

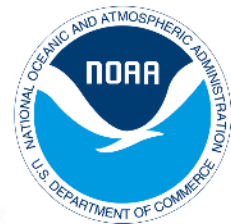
Enhanced Aquatic Connectivity Through Regional Coordination and Selective Fish Passage Solutions

Lisa Walter, Dan Zielinski, Andrew Muir, and John Dettmers
Great Lakes Fishery Commission





Fisheries and Oceans
Canada



Great Lakes Drainage Basin



Legend

- Lake Superior Drainage Basin
- Lake Huron Drainage Basin
- Lake Michigan Drainage Basin
- Lake Ontario Drainage Basin
- Lake Erie Drainage Basin
- U.S.A./Canada Border
- Cities/Towns

Environment Canada / Environnement Canada



Canada



Sea Lamprey Invasion and Expansion

Lake Superior
1938

Lake Huron
1937

Lake Michigan
1936

Lake Ontario
1835

Lake Erie
1921





Great Lakes Fishery Commission

Who are we?

- 1954 Convention on Great Lakes Fisheries
 - Establish working arrangements among governments to ensure coordinated fishery management
 - Control sea lampreys
- Facilitates Great Lakes fishery management through the *Joint Strategic Plan for the Management of Great Lakes Fisheries*
 - Ecosystem-based approach

