

## 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  | <b>OVERALL B</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.



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



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<sup>2</sup> 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**

| <b>Land and Water Cover</b>                   | <b>Region (km<sup>2</sup>)</b> | <b>Region %</b> | <b>Lake Superior Total (km<sup>2</sup>)</b>         | <b>Notes</b>   |
|---|--------------------------------|-----------------|---|--|
| 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  |  |
| <b>Total Area</b>                             | <b>6,811.57</b>                | <b>100</b>      | <b>145,146.40</b>                                   |  |
| <b>Coastal Features</b>                       | <b>Region</b>                  | <b>Region %</b> | <b>% of Lake Superior Total for Coastal Feature</b> |  |
| 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 <sup>2</sup> )          | 209.94                         | 39.80*          | 19.03**   | *% of Regional Coastal Area<br>** % of Lake Superior Total Coastal Wetlands              |
| Natural Cover in Coastal Zone                 | 453.26                         | 85.93*          | 7.34**  | *% of Regional Coastal Area<br>** % of Lake Superior Total Natural Cover in Coastal Area |
| Number of Islands                             | 44                             | NA              | 1.7   |  |
| <b>Condition</b>                              | <b>Region</b>                  | <b>Region %</b> | <b>% of Lake Superior Total</b>                     |  |
| Population Density (persons/km <sup>2</sup> ) | 8.65                           | NA              |   |  |
| Road Density (km/km <sup>2</sup> )            | 0.46                           | NA              |   |  |
| Number of Dams and Barriers                   | 1,835                          | NA              | 7.8   |  |
| Artificial Shoreline (km)                     | 3.48                           | 1.21            | 1.53  |  |
| <b>Land Ownership &amp; Protection</b>        | <b>Region (km<sup>2</sup>)</b> | <b>Region %</b> | <b>Regional Area (km<sup>2</sup>)</b>               |  |
| 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<br>**Regional Coastal Area (km <sup>2</sup> )                |

## 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

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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).

