Using the Stream Salmonid Simulator to Evaluate Production of Juvenile Chinook Salmon under Alternative Hydrographs

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Capacity

Capacity (fish / m²)

Fry
- Natural
- ROD

Parr
- Natural
- ROD
Weekly Abundance passing Pear Tree

Weekly abundance (hundreds of thousands)

Median passage date
Natural – April 20
ROD – April 11

80th percentile (SS)
Natural – May 18
ROD – May 19
Mean size of fish passing Pear Tree

Weekly mean fork length (mm)

- natural
- ROD
<table>
<thead>
<tr>
<th></th>
<th>Natural</th>
<th>ROD</th>
<th>Difference (Natural – ROD)</th>
<th>Percent change (Nat-Rod)/Rod</th>
</tr>
</thead>
<tbody>
<tr>
<td>N - tot (millions)</td>
<td>5.0</td>
<td>5.0</td>
<td>0.0</td>
<td>0.8</td>
</tr>
</tbody>
</table>
Mechanisms Driving Differences

- Migration timing
  - Higher capacity during fry rearing
  - Reduces movement probability
  - Fish remain upstream longer
- Size
  - Temperature increased growth
- More parr sized fish
  - Longer residence
  - Faster growth
Movement probability
Movement probability
### Summary Statistics by Scenario

<table>
<thead>
<tr>
<th></th>
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<th>ROD</th>
<th>Difference (Natural – ROD)</th>
<th>Difference (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N - tot (millions)</td>
<td>5.0</td>
<td>5.0</td>
<td>0.0</td>
<td>0.8</td>
</tr>
<tr>
<td>N - Fry (millions)</td>
<td>3.8</td>
<td>4.2</td>
<td>-0.4</td>
<td>-8.0</td>
</tr>
<tr>
<td>N - Parr (millions)</td>
<td>1.2</td>
<td>0.8</td>
<td>0.4</td>
<td>46.6</td>
</tr>
<tr>
<td>Fry - FL (mm)</td>
<td>34.0</td>
<td>33.0</td>
<td>1.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Parr - FL (mm)</td>
<td>83.0</td>
<td>76.0</td>
<td>7.0</td>
<td>9.2</td>
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<tr>
<td>Fry - Mass (g)</td>
<td>0.4</td>
<td>0.4</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Parr - Mass (g)</td>
<td>5.9</td>
<td>4.6</td>
<td>1.3</td>
<td>28.3</td>
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<tr>
<td>Fry - BioMass (Metric ton)</td>
<td>2.5</td>
<td>2.2</td>
<td>0.3</td>
<td>12.3</td>
</tr>
<tr>
<td>Parr - BioMass (Metric ton)</td>
<td>4.9</td>
<td>3.3</td>
<td>1.6</td>
<td>48.1</td>
</tr>
</tbody>
</table>