

# Draft Management Plan for State-owned Lands on Northern Lake Michigan Islands

Michigan Department of Natural Resources  
Wildlife Division

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McFadden Point, Beaver Island. Photo by Josh Cohen, Michigan Natural Features Inventory

## Purpose and Need for the Plan

Several recent efforts have highlighted the need to examine state land management on Lake Michigan islands and formulate an approach for effective management of these unique resources in the future. The Department of Natural Resources (DNR or the Department) recognizes state land management actions can have social, economic, and ecological impacts within and beyond state land borders. In addition, actions on lands adjacent to state land can have similar effects. Based on these relationships, we have undertaken a collaborative approach to developing this plan. The purpose of this plan is to provide a vision and intended actions for the future management of state owned lands on northern Lake Michigan islands, in partnership with local units of government, tribal governments, and other interested stakeholders.

In 2013, the Department published a draft *Managed Public Land Strategy*, and in the same year, the Beaver Island Natural Resources and Ecotourism Steering Committee developed *Recommendations for Natural Resource Management in the Beaver Archipelago*.

At a very high level, the Department's *Managed Public Land Strategy* answered questions regarding the location of public lands, what values are associated with those lands, and how the Department manages them today and how they should be managed in the future. The Strategy provided a broad framework for the continued conservation, use and enjoyment of these lands that was congruent with the Department's goals of protecting cultural and natural resources, providing recreational opportunities, and fostering economic prosperity. Successful implementation of the Department's Strategy will be driven by collaboration with local units of governments, regional organizations, and the private and non-profit sectors. Similarly, the *Recommendations for Natural Resource Management in the Beaver Archipelago* recognized the link between the unique natural resources and the wellbeing of island residents and visitors. This recognition has been manifested in goals that call for effective management of the archipelago's natural resources, economic vitality and growth that results from effective management, and how education and outreach focused on unique natural, historical, and cultural resources can lead to greater appreciation and protection of those resources.

The DNR Wildlife Division administers the state-owned land on the northern Lake Michigan islands, and the completion of these two plans provided a timely opportunity to leverage those efforts and develop a collaborative plan for these properties. The geographic scope of this management plan includes North and South Fox islands, Beaver Island, Garden Island, High Island, Hog Island and Whiskey Island. Collectively, these properties are referred to as the Beaver Island State Wildlife Research Area (Figure 1).

Our planning efforts were also guided by the Department's official policy 29.20-05 Management of State Owned Island Properties (February 1994). That policy recognizes the wide range of values that management efforts may be directed toward, ranging from protection of ecological function and strict limitation of activities, to the development of opportunities for intensive recreational activities. The policy emphasizes the degree of human impact should decrease in proportion to increasing levels of ecological, historical and cultural sensitivities. In addition, the Department must consider the potential economic impact of development plans, recognizing that in most cases the considerations will not override ecological or historical values.

Over the years, documents related to the northern Lake Michigan islands have been developed by various organizations (e.g., Townships, County, State of Michigan, U.S. Fish & Wildlife Service, U.S. Environmental Protection Agency, The Nature Conservancy, Michigan Natural Features Inventory, etc.). These documents provide information on the biodiversity and integrity of native plant and animals communities, migratory birds, fish, and threatened and endangered species, and some reflection of the recreational and economic desires of island residents and visitors. Many of these documents also reflect a desire to manage and maintain the natural resources for the benefit of current and future generations. They were all used to inform the rationale behind this plan and are cited and included in the bibliography where appropriate.

## **How We Developed This Plan**

With the recognition of the unique class of state lands we are striving to manage, we developed this plan after multiple opportunities for input by interested stakeholders. These opportunities included three public meetings on Beaver Island, public meetings in Leland, Traverse City, and Charlevoix, discussions with Tribal governments (Grand Traverse Band of Ottawa and Chippewa Indians, Little Traverse Bay Bands of Odawa Indians), meetings with other groups interested in island management (e.g., The Nature Conservancy, Central Michigan University Biological Station, the Recreational Aviation Foundation, Fox Island Lighthouse Association, and the Office of the Great Lakes), and multiple informal discussions and written correspondence with interested stakeholders. In addition, a writing team was convened for two days to discuss and develop draft goals and objectives that were later provided for public review and comments. Press releases and direct email broadcasts were used to solicit public comment on draft goals and objectives and to provide information on progress. The Vision, Goals, Objectives and Proposed Actions are a direct result of these combined interactions.

## Vision, Goals, Objectives, and Proposed Actions

**Vision:** Respect the ecological and cultural integrity of Northern Lake Michigan Islands while providing island-appropriate opportunities within the context of a broader natural resource-based economy, and providing effective administration of state-owned properties—a distinctively unique class of State lands.

**Goal 1, Partnerships and Collaborative Governance:** Strengthen and broaden partnerships that focus on the effective stewardship of the cultural and ecological resources of the State-owned Lake Michigan island properties—a distinctively unique class of State lands.