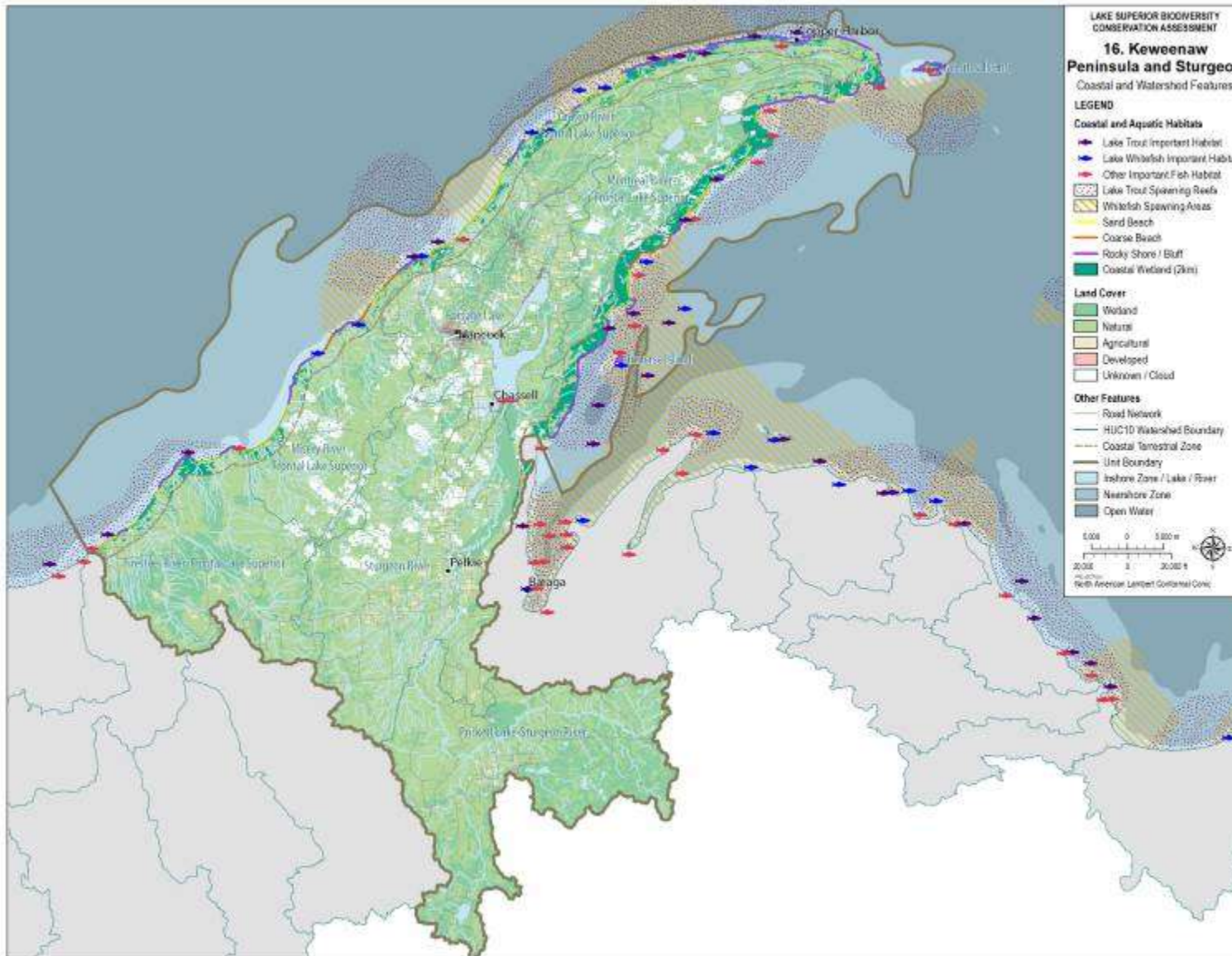
### **Coastal Zone and Islands**

- 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 <sup>1</sup>                   | NA        |        |
| Nearshore <sup>1</sup>                  | B (0.66)  |        |
| Embayments and Inshore <sup>1,2</sup>   | C (0.58)  |        |
| Coastal Wetlands <sup>2,3</sup>         | B (0.705) |        |
| Islands <sup>4</sup>                    | A         |        |
| Coastal Terrestrial <sup>3</sup>        | A (0.966) |        |
| Tributaries and Watersheds <sup>2</sup> | C (0.49)  |        |

