

Returning to a Healthy Lake: An International Biodiversity Conservation Strategy for Lake Erie

The Nature Conservancy:

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Lake Erie Millennium Network Meeting
October 30, 2013

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Photo ©TNC

LEBCS: Partners and Funding



“...working with a **broad network**...developing strategies for the **restoration and conservation** of the **native biodiversity** and **ecosystem function**...”

“primary output... **biodiversity conservation strategies** that will **complement** and **be incorporated** into the **Lakewide Action and Management Plans (LAMPS)**”

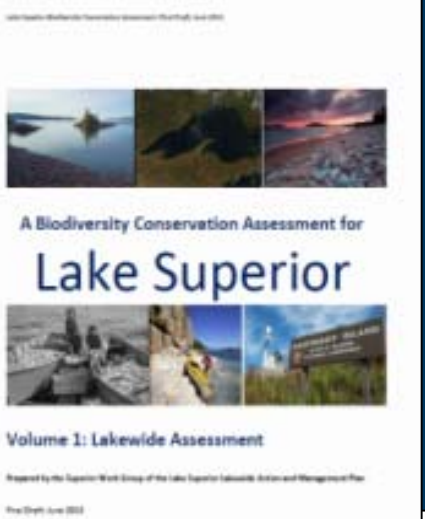
With funding from:



Environment
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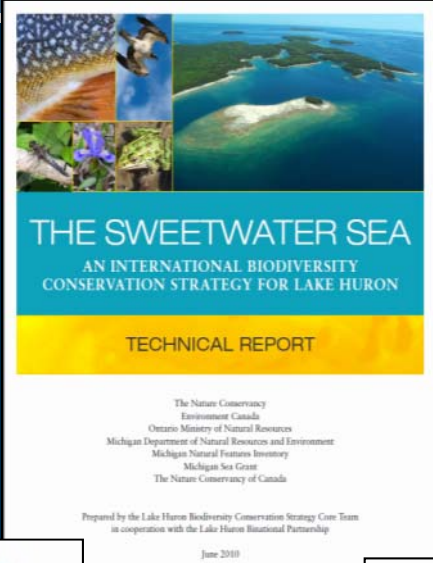
Biodiversity Conservation Strategies for the Great Lakes (2009-2013)



A Biodiversity Conservation Assessment for Lake Superior

Volume 1: Lakewide Assessment

Prepared by the Superior Work Group of the Lake Superior Lakewide Action and Management Plan
Final Draft June 2010

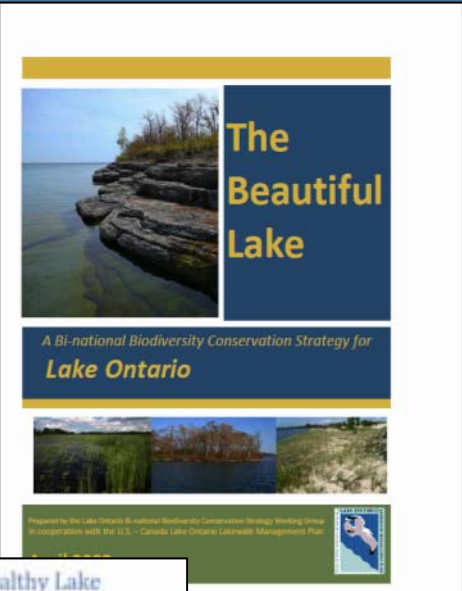


THE SWEETWATER SEA
AN INTERNATIONAL BIODIVERSITY CONSERVATION STRATEGY FOR LAKE HURON

TECHNICAL REPORT

The Nature Conservancy
Environment Canada
Ontario Ministry of Natural Resources
Michigan Department of Natural Resources and Environment
Michigan Natural Features Inventory
Michigan Sea Grant
The Nature Conservancy of Canada

Prepared by the Lake Huron Biodiversity Conservation Strategy Core Team
in cooperation with the Lake Huron Binational Partnership
June 2010



The Beautiful Lake

A Bi-national Biodiversity Conservation Strategy for Lake Ontario

Prepared by the Lake Ontario Bi-national Biodiversity Conservation Strategy Working Group
in cooperation with the U.S. - Canada Lake Ontario Lakewide Management Plan

MICHIGAMI: GREAT WATER
Strategies to Conserve the Biodiversity of Lake Michigan

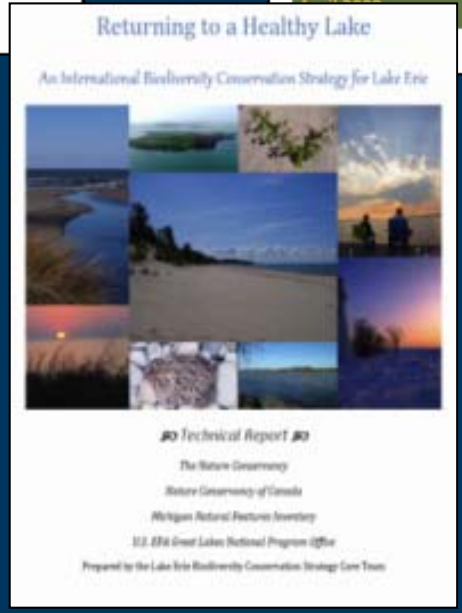


Technical Report #0

The Nature Conservancy
Michigan Natural Features Inventory
U.S. EPA Great Lakes National Program Office

