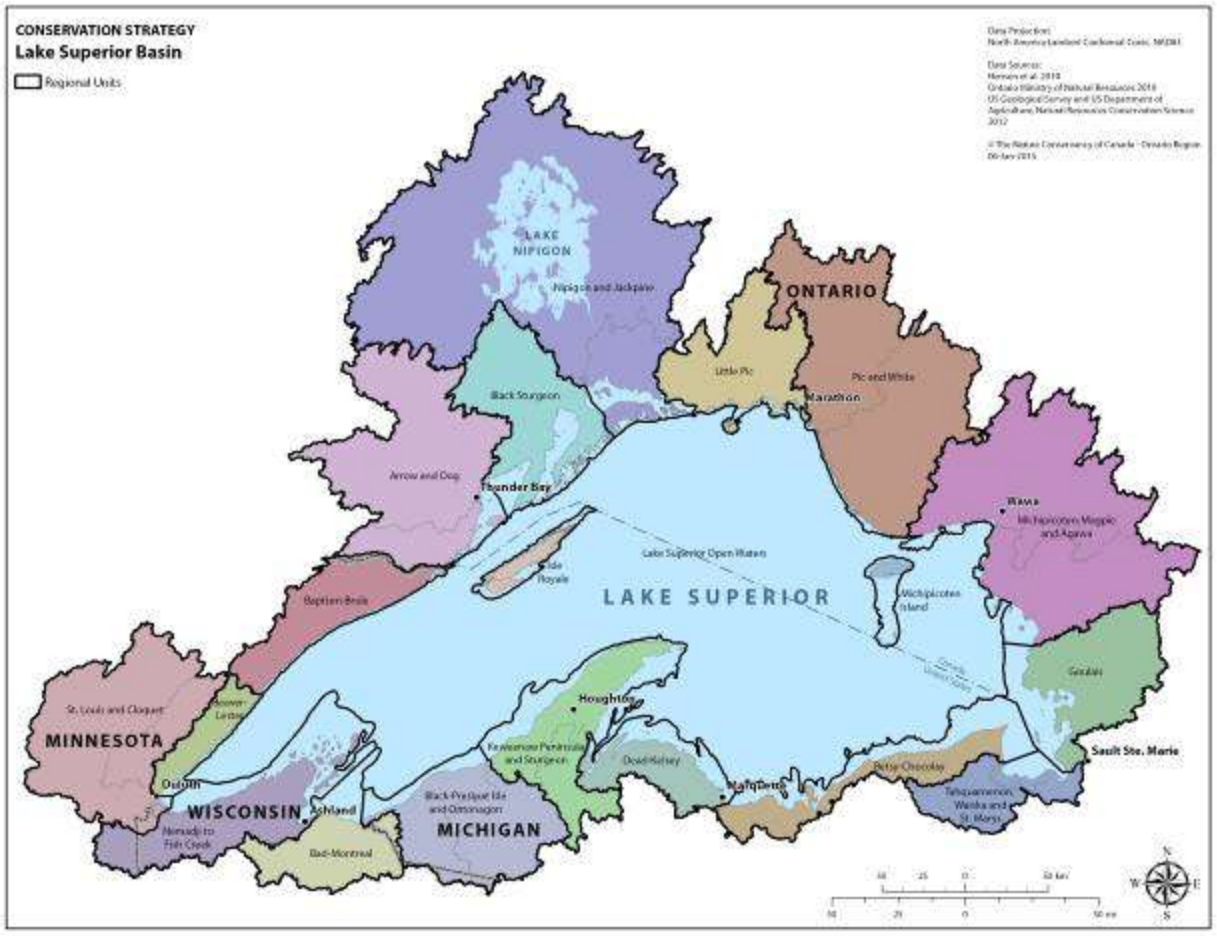
A Biodiversity Conservation Assessment for

Lake Superior



Volume 2: Regional Unit Summaries

Prepared by the Superior Work Group of the Lake Superior Lakewide Action and Management Plan

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Disclaimer

This report reflects the best efforts of the preparers (Dan Kraus and Megan Ihrig) to accurately represent and interpret the available expertise and information on Lake Superior and the views and opinions of project participants. Every effort to ensure the accuracy of the information contained in this study has been taken. We welcome suggestions for improvements.

Data Sources

For a full list of the Data Sources and Methods used to create the Tables and Figures throughout this Regional Unit Summaries report please see Appendix A: Spatial Data Catalogue and Methods.

Volume 1: Lakewide Assessment & Volume 2: Regional Summaries

Please note that this report includes two volumes. Volume 1 includes an assessment of lakewide biodiversity target health and threats. Volume 2 contains regional summaries and maps that are presented in this document. It is recognized that many regions contain additional information and mapping on biodiversity and threats that could not be fully reflected in this report. Wherever possible, regional and local data and spatial information on biodiversity targets and threats has been noted in the text.

Acknowledgements

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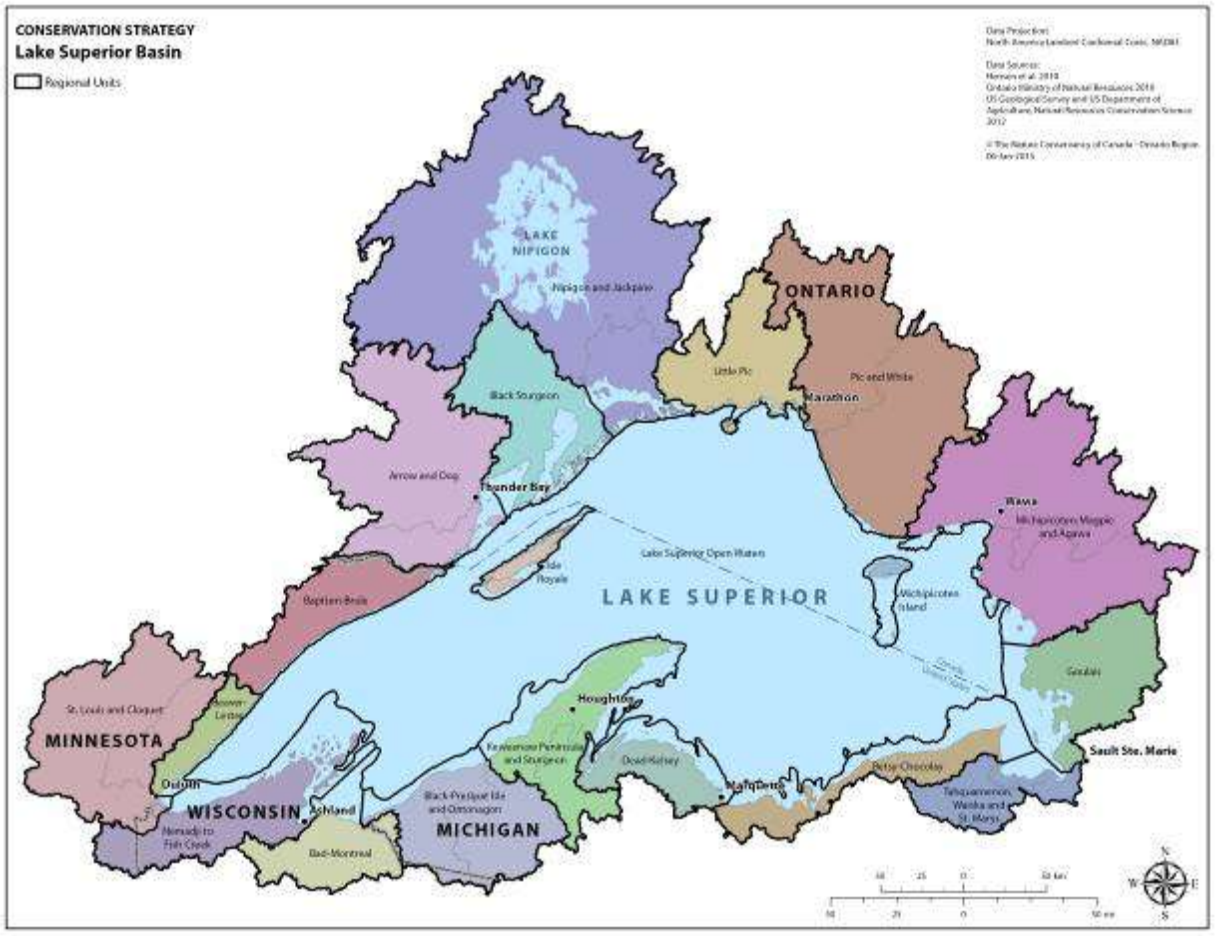
Guide to the Lake Superior Regional Unit Summaries

Volume Two of the Lake Superior Biodiversity Conservation Assessment provides more detailed information and mapping on 20 regional units (Figure I.1). These units are based on quaternary watershed boundaries that were grouped based on coastal environments identified from Lake Superior. In addition to the watershed and coast, each regional unit includes associated inshore and nearshore waters. In some regions, offshore waters were also incorporated to include islands. One unit that encompasses all of the Lake Superior offshore waters was also included. Maintaining the open waters as a single unit was recommended by the Aquatic Community Committee/Lake Superior Technical Committee.

Figure I.1: Lake Superior Biodiversity Conservation Assessment Regional Units



This regional information is intended to compliment the lakewide assessment provided in Volume One, and to provide additional detail to support the development of place-based conservation actions. Information in the regional summaries was based on a review of the literature and expert input. Spatial information was calculated for this project using the data sources outlined in the data catalogue (see Appendix A in this volume). It is recognized that many regions contain additional information and mapping on biodiversity and threats that could not be fully reflected in this report. Wherever possible,

regional and local data and spatial information on biodiversity targets and threats has been included in the text.

This introduction provides some detail on the different sections of the regional unit summaries.

Healthy Waters Report Card

The grades provided in the report card, and conditions and trend table are intended to denote relative condition/health and stresses for each biodiversity target in the region based on available condition and stress indices (see below). **These grades are intended to help highlight where the biodiversity targets are likely in better or worse health than the lakewide average, and to inform discussion about priority areas for conservation and restoration.** This automated assignment on the relative regional health of biodiversity targets was subject to expert review, and in cases where the experts felt the grade did not reflect actual conditions, the results were overridden with this expert input. Expert opinions were also reflected in the trends section of the conditions and trend table.

For each regional unit, a regional average of all stress/condition indices was calculated based on the individual scores of each sub-unit within the region (see Volume One) For example in Regional Unit 1 (Goulais), each of the 92 quaternary watersheds has a watershed stress index value (in this case ranging from 0 to 0.754, max=1). The regional score is based on an average of these sub-units. For the watershed stress index and Great Lakes Cumulative Stress, the average was subtracted from 1. For the Coastal Condition Index, the average was subtracted from the maximum possible score. These regional average values were then applied to the biodiversity targets. For some targets only one average index was used (e.g. the average value of the watershed stress index was used for the tributary and watershed target). For other targets, the condition/stress is likely reflected by a combination of the indices (e.g. embayment health), and the average of multiple indices was applied. The final score/grade is an average of the score for all biodiversity targets.

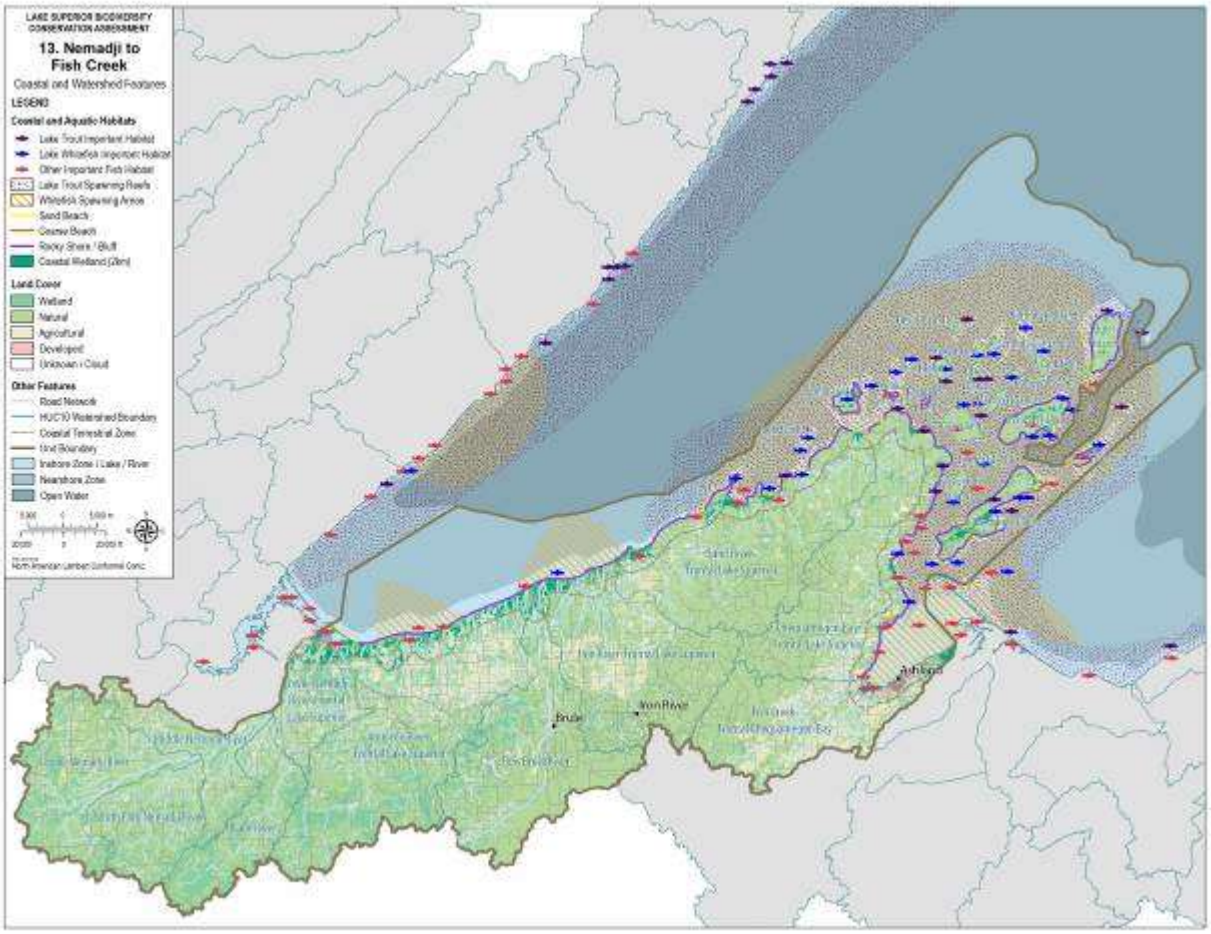
By the Numbers Table

This table provides a summary of information on land/water cover, coastal features, condition and land ownership and protected areas for each region. Where applicable, this information is put into context from a regional and Lake Superior-wide perspective. For example, the Goulais regional unit has 95.1 km of sand beaches. This amount of sand beaches make up almost 30% of the total coastline for the Goulais region, and represents 14.8% of all sand beaches on Lake Superior. The notes column provides some clarification on the different calculations for some attributes.

Coastal and Watershed Features Map Series

This map series depicts land cover, sub-watershed boundaries, coastal habitats (e.g. cobble beach, coastal wetlands) and fish spawning areas. The shaded areas denote current and historic spawning areas for Lake Trout and Lake Whitefish. The point data generally reflect more accurate locations of current spawning areas. This map is intended to provide an overview of the biodiversity targets in the region. Figure I.2 provides an example of the Coastal and Watershed Features map from the Nemadji to Fish Creek regional unit.

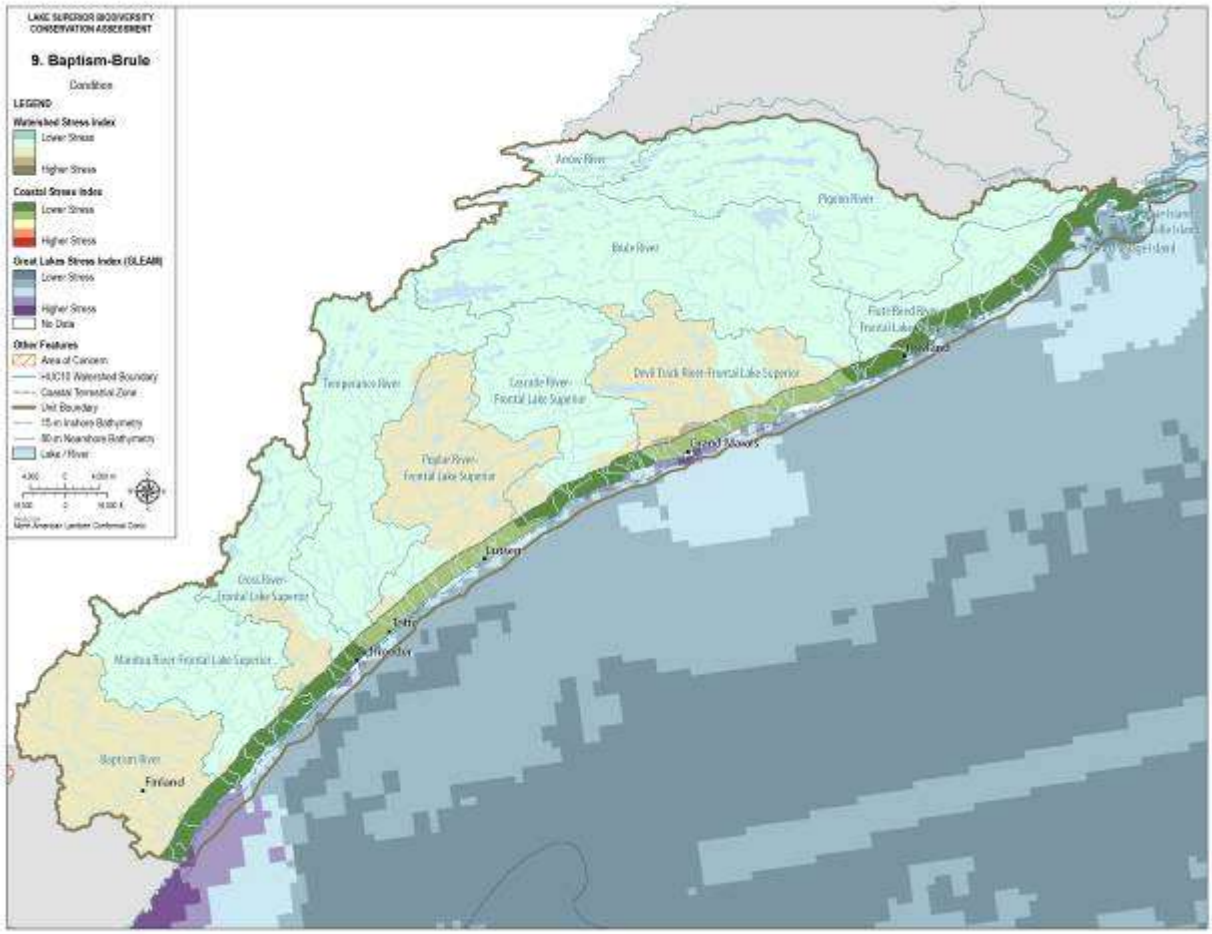
Figure I.2: Coastal and Watershed Features in the Nemadji to Fish Creek regional unit



Condition Map Series

This map series details the stress/condition indices: Watershed Stress Index, Great Lakes Cumulative Stress and the Coastal Condition Index. This map (in combination with the report card) is intended to provide information on the health of the biodiversity targets and highlight potential issue areas. Figure I.3 provides an example of the Condition map from the Baptism-Brule regional unit.

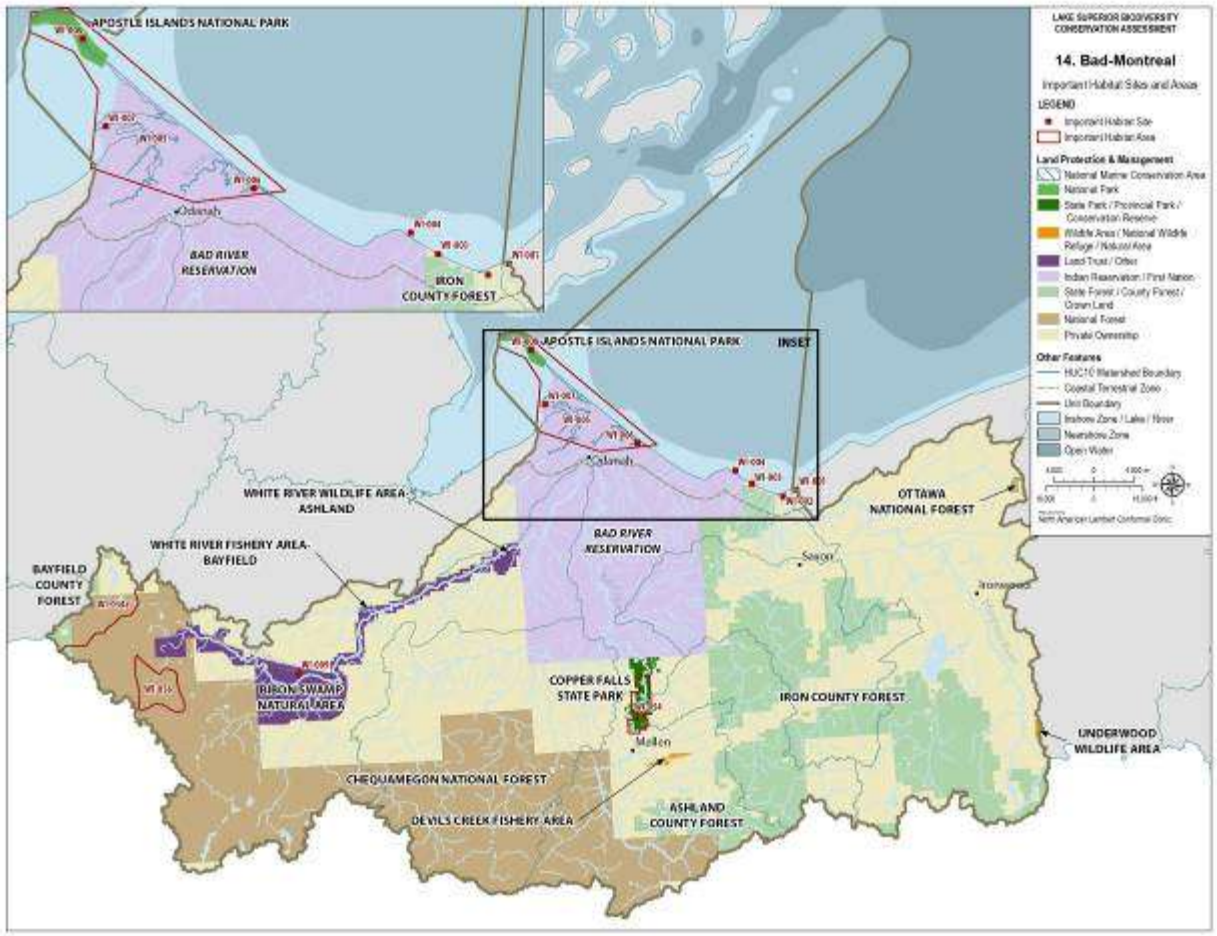
Figure I.3: Condition in the Baptism-Brule regional unit



Important Habitat Sites and Areas Map Series

This map series shows the Important Habitat Sites and Important Habitat Areas mapped by the Lake Superior LAMP (Lake Superior Binational Program [LSBP] Habitat Committee 2006), in the context of the protected areas and land ownership and management (e.g. public lands, national parks) in each regional unit. Additional important habitat areas may occur in some regions, and not all categories of land protection and ownership are reflected. Box 1 provides the criteria that were used to select these sites. Conserving or restoring these system components are of highest priority to maintaining Lake Superior biodiversity, recognizing that other important habitat areas inevitably exist, most notably in remote expanses of Lake Superior's east and north shores where habitats are largely undisturbed. Figure I.4 provides an example of the Important Habitat Sites and Areas map from the Bad-Montreal regional unit.

Figure I.4: Important Habitat Sites and Areas in the Bad-Montreal regional unit



Box 1: Criteria for the Identification of Biodiversity Features in the Lake Superior Watershed

Ecosystems

1. Large, relatively unfragmented areas most representative of the Lake Superior basin ecosystem that support natural community assemblages where ecosystem dynamics are intact or can be restored.
2. Nationally significant ecosystems. Areas that have wildlife and plant habitat values that go beyond local values in that they provide substantial benefits that extend beyond the basin.
3. Old Growth Forest. Tracts of varying size supporting native old growth forest. Tracts that with restoration and proper management could support high quality, native old growth forest.
4. Coastal shore or coastal wetland ecosystems. Sites that have, or with restoration could develop, high quality, diverse ecosystems that are representative of the interacting communities unique to the Lake Superior shoreline.
5. Areas that support high biological and ecological diversity. Sites that support, or with restoration could support the compositional, functional, and structural elements associated with diverse ecosystems.
6. Habitats that contribute to, or with restoration could contribute to maintaining ecosystem integrity on a landscape scale. These areas could include buffering communities around currently protected ecosystems, core areas within a managed area, or may be connecting corridors between important habitat sites.

Communities

1. Rare communities. Communities that are of high quality, or have high restoration potential, or are critically endangered. Examples include: calcareous fens, beach dunes, interdunal wetlands, red clay wetland complexes, bedrock beaches and cliffs.
2. Plant and wildlife habitats that are rare in the Lake Superior basin, or are rare globally.
3. Plant and wildlife habitats that occur only in the Great Lakes basin.
4. Communities that are, or that with restoration could be, outstanding representatives of the natural (i.e. pre-settlement) ecosystem.

Species

1. Sites (large or small) that serve as habitat for vulnerable, endangered, threatened or special concern species (or candidate species) during any stage of their life cycle. Currently occupied habitats and sites with potential for future colonization or reintroduction are included. Prioritization of potential sites depends on status of the species (i.e. rarity at global, sub-national, and basin scales), likelihood of occupation and the quality (or restoration potential) of the site.
2. Sites that serve, or with restoration may serve, vital functions in the life cycle of species named in appropriate planning documents (e.g. Lake Superior Ecosystem Objectives, Fish-Community Objectives for Lake Superior, Tribal resource plans, etc.)
3. Habitats required for the conservation of migratory wildlife (e.g. neotropical migrant birds, migratory fish, etc.), including staging areas, migration corridors and routes.
4. Spawning and nursery grounds for reptiles, amphibians, fish, or aquatic invertebrates. Colonial water bird nesting sites.
5. Habitats that can contribute to the conservation of species most likely to be at risk from human activity.
6. Habitats that support species that provides important ecological functions (e.g. nutrient cycling or chemical detoxification.)

Table of Contents

1. Goulais

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	A
NEARSHORE	B	COASTAL WETLANDS	B
EMBAYMENTS & INSHORE	B	COASTAL TERRESTRIAL	A
TRIBUTARIES & WATERSHEDS	B	**OVERALL B+**	

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

View of Lake Superior shoreline from Batchawana Bay. Photo credit: Sue Greenwood/ Ontario Ministry of Natural Resources

Summary/ Description

The Goulais regional unit is located in Ontario on the eastern shore of Lake Superior, and extends from the international boundary at the St. Marys River in the south to near the Montreal River Harbour in the north. This regional unit is 5,929.95 km^2 in size, including the associated nearshore waters. A number of provincial parks, conservation reserves and enhanced management areas are located in this regional unit. The largest community in the area, Sault Ste. Marie, Ontario is located near the southern end of this regional unit. Other communities in this regional unit include Goulais River, Havilland, Harmony Bay, Batchawana Bay, Obadjiwan (Batchewana[1]) First Nation and Searchmont. The jurisdictional area of the Sault Ste. Marie Region Conservation Authority overlaps with a small portion of this regional unit. The Goulais regional unit contains one tertiary watershed (Goulais) and 10 quaternary watersheds. The watersheds are dominated by forests, with only small areas of developed and agricultural lands. The coast is characterized by sand and cobble beaches, and includes some of the largest sand beaches on the Ontario side of Lake Superior. This region has more private lands than most other Ontario regions, and only 10% of the coast is in protected areas.

[1] The Batchawana spelling is used when referring to geographical places, while the Batchewana spelling is used when referring to the Obadjiwan First Nation.

TABLE 1.1: Goulais BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	39.79	0.60	1,441.07	
Developed	10.38	0.16	389.55	
Forest	4,939.44	74.30	107,747.13	
Associated Nearshore Waters	1,529.16	23.00	17,868.03	
Other	71.28	1.07	8,227.57	
Water (inland)	58.17	0.87	9,473.05	
Total Area	**6,648.22**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	317.74	NA	5.45	Based on SOLEC shoreline
Sand Beaches (km)	95.08	29.92	14.77*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	33.78	7.54*	3.06**	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone (km^2)	420.89	93.90*	6.82**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	145	NA	5.5	
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	0.40	NA		
Road Density (km/km^2)	0.49	NA		
Number of Dams and Barriers	1,627	NA	6.9	
Artificial Shoreline (km)	17.94	5.56	7.87	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	1,637.23	31.98	5,119.05	Regional area based on landmass
Public/Crown	3,022.86	59.05	5,119.05	
Tribes/ First Nations	7.40	0.14	5,119.05	
Parks & Protected Areas (total)	451.56	8.82	5,119.05	
Parks & Protected Areas (coast)	43.24	9.65*	448.21**	*% of Regional Coastal Area **Regional Coastal Area (km^2)

Important Biodiversity Features

Nearshore and Inshore Waters

- The Goulais regional unit contains sites of Important Habitat for both Lake Trout and Lake Whitefish. Important Habitat sites for Lake Trout are found off the coast of the Goulais region, in the nearshore zone (Lake Superior Binational Program Habitat Committee 2006) (Figure 1.1).
- Goulais Bay contains one of the largest remaining populations of the threatened Lake Sturgeon (K. Rogers, pers. comm., December 5 2014). Goulais Bay and Batchawana Bay are noted as Lake Superior embayments which are important for Lake Sturgeon (Auer 2003). In the Goulais regional unit these embayments and the nearshore zone, which provides corridors for movement, are identified as critical management areas for Lake Sturgeon in the Lake Superior basin (Auer 2003).

- Recent surveys have found that a population of Muskellunge exist in Goulais Bay. The presence of Musky in the Ontario waters of Lake Superior is very unique and exhibits the profound biodiversity that is found in Goulais Bay and River. Muskellunge are an apex predator and an indicator of nearshore/coastal wetland health. Tiger Muskellunge (a hybrid between Northern Pike and Muskellunge) have also been found in Goulais Bay and River. The Goulais region is the only region in the Ontario waters of Lake Superior where Tiger Muskellunge are known to exist (K. Rogers, pers. comm., December 5 2014).

Coastal Zone and Islands

- Ile Parisienne is noted as an Important Habitat site for Lake Whitefish (Lake Superior Binational Program Habitat Committee 2006). Important spawning areas for Lake Trout and Lake Whitefish are noted in the shoals and waters around the island (Figure 1.1). Most of the island (991 hectares) and a marine zone which extends 1.6 km from the shore of Ile Parisienne into Whitefish Bay are designated as a provincial conservation reserve, which is 4,669 hectares in total size (OMNR 2005a).
- The waters near the islands of Sandy Islands Provincial Park are Important Habitat for both Lake Trout and Lake Whitefish (Lake Superior Binational Program Habitat Committee 2006) (Figure 1.1).
- The Goulais River Beach Ridges Conservation Reserve protects an area containing ancient beach ridge landforms. The majority of the site is made up of wetlands, including bogs, fens, swamps and marshes; these wetlands may be of provincial significance. Moose and a number of bird species are often found in the wetlands. Upland forests have developed on the raised beach dunes that are interspersed between the wetlands (OMNR 2005b).
- This regional unit also contains Important Habitat Areas and Important Habitat Sites. Many of the Important Habitat Sites are located near the shore, while some are located further inland (Lake Superior Binational Program Habitat Committee 2006) (Table 1.3, Figure 1.3).
- Portions of the 2,937 hectare Great Lakes Coast – Sault Ste. Marie Enhanced Management Area (EMA) are located within the Goulais Region. This EMA contains islands and parcels of Crown land, located along Lake Superior's eastern coast, and the north shore of the St. Marys River and Lake Huron. This EMA contains geographically diverse areas, including provincially significant wetlands and habitat for fish and wildlife species. Many recreational activities are permitted throughout the area (OMNR 2007a).

Tributaries and Watersheds

- A number of tributaries in the Goulais region were historically used by Lake Sturgeon for spawning, including the Batchawana River, Chippewa River and Goulais River; the current status of the Lake Sturgeon populations in these rivers is being investigated. The OMNR is actively engaging in research of Lake Sturgeon populations in the Batchawana, Chippewa and Goulais Rivers, and Batchawana and Goulais Bays (S. Greenwood, pers. comm., March 11 2013). The Batchawana River population status is extant, while the population trajectory is unknown. The Chippewa River population status and population trajectory are both unknown. The Goulais River population status is extant, while the population status is unknown (Golder Associates Ltd. 2011); however there is not recent evidence of natural reproduction in the Gravel River (Lake Superior Lake Sturgeon Work Group 2012, unpublished data).
- Two additional tributaries in the Goulais regional unit, the Harmony River and Stokely Creek, were identified as historical spawning tributaries for Lake Sturgeon. The population status for both tributaries is extirpated (Golder Associates Ltd. 2011). There is some uncertainty as to whether these tributaries, which can be described as shallow and flashy, ever supported Lake Sturgeon spawning. A naming error in a chart for the area, which refers to the Chippewa River as the

Harmony River, could have caused some of this uncertainty (S. Greenwood, pers. comm., February 3 2013).

- A Lake Sturgeon Rehabilitation Plan for Lake Superior (Auer 2003) identifies the Batchawana, Chippewa and Goulais Rivers as three of the seventeen tributaries to Lake Superior in which there should be a focus on Lake Sturgeon rehabilitation.
- The Goulais and Batchawana Rivers are noted historically as important Walleye spawning rivers. Walleye stocks were almost extirpated in the 1960's (Hoff 2002) and have not made significant recovery since that time (S. Greenwood, pers. comm., March 11 2013)
- The Goulais River is approximately 67 kilometres long, and is classified as a provincial park. The river supports a self-sustaining Brook Trout population. Some shoreline wetlands are present (OMNR 2006b).
- The Goulais River Beach Ridges Conservation Reserve protects the Goulais River environment, which is described as exceptional in quality (OMNR 2005b). Cranberry Creek is located in the western section of the Goulais River Beach Ridges Conservation Reserve. This creek provides habitat for Brook Trout and Rainbow Trout (OMNR 2005b).
- Brook Trout populations which are self-sustaining are found in the Batchawana River (OMNR 2006a).
- Records of native northern lamprey (Icthyomyzon) larvae exist for many eastern tributaries, including West Davignon Creek, Little Carp River, Cranberry Creek, Goulais River, Haviland Creek, Stokely Creek, Chippewa River and Batchawana River. Since Icthyomyzon larvae can only be identified to genus, not species, it is possible that the larvae are Silver Lamprey (Ichthyomyzon unicuspis). However, they are most likely Northern Brook Lamprey (Ichthyomyzon fossor).While listed as "Historical" (Table 1.4), further study may determine that Northern Brook Lamprey are currently present in the Goulais regional unit (M. Steeves, pers. comm., June 17 2015).

Figure 1.1: Goulais - Coastal and Watershed Features

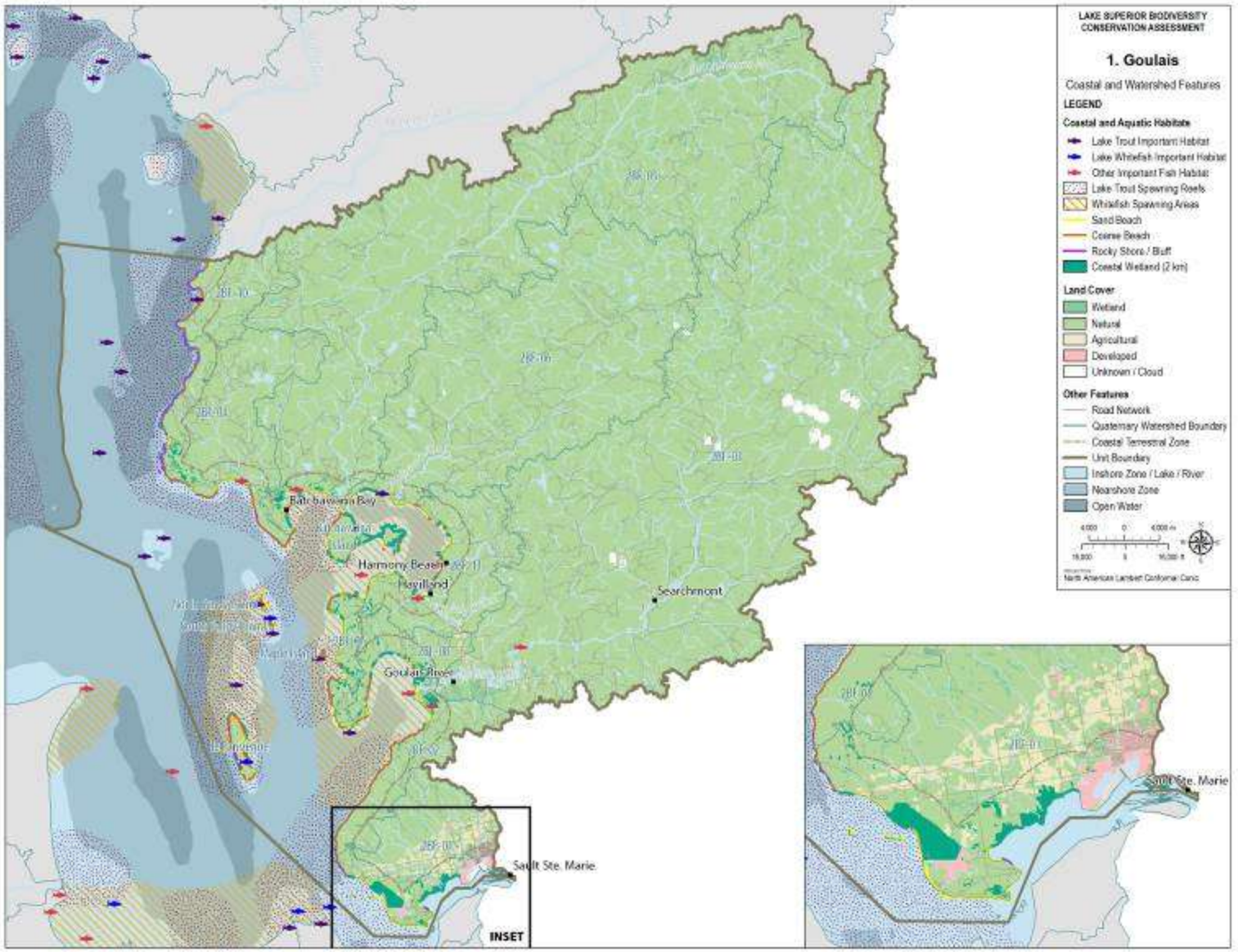


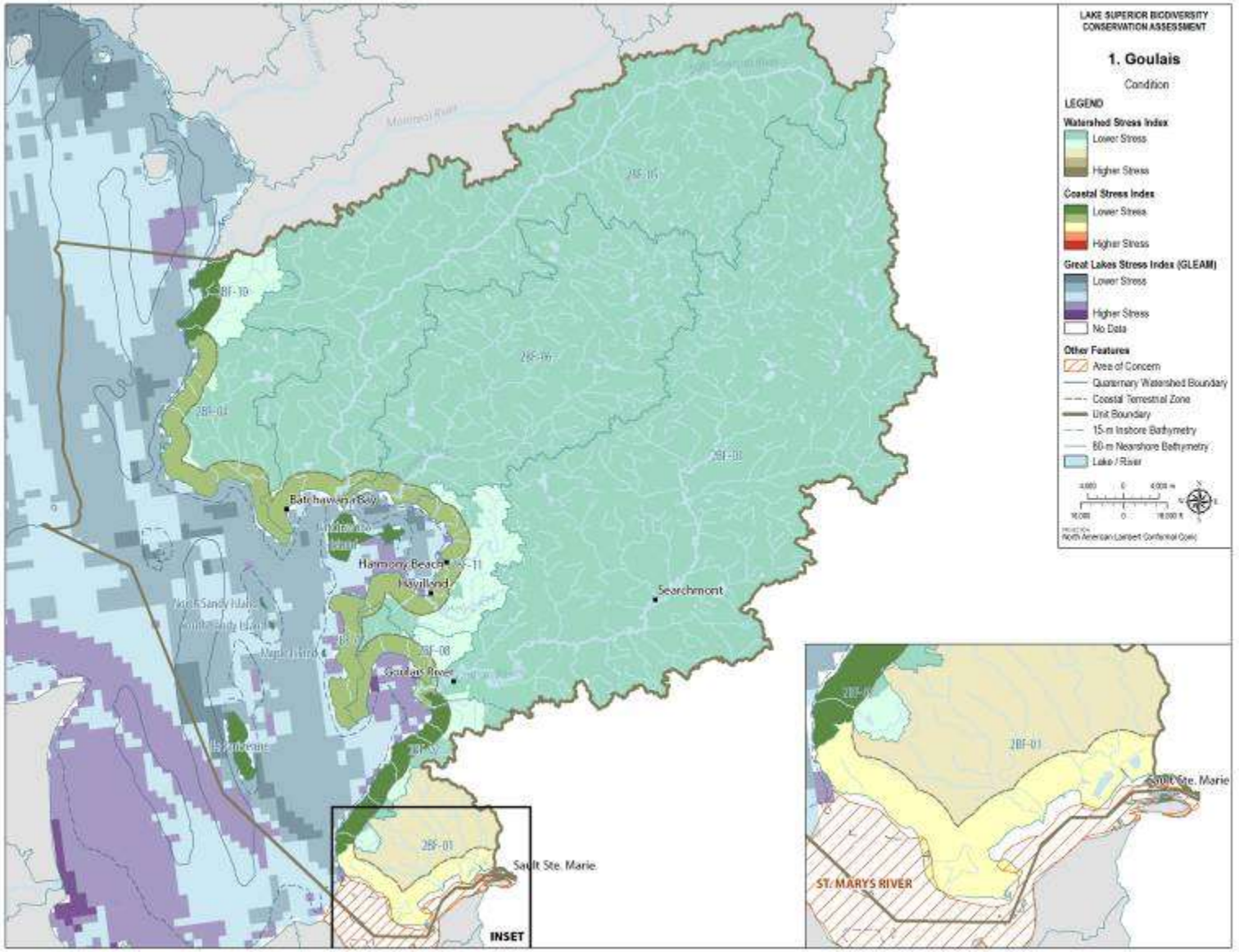
TABLE 1.2: Goulais CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	NA
Nearshore[1]	B (0.62)	Unknown
Embayments and Inshore[1,2]	B (0.67)	Unknown
Coastal Wetlands[2,3]	B (0.762)	Unknown
Islands[4]	A	Unknown
Coastal Terrestrial[3]	A (0.955)	Unknown
Tributaries and Watersheds[2]	B (0.71)	Unknown

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

Figure 1.2: Goulais - Condition



Important Issues & Threats

- The rehabilitation of lean Lake Trout and Lake Whitefish in the nearshore waters of the east end of the lake has not progressed to the same extent as the remainder of the lake. Ensuring that the unregulated fish harvests in the region are at levels that maintain sustainable populations will provide for the opportunity to resume cooperative rehabilitative fish stocking efforts.
- The presence of Emerald Ash Borer (EAB) has been detected within the boundaries of the nearby City of Sault Ste. Marie, Ontario. The entire area of the city is now regulated, meaning a number of regulated articles (e.g. firewood of all species; trees, nursery stock or other materials from the Ash (*Fraxinus*) genus) cannot be moved without permission (CFIA 2012).
- The Prince Wind Farm is a 300 hectare 126 turbine wind farm on the south shore of Goulais Bay. The Prince Wind Farm is operated by Brookfield Renewable Power (Canadian Wind Energy Association 2008). Several other wind farms are in development.
- The St. Marys River Area of Concern (AOC) is located between two regional units, the Goulais and Tahquamenon, Waiska and St. Marys regional units. A number of point and nonpoint sources have contributed to beneficial use impairments, and sediments are contaminated with arsenic, cadmium, chromium, copper, cyanide and lead. Ten beneficial use impairments were identified in the St. Marys River AOC (U.S. EPA 2013a).

Conservation In Action

Parks & Protected Areas

- Algoma Headwaters Provincial Park
- Goulais River Provincial Park
- Batchawana River Provincial Park
- Batchawana Bay Provincial Park
- Pancake Bay Provincial Park
- Sandy Islands Provincial Park
- Lake Superior Provincial Park Addition
- Goulais River Beach Ridges Conservation Reserve
- Ile Parisienne Conservation Reserve
- Great Lakes Coast - Sault Ste. Marie Enhanced Management Area
- Algoma Highlands Conservancy King-Mountain and Robertson Cliff properties

Existing Programs & Projects

- Two Provincially Significant Wetlands (PSWs) are located in the Goulais regional unit. Carp Rivers PSW (157.89 hectares) and Shore Ridges Wetland PSW (497.39 hectares) are both located in the southern end of the regional unit. The two PSWs provide a combined total of 655.29 hectares.
- The Algoma Highlands Conservancy owns more than 1200 hectares that are maintained under a designation of conservation forest. This is intended to provide protection for plants and animals at risk, and to provide low-impact recreation and environmental education opportunities. A system of multi-use trails are maintained in conjunction with partners, and uses including hunting, fishing, the use of motorized vehicles, and the harming of plants or wildlife are prohibited (Algoma Highlands Conservancy No date).
- Peregrine Falcons have been reintroduced to Ontario, including in the Lake Superior basin, following their extirpation as a breeding species in Ontario in the early 1960s (Ontario Peregrine Falcon Recovery Team 2010). The Ontario Ministry of Natural Resources (OMNR), Canadian Wildlife Service and many naturalist organizations and corporations have been involved in the re-establishment of Peregrine Falcons across Ontario (Ontario Peregrine Falcon Recovery Team 2010).

Project Peregrine is a project of the Thunder Bay Field Naturalists, supported by the OMNR. Established in 1989, Project Peregrine now conducts an intensive monitoring program with volunteers and OMNR staff in a number of areas throughout the Ontario portion of the Lake Superior Basin (Thunder Bay Field Naturalists No Date, Ontario Peregrine Falcon Recovery Team 2010). In the 2010 Ontario Peregrine Falcon survey, 72 of the 119 identified territories in Ontario were located in the Lake Superior basin. In Ontario the Lake Superior basin is the location of the highest quality of cliff nesting sites and supports the highest increase in the number of territories, and the highest density of cliff nesting birds (Chikoski and Nyman 2011). Peregrine Falcons born and banded in Ontario have also been observed nesting in Minnesota, Wisconsin and Michigan (Redig et al. 2010 as cited in Chikoski and Nyman 2011). Peregrine Falcons are listed as Special Concern by the Committee on the Status of Species at Risk in Ontario (COSSARO) and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (OMNR 2013a, COSEWIC 2011a).

TABLE 1.3: Goulais IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
ON-005	Site	Batchawana Island	Coastal wetland; rare animal habitat, migratory bird habitat
ON-006	Site	Batchawana River	Fish spawning area
ON-007	Site	Batchawana Bay	Staging area and brood habitat for migratory waterfowl
ON-007	Area	Batchawana Bay	Staging area and brood habitat for migratory waterfowl
ON-015	Site	Bojack and Bone	Nesting site for water birds
ON-019	Site	Chippewa River	Excellent Moose habitat, little access
ON-024	Site	Deadman's Cove	Wetland, fen with rare plants
ON-033	Site	Flowerpot Islands	Colonial water birds
ON-041	Area	Goulais River Delta	Fish spawning area, rare species habitat
ON-044	Site	Harmony River	Fish spawning habitat (largest run of rainbow smelt in area) feeding area for heron
ON-050	Site	King Mountain	High biodiversity value; old growth forest pockets; representative landscape
ON-056	Site	Marlette's Bay	Waterfowl staging area, brood habitat
ON-070	Site	Chippewa River Mouth	Fish spawning habitat
ON-092	Site	Pancake River	Fish spawning area
ON-102	Site	Robertson Cliffs	Rare animal habitat
ON-104	Site	Sand Point	Yellow perch habitat; perch numbers declining
ON-126	Site	Turkey Lakes	Old growth maple and birch; high biodiversity value (wildlife); roadless area; fish spawning area
ON-128	Site	Upper St. Mary's River	Fish spawning area
ON-128	Area	Upper St. Mary's River	Fish spawning area
ON-130	Site	Whiskey Point	Significant staging area for waterfowl
ON-132	Site	Wily Lake	Fish spawning area
ON-136	Site	Gros Cap Corridor	Migratory fish habitat; commercial fishery; colonial water bird habitat; Gros Cap reef

Figure 1.3: Goulais – Important Habitat Sites and Areas

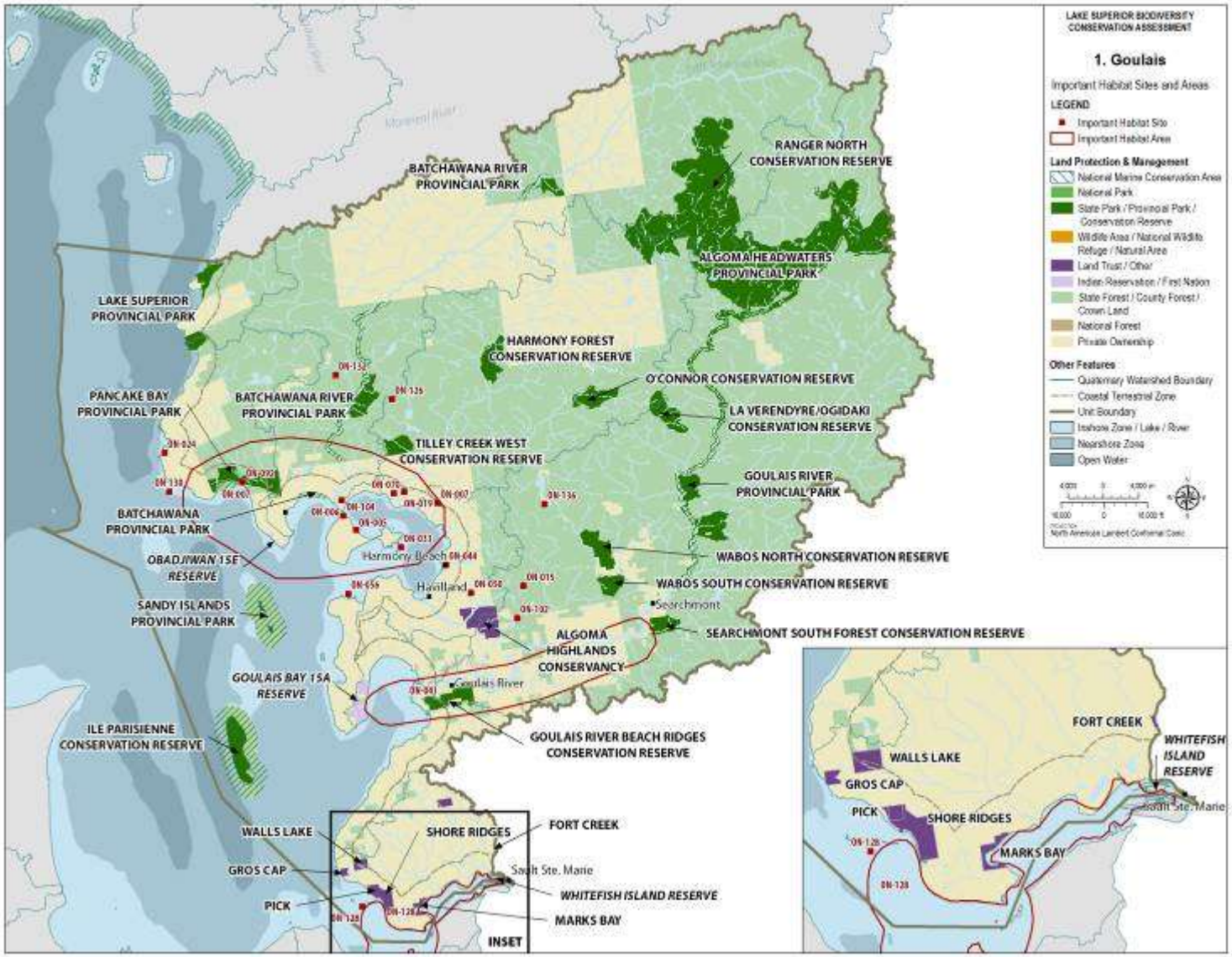


TABLE 1.4: Goulais LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 39 species and communities of conservation concern have been documented in the regional unit. 13 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 26 species and communities were once known to occur here, but have current conservation ranks of H (Historical).[2]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
American Dune Grass - Beach Pea - Sand Cherry Dune Grassland Type	American Dune Grass - Beach Pea - Sand Cherry Dune Grassland Type
Bat Colony	Bat Hibernaculum/Nursery
Calamovilfa longifolia var. magna	Great Lakes Sand Reed
Carex argyrantha	Silvery-flowered Sedge
Common Reed Grass Organic Shallow Marsh Type	Common Reed Grass Organic Shallow Marsh Type
Falco peregrinus	Peregrine Falcon
Glyptemys insculpta	Wood Turtle
Haliaeetus leucocephalus	Bald Eagle
Hudsonia tomentosa	Woolly Beach-heath
Juncus greenei	Greene's Rush
Prunus pumila var. pumila	Sand Cherry
Tanacetum bipinnatum	Floccose Tansy
Trichophorum clintonii	Clinton's Clubrush
Historical Records	
Scientific Name	**Common Name**
Acipenser fulvescens pop. 3	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)
Anaptychia setifera	A Lichen
Arigomphus cornutus	Horned Clubtail
Black Spruce Coniferous Organic Swamp Type	Black Spruce Coniferous Organic Swamp Type
Carex wiegandii	Wiegand's Sedge
Dicranum brevifolium	A Moss
Diplophyllum taxifolium	A Liverwort
Elymus glaucus	Blue Wild Rye
Frullania bolanderi	A Liverwort
Galium kamtschaticum	Boreal Bedstraw
Great Lakes Arctic-Alpine Basic Open Bedrock Shoreline Type	Great Lakes Arctic-Alpine Basic Open Bedrock Shoreline Type
Hieracium venosum	Rattlesnake Hawkweed
Huperzia appressa	Mountain Firmoss
Ichthyomyzon fossor	Northern Brook Lamprey
Lampropeltis triangulum	Milksnake
Myotis leibii	Eastern Small-footed Myotis
Myotis septentrionalis	Northern Myotis

[2] Data included here were provided by the Ontario Ministry of Natural Resources and Forestry. Copyright Queen's Printer for Ontario (2012).

Ophiogomphus carolus	Riffle Snaketail
Perimyotis subflavus	Eastern Pipistrelle
Pisidium equilaterale	Round Peaclam
Polystichum braunii	Braun's Holly Fern
Pseudoleskeella tectorum	A Moss
Pterospora andromedea	Woodland Pinedrops
Scapania gymnostomophila	A Liverwort
Somatochlora elongata	Ski-tailed Emerald
Vaccinium ovalifolium	Oval-leaved Bilberry

2. Michipicoten-Magpie and Agawa

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	A
NEARSHORE	B	COASTAL WETLANDS	A-
EMBAYMENTS & INSHORE	B	COASTAL TERRESTRIAL	A+
TRIBUTARIES & WATERSHEDS	A	**OVERALL A**	

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

Sunset over Lake Superior shoreline in Lake Superior Provincial Park. Photo credit: Ethan Meleg

Summary/ Description

The Michipicoten-Magpie and Agawa unit is located in Ontario on the eastern shore of Lake Superior, and contains the easternmost portion of the Lake Superior basin. Including the associated nearshore waters, this regional unit is 14,413.9 km^2 in size. This regional unit has its southern boundary near the Montreal River, while its northern boundary is near Pilot Harbour. Lake Superior Provincial Park, a 155,647 ha natural environment class park, is located in this regional unit, along the Lake Superior shore (OMNR 2006d). A portion of the Chapleau Crown Game Reserve is also located in this regional unit. Communities in this regional unit include Dubreuilville, Hawk Junction, Montreal River, Missanabie Cree First Nation, Michipicoten First Nation, Michipicoten River and Wawa. The Michipicoten-Magpie and Agawa unit combines two tertiary watersheds, the Michipicoten-Magpie and the Agawa, and contains 22 quaternary watersheds. The watersheds are dominated by forests - developed and agricultural lands are very limited. The coast is characterized by rocky shores and cliffs. Coastal wetlands and sand beaches are very rare in this region. Lake Superior Provincial Park and several other parks protect almost two-thirds of the coast in this region.

TABLE 2.1: Michipicoten-Magpie and Agawa BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	7.15	0.04	1,441.07	
Developed	2.18	0.01	389.55	
Forest	13,465.84	83.65	107,747.13	
Associated Nearshore Waters	938.81	5.83	17,868.03	
Other	1,044.89	6.49	8,227.57	
Water (inland)	638.71	3.97	9,473.05	
Total Area	**16,097.59**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	355.60	NA	6.10	Based on SOLEC shoreline
Sand Beaches (km)	36.25	10.19	5.63*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	3.32	0.82*	0.30**	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone	396.37	97.24*	6.42**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	291	NA	11.0	
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	0.02	NA		
Road Density (km/km^2)	0.18	NA		
Number of Dams and Barriers	1,270	NA	5.4	
Artificial Shoreline (km)	0.75	0.21	0.33	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	2,941.36	19.41	15,155.66	Regional area based on landmass
Public/Crown	8,683.57	57.30	15,155.66	
Tribes/ First Nations	35.96	0.24	15,155.66	
Parks & Protected Areas (total)	3,494.78	23.06	15,155.66	
Parks & Protected Areas (coast)	253.01	62.07*	407.61**	*% of Regional Coastal Area **Regional Coastal Area (km^2)

Important Biodiversity Features

Nearshore and Inshore Waters

- The Michipicoten-Magpie and Agawa regional unit contains sites of Important Habitat for both Lake Trout and Lake Whitefish. Important Habitat sites for Lake Trout are found off the coast of the Michipicoten-Magpie and Agawa region, in the inshore and nearshore zones (Lake Superior Binational Program Habitat Committee 2006) (Figure 2.1).
- Michipicoten Bay is noted as a Lake Superior embayment important for Lake Sturgeon (Auer 2003). In the Michipicoten-Magpie and Agawa regional unit this embayment and the nearshore zone, which provides corridors for movement, are identified as critical management areas for Lake Sturgeon in the Lake Superior basin (Auer 2003).

- An offshore cobble bar complex is located at Montreal River Provincial Nature Reserve. This cobble bar formed 6,000 years ago, when glacial lakes were present. Under present day conditions the cobble bar is 60 metres above Lake Superior water levels (OMNR 2006e).

Coastal Zone and Islands

- Leach Island, South Lizard Island and Rowe Island (islands which are part of Lake Superior Provincial Park) are noted as an Important Habitat site for Lake Trout (Lake Superior Binational Program Habitat Committee 2006) (Figure 2.1).
- The Michipicoten-Magpie and Agawa regional unit contains Important Habitat Areas, including one area which extends along the coast and into the White and Pic regional unit. Several Important Habitat Sites are also found in this region, including along the shore, inland, and on Leach Island and Montreal Island (part of Lake Superior Provincial Park) (Lake Superior Binational Program Habitat Committee 2006) (Table 2.3, Figure 2.3).
- The McGregor Cove natural heritage area contains arctic coastal disjunct species (OMNR 2006c) and the Lake Superior shoreline at Montreal River Provincial Nature Reserve also contains two kilometres of habitat suitable for arctic alpine plant species (OMNR 2006e).
- The shoreline of Lake Superior at Montreal River Provincial Nature Reserve is noted to be a high energy cobble beach (OMNR 2006e).
- Driftwood Beach at Michipicoten Provincial Park is considered a significant landscape feature (OMNR 2006g).
- 170 taxa have been recorded in Michipicoten Post Provincial Park (Thompson 1994 as cited in OMNR 2004a). Two of the plant species were provincially significant, and six of the species were regionally significant (Thompson 1994 as cited in OMNR 2004a).
- 34 migratory bird species and 4 year round resident bird species have been recorded in Michipicoten Post Provincial Park (OMNR 2004a).

Tributaries and Watersheds

- The fish community on the lower Michipicoten River is largely comprised of introduced species, including Rainbow Trout, Chinook Salmon, Coho Salmon and pink salmon. Less abundant are native fish species, including Walleye, Lake Trout, Lake Sturgeon and Brook Trout (Eason 2003 as cited in OMNR 2004a).
- Historically 21 tributaries in Lake Superior had Lake Sturgeon spawning runs. One of these historical spawning tributaries, the Michipicoten River, is in the Michipicoten-Magpie and Agawa regional unit. The population status and population trajectory are both considered unknown (Golder Associates Ltd. 2011); however there is no recent evidence of Lake Sturgeon spawning in the Michipicoten River (Lake Superior Lake Sturgeon Work Group 2012, unpublished data).
- A Lake Sturgeon Rehabilitation Plan for Lake Superior (Auer 2003) identifies the Michipicoten River as one of the seventeen tributaries to Lake Superior in which there should be a focus on Lake Sturgeon rehabilitation. Habitat restoration is a priority in the Michipicoten River, due to barriers to migration and spawning (Auer 2003).
- The Michipicoten River mouth is a site for bald eagles during fall salmon spawning (OMNR 2004a).
- The rivers flowing through Lake Superior Provincial Park are noted to drop rapidly as they flow from the interior highlands to Lake Superior. This is noted to create rapids and waterfalls (OMND 2006d).
- The Lake Superior Highlands Recommended Conservation Reserve is a 54,007 hectare area along the northeastern Lake Superior coast, in the White and Pic and Michipicoten-Magpie and Agawa regional units. The boundary of this unit was extended to include a waterway which would connect the Lake Superior shoreline. This area also provides critical habitat for caribou (OMNR 2006h).

- The Nimoosh Provincial Park combines a number of rivers, parks, and life and earth science areas. The Nimoosh River links Obtanga Provincial Park with the Lake Superior shore (OMNR 2006i). Areas of important spawning habitat for Lake Trout are located in the Dog River (OMNR 2006i).

Figure 2.1: Michipicoten-Magpie and Agawa - Coastal and Watershed Features

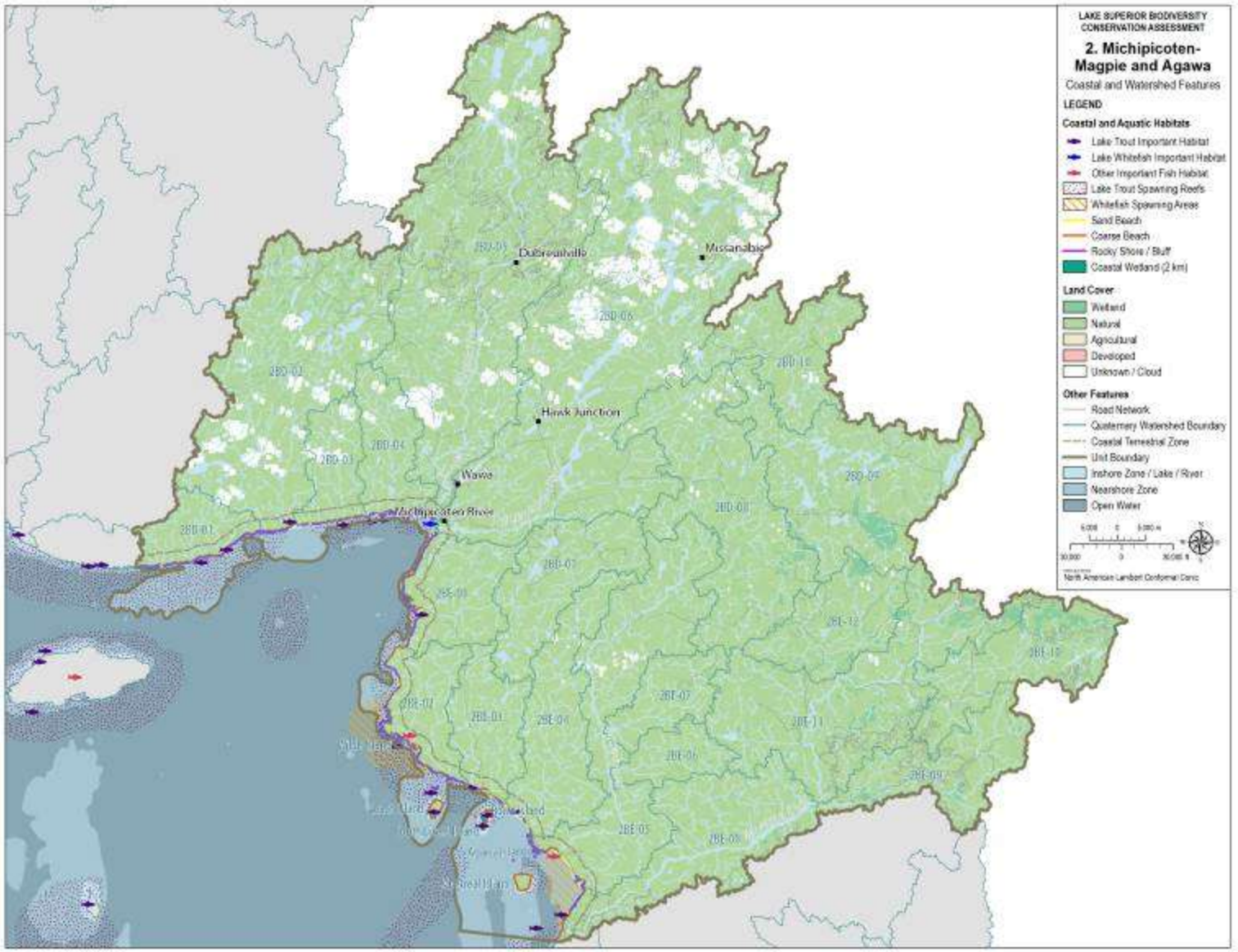


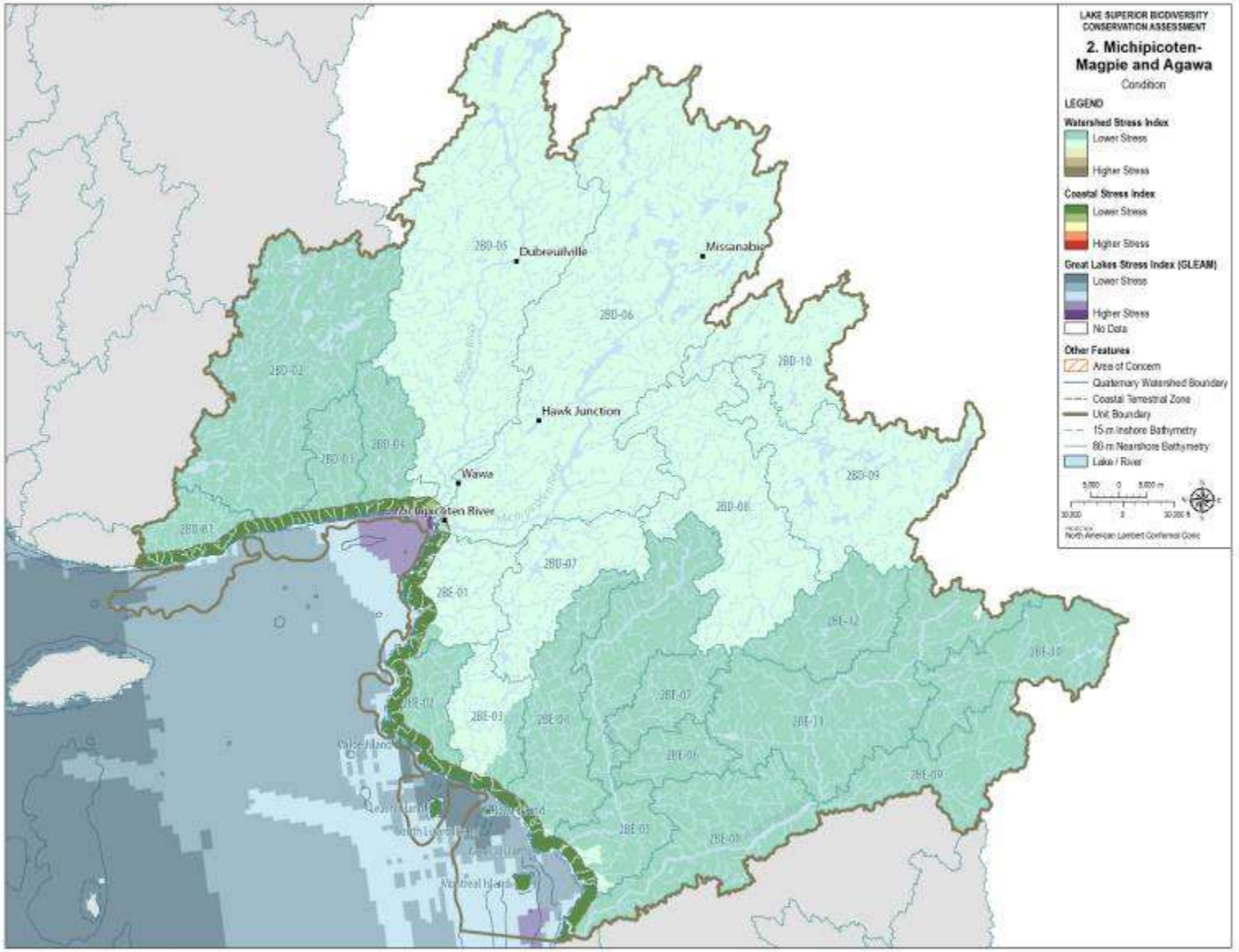
TABLE 2.2: Michipicoten-Magpie and Agawa CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	NA
Nearshore[1]	B (0.62)	Unknown
Embayments and Inshore[1,2]	B (0.74)	Unknown
Coastal Wetlands[2,3]	A- (0.825)	Unknown
Islands[4]	A	Unknown
Coastal Terrestrial[3]	A+ (0.995)	Unknown
Tributaries and Watersheds[2]	A (0.86)	Unknown

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

Figure 2.2: Michipicoten-Magpie and Agawa - Condition



Important Issues & Threats

- The rehabilitation of lean Lake Trout and Lake Whitefish in the nearshore waters of the east end of the lake has not progressed to the same extent as the remainder of the lake. Ensuring that the unregulated fish harvests in the region are at levels that maintain sustainable populations will provide for the opportunity to resume cooperative rehabilitative fish stocking efforts.
- Twenty-one of the species identified in Michipicoten Post Provincial Park were non-native species (Thompson 1994 as cited in OMNR 2004a).
- The Michipicoten River and Magpie River were both reported to have a number of dams. Four power dams and four storage dams were reported on the Michipicoten River system. Three power dams and one storage dam were reported to be in operation on the Magpie River (OMNR 2004a).
- Recreational use of Michipicoten Post Provincial Park is generally compatible, however some activities are incompatible, and some areas are more sensitive to activities. The majority of park use occurs in and around Driftwood Beach, in the nearby coastal forest and in the waters of Lake Superior. Driftwood Beach is a sandy beach community that is both well-used and sensitive to recreational use. All-terrain and off-road vehicle use on the beach and in the forest is significant. Camping, relic hunting, and other human activities have led to some degradation of areas of Michipicoten Post Provincial Park (OMNR 2004a).
- Portions of the South Michipicoten River – Superior Shoreline Conservation Reserve are subject to mining claims and leases. There is low to high mineral potential in these sites; if the mining claims are surrendered the claim and lease areas will be added to the conservation reserve lands (OMNR 2006f).

Conservation In Action

Parks & Protected Areas

- Lake Superior Provincial Park
- Wenebegon River Provincial Park
- The Shoals Provincial Park
- Potholes Provincial Nature Reserve
- Michipicoten Post Provincial Park
- Nimoosh Provincial Park
- Obatanga Provincial Park
- Montreal River Provincial Nature Reserve
- South Michipicoten River – Superior Shoreline Conservation Reserve
- South Michipicoten River Forest Reserve
- Lake Superior Highlands Recommended Conservation Reserve (Recommended)
- Chapleau Crown Game Preserve

Existing Programs & Projects

- The Magpie and Michipicoten Rivers were the focus of several research projects examining the ecological effects of hydropower peaking (OMNR No date a). Hydropower peaking can be described as the variable flows in rivers resulting from storing waters in reservoirs during non-peak periods and the release of water from reservoirs to produce power during peak hours. The alterations to river flow did not necessarily result in a decrease in productive fish habitat, but some fishes and invertebrates are constrained by the altered flow regime (OMNR No date a). Implications for river management include treating the high and low flows in hydropower peaking rivers as two rivers, and acknowledging the longitudinal and latitudinal gradients in hydropower peaking rivers (OMNR No date a).

- The Michipicoten River system is the focus of a water management plan. In the lower reach of the river, the plan will focus on increasing the minimum flow from the lowest hydro dam (OMNR 2004a).
- Fall aerial helicopter flight counts for spawning Chinook Salmon were conducted on the Michipicoten River from 1987 to 2000 (Greenwood 2000). Volunteers have continued to count spawning Chinook Salmon, but the data for these counts are not known (S. Greenwood, pers. comm., April 22 2013).
- Peregrine Falcons have been reintroduced to Ontario, including in the Lake Superior basin, following their extirpation as a breeding species in Ontario in the early 1960s (Ontario Peregrine Falcon Recovery Team 2010). The Ontario Ministry of Natural Resources (OMNR), Canadian Wildlife Service and many naturalist organizations and corporations have been involved in the re-establishment of Peregrine Falcons across Ontario (Ontario Peregrine Falcon Recovery Team 2010). Project Peregrine is a project of the Thunder Bay Field Naturalists, supported by the OMNR. Established in 1989, Project Peregrine now conducts an intensive monitoring program with volunteers and OMNR staff in a number of areas throughout the Ontario portion of the Lake Superior Basin (Thunder Bay Field Naturalists No Date, Ontario Peregrine Falcon Recovery Team 2010). In the 2010 Ontario Peregrine Falcon survey, 72 of the 119 identified territories in Ontario were located in the Lake Superior basin. In Ontario the Lake Superior basin is the location of the highest quality of cliff nesting sites and supports the highest increase in the number of territories, and the highest density of cliff nesting birds (Chikoski and Nyman 2011). Peregrine Falcons born and banded in Ontario have also been observed nesting in Minnesota, Wisconsin and Michigan (Redig et al. 2010 as cited in Chikoski and Nyman 2011). Peregrine Falcons are listed as Special Concern by the Committee on the Status of Species at Risk in Ontario (COSSARO) and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (OMNR 2013a, COSEWIC 2011a).
- Over twenty percent (150,336 hectares) of the 731,621 hectare Chapleau Crown Game Preserve is within the Lake Superior Biodiversity Conservation Assessment study area. The Crown Game Preserve is considered an exceptional area for wildlife viewing.

TABLE 2.3: Michipicoten-Magpie and Agawa IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
ON-001	Site	Michipicoten Corridor	Habitat for rare plants (arctic disjuncts) and animals; rocky outcrops and shallow soils with acid sensitivity
ON-001	Area	Michipicoten Corridor	Habitat for rare plants (arctic disjuncts) and animals; rocky outcrops and shallow soils with acid sensitivity
ON-025	Site	Dog River System	Fish spawning area (Dog R. strain of Lake Trout is one of few river-spawning populations); fish habitat; waterfowl breeding/staging, rare plant habitat
ON-029	Site	Dove Bay	Fish spawning area
ON-031	Site	Eagle River	Fish habitat
ON-035	Site	Wawa Fume Kill	High biodiversity values
ON-042	Site	Gravel Beach	Fish spawning area
ON-052	Site	Leach Island	Rare animal habitat (unoccupied)
ON-060	Site	Megason Lake	Old growth pockets, roadless area; provincially significant wetlands; fish spawning area, headwaters for several rivers
ON-062	Site	Michipicoten Harbor	Fish spawning area
ON-065	Site	Michipicoten River	Fish spawning area/habitat; coastal wetland/estuary
ON-066	Site	Lower Michipicoten River	Fish spawning habitat
ON-068	Site	Montreal Island	Former populations of Woodland Caribou
ON-069	Site	Montreal River Nature Reserve	Excellent Moose habitat
ON-069	Area	Montreal River Nature Reserve	Excellent Moose habitat
ON-075	Site	Montreal River Mouth	Fish spawning habitat
ON-105	Site	Sandy Beach	Shorebird habitat, dune habitat
ON-108	Site	Montreal Shoreline North	Rare arctic plant habitat
ON-124	Site	The Flats	Rare animal habitat
ON-135	Site	Wolf-Achigan Lakes	Old growth forest, high biodiversity value (landscape level), fish habitat, roadless area
ON-136	Area	Gros Cap Corridor	Migratory fish habitat; commercial fishery; colonial water bird habitat; Gros Cap reef
ON-168	Area	Potholes Nature Reserve	

Figure 2.3: Michipicoten-Magpie and Agawa - Important Habitat Sites and Areas

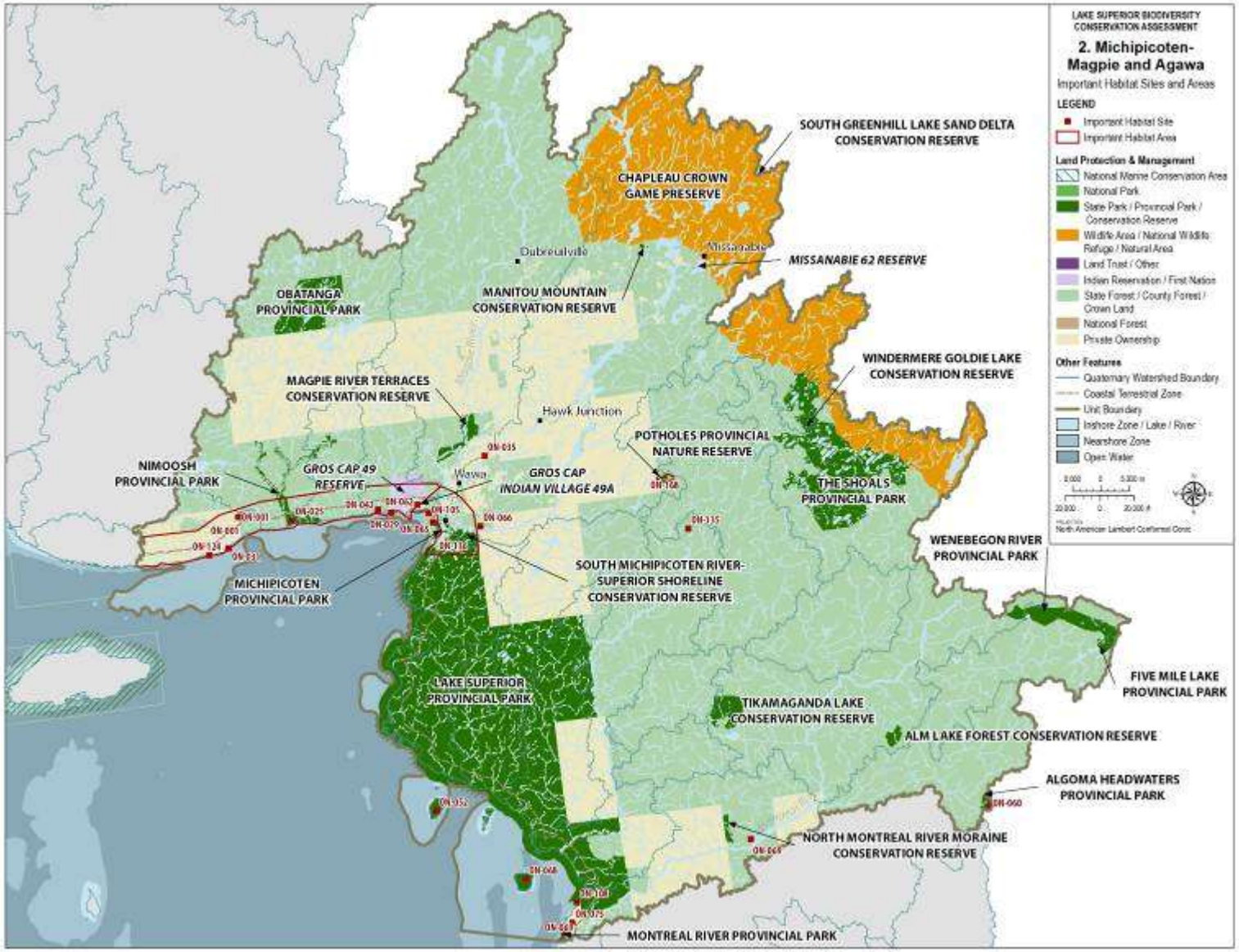


TABLE 2.4: Michipicoten-Magpie and Agawa LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 44 species and communities of conservation concern have been documented in the regional unit. 16 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 28 species and communities were once known to occur here, but have current conservation ranks of H (Historical).[3]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
Acidic Open Bedrock Shoreline Type	Acidic Open Bedrock Shoreline Type
American Dune Grass - Beach Pea - Sand Cherry Dune Grassland Type	American Dune Grass - Beach Pea - Sand Cherry Dune Grassland Type
Bat Colony	Bat Hibernaculum/Nursery
Botrychium pallidum	Pale Moonwort
Diplophyllum taxifolium	A Liverwort
Dry Red Pine - White Pine Coniferous Forest Type	Dry Red Pine - White Pine Coniferous Forest Type
Eleocharis nitida	Quill Spike-rush
Falco peregrinus	Peregrine Falcon
Great Lakes Arctic-Alpine Basic Open Bedrock Shoreline Type	Great Lakes Arctic-Alpine Basic Open Bedrock Shoreline Type
Haliaeetus leucocephalus	Bald Eagle
Hudsonia tomentosa	Woolly Beach-heath
Hygrohypnum eugyrium	A Moss
Listera auriculata	Auricled Twayblade
Moist - Fresh Sugar Maple - Yellow Birch Deciduous Forest Type	Moist - Fresh Sugar Maple - Yellow Birch Deciduous Forest Type
Pogonatum dentatum	Haircap
Viola novae-angliae	New England Violet
Historical Records	
Scientific Name	**Common Name**
Anaptychia setifera	A Lichen
Andreaea crassinervia	A Moss
Botrychium acuminatum	Pointed Moonwort
Botrychium hesperium	Western Moonwort
Botrychium pseudopinnatum	False Northwestern Moonwort
Coregonus zenithicus	Shortjaw Cisco
Galium kamtschaticum	Boreal Bedstraw
Grimmia teretinervis	A Moss
Gymnocarpium robertianum	Limestone Oak Fern
Leptogium rivulare	Flooded Jellyskin
Marsupella sparsifolia	A Liverwort
Moehringia macrophylla	Large-leaved Sandwort
Mylia taylorii	A Liverwort
Myotis leibii	Eastern Small-footed Myotis
Myotis septentrionalis	Northern Myotis

[3] Data included here were provided by the Ontario Ministry of Natural Resources and Forestry. Copyright Queen's Printer for Ontario (2012).

