Breakout Session III - Aquatic Organism Barrier Removal and its Significance to the Great Lakes Basin

Samuel Prentice, Huron Pines
June 12th, 2014
Watersheds
- Au Gres River
- Au Sable River
- Black River
- Cheboygan River
- Coastal Lake Huron
- East Branch Au Gres River
- Manistee River
- Muskegon River
- Ocqueoc River
- Pigeon River
- Pine River/Van Etten Lake
- Rifle River
- Sturgeon River
- Tawas River
- Thunder Bay River

7,380 Square Miles
4,423,731 Acres
5,005 River Miles
172,800 Lake Acres
517 Shoreline Miles

Huron Pines
Conserving the Forests, Lakes and Streams of Northeast Michigan
Presentation Outline

I. Barriers-What’s the big deal?

II. Removal-There are so many options, how do you choose?

III. Success Stories

IV. Future Projects
I. Barriers-What’s the big deal?
Dams-A Time to Build Up

- Dam expansion in late 1800s to early 1900s
- Lumber mills
- Timber transport
- Hydroelectric power
- Irrigation
- Recreation
- Navigation
Dams-A Time to Break Down

- 2,500 registered dams (regulated)
- Unregulated?
- Typical 50 year lifespan
- By 2020, 80% of Michigan Dams will be older than their intended lifespan
Aquatic Organism Barriers-Dams

- Block flow of sediment, plants, nutrients, fish
- Slow rivers and disrupt hydrology
- Alter water temperatures
- Decrease dissolved oxygen
- Alter timing of flows (peaking)
- Increased risk of predation
Aquatic Organism Barriers-Road Crossings?

- Block flow of sediment, plants, nutrients, fish
- Slow rivers and disrupt hydrology
- Alter water temperatures
- Decrease dissolved oxygen
- Increased risk of predation
Dams-Significance to the Great Lakes Basin

- Restoring aquatic ecosystem connectivity requires expanding inventories of both dams and road crossings - Frontiers in Ecology and Environment 2013
- 7,000 dams on rivers, creeks, streams in the Great Lakes

Slide credit: Restoring aquatic ecosystem connectivity requires expanding inventories of both dams and road crossings. UW-Madison Center for Limnology
Road Crossings—Significance to the Great Lakes Basin

- More than 260,000 road crossings on rivers, creeks, streams in the Great Lakes
- 64% estimated to negatively impact fish passage

Slide credit: Restoring aquatic ecosystem connectivity requires expanding inventories of both dams and road crossings. UW-Madison Center for Limnology
Significance to Lake Huron

- 86% of major Lake Huron tributaries are disconnected (Gebhardt et al. 2003).
- Recreation
- Commercial fishing
- Pollution
- Maintenance expense

*Slide credit: Development of Conservation Priorities for Migratory, River-spawning Fishes in the Michigan Waters of Lake Huron. March 2012*
Significance to Saginaw Bay

- 72% of river reaches are inaccessible to fish migrating from the bay
- Improving fish passage is the single surest way to increase natural reproduction

Map of Dam Removals 1936-2013

http://www.americanrivers.org/initiatives/dams/dam-removals-map/

Slide credit: American Rivers Map of U.S. Dam Removals 1936-2013
II. Removal-There are so many options, how do you choose?
Resource Inventories

- Provides consistent approach
- Comprehensive by creek, stream or watershed
- Critical component to prioritization

Building the Knowledge Base - Known Dams
Building the Knowledge Base - Known and Suspect Dams
Building the Knowledge Base - Road Crossings and Erosion Sites
Factors That Drive Prioritization

- Biological
- Financial
- Social
- Technical
- Legal
- Partner Input
Targeted Project Sites - Vetted and Prioritized
## Removal Options

<table>
<thead>
<tr>
<th>Resource Function Restored</th>
<th>Fish Ladder</th>
<th>Bypass Channel</th>
<th>Grade Control</th>
<th>Lowered Dam</th>
<th>Full Removal</th>
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<td>Natural Flow Regimes</td>
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<td>Predation Risk</td>
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III. Success Stories
Aquatic Organism Barrier Success Stories

