Development of a salmonid validation monitoring program for Washington Department of Natural Resources on the Olympic Experimental State Forest.
Validation monitoring, used to evaluate cause-and-effect relationships between habitat conditions resulting from implementation of conservation strategies and the salmonid and northern spotted owl populations these strategies are intended to benefit. (HCP 1997)
What are we validating?

The “underlying hypothesis” or rather the conceptual basis for management in the OESF is that “It is possible to produce quality commercial timber and provide and protect ecological values in a managed forest by maintaining an arrangement of forest structure and stand diversity” (DNR 1997, p. IV.83).
2015 sampling of existing habitat sites

Backpack electrofishing

Crew: Kevin Alexander
      Jason Michaud

Goal: 50 habitat monitoring sites
      30 fish/site
      up to 9 pool habitat units
### All Basins

<table>
<thead>
<tr>
<th>Species</th>
<th>% of basins</th>
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<tbody>
<tr>
<td>Cutthroat</td>
<td>82%</td>
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<tr>
<td>Coho</td>
<td>62%</td>
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<tr>
<td>Steelhead</td>
<td>23%</td>
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**Dominate salmonid species per basin**
Existing Knowledge?

IP model (high potential 1 to .75)

- Found and Predicted
- Not Found and Not Predicted
- Found and Not Predicted
- Predicted and Not Found

WDFW SaSI

- Found and Predicted
- Not Found and Not Predicted
- Found and Not Predicted
- Predicted and Not Found
Coho

Number of fish

Fork length (mm)

Basin 196
Cutthroat trout

Fork length (mm)

30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210

Number of fish

0 1 2 3 4 5 6

Basin 724

Age-0 fish

Anadromous?

Age-1 fish

Basin 157

Age-0 fish

Age-1 fish

Age-2?

Basin 621

Age-1 fish

Age-2?

Resident?

Age-3?

Cutthroat trout
Initial thoughts on monitoring

Study plan - (2016)

with a little help from our friends
Initial ideas for a sampling plan (starting in 2016)

• 50 existing habitat sites (20 annual and 30 rotating sites*)
• Evaluation of reach vs whole stream sampling (2016 and 2017)
• Snorkel surveys (Type -1 and Type-2 basins in the Clearwater)
• Redd surveys (fall)
• Winter sampling on 20 annual sites (if funded)
• PIT tagging in 20 annual sites (2,000-3,000 fish per year; if funded)

* Rotating panel to start after 2017 and 2018 testing.
## Sampling design

### 50 sites

20 sites annually (starting 2016)

30 sites sampled on a rotating basin (starting 2018)
2 year (15 sites per year) or 3 year (10 sites per year)

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## Juvenile salmonid sampling technique evaluation (2016 and 2017)

**Higher precision or more coverage?**

<table>
<thead>
<tr>
<th>Survey type</th>
<th>Survey Length</th>
<th>Precision</th>
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<tbody>
<tr>
<td>Reach</td>
<td>20 BFW (at least 100m)</td>
<td>high</td>
</tr>
<tr>
<td>Continuous survey</td>
<td>fish baring distribution of stream</td>
<td>low to med</td>
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</tbody>
</table>
Why?

How well does habitat reach represent the fish baring distribution in the basin?

Can reach scale monitoring be used to calibrate and improve the precision of continuous monitoring?
Larger stream sampling (DNR Type 1 and Type 2)

Snorkel surveys
- Clearwater River
- 1 week
- Species assemblage
- Fish use
- Index of population size
- Connection with type-3 basins
Adult Surveys

DNR redd surveys within 50 basins
Coho only (November to January)

WDFW abundance estimates
(Steelhead, Coho, and Chinook)
Adaptive management

Management

Habitat

Salmonids

Bad

Good