

## Betsy-Chocolay Regional Plan

This is one of twenty Regional Plans prepared to further guide and support implementation of the Lake Superior Biodiversity Conservation Strategy (Strategy). The Strategy, prepared and overseen by the Lake Superior Partnership, contains information and 62 sub-strategies to provide guidance to restoring and protecting biodiversity ([www.natureconservancy.ca/superiorbca](http://www.natureconservancy.ca/superiorbca)).

Regional Plans are intended to be adaptive documents which support and respond to local conservation efforts that are contributing to lakewide biodiversity goals. To contribute an update to this Regional Plan, please contact [superiorplans@glupo.net](mailto:superiorplans@glupo.net).

including Shortjaw Cisco and Kiyi.<sup>1,2</sup>

### 18. Betsy-Chocolay

The Betsy-Chocolay region extends from near Marquette, Michigan in the west to Emerson in the east, south of Whitefish Point. The watersheds are within a forest dominated landscape. The coast includes 20% of all the sand beaches found on Lake Superior and 20% of all Lake Superior coastal wetlands.

Other coastal habitats include rocky shores and sandstone cliffs. Over 93% of the coastal zone of the Betsy-Chocolay unit is natural cover, and over 40% of the coastal zone is wetlands.

Extensive coastal wetland areas occur around Whitefish Point.

Important habitat sites for Lake Trout and Lake Whitefish can be found around Grand Island, Au Train Bay, South Bay, and the Pictured Rocks National Lakeshore. Munising Bay is utilized by Lake Sturgeon. The Grand Sable Dunes are located in this regional unit. The Two Hearted River is a Michigan Natural River System, a designation given to the finest river systems in the state, as well as a Wilderness River and an Outstanding State Resource Water. Several parks and protected areas occur throughout the region, including Hiawatha National Forest, Laughing Whitefish Falls Natural Area, Muskellunge Lake State Park, and Tahquamenon Falls State Park. The Whitefish Point Bird Observatory is a concentration area for migrating birds. Representative landscape complexes and important rare habitats and species are heavily present throughout this regional unit, particularly in the Two Hearted River area. At least 99 species and communities of conservation concern have been documented in this regional unit,



<sup>1</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.

<sup>2</sup>For a full list of the species and communities documented in the regional unit please see the corresponding [regional unit chapter](#) in Vol. 2 of the Lake Superior Biodiversity Conservation Assessment.

| Report Card <sup>3</sup> |       | Overall Grade: B  |
|--------------------------|-------|---|
| Conservation Target      | Grade | Conservation Target Notes   |
| Nearshore                | C     | Pictured Rocks National Lakeshore is located in this region. The region is adversely impacted by invasive species, warming water temperatures, and storm severity.  |
| Embayments & Inshore     | C     | Munising Bay is important to Lake Sturgeon and AuTrain Bay is important for Lake Whitefish and Lake Trout. This region is impacted by shoreline hardening and invasive species.                                   |
| Islands                  | A     | Grand Island is an important region for Lake Whitefish and Lake Trout.  |
| Coastal Wetlands         | B     | The region contains 20% of the total Lake Superior coastal wetlands. The region is impacted by terrestrial invasive species.  |
| Coastal Terrestrial      | A-    | Contains the most extensive sand beaches on Lake Superior, including the Grand Sable Dunes. The region is home to important Piping Plover habitat. The region is adversely affected by human impacts and erosion. |
| Tributaries & Watersheds | C     | This region is impacted by tributary dams and invasive species.   |

