Nearshore Terrestrial Ecosystems

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The Nature Conservancy Canada

Photo Credit: GLNPO Image Collection (Minnesota Extension Service, Dave Hansen)

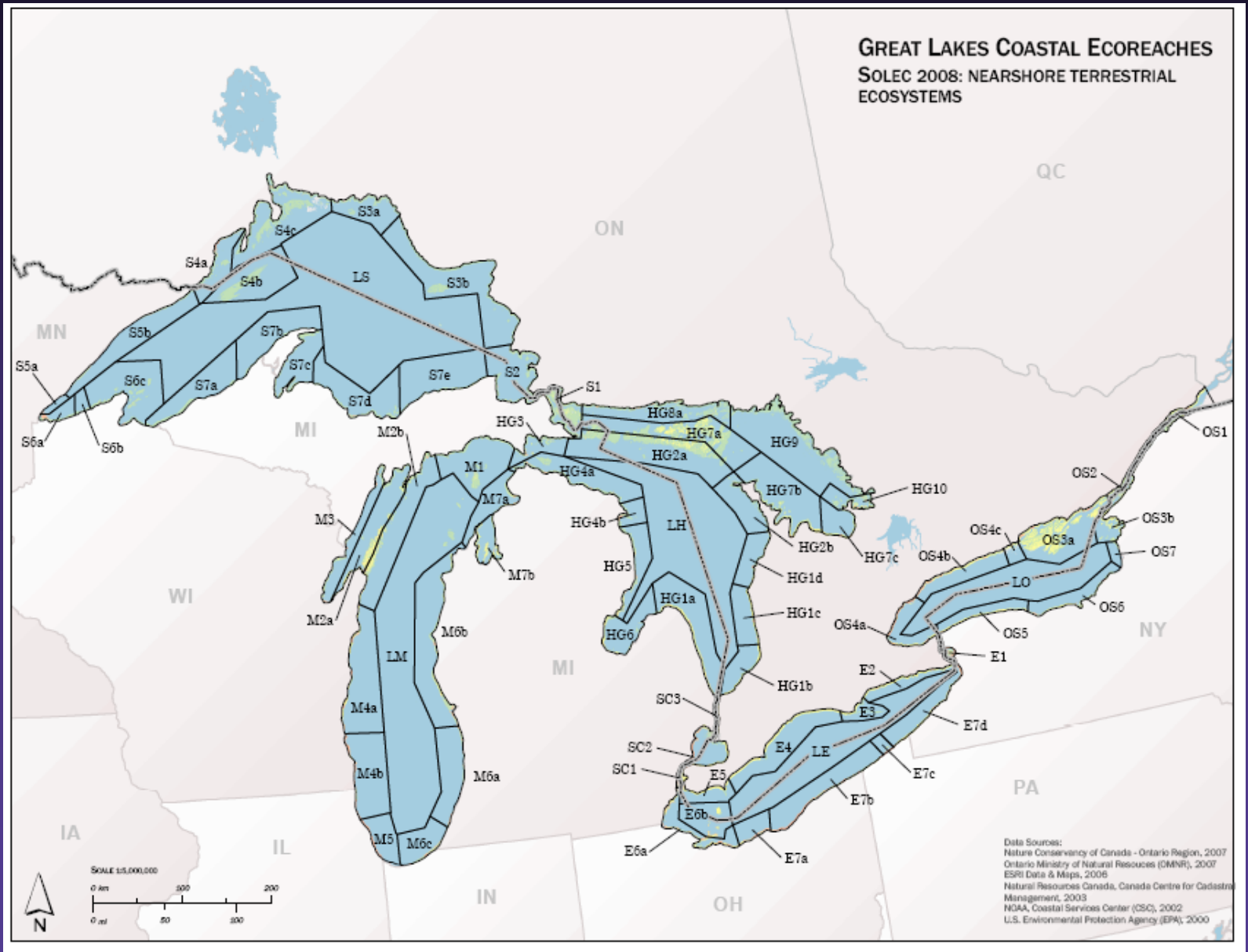
Project Goals

- Update from 1996 SOLEC report on Nearshore Terrestrial Ecosystems (Reid & Holland 1997)
- Establish baseline information
- Identify trends

Methods

- Data-driven approach
- GIS analysis of coastal ecosystems to assess extent & distribution
- GIS assessment of condition/ pressures based on landcover
- Literature review to examine classification of coastal ecosystems, their condition & pressures

Methods


GREAT LAKES COASTAL ECOREACHES
SOLEC 2008: NEARSHORE TERRESTRIAL ECOSYSTEMS
QC
ON
MN
MI
WI
IA
IL
IN
OH
PA
NY
S3a
S4c
S4a
S4b
LS
S3b
S5b
S7b
S5a
S6c
S7a
S7c
S7e
S2
S1
S6a
S6b
S7d
HG8a
HG3
HG7a
HG9
M2b
HG2a
M1
HG4a
HG7b
HG10
M7a
M3
HG4b
LH
HG2b
HG7c
M7b
HG5
HG1d
HG1a
HG1c
M2a
M6b
HG6
LM
HG1b
M4a
SC3
E3
E7d
SC2
E4
LE
SC1
E5
E7c
M4b
M6a
E6b
E7b
M5
M6c
E6a
E7a
OS1
OS2
OS3b
OS4c
OS3a
OS7
OS4b
LO
OS6
OS4a
OS5
E1
E2
N
Data Sources:
Nature Conservancy of Canada - Ontario Region, 2007
Ontario Ministry of Natural Resouces (OMNR), 2007
ESRI Data & Maps, 2006
Natural Resources Canada, Canada Centre for Cadastral Management, 2003
NOAA, Coastal Services Center (CSC), 2002
U.S. Environmental Protection Agency (EPA), 2000

