as readily available throughout the winter. Parts of this being are a popular edible that may be dried and stored while bulbs and leaves can be eaten raw or cooked. These beings are long-lived herbs that grows in rich upland and floodplain forests under mature beech, maple, and hemlock trees and near other wildflowers such as bellwort, bloodroot, ginseng, trout lily, and trillium. Bagwaji' zhigaagawinzhiig grow slowly as clones and rarely by seed. Harvesting just 5-10% of bulbs in an area may cause population decline.

A climate change vulnerability study by BMIC and ITC staff showed these beings are highly vulnerable to extremely highly vulnerable to climate change (ITC 2018). Increased competition from invasive species may reduce growth and reproduction. Because bagwaji' zhigaagawinzhiig grow best in shady areas with damp soil throughout the year, dry soils may reduce growth and reproduction. Bagwaji' zhigaagawinzhiig are also vulnerable to climate change because they grow in cooler areas of the forest, which may become warmer as air temperatures increase (ITC 2018). Even cool microclimates may warm beyond bagwaji' zhigaagawinzhiig tolerance. Forest canopy management which significantly increases light penetration and dries the soil which may also negatively impact patches. The low genetic diversity bagwaji' zhigaagawinzhiig and limited dispersal ability also make it particularly vulnerable.

### **BEZHIGOJIBIK: CONSIDERATION FOR BLUE COHOSH (*Caulophyllum thalictroides*)**

Bezhegojibik is found in rich deciduous forests, often growing alongside trilliums and leeks. It grows 1-3 feet tall with a bright blue berry-like fruit. The roots of this being are used in traditional medicine. Bezhegojibik is found across the Ceded Territory and is at the northern end of its range. It is a relatively

slow-growing, slow-reproducing being and susceptible to over-harvest. It needs slightly moist, shady soils and so could be somewhat vulnerable to droughts caused by climate change.

### **GAAWAANDAG: CONSIDERATION FOR SPRUCE (*Picea sp.*)**

Gaawaandag includes both white and black spruce beings. Gaawaandag twigs and needles may be used in traditional medicine, while the roots have uses for bindings and ropes. Gaawaandag has short, bottlebrush-like needles and a conical shape ideal for shedding snow. These beings may grow in conifer swamps, bogs, stream corridors, and mesic woods—commonly alongside balsam fir, maples, birches, aspens, and pines.

Like other boreal forest beings, gaawaandag is expected to struggle with climate change as its suitable habitat near Bay Mills and the Ceded Territory decreases.

### **GIIZHIKAG: CONSIDERATION FOR NORTHERN WHITE CEDAR (*Thuja occidentalis*)**

Giizhikag is one of four sacred medicines valued by Anishinaabeg, with conspicuous roles in Anishinaabe original teachings, ceremony, and daily life. Over the last century, giizhikag has declined in abundance across its range (Hofmeyer et al. 2009; Dupuis et al. 2011; Danneyrolles et al. 2017). Changing forest management, ownership, hydrology, silvicultural practices, and herbivory, among others, contribute to failures in cedar regeneration and recruitment (Chimner and Hart 1996; Hofmeyer et al. 2009; Dupuis et al. 2011; Dannyrolles et al. 2017)(ITC 2019). Anishinaabe Giizhik harvesters in the Ceded Territory have observed declines in abundance on the landscape and have adapted their harvesting and use practices to protect cedar populations.

Giizhikaatig is found in uplands and lowlands, in a wide variety of moisture conditions. Upland habitats in which this being grows typically consist of dry, calcareous soils, such as limestone cliffs and boulder fields, old fields, and seepage areas. Its primary habitat, lowland sites, consist of swamps, riverbanks, and lakeshores. It prefers neutral or basic soils and is abundant in rich swamps with a strong flow of mineral-rich water, in which it often forms pure, dense stands. It is not found in the center of bogs but can be found on the edges where nutrients are more abundant. Giizhikaatig is found across the Ceded Territories but is at the southwestern end of its range.

During two recent studies, participating Tribes identified giizikaatig as highly vulnerable to climate-driven change, with potential to shift outside of local tribal service areas. Climate and forest response modeling has suggested reductions of 28-70% in suitable habitat at mid-century (2040-2070) in Northern Michigan forests (Handler et al. 2014; Iverson et al. 2016), which may compound existing stressors (ITC 2019). Giizhikaatig is limited in its dispersal ability, and dispersal barriers exist. It is limited to cool and snowy environments with particular hydrologic requirements that are likely to be disrupted as the climate changes. It is highly susceptible to deer browse, particularly in the winter. Predictive models show a reduction in suitable habitat by mid-century (ITC 2019).

## ININAATIG: CONSIDERATION FOR SUGAR MAPLE (*Acer Saccharum*) and Sugarbush

Ininaatig is another special being for the Anishnaabek, providing sap that has been harvested for centuries. From February to April, the warm days and frosty nights allow the sap within the ininaatig to run. They prefer cool, nutrient rich soil locations and are very shade tolerant but slow growing. This being is a preferred firewood.

Ininaatig grows in rich, mesic forests as well as drier, upland forests. It can grow in a variety of soils but does best in well-drained loams. It is very shade-tolerant and can persist underneath a dense forest canopy, where it can respond quickly to canopy openings. It can grow in pure Ininaatig stands, or mixed with other hardwood beings. Ininaatig is found across the Ceded Territory but is at the northwestern edge of its range.

Ininaatig is likely to be affected by increasing temperatures, drought stress, heavy precipitation events, and unseasonal freeze/thaw events. It depends on a winter snowpack for insulation, and is affected by several insect beings that are likely to have better over winter survival. Deer and earthworms are threats to this being, and models show a projected decline in suitable habitat for the Ceded Territory.

Climate change is also likely to negatively impact the practice of iskigamizigewin (sugaring), shortening the season and sugar content. Bay Mills may explore the prospects of assisted migration of southern ininaatig and their south-adapted genetics.

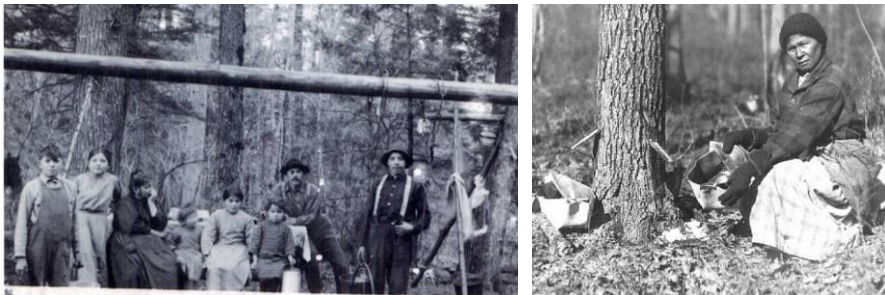


Figure 16 and 17. Left: Bay Mills family sugaring, photo courtesy of Bay Mills Ojibwe History Dept Right: Mrs. J. Mink collecting maple sap, Mille Lacs 1925 Copyright Minnesota Historical Society Collections <https://ojibwe.lib.umn.edu/collection/mrs-john-mink-collecting-maple-sap-mille-lacs-fb5a7837-fbaa-41a1-aa39-9ae3581d6813>.

## JIISENS: CONSIDERATION FOR WILD GINSENG (*Panax quinquefolius*)

Across much of North America, the root of Jiisens has been used medicinally. Jiisens prefers rich, shady, moist, undisturbed deciduous woods, with canopy beings such as maple and basswood, but it can also be found in mixed forests, and in either drier or wetter sites. It occurs most commonly on slopes or ravines and can be found in many soil types. Jiisens is more prevalent in the southern parts of the 1836 Ceded

Territory and is widespread but scarce in the region. This being was once abundant but is now threatened by human harvest for commercial sale, logging, and to a lesser extent, habitat loss and degradation. It is slow-growing and takes five to eight years to mature, which makes it particularly sensitive to disturbance. These factors make jiisens particularly vulnerable to climate change as well.

### **MAKONINAGAAWANZHIG: CONSIDERATION FOR MOUNTAIN ASH** *(Sorbus sp.)*

Makoninagaawanzh is a special being with spiritual connections for the Anishinabek and especially the people of Gnoozekaning. Traditionally the root bark has medicinal uses. The being is a shrub or small tree, growing less than 30ft tall. Its small white flowers bloom in flat clusters; its reddish berries mature in autumn and persist on tree through the winter, offering food for birds. *Sorbus americana* and *Sorbus decora* both grow on forested dunes and bluffs, especially frequent at edges of forests along Lake Superior; deciduous, mixed, and coniferous forests, often with fir, cedar, and pine, but sometimes in beech-maple stands. Makoninagaawanzh seems to thrive particularly well along shores, perhaps because of the moister climate and perhaps because released from competition of larger trees in the forest.

Due to its moisture requirements and association with boreal forests, Makoninagaawanzh is expected to struggle with climate change.

### **MASHKIIGIMINAGAAWANZH: CONSIDERATION FOR CRANBERRIES** *(Vaccinium macrocarpon and V. oxycoccus)*

Mashkiigiminagaawanzh are native to North America and provide food and medicine to Anishinaabek and animals. The berries of mashkiigiminagaawanzh plants are a favorite wild edible; additionally, the leaves are used medicinally. The Bay Mills area has two species of mashkiigiminagaawanzh —large cranberry (*Vaccinium macrocarpon*) and small cranberry (*Vaccinium oxycoccus*). Both beings have creeping, evergreen vines. The leaves are alternate along the vine, leathery, and whiteish undersides. Pink flowers are found in pairs along the vine and may resemble a bird's head. These beings grow in swamps, open bogs, and wet shores with acid soils. Mashkiigiminagaawanzh are especially vulnerable to land use conversion and habitat fragmentation, particularly the conversion of wetlands and bogs.

According to a 2017 climate change vulnerability study by BMIC and ITC staff, mashkiigiminagaawanzh is forecasted to be moderately vulnerable to climate change in EUP. Abundance and/or range extent may decrease by the year 2050. mashkiigiminagaawanzh is at its southern limit in the Ceded Territory and grows in cooler areas of the forest, which may become too warm for the plant to grow. Mashkiigiminagaawanzh may be out-competed by other plants as soils warm, dry out.

Additional Ojibwe names for these beings include Aniibimin and Mashkiigimin

### **MASHKIIGOBAG: CONSIDERATION FOR LABRADOR TEA (*Rhododendron groenlandicum*)**

Mashkiigobag are native to North America and provide food and medicine to Anishinaabek and animals. Mashkiigobag tea leaves are fragrant and have wooly undersides that turn from bright white to rusty

brown within the first two years of age. In traditional medicine, the leaves of this plant are used to treat a variety of ailments. This being is an evergreen shrub that grows in cool bogs, conifer swamps, and other wetlands with acidic soils. They grow in cool forests with spruce and other conifers and reproduce by seed and layering. Mashkiigobag habitat has declined in Michigan due to changing land use and wetland loss.

According to a 2017 climate change vulnerability study by BMIC and ITC staff, mashkiigobag is forecasted to be moderately vulnerable to climate change in EUP. Abundance and/or range extent may decrease by the year 2050. Mashkiigobag is at its southern limit in the Ceded Territory and grows in cooler areas of the forest, which may become too warm for the plant to grow. Mashkiigobag may be out-competed by other plants as soils warm, dry out, and become more nutrient-rich. Loss of sphagnum moss may cause soils and waters to be less acidic. This may lower mashkiigobag growth and reproduction.

### **MASHKIIQWAATIG: CONSIDERATION FOR TAMARACK (*Larix laricina*)**

Mashkiigwaatig is a wetland being with rot-resistant properties in its timber. The needles and bark of mashkiigwaatig have medicinal uses, while the roots have applications in binding and ropes. Mashkiigwaatig is found in open and forested bogs and swamps. It is also found along streams, lakes, and sometimes in upland sites, particularly in the northern parts of its range. Seedlings require full sunlight.

Mashkiigwaatig is a northern being at the southern end of its range in the Ceded Territory, and it is likely to be impacted by increasing temperatures. Changing hydrology will affect mashkiigwaatig and may also impact sphagnum moss, which mashkiigwaatig depends on. Disturbances such as wind storms and fires and a reduced snowpack will also negatively impact this being. There are a few insects that may thrive in a warmer climate and have severe impacts on mashkiigwaatig. Overall, mashkiigwaatig is expected to be highly vulnerable (GLIFWC Climate Change program 2021).

### **MESKOJIBIKAK: CONSIDERATION FOR BLOODROOT (*Sanguinaria canadensis*)**

Meskojibikak is a small plant, growing 3-12in tall with a distinctive single, lobed leaf and a single, white flower. Juice from a broken stem is distinctively red. This being is used in traditional medicine and crafts. Meskojibikak is an early spring ephemeral plant, flowering in April and May in mesic deciduous hardwoods. It grows from southern Canada to the Gulf Coast; is generally rare, but locally abundant across the Ceded Territory. The being produces only 20-30 seeds per plant which are spread ants feeding on the fruit (elaiosome). Over-collecting has led to dramatic declines in wild populations.

### **MIGIZIWAZISON: CONSIDERATION FOR NESTING RAPTORS**

Migizi and other raptor beings hold a special place for Anishinabek people, both culturally and spiritually. Consideration for these beings during their nesting is especially important. While various birds have different nesting preferences, large mature trees and buffer space from disturbance are commonalities.

Preservation of large diameter white pine or other trees in the vicinity of lakes are particularly favored by migiziwazison.

Raptor research demonstrates human-caused disturbance to during courtship, nesting and post-fledging stages can be detrimental to nest initiation, nest success, fledgling survival and ultimately re-occupancy of the nest site or territory. However, migizi and other raptors may respond variably dependent on the activity and timing. Disturbance should be especially avoided during the early courtship and egg laying nesting stages. Appropriate activities may not interfere with breeding if initiated after August 15<sup>th</sup>. Logging trucks and other vehicle disturbance may be permissible within 400 m of active nest sites (Goodall et al 2015).

### **MIINAGAAWANZH (MIIN): CONSIDERATION FOR BLUEBERRIES** *(Vaccinium angustifolium and Vaccinium myrtilloides)*

Miin are native to North America and provide food and medicine to Anishinaabek, other people, and animals across Michigan. The berries of miinagaawanzh plants are a favorite wild edible; additionally, the leaves and flowers are used medicinally. The Bay Mills area has two species of Miin —lowbush or common blueberry (*Vaccinium angustifolium*) and huckleberry or velvet-leaf blueberry (*Vaccinium myrtilloides*); the former miin are found in drier habitats and the latter in moister sites or overtaking *V. angustifolium* when patches have gone too long without disturbance. Miin flower and begin growing berries at four years of age. Miin can grow in areas with dry, acidic soils and plenty of sunlight, such as sand barrens or rocky outcrops. It can also grow in upland forests, often in association with pines, oaks, paper birch or aspen, or in swamps and sphagnum bogs, often with black spruce and tamarack. It relies on disturbances such as clearing or burning that create sunny openings.

Miin is fairly tolerant of a wide range of temperatures and precipitation levels, and grows in a wide variety of habitats. A reduction in snow cover may cause damage to the plants, and altered precipitation patterns or increased temperatures may affect miin growth if the changes are extreme. It thrives on disturbance, so increases in most disturbances, particularly fires, will only benefit miin plants. However, the climate impact on berry production will vary widely depending on the frosts of precipitation at crucial times of berry development. A climate change vulnerability study by BMIC and ITC staff rated miin as low vulnerability to climate change (ITC 2018). This is because the forecasted warmer summer temperatures may lead to drier soils; miinagaawanzh may benefit from drier soils. But warmer winter temperatures may reduce snowpack. Without the protection of snowpack, cold winter temperatures may harm miin plants. Increasing freeze-thaw cycles in the springtime may reduce miin flowering and fruit production (ITC 2018). Heavy rain during flowering and pollination may decrease fruit production, but more frequent fires may increase habitat for the plan. Increased competition from invasive species may reduce miin growth and reproduction (ITC 2018).

### **MOOZ: CONSIDERATION FOR MOOSE (*Alces alces*)**

Mooz are special to the Anishnabek and were traditionally hunted as a food source. Mooz were once widespread and abundant, but populations declined due to habitat loss, competition with deer, disease,

and hunting pressure. Moos are occasionally observed in Bay Mills' forests, more commonly on Sugar Island. The St. Mary's River separating Michigan from Ontario, Canada is not a barrier to moose, thus moos occasionally move between Ontario and the eastern Upper Peninsula. Despite these occurrences, moos populations have been low since the late 1800s. The distribution of moos appears closely related to the distribution of wetlands, in particular, areas where forested and shrub wetlands are interspersed with forested uplands, require both young for food and old forests for cover.