Nardia insecta	A Liverwort
Odontoschisma macounii	A Liverwort
Packera obovata	Round-leaved Groundsel
Pannaria conoplea	A Lichen
Polystichum braunii	Braun's Holly Fern
Porpidia diversa	A Lichen
Potamogeton confervoides	Alga Pondweed
Pseudoleskeella tectorum	A Moss
Pterospora andromedea	Woodland Pinedrops
Stereocaulon subcoralloides	A Lichen
Tetraplodon mnioides	A Moss
Vaccinium ovalifolium	Oval-leaved Bilberry
Woodsia alpina	Alpine Woodsia

3. Pic and White

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	A
NEARSHORE	B	COASTAL WETLANDS	A
EMBAYMENTS & INSHORE	A	COASTAL TERRESTRIAL	A+
TRIBUTARIES & WATERSHEDS	A	**OVERALL A**	

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
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C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

Pukaskwa Depot Beach. Photo credit: Sue Greenwood/ Ontario Ministry of Natural Resources

Summary/ Description

The Pic and White regional unit is located on the northeastern shore of Lake Superior. Including the associated nearshore waters this regional unit is 13,098.83 km^2 in size. The regional boundaries for this unit are found north of the Pic River (and just south of Marathon) in the east, to just west of Pilot Harbour. Pukaskwa National Park, an 187,800 hectare wilderness national park of boreal forest is located along the Lake Superior coast (Parks Canada 2013). Communities in this regional unit include the Ojibways of the Pic River First Nation, Heron Bay, Mobert, Pic Mobert First Nation, Hillsport, Manitouwadge and White River. The Pic and White regional unit combines two tertiary watersheds, Pic and White, and contains 19 quaternary watersheds. The watersheds are dominated by forests, including protected forests within Pukaskwa National Park. The coast is characterized by rocky shores and cliffs, with scattered nearshore islands. Coastal wetlands and sand beaches are very rare in this region. Pukaskwa National Park protects over 70% of the coast in this region, and is part of the longest roadless stretch of coastline in the Great Lakes.

TABLE 3.1: Pic and White BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	1.90	0.01	1,441.07	
Developed	1.23	0.01	389.55	
Forest	13,204.70	90.65	107,747.13	
Associated Nearshore Waters	237.44	1.63	17,868.03	
Other	637.79	4.38	8,227.57	
Water (inland)	482.88	3.32	9,473.05	
Total Area	**14,565.93**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	380.27	NA	6.52	Based on SOLEC shoreline
Sand Beaches (km)	18.76	4.93	2.91*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	3.09	1.10*	0.28**	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone	267.95	95.59*	4.34**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	387	NA	14.6	
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	0.12	NA		
Road Density (km/km^2)	0.08	NA		
Number of Dams and Barriers	486	NA	2.1	
Artificial Shoreline (km)	0.13	0.03	0.06	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	483.66	3.38	14,328.49	Regional area based on landmass
Public/Crown	11,711.54	81.74	14,328.49	
Tribes/ First Nations	4.52	0.03	14,328.49	
Parks & Protected Areas (total)	2,128.76	14.86	14,328.49	
Parks & Protected Areas (coast)	197.19	70.35*	280.32 **	*% of Regional Coastal Area **Regional Coastal Area (km^2)

Important Biodiversity Features

Nearshore and Inshore Waters

- The Pic and White regional unit contains a number of sites of Important Habitat for Lake Trout; these sites are found in many areas along the coast (Lake Superior Binational Program Habitat Committee 2006) (Figure 3.1).

Coastal Zone and Islands

- This regional unit contains Important Habitat Areas, including one large area which is Pukaskwa National Park. Another Important Habitat Area along the coast extends from the Michipicoten-

Magpie and Agawa regional unit into the Pic and White regional unit. Smaller Important Habitat Areas are also located in this regional unit, along with several Important Habitat Sites (Lake Superior Binational Program Habitat Committee 2006) (Table 3.3, Figure 3.3).

- Arctic-alpine disjunct species can be found in Pukaskwa National Park (Parks Canada 2013).
- Woodland Caribou are still found within Pukaskwa National Park, an area they have inhabited since the retreat of the last glaciers (Parks Canada 2013).
- Craig's Pit Provincial Nature Reserve is an important migratory bird observation area, and contains bluffs and kettle holes. This area also contains examples of landform processes and themes which are environmental indicators from the Lake Minong stage and later (OMNR 2006l).

Tributaries and Watersheds

- Historically 21 tributaries in Lake Superior had Lake Sturgeon spawning runs (Lake Superior Lake Sturgeon Work Group 2012, unpublished data). Two of these historical spawning tributaries, the White River (Ontario) and the Pic River are in the Pic and White regional unit. The White River population status and population trajectory are both listed as unknown (Golder Associates Ltd. 2011); however, recent research in 2011 and 2012 suggests that the population status in the White River is extant (Ecclestone 2013). The population status is still currently described as unknown (Lake Superior Lake Sturgeon Work Group 2012, unpublished data). Ongoing research indicates Lake Sturgeon abundance, sex ratio, natural recruitment and year class structure are approaching criteria for self-sustaining classification, based on the criteria listed in the Lake Sturgeon Rehabilitation Plan for Lake Superior (Ecclestone 2013).
- The White River (Ontario) is one of ten Lake Superior tributaries where Lake Sturgeon have currently been documented spawning (as of 2012); this is the same number as 2005, however the specific tributaries have changed (Lake Superior Lake Sturgeon Work Group 2012, unpublished data). The White River (Ontario) and the St. Louis River (Minnesota) have recent evidence of natural reproduction, while there is not recent evidence from the Gravel and Michipicoten rivers. The White River (Wisconsin) had been removed as it is a tributary to the Bad River and is not a separate spawning population (Lake Superior Lake Sturgeon Work Group 2012, unpublished data).
- The Pic River Lake Sturgeon population status is extant, while the population trajectory is unknown (Golder Associates Ltd. 2011). Although recent research has indicated that the Pic River Lake Sturgeon population abundance is relatively low and the sex ratio is unequal, a total of 24 year classes are present in the system and natural recruitment has been documented at Manitou and Kagiano Falls (Ecclestone et al. 2013).
- A Lake Sturgeon Rehabilitation Plan for Lake Superior (Auer 2003) identifies the Pic and White (identified as the Big Pic) Rivers as two of the seventeen tributaries to Lake Superior in which there should be a focus on Lake Sturgeon rehabilitation.
- The Lake Superior Highlands Recommended Conservation Reserve is a 54,007 hectare area along the northeastern Lake Superior coast, in the Pic and White and Michipicoten-Magpie and Agawa regional units. The boundary was extended to include a waterway which would help allow gene flow to the Lake Superior shoreline. This area provides critical habitat for caribou (OMNR 2006h).
- Pukaskwa River Provincial Park is linked to Pukaskwa National Park. It is described as free-flowing, and with spectacular scenery and geology (OMNR 2006j).
- The Pokei Lake / White River Wetlands Provincial Park area includes riparian wetlands in the floodplain of the White River. The area of the wetlands is described as extensive, and includes marsh, fen and various swamps. The site is also noted for backwater ponds along the river which are suitable for waterfowl, eagle nesting sites, and caribou have been viewed in the area (OMNR 2006k).

Figure 3.1: Pic and White - Coastal and Watershed Features

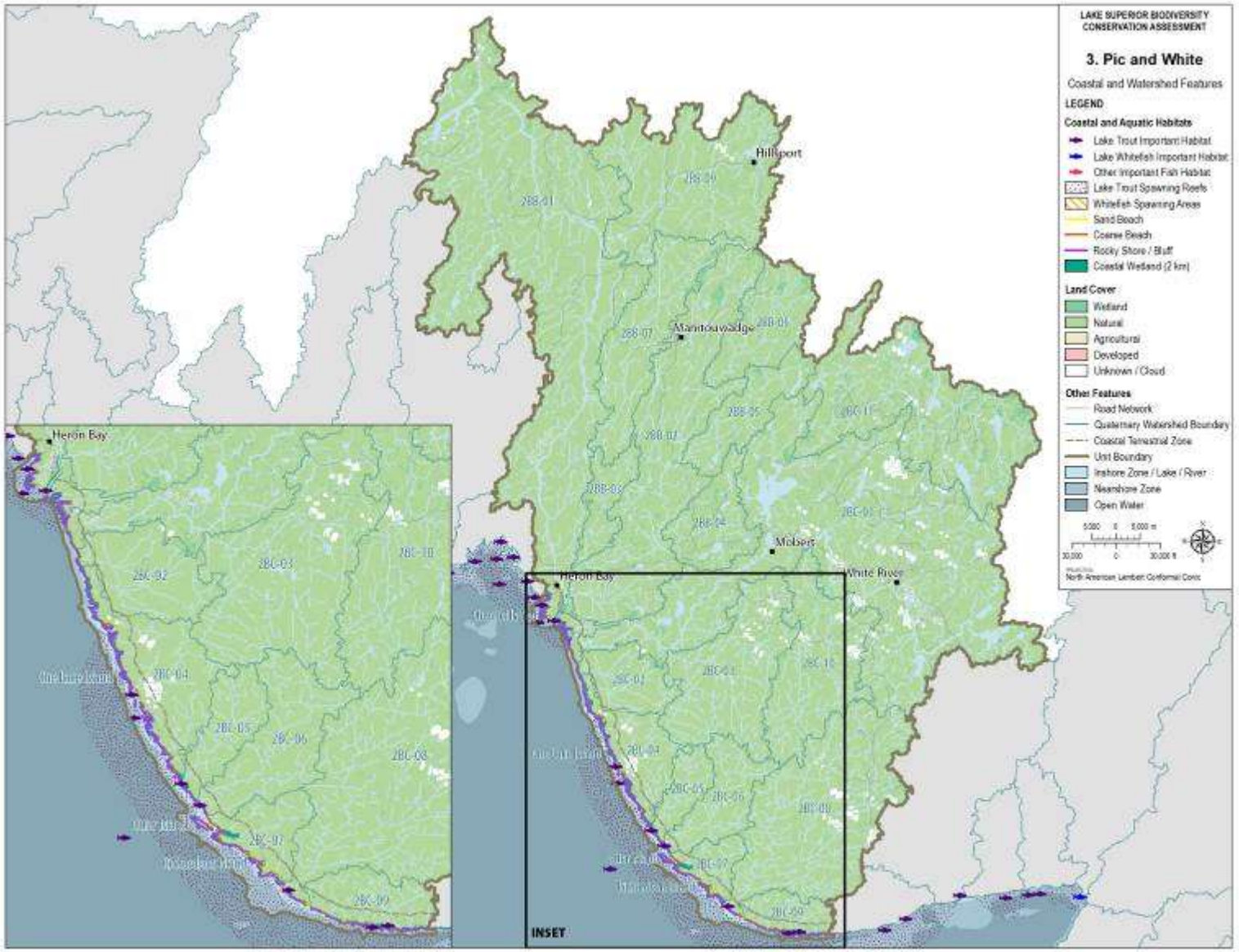


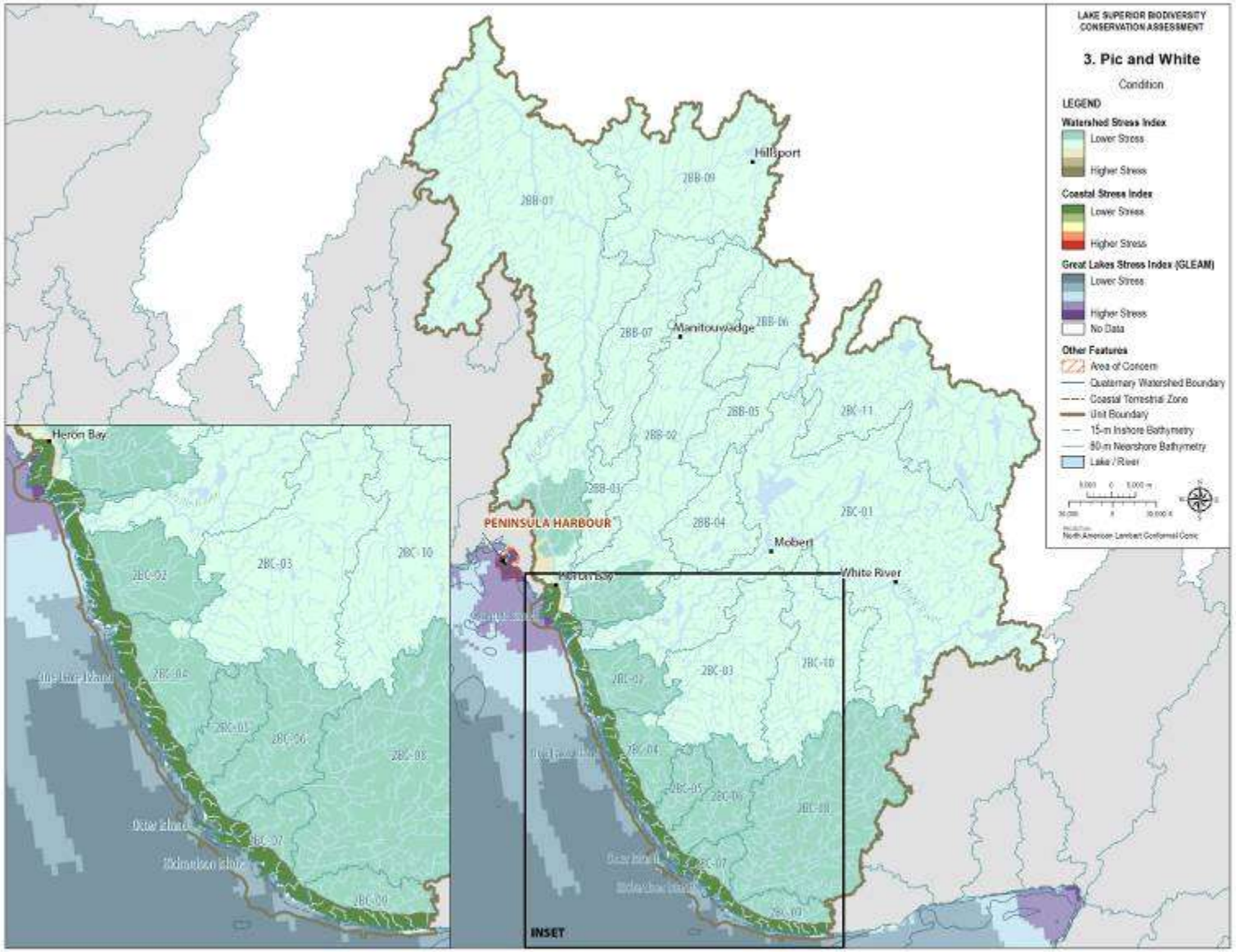
TABLE 3.2: Pic and White CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	NA
Nearshore[1]	B (0.73)	Unknown
Embayments and Inshore[1,2]	A (0.80)	Unknown
Coastal Wetlands[2,3]	A (0.863)	Unknown
Islands[4]	A	Unknown
Coastal Terrestrial[3]	A+ (1.000)	Unknown
Tributaries and Watersheds[2]	A (0.86)	Unknown

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

Figure 3.2: Pic and White - Condition



Important Issues & Threats

- In 2014 the Stillwater Mining Company announced that subsidiary Stillwater Canada Inc would reduce activities associated with the Marathon Platinum Group Metals-Copper Project near the north shore of Lake Superior, approximately 10 kilometres north of the community of Marathon Ontario. Future development will be contingent on an improved economic return from the project, and the results of limited exploration activities undertaken in 2014. An Environmental Assessment had previously been submitted, however the permitting process was suspended prior to the September 2014 announcement. Stillwater Mining Company has stated that Stillwater Canada Inc will maintain tenure of the project, look for opportunities to realize value from the project and maintain existing relationships with local aboriginal communities and municipalities (Stillwater Mining Company 2014).
- The rehabilitation of lean Lake Trout and Lake Whitefish in the nearshore waters of the east end of the lake has not progressed to the same extent as the remainder of the lake. Ensuring that the unregulated fish harvests in the region are at levels that maintain sustainable populations will provide for the opportunity to resume cooperative rehabilitative fish stocking efforts.
- Although there has been no logging in Pukaskwa National Park since the early 1900s, anthropogenic disturbance on lands adjacent to Pukaskwa National Park has likely caused changes to populations of animals within the boundaries of the park (C. Drake, pers. .comm., Dec 18 2014).
- Barrick Gold operates two gold mines at the Hemlo property, approximately 20 kilometres north of Pukaskwa National Park. The David Bell mine is an underground mine, and the Williams mine is an underground and open pit mine. The mines share facilities for milling, processing, and tailings (Barrick 2014).

  The Nuclear Waste Management Organization (NWMO) is in the process of selecting a site for the long-term management of Canada's used nuclear fuel (NWMO 2010a). In January 2015, the NWMO completed the first phase of a preliminary assessment for six Northern Ontario communities that expressed interest in learning more about the site selection process. Two of the communities, the Township of Manitouwadge and the Township of White River are in the Lake Superior basin, in the Pic and White regional unit. Both communities are assessed with strong potential to meet the site requirements, and will be studied further. Technical suitability and safety have not been confirmed in the preliminary findings, and several more years of studies are expected before a preferred site and informed and willing host is identified (NWMO 2010b).

Conservation In Action

Parks & Protected Areas

- Pukaskwa National Park
- Pokei Lake White River Wetlands Provincial Park
- White Lake Provincial Park
- White Lake Peatlands Provincial Nature Reserve
- Pen Lake Fen Provincial Park
- Craig's Pit Provincial Nature Reserve (also in Little Pic regional unit)
- Lake Superior Shoreline Enhanced Management Area (also in Little Pic and Nipigon and Jackpine regional units)

Existing Programs & Projects

- The Ojibways of the Pic River First Nation Reserve is located near the mouth of the Pic River, and near the north end of Pukaskwa National Park. The Lands and Resources Department of the Pic River First Nation has recently participated in the Environmental Review Panel for the Stillwater

Mine, in land-use mapping, and in ongoing meetings with Pukaskwa National Park for the Park Management Plan and Park Advisory Committee (Ojibways of the Pic River First Nation 2012).

- Peregrine Falcons have been reintroduced to Ontario, including in the Lake Superior basin, following their extirpation as a breeding species in Ontario in the early 1960s (Ontario Peregrine Falcon Recovery Team 2010).
- Pukaskwa National Park has several plans relevant to biodiversity conservation in the park. These include the Pukaskwa National Park Management Plan (anticipated to be available in 2015) and the Pukaskwa National Park Fire Management Plan (2007) (C. Drake, pers. comm., June 27 2014).
- Pukaskwa National Park has several programs and procedures in place to ensure ecological integrity is maintained or improved in the Park (15% of the region, 70% of the coast) in the future. Examples of programs include, 1. Fire Management Program. A history of fire suppression has resulted in an excess of older seral staged forests in Pukaskwa and a paucity of sites that have undergone this natural disturbance, limiting habitat for species that rely on fire disturbance to persist. 2. Ecological Integrity Monitoring Program. The status of Ecological Integrity of the Park is assessed through the Park's long-term Ecological Integrity Monitoring Program (EIMP). Any concerns identified as part of the EIMP are actively managed where possible to ensure the health of the park is restored or maintained. 3. Species at Risk Program. Species at Risk within the Park will have an Action Plan for recovering habitat and/or populations where feasible. E.g. Pitcher's thistle seeds were introduced to two new locations in the summer of 2013 to improve their declining status in the Park (C. Drake, pers. comm., June 27 2014).

TABLE 3.3: Pic and White IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
ON-001	Area	Michipicoten Corridor	Habitat for rare plants (arctic disjuncts) and animals; rocky outcrops and shallow soils with acid sensitivity
ON-037	Site	Redsucker Cove	Fish spawning habitat
ON-055	Site	Maple, Hilltop, and Jackfish Lakes	Fish spawning habitat
ON-084	Site	North Skipper Lake	
ON-097	Site	Pipe River Watershed	Excellent Moose habitat; fish spawning area
ON-099	Site	Jarvey Lake	Fish habitat
ON-115	Site	Ogilvy Point Islands	Colonial water bird habitat
ON-122	Site	Starr Island	Colonial water bird habitat
ON-172	Area	Pukaskwa National Park	Large intact protected area, Woodland Caribou population, sand dunes, rare plant habitat
ON-185	Area	White Lake Peatlands Nature Reserve	

Figure 3.3: Pic and White - Important Habitat Sites and Areas

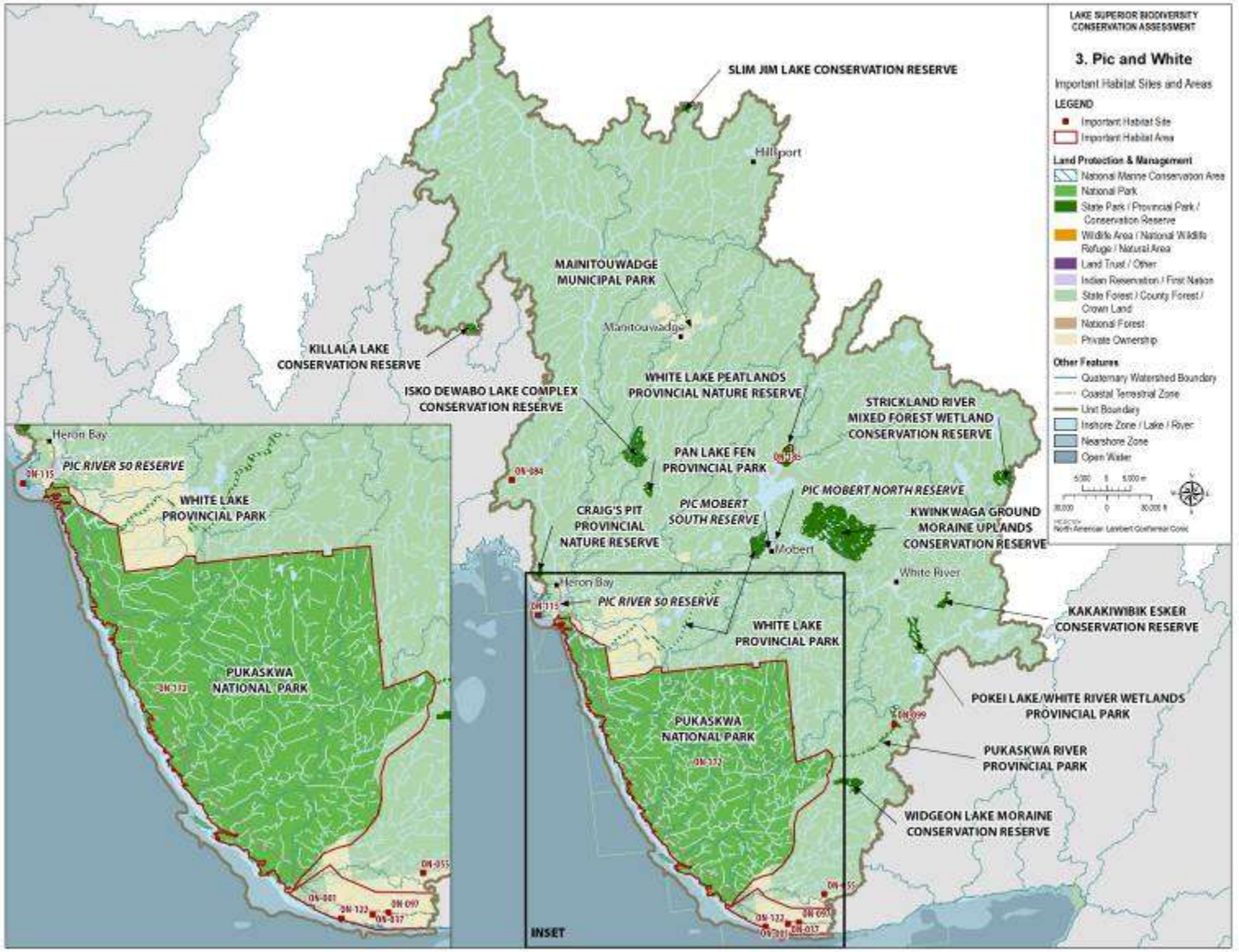


TABLE 3.4: Pic and White LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 37 species and communities of conservation concern have been documented in the regional unit. 10 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 27 species and communities were once known to occur here, but have current conservation ranks of H (Historical).[4]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
American Dune Grass - Beach Pea - Sand Cherry Dune Grassland Type	American Dune Grass - Beach Pea - Sand Cherry Dune Grassland Type
Caprimulgus vociferus	Whip-poor-will
Carex rossii	Ross' Sedge
Cirsium pitcheri	Pitcher's Thistle
Euchloe ausonides	Large Marble
Falco peregrinus	Peregrine Falcon
Haliaeetus leucocephalus	Bald Eagle
Ichthyomyzon fossor	Northern Brook Lamprey
Rangifer tarandus caribou	Woodland Caribou (Forest-dwelling boreal population)
Tofieldia pusilla	Small False Asphodel
Historical Records	
Scientific Name	**Common Name**
Acipenser fulvescens pop. 3	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)
Anaptychia setifera	A Lichen
Bombus affinis	Rusty-patched Bumble Bee
Botrychium acuminatum	Pointed Moonwort
Botrychium hesperium	Western Moonwort
Botrychium spathulatum	Spatulate Moonwort
Bromus pumpellianus	Pumpelly's Brome
Chelydra serpentine	Snapping Turtle
Coregonus zenithicus	Shortjaw Cisco
Dicranella grevilleana	A Moss
Erebia mancinus	Taiga Alpine
Listera auriculata	Auricled Twayblade
Listera borealis	Northern Twayblade
Packera obovata	Round-leaved Groundsel
Pannaria conoplea	A Lichen
Peltigera collina	A Lichen
Potamogeton confervoides	Alga Pondweed
Scapania gymnostomophila	A Liverwort
Schoenoplectus heterochaetus	Slender Bulrush
Splachnum luteum	A Moss
Splachnum rubrum	A Moss
Stereocaulon glaucescens	A Foam Lichen

[4] Data included here were provided by the Ontario Ministry of Natural Resources and Forestry. Copyright Queen's Printer for Ontario (2012).

Trichophorum clintonii	Clinton's Clubrush
Umbilicaria arctica	A Lichen
Vaccinium membranaceum	Mountain Huckleberry
Vertigo elatior	Tapered Vertigo
Zizia aptera	Heart-leaved Alexanders

4. Michipicoten Island

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	A
NEARSHORE	A	COASTAL WETLANDS	A
EMBAYMENTS & INSHORE	A	COASTAL TERRESTRIAL	A+
TRIBUTARIES & WATERSHEDS	A	**OVERALL A**	

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

Photo of Caribou Island Lighthouse in the distance taken from Caribou Island. Photo credit Bruce Tomlinson, Ontario Ministry of Natural Resources (OMNR). Photo supplied by Sue Greenwood, OMNR

Summary/ Description

The Michipicoten Island regional unit contains Michipicoten Island and Caribou Island, as well as other smaller islands and island complexes. This regional unit measures 783.66 km^2 in size, including the associated nearshore waters. Michipicoten Island is located in the northeastern portion of Lake Superior. It is the third largest island in the lake, and is approximately 26 by 10 km wide (from north to south) (OMNR 2004a). The topography of the island is variable, with close to 300 m in topographic relief from the Lake Superior shoreline (181 m above sea level) to the island's highest elevation (479 m above sea level) (OMNR 2004a). First nations of the Lake Superior area gave the island the name Missipacouatong, which means "land of the big bluffs" (Annells 1974 as cited in OMNR 2004a). The closest mainland to Michipicoten Island is approximately 16 kilometres to the north, and the community of Wawa is approximately 65 kilometres to the northeast (OMNR 2004a). No Moose, deer, bear or wolves occur on Michipicoten Island, but Beaver and Woodland Caribou are abundant (COSEWIC 2011b, OMNR 2013b, 2004a). Approximately 40 kilometres south of Michipicoten Island is the 6.09 km^2 Caribou Island. Caribou Island is the most isolated island in the Great Lakes, and it is also the most isolated freshwater island in the world (Henson et al. 2010). Michipicoten Island regional unit does not contain any tertiary or quaternary watershed units, but is comprised of islands and island complexes. While Michipicoten Island is characterized by high cliffs and cobble beaches, Caribou Island is generally flat and has large sand beaches. Much of Michipicoten Island is provincial park, except for some small private and federal parcels. Caribou Island is privately owned by a U.S. foundation.

TABLE 4.1: Michipicoten Island BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	0.09	0.01	1,441.07	
Developed	0.08	0.01	389.55	
Forest	184.38	21.04	107,747.13	
Associated Nearshore Waters	681.44	77.75	17,868.03	
Other	1.47	0.17	8,227.57	
Water (inland)	8.94	1.02	9,473.05	
Total Area	**876.39**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	130.53	NA	2.24	Based on SOLEC shoreline
Sand Beaches (km)	11.56	8.86	1.80*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	0.89	0.67*	0.08**	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone	124.35	93.95*	2.01**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	83	NA	3.1	
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	0.00	NA		
Road Density (km/km^2)	0	NA		
Number of Dams and Barriers	0	NA	0	
Artificial Shoreline (km)	0.19	0.15	0.08	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	6.86	3.52	194.96	Regional area based on landmass
Public/Crown	-	0.00	194.96	
Tribes/ First Nations	-	0.00	194.96	
Parks & Protected Areas (total)	188.10	96.48	194.96	
Parks & Protected Areas (coast)	125.49	94.82*	132.35**	*% of Regional Coastal Area **Regional Coastal Area (km^2)

Important Biodiversity Features

Nearshore and Inshore Waters

- Spawning beds for Lake Trout are known to be present in the Lake Superior portion of Michipicoten Island Provincial Park (OMNR 2004a).
- The fish community in the waters of Michipicoten Island Provincial Park includes Lake Trout, Coho Salmon, Chinook Salmon, Cisco and Lake Whitefish. These species support a sport fishing fishery, especially in areas along the southern and southwestern shore of Michipicoten Island (OMNR 2004a).

- The provincially rare Pygmy Whitefish is found in the eastern waters of Lake Superior, around Michipicoten Island (Petzold 2003 as cited in OMNR 2004a).

Coastal Zone and Islands

- The Michipicoten Island regional unit contains sites of Important Habitat for Lake Trout and Lake Whitefish (Figure 4.1). Lake Trout spawning sites are noted around the Breeder Islands just south west of Michipicoten Island and in Quebec Harbour (Goodier 1982) located on the south shore. Lake Whitefish are also noted as spawning in Quebec Harbour. Lake Trout spawning is noted on Caribou Island and commercial fishers report Lake Whitefish spawning along the southwest shore of Caribou Island prior to 1955 (Lake Superior Binational Program Habitat Committee 2006, Goodier 1982).
- Michipicoten Island is considered to be an Important Habitat Area (Lake Superior Binational Program Habitat Committee 2006) (Table 4.3, Figure 4.3).
- Much of Michipicoten Island's shoreline is bare bedrock knolls, exposed to wave action. The shoreline is also composed of beach deposits of sand, pebble and cobble (OMNR 2004a).
- Michipicoten Island's present shoreline was established approximately 2,000 years ago (OMNR 2004a).
- East Sand Bay and West Sand Bay are provincially rare sand beach communities, and are classified as provincially significant vegetation communities (White 2000 as cited in OMNR 2004).
- The Rocky Shoreline habitats of Michipicoten Island support provincially and regionally significant plants, and are classified as provincially significant vegetation communities (White 2000 as cited in OMNR 2004).
- The Quebec Harbour Wetland Complex is regionally significant, and is the most extensive and diverse wetland on Michipicoten Island, containing a variety of wetland communities (White 2000 as cited in OMNR 2004a).
- The Caribou Island shoreline has large sections of sandy beaches and dunes (Henson et al. 2010). Wetlands occur between the ridges of the dunes, and open bogs, treed muskegs and forested dunes are also present (Liebermann 1998 as cited in Henson et al. 2010).
- The topographic relief found on Michipicoten Island contributes to habitat diversity, and allows southern and northern plant species to be found in relatively close proximity to one another (OMNR 2004a). Many of these species are arctic-alpine disjuncts, or at the extent of their geographic range. Ten provincially significant and 53 regionally significant plant species have been identified (OMNR 2004a).

Tributaries and Watersheds

- The Interior Lake Shorelines of Michipicoten Island are classified as provincially significant vegetation communities (White 2000 as cited in OMNR 2004). They are described as "lakes of little disturbance on an isolated island exposed to the climatic influence of Lake Superior" (OMNR 2004a:12). There are over 20 inland lakes on Michipicoten Island (OMNR 2004a).
- The presence of an abundant Beaver population has altered the natural hydrology of Michipicoten Island, with many areas flooded (OMNR 2004a).
- Approximately 87% of Michipicoten Island is forested (Noble 1984 as cited in OMNR 2004a); remaining areas are water, non-forested wetlands, beaches, talus slopes and rock outcrops (OMNR 2004a).

Figure 4.1: Michipicoten Island - Coastal and Watershed Features

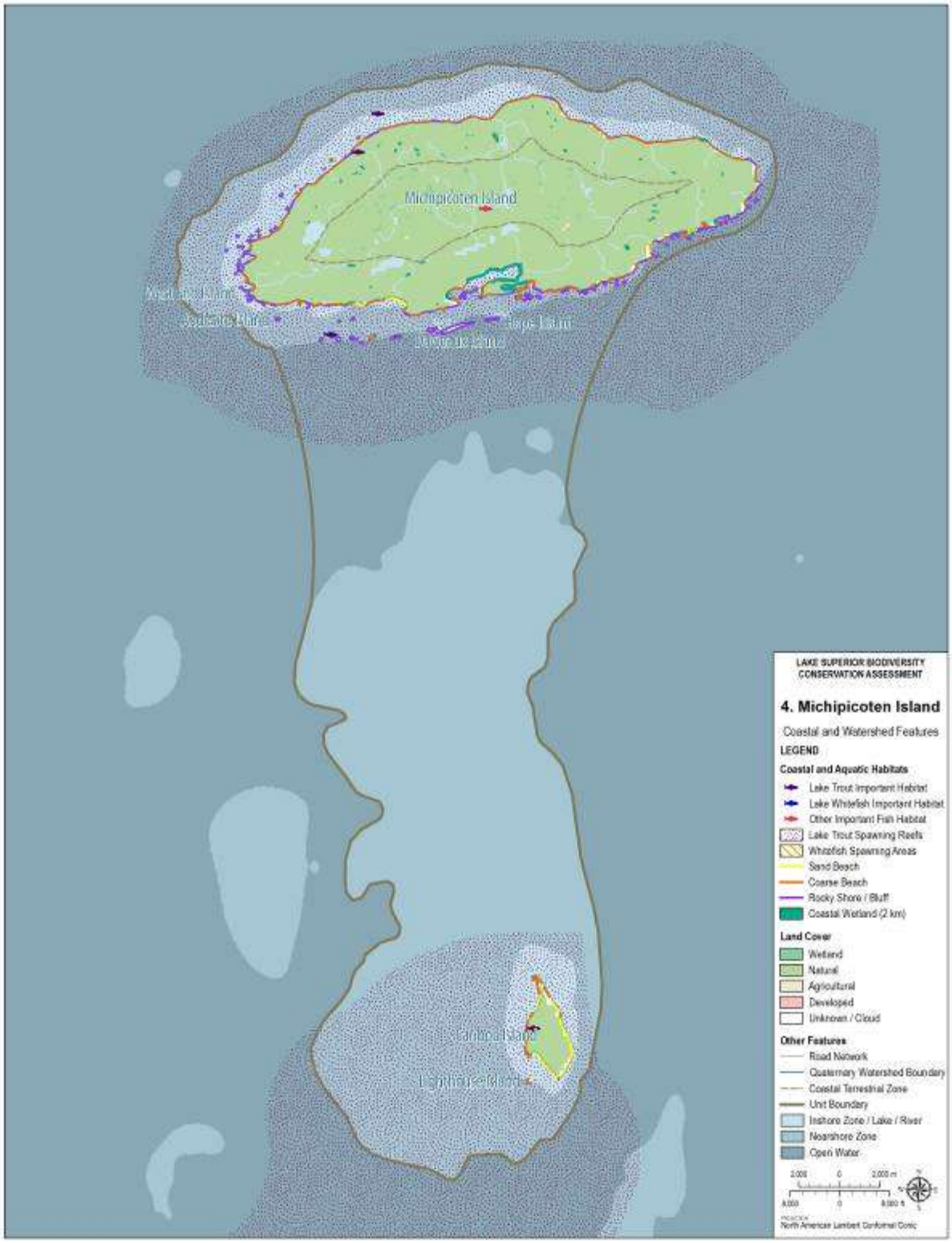


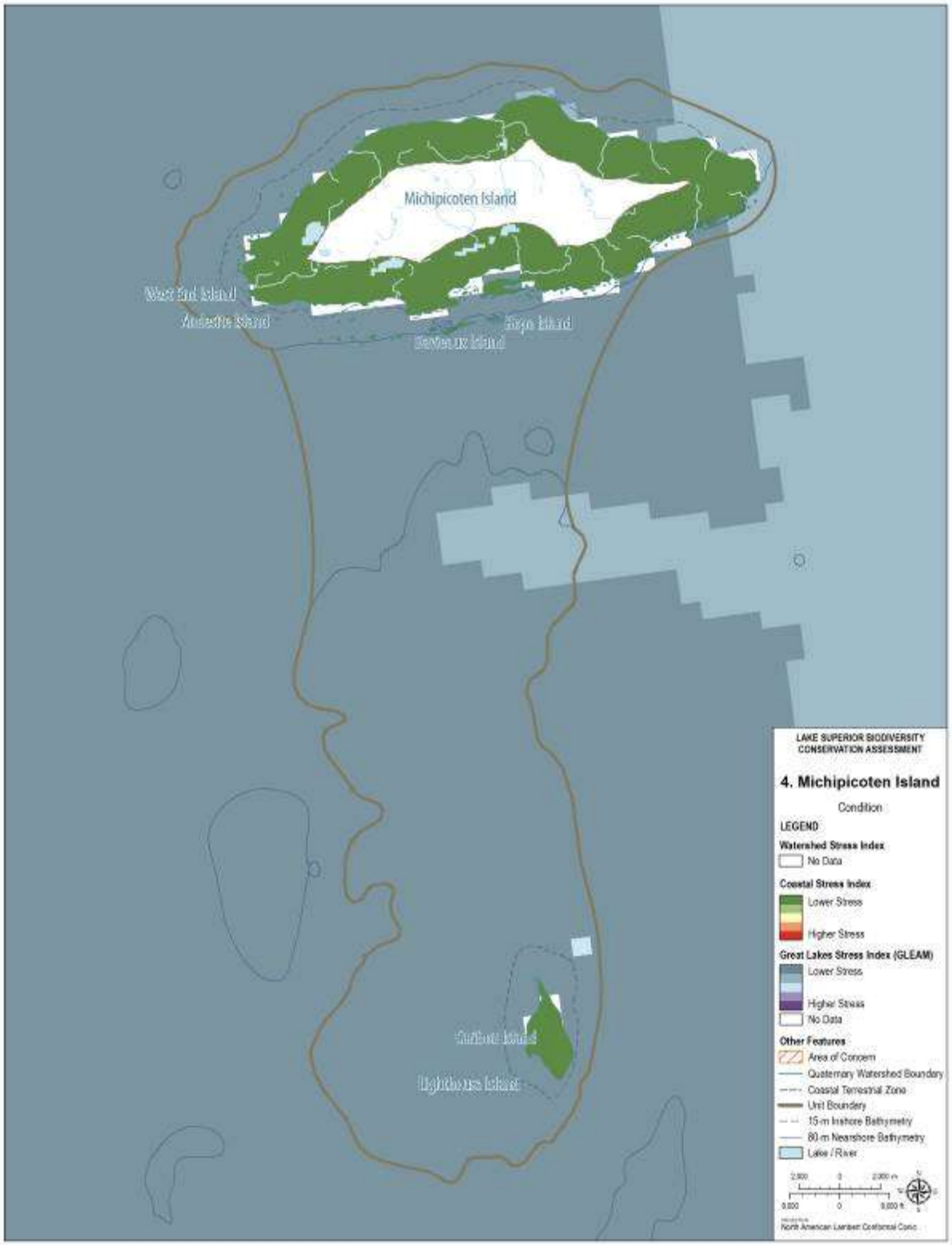
TABLE 4.2: Michipicoten Island CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	NA
Nearshore[1]	A (0.90)	Unknown
Embayments and Inshore[1,2]	A (0.90)	Unknown
Coastal Wetlands[2,3]	A (0.933)	Unknown
Islands[4]	A	Unknown
Coastal Terrestrial[3]	A+ (0.998)	Unknown
Tributaries and Watersheds[2]	A (0.90)	Unknown

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

Figure 4.2: Michipicoten Island - Condition



Important Issues & Threats

- Michipicoten Island Provincial Park's sand beaches are sought out by visitors to the island for recreational use, and they are especially sought out given the rarity of the beaches on the island (OMNR 2004a). These sand beach communities contain significant and sensitive species, and are also considered the most sensitive feature to recreation use (OMNR 2004a).
- The shorelines of Michipicoten Island Provincial Park are the focus of recreational activities. Many of these shorelines contain significant species; recreation and interpretation must be weighed against constraints to manage the areas (OMNR 2004a).
- 170 acres in the southeast portion of Michipicoten Island are listed for sale. The property includes over 9,300 feet of Lake Superior coastline, including pebble and boulder beaches, and two small islands (Apex Realty Services Ltd. 2013).

Conservation In Action

Parks & Protected Areas

- Michipicoten Island Provincial Park: The boundaries of Michipicoten Island Provincial Park extend 2.5 kilometres offshore of Michipicoten Island, and the park designation applies to the islands and shoals within that area (OMNR 2004a). Some private and federal lands within the park boundaries are excluded from the provincial park and related policies (OMNR 2004a).

Existing Programs & Projects

- Michipicoten Island is the source of one of two Lake Trout brood stock gametes (Michipicoten strain) used by the provincial fish culture system for Lake Trout rehabilitation stocking in Lake Superior and Lake Huron (S. Greenwood, pers. comm., March 11 2013).
- The caribou population found on Michipicoten Island today is the result of a successful 1982 translocation of eight animals from Slate Islands Provincial Park (Ontario Woodland Caribou Recovery Team 2008), in addition to the one adult male already present on the island (believed to be from the Pukaskwa herd) (Gogan and Cochrane 1994). The caribou population that was historically present on the island was extirpated in the late 1800s, when there were active copper mining operations on the island. The current population is estimated to be between 400 and 500 individuals (S. Lebel and G. Eason, pers. comm., June 18 2013).
- Peregrine Falcons have been reintroduced to Ontario, including in the Lake Superior basin, following their extirpation as a breeding species in Ontario in the early 1960s (Ontario Peregrine Falcon Recovery Team 2010).
- Caribou Island has been on the market in the past and may be available for purchase in the future.

TABLE 4.3: Michipicoten Island IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
ON-162	Area	Michipicoten Island	Provincial Park; fish spawning

Figure 4.3: Michipicoten Island - Important Habitat Sites and Areas

TABLE 4.4: Michipicoten Island LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 10 species and communities of conservation concern have been documented in the regional unit. 3 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 7 species and communities were once known to occur here, but have current conservation ranks of H (Historical).[5]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
American Dune Grass - Beach Pea - Sand Cherry Dune Grassland Type	American Dune Grass - Beach Pea - Sand Cherry Dune Grassland Type
Potamogeton confervoides	Alga Pondweed
Rangifer tarandus caribou	Woodland Caribou (Forest-dwelling boreal population)
Historical Records	
Scientific Name	**Common Name**
Coregonus zenithicus	Shortjaw Cisco
Elymus glaucus	Blue Wild Rye
Galium kamtschaticum	Boreal Bedstraw
Myoxocephalus thompsoni	Deepwater Sculpin
Polystichum braunii	Braun's Holly Fern
Vaccinium ovalifolium	Oval-leaved Bilberry
Woodsia alpina	Alpine Woodsia

[5] Data included here were provided by the Ontario Ministry of Natural Resources and Forestry. Copyright Queen's Printer for Ontario (2012).

5. Little Pic

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	A
NEARSHORE	C	COASTAL WETLANDS	B
EMBAYMENTS & INSHORE	B	COASTAL TERRESTRIAL	A+
TRIBUTARIES & WATERSHEDS	B	**OVERALL B**	

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

Woodland caribou inhabit the islands of Slate Island Provincial Park. Photo credit: Township of Schreiber & Township of Terrace Bay www.terracebayschreiber.ca

Summary/ Description

The Little Pic regional unit is located on the northern Lake Superior shore. This regional unit extends from near the community of Schreiber in the west, to between Marathon and the Pic River in the east. This regional unit also contains the Slate Islands, which are designated as a provincial park. The Little Pic regional unit is 4,811.5 km^2 in size, including the associated nearshore waters. Communities in this regional unit include Marathon, Terrace Bay, Schreiber, Pays Plat First Nation and Rossport. The Little Pic regional unit contains one tertiary watershed, Little Pic, and eight quaternary watersheds. The watersheds in this unit are characterized by forests, primarily within provincial Crown Lands. The coast is dominated by rocky shores and cliffs and cobble beaches with scattered sandy beaches in sheltered coves. Coastal wetlands are very rare. Almost one-third of the coast is in protected areas.

TABLE 5.1: Little Pic BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	4.36	0.08	1,441.07	
Developed	0.06	0.00	389.55	
Forest	4,632.13	86.67	107,747.13	
Associated Nearshore Waters	288.04	5.39	17,868.03	
Other	168.95	3.16	8,227.57	
Water (inland)	251.23	4.70	9,473.05	
Total Area	**5,344.77**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	416.66	NA	7.15	Based on SOLEC shoreline
Sand Beaches (km)	29.52	7.08	4.59*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	1.02	0.27*	0.09 **	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone	351.32	93.78*	5.69**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	317	NA	12.0	
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	0.75	NA		
Road Density (km/km^2)	0.11	NA		
Number of Dams and Barriers	305	NA	1.3	
Artificial Shoreline (km)	3.03	0.73	1.33	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	124.95	2.47	5,056.74	Regional area based on landmass
Public/Crown	4,398.54	86.98	5,056.74	
Tribes/ First Nations	2.11	0.04	5,056.74	
Parks & Protected Areas (total)	531.14	10.50	5,056.74	
Parks & Protected Areas (coast)	108.50	28.96*	374.62**	*% of Regional Coastal Area **Regional Coastal Area (km^2)

Important Biodiversity Features

Nearshore and Inshore Waters

- The Little Pic regional unit contains a number of sites of Important Habitat for Lake Trout and Lake Whitefish; these Important Habitat Sites are found in many areas along the coast (Lake Superior Binational Program Habitat Committee 2006). The Lake Trout Important Habitat Sites are also located around the Slate Islands (Lake Superior Binational Program Habitat Committee 2006) (Figure 5.1).

Coastal Zone and Islands

- Areas identified as Important Habitat Areas are found in this regional unit, including around the Slate Islands, Neys Provincial Park and Steel River Provincial Park. Several Important Habitat Sites are also found in the White Pic region (Lake Superior Binational Program Habitat Committee 2006) (Table 5.3, Figure 5.3).
- Craig's Pit Provincial Nature Reserve is an important migratory bird observation area, and contains bluffs and kettle holes. This area also contains examples of landform processes and themes which are environmental indicators from the Lake Minong stage and later (OMNR 2006l).

Tributaries and Watersheds

- Historically 21 tributaries in Lake Superior had Lake Sturgeon spawning runs (Lake Superior Lake Sturgeon Work Group 2012, unpublished data). One of these historical spawning tributaries, the Prairie River, is in the Little Pic regional unit. The population status in this river is considered extirpated (Golder Associates Ltd. 2011). However a 2011 lakewide juvenile Lake Sturgeon survey captured sturgeon off the Prairie River. The natal source of these fish is under investigation (Lake Superior Lake Sturgeon Work Group 2012, unpublished data).

Figure 5.1: Little Pic - Coastal and Watershed Features

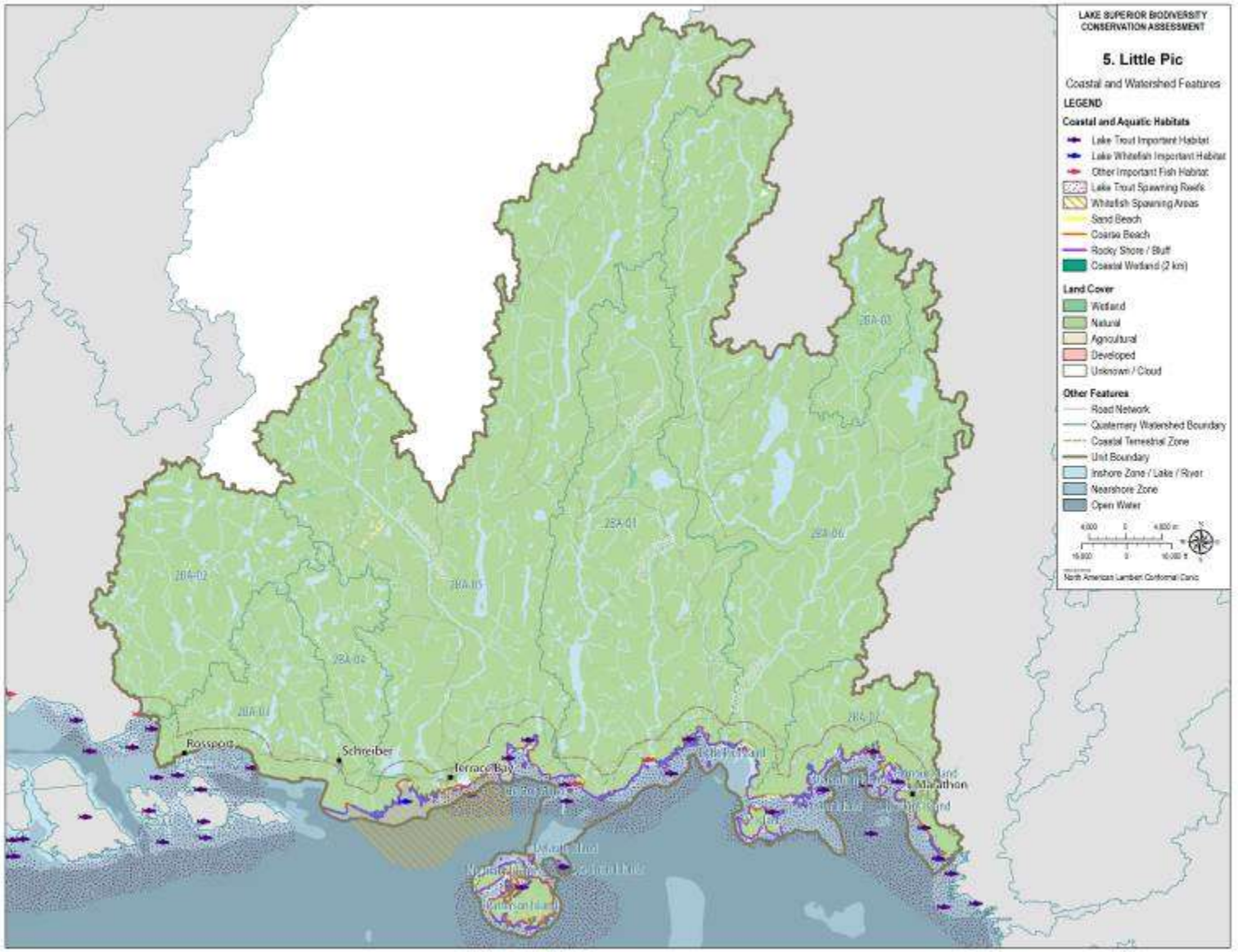


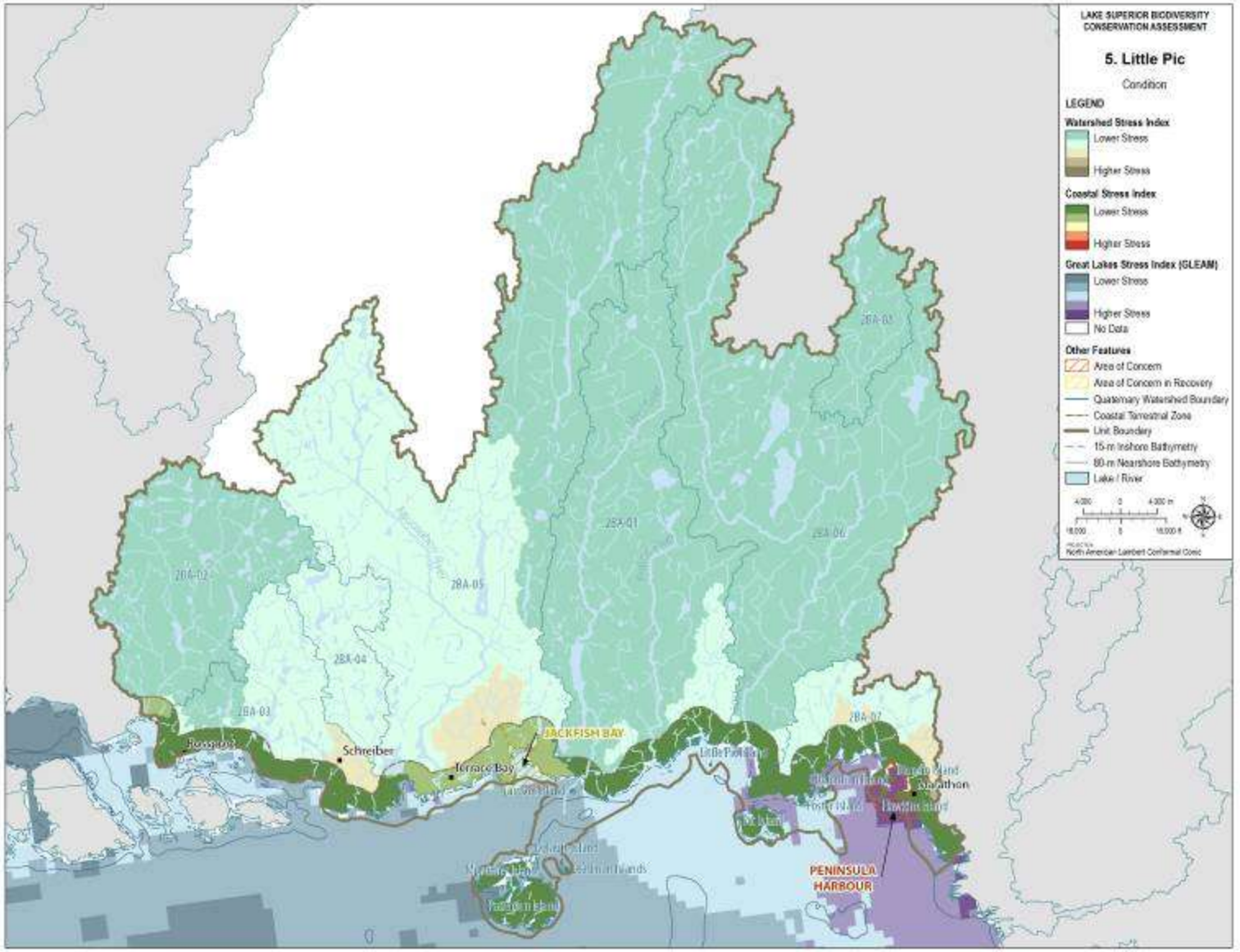
TABLE 5.2: Little Pic CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	NA
Nearshore[1]	C (0.52)	Unknown
Embayments and Inshore[1,2]	B (0.62)	Unknown
Coastal Wetlands[2,3]	B (0.742)	Unknown
Islands[4]	A	Unknown
Coastal Terrestrial[3]	A+ (0.996)	Unknown
Tributaries and Watersheds[2]	B (0.71)	Unknown

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

Figure 5.2: Little Pic - Condition



Important Issues & Threats

- The Peninsula Harbour Area of Concern (AOC) is located in the Little Pic regional unit (Figure 5.2). Seven Beneficial Use Impairments (BUIs) were identified as impaired or requiring further assessment in the Peninsula Harbour AOC (Peninsula Harbour Remedial Action Plan Team 1991). In 2012 a layer of clean sand was placed on top of the most contaminated sediment in Jellicoe Cove. This process is called thin-layer capping, and it addresses several BUIs by creating clean fish habitat, stopping contaminated sediment from spreading, and reduces risk for fish, as well as other species, including humans (Environment Canada 2014a). Regulations implemented in the 1990s for the pulp and paper industry and sewage treatment plants also improved local water quality. All necessary actions to restore water quality and ecosystem health have been completed as of August 2012, and a monitoring plan is in place for the sediment remediation project. The Peninsula Harbour AOC will be delisted or designated an AOC in Recovery by 2019, based on the monitoring results (Environment Canada 2014a).
- The Jackfish Bay Area of Concern (AOC) was officially re-designated as an AOC in Recovery in May 2011 (Environment Canada 2014b). This AOC in Recovery is located in the Little Pic regional unit, near Terrace Bay (Figure 5.2). A pulp and paper mill contributed to degraded water quality, sediment, fish and fish habitat, among other impairments. Overfishing and the impacts of sea lamprey also reduced Lake Trout populations (Environment Canada 2014b). Eight beneficial use impairments (BUIs) were identified as impaired or requiring further assessment in the Jackfish Bay AOC (Jackfish Bay Remedial Action Plan Team 1998). Once environmental monitoring indicates that the five remaining BUIs have been restored, Jackfish Bay AOC in Recovery will be delisted (Environment Canada 2014b).
- In 2014 the Stillwater Mining Company announced that subsidiary Stillwater Canada Inc would reduce activities associated with the Marathon Platinum Group Metals-Copper Project near the north shore of Lake Superior, approximately 10 kilometres north of the community of Marathon Ontario. Future development will be contingent on an improved economic return from the project, and the results of limited exploration activities undertaken in 2014. An Environmental Assessment had previously been submitted, however the permitting process was suspended prior to the September 2014 announcement. Stillwater Mining Company has stated that Stillwater Canada Inc will maintain tenure of the project, look for opportunities to realize value from the project and maintain existing relationships with local aboriginal communities and municipalities (Stillwater Mining Company 2014).
- The Coldwell Wind Energy Project is a 66 wind turbine project in development (Brookfield Renewable Energy Partners L.P. 2013) approximately 20 kilometres northwest of Marathon, Ontario, near Neys Provincial Park and Red Sucker Point Provincial Nature Reserve (Brookfield Renewable Power Inc. No date).
- The Lower Lake Hydroelectric Project is a 10 MW hydroelectric project in development near Terrace Bay (Brookfield Renewable Energy Partners L.P. 2013).
- There is currently approximately 4,500 acres for sale on the Lake Superior coast, near Terrace Bay.

Conservation In Action

Parks & Protected Areas

- The Lake Superior National Marine Conservation Area (LSNMCA) of Canada includes a significant portion of the nearshore and inshore waters associated with the Little Pic regional unit, as well as some coastal lands (Parks Canada 2009). National Marine Conservation Areas protect and conserve representative marine areas for the benefit, education and enjoyment of the people of Canada and

the world. By law, each national marine conservation area must contain at least one zone that fosters and encourages the ecologically sustainable use of aquatic resources and at least one zone that fully protects special features or sensitive elements of ecosystems. Currently, the Lake Superior NMCA has proposed two zones that offer some protection for the Gunilda shipwreck (Nipigon and Jackpine regional unit), and Gapen's Pool Brook Trout Spawning Area (Nipigon and Jackpine regional unit) (C. Vis, pers. comm., December 18 2014).

- The LSNMCA extends beyond the nearshore water boundary associated with the Little Pic region, to the international boundary with the United States.
- Craig's Pit Provincial Nature Reserve (also in White/ Pic)
- Red Sucker Point Provincial Nature Reserve
- Neys Provincial Park
- Slate Islands Provincial Park
- Prairie River Mouth Provincial Nature Reserve
- Steel River Provincial Park
- Rainbow Falls Provincial Park
- Schreiber Channel Provincial Nature Reserve
- Lake Superior Shoreline Enhanced Management Area (also in Pic and White and Nipigon and Jackpine regional units)
- Terrace Bay Nature Reserve (Thunder Bay Field Naturalists)
- Schreiber Point Nature Reserve (Thunder Bay Field Naturalists)

Existing Programs & Projects

- The Slate Islands are the source of one of two Lake Trout brood stock gametes (Slate Island strain) used by the provincial fish culture system for Lake Trout rehabilitation stocking in Lake Superior (S. Greenwood, pers. comm., March 11 2013).
- The Ontario MNR Upper Great Lakes Management Unit (UGLMU) has established the Fish Community Index Netting (FCIN) program on Lake Superior. Started in 2009, the FCIN program represents an ecosystem-based fish community approach, which provides trend-through-time information on the fish community. Emphasis is on the commercially important species of Lake Trout and Lake Whitefish, but the shift is away from a single species approach, to monitoring of fish population dynamics (Thunder Bay RAP 2013). The FCIN program is underway in the Thunder Bay, Peninsula Harbour and Jackfish Bay AOCs, as well as in Nipigon Bay (no commercial fisheries) (M. Chase, pers. comm., June 3 2013).
- In July 2014 the Thunder Bay Field Naturalists (TBFN) purchased a large parcel near Terrace Bay. At nearly 1363 acres, the Terrace Bay Nature Reserve is the TBFN's largest nature reserve (B. Yurkoski, pers. comm., February 16 2015). The nature reserve includes a large area of the mainland including 10.5 kilometres of Lake Superior shoreline, as well as 15 small islands. The site features arctic-alpine disjunct plants, island based gull rookeries and a varied shoreline which includes exposed bedrock, cobble beaches, sand beaches. Inland raised boulder beaches can be found far from the current shoreline. The parcel is described as pristine Lake Superior shoreline (TBFN No date).
- Schreiber Point Nature Reserve (TBFN) is located in the Little Pic regional unit. It is 46 acres in area and is a Great Lakes Conservation Blueprint priority site (B. Yurkoski, pers. comm., February 16 2015).
- Peregrine Falcons have been reintroduced to Ontario, including in the Lake Superior basin, following their extirpation as a breeding species in Ontario in the early 1960s (Ontario Peregrine Falcon Recovery Team 2010).

TABLE 5.3: Little Pic IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
ON-008	Site	Beatty and Sturdee Coves	Colonial water bird nesting area
ON-009	Site	Big Duck Creek	Fish spawning habitat in Big Duck Creek; fish habitat
ON-014	Site	Blackbird Creek	Fish habitat (Brook Trout)
ON-018	Site	Nicholl Island Causeway	Spring and fall staging area for migratory birds
ON-039	Site	Golfcourse Creek	Fish spawning habitat
ON-045	Site	Hawkins Island	Colonial water bird habitat
ON-047	Site	Jackfish Lake	Former fish spawning areas
ON-067	Site	Mink Creek	Former fish spawning area
ON-087	Site	Schreiber Mine	Rare animal habitat (overwintering area for bats)
ON-109	Site	Sturdee Cove Shore	Fish spawning area
ON-125	Site	Tunnel Bay	Former fish spawning habitat
ON-137	Area	Peninsula Harbor	Former fish spawning area; colonial nesting bird habitat
ON-143	Area	Craig's Pit Nature Reserve	Environmentally Sensitive Area; hawk watch site; broken end moraine
ON-164	Area	Neys	Remnant Woodland Caribou population, dune and beach communities; Provincial Park
ON-170	Area	Prairie River Mouth Nature Reserve	Migratory fish habitat; sandbar, beach ridges, and dunes
ON-174	Area	Red Sucker Point Nature Reserve	
ON-177	Area	Slate Islands	Globally significant Woodland Caribou population, rare plant habitat
ON-179	Area	Steel River	Environmentally Sensitive Area; migratory waterfowl site; raptor and wading bird habitat; migratory fish habitat

Figure 5.3: Little Pic - Important Habitat Sites and Areas

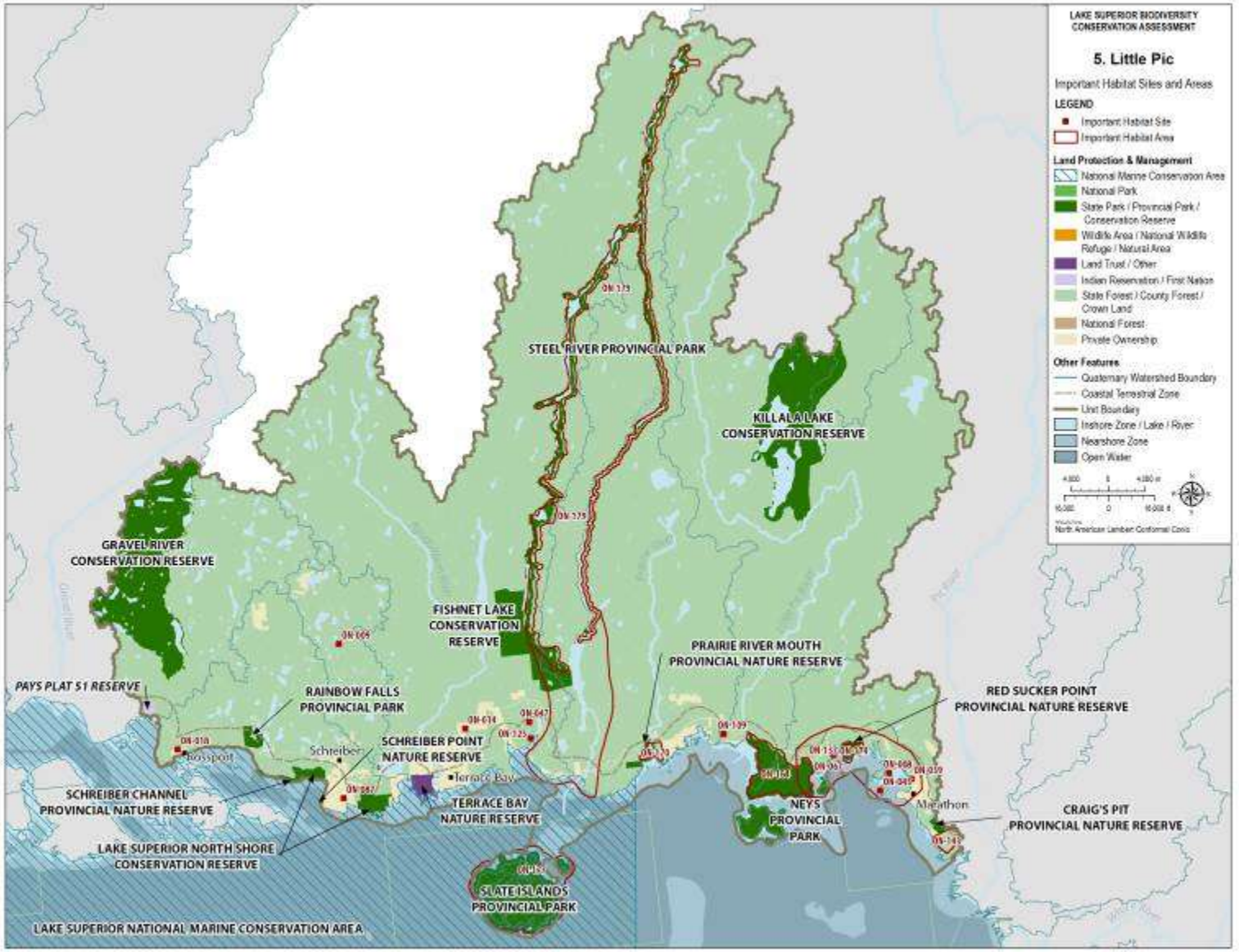


TABLE 5.4: Little Pic LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 53 species and communities of conservation concern have been documented in the regional unit. 22 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 31 species and communities were once known to occur here, but have current conservation ranks of H (Historical).[6]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
American Dune Grass - Beach Pea - Sand Cherry Dune Grassland Type	American Dune Grass - Beach Pea - Sand Cherry Dune Grassland Type
Bat Colony	Bat Hibernaculum/Nursery
Botrychium ascendens	Upswept Moonwort
Botrychium pseudopinnatum	False Northwestern Moonwort
Botrychium spathulatum	Spatulate Moonwort
Carex atratiformis	Scabrous Black Sedge
Cerastium alpinum	Alpine Chickweed
Cystopteris laurentiana	Laurentian Bladder Fern
Euchloe ausonides	Large Marble
Falco peregrines	Peregrine Falcon
Haliaeetus leucocephalus	Bald Eagle
Huperzia appressa	Mountain Firmoss
Ichthyomyzon fossor	Northern Brook Lamprey
Juncus vaseyi	Vasey's Rush
Moehringia macrophylla	Large-leaved Sandwort
Oeneis macounii	Macoun's Arctic
Oplopanax horridus	Devil's Club
Oxytropis splendens	Showy Locoweed
Phacelia franklinii	Franklin's Scorpionweed
Rangifer tarandus caribou	Woodland Caribou (Forest-dwelling boreal population)
Saxifraga oppositifolia	Purple Mountain Saxifrage
Woodsia alpine	Alpine Woodsia
Historical Records	
Scientific Name	**Common Name**
Acipenser fulvescens pop. 3	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)
Anaptychia setifera	A Lichen
Antennaria rosea	Rosy Pussytoes
Botrychium acuminatum	Pointed Moonwort
Botrychium campestre	Prairie Moonwort
Botrychium hesperium	Western Moonwort
Bromus pumpellianus	Pumpelly's Brome
Bryum blindii	A Moss
Bryum pallens	A Moss
Cystopteris montana	Mountain Bladder Fern

[6] Data included here were provided by the Ontario Ministry of Natural Resources and Forestry. Copyright Queen's Printer for Ontario (2012).

Dryas drummondii	Yellow Mountain Avens
Erebia mancinus	Taiga Alpine
Great Lakes Arctic-Alpine Basic Open Bedrock Shoreline Type	Great Lakes Arctic-Alpine Basic Open Bedrock Shoreline Type
Grimmia teretinervis	A Moss
Grimmia torquata	A Moss
Listera borealis	Northern Twayblade
Myotis septentrionalis	Northern Myotis
Myurella tenerrima	A Moss
Peltigera collina	A Lichen
Porpidia diversa	A Lichen
Porpidia herteliana	A Lichen
Potamogeton confervoides	Alga Pondweed
Scapania gymnostomophila	A Liverwort
Splachnum rubrum	A Moss
Stereocaulon glaucescens	A Foam Lichen
Stereocaulon subcoralloides	A Lichen
Trichophorum clintonii	Clinton's Clubrush
Vaccinium ovalifolium	Oval-leaved Bilberry
Vertigo elatior	Tapered Vertigo
Vertigo paradoxa	Classification Uncertain
Zizia aptera	Heart-leaved Alexanders

6. Nipigon and Jackpine

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	A
NEARSHORE	C	COASTAL WETLANDS	B
EMBAYMENTS & INSHORE	B	COASTAL TERRESTRIAL	A+
TRIBUTARIES & WATERSHEDS	B	**OVERALL A-**	

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

Cypress Bay, in the Nipigon and Jackpine regional unit. Photo credit: Ontario Ministry of Natural Resources

Summary/ Description

The Nipigon and Jackpine regional unit is located along the northern shore of Lake Superior, and extends the furthest north of any of the regional units. The regional unit is 25,558 km^2 in size, including the associated nearshore waters, and is the largest of any of the regional units in this study. The regional unit extends inland considerably, and includes Lake Nipigon and the surrounding area, as well as Nipigon Bay. The relatively short shoreline of this regional unit starts just west of St. Ignace Island, and extends to east of Wilson Island, near the community of Schreiber. Communities in this regional unit include Nipigon, MacDiarmid, Beardmore, Armstrong, Whitesand First Nation, Kiashke Zaaging Anishinaabek (Gull Bay) First Nation, Biinjitiwaabik Zaaging Anishinaabek (Rocky Bay) First Nation, Bingwi Neyaashi Anishinaabek (Sand Point) First Nation, Animbiigoo Zaagiìgan Anishinaabek (Lake Nipigon Ojibway) First Nation, Namaygoosisagagun First Nation, and Red Rock Indian Band (Lake Helen First Nation). A number of provincial parks and nature reserves are located in this region, along with an enhanced management area. Several large islands, including St. Ignace Island, Simpson Island and Wilson Island are located in this area. This regional unit contains the largest remnant population of Brook Trout in Lake Superior (M. Chase, pers. comm., June 3 2013). The Nipigon and Jackpine regional unit combines two tertiary watershed units, Nipigon and Jackpine, and contains 32 quaternary watersheds. The watersheds are almost completely dominated by forests. The coasts are characterized by rocky shores and cliffs, with scattered sand beaches and coastal wetlands.

TABLE 6.1: Nipigon and Jackpine BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	6.54	0.02	1,441.07	
Developed	1.42	0.01	389.55	
Forest	19,366.98	68.48	107,747.13	
Associated Nearshore Waters	794.43	2.81	17,868.03	
Other	1,959.85	6.93	8,227.57	
Water (inland)	6,151.96	21.75	9,473.05	
Total Area	**28,281.17**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	533.98	NA	9.16	Based on SOLEC shoreline
Sand Beaches (km)	27.80	5.21	4.32*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	4.71	0.97*	0.43 **	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone	437.96	89.98*	7.09**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	212	NA	8.0	
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	0.06	NA		
Road Density (km/km^2)	0.16	NA		
Number of Dams and Barriers	1188	NA	5.0	
Artificial Shoreline (km)	6.95	1.30	3.05	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	574.94	2.09	27,486.60	Regional area based on landmass
Public/Crown	22,791.03	82.92	27,486.60	
Tribes/ First Nations	67.96	0.25	27,486.60	
Parks & Protected Areas (total)	4,052.67	14.74	27,486.60	
Parks & Protected Areas (coast)	65.52	13.46*	486.75**	*% of Regional Coastal Area **Regional Coastal Area (km^2)

Important Biodiversity Features

Nearshore and Inshore Waters

- Nipigon Bay is noted as a Lake Superior embayment important for Lake Sturgeon (Auer 2003). In the Nipigon and Jackpine regional unit this embayment and the nearshore zone, which provides corridors for movement, are identified as critical management areas for Lake Sturgeon in the Lake Superior basin (Auer 2003).
- Nipigon Bay and the nearshore waters are critical management areas for Brook Trout in the Lake Superior basin (M. Chase, pers. comm., June 3 2013).

Coastal Zone and Islands

- The Nipigon and Jackpine regional unit provides several sites of Important Habitat for Lake Trout, including many sites around St. Ignace Island, Simpson Island, Vein Island, Wilson Island, La Grange Island and Vert Island. Additional Important Habitat Sites for Lake Trout are found in areas along the Lake Superior coast (Lake Superior Binational Program Habitat Committee 2006) (Figure 6.1).
- One area identified as an Important Habitat Area is found around St. Ignace Island and Simpson Island, while other Important Habitat Areas are found throughout the regional unit (Lake Superior Binational Program Habitat Committee 2006) (Table 6.3, Figure 6.3).
- A number of Important Habitat Sites are clustered around the shore and some of the eastern islands (Lake Superior Binational Program Habitat Committee 2006) (Table 6.3, Figure 6.3).

Tributaries and Watersheds

- Few wild populations of Brook Trout in the Lake Superior basin are both sufficiently large to serve as a source population for brood stock and exhibit the migratory or lake-dwelling life history. The populations which fit these criteria include populations from Nipigon Bay and Lake Nipigon. In 2002 there were three strains of Brook Trout brood stock available for stocking, including the Lake Nipigon strain from Lake Nipigon, Ontario (Newman et al. 2003). The trigger that causes the development of the coaster Brook Trout life-history variant is unknown, and the right conditions must be present for this trait to develop. Decisions concerning the rehabilitation of Brook Trout must consider a number of factors (M. Chase, pers. comm., June 3 2013).
- Coaster Brook Trout in the Nipigon River have shown some ability to co-exist with other salmonind species, although competition may still be a factor in certain habitats and at certain densities (Newman et al. 2003).
- Historically 21 tributaries in Lake Superior had Lake Sturgeon spawning runs. Two of these historical spawning tributaries, the Gravel River and the Nipigon River are in the Nipigon and Jackpine regional unit. The Gravel River population status and population trajectory are both unknown (Golder Associates Ltd. 2011); however there is not recent evidence of natural reproduction in the Gravel River (Lake Superior Lake Sturgeon Work Group 2012, unpublished data). The Nipigon River population status is extant, while the population trajectory is unknown (Golder Associates Ltd. 2011).
- A sub-population of Lake Sturgeon which is physically isolated from other populations is found within Lake Nipigon. The Lake Nipigon population status is extant, while the population trajectory is stable (Golder Associates Ltd. 2011).
- A Lake Sturgeon Rehabilitation Plan for Lake Superior (Auer 2003) identifies the Gravel River and Nipigon River as two of the seventeen tributaries to Lake Superior in which there should be a focus on Lake Sturgeon rehabilitation.
- Several areas around Lake Nipigon are identified as Important Habitat Areas, including Kabitotikwia River Provincial Nature Reserve, West Bay Provincial Nature Reserve, Kopka River Provincial Park Addition, Livingstone Point Provincial Park and Lake Nipigon Provincial Park. A large Important Habitat area which lies mostly north of the Nipigon and Jackpine regional unit partially extends into the northern portion of the unit (Lake Superior Binational Program Habitat Committee 2006) (Table 6.3, Figure 6.3).