1. Establish a diverse partnership group that includes island residents, local, tribal, and federal governments, other state agencies, universities, user groups, non-government organizations, and others, to increase capacity for stewardship of ecological and cultural resources on State-owned lands
  - a. Identify relevant interested parties that can represent the most relevant values and issues
  - b. Identify governance principles under which this partnership will operate, including leadership, guiding principles, and decision making
    - i. Engage in regular partnership dialogue to understand how ecological, social, and economic values intersect, thus identifying and clarifying the short- and long-term challenges and opportunities that exist
2. Integrate decision-making, management actions, and education and outreach across all ownerships
  - a. Identify values common to all ownerships
  - b. Identify where opportunities exist to implement shared values
  - c. Develop and implement on-the-ground strategies
3. Engage with government programs and partners responsible for management of aquatic resources, where land management decisions may cross land-water boundaries
  - a. Identify stakeholders with near shore interests (e.g., DNR Fisheries Division, US Coast Guard, Chippewa Ottawa Resource Authority, National Ocean and Atmospheric Administration Coastal Zone Management Program, Michigan Sea Grant) and collaborate when appropriate

4. Implement an adaptive approach to management.
  - a. Set priorities, implement management, report and evaluate.
  - b. Establish timeline and milestones

**Goal 2, Ecological Resources:** Collaborate with partners to manage important ecological resources.

1. Identify and document important ecological resources
  - a. Create a suite of ecological objectives, either narrative or numeric, for short-term and long-term time horizons
  - b. Monitor the distribution and abundance of key ecological elements through time
2. Identify key stressors or threats facing those ecological resources
  - a. Characterize severity, scope, irreversibility of stressors/threats
  - b. Identify gaps in knowledge
3. Identify and prioritize management efforts needed to address stressors and achieve the ecological objectives.
  - a. Implement priority management strategies
    - i. Protect prioritized ecological resources
    - ii. Restore prioritized ecological resources
  - b. Monitor success of prioritized management strategies

**Goal 3, Cultural Resources:** Collaborate with partners to promote respect and understanding of important cultural resources.

1. Identify and document important cultural characteristics
  - a. Create a suite of cultural objectives, either narrative or numeric, for short-term and long-term time horizons
  - b. Monitor key cultural resources through time
2. Identify key stressors or threats facing those cultural elements
  - a. Characterize severity, scope, irreversibility of stressors/threats
  - b. Identify gaps in knowledge
3. Identify and prioritize protection efforts needed to address stressors and achieve the cultural objectives
  - a. Implement priority cultural strategies
    - i. Protect prioritized cultural resources

1. Create cultural education program including signage and other educational materials
    - ii. Restore prioritized cultural resources
  - b. Monitor success of prioritized cultural strategies
4. Develop educational materials that focus on promoting respect and understanding of important cultural resources

**Goal 4, Recreation:** Enhance opportunities for island-based recreation or subsistence activities compatible with the maintenance of ecological and cultural integrity.

1. Define a suite of recreational objectives, either narrative or numeric, for short-term and long-term time horizons
  - a. Review current list of recreational objectives from township, county and state recreational and master plans
  - b. Prioritize recreational objectives using a collaborative process
2. Identify existing recreational infrastructure
  - a. Inventory existing infrastructure
    - i. Location
    - ii. Condition
    - iii. Deferred maintenance needs
3. Identify desired recreational opportunities
  - a. Prioritize infrastructure actions
  - b. Collaborate with partners to implement recreational actions
4. Monitor recreational use on state-owned lands
  - a. Track number of use permits issued
  - b. Track number of special hunt permits issued
  - c. Survey recreational users
  - d. Evaluate impacts of recreational use on ecological and cultural resources
5. Support and promote island based recreational opportunities
  - a. Create print and social media promotional materials
  - b. Identify new potential users/audience

**Goal 5, Other Natural Resources-Based Activities:** Integrate all natural resource-based activities with the protection of ecological and cultural features.

1. Document other existing natural resource-based practices on state lands and evaluate how they interface with ecological and cultural resources
  - a. Identify location and intensity
    - i. Timber – logging, firewood
    - ii. Extraction – gravel
    - iii. Research
  - b. Evaluate and monitor impacts
  - c. Minimize incompatible uses and restore as necessary
  - d. Enhance compatible uses
2. Identify other new potential economic opportunities that may be viable and compatible with the enhancement and maintenance of the integrity of ecological and cultural resources
  - a. Identify and engage organizations that may assist in the development of potential new uses
  - b. Identify potential location and intensity
    - i. Wind farms

**Goal 6, State Land Administration:** Develop and implement an effective framework for the administration of State-owned Lake Michigan island properties.

1. Identify roles and responsibilities for land management of the island properties among the Divisions within the Department of Natural Resources
  - a. Review existing documentation on island decision-making authority
  - b. Communicate decision making authority to the partners
2. Identify internal DNR and external resources that can help meet administrative needs
  - a. Human resources
  - b. Fiscal resources
  - c. Physical resources (equipment, housing, office, etc.)
3. Address unresolved land matters issues
  - a. Identify land matters issues (e.g., Forest Certification inclusion, official land designations)
  - b. Develop strategies to address them

## Plan Implementation

This Plan represents a new approach to state land management, one based on partnerships and shared governance responsibilities. Because of the approach, implementation will come under the purview of the partnership group that is proposed under Goal 1. As a state land management agency, the DNR cannot abdicate its ultimate responsibilities, yet believes that shared governance is the best approach to managing these unique properties. To that end, the DNR will participate fully in the partnerships and seriously consider any recommendations of the partnership, unless they are considered a violation of state law or policy.