Moos has become a symbol of climate change in the region and is the subject of intensive studies. Climate change is expected to cause many direct (such as increasing temperatures), and indirect (such as increased competition and predation, diseases, and changes in vegetation and snowpack) effects on moos. Declines have already been linked to increasing temperatures, and there are multiple aspects of moos's natural history that make it vulnerable to climate change. According to Beyer et al, 2011, the Upper Peninsula winters will be similar to current winters in the southern Lower Peninsula and Upper Peninsula summers would be similar to current summers in Missouri. Given what biologists know about the limits to the southern distribution of moos, moose are unlikely to persist in Michigan if these projections are realized. Bay Mills hopes to provide habitat favorable for moos on Sugar Island as opportunity allows by

- Increasing stand complexity and encourage mixed stands: Promote regeneration techniques such as fire that encourage mixed stands similar in composition, age and size to those existing under the range of natural variation and discourage the establishment of stands uniformly dominated by a single species.
- Increasing rotation age of aspen stands to increase understory browse component while retaining summer thermal cover.
- Efforts to increase moos habitat should focus on increasing mesic conifer stands (white pine and eastern hemlock) as well as young aspen aged 0-20 years.

### **MOOZOMIZH: CONSIDERATION FOR STRIPED MAPLE OR MOOSE MAPLE** *(Acer pensylvanicum)*

Moozomizh is a culturally important being. Unlike other maples, this species is not tapped for syrup, possibly due to its small size. The inner bark of moozomizh has medicinal uses. It is also an important food source for wildlife. Moozomizh is a tall shrub or small tree, rarely growing larger than 8 inches diameter. Moozomizh is an understory tree species of mesic woods, mixed conifer stands, and cedar swamps. It attains its best growth on shaded, cool northern slopes in deep valleys favoring habitats where moisture conditions are moderate. The being is well-suited to expanding and developing its understory position in the forest should the situation arise. Large numbers of small trees that are capable of surviving from year to year under heavy shade await a disturbance in the upper canopy, even after decades of suppression.

Moozomizh is sparsely distributed across its home range is a highly adaptable species present. The USFS NRS Climate Change Atlas forecasts this being become rarer on the landscape and decline and with a poor capacity to cope with a changing climate. (USFS NRS Climate Change Atlas 2020 <https://www.fs.fed.us/nrs/atlas/tree/315>)

### NAMEPINAG: CONSIDERATION FOR WILD GINGER (*Asarum canadense*)

Namepinag is a relatively rare being. Traditionally, namepin roots have been used to aid digestion and a variety of other medicinal applications. Namepin is also used as a spice for food. Namepin is a low-growing perennial and the companion of ‘mouse-ear chickweed.’ Namepin grows in moist, rich, deciduous forests. Namepin is found across the Ceded Territory.

This being has very limited dispersal ability, is dependent on ants for its primary form of dispersal, and there are also several barriers to its dispersal. Changing (wet or dry) conditions can both negatively affect this being which prefers a moderate amount of moisture. There are many non-local beings that may outcompete namepin in the forest understory as well. (GLIFWC Climate Change program).

### OMAKAKII: CONSIDERATION FOR SPRING PEEPERS (*Pseudacris crucifer*) and VERNAL POOL HABITAT

Omakakii live in wooded areas near temporary, semi-permanent, or permanent ponds, marshes, or swamps where it breeds especially vernal pools. This fishless habitat is home to many other sensitive amphibian and macroinvertebrate beings. Omakakii is ground-dwelling and hides under the leaf litter, logs, and rocks in the winter and when not active. Vernal pools themselves are also special cultural places that are closely tied to the changing of seasons. These seasonal pools are generally found in forested areas. They fill with water in the spring from snowmelt and run-off and are frequently dry during the late summer and fall. Salamanders, wood frogs, and other amphibians use these temporary pools to lay their eggs in the spring and as habitat as they develop into juveniles and adults.

Amphibians are cold-blooded (ectotherms) and dependent on their environment for temperature regulation, which may make them more sensitive to climate change. Omakakii and many other amphibian beings are vulnerable to climate change by way of natural and anthropogenic barriers, limited dispersal, hydrological niche (sensitivity to changes in precipitation), changes in disturbance regime, and low genetic variation. Their breeding habitat, vernal pools, is dependent upon snowmelt and runoff, and therefore they are particularly sensitive to extreme weather events and changing climate conditions. If it is dry for too long, the pools may disappear completely, devastating for migrating amphibians returning to breed. Based on vulnerability assessment results, vernal pools are extremely sensitive to changing climate conditions and have limited ability to accommodate or adjust to those impacts. Management decisions should be made with buffers around this sensitive habitat.

### OZAGADIGOMIG: CONSIDERATION FOR SERVICEBERRY/ SASKATOON (*Amelanchier sp.*)

Ozagadigom are native to North America and provide food and medicine to Anishinaabek, other people, and animals across Michigan. The berries of ozagadigomig are a favorite wild edible, even nicknamed ‘sugarplum.’ Additionally, the bark is used medicinally. Ozagadigom is a large shrub or small tree that grows in clumps of several trunks. It is shade-tolerant and often found in the understory of mixed woods. There are at least six species of *Amelanchier* sp found in Michigan. Some are at the northern end of their

home range, some at the southern end. Therefore, of these six species, the northern-most beings are likely to be impacted by climate change. This local favorite grows in openings, benefitting from fire disturbance. Under full sunlight, berries grow particularly plentiful and sweet. In English, this plant may be called serviceberry, Saskatoon, juneberry, shadberry, or sugarplum.

The USFS NRS Climate Change Atlas modeled at the genus level. The Atlas forecasts this being be unlikely to expand and colonize projected suitable habitat naturally within 100 years. Its capacity to cope is rated at poor. (USFS NRS Climate Change Atlas 2020 <https://www.fs.fed.us/nrs/atlas/tree/315>)

### SHKITAAGON: CONSIDERATION FOR CHAGA mushroom (*Inonotus obliquus*)

Shkitaagon is a tree mushroom with culturally importance for the Anishinaabek. Shkitaagon is a woody, medicinal mushroom that has been used for thousands of years by North American and Eurasian groups. Recently, it is gaining popularity across a broader audience for medicinal and supplemental use. This being is a parasitic mushroom dependent on paper birch and yellow birch as host trees to produce sterile conks. It may grow on other tree species, but only as a buried stem canker. Therefore, shkitaagon declines are directly linked to declines in these birches. The mushroom is fairly widespread, but only a small percentage of birch trees will have a visible conk; of these trees, most are older yellow birch. Additionally, shkitaagon is slow-growing and susceptible to over-harvest.

Shkitaagon vulnerability to climate change is not well-understood, but at best, trends would follow wiinizkig (birch) climate change trends.

### WAAWAATESIWAG: CONSIDERATION FOR FIREFLIES (many species)

In many cultures, waawaatesiwag are the subject of many stories, symbolizing enlightenment and beings that bring help to those in need. The Anishinabek people also have stories about these little beings; they are first seen in June or early July, when deer start coming around.

Little is known about waawaatesi populations, as there are over 2,000 species, many of which are extremely difficult to identify, each with unique habitats and life histories. Tribal members have observed fewer waawaatesiwag and appearing later in the season. This corresponds with worldwide reports of firefly declines. Logged areas and forest clear-cutting, as well as wetland fragmentation and loss, are likely to reduce habitat with adequate soil moisture for waawaatesiwag. Light pollution is thought to negatively affect waawaatesiwag by disrupting its flash communication (GLIFWC 2018). In general, most of these barriers are unstudied. Although little is known about waawaatesi in general, there are several factors that make it vulnerable to climate change, including anthropogenic barriers, changes in precipitation, and susceptibility to predators. Numerous studies also find waawaatesiwag around the planet are declining due to habitat loss, artificial light, and pesticides (especially neonicotinoids).

### **WIIGOBIISHAATIG: CONSIDERATION FOR BASSWOOD (*Tilia americana*)**

Wiigobiishaatig is a large deciduous tree, reaching up to 80ft tall. It often sprouts after fire or cutting, growing in clumps of trunks alongside sugar maple and other hardwoods. The leaves are toothed and heart-shaped with unequal lobes. Clusters of fragrant flowers bloom in July, attracting bees. The flowers and bark are both used by the Anishinabek in traditional medicine and crafts.

Historic forestry practices have greatly reduced the basswood across the landscape. Although it has low vulnerability to climate change, it must be given opportunity to grow in forest management plans.

### **WIIGWAASAG: CONSIDERATION FOR PAPER BIRCH (*Betula papyrifera*)**

Wiigwaas are considered an important cultural resource, representing a central material for basketry, canoes, shelter, and a preferred firewood. Wiigwaas can grow on almost any soil type and on any topographic feature, from steep rocky outcrops to the borders of swamps and bogs. It grows best in cool, moist sites in well-drained soil but can survive in poor quality sites. It can be found mixed with other hardwoods in dry northern forests or form pure stands, particularly in areas recently disturbed by fire or logging. Pure stands are often succeeded by other plant beings after one generation.

Wiigwaas is found across the 1836 Ceded Territory but is at the southern end of its range. The number of paper birch has decreased by 49% on forest land in the Ceded Territory since 1980. According to the GLIFWC Climate Change program, bark supply has declined 45.5% (GLIFWC 2021). In the Upper Peninsula, overharvesting of young Wiigwaas for poles for the interior decoration industry is a serious threat to this being, and in response several tribes have limited birch pole harvest to ceremonial use only. Additionally, forests are generally not managed to promote wiigwaas and suppression of cultural fire has reduced the disturbance regime that once helped to create habitat for this being to germinate.

Wiigwaas is a northern being, adapted to cold temperatures and snow. It is susceptible to drought and insect pests as well as deer herbivory. It is also easily outcompeted with time. Wiigwaas has already declined in recent history for a variety of reasons, and models suggest Wiigwaas will experience a decline in suitable habitat by mid-century in the Ceded Territory due to climate change. These factors make it particularly vulnerable. Bay Mills Indian Community hopes to favor Wiigwaas through prescribed fire and selectively scarifying the soil to promote regeneration.

### **WIINIZIKIG: CONSIDERATION FOR YELLOW BIRCH (*Betula alleghaniensis*)**

Traditionally wiinizik has a number of craft and construction uses. The Anishinabek people also have stories about the appearance of birch bark and how the tree became so helpful to humans. The twigs and bark have medicinal uses; sap is also collected and condensed into syrup—making this being another kind of ziinzibaakwadwaatig or sugar tree. The close-grained wood makes this tree useful for furniture and veneer. The twigs are browsed on by whitetail deer, moose and rabbits.

Much like wiigwaas, wiinizik prefers to grow in cooler conditions and is often found on north facing slopes, swamps, stream banks, and rich woods. This mid-to-late successional being is commonly associated with hemlock, beech, and maple. Wiinizik needs coarse woody debris for nurse logs, large

canopy gaps (sunlight), and bare mineral soil or mixed soil to germinate. Recent forest management practices are generally not managed to promote wiinizik; in wiinizik stands, management favors single tree selection, benefiting more shade-tolerant beings and not disturbing the soil enough for wiinizik.

Many species of birch, such as wiinizik, are boreal species with preference for colder temperatures. It is expected that boreal tree species, already at the southern limit of their range, will have difficulty with the overall warming that is expected in the region. It does not grow well in dry regions or regions with hot summers and will often last only 30-50 years in such conditions, a fraction of their possible lifespan. Based on these factors, wiinizik have a high sensitivity to changing climate conditions and a low ability to adapt to climate-related impacts). This finding suggests that wiinizik are highly vulnerable to climate change (Stults et al, 2016).

### ZHINGWAAK: CONSIDERATION FOR EASTERN WHITE PINE (*Pinus strobus*)

Zhingwaak is a special being for the Anishinabek. Traditionally, the needles, trunk, and pitch of zhingwaak was used medicinally and this being has spiritual connections. The lumber is also used. The Eastern Upper Peninsula is in the central part of zhingwaak's home range, extending around the Great Lakes to New England and through the Appalachian Mountains. Because this being is somewhat resistant to fire, mature survivors are able to re-seed burned areas. In pure stands mature trees usually have no branches on the lower half of the trunk. Modeling has suggested that by 2100 zhingwaak could experience increases under both mild climate change scenarios and more severe climate change scenarios. (GLIFWC Climate Change program 2021).

## 3.9 Vegetation Assessments (past)

### WETLAND INVENTORY OF 2012 (ITC)

In 2012 Intertribal Council of Michigan completed a wetland inventory for portions of BMIC. It categorized the types of wetlands present at these sites. This document also provided general management recommendations to improve and retain high quality wetland conditions in these areas.

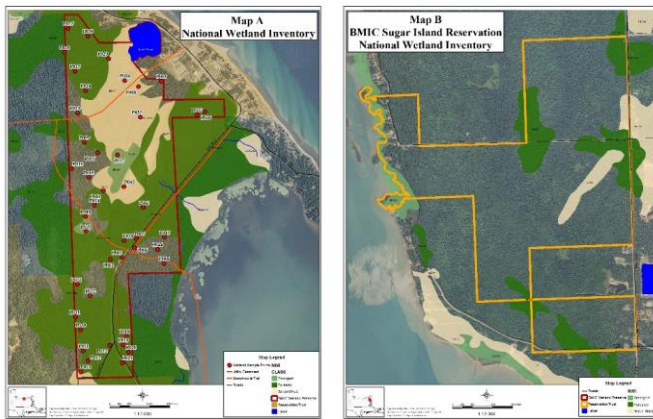


Figure 18 and 19. Maps of the Wetland Preserve and Sugar Island wetland types.

#### SUGAR ISLAND INVENTORY OF 2017

In 2017, BMIC Biological Services staff performed an extensive understory vegetation survey used to create an inventory of the species that can be found on the island to help define and delineate the different types of forest stands located throughout the property. Across the 608 acres, 480 points were randomly selected and surveyed with a 1m<sup>2</sup> quadrat; all species and their numbers were recorded. Although they are still occupied with many of the species that are indicative of northern hardwood swamps, they are showing a movement towards becoming more like wet meadows due to openings in the canopy and an increase in standing water (BMIC 2017).

#### WETLAND VEGETATION SURVEYS OF 2019 - 2021 (BMIC)

Beginning in 2019 BMIC Biological Services staff performed vegetation surveys of wetlands in the Brimley area (main reservation). These surveys differed from Sugar Island quadrats in that they were timed-meander surveys including aquatic, submergent, emergent, and upland plants. This survey method was more useful in sampling open water wetlands where water depth could vary knee-deep to bottomless. The same wetland were resurveyed three times over the growing season to better capture species diversity.

#### CEDAR ASSESSMENT OF 2019

During 2019, the Inter-Tribal Council of Michigan (ITCMI) assessed the current status and trends of northern white cedar (*Thuja occidentalis*) in Mackinac and Chippewa counties. Their assessment identified forest management strategies to support and enhance cedar population on tribal and public lands, with an

emphasis on current and future tribal cedar harvest for timber and non-timber products. Below is a map of their study sites with an inset of Bay Mills lands. Refer to ITCMI 2019 for more information on the study.

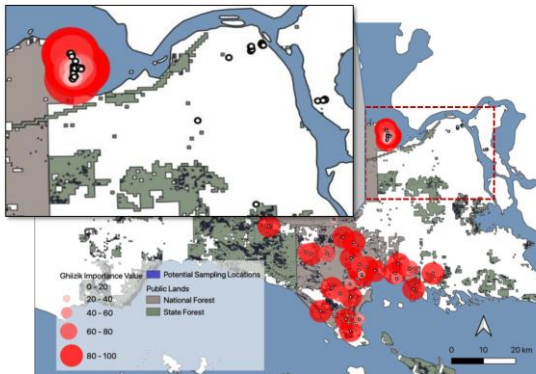


Figure 20. Cedar study sites from 2019 Inter-Tribal Council of Michigan assessment.

