

Restoring Great Lakes Areas of Concern



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What are Areas of Concern?

“An Area of Concern is a geographic area designated by the Parties where significant impairment of *beneficial uses* has occurred as a result of human activities at the local level”

The 14 “Beneficial Uses”

ENVIRONMENT	Degradation of fish and wildlife populations	Restrictions on drinking water consumption or taste and odour problems	HEALTH
	Fish tumours or other deformities	Restrictions on fish and wildlife consumption	
	Bird or animal deformities or reproduction problems	Beach closings	
	Degradation of benthos	Added costs to agriculture or industry	ECONOMY
	Degradation of phytoplankton and zooplankton populations	Restrictions on dredging activities	
	Loss of fish & wildlife habitat	Tainting of fish or wildlife flavour	
	Eutrophication or undesirable algae	Degradation of aesthetics	



Source: EPA



Source: USDA Natural Resources
Conservation Service, Romy Myszk



Source: National Park Service, Indiana Dunes National Lakeshore



Source: Cleveland Press

Canadian and U.S. Areas of Concern in the Great Lakes Basin





Advancing Areas of Concern – Canada

- 17 AOCs, including 5 binational.
- 3 delisted and 2 AOCs in recovery.
- Nipigon Bay – all remedial actions completed.
- Beneficial Use Impairments:
 - 65 Restored to “Not Impaired” status
 - 81 Impaired
 - 22 Require Further Assessment
- Canada - Ontario Agreement Goal: By 2019 complete all remedial actions in five AOCs.

The Greens are Catching Up to the Reds

AOC	Restrictions on fish & wildlife consumption	Tainting of fish & wildlife flavour	Degradation of fish & wildlife populations	Fish tumours or other deformities	Bird/animal deformities or reproduction problems	Degradation of benthos	Restrictions on dredging activities	Eutrophication or undesirable algae	Restrictions - drinking water consumption, taste/odour problems	Beach Closings	Degradation of aesthetics	Added costs to agriculture or industry	Degradation of phyto- and zooplankton populations	Loss of fish & wildlife habitat
Thunder Bay												2004		
Nipigon Bay Completed		1995	2016	1995		2016	1995	2016			2016			2016
Jackfish Bay In Recovery				2010	2010		1998							
Peninsula Harbour				2012			2012							
St. Marys River					2016									
Spanish Harbour In Recovery			1999		1999					1999		1999	1999	1999
Sewern Sound Depleted	2002		2002				2002	2002			2002			2002
Collingwood Harbour Depleted	1994		1994		1994	1994	1994	1994		1994	1994		1994	1994
St. Clair River		2011									2016	2012		
Detroit River		2014							2011	2016	2016	2011		
Wheatley Harbour Depleted	2010		2010			2010	2010	2010						2010
Niagara River				2009	2009		2009							
Hamilton Harbour														
Toronto and Region				2011	2011	2016	2016							
Port Hope Harbour														
Bay of Quinte														
St. Lawrence River		1997			2007	2007	2007		1997		1997	1997		

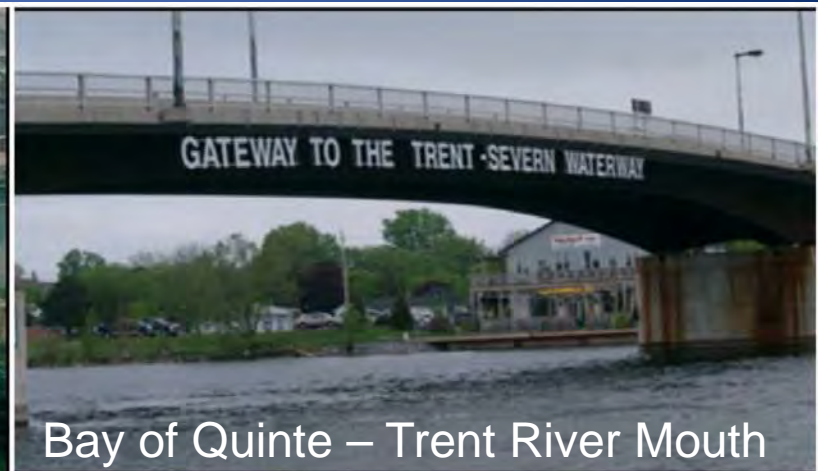
Advancing Restoration Actions – Canadian Areas of Concern