The first task of the partnership will be to convene the group and develop a charter under which the group will operate. This should include, at the very least, timetables and frequency of meetings, leadership of the group, discussions of acceptable behavior of members, expectations for communication among group members and communications to the groups they represent, and a decision making process that is based on a consensus or “will live with” approach.

The expected next steps of the group will be to conduct a thorough discussion and analysis of where we are today and where we would like to be in the future. This will require serious discussion and prioritization of the actions that can be reasonably and effectively carried out by partners to reach our desired future conditions.



## Description of State-owned Lands and Management Challenges

### ***Beaver Island***

Beaver Island is the largest island in this group, and the most biologically diverse (biodiversity score of 273, Henson et al. 2010). There are approximately 12,400 acres of state-owned land on the island, or about one-third of the island, mostly located on the southern half of the island. It is the only island with state ownership considered in this plan where a formal forest inventory has been conducted. Major cover types on state land include northern hardwoods, lowland deciduous forest, and lowland coniferous forests. In addition, natural features surveys have identified numerous occurrences of threatened and endangered species on the island (including designated critical habitat for piping plovers, Federal Register 2001: 22938) and several high quality natural communities (from all ownerships), including open dunes, boreal forest, dry-mesic northern forest, mesic northern forest, bog and poor fen. Descriptions of these high quality natural communities can be found in Cohen et al. (2015). Beaver Island is the only island considered in this plan with scheduled ferry and airline service (two airports), and year-round residents.

Important management challenges to address on state lands, among others, include administration of an existing gravel pit, public access sites at Lake Geneserath, Green Lake, and Donner's Landing, infrastructure at Martin Bluff, historical and cultural sites like old homesteads and "Mormon fields," hiking trails, and Federally-designated Piping Plover critical habitat (Federal Register 2001: 22938).

### ***Garden Island***

Garden Island lies just north of Beaver Island and according to local residents is the easiest and most frequently visited of the outer islands. With the exception of approximately 80 acres, the remainder of the island is state owned (slightly more than 5,000 acres). Garden Island is also biologically diverse (biodiversity score of 221, Henson et al. 2010). Major cover types on the island include northern hardwoods, mixed broadleaf deciduous forests, conifer forests, and wetlands. There are many records of threatened and endangered species on the island and natural communities noted include coastal fen, boreal forest, and mesic northern forest. There are several small lakes and interior wetlands on the island. Garden Island has a long history of occupation and there are at least two cabins on the island (both on state land) and a Native American cemetery.

Important management challenges to address on state lands, among others, include the so called "DNR Cabin," other cabins still standing (e.g., Golden's cabin), other historical structures, the current land use permit with the Miniss Kitigan Drum organization, garbage dumps, trails and trail maintenance,

the old apple orchard at the former “Indian Village” site, the cemetery (including the unknown areal extent of the site), and nearshore waterbird colonies.

### ***High Island***

High Island, lying west of Beaver Island is approximately 3,600 acres and is entirely state-owned. According to local residents, it is visited far less frequently than Garden Island even though the east side of the island has a good anchorage and landing sites. The island is somewhat less biologically diverse (biodiversity score of 181, Henson et al. 2010), yet has some very distinct features, including perched dunes on the west side of the island and a long narrow spit on the northeast. Major cover types include northern hardwoods, broadleaf deciduous and coniferous forests, and sand and dune dominated shorelines. Canada yew is prevalent in the understory. There are records of threatened and endangered species on the island (including designated critical habitat for piping plovers, Federal Register 2001: 22938), and natural communities noted include sand and gravel beach, limestone cobble shore, and open dunes. In addition, there is one small lake and numerous old fields that are filling in (mostly on the north half of the island).

Important management challenges to address on state lands, among others, include the two research cabins in need of removal, House of David structures and other historical structures, protection and signage of the colonial nesting spit, trails and trail maintenance, proposed camping sites, a historical apple orchard, an agreement with The Nature Conservancy natural area designation, pending Natural Area proposal, potential old water well site in Section 27, and Federally-designated Piping Plover critical habitat.

### ***Hog Island***

Hog Island, located to the northeast of Beaver Island and east of Garden Island, is about 2,200 acres in size and is entirely state owned. The biodiversity score is 212 (Henson et al. 2010) and there have been numerous occurrences of threatened and endangered species recorded there. Topographically, Hog Island is lower in elevation and there are numerous wetland areas around the island that grow and shrink in size depending on Lake Michigan water levels. Natural communities noted on the island include interdunal wetland and Great Lakes marsh. Major cover types include northern hardwoods, conifer swamp, and wetlands.

Important management challenges to address on state lands, among others, include, nearshore colonial waterbird sites, abandoned vehicles, and Federal mineral rights.

### ***Whiskey Island***

The smallest of the islands in this plan, Whiskey Island's approximately 100 acres is entirely state owned and undeveloped. The state acquired Whiskey Island in 2012 as part of a land exchange on Beaver Island. Cover types include mixed conifer, balsam fir and some aspen. No natural heritage surveys have been conducted on the island, yet earlier visits noted several threatened and endangered plant species on the island.

Important management challenges to address on state lands, among others, include the nearshore colonial waterbird site.