### 3.10 Forest Health Considerations

#### 3.10.i Forest Insect and Disease Threats

The following trees are the most common in the BMIC: Balsam Fir (*Abies balsamea*), Red maple (*Acer rubrum*), Sugar Maple (*Acer saccharum*), Yellow Birch (*Betula alleghaniensis*), Paper Birch (*Betula papyrifera*), American Beech (*Fagus grandifolia*), White ash (*Fraxinus americana*), Black Ash (*Fraxinus nigra*), Green ash (*Fraxinus pennsylvanica*), Tamarack (*Larix laricina*), White spruce (*Picea glauca*), Black Spruce (*Picea mariana*), Jack pine (*Pinus banksiana*), Red pine (*Pinus resinosa*), White Pine (*Pinus strobus*), Balsam Poplar (*Populus balsamifera*), Big-tooth Aspen (*Populus grandidentata*), Quaking aspen (*Populus tremuloides*), Red Oak (*Quercus rubra*), Northern White Cedar (*Thuja occidentalis*), Eastern Hemlock (*Tsuga canadensis*), Tag alder (*Alnus incana*), Willow spp (*Salix* spp). Therefore the following insects and diseases are most likely to impact BMIC trees

Table 10. Forest insect pests and diseases that may impact the BMIC trees

Common Name	Scientific Name	Family	Type
Bronze Birch Borer	<i>Agrilus anxius</i>	BUPRESTIDAE	Insect
Emerald Ash Borer**	<i>Agrilus planipennis</i>	BUPRESTIDAE	Insect
Eastern Larch Beetle	<i>Dendroctonus simplex</i>	CURCULIONIDAE	Insect
Spruce Beetle	<i>Dendroctonus rufipennis</i>	CURCULIONIDAE	Insect
Hemlock Looper	<i>Lambdina fiscellaria</i>	GEOMETRIDAE	Insect
Jack Pine Budworm	<i>Choristoneura pinus pinus</i>	TORTRICIDAE	Insect

Spruce Budworm	<i>CChoristoneura fumiferana</i>	TORTRICIDAE	Insect
White Pine Weevil	<i>Pissodes strobi</i>	CURCULIONIDAE	Insect
Forest Tent Caterpillar	<i>Malacosoma disstria</i>	LASIOCAMPIDAE	Insect
Eastern Tent Caterpillar	<i>Malacosoma americanum</i>	LASIOCAMPIDAE	Insect
Spongy Moth**	<i>Lymantria dispar dispar</i>	EREBIDAE	Insect
White Pine Leaf Adelgid	<i>Pineus pinifoliae</i>	ADELGIDAE	Insect
Maple Borer	<i>Glycobius speciosus</i>	CERAMBYCIDAE	Insect
Hemlock Woolly Adelgid**	<i>Adelges tsugae</i>	ADELGIDAE	Insect
Asian Long-Horned Beetle**	<i>Anoplophora glabripennis</i>	CERAMBYCIDAE	Insect
Armillaria root disease	<i>Armillaria spp</i>	PHYSALACRIACEAE	Pathogen
Hypoxylon Canker	<i>Hypoxylon spp</i>	XYLARIACEAE	Pathogen
White Pine Blister Rust	<i>Cronartium ribicola</i>	CRONARTIACEAE	Pathogen
Bast Scales on white pine	<i>Matsucoccus macrocitrices</i>	MATSUCCOCCIDAE	Pathogen
Caliciopsis Canker	<i>Caliciopsis pinea</i>	CORYNELIACEAE	Pathogen
Shoot Blight	<i>Diplodia pinea</i>	BOTRYOSPHAERIACEAE	Pathogen
Sirococcus Shoot Blight	<i>Sirococcus strobilinus</i>	GNOMONIACEAE	Pathogen
Heterobasidial Root Rot**	<i>Heterobasidial annosum</i>	BONDARZEWIACEAE	Pathogen
Oak Wilt**	<i>Ceratocystis fagacearum</i>	CERATOCYSTIDACEAE	Pathogen

\*\* indicates non-native, invasive species.

To determine the significance of an outbreak, a forester, or other specialist, should evaluate all potentially destructive insect and disease infestations on the reservation. The evaluation should determine the likely course of the outbreak, the damage or loss that might be incurred if no action is taken, and the measures that should be used to suppress the outbreak.

### 3.10.ii Forest Invasive Species

Invasive species constitute a major threat to all habitat types. Numerous invasive species already exist within the watershed, and several others are threatening invasion. Table 4 includes many of the invasive species already residing within the watershed as well as several species which may pose a threat in the near future. Some invasive species are legally designated by the State of Michigan as either "prohibited" or "restricted." If a species is prohibited or restricted, it is unlawful to possess, introduce, import, sell or offer that species for sale as a live organism, except under certain circumstances. The term "prohibited" is used for species that are not widely distributed in the state. Often, management or control techniques for prohibited species are not available ([www.Michigan.gov/invasives/](http://www.Michigan.gov/invasives/)). The term "restricted" is applied to species that are established in the state. Management and control practices are usually available for restricted species. A number of the following species use rivers as corridors to further spread and take hold, such as emerald ash borer and Himalayan balsam. Regular monitoring and prevention campaigns can limit their spread.

Table 11: Invasive species of concern

Common Name	Scientific Name	State designated Invasive Species	DNR Watch List	Present in Chippewa Co
Hemlock Woolly Adelgid	<i>Adelges tsugae</i>			
Emerald Ash Borer	<i>Agrilus planipennis</i>	Prohibited		X
Garlic Mustard	<i>Allaria petiolate</i>			X
Asian Long-horned Beetle	<i>Anoplophora glabripennis</i>			
Japanese Barberry	<i>Berberis thunbergii</i>			X
Spotted Knapweed	<i>Centaurea maculosa</i>			X
Canada Thistle	<i>Cirsium arvense</i>			X
European Swamp Thistle	<i>Cirsium palustre</i>			X
Leafy Spurge	<i>Euphorbia esula</i>			X
Autumn Olive, Russian Olive	<i>Elaeagnus sp</i>			
Glossy Buckthorn	<i>Frangula alnus</i>			X
Himalayan Balsam	<i>Impatiens glandulifera</i>		X	X
European Bush Honeysuckle	<i>Lonicera sp</i>			X
Spotted Lanternfly	<i>Lycorma delicatula</i>			
Spongy Moth	<i>Lymantria dispar</i>			
White Sweet Clover	<i>Melilotus alba</i>			X
Yellow Sweet Clover	<i>Melilotus officinalis</i>			X
Wild Parsnip	<i>Pastinaca sativa</i>			X
Scots Pine	<i>Pinus sylvestris</i>			X
Japanese Knotweed	<i>Polygonum cuspidatum</i>	Prohibited		X
Giant Knotweed	<i>Polygonum sachalinense</i>			
Black Locust	<i>Robinia pseudoacacia</i>			X
Common Buckthorn	<i>Rhamnus cathartica</i>			X
Climbing Nightshade	<i>Solanum dulcamara</i>			X

The Midwest Invasive Species Information Network (MISIN) is a regional effort to develop and provide early detection and response resources for invasive species. Their goal is to assist both experts and citizen scientists in the detection and identification of invasive species in support of successful management. This effort is being led by researchers with the Michigan State University Department of Entomology laboratory for Applied Spatial Ecology and Technical Services in conjunction with a growing consortium of supporting partners. Access the MISIN database for up to date invasive species information or to report a sighting <https://www.misin.msu.edu/>.

#### EMERALD ASH BORER IMPACTS to BAY MILLS FORESTS

Emerald Ash Borer has impacted nearly all of the ash trees (*Fraxinus* sp) of Bay Mills forests. As of 2022, numerous ash trees were still alive and producing seeds, but were adjacent to infected individuals. At this point, no further actions for EAB prevention or remediation are recommended.

Bay Mills Indian Community will pursue under-planting impacted stands to suitable tree species.

## Chapter 4. POLICIES, ORDINANCES, AND REGULATIONS

Harvest of forest products (both timber and non-timber forest products); comes in all shapes, sizes, and scales. Over all, BMIC Executive Council has the authority to [limit the type of harvests and locations of harvests on BMIC trust & fee lands].

IF commercial forest management is to be conducted with area remaining undeveloped forest land and the estimated timber sale of high value and scale....:

1. Then BMIC Executive Council must agree to the project with Tribal Resolution,
2. The project MUST be overseen by BIA Forester
3. The commercial harvest they must be conducted under a contract approved by Bay Mills Tribal Council and in accordance with all other statutes (refer to [section 4.1](#)).
4. Should timber sales be proposed, planning and design will use interdisciplinary expertise including the Biological Services Department and involve the Bay Mills Indian Community Executive Council; this is further explained in [section 4.3](#).
5. If possible, follow guidance of this management plan including recommendations made in [section 4.4](#) Harvesting Policy and Silviculture Guidelines and [section 6.2](#) Forest Goals and Objectives.

IF trees are to be cleared for land development with the area being permanently changed from forest land to developed land....:

1. Then BMIC Executive Council must agree to the project with Tribal Resolution, etc
2. BIA Forester oversight not required but strongly suggested.
3. [BMIC Timber Use Policy](#) applies. If BMIC chooses to allow harvests, small scale and low value harvests are regulated by the BMIC Timber Use Policy of 1993 (see [APPENDIX G](#).)
4. Should timber sales be proposed, planning and design will use interdisciplinary expertise including the Biological Services Department and involve the Bay Mills Indian Community Executive Council; this is further explained in [section 4.3](#).

If the proposed harvest for land development is relatively small (XXXXXXX \_\_\_\_\_), then

5. Then [BMIC Timber Use Policy](#) applies. Citizens should apply for fire wood permit, sap permit at the Conservation Department office.

IF BMIC Executive Council chooses to allow citizens to collect firewood, maple sap, etc. ....

Then [BMIC Timber Use Policy](#) applies. Citizens should apply for fire wood permit, sap permit at the Conservation Department office. Conditions of the permit apply including that ..... the citizens may/may not sell their collected products....

## 4.1 Ordinances, Standards, and Specific Objectives

The statutory authority for management of Indian forest units is 25 United States Code (USC), Parts 2, 5, 9, 13, 406, 407, 413, 415, 466, and 3101-3120. The BIA is committed to the principles of sustained yield management, as required by Part 163, Subpart B 163.11, Forest Management Planning and Sustained Yield Management, of the General Forest Regulations in Title 25, Code of Federal Regulations.

Also, if a project may affect wetlands or other important fish and wildlife habitats, the United States Fish and Wildlife Service (USFWS), in accordance with the NEPA of 1969 (42 U.S.C. 4321-4347) and other environmental laws and rules, recommends complete avoidance of these areas, if possible. If this is not possible, attempts should be made to minimize adverse effects. If adverse effects are unavoidable, then measures should be undertaken to replace the affected areas. Work requiring the alteration or disturbance of wetlands or streams may require a permit from the U.S. Army Corps of Engineers, according to the regulations set forth in Section 10 of the Rivers and Harbors Act or Section 404 of the Clean Water Act.

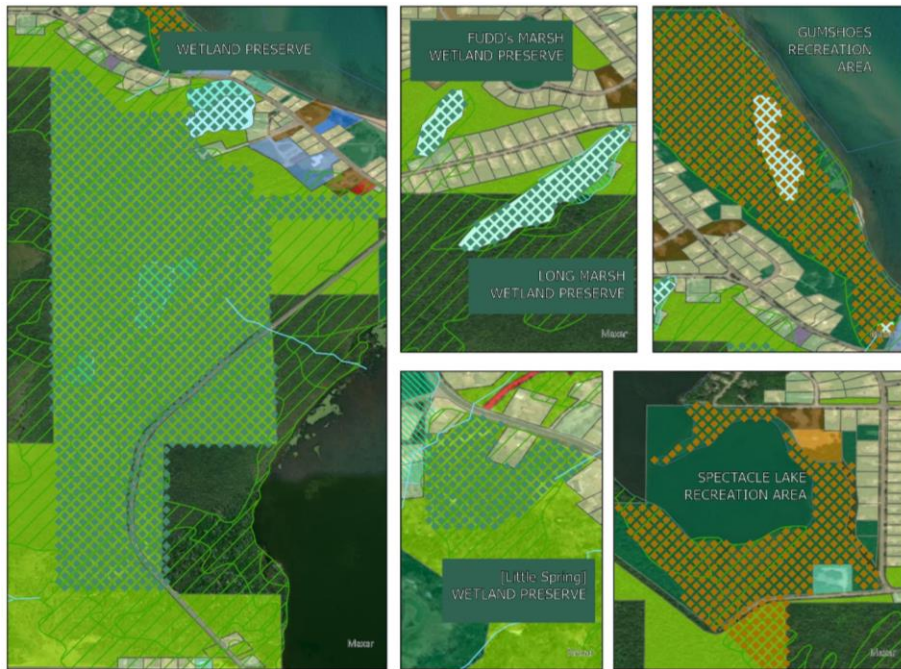
[insert something from CFR 163]????

Additional regulations include

- [BMIC Preserves and Recreation Areas](#)
- [BMIC Timber Use Policy](#)
- [Timber Trespass Policy](#)
- [BMIC Conservation Code](#)

### 4.1.i Preserves and Recreation Areas

The following locations on the Reservation also have some kind of protective status, limiting their land use. Figure 16 depicts the recreation areas and preserves designated by the BMIC Executive Council. These locations have varying degrees of use and regulation of management activities. All of these are excluded from residential or enterprise building development. Nearly all of these are wetlands.



**Commented [AEM5]:** Update map when borders are finalized.

Figure 21. Preserves and recreation areas designated by BMIC Executive Council.

Table 12. Preserves and recreation areas designated by BMIC Executive Council.

Area Name	Acres	Estb	Resolution
Wetland Preserve	460	1996	No. 96-10-14
Formerly the Black Ash Preserve	9.5	2004; redrawn 2021	No. 09-4-13C
Long Marsh Wetland Preserve	20	2022	
Fudd's Marsh Wetland Preserve	14	2022	No. 22-05-09C
Gumshoes Recreation Area	126	2022	No. 05-23-22
Spectacle Lake Recreation Area	60	Pending?	

#### BAY MILLS WETLAND PRESERVE

The Bay Mills Indian Community established a wetland preserve on trust lands in 1996 with Resolution No 96-10-14. The Executive Council of Bay Mills established and designated as “wetland preserve” the area so identified in the below map, within which no activity shall be permitted that which requires discharge of fill material, unless specified by Council. Any such approval shall be conditioned upon an application of a permit from Executive Council, utilizing a specific form. And any and all land use activities within the exterior boundaries of the Reservation, as presently constituted, which are outside the Wetland Preserve, may be exempt from this process. [verify final statement] (BMIC Resolution No 96-10-14). The Wetland

Preserve Resolution does not prohibit timber harvest or vegetation management; but all management actions must be cleared with Bay Mills Executive Council.

#### BAY MILLS BLACK ASH PRESERVE

On the southern end of Bay Mills is a 10.54 acre stand of black ash trees which was established as a preserve by Tribal Council in 2004 in order to protect the trees from disease, infestation, and misuse. The Bay Mills Indian Community reaffirmed the Black Ash Preserve in 2009 with Resolution No. 09-4-13C. Since then, the majority of these ash trees have been infected by Emerald Ash Borer and are declining or dying. The preserve status of the area was reaffirmed in 2021 with slight modification to the boundaries; total acres is now 9.5 acres.



Figure 22 and 23. Original delineation of Black Ash Preserve. Modified Preserve boundary 2021.

#### 4.1.ii BMIC Timber Use Policy

The harvest of forest products provides benefits to the Bay Mills Indian Community. Commercial resale would be handled by BIA Forester. When the value of timber products is relatively small and contract sale is not required, harvesters must acquire a Resale Permit, Free-Use Permit, or Free-Use Without permit. The complete BMIC Timber Use Policy of 1993 may be found in [APPENDIX E](#).

1. Commercial Resale Permit = Stumpage value of product may not exceed \$2500; volumes have been estimated to a cruising accuracy level. Commercial Resale Permits may be issued to a non-tribal entity when it is necessary to prevent loss of value resulting from fire, insects, disease, windthrow, or other catastrophic events, provided tribal loggers decline or are unable to harvest these materials in a timely manner. Form BIA-5331.
2. Free-Use Permits = Stumpage value of product (to be cut in one year by individual) may not exceed \$500. Firewood cutting, clearing of residential or recreational leases; fence posts; maple sap collection; miscellaneous cutting done for educational, religious, or ceremonial use by groups authorized by the Bay Mills Tribal Council.

**Commented [AEM6]:** Possibly include maps and design harvest area. Commercial/ free use with permit and free use without permit area.

3. Free-use without permit = one Christmas tree per household; cedar or balsam boughs for religious or ceremonial use; and nuts or berries. This does not include cutting of any of the above for resale.

