Jun 11th, 10:40 AM - 11:00 AM

Advancing Fish Passage in the Menomonee River Watershed

C. Nenn
University of Wisconsin - Madison

Follow this and additional works at: https://scholarworks.umass.edu/fishpassage_conference
Addressing Fish Passage Impediments in the Menomonee River Watershed
Menomonee River Watershed

- 136 Square Miles; 55 Miles of Rivers/Streams; 28 Miles Mainstem

Little Menomonee River
Honey Creek
Underwood Creek
Dousman Ditch
Willow Creek
Little Menomonee Creek
Butler Ditch
Lilly Creek
Nor-X-Way Channel
Grantosa Creek
Menomonee River Watershed

- 335,000 Residents
  (2463/sq. mile)
- 16 Municipalities:
  Brookfield
  Greenfield
  Mequon
  Milwaukee
  New Berlin
  Wauwatosa
  West Allis
  Brookfield
  Germantown
  Lisbon
  Richfield
  Butler
  Elm Grove
  Greendale
  Menomonee Falls
  West
  Milwaukee
Menomonee River Watershed

Current Land Use:

- agriculture in N. 1/3, densely urban in lower 1/3, and rest is rapidly urbanizing
- 60% Urban, 40% rural
- 90% of the population receives sanitary sewer service
Land Use Changes

• Land use changes and increased imperviousness in the watershed has caused habitat degradation and stagnated fish diversity.

• Development has created many impassable culverts, has filled in/ altered habitat, and created other artificial barriers like small dams and drop structures.
Menomonee River Watershed

Major Pollutants:

• Urban stormwater
  – Wildlife, pets & lawns
  – Construction site erosion
  – Illicit Discharges

• Rural nonpoint sources
  – Eroding agricultural lands
  – Eroding streambanks

• Sanitary & combined sewer overflows
Riparian Corridors Conditions

- Greater than 75 feet
- 51 - 75 feet
- 26 - 50 feet
- Less than 25 feet
- Enclosed conduit
Wetlands

• Filling, dredging, channel relocation, and engineering have destroyed most of the spawning wetlands in the lower portion of the river as well as the ecological functions they once provided.

• Wetland fish spawning habitat for northern pike and marsh spawning walleye are absent from the lower reaches of the Menomonee River and Milwaukee Estuary;

• Habitat suitable for sustaining potadromous fish populations is present throughout the upper Menomonee River and some of its major tributaries (estimated at 3,700 acres of riparian wetlands).
Stream Condition--SEWRPC
Menomonee Fish

- Central stoneroller
- Hornyhead chub
- White sucker
- Black bullhead
- Northern pike
- Largemouth bass
- Johnny darter
- Bluegill
- Pumpkinseed
- Green sunfish
- Black crappie
- Central mudminnow
- Rock bass
- Creek chub
- Bluntnose minnow
- Blacknose dace
(SEWRPC_TR-39)
Menomonee River
Biological Conditions

Fish Community

Macroinvertebrates-
Aquatic Bugs
Fish Passage Project Goals

• Removing artificial barriers to aquatic life passage will increase access for Lake Michigan and other native fish to pass to upstream spawning habitats (e.g., vegetated wetlands, etc.);
• Improve fish productivity;
• Enhance recreational opportunities; and
• Provide a more cost-effective alternative to restoring degraded habitats or creating new ones further downstream.
## Menomonee River Watershed Fish Passage Impediments

<table>
<thead>
<tr>
<th></th>
<th>Milwaukee</th>
<th>Ozaukee</th>
<th>Washington</th>
<th>Waukesha</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dam / Weir</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Low Water Crossing</td>
<td>9</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Railroad Culvert</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Railroad Culvert Barrier</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road Culvert Barrier</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>9</td>
<td>20</td>
</tr>
<tr>
<td>Rocky Debris Major</td>
<td>2</td>
<td></td>
<td>1</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Sediment Debris Major</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Waterfall / Cascade</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Woody Debris Major</td>
<td>43</td>
<td>13</td>
<td>4</td>
<td></td>
<td>60</td>
</tr>
</tbody>
</table>

### Totals

- Total Impediments: 118
- "Passable/Minor" Impediments: 264
- Total Survey Points: 382
Example Reach Map from our Fish Passage GIS
Example Barrier Survey Form (from our Microsoft Access Database)
### Stream Crossing Data Sheet

**Site ID:** 1723-155  **Date:** 8-1-2012

**Surveyed by:** Joe Zacc  **Dem:** Ford

**Stream Name:** Butler Creek  **Crossing Type:** Culvert(s)

**Road Name:** Campbell Dr

<table>
<thead>
<tr>
<th>GPS Waypoint</th>
<th>Lat:</th>
<th>Lon:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Outcome:** Full survey  **No crossing**  **No stream**  **No access**

**Notes:** 3 culverts perched; also 3 small storm outlets; rock blockage upstream of inlet.

**Photos:**

**Inlet:** Y  **Outlet:** Y

**Upstream:** X  **Downstream:** X

**Other:** X

**Exotic Species:**

### Structure 1

<table>
<thead>
<tr>
<th>Shape</th>
<th>Round Arch</th>
<th>Rectangular Open Bottom</th>
<th>Elliptical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Metal</td>
<td>Concrete</td>
<td>Plastic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interior Surface</th>
<th>Smooth</th>
<th>Corrugated</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Plugged</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crushed</td>
<td>%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rusted</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Length (ft)</th>
<th>144.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width (ft)</td>
<td>10.5</td>
</tr>
<tr>
<td>Height (ft)</td>
<td>7.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inlet Type</th>
<th>Projecting Wingwall</th>
<th>Mitered Apron</th>
<th>Headwall Trunnion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inlet Elevation (ft)</td>
<td>22.5</td>
<td>22.5</td>
<td>22.5</td>
</tr>
</tbody>
</table>

