Recent Observations of River Lamprey in the Lower Columbia River

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River Lamprey *Lampetra ayersi*

- Parasitic lamprey species related to the Western Brook lamprey *Lampetra richardsoni* (Vladykov and Follett 1958)

**Introduction to River Lamprey**

- Distribution
- Life history
- Recent findings

**Predation studies**

- Sampling designs
- Results
- Lamprey as prey
River Lamprey
Distribution

World Distribution:

Coastal rivers of North America from San Francisco Bay, CA to the Skeena River, BC

Local Distribution (Historic):

Lower and mid Columbia River likely including the Willamette River
River Lamprey
Life history

- Juvenile life history similar to other lamprey species
- Anadromous / estuarine - near-shore, surface-oriented, brief marine residence (10 weeks, June – August)
- Parasite / predator / scavenger - on small fishes such as herring, smelt, juvenile salmon
- Adults are 25 cm long, migrate in the fall, spawn in the spring

River lamprey wound on herring
From Beamish, 1980
River Lamprey
Detection

• Juveniles difficult to distinguish from Brook lamprey
• Adults rarely observed in fresh water
• Recent observations in
  o California coastal rivers
  o Salish Sea / Fraser River and other tributaries
• Common detection methods:
  o Surface or mid-level trawls in estuaries / near shore
  o Smolt traps set low in large tributaries
• Last recorded detection in the Columbia River was in the early 1980s (captured in estuary trawls)
Predation Studies on the Columbia and Snake Rivers
Sampling Methods
Fish Processing - field
Fish Processing – lab
Lamprey mouth parts from Northern Pikeminnow diet samples
<table>
<thead>
<tr>
<th></th>
<th>Years</th>
<th># samples</th>
<th># w/lamprey</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indexing</strong></td>
<td>1994-2010</td>
<td>16,905</td>
<td>20</td>
</tr>
<tr>
<td><strong>(NPM,SMB,WAL)</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Dam Angling</strong></td>
<td>2006-2010</td>
<td>1,642</td>
<td>442</td>
</tr>
<tr>
<td><strong>(NPM)</strong></td>
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</table>
Number of samples containing food = 994
<table>
<thead>
<tr>
<th>Fish Taxa</th>
<th>Count</th>
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<tbody>
<tr>
<td>Lamprey</td>
<td>442</td>
</tr>
<tr>
<td>Salmon</td>
<td>224</td>
</tr>
<tr>
<td>American Shad</td>
<td>51</td>
</tr>
<tr>
<td>Bass</td>
<td>13</td>
</tr>
<tr>
<td>Sculpin</td>
<td>9</td>
</tr>
<tr>
<td>Sucker</td>
<td>6</td>
</tr>
<tr>
<td>Minnow</td>
<td>5</td>
</tr>
<tr>
<td>Mountain Whitefish</td>
<td>3</td>
</tr>
<tr>
<td>Catfish</td>
<td>1</td>
</tr>
</tbody>
</table>
Number of samples containing fish = 585
Two distinct lamprey mouth part configurations
Pacific Lamprey
*Entosphenus tridentatus*

River Lamprey *Lampetra ayersi*
or Brook Lamprey *Lampetra richardsoni* ?
Well-developed cusps

River Lamprey *Lampetra ayersi*
Oddities
River Lamprey

- Three samples have contained river lamprey remains
- All have been from Northern Pikeminnow samples
  - One from below Bonneville Dam in 2008
  - One from the tailrace of The Dalles Dam in 2009
  - One from the tailrace of John Day Dam in 2010
Summary / Conclusions

- Evidence that River Lamprey are still present in the Columbia Basin
- The River Lamprey are passing above some Columbia River dams
- Need to explore other sampling methods to detect River Lamprey:
  - Smolt traps in lower large mainstem rivers (Clackamas, Sandy, Willamette)
  - Mid-level trawls in larger mainstems (Lower Willamette, Columbia, estuary)
Questions ?