**Commented [AEM7]:** Lots of gray area in this policy. Review with Bex????

When the value of timber products is relatively large, a contract sale is required. Refer to the statutes listed above in [section 4.1](#).

#### 4.1.iii Timber Trespass Policy

Title 25, Code of Federal Regulations (Indians), Part 163 (General Forestry Regulations), Section 163.29 (Trespass), clarifies the Secretary's authority to manage trust forestland and to issue regulations that set civil penalties for forest trespass. Tribes that adopt these regulations have concurrent civil jurisdiction to enforce the act and regulations. At the request of the Tribe, federal agencies will defer to Tribal prosecution of forest trespass cases. Tribal court judgments in forest trespass cases are entitled to full faith and credit in federal and state courts. At Bay Mills Indian Community, in the event of fire trespass, the BIA and Tribe will assess the damages and determine if the Tribe or landowner will incur a fee.

Most timber trespass involves commercial sale of posts, poles, and firewood material cut under the free use authority. However, this type of trespass is difficult to control. Timber trespass policies and procedures can be found in [53 IAM Chapter 7](#).

#### 4.2 Documentation, Monitoring, and Records

Documentation and records for all timber sales, commercial resale permits, free-use permits, and forest development activities are kept at the BIA Michigan Agency. Copies of these documents and records are sent to the Midwest Regional Office.

#### 4.3 Planning, Coordination, and Communication

Should timber sales be proposed, planning and design will use interdisciplinary expertise and involve the Bay Mills Indian Community Executive Council. The planning process will begin after the BIA approves the FMP. The Agency may consult with the Bay Mills Biological Services Department before any final design plan is prepared. After preliminary reconnaissance and mapping of the sale area, an archaeologist from the Midwest Regional Office will be involved so that considerations regarding cultural, fish, and wildlife resources can be built into the final sale design. Other resource specialists (e.g. soil scientist, hydrologist, etc.) will be brought into the planning/NEPA process as necessary.

When the sale unit design is finalized, the sale will be cruised and required documents will be prepared. After the sale has been advertised, the Superintendent will make the decision to award the contract and present it to the Executive Council for approval. A final meeting between the Michigan Agency and Bay

Mills Indian Community will be required after the sale is completed to discuss options and recommendations on any post-harvest management activities.

#### 4.4 Harvesting Policy and Silvicultural Guidelines

BMIC has only small acreage of forest categorized as “commercial.” Of that acreage, very little is logistically feasible for commercial timber harvest. Therefore, **Bay Mills prefers to conduct little to no harvesting within the reservation’s core forest management areas until an updated Forest Inventory Assessment can be conducted at which time this topic will be revisited.** This will not impact timber sales in advance of planned road-building and land-clearing for development. Dead and dying trees deemed hazardous to people, homes, or facilities may be removed. Others may be left in place for wildlife habitat, recreation, aesthetics, and subsistence hunting/gathering. Major management considerations are primarily based on goals of promoting wildlife habitat, gathering and hunting opportunities for community members, aesthetics, and forest health and resiliency. Refer to [Chapter 6](#).  
.....

Any timber harvests should have Tribal Council approval in the form of a Tribal Resolution prior to timber sale. Refer to Chapter 4 for more information. .... [insert something from CFR 163]

If BMIC chooses to allow harvests, small scale and low value harvests are regulated by the BMIC Timber Use Policy of 1993 (see [APPENDIX G](#).) If the BMIC chooses to hold a large commercial harvest they must be conducted under a contract approved by Bay Mills Tribal Council and in accordance with all other statutes (refer to section 4.1).

*“Sale of Tribal forest products may be made to enrolled members of the Bay Mills Tribe, as well as to non-members. Sale of sawlog products shall be advertised for open market bidding, and these contracts or permits shall be approved by the Superintendent. Permits will not be issued on trust lands without the written consent of the beneficial owners. Forest products shall be sold using standard BIA contract or permit forms, and sales shall be cruised and sale documents shall be prepared in accordance with 53 IAM requirements. All documents pertaining to the sale of timber shall be provided to the Midwest Regional Office for informational purposes.”*

Forest stand prescriptions and harvesting will likely follow standard State of Michigan Best Management Practices. Silvicultural guidelines will be largely based on habitat type, wetness, and soils ([see section 4.4.i](#)). Additional considerations will include measures to protect moose habitat, long-eared bats during hibernation and pupping season, and raptor species during the nesting season following USFWS guidelines. Refer to [section 3.6](#) for more on wildlife considerations and [section 3.8](#) for species of cultural significance.

- BMIC vegetation management will strive to not interfere with forest-dwelling bats such as northern long-eared bats. The northern long-eared bat 4(d) rule prohibits incidental take that

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may occur from tree removal activities within 150 feet of a known occupied maternity roost tree during the pup season (June 1 to July 31) or within a 1/4 mile of a hibernation site, year round.

- BMIC vegetation management will strive to not interfere with breeding raptors. Raptor research demonstrates human-caused disturbance to during courtship, nesting and post-fledging stages can be detrimental to nest initiation, nest success, fledgling survival and ultimately re-occupancy of the nest site or territory. However raptors may respond variably dependent on the activity and timing. Appropriate timber harvest, vegetation management, or other construction/development activities may not interfere with raptor breeding ecology if initiated after August 15<sup>th</sup>. Logging trucks and other vehicle disturbance may be permissible within 400 m (¼ mile) of active nest sites (Goodall et al 2015).

#### 4.4.i Silvicultural Guidelines by Forest Type

According to the 1997 BMIC FIA the reservation (including lands on Sugar Island) consist of the following major forest cover types: swamp hardwoods, northern hardwoods, aspen/northern hardwoods, aspen, fir/spruce, swamp conifer, cedar, and black spruce.

It is the position of the BMIC that little to no commercial harvesting will be conducted on Tribal lands but the Tribe reserves the right to change their stance on a case by case basis. Major management considerations are primarily based on goals of promoting wildlife habitat, gathering and hunting opportunities for community members, aesthetics, and forest health and resiliency.

Below are the characteristics and silvicultural considerations and guidelines for the major forest types of BMIC.

##### ASPEN FOREST TYPE (approx. 261 acres)

Characteristics: Aspen comprises more than 50% of the basal area in sawtimber and poletimber stands or more than 50% of the stems in sapling and seedling stands. Principal species are bigtooth aspen (*Populus grandidentata*) and trembling aspen (*P. tremuloides*). Aspen will refer to both trembling and bigtooth in this section, unless otherwise noted. Balsam poplar (*P. balsamifera*) will also be discussed. Aspen grows with a variety of trees and shrubs over its extensive range, either as a dominant or an associate.

Aspen is a “pioneer” tree species generally growing in even-aged stands regenerated following a major disturbance. Aspen often outgrows other associated species and can form nearly pure stands. Two-aged stands are the result of suckering after partial cutting or partial loss from natural disturbance events like wind or fire. In undisturbed stands, more tolerant associates will replace aspen through natural succession.

Management: Aspen responds well to cutting and intensive management and typically root sprouts (i.e. “suckering”) within a year of cutting. To maintain and promote pure aspen stands, coppice, or total tree removal with vegetative reproduction, is recommended. Another method is coppice with standards, where the “standards” are crop trees either of the same species or a different species (e.g. cutting aspen but leaving red pine as the standard) to slowly convert a stand to a different composition or develop a two-aged stand. As mentioned above, aspen is a “pioneer” species and is intolerant to shade and short-lived, it can be replaced in stands by more tolerant species through natural succession if no disturbance or management.

#### SWAMP HARDWOODS FOREST TYPE (approx. 239 acres)

Characteristics: Any combination of black ash (*Fraxinus nigra*), green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*), silver maple (*Acer saccharinum*), swamp white oak (*Quercus bicolor*), and elms (*Ulmus spp.*) comprises 50% or more of the basal area in sawtimber and poletimber stands, or 50% or more of the stems in sapling and seedling stands. This type occurs on wetlands characterized by periodic inundation (fluctuating water table near or above the soil surface) and nearly permanent subsurface water flow.

Swamp hardwood stands are often composed of relatively pure black ash, although mixed stands are commonly found. Black ash with its rapid growth rate initially, dominates the structure and composition in this cover type. In old growth black ash stands, an uneven age structure with gaps is usually exhibited depending on the natural disturbance regime at the site (wind throw and flooding).

Associates in swamp hardwood communities include: aspen (*Populus spp.*), white birch (*Betula papyrifera*), yellow birch (*Betula alleghaniensis*), balsam fir (*Abies balsamea*), northern white cedar (*Thuja occidentalis*), hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*), white spruce (*Picea glauca*), black spruce (*Picea mariana*), and tamarack (*Larix laricina*).

Differences in species composition are dependent on variation in site, soils and duration of high water. Black ash-dominated swamps are adapted to more stagnant water with reduced oxygen content whereas, green ash is more likely to occur with moving, oxygen rich water. Due to the presence of emerald ash borer (EAB) in the upper Midwest, the domination of black and green ash on swamp hardwood sites is expected to decline. (Source: WNDR Silvicultural Handbook)

Management: The cultural and ecological function of swamp hardwoods are of the utmost importance to the Tribe. Promoting and maintaining these functions will guide management. The associate soils are fragile and seldom freeze making operability a limiting factor. Due to this, management will consist of planting on “dry spots” and hummocks to rehabilitate the ecological function of black ash lost to EAB. Planting species will be well-suited to wet and poorly-drained soils and will also be considered due to their “climate change” adaptability.

Silvicultural prescriptions will be limited to single-tree selection (selecting for the best quality trees) to promote healthy, vigorous, and resilient trees. Patch (or group) cuts can be implemented in poor quality stands that have been affected by abiotic and biotic factors (including but not limited to: pests, disease, wind/ice events, and/or poor management). Both methods will create gaps that will promote regeneration for intolerant and mid-tolerant species and promote wildlife habitat by creating browse and cover. Patches are recommended to be at 0.1 acre and no more than 1 acre in size.

#### NORTHERN HARDWOODS FOREST TYPE (approx. 134 acres)

Characteristics: Any combination of sugar maple (*Acer saccharum*), beech (*Fagus grandifolia*), basswood (*Tilia americana*), white ash (*Fraxinus americana*), and yellow birch (*Betula*

*allegghaniensis*) comprises more than 50% of the basal area in sawtimber and poletimber stands or more than 50% of the stems in sapling and seedling stands.

Within the northern hardwood cover type, associated species are: red maple (*Acer rubrum*), red oak (*Quercus rubra*), hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*), and balsam fir (*Abies balsamea*). Many other tree species occurring in Michigan can be found as occasional associates in northern hardwood stands.

Management: Promoting, healthy, resilient, and diverse northern hardwood stands are desired. The use of single tree selection will produce a result of structural diversity while promoting healthy, vigorous trees and should improve residual forest by removing the worst and leaving the best trees. Crop tree release can be used for species that are less represented in a stand (e.g. white pine, red oak). The use of patch (or group) selection can promote regeneration for intolerant or mid-tolerant species in poor quality stands and should not be less than 0.1 acre and no greater than 2 acres in size. Silvicultural methods will depend on factors such as quality of standing timber, existing regeneration, and forest health.

ASPEN/ NORTHERN HARDWOOD FORET TYPE (approx. 206 acres)

Characteristics: A combination of mixed hardwoods that consist of significant portions of northern hardwood and aspen, more or less.

Management: Silvicultural prescriptions will primarily consist of single-tree selection with aspen removal or conversion to either pure aspen or northern hardwoods depending on site conditions and quality (i.e. stand conversion). Elements of both aspen management and northern hardwood management can be applied depending on stand and site quality including: patch (or group) selection, single tree selection, single tree selection/aspen removal, or clearcut with reserves.

CEDAR FOREST TYPE (approx. 15 acres)

Characteristics: 50% or more of swamp conifers that is comprised of northern white cedar (*Thuja occidentalis*).

Management: Due to the cultural importance of northern white cedar and the limited operability in these stands where this species grows, the Tribe desires to severely limit and restrict the harvest of these stands. Considerations for management will include planting (with fencing to exclude deer in poorly stocked areas) and release highly stocked areas to promote growth, health, and vigor. If the Tribe desires to manage this species, harvesting will be limited to when soils are frozen to reduce risk of rutting and impacts to water quality.

BLACK SPRUCE FOREST TYPE (approx. 15 acres)

Characteristics: More than 50 percent swamp conifers with black spruce (*Picea mariana*) predominant. Common associates include: tamarack (*Larix laricina*), northern white cedar (*Thuja occidentalis*) and balsam fir (*Abies balsamea*). Occasional associates include: white spruce (*Picea glauca*), hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*), jack pine (*P. banksiana*), balsam poplar (*Populus balsamifera*), quaking aspen (*P. tremuloides*), black ash (*Fraxinus nigra*), red maple (*Acer rubrum*), paper birch (*Betula papyrifera*) and yellow birch (*B. allegheniensis*).

Black spruce is found almost entirely on peat bogs, muck-filled seepages, and stream courses in Wisconsin. Occasionally black spruce will be found on mineral soil adjacent to a swamp that contains black spruce. A few plantations of black spruce have also been established on upland sites.

Management: Due to the cultural importance of the ecosystem where black spruce is found and the limited operability, the Tribe desires to severely limit and restrict the harvest of these stands. If the Tribe wishes do so, harvesting will be limited to times of year when the soil is frozen to limit the possibility of rutting and limit impacts to water quality.

RED PINE FOREST TYPE (approx. 20 acres)

Characteristics: Red pine (*Pinus resinosa*) comprises 50% or more of the basal area in sawtimber and poletimber stands, or 50% or more of the stems in sapling and seedling stands. In mixed pine stands, red pine is predominant. Many red pine stands are fairly pure with few associates. Pure natural stands typically originate following catastrophic fire. Red pine plantations often are established as monocultures. The most common associate within the red pine cover type is white pine (*Pinus strobus*). Other major associates are jack pine (*Pinus banksiana*), aspen (*Populus spp.*), and oak (*Quercus spp.*).

Management: Red pine is a long-lived species, some trees can live up to 400 years and stands can persist up to 200 years. The only stand of red pine on the BMIC reservation occurs adjacent to the community. Aesthetics and maintaining the stand for species diversity are the primary management goals of the Tribe concerning this species. Management will be limited to pre-commercial or commercial thinning (if feasible) relative to basal area (see stocking chart below) to maintain tree health and vigor.

An important consideration when thinning red pine stands is the identification and control of Annosum, also known as *Heterobasidion annosum*, root rot and red pine pocket mortality. A new infection site primarily originates when spores land on freshly cut stumps; the fungus also spreads through root contact and root grafting. If Annosum is not present in the stand, consider treating freshly cut stumps with a fungicide (e.g. "Sporax," "Cellu-Treat") to prevent new infections. The risk of Annosum is low currently for the BMIC but risk can increase over time as the fungus spreads throughout the Upper Peninsula; the recommended management if Annosum is found is land-use change or stand conversion. Other considerations for diseases concern "drip diseases," including Sirococcus and Diplodia, underplanting red pine seedlings/saplings is not recommended due to these diseases. Either underplanting of another species (e.g. white pine) or rotation (i.e. clearcut) with planting of red pine seedlings is recommended.

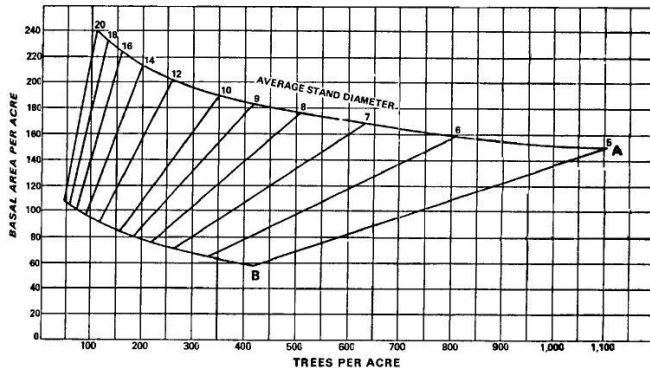


Figure 24. Stocking Chart for Red Pine (Benzie 1977)

#### 4.5 Organization Structure and Funding

Bay Mills Indian Community's administrative duties are handled by the Bay Mills Indian Community Executive Council, with many of the resources overseen by the Tribal Manager. This Board consists of five elected members: Chairperson, Vice Chair, Secretary, Treasurer, and Council Person.

Bay Mills Indian Community Biological Services Department conducts research, monitoring, and land management of the natural resources around BMIC Ceded Territory with cooperation of local partners. This department relies on grant funding for staff capacity and project implementation. The Department currently supports a variety of resource specialists but not a dedicated forester.