Importance of Coastal Terrestrial Ecosystems

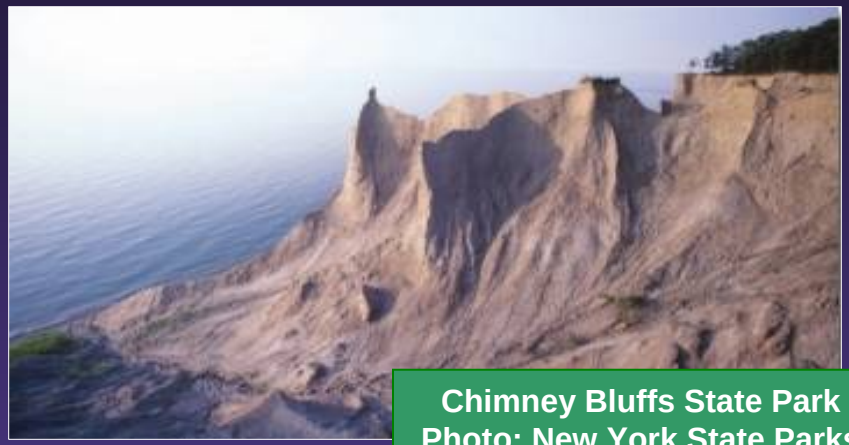
- 28,300 km of coast
- Over 25 globally rare vegetation communities
- Endemic species

Great Lakes Foredunes
Pinery Provincial Park, Lake Huron

Lakeplain Prairie
Ojibway Provincial Nature Reserve, Detriot River

Importance of Coastal Terrestrial Ecosystems

- Linked to the biodiversity and health of nearshore waters
- Zone of transfer of biomass and sediments



Chimney Bluffs State Park
Photo: New York State Parks

Mayflies
Lake Erie

Coastal Terrestrial Ecosystems

Cobble Beach
Manitoulin Island, Lake Huron

1. Great Lakes Sand Beaches
2. Great Lakes Foredunes
3. Coastal Back Dune Complexes
4. Bedrock Shores
5. Cobble Beaches
6. Shoreline Cliffs
7. Shoreline Bluffs
8. Lakeplain Prairies
9. Arctic-Alpine Disjunct Communities
10. Atlantic Coastal Plain Disjunct Communities
11. Rich Coastal Fens
12. Shoreline Alvars
13. Coastal Rock Barrens
14. Great Lakes Coastal Forests