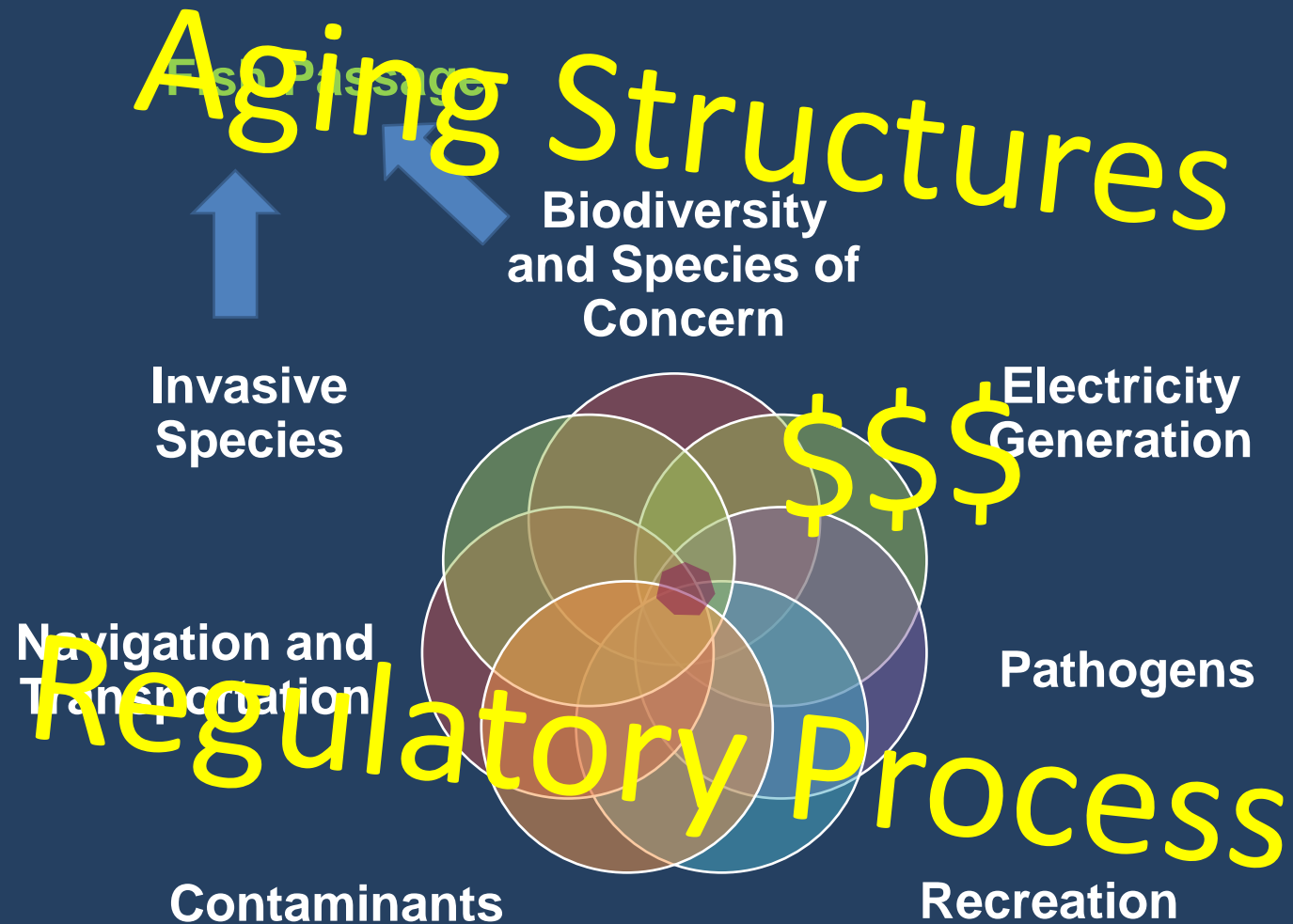
Grey Control Budget: \$21M

ment Costs: \$8.2M

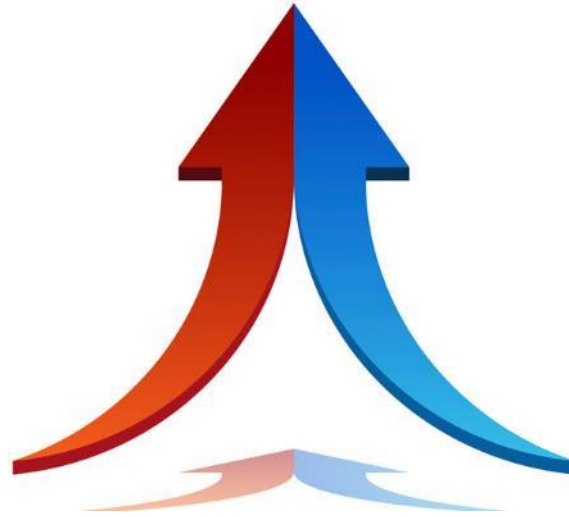
Budget!



Connecting Aquatic Systems – Why So Challenging?



Bi-Directional Selective Fish Passage



**Fish Passage
Technology**

Social Support



Aquatic Connectivity Coordination

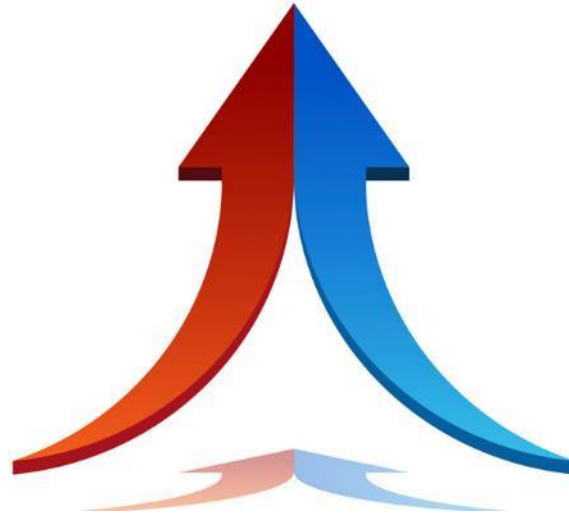
- Proactive action and transdisciplinary discussion
- Build agreement about priorities for barrier assessments and action
- Link action to opportunities
- Facilitation and coordination through the Joint Strategic Plan



Identified Needs:

- Basin-wide, accessible dam inventories
- Decision support tool development and evaluation
- “Shovel-ready” projects
- Monitoring – what value was added?
- Clearer communication between barrier owners and resource agencies
- Develop a cohesive sense about where to:
 - Prioritize improved connectivity
 - Prevent increased spread of invasive species

Bi-Directional Selective Fish Passage



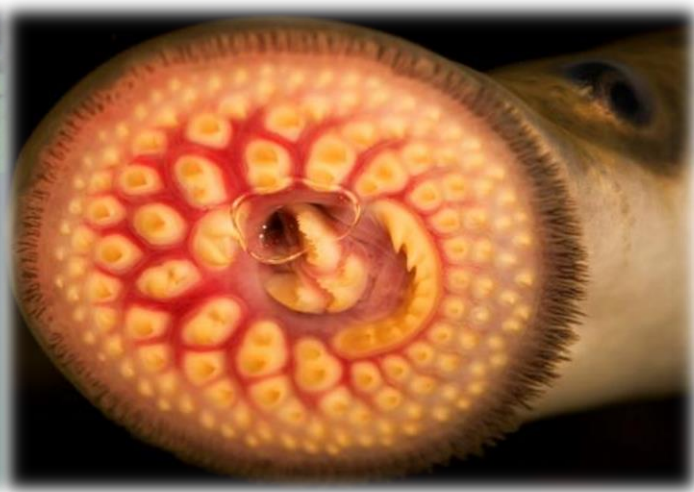
**Fish Passage
Technology**

Social Support



What is FishPass?

An innovative project to **enhance fish passage and connectivity** between the Boardman River and Lake Michigan **while removing invasive or non-desirable fishes** through controlled sorting



FishPass – finding an innovative solution to global problem

- No solution exists for multi-species sorting
- Fish behavior will drive the design
- Integration of multiple techniques and technologies
- Adaptive infrastructure can be modified to achieve passage and removal



What will FishPass do?