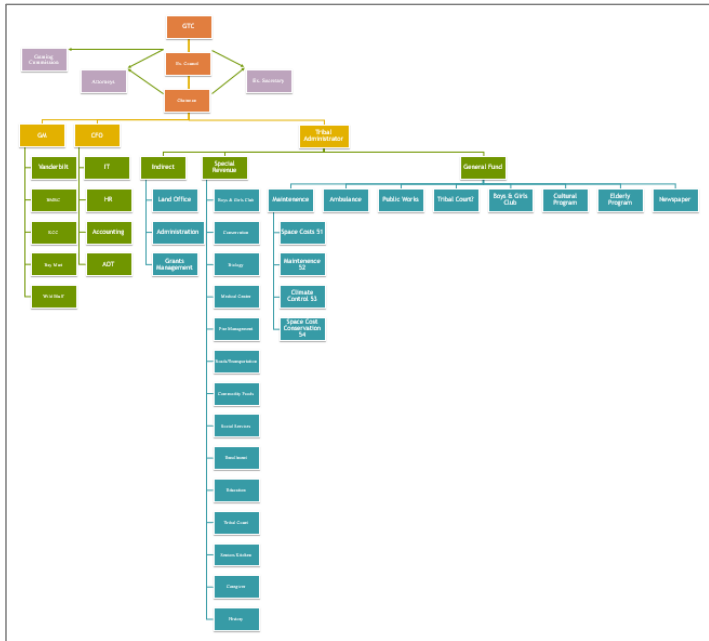


Figure 25. Bay Mills Indian Community Organizational Hierarchy

### 4.6 Other Federal Mandates

This FMP has been prepared in accordance with various federal mandates, such as the NEPA, Endangered Species Act (ESA), and the NHPA.

## Chapter 5. FOREST MANAGEMENT AND CURRENT CONDITION

### 5.1 Past Harvests

According to the BMIC Forest Inventory Analysis Report, forest resources of Bay Mills trust lands have not provided significant economic benefits to the tribes or its members in the past. Although limited information is available, most of the timber harvested on the Bay Mills Indian Community reservation during the 1970s and 1980s was “free use.” The timber harvested during this period was primarily for fuelwood by tribal members (BMIC FIA 1997). Between 1990 and 1996, the mean annual harvest on BMIC lands was 142 thousand board feet (MBF), with the mean annual value for harvested timber estimated to be \$5,283 (Table 13).

Utilization for forest resources and economic benefits have improved slightly over the last decades. However, utilization of forest resources has been and is likely to continue to occur as a secondary or indirect income operation. Timber will be harvested and sold as lands are developed for housing and other facilities. Areas not suitable for development are valued for wildlife habitat, recreation, aesthetics, and subsistence hunting/gathering.

Table 13. Timber Harvest at the Bay Mills Indian Community Source: BMIC Forest Inventory Analysis Report (1997)

Harvest Type	1996		1995		1992		1991		1990	
	MBF	Value	MBF	Value	MBF	Value	MBF	Value	MBF	Value
Contract and Permit Harvest	--	--	142	1,725	129	3,220	284	6,820	--	--
Total Free Use	263	22,743	--	--	25	250	--	--	50	300
Cut in	--	--	69	1,302	30	623	--	--	--	--
Grand Total- All Harvest	263	22,743	211	3,027	183	4,093	284	6,820	50	300

Estimated volumes of sawtimber (MBF) and cordwood (cords) by management compartment is provided for each species in Table 4-2. The greatest sawtimber volumes in Compartment 401 are in miscellaneous hardwoods (381.3 MBF) and miscellaneous softwoods (158 MBF). In Compartment 402, the greatest sawtimber volumes are in miscellaneous hardwoods (145 MBF) and soft maple (106 MBF). The greatest cordwood volumes in Compartment 401 are in miscellaneous hardwoods (1964.9 cords), cedar (1427 cords), soft maple (1396.5 cords), and aspen (1061 cords), while the greatest cordwood volumes in Compartment 402 are in miscellaneous softwoods (3677 cords), soft maple (1377 cords), and miscellaneous hardwoods (1154 cords).

Table 14. Estimated Sawtimber and Cordwood Volumes by Species and Compartment for the Bay Mills Indian Community Source: BMIC Forest Inventory Analysis Report (1997)

Species	Compartment		Compartment	
	401 (Brimley)	402 (Sugar Island)	401 (Brimley)	402 (Sugar Island)
	MBF		CORDS	
Miscellaneous Hardwoods	381.3	145.0	1964.9	1154.0
Miscellaneous Softwoods	158.0	86.2	782.7	3677.0
Aspen	63.8	13.1	1061.0	787.0
White Spruce	35.3	--	95.4	4.3
Soft Maple	1.6	106.0	1396.5	1377.0
Hemlock	1.3	6.4	47.0	7.6
White Ash	1.8	47.2	36.5	368.3
Yellow Birch	4.8	18.8	147.4	205.9
Cedar	8.4	1.4	1427.0	3.0
Hard Maple	4.0	--	352.8	--
White Birch	2.2	--	229.5	249.2
Black Spruce	--	--	93.8	258.8
Balsam Poplar	--	--	51.5	--
Balsam Fir	--	--	44.9	7.1
Black Ash	--	--	62.4	19.8
Tamarack	--	--	13.3	4.0
<b>TOTAL</b>	<b>662.5</b>	<b>424.1</b>	<b>7806.6</b>	<b>8123</b>

\*\* NOTE: Compartments and stands have been renumbered since this inventory.

## 5.2 Forest Inventory of 1990s

### INVENTORY of 1990

The most recent forest inventory to be performed at the BMIC, took place from 1992 to 1994. Stand information was delineated from 1986 Michigan Department of Natural Resources (MDNR) black and white infrared aerial photographs and were verified by point sampling. This information was then entered into the BIA BIACRUISE Program and added into the Operations Inventory System (OPINV).

During the 1991 survey, contractors located, established, measured, and recorded data from 147 sample points at the BMIC. Variable radius plots, using a basal area factor (BAF) that resulted in at least six trees per point, were selected to determine number, quality, species, and size class of all live trees with a five inch diameter at breast height (DBH) or larger. In addition, a fixed radius plot (1/300 acre) was used to determine number, quality, size, and species of live non-cull trees less than five inches DBH.

Standard errors were calculated with the BIACRUISE Program for stands within the forested areas of compartments 401 and 402. At least two inventory plots were established for each forested stand. In

compartment 401, standard errors for 21 forested stands were between 23.5 and 100 percent, with the mean standard error being 63.5 percent. In compartment 402, standard errors for 11 forested stands were between 13.4 and 100 percent, with the mean standard error being 48 percent. Taking these error estimates into consideration, it is believed that the current inventory is an inadequate representation of the existing forest resources and volumes at the BMIC.

**Commented [VS12]:** Changed to “inadequate” since it mentions SE of 100%.

**MAJOR FOREST TYPES OF 1900**

Major forest types at the BMIC are characteristic of those found in the Eastern Upper Peninsula of Michigan and include aspen, hardwoods, and conifers (Table 15).

Table 15. Acres of Forest Type at the Bay Mills Indian Community  
 Source: BMIC Forest Inventory Analysis Report (1997) (please note, more acres have been acquired converted to trust land since this inventory was completed).

Forest Type	Acres at Time of Survey (1997)
Aspen	467
Upland Hardwood	305
Lowland Hardwood	259
Upland Conifer	68
Lowland Conifer	218
Non-Forest	2,073
<b>TOTAL</b>	<b>3,390</b>

**FOREST CONDITION OF 1990**

During the 1992 stand examination, each stand was classed in one of eight condition classes: non-stocked, high risk, overstocked, mature, sparse, low quality, good, and regenerating. None of the stands at the BMIC were classified as non-stocked, overstocked, low quality, or regenerating. In 1992 both the Sugar Island compartment (402) and the Brimley area compartment (401) had a high percentage of acres in “good” condition. Compartment 401 had a high percentage of matures stands are sparsely-stocked stands. The “high risk” stands in Compartment 402 were aspen stands that were deteriorating. For complete list of forest condition from 1992, please refer to Appendix B.

Re-inventorying existing forest resources and updating the current forest inventory database for BMIC is necessary. This work is being planned and will likely be completed within next five years. Inventory recommendations made in the 1997 BMIC Forest Inventory Analysis Report should be implemented when these new surveys are completed.

**5.3 Fire Management**

The BMIC last updated their Fire Management Plan on August 11, 2014. This plan states that the BIA and Tribe are committed to providing a wildland fire management program that provides for the safety of firefighters and the public, while remaining cost effective and responsive to various Tribal goals. This forest management plan will strive to compliment those fire management goals. Any specific stands

proposed with fire management goals will be included in [section 6.2](#). Please refer to the BMIC Fire Management Plan for more information.

## Chapter 6. FUTURE FOREST MANAGEMENT GOALS AND OBJECTIVES

Forestry resources found at the BMIC include balsam fir, tamarack, white spruce, black spruce, eastern hemlock, yellow birch, white ash, black ash, balsam poplar, jack pine, northern white cedar, red maple, sugar maple, paper birch, and quaking aspen. A considerable majority is forested wetland. Large blocks of forest have been organized into 'forest management areas' for the sake of this management plan (see [section 6.1](#)). Goals and objectives for each of these areas is found in [section 6.2](#).

### 6.1 Forest Management Areas

Bay Mills Indian Community has a small land base. Although there are areas of undeveloped forest lands, some are slated for development in the near future. Due to this pressure, forest management plans and goals will focus on areas not likely to be developed in the foreseeable future. Compartment and Stand numbers were updated in 2022 and may no longer match historical numbers or stand boundaries. Goals and objectives for these forested areas is separated into eight management areas due to their location and land type. They are outlined in the remainder of this chapter.

### BRIMLEY FARMS FOREST MANAGEMENT AREA

Reservation 470; Compartment 200; Stands (most not yet assigned) 12, B, C, D, E

This forest management area is named for nearby town and surrounding agricultural fields. These stands are fairly new, fragmented, and have not yet been thoroughly surveyed. These stands are located along roads M-221, 7 ½ Mile, and Bound Rd. Stand A is 3 acres and located near the Waishkey Bay Farm headquarters. This stand is swamp conifers which are ephemeral wet; this draining area has high fern diversity. Stand B is 2.75 acres and comprised of mature upland hardwoods and mature aspen (8-16 inches DBH). Stand C is 13 acres and is dominated by trembling aspen (4-8 inches DBH), willow, and tag alder. It also has swathes of reed canary grass and clematis. Stand D is 9 acres of red maple, trembling aspen, and tag alder. It has a somewhat open understory with a draining swale through the middle. Stand E contains two branched tributaries to the Waishkey River. The 24-acres stand is upland hardwoods of yellow birch, paper birch, sugar maple, red maple, cedar, balsam fir of 8-16 inches DBH. The riparian corridors within the stand have steep slopes with balsam, small maples, and birches.



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Figure 26. Map of Brimley Farms FMA forest type, wetland types, and soils.

Table 16. Brimley Farms Forest Management Area stand information from informal survey.

Comp	Stand	Primary Type	Year of Origin	Site Index Species	Acres	Forest Class
200	12	Mixed Conifer/Hrd	Unkn	Unkn	3	<i>Undesignated</i>
200	B	Mixed Hardwoods	Unkn	Unkn	2.75	<i>Undesignated</i>
200	C	Mixed Hardwoods	Unkn	Unkn	13	<i>Undesignated</i>
200	D	Mixed Hardwoods	Unkn	Unkn	9	<i>Undesignated</i>
200	E	Mixed Hardwoods	Unkn	Unkn	24	<i>Undesignated</i>
					56	TOTAL

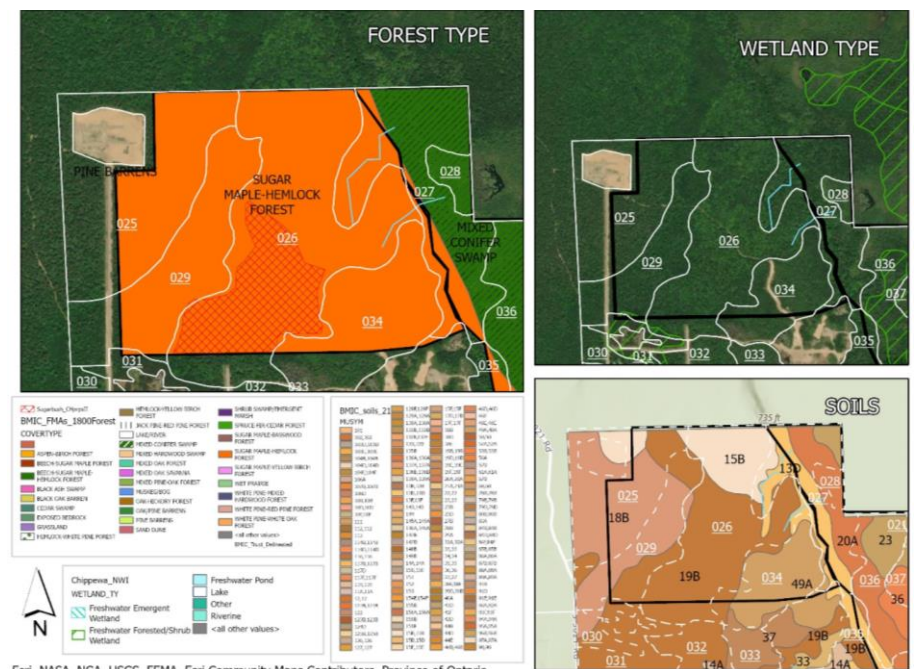


Figure 27 and 28. Photos of stand D and stream in Stand E.

## CHIEF HARDWOODS FOREST MANAGEMENT AREA

Reservation 470; Compartment 100; Stands 25, 26, 27, 29, 31, 34

Named for a stand of culturally special trees, the Chief Hardwoods Area is perched atop an old shoreline ridge. The area was once owned and managed by the US Forest Service, but was transferred to Bay Mills Indian Community decades ago. This forest management area is north of Plantation Rd and a large housing development and construction area; it is east of "Half Mile Rd," a seasonal road and snowmobile trail. A recently closed haul road divides the area. A proposed hiking trail may be developed following the ridge at the top or base of the bluff. The ridge line divides the Chief Hardwoods Area from the Great Wetland Preserve Area. The Chief Hardwoods Area contains of mixture of hardwood species and upland conifer with some steep drainages down towards the Wetland Preserve. In areas, the aspen are beginning to die as natural succession takes place. Maples, yellow birch, oak, and pine dominate the canopy. The area appears suitable for low quality maple, high quality pine, and good quality oak. An interesting feature in this stand, compared to the wider area, is the amount of natural oak regeneration in the stand. It may contain some springs and vernal pools.



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Figure 29. Map of Chief Hardwoods FMA forest type, wetland types, and soils.

Table 17. Chief Hardwoods Forest Management Area stand information redelineated 2022.