Prepared by the Lake Michigan Biodiversity Conservation Strategy Core Team

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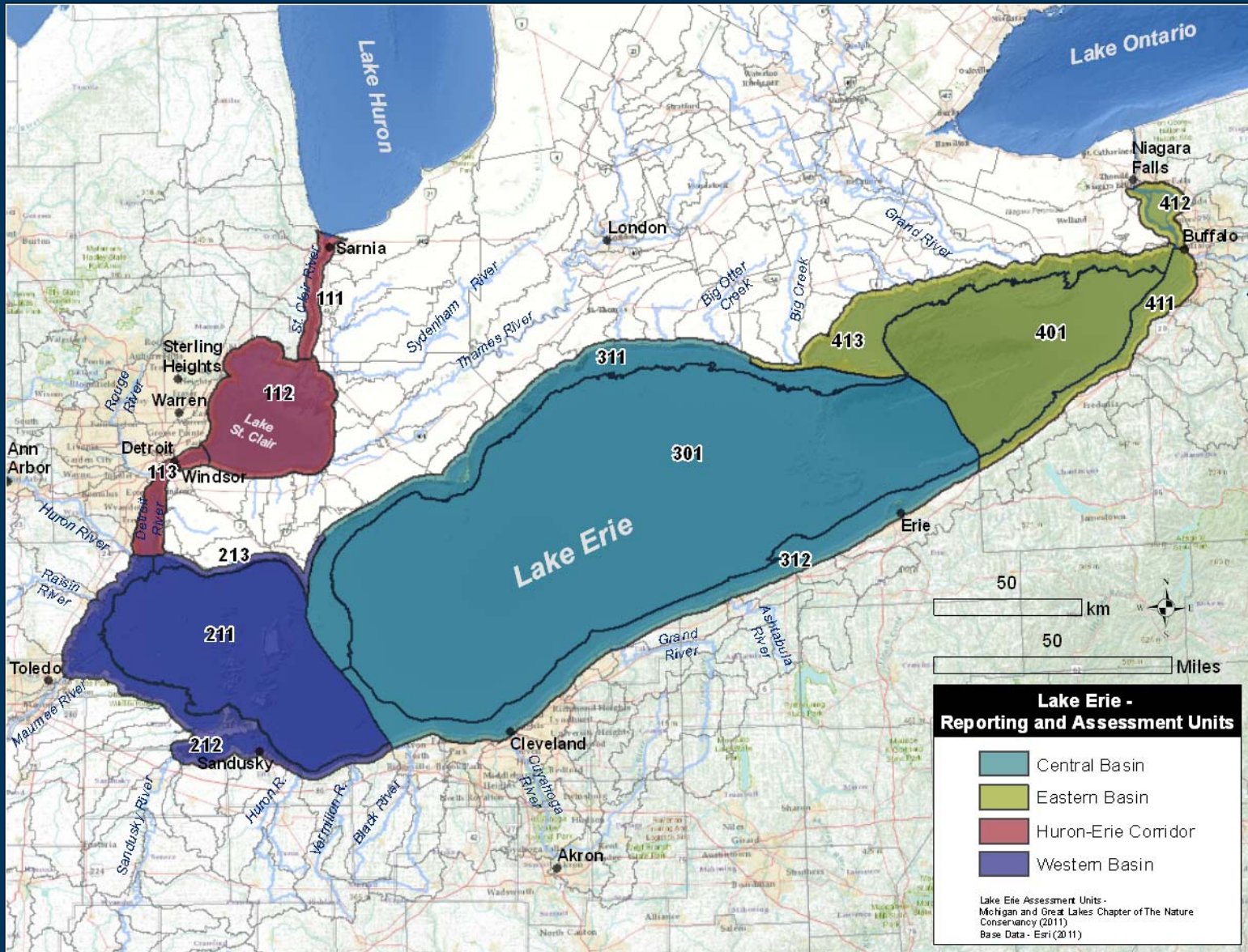
Conservation Action Planning (CAP)



Components of LEBCS

- Defining biodiversity conservation targets
- Assessing viability (current status and goals for future)
 - 110 indicators
- Critical threats
- Conservation strategies
- Priority areas (significant coastal biodiversity)
- Ecosystem services assessment
- Implementation recommendations

Providing greater resolution: Lake Erie Stratification Units



Aquatic Biodiversity Targets

- 
- Open Water Benthic and Pelagic Ecosystem
 - Nearshore Zone
 - Native Migratory Fish
 - Coastal Wetlands
 - Lake Erie Connecting Channels