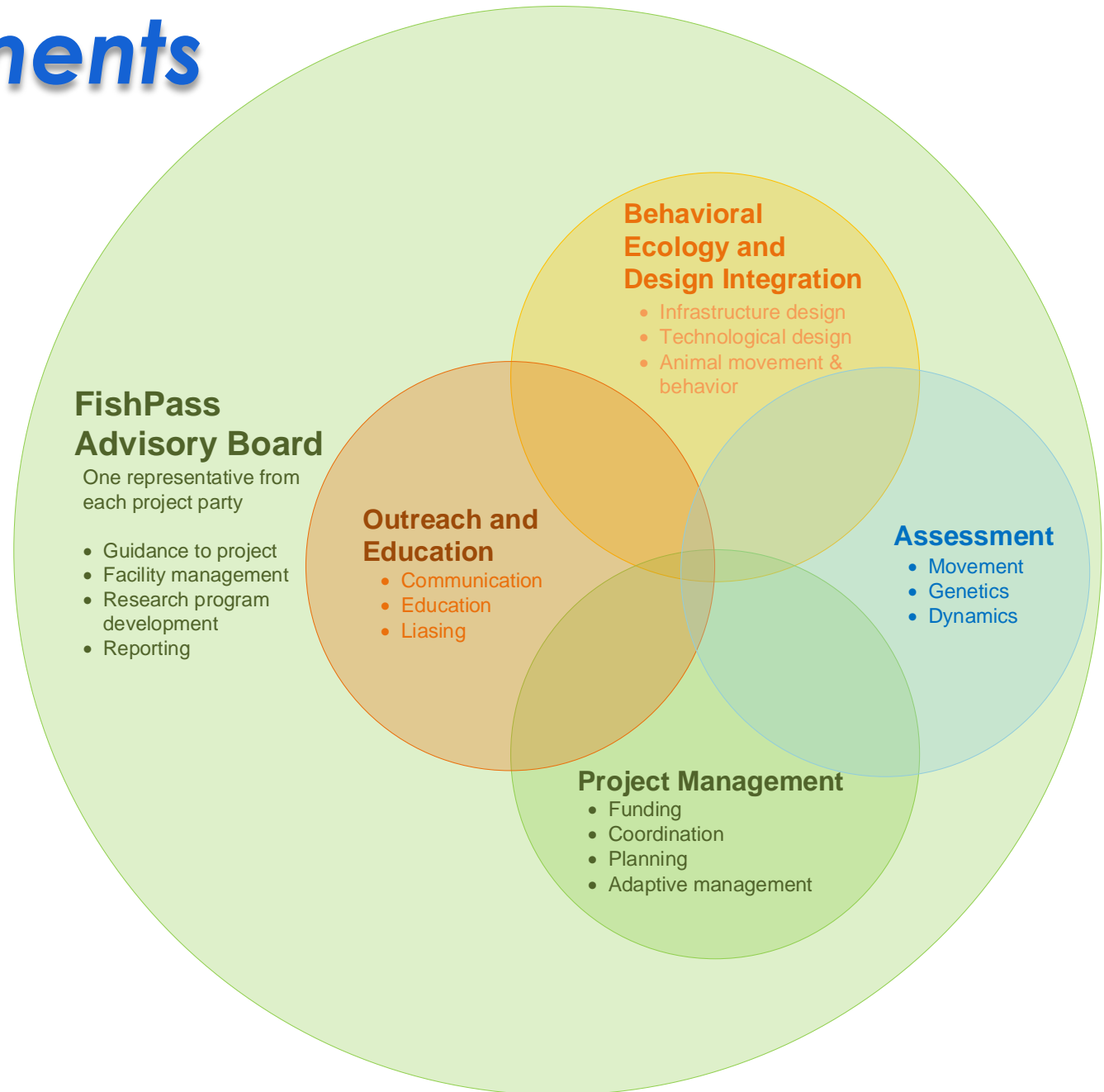
- **Replace** deteriorating Union Street Dam with an improved barrier featuring a fish-sorting channel and a nature-like river channel
- Optimize various sorting technologies and techniques **below a barrier with selective capacity** to maximize efficiency of passing desirable fishes and removing invasive fishes
- **Develop** into a living laboratory with a strong education & outreach center
- **Convert** to permanent selective fishway completing the Boardman River Restoration Project