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

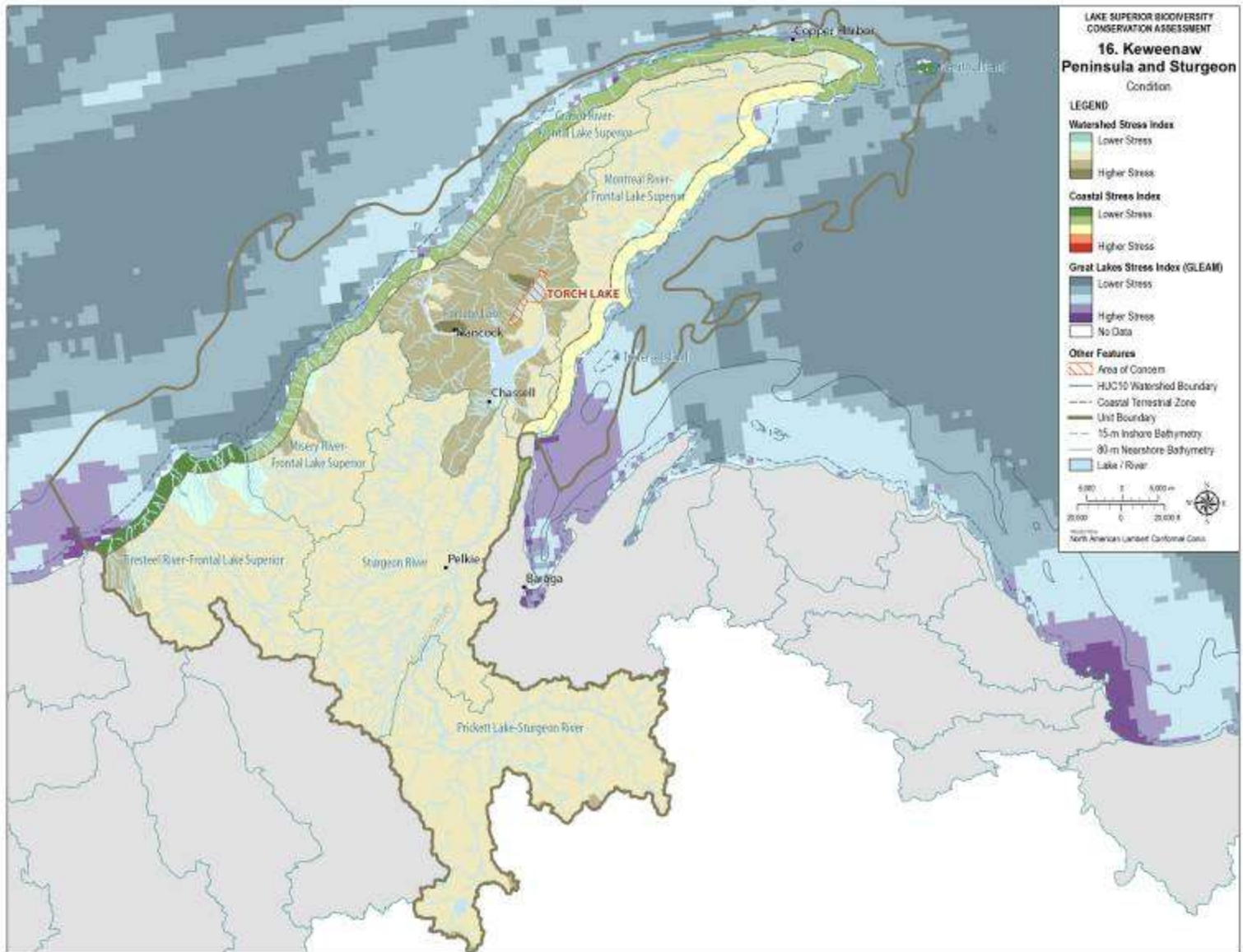
1: Great Lakes Cumulative Stress (GLEAM 2012, Allan et al. 2013)

2: Watershed Stress Index (GLEI 2013)

3: Coastal Condition Index (developed for this report)

4 : Island Condition Score (Henson et al. 2010)

