Coho Recovery Planning at the Population Scale

Water Quality Summit
February 28, 2018
The Coho Business Plan

Discuss efforts to plan for and inform recovery, highlighting the value of coordination.

- Why coho?
- Determining restoration priorities
- Detecting change: the need for focus and coordination
- Monitoring priorities
Why Coast Coho?
A full year in freshwater....

Dig ‘redds’ (gravel nests) Nov-January in smaller streams with slow, cool water and good gravel, deposit eggs, then die.

Emerged from eggs first spring after spawning.

Rear in slow moving, protected streams with pools, beaver ponds, side channels summer and winter.

Adults re-enter freshwater and return to their natal stream as 3 year-olds.

Migrate to the ocean as smolts (April-early June); may be in estuaries for weeks to a month.

Typically spend two summers in the ocean (“jacks” return after only 6 months at sea.)
Why Coho?

- Excellent indicator of watershed health
- Restoration benefits the other Pacific salmonids (Chinook, chum, cutthroat, and steelhead)
- ESA Listed
Listing and recovery

- Listing is driven by NMFS’ conclusion that watershed health is declining on the Oregon coast.

- The key to recovery is showing improving trends in critical habitats (including water quality).

- This requires:
  - An adequate regulatory floor
  - *A larger, more focused, and better coordinated restoration effort*
Purpose of the Coho Business Plan

Recover Oregon Coast (OC) coho through the restoration of critical habitats in wild coho strongholds.

*If we’re successful, OC coho will become the first run of Pacific salmon removed from the Endangered Species list.*
Instream habitat loss

Stephen Dow Beckham
Instream habitat loss

Stephen Dow Beckham
Off-channel habitat loss

http://www.miningartifacts.org/OregonMines.html
Disconnected floodplains
Upland habitat loss
Elevated stream temperatures

Chandra LeGue
Elevated stream temperatures
Sedimentation
Challenges to Recovery

- Small groups working in large landscapes
- Often difficult to detect impacts of restoration beyond the project scale
- Cumulative impacts of local work difficult to roll-up; hard for funders to show returns on investment at scale
(It’s also hard to evaluate...)

How effective are water related conservation and restoration projects and programs in the region?
“How can we support locally led recovery efforts and show improving trends?”
**Our Goals**

1. Facilitate a science-driven process for local partnerships to: 1) agree on a shared long term recovery strategy, and 2) coordinate implementation of a prioritized project list in the short term.

2. Accelerate the pace and effectiveness of local habitat protection and restoration efforts.
The Coho Strategic Action Plans
Facilitate focus and coordination

The shared recovery strategy presents...

- **A limited set of indicators** that represent LFs

- **Focal areas**, where indicators can move with an attainable level of investment in a reasonable amount of time

- **A limited set of restoration strategies** that can move indicators

- **Site-specific** projects
Determine Indicators

Reflect limiting factors:

1) winter rearing habitat, and

2) water quality
Identify Focal Areas

Where can we move indicators?
1. Capture areas of highest production
2. Capture areas with greatest use across life stages
3. Capture all life histories
4. Capture cold water tributaries
Good data is essential to.....

• Evaluate sub-watershed function

• Determine priority stresses

• Describe desired future conditions (goals)
What to do and where to do it?

Example: Nehalem

- Protect anchors
- Protect standing timber that will end up in anchors
- Reconnect floodplains and off-channel habitats in anchors
- Install LWD in anchors
- Enhance riparian zones
Protect & Enhance Anchor Habitats
Protect & Enhance Anchor Habitats
Identify Anchor Habitats

Rock Creek (Nehalem)

www.wildsalmoncenter.org
Anchor Habitat Criteria

Terrace height: <2 feet above water optimal
Anchor Habitat Criteria

Channel gradient (slope):

2-4 % optimal
Anchor Habitat Criteria

Floodplain width: the wider, the better
Anchor Habitat Criteria

Temperature: > 17.8 discarded
Temperature

Historic Stream Temps (1993-2011)
- 18.1 - 20.1
- 15.6 - 18.0
- 14.1 - 15.5
- 12.8 - 14.0
- 8.6 - 12.7

Temperature Data Source: NorWeST
Sources: Esri, DeLorme, USGS, NPS
Testing our Model

Beavers!!

Habitat Quality

- High
- Very
- Good
- Fair
- Poor

Ground Truth
Modeled

Fall1 Fall2 Fall3 Fall4 Fall5 Fall6 Fall7 Fall8 TribA Seg1 Seg2 Seg3 Seg4 Seg5 Seg6 Seg7

www.wildsalmoncenter.org
Protect Remaining Old Growth
Potential Upslope LWD reaches: Highest Ranking
Partnering with Forest Managers