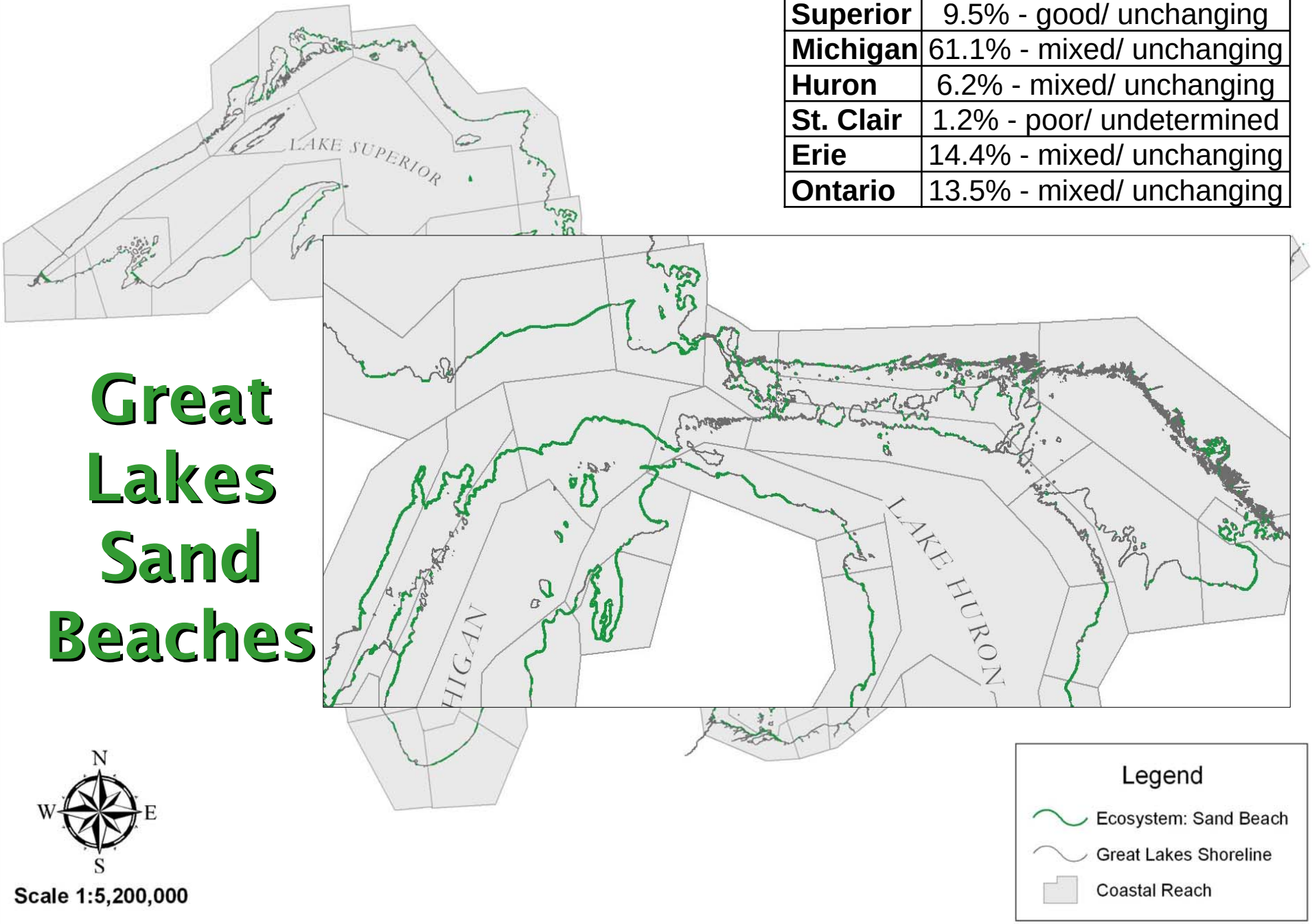
Great Lakes Sand Beaches

- 3385 km
- Ranked globally rare
- Many key sites are within protected areas

Great Lakes Beach
Carter Bay, Lake Huron

Great Lakes Sand Beaches

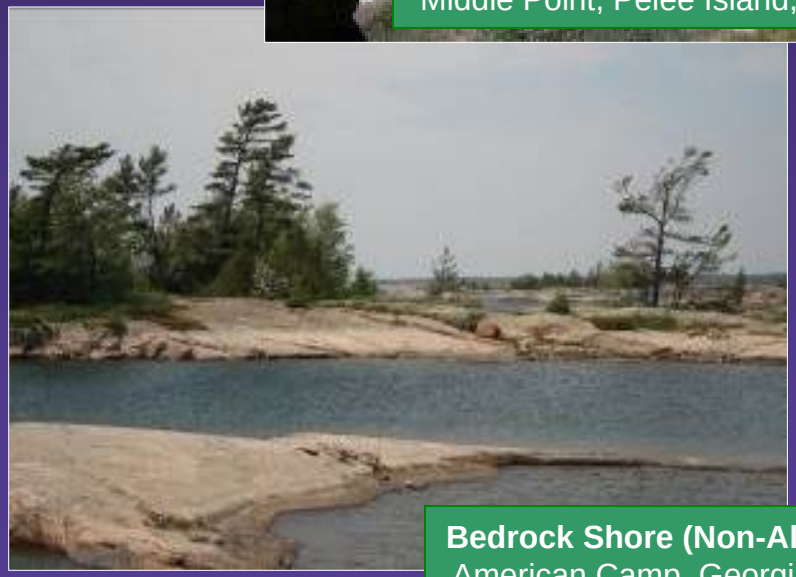
	% of Coast - Status/Trend
Superior	9.5% - good/ unchanging
Michigan	61.1% - mixed/ unchanging
Huron	6.2% - mixed/ unchanging
St. Clair	1.2% - poor/ undetermined
Erie	14.4% - mixed/ unchanging
Ontario	13.5% - mixed/ unchanging



Bedrock Shores

- 6000 km
- Four major types identified based on substrate
- Limestone and sandstone types considered globally rare

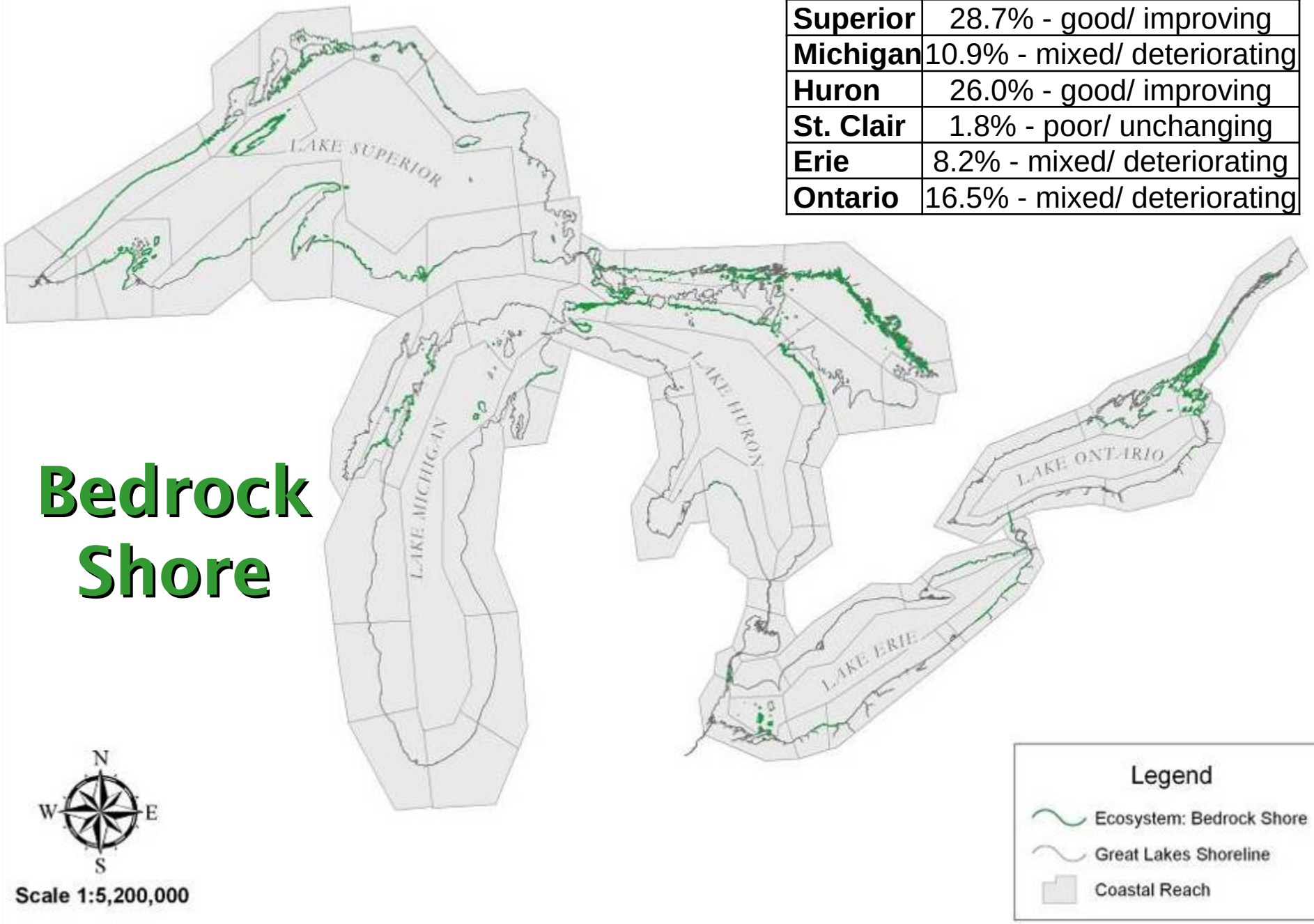
Bedrock Shore (Alkaline)
Middle Point, Pelee Island, Lake Erie



