

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



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 km² 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 (km²)	Region %	Lake Superior Total (km²)	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 (km²)	Region %	Regional Area (km²)	
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

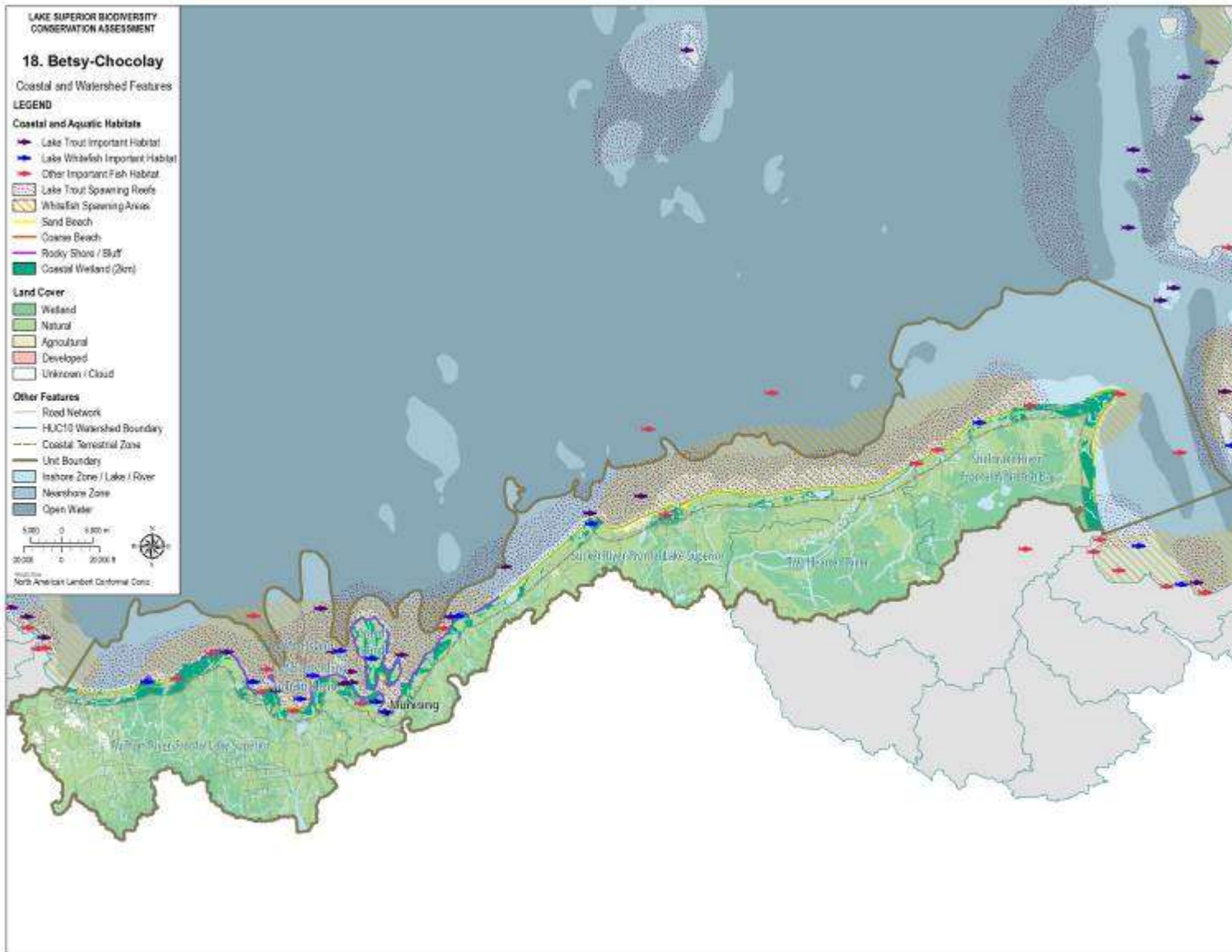


TABLE 18.2: Betsy-Chocolay CONDITION AND TRENDS

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

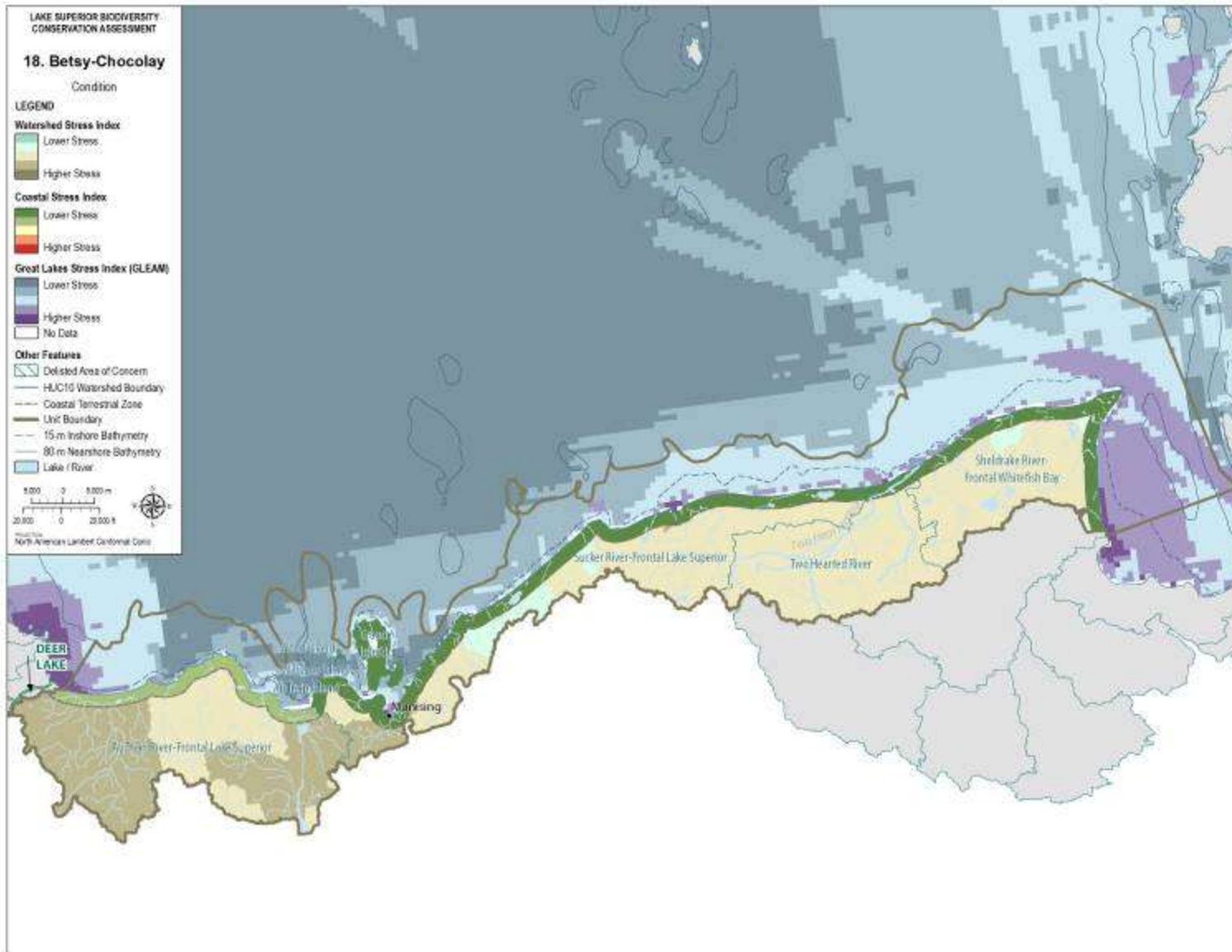
1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)

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).