High Priority HUCS: Salmonberry
## Partnering with Forest Managers

<table>
<thead>
<tr>
<th>Tributary Name</th>
<th>Acreage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lousignont Creek-Nehalem River</td>
<td>113</td>
</tr>
<tr>
<td>Foley Creek</td>
<td>61</td>
</tr>
<tr>
<td>Anderson Creek-Nehalem River</td>
<td>53</td>
</tr>
<tr>
<td>Lost Creek-Nehalem River</td>
<td>46</td>
</tr>
<tr>
<td>Cook Creek</td>
<td>43</td>
</tr>
<tr>
<td>Wolf Creek</td>
<td>36</td>
</tr>
<tr>
<td>Lower North Fork Nehalem River</td>
<td>33</td>
</tr>
<tr>
<td>Buster Creek</td>
<td>29</td>
</tr>
<tr>
<td>Cronin Creek-Nehalem River</td>
<td>22</td>
</tr>
<tr>
<td>Lower Salmonberry River</td>
<td>21</td>
</tr>
<tr>
<td>Northup Creek-Nehalem River</td>
<td>13</td>
</tr>
<tr>
<td>Cow Creek-Nehalem River</td>
<td>12</td>
</tr>
<tr>
<td>Deep Creek</td>
<td>12</td>
</tr>
<tr>
<td>Middle North Fork Nehalem River</td>
<td>10</td>
</tr>
<tr>
<td>Upper Salmonberry River</td>
<td>8</td>
</tr>
<tr>
<td>Humbug Creek</td>
<td>7</td>
</tr>
<tr>
<td>Lower Rock Creek</td>
<td>6</td>
</tr>
<tr>
<td>East Fork Nehalem River</td>
<td>6</td>
</tr>
<tr>
<td>Fishhawk Creek</td>
<td>5</td>
</tr>
</tbody>
</table>
Example: Nehalem

- Protect anchors
- Protect standing timber that will end up in anchors
- Reconnect floodplains and off-channel habitats in anchors
- Install large wood in anchors
- Enhance riparian zones
Reconnect floodplains
Reconnect floodplains
# Project Scoring

## Importance of the Tributary or Reach

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Score</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4 - 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Life Stages: Which stage(s) of the life cycle does the trib support? (spawning, over-wintering, summer rearing, all)</td>
<td></td>
<td>none</td>
<td>spawning</td>
<td>Summer rearing</td>
<td>Over-wintering</td>
<td>More than one stage: score is cumulative</td>
</tr>
<tr>
<td>• Habitat Value: What is the current value of the habitat?</td>
<td></td>
<td>Poor/Low</td>
<td>Medium</td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Habitat Potential: Is site high IP? (use percent of trib)</td>
<td></td>
<td>No</td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Bonus: Does the tributary support a unique life history or habitat type? (e.g. estuary, nomadic)</td>
<td></td>
<td>No</td>
<td></td>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Bonus: Is the tributary a cold water source?</td>
<td></td>
<td>No</td>
<td></td>
<td>yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Total Score for tributary or reach:

## Biological / Ecological Benefit of the Project

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Score</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Limiting factors: Which stresses and/or limiting factors does this project address?</td>
<td></td>
<td>None</td>
<td>Addresses a stress but not the limiting factor(s) (e.g. bedload transport)</td>
<td>Addresses Temperature</td>
<td>Prevents loss of complexity (e.g. prevent mass wasting)</td>
<td>Has a high likelihood of increasing complexity or winter habitat</td>
<td>High likelihood of significantly addressing temp and complexity</td>
</tr>
<tr>
<td>• Processes: How many high priority, altered processes does it address? 1) Suspended sediment production, 2) flows (hyporheic and base flows), 3) LWD delivery, 4) channel migration, 5) floodplain interaction (inc estuaries), 6) riparian function, 7) Bedload transport and gravel supply, 8) Longitudinal connectivity</td>
<td></td>
<td>None</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Notes: Make these compatible with common framework.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Longevity: How long will benefit last?</td>
<td></td>
<td>0-4 years</td>
<td>5 – 10 years</td>
<td>10-25 years</td>
<td>&gt; 25 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Assurance of success: has approach worked before? Is location suitable?</td>
<td></td>
<td>No / unknown</td>
<td>No / yes</td>
<td>Yes / yes</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Total Score for the Project:
Final Sub-Watershed Map
# Monitoring Framework (riparian)

## Table 10-1. SAP Monitoring Framework

<table>
<thead>
<tr>
<th>Implementation Monitoring – Is the SAP being implemented?</th>
<th>Cumulative Objectives (see Table 8-1) and Goals 5-6</th>
<th>Key Ecological Attribute (component)</th>
<th>Effectiveness Monitoring – Is SAP implementation having the intended effects? Are we moving towards our stated outcomes?</th>
<th>Indicator</th>
<th>Monitoring Sites</th>
<th>Lead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation Locations</td>
<td>Project Tracking Metrics</td>
<td>Temperature (tributaries and mainstem)</td>
<td>Total # of days where monitoring locations exceed temperature standards (DEQ 7-day running average max)</td>
<td>Lower North Fork Siuslaw, Triangle Lake, Others to be determined</td>
<td>SWC, Tribes</td>
<td></td>
</tr>
<tr>
<td>Priority reaches in Deadwood, Dogwood, North Fork Siuslaw, and Upper Indian Creek watersheds</td>
<td>Acres planted</td>
<td></td>
<td>Number of consecutive days meeting cold water refugia criteria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acreage acquired or placed under easement</td>
<td></td>
<td>Presence of a thermal barrier in the mainstem that prevents migration of fish during warm periods (7 day moving mean of daily summer max temp is &lt; 20°C)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>% of high priority sites planted</td>
<td></td>
<td>Enhance 38 miles of riparian vegetation to reduce stream temperatures and/or ensure future LWD recruitment into anchor habitats.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Riparian function (tributaries)</td>
<td></td>
<td>% of selected riparian areas with conifers &gt; 20'' dbh in 164' buffer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td># of conifers &gt;50'' dbh &amp; # of conifers &gt;90'' dbh</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>% of 6th fields basins with &gt; 50% of riparian area in late seral</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>% of conifer present in riparian zones</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No field assessment</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Evaluating Recovery...  .....monitoring priorities

- Address limiting factors: 1) juvenile rearing habitat and 2) water quality

- To measure change, we must be able to assess:
  - Instream complexity
  - Floodplain connectivity
  - Off-channel habitats
  - Beaver populations
  - Riparian buffers
  - Temperature
  - Sediment
  - Flow

Are these improving?
Thank you