1. Remediation of Contaminated Sediments
2. Restoration of Fish & Wildlife Habitat
3. Municipal & Industrial Waste Water
Treatment and Non-Point Source
Management
4. Studies & Investigations, BUI
Assessments & Follow-up Monitoring

Remediation of Contaminated Sediments in Canadian AOCs



Recently Completed Remediation Projects



Peninsula Harbour Thin Layer Cap



Randle Reef – Hamilton Harbour AOC

8 years to complete:
2015-2022

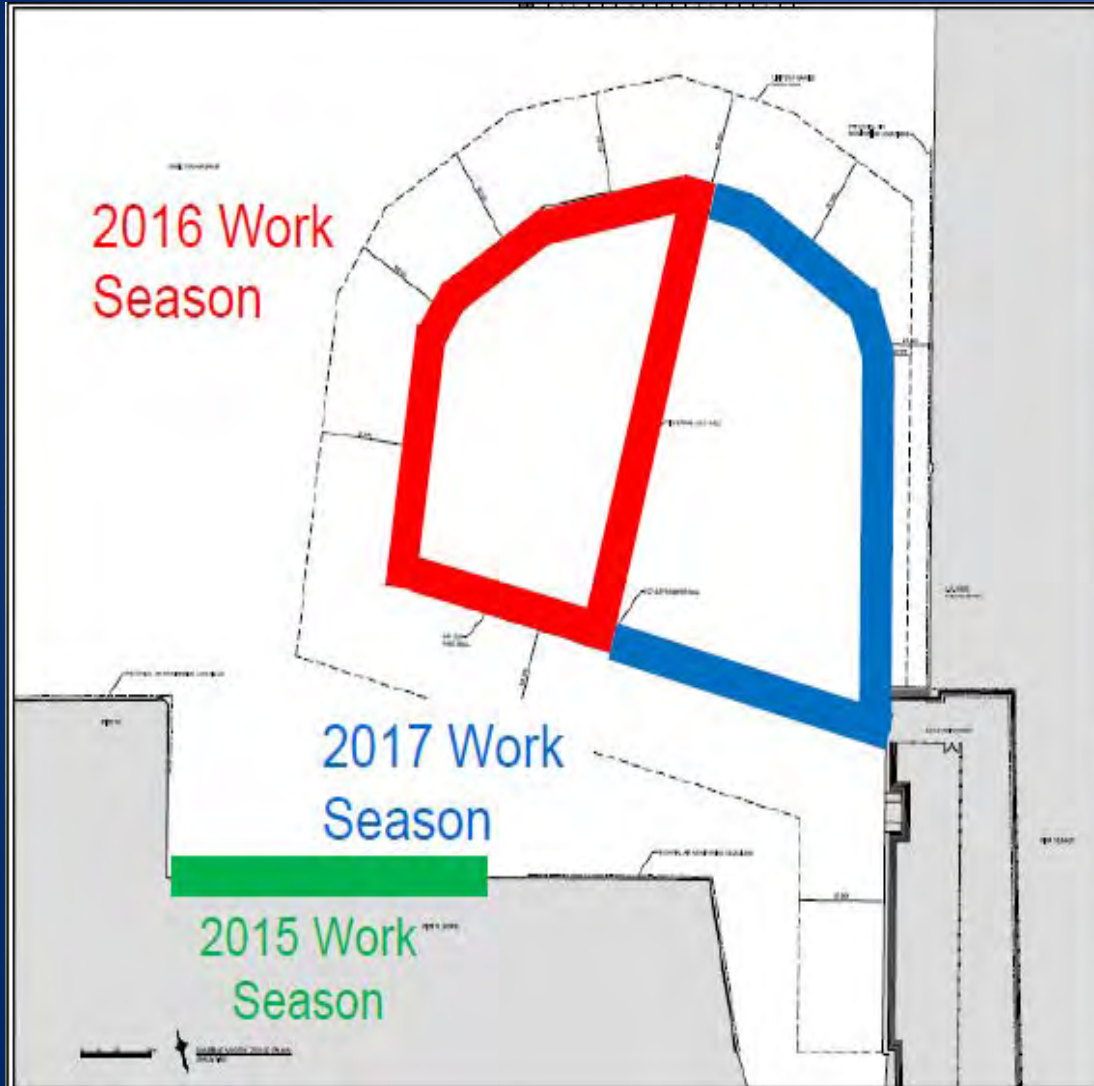
Stage 1
Containment

Stage 2
Dredging

Stage 3
Capping



Randle Reef - Stage 1 Construction





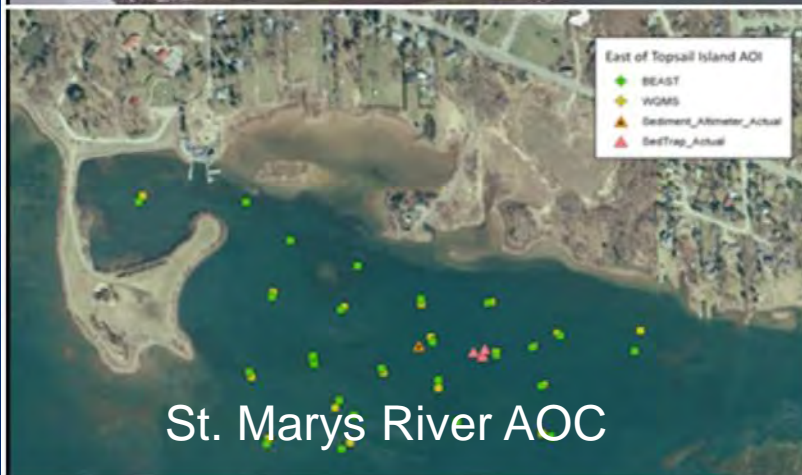
AOCs With Remaining Actions



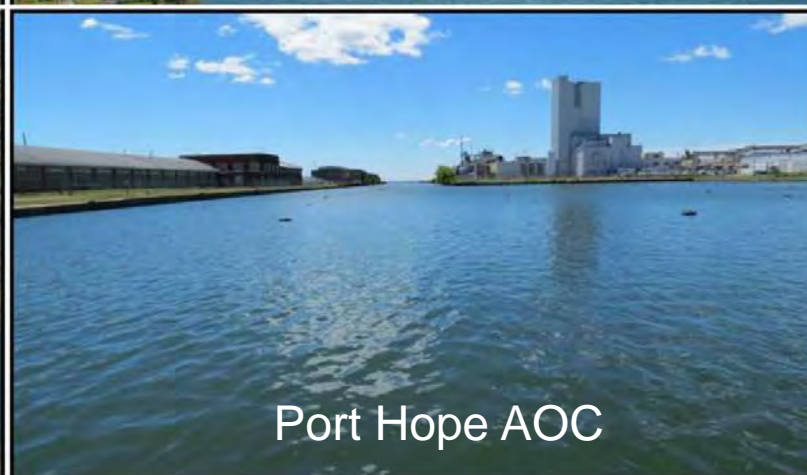
Thunder Bay North Harbour



St. Clair River AOC



St. Marys River AOC



Port Hope AOC