Terrestrial Biodiversity Targets

- Islands
- Coastal Terrestrial Systems
- Aerial Migrants

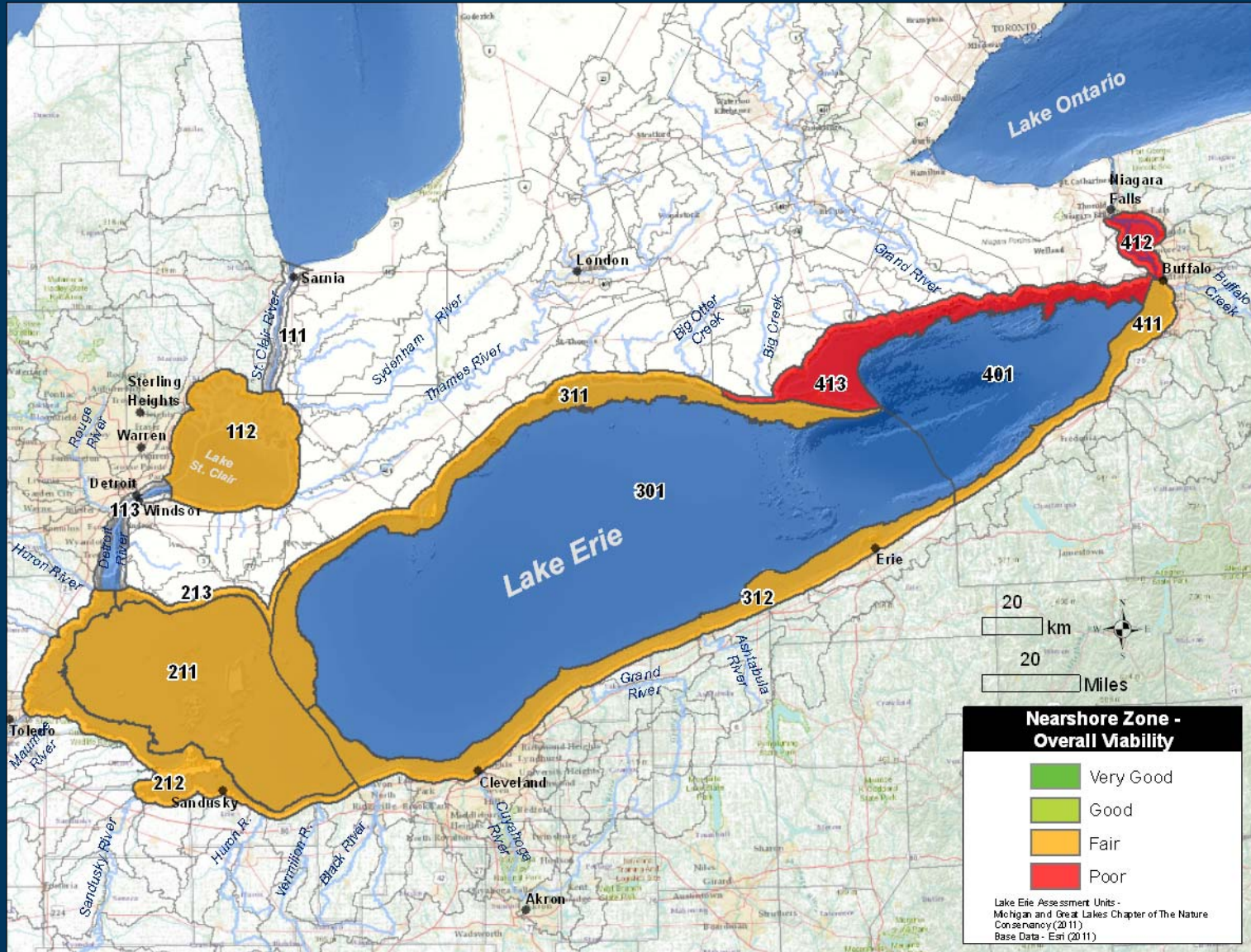


North Bass Island Photo ©TNC

Current Viability Status: Nearshore Zone

KEA Type	KEA	Indicator	Poor	Fair	Good	Very Good	RS	RU	AU	Current Value (Source)
Condition	Food web linkages	Hexagenia mean density in fine sediments (3 yr average)	<30 / m ²	30-100 / m ² or >400 / m ²	101-200 / m ² or 301-400 / m ²	201-300 / m ²	RS	HEC	112	NA
								WB	211	NA
									212	NA
									213	NA
									311	(NS)
								CB	312	(NS)
									EB	411
								413		NA
Condition	Food web linkages	Mean densities of rotifers, copepods, and cladocerans in early summer (individuals/L)	Rotifers <100; Copepods <50; Cladocerans <35	Rotifers 100 - 150; Copepods 50 - 75; Cladocerans 35 - 50	Rotifers >150 - 300; Copepods >75 - 125; Cladocerans >50 - 75	Rotifers >300; Copepods >125; Cladocerans >75	RS	HEC	112	NA
								WB	211	NA
									212	NA
									213	NA
									311	NA
								CB	312	NA
									EB	411
								413		NA
Condition	Soil / sediment stability & movement (land context)	Bed load traps and groins (number of structures per 100 km of shoreline)	>100	>50 - 100	>25 - 50	0 - 25	EK	HEC	112	0 (IA)
								WB	211	30.57 (IA)
									212	154.18 (IA)
									213	6.19 (IA)
									311	1.16 (IA)
								CB	312	291.28 (IA)
									EB	411
								413		4.56 (IA)