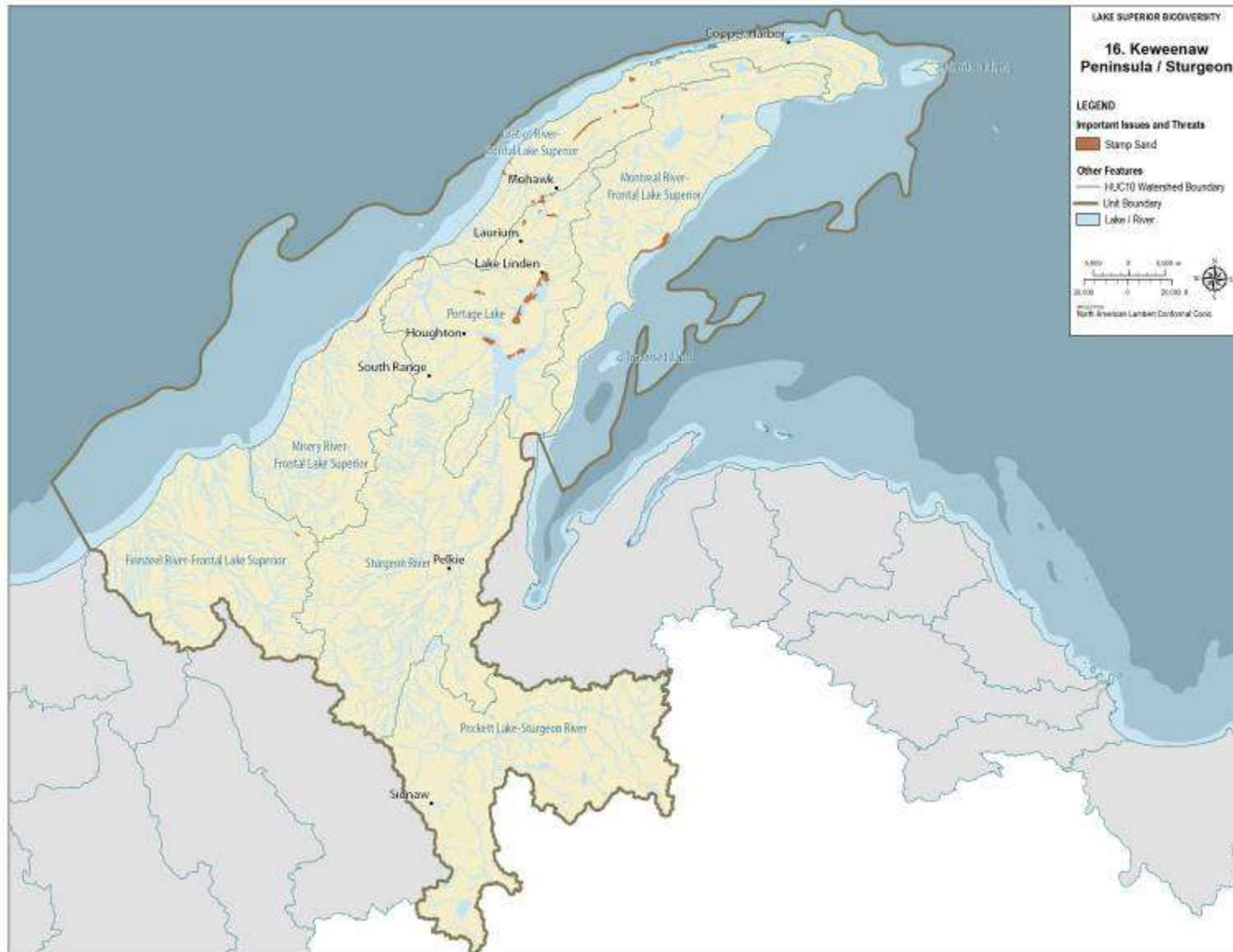
Figure 16.2: Keweenaw Peninsula and Sturgeon - Condition



