Developing a Science and Monitoring Strategy to Assess Recovery of Fisheries Habitats and Populations in the St. Clair-Detroit River System

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St. Clair-Detroit River System

160 km long

International border

Key trade route

Major industrial & metropolitan centers

<table>
<thead>
<tr>
<th>River system</th>
<th>Annual mean discharge (m³s⁻¹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mississippi</td>
<td>18,400</td>
</tr>
<tr>
<td><strong>St. Lawrence</strong></td>
<td><strong>10,800</strong></td>
</tr>
<tr>
<td>Columbia</td>
<td>7500</td>
</tr>
<tr>
<td>Danube</td>
<td>6450</td>
</tr>
<tr>
<td>Yukon</td>
<td>6370</td>
</tr>
<tr>
<td>Niagaraᵃ</td>
<td>5692</td>
</tr>
<tr>
<td><strong>Detroitᵃ</strong></td>
<td><strong>5210</strong></td>
</tr>
<tr>
<td><strong>St. Clairᵃ</strong></td>
<td><strong>5097</strong></td>
</tr>
<tr>
<td>Nile</td>
<td>3000</td>
</tr>
<tr>
<td>St. Marysᵃ</td>
<td>2100</td>
</tr>
<tr>
<td>Missouriᵇ</td>
<td>1955</td>
</tr>
<tr>
<td>Sacramento</td>
<td>1140</td>
</tr>
<tr>
<td>Colorado</td>
<td>550</td>
</tr>
</tbody>
</table>
A Vibrant Ecosystem Exists

• Drinking water, transportation, industry

• World-class muskie, smallmouth bass, walleye, yellow perch

• Increasing evidence of lake sturgeon, lake whitefish, rare and endangered species

• Bald Eagles

• Migratory waterfowl

• Continued recovery
Key Issues in St. Clair & Detroit River

Industrialization
  Legacy Contaminants

Urbanization

Erosion/sediment

Loss of habitat

Recruitment issues

Invasive species impacts

R. Burns
The Need for Continued Restoration

• Major habitat degradation associated with:
  • Riparian development / urbanization
  • Industry & associated pollutants
  • Dredging & channel modification
  • 97% of wetlands loss

• Variability in fisheries recruitment and production
  • Within SCDRS and adjoining Great Lakes

• Loss of ecosystem services
  • Societal, Economic, and Ecological
Our Approach

• Communication and Consensus Building
  • Interjurisdictional agencies and partners
  • Identify and define management goals and objectives

• Inventory of monitoring and assessment programs
  • Workshops and conference calls
  • Database developed
  • Relate to broad management goals and objectives
  • Identify redundancies, collaborative opportunities

• Viability analysis
  • Snapshot of baseline conditions and trends
  • Identify and prioritize knowledge and monitoring gaps
Communication & Consensus Building

• St. Clair – Detroit River System Initiative
  
  • Organized in 2004
  
  • Voluntary consortium of researchers, managers, academic, federal, provincial, state, First Nations and private sector groups
  
  • Successfully cultivating effective working relationships

scdrs.org
A Collective Impact Initiative for Recovery

**Components**

- Common Agenda
- Shared Measurement System
- Continuous Communication
- Mutually Reinforcing Activities
- Backbone Support Organizations

**Description**

- Strategic Priorities: shared vision, common understanding of problem, joint approach for solutions, agreed to actions
- Common evaluation of success
- Frequent, informed interactions
- Coordination of separate signatory efforts thru over-arching plan of actions
- Dedicated core facilitation, structured decision making

Shared Vision Statement: The St. Clair-Detroit River System is a thriving ecosystem managed with science-based principles and broad social support, providing desired environmental services for the region and the Great Lakes basin.