Bedrock Shore (Non-Alkaline)
American Camp, Georgian Bay

Bedrock Shore

	% of Coast - Status/Trend
Superior	28.7% - good/ improving
Michigan	10.9% - mixed/ deteriorating
Huron	26.0% - good/ improving
St. Clair	1.8% - poor/ unchanging
Erie	8.2% - mixed/ deteriorating
Ontario	16.5% - mixed/ deteriorating



Cobble Beaches

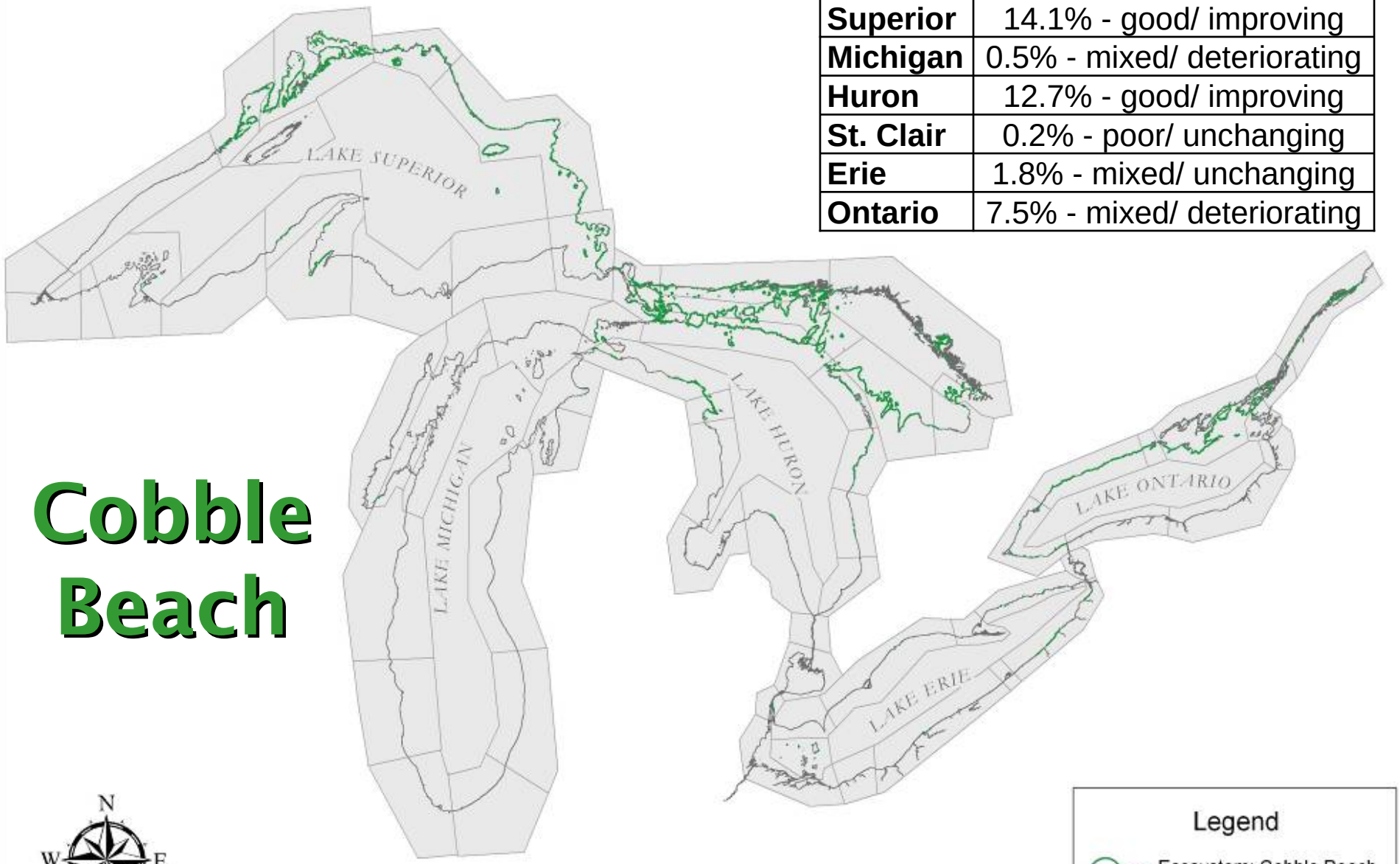
- 2720 km
- Three major types identified based on substrate
- Limestone type considered globally rare

Cobble Beach
Gravelly Point, Bruce Peninsula, Georgian Bay

Cobble Beach
Cape Hurd, Bruce Peninsula, Lake Huron

Cobble Beach

	% of Coast - Status/Trend
Superior	14.1% - good/ improving
Michigan	0.5% - mixed/ deteriorating
Huron	12.7% - good/ improving
St. Clair	0.2% - poor/ unchanging
Erie	1.8% - mixed/ unchanging
Ontario	7.5% - mixed/ deteriorating