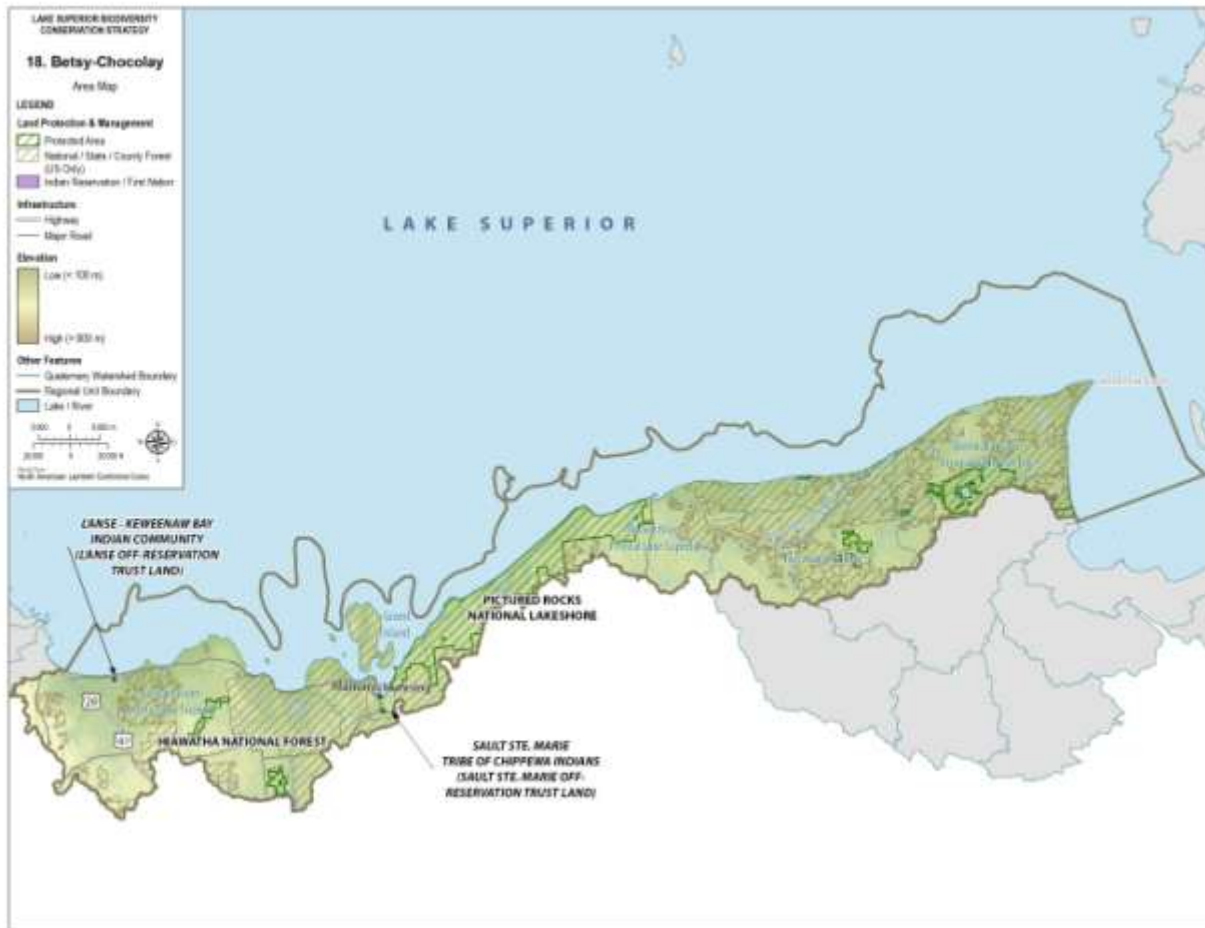
## Overview of Conservation Opportunities

Threats to the region come from terrestrial invasive species, coastal erosion, and forest fragmentation. Forest conservation efforts and enhanced education on invasive species in the region are necessary to maintain the high level of protection already in the region. Additional work on coastal dune erosion control and assessments of the high quality river systems in the region would be beneficial. Several individual watersheds have state-approved watershed management plans that could assist in some linkages.

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<sup>3</sup>Report Card grades are intended to denote relative (within Lake Superior basin) condition/health and stresses for each biodiversity target in the region based on available condition and stress indices. A more detailed explanation and expert comments on grades are available in the Lake Superior Biodiversity Conservation Assessment - Volume 2: Regional Unit Summaries.

## Area Map



## Conservation Actions

The Lake Superior community has a strong and ongoing history of taking action to restore and protect the lake’s extraordinary biodiversity. Actions are occurring at all scales – from national, state, provincial, tribal, First Nations, Métis, and municipal programs, to lakewide initiatives, to local projects by communities, businesses and households. Some important habitats currently have a conservation designation with a corresponding management strategy. Active supervision of these areas is essential to sustaining biodiversity. The table below presents next steps for conserving and protecting biodiversity in this regional unit. Other existing plans relevant to conserving habitats and species in this region should continue to be implemented. A list of existing plans relevant to the next steps presented below is presented at the end of this document.