Figure 6.1: Nipigon and Jackpine - Coastal and Watershed Features

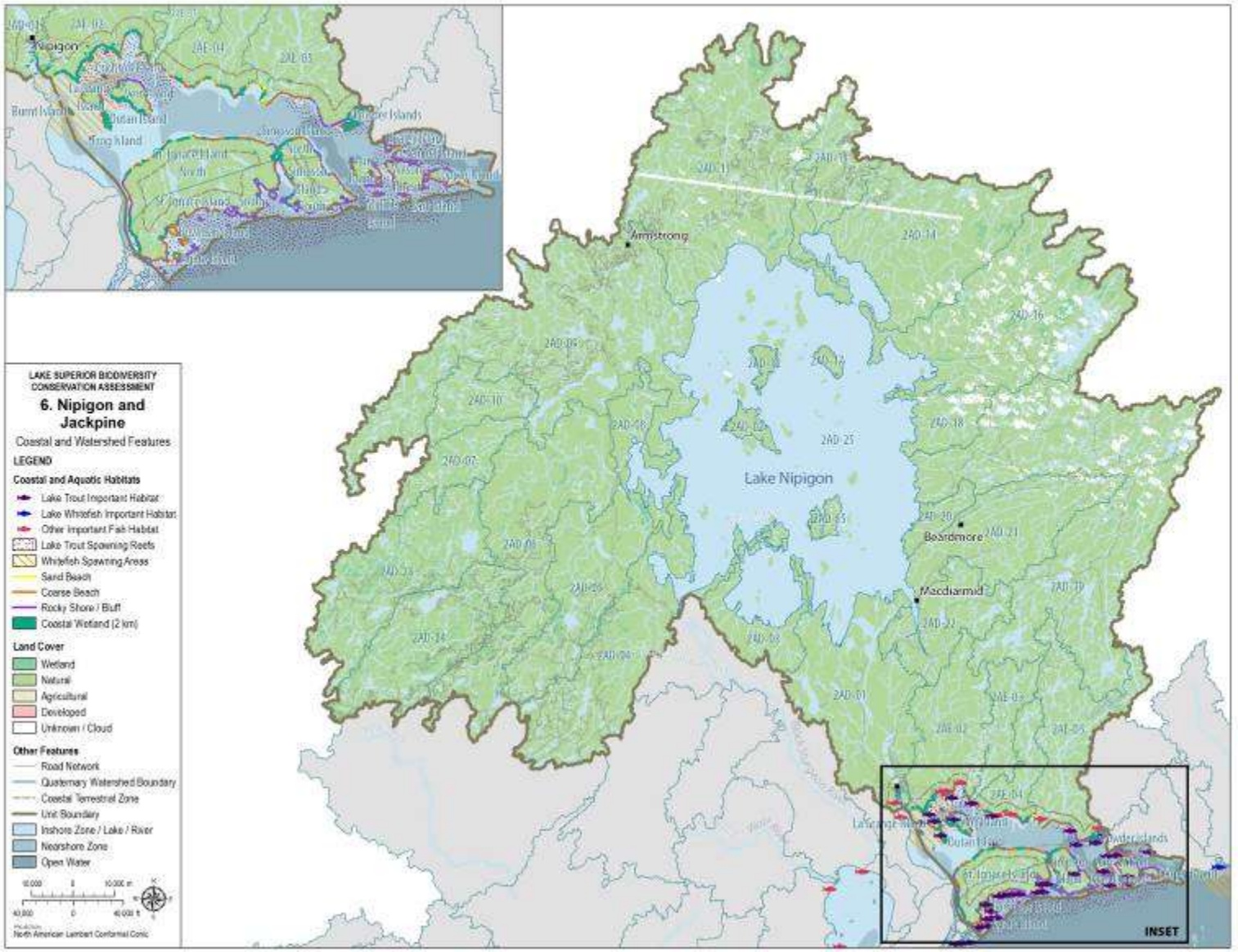


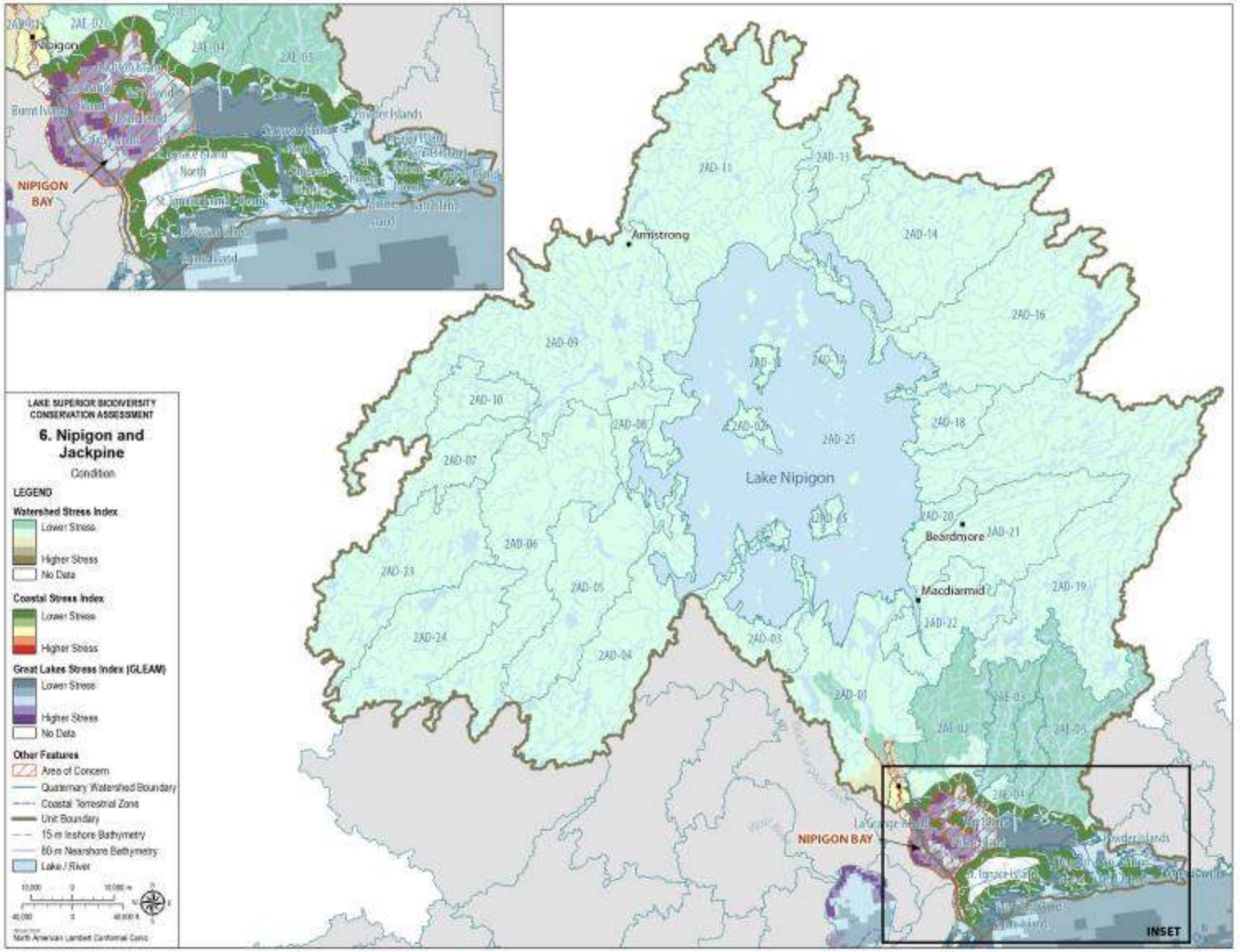
TABLE 6.2: Nipigon and Jackpine CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	NA
Nearshore[1]	C (0.59)	Unknown
Embayments and Inshore[1,2]	B (0.68)	Unknown
Coastal Wetlands[2,3]	B (0.782)	Unknown
Islands[4]	A	Unknown
Coastal Terrestrial[3]	A+ (0.996)	Unknown
Tributaries and Watersheds[2]	B (0.76)	Unknown

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

Figure 6.2: Nipigon and Jackpine - Condition



Important Issues & Threats

- The Nipigon Bay Area of Concern (AOC) is located in the Nipigon and Jackpine regional unit (Figure 6.2). Eight Beneficial Use Impairments (BUIs) were identified as impaired or requiring further assessment in the 1991 Stage 1 Status (Nipigon Bay Remedial Action Plan Team 2011). Discharges of industrial and municipal effluent from mills and sewage treatment plants, hydro-electric development and related changes to water levels and flows in Lake Nipigon and the Nipigon River, and negative impacts from previous timber harvest practices (such as log driving) all contributed to the impairments to water quality and environmental health. Many improvements have occurred, including upgrades to mills and water treatments plants due to regulatory requirements, restoration and rehabilitation of important creeks, and several other actions, resulting in improvements to water quality and environmental health. Upgrades to the water pollution control plant in the Township of Red Rock are the final action required to restore water quality and ecosystem health in this AOC. Monitoring will assess the restoration of beneficial uses, and the anticpated delisting for the Nipigon Bay AOC is 2019 (Environment Canada 2014c).

Conservation In Action

Parks & Protected Areas

- The Lake Superior National Marine Conservation Area (LSNMCA) of Canada includes a significant portion of the nearshore and inshore waters associated with the Nipigon and Jackpine regional unit, as well as some coastal lands (Parks Canada 2009). National Marine Conservation Areas protect and conserve representative marine areas for the benefit, education and enjoyment of the people of Canada and the world. By law, each national marine conservation area must contain at least one zone that fosters and encourages the ecologically sustainable use of aquatic resources and at least one zone that fully protects special features or sensitive elements of ecosystems. Currently, the Lake Superior NMCA has proposed two zones that offer some protection for the Gunilda shipwreck (Nipigon and Jackpine regional unit), and Gapen's Pool Brook Trout Spawning Area (Nipigon and Jackpine regional unit) (C. Vis, pers. comm., December 18 2014).
- The LSNMCA extends beyond the nearshore water boundary associated with the Nipigon and Jackpine region, to the international boundary with the United States.
- Gravel River Provincial Nature Reserve
- Ruby Lake Provincial Park
- Lake Nipigon Provincial Park
- Livingstone Point Provincial Park
- Wabakimi Provincial Park (portion)
- Whitesand Provincial Park
- Windigo Bay Provincial Park
- Kopka River Provincial Park
- Kopka River Provincial Park Addition
- Wilson Island
- West Bay Provincial Nature Reserve
- Pantagruel Creek Provincial Nature Reserve
- Gull River Provincial Park
- Kabitotkwia River Provincial Nature Reserve
- Kaiashk Provincial Nature Reserve
- Black Sturgeon River Provincial Park (portion)

- Lake Superior Shoreline Enhanced Management Area (also in Pic and White and Little Pic regional units)
- Bowman Island Nature Reserve (Thunder Bay Field Naturalists)
- Nipigon River Nature Reserve (Thunder Bay Field Naturalists)
- Paradise Island Nature Reserve (Thunder Bay Field Naturalists)

Existing Programs & Projects

- Three Provincially Significant Wetlands (PSWs) are located in the Nipigon and Jackpine regional unit. Kabitotikwia River PSW (1515.02 hectares) and Poshkokagan River PSW (168.84 hectares) are located on Lake Nipigon, and Nipigon River PSW (78.60 hectares) is located along the Nipigon River. The three PSWs provide a combined total of 1,762.47 hectares.
- Existing populations of native Brook Trout in the Nipigon area seem to be responding well to measures taken for their conservation, including restrictions on harvests and the protection of spawning habitat (Newman et al. 2003). Seasonal refuge areas have been established on the Nipigon River by the Ontario Ministry of Natural Resources, in order to protect spawning adults and habitat from destruction by fishermen wading through the area (Newman et al. 2003).
- Both the Ontario Ministry of Natural Resources Dorion Fish Culture Station and the Red Cliff Tribal Fish Hatchery rear captive brood stock and production fish of the Lake Nipigon strain of Brook Trout (Newman et al. 2003). The OMNR Dorion Fish Culture Station is located in the Black-Sturgeon region, while the Red Cliff Tribal Fish Hatchery is located in the Nemadji to Fish Creek region. The offspring from the Dorion Fish Culture Station are not stocked into Lake Superior (M. Chase, pers. comm., June 3 2013).
- The Ontario MNR Upper Great Lakes Management Unit (UGLMU) has established the Fish Community Index Netting (FCIN) program on Lake Superior. Started in 2009, the FCIN program represents an ecosystem-based fish community approach, which provides trend-through-time information on the fish community. Emphasis is on the commercially important species of Lake Trout and Lake Whitefish, but the shift is away from a single species approach, to monitoring of fish population dynamics (Thunder Bay RAP 2013). The FCIN program is underway in the Thunder Bay, Peninsula Harbour and Jackfish Bay AOCs, as well as in Nipigon Bay (no commercial fisheries) (M. Chase, pers. comm., June 3 2013).
- Peregrine Falcons have been reintroduced to Ontario, including in the Lake Superior basin, following their extirpation as a breeding species in Ontario in the early 1960s (Ontario Peregrine Falcon Recovery Team 2010).
- The Thunder Bay Field Naturalists have three nature reserves in the Nipigon and Jackpine regional unit. Bowman Island Nature Reserve is 80 acres in total (40 acres of land and 40 acres of water), and is an Area of Natural and Scientific Interest (ANSI), part of the Great Lakes Heritage Coast, and is within the Lake Superior National Marine Conservation Area. Nipigon River Nature Reserve is 545 acres in total area and is adjacent to other conservation lands, is a Great Lakes Heritage Coast signature site, and contains provincially significant wetlands. Paradise Island Nature Reserve is 112 acres in total (58 acres of land and 54 acres of water). It is adjacent to conservation lands, a Great Lakes Heritage Coast signature site, an ANSI and within the Lake Superior National Marine Conservation Area (B. Yurkoski, pers. comm., February 16 2015).
- Schreiber Point Nature Reserve (TBFN) is located in the Little Pic regional unit. It is 46 acres in area and is a Great Lakes Conservation Blueprint priority site.
- The Nature Conservancy of Canada has conserved the 399 acre Powder Islands, which are made up of two large islands dominated by Lake Superior coastal forests.

- Wilson Island is owned by the Nature Conservancy of Canada, and managed through an agreement with the Pays Plat First Nation.

TABLE 6.3: Nipigon and Jackpine IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
ON-017	Site	Cat Islands	Nesting site for colonial water birds
ON-022	Site	Cobinosh Island	Historic rare animal habitat
ON-023	Site	Cypress River	Fish spawning area
ON-030	Site	Dublin Creek	Suspected fish spawning area
ON-046	Site	Inside Islands of Nipigon Bay	Fish habitat; raptor habitat
ON-048	Site	Kama Bay West	Fish spawning area
ON-051	Site	Lake Helen	Former fish spawning area
ON-058	Site	McInnes Lake and Creek	Fish spawning area
ON-074	Area	Gravel River Nature Reserve	Important staging area for migration
ON-077	Site	Kabitotikuia River Mouth	Coastal wetland, rare animal habitat; Provincial Nature Reserve
ON-078	Site	Nipigon River and Bay	Significant coastal wetland; waterfowl nesting/staging area; high biodiversity value
ON-078	Area	Nipigon River and Bay	Significant coastal wetland; waterfowl nesting/staging area; high biodiversity value
ON-085	Site	Northeast Wilson Island	Rare plant habitat
ON-088	Site	Onaman River Mouth	Large wetland; high biodiversity value
ON-091	Site	Outan Island	Rare animal habitat
ON-093	Site	Parmachene Bridge at Polly Lake	
ON-119	Site	Speckle Islands	Colonial water bird habitat
ON-121	Area	St. Ignace and Simpson Islands	Rare animal habitat (Woodland Caribou unoccupied)
ON-123	Site	Steamboat Bay	Former fish spawning area
ON-133	Site	Windikokan Lake	Fish spawning area
ON-149	Area	Kabitotikuia River Nature Reserve	
ON-152	Area	Kama Hill Nature Reserve	Kama Cliffs; representative landform and vegetation types (sparse forests and conifer on broken bedrock)
ON-156	Area	Lake Nipigon	Woodland Caribou calving islands, long undeveloped lakeshore
ON-157	Area	Windigo Bay Nature Reserve	Woodland Caribou habitat and migration route, sand dune communities
ON-161	Area	Livingstone Point Nature Reserve	
ON-182	Area	Wabakimi Wilderness Area	Woodland Caribou habitat, large pristine protected area
ON-183	Area	West Bay Nature Reserve	Fish spawning habitat

Figure 6.3: Nipigon and Jackpine - Important Habitat Sites and Areas

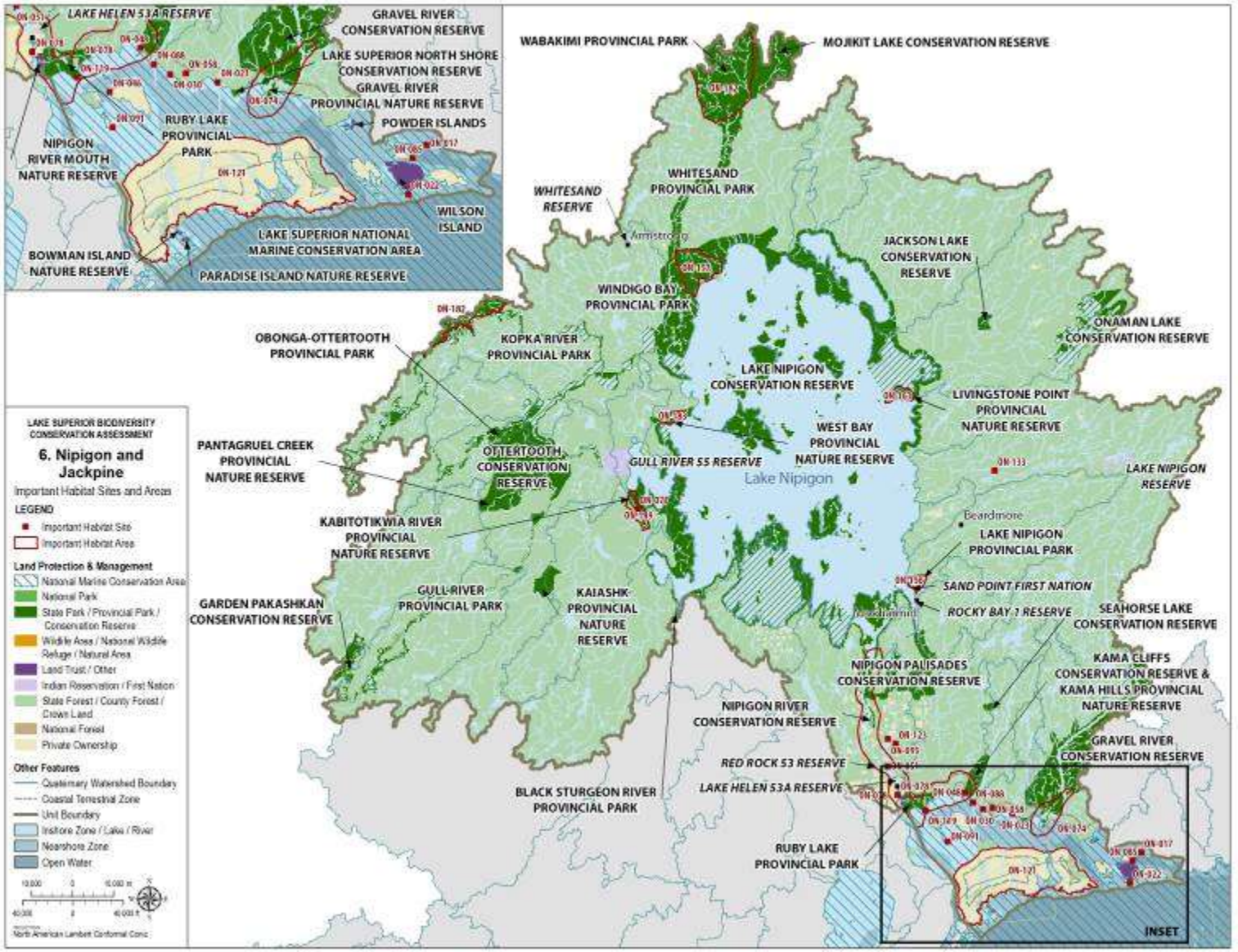


TABLE 6.4: Nipigon and Jackpine LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 61 species and communities of conservation concern have been documented in the regional unit. 20 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 41 species and communities were once known to occur here, but have current conservation ranks of F (Failed to find) or H (Historical).[7]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
Arnica lonchophylla	Long-leaved Arnica
Botrychium pallidum	Pale Moonwort
Botrychium pseudopinnatum	False Northwestern Moonwort
Caprimulgus vociferus	Whip-poor-will
Carex rossii	Ross' Sedge
Coturnicops noveboracensis	Yellow Rail
Cystopteris laurentiana	Laurentian Bladder Fern
Dryas drummondii	Yellow Mountain Avens
Erebia mancinus	Taiga Alpine
Great Lakes Arctic-Alpine Basic Open Bedrock Shoreline Type	Great Lakes Arctic-Alpine Basic Open Bedrock Shoreline Type
Gulo gulo	Wolverine
Huperzia appressa	Mountain Firmoss
Ichthyomyzon fossor	Northern Brook Lamprey
Juncus longistylis	Long-styled Rush
Juncus vaseyi	Vasey's Rush
Oeneis macounii	Macoun's Arctic
Pelecanus erythrorhynchos	American White Pelican
Phacelia franklinii	Franklin's Scorpionweed
Rangifer tarandus caribou	Woodland Caribou (Forest-dwelling boreal population)
Woodsia scopulina	Mountain Woodsia
Historical or Failed to Find Records	
Scientific Name	**Common Name**
Acipenser fulvescens pop. 3	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)
Aeshna juncea	Sedge Darner
Aeshna subarctica	Subarctic Darner
Amphidium mougeotii	A Moss
Anastrophyllum saxicola	A Liverwort
Aulacomnium turgidum	A Moss
Botrychium acuminatum	Pointed Moonwort
Botrychium hesperium	Western Moonwort
Bryum blindii	A Moss
Coregonus zenithicus	Shortjaw Cisco
Dicranella crispa	A Moss
Elymus glaucus	Blue Wild Rye
Erebia discoidalis	Red-disked Alpine

[7] Data included here were provided by the Ontario Ministry of Natural Resources and Forestry. Copyright Queen's Printer for Ontario (2012).

Euchloe ausonides	Large Marble
Falco peregrinus	Peregrine Falcon
Fontinalis sphagnifolia	A Moss
Grimmia teretinervis	A Moss
Grimmia torquata	A Moss
Gymnocarpium robertianum	Limestone Oak Fern
Haliaeetus leucocephalus	Bald Eagle
Hypnum plicatulum	A Moss
Ixobrychus exilis	Least Bittern
Listera auriculata	Auricled Twayblade
Moehringia macrophylla	Large-leaved Sandwort
Myotis septentrionalis	Northern Myotis
Myoxocephalus thompsoni	Deepwater Sculpin
Ophiogomphus anomalus	Extra-striped Snaketail
Pannaria conoplea	A Lichen
Porpidia diversa	A Lichen
Potentilla bimundorum	Staghorn Cinquefoil
Pseudoleskeella tectorum	A Moss
Rhizomnium gracile	A Moss
Somatochlora elongata	Ski-tailed Emerald
Stereocaulon glaucescens	A Foam Lichen
Stylurus notatus	Elusive Clubtail
Tayloria serrata	A Moss
Valvata sincera ontariensis	Loosely Coiled Valve-snail
Vertigo paradoxa	Classification Uncertain
Viola epipsila	Northern Marsh Violet
Woodsia alpina	Alpine Woodsia
Zizia aptera	Heart-leaved Alexanders

7. Black Sturgeon

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	A
NEARSHORE	C	COASTAL WETLANDS	A-
EMBAYMENTS & INSHORE	B	COASTAL TERRESTRIAL	A+
TRIBUTARIES & WATERSHEDS	A	**OVERALL**	**A-**

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

The Black Sturgeon River, looking towards the river mouth. Photo credit: Ontario Ministry of Natural Resources

Summary/ Description

The Black Sturgeon regional unit is located on the northern shore of Lake Superior. This regional unit is 6,333 km^2 in size, including the associated nearshore waters. The Black Sturgeon regional unit extends from near Thunder Bay in the west, to near the communities of Red Rock and Nipigon in the east. Communities in this regional unit include Red Rock, Red Rock Indian Band (Lake Helen First Nation), the Township of Shuniah, and the Township of Dorion. This regional unit includes Black Bay, a portion of Thunder Bay, and the Sibley and Black Bay Peninsulas. A number of provincial parks, nature reserves and conservation areas are located in this regional unit. The Lakehead Region Conservation Authority's area of jurisdiction covers eight municipalities, including municipalities in the Black Sturgeon and Arrow and Dog regional units. The Black Sturgeon regional unit contains one tertiary watershed, Black Sturgeon, and 12 quaternary watersheds. The watersheds are characterized by forests. The coast is characterized by rocky shores, cliffs, cobble beaches, and includes some of the most extensive coastal wetlands on the Ontario portion of Lake Superior.

TABLE 7.1: Black Sturgeon BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	14.73	0.21	1,441.07	
Developed	1.07	0.02	389.55	
Forest	4,903.13	69.62	107,747.13	
Associated Nearshore Waters	1,536.40	21.82	17,868.03	
Other	282.69	4.01	8,227.57	
Water (inland)	304.32	4.32	9,473.05	
Total Area	**7,042.33**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	866.71	NA	14.87	Based on SOLEC shoreline
Sand Beaches (km)	47.83	5.52	7.43*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	51.35	6.57*	4.65**	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone	713.83	91.31*	11.56**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	426	NA	16.1	
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	0.67	NA		
Road Density (km/km^2)	0.23	NA		
Number of Dams and Barriers	504	NA	2.1	
Artificial Shoreline (km)	8.17	0.94	3.58	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	979.31	17.79	5,505.89	Regional area based on landmass
Public/Crown	4,029.54	73.19	5,505.89	
Tribes/ First Nations		0.00	5,505.89	
Parks & Protected Areas (total)	497.05	9.03	5,505.89	
Parks & Protected Areas (coast)	151.39	19.37*	781.73**	*% of Regional Coastal Area **Regional Coastal Area (km^2)

Important Biodiversity Features

Nearshore and Inshore Waters

- Black Bay is noted as a Lake Superior embayment important for Lake Sturgeon (Auer 2003). In the Black Sturgeon regional unit this embayment and the nearshore zone, which provides corridors for movement, are identified as critical management areas for Lake Sturgeon in the Lake Superior basin (Auer 2003).
- Cisco are an important feature in western Lake Superior. Large spawning aggregations of Cisco are found in Black Bay and Thunder Bay (S. Greenwood, pers. comm., March 11 2013).

Coastal Zone and Islands

- The Black Sturgeon regional unit provides several sites of Important Habitat for Lake Trout, including many sites around the southern tip of the Black Bay Peninsula, Edward Island and Porphyry Island, and the southern tip of the Sibley Peninsula. One Important Habitat Area for Lake Whitefish is noted in Black Bay. Additional Important Habitat Sites for Lake Trout are found in areas along the Lake Superior coast in Thunder Bay (Lake Superior Binational Program Habitat Committee 2006) (Figure 7.1).
- Several Important Habitat Areas are located in the Black Sturgeon regional unit, including Black Bay, the Black Bay Peninsula, much of the Sibley Peninsula, and several smaller Important Habitat Areas on Edward Island and Porphyry Island. Additional Important Habitat Areas are found in other areas of the regional unit, along with several Important Habitat Sites (Lake Superior Binational Program Habitat Committee 2006) (Table 7.3, Figure 7.3).

Tributaries and Watersheds

- The Black Sturgeon River contains spawning habitat for native migratory fishes, but the Camp 43 dam restricts fish movement beyond the dam. The Ontario Ministry of Natural Resources (OMNR) is currently undertaking an Environmental Assessment to determine if they will decommission the Camp 43 dam (OMNR 2012). (See Important Issues and Threats).
- Historically 21 tributaries in Lake Superior had Lake Sturgeon spawning runs (Lake Superior Lake Sturgeon Work Group 2012, unpublished data). Two of these historical spawning tributaries, the Black Sturgeon River and the Wolf River are in the Black Sturgeon regional unit. The Black Sturgeon River population status is extant and the population trajectory is unknown. The Wolf River population status is extirpated (Golder Associates Ltd. 2011).
- A Lake Sturgeon Rehabilitation Plan for Lake Superior (Auer 2003) identifies the Black Sturgeon River and Wolf River as two of the seventeen tributaries to Lake Superior in which there should be a focus on Lake Sturgeon rehabilitation. Habitat restoration is a priority in the Black Sturgeon River and Wolf River, due to barriers to migration and spawning (Auer 2003).

Figure 7.1: Black Sturgeon - Coastal and Watershed Features

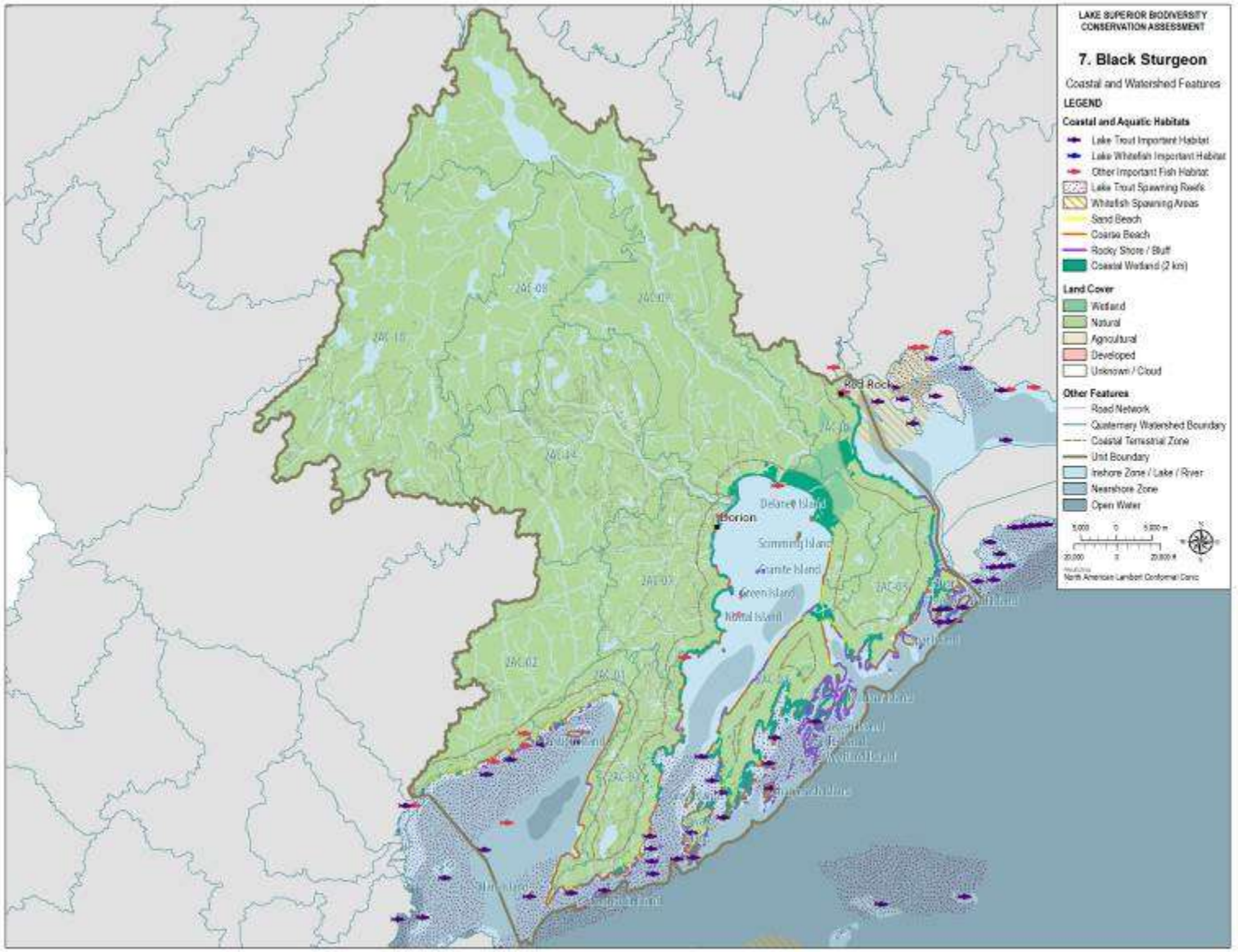


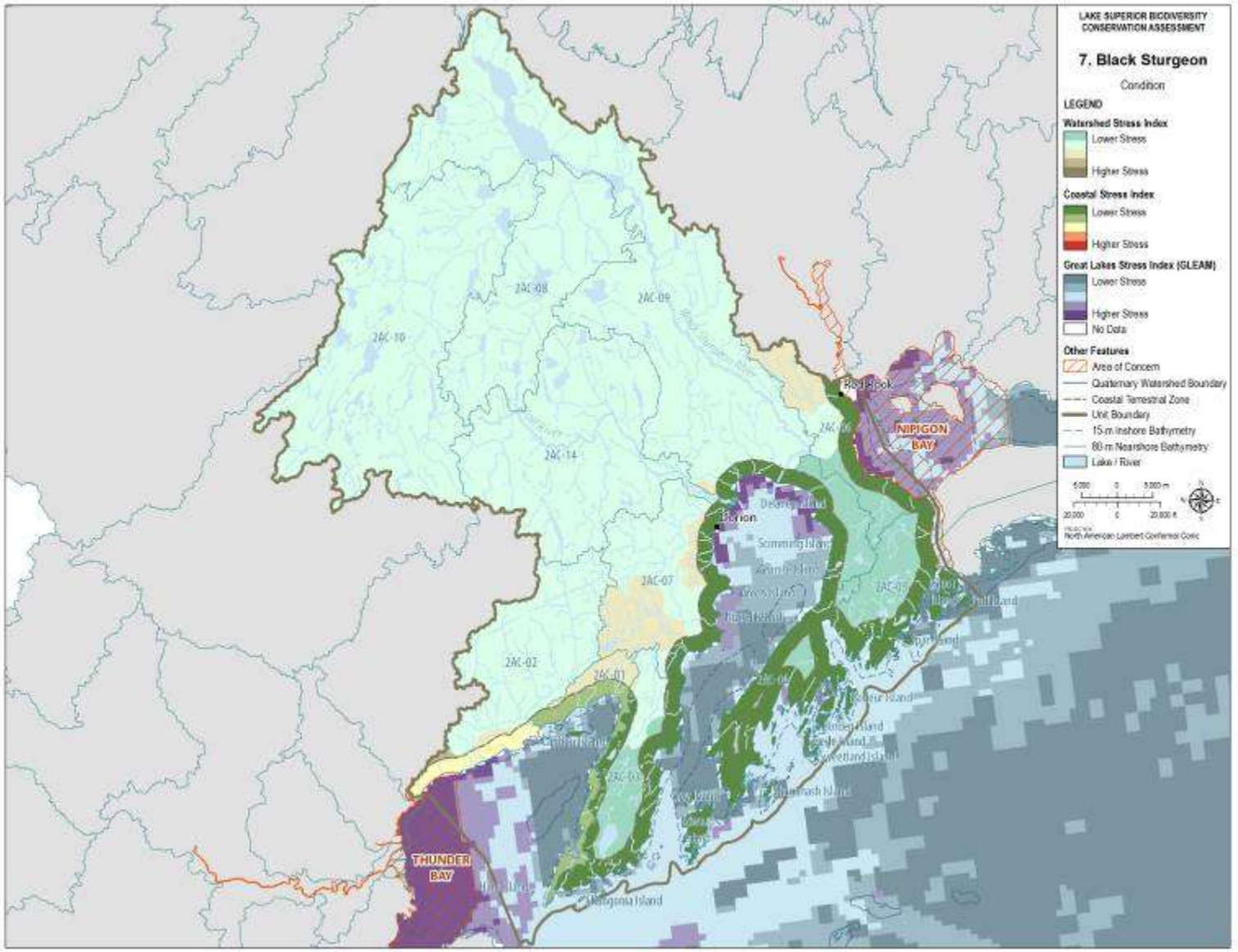
TABLE 7.2: Black Sturgeon CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	NA
Nearshore[1]	C (0.59)	Unknown
Embayments and Inshore[1,2]	B (0.72)	Unknown
Coastal Wetlands[2,3]	A- (0.808)	Unknown
Islands[4]	A	Unknown
Coastal Terrestrial[3]	A+ (0.994)	Unknown
Tributaries and Watersheds[2]	A (0.84)	Unknown

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

Figure 7.2: Black Sturgeon - Condition



Important Issues & Threats

- The Ontario Ministry of Natural Resources (OMNR) is currently undertaking an Environmental Assessment process to examine the recommendations of the Fishery Management Zone 9 Advisory Council: to decommission the Camp 43 dam and construct a multi-purpose sea lamprey barrier at Eskwanonwatin Lake (OMNR 2012). One of the largest populations of Walleye in Lake Superior previously inhabited Black Bay. The Camp 43 dam, 17 kilometres upstream on the Black Sturgeon River, cut off access to spawning habitat for native migratory fishes. The removal of the dam and the reinstatement of access to naturally occurring spawning habitat would be an essential step in the large scale rehabilitation of the Black Bay and Black Sturgeon River native fish community (OMNR 2012). If the proposed project is completed an additional 50 kilometres of river habitat will be available to native migratory fish species, including Walleye, Lake Sturgeon and coaster Brook Trout (OMNR 2012). Additional possible benefits stemming from the decommissioning of the dam would provide Brook Trout with access to 40 small tributaries, along with an un-quantified amount of spawning and nursery habitat; the potential reestablishment of Walleye and Cisco as the top predator and prey species in Black Bay, with the reduction of the Rainbow Smelt population; and avoiding catastrophic failure of the dam before it is at the end of its lifespan. Potential effects and mitigation measures are also described in the project summary (OMNR 2012). As demonstrated prior to the Camp 43 dam being refurbished to block sea lamprey migration, this preferred option will also result in the infestation of 50 kilometres of the Black Sturgeon River as well as four tributaries to the Black Sturgeon River by Sea Lamprey, and is stated to result in "an incremental increase in parasitic sea lamprey in Lake Superior" (OMNR 2012:1). Some experts note that the cost of additional lampricide treatment is high relative to the Lake Superior control budget for Sea Lamprey, and that there are additional risks to Lake Trout and other large fish species by allowing Sea Lamprey additional river access (S Greenwood, pers. comm., March 11 2012). Further, the requirement to treat this newly infested area will expose an estimated 14 million Northern Brook Lampreys to lampricide, and will extirpate this population in this portion of the Black Sturgeon River ((M. Steeves, pers. comm., June 17 2015).

Conservation In Action

Parks & Protected Areas

- The Lake Superior National Marine Conservation Area (LSNMCA) of Canada includes a significant portion of the nearshore and inshore waters associated with the Black Sturgeon regional unit, as well as some coastal lands (Parks Canada 2009). National Marine Conservation Areas protect and conserve representative marine areas for the benefit, education and enjoyment of the people of Canada and the world. By law, each national marine conservation area must contain at least one zone that fosters and encourages the ecologically sustainable use of aquatic resources and at least one zone that fully protects special features or sensitive elements of ecosystems. Currently, the Lake Superior NMCA has proposed two zones that offer some protection for the Gunilda shipwreck (Nipigon and Jackpine regional unit), and Gapen's Pool Brook Trout Spawning Area (Nipigon and Jackpine regional unit) (C. Vis, pers. comm., December 18 2014).
- The LSNMCA extends beyond the nearshore water boundary associated with the Black Sturgeon region, to the international boundary with the United States.
- Black Sturgeon River Provincial Park (portion)
- Albert Lake Mesa Provincial Nature Reserve
- Cavern Lake Provincial Nature Reserve
- Ouimet Canyon Provincial Park
- Hurkett Cove Conservation Area

- Granite Point Conservation Area
- Shesheeb Bay Provincial Nature Reserve
- Sleeping Giant Provincial Park
- Edward Island Provincial Park
- Porphyry Island Provincial Park
- Puff Island Provincial Nature Reserve
- Silver Harbour Conservation Area
- Black Bay Nature Reserve (Thunder Bay Field Naturalists)
- Elizabeth and Gordon McClaren Hare Island Nature Reserve (Thunder Bay Field Naturalists)
- Red Rock Nature Reserve (Thunder Bay Field Naturalists)

Existing Programs & Projects

- Four Provincially Significant Wetlands (PSWs) are located in the Black Sturgeon regional unit. Black Bay PSW (6,490.01 hectares), Harvais Lake PSW (13.93 hectares), Hurkett Cove PSW (186.46 hectares) and Shesheeb Bay PSW (516.46 hectares) are all located in the southern end of the regional unit, near Black Bay and Shesheeb Bay (on Black Bay Peninsula). The four PSWs provide a combined total of 7,206.86 hectares.
- The Ontario Ministry of Natural Resources Dorion Fish Culture Station is the site of captive rearing of brood stock and production fish for the Lake Nipigon strain of Brook Trout (Newman et al. 2003). This facility is located in the Black-Sturgeon region of the Lake Superior basin. The offspring from the Dorion Fish Culture Station are not stocked into Lake Superior (M. Chase, pers. comm., June 3 2013).
- The Ontario Ministry of Natural Resources undertook tracking of adult Lake Sturgeon on the Black Sturgeon River, to monitor seasonal distribution and identify important habitat (OMNR 2013c). This work ended in the fall of 2009 (M. Chase, pers. comm., June 3 2013).
- The Thunder Bay Field Naturalists have three nature reserves in the Black Sturgeon regional unit. Black Bay Nature Reserve is 160.5 acres in total and is a Great Lakes Heritage Coast signature site, and also contains provincially significant wetlands. Elizabeth and Gordon McClaren Hare Island Nature Reserve is 4 acres in total area and is adjacent to other conservation lands and is a Great Lakes Heritage Coast signature site. Red Rock Nature Reserve is 11.5 acres in total and is a Great Lakes Heritage Coast signature site (B. Yurkoski, pers. comm., February 16 2015).
- The Lakehead Region Conservation Authority (LRCA) undertakes a number of programs and services related to the Black Sturgeon regional unit. These include water control structures such as dams and channels, forest management and tree planting, and erosion control, among other programs (LRCA No date).
- Peregrine Falcons have been reintroduced to Ontario, including in the Lake Superior basin, following their extirpation as a breeding species in Ontario in the early 1960s (Ontario Peregrine Falcon Recovery Team 2010).

TABLE 7.3: Black Sturgeon IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
ON-011	Site	Black Bay Peninsula	High biodiversity value, relatively undisturbed habitat, significant wetland
ON-011	Area	Black Bay Peninsula	High biodiversity value, relatively undisturbed habitat, significant wetland
ON-013	Site	Black Sturgeon River, Split Rapids	Spawning area and previous spawning area for fish
ON-020	Site	Clark Island	Historic rare animal habitat
ON-021	Site	Nipigon Bay Clay Banks	Historic fish spawning habitat
ON-034	Site	Fluor Island	High biodiversity values
ON-083	Site	Nonwatin Lake and Black Sturgeon River	Fish spawning area
ON-106	Site	Shangoina Island	Rare animal habitat (unoccupied by Peregrine Falcon), colonial water bird habitat
ON-107	Site	Shillibeer Lake	Wetland; staging area for waterfowl
ON-138	Area	Black Bay	Extensive coastal wetlands, diversity of aquatic habitats; provincially significant bog community at east end of bay
ON-140	Area	Albert Lake Mesa Nature Reserve	Rare plant habitat
ON-142	Area	Cavern Lake Nature Reserve	Arctic-alpine plant community, rare plants, bat hibernaculum
ON-146	Area	Edward Island Nature Reserve	Fish spawning habitat; unique landform vegetation; part of Lake Superior Archipelago
ON-166	Area	Ouimet Canyon Nature Reserve	Arctic-alpine plant community, rare plant habitat
ON-171	Area	Puff Island Nature Reserve	Environmentally Sensitive Area (unusual geological features, bog area)
ON-175	Area	Shesheeb Bay Nature Reserve	Fish spawning habitat
ON-178	Area	Sleeping Giant	Old growth red and white pine stands, rare plant habitat, cliff habitats, coastal wetlands

Figure 7.3: Black Sturgeon - Important Habitat Sites and Areas

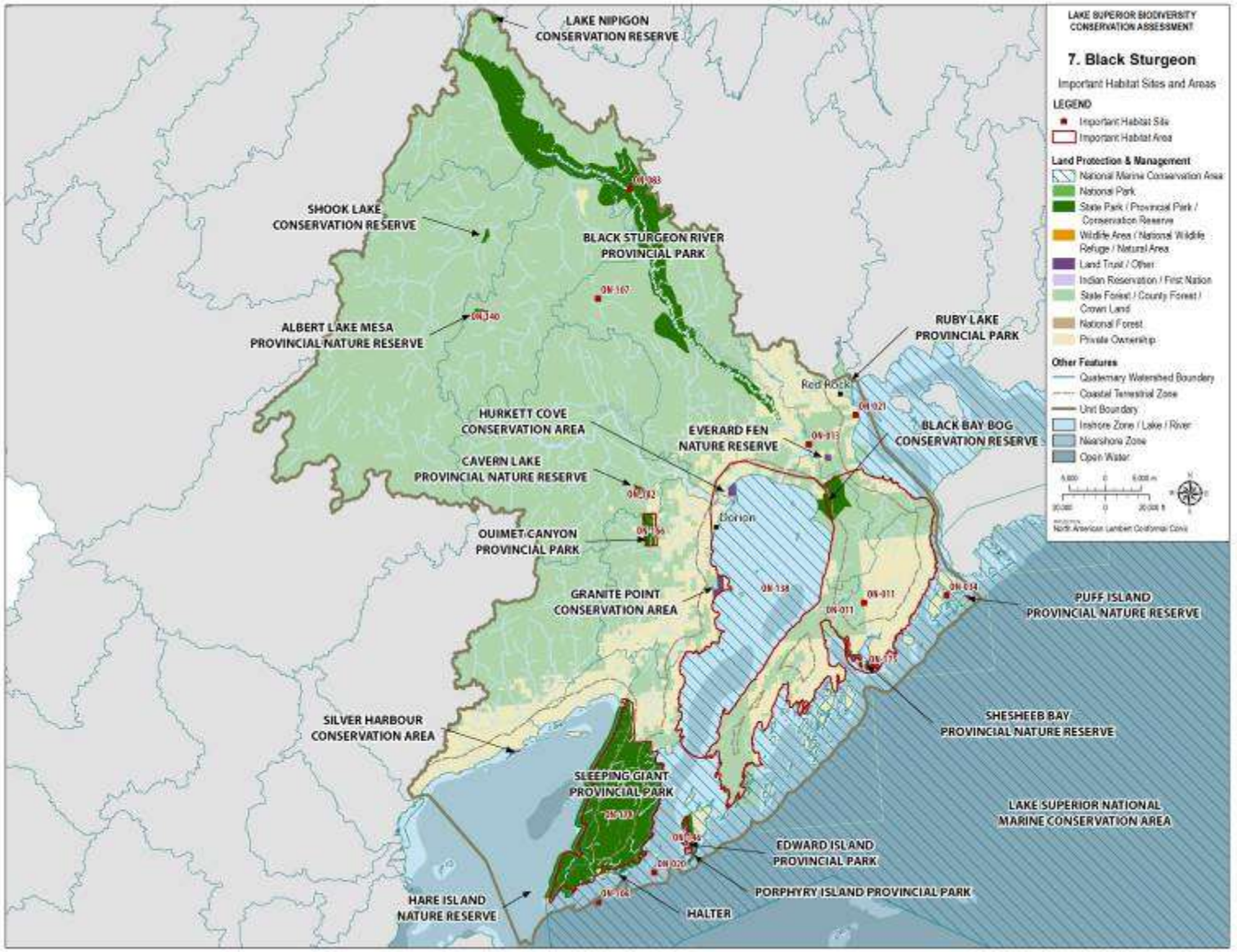


TABLE 7.4: Black Sturgeon LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 83 species and communities of conservation concern have been documented in the regional unit. 41 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 42 species and communities were once known to occur here, but have current conservation ranks of H (Historical).[8]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
American Dune Grass - Beach Pea - Sand Cherry Dune Grassland Type	American Dune Grass - Beach Pea - Sand Cherry Dune Grassland Type
Antennaria rosea	Rosy Pussytoes
Arenaria humifusa	Creeping Sandwort
Arnellia fennica	A Liverwort
Arnica cordifolia	Heart-leaved Arnica
Arnica lonchophylla	Long-leaved Arnica
Artemisia frigida	Prairie Sagebrush
Aulacomnium acuminatum	A Moss
Aulacomnium turgidum	A Moss
Basic Open Glaciere Talus Type	Basic Open Glaciere Talus Type
Bat Colony	Bat Hibernaculum/Nursery
Boreal Acidic Sandstone Open Cliff Type	Boreal Acidic Sandstone Open Cliff Type
Botrychium pseudopinnatum	False Northwestern Moonwort
Calamagrostis purpurascens	Purple Reed Grass
Caprimulgus vociferus	Whip-poor-will
Carex rossii	Ross' Sedge
Carex xerantica	Dryland Sedge
Corispermum americanum	American Bugseed
Cystopteris laurentiana	Laurentian Bladder Fern
Eleocharis nitida	Quill Spike-rush
Enallagma clausum	Alkali Bluet
Erebia discoidalis	Red-disked Alpine
Erebia mancinus	Taiga Alpine
Falco peregrinus	Peregrine Falcon
Gulo gulo	Wolverine
Gymnocarpium jessoense	Nahanni Oak Fern
Huperzia appressa	Mountain Firmoss
Hypnum fertile	A Moss
Ichthyomyzon fossor	Northern Brook Lamprey
Mnium thomsonii	A Moss
Moehringia macrophylla	Large-leaved Sandwort
Oeneis macounii	Macoun's Arctic
Oplopanax horridus	Devil's Club
Orthothecium chryseum	A Moss
Oxytropis splendens	Showy Locoweed
Pelecanus erythrorhynchos	American White Pelican

[8] Data included here were provided by the Ontario Ministry of Natural Resources and Forestry. Copyright Queen's Printer for Ontario (2012).

Potentilla hippiana	Horse Cinquefoil
Rangifer tarandus caribou	Woodland Caribou (Forest-dwelling boreal population)
Silene acaulis	Moss Campion
Trichophorum clintonii	Clinton's Clubrush
Viola epipsila	Northern Marsh Violet
Historical Records	
Scientific Name	**Common Name**
Acipenser fulvescens pop. 3	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)
Antennaria parvifolia	Small-leaved Pussytoes
Aquila chrysaetos	Golden Eagle
Astragalus adsurgens	Laxmann's Milk-vetch
Botrychium hesperium	Western Moonwort
Botrychium pallidum	Pale Moonwort
Botrychium spathulatum	Spatulate Moonwort
Bromus pumpellianus	Pumpelly's Brome
Bryum blindii	A Moss
Carex atratiformis	Scabrous Black Sedge
Carex loliacea	Ryegrass Sedge
Chelydra serpentina	Snapping Turtle
Chenopodium leptophyllum	Slim-leaved Goosefoot
Coregonus hoyi	Bloater
Coregonus zenithicus	Shortjaw Cisco
Cystopteris montana	Mountain Bladder Fern
Euchloe ausonides	Large Marble
Frullania inflata	A Liverwort
Great Lakes Arctic-Alpine Basic Open Bedrock Shoreline Type	Great Lakes Arctic-Alpine Basic Open Bedrock Shoreline Type
Grimmia teretinervis	A Moss
Gymnocarpium robertianum	Limestone Oak Fern
Leucophysalis grandiflora	Large-flowered Ground Cherry
Listera auriculata	Auricled Twayblade
Lobaria scrobiculata	A Lichen
Lycaena helloides	Purplish Copper
Malaxis paludosa	Bog Adder's-mouth
Myotis septentrionalis	Northern Myotis
Myurella tenerrima	A Moss
Pannaria conoplea	A Lichen
Phacelia franklinii	Franklin's Scorpionweed
Polystichum braunii	Braun's Holly Fern
Potentilla bimundorum	Staghorn Cinquefoil
Potentilla pulcherrima	Soft Cinquefoil
Rhizomnium gracile	A Moss
Sagittaria cristata	Crested Arrowhead
Scapania degenii	A Liverwort
Senecio eremophilus	Desert Ragwort
Stereocaulon subcoralloides	A Lichen
Sympetrum corruptum	Variegated Meadowhawk
Tetraplodon mnioides	A Moss
Woodsia alpina	Alpine Woodsia
Zizia aptera	Heart-leaved Alexanders

8. Arrow and Dog

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	A
NEARSHORE	D	COASTAL WETLANDS	C
EMBAYMENTS & INSHORE	C	COASTAL TERRESTRIAL	A
TRIBUTARIES & WATERSHEDS	C	**OVERALL B-**	

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

The mouth of the Current River, near Thunder Bay, Ontario. Photo credit: Ontario Ministry of Natural Resources

Summary/ Description

The Arrow and Dog regional unit is located on the northwestern shore of Lake Superior, and is 10,111.61 km^2 in size, including the associated nearshore waters. This regional unit extends from the international boundary in the west to just past the community of Thunder Bay in the east. Communities in this regional unit include the City of Thunder Bay, Fort William First Nation, Lac Des Mille Lacs First Nation, the Municipality of Oliver-Paipoonge, the Municipality of Neebing, the Township of O'Connor, the Township of Conmee, and the Township of Gillies. Several provincial parks, nature reserves and conservation areas are located in this regional unit. The Lakehead Region Conservation Authority's area of jurisdiction covers eight municipalities, including municipalities in the Dog/Arrow and Black Sturgeon regional units. The Arrow and Dog regional unit combines two tertiary watersheds, Arrow and Dog, and 17 quaternary watersheds. The watersheds are characterized by forests. The coast is dominated by cobble beaches with rocky shores and scattered coastal wetlands.

TABLE 8.1: Arrow and Dog BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	78.16	0.69	1,441.07	
Developed	44.92	0.40	389.55	
Forest	9,439.22	83.86	107,747.13	
Associated Nearshore Waters	484.49	4.30	17,868.03	
Other	521.47	4.63	8,227.57	
Water (inland)	688.03	6.11	9,473.05	
Total Area	**11,256.30**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	308.97	NA	5.30	Based on SOLEC shoreline
Sand Beaches (km)	1.28	0.42	0.20*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	17.31	7.34*	1.57**	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone	194.02	82.31*	3.14**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	109	NA	4.1	
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	5.75	NA		
Road Density (km/km^2)	0.74	NA		
Number of Dams and Barriers	2942	NA	12.4	
Artificial Shoreline (km)	36.83	11.92	16.16	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	3,116.63	28.93	10,771.30	Regional area based on landmass
Public/Crown	7,306.71	67.84	10,771.30	
Tribes/ First Nations	63.49	0.59	10,771.30	
Parks & Protected Areas (total)	284.47	2.64	10,771.30	
Parks & Protected Areas (coast)	17.98	7.63*	235.72**	*% of Regional Coastal Area **Regional Coastal Area (km^2)

Important Biodiversity Features

Nearshore and Inshore Waters

- Thunder Bay is noted as a Lake Superior embayment important for Lake Sturgeon (Auer 2003). In the Arrow and Dog regional unit this embayment and the nearshore zone, which provides corridors for movement, are identified as critical management areas for Lake Sturgeon in the Lake Superior basin (Auer 2003).
- Cisco are an important feature in western Lake Superior. Large spawning aggregations of Cisco are found in Thunder Bay (S. Greenwood, pers. comm., March 11 2013).

Coastal Zone and Islands

- The Arrow and Dog regional unit provides several sites of Important Habitat for Lake Trout, including many in Thunder Bay and around Pie Island and Flatland Island. One location of Important Habitat for Lake Whitefish is noted along the shore, near the international border (Lake Superior Binational Program Habitat Committee 2006) (Figure 8.1).

Tributaries and Watersheds

- Historically 21 tributaries in Lake Superior had Lake Sturgeon spawning runs. Two of these historical spawning tributaries, the Kaministiquia River and the Pigeon River are in the Arrow and Dog regional unit (the Pigeon River is on the shared boundary between the Arrow and Dog and Baptism-Brule regional units). The Kaministiquia River population status is extant and the population trajectory is stable. The Pigeon River population status is extant, while the population trajectory is unknown (Golder Associates Ltd. 2011).
- A Lake Sturgeon Rehabilitation Plan for Lake Superior (Auer 2003) identifies the Kaministiqua and Pigeon Rivers as two of the seventeen tributaries to Lake Superior in which there should be a focus on Lake Sturgeon rehabilitation.
- Several Important Habitat Areas are located throughout the Arrow and Dog regional unit, including Castle Creek Provincial Nature Reserve and Fraleigh Lake Provincial Nature Reserve and Kashabowie Provincial Park. Important Habitat Sites are also located throughout the Arrow and Dog regional unit (Lake Superior Binational Program Habitat Committee 2006) (Table 8.3, Figure 8.3).

Figure 8.1: Arrow and Dog - Coastal and Watershed Features

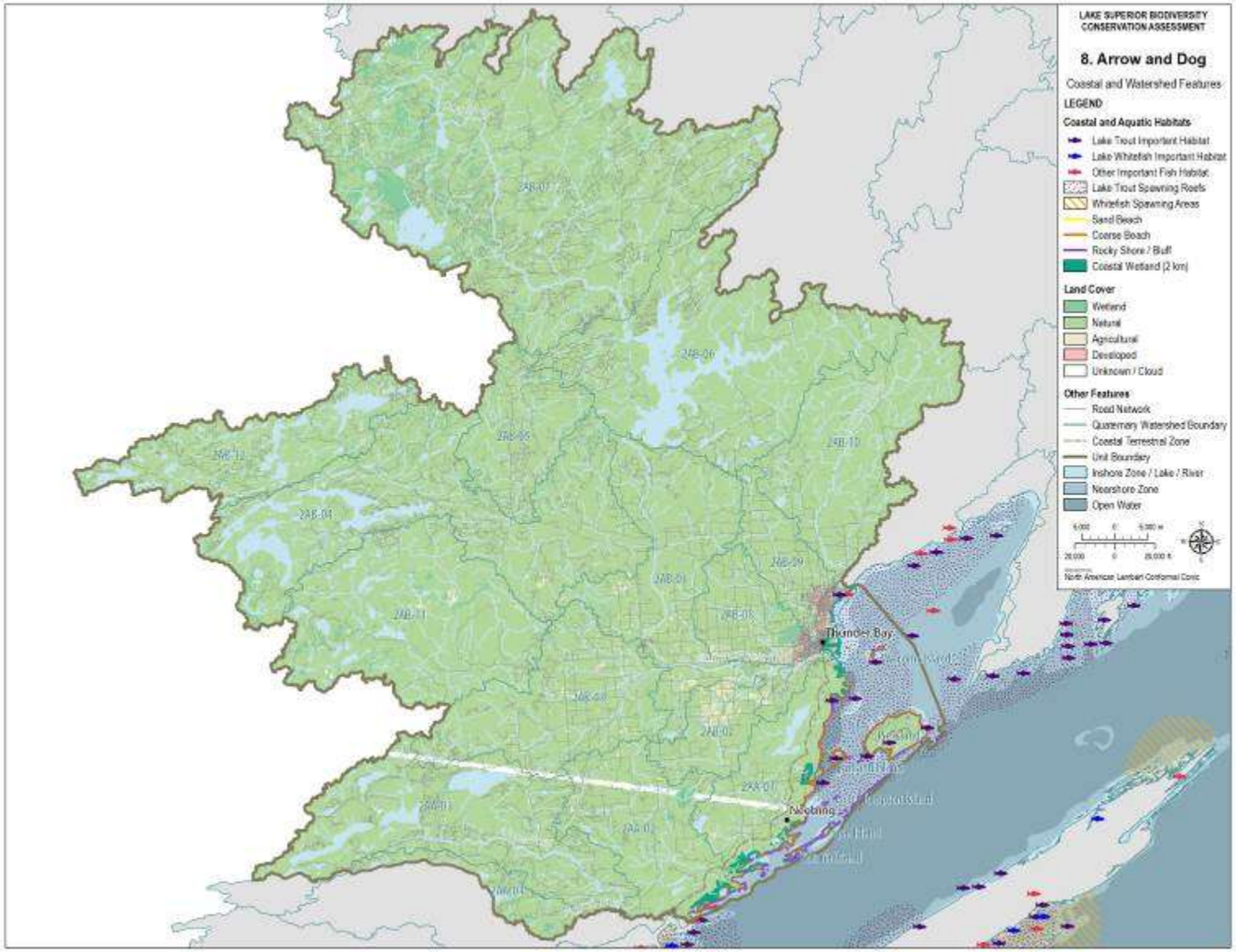


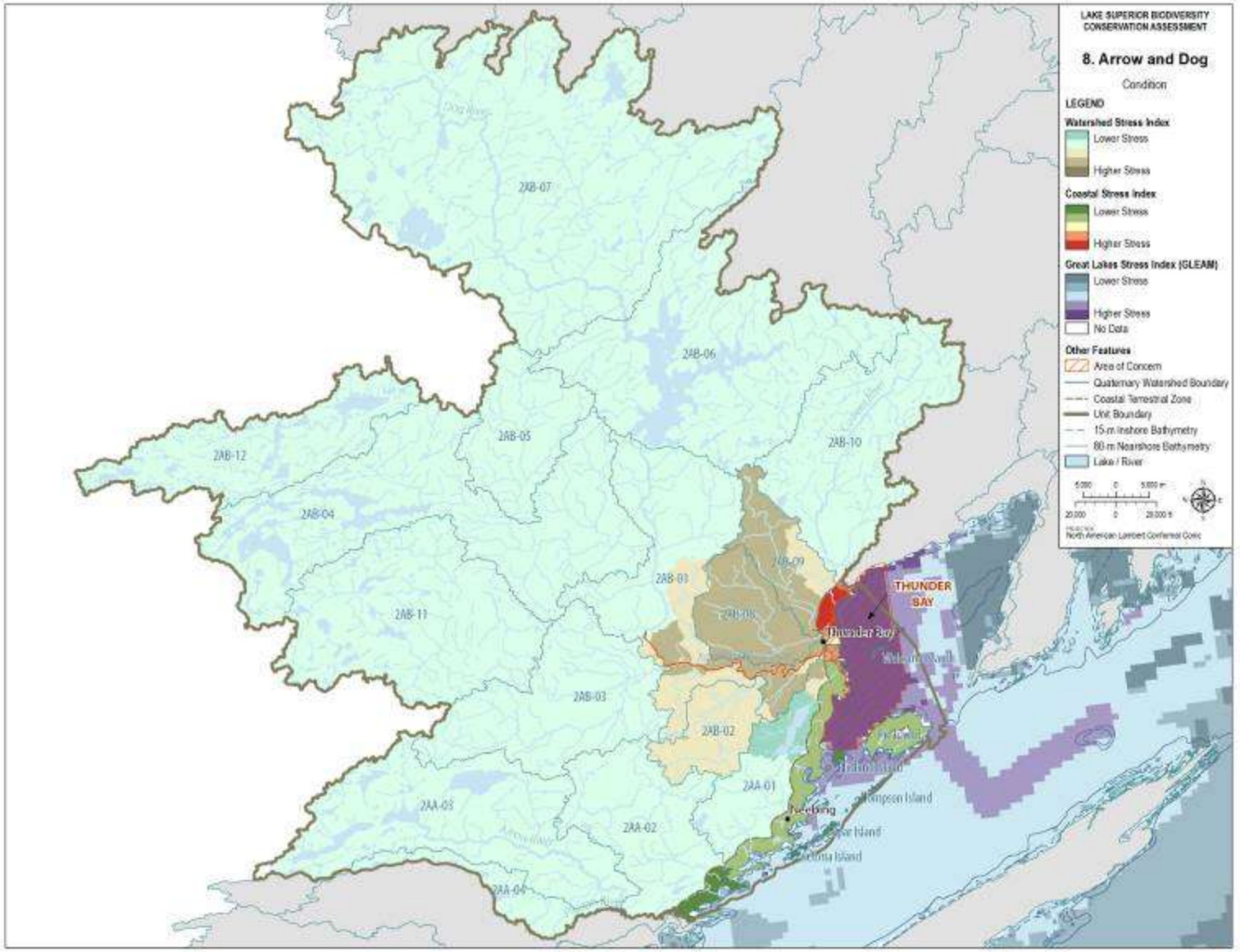
TABLE 8.2: Arrow and Dog CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	NA
Nearshore[1]	D (0.25)	Unknown
Embayments and Inshore[1,2]	C (0.40)	Unknown
Coastal Wetlands[2,3]	C (0.578)	Unknown
Islands[4]	A	Unknown
Coastal Terrestrial[3]	A (0.945)	Unknown
Tributaries and Watersheds[2]	C (0.54)	Unknown

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

Figure 8.2: Arrow and Dog - Condition



Important Issues & Threats

- The Thunder Bay Area of Concern (AOC) is located in the Arrow and Dog regional unit (Figure 8.2). The boundaries run along 28 km of shoreline and 9 km off shore, and the Welcome Islands are included in the boundaries. The issues associated with this AOC include Impairments to Fish Health, Impairments to Sediment Quality, Impairments to Water Quality and Impairments to Wildlife. These impairments were the result of discharges, largely from the forest products industry. Along the waterfront, fish and wildlife habitat was destroyed due to industrialization, dredging, release of pollutatns, channelization and waste disposal (Environment Canada 2014d). Approximately $165.6 million (Canadian dollars) has been spent to complete a number of remedial projects. The Public Advisory Committee (PAC) was re-established in 2009, following a six year hiatus after the Stage 2 report. The PAC is organized into five subcommittees to focus on the remaining beneficial use impairments (BUIs) (Thunder Bay RAP 2013). Many actions have been taken to improve the Thunder Bay AOC, including the remediation of contaminated sediment, upgrades to wastewater treatment plants due to federal and provincial regulations, habitat rehabilitation and shoreline softening. The remaining contaminated sediment requires remediation, and risk assessments are providing recommendations on remediation actions. The anticipated delisting date of the Thunder Bay AOC is 2025 (Environment Canada 2014d).

Conservation In Action

Parks & Protected Areas

- Centennial Park
- Cascades Conservation Area
- Wishart Conservation Area
- Hazelwood Lake Conservation Area
- Silver Falls Provincial Park
- Kashabowie Provincial Park
- Little Greenwater Lake Provincial Nature Reserve
- Matawin River Provincial Nature Reserve
- Arrow Lake Provincial Park
- Castle Creek Provincial Nature Reserve
- Divide Ridge Provincial Nature Reserve
- Fraleigh Lake Provincial Nature Reserve
- Kakabeka Falls Provincial Park
- Cedar Falls Conservation Area
- Le Pate Provincial Nature Reserve
- Thomson Island Provincial Nature Reserve
- Pigeon River Provincial Park
- Devon Road Mesa Provincial Nature Reserve
- Le Verendrye Provincial Park
- Caldwell Lake Nature Reserve (Thunder Bay Field Naturalists)
- Kam River Nature Reserve (Thunder Bay Field Naturalists)
- Painted Rock Nature Reserve (Thunder Bay Field Naturalists)
- Pine Bay Phase 1 Nature Reserve (Thunder Bay Field Naturalists)
- Pine Bay Phase 2 Nature Reserve (Thunder Bay Field Naturalists)
- William Bog Nature Reserve (Thunder Bay Field Naturalists)

Existing Programs & Projects

- Fourteen Provincially Significant Wetlands (PSWs) are located in the Arrow and Dog regional unit. Caldwell Lake PSW (157.73 hectares), Cloud Bay PSW (270.61 hectares), Horseshoe Lake PSW (27.09 hectares), Matawin River PSW (742.93 hectares), Mills Block PSW (355.17 hectares), Mission Island PSW (54.26 hectares), Neebing Marsh PSW (35.80 hectares), Neebing River PSW (139.19 hectares), Pearson Wetland PSW (653.44 hectares), Pine Bay PSW (690.59 hectares), Rosslyn Wetland PSW (109.45 hectares), Sturgeon Wetland PSW (115.57 hectares), WhiteFish PSW (302.24 hectares) and William's Bog PSW (655.64 hectares) are dispersed throughout the southern portion of the regional unit. The fourteen PSWs provide a combined total of 4,309.70 hectares.
- The Ontario Ministry of Natural Resources (MNR) conducted an eight-year study to track adult Lake Sturgeon and monitor larval Lake Sturgeon in the Kaministiquia River below Kakabeka Falls (Thunder Bay RAP 2013). The fieldwork was completed in 2012 (M. Chase, pers. comm., June 3 2013). The purpose was to determine the impacts of water flow and water level variation on Lake Sturgeon spawning success. This research will help to protect spawning habitat and rehabilitate Lake Sturgeon populations which use the Kaministiquia River, as well as to guide future hydro-electric development and water management planning around Lake Superior. This work is being completed in partnership with Ontario Power Generation (OMNR 2013c).
- The Ontario MNR Upper Great Lakes Management Unit (UGLMU) has established the Fish Community Index Netting (FCIN) program on Lake Superior. Started in 2009, the FCIN program represents an ecosystem-based fish community approach, which provides trend-through-time information on the fish community. Emphasis is on the commercially important species of Lake Trout and Lake Whitefish, but the shift is away from a single species approach, to monitoring of fish population dynamics (Thunder Bay RAP 2013). The FCIN program is underway in the Thunder Bay, Peninsula Harbour and Jackfish Bay AOCs, as well as in Nipigon Bay (no commercial fisheries) (M. Chase, pers. comm., June 3 2013).
- The Kaministiquia River Walleye Radio Telemetry Project is a project which uses radio telemetry to record the movement patterns and seasonal distribution of adult Walleye in the Kaministiquia River. The project will help to identify critical habitat and migration routes, as well as to monitor improvements made to alleviate water quality barriers. The multi-year project started in 2009 (Thunder Bay RAP 2013).
- The Current River Walleye Assessment involves the periodic assessment of the spawning population of Walleye at the mouth of the Current River, within Thunder Bay harbour. Artificial spawning habitat was created in 1991 to replace historical spawning habitat lost due to construction and development. A mark-recapture protocol has been used during three phases (1991-1993, 1999-2000 and 2010-2012) to conduct spawning assessments (Thunder Bay RAP 2013).
- The Lakehead Region Conservation Authority (LRCA) undertakes a number of programs and services related to the Arrow and Dog regional unit. These include water control structures such as dams and channels, forest management and tree planting, and erosion control, among other programs (LRCA No date).
- Caldwell Lake Nature Reserve (Thunder Bay Field Naturalists)
- Kam River Nature Reserve (Thunder Bay Field Naturalists)
- Painted Rock Nature Reserve (Thunder Bay Field Naturalists)
- Pine Bay Phase 1 Nature Reserve (Thunder Bay Field Naturalists)
- Pine Bay Phase 2 Nature Reserve (Thunder Bay Field Naturalists)
- William Bog Nature Reserve (Thunder Bay Field Naturalists)

- The Thunder Bay Field Naturalists have six nature reserves in the Arrow and Dog regional unit. Caldwell Lake Nature Reserve is 80 acres in total (40 acres of land and 40 acres of water), and is an Area of Natural and Scientific Interest (ANSI), part of the Great Lakes Heritage Coast, and is within the Lake Superior National Marine Conservation Area. Nipigon River Nature Reserve is 545 acres in total area and is adjacent to other conservation lands, is a Great Lakes Heritage Coast signature site, and contains provincially significant wetlands. Paradise Island Nature Reserve is 112 acres in total (58 acres of land and 54 acres of water). It is adjacent to conservation lands, a Great Lakes Heritage Coast signature site, an ANSI and within the Lake Superior National Marine Conservation Area (B. Yurkoski, pers. comm., February 16 2015).
- Peregrine Falcons have been reintroduced to Ontario, including in the Lake Superior basin, following their extirpation as a breeding species in Ontario in the early 1960s (Ontario Peregrine Falcon Recovery Team 2010).
- The Thunder Bay Field Naturalists have an active land securement program, and have recently purchased important coastal wetlands at Pine Bay.

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TABLE 8.3: Arrow and Dog IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
ON-016	Site	Caldwell Lake	Wetland; rare plant and animal habitat
ON-049	Site	Keifer Terminal Floodway	Coastal wetland; waterfowl staging area and brood rearing
ON-057	Site	Matawin River Nature Reserve	System of productive wetlands; fish spawning habitat waterfowl staging area, rare plant habitat
ON-057	Area	Matawin River Nature Reserve	System of productive wetlands; fish spawning habitat waterfowl staging area, rare plant habitat
ON-059	Area	Cloud Bay	Coastal wetland, waterfowl migration habitat
ON-086	Site	Northwood Bog	Rare plant habitat
ON-098	Site	Prince and Jarvis	Undisturbed, diverse habitat; raised cobble beaches and Norwester Chain Mountains
ON-114	Site	Slate River Drainage	Waterfowl staging and brood habitat
ON-116	Site	South Fowl Lake	Rare plant habitat (provincially and locally rare plants); Rare animal habitat, excellent waterfowl habitat
ON-129	Site	West Whitefish Lake	Large inland wetland, waterfowl breeding and staging area, rare animal habitat
ON-141	Area	Castle Creek Nature Reserve	Cliff habitat, wetlands, rare plants
ON-144	Area	Devon Road Mesa Nature Reserve	Rare plant habitat
ON-145	Area	Divide Ridge Nature Reserve	Cliff habitat
ON-147	Area	Fraleigh Lake Nature Reserve	
ON-151	Area	Kakabeka Falls	Fish spawning habitat
ON-153	Area	Kashabowie	Fish spawning habitat
ON-155	Area	La Verendrye	Rare plant habitat, cliff communities, wild rice marshes
ON-158	Area	Le Pate Nature Reserve	Unique landform feature (mesa)
ON-160	Area	Little Greenwater Lake Nature Reserve	
ON-163	Area	Middle Falls	Fish spawning habitat
ON-181	Area	Thompson Island Nature Reserve	

Figure 8.3: Arrow and Dog - Important Habitat Sites and Areas

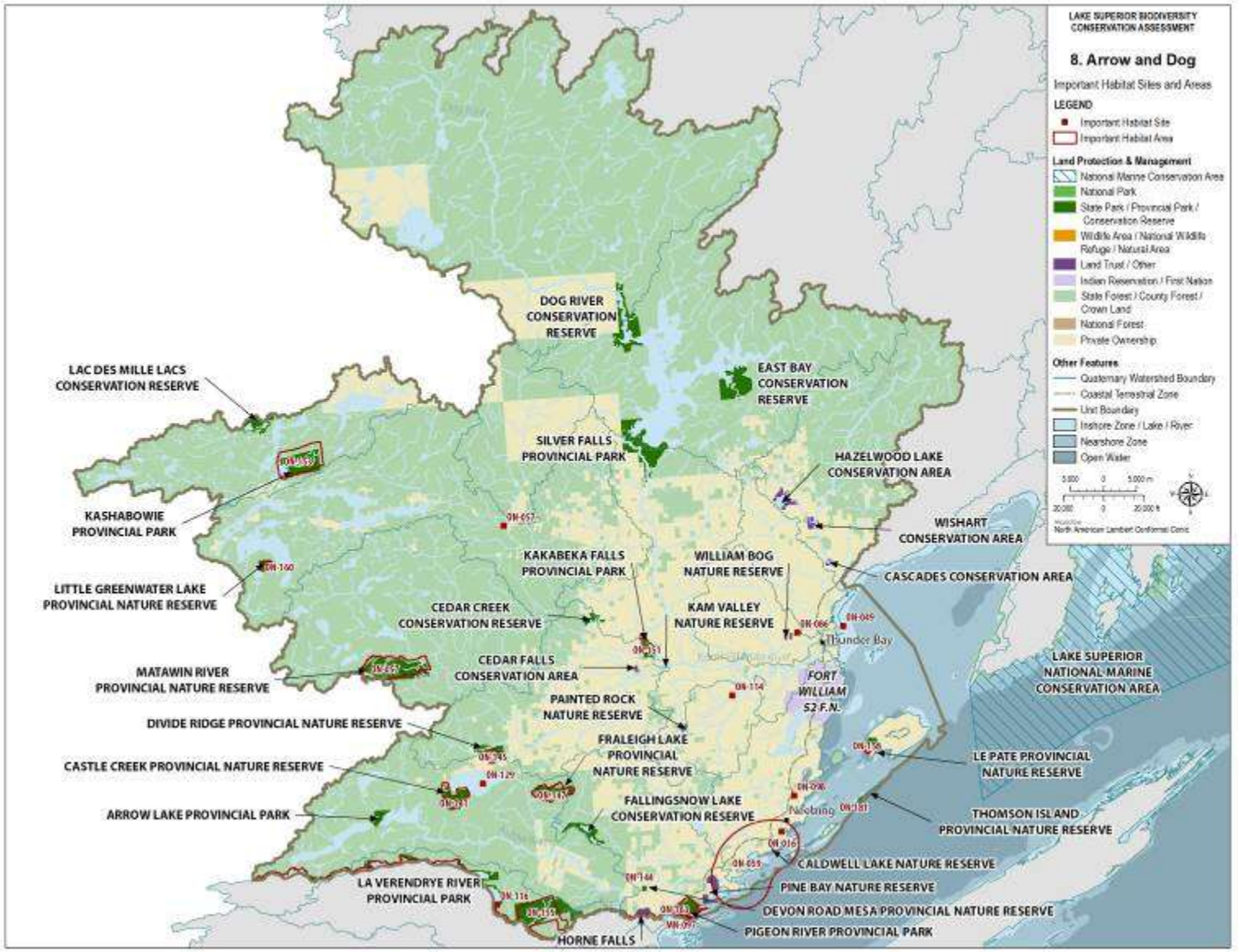


TABLE 8.4: Arrow and Dog LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 96 species and communities of conservation concern have been documented in the regional unit. 53 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 43 species and communities were once known to occur here, but have current conservation ranks of H (Historical).[9]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
Adoxa moschatellina	Muskroot
Amphidium mougeotii	A Moss
Arigomphus cornutus	Horned Clubtail
Artemisia frigida	Prairie Sagebrush
Basic Open Cliff Type	Basic Open Cliff Type
Boreal Open Seepage Fen Type	Boreal Open Seepage Fen Type
Botrychium pallidum	Pale Moonwort
Botrychium spathulatum	Spatulate Moonwort
Bur Oak - Saskatoon Berry Dry Deciduous Woodland Type	Bur Oak - Saskatoon Berry Dry Deciduous Woodland Type
Calamagrostis purpurascens	Purple Reed Grass
Caprimulgus vociferus	Whip-poor-will
Carex praticola	Northern Meadow Sedge
Carex rossii	Ross' Sedge
Carex supina	Weak Arctic Sedge
Carex xerantica	Dryland Sedge
Chelydra serpentina	Snapping Turtle
Chlidonias niger	Black Tern
Cirsium flodmanii	Flodman'sThistle
Corispermum americanum	American Bugseed
Corispermum villosum	Hairy Bugseed
Cypripedium arietinum	Ram's-head Lady's-slipper
Dichanthelium leibergii	Leiberg's Panic Grass
Dichanthelium perlongum	Long-stalked Panic Grass
Dolichonyx oryzivorus	Bobolink
Dry Fescue Mixedgrass Prairie Type	Dry Fescue Mixedgrass Prairie Type
Erebia discoidalis	Red-disked Alpine
Erigeron glabellus	Streamside Fleabane
Falco peregrinus	Peregrine Falcon
Festuca hallii	Plains Rough Fescue
Gymnocarpium jessoense	Nahanni Oak Fern
Haliaeetus leucocephalus	Bald Eagle
Hesperostipa comata	Needle-and-thread Grass
Huperzia appressa	Mountain Firmoss
Juncus vaseyi	Vasey's Rush
Leucophysalis grandiflora	Large-flowered Ground Cherry
Listera auriculata	Auricled Twayblade
Lithospermum canescens	Hoary Puccoon

[9] Data included here were provided by the Ontario Ministry of Natural Resources and Forestry. Copyright Queen's Printer for Ontario (2012).