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S

Scale 1:5,200,000

Legend

Ecosystem: Cobble Beach

Great Lakes Shoreline

Coastal Reach

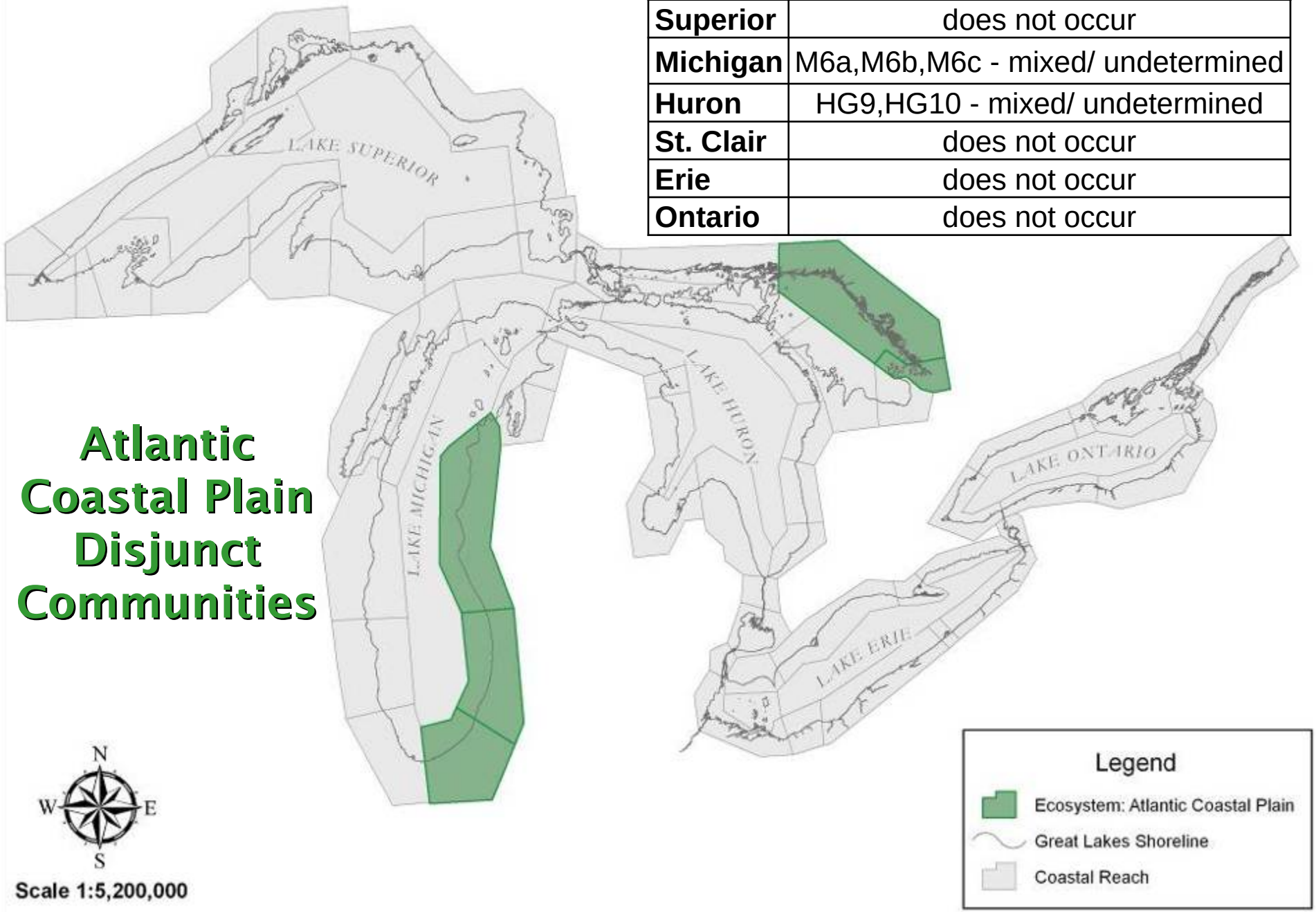
Atlantic Coastal Plain Disjunct Communities

Atlantic Coastal Plain Disjuncts
Sandy Island, Georgian Bay

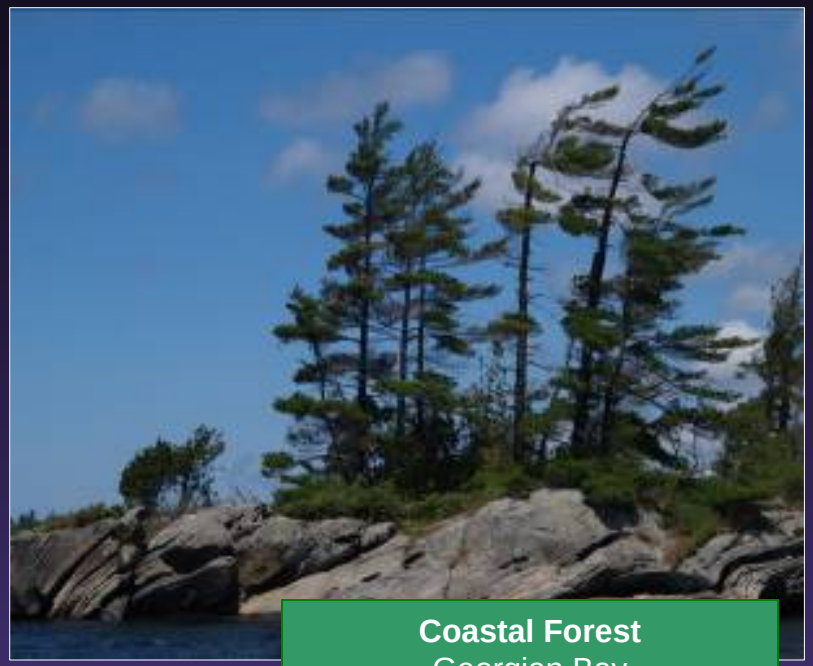
- Globally rare
- Limited by specific habitat requirements
- Not restricted to Great Lakes shores