Comp	Stand	Primary Type	Year of Origin	Site Index Species	Acres	Forest Class
100	25	Mixed Conifer/Hrd	Unkn	Unkn	25	Commercial
100	26	Mixed Hardwoods	Unkn	Unkn	80	Commercial
100	27	Mixed Hardwoods	Unkn	Unkn	40	Unsuitable slopes
100	29	Mixed Hardwoods	Unkn	Unkn	34	Commercial
100	34	Mixed Hardwoods	Unkn	Unkn	32	Commercial
					218.1	TOTAL

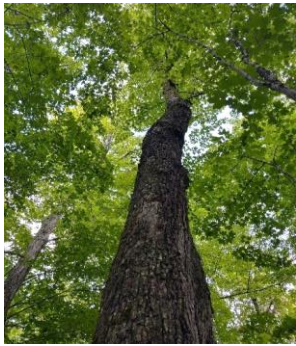


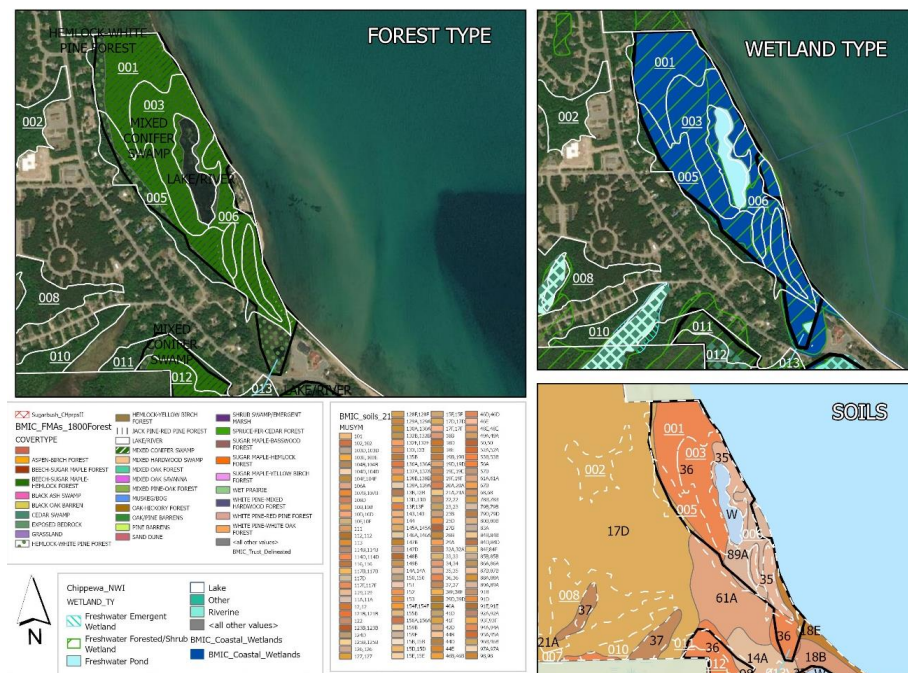
Figure 30 and 31. Trail camera image from Chief Hardwoods. Large sugar maple tree in Chief Hardwoods forest management area.

## GREATER GUMSHOES WETLAND FOREST MANAGEMENT AREA

Reservation 470; Compartment 100; Stands 1, 3, 5, 6

Named for Gumshoes Rd and Gumshoes Campground, these forest goals will not reflect plans or management activities inside the campground. However, forest goals will allow for these activities to continue. This area is also known as Gumshoes Recreation Area (see [section 4.1.1](#)).

The Greater Gumshoes Wetland Area is an area of lowland conifer forest and Great Lakes coastal wetland. The area includes North Pond, also known as Gumshoes Pond, the College Pond, and a large cedar stand. The Cowardin classification system categorizes much of this area as palustrine forested scrub shrub saturated wetland and palustrine scrub shrub and emergent, saturated, semi-permanently or seasonally flooded wetland. A seasonal road to the campground bisects the area as well as some user-made ATV trails. The area is east of Lakeshore Drive, downhill from numerous homes and west of the St Marys River.



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Figure 32. Map of Greater Gumshoes Wetland Management Area; forest cover and wetland type, soils types, and land use.

Table 18. Greater Gumshoes Wetland Forest Management Area stand information as of 1990

Comp	Stand	Primary Type	Year of Origin	Site Index Species	Acres	Forest Class
100	1	Upland Fir- Spruce; Lowland Brush	1935	White Spruce	26	<i>Recreation Area</i>
100	3	Lowland Brush	Unkn	Unkn	28	<i>Recreation Area</i>
100	5	Lowland Brush	Unkn	Unkn	25	<i>Recreation Area</i>
100	6	Lowland Brush	Unkn	Unkn	17	<i>Recreation Area</i>
					96	<i>TOTAL</i>



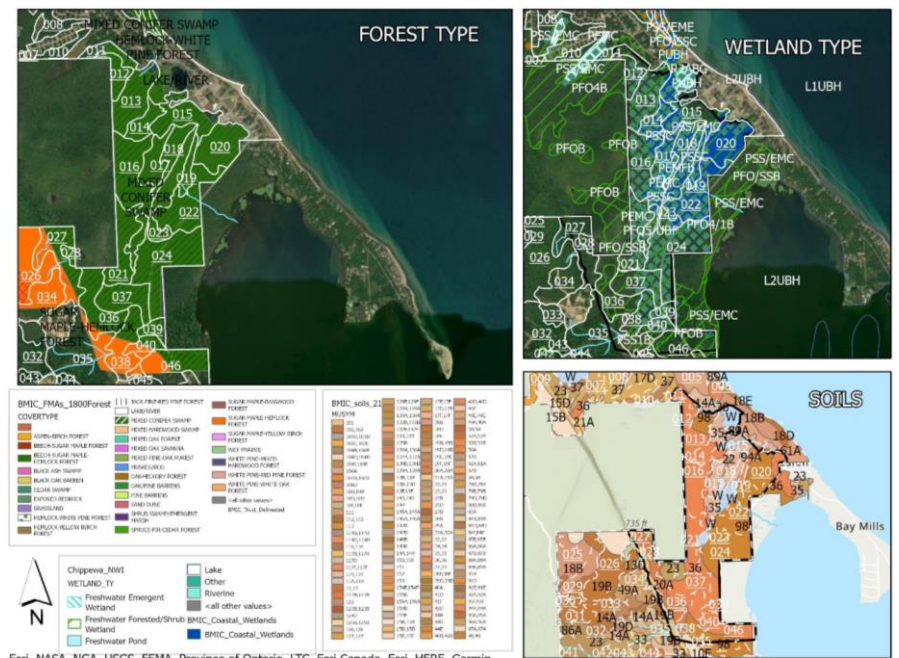
Figure 33 - 35. Cedar stands and North Pond within the Gumshoes Wetland Forest Management Area.

### GREATER WETLAND PRESERVE FOREST MANAGEMENT AREA

Reservation 470; Compartment 100; Stands 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 27, 28, 36, 37, 38, 39, 40, 45, 46

The official Bay Mills Wetland Preserve is 460 acres of Great Lakes coastal wetland (see section 3.5.i). The Greater Wetland Preserve area includes Bay Mills trust lands surrounding the Wetland Preserve that are not held under lease to Bay Mills members. This area continues west up to the base of the bluff. This area has been designated a preserve area by BMIC Executive Council (see [section 4.1.i](#)).

This area is predominately palustrine Forested, saturated forest and palustrine scrub, shrub, board-leaved deciduous, saturated forest. This area also contains emergent wetland and palustrine forested dead open water, semi-permanently flooded. This area is considered Great Lakes coastal wetland. Numerous small creeks, including Deep Creek, drain out to Waishkey Bay. The areas is south and west of Lakeshore Drive and north of Plantation Road. The ridge line divides the Great Wetland Preserve Area from the Chief Hardwoods Area. A snowmobile trail runs through the center of the area. West of the area is more lowland conifer swamp which is owned and managed by the US Forest Service. East of the area and Lakeshore Drive is lowland conifer swamp draining into Waishkey Bay, which is owned and managed by the State of Michigan. A proposed hiking trail may be developed following the ridge at the top or base of the bluff.



Esri, NASA, NGA, USGS, FEMA, Province of Ontario, LTC, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, NRCAN, Parks

Figure 36. Map of Greater Wetland Preserve Management Area; forest cover and wetland type, soils types, and land use.

Table 19 Greater Wetland Preserve Forest Management Area stand information redelineated 2022.

Comp	Stand	Primary Type	Year of Origin	Site Index Species	Acres	Forest Class
100	11	Swamp Conifers	1942	Northern White	12	Preserve
100	12	Swamp Conifers	1942	Northern White	16	Preserve
100	13	Swamp Conifers	1955	Northern White	40.7	Preserve
100	14	Lowland Brush	Unkn	Unkn	16	Preserve
100	15	Upland Fir- Spruce	1923	White Spruce	37	Preserve
100	16	Swamp Conifers	1955	Northern White	53	Preserve
100	17	Lowland Brush	Unkn	Unkn	22	Preserve
100	18	Lowland Brush	Unkn	Unkn	19	Preserve
100	19	Lowland Brush	Unkn	Unkn	10	Preserve
100	20	White Cedar	1930	Paper Birch	39	Preserve
100	21	Lowland Brush	1927	Black Spruce	34	Preserve
100	22	Lowland Brush	Unkn	Unkn	45	Preserve
100	23	Lowland Brush	Unkn	Unkn	8	Preserve
100	24	Lowland Brush	1952	Northern White	69	Preserve
100	27	Swamp Conifers	Unkn	Unkn	41	Preserve
100	28	Swamp Conifers	Unkn	Unkn	4	Preserve
100	36	Swamp Conifers	Unkn	Unkn	38	Preserve
100	37	White Cedar	1930	Paper Birch	31	Preserve
100	38	White Cedar	1930	Paper Birch	33	Preserve
100	39	White Cedar	1930	Paper Birch	9	Preserve
100	40	White Cedar	1930	Paper Birch	12	Preserve
100	45	Swamp Hardwoods	1930	Quaking Aspen	10	Preserve
100	46	Swamp Hardwoods	1930	Quaking Aspen	46	Preserve
					539.1	TOTAL

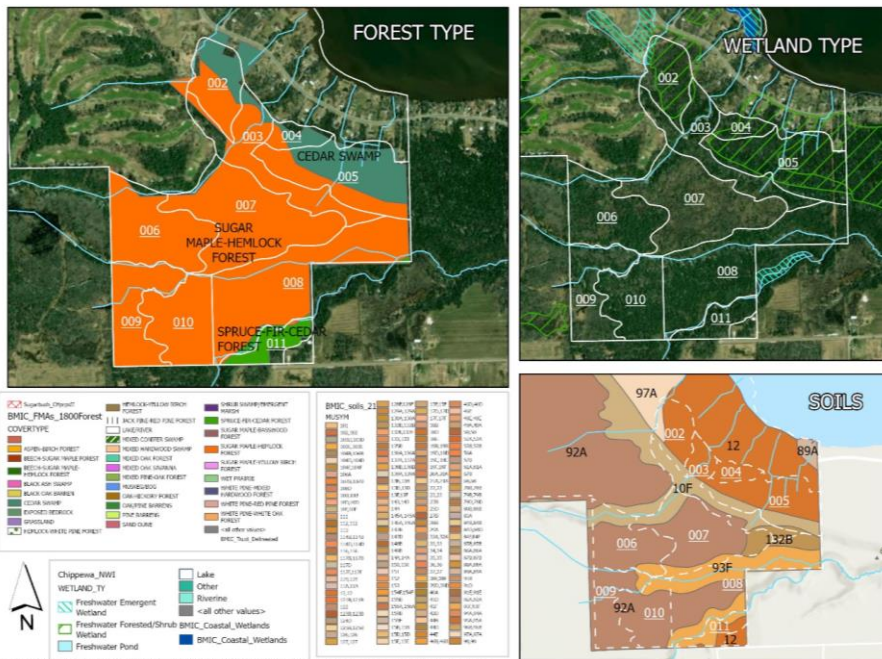


Figures 37 and 38. Greater Wetland Preserve Forest Management Area: wetland vegetation survey in main pond and a northern cedar-sphagnum stand.

**LITTLE WAISHKEY HEADWATERS (SOUTH FARMS) FOREST MANAGEMENT AREA**

Compartment 200; Stands 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

The Farms Area is an old, local name for that area of the reservation. The South Farms forest management area is located south of Wild Bluff Golf Course and Lakeshore Drive, and north of Irish Line Rd. Little Waishkey Creek and Club Creek drain the area. Some of the area near Lakeshore Drive is palustrine forested broad-leaved deciduous, saturated wetland. The further inland area is mixed hardwood/ conifer stands drained by two streams. The hardwood stand contains mature oak, aspen, red maple, basswood, and some ash trees infected with emerald ash borer. It may contain some springs and vernal pools. The small northeastern corner of this area has been designated a wetland preserve area by BMIC Executive Council (see [section 4.1.i](#)).



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 Figure 39. Little Waishkey Headwaters Forest Management Area forest type, wetland type, and soils types.

Table 20. Little Waishkey Headwaters (south Farms) Forest Management Area stand information redelineated 2022.

Comp	Stand	Primary Type	Year of Origin	Site Index Species	Acres	Forest Class
200	2	Swamp Hardwoods	1937	White Ash	14	<i>Preserve</i>
200	3	Swamp Hardwoods	1927	Quaking Aspen	22	<i>Commercial</i>
200	4	Swamp Hardwoods	1941	American Holly	4	<i>Commercial</i>
200	5	Swamp Hardwoods	1907	Bigtooth Aspen	31	<i>Commercial</i>
200	6	Aspen- Northern Hardwoods	unkn	Quaking Aspen	27	<i>Commercial</i>
200	7	Aspen- Northern Hardwoods	unkn	Quaking Aspen	40	<i>Commercial</i>
200	8	Aspen- Northern Hardwoods	unkn	Quaking Aspen	46	<i>Commercial (moose)</i>
200	9	Trembling Aspen	1927	Quaking Aspen	19	<i>Commercial</i>
200	10	Aspen- Northern Hardwoods	unkn	Quaking Aspen	20	<i>Commercial</i>
200	11	Swamp Hardwoods	1905	Balsam Poplar	8	<i>Commercial</i>
					231	<i>TOTAL</i>



Figures 40 - 42. Tributary stream to Little Waishkey. Upper bluff ash-sedge opening in Little Waishkey Headwaters/ south Farms Forest Management Area. Beaver-gnawed tree in headwaters.



Table 21. Plantation South Bluff Forest Management Area stand information redelineated 2022.

Comp	Stand	Primary Type	Year of Origin	Site Index Species	Acres	Forest Class
200	1	Hemlock/ Hardwoods	unkn	unkn	19.5	Commercial
200	F	Swamp Hardwoods/ Ash	unkn	unkn	16	Commercial
200	G	Mixed conifer/Hrd	unkn	unkn	21	Commercial
					56.5	TOTAL



Figure 44. Understory of upland hardwoods in Stand G. Portions of the understory are thickly covered in wild leeks.

## SPECTACLE LAKE FOREST MANAGEMENT AREA

Reservation 470; Compartment 100; Stands 7, 9

The Spectacle Lake area wraps around the southern end of Spectacle Lake on both the east and west sides, and up onto the bluff. The western and southern sides of the shoreline is wetland: palustrine scrub shrub and emergent, saturated, semi-permanently or seasonally flooded wetland and palustrine forested, needle-leaved evergreen and broad-leaved deciduous, saturated wetland. The eastern side transitions into red pine plantation and is used for recreation. A paved road to Spectacle Lake/ Mission Hill Overlook crosses the middle of the area; it gains elevation up the bluff quickly and is closed in the winter. This road is also used to access the USFS roads and trails as well as the Mission Hill Cemetery. The steep hillside east of the overlook is routinely cleared of brush.

At the base of the bluff are user-made ATV and snowmobile trails. A proposed hiking trail may be developed following the ridge at the top or base of the bluff. A separate hiking trail follows the east shore of Spectacle Lake through Stand 7.

This area includes a picnic/ kayak launch/day use area on the eastern side of the lake with a scenic overlook on the western side of the lake; it has been designated a recreation area by BMIC Executive Council (see [section 4.1.i](#)).

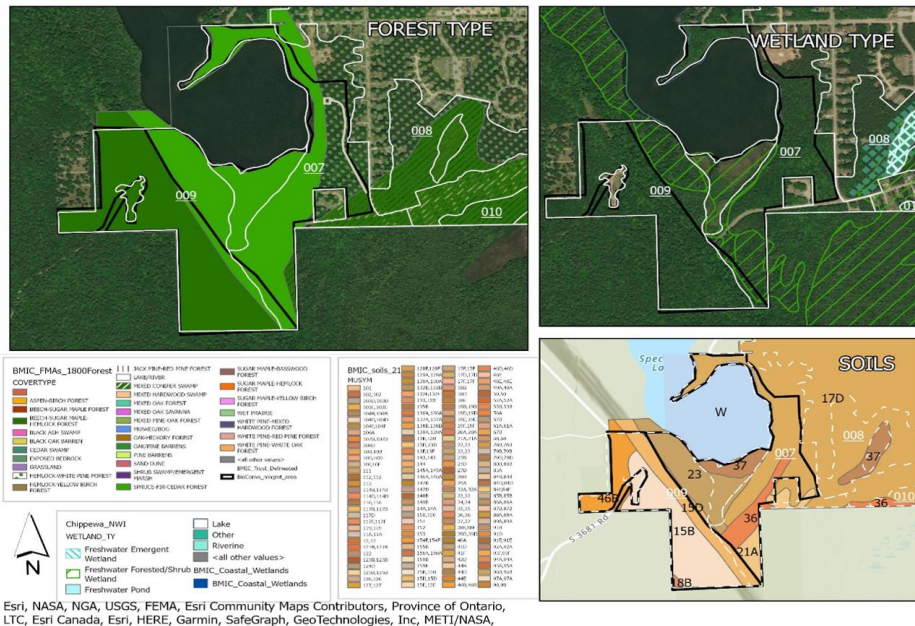


Figure 45. Map of Spectacle Lake Forest Management Area; forest cover and wetland type, and soils types.