Mannia pilosa	A Liverwort
Moist - Fresh Sugar Maple - Yellow Birch Deciduous Forest Type	Moist - Fresh Sugar Maple - Yellow Birch Deciduous Forest Type
Ophiogomphus anomalus	Extra-striped Snaketail
Ophiogomphus carolus	Riffle Snaketail
Oxytropis borealis var. viscida	Sticky Boreal Locoweed
Pascopyrum smithii	Western Wheat Grass
Pelecanus erythrorhynchos	American White Pelican
Podiceps grisegena	Red-necked Grebe
Salix myricoides	Blue-leaved Willow
Schoenoplectus heterochaetus	Slender Bulrush
Senecio eremophilus	Desert Ragwort
Solidago missouriensis	Missouri Goldenrod
Tamarack - Black Spruce Coniferous Organic Swamp Type	Tamarack - Black Spruce Coniferous Organic Swamp Type
Taxidea taxus	American Badger
Trichophorum clintonii	Clinton's Clubrush
Woodsia scopulina	Mountain Woodsia
Historical Records	
Scientific Name	**Common Name**
Acipenser fulvescens pop. 3	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)
Antennaria parvifolia	Small-leaved Pussytoes
Antennaria rosea	Rosy Pussytoes
Aquila chrysaetos	Golden Eagle
Arnica lonchophylla	Long-leaved Arnica
Asterella gracilis	A Liverwort
Astragalus adsurgens	Laxmann's Milk-vetch
Bromus pumpellianus	Pumpelly's Brome
Bryum blindii	A Moss
Carex atratiformis	Scabrous Black Sedge
Cerastium alpinum	Alpine Chickweed
Chenopodium leptophyllum	Slim-leaved Goosefoot
Cirsium drummondii	Drummond's Thistle
Coregonus hoyi	Bloater
Coregonus zenithicus	Shortjaw Cisco
Coscinodon cribrosus	Copper Coscinodon
Cuscuta cephalanthi	Buttonbush Dodder
Cystopteris laurentiana	Laurentian Bladder Fern
Diplophyllum taxifolium	A Liverwort
Euchloe ausonides	Large Marble
Great Lakes Arctic-Alpine Basic Open Bedrock Shoreline Type	Great Lakes Arctic-Alpine Basic Open Bedrock Shoreline Type
Gymnocarpium robertianum	Limestone Oak Fern
Ichthyomyzon fossor	Northern Brook Lamprey
Juncus subtilis	Creeping Rush
Lanius ludovicianus	Loggerhead Shrike
Lycaena helloides	Purplish Copper
Mannia sibirica	A Liverwort
Moehringia macrophylla	Large-leaved Sandwort
Myotis septentrionalis	Northern Myotis
Oeneis macounii	Macoun's Arctic
Pannaria conoplea	A Lichen
Phacelia franklinii	Franklin's Scorpionweed
Planorbella corpulenta whiteavesi	Whiteave's Capacious Rams-horn
Poa secunda	Curly Blue Grass

Polystichum braunii	Braun's Holly Fern
Rhizocarpon oederi	A Lichen
Scapania degenii	A Liverwort
Stereocaulon subcoralloides	A Lichen
Syngrapha selecta	
Viola epipsila	Northern Marsh Violet
Viola novae-angliae	New England Violet
Woodsia alpina	Alpine Woodsia
Xanthocephalus xanthocephalus	Yellow-headed Blackbird

9. Baptism-Brule

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	A
NEARSHORE	C	COASTAL WETLANDS	B
EMBAYMENTS & INSHORE	C	COASTAL TERRESTRIAL	A+
TRIBUTARIES & WATERSHEDS	C	**OVERALL B**	

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

Susie Island is the largest of 13 small, rocky islands jutting out of Lake Superior at the Pigeon River outlet. The island has been protected by The Nature Conservancy. Photo credit: The Nature Conservancy.

Summary/ Description

The Baptism-Brule region is located in the western portion of the Lake Superior basin, from the Ontario-Minnesota international boundary to just north of Silver Bay (near Illgen City), Minnesota. Including the nearshore waters associated with this regional unit, it is 3,912 km^2 in size. This hydrologic region is referred to as HUC 04010101 and is part of the larger Subregion 0401, Western Lake Superior. The region is located within the Northern Lakes and Forest ecoregion of Minnesota (USDA NRCS No date a), and is also referred to as the Lake Superior North Watershed by the Minnesota Pollution Control Agency (Minnesota PCA 2012a). Most of the land-base of the regional unit is in Cook County, with a smaller portion in Lake County (USDA NRCS No date a). The largest land ownership type in the watershed is federal ownership. State ownership is the second largest ownership type, followed by private. The remaining land is owned by tribal, private major, county or conservancy agencies (USDA NRCS No date a). Communities in the area include: Finland, Schroeder, Tofte, Lutsen, Grand Marais, Hovland (Minnesota PCA 2012a). The Grand Portage Band of Lake Superior Chippewa community is located at Grand Portage, and is one of the oldest Ojibwa settlements in Minnesota (Grand Portage No date). The Baptism-Brule regional unit is part of the territory ceded in the Treaty of 1854. The signatory tribes retain rights to hunt, fish, and gather within the regional unit (A. McCammon Soltis, pers. comm., January 5 2015). The Sawtooth Mountains are found along the shoreline (USDA NRCS No date a, No date b). The Baptism-Brule regional unit contains one tertiary (HUC 8) watershed, Baptism-Brule, and 11 quaternary (HUC 10) watersheds. The watersheds are almost completely forested. The coasts are dominated by exposed rocky shores and cliffs. Coastal wetlands are very rare in this region.

TABLE 9.1: Baptism-Brule BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	0.53	0.01	1,441.07	
Developed	0.80	0.02	389.55	
Forest	3,857.75	88.24	107,747.13	
Associated Nearshore Waters	257.84	5.90	17,868.03	
Other	75.90	1.74	8,227.57	
Water (inland)	178.96	4.09	9,473.05	
Total Area	**4,371.78**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	215.54	NA	3.70	Based on SOLEC shoreline
Sand Beaches (km)	2.00	0.93	0.31*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	12.55	3.80*	1.14**	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone	313.83	94.94*	5.08**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	46	NA	1.7	
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	1.26	NA		
Road Density (km/km^2)	0.33	NA		
Number of Dams and Barriers	816	NA	3.5	
Artificial Shoreline (km)	4.08	1.89	1.79	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	151.03	3.67	4,113.94	Regional area based on landmass
Public/Crown	3,655.64	88.88	4,113.94	
Tribes/ First Nations	187.55	4.56	4,113.94	
Parks & Protected Areas (total)	152.91	3.72	4,113.94	
Parks & Protected Areas (coast)	62.91	19.03*	330.55**	*% of Regional Coastal Area **Regional Coastal Area (km^2)

Important Biodiversity Features

Nearshore and Inshore Waters

- Grand Portage Bay, Clark's Bay and Wauswaugoning Bay are noted as Lake Superior embayments which are important for Lake Sturgeon (Auer 2003). In the Baptism-Brule regional unit these embayments and the nearshore zone, which provides corridors for movement, are identified as critical management areas for Lake Sturgeon in the Lake Superior basin (Auer 2003). Pigeon Bay is also noted to be used by Lake Sturgeon, in fact it is the bay most used by Lake Sturgeon in Grand Portage waters (S. Moore, pers. comm., May 14 2013).

- Areas identified as important habitat for Lake Trout are found in areas along the coast, and areas identified as important habitat for Lake Whitefish are found near Grand Portage, at the northern end of the Baptism-Brule regional unit (Lake Superior Binational Program Habitat Committee 2006) (Figure 9.1).
- The Baptism-Brule regional unit has several areas identified as biologically important by the Lake Superior Binational Program Habitat Committee (2006). A number of Important Habitat Sites and Important Habitat Areas are located within the region and along the shoreline (Table 9.3, Figure 9.3).

Coastal Zone and Islands

- A few small State Important Bird Areas are found along the coast in the Baptism-Brule regional unit (National Audubon Society 2013, 2012). These sites are some of the nine locations along Lake Superior that make up the 125 acre North Shore Peregrine Falcon Eyries IBA. These nine cliff areas are geographically separate and under different ownerships, but combined represent 70% of the recorded natural nest sites for Peregrine Falcons in Minnesota (Minnesota DNR 2013b).
- Susie Island is a Minnesota Biological Survey Site of Statewide Biodiversity Significance. Susie Island is noted to be ecologically significant due to unique flora and the presence of arctic-alpine disjunct species. Nine rare plant species are known to occur on the island (Minnesota DNR 1984).
- Arctic disjunct plant species occur in several locations along the coast (B. Carlson, pers. comm., March 20 2013)

Tributaries and Watersheds

- Historically 21 tributaries in Lake Superior had Lake Sturgeon spawning runs. One of these historical spawning tributaries, the Pigeon River is on the shared boundary between the Arrow and Dog and Baptism-Brule regional units. The Pigeon River population status is extant, while the population trajectory is unknown (Golder Associates Ltd. 2011).
- A Lake Sturgeon Rehabilitation Plan for Lake Superior (Auer 2003) identifies the Pigeon River as one of the seventeen tributaries to Lake Superior in which there should be a focus on Lake Sturgeon rehabilitation.
- Despite impairment issues in some areas, many areas of the watershed are described as of exceptional water quality (Minnesota PCA 2012a).
- The Art Lake Hardwood Ridges area is a Minnesota Biological Survey Site of Outstanding Biodiversity Significance. It is noted as a large natural area (4,670 acres) which is unfragmented in nature. The site contains high-quality native plant communities, including communities ranked as S2 (Imperiled) and S3 (Vulnerable to Extirpation) by the Natural Heritage and Nongame Wildlife Research Program. Large patches of old-growth upland forests and lowland forests are found within this area, as are rare plants and a rare bird species (defined as rare by Minnesota statutes) (Minnesota DNR 2008).
- The Baptism-Brule watershed is highly forested; other land covers include open water, shrub or scrubland and wetlands (USDA NRCS No date a). Agriculture accounts for a very small portion of land use; much of the land in this region is not well-suited for agriculture (USDA NRCS No date a).

Figure 9.1: Baptism-Brule - Coastal and Watershed Features

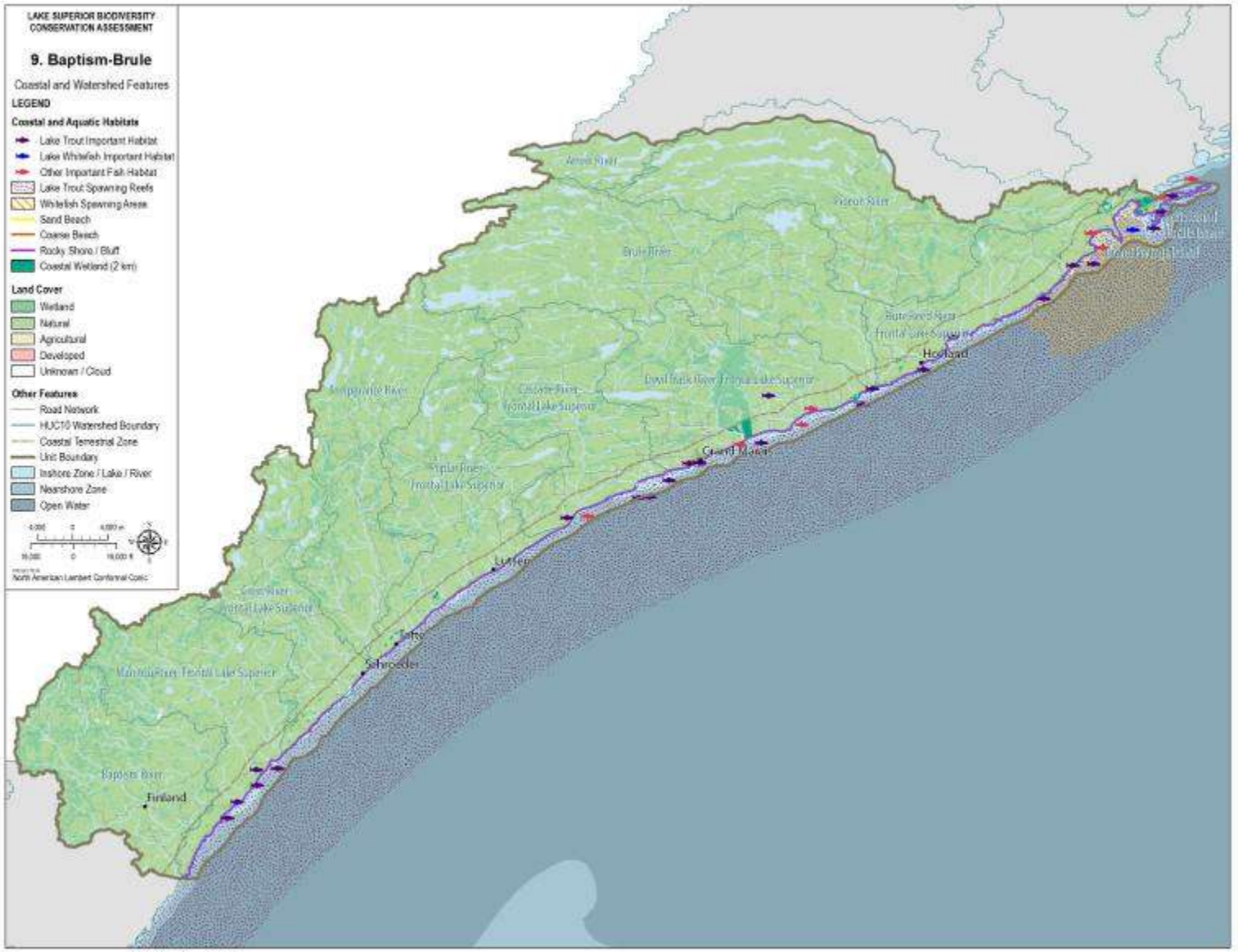


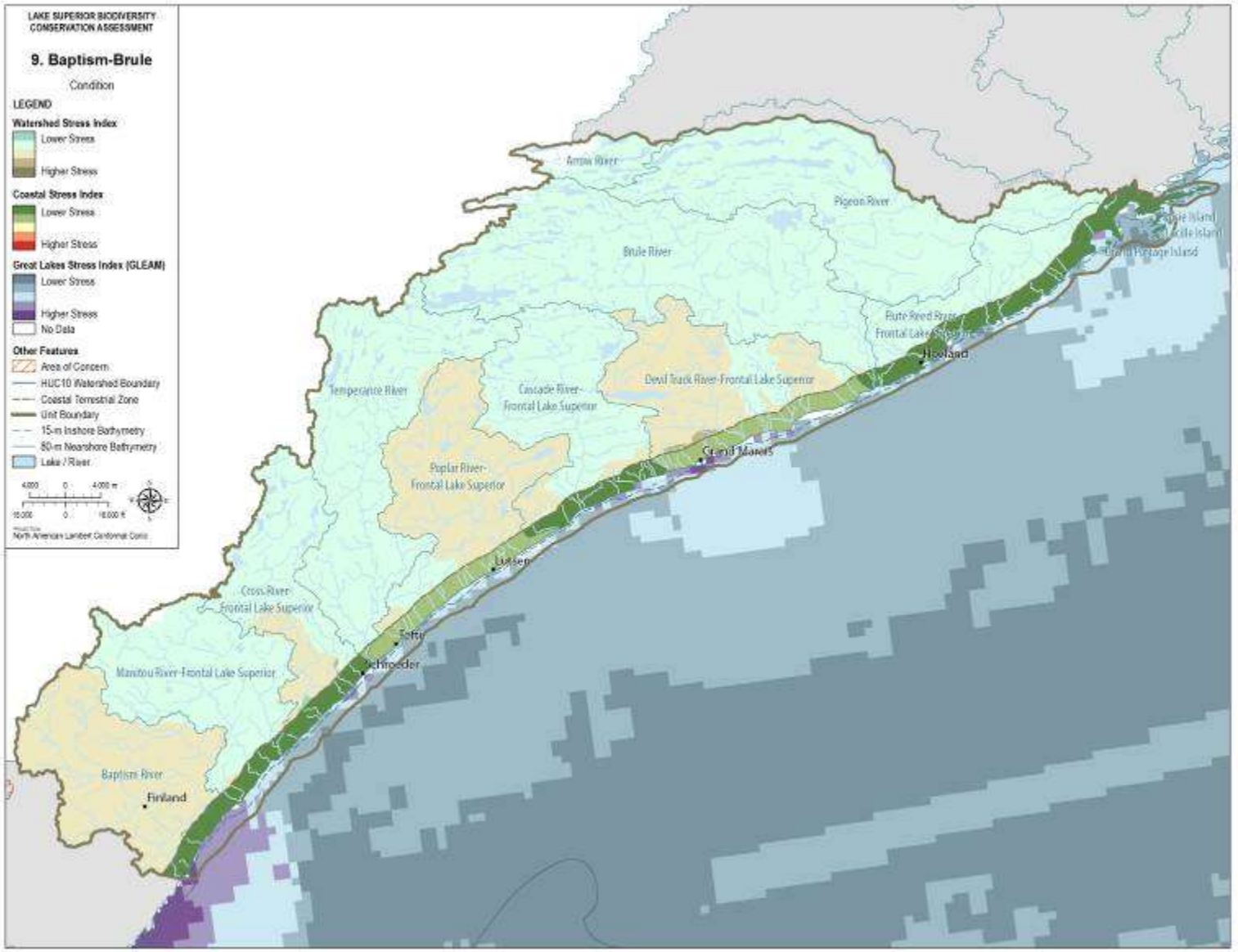
TABLE 9.2: Baptism-Brule CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	
Nearshore[1]	C (0.57)	
Embayments and Inshore[1,2]	C (0.57)	
Coastal Wetlands[2,3]	B (0.706)	
Islands[4]	A	
Coastal Terrestrial[3]	A+ (0.979)	Some local experts feel a grade of A may accurately reflect local conditions in the Coastal Terrestrial target. This is due to the combined effects of recent housing development fragmenting the forest, and the forest lacking much of its natural conifer component. Significant changes to forest cover and forest disturbance over the past 100 years have impacted the Coastal Terrestrial target (E. Perry, pers. comm., February 26 2013).
Tributaries and Watersheds[2]	C (0.57)	

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

Figure 9.2: Baptism-Brule - Condition



Important Issues & Threats

- The Rapid Watershed Assessment completed by the United States Department of Agriculture Natural Resources Conservation Service (USDA NRCS No date a) identifies several watershed concerns in the Baptism-Brule region. These include erosion (sheet and rill, streambank, lakeshore and roadside), groundwater and surfacewater quality and quantity, and management of timberlands, shoreline and wetlands (USDA NRCS No date a). The transport of sediments and pollutants to surfacewater due to erosion and stormwater are also identified (USDA NRCS No date a).
- Development pressures are stated to be moderate in this region (USDA NRCS No date a), however, development along the Lake Superior shoreline is noted as significant (Minnesota PCA 2012a). Other areas of the Baptism-Brule region are noted to be facing increased growth and development pressures, including the along the shorelines of the lower reaches of the Poplar and Flute Reed rivers (Minnesota PCA 2012a). This development is noted to be a contributing factor to pollution problems (Minnesota PCA 2012a).
- Estimates indicate 22 farm operations are located in the watershed region; more than 80% of these farms are less than 180 acres in size (USDA NRCS No date a).
- Some streams and lakes in the Baptism-Brule region are classified as impaired due to identified impairments, such as mercury or PCB in fish tissue, mercury in the water column, or turbidity. In the affected waterbodies, these impairments lead to designated uses being affected (Minnesota PCA 2012a).
- The USGS lists a total of 14 records for Nonindigenous Aquatic Species in the Baptism-Brule region. Of these, 4 are classified as exotic, 9 as native, and 1 as native hybrid (USGS 2012a).
- An Emergency Prevention and Response Plan for Viral Hemorrhagic Septicemia has been developed for Isle Royale National Park, Pictured Rocks National Lakeshore, Apostle Islands National Lakeshore and the Grand Portage Band of the Lake Superior Chippewa Reservation (within which is the Grand Portage National Monument) (NPS 2013a).
- Forest fragmentation as a result of housing development is an emerging concern in Minnesota. The forest that is present lacks much of its natural conifer component (E. Perry, pers. comm., February 26 2013).

Conservation In Action

Parks & Protected Areas

- Temperance State Park
- Cascade State Park
- Judge CR Magney State Park
- Boundary Waters Canoe Area Wilderness (within Superior National Forest)
- Superior National Forest

Existing Programs & Projects

- Brook Trout restocking efforts in Grand Portage, Minnesota, using fertilized eggs or fry of the Nipigon-strain of Brook Trout have been successful. The stocked Brook Trout migrated to Lake Superior and as adults they returned to the streams where they were stocked and successfully reproduced (Newman et al. 2003). The success of this restocking effort may be due to a combination of factors, including the strain of Brook Trout used, the early life stage at which the Brook Trout were stocked, and the protection from overharvest provided by Grand Portage (Newman et al. 2003).

- There are a number of Minnesota Biological Survey (MBS) Sites delineated in the Baptism-Brule regional units within Minnesota, some of which have been ranked with Outstanding or High Biodiversity Significance, based on statewide ranking criteria. The Minnesota Department of Natural Resource's MBS systematically collects, interprets, and delivers data on the distribution and ecology of native plants, animals, native plant communities, and functional landscapes throughout the state. MBS conducts landscape assessments, field surveys and monitoring activities, and provides data and tools to guide conservation and management within *MBS Sites of Statewide Biodiversity Significance* (MBS Sites). Biodiversity information includes the location and biodiversity significance rank of MBS Sites, the location and status of rare species populations, the type and condition of native plant communities, and, for selected sites, *MBS Ecological Evaluation* reports (Minnesota DNR 2013e, B. Carlson, pers. comm., March 20 2013). The MBS Sites located within the Baptism-Brule regional unit are Art Lake Hardwood Ridges, Deronda Bay, George Crosby Manitou State Park & Caribou Falls State Wayside, Horseshow Bay Shore, Hovland lookout Tower, Hovland Woods, Hovland Woods SNA (Swamp River W), Icelandite Coastal Fen, Iona's Beach, Lake Agnes Northern Hardwoods, Lutsen Natural Area, Myhr Creek Ridge, Ninemile Lakes and Ridges, Susie Island and Thomsonite Beach (L. Gerdes, pers. comm., March 18 2013).
- The State of Minnesota specifies a policy goal of non-degradation for all waters, maintaining them in a natural and unpolluted state. There are three levels of protection for surface waters. The highest level of protection applies to Outstanding Resource Value Waters (ORVWs). Additionally, all surface waters in the Lake Superior basin are Outstanding International Resource Waters (OIRW) (MPCA 2012e).
- The Grand Portage Band of Lake Superior Chippewa uses the designation of Outstanding Tribal Water Resources (OTRWs) as part of an anti-degradation policy to maintain and protect high quality waters. All waters within the boundaries of the Grand Portage Reservation are OTWRs, assigned to one of two subcategories. Each subcategory has specific implementation procedures (Grand Portage Band of Lake Superior Chippewa 2006).
- The Natural Resources Conservation Service (NRCS) Performance Results System (PRS) provides support for reporting the development and delivery of conservation programs (USDA NRCS No date d). From 1999 through 2007 a total of 46,953 acres were planned for conservation use, through the Total Conservations Systems. During this same period, a total of 3,945 acres of the planned conservation systems were applied (USDA NRCS No date a). Some of the conservation practices implemented included tree and shrub establishment (amounting to 1,032 total acres), total wildlife habitat (977 total acres), total wetlands created, restored or enhanced (60 total acres) and erosion control total soil saved (amounting to 722 tons per year) (USDA NRCS No date a).
- A number of projects, plans and monitoring programs are underway in this region. The 10 year rotation for intensive watershed monitoring for Minnesota's major watersheds will take place in the Baptism-Brule region in 2013; further studies and plans may be developed depending on the results of the monitoring program (Minnesota PCA 2012a). Monitoring of the Flute Reed River is undertaken by a partnership including a citizen's organization, the Minnesota Pollution Control Agency and the county Soil and Water Conservation District (Minnesota PCA 2012a). Lake associations are also monitoring lakes and working to develop lake management plans (Minnesota PCA 2012a).
- The Manitou Collaborative is a partnership which includes the United States Forest Service, the Minnesota Forest Resources Council, The Nature Conservancy, the Minnesota Department of Natural Resources, Wolf Ridge Environmental Learning Center and Lake County. The partnership of

public and private landowners began in 2000, and collaboratively the partners manage 100,000 acres in northeastern Minnesota. One fifth of the Manitou Landscape area is classified as Outstanding for statewide biodiversity significance, and 200 miles of high quality streams are located within this area. Mutually agreed upon management objectives for the vegetation include mimicking the range of natural variability to restore diverse and multi-aged forests and promoting diverse forests of multiple growth stages, while supporting the local economy (The Manitou Collaborative No date, USDA Forest Service No date a). The Art Lake Hardwood Ridges Minnesota Biological Survey Site of Outstanding Biodiversity Significance is located within the Manitou Collaborative area of focus (Minnesota DNR 2008).

- The North Shore Forest Collaborative is a combined effort of local, state and federal groups, along with public and private groups and individuals. Concentrated on the ecosystems along the North Shore of Lake Superior, the Collaborative agencies work together to restore and maintain native trees and forest communities for a healthy forest environment (North Shore Forest Collaborative No date).
- The North Shore Stewardship Association works to promote the protection and restoration of the North Shore of Lake Superior (Sugarloaf: The North Shore Stewardship Association No date).
- Six Citizen-based Groups are noted to do work in the Baptism-Brule (U.S. EPA 2013b). Additional projects, plans, conservation districts, organizations and partners related to the Baptism-Brule regional unit are noted in the Rapid Watershed Assessment (USDA NRCS No date a).
- Minnesota Biological Survey (MBS) Sites of Biodiversity Significance ranked High and Outstanding (B. Carlson, pers. comm., March 20 2013)

TABLE 9.3: Baptism-Brule IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
MN-004	Site	Amenda Creek	Northern Hardwood Forest, Upland White Cedar Forest
MN-006	Site	Grand Marais Point	Arctic disjunct plant community, rare plant habitat, geologic features
MN-011	Site	Big Bay	Geologic Feature
MN-013	Area	Boundary Waters Canoe Area	Rare plant and animal habitat, large representative ecosystems, geologic features
MN-015	Area	Butterwort Cliffs SNA	Rock shore community, aspen-birch forest, rare plant habitat, colonial waterbird habitat
MN-017	Site	Cannonball Bay	Arctic disjunct plant community, rare plant habitat
MN-018	Site	Caribou Falls WMA	Anadromous fish habitat, deer concentration area
MN-019	Area	Cascade River State Park	Arctic disjunct plant community, rare plant habitat
MN-026	Site	Deronda Bay and Red Rock	Rare plant habitat, geologic feature
MN-028	Site	Devil Track Lake	Rare animal habitat
MN-031	Site	Five Mile Rock	Colonial waterbird nesting habitat, geologic feature
MN-034	Area	George H. Crosby Manitou State Park	Northern hardwood forest, upland white cedar forest, rare animal habitat, rare plant habitat, anadromous fish habitat
MN-035	Site	Good Harbor Bay	Arctic disjunct plant community, rare plant habitat, geologic feature
MN-037	Site	Grand Marais Fen	Poor fen, sedge subtype
MN-038	Site	Grand Portage 4	Rare plant community
MN-039	Area	Grand Portage State Park	Rare plant habitat
MN-040	Area	Hat Point Area	Representative forest ecosystems, coastal shore communities, important natural/cultural resource
MN-041	Site	Heartbreak Creek	Northern hardwood-conifer forest, yellow birch-white cedar subtype, upland white cedar forest
MN-042	Site	Hollow Rock	Geomorphic feature (sea arch)
MN-045	Site	Horseshoe Bay	Geomorphic feature (raised beach)
MN-046	Area	Hovland Woods SNA	Large old growth forest complex with bogs, swamps, lake in the landscape, rare plant and animal habitat
MN-050	Area	Judge C. R. Magney State Park	Old growth white pine forest, rare plant habitat, geomorphic features, anadromous fish habitat
MN-051	Site	Kadunce Creek	Rare plant community
MN-052	Site	Kennedy Creek	Rare animal habitat
MN-055	Site	Lake Agnes Hardwoods	Northern hardwood forest, rare plant habitat
MN-056	Area	Lake Superior Highlands	Extensive natural communities and high biodiversity, rare plant and animal habitat
MN-058	Site	LeVeaux WMA	Representative natural plant communities, rare animal habitat
MN-060	Site	Little Marais	Rare animal habitat, colonial waterbird nesting habitat
MN-062	Area	Lutsen SNA	Old growth Northern Hardwood forest and upland white cedar forest
MN-065	Site	Manitou River	Fish spawning habitat, rare plant habitat
MN-068	Site	Mineral Center Maple Ridge	Northern Hardwood forest, rare plant habitat
MN-071	Site	Moose Fence Cedars	Upland white cedar forest
MN-077	Site	Oberg Mountain Hardwoods	Northern hardwood forest, rare plant habitat
MN-078	Site	Onion River Hardwoods	Northern hardwood forest, rare plant habitat

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
MN-079	Area	Paradise Beach	Coastal wetland, tamarack swamp, colonial waterbird nesting habitat, waterbird concentrations, geologic formations
MN-080	Site	Pearl Beach Hardwoods	Northern hardwood forest
MN-082	Site	Poplar River	Fish spawning habitat
MN-088	Site	Schroeder RNA	Northern hardwood forest, rare plant habitat
MN-090	Site	South Fowl Lake	Rare plant habitat
MN-091	Site	South Lutsen	Rare plant and animal habitat
MN-093	Area	Spring Beauty Hardwoods SNA	Old growth northern hardwood forest, rare plant habitat
MN-095	Area	Sugar Loaf Point SNA	Coastal wetland restoration project, rare plant habitat, geologic features
MN-097	Area	Susie Islands	Arctic-disjunct plant community, rare animal habitat
MN-098	Area	Swamp River Bog	Rare plant communities, old growth forest, rare plant habitat, rare animal habitat, waterbird concentrations
MN-099	Area	Temperance River State Park	Rare plant habitat, arctic disjunct plant populations, unusual geomorphic feature
MN-100	Area	Tettegouche State Park	Lake Superior pebble and bedrock beaches, exposed cliffs, Northern Hardwood-Conifer Forest, Northern Oak Forest, Upland White Cedar Forest
MN-102	Site	Tofte Town Park	Arctic and alpine disjunct plant habitat
MN-105	Site	Wolf Ridge	Rare animal habitat
MN-106	Site	Wringer Lake Hardwoods	Northern hardwood forest, rare plant habitat
MN-107	Site	Yellow Birch	Northern hardwood forest, rare plant habitat
MN-109	Site	Cross River State Park	Northern hardwoods forest, rare plant habitat
MN-110	Area	Devils Track Falls State Park	Rare plant habitat
MN-112	Area	Kadunce River State Park	Rare plant habitat
ON-155	Area	La Verendrye	Rare plant habitat, cliff communities, wild rice marshes

Figure 9.3: Baptism-Brule - Important Habitat Sites and Areas

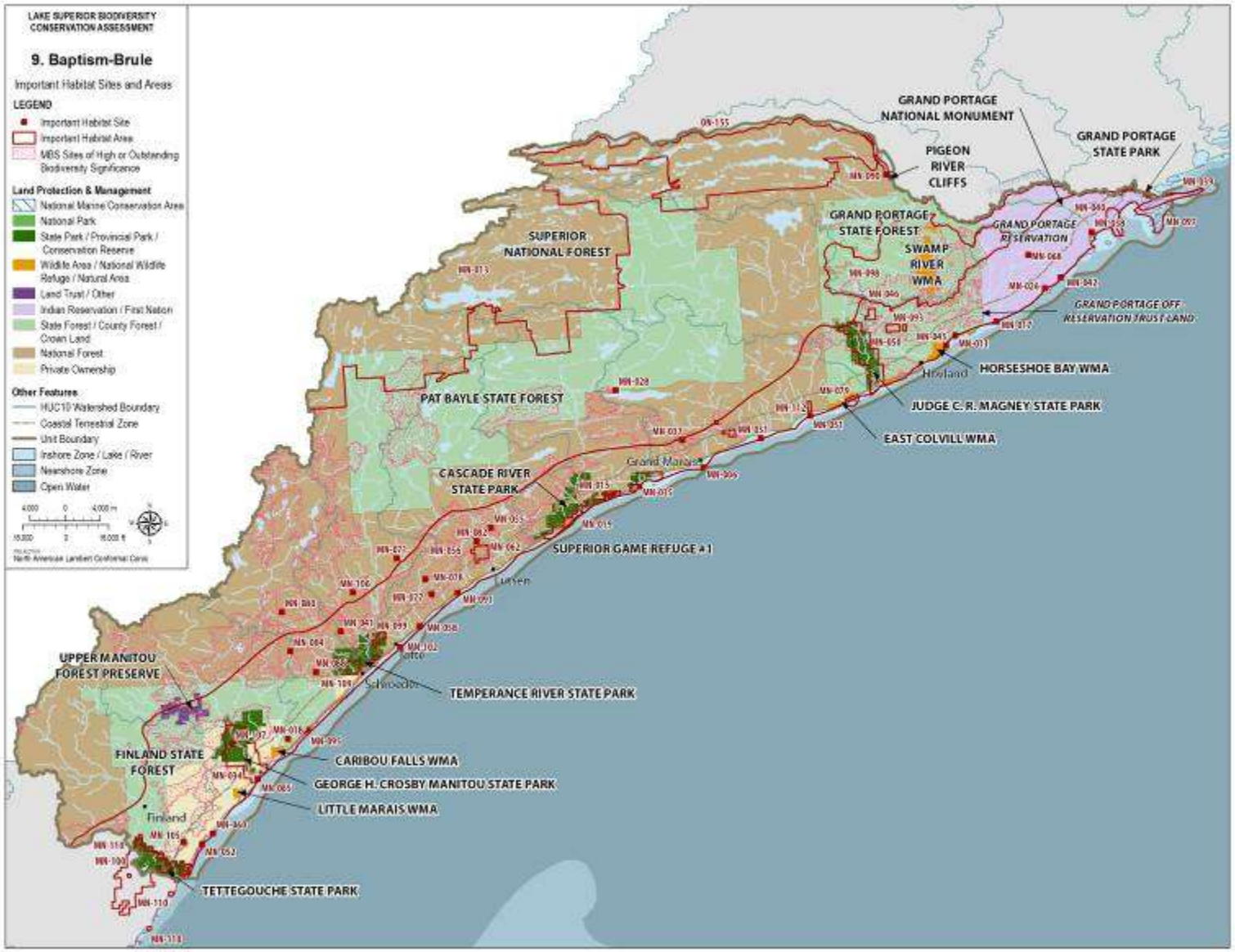


TABLE 9.4: Baptism-Brule LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 179 species and communities of conservation concern have been documented in the regional unit. 148 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 2 species and communities were once known to occur here, but have current conservation ranks of H (Historical). A further 29 species and communities of conservation concern are known to occur in this regional unit, but are currently not ranked for viability. [10]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
Accipiter gentilis	Northern Goshawk
Actaea pachypoda	White Baneberry
Adlumia fungosa	Climbing Fumitory
Adoxa moschatellina	Moschatel
Ahtiana aurescens	Eastern candlewax lichen
Allium schoenoprasum	Chives
Allocetraria oakesiana	Yellow ribbon lichen
Anaptychia crinalis	Hanging fringe lichen
Arctoparmelia centrifuga	Concentric Ring Lichen
Arethusa bulbosa	Dragon's-mouth
Arnica lonchophylla	Long-leaved Arnica
Artemisia campestris	Canadian Wormwood
Aspen - Birch Forest; Balsam Fir Subtype	Aspen - Birch Forest; Balsam Fir subtype
Aspen - Birch Forest; Hardwood Subtype	Aspen - Birch Forest, Hardwood Subtype
Asplenium trichomanes ssp. trichomanes	Maidenhair Spleenwort
Bistorta vivipara	Alpine Bistort
Boechera retrofracta	Holboell's Rock-cress
Botrychium lanceolatum ssp. angustisegmentum	Lanceleaf Grapefern
Botrychium lunaria	Common Moonwort
Botrychium matricariifolium	Matricary Grapefern
Botrychium michiganense	Michigan Moonwort
Botrychium minganense	Mingan Moonwort
Botrychium pallidum	Pale Moonwort
Botrychium rugulosum	St. Lawrence Grapefern
Botrychium simplex	Least Moonwort
Calamagrostis lacustris	Marsh Reedgrass
Calamagrostis purpurascens	Purple Reedgrass
Carex conoidea	Katahdin Sedge
Carex exilis	Coastal Sedge
Carex flava	Yellow Sedge
Carex gynandra	A Species of Sedge
Carex media	Intermediate Sedge
Carex michauxiana	Michaux's Sedge
Carex novae-angliae	New England Sedge

[10] Data included here were provided by the Division of Ecological and Water Resources, Minnesota Department of Natural Resources (DNR), and were current as of December 3 2014. These data are not based on an exhaustive inventory of the state. The lack of data for any geographic area shall not be construed to mean that no significant features are present.

Carex ormostachya	Necklace Spike Sedge
Carex pallescens	Pale Sedge
Carex praticola	Prairie Sedge
Carex rossii	Ross' Sedge
Carex supina ssp. spaniocarpa	Weak Arctic Sedge
Carex woodii	Wood's Sedge
Ceratophyllum echinatum	Spiny Hornwort
Claytonia caroliniana	Carolina Spring-beauty
Colonial Waterbird Nesting Area	Colonial Waterbird Nesting Site
Coregonus kiyi	Kiyi
Coregonus zenithicus	Shortjaw Cisco
Crataegus douglasii	Black Hawthorn
Cygnus buccinator	Trumpeter Swan
Cystopteris laurentiana	Laurentian Bladder Fern
Deschampsia flexuosa	Slender Hairgrass
Draba arabisans	Rock Whitlow-grass
Draba cana	Hoary Draba
Draba norvegica	Norwegian Whitlow-grass
Drosera anglica	English Sundew
Drosera linearis	Linear-leaved Sundew
Eleocharis nitida	Neat Spike-rush
Eleocharis quinqueflora	Few-flowered Spike-rush
Eleocharis robbinsii	Robbin's Spike-rush
Empetrum atropurpureum	Purple Crowberry
Erigeron acris var. kamtschaticus	Bitter Fleabane
Euphrasia hudsoniana var. ramosior	Hudson Bay Eyebright
Falco peregrinus	Peregrine Falcon
Fontinalis welchiana	
Frullania selwyniana	Selwyn's Ear-leaf Liverwort
Geocaulon lividum	Northern Comandra
Haliaeetus leucocephalus	Bald Eagle
Huperzia appalachiana	Appalachian Fir-clubmoss
Huperzia porophila	Rock Clubmoss
Hydroptila novicola	A Caddisfly
Juncus stygius var. americanus	Bog Rush
Lake Superior Rocky Shore Class	Lake Superior Rocky Shore
Lasmigona compressa	Creek Heelsplitter
Limnephilus rossi	A Caddisfly
Listera auriculata	Auricled Twayblade
Littorella americana	American Shore-plantain
Lobaria quercizans	Smooth lungwort
Lobaria scrobiculata	Textured lungwort
Lowland White Cedar Forest (North Shore) Type	Lowland White Cedar Forest (North Shore)
Luzula parviflora	Small-flowered Woodrush
Lycaeides idas nabokovi	Nabokov's Blue
Menegazzia terebrata	Port-hole Lichen
Microtus chrotorrhinus	Rock Vole
Moehringia macrophylla	Large-leaved Sandwort
Muhlenbergia uniflora	One Flowered Muhly
Myotis septentrionalis	Northern Myotis
Myriophyllum tenellum	Leafless Water Milfoil
Najas gracillima	Thread-like Naiad
Native Plant Community, Undetermined Class	Native Plant Community, Undetermined Class
Northern Poor Fen Class	Northern Poor Fen
Nymphaea leibergii	Small White Water-lily
Ophiogomphus anomalus	Extra-striped Snaketail

Osmorhiza berteroi	Chilean Sweet Cicely
Osmorhiza depauperata	Blunt-fruited Sweet Cicely
Oxytropis viscida	Sticky Locoweed
Packera indecora	Elegant Groundsel
Paper Birch - Sugar Maple Forest (North Shore) Type	Paper Birch - Sugar Maple Forest (North Shore)
Peltigera venosa	Fan lichen
Phacelia franklinii	Franklin's Phacelia
Phenacomys ungava	Eastern Heather Vole
Pinguicula vulgaris	Butterwort
Piptatherum canadense	Canada Mountain-Ricegrass
Platanthera clavellata	Club-spur Orchid
Polystichum braunii	Braun's Holly Fern
Potamogeton oakesianus	Oakes' Pondweed
Potamogeton vaseyi	Vasey's Pondweed
Prosartes trachycarpa	Wartyfruit Fairy Bells
Protopannaria pezizoides	Brown-gray Moss-shingle Lichen
Pseudocyphellaria crocata	Yellow specklebelly lichen
Pyrola minor	Small Shinleaf
Ramalina thrausta	Angel's Hair Lichen
Ranunculus lapponicus	Lapland Buttercup
Red Pine - White Pine Woodland (Canadian Shield) Type	Red Pine - White Pine Woodland (Canadian Shield)
Rhynchospora fusca	Sooty-colored Beak-rush
Rubus chamaemorus	Cloudberry
Sagina nodosa ssp. borealis	Knotty Pearlwort
Salix pellita	Satiny Willow
Saxifraga cernua	Nodding Saxifrage
Saxifraga paniculata	Encrusted Saxifrage
Schistostega pennata	Luminous Moss
Scirpus georgianus	Georgia Bulrush
Scirpus pedicellatus	Woolgrass
Selaginella selaginoides	Northern Spikemoss
Setophaga caerulescens	Black-throated Blue Warbler
Shepherdia canadensis	Canada Buffaloberry
Sorex fumeus	Smoky Shrew
Sparganium glomeratum	Clustered Bur-reed
Splachnum ampullaceum	A Species of Moss
Splachnum rubrum	Red Parasol Moss
Sticta fuliginosa	Peppered moon lichen
Subularia aquatica ssp. americana	Awlwort
Sugar Maple Forest (North Shore) Type	Sugar Maple Forest (North Shore)
Tayloria serrata	
Tofieldia pusilla	Small False Asphodel
Torreyochloa pallida	Torrey's Manna-grass
Torreyochloa pallida var. fernaldii	Pale Manna Grass
Trichocolea tomentella	A Species of Liverwort
Trisetum spicatum	Narrow False Oats
Upland White Cedar Forest Type	Upland White Cedar Forest
Usnea longissima	Methuselah's Beard Lichen
Utricularia resupinata	Lavendar Bladderwort
Vaccinium uliginosum	Alpine Bilberry
Waldsteinia fragarioides var. fragarioides	Barren Strawberry
White Cedar - Yellow Birch Forest Type	White Cedar - Yellow Birch Forest
White Pine - Red Pine Forest Type	White Pine - Red Pine Forest
Woodsia alpina	Alpine Woodsia
Woodsia glabella	Smooth Woodsia
Woodsia oregana ssp. cathcartiana	Oregon Woodsia

Woodsia scopulina ssp. laurentiana	Rocky Mountain Woodsia
Xyris montana	Montane Yellow-eyed Grass
Historical Records	
Scientific Name	**Common Name**
Agrostis scabra	Rough Bentgrass
Empetrum nigrum	Black Crowberry
Unranked Records	
Scientific Name	**Common Name**
Acipenser fulvescens	Lake Sturgeon
Aegolius funereus	Boreal Owl
Bidens discoidea	Bur-marigold
Black Spruce Bog Type	Black Spruce Bog
Botaurus lentiginosus	American Bittern
Buteo lineatus	Red-shouldered Hawk
Carex xerantica	Dry Sedge
Castilleja septentrionalis	Northern Paintbrush
Coccocarpia palmicola	Salted shell lichen
Coturnicops noveboracensis	Yellow Rail
Ice erosion (quaternary)	Ice Erosion (Quaternary)
Igneous composition (middle proterozoic)	Igneous Composition (Middle Proterozoic)
Igneous intrusion (middle proterozoic)	Igneous Intrusion (Middle Proterozoic)
Igneous unit or sequence (middle proterozoic)	Igneous Unit or Sequence (Middle Proterozoic)
Juniperus horizontalis	Creeping Juniper
Lake erosion (quaternary)	Lake Erosion (Quaternary)
Listera convallarioides	Broad-lipped Twayblade
Mineral	Mineral
Mixed unit or sequence (middle proterozoic)	Mixed Unit or Sequence (Middle Proterozoic)
Northern Rich Tamarack Swamp (Western Basin) Class	Northern Rich Tamarack Swamp (Western Basin)
Parmelia stictica	A Species of Lichen
Red Oak - Sugar Maple - Basswood - (Bluebead Lily) Forest Type	Red Oak - Sugar Maple - Basswood - (Bluebead Lily) Forest
Stream erosion (proterozoic, phanerozoic)	Stream Erosion (Proterozoic, Phanerozoic)
Stream erosion (quaternary)	Stream Erosion (Quaternary)
Strix nebulosa	Great Gray Owl
Trichophorum clintonii	Clinton's Bulrush
Umbilicaria torrefacta	Punctured rock tripe lichen
Utricularia gibba	Humped Bladderwort
Vitis riparia	Dune Grape

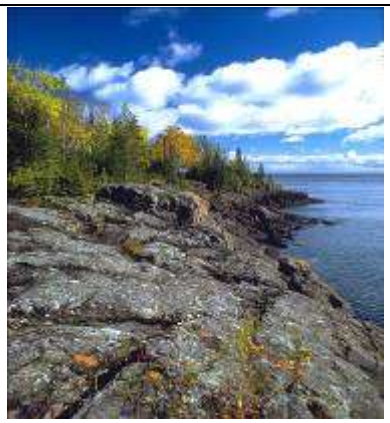
10. Isle Royale

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	A
NEARSHORE	B	COASTAL WETLANDS	A-
EMBAYMENTS & INSHORE	B	COASTAL TERRESTRIAL	A+
TRIBUTARIES & WATERSHEDS	A	**OVERALL A**	

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*



Isle Royale was designated as a World Biosphere Reserve in 1980. Photo credit: National Park Service.

Summary/ Description

Isle Royale is located in the northwestern part of Lake Superior, the closest mainland is approximately 14 miles (22.5 kilometres) away (NPS 2013c). The island of Isle Royale is a national park, along with the more than 450 smaller islands located around it (NPS 2013c). This regional unit is 950.37 km^2 in size, including the associated nearshore waters. The Isle Royale regional unit is part of the territory ceded in the Treaty of 1842. The signatory tribes retain rights to hunt, fish, and gather within the regional unit (A. McCammon Soltis, pers. comm., January 5 2015). The waters of Isle Royale are said to contain the most productive native fishery in Lake Superior, as well as the most genetically diverse Lake Trout populations in the entire lake (NPS 2013c). Recently, evidence of the "redfin" Lake Trout morph has been found in the Isle Royale waters (Muir et al 2014). Only about half of the mammal species found on the mainland are found in the park, and for some of these species long-term research has been studying ecological interactions (NPS 2013c, UNESCO 2005). A number of other research projects are carried out in the park, due to its remote and relatively undisturbed ecosystem; research topics include vegetation studies and acid rain (UNESCO 2005). Several western disjunct plant species are found in the Isle Royale regional unit (NPS 2013c). The Isle Royale regional unit is composed solely of islands and island complexes. There are no tertiary (HUC 8) or quaternary (HUC 10) watersheds identified for this regional unit. The watersheds are completely forested, and are some of the most intact in the Lake Superior basin. The coasts are dominated by exposed rocky shores and cliffs. Wetlands are common within the coastal area.

TABLE 10.1: Isle Royale BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	0.0	0.0	1,441.07	
Developed	0.08	0.01	389.55	
Forest	492.38	46.41	107,747.13	
Associated Nearshore Waters	488.78	46.07	17,868.03	
Other	27.74	2.61	8,227.57	
Water (inland)	52.04	4.90	9,473.05	
Total Area	**1,061.02**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	477.98	NA	8.20	Based on SOLEC shoreline
Sand Beaches (km)	0.00	0.00	0.00*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	105.02	28.92*	9.52 **	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone	324.68	89.42*	5.26**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	433	NA	16.3	
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	0.00	NA		
Road Density (km/km^2)	0	NA		
Number of Dams and Barriers	0	NA	0	
Artificial Shoreline (km)	0.89	0.19	0.39	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	0.14	0.02	572.24	Regional area based on landmass
Public/Crown		0.00	572.24	
Tribes/ First Nations		0.00	572.24	
Parks & Protected Areas (total)	572.11	99.98	572.24	
Parks & Protected Areas (coast)	362.94	99.96*	363.08**	*% of Regional Coastal Area **Regional Coastal Area (km^2)

Important Biodiversity Features

Nearshore and Inshore Waters

- Important habitat for both Lake Whitefish and Lake Trout is found in many areas of Isle Royale (Lake Superior Binational Program Habitat Committee 2006) (Figure 10.1).
- The fisheries around Isle Royale may contain unique morphotypes of Lake Trout (NPS 2013a). Recent work by Muir et al. (2014) has demonstrated quantitative evidence of a Lake Trout morph, the “redfin”, in the waters off Isle Royale.

- Sampling of the nearshore and inshore fish community over approximately 300 kilometres of Isle Royale shoreline in and around major embayments resulted in 17 fish species sampled. Twelve of these species were common in the Lake Superior fish community (Gorman et al. 2008).

Coastal Zone and Islands

- The coastal zone of Isle Royal is one of the most intact in the entire Great Lakes
- The entire Isle Royale regional unit is identified as an Important Habitat Area by the Lake Superior Binational Program Habitat Committee (2006). Several Important Habitat Sites are also located on the island (Table 10.3, Figure 10.3).
- Isle Royale National Park is noted as a State Important Bird Area (National Audubon Society 2013, 2012).
- The islands of Isle Royale National Park are home to 18 species of mammal, in comparison to the 40 or more mammal species found on the mainland (NPS 2013c). The isolation of the island makes colonisation by new species more difficult and some species which were previously present (e.g. caribou and coyote) are no longer part of the Isle Royale ecosystem (NPS 2013c).
- The shoreline of Isle Royale is described as heavily forested (NPS 2013c).

Tributaries and Watersheds

- Several of the streams support coaster Brook Trout
- As with the coastal areas, the watersheds of the island are some of the last undisturbed watersheds in the Great Lakes. Many types of wetlands are supported on Isle Royale (NPS 2013c).
- Some inland lakes support high abundances of clams, while other inland lakes contain no clams at all (NPS 2013c).

Figure 10.1: Isle Royale - Coastal and Watershed Features

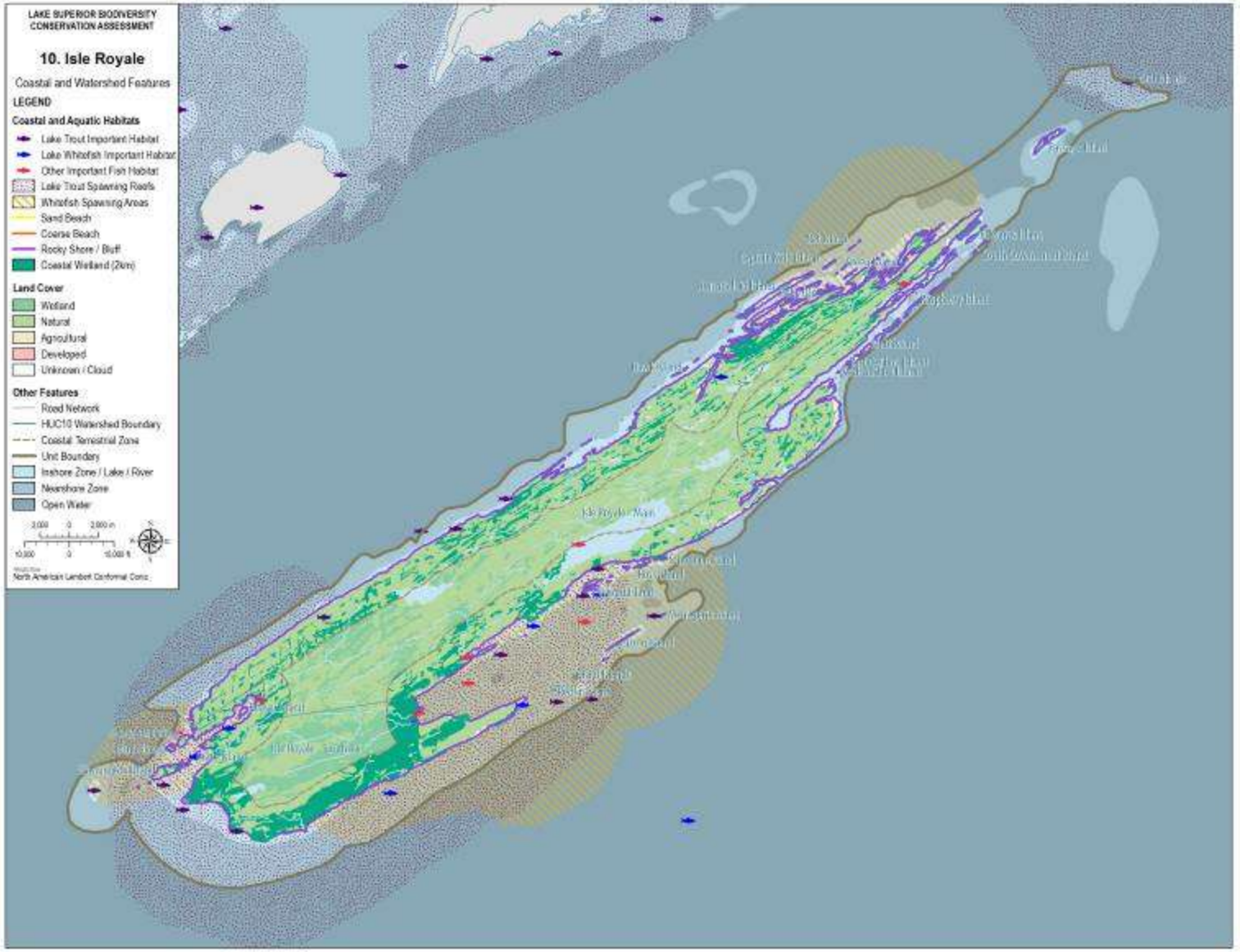


TABLE 10.2: Isle Royale CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	
Nearshore[1]	B (0.61)	
Embayments and Inshore[1,2]	B (0.76)	
Coastal Wetlands[2,3]	A- (0.837)	
Islands[4]	A	
Coastal Terrestrial[3]	A+ (1.000)	
Tributaries and Watersheds[2]	A (0.90)	

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

Figure 10.2: Isle Royale - Condition

Important Issues & Threats

- An Emergency Prevention and Response Plan for Viral Hemorrhagic Septicemia has been developed for Isle Royale National Park, Pictured Rocks National Lakeshore, Apostle Islands National Lakeshore and the Grand Portage Band of the Lake Superior Chippewa Reservation (within which is the Grand Portage National Monument) (NPS 2013a).
- The presence of Emerald Ash Borer (EAB) has not yet been detected on Isle Royale; however, the island is now under Federal EAB quarantine and Michigan state quarantine (Cooperative Emerald Ash Borer Project 2013).
- Some harvesting of white pine for timber has occurred in the past (UNESCO 2005).
- Acid rain has been studied in Isle Royale (UNESCO 2005).
- High levels of PCBs are noted in the lakes of Isle Royale (UNSECO 2005).
- Invasive gypsy moths (*Lymantria dispar*) have been trapped on Isle Royale since 2000, but no reproducing populations are known to exist on the island (NPS 2013c).
- Invasive spiny water fleas (*Bythotrephes cederstremi*) have been found in the Lake Superior waters of Isle Royale, but they have not yet been discovered in the inland lakes o(NPS 2013c).

Conservation In Action

Parks & Protected Areas

- Isle Royale National Park
- Isle Royale Biosphere Reserve

Existing Programs & Projects

- Few wild populations of Brook Trout are both sufficiently large to serve as a source population for brood stock, and exhibit the migratory or lake-dwelling life history. In 2002 three strains in the Lake Superior basin met both of these criteria. Two of these strains were from the Isle Royale area, including the Tobin Harbor and Siskiwit Bay strains (Newman et al. 2003). The Siskiwit Bay strain comes from a migratory population which spawns in the Big Siskiwit River and the Little Siskiwit River (Newman et al. 2003). The gametes that contribute to the captive stock were collected in 1995 and 1999 (Newman et al. 2003).
- Captive brood stock and production fish from the Tobin Harbor and Siskiwit Bay strains of Brook Trout are reared at the U.S. Fish and Wildlife Service Iron River National Fish Hatchery (in the Nemadji to Fish Creek region) (Newman et al. 2003).
- Zebra mussels are present in Isle Royale National Park, but an eradication program has been in place since 2009. The park is now one of the few areas worldwide where zebra mussel numbers are declining (P. Brown, pers. comm., June 24 2014).
- Under the Michigan Water Quality Standards (WQS), all waterbodies within the designated boundary of Isle Royale National Park have been designated as Outstanding State Resource Waters. Under the above designation, additional anti-degradation controls are applied for new or increased pollutant loadings (Michigan DEQ 2013a).
- The ongoing ecological study of wolves on Isle Royale has been underway for 55 years (Vucetich and Peterson 2013); it is the longest continuous predator/prey study in the world (Vucetich 2012, Vucetich and Peterson 2013). The predator/prey interaction study between wolves and Moose is part of the ongoing research in Isle Royale National Park (UNESCO 2005). The Wolf population in January 2013 was 8 individuals, the lowest the population has ever been during the history of the

study (Vucetich and Peterson 2013). This is also the first year in the history of the project that no reproduction was documented (Vucetich and Peterson 2013).

- A 13 year breeding bird survey conducted on Isle Royale revealed significant increases in abundance for ten species, and significant decreases in abundance for eight species; these trends were consistent with studies from other areas (Egan 2009). 85 species were detected over the 13 years, with an average of 57 species detected each year (Egan 2009).
- The Isle Royale & Keweenaw Parks Association is a non-profit educational organization that works with the National Park Service to promote public understanding of Isle Royale National Park and Keweenaw National Historical Park. The group also works to fund research projects (Isle Royale & Keweenaw Parks Association 2010).

TABLE 10.3: Isle Royale IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
MI-008	Site	Caribou Island	Rare plant habitat
MI-011	Site	Davidson Island	Rare plant and animal habitat
MI-012	Site	Edwards Island	Rare plant habitat
MI-015	Site	Hat Island	Rare plant and animal habitats
MI-043	Area	Isle Royale	Rare plant and animal habitat, fish spawning habitat, colonial waterbird habitats

Figure 10.3: Isle Royale - Important Habitat Sites and Areas

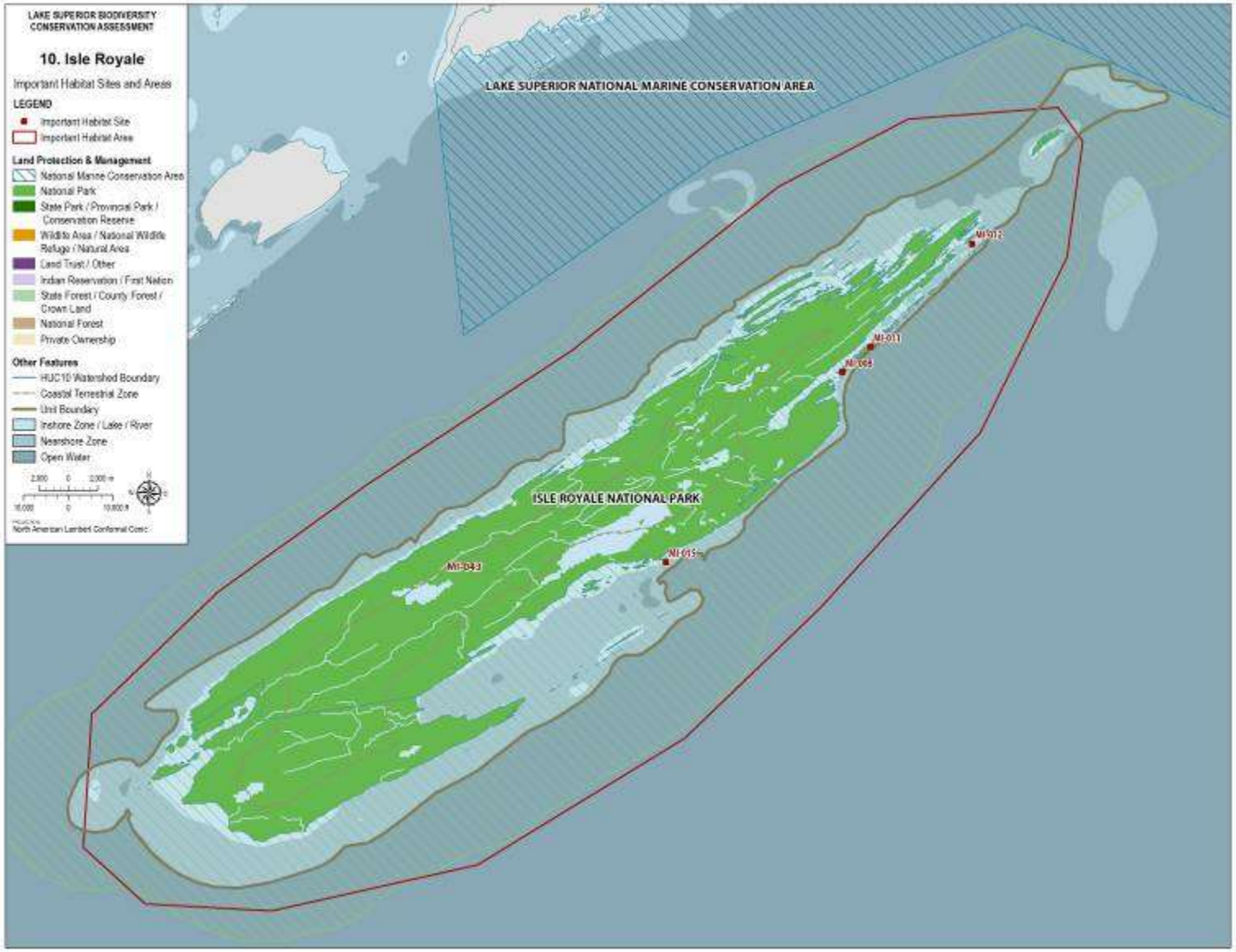


TABLE 10.4: Isle Royale LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 88 species and communities of conservation concern have been documented in the regional unit. 61 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 26 species and communities were once known to occur here, but have current conservation ranks of H (Historical). One additional species or community of conservation concern is known to occur in this regional unit, but is currently not ranked for viability.[11]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
Allium schoenoprasum	Chives
Amerorchis rotundifolia	Small round-leaved orchis
Arnica lonchophylla	Longleaf arnica
Aster modestus	Great northern aster
Beckmannia syzigachne	Slough grass
Calypso bulbosa	Calypso or fairy-slipper
Canis lupus	Gray Wolf
Carex atratiformis	Sedge
Carex media	Sedge
Castilleja septentrionalis	Pale Indian paintbrush
Clematis occidentalis	Purple clematis
Collinsia parviflora	Small blue-eyed Mary
Coregonus artedi	Lake herring or Cisco
Coregonus kiyi	Kiyi
Coregonus zenithicus	Shortjaw cisco
Crataegus douglasii	Douglas's hawthorn
Cryptogramma acrostichoides	American rock-brake
Cypripedium arietinum	Ram's head lady's-slipper
Draba arabisans	Rock whitlow grass
Draba glabella	Smooth whitlow grass
Draba incana	Twisted whitlow grass
Drosera anglica	English sundew
Dryopteris fragrans	Fragrant cliff woodfern
Empetrum nigrum	Black crowberry
Euphrasia hudsoniana	Eyebright
Euphrasia nemorosa	Eyebright
Gavia immer	Common loon
Haliaeetus leucocephalus	Bald eagle
Huperzia appalachiana	Mountain fir-moss
Huperzia selago	Fir clubmoss
Listera auriculata	Auricled twayblade
Lonicera involucrata	Black twinberry
Luzula parviflora	Small-flowered wood rush
Myriophyllum alterniflorum	Alternate-leaved water-milfoil
Nymphaea leibergii	Pygmy water lily
Oplopanax horridus	Devil's club
Pandion haliaetus	Osprey
Parnassia palustris	Marsh grass-of-parnassus

[11] Data included here were provided by the Michigan Natural Features Inventory of Michigan State University, and were current as of August 1 2014. These data are not based on an exhaustive inventory of the state. The lack of data for any geographic area shall not be construed to mean that no significant features are present.

Phacelia franklinii	Franklin's phacelia
Pinguicula vulgaris	Butterwort
Poa alpina	Alpine bluegrass
Poa canbyi	Canbyi's bluegrass
Polygonum viviparum	Alpine bistort
Potentilla pensylvanica	Prairie cinquefoil
Prosartes trachycarpa	Northern fairy bells
Ranunculus macounii	Macoun's buttercup
Ranunculus rhomboideus	Prairie buttercup
Ribes oxyacanthoides	Northern gooseberry
Sagina nodosa	Pearlwort
Salix pellita	Satiny willow
Salix planifolia	Tea-leaved willow
Saxifraga paniculata	Encrusted saxifrage
Saxifraga tricuspidata	Prickly saxifrage
Senecio indecorus	Northern ragwort
Tofieldia pusilla	False asphodel
Trisetum spicatum	Downy oat-grass
Vaccinium cespitosum	Dwarf bilberry
Vaccinium uliginosum	Alpine blueberry
Vaccinium vitis-idaea	Mountain cranberry
Viburnum edule	Squashberry or mooseberry
Woodsia alpina	Northern woodsia
Historical Records	
Scientific Name	**Common Name**
Alces americanus	Moose
Antennaria rosea	Rosy pussytoes
Bryoria lanestris	Lichen
Calamagrostis lacustris	Northern reedgrass
Callitriche hermaphroditica	Autumnal water-starwort
Coregonus bartlettii	Siskiwit lake cisco
Dermatocarpon reticulatum	Lichen
Erigeron acris	Fleabane
Euchloe ausonides	Large marble
Great Blue Heron Rookery	Great Blue Heron Rookery
Hypotrachyna revoluta	Lichen
Lactuca pulchella	Blue lettuce
Lobaria scrobiculata	Lichen
Lycaeides idas nabokovi	Northern blue
Lynx canadensis	Lynx
Melanelia substygia	Lichen
Moehringia macrophylla	Big-leaf sandwort
Oeneis macounii	Macoun's arctic
Osmorhiza depauperata	Sweet Cicely
Parmelia stictica	Lichen
Pisidium idahoense	Giant northern pea clam
Placynthium aspratile	Lichen
Pseudacris triseriata maculata	Boreal chorus frog
Ramalina farinacea	Lichen
Sticta fuliginosa	Lichen
Subularia aquatica	Awlwort
Unranked Records	
Scientific Name	**Common Name**
Dermatocarpon moulinsii	Lichen

11. Beaver-Lester

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	A
NEARSHORE	D	COASTAL WETLANDS	C
EMBAYMENTS & INSHORE	D	COASTAL TERRESTRIAL	A
TRIBUTARIES & WATERSHEDS	C	**OVERALL C**	

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

Cliffs and rocky shores at Palisade Head and Shovel Point, Tettegouche State Park. Photo credit: wikipedia.org/wiki/Portal: Minnesota/ Scenic

Summary/ Description

The Beaver-Lester region extends from just north of Silver Bay, Minnesota, to Duluth, Minnesota. The Beaver-Lester regional unit is 1,686.67km^2 in size, including the associated nearshore waters. This regional unit spans two Minnesota counties, with approximately 35% of the land-base of the regional unit in St. Louis County and approximately 65% of the regional unit land-base in Lake County (USDA NRCS No date b). The Beaver-Lester regional unit is part of the territory ceded in the Treaty of 1854. The signatory tribes retain rights to hunt, fish, and gather within the regional unit (A. McCammon Soltis, pers. comm., January 5 2015). The Beaver-Lester region is located in the Northern Lakes and Forest ecoregion, and the watershed is described as largely forested (USDA NRCS No date b). This hydrologic region is referred to as HUC 04010102. This region is part of Subregion 0401 - Western Lake Superior. Long ridges slope towards Lake Superior, and the Sawtooth Mountains are found along the shoreline (USDA NRCS No date a, No date b). Communities in the area include Silver Bay, Two Harbors, Arnold, Knife River and Beaver Bay. The Beaver- Lester regional unit contains one tertiary (HUC 8) watershed, Beaver-Lester, and four quaternary (HUC 10) watersheds. Most of the region is forested. The coast is characterized by rocky shores and cliffs. Coastal wetlands are very rare, and concentrated in the Knife River area.

TABLE 11.1: Beaver-Lester BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	7.78	0.41	1,441.07	
Developed	23.67	1.25	389.55	
Forest	1,516.26	80.23	107,747.13	
Associated Nearshore Waters	272.32	14.41	17,868.03	
Other	54.64	2.89	8,227.57	
Water (inland)	15.30	0.81	9,473.05	
Total Area	**1,889.97**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	117.57	NA	2.02	Based on SOLEC shoreline
Sand Beaches (km)	0.95	0.81	0.15*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	7.32	3.57*	0.66**	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone	179.59	87.46*	2.91**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	12	NA	0.5	
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	39.46	NA		
Road Density (km/km^2)	0.71	NA		
Number of Dams and Barriers	933	NA	3.9	
Artificial Shoreline (km)	10.94	9.30	4.80	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	1,298.14	80.30	1,616.55	Regional area based on landmass
Public/Crown	273.18	16.90	1,616.55	
Tribes/ First Nations	0.00	0.00	1,616.55	
Parks & Protected Areas (total)	45.22	2.80	1,616.55	
Parks & Protected Areas (coast)	23.44	11.41*	205.34**	*% of Regional Coastal Area **Regional Coastal Area (km^2)

Important Biodiversity Features

Nearshore and Inshore Waters

- Important habitat areas for Lake Trout are found in several locations along the coast, and one important habitat area for Lake Whitefish is noted between Duluth and Two Harbors (Lake Superior Binational Program Habitat Committee 2006) (Figure 11.1).

Coastal Zone and Islands

- The Beaver-Lester regional unit contains a number of areas identified as biologically important by the Lake Superior Binational Program Habitat Committee (2006). A number of Important Habitat

Sites are located along the Lake Superior shore, as well as in some inland areas. Much of the coastal area is an Important Habitat Area, as is Tettegouche State Park, a portion of which lies in both the Beaver-Lester and the Baptism-Brule regional units (Table 11.3, Figure 11.3).

- Several small State Important Bird Areas (IBAs) are found along the coast in the Beaver-Lester regional unit (National Audubon Society 2013, 2012). These sites are some of the nine locations along Lake Superior that make up the 125 acre North Shore Peregrine Falcon Eyries IBA. These nine cliff areas are geographically separate and under different ownerships, but combined represent 70% of the recorded natural nest sites for Peregrine Falcons in Minnesota (Minnesota DNR 2013b). The Hawk Ridge Nature Reserve IBA is another State IBA located in the Beaver-Lester regional unit (National Audubon Society 2013, 2012). This IBA is noted as one of the best locations in North America for autumn hawk watching (Minnesota DNR 2013c).
- Arctic disjunct plant species, native plant communities occur along the coast (B. Carlson, pers. comm., March 20 2013).
- Minnesota Point is a freshwater sandbar and associated rare species, rare native plant communities (B. Carlson, pers. comm., March 20 2013).
- Knife Island is an important island for colonial nesting waterbirds (T. Kaspar, pers. comm., March 14 2013)

Tributaries and Watersheds

- Although the watersheds are characterized for forests, this region is highly fragmented by roads.

Figure 11.1: Beaver-Lester - Coastal and Watershed Features

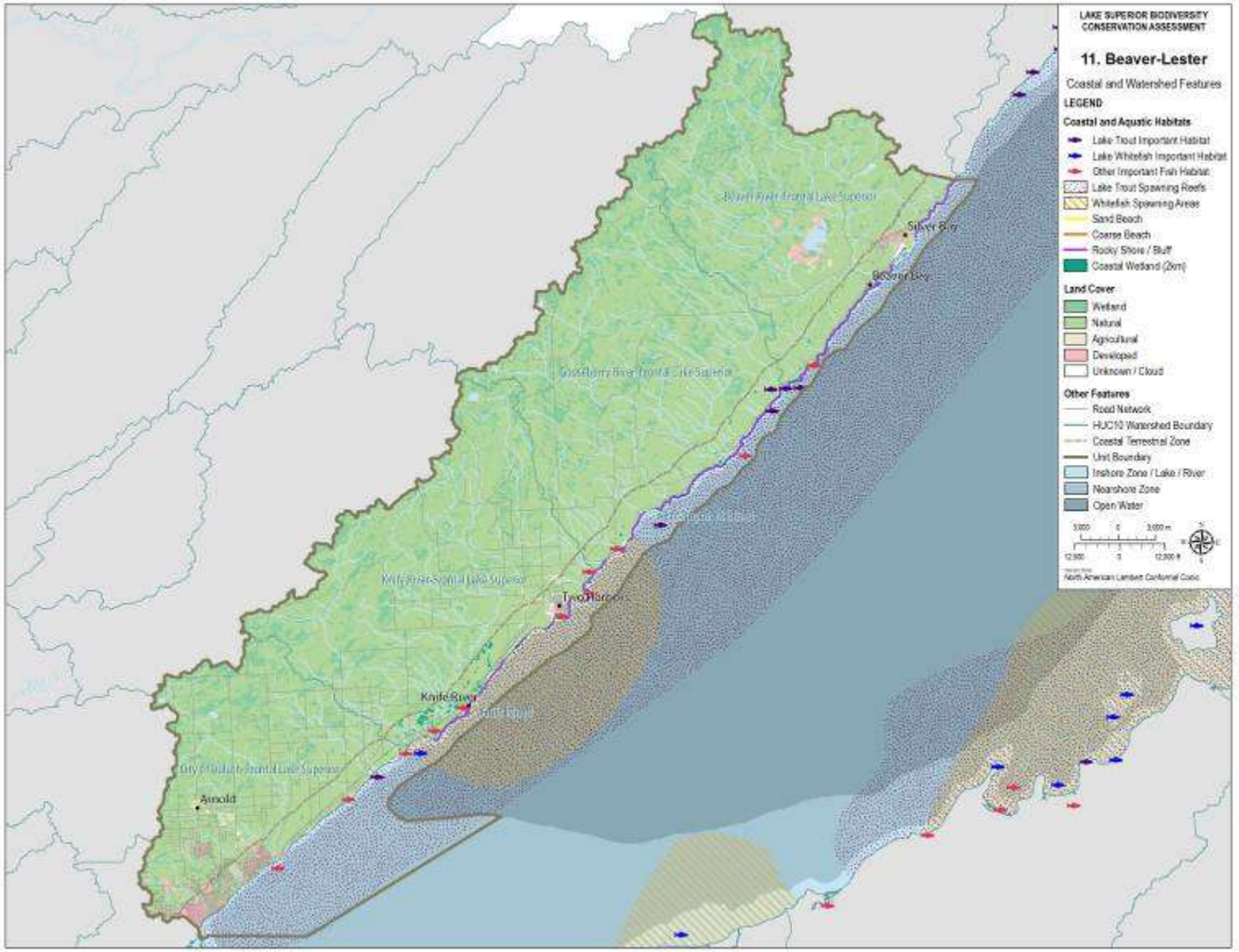


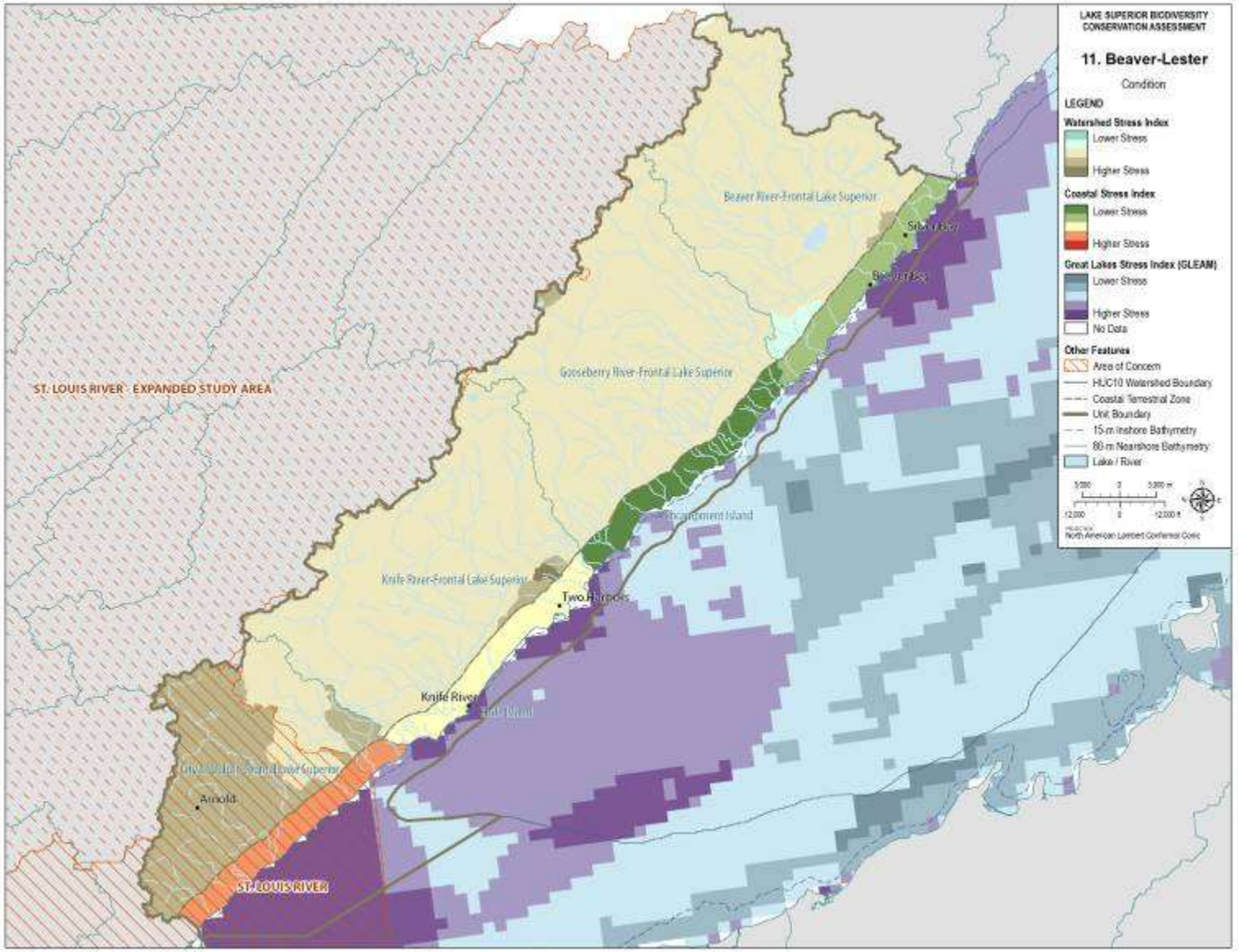
TABLE 11.2: Beaver-Lester CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	
Nearshore[1]	D (0.20)	
Embayments and Inshore[1,2]	D (0.31)	
Coastal Wetlands[2,3]	C (0.519)	
Islands[4]	A	
Coastal Terrestrial[3]	A (0.938)	Local experts feel a condition grade of B (Good) may accurately reflect local conditions in the Coastal Terrestrial target. The rationale for this condition is that the forest of this area, though extensive, is heavily dominated by relatively young forest of aspen and birch (with notable exceptions) and missing conifers and older age classes. It has also been fragmented by development near the shore (E. Perry, pers. comm., February 26 2013).
Tributaries and Watersheds[2]	C (0.42)	

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

Figure 11.2: Beaver-Lester - Condition



Important Issues & Threats

- The ports of Two Harbors, Minnesota, Superior, Wisconsin-Duluth, Minnesota and Presque Isle-Marquette, Michigan have been identified as sites at high risk for invasion by aquatic invasive species, due to ballast water from laker traffic (Rup et al. 2010 as cited in International Joint Commission (IJC) Work Group on Aquatic Invasive Species Rapid Response 2011).
- The St. Louis River Area of Concern (AOC) is located in three regional units, including portions of the Beaver-Lester regional unit. The St. Louis River has faced issues of habitat loss and degradation, and pollution and contamination, especially in its lower reaches. The lower 39 miles (63 kilometres) of the St. Louis River are the main focus of the St. Louis River Remedial Action Plan (RAP) (U.S. EPA 2013c) and are designated as a Lake Superior Area of Concern (AOC). Nine beneficial use impairments were identified in the St. Louis River AOC (U.S. EPA 2013c).
- Thirty-three farms are noted to operate in this regional unit. Approximately two-thirds of those farms are less than 180 acres, while one-third of the farms are 180 to 1,000 acres (USDA NRCS No date b). Land within this regional unit is generally considered as poorly suited for agriculture (USDA NRCS No date b).
- Erosion, water quality and quantity, and management of shorelines, woodlands, stormwater and wetlands are noted in the Rapid Watershed Assessment as the main resource concerns in this regional unit (USDA NRCS No date b).
- Development pressure is noted to be moderate in this region (USDA NRCS No date b). The lakeshore and timberlands are two areas noted to be parceled out for new recreation, lake or country homes (USDA NRCS No date b).
- A number of waterbodies within the Beaver-Lester regional unit are listed as impaired. Reasons for impairment include mercury, pH, turbidity, low dissolved oxygen, absence of trout due to temperature and PCBs. Affected uses include aquatic consumption and aquatic life (USDA NRCS No date b).
- Over 50 species were listed as endangered or threatened (USDA NRCS No date b).
- The USGS lists a total of 13 records for Nonindigenous Aquatic Species in the Beaver-Lester region; 4 are classified as exotic, 8 as native, and 1 as native hybrid (USGS 2012b).
- Forest fragmentation as a result of housing development is an emerging concern in Minnesota. The forest that is present lacks much of its natural conifer component (E. Perry, pers. comm., February 26 2013).

