

Ryerson Creek Outfall Project: *Great Lakes Legacy Act*

Mark Loomis
U.S. EPA Great Lakes
National Program
Office (GLNPO)

WEDA Midwest
Chapter Meeting

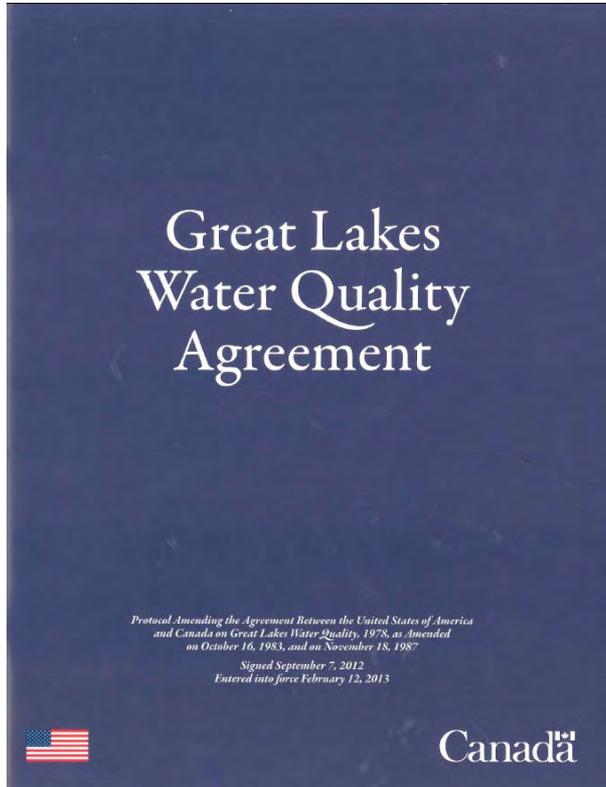
March 18, 2021



Agenda

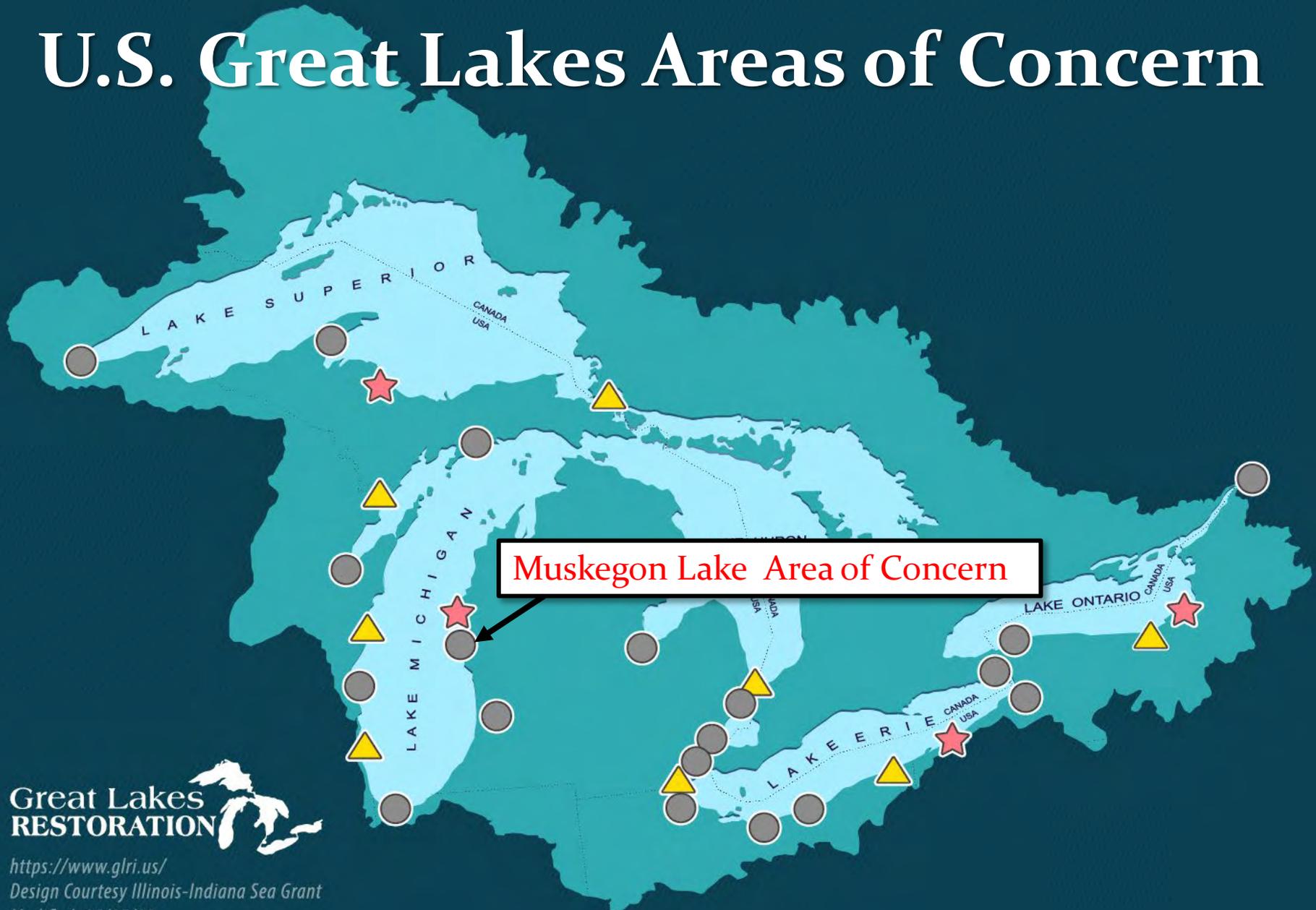
1. Great Lakes Water Quality Agreement: GLNPO and AOCs
2. How does GLNPO execute contaminated sediment work?
3. Site History
4. Clean Up Goals, Remedial Approach
5. Project Coordination and Funding
6. Anticipated Risks and Response
7. Implementation
8. Questions