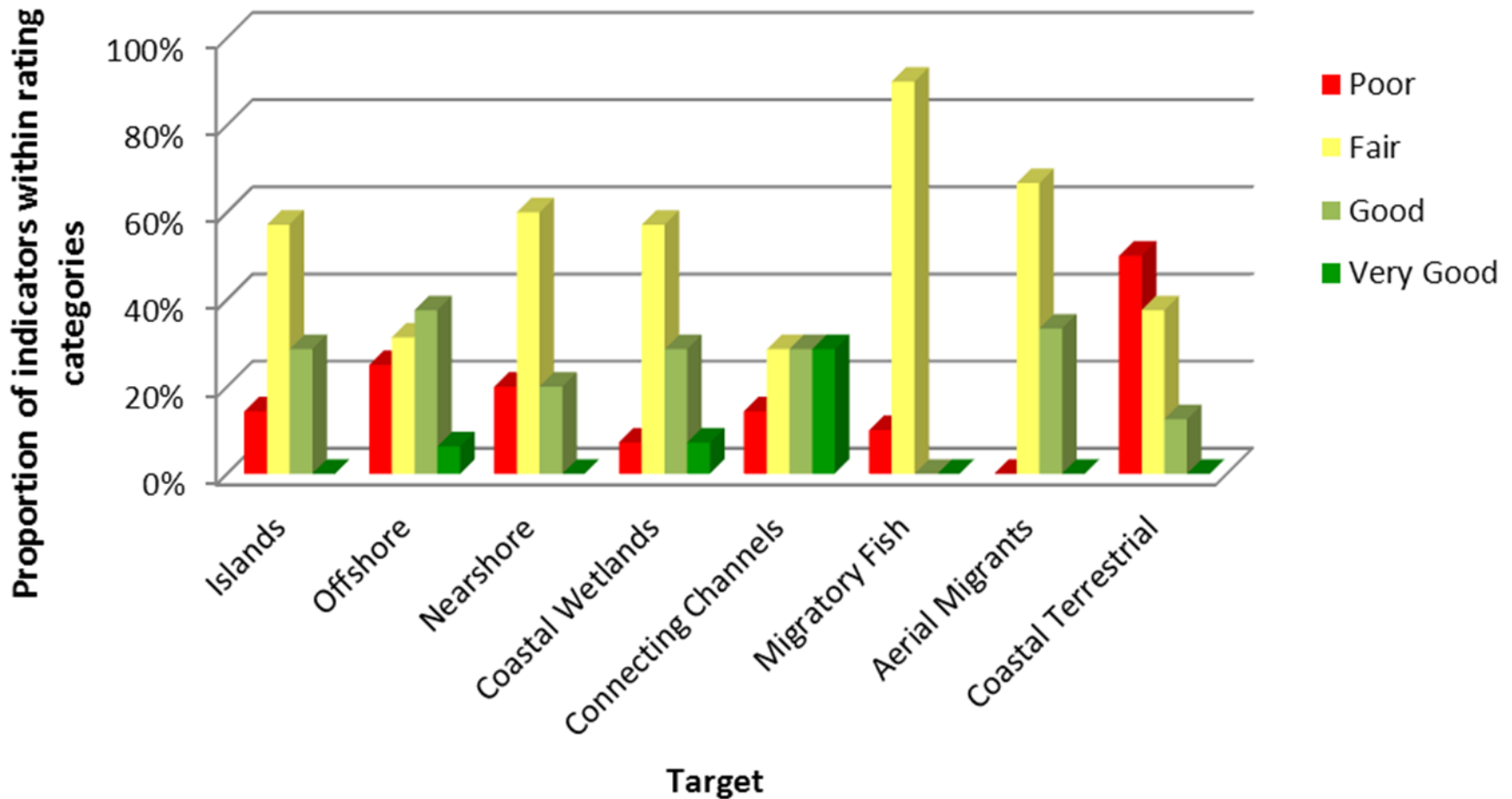
Current Viability Status: Nearshore Zone