### ***North Fox Island***

The Fox islands are more isolated from the mainland than those in the Beaver Island group and thus are more impoverished from a biodiversity standpoint (North Fox biodiversity score is 163). North Fox Island is approximately 820 acres, is entirely state-owned, and is oriented in a general north-south direction. Canada yew is prevalent in the understory and major cover types include northern hardwoods, mixed conifers, and lowland conifers. Several threatened and endangered species have been recorded on the island and natural communities include mesic northern forest and boreal forest. While uninhabited, the island does have a small cabin and a grass airstrip that has been minimally maintained by interested aviators.

Important management challenges to address on state lands, among others, include the airstrip, cabin, old foundations, caches, trails and trail maintenance, wells, and a proposed lease of the airstrip and cabin by a recreation group.

### ***South Fox Island***

South Fox Island is approximately 3,400 acres in size, of which 1,258 acres are state owned, the rest belonging to one landowner. Biologically, South Fox Island is the least diverse of the islands considered in this plan (biodiversity score of 129), yet there are some notable natural features, including perched dunes on the west side of the island, and several areas of centuries-old white cedar trees. Major cover types include northern hardwoods, mixed conifers, and dune complexes. A number of threatened and endangered species have been recorded on the island (including designated critical habitat for piping plovers, Federal Register 2001: 22938), and natural communities noted include boreal forest and open dunes. There are no year-round residents, yet the private landowner does employ a caretaker who is on the island part of the year and there are regular visitors during that time, mainly arriving by plane using the paved private airstrip. There is a small Native American cemetery on the island and a lighthouse on the south tip of the island that has recently undergone renovations conducted by a conservancy group.

Important management challenges to address on state lands, among others, include ownership of a tower potentially on state land, a land locked state parcel, fences, a reported shooting range, trails and trail maintenance, hunting camp refuse, a cemetery, historical structures, Federally-designated Piping Plover critical habitat, and clarifying the administrative authority for the lighthouse property.

## **State Land Acquisition History**

Department owned and administered lands are managed to meet the Department's mission, and some of these lands are managed for a specific subset of the mission based on the funds used to acquire and manage these lands. There are more than 900,000 acres across the state acquired with fees derived from the sale of state fishing and hunting licenses and federal funds administered by the US Fish and Wildlife Service (US FWS). The uses of these funds are governed by state and federal laws and come with use restrictions and joint compliance oversight by the Department and the US Fish and Wildlife Service.

The Wildlife Division is responsible for ensuring lands acquired with hunting license dollars continue to serve their intended purpose. Generally, these lands have been acquired for the purposes of providing and enhancing wildlife habitat, providing for the management of wildlife populations and providing public access for hunting or other wildlife-oriented recreation.

State administration of lands on these islands began with tax reversions as early as 1903 on Beaver Island and 1907 on Garden Island. State acquisition of properties through purchase began in earnest in the 1950s. The primary sources of funds for purchases were the State Game Fund (now called the Game and Fish Protection Fund) and the Federal Aid in Restoration/Pittman-Robertson Fund. All of the state lands considered in this plan are administered under Wildlife and Game Area State Land Rules (PA 451, Section 504).

The history and distribution of acquisition source by island is detailed below:

### ***Beaver Island***

The island is 33% state land. The first properties tax reverted in 1903 and significant acreages reverted in 1932 and 1939. Most State purchasing occurred in 1950s using the State Game Fund.

<b>Acquistion Type</b>	<b>Acres</b>	<b>% of Total</b>
Tax Reverted	6,422	52.5%
Purchase	4,034	33.0%
Exchange Acq	822	6.7%
Fed Govt Exchange (GX-Acq)	678	5.5%
Swamp Grant	238	1.9%
Gift	40	0.3%
Court Order (Acq)	3	0.0%
<b>Total</b>	<b>12,237</b>	

### ***Garden Island***

The island is 98% state land. The first properties tax reverted on Garden Island in 1907 and significant acreage reverted in 1939 and 1941. Most state purchases occurred in the 1950s using State Game and Pittman-Robertson funds. In addition, the State acquired lands on Garden Island through exchange with the Federal Government in 1958 and 1964.

<b>Acquistion Type</b>	<b>Acres</b>	<b>% of Total</b>
Tax Reverted	1,866	43.9%
Purchase	1,843	43.3%
Fed Govt Exchange (GX-Acq)	545	12.8%
<b>Total</b>	<b>4,254</b>	

### ***High Island***

High Island is 100% state land. The first properties tax reverted to the State in 1925 and additional parcels reverted in 1939 and 1940. The State acquired additional properties through exchange in 1952. The State purchased the remainder of the island properties in 1958 with the use of Pittman-Robertson Funds.

<b>Acquistion Type</b>	<b>Acres</b>	<b>% of Total</b>
Purchase	3,077	87.9%
Tax Reverted	215	6.2%
Exchange Acq	134	3.8%
Gift	73	2.1%
<b>Total</b>	<b>3,500</b>	

### ***Hog Island***

Hog Island is 100% state land. The first parcel tax reverted to the State in 1925 with an additional parcel reverting in 1939. Much of the island was purchased by

the State in the 1950s with State Game Fund. The State acquired additional acreage in 1962 through an exchange with the Federal Government. The last private parcel on Hog Island was purchased by the State in 1995.