Where does GLNPO, AOCs and BUIs Come From?

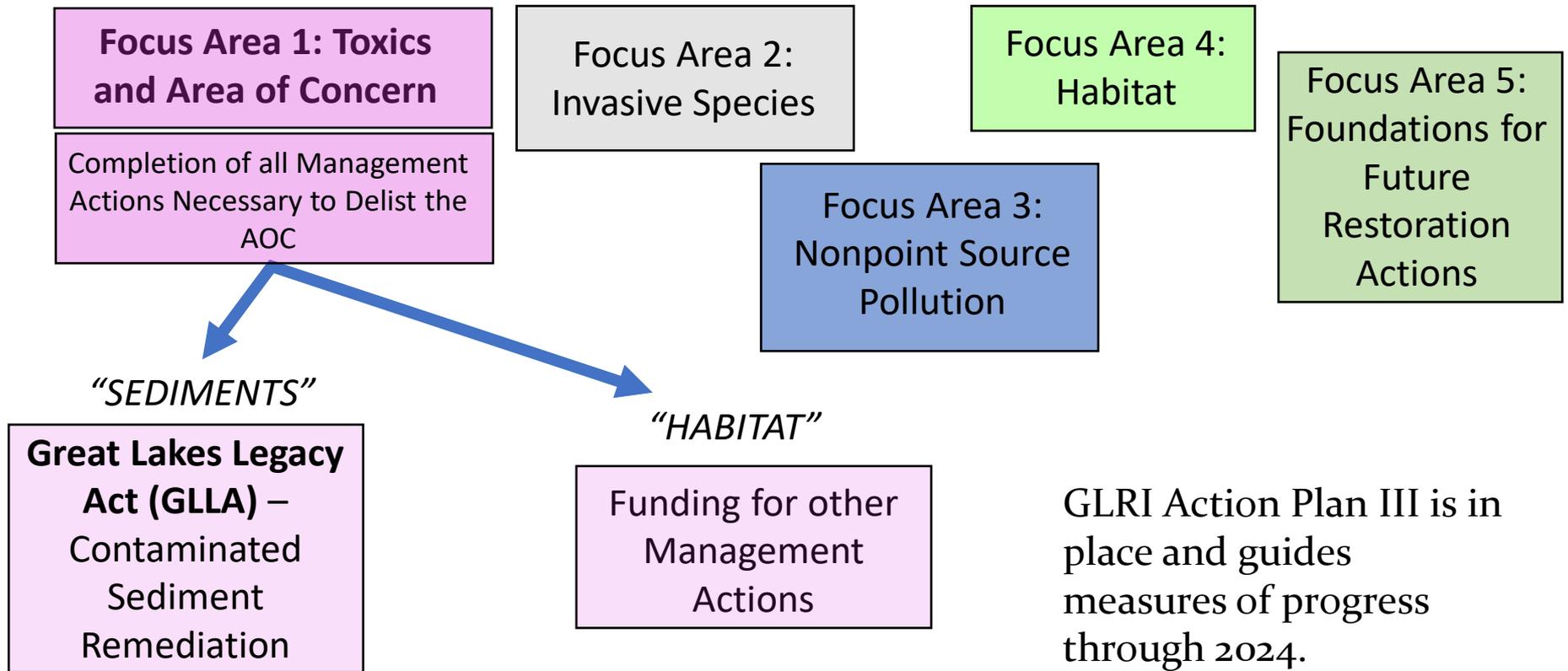


- Great Lakes Water Quality Agreement—1987 and 2012
- *“An AOC is a geographic area designated by the Parties where significant impairment of beneficial uses has occurred as a result of human activities at the local levels.”*
- *“A BUI is a reduction of the chemical, physical or biological integrity of the Waters of the Great Lakes sufficient to cause up to the following 14 impairments:*

U.S. Great Lakes Areas of Concern



Great Lakes Restoration Initiative (GLRI): Action Plan III



AUTHORITY: Ryerson Creek is being done under the GLLA ... more on this in a bit.