Regional Plan Next Steps

There is some variation among Regional Plans in how future actions from existing plans were incorporated into this document, based on advice from the implementers of those plans in the region. Similarly, implementation approaches vary greatly among regional units. The Lake Superior Partnership serves an important role in facilitating cooperation among agencies to support on-the-ground action. Priority implementation actions developed through the Partnership are identified in the Lake Superior LAMP, Lake Partnership committee work plans, and agency specific action plans.

| Regional Objective  | Next Step   | Conservation Target      | Primary Lakewide Strategy |
|---|---|--------------------------|---------------------------|
| <b>Lakewide Strategy 1: Restore and protect a system of representative, high quality habitats.</b>  |   |                          |                           |
| <p><i>Common Actions For All Regional Plans</i></p> <p>Maintain or enhance areas where large blocks of land with natural cover exist or could be expanded.</p> <p>Preserve sites that have high species diversity and/or critical habitat for fish or wildlife.</p> |   | Multiple                 | 1.1                       |
| Protect the habitats of biological significance with special consideration to environmentally-sensitive sites in nearshore areas.   | Protect, manage, or restore sensitive habitat for Lake Trout, particularly Grand Island, AuTrain Bay, and South Bay.              | Nearshore                | 1.1                       |
|   | Protect, manage, or restore sensitive habitat for Lake Whitefish, particularly Grand Island, AuTrain Bay, and South Bay.          |                          |                           |
|   | Protect Big Reef near the Pictured Rocks National Lakeshore as a high quality spawning area.                                      |                          |                           |
|   | Protect the integrity of the Lake Superior coast with special consideration for the Grand Sable Dunes.                            | Coastal Terrestrial      | 1.1                       |
|   | Protect the integrity and connectivity of the region’s extensive coastal wetlands, particularly in the region of Whitefish Point. | Coastal Wetlands         | 1.1                       |
| Protect the habitats of biological significance with special consideration of important fish spawning sites in the tributaries.   | Identify and protect important fish spawning habitats.  | Tributaries & Watersheds | 1.1                       |

| Regional Objective  | Next Step  | Conservation Target      | Primary Lakewide Strategy |
|---|--|--------------------------|---------------------------|
| Restore habitats of biological significance.  | Restore coastal wetlands, where feasible.  | Coastal Wetlands         | 1.1                       |
| Protect the sensitive habitats of the Two-Hearted watershed.  | Inventory, monitor, and protect the rare plants and animals and their habitat.   | Multiple                 | 1.6                       |
| Protect the sensitive habitats in the region of Whitefish Point.  | Inventory, monitor, and protect the rare plants and Peregrine Falcons and their habitat.   | Multiple                 | 1.6                       |
| Protect the habitats of biological significance with special consideration given to tributaries supporting Ebony Boghaunter and King Rail.  | Protect and restore habitats by planting/favoring long-lived conifer and adding large woody material to streams.                                       | Tributaries & Watersheds | 1.1                       |
| Protect the habitats of biological significance with special consideration given to Jack Pine habitats.   | Support and manage habitats for the Kirtland's Warbler.  | Tributaries & Watersheds | 1.2                       |
| Protect water quality in the tributaries of the AuTrain River and Two-Hearted River.  | Decommission unnecessary roads.  | Tributaries & Watersheds | 1.4                       |
|   | Monitor water quality in tributaries that may be affected by mining activities.  | Multiple                 |                           |
|   | Inventory and repair eroding roads, trails, landings, and recreation sites near waterbodies.   | Tributaries & Watersheds |                           |
| Restore diversity and structure in northern hardwood ecosystems.  | Manage northern hardwood ecosystems to promote mid-tolerant tree species (Red Oak, Yellow Birch, Ash, and White Pine) and restore long-lived conifers. | Tributaries & Watersheds | 1.1                       |
|   | Maintain and promote large standing and down dead trees for cavity nesters and other wildlife and fish species.  |                          | 1.3                       |
| Achieve and maintain young forest habitats.   | Regenerate Aspen, Paper Birch, and Jack Pine where these stands are at risk of transitioning to later successional forest types.                       | Tributaries & Watersheds | 1.3                       |
| Increase people's awareness of, and challenges to, conserving critical aspects of Lake Superior's biodiversity, including cold water tributaries, barrens, and old growth habitats. | Support the outreach and education efforts in the Pictured Rocks National Lakeshore, Hiawatha National Forest, and Tahquamenon Falls State Park.       | Tributaries & Watersheds | 1.8                       |