SCDRS.org
Common Agenda: An Integration of Strategies

- Improved habitats
- Improved indigenous biodiversity
- Eliminate impairments
- Improve environmental conditions
- Improve Fish & Wildlife
- Enhance societal benefits
- Eliminate areas of concern

Common Agenda

Enhanced satisfaction within the corridor
Adaptive Management Principles

Involves risk, uncertainty

Learning by questioning, experimenting, & monitoring outcomes
Integration with Larger Fisheries Plans

- Strategic Great Lakes Fishery Management Plan
- Lakes Huron & Erie Fish Community Objectives (GLFC)
- Michigan & Ontario Lake Sturgeon Rehabilitation Strategies
- Species at risk programs
Large Investments in Habitat Restoration

• Shoreline habitat restoration, added riparian complexity
• Fish spawning reefs restored
• Water quality improvements
• Positive responses by fish, aquatic fauna, & stakeholders
• Delisting of Beneficial Use Impairments
The Need to Measure Progress

• How are restoration efforts performing/maturing?
  • Physical maturation
  • Biological function

• What are trajectories for fish populations?

• What are views and desires of anglers and stakeholders?

• How are management goals and objectives being realized?
Transitioning from Research to LTMP

• Relevant to management goals/objectives
  - Adaptive management design
  - Interjurisdictional consensus
  - Timely and regular analyses and reporting

• Ability to detect changes in metrics
  - Standardized methods
  - Establish baselines

• Statistically rigorous & credible

• Realistically affordable & sustainable
  - Requires commitment
  - Pool resources & collaborate

Compiling an Inventory & Database of Monitoring Programs

• Inventory of historic and existing monitoring programs
  • Agency, Target, Methods, Scope, Data sets, Reports
  • Long-term and short term programs
  • Relational database routinely updated

• Link to SCDRSI Priority objectives and key indicators
  • Identify match/mismatch between objectives and monitoring
  • Identify need for new or expanded monitoring programs
  • Identify specific research projects
Viability Analysis

- Identify Key Ecological Attributes and Targets
- Rate status of indicators
- Identify information gaps and science needs
- Provide snapshot of baseline status and trajectories
- Inform monitoring needs

<table>
<thead>
<tr>
<th>Indicator Rating</th>
<th>Description</th>
<th>Points Assigned to Indicators</th>
<th>KEA / Target Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Good</td>
<td>The indicator is functioning at an ecologically desirable status and requires little human intervention.</td>
<td>4.0</td>
<td>3.75 - 4.0</td>
</tr>
<tr>
<td>Good</td>
<td>The indicator is functioning within its acceptable range of variation; it may require some human intervention.</td>
<td>3.5</td>
<td>3.0 – 3.745</td>
</tr>
<tr>
<td>Fair</td>
<td>The indicator lies outside its acceptable range of variation and requires human intervention. If unchecked, the target will be vulnerable to serious degradation.</td>
<td>2.5</td>
<td>1.75 - 2.995</td>
</tr>
<tr>
<td>Poor</td>
<td>Allowing the indicator to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible.</td>
<td>1.0</td>
<td>1 – 1.745</td>
</tr>
<tr>
<td>NA</td>
<td>Target was not applicable in the specific segment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Example Indicator Report Card to Measure Progress**

**Themes**
Protection, enhancement, and restoration of physical habitat.

**Goal**
Completion of targeted habitat projects as per AOC habitat plans; pre/post monitoring protocol for projects.

**Priority Objective**
Complete habitat improvement projects to remove loss of fish and wildlife habitat Beneficial Use Impairment (BUI)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Time Frame</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of projects left to complete leading to the removal of this BUI in the Detroit River</td>
<td>Annually</td>
<td>9</td>
</tr>
<tr>
<td>Number of projects left to complete leading to the removal of this BUI in the St. Clair River</td>
<td>Annually</td>
<td>Complete</td>
</tr>
<tr>
<td>Canadian response indicators</td>
<td>Annually</td>
<td>Research and monitoring need</td>
</tr>
<tr>
<td>Overall rating</td>
<td></td>
<td><strong>Good/Improving</strong></td>
</tr>
</tbody>
</table>
A Renaissance for Large Rivers

• Scientifically credible collective impact & adaptive approach.

• Reviving resilient functional ecosystems and economies.

• Support multiple wise uses.

• Restore a sense of place, heritage, & tradition.
Acknowledgments

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