*GLLA is “match-limited” and sufficient match is always a challenge for the program

Ryerson Creek GLLA Project Overview

- Total Cost: \$6.5M
- Cubic Yards Removed: 10,500
- Nonfederal Sponsors: State of Michigan (EGLE), Industry partner
- Contractor: Severson Environmental Services (GLNPOCS II)
- Remedial Objectives:



- ❖ Reduction in risk to human health and benthic communities sufficient to support removal of the Degradation of Benthos BUI. Achieving this RAO must address impacted sediments above the CUG (Oil Range Organics @ 1,400 ppm)
- ❖ Mass Removal (Mechanically Dredge) ~10,500 cy of sediments contaminated with heavy metals, petroleum, and PAHs.
- ❖ Placement of residual sand cover at thickness to provide protectiveness and habitat substrate.

Muskegon Lake Historical Perspective

- Lumber Era (late 1800s) – economic boom results in shoreline degradation and loss of habitat from milling and mill debris associated with lumbering in the Muskegon River watershed.
- Industrial Era (early to mid 1900s) – sawmills are replaced with foundries, manufacturing and other industrial operations.
- Blue Economy Era (the future) – Muskegon is turning their City and economy back to the lakefront, focusing on restoring and revitalizing its lake front and natural resources. Delisting the Area of Concern (AOC) is a key step in showing the value of the lake as both an ecological and economic resource.

Ryerson Creek Historical Perspective (1874)



Muskegon
MICHIGAN.
1874

INDEX	
1. CITY SQUARE	11. MUSKEGON LAKE
2. WAREHOUSE	12. MUSKEGON LAKE
3. FACTORY	13. MUSKEGON LAKE
4. THE STATE HOUSE	14. MUSKEGON LAKE
5. MUSKEGON LAKE STEAMSHIP COMPANY	15. MUSKEGON LAKE
6. THE CITY OF MUSKEGON	16. MUSKEGON LAKE
7. THE CITY OF MUSKEGON	17. MUSKEGON LAKE
8. THE CITY OF MUSKEGON	18. MUSKEGON LAKE
9. THE CITY OF MUSKEGON	19. MUSKEGON LAKE
10. THE CITY OF MUSKEGON	20. MUSKEGON LAKE