| Inlet Sediment Depth (ft) | 0 |

<table>
<thead>
<tr>
<th>Inlet Sediment Type</th>
<th>Silt</th>
<th>Sand</th>
<th>Gravel</th>
<th>Cobble</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlet Type</td>
<td>At grade</td>
<td>Embedded Apron</td>
<td>Freefall</td>
<td></td>
</tr>
<tr>
<td>Outlet Elevation (ft)</td>
<td>23.8</td>
<td>23.5</td>
<td>23.3</td>
<td></td>
</tr>
</tbody>
</table>

| Outlet Sediment Depth (ft) | 0 |

| Outlet Sediment Type | Silt  | Sand | Gravel | Cobble |

*Do not complete for open bottom structures.*
Tier 1: Connection to Lake Michigan

Tier 2: Connection to Mainstem

Tier 3: Connection to highest quality areas

SEWRPC Prioritization
### Tributary Impediment Prioritization

<table>
<thead>
<tr>
<th>&quot;C&quot; = Impediment Ordination</th>
<th>Description</th>
<th>&quot;D&quot; = Tributary Sub-Basin Fragment Length (Miles)</th>
<th>Description</th>
<th>&quot;E&quot; = Impediment Significance Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Reach not isolated from mainstem river</td>
<td>&quot;Y&quot;</td>
<td>&quot;Y&quot; total miles of tributary sub-basin channel fragment(s) length isolated by the impediment</td>
<td>1</td>
<td>Small-Scale Conservation Corps Impediment (SSCC)</td>
</tr>
<tr>
<td>1</td>
<td>Reach isolated from mainstem river by 1 impediment</td>
<td></td>
<td></td>
<td>2</td>
<td>Large-Scale Conservation Corps Impediment (LSCC)</td>
</tr>
<tr>
<td>2</td>
<td>Reach isolated from mainstem river by 2 impediment</td>
<td></td>
<td></td>
<td>5</td>
<td>Publicly Owned &quot;Public Works&quot; Impediment (PUPW)</td>
</tr>
<tr>
<td>3</td>
<td>Reach isolated from mainstem river by 3 impediment</td>
<td></td>
<td></td>
<td>7</td>
<td>Privately Owned &quot;Public Works&quot; Impediment (PRPW)</td>
</tr>
<tr>
<td>4</td>
<td>Reach isolated from mainstem river by 4 impediment</td>
<td></td>
<td></td>
<td>10</td>
<td>Publicly Owned &quot;DOT&quot; Impediment (PUDOT)</td>
</tr>
<tr>
<td>&quot;Q&quot;</td>
<td>Reach isolated from mainstem river by &quot;Q&quot; number of impediments</td>
<td></td>
<td></td>
<td>10</td>
<td>Invasive Vegetation Impediment (INVE)</td>
</tr>
</tbody>
</table>

"1000 Q" = Permanent Natural Impediment (PENA)
Potential Spawning Habitat Consideration

- 75 areas of promising spawning habitat were identified.
- Major tributaries with the best potential for spawning habitat include the Little Menomonee River and Creek, Nor-X-Way Channel, and Dretzka Park Creek among others.
Priority SEWRPC Projects To Improve The Fishery Within Menomonee River Watershed

Instream Measures

(1) Removal of approximately 1,000 linear feet of concrete (within reach MN-18) in the vicinity of Wisconsin Avenue and IH-94 to reestablish fish passage to upstream reaches from Lake Michigan.

(2) Removal and/or retrofitting of five low-gradient structures within the vicinity North Menomonee River Parkway between Swan Boulevard and Harmonee Avenue (within Reach MN-17A).
MMSD Concrete Removal

Menomonee River Watershed: Potential Barriers & Habitat Connections Surveyed (382 Total)
Menomonee River
River Crossing – Fish Passage Obstructions
N. Menomonee River Pkwy between Swan Blvd & Harmonee Ave
09-14-2009 (Low Flow)
Menomonee River
East of Swan Blvd & N. Menomonee River Pkwy
09-14-2009 (Low Flow)

Second Set of Pictures

#1) Sewer Crossing @ 90th Street & N. Menomonee River Pkwy
~2 feet wide; ~4-6 inches high

#2) Hoyt Park Playground Area
    Dam/Grade control
    ~ 4 feet wide; ~2.5 feet high
Menomonee River
N. Menomonee River Pkwy & Hoyt Park Drive
09-14-2009 (Low Flow)

First Set of Pictures

#2) Hoyt Park Playground Dam/Grade control
~ 4 feet wide; ~2-3 feet high

#3) Sewer Crossing downstream of footbridge
~4 feet wide; ~2-4 inches high
First Set of Pictures

#4) Sewer Crossing @ Charles Hart Pkwy & N. Menomonee River Pkwy
~ 3-4 feet wide; ~1-2 feet high

#5) Old Road Crossing
~ 8 feet wide; ~2.5 feet high
Interfluve Designs
Crossing 1—Likely Removal

Crossing #1 - Sewer Crossing

Before.....

......After
Crossing 2 (and 5)--Removal

Crossing #2 - Stone Walking Path

Before.....

......After

This image can also serve as an example of the removal of Crossing #5 - Old Stone Road.
Crossings 3 and 4 – Removal or Ramp

Plan Sketch:
Rock ramp fishway at sewer crossing #4

This approach can be also be implemented at Sewer Crossing #3.
Next Steps

- Start removal of several major woody debris jams with Great Lakes CCC and volunteers-focusing on man-made debris
- Start design of 5 priority infrastructure barriers (WCMP funded)
- Meet with private and public impediment owners
- Fundraise to address impediments/work with municipalities to budget for fish passage