Population Study of North Umpqua Steelhead

Michelle Pepping
University of California, Davis
It is important to study the North Umpqua Steelhead

- Wild summer and winter run
- Hatchery summer run
- World famous fly fishing
- Complex geology
There is variation of adult migration timing

Prince et al. 2017
The NU has a stable population of steelhead.
The winter run is increasing while the summer run is in decline.
Winter steelhead spawn soon after migration

Prince et al. 2017
There are many disadvantages for summer steelhead

• Challenges of early migration:
  • Hot water
  • Low water
  • Predation /fishing
  • Habitat degradation

Prince et al. 2017
This study had two main objectives

1. Determine spawning and rearing habitat utilized by summers to prioritize for conservation

2. Begin to understand historic evolutionary advantages to summer run timing
Removal of potential high flow barrier
Samples were collected in tributaries throughout the North Umpqua basin.
Rapture sequencing gives us genomic data from fin clips
GWAS identified strong association between Greb1L and migration timing.
Run timing populations do not have random mating

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<thead>
<tr>
<th></th>
<th>Number of Samples</th>
<th>Observed Proportion</th>
<th>Expected Proportion (HWE)</th>
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<tbody>
<tr>
<td>Total Samples</td>
<td>573</td>
<td></td>
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<tr>
<td>Clarkii</td>
<td>38</td>
<td></td>
<td></td>
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<tr>
<td>Hybrid</td>
<td>9</td>
<td></td>
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<tr>
<td>Mykiss</td>
<td>526 (92%)</td>
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<tr>
<td>Mykiss Genotyped at Greb1L</td>
<td>479 (91%)</td>
<td></td>
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<tr>
<td>Winters</td>
<td>118</td>
<td>0.246</td>
<td>0.09</td>
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<tr>
<td>Hybrids (heterozygotes)</td>
<td>51</td>
<td>0.106</td>
<td>0.42</td>
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<tr>
<td>Summers</td>
<td>310</td>
<td>0.647</td>
<td>0.49</td>
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</table>
Most early migration genes are found in Steamboat and Canton Creek.
Distribution of Juvenile Steelhead

Homozygous Summer

Heterozygous

Homozygous Winter
We hope to answer more questions with this year and future year’s data.

• How consistent are results across time?
• What is the run timing of juveniles in the main stem?
• What proportion hybrids are from hatchery summers?
• Are there size differences between the runs?
• Approximately how many spawning individuals are at each sampling location?
Thank you!

- Michael Miller
- Sean O’Rourke
- Connie Huang
- Jeff Dose
- ODFW – Roseburg
- NOAA
- The North Umpqua Foundation