<b>Acquisition Type</b>	<b>Acres</b>	<b>% of Total</b>
Fed Govt Exchange (GX-Acq)	1,288	62.4%
Purchase	690	33.4%
Tax Reverted	61	2.9%
US Govt transfer of unclaimed islands & rec land	24	1.2%
<b>Total</b>	<b>2,063</b>	

### ***Whiskey Island***

Whiskey Island is completely state owned and was acquired in 2012 through an exchange with St. James Township/Charlevoix County.

### ***North Fox***

North Fox is completely state owned. The island was purchased in 2000 with Michigan Natural Resources Trust Fund and Land Exchange Facilitation Fund dollars.

### ***South Fox Island***

The island is 33% state land. Most was purchased in 1958 with Pittman-Robertson Funds. Nearly 300 additional acres were acquired through an exchange with the Federal Government in 1964. In 2002, ownership was consolidated through an exchange with the only other property owner on the island.

<b>Acquisition Type</b>	<b>Acres</b>	<b>% of Total</b>
Purchase	798	72.5%
Exchange Acq	219	19.9%
Fed Govt Exchange (GX-Acq)	74	6.7%
Gift	10	0.9%
<b>Total</b>	<b>1,101</b>	

## **History of Wildlife Research and Management**

Through the 1970s, nearly all of the research and management activities undertaken by the Department centered on game species research, introductions, and special hunts on the islands. Since that time there has been greater recognition of the broader ecological, cultural and historical significance of these islands. As such, the emphasis has shifted to efforts focusing on

conservation planning, historic preservation, the importance of the land/water interface, threatened and endangered species, high quality natural communities, and colonial and migratory bird studies.

### ***White-tailed Deer***

In 1927, the Department relocated 17 deer from a private facility in Frankenmuth to Beaver Island (Bartlett 1938). In 1938, Beaver Island was opened to deer hunting under a “one buck law.” At that time, Department staff estimated the island population to be 500-750 deer (Dayton 1939). In 2011, regulations for antler-point restriction began on Beaver Island. In recent years (2010-2014) the deer harvest has varied from 100-150 deer. While a few deer probably remain on Garden Island, local residents have mentioned significant hunting effort has declined in recent years due to the low deer numbers.

In 1915, a private landowner on South Fox Island planted an unknown number of white-tailed deer. The population was estimated to be 40-50 animals by 1925. During a visit in 1945, little deer sign on was found on the island, although they were still present (Bartlett 1945). A second introduction of 17 deer from the Department’s Cusino and Houghton Lake research pens, and the Traverse City zoo took place in 1962 and the population increased rapidly (Firestone 1996). Hunts with special regulations to reduce the herd were initiated in the late 1960s and starting in 1971 an administrative “exchange” of hunting lands, restricted public hunting to lands north of the township line. Deer hunting on state land on South Fox Island has been by permit only since the mid-1980s. South Fox antler-point restrictions were initiated in 1997. In 2005 there were 111 permits requested and 23 deer taken. No requests to hunt deer on South Fox Island were received in 2014, the first year since permits were issued.

The North Fox Island deer population was started in 1959 with two bucks and five does from a deer farm in Charlotte, Michigan (Firestone 1996). The population grew quickly and by the early 1970s the once abundant Canada yew was disappearing, prompting the owner to begin reducing the deer herd. Between October 1974 and January 1975, 144 deer were harvested, and by 1976 there were few, if any, deer on the island.

Current information suggests deer are present on Beaver, Garden and South Fox islands, and there are no deer on High, Whiskey, Hog, or North Fox islands.

### ***Ruffed Grouse***

In 1948 and 1949, 68 ruffed grouse were introduced to Beaver Island from Sandhill Game Farm, Babcock, WI (Ammann and Palmer 1958). In 1951, High Island was evaluated as a potential location for a long-term research study and several grouse and deer studies were proposed (Douglass 1951). These views undoubtedly lead to much of the justification for large number of island property

acquisitions that occurred in the 1950's. Beaver Island was first opened to ruffed grouse hunting in 1954. In 1956 and 1957 ruffed grouse were released on High, Garden, and Hog Islands at a stocking rate of 5 birds per square mile as part of a research study (Moran and Palmer 1963). Grouse became established on High and Garden islands, however the reintroduction to Hog Island was an apparent failure. In 1961, 28 ruffed grouse were released on Hog Island again. This attempt on Hog Island also failed and currently grouse are common on Beaver and High islands and less common on Garden Island.

### ***Wild Turkey***

Presently, wild turkeys are abundant on Beaver Island but are not present in significant number on any of the other islands. In 1961 or 62, thirty-eight wild turkeys were released on Beaver Island. A turkey hunt was attempted on Beaver Island in 1967 and 1968 with limited success. In 1992, a number of wild turkeys were moved to Beaver Island in an attempt to supplement the low population and hunting was re-opened on Beaver Island in 2002.

### ***Woodcock***

From 1968 to 1971, an investigation of the characteristics of the local woodcock population was conducted on High Island. The major objectives of the project included the determination of: 1) dynamics of a heavily exploited local woodcock population; 2) the degree to which singing-ground counts and wing collections may be useful in appraising population status; 3) the effects of hunting on the population; and 4) behavioral characteristics of the population that may limit the population growth of be important in woodcock management.