| Regional Objective  | Next Step   | Conservation Target      | Primary Lakewide Strategy |
|---|---|--------------------------|---------------------------|
| Restore wetland habitats that have been hydrologically altered by roads, railroads or trails.   | Inventory, assess, and remove/restore roads, trails, railroads from wetlands where the hydrology and wetland function have been impaired.   | Tributaries & Watersheds | 1.3                       |
| Manage openings to provide habitats of biological significance and promote existing pollinator habitat as well as restore/enhance areas for pollinators.                              | Inventory, assess, and restore natural openings to native plant species.  | Multiple                 | 1.10                      |
| Protect and preserve critical dune habitat from erosion.  | Inventory, assess, and develop management plans to address threats.   | Coastal Terrestrial      | 1.1                       |
| <b>Lakewide Strategy 2: Manage plants and animals in a manner that ensures diverse, healthy, and self-sustaining populations.</b>   |   |                          |                           |
| <i>Common Actions For All Regional Plans</i><br>Review lists of regional species of conservation concern and identify gaps in monitoring, planning, and related conservation actions. |   | Multiple                 | 2.7                       |
| Restore the inshore fish community.   | Conduct an assessment of the inshore fish community.  | Embayments & Inshore     | 2.4                       |
| Restore and protect self-sustaining Lake Whitefish populations in as many of the original, native habitats as is practical, with emphasis in priority areas.                          | Conduct annual survey(s) to determine Lake Whitefish population status and trends.  | Nearshore                | 2.7                       |
| Restore and protect self-sustaining Lake Sturgeon populations in each tributary where they historically used to spawn (i.e., minimum 1500 adults).                                    | Identify and take the actions necessary to rehabilitate Lake Sturgeon in the region.  | Tributaries & Watersheds | 2.4                       |
| Restore and protect self-sustaining Brook Trout populations and coldwater habitats within the region.   | Take actions to rehabilitate Brook Trout in some of the 10 tributaries identified in the Brook Trout Rehabilitation Plan for Lake Superior. | Tributaries & Watersheds | 2.4                       |
| Restore and protect self-sustaining fish populations within tributaries of the Two-Hearted River.   | Determine the highest quality cold water habitats and prioritize projects to protect and connect habitats.                                  | Tributaries & Watersheds | 2.4                       |

| Regional Objective  | Next Step   | Conservation Target      | Primary Lakewide Strategy |
|---|---|--------------------------|---------------------------|
| Protect sensitive reptiles and amphibians, particularly Wood Turtles, Blanding’s Turtles, Mudpuppies, Eastern Newts, Tiger Salamanders, Mink Frogs, Five-lined Skinks, Smooth Green Snakes, and Ring-necked Snakes. | Document the presence of sensitive herptofauna and prioritize protection of specific habitat types, particularly in the regions of the Two-Hearted River, Rock River Canyon, and the Whitefish National Wildlife Reserve. | Multiple                 | 2.7                       |
|   | Maintain large upland openings where sensitive snake populations exist.   |                          |                           |
|   | Determine where turtles are most vulnerable at road-stream crossings and install protective devices.  |                          |                           |
|   | Evaluate the impact of subsidized mesopredators (e.g., Raccoons and Skunks) on turtle nest predation.   |                          | 2.3                       |
| Protect self-sustaining Moose populations in the region.  | Manage habitat to provide food sources and adequate cover for Moose in the face of a changing climate.  | Tributaries & Watersheds | 2.4                       |
|   | Manage Deer densities at a level compatible with viable Moose populations.  |                          |                           |
| Increase people's awareness of, and challenges to, conserving Lake Superior's biodiversity, including the State Endangered Piping Plover.   | Develop signs to post at boat landings and education materials to inform users of best practices to minimize disturbance.   | Coastal Terrestrial      | 2.3                       |
|   | Establish off-road vehicle controls in Piping Plover habitat areas.   |                          |                           |
| <b>Lakewide Strategy 3: Reduce the impact of existing aquatic invasive species and prevent the introduction of new ones.</b>  |   |                          |                           |
| <i>Common Actions For All Regional Plans</i><br>Control high priority infestations of aquatic invasive species, including continued control of Sea Lamprey.   |   | Multiple                 | 3.2                       |
| Prevent the spread of high priority aquatic invasive species in the region.   | Support the region’s aquatic invasive species prevention groups.  | Tributaries & Watersheds | 3.11                      |
|   | Prevent the spread of aquatic invasive species from ballast water via outreach and education.   | Nearshore                | 3.3                       |
|   | Install boat wash stations at Lake Superior landings and other “super-spreader” lakes.  | Tributaries & Watersheds | 3.3                       |
|   | Support the use of boat wash stations at high use landings and events (e.g. fishing tournaments) at other inland lakes.   | Tributaries & Watersheds | 3.3                       |