Restoration of Fish & Wildlife Habitat



TRCA Photos



Cell 2 Wetland Creation Project, Toronto Region AOC

ECCC photos





Binational Fighting Island Spawning Reef Project Detroit River AOC



Swan Lake Marsh Restoration



Photo credits: Walpole island First Nation

Coote's Paradise, Hamilton Harbour AOC



Source: Royal Botanical Gardens

Kama Creek, Nipigon Bay AOC



McIntyre River, Thunder Bay AOC



Windsor Waterfront, Detroit River AOC



Don River Waterfront Toronto

waterfronttoronto.ca



St. Marys River

Municipal & Industrial Waste Water Treatment and Non-Point Source Management

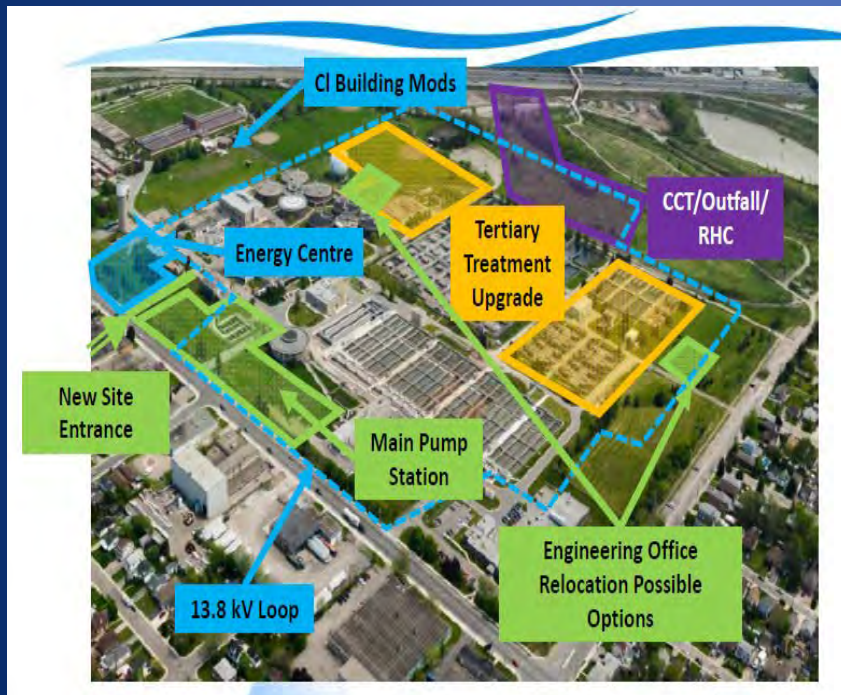


Toronto Region AOC

Brown & Story

Hamilton Harbour WWTP Upgrades

Woodward Ave. City of Hamilton



Skyway, Halton Region



City of Toronto Wet Weather Flow Projects