Conservation In Action

Parks & Protected Areas

- Tettegouche State Park

Existing Programs & Projects

- There are a number of Minnesota Biological Survey (MBS) Sites delineated in the Beaver-Lester regional unit, some of which have been ranked with Outstanding or High Biodiversity Significance, based on statewide ranking criteria. The Minnesota Department of Natural Resource's MBS systematically collects, interprets, and delivers data on the distribution and ecology of native plants, animals, native plant communities, and functional landscapes throughout the state. MBS conducts landscape assessments, field surveys and monitoring activities, and provides data and tools to guide conservation and management within *MBS Sites of Statewide Biodiversity Significance* (MBS Sites). Biodiversity information includes the location and biodiversity significance rank of MBS Sites, the location and status of rare

species populations, the type and condition of native plant communities, and, for selected sites, *MBS Ecological Evaluation* reports (Minnesota DNR 2013e, B. Carlson, pers. comm., March 20 2013). The MBS Sites located within the Beaver-Lester regional unit are Encampment Forest Area, Fault Line Ridges, Magney-Snively, Minnesota Point Pine Forest, Moose Mountain, Nopeming Unconformity and Tettegouche State Park (L. Gerdes, pers. comm., March 18 2013).

- The State of Minnesota specifies a policy goal of nondegradation for all waters, maintaining them in a natural and unpolluted state. There are three levels of protection for surface waters. The highest level of protection applies to Outstanding Resource Value Waters (ORVWs). Additionally, all surface waters in the Lake Superior basin are Outstanding International Resource Waters (OIRW) (MPCA 2012e).
- The Manitou Collaborative is a partnership which includes the United States Forest Service, the Minnesota Forest Resources Council, The Nature Conservancy, the Minnesota Department of Natural Resources, Wolf Ridge Environmental Learning Center and Lake County. The partnership of public and private landowners began in 2000, and collaboratively the partners manage 100,000 acres in northeastern Minnesota. One fifth of the Manitou Landscape area is classified as Outstanding for statewide biodiversity significance, and 200 miles of high quality streams are located within this area. Mutually agreed upon management objectives for the vegetation include mimicking the range of natural variability to restore diverse and multi-aged forests and promoting diverse forests of multiple growth stages, while supporting the local economy (The Manitou Collaborative No date, USDA Forest Service No date a).
- The North Shore Forest Collaborative is a combined effort of local, state and federal groups, along with public and private groups and individuals. Concentrated on the ecosystems along the North Shore of Lake Superior, the Collaborative agencies work together to restore and maintain native trees and forest communities for a healthy forest environment (North Shore Forest Collaborative No date).
- Sugarloaf: The North Shore Stewardship Association works to promote the protection and restoration of the North Shore of Lake Superior (Sugarloaf: The North Shore Stewardship Association No date).
- 12 Citizen-based Groups are noted to do work in the Beaver-Lester regional unit (U.S. EPA 2013d). Additional projects, plans, conservation districts, organizations and partners related to the Beaver-Lester regional unit are noted in the Rapid Watershed Assessment (USDA NRCS No date b).
- The Natural Resources Conservation Service (NRCS) Performance Results System (PRS) provides support for reporting the development and delivery of conservation programs (USDA NRCS No date d). From 1999 to 2007 plans were made for a total of 1,454 acres of Total Conservation Systems. From 1999 to 2007 the Total Conservation Systems Applied amounted to 656 acres. The activities which contributed the largest amount to the Total Conservation Systems Applied were Total Wildlife Habitat (350 acres), Erosion Control Total Soil Saved (99 tons/year), Tree and Shrub Establishment (250 acres) and Riparian Forest Buffers (48 acres). Additional activities involved prescribed grazing and wetlands (created, restored or enhanced) (USDA NRCS No date b).
- Shoreline Management of the North Shore Management Zone is described as local districts regulating and managing development density on and adjacent to shorelines, while giving priority to environmental protection and orderly growth (USDA NRCS No date b).

TABLE 11.3: Beaver-Lester IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
MN-001	Site	Agate Bay	Colonial waterbird nesting, waterfowl concentrations
MN-007	Site	Beaver Bay	Waterbird concentrations, Upland White Cedar Forest
MN-008	Site	Beaver Island	Arctic disjunct plant community, rare plant habitat, colonial waterbird nesting habitat
MN-014	Site	Burlington Bay	Colonial Waterbirds, waterfowl concentrations
MN-020	Site	Cathedral Grove	Great Lakes pine forest, old growth forest
MN-025	Site	Crow Creek Bluff	Rare animal habitat
MN-029	Site	Duluth 8	Rare animal habitat
MN-030	Site	Flood Bay	Colonial waterbird nesting habitat, shorebird migratory habitat, geomorphic feature
MN-036	Area	Gooseberry Falls State Park	Conifer, aspen and birch forests, fish spawning habitat, rare plant and animal habitat
MN-053	Site	Knife River	Rare plant habitat, anadromous fish habitat, geomorphic features
MN-054	Site	Lafayette Bluff and Encampment Island	Colonial waterbird nesting habitat
MN-056	Area	Lake Superior Highlands	Extensive natural communities and high biodiversity, rare plant and animal habitat
MN-057	Site	Lester Park Waterworks	Rare plant habitat
MN-059	Site	Lighthouse Point	Rare plant habitat
MN-067	Site	Marble Lake Lookout Tower	Northern Hardwoods forest, rare plant habitat
MN-072	Area	Moose Mountain SNA	Old growth Northern Hardwoods forest, rare plant habitat
MN-076	Site	Normanna 18	Rare animal habitat
MN-086j	Area	St. Louis Estuary	Great Lakes freshwater estuary, rare plant and animal habitat, colonial waterbird nesting habitat
MN-092	Area	Split Rock Lighthouse State Park	Rare plant and animal habitats, colonial waterbird nesting habitat, geomorphic feature, waterbird concentrations
MN-094	Site	Stony Point	Rare plant habitat, arctic disjunct plant community, waterbird concentrations
MN-100	Area	Tettegouche State Park	Lake Superior pebble and bedrock beaches, exposed cliffs, Northern Hardwood-Conifer Forest, Northern Oak Forest, Upland White Cedar Forest
MN-110	Area	Devils Track Falls State Park	Rare plant habitat

Figure 11.3: Beaver-Lester - Important Habitat Sites and Areas

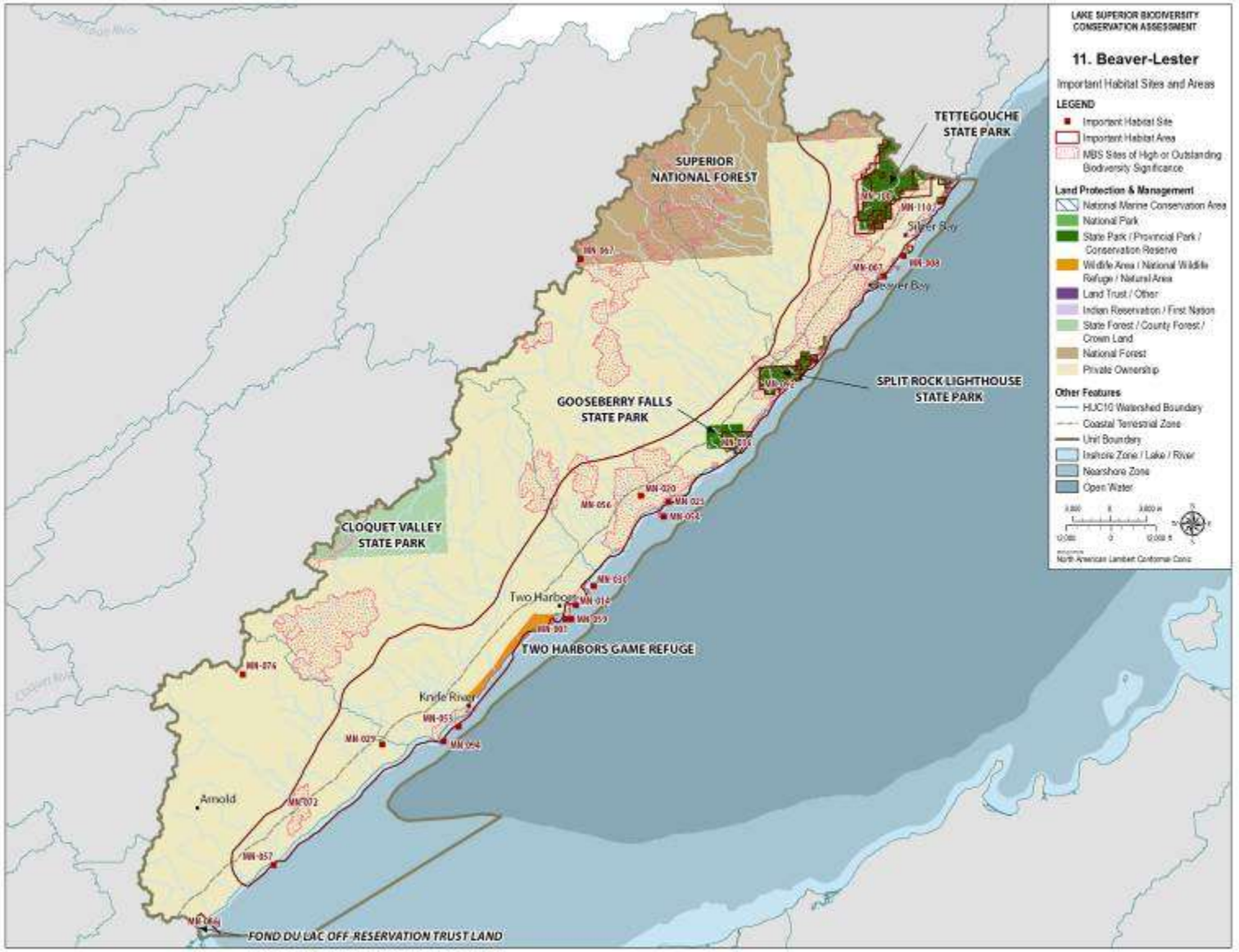


TABLE 11.4: Beaver-Lester LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 96 species and communities of conservation concern have been documented in the regional unit. 46 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 9 species and communities were once known to occur here, but have current conservation ranks of F (Failed to find) or H (Historical). A further 41 species and communities of conservation concern are known to occur in this regional unit, but are currently not ranked for viability.[12]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
Accipiter gentilis	Northern Goshawk
Allium schoenoprasum	Chives
Artemisia campestris	Canadian Wormwood
Asplenium trichomanes ssp. trichomanes	Maidenhair Spleenwort
Bat Colony	Bat Concentration
Bistorta vivipara	Alpine Bistort
Boechera retrofracta	Holboell's Rock-cress
Botrychium lanceolatum ssp. angustisegmentum	Lanceleaf Grapefern
Botrychium mormo	Goblin Fern
Botrychium pallidum	Pale Moonwort
Botrychium simplex	Least Moonwort
Calamagrostis lacustris	Marsh Reedgrass
Callitriche heterophylla	Larger Water-starwort
Carex garberi	Garber's Sedge
Carex novae-angliae	New England Sedge
Carex ormostachya	Necklace Spike Sedge
Carex pallescens	Pale Sedge
Carex rossii	Ross' Sedge
Carex scirpoidea	Northern Singlespike Sedge
Coregonus zenithicus	Shortjaw Cisco
Crataegus douglasii	Black Hawthorn
Eleocharis nitida	Neat Spike-rush
Euphrasia hudsoniana var. ramosior	Hudson Bay Eyebright
Falco peregrinus	Peregrine Falcon
Glyptemys insculpta	Wood Turtle
Huperzia appalachiana	Appalachian Fir-clubmoss
Huperzia x bartleyi	A hybrid Clubmoss
Hydroptila novicola	A Caddisfly
Igneous intrusion (middle proterozoic)	Igneous Intrusion (Middle Proterozoic)
Luzula parviflora	Small-flowered Woodrush
Myotis septentrionalis	Northern Myotis
Native Plant Community, Undetermined Class	Native Plant Community, Undetermined Class
Perimyotis subflavus	Tricolored Bat

[12] Data included here were provided by the Division of Ecological and Water Resources, Minnesota Department of Natural Resources (DNR), and were current as of December 3 2014. These data are not based on an exhaustive inventory of the state. The lack of data for any geographic area shall not be construed to mean that no significant features are present.

Pinguicula vulgaris	Butterwort
Sagina nodosa ssp. borealis	Knotty Pearlwort
Saxifraga paniculata	Encrusted Saxifrage
Scirpus pedicellatus	Woolgrass
Sorex fumeus	Smoky Shrew
Sugar Maple - Basswood - (Bluebead Lily) Forest Type	Sugar Maple - Basswood - (Bluebead Lily) Forest
Torreyochloa pallida var. fernaldii	Pale Manna Grass
Trisetum spicatum	Narrow False Oats
Tsuga canadensis	Eastern Hemlock
Upland White Cedar Forest Type	Upland White Cedar Forest
Viola lanceolata var. lanceolata	Lance-leaved Violet
White Cedar - Yellow Birch Forest Type	White Cedar - Yellow Birch Forest
White Pine - Red Pine Forest Type	White Pine - Red Pine Forest
Historical or Failed to Find Records	
Scientific Name	**Common Name**
Adlumia fungosa	Climbing Fumitory
Agrostis scabra	Rough Bentgrass
Anaptychia crinalis	Hanging fringe lichen
Coregonus kiyi	Kiyi
Cystopteris laurentiana	Laurentian Bladder Fern
Huperzia porophila	Rock Clubmoss
Listera auriculata	Auricled Twayblade
Shepherdia canadensis	Canada Buffaloberry
Woodsia glabella	Smooth Woodsia
Unranked Records	
Scientific Name	**Common Name**
Acipenser fulvescens	Lake Sturgeon
Actaea pachypoda	White Baneberry
Adoxa moschatellina	Moschatel
Alder - (Maple - Loosestrife) Swamp Type	Alder - (Maple - Loosestrife) Swamp
Arethusa bulbosa	Dragon's-mouth
Arnica lonchophylla	Long-leaved Arnica
Black Spruce - Jack Pine Woodland; Black Spruce - Feathermoss Subtype	Black Spruce - Jack Pine Woodland, Black Spruce - Feathermoss Subtype
Botaurus lentiginosus	American Bittern
Botrychium matricariifolium	Matricary Grapefern
Buteo lineatus	Red-shouldered Hawk
Carex flava	Yellow Sedge
Carex gynandra	A Species of Sedge
Carex media	Intermediate Sedge
Claytonia caroliniana	Carolina Spring-beauty
Colonial Waterbird Nesting Area	Colonial Waterbird Nesting Site
Draba arabisans	Rock Whitlow-grass
Emydoidea blandingii	Blanding's Turtle
Haliaeetus leucocephalus	Bald Eagle
Igneous composition (middle proterozoic)	Igneous Composition (Middle Proterozoic)
Igneous unit or sequence (middle proterozoic)	Igneous Unit or Sequence (Middle Proterozoic)
Juniperus horizontalis	Creeping Juniper
Lake and wetland composite (quaternary)	Lake and Wetland Composite (Quaternary)
Lake Superior Rocky Shore Class	Lake Superior Rocky Shore
Lobaria quercizans	Smooth lungwort
Microtus chrotorrhinus	Rock Vole
Parmelia stictica	A Species of Lichen

Platanthera clavellata	Club-spur Orchid
Poa wolfii	Wolf's Bluegrass
Potamogeton oakesianus	Oakes' Pondweed
Potamogeton vaseyi	Vasey's Pondweed
Pyrola minor	Small Shinleaf
Red Oak - Sugar Maple - Basswood - (Bluebead Lily) Forest Type	Red Oak - Sugar Maple - Basswood - (Bluebead Lily) Forest
Rhynchospora fusca	Sooty-colored Beak-rush
Salix pellita	Satiny Willow
Setophaga caerulescens	Black-throated Blue Warbler
Sparganium glomeratum	Clustered Bur-reed
Stream erosion (quaternary)	Stream Erosion (Quaternary)
Sugar Maple Forest (North Shore) Type	Sugar Maple Forest (North Shore)
Torreyochloa pallida	Torrey's Manna-grass
Waldsteinia fragarioides var. fragarioides	Barren Strawberry
Woodsia alpina	Alpine Woodsia

12. St. Louis and Cloquet

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	A
NEARSHORE	D	COASTAL WETLANDS	D
EMBAYMENTS & INSHORE	D	COASTAL TERRESTRIAL	C
TRIBUTARIES & WATERSHEDS	D	**OVERALL C**	

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

Clough Island is located in the St. Louis River Estuary – one of the largest estuaries in the Great Lakes. Clough Island was protected by The Nature Conservancy, the Wisconsin Department of Natural Resources (WDNR) and the U.S. Fish and Wildlife Service in 2010. As of 2011 the WDNR owns and manages Clough Island.

Summary/ Description

The St. Louis and Cloquet region includes the westernmost portion of the Lake Superior watershed. The St. Louis and Cloquet regional unit is 8,677 km^2 in size, including the associated nearshore waters. This region encompasses only a small portion of the Lake Superior shoreline, the Duluth-Superior harbour from Duluth, Minnesota to Superior, Wisconsin. However, the region extends inland to the north and to the west, into Minnesota, and includes the communities of Hoyt Lakes, Virginia, Hibbing, Floodwood and Cloquet. The Fond du Lac Indian Reservation is located in this regional unit and the Fond du Lac Band of Lake Superior Chippewa is a significant landholder in the regional unit. The St. Louis and Cloquet regional unit is part of the territory ceded in the Treaties of 1842 and 1854. The signatory tribes retain rights to hunt, fish, and gather within the regional unit (A. McCammon Soltis, pers. comm., January 5 2015).

The St. Louis River is the largest U.S. tributary and the second largest tributary to Lake Superior (Minnesota PCA 2012c). The St. Louis River is a very biologically productive area and becomes an estuary in its lower reaches. The Cloquet and Whiteface rivers are the main tributaries. This regional unit contains both highly developed areas, as well as high quality areas. The St. Louis and Cloquet regional unit combines two tertiary (HUC 8) watersheds, St. Louis and Cloquet, and contains 22 quaternary (HUC 10) watersheds. The watersheds of this region are dominated by forests, but the coastal areas have the highest amount of developed land and artificial shoreline in Lake Superior.

TABLE 12.1: St. Louis and Cloquet BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	178.45	1.84	1,441.07	
Developed	237.85	2.45	389.55	
Forest	8,038.85	82.70	107,747.13	
Associated Nearshore Waters	88.83	0.91	17,868.03	
Other	979.77	10.08	8,227.57	
Water (inland)	196.60	2.02	9,473.05	
Total Area	**9,720.34**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	88.65	NA	1.52	Based on SOLEC shoreline
Sand Beaches (km)	8.94	10.08	1.39*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	30.95	20.22*	2.81**	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone	73.02	47.69*	1.18**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	2*	NA	0	*Based on (Henson et al. 2010). Additional islands may be present in the regional unit
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	15.83	NA		
Road Density (km/km^2)	0.69	NA		
Number of Dams and Barriers	2478	NA	10.5	
Artificial Shoreline (km)	45.88	51.75	20.13	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	5,986.48	62.16	9,631.51	Regional area based on landmass
Public/Crown	3,181.32	33.03	9,631.51	
Tribes/ First Nations	344.46	3.58	9,631.51	
Parks & Protected Areas (total)	119.25	1.24	9,631.51	
Parks & Protected Areas (coast)	4.76	3.11*	153.11**	*% of Regional Coastal Area **Regional Coastal Area (km^2)

IMPORTANT BIODIVERSITY FEATURES

Nearshore and Inshore Waters

- St. Louis Bay is noted as a Lake Superior embayment important for Lake Sturgeon (Auer 2003).
- North Bay is a proposed site for the Duluth Natural Areas Program (DNAP). North Bay is also located within a Minnesota Biological Survey Site of Outstanding Biodiversity Significance (B. Carlson, pers. comm., March 20 2013).
- Rask Bay is within a Minnesota Biological Survey Site of Outstanding Biodiversity Significance (B. Carlson, pers. comm., March 20 2013).

Coastal Zone and Islands

- The 12,000 acre St. Louis River Estuary wetland complex is one of the largest estuarine wetland complexes in the Lake Superior Basin. Areas described as wilderness-like are still found in the upper estuary (U.S. EPA 2013c), and the estuary shoreline is a mix of forest, wetlands and industry (Minnesota DNR 2012b).
- The estuary provides critical habitat for a number of migrating and breeding birds; up to 230 different species have been observed in the area (Allen 2013). Included in the 115 known species of breeding birds are common terns, which are listed as endangered in Wisconsin and threatened in Minnesota (Allen 2013). Nearly two-thirds of the entire Lake Superior basin population of common terns have nested in the estuary in recent years (Allen 2013).
- In total, 45 species of native fish have been documented in the estuary, and it is an important area for migratory fish species that spawn upstream of Lake Superior (Allen 2013). A number of other species, including Wolf, Black Bear, Bobcat, Mink, Beaver and River Otter all use the estuary habitat (TNC No date a).
- Spirit Island and Clough Island are key islands for biodiversity.
- The Wisconsin Department of Natural Resources (WDNR) has identified primary coastal wetlands deemed to be ecologically significant coastal wetlands. Several of these Lake Superior ecologically significant coastal wetlands are located in the St. Louis and Cloquet regional unit, including S-01 Red River Breaks – St. Louis River Marshes, S-02 Oliver Marsh, S-03 Superior Municipal Forest and S-04 Pokegama Carnegie Wetlands (WDNR 2012c). A complete list of the Lake Superior ecologically significant wetlands and their specific site attributes is available on the WDNR website (WDNR 2012c, 2012d).

Tributaries and Watersheds

- The St. Louis River is 195 miles (314 kilometres) long and its watershed drains nearly 3,600 square miles (9,300 square kilometres) (Minnesota PCA 2012b). The upper St. Louis River watershed is largely remote and forested, with bluffs and wooded hills (Minnesota DNR 2012a). The Fond du Lac Dam is 21 miles (34 kilometres) upstream of Lake Superior; at the dam there is a marked difference in hydrologic variables between upstream and downstream segments of the river. For this reason agencies like the Minnesota Pollution Control Agency (Minnesota PCA) address the two segments separately (Minnesota PCA 2012b).
- Historically 21 tributaries in Lake Superior had Lake Sturgeon spawning runs. One of these historical spawning tributaries, the St. Louis River, is in the St. Louis regional unit. The Lake Sturgeon population status in the St. Louis River is reintroduced and the population trajectory is unknown (Golder Associates Ltd. 2011). Natural reproduction of Lake Sturgeon in the St. Louis River following

28 years of stocking was first documented in 2011 (W. Blust, pers. comm., March 6 2013). The St. Louis River is one of ten Lake Superior tributaries with recent evidence of natural reproduction (as of 2012). This is the same number of rivers as in 2005, however the specific tributaries have changed (Lake Superior Lake Sturgeon Work Group 2012, unpublished data).

- A Lake Sturgeon Rehabilitation Plan for Lake Superior (Auer 2003) identifies the St. Louis River as one of the seventeen tributaries to Lake Superior in which there should be a focus on Lake Sturgeon rehabilitation.
- The Cloquet River is a main tributary of the St. Louis River. It flows approximately 100 miles (161 kilometres) from Cloquet Lake to the St. Louis River, and it is relatively undeveloped, especially in the upper reaches (Minnesota PCA 2012b). Above Island Lake are areas classified as both primitive and as natural areas in the St. Louis River Management Plan. This plan also notes the river's exceptional recreational and scenic value (Minnesota PCA 2011a). Farmland, recreational homes and hydro power uses are found in the lower part of the river, but there are no large towns or cities along the river (Minnesota PCA 2011a, Minnesota DNR 2013a). A number of common game fish are found in the Cloquet River, and a small number of Brook Trout are found in the far upper reaches. Wildlife species found in this area include timber wolves, bobcats, Canadian Lynx, Moose, Black Bears and Bald Eagles (Minnesota DNR 2013a). Lakes are prominent features of the landscape in the Cloquet portion of the region, unlike most areas of the Lake Superior basin, which tend to be poorly drained or consist of rivers draining elevated terrain (Minnesota PCA 2011a).
- The Whiteface River is another main tributary of the St. Louis River. It flows 80 miles (129 kilometres) from the Whiteface Reservoir to the St. Louis River (Minnesota PCA 2012b). The federal government owns much of the land in the headwaters of the St. Louis, Cloquet and Whiteface rivers, while land ownership varies in other sections of each river (Minnesota PCA 2012b).
- The St. Louis/Red River Breaks Streambank Protection Area includes 6,500 acres of land owned by the Wisconsin Department of Natural Resources. This area is characterized by steep, branching ravines which flow into the Red River and St. Louis River, and is protected to protect water quality (WDNR 2012b, R. O'Connor, pers. comm., March 15 2013).
- The red clay plain near Superior, Wisconsin is the location of more than a dozen rare plant species, including some that are found nowhere else is Wisconsin (R. O'Connor, pers. comm., March 15 2013).

.

Figure 12.1: St. Louis and Cloquet - Coastal and Watershed Features

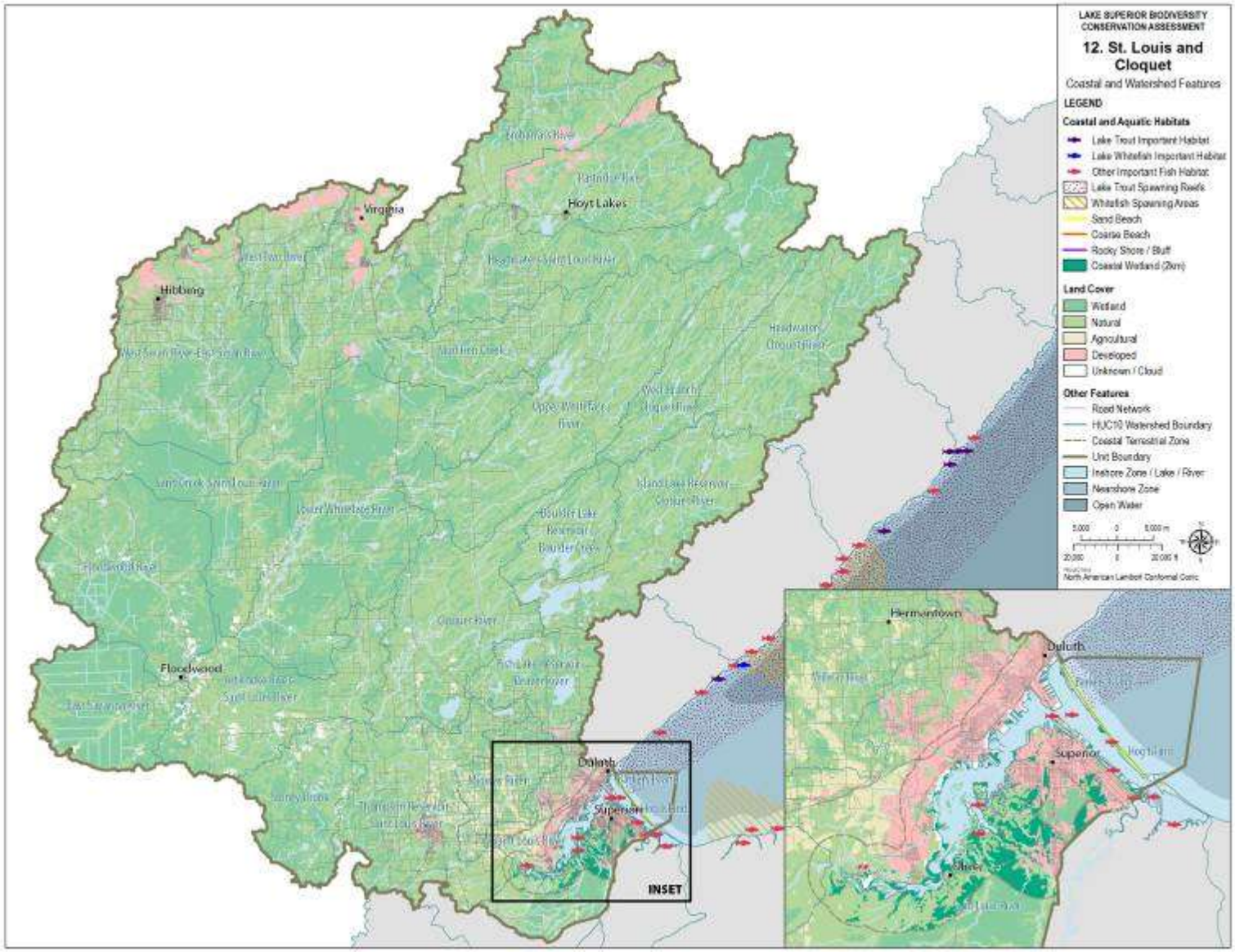


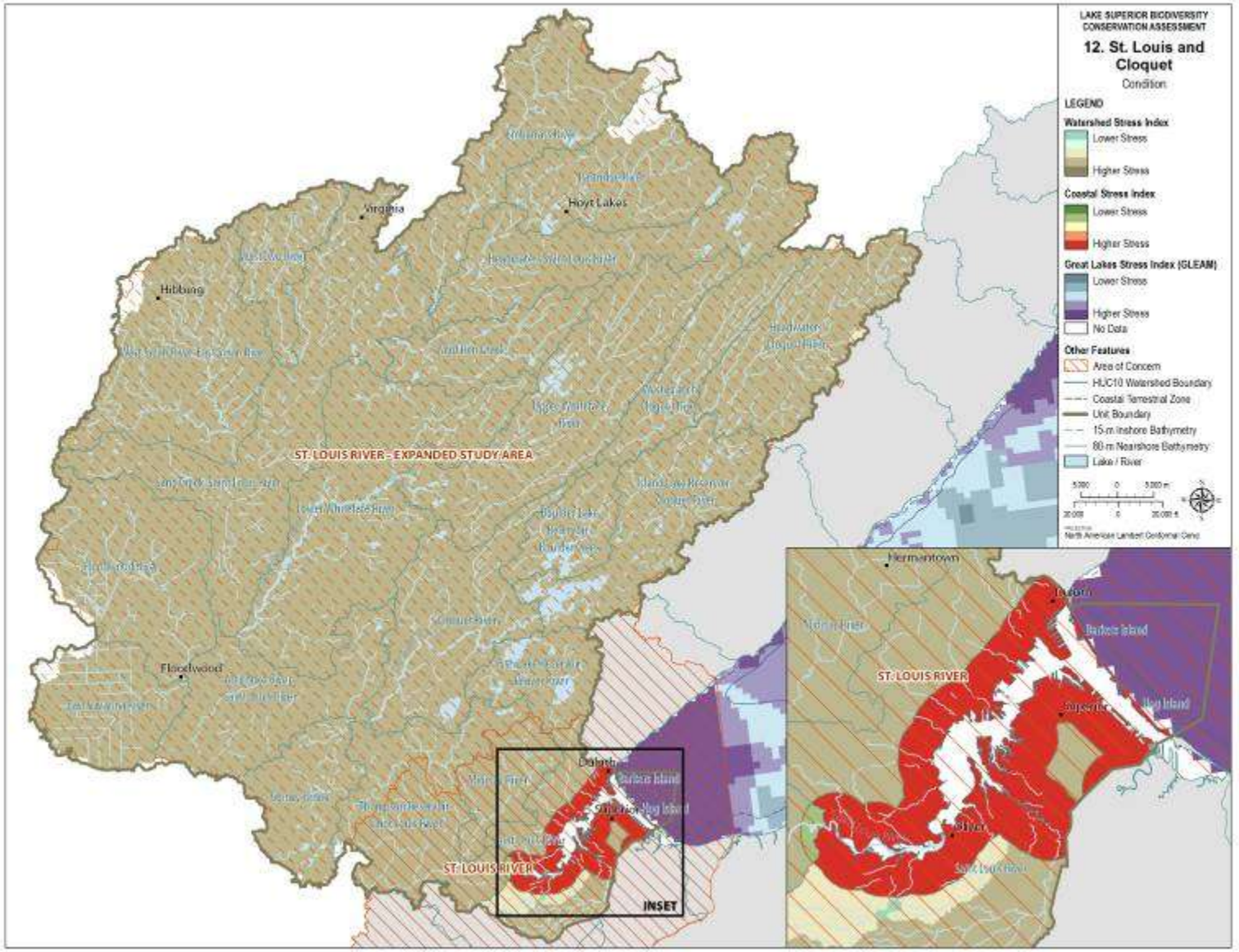
TABLE 12.2: St. Louis and Cloquet CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	
Nearshore[1]	D (0.03)	
Embayments and Inshore[1,2]	D (0.20)	
Coastal Wetlands[2,3]	D (0.300)	Local experts believe a condition score of C may be accurate for coastal wetlands in this regional unit. Several high quality wetlands help to provide some balance for those that are severely degraded (C. Hagen et al., pers. comm., March 20 2013). An estimated 7,700 acres of wetland and open water habitat have been lost from the estuary (U.S. EPA 2013c).
Islands[4]	A	Local experts believe a condition score of B may be accurate for islands in this regional unit. Many islands have invasive species; if left unmanaged these invasive species will degrade island biodiversity (C. Hagen et al., pers. comm., March 20 2013).
Coastal Terrestrial[3]	C (0.500)	
Tributaries and Watersheds[2]	D (0.37)	Natural reproduction of Lake Sturgeon in the St. Louis River following 28 years of stocking was first documented in 2011. The Lake Sturgeon population had been extirpated due to pollution and overfishing (W. Blust, pers. comm., March 6 2013).

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

Figure 12.2: St. Louis and Cloquet - Condition



IMPORTANT ISSUES & THREATS

- The St. Louis River Area of Concern (AOC) is located in three regional units, including the St. Louis and Cloquet regional unit. The St. Louis River has faced issues of habitat loss and degradation, and pollution and contamination, especially in its lower reaches. The lower 39 miles (63 kilometres) of the St. Louis River are the main focus of the St. Louis River Remedial Action Plan (RAP) (U.S. EPA 2013c) and are designated as a Lake Superior Area of Concern (AOC). The St. Louis River Expanded Study Area encompasses the entire St. Louis and Cloquet regional unit. Nine beneficial use impairments were identified in the St. Louis River AOC (U.S. EPA 2013c).
- The lower St. Louis River has long been used for transportation. Native Americans and early European explorers used the St. Louis River as a linkage between the Great Lakes and the Mississippi River system, by way of a 6 mile portage between the East Savannah River (near Floodwood, Minnesota) and the West Savannah River and the Mississippi River system (Minnesota DNR 2012b). Transportation continues to be a major part of the St. Louis River today, and Great Lakes freighters use the lower reaches as a shipping channel. The Duluth-Superior Harbor is at the end of the estuary, and is one of the busiest ports on the Great Lakes (Minnesota PCA 2012c).
- Major cities and industries are part of the landscape of the lower estuary, with urban development, an industrial harbour and a major port within this area (U.S. EPA 2013c). Dredging restrictions and containment actions in parts of the St. Louis River AOC, in place due to sediments containing elevated levels of toxic, bio-accumulative contaminants, have negative economic consequences, in addition to the negative environmental impacts of the contaminated sediments. Minnesota and Wisconsin are conducting sediment characterization and assessment projects in the St. Louis River AOC, to determine prioritization for areas requiring remediation and restoration (LSBP 2012).
- The ports of Two Harbors, Minnesota, Superior, Wisconsin-Duluth, Minnesota and Presque Isle-Marquette, Michigan have been identified as sites at high risk for invasion by aquatic invasive species, due to ballast water from laker traffic (Rup et al. 2010 as cited in International Joint Commission (IJC) Work Group on Aquatic Invasive Species Rapid Response 2011).
- Pollution and habitat degradation have caused significant impairments, specifically to the St. Louis AOC region. An estimated 7,700 acres of wetland and open water habitat have been lost from the estuary (U.S. EPA 2013c). The continued loss of habitat remains an issue for the St. Louis River (U.S. EPA No date). The loss of habitat in the St. Louis estuary over 100 years ago contributed to the extirpation of the stock of Lake Whitefish that spawned in this area (Horns et al. 2003). Work by the Great Lakes Environmental Indicators Project has found contamination from polycyclic aromatic hydrocarbons (PAHs) in the St. Louis River, and in other areas of industrial activity (LSBP 2008).
- Levels of mercury in fish tissue remain a cause for impairment in this region. Fish consumption advisories based on mercury and polychlorinated biphenyls (PCBs) are issued by both Minnesota and Wisconsin for Lake Superior and the St. Louis River (U.S. EPA No date). The levels of mercury and PCBs in fish tissues also exceed the levels established for the protection of aquatic life and fish eating birds (U.S. EPA No date).
- The Cloquet River Valley was extensively forested before widespread logging. Estimates put the amount of pine in the valley at eight billion board feet; by 1925 nearly all of the pine stands had been logged. Some small areas of mature white and red pine are still scattered amongst second-growth forests (Minnesota DNR 2013a). During times of extensive logging, loggers blasted away rock formations, curves, and logjams in the St. Louis River, to allow log drives to move freely downriver (Minnesota DNR 2012b). Logging and forest fragmentation continue to be primary stressors of the upper Cloquet River. Forest cover has been converted from the historic conifer forest to the present aspen-dominated forest cover. Efforts to restore the forest to its original composition are underway (C. Hagen et al., pers. comm., March 20 2013).

- Forest fragmentation as a result of housing development is an emerging concern in Minnesota. The forest that is present lacks much of its natural conifer component (E. Perry, pers. comm., February 26 2013).
- Invasive species including but not limited to zebra mussels, round goby, rusty crayfish and purple loosestrife are found in the lower St. Louis River, including on Clough Island (Minnesota DNR 2012b, TNC No date a). Competition from invasive species is a threat to the region (U.S. EPA 2013e). Purple loosestrife in wetlands in the lower estuary in Minnesota and Wisconsin is being subjected to bio-control as a management measure (U.S. EPA 2013c).
- Due to the proximity of the headwaters to the Mesabi Iron range, there is intensive mining (e.g. US Steel-Minntac Mine. In addition to mines in current operation, there are additional proposed mines (e.g. PolyMet-NorthMet Mine) (See Figure 3.4 Mining in Lake Superior Basin in Volume 1: Lakewide Assessment). Future threats to the region include those related to infrastructure transportation changes, including changes to roads, rail and shipping (C. Hagen et al., pers. comm., March 20 2013).
- The Arrowhead Refinery Co. Superfund Site is a 10 acre site located in Hermantown, Minnesota, in St. Louis. County. The site is located within a white cedar wetland. The Arrowhead Refinery Co. reclaimed waste oil from 1945 to 1977. Waste sludge amounting to 7,000 cubic yards was disposed of on the property in an unlined 2 acre lagoon. The State of Minnesota found PCBs, phenols, cyanide, lead, barium, arsenic, cadmium, chromium and selenium contaminating the ground and surface water near the site (U.S. EPA 2012a ; U.S. EPA 2013f). The site has now been fully remediated and the MPCA and EPA will begin the process to delist the site from the National Priorities List (NPL) (U.S. EPA 2013f).
- The St. Louis River Superfund Site is two Superfund Sites, the St. Louis River/Interlake/Duluth Tar site (SLRIDT) and the U.S. Steel site. The SLRIDT site is 255 acres of land, river embayments, wetlands and shipping slips located on the St. Louis River, four miles upstream of Lake Superior. The U.S. Steel site is eight miles upstream from Lake Superior, on the St. Louis River. The U.S. Steel site consists of 500 acres of land and 200 acres of sediment. Both sites have been contaminated by past industrial operations and disposal activities, resulting in contamination of soil, groundwater and sediment. The U.S. Steel site 2008 Five Year Review noted that the migration of contaminants to the St. Louis River is occurring (U.S. EPA 2013g)

CONSERVATION IN ACTION

PARKS & PROTECTED AREAS

- Jay Cooke State Park
- Cloquet Valley State Forest
- Superior National Forest
- Boundary Waters Canoe Area Wilderness (within Superior National Forest)
- Savanna Portage State Park
- The Superior Municipal Forest is 4,400 acres and the third largest forest within a city in the United States (City of Superior No date a).
- Wisconsin Point is a 3 mile 229 acre area that combined with Minnesota Point (7 miles long) is the largest freshwater sandbar in the world (City of Superior No date b, City of Duluth 2013a).
- The St. Louis River Estuary has been named a National Estuarine Research Reserve (NERR). The Lake Superior National Estuarine Research Reserve includes estuarine wetlands and red clay bluffs which are steep and highly erodible, as well as Wisconsin Point, the largest freshwater bay mouth sand bar in the world (NERRS 2010).
- Two Wisconsin State Natural Areas and 11 Wisconsin Priority Wetlands are located in the boundaries of the Lake Superior NERR (NERRS 2010).

- The Duluth Natural Areas Program permanently conserves the most ecologically significant lands owned by the City of Duluth and private landowners who have volunteered their lands for consideration (City of Duluth 2013b).
- Magney-Snively Forest (B. Carlson, pers. comm., March 20 2013).
- City of Duluth Mission Creek Forest (B. Carlson, pers. comm., March 20 2013).

EXISTING PROGRAMS & PROJECTS

- The U.S. EPA has developed a state of the art early detection design for invasive fish species, using the St. Louis River Estuary as a case study (G. Czypinski, pers. comm., March 20 2013).
- The U.S. Fish and Wildlife Service is undertaking early detection monitoring for new invasive fish species in the St. Louis River Estuary using the design developed by the U.S. EPA (G. Czypinski, pers. comm., March 20 2013).
- The 1854 Treaty Authority is conducting forage fish community monitoring in the St. Louis River Estuary and propagates and monitors wild rice in the treaty area, including the Cloquet River watershed. (G. Czypinski, pers. comm., March 20 2013).
- The Fond du Lac Band of Lake Superior Chippewa is a significant landholder in this regional unit (C. Hagen et al., pers. comm., March 20 2013).
- The St. Louis and Cloquet regional unit contains a number of areas identified as biologically important by the Lake Superior Binational Program Habitat Committee (2006) (Table 12.3, Figure 12.3).
- There are a number of Minnesota Biological Survey (MBS) Sites delineated in the Minnesota portion of the St. Louis and Cloquet regional unit, some of which have been ranked with Outstanding or High Biodiversity Significance, based on statewide ranking criteria. The Minnesota Department of Natural Resource's MBS systematically collects, interprets, and delivers data on the distribution and ecology of native plants, animals, native plant communities, and functional landscapes throughout the state. MBS conducts landscape assessments, field surveys and monitoring activities, and provides data and tools to guide conservation and management within *MBS Sites of Statewide Biodiversity Significance* (MBS Sites). Biodiversity information includes the location and biodiversity significance rank of MBS Sites, the location and status of rare species populations, the type and condition of native plant communities, and, for selected sites, *MBS Ecological Evaluation* reports (Minnesota DNR 2013e, B. Carlson, pers. comm., March 20 2013). The MBS Sites located within the St. Louis and Cloquet regional unit are Cloquet, Cloquet River, Headwaters and Mission Creek (L. Gerdes, pers. comm., March 18 2013).
- The WDNR has a Designated Waters designation for waterbodies with permit requirements. Designated Waters include Areas of Special Natural Resource Interest (ASNRI), Public Rights Features (PRF) and Priority Navigable Waters (PNW) (WDNR No date). These designations offer protection for various important waters, including Wild Rice Waters and Outstanding and Exceptional Resource Waters (C. Hagen et al., pers. comm., March 20 2013).
- The headwaters of the Stoney Brook watershed are located in the Fond du Lac Band reservation, and they are designated as Outstanding Reservation Reserve Waters (ORRWs) by the Fond du Lac Band (LSBP 2008, N. Schudlt, pers. comm., March 19 2013).
- The Outstanding Reservation Reserve Waters designated by the Fond du Lac Band include the Band's wild rice waters. The designation comes from the Fond du Lac Band's promulgation of water quality standards and antidegradation procedures (N. Schudlt, pers. comm., March 19 2013).
- The St. Louis River Alliance started as a Citizens Advisory Committee, and helped develop the Remedial Action Plan (RAP) for the St. Louis River AOC. The group contributes volunteer hours

towards river clean-up, macroinvertebrate monitoring, and invasive species removal. The Lower St. Louis River Habitat Plan was created by the St. Louis River Alliance, along with city, county, state and federal groups. The plan is used to protect, enhance and restore the river (U.S. EPA 2013c).

- The Duluth Natural Areas Program (DNAP) identifies and conserves ecologically significant city-owned lands, as well as private lands which are voluntarily identified with the support and consent of the landowner. Nominated properties are reviewed by city government and the eligibility of the property is determined by scientific criteria and the development of a management plan (City of Duluth 2013).
- A number of projects involving multiple agencies have resulted in the purchase and protection of lands in this region. The Wisconsin Department of Natural Resources' St. Louis River Streambank Protection Project purchased 6,900 acres along the St. Louis River, the Red River, and the main tributaries of the Red River. Another 22,000 acres were acquired along the St. Louis, Cloquet and Whiteface rivers by the St. Louis River Board, and were then transferred to the Minnesota Department of Natural Resources (U.S. EPA 2013c).
- In 2010 The Nature Conservancy acquired the 358 acre Clough Island, the largest island in the St. Louis River Estuary, in order to preserve critical habitat for migratory and breeding birds and fish (Allen 2013; TNC 2010). The acquisition of Clough Island was aided by WDNR Stewardship Funding, and the US Fish and Wildlife Service. The WDNR became the owner of Clough Island in 2011 (C. Hagen et al., pers. comm., March 20 2013). A recent grant to initiate restoration work on Clough Island included funding for invasive species control and the planting of thousands of conifer trees (R. O'Connor, pers. comm., March 15 2013).
- Reintroduction of Lake Sturgeon to the estuary has been undertaken by the Minnesota Department of Natural Resources and the Wisconsin Department of Natural Resources (TNC 2010).
- The University of Wisconsin-Extension has been designated by the State of Wisconsin as the lead state agency for the Lake Superior NERR, and has led the development of a five year management plan (University of Wisconsin-Extension 2010). Wisconsin's Wildlife Action Plan identified the St. Louis River Freshwater Estuary complex and the associated wetland and boreal forests as areas of continental significance (NERRS 2010).
- Wisconsin's Wildlife Action Plan identified a number of Conservation Opportunity Areas for Wildlife Species of Greatest Conservation Need. In the Superior Coastal Plain Ecological Landscape several areas of State, Continental and Global Significance were identified, including some in the St. Louis and Cloquet regional unit (WDNR 2008a, 2008b, 2008c).
- Large tracts of land in the Cloquet River Watershed portion of this region are owned by Minnesota Power. The Boulder Lake Environmental Learning Center is sponsored by Minnesota Power and provides programming for recreational users of the 18,000 acre Boulder Lake Management Area and Cloquet River (Minnesota PCA 2011a). Many other organizations work within the Cloquet River Watershed, including the Friends of the Cloquet Valley State Forest (Minnesota PCA 2011a).
- The Wisconsin Wetlands Association has identified a set of representative high quality wetlands in different regions of Wisconsin. These are referred to as Wetland Gems, and were identified by building on existing conservation planning efforts (Wisconsin Wetlands Association No date a). Several Wetland Gems are in the Superior Region, including some in the St. Louis and Cloquet regional unit (Wisconsin Wetlands Association No date b).
- The Sax-Zim Bog is a 98,657 hectare (243,786 acre) State Important Bird Area (IBA) located within the St. Louis and Cloquet regional unit (National Audubon Society 2013, 2012). This IBA is a known wintering area for hawks and owls, and also provides habitat for over 240 species of migrant and breeding birds (Minnesota DNR 2013d).

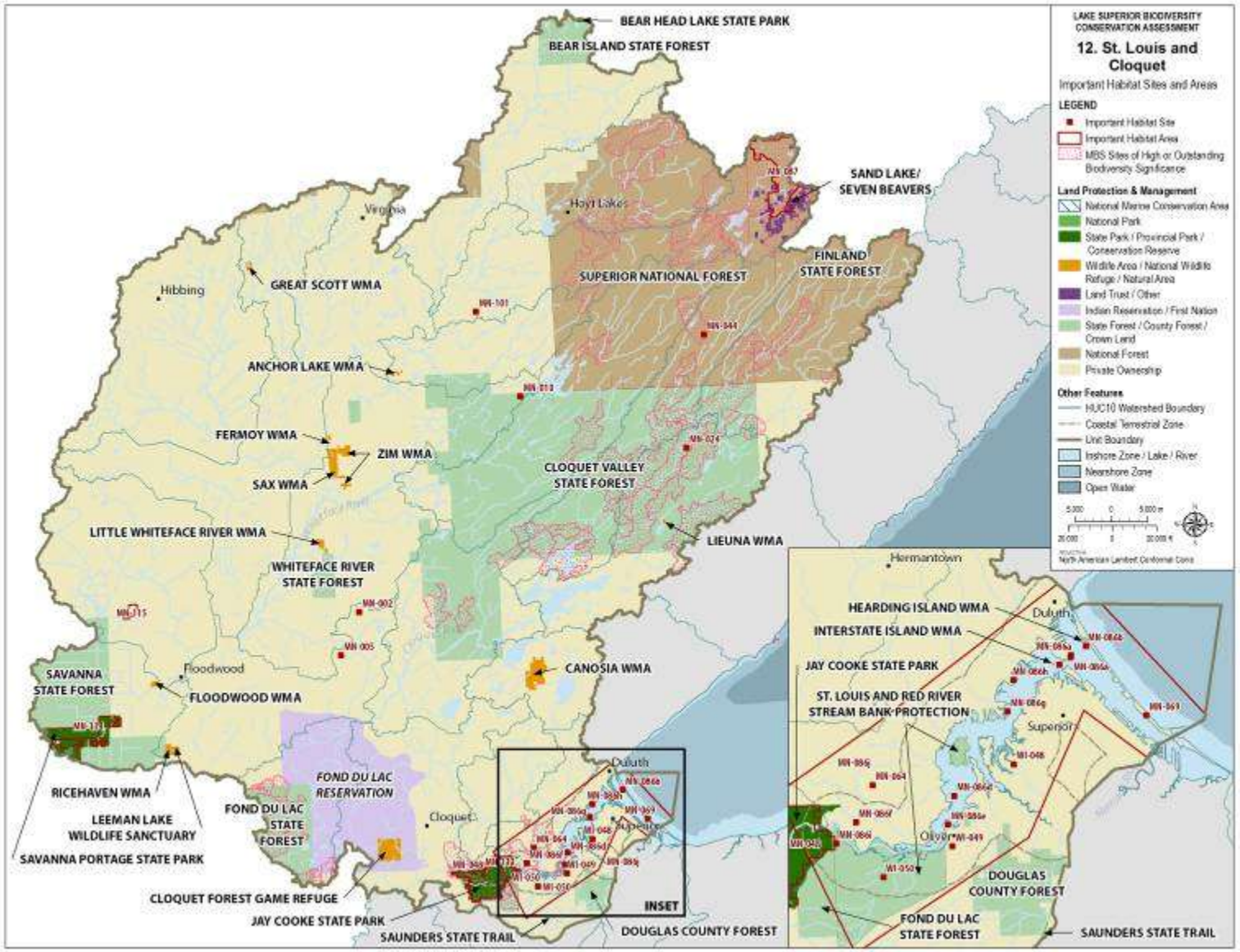
- Wisconsin Point is another State Important Bird Area in the St. Louis and Cloquet regional unit; this site is 77% open water (National Audubon Society 2013, 2012). The City of Superior and partners have developed a plan for Wisconsin Point (C. Hagen et al., pers. comm., March 20 2013).
- Many other diverse programs and projects focus on parts of the St. Louis and Cloquet regional unit and 34 Citizen-based Groups are noted to do work in the St. Louis- Cloquet regional unit (U.S. EPA 2013h, 2013i). A number of other projects, undertaken by the Minnesota Pollution Control Agency and partner organizations are completed, in progress, or scheduled to start; these include the St. Louis River Citizens River Watch, the Cloquet River Major Watershed WRAP Strategy and the Mercury Pollutant Reduction Plan. The St. Louis River Trail Association promotes recreational opportunities based on good environmental stewardship, and non-motorized hiking along a natural surface trail they aim to build and maintain along the St. Louis River in Northern Minnesota (SLRT 2012). The City of Duluth and the University of Minnesota – Duluth collaborated on an urban stream awareness project, designed to increase public understanding of and demonstrate the importance of aquatic ecosystems (Minnesota PCA 2012c). Other initiatives include the Sand Lake-Seven Beavers Forest Collaborative and St. Louis County Cooperative Weed Management Area (B. Carlson, pers. comm., March 20 2013).
- The Minnesota Department of Natural Resources is undertaking a spawning habitat enhancement and shoreline restoration project at Chambers Grove, in the St. Louis River estuary. By removing 800 feet of hardened shoreline, a critical spawning area for Lake Sturgeon, Walleye, and Smallmouth Bass will be restored to viable spawning habitat. The natural function of the shoreline will also be restored. The project is funded through NOAA Fisheries, with funds from the Great Lakes Restoration Initiative (National Oceanic and Atmospheric Administration No date).

TABLE 12.3: St. Louis and Cloquet IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
MN-002	Site	Alborn Fen	Poor Fen, sedge subtype, rare plant habitat
MN-005	Site	Arlberg Bog	Rare plant habitat
MN-010	Site	Blackfoot Lake Peatland	Poor Fen, Sedge subtype, rare plant habitat
MN-024	Site	Cloquet River Macrosite	Rare animal habitat
MN-044	Site	Hornby Lake	Rare plant habitat
MN-048	Area	Jay Cooke State Park	Rare plant habitat, northern hardwood forest
MN-064	Site	Magney Hardwoods Forest	Old growth mixed hardwoods/conifer forest and northern hardwoods forest; rare plant habitat
MN-069	Site	Minnesota Point	Rare plant habitat, unique geomorphic formation, old growth pine forest
MN-086a	Site	Interstate Island	Rare animal habitat, colonial waterbird nesting habitat
MN-086b	Site	Hearding Island	Open dunes, representative natural plant community
MN-086d	Site	Spirit Lake Point	Great Lakes marsh, migratory wildlife habitat
MN-086e	Site	Mud Lake	Great Lakes marsh, migratory wildlife habitat
MN-086f	Site	Fond Du Lac	Great Lakes marsh, migratory wildlife habitat
MN-086g	Site	Grassy Point	Great Lakes wetland complex
MN-086h	Site	Bong Bridge	Rare animal habitat
MN-086i	Site	Swamp Lake	Rare animal habitat
MN-086j	Area	St. Louis Estuary	Great Lakes freshwater estuary, rare plant and animal habitat, colonial waterbird nesting habitat
MN-087	Area	Sand Lake Peatland	Large patterned peatland, significant bog and fen features, rare plant habitat, rare animal habitat, geological processes
MN-101	Site	Tikander	Rare animal habitat, rare plant habitat, colonial waterbird nesting habitat
MN-111	Area	Hemlock Ravine SNA	Rare plant habitat, old growth northern hardwoods, white pine, and eastern hemlock forest
MN-114	Area	Savanna Portage State Park	Northern hardwood forest
MN-115	Area	Tettegouche State Park	Northern hardwood forest, Northern hardwood-conifer forest, old growth white cedar forest, complex of forested highlands, wetlands, streams and lakes with high biodiversity, Shoreline cliffs, rare animal habitat
WI-048	Site	Superior Municipal Forest	Great Lakes pine forest, rare plant and animal habitat, Great Lakes freshwater estuary
WI-049	Site	Oliver Wetlands	Great Lakes freshwater estuary, coastal marsh, migratory bird habitat
WI-050	Site	Red River	Rare plant habitat, eroding red clay bluffs, fish spawning habitat

In the St. Louis and Cloquet Unit, there are potentially many additional priority areas for conservation. One is the region around the headwaters of the St. Louis River, including but not limited to the Sand Lake Peatland Scientific and Natural Area. It is a large landscape of high ecological quality storing lots of water for the river, and only parts have been protected.

Figure 12.3: St. Louis and Cloquet - Important Habitat Sites and Areas



*The St. Louis Red River Streambank Protection Area is not a State Park, but was classified with this category due to the state ownership of the site.

TABLE 12.4: St. Louis and Cloquet LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 168 species and communities of conservation concern have been documented in the regional unit. 87 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 14 species and communities were once known to occur here, but have current conservation ranks of F (Failed to find) or H (Historical). A further 67 species and communities of conservation concern are known to occur in this regional unit, but are currently not ranked for viability.[13]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
Accipiter gentilis	Northern Goshawk
Acipenser fulvescens	Lake Sturgeon
Actaea pachypoda	White Baneberry
Ammophila breviligulata ssp. breviligulata	Beach Grass
Boreal forest	Boreal Forest
Botaurus lentiginosus	American Bittern
Botrychium acuminatum	Pointed Moonwort
Botrychium ascendens	Upward-lobed Moonwort
Botrychium campestre	Prairie Moonwort
Botrychium lineare	Narrowleaf Grape Fern
Botrychium lunaria	Common Moonwort
Botrychium matricariifolium	Matricary Grapefern
Botrychium michiganense	Michigan Moonwort
Botrychium mormo	Goblin Fern
Botrychium oneidense	Blunt-lobed Grapefern
Botrychium pallidum	Pale Moonwort
Botrychium rugulosum	St. Lawrence Grapefern
Botrychium simplex	Least Moonwort
Calamagrostis stricta	Slim-stem Small Reed Grass
Callitriche heterophylla	Larger Water-starwort
Caltha natans	Floating Marsh-marigold
Canadanthus modestus	Northwestern Sticky Aster
Carex exilis	Coastal Sedge
Carex garberi	Garber's Sedge

[13] For the Minnesota portions of this unit, data included here were provided by the Division of Ecological and Water Resources, Minnesota Department of Natural Resources (DNR), and were current as of December 3 2014. These data are not based on an exhaustive inventory of the state. The lack of data for any geographic area shall not be construed to mean that no significant features are present.

For the Wisconsin portions of this unit, data included here were provided by the Bureau of Natural Heritage Conservation, Wisconsin Department of Natural Resources (DNR). Although the NHI database is the most up-to-date and comprehensive database on the occurrences of rare species and natural communities available, many areas of the state have not been inventoried. Similarly, the presence of one rare species at a location does not imply that all taxonomic groups have been surveyed for at that site. As such, the data should be interpreted with caution and an "absence of evidence is not evidence of absence" philosophy should be followed.

Carex gynandra	A Species of Sedge
Carex nigra	Smooth Black Sedge
Carex novae-angliae	New England Sedge
Carex ormostachya	Necklace Spike Sedge
Carex pallescens	Pale Sedge
Carex rossii	Ross' Sedge
Coregonus zenithicus	Shortjaw Cisco
Cygnus buccinator	Trumpeter Swan
Cypripedium arietinum	Ram's-head Lady's-slipper
Deschampsia flexuosa	Slender Hairgrass
Drosera anglica	English Sundew
Eleocharis compressa	Flat-stemmed Spike-rush
Eleocharis flavescens var. olivacea	Olivaceous Spike-rush
Eleocharis nitida	Neat Spike-rush
Elliptio complanata	Eastern Elliptio
Emergent marsh	Emergent Marsh
Equisetum palustre	Marsh Horsetail
Falco peregrinus	Peregrine Falcon
Forested seep	Forested Seep
Geocaulon lividum	Northern Comandra
Geum macrophyllum var. macrophyllum	Large-leaved Avens
Glyptemys insculpta	Wood Turtle
Haliaeetus leucocephalus	Bald Eagle
Hemidactylium scutatum	Four-toed Salamander
Hydroptila novicola	A Caddisfly
Ixobrychus exilis	Least Bittern
Juncus stygius var. americanus	Bog Rush
Juncus vaseyi	Vasey's Rush
Littorella americana	American Shore-plantain
Lycaeides idas nabokovi	Nabokov's Blue
Microtus chrotorrhinus	Rock Vole
Northern Poor Fen Class	Northern Poor Fen
Northern sedge meadow	Northern Sedge Meadow
Ophiogomphus anomalus	Extra-striped Snaketail
Oxyethira itascae	A Caddisfly
Parnassia palustris	Marsh Grass-of-Parnassus
Perimyotis subflavus	Tricolored Bat
Petasites sagittatus	Arrow-leaved Sweet-coltsfoot
Phalacrocorax auritus	Double-crested Cormorant
Pinguicula vulgaris	Common Butterwort
Piptatherum canadense	Canada Mountain-Ricegrass
Polemonium occidentale ssp. lacustre	Western Jacob's Ladder
Ranunculus cymbalaria	Seaside Crowfoot
Red Oak - Sugar Maple - Basswood - (Bluebead Lily) Forest Type	Red Oak - Sugar Maple - Basswood - (Bluebead Lily) Forest
Rhynchospora fusca	Sooty-colored Beak-rush
Rubus chamaemorus	Cloudberry
Salix planifolia	Tea-leaved Willow
Schoenoplectus torreyi	Torrey's Bulrush
Setophaga caerulescens	Black-throated Blue Warbler
Shepherdia canadensis	Canada Buffaloberry
Sorex fumeus	Smoky Shrew
Sticta fuliginosa	Peppered moon lichen
Streptopus amplexifolius	White Mandarin
Stuckenia vaginata	Sheathed Pondweed
Sugar Maple - Basswood - (Bluebead Lily) Forest Type	Sugar Maple - Basswood - (Bluebead Lily) Forest

Sugar Maple - Basswood - (Horsetail) Forest Type	Sugar Maple - Basswood - (Horsetail) Forest
Torreyochloa pallida	Torrey's Manna-grass
Torreyochloa pallida var. fernaldii	Pale Manna Grass
Tsuga canadensis	Eastern Hemlock
Utricularia geminiscapa	Hidden-fruited Bladderwort
Utricularia resupinata	Lavendar Bladderwort
White Pine - White Spruce - Paper Birch Forest Type	White Pine - White Spruce - Paper Birch Forest
Xyris montana	Montane Yellow-eyed Grass
Historical or Failed to Find Records	
Scientific Name	**Common Name**
Actinonaias ligamentina	Mucket
Adlumia fungosa	Climbing Fumitory
Allium schoenoprasum	Chives
Botrychium lanceolatum ssp. angustisegmentum	Lanceleaf Grapefern
Calamagrostis lacustris	Marsh Reedgrass
Calypso bulbosa	Fairy Slipper
Carex merritt-fernaldii	Fernald's Sedge
Charadrius melodus	Piping Plover
Cicindela hirticollis rhodensis	Hairy-necked Tiger Beetle
Hudsonia tomentosa	Beach-heather
Leucophysalis grandiflora	Large-flowered Ground-cherry
Phacelia franklinii	Franklin's Phacelia
Pyrgus centaureae freija	Grizzled Skipper
Sterna hirundo	Common Tern
Unranked Records	
Scientific Name	**Common Name**
Adoxa moschatellina	Moschatel
Aegolius funereus	Boreal Owl
Ahtiana aurescens	Eastern candlewax lichen
Ammodramus leconteii	Le Conte's Sparrow
Ammodramus nelsoni	Nelson's Sparrow
Anguilla rostrata	American Eel
Arethusa bulbosa	Dragon's-mouth
Aspen - Birch - Basswood Forest Type	Aspen - Birch - Basswood Forest
Bartramia longicauda	Upland Sandpiper
Bidens discoidea	Bur-marigold
Black Spruce Bog Type	Black Spruce Bog
Botrychium minganense	Mingan Moonwort
Buteo lineatus	Red-shouldered Hawk
Cardamine pratensis	Cuckoo Flower
Carex flava	Yellow Sedge
Carex michauxiana	Michaux's Sedge
Ceratophyllum echinatum	Spiny Hornwort
Claytonia caroliniana	Carolina Spring-beauty
Colonial Waterbird Nesting Area	Colonial Waterbird Nesting Site
Coturnicops noveboracensis	Yellow Rail
Elatine triandra	Three Stamened Waterwort
Eleocharis mamillata	Mamillate Spike-rush
Elodea bifoliata	Twoleaf Waterweed
Emydoidea blandingii	Blanding's Turtle
Ephemeral pond	Ephemeral Pond
Erebia mancinus	Taiga Alpine
Esker (quaternary)	Esker (Quaternary)

Etheostoma microperca	Least Darter
Grus canadensis	Sandhill Crane
Hydroprogne caspia	Caspian Tern
Ice composite (quaternary)	Ice Composite (Quaternary)
Igneous unit or sequence (middle proterozoic)	Igneous Unit or Sequence (Middle Proterozoic)
Lake and wetland deposition (quaternary)	Lake and Wetland Deposition (Quaternary)
Lasmigona compressa	Creek Heelsplitter
Ligumia recta	Black Sandshell
Lobaria quercizans	Smooth lungwort
Malaxis monophyllos var. brachypoda	White Adder's-mouth
Mixed unit or sequence (lower proterozoic, upper proterozoic)	Mixed Unit or Sequence (Lower Proterozoic, Upper Proterozoic)
Myotis septentrionalis	Northern Myotis
Myriophyllum tenellum	Leafless Water Milfoil
Najas gracillima	Thread-like Naiad
Native Plant Community, Undetermined Class	Native Plant Community, Undetermined Class
Notropis anogenus	Pugnose Shiner
Oporornis agilis	Connecticut Warbler
Outwash plain (quaternary)	Outwash Plain (Quaternary)
Platanthera clavellata	Club-spur Orchid
Poa sylvestris	Woodland Bluegrass
Potamogeton oakesianus	Oakes' Pondweed
Potamogeton vaseyi	Vasey's Pondweed
Pyrola minor	Small Shinleaf
Ranunculus gmelinii	Small Yellow Water Crowfoot
Ranunculus lapponicus	Lapland Buttercup
Salix pellita	Satiny Willow
Sand Beach (Lake Superior) Type	Sand Beach (Lake Superior)
Scirpus pedicellatus	Woolgrass
Sparganium glomeratum	Clustered Bur-reed
Spermophilus franklinii	Franklin's Ground Squirrel
Spiranthes casei var. casei	
Stream erosion (holocene)	Stream Erosion (Holocene)
Stream erosion (quaternary)	Stream Erosion (Quaternary)
Stream process (holocene)	Stream Process (Holocene)
Strix nebulosa	Great Gray Owl
Sturnella neglecta	Western Meadowlark
Sugar Maple Forest (North Shore) Type	Sugar Maple Forest (North Shore)
Tomenthypnum falcifolium	Curved-leaved golden moss
Utricularia gibba	Humped Bladderwort
Waldsteinia fragarioides var. fragarioides	Barren Strawberry

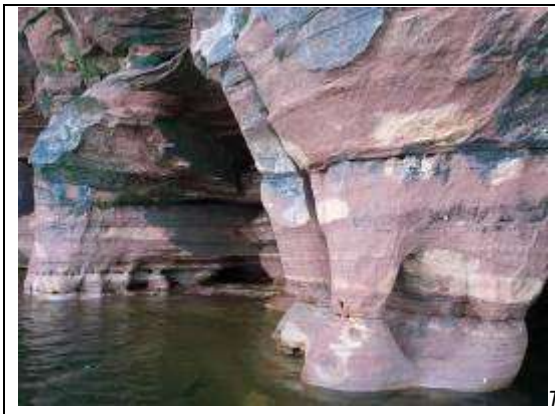
13. Nemadji to Fish Creek

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	A
NEARSHORE	C	COASTAL WETLANDS	B
EMBAYMENTS & INSHORE	C	COASTAL TERRESTRIAL	A
TRIBUTARIES & WATERSHEDS	C	**OVERALL B**	

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*



The sandstone in the Apostle Islands have eroded into unique cliff formations, including sea caves. Photo credit: National Park Service

Summary/ Description

The Nemadji to Fish Creek regional unit is located along the southern Lake Superior coast. It is 6736 km^2 in size, including the associated nearshore waters. The regional unit boundary extends along the Lake Superior shoreline from near Superior, Wisconsin to past Ashland, Wisconsin. In this Biodiversity Conservation Assessment the Beartrap Creek subwatershed is considered part of the Lower Bad River subwatershed and the Bad-Montreal regional unit. This regional unit delineation reflects local management boundaries as adopted by the Bad River Band of Lake Superior Tribe of Chippewa Indians and the Wisconsin Department of Natural Resources (N. Tillison, pers. comm., April 26 2013). Inland, most of this regional unit is located in Wisconsin; however the western portion of this regional unit extends into Minnesota. Approximately 15% of the regional unit land base is in two Minnesota counties (Carlton and Pine counties) and 85% of the regional unit land base is in Wisconsin (in Bayfield, Ashland and Douglas counties) (USDA NRCS No date c). The reservation of the Red Cliff Band of Lake Superior Chippewa is located in this regional unit. A portion of the reservation of the Bad River Band of Lake Superior Tribe of Chippewa Indians is also located in this regional unit (A. McCammon Soltis, pers. comm., March 19 2013). The Nemadji to Fish Creek regional unit is part of the territory ceded in the Treaties of 1842 and 1854. The signatory tribes retain rights to hunt, fish, and gather within the regional unit (A. McCammon Soltis, pers. comm., January 5 2015). The eastern portion of this region includes the Bayfield Peninsula, Chequamegon Bay and the Apostle Islands National Lakeshore. This regional unit is referred to as HUC 04010301, and it is part of Subregion 0401 – Western Lake Superior. The Nemadji to Fish Creek regional unit contains one tertiary (HUC 8) watershed, Beartrap-Nemadji, and 11 quaternary (HUC 10) watersheds. This region contains more agricultural land than most other regions, and just over 50% of the region is forested. The coast is dominated by rocky shores and cliffs, and many coastal wetlands.

TABLE 13.1: Nemadji to Fish Creek BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	530.41	7.02	1,441.07	
Developed	20.64	0.27	389.55	
Forest	3,979.84	52.66	107,747.13	
Associated Nearshore Waters	2,682.17	35.49	17,868.03	
Other	317.18	4.20	8,227.57	
Water (inland)	27.53	0.36	9,473.05	
Total Area	**7,557.78**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	488.85	NA	8.39	Based on SOLEC shoreline
Sand Beaches (km)	34.86	7.13	5.42*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	96.02	14.09*	8.70**	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone	602.73	88.46*	9.76**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	63	NA	2.4	
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	7.09	NA		
Road Density (km/km^2)	0.67	NA		
Number of Dams and Barriers	2,681	NA	11.3	
Artificial Shoreline (km)	25.59	6.05	12.98	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	2,828.56	58.02	4,874.79	Regional area based on landmass
Public/Crown	1,715.52	35.19	4,874.79	
Tribes/ First Nations	56.23	1.15	4,874.79	
Parks & Protected Areas (total)	274.49	5.63	4,874.79	
Parks & Protected Areas (coast)	201.49	29.57*	681.34**	*% of Regional Coastal Area **Regional Coastal Area (km^2)

Important Biodiversity Features

Nearshore and Inshore Waters

- The Nemadji to Fish Creek regional unit contains a number of areas identified as Important Habitat for Lake Whitefish and Lake Trout, especially in and around the Bayfield Peninsula and the Apostle Islands (Lake Superior Binational Program Habitat Committee 2006) (Figure 13.1). The shoals near the Apostle Islands National Lakeshore's one-quarter mile lakeward boundary are especially important for Lake Trout and Lake Whitefish, as they provide critical spawning areas (NPS 2013b).

- Chequamegon Bay is noted as a Lake Superior embayment important for Lake Sturgeon (Auer 2003). In the Nemadji to Fish Creek regional unit this embayment and the nearshore zone, which provides corridors for movement, are identified as critical management areas for Lake Sturgeon in the Lake Superior basin (Auer 2003).
- The waters around the Apostle Islands are described as relatively shallow, with a diverse and complex fish community for Lake Superior (NPS 2013b).

Coastal Zone and Islands

- The Wisconsin Department of Natural Resources (WDNR) has identified primary coastal wetlands deemed to be ecologically significant coastal wetlands. This assessment has been completed for both the Lake Superior and Lake Michigan basins. Several of these Lake Superior ecologically significant coastal wetlands are located in the Nemadji to Fish Creek regional unit, including S-06 Nemadji River Bottoms, S-08 Allouez Bay-Wisconsin Point, S-09 Port Wing, S-11 Lost Creek, S-17 Big Bay Wetlands and S-22 Mouth of the Brule River (WDNR 2012c, 2012d). A number of the ecologically significant coastal wetlands are located on the islands of the Apostle Islands National Lakeshore (WDNR 2012d). A complete list of the Lake Superior ecologically significant wetlands and their specific site attributes is available on the WDNR website (WDNR 2012c, 2012d).
- A number of Important Habitat Sites are located along the Lake Superior shore, as well as a number of additional sites inland. Several Important Habitat Areas are also located in the Nemadji to Fish Creek region; the group of Apostle Islands are one of these Important Habitat Areas (Lake Superior Binational Program Habitat Committee 2006) (Table 13.3, Figure 13.3).
- Resident breeding birds and neotropical migrant birds use the islands within the Apostle Islands National Lakeshore for important habitat. Important migratory bird concentration points are also located in the lakeshore (NPS 2013b).
- Chequamegon Bay is described as among the best Wisconsin birding locations. More than 300 bird species have been observed in the area (a 40-mile radius around Ashland, Wisconsin) since 1972 (NPS 2013b).
- Stockton Islands, part of the Apostle Islands National Lakeshore, has one of the highest concentrations of Black Bears in North America. Many other mammals, including White-tailed Deer, Snowshoe Hare, Red Fox and Beaver are found on the islands. Many common mainland species, such as Raccoon, Skunk, Porcupines and Eastern Gray Squirrels are not found on the islands (NPS 2013b).
- Over 800 plant species are known to occur within the Apostle Islands National Lakeshore. Some islands contain old-growth remnant forests, as they were never commercially logged. Wetland, Precambrian sandstone ledges and bluffs, and many dunal features provide habitat for a number of rare plant species (NPS 2013b).

Tributaries and Watersheds

- There are native, self-sustaining Brook Trout in many of the tributaries of this regional unit (M. Jennings, pers. comm., March 13 2013).
- The deeply cut streams characteristic of this watershed have influenced land use in the regional unit. The valleys remain largely forested, while flat upland areas tend to be used for agriculture and recreation (USDA NRCS No date c).
- The Nemadji to Fish Creek regional unit is in the Northern Lakes and Forest Ecoregion. Portions of the regional unit are located within the Lake Superior Lacustrine Clay Plain and the Minnesota/Wisconsin Upland Till Plain (USDA NRCS No date c).

- The Nemadji River Floodplain Forest contains a floodplain forest which is unusual in its composition, and may be unique to Wisconsin. An unusual mix of tree species and a rich herb layer are found . Floodplain forests are very rare along Lake Superior tributaries. The Nemadji River Floodplain Forest is located along the Nemadji River, on terraces 15 feet above normal water levels. It was designated a State Natural Area in 1997, and is owned by Douglas County (WDNR 2013a).