Atlantic Coastal Plain Disjunct Communities

	Coastal Ecoreaches - Status/Trend
Superior	does not occur
Michigan	M6a,M6b,M6c - mixed/ undetermined
Huron	HG9,HG10 - mixed/ undetermined
St. Clair	does not occur
Erie	does not occur
Ontario	does not occur



Coastal Forests



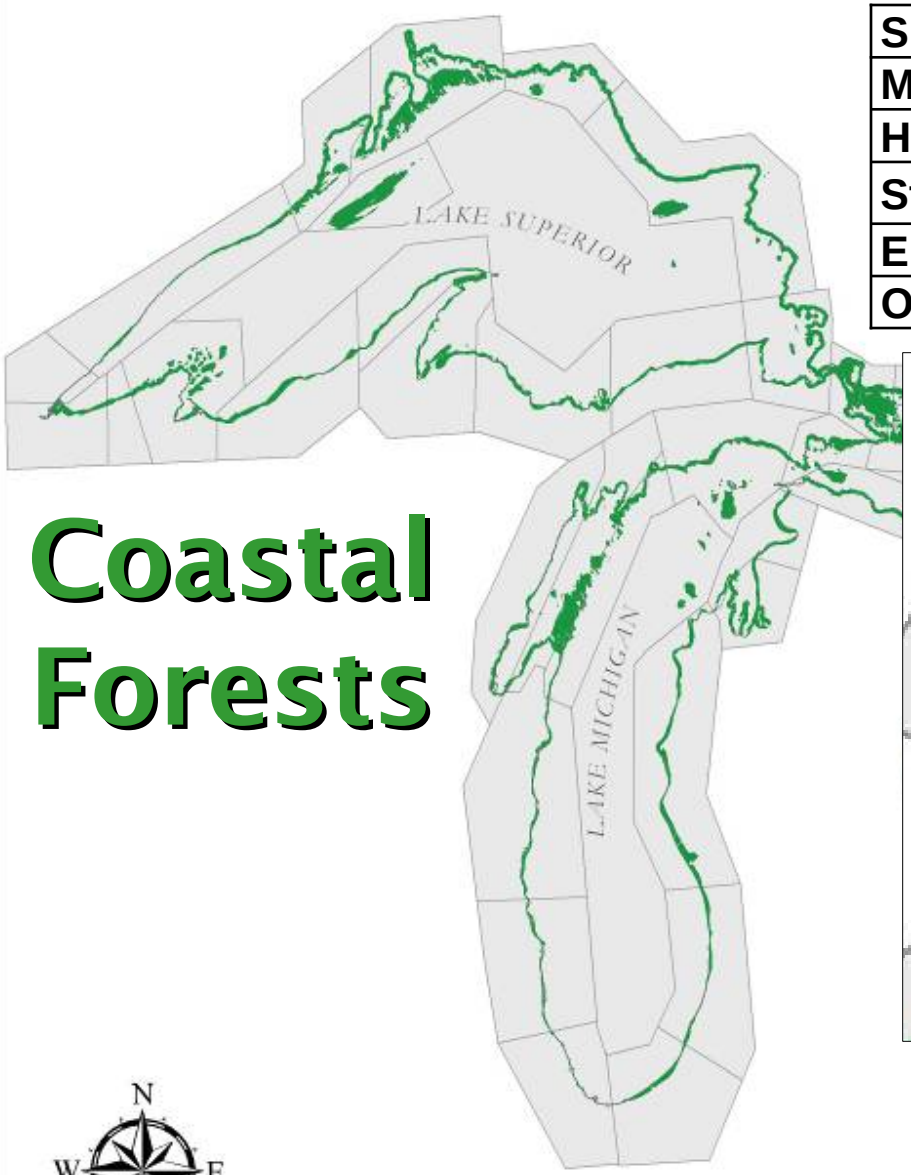
Coastal Forest
Georgian Bay

Coastal Forest
Trout Bay, Lake Superior

- Coast influences structure and composition
- Important for migratory species
- Biomass transfer from lake to land

Coastal Forests

	% of Coast (2km inland) - Status/Trend
Superior	80.1% - good/ improving
Michigan	28.9% - mixed/ deteriorating
Huron	59.9% - mixed/ improving
St. Clair	9.5% - poor/deteriorating
Erie	14.2% - poor/deteriorating
Ontario	24.0% - mixed/ unchanging