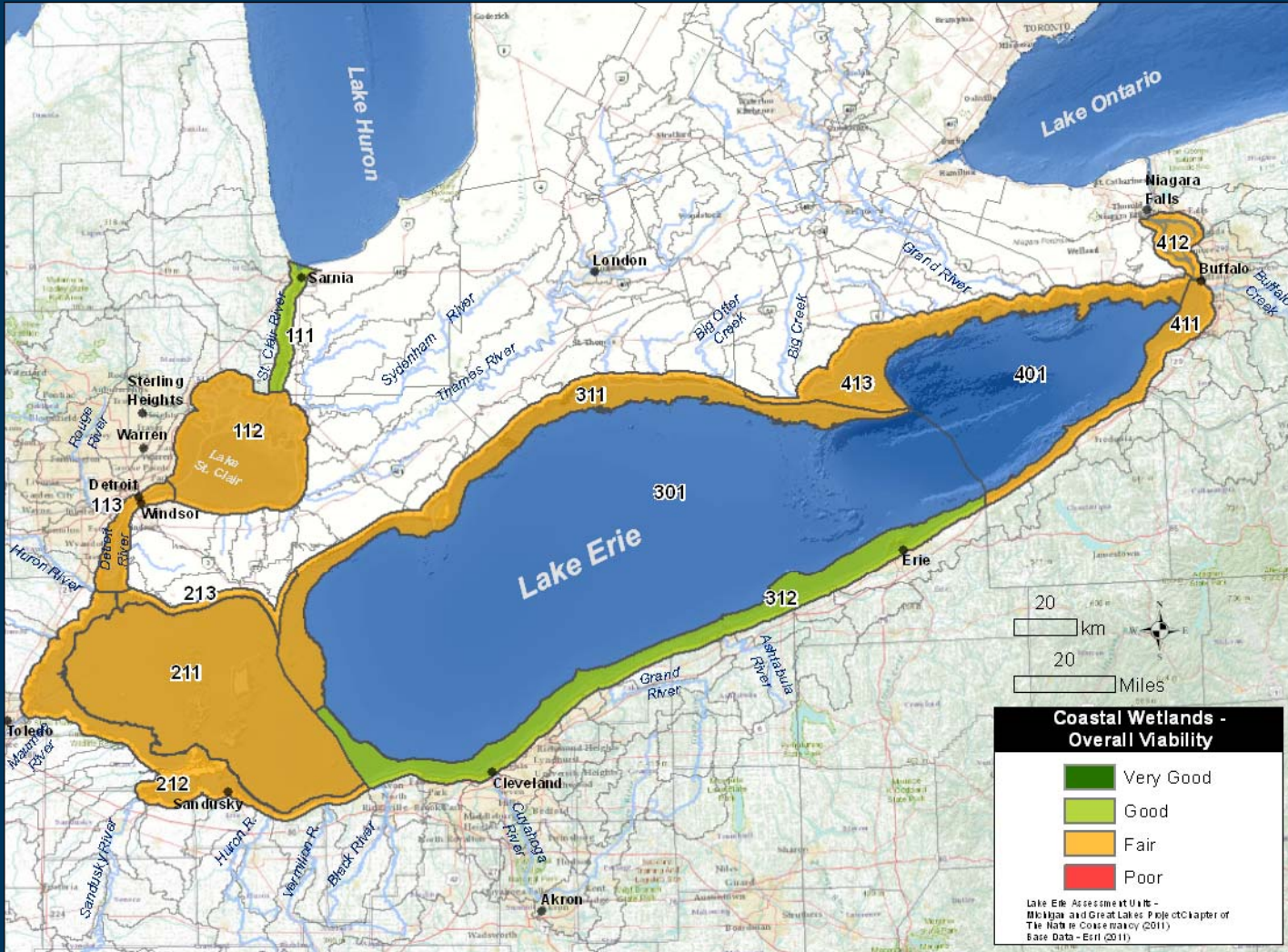
Current status of biodiversity

Target	Huron-Erie Corridor	Western Basin	Central Basin	Eastern Basin	Lakewide
Nearshore Zone	Fair	Fair	Fair	Fair	Fair
Aerial Migrants	Good	Good	Fair	Fair	Good
Coastal Terrestrial Systems	Fair	Fair	Fair	Fair	Fair
Coastal Wetlands	Fair	Fair	Good	Fair	Fair
Connecting Channels	Fair			Fair	Fair
Islands	Fair	Fair	Good	Fair	Fair
Native Migratory Fish	Fair	Fair	Fair	Fair	Fair
Open Water Benthic and Pelagic Ecosystem			Fair	Fair	Fair
Overall Biodiversity Health	Fair	Fair	Fair	Fair	Fair