Figure 13.1: Nemadji to Fish Creek - Coastal and Watershed Features

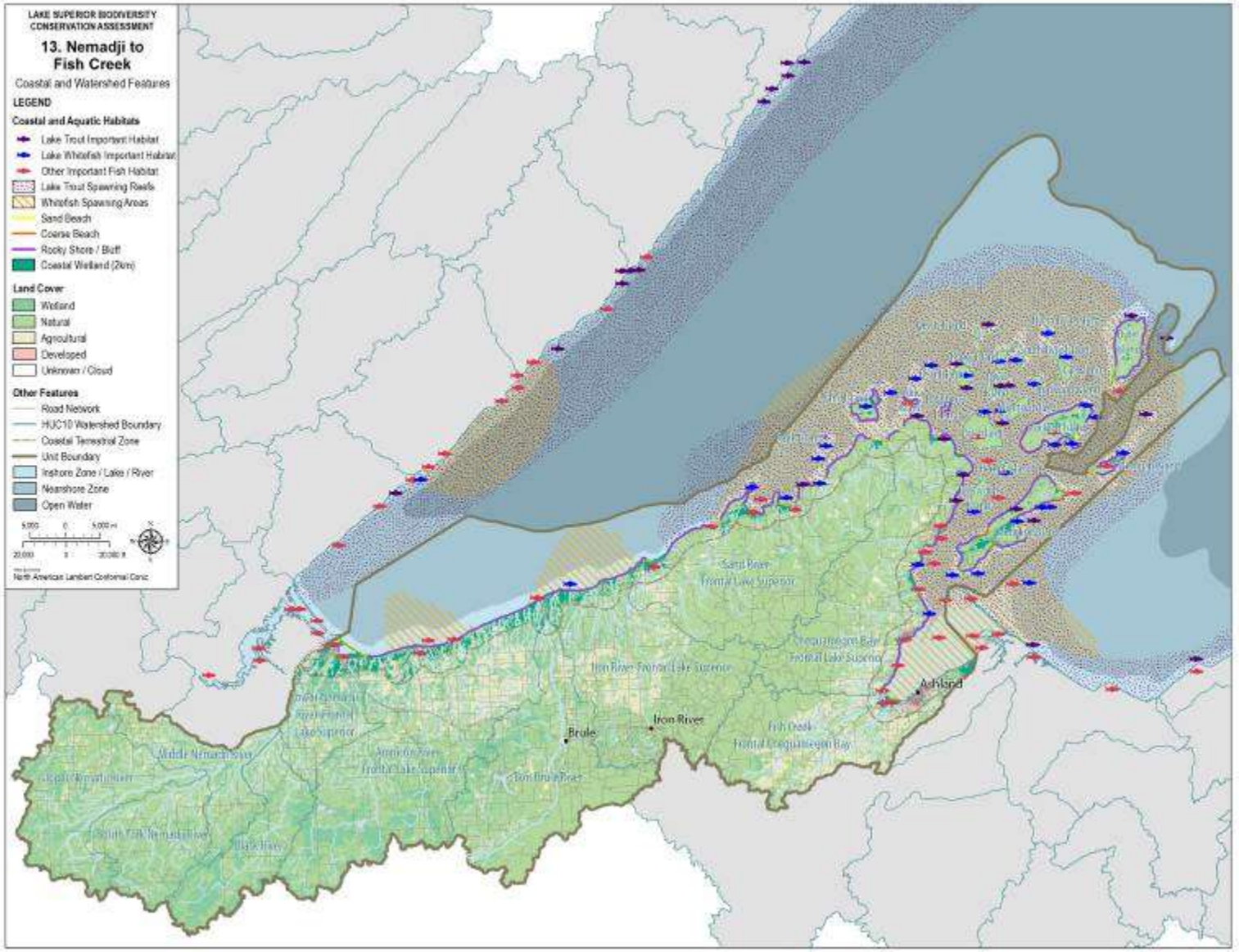


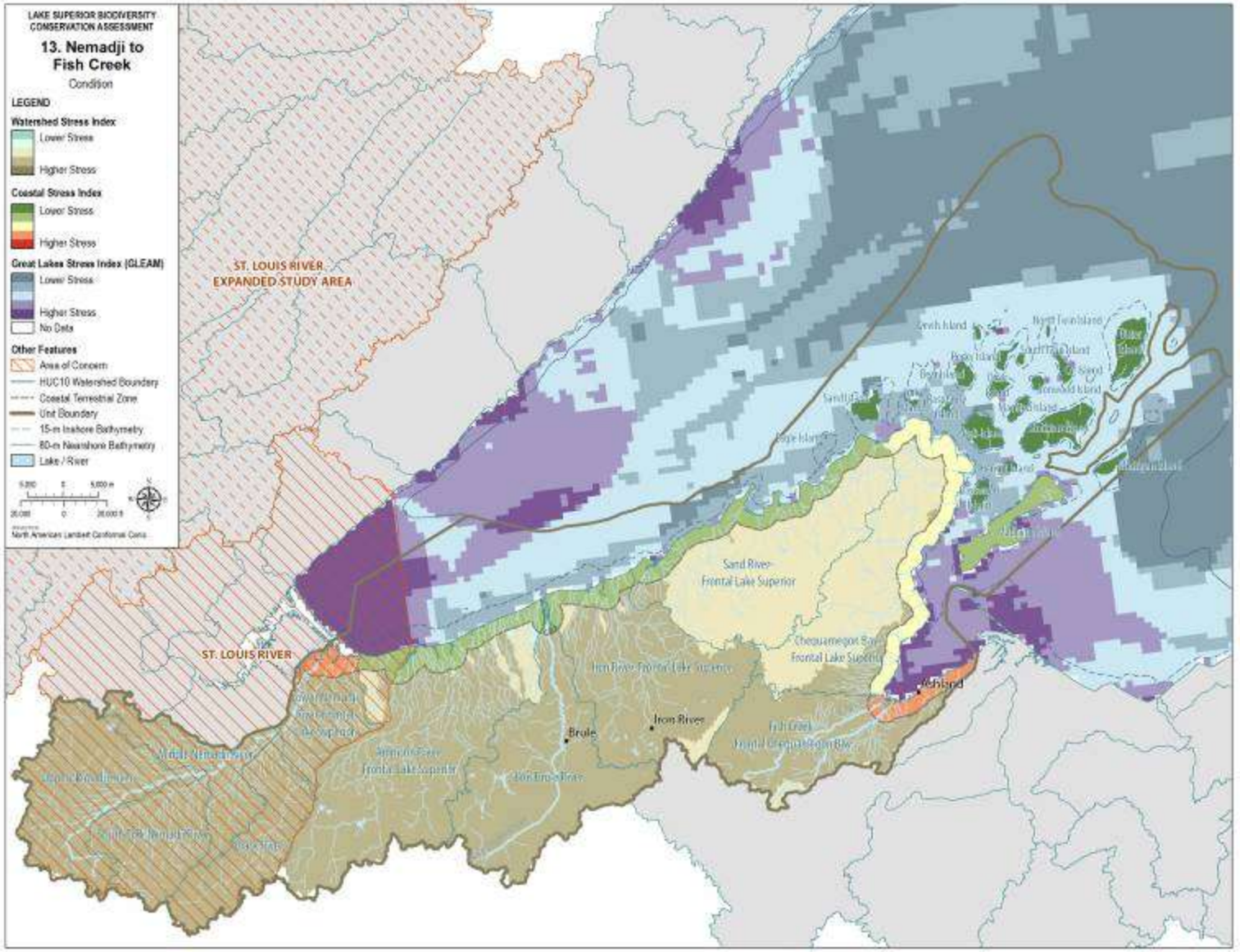
TABLE 13.2: Nemadji to Fish Creek CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	
Nearshore[1]	C (0.57)	
Embayments and Inshore[1,2]	C (0.51)	
Coastal Wetlands[2,3]	B (0.655)	Local experts believe a grade of B may be low for the coastal wetlands target. Although the Nemadji and other smaller wetlands are described as compromised, the Nemadji to Fish Creek unit also contains a dozen or more exemplary sites, including Bark Bay, Raspberry Bay, Lost Creek, and others (R. O'Connor, pers. comm., March 15 2013).
Islands[4]	A	Local experts believe a condition score of B may be accurate for islands in this regional unit. The islands are under continual management to maintain their current good condition. Without continued management the islands' biodiversity would suffer degradation (C. Hagen et al., pers. comm., March 20 2013).
Coastal Terrestrial[3]	A (0.956)	Local experts believe a condition score of B may be accurate for the coastal terrestrial portion of this regional unit. Although there is still quite a bit of public land in this area, significant areas of private land have fragmented the riparian corridor (C. Hagen et al., pers. comm., March 20 2013). In addition, the loss of conifers and prevalence of aspen, which is still being heavily promoted by state agencies, are provided as additional reasons that a condition score of A may be too high. Research has demonstrated that from a water quality standpoint, young aspen (0-15 years) is no different than open land (R. O'Connor, pers. comm., March 15 2013).
Tributaries and Watersheds[2]	C (0.44)	

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

Figure 13.2: Nemadji to Fish Creek - Condition



Important Issues & Threats

- The St. Louis River Area of Concern (AOC) is located in three regional units, including portions of the Nemadji to Fish Creek regional unit. The St. Louis River has faced issues of habitat loss and degradation, and pollution and contamination, especially in its lower reaches. The lower 39 miles (63 kilometres) of the St. Louis River are the main focus of the St. Louis River Remedial Action Plan (RAP) (U.S. EPA 2013c) and are designated as a Lake Superior Area of Concern (AOC). Nine beneficial use impairments were identified in the St. Louis River AOC (U.S. EPA 2013c).
- Chequamegon Bay has two highly contaminated sites that were not given AOC designations. These are both Superfund sites. One is located on the Ashland waterfront and upland areas and is called the Ashland/Northern States Power Lakefront Site (U.S. EPA 2013j). The second site is a mostly upland area on the west side of Chequamegon Bay (at Barksdale, Wisconsin) called the DuPont Barksdale Explosives Plant Site (U.S. EPA 2011). These are both priority sites for improving the health of Chequamegon Bay (M. Hudson, pers. comm., March 20 2013).
- The populations of native, self-sustaining Brook Trout in many of the tributaries of this regional unit face a number of threats, since many of the streams are thermally marginal for coldwater fish. Climate change has the potential to make these streams unsuitable for Brook Trout, as well as non-native but self-sustaining trout and salmon. Maintenance of shaded riparian zones is important to conservation in these streams. Conversion of forest cover to cover types that increase runoff would threaten these fish, as would major changes in availability of groundwater, if future demand increases withdrawals (M. Jennings, pers. comm., March 13 2013).
- The Nemadji to Fish Creek watershed is the largest single source of sediment to Lake Superior (USDA NRCS No date c). Because the mouth of the Nemadji River is located in Superior Bay, the U.S. Army Corps of Engineers must dredge Superior Bay annually, to maintain the necessary depth for shipping traffic (USDA NRCS No date c). Estimates completed 15 years ago by the Minnesota Natural Resources Conservation Service (NRCS) indicate that the annual amount of sediment transported by the Nemadji River is on average 120,000 tons, with 33,000 tons of sediment dredged annually (USDA NRCS No date c, Baird & Associates 2000).
- The Nemadji River Basin Project determined that the erosion of valley walls accounts for 98% of the sediment yield from the Nemadji Basin. The amount of sediment eroded and transported along the tributaries of the Nemadji Basin to the mouth of the river (the sediment delivery ration SDR) was nearly 98% (Baird & Associates 2000).
- A top resource concern noted in Rapid Watershed Assessment for this regional unit is Bankfull Flow and Channel Downcutting. Problems with erosion, sedimentation and turbidity in this regional unit can be linked to the conversion of land use from old growth coniferous forests to forests of poplar. The amount of water yielded by the land increased with this cover change. Incompatible forestry (e.g. clear-cut logging) and agriculture may create the same hydrologic system response as open lands[14] on the clay plains of the region (USDA NRCS No date c, C. Hagen et al., pers. comm., March 20 2013).
- This regional unit contains clay plains and sand barrens. Management of certain areas of the regional unit as open lands is desired. For example in the Moquah Barrens open grassland is the management goal, and there is not a detrimental effect to the watershed (C Hagen et al., pers. comm., March 20 2013).

[14] Open lands are defined by Baird & Associates (2000) as meadows, pasture or timber growth aged 0 to 15 years. The definition for open growth is not given in the Rapid Watershed Assessment (USDA No date c)

- The conversion of land cover to coniferous forests in red-clay soil areas is one management opportunity noted for woodland management which would also address erosion concerns (USDA NRCS No date c).
- Development pressure for this regional unit is described as moderate. Development may occur on farms, timberland, or lakeshore areas (USDA NRCS No date c).
- Agricultural land use accounts for approximately eleven percent of the land-base for this regional unit. There are estimated to be approximately 1,617 farms in this regional unit. Of these farms, approximately sixty percent are less than 180 acres is size, thirty-seven percent are between 180 and 1,000 acres in size, and three percent are larger than 1,000 acres (USDA NRCS No date c).
- A large portion of the soils in this regional unit are classified as having several limitations or very severe limitations through Land Capability Classification. These classifications reflect how the soils would fare with typical field crops, the possibility of damage if they were used for field crops, and how they respond to management (USDA NRCS No date c).
- A number of waterbodies within the Nemadji to Fish Creek regional unit are listed as impaired. Reasons for impairment include excess nutrients, mercury, degraded habitat, e-coli, contaminated sediments, turbidity, and others. Affected uses include aquatic consumption, aquatic life and aquatic recreation (USDA NRCS No date c).
- An Emergency Prevention and Response Plan for Viral Hemorrhagic Septicemia has been developed for Isle Royale National Park, Pictured Rocks National Lakeshore, Apostle Islands National Lakeshore and the Grand Portage Band of the Lake Superior Chippewa Reservation (within which is the Grand Portage National Monument) (NPS 2013a).
- Concerns identified through the Rapid Watershed Assessment are mainly related to the large amounts of sediments transported in the waters, due to the highly erodible clay soil and high riverbanks (USDA NRCS No date c). The sediment transported through the watershed eventually is deposited into Western Lake Superior (USDA NRCS No date c).

Conservation In Action

Parks & Protected Areas

- Apostle Islands National Lakeshore is located in the Nemadji to Fish Creek regional unit. The park is a combination of 21 islands located off the Bayfield Peninsula, and 12 miles of mainland (NPS 2013b).
- Although Long Island is included in the Apostle Islands, it is an extension of the Chequamegon Point barrier spit, and it is the only Apostle Island which does not have a bedrock core.
- The Red Cliff Band of Lake Superior Chippewa dedicated 90 acres of transitional boreal forest and one-quarter mile of pristine sand beach on Lake Superior for the development of Frog Bay Tribal National Park in August 2012. Although within the reservation boundaries, the parcel had been lost by the Tribe and held in private status for generations. Through a substantial donation by former owners David and Marjorie Johnson, and assistance from Bayfield Regional Conservancy, the Tribe was able to recover these lost reservation lands. Red Cliff has opened the doors of this unique area for the quiet enjoyment of tribal members and the general public alike, creating nearly two miles of hiking trails through mature forests of cedar, hemlock and yellow birch. The beach on Lake Superior affords views of five islands on the Apostle Islands National Lakeshore (C. Abel, pers. comm., December 15 2014). The Frog Bay Tribal National Park is the first national park ever designated by a federally recognized tribe (R. O'Connor, pers. comm., March 15 2013).
- Chequamegon National Forest

Existing Programs & Projects

- The U.S. Fish and Wildlife Service Iron River National Fish Hatchery is located in the Nemadji to Fish Creek region. The captive brood stock and production fish from the Brook Trout of the Isle Royale region (the Tobin Harbor and Siskiwit Bay strains) are reared at this facility (Newman et al. 2003). The Red Cliff Tribal Fish Hatchery is also located in this region. The Red Cliff Tribal Fish Hatchery rears captive brood stock and production fish from the Lake Nipigon strain of Brook Trout (Newman et al. 2003).
- Bayfield State Fish Hatchery
- The U.S. Fish and Wildlife Service is undertaking early detection monitoring for new aquatic invasive species in Chequamegon Bay (G. Czypinski, pers. comm., March 20 2013).
- Bog Lake on Madeline Islands has been designated as a high quality waterbody through the Bad River Band of Lake Superior Tribe of Chippewa Indians Outstanding Tribal Resource Waters (OTRWs) designation (Bad River Band of Lake Superior Tribe of Chippewa Indians 2011).
- The WDNR has a Designated Waters designation for waterbodies with permit requirements. Designated Waters include Areas of Special Natural Resource Interest (ASNRI), Public Rights Features (PRF) and Priority Navigable Waters (PNW) (WDNR No date). These designations offer protection for various important waters, including Wild Rice Waters and Outstanding and Exceptional Resource Waters (C. Hagen et al., pers. comm., March 20 2013).
- Wisconsin's Wildlife Action Plan identified a number of Conservation Opportunity Areas for Wildlife Species of Greatest Conservation Need. In the Superior Coastal Plain Ecological Landscape several areas of State, Continental and Global Significance were identified, including some in the Nemadji to Fish Creek regional unit (WDNR 2008a, 2008b, 2008c).
- The Chequamegon Bay Area Partnership (CBAP) recently published a Strategic Priorities document that outlines important issues and threats to the Chequamegon Bay area (CBAP 2013).
- There are watershed partnership efforts underway to implement the Fish Creek Watershed Restoration and Management Plan and the Marengo River Watershed Action Plan. Fish Creek and the Marengo River quaternary watersheds are two of the largest sediment contributors to the Chequamegon Bay area (M. Hudson, pers. comm., March 20 2013).
- The Bayfield Regional Conservancy, a land trust working within the Nemadji to Fish Creek and the Bad-Montreal regional units, has developed strategic conservation plans for areas in these regional units (M. Hudson, pers. comm., March 20 2013).
- The Wisconsin Wetlands Association has identified a set of representative high quality wetlands in different regions of Wisconsin. These are referred to as Wetland Gems, and were identified by building on existing conservation planning efforts (Wisconsin Wetlands Association No date a). Several Wetland Gems are in the Superior Region, including some in the Nemadji to Fish Creek regional unit (Wisconsin Wetlands Association No date b).
- The Natural Resources Conservation Service (NRCS) Performance Results System (PRS) provides support for reporting the development and delivery of conservation programs (USDA NRCS No date d). From 1999 to 2007 plans were made for a total of 21,798 acres of Total Conservation Systems. From 1999 to 2007 the Total Conservation Systems Applied amounted to 22,439 acres. The activities which contributed the largest amount to the Total Conservation Systems Applied were Total Wildlife Habitat (10,866 acres), Erosion Control Total Soil Saved (7,912 tons/year), Total Nutrient Management (5,589 acres) and Riparian Forest Buffers (4,198 acres). Additional activities involved pest management systems, prescribed grazing, tree and shrub establishment and wetlands (created, restored or enhanced) (USDA NRCS No date c).
- A number of State Important Bird Areas (IBAs) are located in the Nemadji to Fish Creek regional unit. These IBAs are Apostle Islands National Lakeshore IBA, Brule Glacial Spillway IBA, Lower

Chequamegon Bay IBA, Moose Junction Peatlands IBA, Wisconsin Point IBA, Moquah Barrens IBA and South Shore Wetlands IBA (National Audubon Society 2013, 2012).

- 27 Citizen-based Groups are noted to do work in the Nemadji to Fish Creek regional unit (U.S. EPA 2013r). Additional projects, plans, conservation districts, organizations and partners related to the Nemadji to Fish Creek regional unit are noted in the Rapid Watershed Assessment (USDA NRCS No date c). The Chequamegon Bay Area Partnership is a strong partnership in the area (C. Hagen et al., pers. comm., March 20 2013).

TABLE 13.3: Nemadji to Fish Creek IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
MN-009	Area	Black Lake Bog SNA	Black ash swamp, fen, forested bog, and open bog plant communities, rare plant habitat.
MN-043	Site	Holyoke	Northern hardwood forest
MN-086j	Area	St. Louis Estuary	Great Lakes freshwater estuary, rare plant and animal habitat, colonial waterbird nesting habitat
MN-089	Site	Soo Line	Northern hardwood forest, rare plant habitat
WI-010	Area	Apostle Islands	Extensive and diverse natural plant and animal communities. Rare plant and animal habitat
WI-012	Site	La Pointe Marina	Coastal wetlands, fish spawning habitat
WI-013	Site	Grant's Point	Coastal wetland and beach
WI-014	Site	Bog Lake and Amnicon Point	Unprotected sand beach, open-water coastal wetland
WI-015	Site	North Fish Creek Watershed	Old growth forest, fish spawning habitat, rare plant habitat, migratory wildlife areas
WI-016	Site	Whittlesey Creek Mouth	Coastal wetlands, fish spawning habitat, groundwater fed river system
WI-018	Site	Sioux River Wetland Estuary	Extensive coastal and riparian wetlands, sand beach and sandstone cliffs, rare plant habitat, shoreline bog
WI-019	Site	Onion River	Small coastal estuary, fish spawning habitat
WI-020	Site	Pikes Creek Slough	Coastal estuary wetland community
WI-021	Site	Schooner Bay/Red Cliff Bay	Small coastal estuary with extensive wetlands.
WI-022	Site	Frog Bay	Small coastal wetland estuary complex
WI-023	Site	Raspberry Bay and River	Great Lakes sand, gravel, and rock shoreline, riparian wetlands, fish spawning habitat
WI-024	Site	Little Sand Bay	Coastal wetlands, sand beach, hemlock and cedar forest
WI-025	Site	Big Sand Bay /Sand River	Small coastal freshwater estuary, good fish habitat
WI-026	Site	Mawikwe Bay Tributaries	Three small tributaries form small coastal wetlands at their mouths, sand beach, Lake Trout spawning area off point
WI-027	Site	Siskiwit Bay and River	Bay with pawning area for Lake Whitefish. Shorebirds use the sand beaches of Siskiwit Bay. Riverine fish spawning habitat.
WI-028	Site	Lost Creek Natural Area	Extensive coastal wetland, rare plant habitat, shorebird and fish habitats
WI-029	Site	Bark Bay and Point	Beach dunes landscape, extensive coastal wetlands and bog. The bay supports submergent vegetation.
WI-030	Site	Bark River	Extensive riparian wetlands, cedar and white pine forest, fish habitat
WI-031	Site	Cranberry River State Fishery Area	Great Lakes coastal lagoon and coastal wetlands, diverse fish community
WI-032	Site	Cranberry River Headwaters	Ground water source for fish habitat
WI-033	Site	Flag River Fishery Area & Port Wing Natural Area	Extensive coastal wetland area, old beach ridges, rare plant habitat
WI-034a	Site	Mud Lake	Riparian wetland habitat, bog
WI-034b	Site	Millpond Lake	Riparian wetland habitat

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
WI-034c	Site	Sand Barrens	Rare plant habitat, representative natural community, ecological processes
WI-034d	Site	Iron River Mouth	Great lakes coastal wetlands, fish spawning habitat
WI-034e	Area	Iron River Watershed	Fish spawning habitat
WI-035	Site	Reefer Creek	Small freshwater estuary, fish spawning habitat
WI-036	Site	Fish Creek	Small estuary with coastal wetlands, eroding scarps in unconsolidated sediments
WI-037	Site	Martinson's Landing	Freshwater estuary and coastal wetlands, sand beach, erodible clay banks
WI-038	Site	Brule River Watershed	Great Lakes coastal wetlands, fish spawning habitat, old growth forest, riparian wetlands
WI-038	Area	Brule River Watershed	Great Lakes coastal wetlands, fish spawning habitat, old growth forest, riparian wetlands
WI-039	Site	Smith Creek Estuary	Coastal wetlands
WI-040	Site	Pearson Creek Estuary	Coastal wetlands, gravel beach, eroding red clay bluffs
WI-041	Site	Poplar River Estuary	Coastal freshwater wetland estuary, fish spawning habitat
WI-042	Site	Middle River Estuary	Lake Superior freshwater estuary with coastal wetlands, fish spawning habitat, eroding red clay deposits.
WI-043	Site	Amnicon River Estuary	Freshwater estuary with coastal wetlands and sheltered vegetated banks, fish spawning habitat
WI-044	Site	Small Estuaries	Several small streams flow through red clay soils and form small estuaries where they enter Lake Superior, alder thickets, shrub carr wetlands
WI-045	Site	Wisconsin Point & Allouez Bay	Bay mouth bar geological feature, longest freshwater sand spit, sand dune ecosystem, colonial waterbird nesting area, migratory wildlife habitat
WI-046	Site	Nemadji River Mouth	Extensive riparian wetlands, great lakes coastal marsh
WI-047	Site	Hog Island	Shallow open water and wetlands, breeding and migrating waterfowl habitat
WI-051	Site	Chequamegon Bay	Fish spawning habitat, coastal wetlands
WI-052	Site	Ashland Tern Island	Colonial waterbird nesting habitat, rare animal habitat
WI-053	Site	NSP Tern Island	Colonial waterbird nesting habitat, rare animal habitat
WI-055	Area	Big Bay State Park	Coastal lagoon and wetlands complex, floating bog, sand beaches, and unique plant communities.
WI-059	Site	Ashland County, WI (island)	Piping Plover critical habitat site
WI-060	Site	Gull Island Refuge	Critical nesting areas for gulls and colonial waterbirds (gulls, double-crested cormorants)
WI-061	Site	Devil's Island	The Devils Island Formation, between the sandstones, represents deposition across sand flats that were intermittently covered by shallow ponded water

Figure 13.3: Nemadji to Fish Creek - Important Habitat Sites and Areas

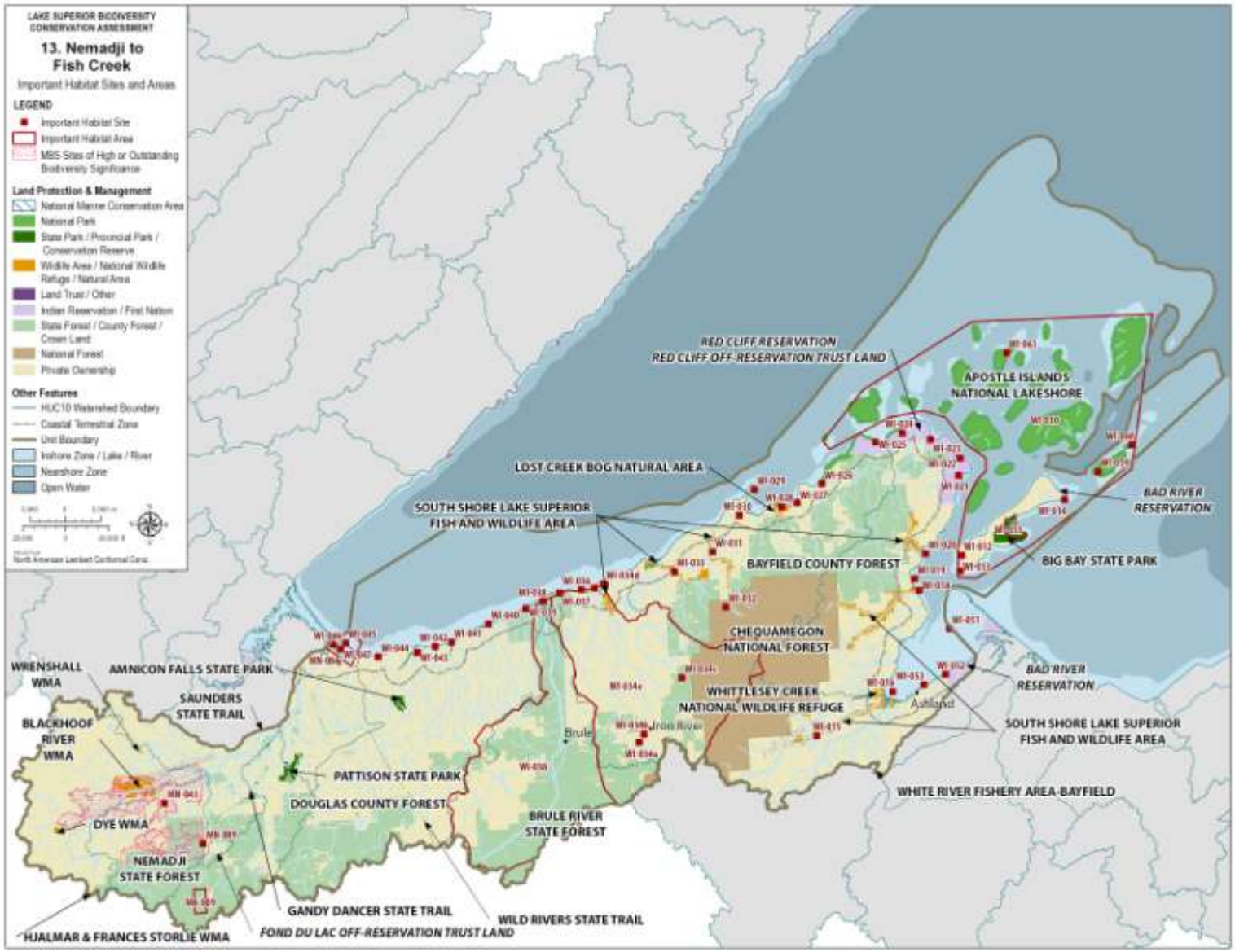


TABLE 13.4: Nemadji to Fish Creek LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 207 species and communities of conservation concern have been documented in the regional unit. 108 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 19 species and communities were once known to occur here, but have current conservation ranks of F (Failed to find) or H (Historical). A further 80 species and communities of conservation concern are known to occur in this regional unit, but are currently not ranked for viability.[15]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
Accipiter gentilis	Northern Goshawk
Alder thicket	Alder Thicket
Armoracia lacustris	Lake-cress
Asclepias ovalifolia	Dwarf Milkweed
Asio otus	Long-eared Owl
Bedrock shore	Bedrock Shore
Black spruce swamp	Black Spruce Swamp
Boreal forest	Boreal Forest
Botrychium lanceolatum ssp. angustisegmentum	Lanceleaf Grapefern
Botrychium oneidense	Blunt-lobed Grapefern
Botrychium rugulosum	Rugulose Grape-fern
Calamagrostis stricta	Slim-stem Small Reed Grass
Callitriche hermaphroditica	Autumnal Water-starwort
Caltha natans	Floating Marsh-marigold
Carex capillaris	Hair-like Sedge
Carex concinna	Beautiful Sedge
Carex exilis	Coast Sedge
Carex lenticularis	Shore Sedge
Carex livida var. radicaulis	Livid Sedge
Carex merritt-fernaldii	Fernald's Sedge
Carex michauxiana	Michaux's Sedge
Carex prasina	Drooping Sedge
Contopus cooperi	Olive-sided Flycatcher
Cygnus buccinator	Trumpeter Swan
Cypripedium arietinum	Ram's-head Lady's-slipper

[15] For the Minnesota portions of this unit, data included here were provided by the Division of Ecological and Water Resources, Minnesota Department of Natural Resources (DNR), and were current as of December 3 2014. These data are not based on an exhaustive inventory of the state. The lack of data for any geographic area shall not be construed to mean that no significant features are present.
For the Wisconsin portions of this unit, data included here were provided by the Bureau of Natural Heritage Conservation, Wisconsin Department of Natural Resources (DNR). Although the NHI database is the most up-to-date and comprehensive database on the occurrences of rare species and natural communities available, many areas of the state have not been inventoried. Similarly, the presence of one rare species at a location does not imply that all taxonomic groups have been surveyed for at that site. As such, the data should be interpreted with caution and an "absence of evidence is not evidence of absence" philosophy should be followed.

Cystopteris laurentiana	Laurentian Bladder Fern
Deschampsia cespitosa	Tufted Hairgrass
Dry cliff	Dry Cliff
Dryopteris fragrans	Fragrant Fern
Elatine triandra	Three Stamened Waterwort
Eleocharis compressa	Flat-stemmed Spike-rush
Eleocharis mamillata	Mamillate Spike-rush
Eleocharis nitida	Slender Spike-rush
Eleocharis robbinsii	Robbins' Spike-rush
Elliptio complanata	Eastern Elliptio
Emergent marsh	Emergent Marsh
Enallagma clausum	Alkali Bluet
Epilobium strictum	Downy Willow-herb
Equisetum palustre	Marsh Horsetail
Eriophorum chamissonis	Russet Cotton-grass
Floodplain forest	Floodplain Forest
Geum macrophyllum var. macrophyllum	Large-leaved Avens
Glaucomys sabrinus	Northern Flying Squirrel
Glyptemys insculpta	Wood Turtle
Goodyera oblongifolia	Giant Rattlesnake-plantain
Great lakes barrens	Great Lakes Barrens
Great lakes dune	Great Lakes Dune
Gymnocarpium jessoense ssp. parvulum	Northern Oak Fern
Haliaeetus leucocephalus	Bald Eagle
Hardwood swamp	Hardwood Swamp
Hesperia metea	Cobweb Skipper
Huperzia selago	Fir Clubmoss
Inland beach	Inland Beach
Interdunal wetland	Interdunal Wetland
Juncus vaseyi	Vasey's Rush
Lake--soft bog	Lake--Soft Bog
Listera auriculata	Auricled Twayblade
Listera convallarioides	Broad-leaved Twayblade
Lonicera involucrata	Fly Honeysuckle
Martes americana	American Marten
Mesic floodplain terrace	Mesic Floodplain Terrace
Muskeg	Muskeg
Myosotis laxa	Small Forget-me-not
Myotis lucifugus	Little Brown Bat
Northern dry forest	Northern Dry Forest
Northern dry-mesic forest	Northern Dry-mesic Forest
Northern mesic forest	Northern Mesic Forest
Northern sedge meadow	Northern Sedge Meadow
Northern wet forest	Northern Wet Forest
Northern wet-mesic forest	Northern Wet-mesic Forest
Omalotheca sylvatica	Woodland Cudweed
Open bog	Open Bog
Orobanche uniflora	One-flowered Broomrape
Osmorhiza berteroi	Chilean Sweet Cicely
Packera indecora	Plains Ragwort
Parnassia palustris	Marsh Grass-of-Parnassus
Petasites sagittatus	Arrow-leaved Sweet-coltsfoot
Pine barrens	Pine Barrens
Pinguicula vulgaris	Common Butterwort
Piptatherum canadense	Canada Mountain-ricegrass
Platanthera hookeri	Hooker's Orchid

Poor fen	Poor Fen
Potamogeton confervoides	Algae-like Pondweed
Primula mistassinica	Bird's-eye Primrose
Ranunculus cymbalaria	Seaside Crowfoot
Ranunculus lapponicus	Lapland Buttercup
Regulus calendula	Ruby-crowned Kinglet
Rhynchospora fusca	Brown Beak-rush
Ribes oxyacanthoides	Canada Gooseberry
Salix pellita	Satiny Willow
Salix planifolia	Tea-leaved Willow
Schoenoplectus torreyi	Torrey's Bulrush
Scirpus georgianus	Georgia Bulrush
Shore fen	Shore Fen
Shrub-carr	Shrub-carr
Somatochlora incurvata	Warpaint Emerald
Spermophilus franklinii	Franklin's Ground Squirrel
Spring pond	Spring Pond
Stream--fast, soft, cold	Stream--Fast, Soft, Cold
Submergent marsh	Submergent Marsh
Tamarack (poor) swamp	Tamarack (Poor) Swamp
Thalictrum venulosum	Veined Meadowrue
Tsuga canadensis	Eastern Hemlock
Utricularia resupinata	Northeastern Bladderwort
Vaccinium vitis-idaea ssp. minus	Mountain Cranberry
Waldsteinia fragarioides var. fragarioides	Barren Strawberry
Woodsia oregana ssp. cathcartiana	Oregon Woodsia
Xyris montana	Montane Yellow-eyed Grass
Historical or Failed to Find Records	
Scientific Name	**Common Name**
Amerorchis rotundifolia	Round-leaved Orchis
Botrychium lunaria	Moonwort Grape-fern
Botrychium minganense	Mingan's Moonwort
Calylophus serrulatus	Yellow Evening Primrose
Calypso bulbosa	Fairy Slipper
Chlidonias niger	Black Tern
Cirsium pitcheri	Dune Thistle
Drosera anglica	English Sundew
Drosera linearis	Slenderleaf Sundew
Glycyrrhiza lepidota	Wild Licorice
Lasmigona compressa	Creek Heelsplitter
Leucophysalis grandiflora	Large-flowered Ground-cherry
Pyrola minor	Lesser Wintergreen
Ranunculus gmelinii	Small Yellow Water Crowfoot
Senecio congestus	Marsh Ragwort
Sterna hirundo	Common Tern
Streptopus amplexifolius	White Mandarin
Triglochin palustris	Slender Bog Arrow-grass
Trisetum spicatum	Narrow False Oats
Unranked Records	
Scientific Name	**Common Name**
Actaea pachypoda	White Baneberry
Adoxa moschatellina	Moschatel
Aeshna sitchensis	Zigzag Darner

Aeshna subarctica	Subarctic Darner
Ambystoma maculatum	Spotted Salamander
Ammodramus leconteii	Le Conte's Sparrow
Anguilla rostrata	American Eel
Bartramia longicauda	Upland Sandpiper
Bidens discoidea	Bur-marigold
Bird Rookery	Bird Rookery
Black Spruce Bog Type	Black Spruce Bog
Black Spruce Bog; Semi-Treed Subtype	Black Spruce Bog, Semi-Treed Subtype
Bog Birch - Alder Shore Fen Type	Bog Birch - Alder Shore Fen
Boloria chariclea	Arctic Fritillary
Botaurus lentiginosus	American Bittern
Botrychium matricariifolium	Matricary Grapefern
Botrychium pallidum	Pale Moonwort
Botrychium simplex	Least Moonwort
Brachycentrus lateralis	A Humpless Casemaker Caddisfly
Bucephala clangula	Common Goldeneye
Canis lupus	Gray Wolf
Carex gynandra	A Species of Sedge
Carex ormostachya	Necklace Spike Sedge
Catharus ustulatus	Swainson's Thrush
Charadrius melodus	Piping Plover
Chloealtis abdominalis	Rocky Mountain Sprinkled Locust
Cicindela hirticollis rhodensis	Beach-dune Tiger Beetle
Cicindela patruela patruela	A Tiger Beetle
Coregonus zenithicus	Shortjaw Cisco
Coturnicops noveboracensis	Yellow Rail
Dryopteris expansa	Spreading Woodfern
Emydoidea blandingii	Blanding's Turtle
Ephemeral pond	Ephemeral Pond
Falcipennis canadensis	Spruce Grouse
Falco peregrinus	Peregrine Falcon
Great lakes beach	Great Lakes Beach
Gymnocarpium robertianum	Limestone Oak Fern
Haliplus canadensis	A Crawling Water Beetle
Haploperla orpha	Quadrate Sallfly
Hemidactylium scutatum	Four-toed Salamander
Huperzia appalachiana	Appalachian Clubmoss
Hydraena angulicollis	A Minute Moss Beetle
Hygrotus falli	A Predaceous Diving Beetle
Hygrotus farctus	A Predaceous Diving Beetle
Ichthyomyzon fossor	Northern Brook Lamprey
Ilybius angustior	A Predaceous Diving Beetle
Ilybius subaeneus	A Predaceous Diving Beetle
Isogenoides frontalis	A Perlodid Stonefly
Isogenoides olivaceus	A Perlodid Stonefly
Ixobrychus exilis	Least Bittern
Lake--deep, hard, drainage	Lake--Deep, Hard, Drainage
Littorella americana	American Shore-plantain
Lycaena dione	Gray Copper
Maccaffertium pulchellum	A Flat-headed Mayfly
Malaxis monophyllos var. brachypoda	White Adder's-mouth
Migratory Bird Concentration Site	Migratory Bird Concentration Site
Moist cliff	Moist Cliff
Myriophyllum tenellum	Leafless Water Milfoil
Najas gracillima	Thread-like Naiad

Native Plant Community, Undetermined Class	Native Plant Community, Undetermined Class
Oeneis chryxus	Chryxus Arctic
Oporornis agilis	Connecticut Warbler
Oreodytes scitulus	A Predaceous Diving Beetle
Persicaria careyi	Carey's Smartweed
Potamogeton vaseyi	Vasey's Pondweed
Psectraglaea carnosa	Pink Sallow
Red Oak - Sugar Maple - Basswood - (Bluebead Lily) Forest Type	Red Oak - Sugar Maple - Basswood - (Bluebead Lily) Forest
Rhithrogena undulata	A Flat-headed Mayfly
Sanfilippodytes pseudovilis	A Predaceous Diving Beetle
Setophaga cerulea	Cerulean Warbler
Somatochlora forcipata	Forcipate Emerald
Sparbarus maculatus	A Small Square-gilled Mayfly
Sparganium glomeratum	Clustered Bur-reed
Springs and spring runs, soft	Springs and Spring Runs, Soft
Sturnella neglecta	Western Meadowlark
Sugar Maple - Basswood - (Bluebead Lily) Forest Type	Sugar Maple - Basswood - (Bluebead Lily) Forest
Tympanuchus phasianellus	Sharp-tailed Grouse
Vertigo paradoxa	Mystery Vertigo
Willow - Dogwood Shrub Swamp Type	Willow - Dogwood Shrub Swamp
Zoogenetes harpa	Boreal Top

14. Bad-Montreal

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	A
NEARSHORE	C	COASTAL WETLANDS	B
EMBAYMENTS & INSHORE	C	COASTAL TERRESTRIAL	A+
TRIBUTARIES & WATERSHEDS	C	**OVERALL B**	

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

The Bad River Kakagon Slough complex. Photo supplied by Ryan O'Connor, WDNR. Photo taken by Christina Isenring, WDNR.

Summary/ Description

The Bad-Montreal region is located along the southern shore of Lake Superior, and is 3,764 km^2 in size, including the associated nearshore waters. The regional unit extends along the shore from just east of Ashland to the mouth of the Montreal River, and the state boundary line between Wisconsin and Michigan. In this Biodiversity Conservation Assessment the Beartrap Creek subwatershed is considered part of the Lower Bad River subwatershed and the Bad-Montreal regional unit. This regional unit delineation reflects local management boundaries as adopted and managed by the Bad River Band of the Lake Superior Tribe of Chippewa Indians and the Wisconsin Department of Natural Resources (N. Tillison, pers. comm., April 26 2013). These locally adopted management boundaries place the Chequamegon Point barrier spit and Long Island in the Bad-Montreal regional unit. Most of the reservation of the Bad River Band of Lake Superior Tribe of Chippewa Indians is located in this regional unit. The Bad-Montreal regional unit is part of the territory ceded in the Treaty of 1842. The signatory tribes retain rights to hunt, fish, and gather within the regional unit (A. McCammon Soltis, pers. comm., January 5 2015). Inland, the western and central portions of the regional unit is comprised of three Wisconsin counties (Bayfield, Ashland and Iron, and the easternmost portion extends into one Michigan county (Gogebic County) (USDA NRCS No date d). The 25 mile Penokee-Gogebic Range is found in this regional unit, in Iron and Ashland counties (TNC No date b). This unit is referred to as HUC 04010302, and it is the easternmost region of Subregion 0401 – Western Lake Superior. The Bad and Montreal Rivers are the main tributaries and both drain to Lake Superior. The Montreal River forms the Wisconsin / Michigan state border for thirty miles upstream of Lake Superior (USDA NRCS No date d). Public and tribal ownership account for a large portion of ownership in the regional unit, which is described as forested; wetlands and agriculture also account for some land use (USDA NRCS No date d). The Bad-Montreal regional unit contains one tertiary (HUC 8) watershed, Bad-Montreal, and 7 quaternary (HUC 10) watersheds. The watershed is primarily forest, with some agricultural lands. The shoreline includes extensive coastal wetlands and sand beaches.

TABLE 14.1: Bad-Montreal BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	254.41	6.02	1,441.07	
Developed	6.75	0.16	389.55	
Forest	2,995.10	70.83	107,747.13	
Associated Nearshore Waters	750.57	17.75	17,868.03	
Other	192.99	4.56	8,227.57	
Water (inland)	28.58	0.68	9,473.05	
Total Area	**4,228.41**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	76.45	NA	1.31	Based on SOLEC shoreline
Sand Beaches (km)	19.88	26.01	3.09*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	47.77	45.00*	4.33**	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone	101.99	96.08*	1.65**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	13	NA	0.5	
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	5.08	NA		
Road Density (km/km^2)	0.85	NA		
Number of Dams and Barriers	1,516	NA	6.4	
Artificial Shoreline (km)	1.14	1.49	0.50	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	1,568.65	45.11	3,477.68	Regional area based on landmass
Public/Crown	1,300.17	37.39	3,477.68	
Tribes/ First Nations	488.05	14.03	3,477.68	
Parks & Protected Areas (total)	120.81	3.47	3,477.68	
Parks & Protected Areas (coast)	1.24	1.17*	106.16**	*% of Regional Coastal Area **Regional Coastal Area (km^2)

Important Biodiversity Features

Nearshore and Inshore Waters

- The nearshore and inshore waters of this regional unit provide areas of Important Habitat for Lake Whitefish and for Lake Trout (Lake Superior Binational Program Habitat Committee 2006) (Figure 14.1).
- Chequamegon Bay is noted as a Lake Superior embayment important for Lake Sturgeon (Auer 2003). In the Bad-Montreal regional unit this embayment and the nearshore zone, which provides corridors for movement, are identified as critical management areas for Lake Sturgeon in the Lake Superior basin (Auer 2003).

- The waters off of Marble Point on the Bad River Indian Reservation are noted to be critical spawning and nursery habitat for fish and wildlife, including Cisco and Lake Trout (WDNR 1999a).

Coastal Zone and Islands

- The Kakagon and Bad River Sloughs is a 4,355 ha largely undeveloped wetland complex, located at the mouth of the Bad River on Lake Superior (Ramsar & Wetlands International 2013). As of 2012, the Kakagon and Bad River Sloughs site is designated as a Ramsar Wetland of International Importance. The site is comprised of sloughs, bogs and coastal lagoons, and is located in the Bad-Montreal regional unit, to reflect locally adopted management boundaries. The area is located on the Bad River Band of Lake Superior Tribe of Chippewa Indians Reservation, and is a Conservation Area under tribal management through an Integrated Resource Management Plan (Ramsar & Wetlands International 2013, USDA NRCS No date d). The slough is the largest freshwater estuary remaining on Lake Superior and may also be in the most pristine condition; it is an important spawning area for the fish community of Lake Superior and it is the Great Lakes' largest remaining natural wild rice bed (USDA NRCS No date d, BRWA 2013a, Ramsar & Wetlands International 2013).

Wild rice in the Kakagon and Bad River Slough complex. Photo supplied by Cyrus Hester, Bad River Band of the Lake Superior Tribe of Chippewa Indians. Photo credit: Mike Wiggins Jr.

- Long Island is a site for the Piping Plover (*Charadirius melodus*), an endangered species (Ramsar & Wetlands International 2013).
- The Bad-Montreal regional unit contains several areas which are noted to be Important Habitat Sites, as well as an Important Habitat Area (Lake Superior Binational Program Habitat Committee 2006) (Table 14.3, Figure 14.3).
- The Wisconsin Department of Natural Resources (WDNR) has identified primary coastal wetlands deemed to be ecologically significant coastal wetlands. This assessment has been completed for both the Lake Superior and Lake Michigan basins. Site S-21 Bad River-Kakagon Sloughs is located in the Bad-Montreal regional unit (WDNR 2012d). A complete list of the Lake Superior ecologically significant wetlands and their specific site attributes is available on the WDNR website (WDNR 2012c, 2012d).

Tributaries and Watersheds

- Rivers and streams in this regional unit are known to be important to Lake Sturgeon, Brook Trout, Walleye and introduced salmon, steelhead and Brown Trout (USDA NRCS No date d, BRWA 2013a, W. Blust, pers. comm., March 6 2013).
- The Bad River provides important spawning habitat for Lake Sturgeon and Walleye (W. Blust, pers. comm., March 6 2013).
- The headwater streams and wetlands of the Bad River watershed are also critical to cold-water fisheries, climate resilience and downstream flow regimes (C. Hester and N. Tillison, pers. comm., March 25 2013, TNC No date b).
- Historically 21 tributaries in Lake Superior had Lake Sturgeon spawning runs. Three of these historical spawning tributaries, the Bad River, the White River (Wisconsin) and the Montreal River are in the Bad-Montreal regional unit. The Bad River and White River are now recognized as one

Lake Sturgeon population, for which the population status is extant and the population trajectory is stable. The Montreal River population status is extirpated (Golder Associates Ltd. 2011).

- The Bad River is one of ten Lake Superior tributaries where Lake Sturgeon have currently been documented spawning (as of 2012); this is the same number as 2005, however the specific tributaries have changed (Lake Superior Lake Sturgeon Work Group 2012, unpublished data). The White River (Wisconsin) had been removed as it is a tributary to the Bad River and is not a separate spawning population (Lake Superior Lake Sturgeon Work Group 2012, unpublished data). Genetic studies support the viewpoint that the same fish use spawning locations in both the Bad and White rivers (Lake Superior Lake Sturgeon Work Group 2012, unpublished data).
- The Lake Sturgeon population in the Bad River is one of two Lake Superior populations which meets the criteria for self-sustaining, as defined in the Auer (2003) Lake Sturgeon Rehabilitation Plan for Lake Superior (Lake Superior Lake Sturgeon Work Group 2012, unpublished data)
- A Lake Sturgeon Rehabilitation Plan for Lake Superior (Auer 2003) identifies the Bad River as one of the seventeen tributaries to Lake Superior in which there should be a focus on Lake Sturgeon rehabilitation.
- The entire White River, from the headwaters to Lake Superior is a State of Wisconsin fishery, natural or wildlife area (S. Toshner, pers. comm., March 6 2013). Eighteen Mile Creek and Long Lake Branch are two White River tributaries with high ecological importance (WDNR 2013b).
- The Penokee Range is noted to have extensive forests and unusual features, including high-gradient, soft headwater streams and glades of open bedrock (WDNR 2005).

Figure 14.1: Bad-Montreal - Coastal and Watershed Features

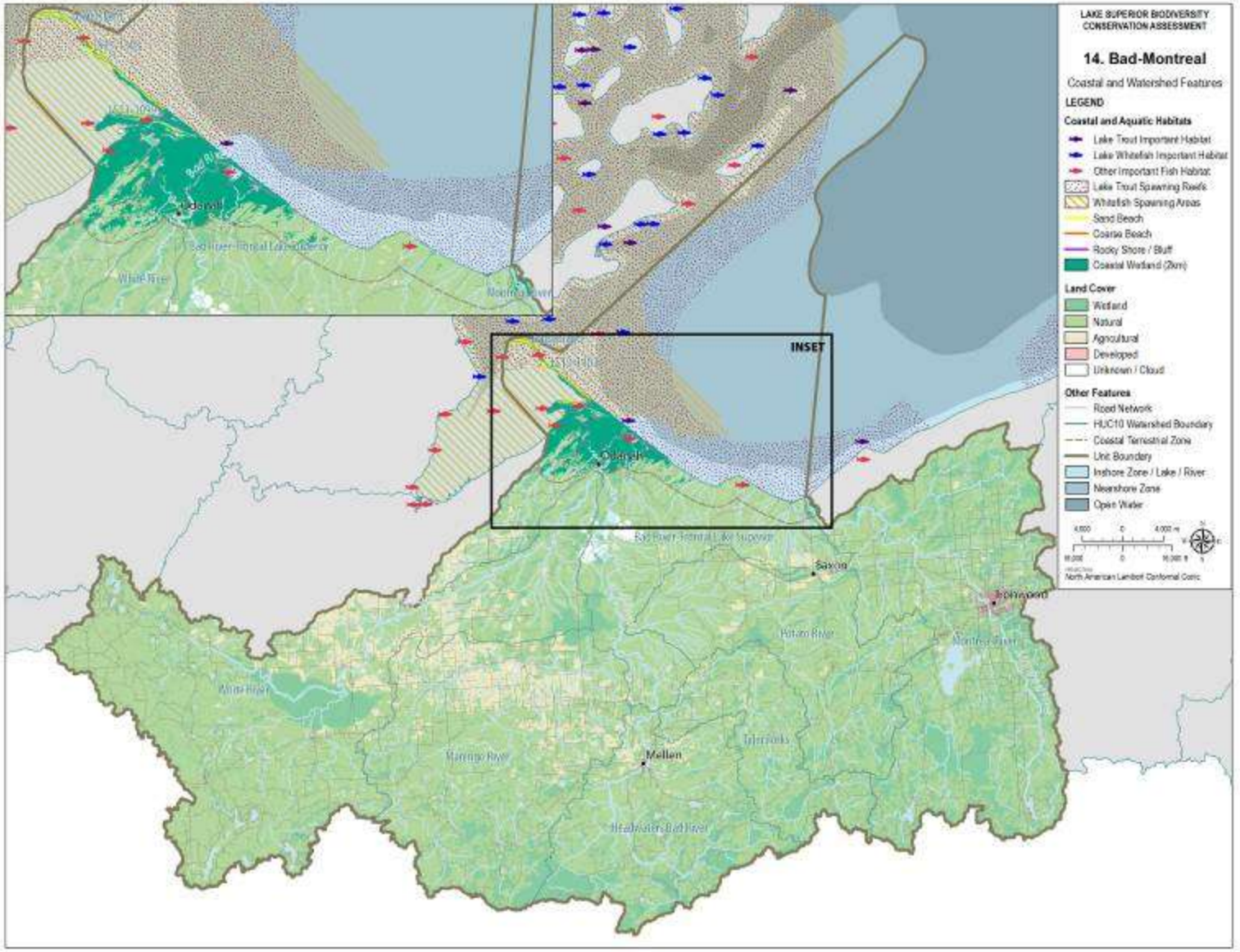


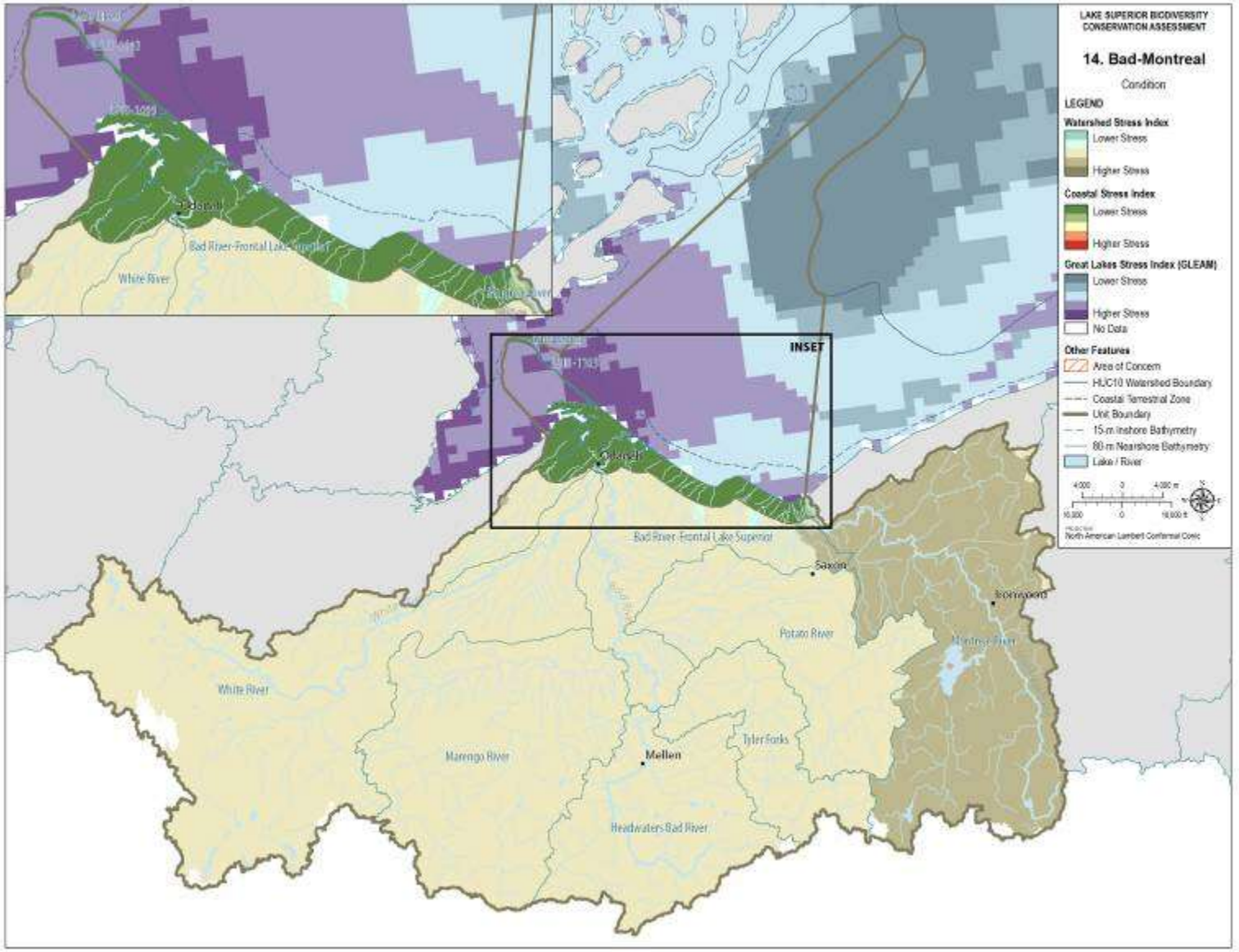
TABLE 14.2: Bad-Montreal CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	
Nearshore[1]	C (0.50)	
Embayments and Inshore[1,2]	C (0.53)	
Coastal Wetlands[2,3]	B (0.674)	Local experts believe a condition score of B may be low for the coastal wetlands target, due to the presence of the Kakagon and Bad River Sloughs. At over 10,000 acres, this wetland complex is the largest, most pristine freshwater estuary and coastal wetland complex on the largest freshwater lake in the world (R. O'Connor, pers. comm., March 15 2013). The B score is driven by the assessment of watershed stresses and the condition of nearshore waters.
Islands[4]	A	
Coastal Terrestrial[3]	A+ (0.972)	Local experts believe a condition score of B may be accurate for the coastal terrestrial portion of this regional unit (C. Hagen et al., pers. comm., March 20 2013).
Tributaries and Watersheds[2]	C (0.55)	

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

Figure 14.2: Bad-Montreal - Condition



Important Issues & Threats

- Non-native invasive species, including purple loosestrife, ruffe and sea lamprey have been noted as threat to the Lower Bad River Watershed (WDNR 1999b). Significant purple loosestrife infestations along rivers in the watershed were noted by the Great Lakes Indian Fish and Wildlife Commission. Common buckthorn and spotted knapweed have also been noted (WDNR 1999b).
- Invasive species are noted to be a large ecological threat to the Kakagon and Bad River Sloughs (Ramsar & Wetlands International 2013).
- Mining companies own a band of land approximately 22 miles long and 22,000 acres in size in the Penokee Range (TNC No date b). Mining in the Penokee-Gogebic Range could impact much of the headwaters in the Bad River watershed, and is viewed as a significant ecological threat to the Kakagon and Bad River Sloughs (Ramsar & Wetlands International 2013, TNC No date b). Impacts throughout the Bad River watershed will have downstream impacts on the sloughs and Lake Superior. In total, 71 miles of perennial and intermittent waters flow through the mining land, including a number of rivers and streams designated as Exceptional or Outstanding Resource Waters by the State of Wisconsin (TNC No date b).
- The Montreal River watershed was noted to be much influenced by the mining history of the area (WDNR 1999a).
- A number of waterbodies within the Bad-Montreal regional unit are listed as impaired. Reasons for impairment include mercury and PCBs. Affected uses include aquatic consumption (USDA NRCS No date c, U.S. EPA 2013k).
- Excessive sediments are a concern in the Bad River Watershed, a "flashy" system in the red clay plain of the Great Lakes Basin. Land use practices, such as silviculture and agricultural practices, have great potential to cause erosion and/or sedimentation problems, particularly if best management practices are not properly implemented and maintained (Bad River Band of Lake Superior Tribe of Chippewa Indians 2006).
- Erosion and slumping of streambanks, channels and gullies leading to sedimentation is the largest non-point resource concern in the Bad-Montreal regional unit. Sediments have a negative effect on fish spawning sites, fish movements, aquatic habitats and Lake Superior (USDA NRCS No date d). The presence of red clay soils interspersed with sands is one natural factor that contributes to this problem. Some water courses are also deeply entrenched, with high banks of up to seventy feet in some locations (USDA NRCS No date d). Other factors contributing to the erosion and slumping include the conversion of native forests to grass and aspen, and in some areas, overgrazing (USDA NRCS No date d). The strategy in place to address this issue is to “slow the flow” of runoff, minimizing channel degradation and erosion (C. Hagen et al., pers. comm., March 20 2013).
- The majority of soils in the regional unit (57%) are classified as poorly suited to most kinds of field crops, based on Land Capability Classification. Other classifications for the soil in the regional unit include moderately well suited (32%), well-suited (5%) and unsuited (5%). These classifications reflect generally how suitable the soils are for typical field crops (USDA NRCS No date d).
- Nutrients entering the watershed from private septic systems and barnyards are a concern (USDA NRCS No date d). Nutrients and bacteria entering the watershed from private septic systems, agriculture (e.g., livestock management, etc.), and municipal wastewater treatment are a concern, particularly in the Marengo River and Beartrap Creek Subwatersheds (Bad River Band of Lake Superior Tribe of Chippewa Indians 2006).
- Hydroelectric power production activities associated with the Gile Flowage may have a negative impact on the fisheries. The Gile Flowage is associated with the Montreal River watershed (USDA NRCS No date d).

- Forest fragmentation through real estate development is an emerging concern in the Upper Peninsula Lake Superior watersheds. Large tracts of forest lands owned by corporate land holders are being sold to companies which run real estate investment trusts; smaller parcels are then developed (W. Taft, pers. comm., February 25, 2013).

Conservation In Action

Parks & Protected Areas

- Bad River Band of the Lake Superior Tribe of Chippewa Indians' Reservation
- Chequamegon National Forest
- Ottawa National Forest
- Copper Falls State Park
- Iron County Forest

Existing Programs & Projects

- A number of waterbodies in the Wisconsin portion of this regional unit have been designated as high quality waters through the state Outstanding Resource Waters (ORWs) or Exceptional Resource Waters (ERWs)[16] designations (USDA NRCS No date d). Over 60 waterbodies, including the Bad River and the Bad River Slough had received one of these designations at the time of the Rapid Watershed Assessment (USDA NRCS No date d).
- All of the waterbodies within the Bad River Indian Reservation portion of this regional unit have been designated as high quality waters through the tribal Outstanding Tribal Resource Waters (OTRWs), ORWs or ERWs designations. The Kakagon and Bad River Slough complex, along with the majority of the Bad River itself, are considered OTRWs, waters supporting wild rice and other sensitive and unique resources (Bad River Band of Lake Superior Tribe of Chippewa Indians 2011).
- The Bad River Band of Lake Superior Tribe of Chippewa Indians has a Non-point Source Management Program for the Bad River, through the Bad River Natural Resources Department (C. Hester and N. Tillison, pers. comm., March 25 2013).
- The WDNR has a Designated Waters designation for waterbodies with permit requirements. Designated Waters include Areas of Special Natural Resource Interest (ASNRI), Public Rights Features (PRF) and Priority Navigable Waters (PNW) (WDNR No date). These designations offer protection for various important waters, including Wild Rice Waters and Outstanding and Exceptional Resource Waters (C. Hagen et al., pers. comm., March 20 2013).
- Wisconsin's Wildlife Action Plan identified a number of Conservation Opportunity Areas for Wildlife Species of Greatest Conservation Need. In the Superior Coastal Plain Ecological Landscape several areas of State, Continental and Global Significance were identified, including some in the Bad-Montreal regional unit (WDNR 2008a, 2008b, 2008c).
- Road stream crossings which are barriers to fish passage and contribute to increased sedimentation have been identified as major concerns in the Bad River watershed. The Bad River Watershed Association (BRWA) and partners, including the US Fish and Wildlife Service, Wisconsin DNR, Ashland County, Iron County, Bayfield County, local towns and local landowners are working to address the issue through the Culvert Restoration Program. The program identifies and inventories all road/stream crossings in the Bad River watershed, and prioritizes crossings which need repair. Education and finding sources of funding are additional facets of the program (BRWA 2013b).

[16] ORWs receive the highest protection standards Wisconsin offers, while ERWs receive the next highest protection. ORWs usually do not have any point source pollution, whereas waters with an existing point source are likely to be designated ERWs (WDNR 2012a).

- The Chequamegon Bay Area Partnership (CBAP) recently published a Strategic Priorities document that outlines important issues and threats to the Chequamegon Bay area (CBAP 2013).
- There are watershed partnership efforts underway to implement the Fish Creek Watershed Restoration and Management Plan and the Marengo River Watershed Action Plan. Fish Creek and the Marengo River quaternary watersheds are two of the largest sediment contributors to the Chequamegon Bay area (M. Hudson, pers. comm., March 20 2013, C. Hagen et al., pers. comm., March 20 2013).
- The Bayfield Regional Conservancy, a land trust working within the Nemadji to Fish Creek and the Bad-Montreal regional units, has developed strategic conservation plans for areas in these regional units (M. Hudson, pers. comm., March 20 2013).
- The White River Properties Group (WRPG) Draft Master Plan and Environmental Assessment is currently in development. The final Master Plan should be finished in fall 2013 (S. Toshner, pers. comm., March 6 2013).
- The Wisconsin Wetlands Association has identified a set of representative high quality wetlands in different regions of Wisconsin. These are referred to as Wetland Gems, and were identified by building on existing conservation planning efforts (Wisconsin Wetlands Association No date a). Several Wetland Gems are in the Superior Region, including the Kakagon Sloughs in the Bad-Montreal regional unit (Wisconsin Wetlands Association No date b).
- A number of State Important Bird Areas (IBAs) are located in the Bad-Montreal regional unit. These IBAs are Bibon Swamp IBA, Camp Nine Pines IBA, Kakagon-Bad River Wetlands and Forest Corridor IBA, Moose Lake Old-Growth Forest-Muskeg IBA, Owen-Teal Forest IBA, Penokee Range IBA and St. Peter's Dome-North Country IBA (National Audubon Society 2013, 2012).
- The Natural Resources Conservation Service (NRCS) Performance Results System (PRS) provides support for reporting the development and delivery of conservation programs. From 1999 to 2007 plans were made for a total of 50,367 acres of Total Conservation Systems. From 1999 to 2007 the Total Conservation Systems Applied amounted to 17,080 acres. The activities which contributed the largest amount to the Total Conservation Systems Applied were Total Wildlife Habitat (9,920 acres), Erosion Control Total Soil Saved (5,739 tons/year), Riparian Forest Buffers (5,661 acres) and Total Nutrient Management (3,137 acres). Additional activities involved prescribed grazing, residue management, wetlands (created, restored or enhanced) and tree and shrub establishment (USDA NRCS No date c).
- The watershed assessment score is used to assess the agricultural non-point pollution potential of Wisconsin watersheds, relative to one another. Based on the criteria used in the model[17], watershed assessment values ranged from 0.0 (lowest conservation need) to 24.4 (highest conservation need). The score for the Bad Montreal Watershed assessment was 1.6 (USDA NRCS No date d).
- A large portion of the Bad-Montreal watershed is a riparian project area of the Conservation Reserve Enhancement Program (CREP). Landowners who agree to fifteen year agreements may have filter strips, riparian buffers and grassed waterways installed, with annual payments available. In Bad-Montreal this project is located in three counties (northern Bayfield, Ashland and Iron) (USDA NRCS No date d).
- The "Slow the Flow" Program has been adopted by the Lake Superior Partner team, as a way to help manage water run-off in clay soils (University of Wisconsin Extension 2011).

[17] Factors used to calculate the watershed assessment score in the model included acres of cropland, acres of highly erodible land, and the number of animal units in the watershed (USDA No date d).

- Trout Unlimited – Wild Rivers Chapter is very active in the Bad-Montreal watershed (S. Toshner, pers. comm., March 6 2013).
- Friends of the White River is very active in the Bad-Montreal watershed (S. Toshner, pers. comm., March 6 2013).
- Key partners in the Bad-Montreal regional unit include the Chequamegon Bay Area Partnership and the Bad River Watershed Association (C. Hagen et al., pers. comm., March 20 2013). Additional partners in the Bad-Montreal regional unit are noted in the Rapid Watershed Assessment (USDA NRCS No date d).
- 25 Citizen-based Groups are noted to do work in the Bad-Montreal regional unit (U.S. EPA 2013k).
- The White River Property Group (WRPG) is a combination of state managed lands, including approximately 1,000 acres of State Wildlife Area (White River Wildlife Area), 4,698 acres of Fishery Area (White River Fishery Area, including the Sajdak Springs State Natural Area which is located within the Fishery Area boundary) and 9,263 acres of State Natural Area (Bibon Swamp State Natural Area). In total nearly 15,000 acres are protected as state managed lands, although in the middle segment of the White River Fishery Area project boundary 90% of land is privately owned (WNDR 2013b).

TABLE 14.3: Bad-Montreal IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
WI-001	Site	Montreal River Mouth	Great Lakes costal wetland, old growth white cedar forest
WI-002	Site	Saxon Harbor	Lake Superior beach, fish spawning area
WI-003	Site	Graveyard Creek	Coastal wetlands, spawning habitat for brook and Rainbow Trout and Coho Salmon
WI-004	Site	Marble Point	Spawning habitat for Lake Trout, exposed rocky cliff shore
WI-005	Area	Kakagon Sloughs/Bad River	Largest, healthiest fully-functioning estuarine system in the upper Great Lakes. Rare plant and animal habitat, high biodiversity
WI-006	Site	Honest John Lake	Coastal wetland includes bog communities, patches of open water, sedge meadow, low shrub and lowland coniferous forest
WI-007	Site	Oak Point	Coastal wetland. Bog communities are present as linear strips occupying swales between the forested ridges
WI-008	Site	Long Island	Lake dune landforms, sand beach. Emergent vegetation is common offshore. Rare plant and animal habitat
WI-009	Site	Bibon Swamp	Large wetland complex, largest cold water stream system
WI-034e	Area	Iron River Watershed	Fish spawning habitat
WI-054	Area	Copper Falls State Park	River gorge with falls, old growth mixed northern hardwoods forest
WI-056	Area	Rainbow Lake Wilderness Area	Representative plant communities, northern hardwood and mixed conifer/deciduous forest communities, old growth forest, diverse habitat types, rare plant and animal habitat.

Figure 14.3: Bad-Montreal - Important Habitat Sites and Areas

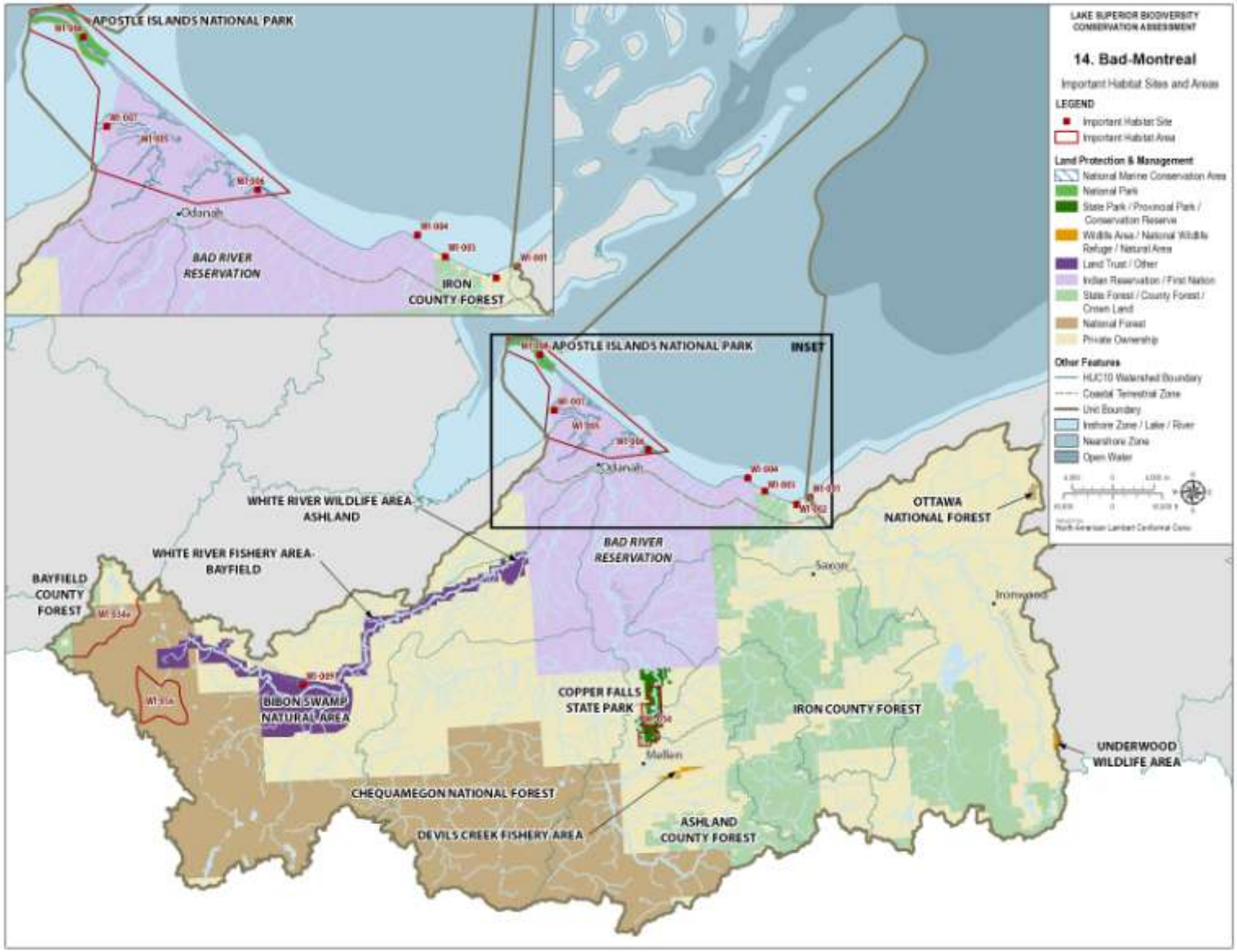


TABLE 14.4: Bad-Montreal LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 145 species and communities of conservation concern have been documented in the regional unit. 84 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 20 species and communities were once known to occur here, but have current conservation ranks of H (Historical). A further 41 species and communities of conservation concern are known to occur in this regional unit, but are currently not ranked for viability. [18]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
Agabetes acuductus	A Water Scavenger Beetle
Alder thicket	Alder Thicket
Arabis missouriensis	Missouri Rock-cress
Asplenium trichomanes	Maidenhair Spleenwort
Bat Hibernaculum	Bat Hibernaculum
Black spruce swamp	Black Spruce Swamp
Boreal forest	Boreal Forest
Botrychium minganense	Mingan's Moonwort
Botrychium oneidense	Blunt-lobe Grape-fern
Botrychium rugulosum	Rugulose Grape-fern
Callitriche hermaphroditica	Autumnal Water-starwort
Callitriche heterophylla	Large Water-starwort
Cardamine maxima	Large Toothwort
Carex lenticularis	Shore Sedge
Carex novae-angliae	New England Sedge
Charadrius melodus	Piping Plover
Clay seepage bluff	Clay Seepage Bluff
Cygnus buccinator	Trumpeter Swan
Cypripedium arietinum	Ram's-head Lady's-slipper
Cystopteris laurentiana	Laurentian Bladder Fern
Drosera anglica	English Sundew
Dry cliff	Dry Cliff
Dryopteris expansa	Spreading Woodfern
Eleocharis robbinsii	Robbins' Spike-rush
Elliptio complanata	Eastern Elliptio
Emergent marsh - wild rice	Emergent Marsh - Wild Rice

[18] For the Michigan portions of this unit, data included here were provided by the Michigan Natural Features Inventory of Michigan State University, and were current as of August 1 2014. These data are not based on an exhaustive inventory of the state. The lack of data for any geographic area shall not be construed to mean that no significant features are present.

For the Wisconsin portions of this unit, data included here were provided by the Bureau of Natural Heritage Conservation, Wisconsin Department of Natural Resources (DNR). Although the NHI database is the most up-to-date and comprehensive database on the occurrences of rare species and natural communities available, many areas of the state have not been inventoried. Similarly, the presence of one rare species at a location does not imply that all taxonomic groups have been surveyed for at that site. As such, the data should be interpreted with caution and an "absence of evidence is not evidence of absence" philosophy should be followed.

Ephemeral pond	Ephemeral Pond
Epiaeschna heros	Swamp Darner
Eptesicus fuscus	Big Brown Bat
Eriophorum chamissonis	Russet Cotton-grass
Falcipennis canadensis	Spruce Grouse
Geum macrophyllum var. macrophyllum	Large-leaved Avens
Glaucomys sabrinus	Northern Flying Squirrel
Gnaphalium sylvaticum	Woodland everlasting
Goodyera oblongifolia	Giant Rattlesnake-plantain
Great lakes dune	Great Lakes Dune
Haliaeetus leucocephalus	Bald eagle
Hardwood swamp	Hardwood Swamp
Interdunal wetland	Interdunal Wetland
Ixobrychus exilis	Least Bittern
Lake--deep, soft, drainage	Lake--Deep, Soft, Drainage
Lake--deep, soft, seepage	Lake--Deep, Soft, Seepage
Lake--deep, very soft, seepage	Lake--Deep, Very Soft, Seepage
Lake--shallow, soft, drainage	Lake--Shallow, Soft, Drainage
Lake--soft bog	Lake--Soft Bog
Littorella uniflora	American Shoreweed
Martes americana	American Marten
Melica smithii	Smith's Melic Grass
Mesic floodplain terrace	Mesic Floodplain Terrace
Moehringia macrophylla	Large-leaved Sandwort
Moist cliff	Moist Cliff
Muskeg	Muskeg
Myotis lucifugus	Little Brown Bat
Northern dry forest	Northern Dry Forest
Northern dry-mesic forest	Northern Dry-mesic Forest
Northern mesic forest	Northern Mesic Forest
Northern wet forest	Northern Wet Forest
Northern wet-mesic forest	Northern Wet-mesic Forest
Open bog	Open Bog
Oporornis agilis	Connecticut Warbler
Orobanche uniflora	One-flowered Broomrape
Osmorhiza berteroi	Chilean Sweet Cicely
Parnassia palustris	Marsh Grass-of-Parnassus
Petasites sagittatus	Arrow-leaved Sweet-coltsfoot
Platanthera flava var. herbiola	Pale Green Orchid
Platanthera hookeri	Hooker's Orchid
Poor fen	Poor Fen
Potamogeton confervoides	Algae-like Pondweed
Potamogeton vaseyi	Vasey's Pondweed
Pyrola minor	Lesser Wintergreen
Rhynchospora fusca	Brown Beak-rush
Salix cordata	Sand Dune Willow
Schoenoplectus torreyi	Torrey's Bulrush
Shrub-carr	Shrub-carr
Sparganium glomeratum	Northern Bur-reed
Spring pond	Spring Pond
Springs and spring runs, soft	Springs and Spring Runs, Soft
Stream--fast, hard, cold	Stream--Fast, Hard, Cold
Stream--fast, soft, cold	Stream--Fast, Soft, Cold
Stream--slow, soft, warm	Stream--Slow, Soft, Warm
Streptopus amplexifolius	White Mandarin
Tamarack (poor) swamp	Tamarack (Poor) Swamp

Utricularia resupinata	Northeastern Bladderwort
Vaccinium vitis-idaea ssp. minus	Mountain Cranberry
Historical Records	
Scientific Name	**Common Name**
Adlumia fungosa	Climbing Fumitory
Amerorchis rotundifolia	Round-leaved Orchis
Botrychium mormo	Little Goblin Moonwort
Calamagrostis stricta	Slim-stem Small Reed Grass
Calypso bulbosa	Calypso or fairy-slipper
Carex merritt-fernaldii	Fernald's Sedge
Dryopteris filix-mas	Male fern
Dryopteris fragrans	Fragrant Fern
Equisetum palustre	Marsh Horsetail
Glycyrrhiza lepidota	Wild Licorice
Glyptemys insculpta	Wood turtle
Gymnocarpium robertianum	Limestone Oak Fern
Leucophysalis grandiflora	Large-flowered Ground-cherry
Listera convallarioides	Broad-leaved Twayblade
Napaeozapus insignis	Woodland Jumping Mouse
Penstemon pallidus	Pale Beardtongue
Polystichum braunii	Braun's Holly-fern
Ranunculus gmelinii	Small Yellow Water Crowfoot
Senecio congestus	Marsh Ragwort
Woodsia oregana ssp. cathcartiana	Oregon Woodsia
Unranked Records	
Scientific Name	**Common Name**
Accipiter gentilis	Northern Goshawk
Acipenser fulvescens	Lake Sturgeon
Agabus leptapsis	A Predaceous Diving Beetle
Ammodramus leconteii	Le Conte's Sparrow
Arphia conspersa	Speckled Rangeland Grasshopper
Asio otus	Long-eared Owl
Bird Rookery	Bird Rookery
Botaurus lentiginosus	American Bittern
Brachycentrus lateralis	A Humpless Casemaker Caddisfly
Buteo lineatus	Red-shouldered Hawk
Canis lupus	Gray Wolf
Catharus ustulatus	Swainson's Thrush
Cicindela hirticollis rhodensis	Beach-dune Tiger Beetle
Cochlicopa morseana	Appalachian Pillar
Contopus cooperi	Olive-sided Flycatcher
Coturnicops noveboracensis	Yellow Rail
Deschampsia cespitosa	Tufted Hairgrass
Etheostoma microperca	Least Darter
Hendersonia occulta	Cherrystone Drop
Hydroprogne caspia	Caspian Tern
Isogenoides frontalis	A Perlodid Stonefly
Isogenoides olivaceus	A Perlodid Stonefly
Laccobius agilis	A Water Scavenger Beetle
Lanius ludovicianus	Loggerhead Shrike
Lepidostoma libum	A Lepidostomatid Caddisfly
Maccaffertium pulchellum	A Flat-headed Mayfly
Melanoplus flavidus	Blue-legged Grasshopper

Migratory Bird Concentration Site	Migratory Bird Concentration Site
Myotis septentrionalis	Northern Long-eared Bat
Northern sedge meadow	Northern Sedge Meadow
Notropis anogenus	Pugnose Shiner
Pieris virginiensis	West Virginia White
Poecile hudsonicus	Boreal Chickadee
Psilotreta indecisa	A Caddisfly
Regulus calendula	Ruby-crowned Kinglet
Setophaga cerulea	Cerulean Warbler
Shore fen	Shore Fen
Sorex palustris	Water Shrew
Stream--slow, hard, cold	Stream--Slow, Hard, Cold
Vertigo paradoxa	Mystery Vertigo
Zoogenetes harpa	Boreal Top

15. Black-Presque Isle and Ontonagon

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	NA
NEARSHORE	C	COASTAL WETLANDS	B
EMBAYMENTS & INSHORE	C	COASTAL TERRESTRIAL	A-
TRIBUTARIES & WATERSHEDS	B	**OVERALL B**	

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

Maple Creek. Photo credit: William Taft/ Michigan Department of Environmental Quality.