Scale 1:5,200,000

Legend

- Ecosystem: Coastal Forest
- Great Lakes Shoreline
- Coastal Reach

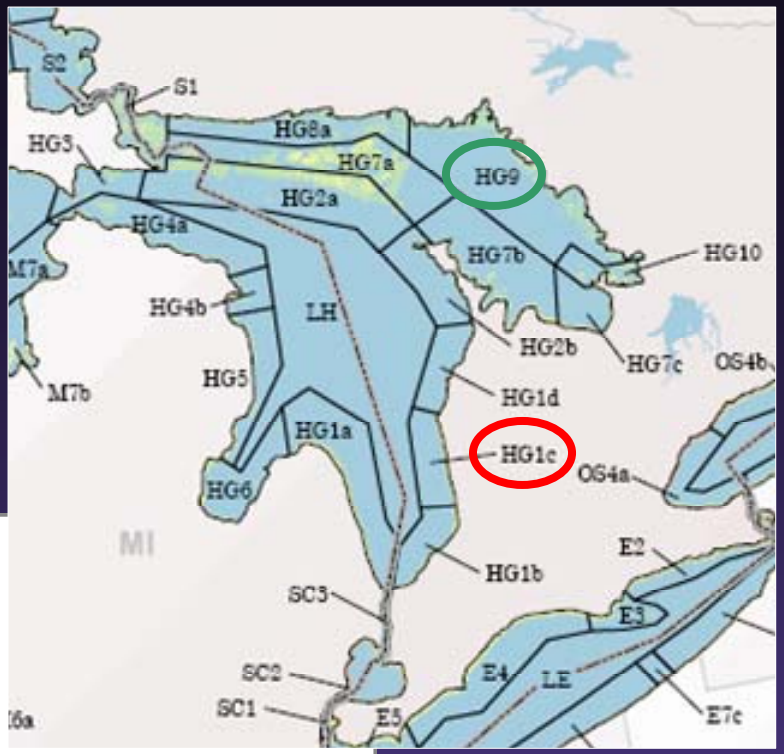
Pressures

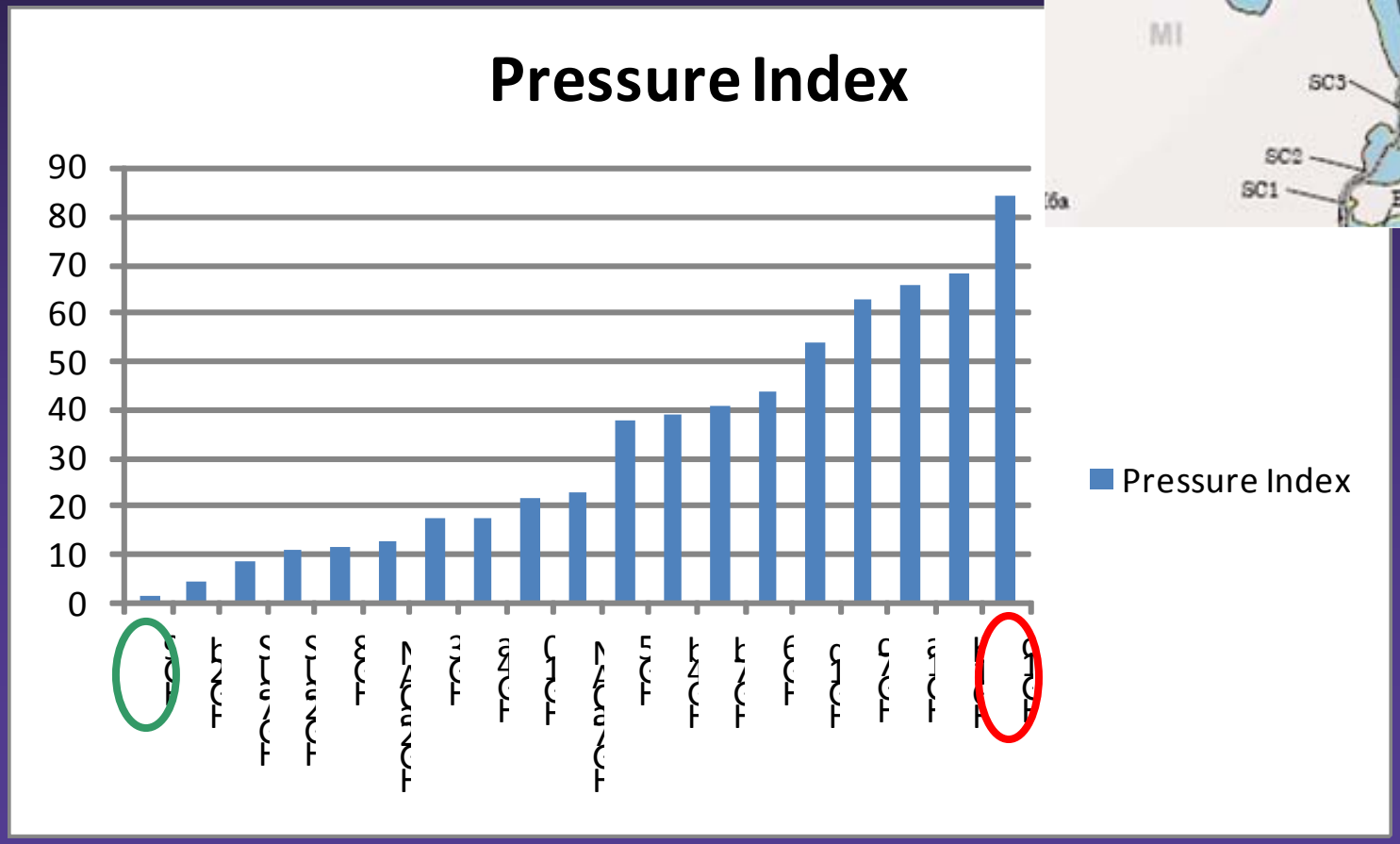
- Coastal Development
- Invasive Species
- Recreational Use
- Shoreline Alterations