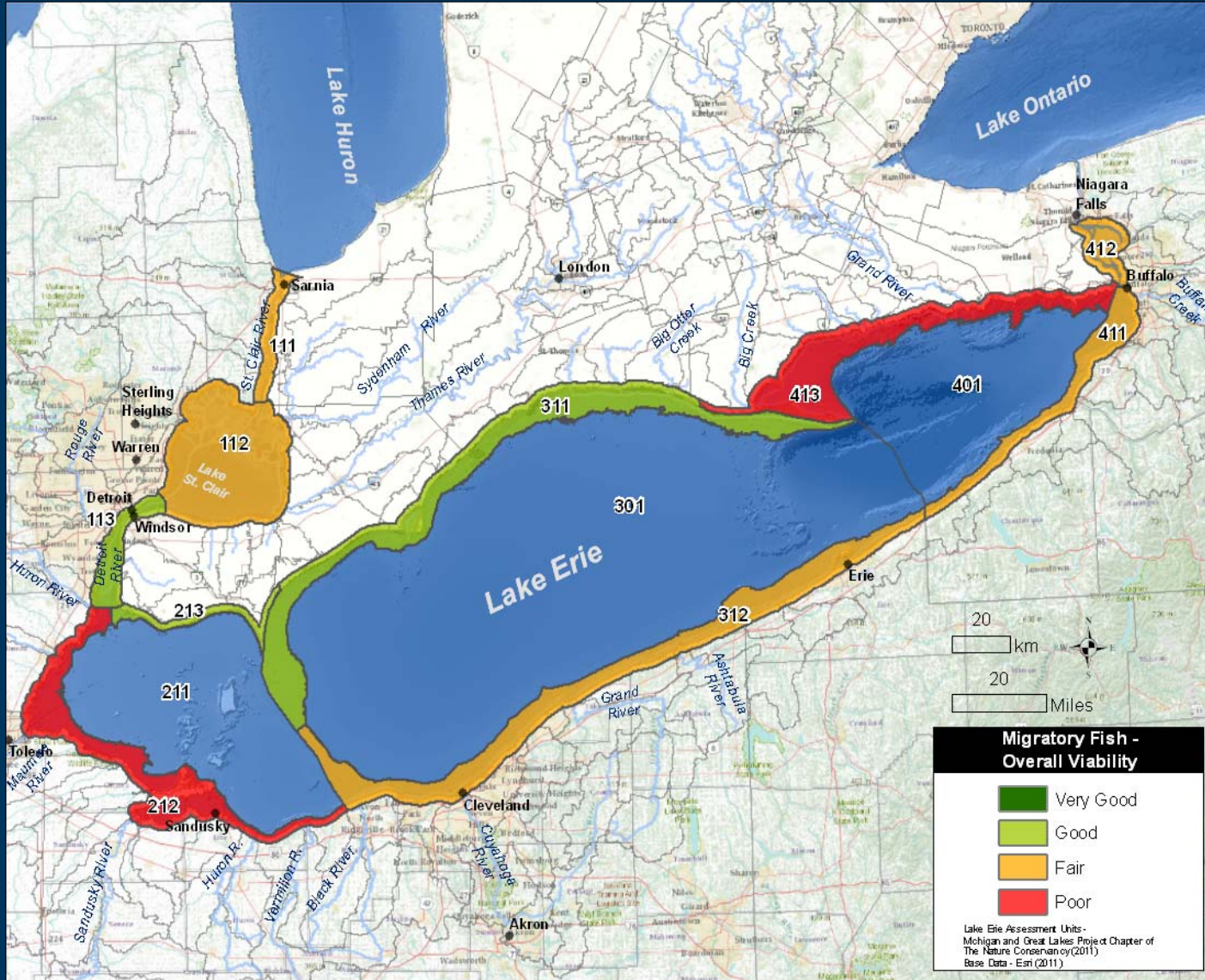
All “Fairs” are not created equal



Overall viability of Coastal Wetlands



Overall viability of Native Migratory Fish



Threat assessment results: Lakewide Summary

	Huron – Erie Corridor	Western Basin	Central Basin	Eastern Basin
Invasive aquatics	Very High	High	High	High
Climate: habitat shifting/ alteration	High	High	High	High
Invasive terrestrial	High	High	High	High
Pollution: Ag/forestry	High	High	High	High
Housing/urban development	High	High	Medium	High
Shoreline Alterations	High	High	Medium	High
Contaminated sediments	Medium	Medium	Medium	High
Pollution: industrial	High	Medium	Medium	Medium
Pollution: Urban/household	Medium	Medium	Medium	High

- Reduce Agricultural Non-Point Source Pollutants
- Prevent, Detect, and Control Invasive Species (aquatic and terrestrial)
- Promote Compatible Housing & Urban Development and Shoreline Restoration
- Reduce Urban Non-Point and Point Source Pollutants
- Remove and Mitigate Dams and Barriers

Reduce Agricultural Non-Point Source Pollutants

**Strategy 1: Target and intensify nutrient management
BMPs to reduce Soluble Reactive Phosphorus
loadings to Lake Erie**

**Strategy 2: Promote in-field management of drainage
AND management of surface drainage channels to
moderate discharge extremes and limit nutrient
export**

Prevent, Detect, and Control Invasive Species (terrestrial)

- 1: Assemble key regional partners to create a coordinated action plan by 2013
- 2: Coordinate regulation of Common Reed in Canada and the U.S.
- 3: Improve coordination of early detection and rapid response of Common Reed.
- 4: Enhance coordination of outreach and marketing.