The study determined that extreme exploitation resulted in male woodcock population decline while the overall population was maintained through immigration. Furthermore, the study determined that peenting counts are an effective measure of population trends. These study findings were important in influencing both woodcock regulations and survey methodology in the Eastern US.

### ***Pheasant and Sharp-tailed Grouse***

Ring-necked pheasants were released on Beaver Island in 1922 and several more introductions apparently continued through 1938. In 1940, twenty-nine sharp-tailed grouse were introduced to Beaver Island from Babcock, WI by the Department (Ammann 1957). The last hunting season for sharp-tailed grouse on the Beaver Island was 1950-51. In 1963, one flock was observed. Sharp-tailed grouse are no longer present and pheasant are present only when they are released by private landowners.



### ***Reptiles and Amphibians***

Several herpetological studies have been conducted on the islands (e.g., Hatt et al. 1948, Bowden and Gillingham 2004), and some of that survey work continues by the Little Traverse Bay Band of Odawa Indians; Michigan Natural Features Inventory; Herpetological Resource and Management, LLC; and Central Michigan University.

A list of species and their island distribution, gleaned from several sources, is provided in Appendix A.

### ***Piping Plovers***

The Great Lakes population of piping plovers is a federally-listed endangered species and research and monitoring has been conducted on this species with renewed interest since the 1980s. In addition, critical habitat for this species was officially designated in 2001 (Federal Register 2001: 22938). These designations, which include land use considerations, are located on Beaver Island from Indian Point to McCauley's Point (5 km of shoreline) and in Greenes Bay (0.8 km). Additional areas include 1.8 km of shoreline on High Island and 6 km on South Fox Island. During 2014, 70 unique pairs were observed in the Great Lakes region. While they have nested on other islands recently, during 2014, High Island was the only island considered in this plan that had nesting plovers (USFWS, East Lansing Field Office, direct communication).

### ***Colonial nesters***

The northern Lake Michigan islands are well known for concentrations of colonial nesters (e.g., Blokpoel and Scharf 1999). Every ten years, the US Fish and Wildlife Service collaborates with many other agencies and groups to conduct a comprehensive survey of colonial nesting birds across the Great Lakes. While the potential for nesting on certain sites is variable from year to year (e.g., due to water levels or weather), several of the islands considered in this plan had colonial nesting activity during the last survey in 2007, including Beaver and High islands. In addition to the 10-year survey, Central Michigan University has been monitoring many of these colonies on a yearly basis. Some of the species expected to be observed nesting in the area include Herring Gulls, Ring-billed Gulls, Common and Caspian Terns, Black-crowned Night Herons, Great Blue Herons, and Double-crested Cormorants.

### ***Migratory Birds***

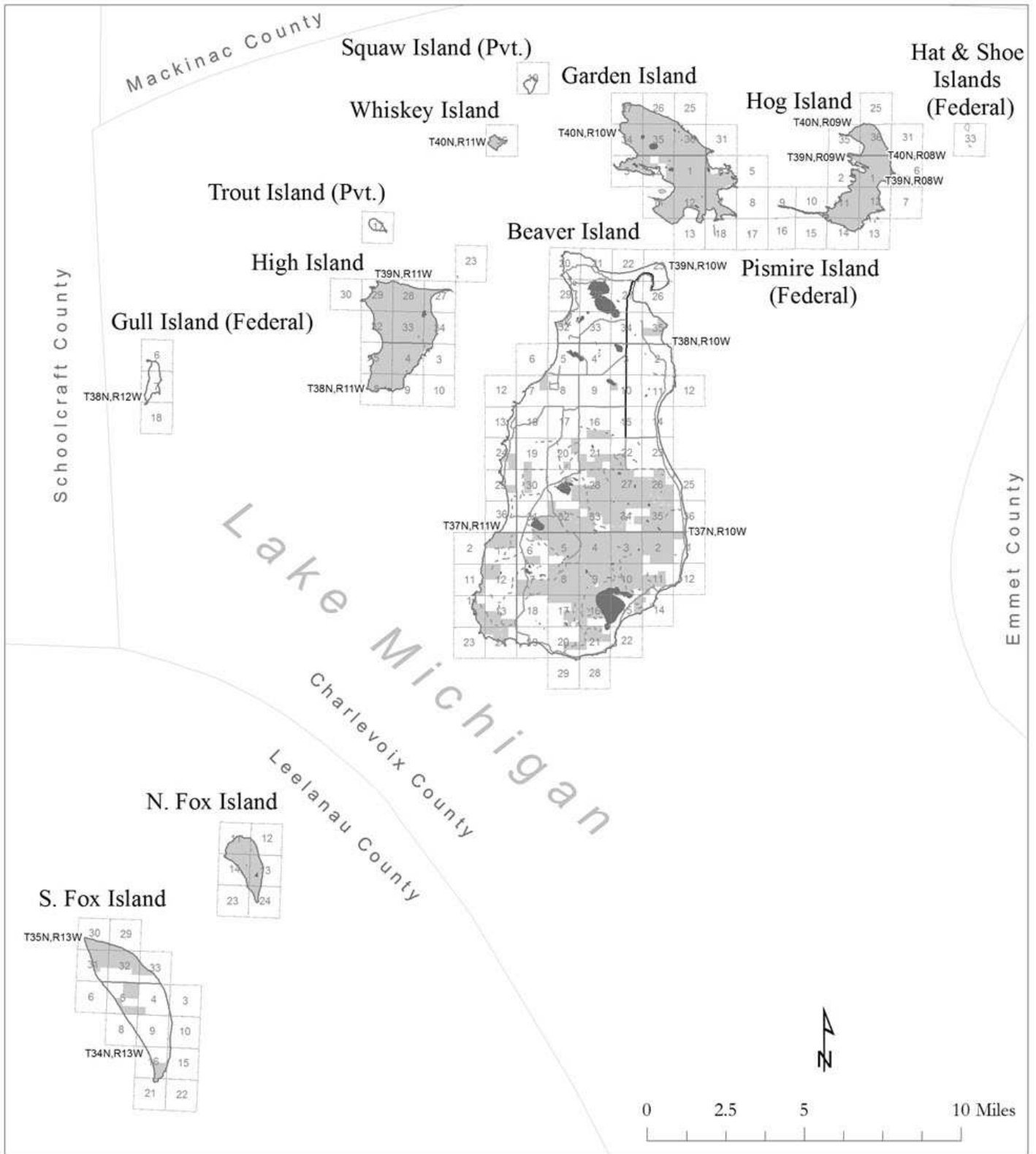
Northern Lake Michigan islands are important stopover sites for migrating birds and many studies have detailed the species that are most prevalent during migration (e.g., Scharf 1999). The National Audubon society has designated much of the area as Important Bird Areas (IBA), including 1) Beavers Islands