## 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 stamp 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

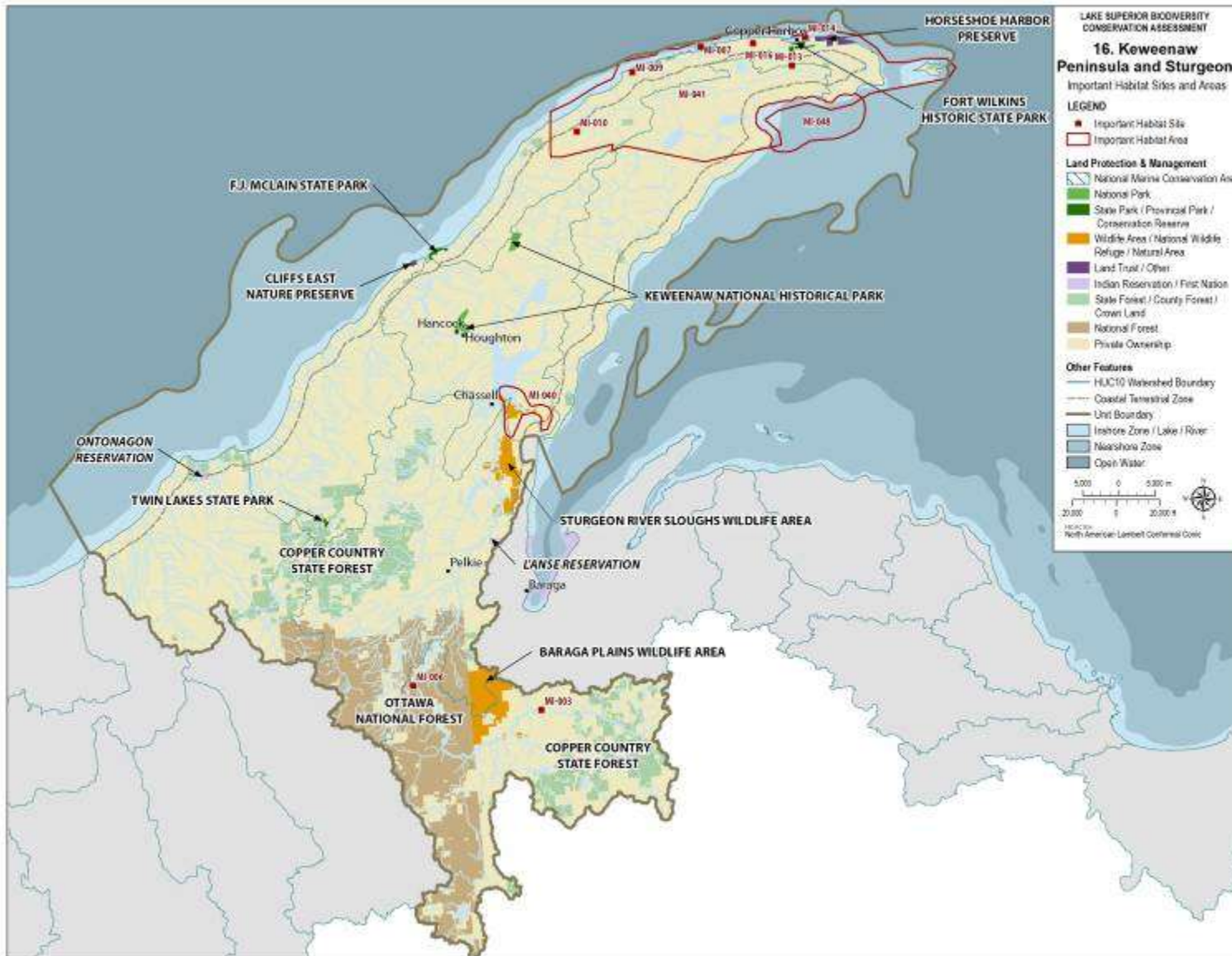
species across land ownership boundaries. It spans Houghton, Keweenaw and Baraga Counties, including the Ottawa National Forest (M. Preisser, pers. comm., May 31 2013).

- 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**

| <i>Code</i> | <i>Site/<br/>Area</i> | <i>Important Habitat Site/Area<br/>Name</i> | <i>Key Features</i>  |
|-------------|-----------------------|---|--|
| 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.<sup>20</sup>

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

<sup>20</sup> 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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|                             |  |
|-----------------------------|--|
| 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                                   |

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| 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           |                               |
| <b>Historical or Extirpated Records</b> |                               |
| 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 oxycanthoides                     | 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           |
| <b>Unranked Records</b>                 |                               |
| Scientific Name                         | Common Name                   |
| Emergent Marsh                          |                               |
| Lobaria scrobiculata                    | Lichen                        |
| Physcia phaea                           | Lichen                        |
| Placynthium aspratile                   | Lichen                        |
| Proserpinus flavofasciata               | Yellow-banded day-sphinx      |