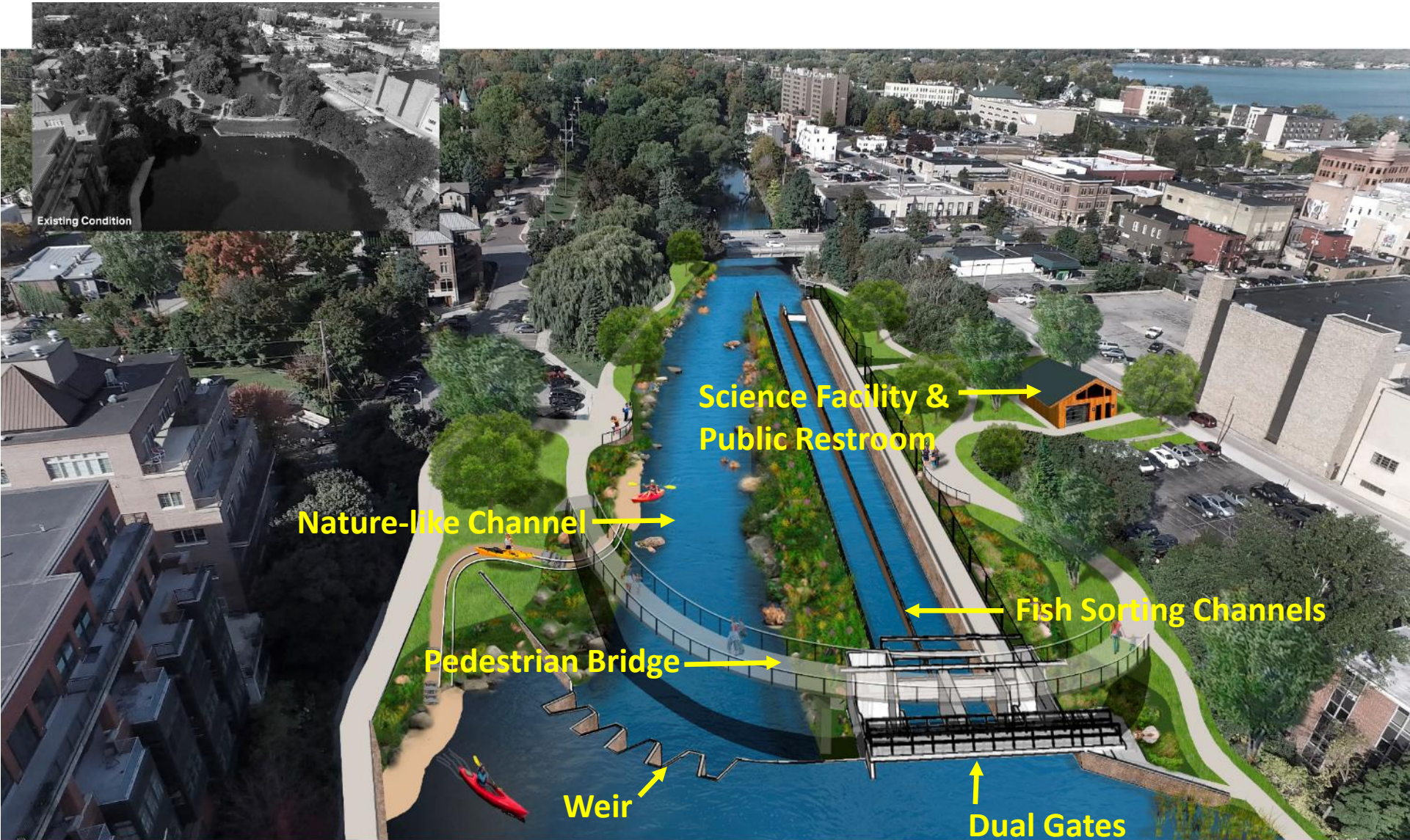
FishPass Elements

Workshop Participation

| ENTITY | WKI | WKII |
|----------------|-----------|-----------|
| US FEDERAL | 15 | 16 |
| US STATE | 4 | 9 |
| CAN FEDERAL | 6 | 0 |
| CAN PROVINCIAL | 1 | 0 |
| TRIBAL | 2 | 3 |
| MUNICIPAL | 3 | 2 |
| US ACADEMIA | 5 | 5 |
| CAN ACADEMIA | 2 | 1 |
| INTERNATIONAL | 13 | 12 |
| INDUSTRY | 4 | 3 |
| FUNDERS | 2 | 1 |
| NGO | 0 | 1 |
| TOTAL: | 57 | 53 |



FishPass Conceptual Design



Integrating

LIFE HISTORY

- Seasonal or daily sorting



MORPHOLOGY

- Video shape recognition
- Elevators
- Screens
- Ladders
- Water velocity barriers



BEHAVIOR

- Eel-ladder style traps
- Funnel
- Pheromones
- Alarm cues
- CO₂ / electrical curtain
- Sound deterrents
- Hydraulic challenges



Potential Technologies

Take Home Messages

- Reconnecting the Great Lakes to their tributaries is a complex, multidisciplinary challenge
- Solutions require harmonizing competing objectives
 - Building and strengthening coordination
 - Joint Strategic Plan
 - Integration of technologies
 - Life history, morphology, behavior

