



The Total Package: Mapping, Prioritizing, Treating, and Monitoring Large-scale *Phragmites* Invasions

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Background

Western Lake Erie Coastal Marshes

- Among the most biologically significant within the Great Lakes
- Provide habitat for a wide variety of flora and fauna
- Migratory waterfowl, shorebirds, landbirds
- Premier stopover point in Great Lakes for long-distance migratory shorebirds
- Loss to development and conversion to agriculture

Preservation and restoration of remaining WLEB coastal marsh sites is imperative.



Threat - Phragmites

- Proliferation of non-native, invasive *Phragmites*
- Alters biotic environment – excluding native species, reducing plant diversity and habitat for wildlife
- Alters abiotic coastal processes – hydrology

Near-monotypic stands of *Phragmites* have replaced high-quality, complex communities over thousands of acres in WLEB wetlands and coastal areas

Rapid expansion of the monotypic plant community has resulted in adverse ecological, economic, and social impacts on the natural resources and people



Remote sensing

- Current extent
- Areas vulnerable to future invasion

Vegetation mapping

Transects



Mixed Cattail and Reed Cane



Mixed Reed Cane and Wet Meadow



Mixed Reed Cane and Shrub Wetlands

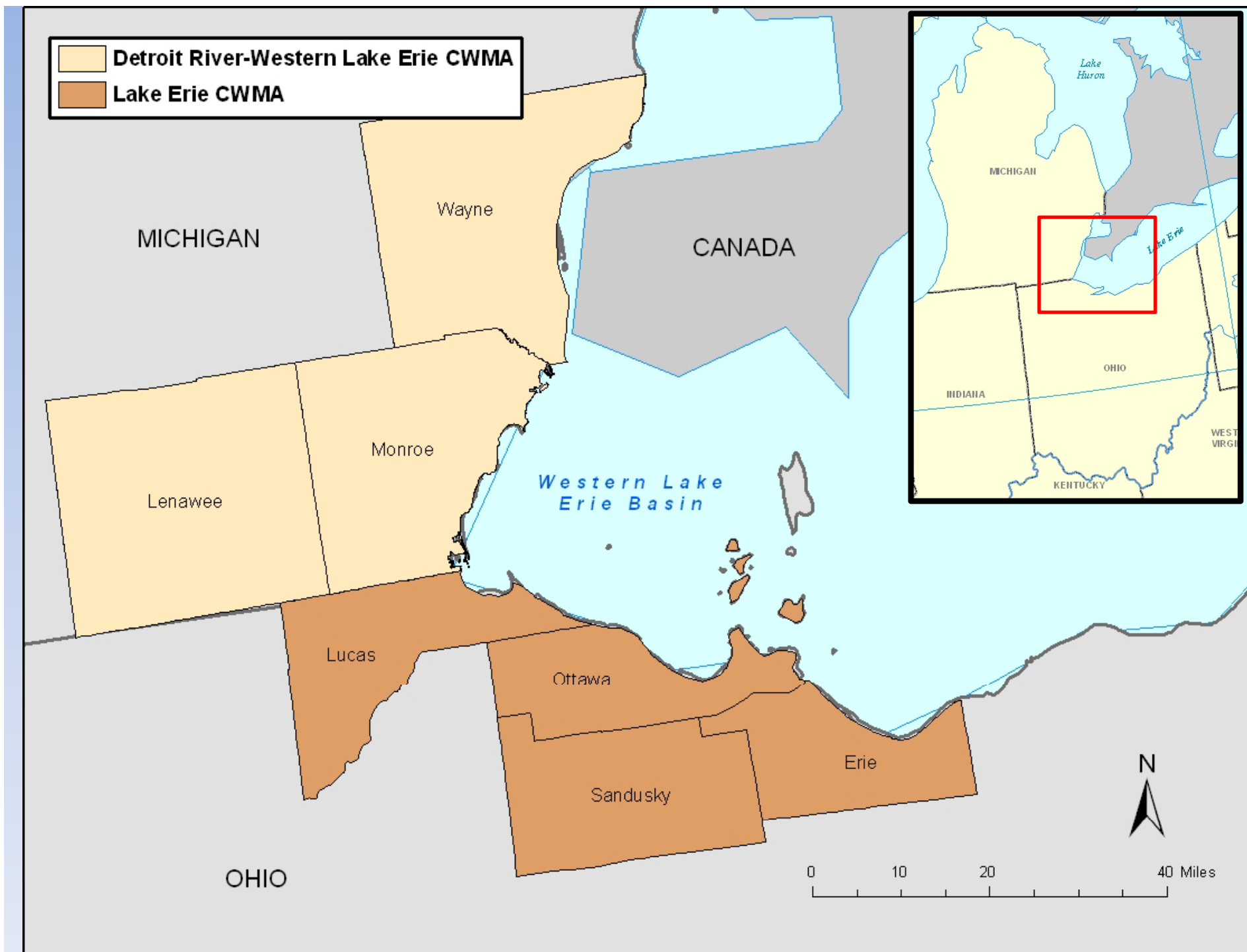


Reed Cane Marsh (Genotype M)