| Regional Objective  | Next Step   | Conservation Target      | Primary Lakewide Strategy |
|---|---|--------------------------|---------------------------|
|   | Inventory non-invaded lakes and initiate rapid response protocols when aquatic invasive species are detected.<br>Control high priority infestations (e.g. Eurasian Watermilfoil, Curly Pondweed, and Rusty Crayfish). | Multiple                 | 3.1                       |
| <b>Lakewide Strategy 4: Adapt to climate change.</b>  |   |                          |                           |
| <i>Common Actions For All Regional Plans</i><br>Incorporate climate change model projections and adaptive management measures into natural resource management plans. |   | Multiple                 | 4.1                       |
| Conduct climate change vulnerability assessments for fisheries, herptofauna, priority habitats and species, and nearshore water quality.                              | Utilize existing forest ecosystem climate change vulnerability report recommendations in project planning.  | Tributaries & Watersheds | 4.1                       |
| Identify and evaluate probable climate change impacts on cold-water dependent aquatic species, especially Brook Trout and Mudpuppies.                                 | Conduct intensive monitoring of high quality cold-water streams for climate change modeling and detection.  | Tributaries & Watersheds | 4.10                      |
| Implement adaptation actions to account for changes in variability and/or frequency in air and water temperatures, water levels, storm events, droughts, etc.         | Replace inadequate road and stream crossings in vulnerable watersheds; ensure they can sustain at least a 100-year flow event.  | Tributaries & Watersheds | 4.2                       |
| Develop and implement a long term climate change monitoring strategy.   | Identify and monitor at priority stream gauge stations to track how discharge and temperature could be changing with respect to climate change.   | Multiple                 | 4.13                      |
|   | Identify and monitor at priority watersheds to measure nutrient and sediment loading.   |                          |                           |
| Implement adaptive plant and forestry management practices that respond to climate change to minimize possible disturbances that impact Lake Superior.                | Address Spruce decline and enhance riparian forest diversity and resiliency.  | Tributaries & Watersheds | 4.3                       |



| Regional Objective  | Next Step   | Conservation Target      | Primary Lakewide Strategy |
|---|---|--------------------------|---------------------------|
| <p>Lakewide Strategy 5: <b>Reduce the negative impacts of dams and barriers by increasing connectivity and natural hydrology between the lake and tributaries.</b></p>  |   |                          |                           |
| <p><i>Common Actions For All Regional Plans</i><br/>                     Address barriers to fish passage created by dams, hydroelectric generation, or misplaced or wrong sized culverts.<br/><br/>                     Maintain flows and water levels on managed streams, rivers and lakes that emulate natural conditions (i.e., magnitude, duration, timing, and pattern).</p> |   | Tributaries & Watersheds | 5.2                       |
| <p>Inventory, assess, and prioritize barrier removal projects to restore aquatic habitat connectivity and provide for self-sustaining native populations of aquatic organisms in the region.</p>  | <p>Map unmapped roads in the Two-Hearted River and AuTrain River watersheds.<br/>                     Develop a map of subwatersheds to display watershed ratings of infrastructure vulnerability.<br/>                     Inventory road/stream crossings in watersheds with a high and very high infrastructure vulnerability rating.<br/>                     Estimate risk of failure for infrastructure in present and future climates.<br/>                     Prioritize infrastructure replacement projects and replace those with the best cost/benefit ratio.</p> | Tributaries & Watersheds | 5.1                       |
| <p>Lakewide Strategy 6: <b>Address other existing and emerging threat that may impact important habitat or native plant and animal communities.</b></p>   |   |                          |                           |
| <p>Promote best management practices and consideration of important habitat areas and species in the region during environmental assessment and regulatory processes for mining and related activities.</p>   | <p>Review, implement and promote pertinent mining operation management plans and results within the region (i.e., rehabilitation, water, and energy efficiency).<br/>                     Monitor important habitat and species within mining affected areas and acknowledge best management practices.</p>   | Tributaries & Watersheds | 6.1                       |
| <p>Prevent the spread of high priority terrestrial invasive species in the region.</p>  | <p>Support the region’s Cooperative Weed Management Areas, Central Upper Peninsula and Eastern Upper Peninsula.</p>   | Tributaries & Watersheds | 6.8                       |