Other Municipal Waste Water Management Projects



Amherstburg WWTP, Detroit River AOC



Cornwall WWTP, St. Lawrence AOC

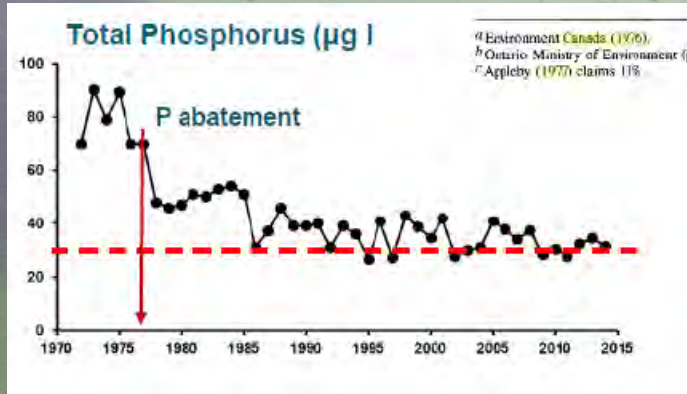


Windsor Storm Water Retention



Nipigon Bay Secondary Treatment

Bay of Quinte Phosphorous Reduction Strategy



Blue-green algae outbreak due to high phosphorous levels in the water.

Studies, Investigations, BUI Assessments, Monitoring

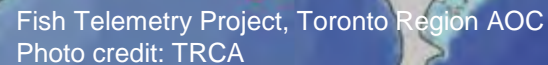


Fish Tumours or Other Deformities





Fish Populations




Beach Closings

Advancing Areas of Concern – United States

- 27 AOCs, including 5 binational.
- 4 delisted.
- 7 AOCs completed all actions for delisting.
- 4 AOCs expect to complete all actions for delisting by the end of 2016.
- 65 Beneficial Use Impairments removed.