Summary/ Description

The Black-Presque Isle and Ontonagon regional unit is located along the southern shore of Lake Superior, (HUC 04020101 and HUC 04020102) and extends from just west of the mouth of the Montreal River in the west, to the community of Ontonagon in the east. The regional unit is 6,150.48 km^2 in size, including the associated nearshore waters. The Porcupine Mountains, Porcupine Mountains State Park and the Ottawa National Forest are all located in the Black-Presque-Isle/ Ontonagon region. The majority of the land-base of this regional unit is in Michigan, however the southernmost portion of the land-base of the regional unit extends into Wisconsin. The Black-Presque Isle and Ontonagon regional unit is part of the territory ceded in the Treaty of 1842. The signatory tribes retain rights to hunt, fish, and gather within the regional unit (A. McCammon Soltis, pers. comm., January 5 2015). It is part of Subregion 0402 – Southern Lake Superior-Lake Superior. The Black-Presque Isle and Ontonagon regional unit combines two tertiary (HUC 8) watersheds, Black-Presque Isle and Ontonagon, and contains 8 quaternary (HUC 10) watersheds. The watersheds of this unit are dominated by forests. The coast is characterized by sand beaches, rocky shore and extensive coastal wetland in the east.

TABLE 15.1: Black-Presque Isle and Ontonagon BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	37.03	0.54	1,441.07	
Developed	7.77	0.11	389.55	
Forest	5,730.13	82.97	107,747.13	
Associated Nearshore Waters	671.67	9.72	17,868.03	
Other	333.33	4.83	8,227.57	
Water (inland)	126.72	1.83	9,473.05	
Total Area	**6,906.66**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	96.27	NA	1.65	Based on SOLEC shoreline
Sand Beaches (km)	24.26	25.20	3.77*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	51.99	25.37*	4.71**	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone	202.22	98.70*	3.27**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	0	NA	0	
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	2.26	NA		
Road Density (km/km^2)	0.48	NA		
Number of Dams and Barriers	2,639	NA	11.2	
Artificial Shoreline (km)	1.09	1.13	0.48	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	3,069.23	49.23	6,234.99	Regional area based on landmass
Public/Crown	2,922.05	46.87	6,234.99	
Tribes/ First Nations	0.69	0.01	6,234.99	
Parks & Protected Areas (total)	243.02	3.90	6,234.99	
Parks & Protected Areas (coast)	69.81	34.07*	204.89**	*% of Regional Coastal Area **Regional Coastal Area (km^2)

Important Biodiversity Features

Nearshore and Inshore Waters

- The Black-Presque-Isle/Ontonagon region contains several sites noted to be Important Habitat for Lake Trout. This region also contains two Important Habitat Areas and one Important Habitat Site (Lake Superior Binational Program Habitat Committee 2006) (Figure 15.1, Table 15.3, Figure 15.3).

Coastal Zone and Islands

- This region contains extensive sand beaches, including large protected coastal areas in the Porcupine Mountains State Park.

Tributaries and Watersheds

- Historically 21 tributaries in Lake Superior had Lake Sturgeon spawning runs. The Ontonagon River is one of these historical spawning tributaries, and is located in the Black-Presque Isle and Ontonagon regional unit. The Ontonagon River population status is reintroduced and the population trajectory is unknown (Golder Associates Ltd. 2011).
- A Lake Sturgeon Rehabilitation Plan for Lake Superior (Auer 2003) identifies the Ontonagon River as one of the seventeen tributaries to Lake Superior in which there should be a focus on Lake Sturgeon rehabilitation. Habitat restoration is a priority in the Ontonagon River, due to the loss of all wetland habitats (Auer 2003).
- Segments of the Black River, Presque Isle River and Ontonagon River have all been designated as portions of the National Wild and Scenic Rivers System (Interagency Wild & Scenic Rivers Council 2012)

Figure 15.1: Black-Presque Isle and Ontonagon - Coastal and Watershed Features

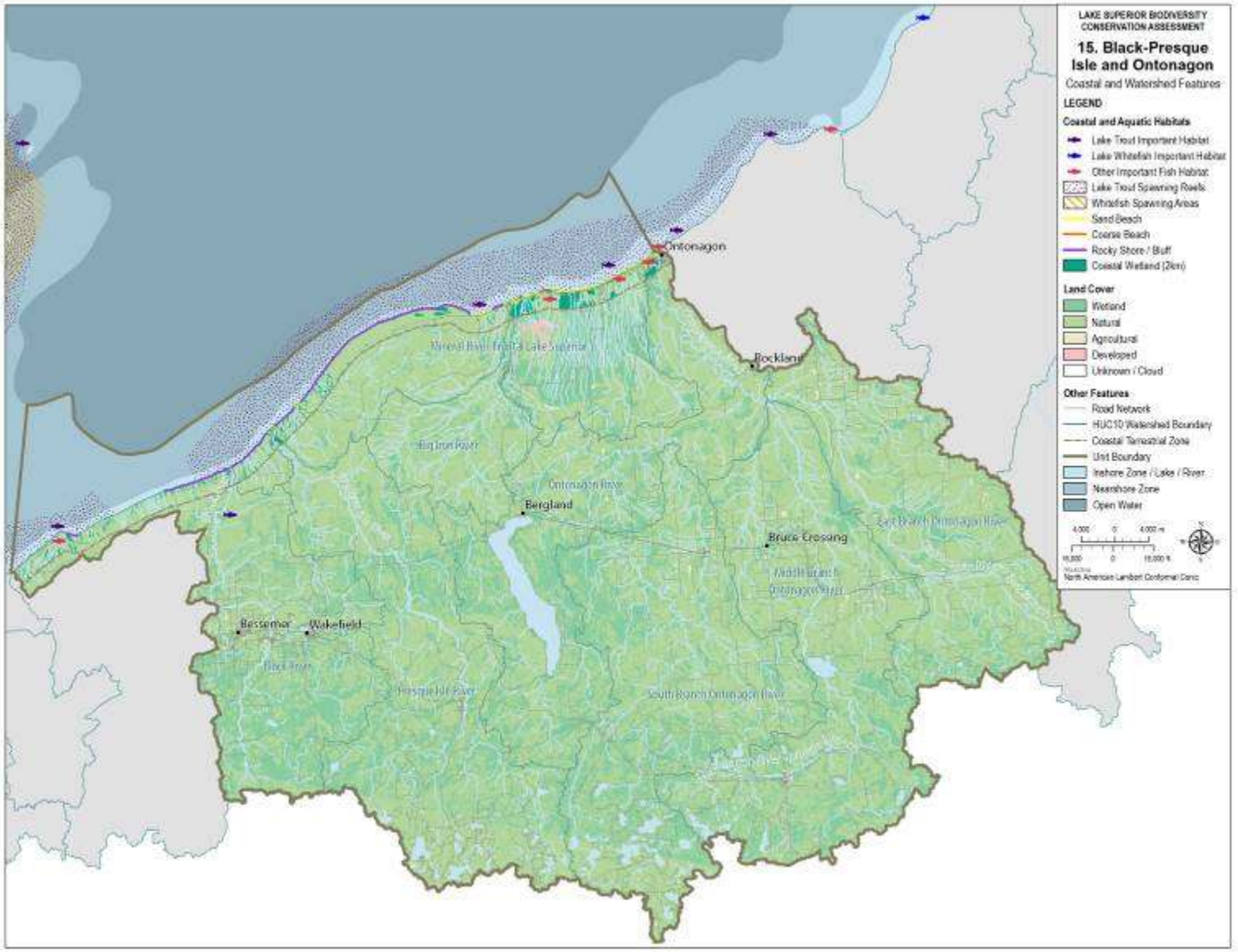


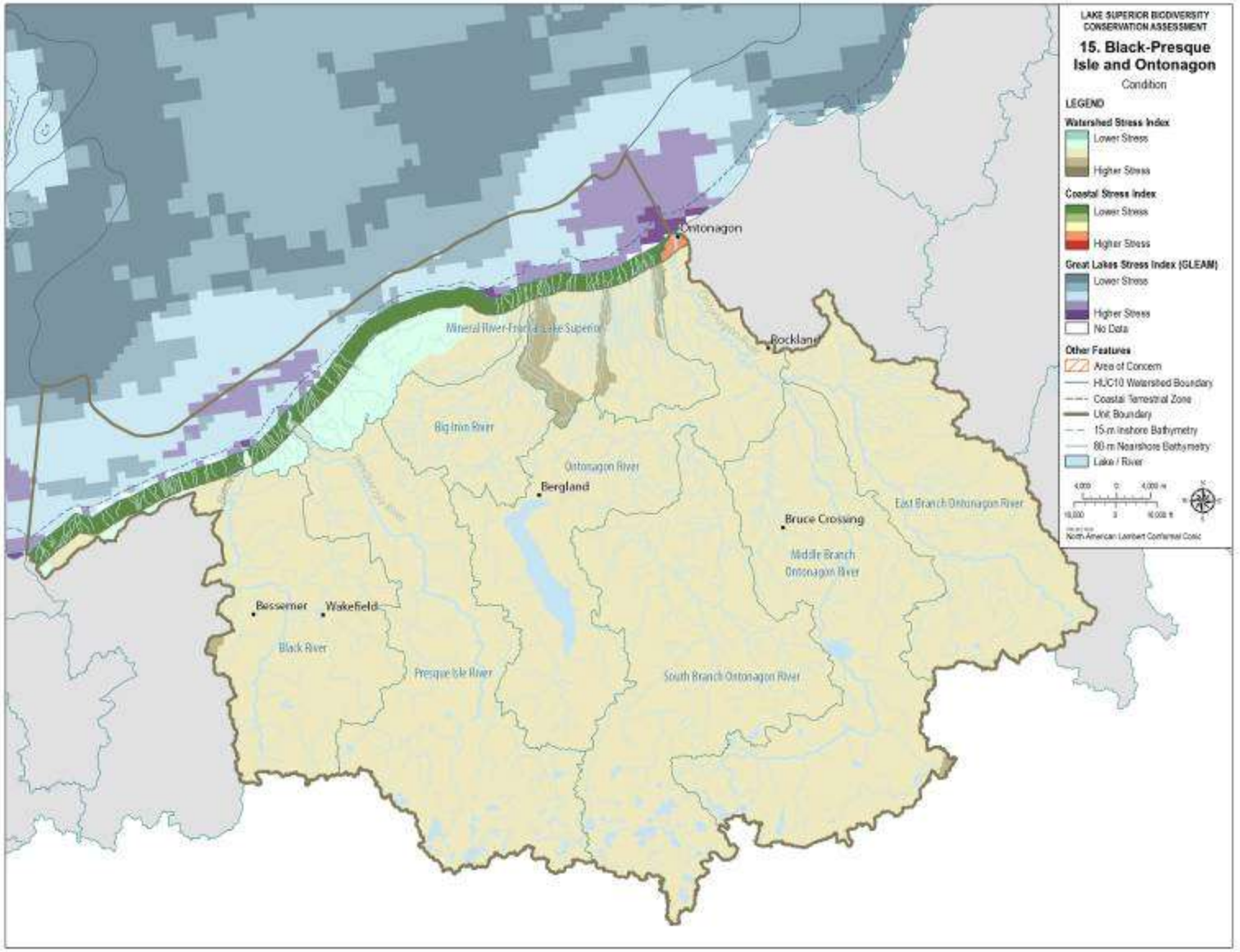
TABLE 15.2: Black-Presque Isle and Ontonagon CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	
Nearshore[1]	C (0.48)	
Embayments and Inshore[1,2]	C (0.54)	
Coastal Wetlands[2,3]	B (0.627)	
Islands[4]	NA	No islands have been documented
Coastal Terrestrial[3]	A- (0.800)	
Tributaries and Watersheds[2]	B (0.60)	

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

Figure 15.2: Black-Presque Isle and Ontonagon - Condition



Important Issues & Threats

- A number of waterbodies within the Black-Presque Isle and Ontonagon regional unit are listed as impaired. Reasons for impairment include mercury and PCBs in the water column, copper, E. coli and mercury and PCBs in fish tissues. Affected uses include aquatic consumption (U.S. EPA 2013l, 2013am).
- Forest fragmentation through real estate development is an emerging concern in the Upper Peninsula Lake Superior watersheds. Large tracts of forest lands owned by corporate land holders are being sold to companies which run real estate investment trusts; smaller parcels are then developed (W. Taft, pers. comm., February 25, 2013).
- The Copperwood Project of Orvana Resources US Corp. (a subsidiary of Orvana Minerals Corp.) is a mineral lease covering 712 hectares in the Black-Presque Isle and Ontonagon regional unit. Proven and probable reserves of both copper and silver have been identified. A mining permit was received from the Michigan Department of Environmental Quality in April 2012, and additional permits related to wetlands, discharges and air-quality are under review by the Michigan DEQ. Production at the mine is expected to start in 2014 (Orvana Minerals Corp. 2013). The Copperwood Measured and Indicated Mineral Resource Area is located in close proximity to the Lake Superior shoreline.

Conservation In Action

Parks & Protected Areas

- Ottawa National Forest
- Agate Falls Scenic Site
- Bond Falls Scenic Site
- Lake Gogebic State Park
- Porcupine Mountains Wilderness State Park
- State Forest – Baraga Management Unit
- Twin Lakes State Park

Existing Programs & Projects

- Under the Michigan Water Quality Standards (WQS), portions of the Ontonagon River (Ontonagon County) are designated as Outstanding State Resource Waters (OSRW). Also under the Michigan WQS, all surface waters of the Lake Superior basin that are not identified as OSRWs are designated as Lake Superior basin - Outstanding International Resource Waters (LSB-OIRW). Under the above designations, additional anti-degradation controls are applied for new or increased pollutant loadings (Michigan DEQ 2013a).
- A 14.0 mile segment of the Black River, from the Ottawa National Forest boundary to Lake Superior, is designated as Scenic through the National Wild and Scenic Rivers System (Interagency Wild & Scenic Rivers Council 2012, USDA Forest Service 2007a).
- 72 miles of the Presque Isle River and its tributaries are designated as Recreational or Scenic through the National Wild and Scenic Rivers System. A total of 24.0 miles are designated as Scenic and 48.0 miles are designated as Recreational (Interagency Wild & Scenic Rivers Council 2012, USDA Forest Service 2007a).
- 170 miles of the Ontonagon River and its tributaries are designated as Recreational, Wild or Scenic through the National Wild and Scenic Rivers System. A total of 43.0 miles are designated as Wild, 35.0 miles are designated as Scenic, and 92.0 miles are designated as Recreational (Interagency Wild & Scenic Rivers Council 2012, USDA Forest Service 2007a).

- The Winegar Moraine and Iron Co. Northern Goshawk State Important Bird Area (IBA) is located in the Black-Presque Isle and Ontonagon regional unit (National Audubon Society 2013, 2012).
- The Western Peninsula Invasives Coalition is the Cooperative Weed Management Area serving all of Gogebic, Iron, and Ontonagon Counties, including the areas covered by the Ottawa National Forest. The mission of the Western Peninsula Invasives Coalition is the prevention, containment and management of non-native invasive species (M. Preisser, pers. comm., May 31 2013).
- 25 Citizen-based Groups are noted to do work in the Black-Presque Isle and Ontonagon regional unit (U.S. EPA 2013l, 2013m).

TABLE 15.3: Black-Presque Isle and Ontonagon IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
MI-005	Site	Long Lake	Rare plant and animal habitats, proposed wilderness
MI-042	Area	Porcupine Mountains	Mesic Northern Forest, rare plant and animal habitat
MI-044	Area	Sylvania Wilderness Area	Large area of undisturbed presettlement vegetation, old growth forest, pristine lakes, diverse habitat types, rare plant and animal habitat.

Figure 15.3: Black-Presque Isle and Ontonagon - Important Habitat Sites and Areas

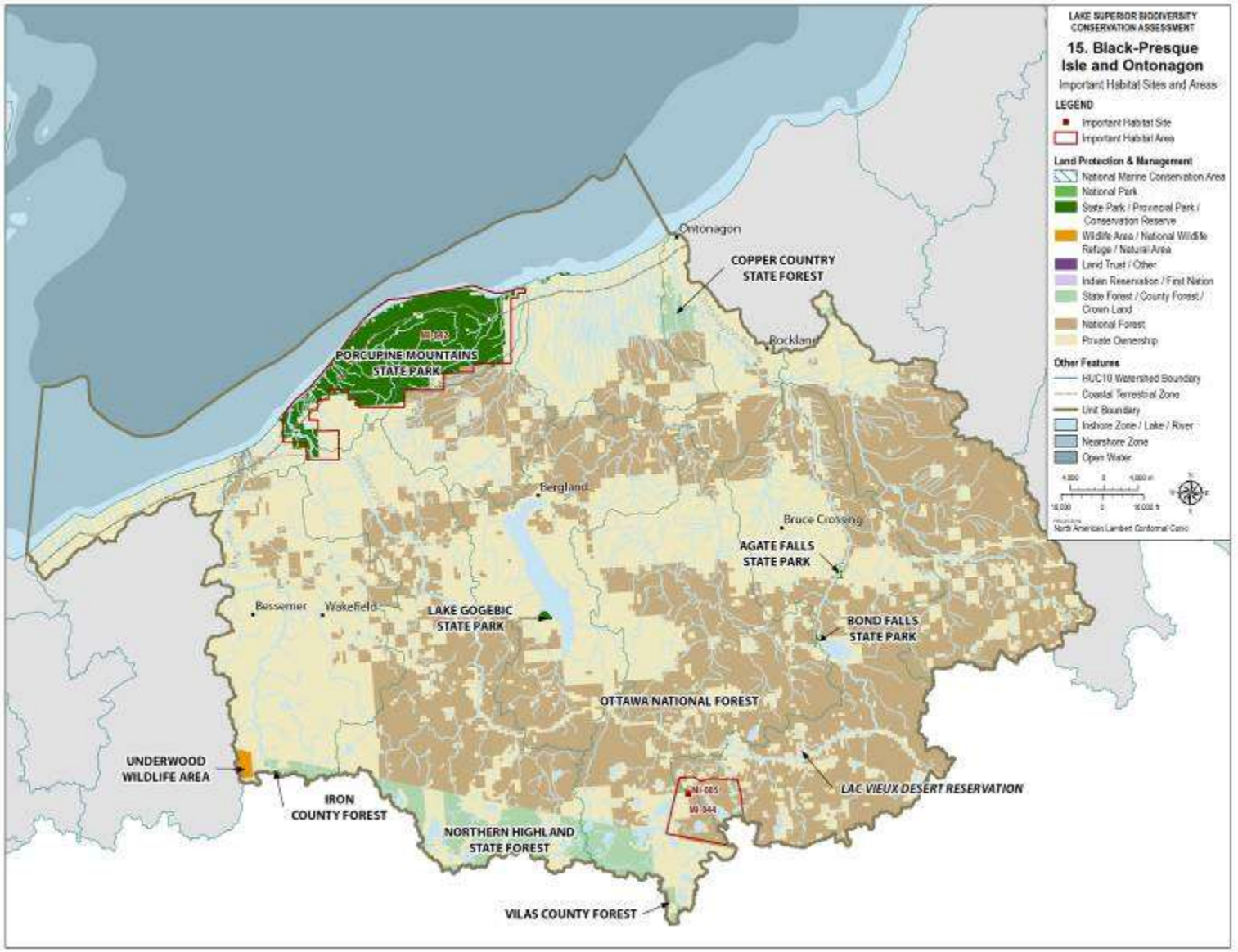


TABLE 15.4: Black-Presque Isle and Ontonagon LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 109 species and communities of conservation concern have been documented in the regional unit. 91 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 13 species and communities were once known to occur here, but have current conservation ranks of F (Failed to find) or H (Historical). A further 5 species and communities of conservation concern are known to occur in this regional unit, but are currently not ranked for viability.[19]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
Accipiter gentilis	Northern goshawk
Agabus wasastjernae	A Predaceous Diving Beetle
Astragalus canadensis	Canadian milk vetch
Astragalus neglectus	Cooper's milk vetch
Black spruce swamp	Black Spruce Swamp
Bog	
Boreal rich fen	Boreal Rich Fen
Botrychium mormo	Goblin moonwort
Calamagrostis lacustris	Northern reedgrass
Callitriche hermaphroditica	Autumnal water-starwort
Carex assiniboinensis	Assiniboia sedge
Clay Bluffs	
Clematis occidentalis	Purple clematis
Clinostomus elongatus	Redside dace
Collinsia parviflora	Small blue-eyed Mary
Coregonus artedi	Lake herring or Cisco
Coregonus kiyi	Kiyi
Coregonus zenithicus	Shortjaw cisco
Cottus ricei	Spoonhead sculpin
Crataegus douglasii	Douglas's hawthorn
Cryptogramma stelleri	Slender cliff brake
Cygnus buccinator	Trumpeter Swan
Cypripedium arietinum	Ram's head lady's-slipper
Dentaria maxima	Large toothwort
Dry-mesic Northern Forest	
Dryopteris filix-mas	Male fern

[19] For the Michigan portions of this unit, data included here were provided by the Michigan Natural Features Inventory of Michigan State University, and were current as of August 1 2014. These data are not based on an exhaustive inventory of the state. The lack of data for any geographic area shall not be construed to mean that no significant features are present.

For the Wisconsin portions of this unit, data included here were provided by the Bureau of Natural Heritage Conservation, Wisconsin Department of Natural Resources (DNR). Although the NHI database is the most up-to-date and comprehensive database on the occurrences of rare species and natural communities available, many areas of the state have not been inventoried. Similarly, the presence of one rare species at a location does not imply that all taxonomic groups have been surveyed for at that site. As such, the data should be interpreted with caution and an "absence of evidence is not evidence of absence" philosophy should be followed.

Dryopteris fragrans	Fragrant cliff woodfern
Emergent Marsh	
Emydoidea blandingii	Blanding's turtle
Falco peregrinus	Peregrine falcon
Galearis spectabilis	Showy orchis
Gavia immer	Common loon
Glyptemys insculpta	Wood turtle
Gomphus lineatifrons	Splendid clubtail
Gomphus quadricolor	Rapids clubtail
Granite Cliff	
Gratiola aurea	Hedge-hyssop
Haliaeetus leucocephalus	Bald eagle
Hardwood-Conifer Swamp	
Helianthus mollis	Downy sunflower
Helophorus latipenis	A Water Scavenger Beetle
Huperzia selago	Fir clubmoss
Lake--deep, soft, seepage	Lake--Deep, Soft, Seepage
Lake--shallow, soft, seepage	Lake--Shallow, Soft, Seepage
Lake--spring	Lake--Spring
Melica smithii	Smith's Melic Grass
Mesic Northern Forest	
Mimulus guttatus	Western monkey flower
Moehringia macrophylla	Big-leaf sandwort
Muskeg	Scrub Bog, Upper Midwest Type
Myriophyllum farwellii	Farwell's water milfoil
Northern Bald	Rich Glade, Upper Midwest Type
Northern dry-mesic forest	Northern Dry-mesic Forest
Northern mesic forest	Northern Mesic Forest
Northern Shrub Thicket	Wet Scrubland, Upper Midwest Type
Northern Wet Meadow	Wet Meadow, Upper Midwest Type
Northern wet-mesic forest	Northern Wet-mesic Forest
Open bog	Open Bog
Ophiogomphus anomalus	Extra-striped snaketail
Panax quinquefolius	Ginseng
Pandion haliaetus	Osprey
Perimyotis subflavus	Eastern pipistrelle
Petasites sagittatus	Sweet coltsfoot
Poor Conifer Swamp	
Poor fen	Poor Fen
Potamogeton vaseyi	Vasey's pondweed
Prosartes hookeri	Fairy bells
Pterospora andromedea	Pine-drops
Ranunculus rhomboideus	Prairie buttercup
Rich Conifer Swamp	
Sand and Gravel Beach	
Sandstone Bedrock Lakeshore	
Sandstone Cliff	
Sandstone Cobble Shore	
Scirpus torreyi	Torrey's bulrush
Silene nivea	Evening campion
Spring pond	Spring Pond
Stream--slow, soft, warm	Stream--Slow, Soft, Warm
Sturnella neglecta	Western meadowlark
Submergent Marsh	
Tympanuchus phasianellus	Sharp-tailed grouse
Vaccinium cespitosum	Dwarf bilberry

Vertigo bollesiana	Delicate vertigo
Vertigo cristata	Crested vertigo
Vertigo paradoxa	Mystery vertigo
Viola novae-angliae	New England violet
Volcanic Bedrock Glade	
Volcanic Bedrock Lakeshore	
Volcanic Cliff	
Volcanic Cobble Shore	
Zizia aptera	Prairie golden alexanders
Historical or Failed to Find Records	
Scientific Name	**Common Name**
Adlumia fungosa	Climbing fumitory
Boloria freija	Freija fritillary
Buteo lineatus	Red-shouldered hawk
Calypso bulbosa	Calypso or fairy-slipper
Great Blue Heron Rookery	Great Blue Heron Rookery
Littorella uniflora	American shore-grass
Lysimachia hybrida	Swamp candles
Notropis dorsalis	Bigmouth shiner
Nuphar pumila	Small yellow pond lily
Planogyra asteriscus	Eastern flat-whorl
Ranunculus cymbalaria	Seaside crowfoot
Ribes oxyacanthoides	Northern gooseberry
Terrapene carolina carolina	Eastern box turtle
Unranked Records	
Scientific Name	**Common Name**
Anzia colpodes	Lichen
Ephemeral pond	Ephemeral Pond
Menegazzia terebrata	Lichen
Northern Hardwood Swamp	Flatwoods, Upper Midwest Type
Northern wet forest	Northern Wet Forest

16. Keweenaw Peninsula and Sturgeon

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	A
NEARSHORE	B	COASTAL WETLANDS	B
EMBAYMENTS & INSHORE	C	COASTAL TERRESTRIAL	A
TRIBUTARIES & WATERSHEDS	C	**OVERALL B**	

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

Queen Anne's Falls on Slaughterhouse Creek, Houghton County. Photo credit: William Taft/ Michigan Department of Environmental Quality

Summary/ Description

The Keweenaw Peninsula and Sturgeon regional unit (HUC 04020103 and HUC 04020104) extends from the community of Ontonagon in the west, up the peninsula to Copper Harbor, and south to include communities such as Pelkie, Sidnaw and Covington. A small portion of the peninsula, from the Portage River Entry (Keweenaw Waterway Lower Entrance) south to Baraga is part of the Dead-Kelsey regional unit. This regional unit is 6,077 km^2 in size, including the associated nearshore waters and encompasses most of the Keweenaw Peninsula. A portion of the Keweenaw Bay Indian Community is located in this regional unit, while the rest of the community is in the Dead-Kelsey regional unit. The Keweenaw Peninsula and Sturgeon regional unit is part of the territory ceded in the Treaty of 1842. The signatory tribes retain rights to hunt, fish, and gather within the regional unit (A. McCammon Soltis, pers. comm., January 5 2015). It is part of Subregion 0402 – Southern Lake Superior-Lake Superior. Part of this region (HUC 04020104, Sturgeon) is entirely inland (with no Lake Superior shoreline), although a portion of this HUC extends up the Keweenaw Peninsula and comes quite close to Keweenaw Bay. The Keweenaw Peninsula and Sturgeon regional unit combines two tertiary (HUC 8) watersheds, Keweenaw Peninsula and Sturgeon, and contains 7 quaternary (HUC 10) watersheds. The watersheds are characterized by forests with some agricultural lands. The coast includes rocky shores and sand beaches. Coastal wetlands are a common habitat along the eastern side of Keweenaw Peninsula.

TABLE 16.1: Keweenaw Peninsula and Sturgeon BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	166.72	2.45	1,441.07	
Developed	10.36	0.15	389.55	
Forest	3,684.64	54.09	107,747.13	
Associated Nearshore Waters	2,033.96	29.86	17,868.03	
Other	797.28	11.70	8,227.57	
Water (inland)	118.61	1.74	9,473.05	
Total Area	**6,811.57**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	287.75	NA	4.94	Based on SOLEC shoreline
Sand Beaches (km)	86.93	30.21	13.51*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	209.94	39.80*	19.03**	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone	453.26	85.93*	7.34**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	44	NA	1.7	
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	8.65	NA		
Road Density (km/km^2)	0.46	NA		
Number of Dams and Barriers	1,835	NA	7.8	
Artificial Shoreline (km)	3.48	1.21	1.53	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	3,823.19	80.03	4,776.91	Regional area based on landmass
Public/Crown	848.52	17.76	4,776.91	
Tribes/ First Nations	12.26	0.26	4,776.91	
Parks & Protected Areas (total)	92.94	1.95	4,776.91	
Parks & Protected Areas (coast)	10.61	2.01*	527.45**	*% of Regional Coastal Area **Regional Coastal Area (km^2)

Important Biodiversity Features

Nearshore and Inshore Waters

- The Keweenaw Peninsula and Sturgeon regional unit contains many sites of Important Habitat for Lake Trout and Lake Whitefish. The Important Habitat Sites for both species are found along the shore throughout the peninsula, as well as in and around Grand Traverse and Little Traverse bays (Lake Superior Binational Program Habitat Committee 2006) (Figure 16.1).
- Misery Bay and Bete Grise Bay are noted as Lake Superior embayments which are important for Lake Sturgeon (Auer 2003). In the Keweenaw Peninsula and Sturgeon regional unit these

embayments and the nearshore zone, which provides corridors for movement, are identified as critical management areas for Lake Sturgeon in the Lake Superior basin (Auer 2003).

- Buffalo Reef is an important spawning reef for both Lake Trout and Lake Whitefish (LSBP 2008).

Coastal Zone and Islands

- This region contains Important Habitat Areas and Important Habitat Sites; a number of these areas and sites are concentrated at the tip of the Keweenaw Peninsula (Lake Superior Binational Program Habitat Committee 2006) (Table 16.3, Figure 16.4).

Tributaries and Watersheds

- The Sturgeon River contains a native stock of Lake Sturgeon (Auer and Baker No date). Historically 21 tributaries in Lake Superior had Lake Sturgeon spawning runs. The Sturgeon River is one of these historical spawning tributaries, and is located in the Keweenaw Peninsula and Sturgeon regional unit. The Sturgeon River population status is extant and the population trajectory is stable (Golder Associates Ltd. 2011).
- The Sturgeon River is one of ten Lake Superior tributaries where Lake Sturgeon have currently been documented spawning (as of 2012). This is the same number of rivers as in 2005, however the specific tributaries have changed (Lake Superior Lake Sturgeon Work Group 2012, unpublished data).
- The Lake Sturgeon population in the Sturgeon River is one of two Lake Superior populations which meets the criteria for self-sustaining, as defined in the Auer (2003) Lake Sturgeon Rehabilitation Plan for Lake Superior (Lake Superior Lake Sturgeon Work Group 2012, unpublished data).
- A Lake Sturgeon Rehabilitation Plan for Lake Superior (Auer 2003) identifies the Sturgeon River as one of the seventeen tributaries to Lake Superior in which there should be a focus on Lake Sturgeon rehabilitation.

Figure 16.1: Keweenaw Peninsula and Sturgeon - Coastal and Watershed Features

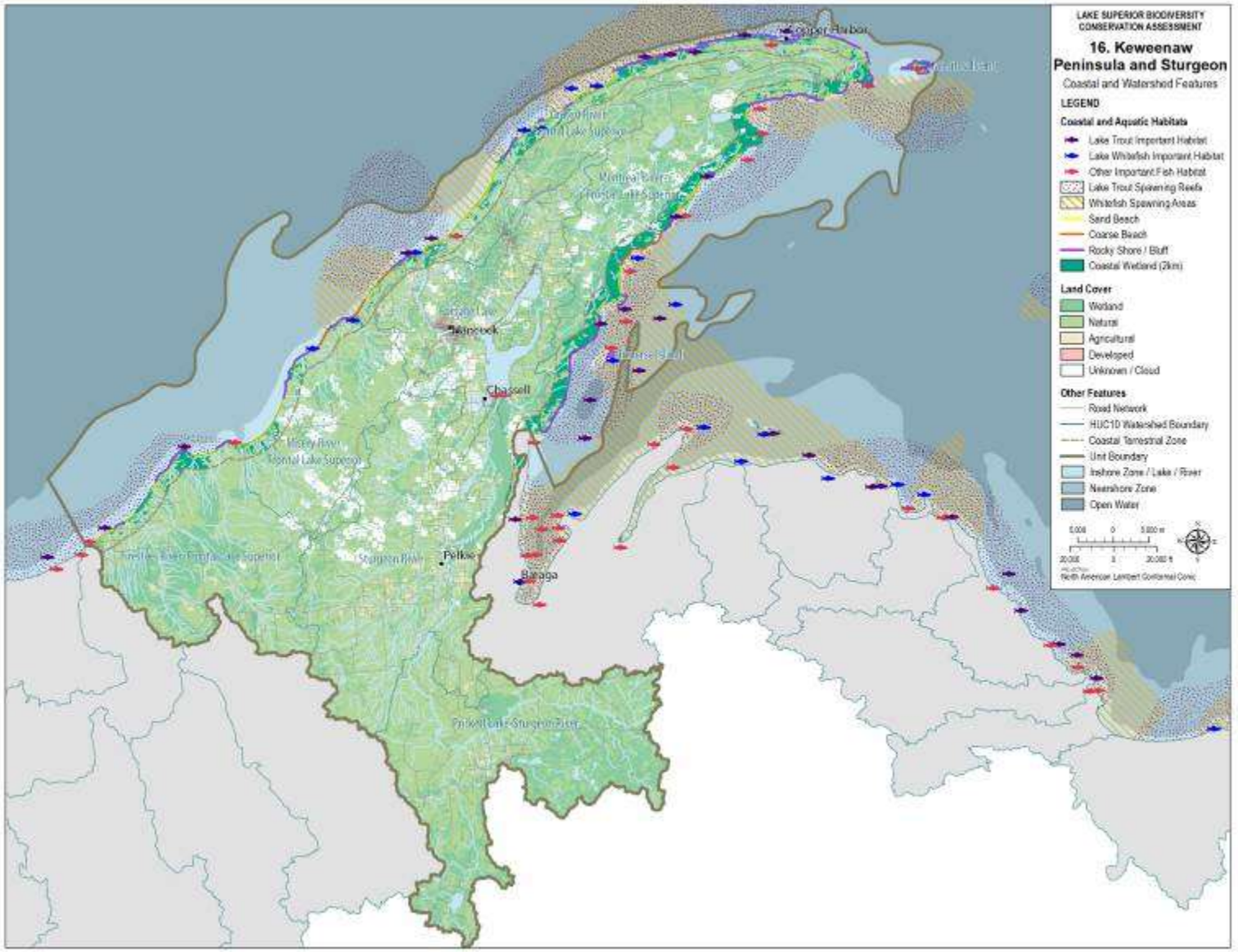


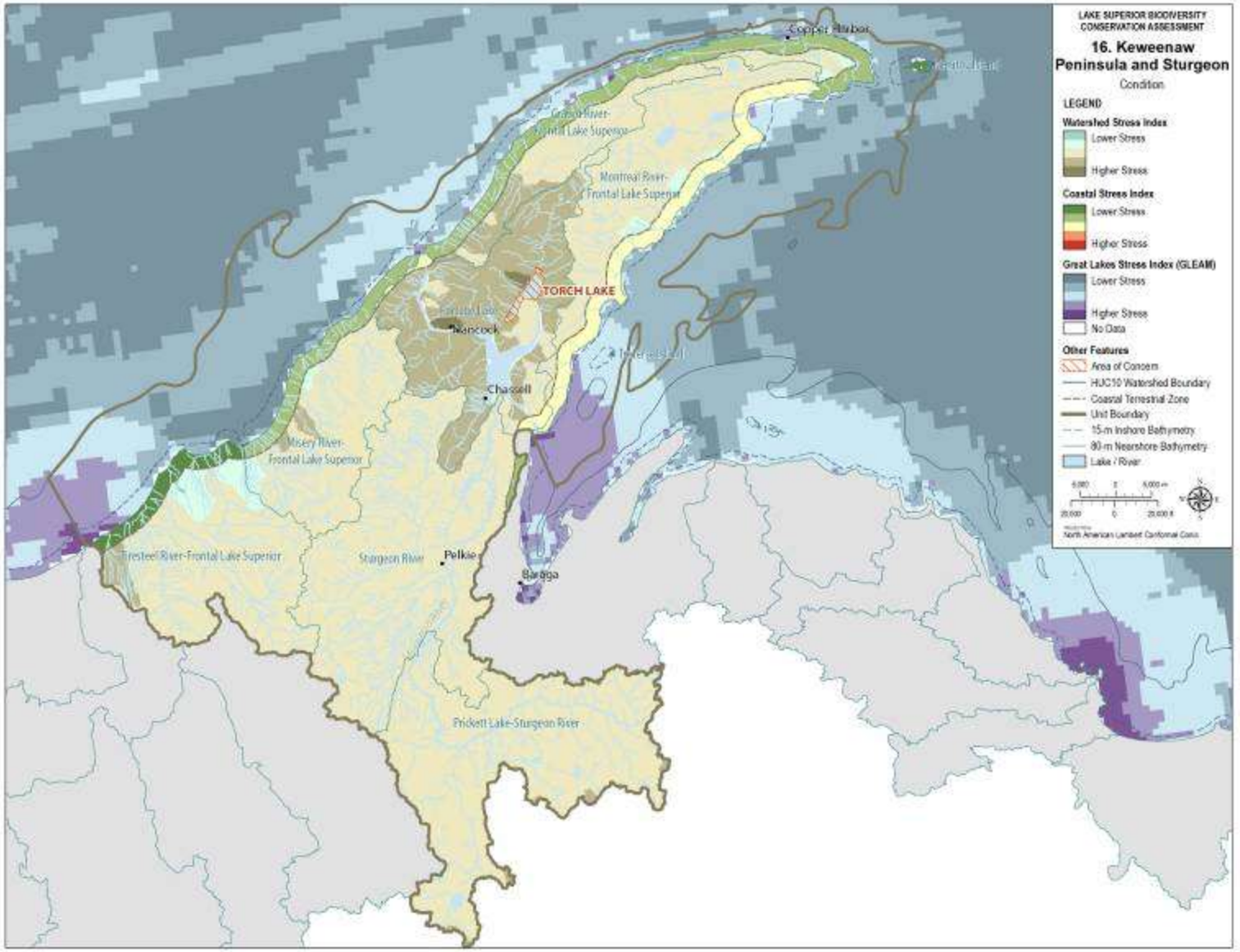
TABLE 16.2: Keweenaw Peninsula and Sturgeon CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	
Nearshore[1]	B (0.66)	
Embayments and Inshore[1,2]	C (0.58)	
Coastal Wetlands[2,3]	B (0.705)	
Islands[4]	A	
Coastal Terrestrial[3]	A (0.966)	
Tributaries and Watersheds[2]	C (0.49)	

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

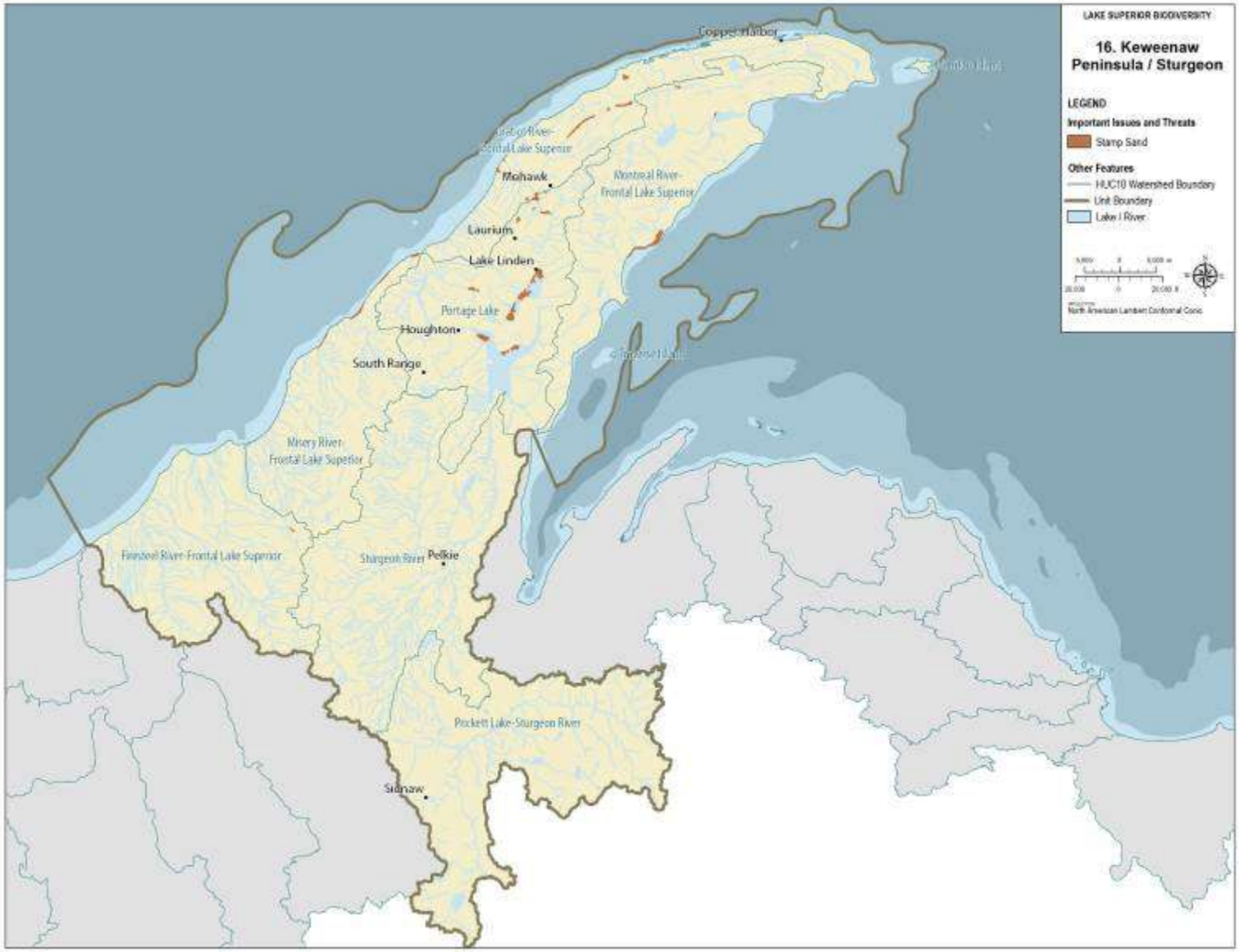
Figure 16.2: Keweenaw Peninsula and Sturgeon - Condition



Important Issues & Threats

- Mining activities have impacted nearshore Lake Superior sediments in the Keweenaw Region; in the Keweenaw Peninsula area, the sediments contain copper enrichments (Kerfoot et al. 2009). Investigations have revealed a metal-rich area around the Keweenaw Peninsula, where copper tailings have drifted from their original sources (Kerfoot et al. 2012). Three large copper mills operated in the Keweenaw Bay area; two were located at Gay, Michigan, and one was north of Baraga, near Assinins (Kerfoot et al. 2012). The two mills at Gay were the Mohawk and Wolverine Mills, combined they discharged 22.7 teragrams (Tg) of stamp sands (coarse sand waste leftover from the processing of ore), amounting to approximately 89% of the total stamp sands discharged into the Keweenaw Bay area (Kerfoot et al. 2012). Over a century after their initial discharge, tailings on the east side of the Keweenaw Peninsula in the Grand Traverse Bay area have drifted and increased the total surface area of shoreline covered (by 178%), as well as the underwater surface area of the bay bottom covered (by 567%) (Kerfoot et al. 2012) (See Figure 16.3). The U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers – Detroit District estimate that stamps sands cover 1,426 acres of the shoreline and lake bottom (Mattes No date). The most affected shoreline area is between Tobacco River and the Traverse River breakwall (Kerfoot et al. 2012, Mattes No date). Important spawning and nursery areas such as Buffalo Reef are expected to be impacted. Lake Whitefish and Lake Trout use this reef, and these are important fisheries for the Keweenaw Bay tribal members (Kerfoot et al. 2012).
- The Torch Lake Area of Concern (AOC) is located in the Keweenaw Peninsula and Sturgeon regional unit, in Houghton County. The 2,700 acre Torch Lake was the site of approximately half of the copper processing in the area between the mid 1840s and 1968 (U.S. EPA 2013n). Copper ore tailings totalling approximately 200 million tons were deposited into Torch Lake during this time, displacing 20% of the lake's original volume (Michigan DNR 1987). The lake was contaminated by other process wastes as well, including other heavy metals, polychlorinated biphenyls, and polycyclic aromatic hydrocarbons (Michigan DEQ 2013e). The 1987 Remedial Action Plan (RAP) for the site identified three Beneficial Use Impairments (BUIs) for the Torch Lake AOC: fish tumors, degraded benthos and fish consumption advisories. The fish tumor BUI was removed in 2007. As of 2013, the two other BUIs remain. Federal, state, and local partners continue to investigate ways to restore the site.
- The Torch Lake Superfund Site is located in Houghton County, Michigan. The Superfund Site designation is due to the contamination of the sediments and shoreline of the lake due from copper mining activities (U.S. EPA 2013o).
- The presence of Emerald Ash Borer (EAB) has been detected in counties in the Keweenaw Peninsula and Sturgeon regional unit. The area is now under a number of quarantine measures, including Federal EAB quarantine and Michigan state quarantine (Cooperative Emerald Ash Borer Project 2013).
- Forest fragmentation through real estate development is an emerging concern in the Upper Peninsula Lake Superior watersheds. Large tracts of forest lands owned by corporate land holders are being sold to companies which run real estate investment trusts; smaller parcels are then developed (W. Taft, pers. comm., February 25, 2013).

Figure 16.3: Location of Stamp Sands in the Keweenaw Peninsula area



Source for Stamp Sands data: U.S. Department of Agriculture, Natural Resources Conservation Service 2000.

Conservation In Action

Parks & Protected Areas

- Ottawa National Forest
- McLain State Park
- State Forest – Baraga Management Unit
- Sturgeon River Sloughs State Wildlife Management Area
- Twin Lakes State Park
- Keweenaw National Historical Park

Existing Programs & Projects

- The Sturgeon River (part of the Sturgeon unit) contains a native stock of Lake Sturgeon. Eggs from the Sturgeon River population are being used in a Lake Sturgeon reintroduction program in the Ontonagon River (Auer and Baker No date). The Sturgeon River population is the nearest native stock to the Ontonagon River.
- 28.0 miles of the Sturgeon River, from where it enters the Ottawa National Forest to the Ottawa National Forest northern boundary, are designated through the National Wild and Scenic Rivers System (Interagency Wild & Scenic Rivers Council 2012, USDA Forest Service 2007a). A 20.0 mile segment, portions of which are in the Sturgeon River Gorge Wilderness, has been classified as Wild, and the management plan states that it will be managed consistent with the wilderness values (USDA Forest Service 2007a). An 8.0 mile segment is designated as Scenic (Interagency Wild & Scenic Rivers Council 2012, USDA Forest Service 2007a).
- The Sturgeon River Gorge Wilderness area is located in the Keweenaw Peninsula and Sturgeon regional unit. Wilderness is defined as Congressionally designated public land, managed in accordance with the Wilderness Act of 1964. Natural processes are given first priority, and management is undertaken in a way that human use does not substantially change nature (USDA Forest Service 2007b)
- Under the Michigan Water Quality Standards (WQS), portions of the Sturgeon River (Baraga and Houghton Counties) are designated as Outstanding State Resource Waters (OSRW). Also under the Michigan WQS, all surface waters of the Lake Superior basin that are not identified as OSRWs are designated as Lake Superior basin - Outstanding International Resource Waters (LSB-OIRW). Under the above designations, additional anti-degradation controls are applied for new or increased pollutant loadings (Michigan DEQ 2013a).
- The State of Michigan has identified exceptional areas of fish and wildlife habitat along its coastline, connecting waterways, and rivermouths. Designated as Environmental Areas (EAs), certain uses within these areas require state review and approval (Michigan DEQ 2013b). One of these EAs is located in the Township of Torch Lake in Houghton County, in the Keweenaw Peninsula /Sturgeon regional unit (Michigan DEQ 2013c, 2013d).
- In this region, several individual watersheds have state-approved watershed management plans, including Eagle River, Otter River, Pilgrim River and Trap Rock River. These plans serve as guides for communities to protect and improve water quality (M. Preisser, pers. comm., May 31 2013).
- The Houghton Keweenaw Conservation District (HKCD) recently expanded the Bete Grise Preserve. HKCD acquired 1,493 acres of property, including high-quality wetlands and approximately 3,300 feet of shoreline frontage on Lac La Belle along the southeastern coast of the Keweenaw. The property will be managed for conservation and passive recreation (M. Preisser, pers. comm., May 31 2013).
- The Keweenaw Invasive Species Management Area facilitates cooperation and education among federal, state, tribal, local groups and landowners in prevention and management of invasive

species across land ownership boundaries. It spans Houghton, Keweenaw and Baraga Counties, including the Ottawa National Forest (M. Preisser, pers. comm., May 31 2013).

- The Isle Royale & Keweenaw Parks Association is a non-profit educational organization that works with the National Park Service to promote public understanding of Isle Royale National Park and Keweenaw National Historical Park. The group also works to fund research projects (Isle Royale & Keweenaw Parks Association 2010).
- A number of State Important Bird Areas (IBAs) are located in the Keweenaw Peninsula and Sturgeon regional unit. These IBAs are Sturgeon River Sloughs Wildlife Area IBA, Winegar Moraine and Iron Co. Northern Goshawk IBA, Peshekee Highlands LTA IBA, Brockway Mountain Hawk Watch IBA and Baraga Plains IBA (National Audubon Society 2013, 2012).
- The Keweenaw Land Trust has protected several coastal areas, including property on Manitou Island.

TABLE 16.3: Keweenaw Peninsula and Sturgeon IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
MI-003	Site	Canyon Falls	Rare plant habitat, geographical feature
MI-006	Site	Silver Mountain	Rare plant habitat, geographical feature
MI-007	Site	Agate Harbor	Rare plant habitat
MI-009	Site	Cat Harbor	Hardwood-conifer swamp, rare plant habitat
MI-010	Site	Cliff Mine	Rare plant habitat
MI-013	Site	Estivant Pines	Dry-mesic northern forest
MI-014	Site	Fort Wilkins	Rare plant and animal habitats
MI-016	Site	Mount Brockway	Rare plant habitat
MI-040	Area	Portage River	Great Lakes marsh, geologic features, rare animal habitat
MI-041	Area	Keweenaw Peninsula	Rare plant and animal habitat geologic features, high biodiversity
MI-048	Area	Bete Grise	

Figure 16.4: Keweenaw Peninsula and Sturgeon - Important Habitat Sites and Areas

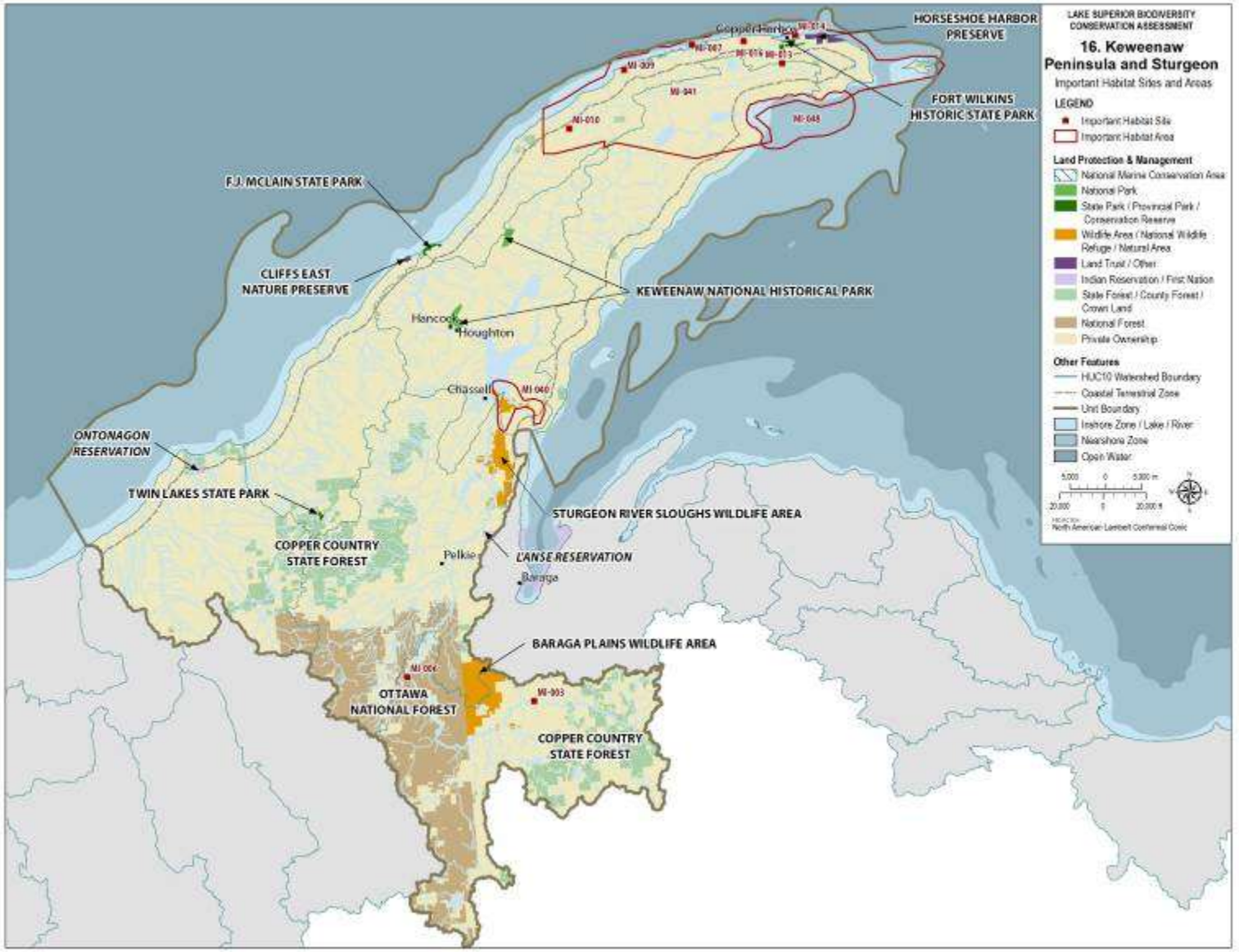


TABLE 16.4: Keweenaw Peninsula and Sturgeon LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 138 species and communities of conservation concern have been documented in the regional unit. 101 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 32 species and communities were once known to occur here, but have current conservation ranks of H (Historical) or X (Extirpated). A further 5 species and communities of conservation concern are known to occur in this regional unit, but are currently not ranked for viability.[20]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
Accipiter gentilis	Northern goshawk
Acipenser fulvescens	Lake sturgeon
Allium schoenoprasum	Chives
Arnica cordifolia	Heart-leaved arnica
Asplenium rhizophyllum	Walking fern
Asplenium trichomanes-ramosum	Green spleenwort
Aster modestus	Great northern aster
Bog	
Boreal Forest	
Botaurus lentiginosus	American bittern
Calamagrostis lacustris	Northern reedgrass
Calypso bulbosa	Calypso or fairy-slipper
Carex media	Sedge
Carex richardsonii	Richardson's sedge
Carex rossii	Ross's sedge
Castilleja septentrionalis	Pale Indian paintbrush
Ceanothus sanguineus	Wild lilac
Chamaerhodos nuttallii var. keweenawensis	Rock-rose
Clematis occidentalis	Purple clematis
Collinsia parviflora	Small blue-eyed Mary
Coregonus artedi	Lake herring or Cisco
Coregonus kiyi	Kiyi
Coregonus zenithicus	Shortjaw cisco
Cottus ricei	Spoonhead sculpin
Crataegus douglasii	Douglas's hawthorn
Cypripedium arietinum	Ram's head lady's-slipper
Cystopteris laurentiana	Laurentian fragile fern
Danthonia intermedia	Wild oat grass
Dendroica kirtlandii	Kirtland's warbler
Draba arabisans	Rock whitlow grass
Drosera anglica	English sundew
Dry Northern Forest	Dry Woodland, Upper Midwest Type
Dry-mesic Northern Forest	

[20] Data included here were provided by the Michigan Natural Features Inventory of Michigan State University, and were current as of August 1 2014. These data are not based on an exhaustive inventory of the state. The lack of data for any geographic area shall not be construed to mean that no significant features are present.

Dryopteris filix-mas	Male fern
Dryopteris fragrans	Fragrant cliff woodfern
Elymus glaucus	Blue wild-rye
Euconulus alderi	A land snail (no common name)
Falco columbarius	Merlin
Gallinula chloropus	Common moorhen
Gavia immer	Common loon
Gentiana linearis	Narrow-leaved gentian
Glyptemys insculpta	Wood turtle
Great Lakes Marsh	
Haliaeetus leucocephalus	Bald eagle
Huperzia selago	Fir clubmoss
Incisalia henrici	Henry's elfin
Interdunal Wetland	Alkaline Shoredunes Pond/marsh, Great Lakes Type
Intermittent Wetland	Infertile Pond/marsh, Great Lakes Type
Listera auriculata	Auricled twayblade
Littorella uniflora	American shore-grass
Luzula parviflora	Small-flowered wood rush
Mesic Northern Forest	
Moehringia macrophylla	Big-leaf sandwort
Myriophyllum alterniflorum	Alternate-leaved water-milfoil
Myriophyllum farwellii	Farwell's water milfoil
Northern Bald	Rich Glade, Upper Midwest Type
Northern Fen	Alkaline Shrub/herb Fen, Upper Midwest Type
Northern Shrub Thicket	Wet Scrubland, Upper Midwest Type
Notropis dorsalis	Bigmouth shiner
Nuphar pumila	Small yellow pond lily
Oryzopsis canadensis	Canada rice grass
Pandion haliaetus	Osprey
Patterned Fen	Rich Shrub/herb Fen, Upper Midwest Type
Pellaea atropurpurea	Purple cliff brake
Perimyotis subflavus	Eastern pipistrelle
Phyciodes batesii	Tawny crescent
Pine Barrens	Barrens, Upper Midwest Type
Pinguicula vulgaris	Butterwort
Planogyra asteriscus	Eastern flat-whorl
Poa alpina	Alpine bluegrass
Polygonum viviparum	Alpine bistort
Poor Conifer Swamp	
Potamogeton confervoides	Alga pondweed
Potentilla pensylvanica	Prairie cinquefoil
Prosartes hookeri	Fairy bells
Pterospora andromedea	Pine-drops
Rich Conifer Swamp	
Sagina nodosa	Pearlwort
Sand and Gravel Beach	
Sandstone Bedrock Lakeshore	
Sandstone Cobble Shore	
Sandstone Lakeshore Cliff	
Scirpus torreyi	Torrey's bulrush
Senecio indecorus	Northern ragwort
Sisyrinchium strictum	Blue-eyed-grass
Submergent Marsh	
Subularia aquatica	Awlwort
Trisetum spicatum	Downy oat-grass
Vaccinium cespitosum	Dwarf bilberry

Vertigo cristata	Crested vertigo
Vertigo modesta modesta	A land snail (no common name)
Vertigo modesta parietalis	A land snail (no common name)
Vertigo paradoxa	Mystery vertigo
Viburnum edule	Squashberry or mooseberry
Viola novae-angliae	New England violet
Volcanic Bedrock Glade	
Volcanic Bedrock Lakeshore	
Volcanic Cliff	
Volcanic Cobble Shore	
Volcanic Lakeshore Cliff	
Wooded Dune and Swale Complex	
Historical or Extirpated Records	
Scientific Name	**Common Name**
Adlumia fungosa	Climbing fumitory
Agropyron spicatum	Bluebunch wheatgrass
Astragalus canadensis	Canadian milk vetch
Boloria freija	Freija fritillary
Boloria frigga	Frigga fritillary
Braya humilis	Low northern rock cress
Calamagrostis stricta	Narrow-leaved reedgrass
Carex davisii	Davis's sedge
Carex inops ssp. heliophila	Sun sedge
Carex scirpoidea	Bulrush sedge
Carex squarrosa	Sedge
Dermatocarpon reticulatum	Lichen
Empetrum nigrum	Black crowberry
Equisetum telmateia	Giant horsetail
Erigeron acris	Fleabane
Falco peregrinus	Peregrine falcon
Great Blue Heron Rookery	Great Blue Heron Rookery
Lactuca pulchella	Blue lettuce
Lonicera involucrata	Black twinberry
Muhlenbergia cuspidata	Plains muhly
Osmorhiza depauperata	Sweet Cicely
Parnassia palustris	Marsh grass-of-parnassus
Phleum alpinum	Mountain timothy
Poa paludigena	Bog bluegrass
Ribes oxyacanthoides	Northern gooseberry
Salix pellita	Satiny willow
Sander canadensis	Sauger
Somatochlora incurvata	Incurvate emerald
Terrapene carolina carolina	Eastern box turtle
Viola epipsila	Northern marsh violet
Woodsia alpina	Northern woodsia
Woodsia obtusa	Blunt-lobed woodsia
Unranked Records	
Scientific Name	**Common Name**
Emergent Marsh	
Lobaria scrobiculata	Lichen
Physcia phaea	Lichen
Placynthium aspratile	Lichen
Proserpinus flavofasciata	Yellow-banded day-sphinx

17. Dead-Kelsey

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	A
NEARSHORE	C	COASTAL WETLANDS	B
EMBAYMENTS & INSHORE	C	COASTAL TERRESTRIAL	A
TRIBUTARIES & WATERSHEDS	C	**OVERALL B**	

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

The Huron Mountains are a dominant feature in the Dead-Kelsey watersheds. Photo credit: NOAA.

Summary/ Description

The Dead-Kelsey region (HUC 04020105) extends from west of Baraga in the west to just beyond Marquette in the east. A small portion of the eastern Keweenaw Peninsula is included in this region, up to the Portage River Entry (the Keweenaw Waterway Lower Entrance). This regional unit is 3,151 km^2 in size, including the associated nearshore waters. A portion of the Keweenaw Bay Indian Community is located in this regional unit, while the rest of the community is in the Keweenaw Peninsula and Sturgeon regional unit. The Dead-Kelsey regional unit is part of the territory ceded in the Treaties of 1836 and 1842. The signatory tribes retain rights to hunt, fish, and gather within the regional unit (A. McCammon Soltis, pers. comm., January 5 2015). This regional unit is part of Subregion 0402 – Southern Lake Superior – Lake Superior. The Huron Mountains are located within this region. Mount Arvon, the highest natural point in Michigan is part of the Huron Mountains. The Dead-Kelsey regional unit contains one tertiary (HUC 8) watershed, Dead-Kelsey, and 6 quaternary (HUC 10) watersheds. The watersheds in this unit are dominated by forests. Coastal habitats include rocky shore, sand beaches and coastal wetlands. This region contains some of the most extensive coastal wetlands in Lake Superior.

TABLE 17.1: Dead-Kelsey BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	45.62	1.29	1,441.07	
Developed	12.89	0.36	389.55	
Forest	2,082.44	58.90	107,747.13	
Associated Nearshore Waters	1,126.54	31.86	17,868.03	
Other	207.10	5.86	8,227.57	
Water (inland)	61.24	1.73	9,473.05	
Total Area	**3,535.82**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	247.51	NA	4.25	Based on SOLEC shoreline
Sand Beaches (km)	19.10	7.72	2.97*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	105.46	26.54*	9.56**	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone	332.86	83.76*	5.39**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	47	NA	1.8	
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	17.23	NA		
Road Density (km/km^2)	0.46	NA		
Number of Dams and Barriers	1,262	NA	5.3	
Artificial Shoreline (km)	15.77	6.37	6.92	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	2,020.48	83.87	2,409.10	Regional area based on landmass
Public/Crown	140.70	5.84	2,409.10	
Tribes/ First Nations	236.04	9.80	2,409.10	
Parks & Protected Areas (total)	11.88	0.49	2,409.10	
Parks & Protected Areas (coast)	0.92	0.23*	397.39**	*% of Regional Coastal Area **Regional Coastal Area (km^2)

Important Biodiversity Features

Nearshore and Inshore Waters

- The Dead-Kelsey regional unit contains a number of sites of Important Habitat for Lake Trout and Lake Whitefish. The Important Habitat Sites for both species are found in Keweenaw Bay (L'Anse Bay, Pequaming Bay, Sand Bay) as well as on the eastern side of Point Abbaye and along the shoreline to Marquette (Lake Superior Binational Program Habitat Committee 2006) (Figure 17.1).
- Keweenaw Bay and Huron Bay are noted as Lake Superior embayments which are important for Lake Sturgeon (Auer 2003). In the Dead-Kelsey regional unit these embayments and the nearshore zone, which provides corridors for movement, are identified as critical management areas for Lake Sturgeon in the Lake Superior basin (Auer 2003).

Coastal Zone and Islands

- This region contains Important Habitat Areas and Important Habitat Sites (Lake Superior Binational Program Habitat Committee 2006) (Table 17.3, Figure 17.3).
- This region contains some of the most extensive coastal wetlands in Lake Superior.

Tributaries and Watersheds

Figure 17.1: Dead-Kelsey - Coastal and Watershed Features

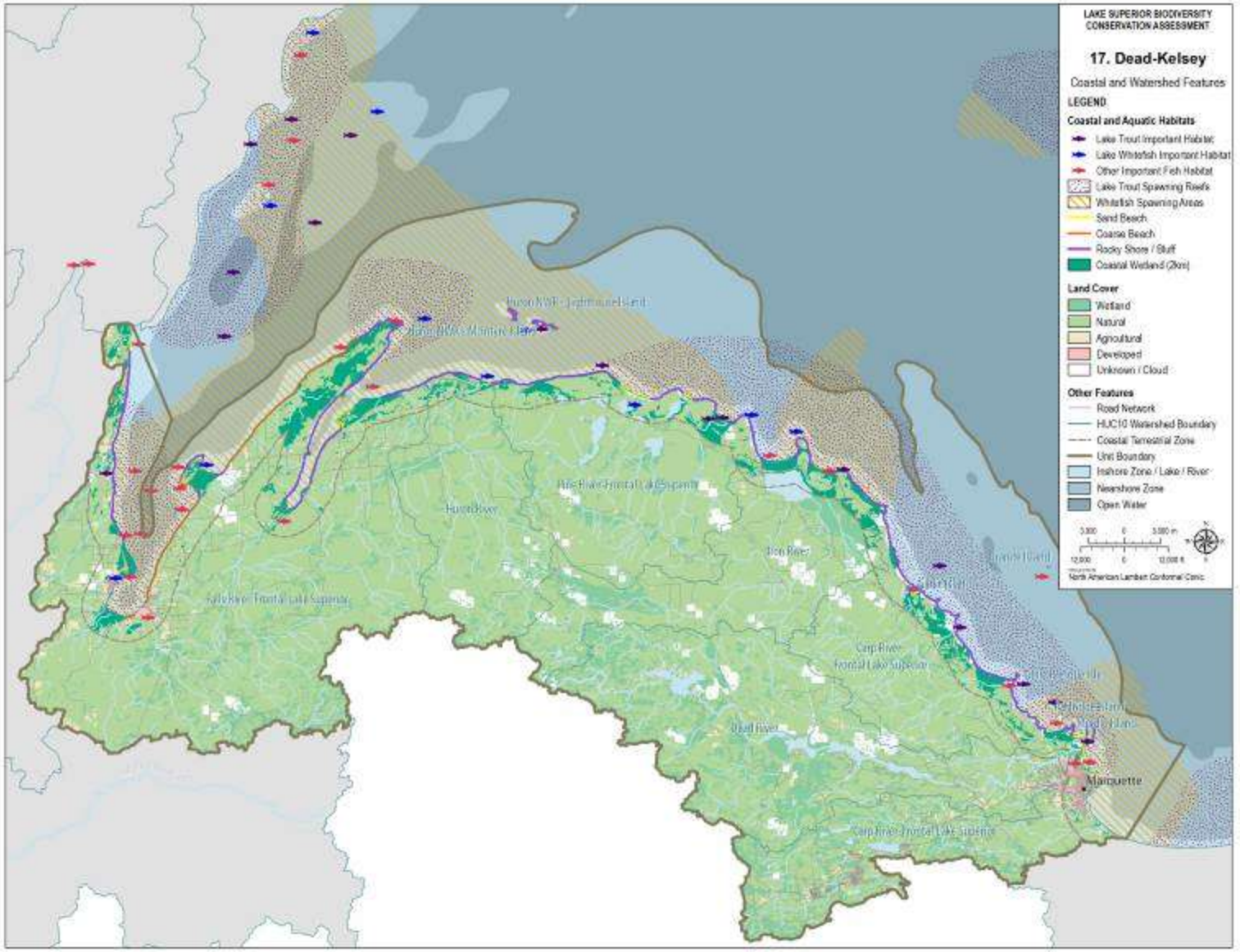


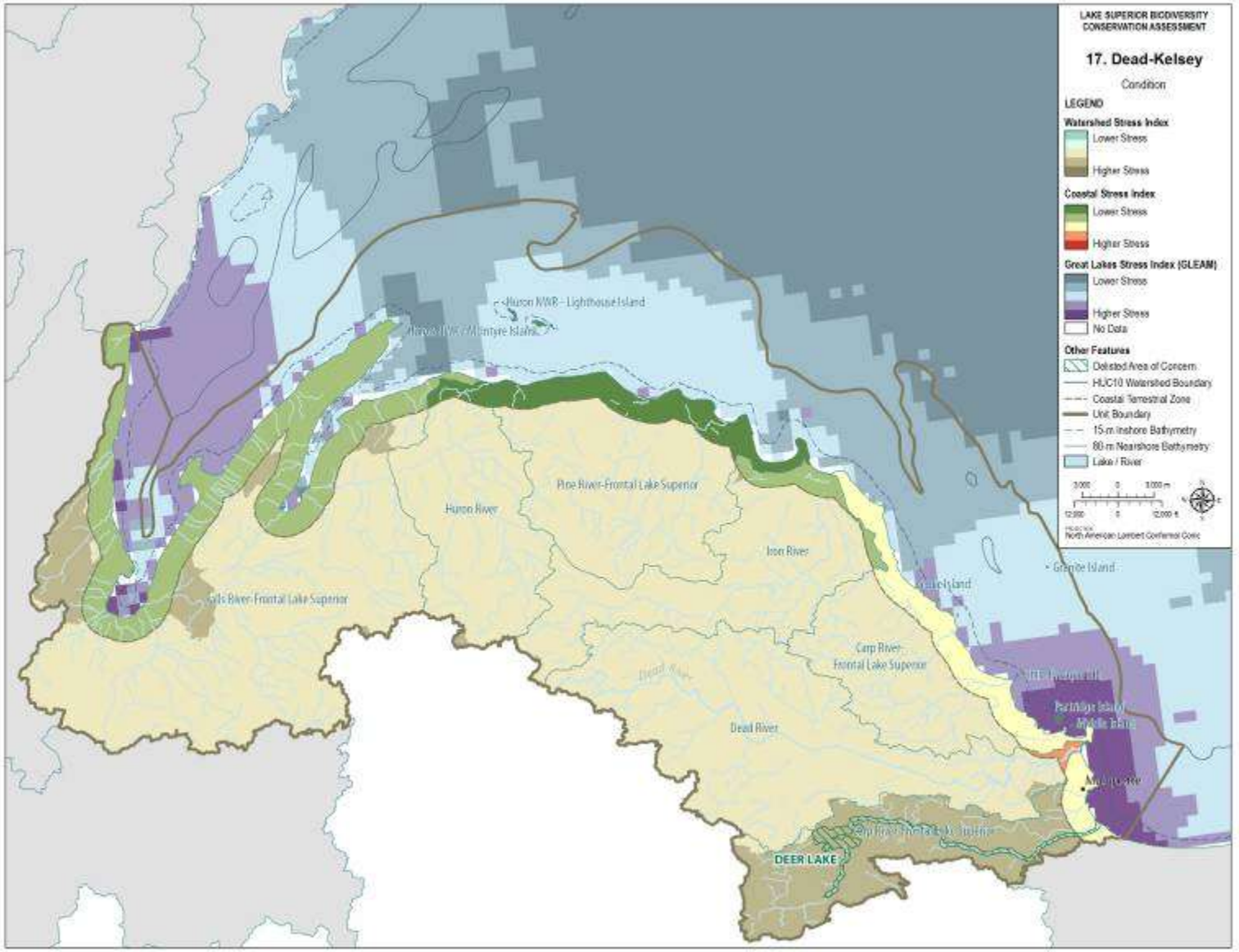
TABLE 17.2: Dead-Kelsey CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	
Nearshore[1]	C (0.52)	
Embayments and Inshore[1,2]	C (0.47)	
Coastal Wetlands[2,3]	B (0.632)	
Islands[4]	A	
Coastal Terrestrial[3]	A (0.955)	
Tributaries and Watersheds[2]	C (0.42)	

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

Figure 17.2: Dead-Kelsey - Condition



Important Issues & Threats

- The ports of Two Harbors, Minnesota, Superior, Wisconsin-Duluth, Minnesota and Presque Isle-Marquette, Michigan have been identified as sites at high risk for invasion by aquatic invasive species, due to ballast water from laker traffic (Rup et al. 2010 as cited in International Joint Commission (IJC) Work Group on Aquatic Invasive Species Rapid Response 2011).
- Mining activities have impacted Lake Superior sediments in the Keweenaw Region; in the Keweenaw Peninsula area, the sediments contain copper enrichments (Kerfoot et al. 2009). Three large copper mills operated in the Keweenaw Bay area; two were located at Gay, Michigan, and one was north of Baraga, near Assinins, Michigan (Kerfoot et al. 2012). The Mass Mill discharged 2.7 teragrams (Tg) of stamp sands, equal to approximately 11% of the total stamp sands discharged into the Keweenaw Bay area (Kerfoot et al. 2012). Investigations have revealed a metal-rich area around the Keweenaw Peninsula, and in the Gay area the copper tailings have drifted from their original sources (Kerfoot et al. 2012). Stamps sands in the Dead-Kelsey region are only found in western lower Keweenaw Bay, north of Baraga (W. Taft, pers. comm., February 25, 2013), which is consistent with the location of the Mass Mill operation.
- The Eagle Mine, a nickel and copper mining operation, is located near the headwaters of the Salmon-Trout River.
- The former Deer Lake Area of Concern (AOC) is located in the Dead-Kelsey regional unit, in Michigan's Marquette County. Two known industrial sources of mercury and untreated wastewater contributed to negative environmental impacts in the AOC. The three beneficial use impairments identified in this AOC were Restrictions on Fish and Wildlife Consumption, Bird or Animal Deformities or Reproductive Problems, and Eutrophication or Undesirable Algae. In October 2014, this AOC was removed from the list of AOCs, the third such delisting on the U.S. side (See Existing Programs and Projects section) (U.S. EPA 2013s, Michigan DEQ 2014, Michigan DEQ 2013e).
- Forest fragmentation through real estate development is an emerging concern in the Upper Peninsula Lake Superior watersheds. Large tracts of forest lands owned by corporate land holders are being sold to companies which run real estate investment trusts; smaller parcels are then developed (W. Taft, pers. comm., February 25, 2013).

Conservation In Action

Parks & Protected Areas

- Ottawa National Forest
- Baraga Plains State Waterfowl Management Area
- Baraga State Park
- Little Presque Isle Natural Area
- Rocking Chair Lakes Natural Area
- State Forest – Baraga & Gwinn Management Units
- Sugarloaf Mountain Natural Area
- Huron Mountain Club (Private)
- McCormick Wilderness Area

Existing Programs & Projects

- Under the Michigan Water Quality Standards (WQS), portions of the Yellow Dog River (Marquette County) are designated as Outstanding State Resource Waters (OSRW). Surface waters of the Lake Superior basin that are not identified as OSRWs are designated as Lake Superior basin - Outstanding

International Resource Waters (LSB-OIRW). Under the above designations, additional anti-degradation controls are applied for new or increased pollutant loadings (Michigan DEQ 2013a).

- A four mile segment of the Yellow Dog River from its source at the Bulldog Lake Dam to the Ottawa National Forest boundary is designated as Wild through the National Wild and Scenic Rivers System (Interagency Wild & Scenic Rivers Council 2012, USDA Forest Service 2007a). This four mile section is entirely within the McCormick Wilderness, and the management plan states that it will be managed consistent with the wilderness values (USDA Forest Service 2007a).
- The State of Michigan has identified exceptional areas of fish and wildlife habitat along its coastline, connecting waterways, and rivermouths. Designated as Environmental Areas (EAs), certain uses within these areas require state review and approval (Michigan DEQ 2013b). Five of these EAs are located in Baraga and Marquette counties, in the Dead-Kelsey regional unit. The three Baraga County EAs are located in Arvon and L'Anse Townships, and the two Marquette County EAs are located in Powell Township (Michigan DEQ 2013c, 2013d).
- A number of State Important Bird Areas (IBAs) are located in the Dead-Kelsey regional unit. These IBAs are Yellow Dog Plains IBA, Peshekee Highlands LTA IBA and Baraga Plains IBA (National Audubon Society 2013, 2012).
- A significant amount of work was completed in the Deer Lake AOC to achieve delisting. Fish mercury levels have declined and there are no longer regular algal blooms on Deer Lake (S. Swart, pers. comm., October 31 2014). The final action in the AOC was a Great Lakes Restoration Initiative project with the City of Ishpeming to divert Partridge Creek from old mine workings below the city and back into the storm water system (City of Ishpeming 2011). Continued monitoring of the site will be undertaken by Cliffs Natural Resources, the Michigan Department of Environmental Quality, the Michigan Department of Natural Resources, and the Deer Lake Public Advisory Council.
- In this region, several individual watersheds have state-approved watershed management plans, including the Lower Dead River, Partridge Creek, Salmon Trout River, and the Whetstone Brook and Orianna Creek watershed. These plans serve as guides for communities to protect and improve water quality (M. Preisser, pers. comm., May 31 2013).
- Two Cooperative Weed Management Areas (CWMA), the Keweenaw Invasive Species Management Area and the Central Upper Peninsula CWMA, cover the counties of this region, including the Ottawa and Hiawatha National Forests. These groups facilitate cooperation and education among federal, state, tribal, local groups and landowners in prevention and management of invasive species (M. Preisser, pers. comm., May 31 2013).
- The private Huron Mountain Club owns 13,000 acres of lands in the Huron Mountains. Approximately 10,000 acres of these lands are old-growth forest, and several lakes are also located in the land holdings. The club has a limited membership of 50 partners, and in 1938 Aldo Leopold created a preservation plan for the area (Wikipedia contributors No Date).
- The Huron Mountain Wildlife Foundation research center is located in the Huron Mountains and supports the scientific study of the Lake Superior region ecosystems. Established in 1955, sponsorship by this group has produced over 200 publications, including theses and peer-reviewed publications. Approved researchers are able to access the private Huron Mountain Club reserve (Huron Mountain Wildlife Foundation No date).

TABLE 17.3: Dead-Kelsey IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
MI-027	Site	Mulligan Creek	Rare plant habitat
MI-035	Site	Presque Isle	Bedrock beach, dry-mesic northern forest, rare plant habitat, geographical features
MI-036	Site	McCormick	Mesic northern forest, rare plant habitat
MI-037	Area	Lake Independence	Great Lakes marsh, geologic features, rare animal habitat, high biodiversity
MI-038	Area	Huron Mountain	Rare plant and animal habitat, mesic northern forest, dry-mesic northern forest, bedrock glade
MI-039	Site	Pequaming Marsh	Great Lakes marsh, rare animal habitat, geologic feature
MI-049	Site	Huron National Wildlife Refuge	The refuge was established for the protection of migratory birds, specifically, a large nesting colony of herring gulls.