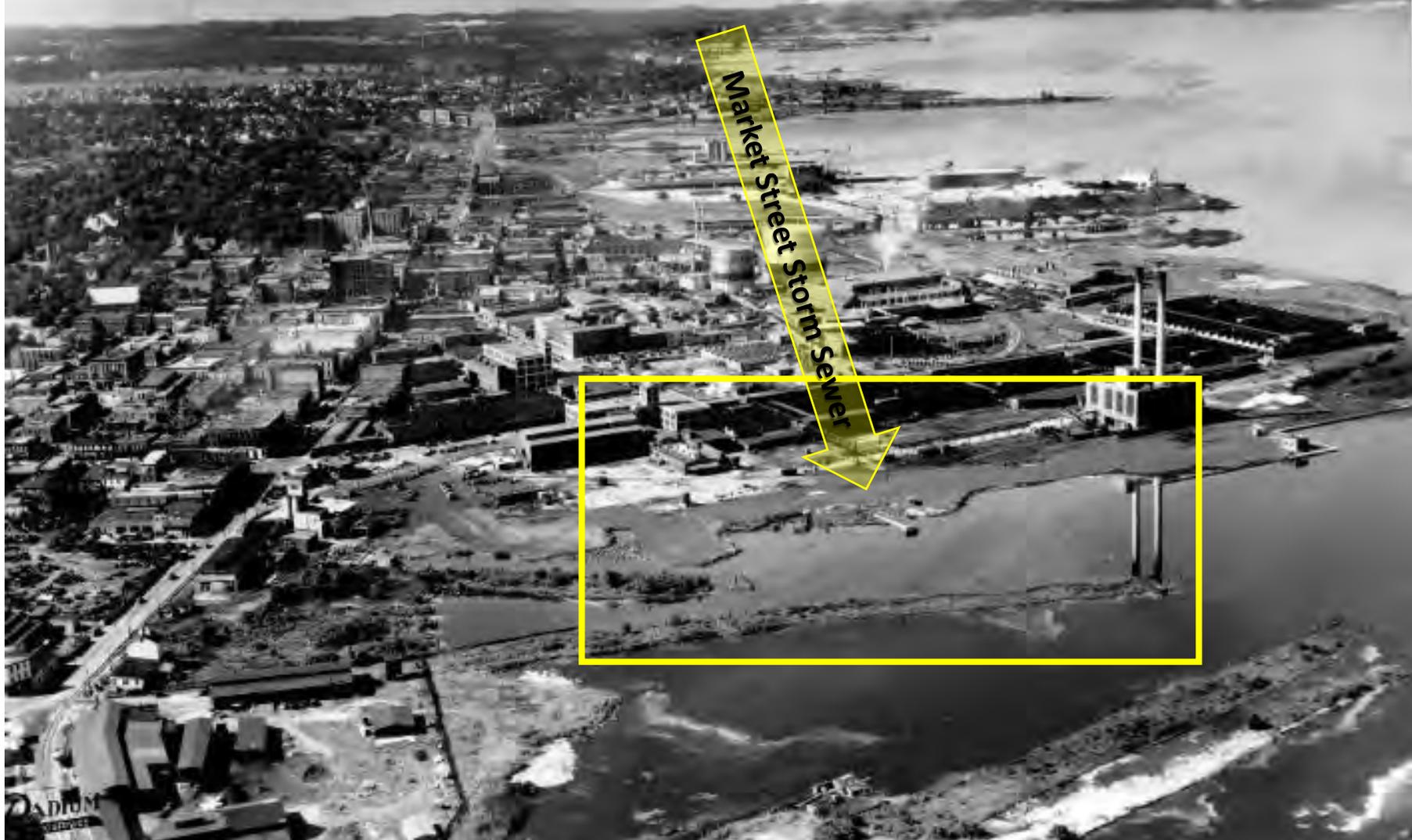


Saw Mill - Industry Fill Areas
Zone 1-4

Ryerson Creek Historical Perspective (1916)



Industrial Era: Former Continental Motors Circa 1930s



Market Street Storm Sewer Outfall (1938 – Since Removed)