Accelerating the Restoration of Beneficial Uses

AOC	State	Restriction on fish & wildlife consumption	Tainting of fish & wildlife flavor	Degraded fish & wildlife populations	Fish tumor or other deformities	Bird & animal deformities or reproduction problems	Degradation of benthos	Restrictions on dredging activities	Eutrophication or undesirable algae	Restrictions – drinking water consumption, taste/odor problems	Beach Closings	Degradation of aesthetics	Added costs to agriculture or industry	Degradation of phyto- and zooplankton	Loss of fish and wildlife habitat	Original Total	Total Removed	Remaining Total
Waukegan Harbor	IL							2014			2011				2013	6	3	3
Grand Calumet River	IN									2012			2011			14	2	12
Clinton River	MI															8	0	8
Deer Lake	MI	2014				2011			2011							3	3	0
Detroit River	MI		2013							2011						11	2	9
Kalamazoo River	MI										2011	2012				8	2	6
Manistique River	MI						2007				2010				2008	5	3	2
Muskegon Lake	MI	2013						2011		2013	2015					9	4	5
River Raisin	MI			2015					2013		2013	2012			2015	9	5	4
Rouge River	MI															9	0	9
Saginaw River & Bay	MI		2008							2008					2014	12	3	9
Torch Lake	MI				2007											3	1	2
White Lake	MI	2013		2014			2012	2011	2012	2014		2014			2014	8	8	0
St. Clair River	MI/ON		2010				2015	2011				2012	2012			10	5	5
St. Marys River	MI/ON					2014						2014				10	2	8
Menominee River	MI/WI										2011					6	1	5
Buffalo River	NY															9	0	9
Eighteenmile Creek	NY															5	0	5
Oswego River	NY	2006		2006					2006						2006	4	4	0
Rochester Embayment	NY				2015					2011			2011			14	3	11
Niagara River	NY/ON				2016											7	1	6
St. Lawrence River	NY/ON													2015		7	1	6
Ashtabula River	OH	2014		2014											2014	6	3	3
Black River	OH															9	0	9
Cuyahoga River	OH															9	0	9
Maumee River	OH												2015			10	1	9
Presque Isle	PA				2013			2007								2	2	0
Fox River/ S Green Bay	WI															13	0	13
Milwaukee Estuary	WI															11	0	11
Sheboygan River	WI							2015	2016							9	2	7
St. Louis River & Bay	WI/MN											2014				9	1	8
Original Total		30	7	25	18	17	27	27	18	8	20	19	4	8	27	255		
Total Removed		5	3	4	4	2	3	6	5	6	6	6	4	1	7		62	
Remaining Total		25	4	21	14	15	24	21	13	2	14	13	0	7	20			193

 BUI Removed

 BUI Impaired

Advancing Restoration Actions – U.S. Areas of Concerns

1. Remediation of Contaminated Sediments
2. Restoration of Fish & Wildlife Habitat
3. Studies and Engineering Design
4. BUI Evaluations and Assessments