| Regional Objective   | Next Step  | Conservation Target      | Primary Lakewide Strategy |
|--|--|--------------------------|---------------------------|
|  | Control high priority infestations (e.g., Garlic Mustard, Japanese Barberry, Bell's/Morrow's/Tartarian Honeysuckle, Purple Loosestrife, Common/Glossy Buckthorn, and 12 new invaders).       |                          |                           |
| Manage forest structure and composition to provide for healthy, resilient forests. | Practice sustainable forestry using best management practices to protect soil and water resources.   | Tributaries & Watersheds | 6.6                       |
|  | Monitor implementation and effectiveness of best management practices across land ownerships throughout the region.  |                          |                           |
|  | Maintain tree vigor and diversity of species, age class, and patch size to promote resilient forests in the face of new threats (e.g., Emerald Ash Borer, Hemlock Woolly Adelgid, Oak Wilt). |                          |                           |

## Regional Plan Development

Regional Plans are informed by a technical assessment, including maps of: 1. Coastal and Watershed Features; 2. Condition, and; 3. Important Habitat Sites. This information is available at: [www.natureconservancy.ca/superiorbca](http://www.natureconservancy.ca/superiorbca) .

The public and stakeholders who are connected to these areas provided input to the Next Steps in each Regional Plan. All input was considered and incorporated whenever possible and when relevant to a lakewide biodiversity conservation targets and threats. To contribute an update to this Regional Plan, please contact [superiorplans@glncpo.net](mailto:superiorplans@glncpo.net).

## Existing Plans

There is a strong ongoing history of action to restore and protect Lake Superior's extraordinary biodiversity. Actions are already occurring at all scales, from national programs to individual efforts. Some important habitats currently have a conservation designation with a corresponding management strategy. Active supervision of these areas is essential to sustaining biodiversity. Other existing plans relevant to conserving habitats and species in this region should continue to be implemented, including but not limited to:

- A Basin-wide Fish Habitat Strategic Plan for the Great Lakes
- Chocolay River Watershed Management Plan
- Cooperative Piping Plover Habitat Conservation in the Lake Michigan and Lake Superior Coastal Zones of the Upper Eastern Peninsula
- Great Lakes Fishery Commission – A Brook Trout rehabilitation plan for Lake Superior
- Great Lakes Fishery Commission – A Lake Sturgeon rehabilitation plan for Lake Superior
- Great Lakes Fishery Commission – A Lake Trout restoration plan for Lake Superior
- Great Lakes Fishery Commission – Fish-community objectives for Lake Superior
- Kirtland's Warbler Recovery Plan
- Lake Superior Aquatic Invasive Species Complete Prevention Plan
- Lake Superior Climate Change Adaptation Plan
- Lake Superior Climate Adaptation, Mitigation, and Implementation Plan
- Michigan Aquatic Invasive Species State Management Plan
- Michigan Climate Action Plan
- Michigan DNR Fisheries Strategic Plan
- Michigan DNR Invasive Species Strategy
- Michigan Forest Action Plan and State Forest Management Plans
- Michigan Great Lakes Plan
- Michigan Wildlife Action Plan
- Munising Bay Watershed Management Plan
- National Fish, Wildlife, and Plants Climate Adaptation Strategy
- Piping Plover Recovery Effort
- Two-Hearted River Watershed Management Plan