Figure 17.3: Dead-Kelsey - Important Habitat Sites and Areas

TABLE 17.4: Dead-Kelsey LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 83 species and communities of conservation concern have been documented in the regional unit. 60 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 23 species and communities were once known to occur here, but have current conservation ranks of H (Historical).[21]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
Armoracia lacustris	Lake cress
Boreal Forest	
Botrychium mormo	Goblin moonwort
Botrychium pallidum	pale moonwort
Caltha natans	Floating marsh marigold
Clematis occidentalis	Purple clematis
Collinsia parviflora	Small blue-eyed Mary
Coregonus artedi	Lake herring or Cisco
Coregonus kiyi	Kiyi
Coregonus zenithicus	Shortjaw cisco
Cottus ricei	Spoonhead sculpin
Crataegus douglasii	Douglas's hawthorn
Cypripedium arietinum	Ram's head lady's-slipper
Cystopteris laurentiana	Laurentian fragile fern
Dendroica kirtlandii	Kirtland's warbler
Draba arabisans	Rock whitlow grass
Dry Northern Forest	Dry Woodland, Upper Midwest Type
Dry-mesic Northern Forest	
Dryopteris filix-mas	Male fern
Dryopteris fragrans	Fragrant cliff woodfern
Elymus glaucus	Blue wild-rye
Falcipennis canadensis	Spruce grouse
Falco peregrinus	Peregrine falcon
Gavia immer	Common loon
Gentiana linearis	Narrow-leaved gentian
Glyptemys insculpta	Wood turtle
Granite Bedrock Glade	
Granite Bedrock Lakeshore	
Granite Cliff	
Granite Lakeshore Cliff	
Great Blue Heron Rookery	Great Blue Heron Rookery
Great Lakes Marsh	
Haliaeetus leucocephalus	Bald eagle
Hardwood-Conifer Swamp	
Interdunal Wetland	Alkaline Shoredunes Pond/marsh, Great Lakes Type
Leymus mollis	American dune wild-rye

[21] Data included here were provided by the Michigan Natural Features Inventory of Michigan State University, and were current as of August 1 2014. These data are not based on an exhaustive inventory of the state. The lack of data for any geographic area shall not be construed to mean that no significant features are present.

Mesic Northern Forest	
Moehringia macrophylla	Big-leaf sandwort
Myriophyllum alterniflorum	Alternate-leaved water-milfoil
Myriophyllum farwellii	Farwell's water milfoil
Northern Shrub Thicket	Wet Scrubland, Upper Midwest Type
Northern Wet Meadow	Wet Meadow, Upper Midwest Type
Nuphar pumila	Small yellow pond lily
Opuntia fragilis	Fragile prickly pear
Pinguicula vulgaris	Butterwort
Poor Conifer Swamp	
Pterospora andromedea	Pine-drops
Ribes oxyacanthoides	Northern gooseberry
Rich Conifer Swamp	
Sand and Gravel Beach	
Sandstone Bedrock Lakeshore	
Sandstone Cobble Shore	
Sandstone Lakeshore Cliff	
Scirpus clintonii	Clinton's bulrush
Submergent Marsh	
Tanacetum huronense	Lake Huron tansy
Trisetum spicatum	Downy oat-grass
Vaccinium cespitosum	Dwarf bilberry
Wooded Dune and Swale Complex	
Woodsia alpina	Northern woodsia
Historical Records	
Scientific Name	**Common Name**
Adlumia fungosa	Climbing fumitory
Amerorchis rotundifolia	Small round-leaved orchis
Calamagrostis lacustris	Northern reedgrass
Calypso bulbosa	Calypso or fairy-slipper
Carex atratiformis	Sedge
Cerastium brachypodum	Shortstalk chickweed
Cincinnatia cincinnatiensis	Campeloma spire snail
Coregonus hubbsi	Ives lake cisco
Dermatocarpon moulinsii	Lichen
Drosera anglica	English sundew
Erebia discoidalis	Red-disked alpine
Galearis spectabilis	Showy orchis
Gymnocarpium jessoense	Northern oak fern
Gymnocarpium robertianum	Limestone oak fern
Juncus stygius	Moor rush
Oryzopsis canadensis	Canada rice grass
Pandion haliaetus	Osprey
Planorbella multivolvis	Acorn ramshorn
Rallus elegans	King rail
Salix pellita	Satiny willow
Sphaerium fabale	River fingernail clam
Umbilicaria torrefacta	Lichen
Woodsia obtusa	Blunt-lobed woodsia

18. Betsy-Chocolay

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	A
NEARSHORE	C	COASTAL WETLANDS	B
EMBAYMENTS & INSHORE	C	COASTAL TERRESTRIAL	A-
TRIBUTARIES & WATERSHEDS	C	**OVERALL B**	

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

The Grand Sable Dunes are part of the longest sand beach on Lake Superior. Photo credit: National Park Service photo by Gregg Bruff.

Summary/ Description

The Betsy-Chocolay region (HUC 04020201) extends from near Marquette in the west to Emerson in the east, south of Whitefish Point. The regional unit is 5,031.48 km^2 in size, including the associated nearshore waters. It is part of Subregion 0402 – Southern Lake Superior-Lake Superior.

The Betsy-Chocolay regional unit contains one tertiary (HUC 8) watershed, Betsy-Chocolay, and 4 quaternary (HUC 10) watersheds. The watersheds are within a forest dominated landscape. The 300 km coast includes over 20% of all the sand beaches found in Lake Superior. Other coastal habitats include rocky shores, sandstone cliffs and coastal wetlands. Extensive coastal wetlands occur at Whitefish Point. The Betsy-Chocolay regional unit is part of the territory ceded in the Treaties of 1836 and 1842. The signatory tribes retain rights to hunt, fish, and gather within the regional unit (A. McCammon Soltis, pers. comm., January 5 2015).

TABLE 18.1: Besty-Chocolay BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	24.43	0.43	1,441.07	
Developed	4.26	0.08	389.55	
Forest	2,665.98	47.20	107,747.13	
Associated Nearshore Waters	2,567.54	45.45	17,868.03	
Other	321.56	5.69	8,227.57	
Water (inland)	64.78	1.15	9,473.05	
Total Area	**5,648.55**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	305.85	NA	5.25	Based on SOLEC shoreline
Sand Beaches (km)	139.24	45.53	21.64*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	230.91	40.79*	20.93**	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone	528.04	93.27*	8.55**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	4	NA	0.2	
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	4.32	NA		
Road Density (km/km^2)	0.30	NA		
Number of Dams and Barriers	846	NA	3.6	
Artificial Shoreline (km)	11.44	3.74	5.02	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	1,403.68	45.57	3,080.07	Regional area based on landmass
Public/Crown	1,308.92	42.50	3,080.07	
Tribes/ First Nations	0.29	0.01	3,080.07	
Parks & Protected Areas (total)	367.19	11.92	3,080.07	
Parks & Protected Areas (coast)	125.94	22.25*	566.11**	*% of Regional Coastal Area **Regional Coastal Area (km^2)

Important Biodiversity Features

Nearshore and Inshore Waters

- The Betsy-Chocolay regional unit contains numerous sites of Important Habitat for Lake Trout and Lake Whitefish. The Important Habitat Sites for both species are found in at various points along the shore, and with a slight concentration of Important Habitat sites for both species in the area of Grand Island, Au Train Bay, and South Bay, near Munising Michigan, and Pictured Rocks National Lakeshore (Lake Superior Binational Program Habitat Committee 2006) (Figure 18.1).
- Munising Bay is noted as a Lake Superior embayment important for Lake Sturgeon (Auer 2003). In the Betsy-Chocolay regional unit this embayment and the nearshore zone, which provides corridors for movement, are identified as critical management areas for Lake Sturgeon in the Lake Superior basin (Auer 2003).

Coastal Zone and Islands

- This region includes some of the most extensive sand beaches on Lake Superior, including the Grand Sable Dunes.

Tributaries and Watersheds

- The Two Hearted watershed covers approximately 269,154 acres (108,922 hectares) (Chippewa/ East Mackinac Conservation District 2008).
- The Betsy-Chocolay regional unit contains many Important Habitat Areas and Important Habitat Sites (Lake Superior Binational Program Habitat Committee 2006) (Table 18.3, Figure 18.3).

Figure 18.1: Betsy-Chocolay - Coastal and Watershed Features

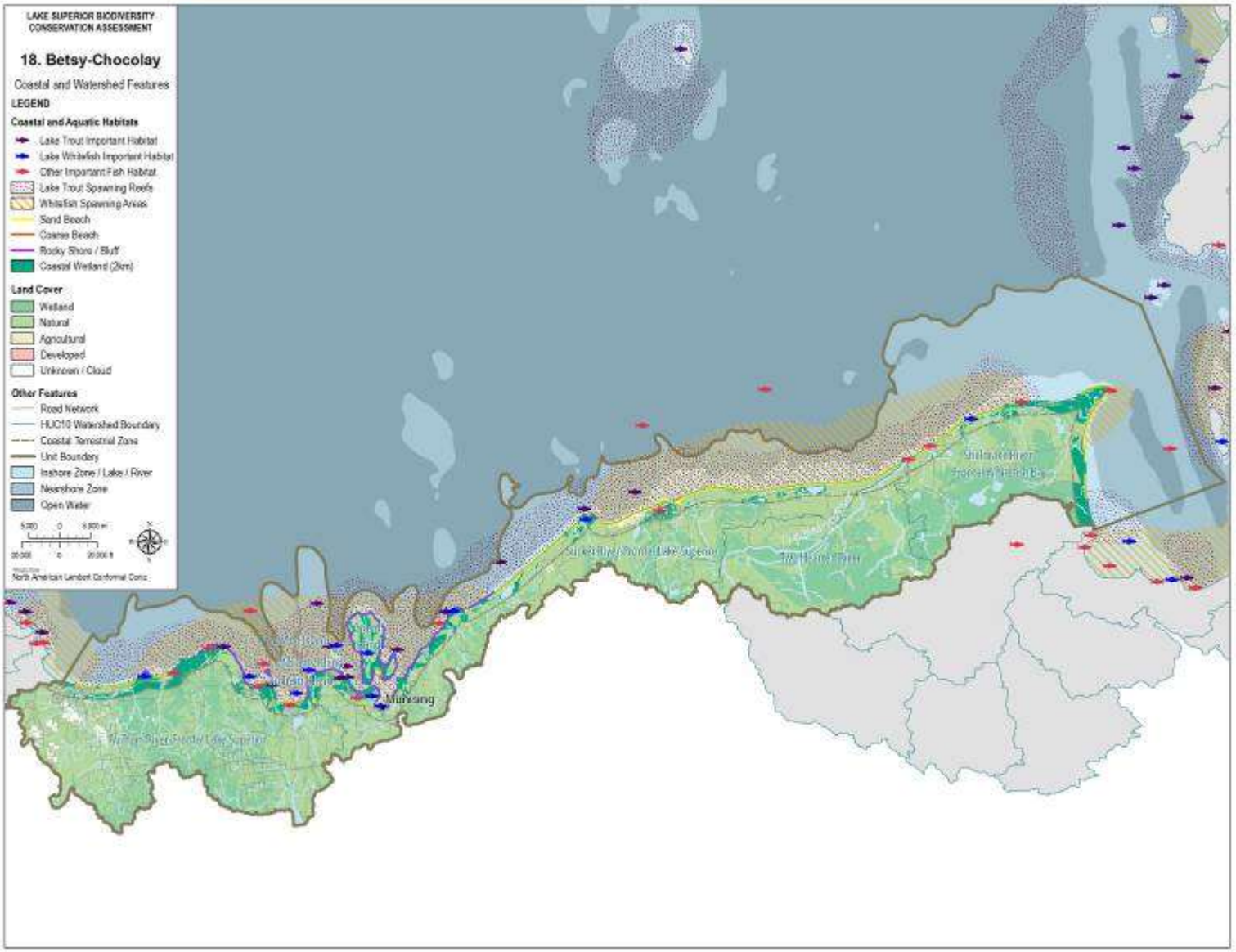


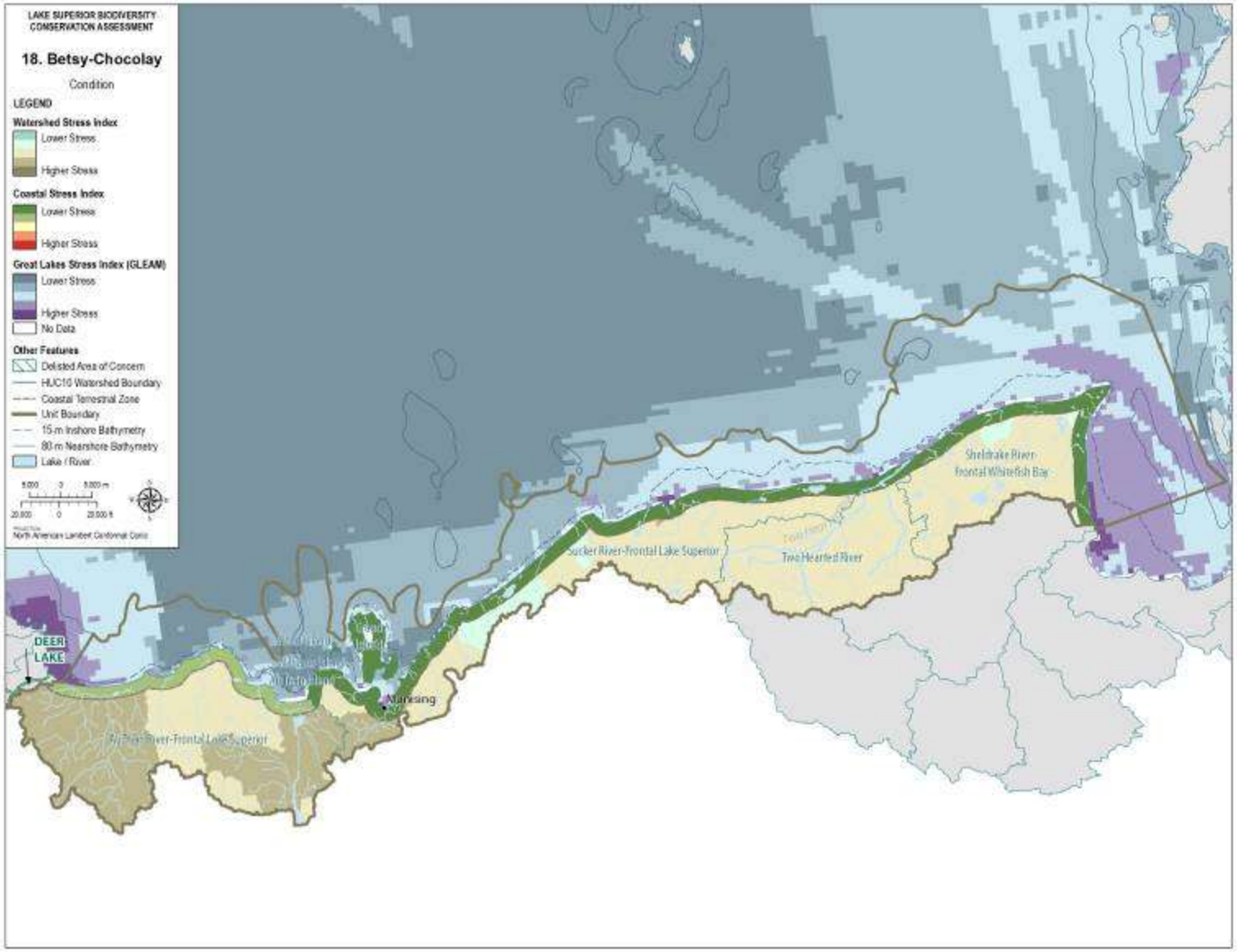
TABLE 18.2: Betsy-Chocolay CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	
Nearshore[1]	C (0.56)	
Embayments and Inshore[1,2]	C (0.54)	
Coastal Wetlands[2,3]	B (0.673)	
Islands[4]	A	
Coastal Terrestrial[3]	A- (0.938)	
Tributaries and Watersheds[2]	C (0.52)	

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

Figure 18.2: Betsy-Chocolay - Condition



Important Issues & Threats

- The Duck Lake Fire of 2012 burned approximately 21,069 acres in the Betsy-Chocolay regional unit, in Luce County (Michigan DNR 2012).
- The presence of Emerald Ash Borer (EAB) has been detected in counties in the Betsy-Chocolay regional unit. The area is now under a number of quarantine measures, including Federal EAB quarantine and Michigan state quarantine (Cooperative Emerald Ash Borer Project 2013).
- An outbreak of Beech Bark Disease has occurred in the Betsy/ Chocolay regional unit (W. Taft, pers. comm., February 25, 2013). Beech scale and beech bark disease were first discovered in Michigan in 2000; affected beech trees were first found in the northwestern Lower Peninsula and the eastern Upper Peninsula (McCullough, Heyd and O'Brien 2002).
- An Emergency Prevention and Response Plan for Viral Hemorrhagic Septicemia has been developed for Isle Royale National Park, Pictured Rocks National Lakeshore, Apostle Islands National Lakeshore and the Grand Portage Band of the Lake Superior Chippewa Reservation (within which is the Grand Portage National Monument) (NPS 2013a).
- Forest fragmentation through real estate development is an emerging concern in the Upper Peninsula Lake Superior watersheds. Large tracts of forest lands owned by corporate land holders are being sold to companies which run real estate investment trusts; smaller parcels are then developed (W. Taft, pers. comm., February 25, 2013).

Conservation In Action

Parks & Protected Areas

- Pictured Rocks National Lakeshore
- Au Train Basin State Waterfowl (Wildlife) Management Area
- Cusino State Wildlife Research Area
- Deer Park Natural Area
- Hiawatha National Forest
- Laughing Whitefish Falls Natural Area
- McMahon Lake Strangmoor Natural Area
- Muskallonge Lake State Park
- State Forest – Gwinn, Newberry & Shingleton Management Units
- Tahquamenon Falls State Park
- Wagner Falls State Park

Existing Programs & Projects

- The Two Hearted River is a Michigan Natural River System, a designation given to the finest river systems in the state (Michigan DNR 2013a). It is the only one of Michigan's 16 Natural River Systems that flows to Lake Superior.
- Under the Michigan Water Quality Standards (WQS), portions of the Two-Hearted River and Dawson Creek (Luce County) and all waterbodies within the designated boundary of Pictured Rocks National Lakeshore are designated as Outstanding State Resource Waters (OSRW). Also under the Michigan WQS, all surface waters of the Lake Superior basin that are not identified as OSRWs are designated as Lake Superior basin - Outstanding International Resource Waters (LSB-OIRW). Under the above designations, additional anti-degradation controls are applied for new or increased pollutant loadings (Michigan DEQ 2013a).

- The State of Michigan has identified exceptional areas of fish and wildlife habitat along its coastline, connecting waterways, and rivermouths. Designated as Environmental Areas (EAs), certain uses within these areas require state review and approval (Michigan DEQ 2013b). Two of these EAs are located in Grand Island Township in Alger County, in the Betsy-Chocolay regional unit (Michigan DEQ 2013c, 2013d).
- A number of State Important Bird Areas (IBAs) are located in the Betsy-Chocolay regional unit. These IBAs are Sleeper Lake burn IBA, Grand Marais to Whitefish Point beaches (Piping Plover) IBA and Tahquamenon Falls State Park and Munising Moraine IV LTA IBA (National Audubon Society 2013, 2012).
- The Whitefish Point Bird Observatory is located in the Betsy/ Chocolay regional unit. Whitefish Point is a concentration area for migrating birds, and the Whitefish Point Bird Observatory has been monitoring and documenting annual spring and fall migrations for over 30 years (Whitefish Point Bird Observatory No date).
- In this region, several individual watersheds have state-approved watershed management plans, including the Chocolay River, Two Hearted River, and the Munising Bay watershed. These plans serve as guides for communities to protect and improve water quality (M. Preisser, pers. comm., May 31 2013).
- The Michigan Department of Natural Resources maintains a fish hatchery along Cherry Creek, just south of Harvey, Michigan on the far west end of this region. It is the primary broodstock and rearing facility for brook and Lake Trout that are used in both inland and Great Lakes waters. The facility also rears splake (a Brook Trout - Lake Trout hybrid) for both Great Lakes and inland waters (M. Preisser, pers. comm., May 31 2013).
- Two Cooperative Weed Management Areas (CWMA), the Central Upper Peninsula CWMA and the Eastern Upper Peninsula CWMA, cover the counties of this region, including the Hiawatha National Forest. These groups facilitate cooperation and education among federal, state, tribal, local groups and landowners in prevention and management of invasive species (M. Preisser, pers. comm., May 31 2013).

TABLE 18.3: Betsy-Chocolay IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
MI-001	Site	Laughing Whitefish Falls/ Whitefish National Wildlife Reserve	Mesic Northern Forest, rare plant habitat
MI-001	Area	Laughing Whitefish Falls/ Whitefish National Wildlife Reserve	Mesic Northern Forest, rare plant habitat
MI-002	Area	Rock River Canyon Wilderness Area	Moist non-acid cliff, mesic northern forest, geographical features, rare plant and animal habitats
MI-004	Site	Whitefish Point	Rare plant and animal habitat
MI-017	Site	Barclay Lake	Bog, dry northern forest, rare plant habitat
MI-018	Site	Barfield Lakes	Bog, dry northern forest, rich conifer swamp, mesic northern forest
MI-019	Site	Beavertown Lakes	Dry northern forest, hardwood-conifer swamp, rich conifer swamp, muskeg, dry-mesic northern forest
MI-020	Site	Blind Sucker River	Rare plant and animal habitat
MI-021	Site	Crisp Point	Rare plant and animal habitat
MI-022	Site	Deer Park	Rare plant and animal habitat
MI-023	Site	Little Lake	Rare plant and animal habitat
MI-024	Site	McMahon Lake	Patterned fen, rare plant habitat
MI-025	Site	Swamp Lakes	Intermittent wetland, dry-mesic northern forest, rare plant habitat
MI-026	Site	Dukes RNA	Rich conifer swamp, mesic northern forest
MI-029	Area	Vermilion	Lake Superior beach community, rare plant and animal habitat
MI-030	Area	Two-Hearted River	Representative landscape complex, old growth red/white pine forest, old growth cedar forest, hemlock and white pine forest, rare plant habitat, migrant bird habitat, relatively undisturbed wetland communities, coastal plain marsh, patterned fen, muskeg,
MI-031	Site	Grand Marais	Rare plant and animal habitats
MI-032	Area	Grand Sable Dunes	Perched dunes, open dunes, geologic feature, rare plant habitat
MI-033	Area	Grand Island	Great Lakes marsh, mesic northern forest, rare plant and animal habitat
MI-034	Area	Au Train	Large Great Lakes marsh, fresh water estuary, high biodiversity
MI-046	Area	Pictured Rocks	Rare plant habitat, geomorphic features
MI-047	Area	Tahquamenon Falls State Park	Representative natural plant communities

Figure 18.3: Betsy-Chocolay - Important Habitat Sites and Areas

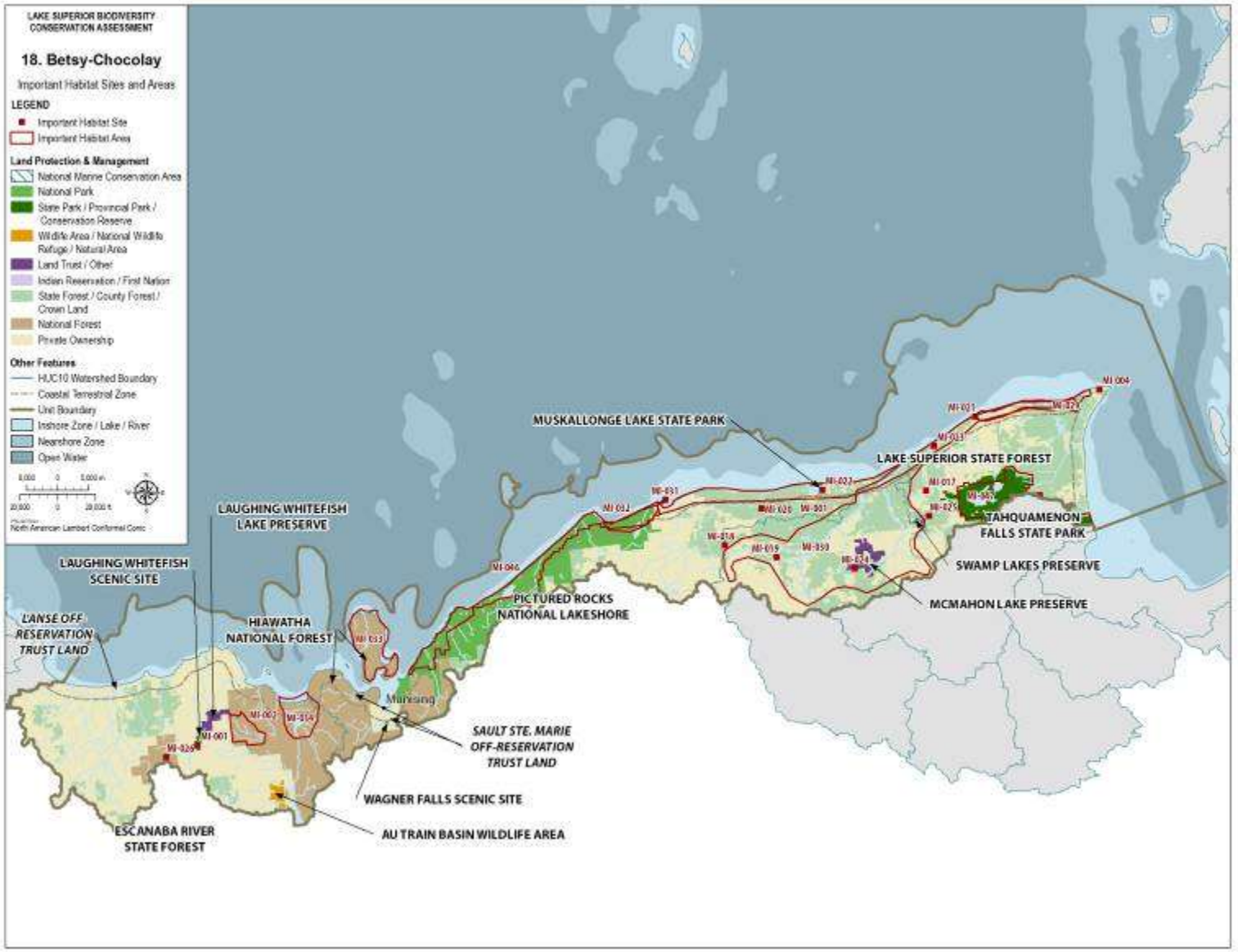


TABLE 18.4: Betsy-Chocolay LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 99 species and communities of conservation concern have been documented in the regional unit. 80 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 18 species and communities were once known to occur here, but have current conservation ranks of F (Failed to find), H (Historical), or X (Extirpated). One additional species or community of conservation concern is known to occur in this regional unit, but is currently not ranked for viability.[22]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
Accipiter gentilis	Northern goshawk
Armoracia lacustris	Lake cress
Bartonia paniculata	Panicled screwstem
Bog	
Boreal Forest	
Botaurus lentiginosus	American bittern
Botrychium acuminatum	Moonwort
Botrychium campestre	Prairie Moonwort or Dunewort
Botrychium hesperium	Western moonwort
Botrychium mormo	Goblin moonwort
Botrychium spathulatum	Spatulate moonwort
Buteo lineatus	Red-shouldered hawk
Callitriche hermaphroditica	Autumnal water-starwort
Calypso bulbosa	Calypso or fairy-slipper
Carex wiegandii	Wiegand's sedge
Charadrius melodus	Piping plover
Cirsium pitcheri	Pitcher's thistle
Coregonus artedi	Lake herring or Cisco
Coregonus kiyi	Kiyi
Coregonus zenithicus	Shortjaw cisco
Cottus ricei	Spoonhead sculpin
Crataegus douglasii	Douglas's hawthorn
Cypripedium arietinum	Ram's head lady's-slipper
Dendroica kirtlandii	Kirtland's warbler
Drosera anglica	English sundew
Dry Northern Forest	Dry Woodland, Upper Midwest Type
Dry-mesic Northern Forest	
Elymus glaucus	Blue wild-rye
Emergent Marsh	
Empetrum nigrum	Black crowberry
Emydoidea blandingii	Blanding's turtle
Falcipennis canadensis	Spruce grouse
Falco columbarius	Merlin
Falco peregrinus	Peregrine falcon

[22] Data included here were provided by the Michigan Natural Features Inventory of Michigan State University, and were current as of August 1 2014. These data are not based on an exhaustive inventory of the state. The lack of data for any geographic area shall not be construed to mean that no significant features are present.

Gavia immer	Common loon
Glyptemys insculpta	Wood turtle
Gnaphalium sylvaticum	Woodland everlasting
Great Lakes Marsh	
Haliaeetus leucocephalus	Bald eagle
Hardwood-Conifer Swamp	
Huperzia selago	Fir clubmoss
Interdunal Wetland	Alkaline Shoredunes Pond/marsh, Great Lakes Type
Intermittent Wetland	Infertile Pond/marsh, Great Lakes Type
Juncus stygius	Moor rush
Leymus mollis	American dune wild-rye
Limestone Cliff	
Listera auriculata	Auricled twayblade
Littorella uniflora	American shore-grass
Luzula parviflora	Small-flowered wood rush
Lycopodiella subappressa	Northern appressed clubmoss
Mesic Northern Forest	
Muskeg	Scrub Bog, Upper Midwest Type
Myriophyllum alterniflorum	Alternate-leaved water-milfoil
Northern Shrub Thicket	Wet Scrubland, Upper Midwest Type
Northern Wet Meadow	Wet Meadow, Upper Midwest Type
Nuphar pumila	Small yellow pond lily
Open Dunes	Beach/shoredunes, Great Lakes Type
Patterned Fen	Rich Shrub/herb Fen, Upper Midwest Type
Pinguicula vulgaris	Butterwort
Poor Conifer Swamp	
Poor Fen	Poor Shrub/herb Fen, Upper Midwest Type
Potamogeton confervoides	Alga pondweed
Rich Conifer Swamp	
Rubus acaulis	Dwarf raspberry
Salix pellita	Satiny willow
Sand and Gravel Beach	
Sandstone Bedrock Lakeshore	
Sandstone Cliff	
Sandstone Lakeshore Cliff	
Senecio indecorus	Northern ragwort
Somatochlora incurvata	Incurvate emerald
Stellaria crassifolia	Fleshy stitchwort
Stellaria longipes	Stitchwort
Tanacetum huronense	Lake Huron tansy
Trimerotropis huroniana	Lake Huron locust
Trisetum spicatum	Downy oat-grass
Tympanuchus phasianellus	Sharp-tailed grouse
Vaccinium cespitosum	Dwarf bilberry
Williamsonia fletcheri	Ebony boghaunter
Wooded Dune and Swale Complex	
Historical or Failed to Find Records	
Scientific Name	**Common Name**
Alasmidonta viridis	Slippershell
Amerorchis rotundifolia	Small round-leaved orchis
Boloria frigga	Frigga fritillary
Coturnicops noveboracensis	Yellow rail
Dendroica cerulea	Cerulean warbler
Erora laeta	Early hairstreak
Euxoa aurulenta	Dune cutworm

Gentiana linearis	Narrow-leaved gentian
Great Blue Heron Rookery	Great Blue Heron Rookery
Heterodermia leucomelos	Lichen
Ligumia nasuta	Eastern pondmussel
Menegazzia terebrata	Lichen
Myriophyllum farwellii	Farwell's water milfoil
Nicrophorus americanus	American burying beetle
Pandion haliaetus	Osprey
Picoides arcticus	Black-backed woodpecker
Polygonia gracilis	Hoary comma
Rallus elegans	King rail
Unranked Records	
Scientific Name	**Common Name**
Anzia colpodes	Lichen

19. Tahquamenon, Waiska and St. Marys

HEALTHY WATERS REPORT CARD

OFFSHORE	NA	ISLANDS	A
NEARSHORE	C	COASTAL WETLANDS	C
EMBAYMENTS & INSHORE	C	COASTAL TERRESTRIAL	A
TRIBUTARIES & WATERSHEDS	C	**OVERALL B-**	

Report card denotes general condition/health of each biodiversity target in the region based on condition/stress indices. See introduction to the regional summaries.

A Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

The mouth of the Tahquamenon River. Photo provided by William Taft. Photo credit: David Kenyon/ Michigan Department of Natural Resources

Summary/ Description

The Tahquamenon, Waiska and St. Marys region (HUC 04020202, HUC 04020203 and HUC 04070001) extends from Emerson to Sault Ste Marie and the Michigan/Ontario border at the St. Marys River. It is 2,939.00 km^2 in size, including the associated nearshore waters. It is part of Subregion 0402 – Southern Lake Superior-Lake Superior. The Bay Mills Indian Community is located in this regional unit. Waiska River and Bay, also known as Waishkey River and Bay, were originally named after an Ojibwe chief who signed several treaties on behalf of his band. His name was recorded on these documents variously as 'Wayishkey' and 'Wayishkee'. The descendants of this chief are still present in Bay Mills area and spell their name 'Waishkey'. The reservation of the Sault tribe of Chippewa Indians is also located in this regional unit. The Tahquamenon, Waiska and St. Marys regional unit is part of the territory ceded in the Treaty of 1836. The signatory tribes retain rights to hunt, fish, and gather within the regional unit (A. McCammon Soltis, pers. comm., January 5 2015). These watersheds are dominated by forest cover. Coastal habitats include sand beaches and coastal wetlands, with scattered rocky shores.

TABLE 19.1: Tahquamenon, Waiska and St. Marys BY THE NUMBERS

Land and Water Cover	***Region (km^2)***	***Region %***	***Lake Superior Total (km^2)***	***Notes***
Agriculture	42.97	1.30	1,441.07	
Developed	3.14	0.10	389.55	
Forest	2,567.93	77.77	107,747.13	
Associated Nearshore Waters	437.60	13.25	17,868.03	
Other	231.69	7.02	8,227.57	
Water (inland)	18.45	0.56	9,473.05	
Total Area	**3,301.80**	**100**	**145,146.40**	
Coastal Features	***Region***	***Region %***	***% of Lake Superior Total for Coastal Feature***	
Coastline (km)	115.64	NA	1.98	Based on SOLEC shoreline
Sand Beaches (km)	39.32	34.00	6.11*	*% of Lake Superior Total Sand Beaches
Coastal Wetlands (km^2)	89.75	53.82*	8.14**	*% of Regional Coastal Area ** % of Lake Superior Total Coastal Wetlands
Natural Cover in Coastal Zone	156.65	93.94*	2.54**	*% of Regional Coastal Area ** % of Lake Superior Total Natural Cover in Coastal Area
Number of Islands	16	NA	0.6	
Condition	***Region***	***Region %***	***% of Lake Superior Total***	
Population Density (persons/km^2)	4.35	NA		
Road Density (km/km^2)	0.47	NA		
Number of Dams and Barriers	305	NA	1.3	
Artificial Shoreline (km)	29.62	25.61	13.00	
Land Ownership & Protection	***Region (km^2)***	***Region %***	***Regional Area (km^2)***	
Private	1,273.71	44.48	2,863.65	Regional area based on landmass
Public/Crown	1,479.03	51.65	2,863.65	
Tribes/ First Nations	10.80	0.38	2,863.65	
Parks & Protected Areas (total)	100.12	3.50	2,863.65	
Parks & Protected Areas (coast)	13.75	8.25*	166.76**	*% of Regional Coastal Area **Regional Coastal Area (km^2)

Important Biodiversity Features

Nearshore and Inshore Waters

- The Tahquamenon, Waiska and St. Marys regional unit contains sites of Important Habitat for Lake Trout and Lake Whitefish (Lake Superior Binational Program Habitat Committee 2006) (Figure 19.1).
- Whitefish Bay is noted as a Lake Superior embayment important for Lake Sturgeon (Auer 2003). In the Tahquamenon, Waiska and St. Marys regional unit this embayment and the nearshore zone, which provides corridors for movement, are identified as critical management areas for Lake Sturgeon in the Lake Superior basin (Auer 2003).

Coastal Zone and Islands

- This region has extensive coastal wetlands in Whitefish Bay and the mouth of the St. Marys River.

Tributaries and Watersheds

- Historically 21 tributaries in Lake Superior had Lake Sturgeon spawning runs. The Tahquamenon River is one of these historical spawning tributaries, and is located in the Tahquamenon, Waiska and St. Marys regional unit. The Tahquamenon River population status is extirpated (Golder Associates Ltd. 2011).
- A Lake Sturgeon Rehabilitation Plan for Lake Superior (Auer 2003) identifies the Tahquamenon River as one of the seventeen tributaries to Lake Superior in which there should be a focus on Lake Sturgeon rehabilitation.
- This regional unit contains two Important Habitat Areas and one Important Habitat Site (Lake Superior Binational Program Habitat Committee 2006) (Table 19.3, Figure 19.3).

Figure 19.1: Tahquamenon, Waiska and St. Marys - Coastal and Watershed Features

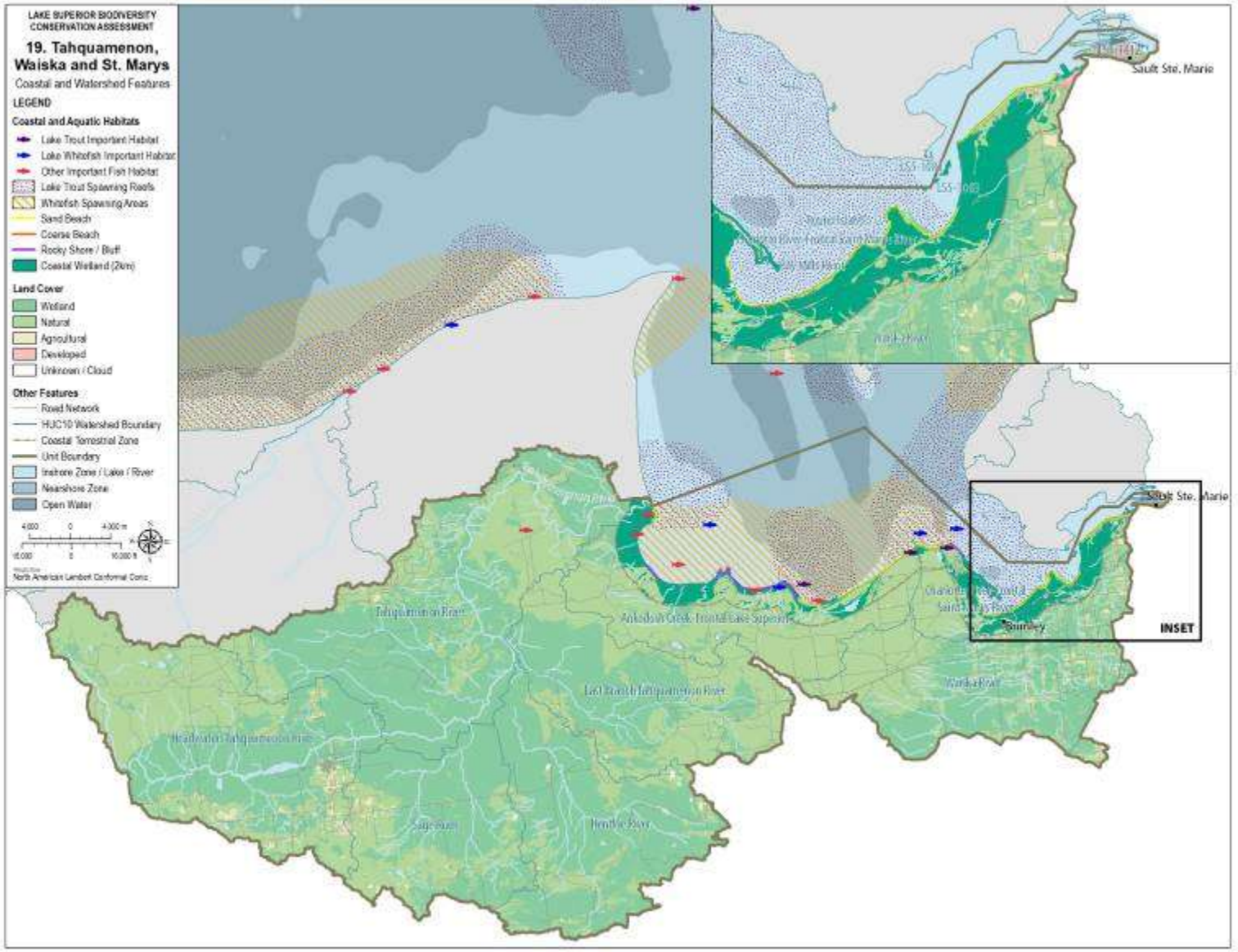


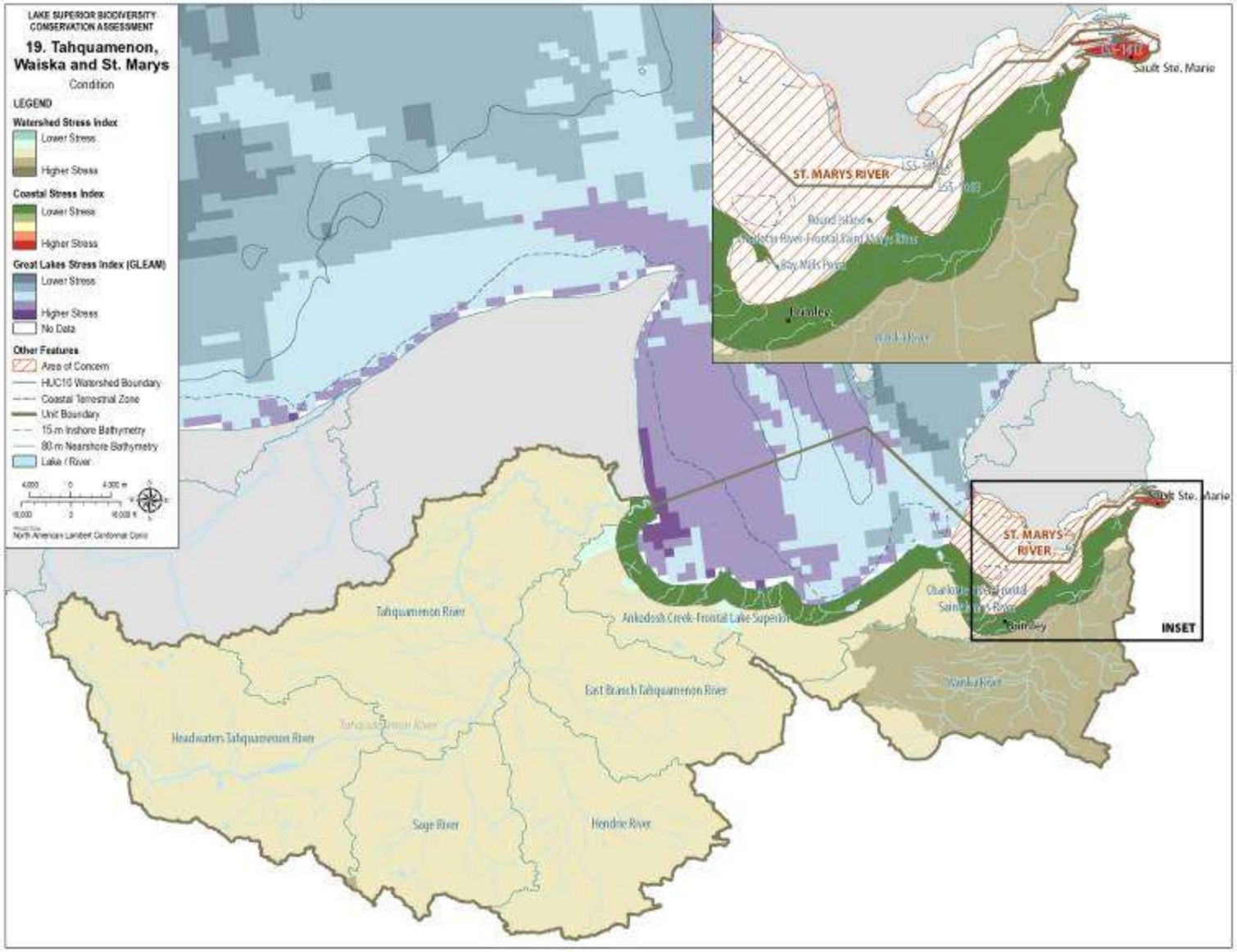
TABLE 19.2: Tahquamenon, Waiska and St. Marys CONDITION AND TRENDS

Target (Data Source)	**Condition**	**Trends**
Offshore[1]	NA	
Nearshore[1]	C (0.41)	
Embayments and Inshore[1,2]	C (0.47)	
Coastal Wetlands[2,3]	C (0.590)	
Islands[4]	A	
Coastal Terrestrial[3]	A (0.840)	
Tributaries and Watersheds[2]	C (0.52)	

A: Very Good	*Ecologically desirable status; requires little intervention for maintenance*
B: Good	*Within acceptable range of variation; may require some intervention for maintenance.*
C: Fair	*Outside of the range of acceptable variation and requires management. If unchecked, the biodiversity target may be vulnerable to serious degradation.*
D: Poor	*Allowing the biodiversity target to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.*
Unknown	*Insufficient information.*

1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)
2: Watershed Stress Index (GLEI 2013)
3: Coastal Condition Index (developed for this report)
4 : Island Condition Score (Henson et al. 2010)

Figure 19.2: Tahquamenon, Waiska and St. Marys - Condition



Important Issues & Threats

- The presence of Emerald Ash Borer (EAB) has been detected in counties in the Tahquamenon, Waiska and St. Marys regional unit. The area is now under a number of quarantine measures, including Federal EAB quarantine and Michigan state quarantine (Cooperative Emerald Ash Borer Project 2013).
- Forest fragmentation through real estate development is an emerging concern in the Upper Peninsula Lake Superior watersheds. Large tracts of forest lands owned by corporate land holders are being sold to companies which run real estate investment trusts; smaller parcels are then developed (W. Taft, pers. comm., February 25, 2013).
- The St. Marys River Area of Concern (AOC) is located between two regional units, the Goulais and Tahquamenon, Waiska and St. Marys regional units. A number of point and nonpoint sources have contributed to beneficial use impairments, and sediments are contaminated with arsenic, cadmium, chromium, copper, cyanide and lead. Ten beneficial use impairments were identified in the St. Marys River AOC (U.S. EPA 2013a).
- The Cannelton Industries Inc. Superfund site is located just inside the boundaries of the Tahquamenon, Waiska and St. Marys regional unit. This site consists of 75 acres along the St. Marys River. Soils, sediments and surface water in the river were contaminated with heavy metals from tannery operations and general wastes. A number of cleanup activities have been undertaken and the EPA plans to remove the site from the National Priorities List within the next several years. A restrictive covenant and easement for the property was signed in March 2013, to ensure the continued management of contaminated materials on the property (U.S. EPA 2013q).

Conservation In Action

Parks & Protected Areas

- Brimley State Park
- Hiawatha National Forest
- State Forest – Sault Ste. Marie Management Unit
- Tahquamenon Falls State Park
- Bay Mills Indian Community Wetland Preserve

Existing Programs & Projects

- The Bay Mills Indian Community Wetland Preserve was established by the Bay Mills Indian Community in 1996. It is 460 acres in size and inhabited by many species that are culturally important (e.g., Black Ash, Northern White Cedar). The Wetland Preserve also contains coastal wetlands. The area is essentially undisturbed other than a few trails (snowmobile, logging) and Lakeshore Drive, which bisects the preserve in generally a north-south direction (Inter-Tribal Council of Michigan 2012).
- Segments of the East Branch of the Tahquamenon River have been designated as portions of the National Wild and Scenic Rivers System (Interagency Wild & Scenic Rivers Council 2012)
- Under the Michigan Water Quality Standards (WQS), portions of the Tahquamenon River (Chippewa County) are designated as Outstanding State Resource Waters (OSRW). Also under the Michigan WQS, all surface waters of the Lake Superior basin that are not identified as OSRWs are designated as Lake Superior basin - Outstanding International Resource Waters (LSB-OIRW). Under the above designations, additional anti-degradation controls are applied for new or increased pollutant loadings (Michigan DEQ 2013a).

- The State of Michigan has identified exceptional areas of fish and wildlife habitat along its coastline, connecting waterways, and rivermouths. Designated as Environmental Areas (EAs), certain uses within these areas require state review and approval (Michigan DEQ 2013b). One EA is located in the Lake Superior waters of Chippewa County (at Tahquamenon Island), in the Tahquamenon, Waiska and St. Marys regional unit (Michigan DEQ 2013c, 2013d).
- The Kirtland's Warbler Management Units & Guide's Rest IBA is a Global Important Bird Area located in the Tahquamenon, Waiska and St. Marys regional unit (National Audubon Society 2013, 2012).
- A number of State Important Bird Areas (IBAs) are located in the Tahquamenon, Waiska and St. Marys regional unit. These IBAs are Sault Sainte Marie Clay Plain IBA, Sleeper Lake burn IBA, Raco Plains & Wilwin Wetland IBA, Dollarville Flooding IBA and Tahquamenon Falls State Park and Munising Moraine IV LTA IBA (National Audubon Society 2013, 2012).
- The Eastern Upper Peninsula Cooperative Weed Management Area is a partnership of city, county, state, federal, and tribal officials who have joined together with local citizens, landowners, and not-for-profit groups to share invasive plant management resources. Their goal is to facilitate cooperation and coordination networking across jurisdictional boundaries (M. Preisser, pers. comm., May 31 2013).

TABLE 19.3: Tahquamenon, Waiska and St. Marys IMPORTANT HABITAT SITES AND AREAS

Code	*Site/ Area*	*Important Habitat Site/Area Name*	*Key Features*
MI-028	Site	Tahquamenon Bay	Rare plant habitat, rare animal habitat, wooded dune and swale complex
MI-045	Area	Delirium Wilderness Area	Representative natural plant communities
MI-047	Area	Tahquamenon Falls State Park	Representative natural plant communities
ON-128	Area	St. Mary's River	Fish spawning area.

Figure 19.3: Tahquamenon, Waiska and St. Marys - Important Habitat Sites and Areas

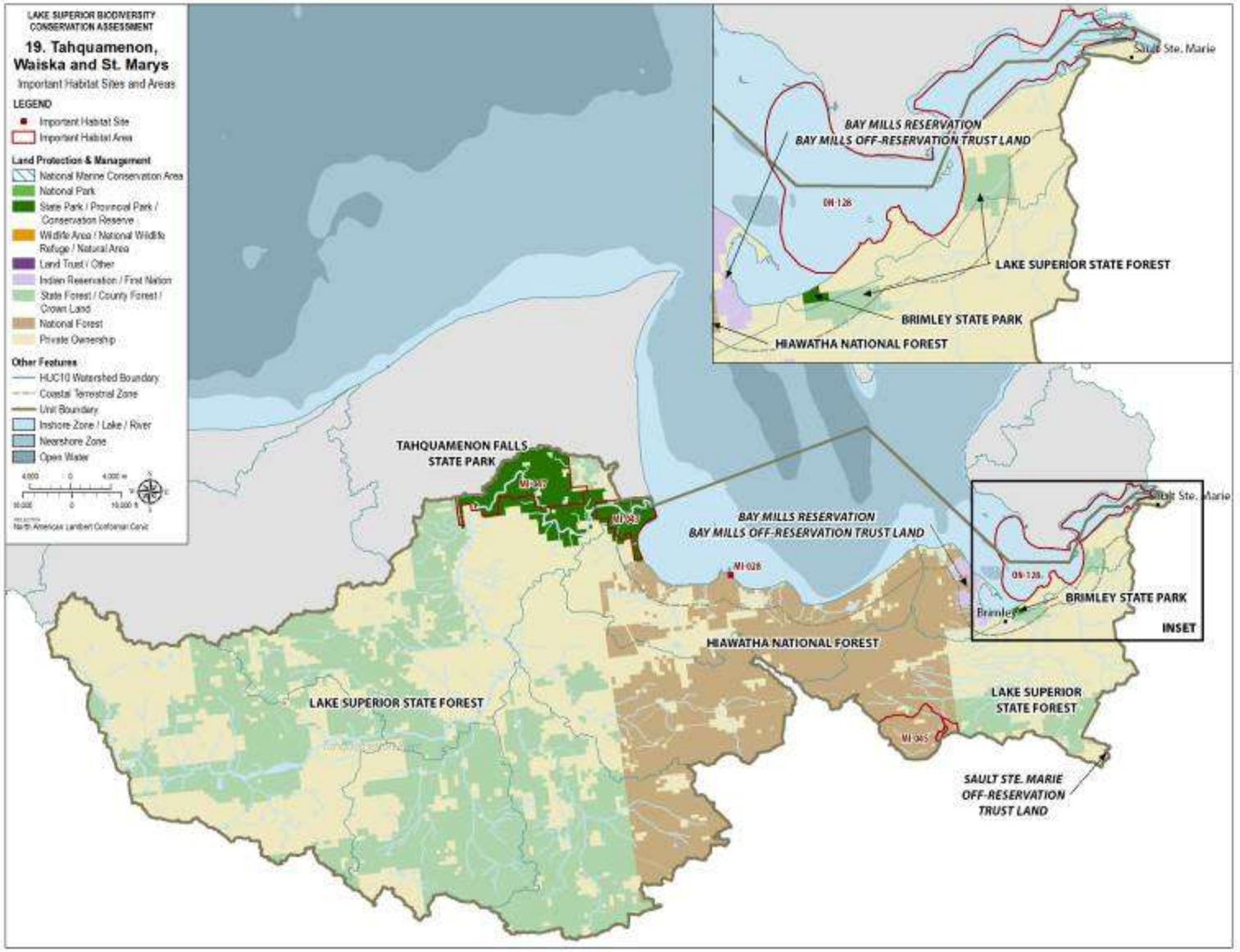


TABLE 19.4: Tahquamenon, Waiska and St. Marys LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

At least 65 species and communities of conservation concern have been documented in the regional unit. 51 of these have viability rankings which indicate the species or community is currently present, or was at the date of last sampling. The viability rankings of these species varies from A to E (A – Excellent predicted viability, B – Good predicted viability, C – Fair predicted viability, D – Probably not viable, E – Verified extant). 12 species and communities were once known to occur here, but have current conservation ranks of F (Failed to find), H (Historical), or X (Extirpated). A further 2 species and communities of conservation concern are known to occur in this regional unit, but are currently not ranked for viability.[23]

Present Records (Viability Rankings of A to E)	
Scientific Name	**Common Name**
Accipiter gentilis	Northern goshawk
Bartonia paniculata	Panicled screwstem
Bog	
Boloria freija	Freija fritillary
Boloria frigga	Frigga fritillary
Botrychium hesperium	Western moonwort
Buteo lineatus	Red-shouldered hawk
Callitriche hermaphroditica	Autumnal water-starwort
Calypso bulbosa	Calypso or fairy-slipper
Carex novae-angliae	New England sedge
Carex wiegandii	Wiegand's sedge
Cave	
Coregonus artedi	Lake herring or Cisco
Cottus ricei	Spoonhead sculpin
Dendroica kirtlandii	Kirtland's warbler
Dry Northern Forest	Dry Woodland, Upper Midwest Type
Emydoidea blandingii	Blanding's turtle
Falcipennis canadensis	Spruce grouse
Falco peregrinus	Peregrine falcon
Galium kamtschaticum	Bedstraw
Gavia immer	Common loon
Haliaeetus leucocephalus	Bald eagle
Hardwood-Conifer Swamp	
Huperzia selago	Fir clubmoss
Intermittent Wetland	Infertile Pond/marsh, Great Lakes Type
Ligumia recta	Black sandshell
Listera auriculata	Auricled twayblade
Lycopodiella subappressa	Northern appressed clubmoss
Mesic Northern Forest	
Muskeg	Scrub Bog, Upper Midwest Type
Myriophyllum alterniflorum	Alternate-leaved water-milfoil
Myriophyllum farwellii	Farwell's water milfoil
Northern Fen	Alkaline Shrub/herb Fen, Upper Midwest Type

[23] Data included here were provided by the Michigan Natural Features Inventory of Michigan State University, and were current as of August 1 2014. These data are not based on an exhaustive inventory of the state. The lack of data for any geographic area shall not be construed to mean that no significant features are present.

Northern Wet Meadow	Wet Meadow, Upper Midwest Type
Oryzopsis canadensis	Canada rice grass
Pandion haliaetus	Osprey
Picoides arcticus	Black-backed woodpecker
Pine Barrens	Barrens, Upper Midwest Type
Poor Conifer Swamp	
Poor Fen	Poor Shrub/herb Fen, Upper Midwest Type
Potamogeton confervoides	Alga pondweed
Rhexia virginica	Meadow beauty
Rich Conifer Swamp	
Rubus acaulis	Dwarf raspberry
Sandstone Cliff	
Sinkhole	
Somatochlora incurvata	Incurvate emerald
Tanacetum huronense	Lake Huron tansy
Tympanuchus phasianellus	Sharp-tailed grouse
Vertigo elatior	Tapered vertigo
Wooded Dune and Swale Complex	
Historical Records	
Scientific Name	**Common Name**
Acipenser fulvescens	Lake sturgeon
Alces americanus	Moose
Botrychium mormo	Goblin moonwort
Chlidonias niger	Black tern
Crataegus douglasii	Douglas's hawthorn
Elymus glaucus	Blue wild-rye
Falco columbarius	Merlin
Great Blue Heron Rookery	Great Blue Heron Rookery
Juncus vaseyi	Vasey's rush
Lanius ludovicianus migrans	Migrant loggerhead shrike
Salix pellita	Satiny willow
Sterna hirundo	Common tern
Unranked Records	
Scientific Name	**Common Name**
Anzia colpodes	Lichen
Botrychium spathulatum	Spatulate moonwort

20. Lake Superior Open Waters

Summary/ Description

The final regional unit includes all of the open, offshore waters of Lake Superior. Classifying the open waters as a single unit was recommended by the Aquatic Community Committee/Lake Superior Technical Committee.

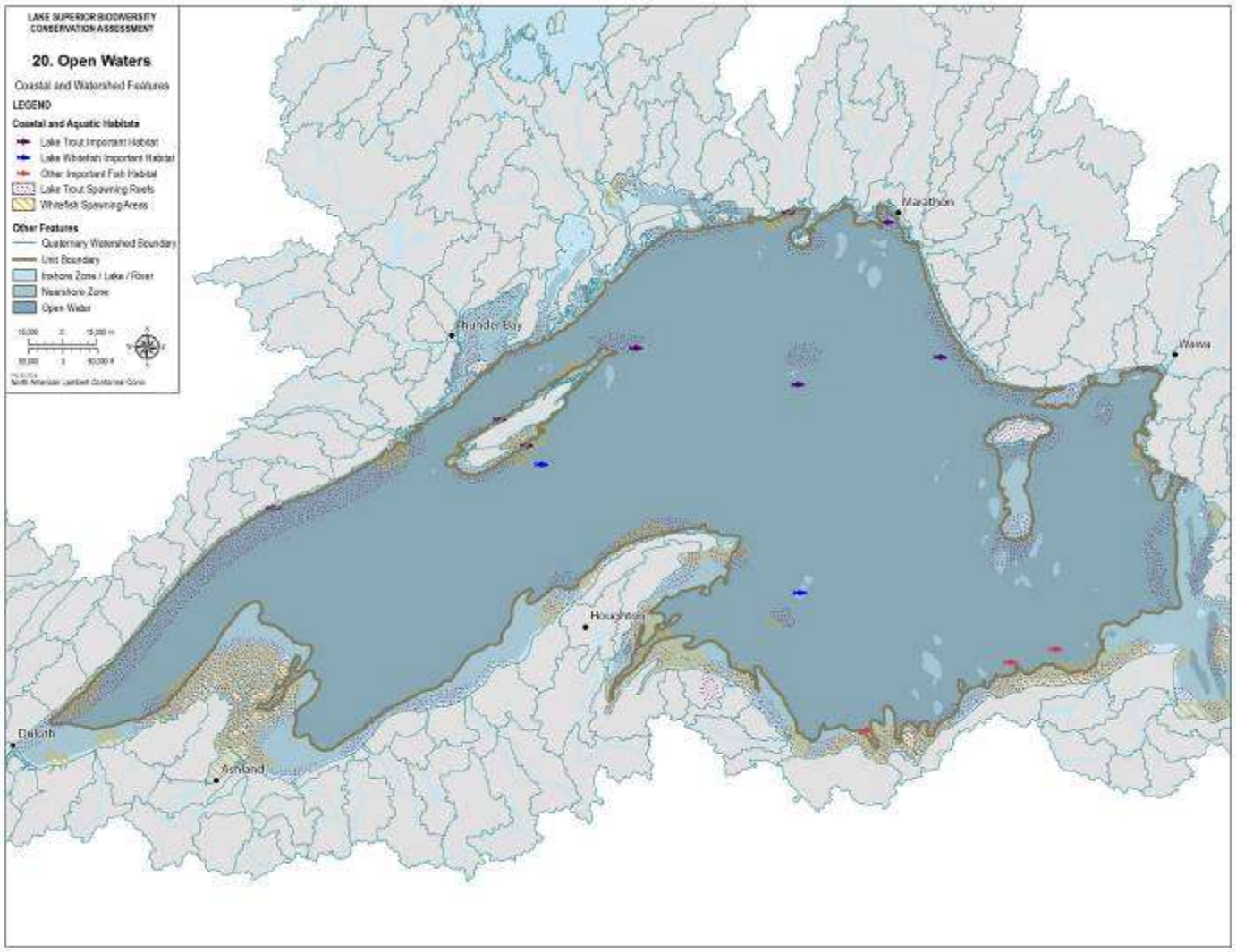
Important Biodiversity Features

Lake Superior sunset. Taken in the Black Presque Isle Ontonagon regional unit. Photo provided by William Taft. Photo credit: Mat Wesener/ Michigan Department of Environmental Quality.

Offshore Waters

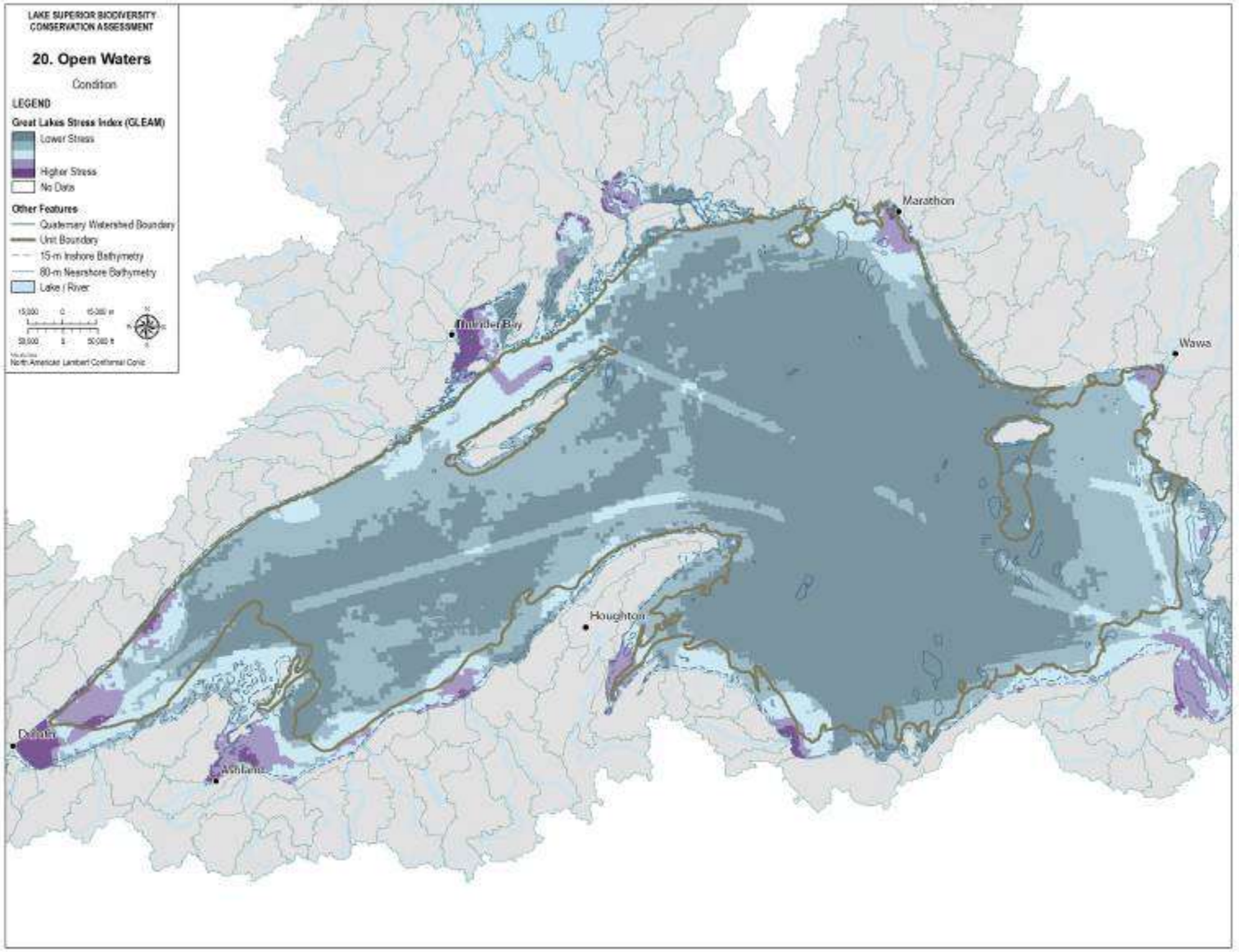
- The historic offshore fish community was a coldwater fish community dominated by Lake Trout, Lake Whitefish and Cisco (OMNR 2013d).
- Lake Trout are the top predator in this deepwater ecosystem, and nearly all of Lake Superior provides important habitat. Lake Trout were historically adapted to a wide range of depths in Lake Superior. Siscowet Lake Trout were historically common throughout the offshore waters, while Humper Lake Trout are present on offshore shoals or banks surrounded by deepwater habitat. Recent work by Muir et al. (2014) has demonstrated quantitative evidence of another Lake Trout morph, the "redfin", in the waters off Isle Royale. The extent of redfin Lake Trout distribution in Lake Superior has yet to be determined.
- A detailed description of these offshore waters can be found in Volume One of this report in the biodiversity target descriptions.

Figure 20.1: Open Waters - Coastal and Watershed Features



Note: Detailed information on the features and condition of nearshore and inshore waters are included in the other regional summaries.

Figure 20.2: Open Waters – Condition



Important Issues & Threats

- The rehabilitation of lean Lake Trout and Lake Whitefish in the nearshore waters of the east end of the lake has not progressed to the same extent as the remainder of the lake. Ensuring that the unregulated fish harvests in the region are at levels that maintain sustainable populations will provide for the opportunity to resume cooperative rehabilitative fish stocking efforts.
- Invasive species and habitat loss have negatively affected the historic fish communities in FMZ 9. The focus of fisheries management in this zone is now rehabilitation of the fish communities (OMNR 2013d).

Conservation In Action

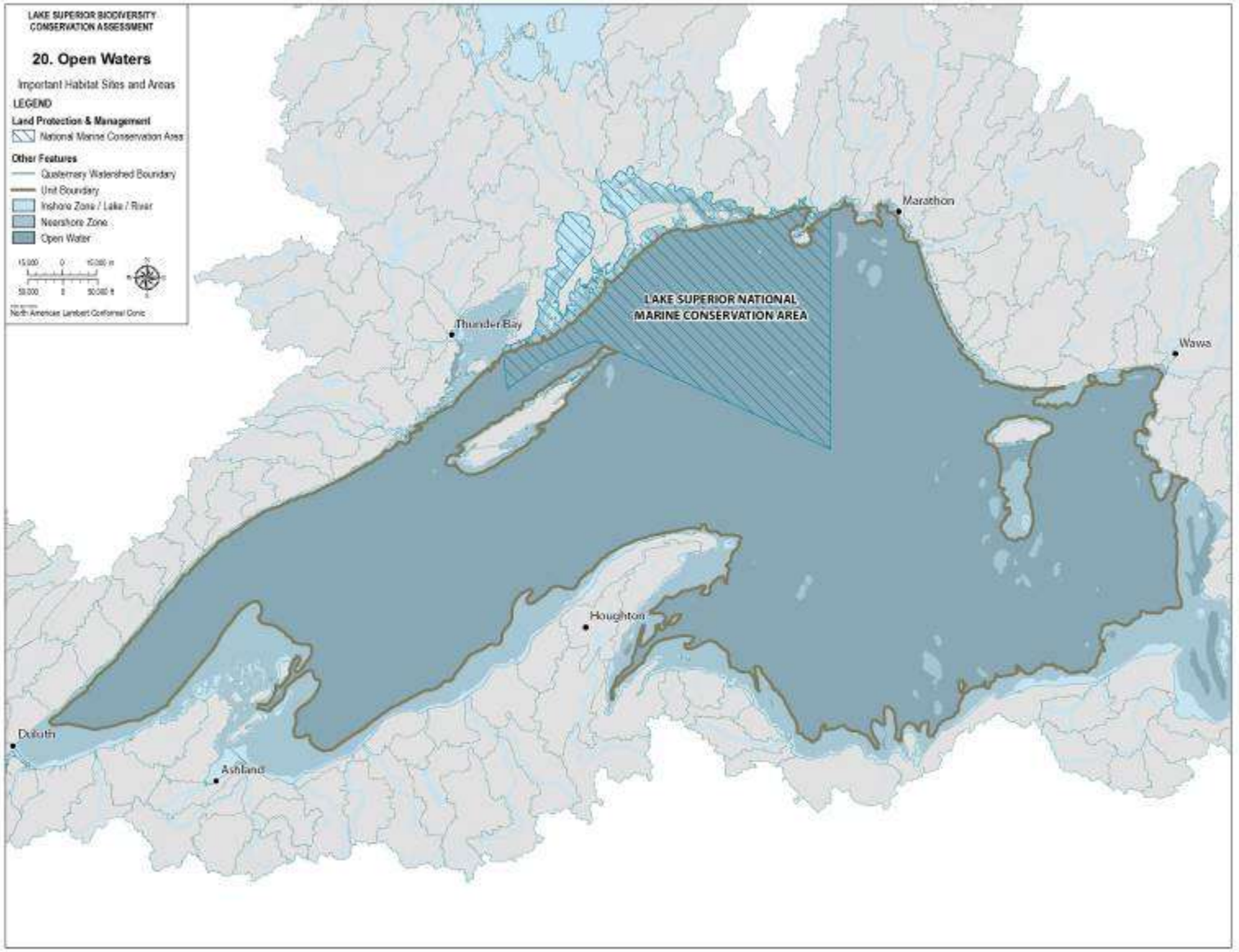
Parks & Protected Areas

- The Lake Superior National Marine Conservation Area (LSNMCA) of Canada extends from the water's edge, beyond the nearshore water boundaries associated with the Little Pic, Nipigon and Jackpine, and Black Sturgeon regional units, into the offshore waters and to the international boundary with the United States. National Marine Conservation Areas protect and conserve representative marine areas for the benefit, education and enjoyment of the people of Canada and the world. By law, each national marine conservation area must contain at least one zone that fosters and encourages the ecologically sustainable use of aquatic resources and at least one zone that fully protects special features or sensitive elements of ecosystems. Currently, the Lake Superior NMCA has proposed two zones that offer some protection for the Gunilda shipwreck (Nipigon and Jackpine regional unit), and Gapen's Pool Brook Trout Spawning Area (Nipigon and Jackpine regional unit) (C. Vis, pers. comm., December 18 2014).

Existing Programs & Projects

- Cooperative management of Lake Superior and FMZ 9 is coordinated through the Great Lakes Fisheries Commission. Provincial, state, federal and tribal agencies all play a role in this collaborative management (OMNR 2013d).
- The Canadian waters of Lake Superior are contained within Fisheries Management Zone 9 (FMZ 9), and are managed by the Upper Great Lakes Management Unit of the Ontario Ministry of Natural Resources (OMNR 2013d, M. Chase, pers. comm., June 3 2013). This includes the nearshore and inshore waters, including embayments, and the offshore waters. Fisheries Management Zone 9 also includes all of the islands in the zone, except for St. Ignace Island, Simpson Island and Michipicoten Island (OMNR 2013d). FMZ 9 is managed to "rehabilitate and maintain a diverse, healthy and self-regulating fish community, dominated by indigenous species and supporting sustainable fisheries" (OMNR 2013d: paragraph 4).
- Tribes in the United States exercise treaty based fishing rights in the open waters of Lake Superior, based on rights reserved in the Treaties of 1836, 1842, and 1854 (A. McCammon Soltis, pers. comm., January 5 2015).

Figure 20.3: Open Waters - Important Habitat Sites and Areas



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Appendix A
Spatial Data Catalogue and Methods

Dataset	Vintage	Scale/ Resolution	Source	Notes
COASTAL AND WATERSHED FEATURES				
Atlas of the Spawning and Nursery Areas of Great Lakes Fishes	1982	-	Goodyear, C. S., T. A. Edsall, D. M. Ormsby Dempsey, G. D. Moss, and P. E. Polanski	Digitized the maps in report for Lake Trout and Lake Whitefish http://www.glsc.usgs.gov/main.php?content=products_publications_atlas&title=Publications0&menu=products
Important Habitat Sites and Areas	2006		Lake Superior Binational Program's Habitat Committee	Available at
SOLEC Shoreline Data (CAN)	2008	-	Environment Canada	Used for Ontario Also used for Artificial Shoreline (Threat).
Great Lakes and St. Lawrence River Medium Resolution Vector Shoreline Data	1997	-	Great Lakes Environmental Research Laboratory, NOAA	Used for the United States. Also used for Artificial Shoreline (Threat). – below just artificial??
Continually Updated Shoreline Product (CUSP)	2011	5,000 – 20,000	U.S. Department of Commerce (DOC), National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), National Geodetic Survey (NGS)	Data Download: http://www.ngs.noaa.gov/CUSP/ Portal: http://shoreline.noaa.gov/data/datasheets/
Wetland Units (Ontario)	2012	1:10,000-1:50,000	Ontario Ministry of Natural Resources	Version also identifies whether wetland evaluated and provincial/other significance
Great Lakes Coastal Wetland Inventory	2004	1:10,000	Publisher: Great Lakes Wetland Consortium Originator: Environment Canada US Geological Service Michigan Natural Features Inventory Ontario Ministry of Natural Resources	Albert, D.A., J. Ingram, T. Thompson, and D. Wilcox http://www.glc.org/wetlands/inventory.html
National Wetlands Inventory Polygons (US)	2003	1:24,000	DNR Minnesota	http://deli.dnr.state.mn.us/metadata.html?id=L260000162101
DNR 100k Wetlands	2002	1:100,000	DNR Minnesota	http://deli.dnr.state.mn.us
Final Wetland Inventory (US)	2007	1:24,000	DNR Michigan/Michigan Department of Technology, Management and Budget	http://www.mcgi.state.mi.us/mgdl/?rel=thext&action=thmname&cid=3&cat=Final%5FWetland%5FInventory Available by County, assembled together
Wetlands	1994	1:24,000	DNR Wisconsin	Available by County, assembled together
Land Use / Land Cover	1999	200 m	Natural Resources Research Institute, University of Minnesota Duluth	Covers entire basin. Used for analysis. http://www.nrri.umn.edu/lsgis2/data/landuse.html Subset from classified Landsat MSS of Great Lakes Basin by Peter Wolter. US land cover was derived from the National Land Cover Database (Vogelmann *et al.* 1998)

Dataset	Vintage	Scale/ Resolution	Source	Notes
				and Canadian land cover from the Ontario Land Cover Database (Spectranalysis 2004). Both of these land cover datasets were derived from 30 m Landsat Thematic Mapper satellite data, and use similar land classification schemes
Roads	2011	1:10,000	Ontario Ministry of Natural Resources	Ontario Road Network
	2001	1:24,000	MN Department of Transportation	DOT Basemap Roads - All Types
	2012	1:24,000	Michigan Center for Geographic Information	MI Geographic Framework All Roads (v12b)
	2010	1:24,000	DNR Wisconsin	WI Roads 2010 (TIGER Lines)
CONDITION				
Areas of Concern	2008	1:5,000-1:10,000	Environment Canada	
Cumulative Stress, Laurentian Great Lakes, 2000-2009	2013	921 m	Dr. J.D. Allan, School of Natural Resources and Environment, University of Michigan	Great Lakes Environmental Assessment and Mapping (GLEAM) Project http://www.greatlakesmapping.org
Watershed Stress Index	2011	-	Host et al., Natural Resources Research Institute, University of Minnesota Duluth	Great Lakes Environmental Indicators (GLEI) Project
Lake Superior Bathymetry	1998	1000 m	Natural Resource Research Institute	http://www.nrri.umn.edu/lsgis2/ - Generated 5-m contours from model for mapping bathymetry on maps
IMPORTANT HABITAT SITES AND AREAS				
Important Habitat Sites and Areas	2006		Lake Superior Binational Program's Habitat Committee	Available http://www.nrri.umn.edu/lsgis/importanthabitat.htm
Federal Marine Conservation Areas (Ontario)	2010	50,000	Parks Canada	
National Parks (Ontario)	2003	1:50,000	Ontario Ministry of Natural Resources	
National Parks (US)	2001 2008	1:24,000 ?	Michigan GAP Land Stewardship Coverage National Park Service	Isle Royal Island geometry: (http://www.mcgi.state.mi.us/mgdl/?rel=thext&action=thmname&cid=4&cat=GAP+Land+Stewardship) Policy Area (Buffer around island)
National Wildlife Areas	2002	~1:50,000	Canadian Wildlife Service	
Crown Game Preserves	-	-	Ontario Ministry of Natural Resources	
Provincial Parks	2011	1:10,000	Ontario Ministry of Natural Resources	
Recommended Provincial Parks	2007	1:10,000	Ontario Parks	
Conservation Reserves	2007	1:10,000	Ontario Parks	
Conservation Authority Properties	2006 – 2012	1:10,000	Ontario Ministry of Natural Resources with supplemental information added by NCC	Dataset is not regularly maintained by MNR. Some areas have been manually added by NCC
NCC Properties	2012		Nature Conservancy of Canada	
NGO	2006		Ontario Ministry of Natural Resources	Dataset is not regularly maintained by MNR. Some areas have been manually added by NCC
Municipal Park	2006		Ontario Ministry of Natural Resources	Dataset is not regularly maintained by MNR.

Dataset	Vintage	Scale/ Resolution	Source	Notes
Conservation and Recreation Lands (Michigan)	2008		Ducks Unlimited and The Nature Conservancy	Michigan
Protected Areas Database of the United States (US)	2011	1:24,000-1:100,000	USGS	Version 1.2 - http://www.protectedlands.net/padus/preview.php Public land ownership, management and conservation lands nationally, including voluntarily provided privately protected areas
Protected Areas Database of the United States (US)	2010		CBI Edition	Version 1.1 - http://www.protectedlands.net/padus/preview.php Public and private protected areas across US at variety of scales
BASE MAP DATA				
Land Use / Land Cover	1999	200 m	Natural Resources Research Institute, University of Minnesota Duluth	Covers entire basin. Used for analysis. http://www.nrri.umn.edu/lsgis2/data/landuse.html Subset from classified Landsat MSS of Great Lakes Basin by Peter Wolter. US land cover was derived from the National Land Cover Database (Vogelmann *et al.* 1998) and Canadian land cover from the Ontario Land Cover Database (Spectranalysis 2004). Both of these land cover datasets were derived from 30 m Landsat Thematic Mapper satellite data, and use similar land classification schemes
Great Lakes				
International Boundaries				
State Boundaries				
Detailed Population Centres				
Basin Names				
Lake Superior Basin HYDRO	2006	1:100,000	The Lake Superior Decision Support Project	http://www.nrri.umn.edu/lsgis/databases.htm
WRIP Water Flow Network (CAN)	2005	1:10,000	Ontario Ministry of Natural Resources	