Remediation of Contaminated Sediments



Lincoln Park Phase I Milwaukee Estuary AOC



Lincoln Park Phase I Milwaukee Estuary AOC



Lincoln Park Phase I Milwaukee Estuary AOC



Lincoln Park Phase II Milwaukee Estuary AOC



Sheboygan River AOC



River Raisin AOC



Ottawa River Maumee River AOC



Restoration of Fish and Wildlife Habitat and Populations



White Lake AOC



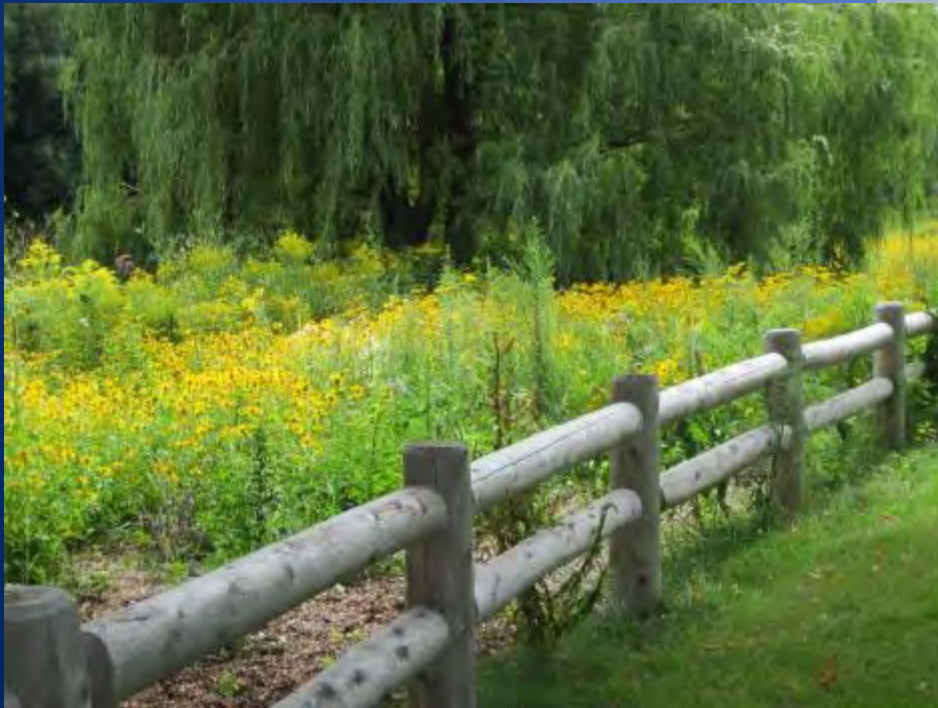
White Lake AOC



Deer Lake AOC



Sheboygan River AOC



Source: University of Wisconsin-Extension

Roxanna Marsh Grand Calumet River AOC



Roxanna Marsh Grand Calumet River AOC



Source: Illinois-Indiana Sea Grant

St. Marys AOC





Menominee and Park Mill Dams Fish Passage and Protection Plan

Downstream Bypass and
Protection at Park Mill Dam

Upstream Fish Lift and Sorting
Facility at Menominee Dam with
transfer to above Park Mill Dam

Downstream Bypass and
Protection at Menominee Dam

(Downstream)

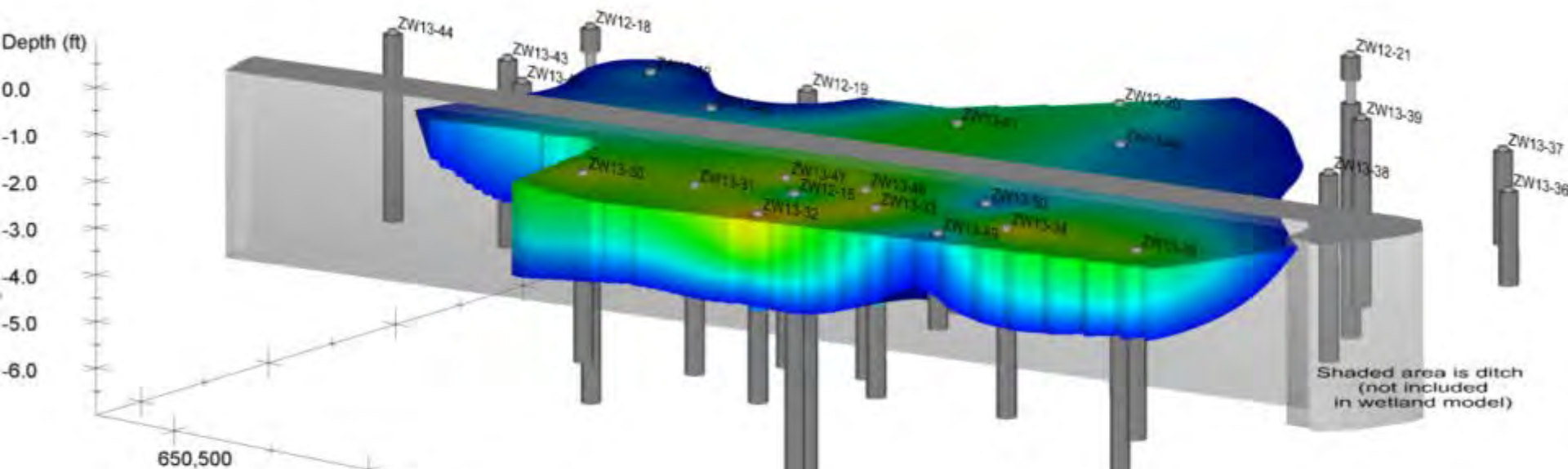
Photo Courtesy of:



Lower Menominee River AOC Fish Elevator



Studies and Engineering Design



Zephyr Restoration Design

Muskegon Lake AOC



Beneficial Use Impairment Assessments



Lake Sturgeon – St. Clair River



Mussel Watch Program





Annex 1 - Areas of Concern

Priorities for Science:

- Implementation of monitoring and scientific assessments to verify restoration of beneficial uses prior to delisting.

Priorities for Action:

- Implementation of remedial actions to restore beneficial uses in Areas of Concern.