Coastal Pressure Index

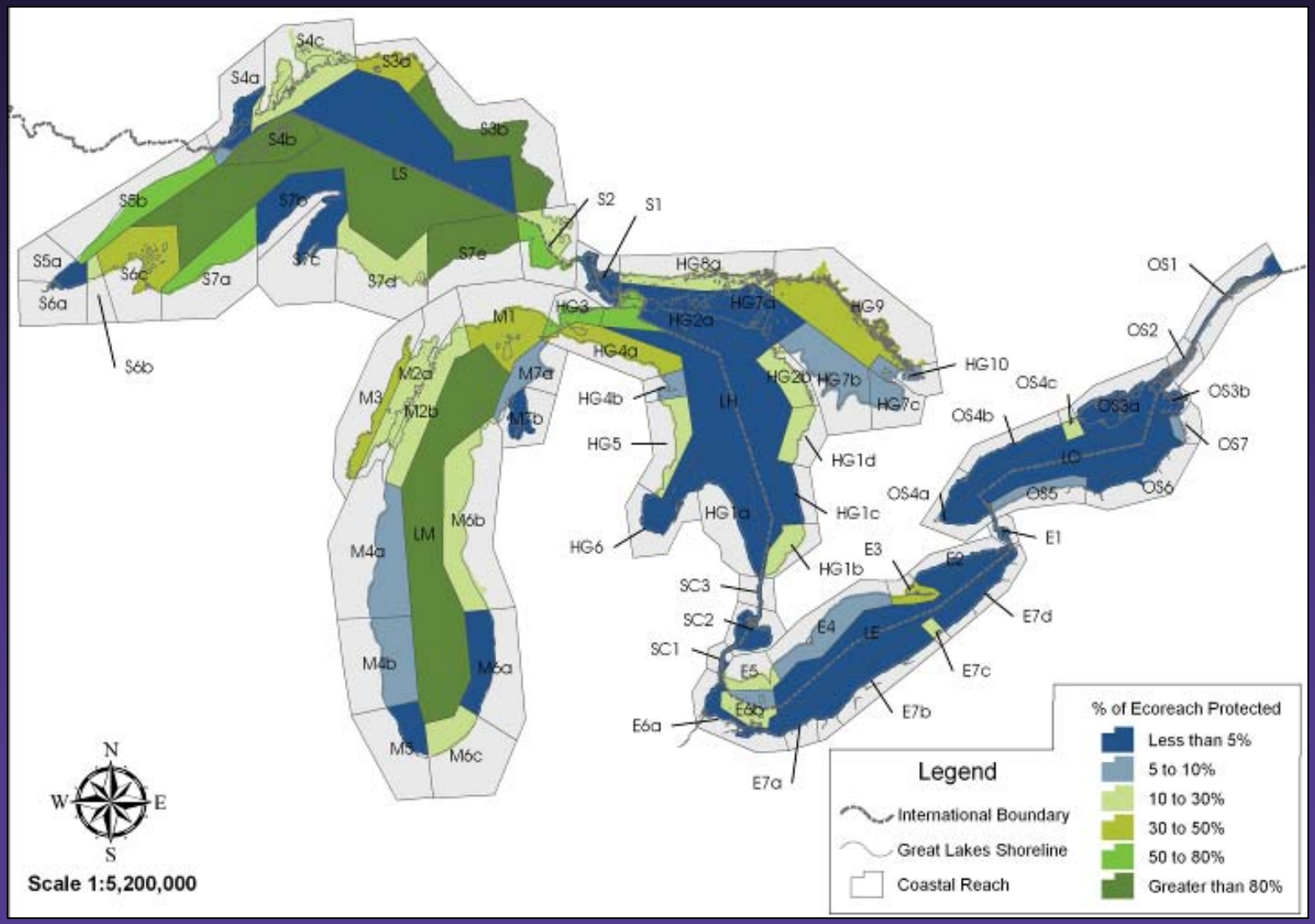
- Index based on land use and shoreline alteration
- Applied to each coastal ecoreach

Coastal Pressure Index





Land Protection

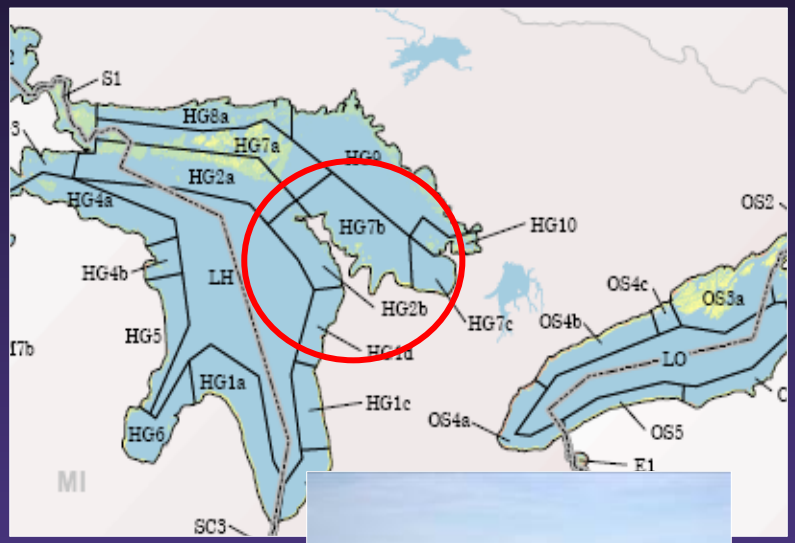


Management Implications

Coastal Ecoreach Report Cards

e.g. Western Bruce Peninsula (HG2b)

- 428.62 km
- Bedrock shore: dominant (~50%)
- Cobble beach: uncommon (~8%)
- Sand beach: very rare (<1%)
- Shoreline Cliff: rare (<4%)
- Four Coastal Alvar Types documented
- Approximately 19% of coast is protected.
- Coastal Pressure Index: Lower - 4.9 (range 0-193.6; median=44)



Management Implications

Need Binational Coastal Terrestrial Classification System

- Build on existing information in NatureServe

Identify gaps in protection

- Representation at different spatial scales

Management Implications

- Key stewardship opportunities
- Good baseline of distribution and status

Acknowledgments

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