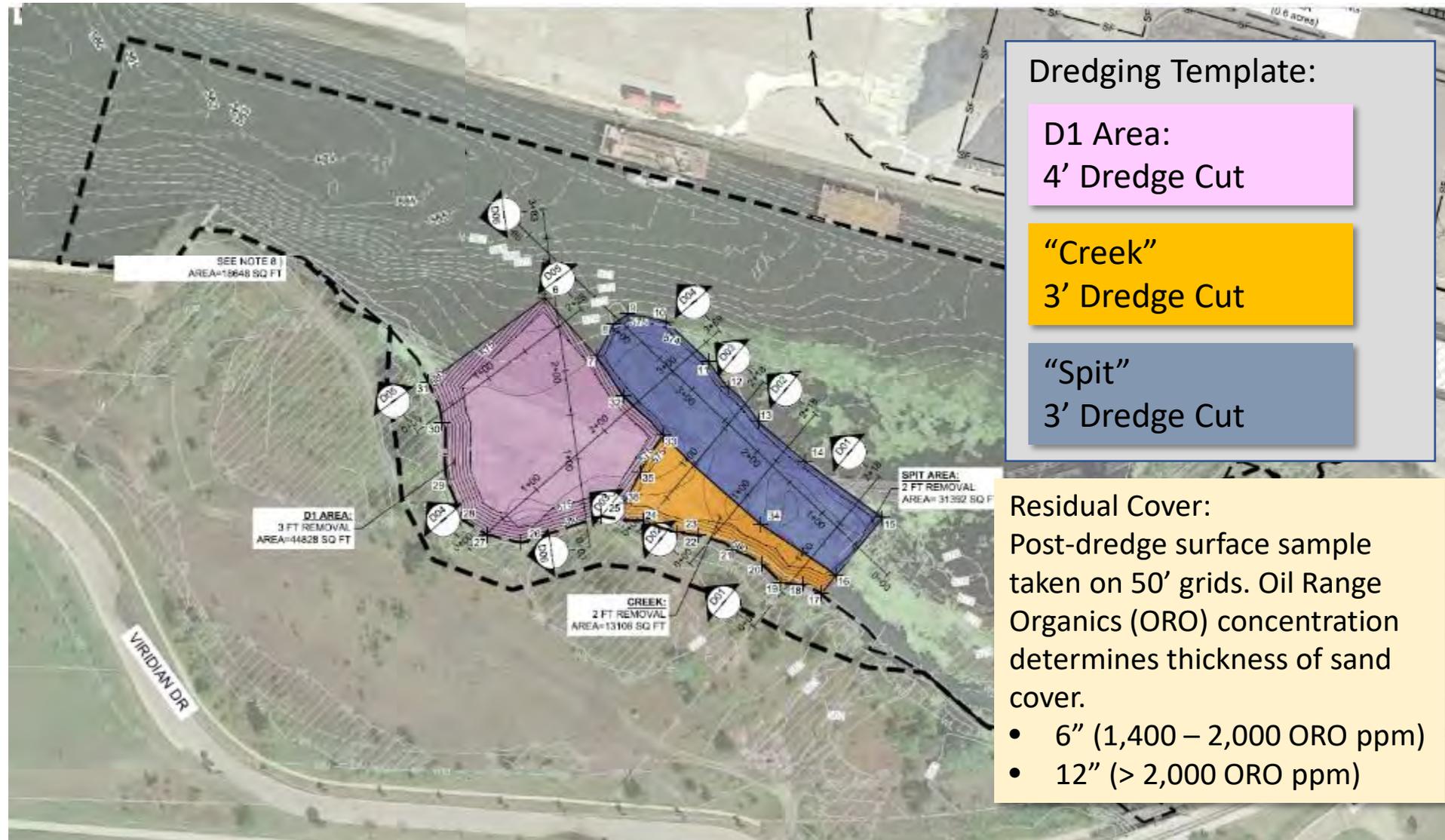


Clean-Up Goal

- Used data from 2006-2015 sampling efforts.
- Focus on oil-range organics (ORO).
- Oil- and diesel-range organics (DRO), oil and grease, heavy metals, and PAHs are present at the site and drive impairments
- OROs represent the most pervasive (by location), and substantial (by concentrations) contaminant.
- ORO is co-located with and predictive of other compounds
- ORO was established as the CUG; sampled post-dredge via ponar on 50' x 50' grid. Sand residual cover placed on grids in exceedance of CUG. 6" cover if greater than 1,400 ppm and 12" cover if greater than 2,000 ppm.

CUG: 1,400 ppm ORO-TPH Eq

Remedial Approach: Dredging with Residual Cover; “Geolift” softened shoreline



Dredging Template:

D1 Area:
4' Dredge Cut

“Creek”
3' Dredge Cut

“Spit”
3' Dredge Cut

Residual Cover:

Post-dredge surface sample taken on 50' grids. Oil Range Organics (ORO) concentration determines thickness of sand cover.

- 6" (1,400 – 2,000 ORO ppm)
- 12" (> 2,000 ORO ppm)

GLLA Project Team Organization

Total Cost (FS/RD/RA)	EPA (Federal)	Nonfederal (Cash & In-kind)
\$6,544,643	\$4,229,643	\$2,315,000



USEPA*
Cash

EGLE*
[RRD] *In-kind/Cash*
[WRD] *Cash*

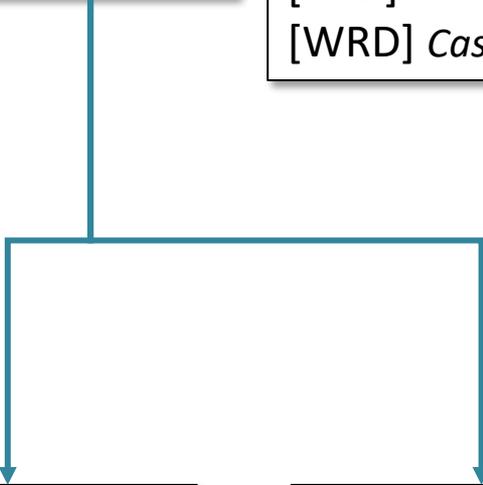
Industry Partner*
In-Kind: FS/RD - Geosyntec
Designer of Record

Muskegon County
Landfill Capacity
10,200 cy min.

City of Muskegon

Property Owners

Muskegon Lake Watershed Partnership



Severson
[GLNPOCS II]

USACE On-site
Federal Rep.



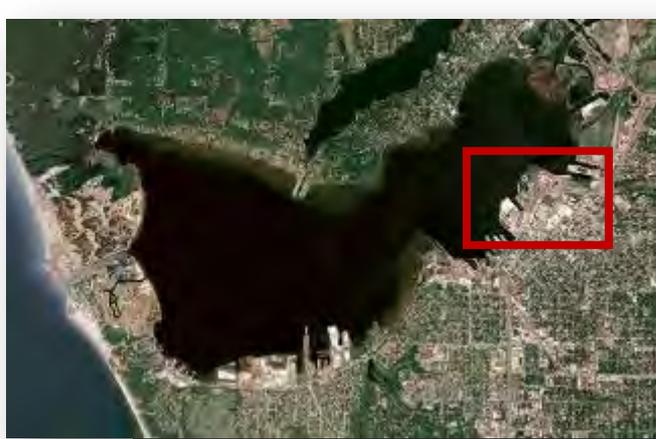
Anticipated Risks

- “Designing to the Dollar” → Limited on NFS Match
- Water-levels → Can impact habitat restoration
- Mill Debris → Unknown conditions and “rich history” of debris
- Permitting → establishment and maintenance challenges
- Land Ownership/Access Agreement