Prevent, Detect, and Control Invasive Species (aquatic)

- 1: Develop common framework for control/ mgmt
- 2: Build political support for policies and regulations re: control and management
- 3: Improve coordination of prevention, early detection and rapid response
- 4: Demonstrate and quantify results of restoration

Coastal Conservation Strategies:

- Strategy 1: Build a Business Case for Coastal Conservation
- Strategy 2: Develop a Comprehensive Education/Outreach Shoreline Softening Program

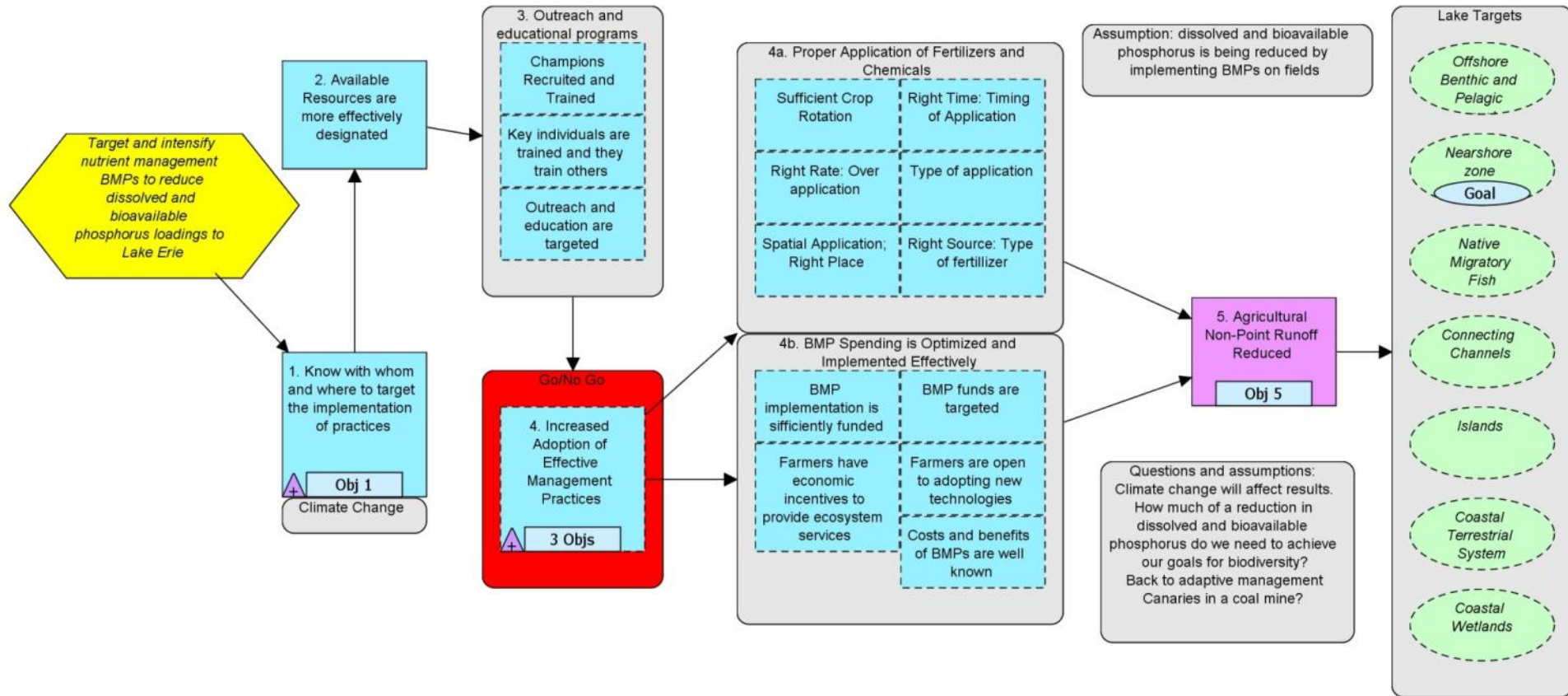
Reduce Urban Non-Point and Point Source Pollutants