Figure 46. Map of Spectacle Lake Forest Management Area; this area includes a picnic/ kayak launch/day use area on the eastern side of the lake with a scenic overlook on the western side of the lake; it has been designated a recreation area by BMIC Executive Council.

Table 22. Spectacle Lake Forest Management Area stand information redelineated in 2022.

Comp	Stand	Primary Type	Year of Origin	Site Index Species	Acres	Forest Class
100	7	Swamp conifer, Hrd, Pine	1932	unkn	16	<i>Recreation Area &amp; Housing</i>
100	9 (lower)	Mixed conifer/Hrd	1960	Yellow Birch	21	<i>Commercial</i>
100	9 (upper)	Northern Hardwoods	1928	Quaking Aspen	12	<i>Commercial</i>
					94.4	<i>TOTAL</i>



Figure 47-48. Looking southward across Spectacle Lake wild rice bed to the bog. Bog and swamp conifers at southern end of Spectacle Lake forest management area.

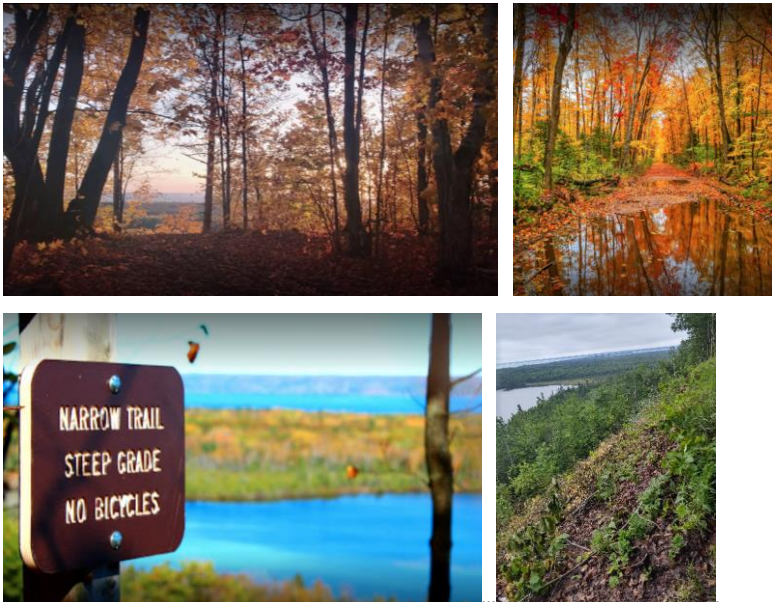


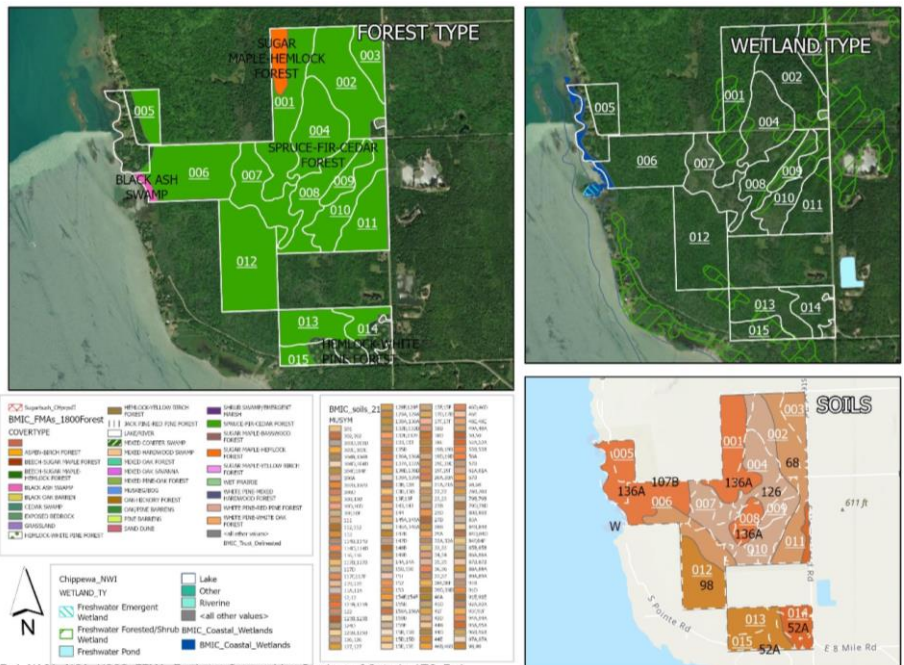
Figure 49-52. Looking eastward off the bluff and across Spectacle Lake. Looking down Tower Rd (main road through the FMA). USFS sign indicating recreation trails adjoining the Overlook parking lot. Brush cleared on steep slope below Overlook to keep view open.

## SUGAR ISLAND FOREST MANAGEMENT AREA

Reservation 470; Compartment 300; Stands 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15

The Sugar Island Forest Management Area includes Bay Mills trust lands that are not held under lease to Bay Mills members.

This area is mostly ash, aspen hemlock, and spruce/fir forest. The ash stands have been significantly impacted by emerald ash borer. Many aspen trees are mature and declining. Small pockets of forested wetland are classified as palustrine, saturated forested wetland, and palustrine scrub, shrub, broad-leaved deciduous, saturated forested wetland. The Sugar Island Forest Management Area is located on Sugar Island in the St Marys River; the area is west of Homestead Road, south of 7 Mile Rd and north 8 Mile Rd.



Esri, NASA, NGA, USGS, FEMA, Earthstar Geographics, Province of Ontario, LTC, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA,

Figure 53. Sugar Island Forest Management Area; forest cover and wetland type, soils types, and land use.

Table 23. Sugar Island Forest Management Area stand information redelineated in 2022.

Comp	Stand	Primary Forest Type	Year of Origin	Site Index Species	Acres	Forest Class
300	1	Aspen- Northern Hardwoods	1927	Quaking Aspen	68	Commercial
300	2	Aspen/ Muskeg	1927	Quaking Aspen	60.6	Non-Forest
300	3	Aspen/ Muskeg	1927	Quaking Aspen	21.6	Non-Forest
300	4	Trembling Aspen	1927	Quaking Aspen	45	Commercial
300	5	Northern Hardwoods	1937	Red Maple	20	Commercial
300	6	Northern Hardwoods	1937	Red Maple	60.6	Commercial
300	7	Swamp Hardwoods	1927	Red Maple	38	Commercial
300	8	Swamp Hardwoods	1927	Red Maple	38	Commercial
300	9	Marsh/ Muskeg	unkn		14	Non-Forest
300	10	Swamp Hardwoods	1925	Balsam Fir	32	Commercial
300	11	Marsh/ Muskeg	unkn	unkn	35	Non-Forest
300	12	Swamp Hardwoods/ Marsh	unkn	unkn	71.5	Non-Forest
300	13	Swamp Hardwoods	unkn	Red Maple	36	Commercial
300	14	Black Spruce	1917	Black Spruce	24	Commercial
300	15	Swamp Hardwoods	unkn	Red Maple	16	Commercial
					580.3	TOTAL



Figures 54 and 55. Trail camera photos from a Sugar Island black ash stand and herbivory exclosures.



## 6.2 Forest Goals, Objectives, and Prescriptions

This section will describe forest goals and objectives for the areas of the reservation most likely to remain forested for the foreseeable future. Forests within the BMIC currently accommodate subsistence gathering of traditional foods and medicines, hunting, firewood gathering, wildlife habitat, recreation, and cultural uses. Non-timber forest products are highly valued by the community. As described in sections 3.4 and section 6.1, forestry resources found at BMIC include balsam fir, tamarack, white spruce, black spruce, eastern hemlock, yellow birch, green ash, black ash, balsam poplar, jack pine, northern white cedar, red maple, sugar maple, paper birch, and quaking aspen.

Forest goals and objectives were identified through discussions with BMIC leadership, natural resources professionals familiar with the area, and forest users. Forest users were surveyed through an online survey in 2021. Stakeholders identified priority desired uses for each of the FMAs. In general, Bay Mills Indian Community does not prioritize commercial forestry management for its limited intact forest. Instead, Bay Mills Indian Community prioritizes non-timber forest products, recreation, cultural uses, wildlife habitat, forest health, invasive species mitigation, water quality, and aesthetics. Specific goals and objectives for each forest stand are found below in Tables 24-31. A significant portion of Bay Mills trust lands are already developed for residences and enterprises. These areas are constantly evolving to reflect the needs of the community. While much of this area is obviously developed, there are currently pockets of remnant woodland surrounded by development. Due to the dynamic nature of these locations, this management plan will not include firm forest management objectives but merely strategies for stewardship (see Table 32).

### GENERAL GOALS

1. Will be sensitive to cultural significance of the forestland in all aspects of the community.
2. Will offer habitat for non-timber forest products as available and appropriate.
3. Will support management goals and objectives of other natural resources management plans as opportunities arise, especially when they enhance *nibi* (water) quality and fish nursery habitat.
4. Will favor or restore native beings that are expected to do well under future conditions and that can help meet future needs. These may include adaptive measures to create a more-resilient forest in the face of climate change. These may also include tree planting that supports food sovereignty.
5. Will inventory forest resources and monitor for impacts to other resources.
6. Will respond to weather events, such as wind-throw, flooding, fire, or disease, and plant new trees when suitable.
7. Will maintain or improve the ability of forest communities to balance the effects of *manidoosag* (little spirits/ forest pests and pathogens); this will include fuels management.
8. Will maintain or improve the ability of forest communities to balance the effects of *bakaan ingoji gaa-ondaadag* (non-local beings).
9. Will encourage and facilitate suitable use of forestland for recreation and tourism.
10. Management of BMIC lands will be according to accepted Best Management Practices. Standards will be maintained and improved by implementation and review of codes of practices, management guidelines, prescriptions, licensing, and regulations of vegetation manipulation on reservation land.

Bay Mills Indian Community recognizes that the most recent forest inventory is 20 years old and conditions on the ground have changed. Bay Mills Indian Community has also acquired more trust land which needs to be inventoried. Without recent stand inventory information, the ability to include proper prescriptions is limited.

As stated above, Bay Mills prioritizes other forest management goals over commercial forest management. **The Bay Mills prefers to conduct little to no harvesting within the Reservation's core forest management areas until an updated Forest Inventory Assessment can be conducted at which time this topic will be revisited.** This will not impact timber sales in advance of planned road-building and land-clearing for development. Any timber harvests should have Tribal Council approval in the form of a Tribal Resolution prior to timber sale. Refer to [Chapter 4](#) for more information.

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Table 24: Brimley Farms Forest Management Area

These stands are fairly new, fragmented, and have not yet been thoroughly surveyed.

Goals	Implementation Strategies and Objectives	Forest Type	Compartment/ Stands
Collect detailed information on the forest stands	a. Collect necessary data on the forest condition through stand exams and surveys	Mixed hardwoods/ conifer	C200/ S 12, B, C, D, E
Manage for non-timber forest products	b. Allow for suitable hunting/ gathering. c. Allow for habitat of and promote growth of forest species of cultural significance (see <a href="#">section 3.8</a> ). d.	All	All
Manage hardwood stands as a sustainable maple and yellow birch sugar bush	e. Follow <a href="#">Audubon Vermont sugar bush guidelines</a> and leave at least 25% other species (beech, oak, cedar, hemlock, spruce, pine, etc)	Mixed hardwoods	C200/ S B, E
Protect steep slopes to minimize erosion	f. Enhance vegetation with tree planting to prevent erosion and maintain high water quality	Mixed hardwoods	C200/ S E
Manage for deer forage (oak)	g. Promote mast tree species such as red oak and beech h. Plant white oak and swamp white oak	Mixed hardwoods	C200/ S B, C, D, E
Buffer springs, vernal pools, and drainages	i. Map springs and vernal pools; apply buffer around them for canopy-opening vegetation management.	Mixed hardwoods	C200/ S 12, B, C, D, E
Maintain or improve the ability of forest communities to balance the effects of non-local beings/ invasive species.	j. Monitor tree health with stand exams k. Monitor for invasive insects/diseases (for example, Hemlock Woolly Adelgid, Asian-long horned beetle, Spotted Lanternfly, and other).	Mixed hardwoods/ conifer	C200/ S 12, B, C, D, E
Encourage and facilitate suitable use of forestland for recreation	l. Allow for suitable hunting/ gathering.	Mixed hardwoods	C200/ S 12, B, C, D, E

Table 25: Chief Hardwoods Forest Management Area

This is a large block of forest with homes immediately to the south. The area is used by residents for recreation and aesthetic enjoyment.

Goals	Implementation Strategies and Objectives	Forest Type	Compartment/ Stands
Collect detailed information on the forest stands	a. Collect necessary data on the forest condition through stand exams and surveys	All	All
Manage for non-timber forest products	m. Allow for suitable hunting/ gathering. n. Allow for habitat of and promote growth of forest species of cultural significance (see <a href="#">section 3.8</a> ).	All	All
Aesthetic enjoyment of green space	b. Make forest management choices that maintain wooded buffer between the homes and promote wildlife viewing.	Mixed hardwoods	C100/ S 25, 26, 29, 31, 34
Manage hardwood stands as a sustainable maple and yellow birch sugar bush	c. Follow <a href="#">Audubon Vermont sugar bush guidelines</a> and leave at least 25% other species (beech, oak, cedar, hemlock, spruce, pine, etc) d. Thin stand to basal area of 100, selecting for healthy trees with large crowns; uneven age management. Create canopy gaps for maple and birch regeneration. Target high quality, healthy sugar maple for release, favouring tree longevity and sap production. e. Maintain ~2 snags/ acre	Mixed hardwoods	C100/ S 26
Protect steep slopes to minimize erosion	f. Enhance vegetation with tree planting to prevent erosion and maintain high water quality g. Implement adaptive plant and forestry management practices that stabilize slopes and enhance riparian forest diversity and resiliency.	Mixed hardwoods	C100/ S 27
Be sensitive to cultural significance of the forestland in all aspects of the community	h. Allow for habitat of and promote growth of forest species of cultural significance (see <a href="#">section 3.8</a> ). i. Promote cedars with desirable characteristics for cultural use, such as those with straight-growing bark, large diameters, healthy foliage, and 100ft proximity to road or trail. Plant cedar in suitable upland habitat.	Mixed hardwoods	C100/ S 25, 26, 29, 31, 34
Manage for deer forage (oak)	j. Promote mast tree species such as red oak and beech i. In northern end of FMA, consider creating canopy gaps followed by prescribed burned for oak management.	Mixed hardwoods	C100/ S 25, 26 (north), 29

	<ul style="list-style-type: none"> <li>ii. In southern end of FMA, thin to 70-80BA; no prescribed burning (due to home proximity). Create a handful of canopy gaps with 40-50BA</li> <li>k. Plant white oak and swamp white oak</li> </ul>		
Buffer springs and vernal pools	<ul style="list-style-type: none"> <li>l. Map springs and vernal pools; apply buffer around them for any vegetation management.</li> </ul>	Mixed hardwoods	C100/ S 25, 26, 29, 31, 34
Maintain or improve the ability of forest communities to balance the effects of non-local beings/ invasive species.	<ul style="list-style-type: none"> <li>m. Monitor tree health with stand exams</li> <li>n. Monitor for invasive insects/diseases (for example, Hemlock Woolly Adelgid, Asian-long horned beetle, Spotted Lanternfly, and other).</li> <li>o. Conduct timber stand improvement treatment on white pine for blister rust.</li> </ul>	Mixed hardwoods/ conifer	All
Manage for fire resiliency	<ul style="list-style-type: none"> <li>p. Create a fire break on northern property boundary, such as a gated road</li> </ul>	Mixed hardwoods/ conifer	C100/ S 25, 26
Encourage and facilitate suitable use of forestland for recreation and tourism	<ul style="list-style-type: none"> <li>q. Allow for proposed hiking trail paralleling the bluff</li> <li>r. Brush out ATV/snowmobile trail intersections</li> </ul>	Mixed hardwoods	C100/ S 27, 35
Protect cultural and archaeological sites	<ul style="list-style-type: none"> <li>s. Avoid ground disturbing activities which could impact special sites.</li> </ul>	All	All

Table 26: Greater Gumshoes Wetland Management Area and Recreation Area

This area includes a campground; it has been designated a recreation area by BMIC Executive Council (see [section 4.1.i](#)).