Anticipated Risks and Response

- “Designing to the Dollar” → Limited on NFS Match
 - CUGs, and a Treatability Study (high oil and organic matter)
 - Clarify turbidity monitoring requirements
 - Conduct additional topo/bathy surveys near end of design
 - Sediment disposal to meet NFS match (10,240 cy)
 - Water-levels → Can impact habitat restoration
 - Reduced habitat restoration scope
 - Mill Debris → Unknown conditions and “rich history” of debris
 - spit was debris; less sediment volume, found cool stuff
 - Permitting → establishment and maintenance challenges
 - See water-level above;
 - Land Ownership/Access Agreement
 - Contractor got access agreements; efficient residual cover operations
 - Riparian rights, insurance and access for Federal representatives
- ❖ COVID?!? → Stay Safe and Communicate

Ryerson Creek Outfall Project Area



Mill Debris Removal





Barge mounted Mechanical Dredging in Moon Pool

Material transport in scows



Dredge Material Management Area and Water Treatment Plant



Material stabilization (Type I Portland Cement 10%)



Material management



“Mill Debris”

“Stabilized Sediment”



Material management



Residual Cover Scow Loading



Residual Cover Placement (1 ft depth over 2 acres)



Residual Cover Placement

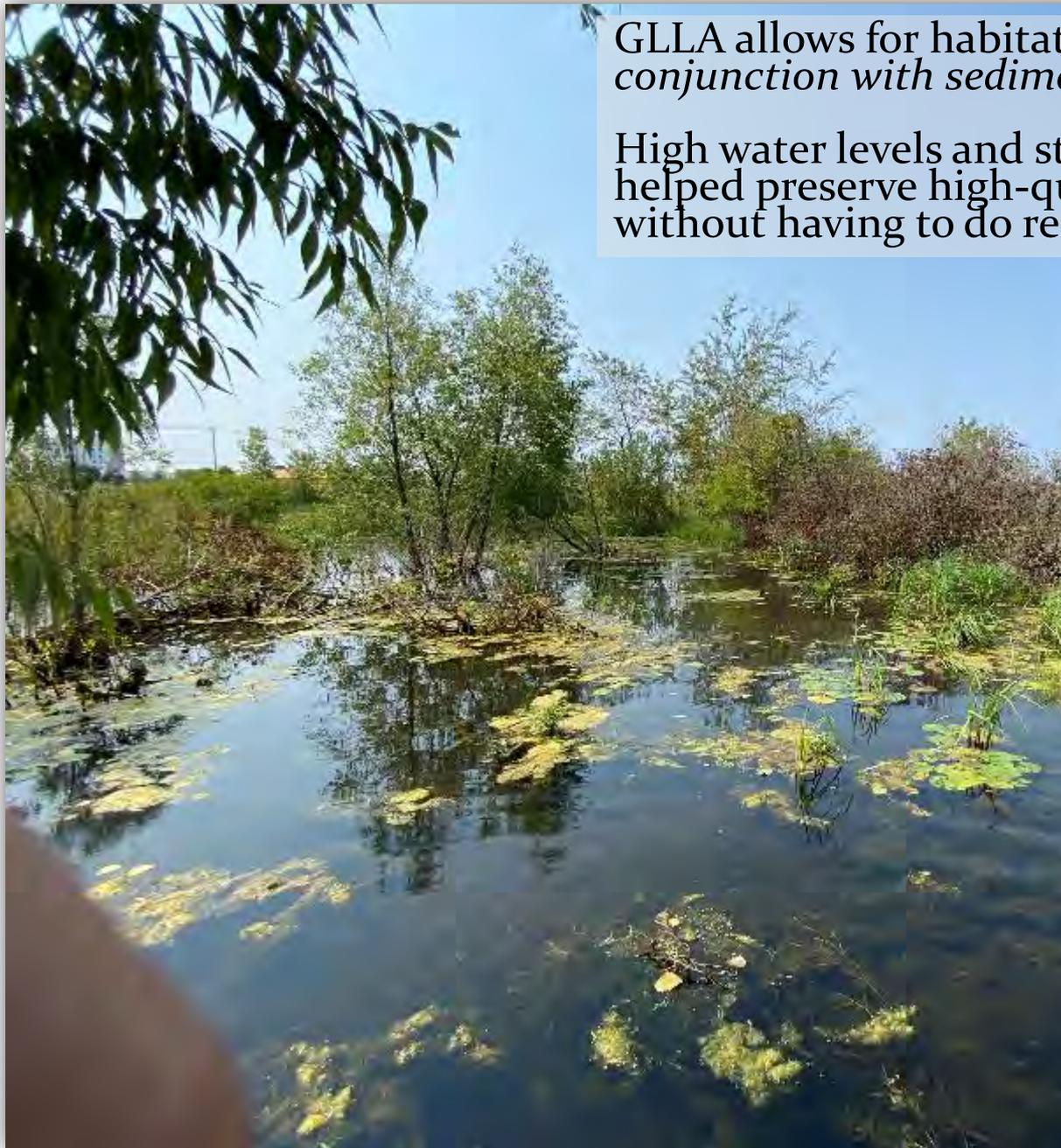


Demobilization

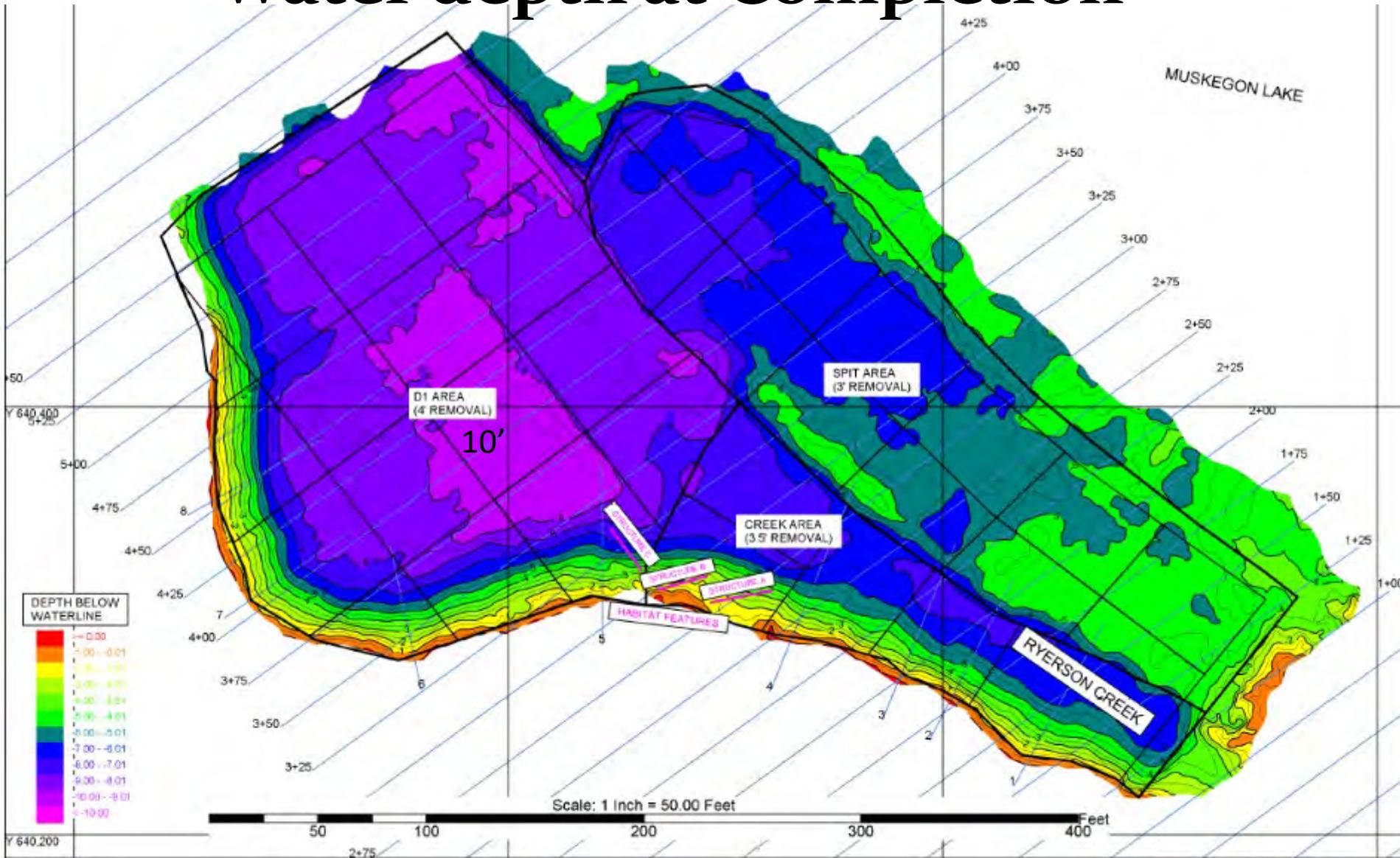


GLLA allows for habitat restoration “*in conjunction with sediment remediation.*”

High water levels and stable post-dredge slopes helped preserve high-quality wetland habitat without having to do restoration.