Strategy 1: Improve Stormwater Management

Strategy 2: Green Infrastructure

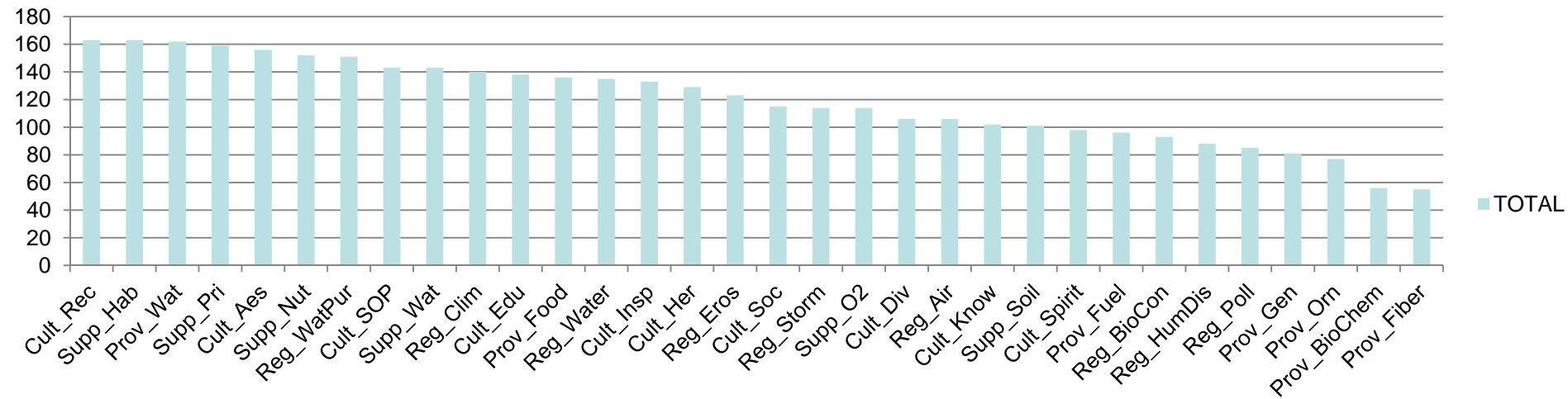
Strategy 1: Increase Connectivity to Lake Erie Focusing on First Barriers

Ag NPS Strategy 1



Ecosystems Services Assessment: Results of survey 1

Lake Erie Ecosystem Services Ranking



What's needed now?

Review and adoption by the LE LAMP

Implementation

- Coordination
- Project tracking

Indicators

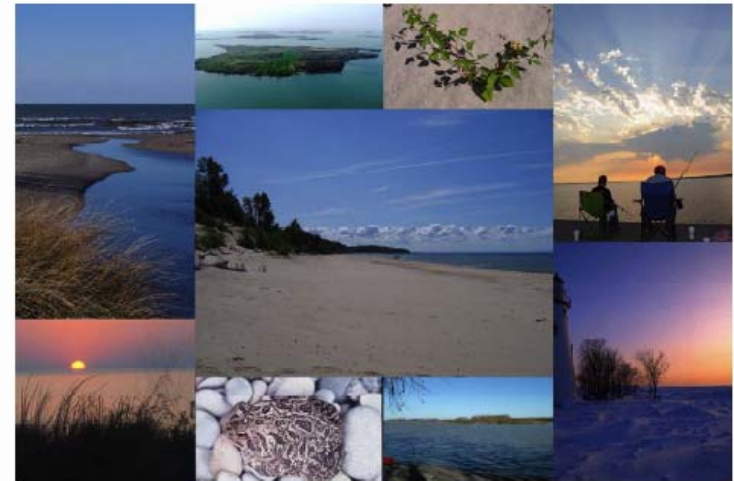
- Tracking
- Revision

Great Lakes Information Management & Delivery System

- Gateway to information
- Track progress

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Conservation By Geography



Africa



Asia Pacific



Latin America



North America

Canada

United States

Alaska

Arizona

California

Colorado

Eastern Division

Michigan

Projects & Reports

Climate Change

▶ Great Lakes Biodiversity

Migratory Birds

Montana

Oregon

West Virginia

Home » Conservation By Geography » North America » United States » Michigan » Projects & Reports » Great Lakes Biodiversity



Great Lakes Biodiversity Conservation Strategies



The Nature Conservancy, working with the Michigan Natural Features Inventory and Nature Conservancy of Canada, has completed biodiversity conservation strategies—or “blueprints”—for Lakes **Ontario, Erie, Huron** and **Michigan**. **Nature Conservancy of Canada** has independently produced a biodiversity conservation assessment for **Lake Superior**.

The blueprints reveal that, overall, the nearshore and open waters, connecting channels, coastal wetlands, islands, and native migratory fish in the lakes face many challenges, but remain in restorable condition. Similarly, coastal areas such as beaches, bluffs, dunes, and shoreline forests are doing very well in some areas and poorly in others.

Critical problems for all lakes include:

- Aquatic and terrestrial invasive species
- Dams and other barriers to passage of migratory fish
- Hardened shorelines (except for Lake Superior)
- Incompatible coastal development
- Pollution from agricultural and urban non-point sources



Key Resources

[Lake Erie](#)

[Lake Huron](#)

[Lake Michigan](#)

[Lake Ontario](#)

[Lake Superior](#)

Supplied by Nature Conservancy of Canada

Questions?

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<http://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/michigan/projects/biodiversity/Pages/default.aspx>