Prioritization

- Conservation owners
- Diked wetlands





Partnership

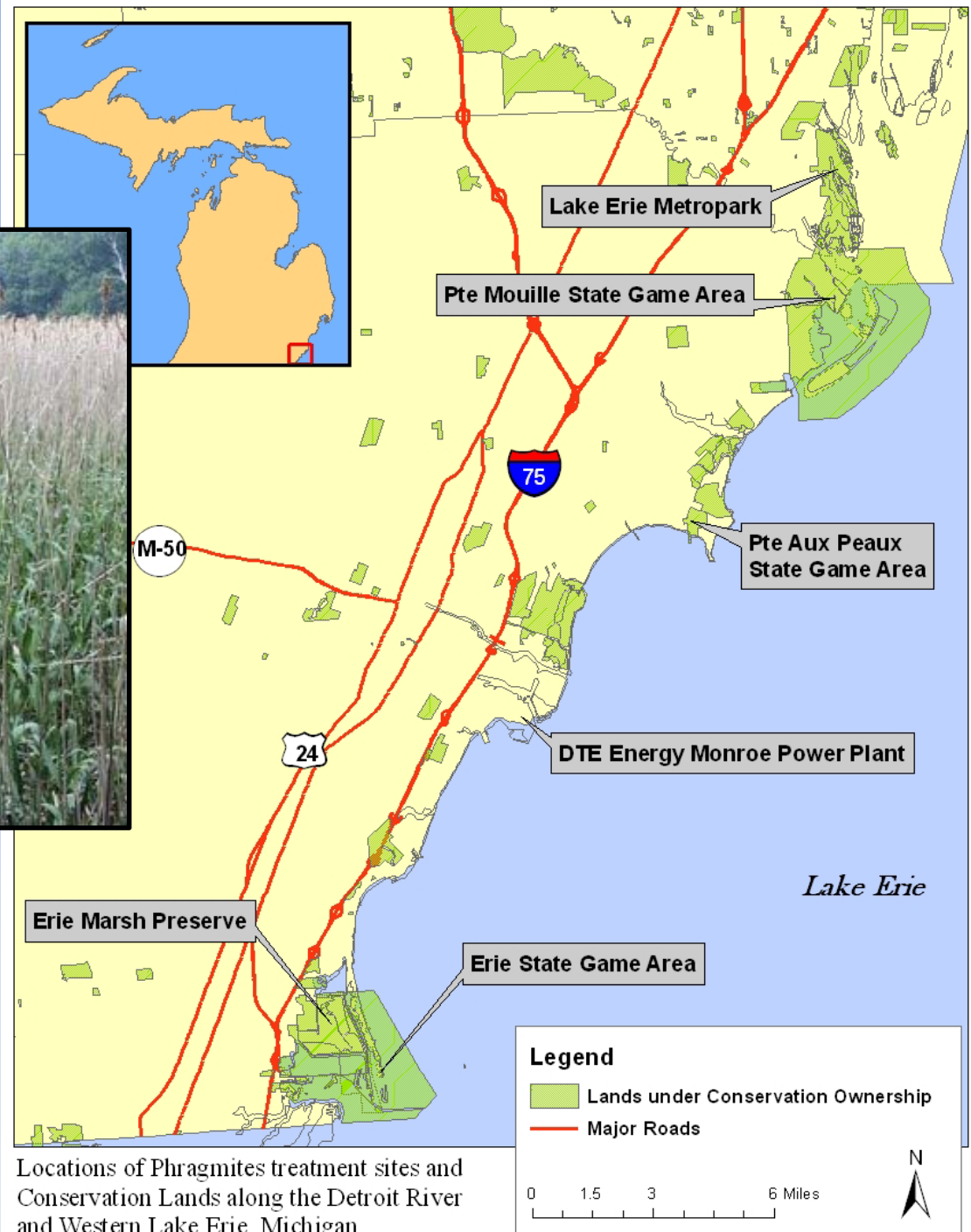
A regional approach to control and management of *Phragmites*

Lake Erie CWMA (Ohio) - 2010

- The Nature Conservancy (TNC)
- USFWS - Ottawa National Wildlife Refuge
- Winous Point Marsh Conservancy
- Ottawa Soil & Water Conservation District
- Ohio Department of Natural Resources

Detroit River-Western Lake Erie CWMA (Michigan) - 2011

- The Nature Conservancy (TNC)
- USFWS - Detroit River International Wildlife Refuge (DRIWR)
- Michigan Department of Natural Resources (MDNR)
- Huron-Clinton Metroparks Authority (HCMA)
- Corporations, Local Governments



Locations of Phragmites treatment sites and Conservation Lands along the Detroit River and Western Lake Erie, Michigan.