- Sturgeon River
  - Poquette Road
- Thunder Bay River
  - Miller Dam
  - Fuller Creek/Halberg Road
- Black River
  - Saunders Dam
Aquatic Organism Barrier Removal

Sturgeon River Watershed, Poquette Road

- Undersized culvert
- Velocity Barrier
- Paved Road
- Capitalized on Partnership with Otsego County Road Commission
- Completed Fall 2013
Partners

Great Lakes Restoration Initiative
Headwaters Chapter of Trout Unlimited
Livingston Township
Michigan Department of Natural Resources
National Fish and Wildlife Foundation
Otsego County Road Commission
Paul H. Young Chapter of Trout Unlimited
Sustain Our Great Lakes
U.S. Fish & Wildlife Service
Wade Trim
Aquatic Organism Barrier Removal

Thunder Bay River Watershed, Miller Dam

- Failing Dam
- Driveway Access
- 7 miles of coldwater restoration
- Stoplog drawdown
- Removal and replacement
- Completed Spring 2012

Partners
Challenge Chapter of Trout Unlimited
Michigan Department of Natural Resources
The Carls Foundation
U.S. Fish & Wildlife Service
Photos provided by U.S. Fish & Wildlife Service - Alpena FWCO
Aquatic Organism Barrier Removal

Thunder Bay River Watershed, Halberg Road

- Undersized culvert
- Perched (Headcut?)
- 2% stream grade
- Former DNR Hunt Creek Fisheries Research Center
- Completed Summer 2013
Aquatic Organism Barrier Removal

Thunder Bay River Watershed, Halberg Road

Removed 48” Culvert

Existing Stream Gradient: 2%
Aquatic Organism Barrier Removal

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Thunder Bay River Watershed, Halberg Road

Removed 48” Culvert

Existing Stream Gradient: 2%

General Plan of Site - Bottomless Aluminum Box Culvert
Aquatic Organism Barrier Removal

Thunder Bay River Watershed, Halberg Road

Removed 48” Culvert

Existing Stream Gradient: 2%
Aquatic Organism Barrier Removal

Thunder Bay River Watershed, Halberg Road

- Huron Pines
- KPM Engineering
- Michigan DNR
- Montmorency County Road Commission
- National Fish and Wildlife Foundation
- U.S. Fish & Wildlife Service
Aquatic Organism Barrier Removal

Black River Watershed, Saunders Dam

- Only barrier on mainstream of the upper Black River in the headwaters
- Resource priority for several years
- Recently acquired property by State of Michigan
- Completed Summer 2013
Aquatic Organism Barrier Removal

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Black River Watershed, Saunders Dam
IV. Future Projects
Aquatic Organism Barrier Removal

Rifle River Watershed, 2014

- Ogemaw County
  - **OG23** Houghton Creek/Flynn Road
  - **OG27** Wilkins Creek/Campbell Road
  - **OG30** Prior Creek/Campbell Road
  - **OG31** Prior Creek/Esmond Road
- Arenac County
  - **AR19** Fritz Creek/Fritz Road
  - **AR20** Unnamed Tributary/Townline Road

Reconnecting > 22.6 miles in 2014
Aquatic Organism Barrier Removal

East Branch Au Sable Bypass Channel, 2014

- Crawford County
- Harrietta Hills Trout Farm, LLC
- Herrick Foundation
- Huron Pines
- Michigan DNR
- National Fish and Wildlife Foundation
- Stantec
- U.S. Fish & Wildlife Service
Aquatic Organism Barrier Removal

Pigeon River Dam Removal, 2015

- Legally mandated water drawdown, 2014
- Optional full removal and bridge replacement, 2015
References


Fishing for answers?

www.huronpines.org
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*Samuel Prentice, Huron Pines*  
*June 12th, 2014*