Goals	Implementation Strategies	Forest Type	Compartment/ Stands
Collect detailed information on the stands	a. Collect necessary data on the forest condition through stand exams and surveys	All	All
Manage for non-timber forest products	b. Allow for suitable hunting/ gathering. c. Allow for habitat of and promote growth of forest species of cultural significance (see <a href="#">section 3.8</a> ).	All	All
Promote cedars with desirable characteristics for cultural use	d. Promote cedar trees with straight-growing bark e. Promote by planting and/or natural regeneration	Forested Wetland	C100/ S 1, 3, 5, 6
Maintain or improve the ability of forest communities to balance the effects of non-local beings/ invasive species.	f. Monitor tree health with stand exams g. Monitor for invasive insects/diseases (for example, Hemlock Woolly Adelgid, Asian-long horned beetle, Spotted Lanternfly, and other).	Forested Wetland	All
Encourage and facilitate suitable and sustainable use of forestland for recreation and tourism	h. Brush out trail and road intersections for public safety. i. Allow for continued mntc of Gumshoes Rd and campground, and other infrastructure within the Rec Area.	Forested Wetland	C100/ S 6
Enhance water quality and fish nursery habitat	j. Monitor tree health with stand exams; maintain healthy forests for filtration and nutrient retention. k. Maintain intact forest cover to shade streams/ wetlands	Forested Wetland	All
Protect cultural and archaeological sites	l. Avoid ground disturbing activities which could impact special sites.	All	All

Table 27: Greater Wetland Preserve Management Area

This is a large coastal wetland with ridges and swales; it has been designated a wetland preserve area by BMIC Executive Council.

Goals	Implementation Strategies	Forest Type	Compartment/ Stands
Collect detailed information on the stands	a. Collect necessary data on the forest condition through stand exams and surveys	All	All
Manage for non-timber forest products	b. Allow for suitable hunting/ gathering. c. Allow for habitat of and promote growth of forest species of cultural significance (see <a href="#">section 3.8</a> ).	All	All
Promote cedars with desirable characteristics for cultural use	d. Promote cedar with straight-growing bark e. Promote artificial and/or natural regeneration	Forested Wetland	C100/ S 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 27, 28, 36, 37, 38, 39, 40, 45, 46
Manage for deer habitat	f. Maintain winter deer cover with conifer trees. g. Plant conifer trees where tag alder and willow have taken over.	Forested Wetland	C100/ S 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 27, 28, 36, 37, 38, 39, 40, 45, 46
Maintain or improve the ability of forest communities to balance the effects of non-local beings/ invasive species.	h. Monitor tree health with stand exams i. Monitor for invasive insects/diseases (for example, Hemlock Woolly Adelgid, Asian-long horned beetle, Spotted Lanternfly, and other).	Forested Wetland	C100/ S 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 27, 28, 36, 37, 38, 39, 40, 45, 46
Enhance water quality and fish nursery habitat	j. Maintain healthy forests k. Maintain intact forest cover to shade streams	Forested Wetland	C100/ S 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 27, 28, 36, 37, 38, 39, 40, 45, 46
Encourage and facilitate sustainable and suitable use of forestland for recreation and tourism	l. Allow for proposed hiking trail paralleling the bluff m. Brush out ATV/snowmobile trail intersections	Forested Wetland	C100/ S 21, 23, 24, 27, 28, 36, 37, 38, 39, 40, 45, 46
Protect cultural and archaeological sites	n. Avoid ground disturbing activities which could impact special sites.	All	All

**Table 28: Little Washkey Headwaters (South Farms) Forest Management Area and Wetland Preserve**

This area is landlocked by homes and intersected by steep drainages. The small northeastern corner of this area has been designated a wetland preserve area by BMIC Executive Council.

Goals	Implementation Strategies	Forest Type	Compartment/ Stands
Collect detailed information on the stands	a. Collect necessary data on the forest condition through stand exams and surveys	All	All
Manage for non-timber forest products	b. Allow for suitable hunting/ gathering. c. Allow for habitat of and promote growth of forest species of cultural significance (see <a href="#">section 3.8</a> ).	All	All
Promote deer habitat and forage	d. Promote mast tree species such as red oak and beech when suitable. Shift forest type on southern end of ridge to more oak; especially under dying ash trees. Consider planting white oak and swamp white oak.	Aspen-hardwoods	C200/ S 6, 7, 8, 9, 10
Enhance water quality and fish nursery habitat	e. Monitor tree health with stand exams; maintain healthy forests for filtration and nutrient retention. f. Maintain intact forest cover to shade streams/ wetlands g. Implement adaptive plant and forestry management practices that stabilize slopes and enhance riparian forest diversity and resiliency.	Swamp hardwoods & Riparian Corridors	C200/ S 2, 3, 4, 5
Buffer springs & vernal pools	h. Map springs and vernal pools. i. When conducting any vegetation management, buffer 30m around vernal pools.	Swamp hardwoods	C200/ S 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Promote cedars with desirable characteristics for cultural use	j. Promote cedar trees with straight-growing bark k. Promote by planting and/or natural regeneration, even on upland sites	Aspen-hardwoods	C200/ S 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Maintain or improve the ability of forest communities to balance the effects of non-local beings/ invasive species.	l. Monitor tree health with stand exams m. Monitor for invasive insects/diseases (for example, Hemlock Woolly Adelgid, Asian-long horned beetle, Spotted Lanternfly, and other). n. Under-plant white oak and swamp white oak beneath ash trees impacted by EAB.	All	All
Fire resiliency	o. Along western property boundary, remove conifers within 50ft of property boundary; this will decrease the ladder fuels.	Mixed hardwoods	C200/ S 6, 9, 10
Protect cultural and archaeological sites	p. Avoid ground disturbing activities which could impact special sites.	All	All

Table 29: Plantation South Bluff Forest Management Area

This area is located north of the golf course, east of and below the bluff, and south of Plantation Rd and the Biological Services/ Conservation Departments.

Goals	Implementation Strategies	Forest Type	Compartment/ Stands
Collect detailed information on the stands	a. Collect necessary data on the forest condition through stand exams and surveys	All	All
Manage for non-timber forest products	b. Allow for suitable hunting/ gathering. c. Allow for habitat of and promote growth of forest species of cultural significance (see <a href="#">section 3.8</a> ).	All	All
Promote deer habitat and forage	d. Promote mast tree species such as red oak and beech when suitable. Shift forest type on southern end of ridge to more oak; especially under dying ash trees. Consider planting white oak and swamp white oak.	Swamp hardwoods	C200/ S 1, F, G
Enhance water quality and fish nursery habitat	e. Monitor tree health with stand exams; maintain healthy forests for filtration and nutrient retention. f. Maintain intact forest cover to shade streams/ wetlands g. Implement adaptive plant and forestry management practices that stabilize slopes and enhance riparian forest diversity and resiliency.	Swamp hardwoods	C200/ S 1, F, G
Buffer springs and vernal pools	h. Map springs and vernal pools. i. When conducting any vegetation management, buffer 30m around vernal pools.	Swamp hardwoods	C200/ S 1, F, G
Promote cedars with desirable characteristics for cultural use	j. Promote cedar trees with straight-growing bark k. Promote by planting and/or natural regeneration, even on upland sites	Swamp hardwoods	C200/ S 1, F, G
Maintain or improve the ability of forest communities to balance the effects of non-local beings/ invasive species.	l. Monitor tree health with stand exams m. Monitor for invasive insects/diseases (for example, Hemlock Woolly Adelgid, Asian-long horned beetle, Spotted Lanternfly, and other). n. Under-plant white oak and swamp white oak beneath ash trees impacted by EAB.	All	All
Protect cultural and archaeological sites	o. Avoid ground disturbing activities which could impact special sites.	All	All

Table 30: Spectacle Lake Forest Management Area and Recreation Area

This area includes a picnic/ kayak launch/day use area on the eastern side of the lake with a scenic overlook on the western side of the lake; it has been designated a recreation area by BMIC Executive Council.

Goals	Implementation Strategies	Forest Type	Compartment/ Stands
Collect detailed information on the stands	a. Collect necessary data on the forest condition through stand exams and surveys	All	All
Manage for non-timber forest products	b. Allow for suitable hunting/ gathering. c. Allow for habitat of and promote growth of forest species of cultural significance (see <a href="#">section 3.8</a> ).	All	All
Encourage and facilitate sustainable and suitable use of forestland for recreation and tourism	d. Allow for proposed hiking trail paralleling the bluff e. Allow for hiking trail and Spectacle Lake recreation area f. Allow for sustaining the view from Mission Hill Overlook. g. Close and revegetate the undesired, user-made trails h. Brush out ATV/snowmobile trail intersections	Mixed hardwoods, mixed conifer, conifer swamp	C100/ S 7, 9
Manage for deer forage	i. Save mast tree species such as red oak and beech	Mixed hardwoods	C100/ S 7, 9
Maintain or improve the ability of forest communities to balance the effects of non-local beings/ invasive species.	j. Monitor tree health with stand exams k. Monitor for invasive insects/diseases (for example, Hemlock Woolly Adelgid, Asian-long horned beetle, Spotted Lanternfly, and other).	All	C100/ S 7, 9
Protect rare and/or culturally -significant species	l. Protect unique wetland and aquatic plants with no-cut buffers of 30m (100ft) m. Protect cranberry habitat with no-cut buffers of 30m (100ft)	Floating bog, wetland	C100/ btwn stands 7 and 9
Manage for fire resiliency	n. Create a fire break on southern and western FMA boundary, such as a gated road o. Thin the western property boundaries. Remove all conifers within 50ft of the boundary to reduce fire risk.	Mixed hardwoods/ conifer	C100/ S 9
Manage hardwood stands as a sustainable maple and yellow birch sugar bush	p. Follow <a href="#">Audubon Vermont sugar bush guidelines</a> and leave at least 25% other species (beech, oak, cedar, hemlock, spruce, pine, etc) Thin stand	Mixed hardwoods	C100/ S 9

	to basal area of 70-80, selecting for healthy trees with large crowns; uneven age management.		
Protect steep slopes to minimize erosion	q. Enhance vegetation with tree planting to prevent erosion and maintain high water quality r. Implement adaptive plant and forestry management practices that stabilize slopes and enhance riparian forest diversity and resiliency.	Mixed hardwoods	C100/ S 7, 9
Buffer springs and vernal pools	s. Map springs and vernal pools; apply buffer around them for any vegetation management.	Mixed hardwoods	C100/ S 7, 9
Be sensitive to cultural significance of the forestland in all aspects of the community	t. Allow for habitat of and promote growth of forest species of cultural significance (see <a href="#">section 3.8</a> ). u. Promote cedars with desirable characteristics for cultural use, such as those with straight-growing bark, large diameters, healthy foliage, and 100ft proximity to road or trail.	Mixed hardwoods	C100/ S 7, 9
Protect cultural and archaeological sites	v. Avoid ground disturbing activities which could impact special sites.	All	All

**Table 31: Sugar Island Forest Management Area**

This area has few homes nearby, but has been most-impacted by the loss of ash trees. Management is complicated by location on an island.

Goals	Implementation Strategies	Forest Type	Compartment/ Stands
Collect detailed information on the stands	a. Collect necessary data on the forest condition through stand exams and surveys	All	All
Manage for non-timber forest products	b. Allow for suitable hunting/ gathering. c. Allow for habitat of and promote growth of forest species of cultural significance (see <a href="#">section 3.8</a> ).	All	All
Manage for moose habitat	d. Promote moose habitat by providing young maple, aspen, etc forage. Refer to <a href="#">section 3.8 Consideration for Moose</a> e. For aspen pocket at 46.405513, -84.214543, clear-fell the overly mature aspen to promote regeneration. Drag slash back from road (Stand 4)	Mixed hardwoods	C300/ S 1, 2,, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
Mitigate Emerald Ash Borer impacts	f. Identify suitable planting sites and plant a variety of supplemental lowland hardwood tree species to compensate for the loss of ash species, including hackberry, red and silver maple, sycamore, basswood, river birch, swamp white oak, and chokecherry. Under-plant variety of tree species in pockets of dead ash. Site prep by hand-scalping away sedges. g. Investigate spring prescribed burn to reduce sedges; then direct seeding of tamarack. h. Collect cones and seeds from Chippewa County trees and plant on site (tamarack, bog birch, etc).	Mixed hardwood swamp, ash stands	C300/ S 1, 4, 9, 10
Maintain or improve the ability of forest communities to balance the effects of non-local beings/ invasive species.	i. Monitor forest health with stand exams. j. Monitor for other invasive insects/diseases (for example, Hemlock Woolly Adelgid, Asian-long horned beetle, Spotted Lanternfly, and others).	Mixed hardwoods and conifer swamp	C300/ S 1, 2,, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
Promote cedars with desirable characteristics for cultural use	k. Promote cedar trees with straight-growing bark l. Promote by planting and/or natural regeneration	Mixed hardwoods and conifer swamp	C300/ S 1, 2,, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
Manage for wildlife habitat (primarily deer forage)	m. Promote mast tree species such as red, white, and swamp white oak and beech n. Leave snags and mature yellow birch for habitat (cavities)	Mixed hardwoods	C300/ S1, 2, 3, 4, 11, 12

Promote paper birch with desirable characteristics for cultural use	<ul style="list-style-type: none"> <li>o. Use fire to create disturbance needed for regrowth.</li> <li>p. Paper birch do well in scarified soils so look to change regulations that allow for this practice to happen (right now it's hard to do this harvesting in summer months in particular because of existing regulations).</li> </ul>	Mixed hardwoods	C300/ S1, 5, 6, 12
Protect cultural and archaeological sites	<ul style="list-style-type: none"> <li>q. Avoid ground disturbing activities which could impact special sites.</li> </ul>	All	All

**Table 32: Stewardship Strategies for Housing, Developed Areas and Non-Forest.**

A significant portion of Bay Mills trust lands are already developed for residences and enterprises. These areas are constantly evolving to reflect the needs of the community. While much of this area is obviously developed, there are currently pockets of undeveloped woodland surrounded by development. Due to the dynamic nature of these locations, the following table does not include firm forest management goals and objectives; instead this table offers technical expertise for common stewardship challenges.

Goals	Implementation Strategies	Forest Type	Compartment/ Stands
Offer technical expertise to manage for non-timber forest products.	a. Allow for suitable foraging/ gathering. b. Allow for habitat of and promote growth of forest species of cultural significance (see <a href="#">section 3.8</a> ).	All	All
Offer technical expertise to support management goals of other natural resources management plans.	c. As opportunities arise, support goals and objectives of the BMIC Comprehensive Management Plan d. As opportunities arise, support goals and objectives of the BMIC Waishkey River Watershed Management Plan e. As opportunities arise, support goals and objectives of the BMIC Non-Point Source Pollution Management Plan f. As opportunities arise, support goals and objectives of the BMIC Solid Waste Management Plan	All	All
Offer technical expertise regarding tree health and hazard tree mitigation.	g. As opportunities arise, educate residents and facility managers about tree health and hazard tree mitigation.	All	All
Offer technical expertise regarding mitigation of Emerald Ash Borer impacts	h. Educate residents and facility managers about tree health and suitable species for supplemental planting.	Mixed hardwood swamp, ash stands	All
Offer technical expertise regarding non-local beings/ invasive species.	i. Monitor for other invasive insects/diseases (for example, Hemlock Woolly Adelgid, Asian-long horned beetle, Spotted Lanternfly, and others).	Mixed hardwoods and conifer swamp	
Offer technical expertise regarding sustainable and suitable use of forestland for recreation and tourism	j. Allow for proposed hiking trail k. Brush out road and trail intersections for public safety	Mixed hardwoods	

## Chapter 7. ENVIRONMENTAL ASSESSMENT

An Environmental Assessment (EA) has been prepared for implementation of this FMP. The EA and Finding of No Significant Impact (FONSI) are provided in the EA document. The FONSI can be found in Appendix A of this document.

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## APPENDICES

APPENDIX A: Environmental Assessment

APPENDIX B: Definitions

APPENDIX C: 1990s Stand Exams

APPENDIX D: 2017 Sugar Island Plant List

APPENDIX E: 2019 Cedar Stands Plant List

APPENDIX F: Detailed Soil Types

APPENDIX G: Bay Mills Indian Community Timber Use Policy 1993

APPENDIX H: Bay Mills Indian Community Forest Desired Uses Survey  
Results 2021