Colonial Waterbirds IBA, 2) Beaver Island Beaches (piping plover) IBA, 3) High Island Beaches (piping plover) IBA, and 4) South Fox Island Beaches (piping plover) IBA. At a local level, the islands have long been recognized as an excellent destination for birders, and in 2014, the Beaver Island Birding Trail and associated annual festival were launched.

### ***Threatened and Endangered Species***

Because of their isolated location and unique natural features, the islands are home to many rare species and have been the focus of survey work for many years (e.g. Penskar et al. 1998, 1999, Higman et al. 2012) and discussions regarding how these species contribute to the overall biodiversity of the islands (e.g., Soule 1997, Pearsall, et al. 2012).

A list of threatened and endangered species and their island distribution, gleaned from several sources, is provided in Appendix B.



**Figure 1. Geographic coverage of the Beaver Island State Wildlife Research Area, Charlevoix and Leelanau Counties, MI. State-owned lands are shaded.**

## Glossary

**Adaptive approach**—A systematic approach for improving resource management by studying past management outcomes, planning future actions, evaluating results of actions, and adjusting management practices as a result.

**Cultural resources**—Sites or objects that have important historical and social significance, including meeting places, documents, objects, archaeological sites and historic places. From a tribal perspective cultural resources are places where the lifestyle and culture of the Anishinaabek, past and present, has created some type of importance to the site. These include, but are not limited to fishing and hunting sites, places where spirits inhabit or use, places where specific plants, minerals, and rocks are obtained for traditional uses, places where ceremonies were or are performed, burial locations, and places where significant events occurred.

**Ecological resources**—Natural resources such as forests, wildlife (including birds, mammals, reptiles, amphibians, and fish), native vegetation, and the conditions needed for functional interaction and survival.

**Governance**—The structure, policies, procedures, regulations and philosophies that groups follow in order to interact and conduct operations.

**Partnership**—For the purposes of this plan, a partnership is an alliance of individuals representing groups with a vested interest in collaborating on the governance and management of state-owned properties on northern Lake Michigan islands. The partnership acts collectively to meet the plan goals and objectives.

**Recreation**—Natural resource-based activities such as hunting, fishing, trapping, hiking, camping, mushroom picking, bird watching, etc.

**Recreational infrastructure**—Constructed objects supporting natural resource-based recreation such as access sites, trails, campsites, outhouses, etc.

**Stressor or threat**—A negative event, process, or entity with the potential to have detrimental effects on cultural or ecological resources. Stressors or threats may result in risks to the long-term sustainability of those resources (e.g., invasive species).

**Subsistence**—From a tribal perspective, any activity by tribal members that involves gathering, harvesting, or using natural resources.

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## **Appendix A. List of Amphibians and Reptiles**

This list is based on information compiled over many years (references below) and represents all records for all lands surveyed, regardless of ownership.



