Invasive fishes in the Pacific NorthWest: A Canadian perspective

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Outline of this talk:

1. Importance of fishing to BC, and invasive fishes
2. Control: Gill netting and angler incentive programs
3. Our Northern pike research
4. Other invasive fishes
5. Cross-border conclusions and action items
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Questions: bheise@tru.ca
<table>
<thead>
<tr>
<th></th>
<th>Value of fisheries in BC</th>
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<tbody>
<tr>
<td>1.</td>
<td>Freshwater sport:</td>
</tr>
<tr>
<td>2.</td>
<td>Salmon sport:</td>
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<td>3.</td>
<td>Salmon commercial:</td>
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The number of invasive freshwater fish species detected in B.C. has increased steadily since the early 1900s.
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• In 2014, MFLNRO and Teck Metals Ltd. implemented the Invasive Northern Pike Suppression Program

• Program includes active removal of pike through gill-netting, and limited PIT tagging

• Gill-netting efforts in 2015-2017 focused in the Robson’s Reach area immediately downstream of the Hugh L. Keenleyside Dam (2017=last year of funding)
Fishing policy in the Columbia River (angler incentive program)

- Regulations were changed from pike fishing being illegal, to fishing allowed, with no catch limits (and anglers encouraged to kill all pike caught)

- In 2014 and 2015 anglers were offered a reward for turning in pike heads (if that head contained a PIT tag)
### Results of the Columbia Pike Suppression Program

<table>
<thead>
<tr>
<th>Year</th>
<th>CPUE (#/hr/net)</th>
<th>Total catch</th>
<th>Mark-recapture est.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>0.19*</td>
<td>133</td>
<td>725 (478-2759)</td>
</tr>
<tr>
<td>2015</td>
<td>0.20</td>
<td>116</td>
<td>410 (151-670)</td>
</tr>
<tr>
<td>2016</td>
<td>0.19</td>
<td>39</td>
<td>107 (59-155)</td>
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*0.44 for May*
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Research conclusions

1. Evidence of movement from the Pend d’Oreille to the Columbia River either through migration through dam or illegal transport (otolith microchemistry)

2. Spawning suspected to be occurring near Celgar Mill, using sunken debris and cover provided by logs

3. Movement of tagged pike limited to approximately 10 km range near Castlegar (acoustic telemetry)
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4 Other invasive fishes in BC

- Smallmouth bass
- Largemouth bass
- Walleye
- Yellow perch
Overlap of evolutionary significant units (ESU) of salmon with that of smallmouth bass in the Columbia River system  
(Source: Carey et al. 2011)
Rainbow trout stocking experiment on Vancouver Island

Number of RBT consumed per Bass Caught

- Shawnigan Lake
- Spider Lake

The number (dots) and prize money (bars) of bass tournaments in Washington state

Carey et al. 2011 Reviews Fish. Sci.
Figure 24. Trophic profile of the primary prey items (%Ei) in the diet of yellow perch (n=34) from Osoyoos Lake in the Okanagan during April 2012 sampling. Error bars represent 95% CI using bootstrap method.
## Risk summary for these fishes

Results from a DFO MoE risk assessment conducted in 2008.

<table>
<thead>
<tr>
<th>Species</th>
<th>Ecol. Consequence Small Water Bodies</th>
<th>Ecol. Consequence Large Water Bodies</th>
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</thead>
<tbody>
<tr>
<td>Largemouth bass</td>
<td>Very High</td>
<td>Moderate</td>
</tr>
<tr>
<td>Smallmouth bass</td>
<td>Very High</td>
<td>High</td>
</tr>
<tr>
<td>Yellow perch</td>
<td>Very High</td>
<td>Medium</td>
</tr>
<tr>
<td>Northern pike</td>
<td>Very High</td>
<td>Very High</td>
</tr>
<tr>
<td>Walleye</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Very high risk = Extirpation of native populations likely
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Cross-border conclusions and action items

1. Form PNWER cross-border Northern pike committee
2. PNWER-scale economic analysis of native fisheries and salmon/steelhead recovery investments at threat from Northern pike
3. Mandatory retention of Walleye, Smallmouth bass and Yellow perch caught in pike suppression programs
4. Increase focus on funding for Canadian and U.S. northern pike suppression programs, where the species is invasive