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- 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

<i>Code</i>	<i>Site/ Area</i>	<i>Important Habitat Site/Area Name</i>	<i>Key Features</i>
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

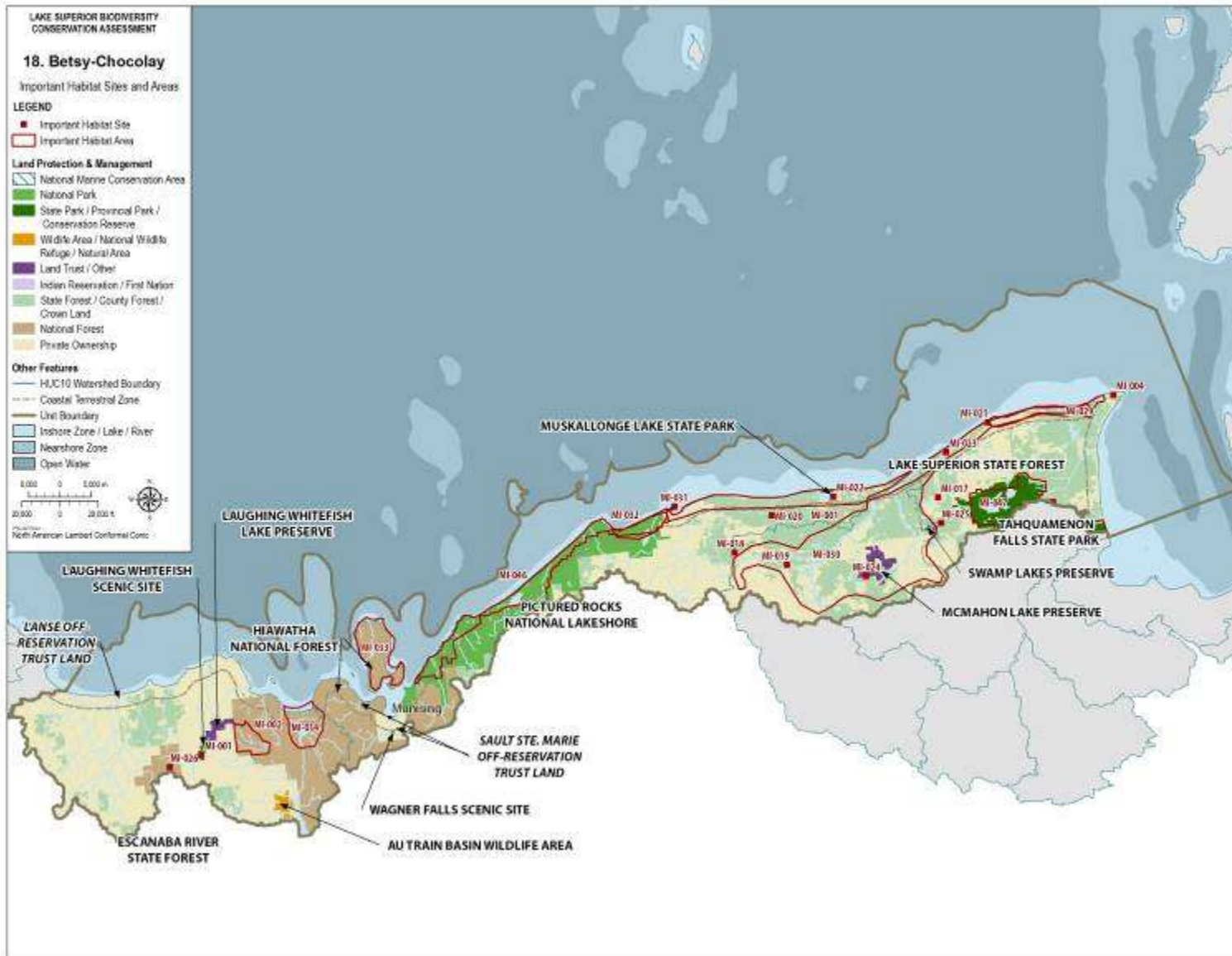


TABLE 18.4: Betsy-Chocolay LIST OF SPECIES AND COMMUNITIES OF CONSERVATION CONCERN

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

<i>Present Records (Viability Rankings of A to E)</i>	
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
Falcapennis 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.

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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
Somatoclora 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

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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
<i>Unranked Records</i>	
Scientific Name	Common Name
Anzia colpodes	Lichen