Species	Common name	Beaver	Garden	Hog	High	Whiskey	South Fox	North Fox
<i>Notophthalmus viridescens</i>	Eastern newt	X	X	X <sup>1</sup>	X			
<i>Plethodon cinereus</i>	Red-backed salamander	X	X	X <sup>2</sup>	X		X	X
<i>Ambystoma laterale</i>	Blue-spotted salamander	X	X		X			
<i>Ambystoma maculatum</i>	Spotted salamander	X			X <sup>3</sup>			
<i>Bufo americanus americanus</i>	Eastern American toad	X	X	X	X	X	X	X
<i>Hyla versicolor</i>	Eastern gray treefrog	X			X <sup>3</sup>			
<i>Pseudacris crucifer crucifer</i>	Northern spring peeper	X	X		X <sup>3</sup>			X
<i>Rana catesbeiana</i>	Bullfrog	X						
<i>Rana clamitans melanota</i>	Green frog	X	X <sup>3</sup>		X			
<i>Rana sylvatica</i>	Wood frog	X	X					
<i>Rana pipiens</i>	Northern leopard frog	X	X					
<i>Terrapene carolina carolina</i>	Eastern box turtle	X <sup>3</sup>						
<i>Chelydra serpentina serpentina</i>	Common snapping turtle	X	X		X <sup>3</sup>	X <sup>3</sup>		
<i>Chrysemys picta</i>	Painted turtle	X	X	X <sup>2</sup>	X	X <sup>3</sup>		
<i>Thamnophis sirtalis</i>	Common garter snake	X	X		X	X	X	X
<i>Thamnophis sauritus septentrionalis</i>	Northern ribbon snake	X						
<i>Nerodia sipedon</i>	Northern water snake	X	X	X	X	X		X
<i>Storeria dekayi</i>	Brown snake			X <sup>2</sup>			X	
<i>Storeria occipitomaculata occipitomaculata</i>	Northern red-bellied snake	X	X		X	X		
<i>Diadophis punctatus edwardsii</i>	Northern ring-necked snake	X	X				X	X
<i>Opheodrys vernalis</i>	Smooth green snake	X						
<i>Lampropeltis triangulum triangulum</i>	Eastern milk snake	X	X		X	X		X

<sup>1</sup> From Herpetological Review (2011) 42(2):235

<sup>2</sup> From Herpetological Review (2013) 44(2):269, 272, and 275

<sup>3</sup> From Mifsud 2014

Rest from Michigan Academician (2004), 213-223

## **Appendix B. List of Threatened, Endangered and Special Concern Species**

This list is based on information compiled over many years and archived in the NatureServe Biotics database and represents all records for all lands surveyed, regardless of ownership.

Scientific name	Common name	Federal status	State Status	Beaver	Garden	High	Hog	North Fox	South Fox	Whiskey
<i>Adlumia fungosa</i>	Climbing fumitory		SC		X			X		
<i>Asplenium viride</i>	Green spleenwort		SC						X	
<i>Botaurus lentiginosus</i>	American bittern		SC	X						
<i>Botrychium campestre</i>	Prairie Moonwort or Dunewort		T						X	
<i>Bromus pumpellianus</i>	Pumpelly's brome grass		T	X				X	X	
<i>Calypso bulbosa</i>	Calypso or fairy-slipper		T	X	X			X		
<i>Carychium nannodes</i>	File thorn		SC						X	
<i>Charadrius melodus</i>	Piping plover	E	E	X		X			X	
<i>Cincinnatia cincinnatiensis</i>	Campeloma spire snail		SC	X						
<i>Cirsium pitcheri</i>	Pitcher's thistle	T	T	X	X	X	X	X	X	
<i>Cypripedium arietinum</i>	Ram's head lady's-slipper		SC	X						
<i>Drosera anglica</i>	English sundew		SC	X	X					
<i>Euxoa aurulenta</i>	Dune cutworm		SC			X				
<i>Falco columbarius</i>	Merlin		T	X						
<i>Falco peregrinus</i>	Peregrine falcon		E						X	
<i>Gallinula chloropus</i>	Common moorhen		T	X						
<i>Gavia immer</i>	Common loon		T	X						
<i>Haliaeetus leucocephalus</i>	Bald eagle		SC	X	X	X	X	X	X	X
<i>Iris lacustris</i>	Dwarf lake iris	T	T	X	X		X			
<i>Littorella uniflora</i>	American shore-grass		SC	X						
<i>Mimulus michiganensis</i>	Michigan monkey flower	E	E	X						
<i>Orobanche fasciculata</i>	Broomrape		T	X		X			X	
<i>Panax quinquefolius</i>	Ginseng		T						X	
<i>Physella magnalacustris</i>	Great Lakes physa		SC	X		X				
<i>Pinguicula vulgaris</i>	Butterwort		SC	X	X					
<i>Pisidium idahoense</i>	Giant northern pea clam		SC	X		X	X			
<i>Pyganodon lacustris</i>	Lake floater		SC	X						
<i>Ranunculus cymbalaria</i>	Seaside crowfoot		T	X						
<i>Scirpus torreyi</i>	Torrey's bulrush		SC	X						
<i>Solidago houghtonii</i>	Houghton's goldenrod	T	T	X	X		X			
<i>Somatochlora hineana</i>	Hine's emerald dragonfly	E	E		X					
<i>Stagnicola contracta</i>	Deepwater pondsnail		E	X						
<i>Stagnicola woodruffi</i>	Coldwater pondsnail		SC			X				
<i>Stellaria longipes</i>	Stitchwort		SC			X				
<i>Sterna caspia</i>	Caspian tern		T			X				
<i>Sterna hirundo</i>	Common tern		T		X	X	X			
<i>Tanacetum huronense</i>	Lake Huron tansy		T	X	X	X	X	X	X	
<i>Trimerotropis huroniana</i>	Lake Huron locust		T	X	X	X	X	X	X	