Funding

- Ohio and Michigan
 - 3 GLRI grants to TNC
 - over 3,000 acres on public and private lands
 - 2010-2014
- Point Mouillee State Game Area, MI
 - NOAA funds
 - 1,000 acres on State land
 - 2010
- Sterling State Park, MI
 - GLRI grant
 - 1,100 acres on public and private lands
 - 2011-2015

Over 5,000 acres and over \$2,000,000

Field Activities

- Initial Treatments with Helicopter
 - ATV applications near trees, crops, etc.
- Follow-up Treatments with Marsh Master
 - Mowing
 - Burning
 - Herbicide
- Long-term
 - Adaptive management
 - Integrated pest mgmt





Results

2011

- Initial treatment of 1,900 acres (700 MI; 1,200 OH)

2012

- Initial treatment of 1,000 acres (700 MI; 300 OH)
- Mowing, burning, follow-up herbicide on 2011 treatments

2013

- Initial treatment of 250 acres in MI
- Mowing, burning, follow-up herbicide on previous treatments









FID	Shape *	Id	Contractor	Date	Site	Treatment	Chemicals	Method	Acres
0	Polygon	1	Hamilton Helicopter	9/11/2012	Erie Marsh	Herbicide	Rodeo/Habitat/Cygnnet Plus 3/3/1 pts/ac	Aerial	32.43180
1	Polygon	2	Hamilton Helicopter	9/11/2012	Erie Marsh	Herbicide	Rodeo/Habitat/Cygnnet Plus 3/3/1 pts/ac	Aerial	0.578881
2	Polygon	3	Hamilton Helicopter	9/11/2012	Toledo Beach Marina	Herbicide	Rodeo/Habitat/Cygnnet Plus 3/3/1 pts/ac	Aerial	9.1942
3	Polygon	4	Hamilton Helicopter	9/11/2012	Toledo Beach Marina	Herbicide	Rodeo/Habitat/Cygnnet Plus 3/3/1 pts/ac	Aerial	46.8926
4	Polygon	5	Hamilton Helicopter	9/11/2012	Toledo Beach Marina	Herbicide	Rodeo/Habitat/Cygnnet Plus 3/3/1 pts/ac	Aerial	1.86803
5	Polygon	6	Hamilton Helicopter	9/11/2012	Toledo Beach Marina	Herbicide	Rodeo/Habitat/Cygnnet Plus 3/3/1 pts/ac	Aerial	0.418735
6	Polygon	7	Hamilton Helicopter	9/11/2012	Toledo Beach Marina	Herbicide	Rodeo/Habitat/Cygnnet Plus 3/3/1 pts/ac	Aerial	0.255893
7	Polygon	8	Hamilton Helicopter	9/12/2012	Great Lakes Aggregate	Herbicide	Rodeo/Habitat/Cygnnet Plus 3/3/1 pts/ac	Aerial	291.0840
8	Polygon	9	Hamilton Helicopter	9/12/2012	Pte Mouillee SGA	Herbicide	Rodeo/Habitat/Cygnnet Plus 3/3/1 pts/ac	Aerial	130.6909
9	Polygon	10	Hamilton Helicopter	9/12/2012	Pte Mouillee SGA	Herbicide	Rodeo/Habitat/Cygnnet Plus 3/3/1 pts/ac	Aerial	675.3129
10	Polygon	11	Hamilton Helicopter	9/12/2012	Pte Mouillee SGA	Herbicide	Rodeo/Habitat/Cygnnet Plus 3/3/1 pts/ac	Aerial	584.5709
11	Polygon	12	Hamilton Helicopter	9/12/2012	Pte Mouillee SGA	Herbicide	Rodeo/Habitat/Cygnnet Plus 3/3/1 pts/ac	Aerial	10.1041



Benefits

- Restored ecosystem services
- Reclaimed healthy, viable coastal wetlands
- Recreation, wildlife, and other opportunities for 7 million people of Detroit, MI and Toledo, OH
- Sustained eradication of *Phragmites* in key wetlands in Lake Erie
- Develop a long-term, sustained regional collaboration for invasives management through shared equipment and resources

Partners/Acknowledgments

Partners

- USFWS - DRIWR
- Michigan DNR
- Huron-Clinton Metropolitan Authority
- Private lands
- Corporate lands

Funders

- USFWS – Great Lakes Restoration Initiative
- U.S. EPA – Great Lakes Restoration Initiative



Questions?

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Photo: Jason Whalen