Water depth at Completion



DRAWING NOTES:

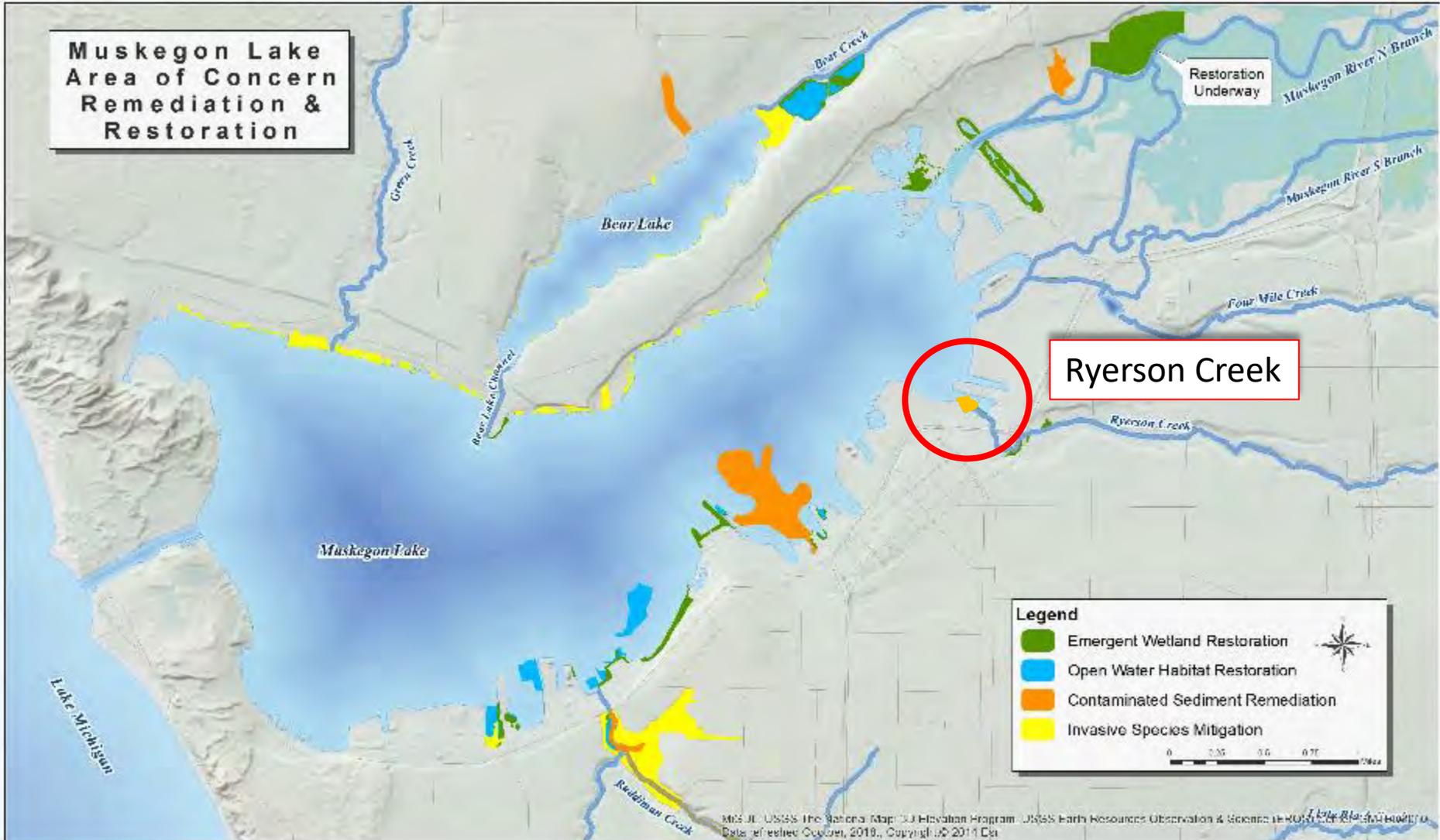
1. INFORMATION DEPICTED ON THIS DRAWING REPRESENTS RESULTS OF SOUNDINGS ON DATES INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME.
2. DATA REDUCED TO 3/32" SORT FILE USING AVERAGE SOUNDING SELECTION.
3. CROSS SECTIONS REFERENCED TO STATIONING LINES SHOWN IN BLUE.
4. CONTOUR SPACING IS 0.01 FEET UNLESS NOTED OTHERWISE.

INFO / EQUIPMENT	
SURVEY DATE:	10/20/20
PERSONNEL:	BJ
VESSEL:	JESSICA JEAN
ECHOSOUNDER:	SIEMENS 212
SONAR FREQUENCY:	400KHz

Muskegon Lake Area of Concern: Progress in Remediation and Restoration

~\$74 million of sed remediation and habitat restoration projects

- ❖ \$57 million from EPA
- ❖ \$17 million cash and in-kind contributions



Questions

More Information?

Great Lakes Restoration Initiative → GLRI.us

Great Lakes Legacy Act → Greatlakesmud.org

Mark Loomis

U.S. EPA GLNPO

Loomis.mark@epa.gov

312-886-0406



Harbor 31 Aerial - Post_03.jpg