Snhomish Basin Salmon Conservation Plan

WLRD Science Seminar
May 25, 2005
Presentation Overview

- What makes the Snohomish River Basin unique?
- Why a salmon conservation plan?
- Who is the Forum?
- What is the science behind the plan?
- What are the plan’s key components?
- When and how will the plan be implemented?
Snohomish River Basin

- Second largest basin in Puget Sound
- Nine salmonid species
- Two ESA listed species
- Critical basin for Chinook recovery
- 25-50% of wild coho in Puget Sound
## Shared Strategy Planning Targets

<table>
<thead>
<tr>
<th>Population</th>
<th>Mean spawner abundance for 1996-2000</th>
<th>Low productivity(^1)</th>
<th>High productivity(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Planning Range for Abundance</td>
<td>Planning targets for abundance (w/productivity in parentheses)</td>
<td></td>
</tr>
<tr>
<td>NF Nooksack</td>
<td>120</td>
<td>16,000 – 26,000 (1.0)</td>
<td>16,000 (1.0) 3,800 (3.4)</td>
</tr>
<tr>
<td>SF Nooksack</td>
<td>200</td>
<td>9,100 – 13,000 (1.0)</td>
<td>9,100 (1.0) 2,000 (3.6)</td>
</tr>
<tr>
<td>Lower Skagit</td>
<td>2,300</td>
<td>16,000 – 22,000 (1.0)</td>
<td>16,000 (1.0) 3,900 (3.0)</td>
</tr>
<tr>
<td>Upper Skagit</td>
<td>8,920</td>
<td>17,000 – 35,000 (1.0)</td>
<td>26,000 (1.0) 5,380 (3.8)</td>
</tr>
<tr>
<td>Upper Cascade</td>
<td>330</td>
<td>1,200 – 1,700 (1.0)</td>
<td>1,200 (1.0) 290 (3.0)</td>
</tr>
<tr>
<td>Lower Sauk</td>
<td>660*</td>
<td>5,600 – 7,800 (1.0)</td>
<td>5,600 (1.0) 1,400 (3.0)</td>
</tr>
<tr>
<td>Upper Sauk</td>
<td>370</td>
<td>3,000 – 4,200 (1.0)</td>
<td>3,030 (1.0) 750 (3.0)</td>
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<tr>
<td>Suiattle</td>
<td>420</td>
<td>600 – 800 (1.0)</td>
<td>610 (1.0) 160 (2.8)</td>
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<tr>
<td>NF Stillaguamish</td>
<td>660</td>
<td>18,000 – 24,000 (1.0)</td>
<td>18,000 (1.0) 4,000 (3.4)</td>
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<tr>
<td>SF Stillaguamish</td>
<td>240</td>
<td>15,000 – 20,000 (1.0)</td>
<td>15,000 (1.0) 3,600 (3.3)</td>
</tr>
<tr>
<td>Skykomish</td>
<td>1,700</td>
<td>17,000 – 51,000 (1.0)</td>
<td>39,000 (1.0) 8,700 (3.4)</td>
</tr>
<tr>
<td>Snoqualmie</td>
<td>1,200</td>
<td>17,000 – 33,000 (1.0)</td>
<td>25,000 (1.0) 5,500 (3.6)</td>
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<tr>
<td>NL Washington</td>
<td>194*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cedar</td>
<td>398*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td>7,191*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>329*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Puyallup</td>
<td>2,400</td>
<td>17,000 – 33,000 (1.0)</td>
<td>18,000 (1.0) 5,300 (2.3)</td>
</tr>
<tr>
<td>Nisqually</td>
<td>890</td>
<td>13,000 – 17,000 (1.0)</td>
<td>13,000 (1.0) 3,400 (3.0)</td>
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<tr>
<td>Skokomish</td>
<td>1,500*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dosewallips</td>
<td>No data yet</td>
<td>3,000 – 4,700 (1.0)</td>
<td></td>
</tr>
<tr>
<td>Dungeness</td>
<td>123*</td>
<td>4,700 – 8,100 (1.0)</td>
<td></td>
</tr>
<tr>
<td>Elwha</td>
<td>1,319*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Some Basin Challenges

- Urbanizing
- Water supply for over 1 million people
- Changing economic base and land uses
- Existing development in key habitat areas
Snohomish Basin Salmon Recovery Forum

39 Members
- Local governments (2 counties, 14 cities)
- Tulalip Tribes
- 7 Special purpose districts
- 11 Interests/groups
- 3 Citizens
- WDFW “ex officio”

Activities
- Prioritize habitat projects for SRF Board
- Develop salmon conservation plan
- Adaptively manage plan
- Discuss differing viewpoints, coordinate local action
Direct efforts to where they will make the most difference

Equity: All areas play a role

Tailor solutions for different groups and areas

Practical and readable

Include capital projects, incentives, and policy

Incorporate community values

Multi-salmon species

Follow state and regional guidance

Strong scientific foundation
Ecological Analysis for Salmon Conservation

- Integrated technical work in basin
- Formulated hypotheses, strategy and recovery actions
- Assisted development and evaluation of plan alternatives
Step 1: Where are the fish currently?

- 5-year average of escapement data
- Relative comparison of abundance among subbasins
Step 2: What is the current condition of aquatic habitat?

- Combine data from Snohomish habitat inventory reports

- Identify a level of certainty rating for each data input

- Documentation for models
Step 3: What are the current conditions of watershed processes?

- Riparian Forests
- Hydrology (Peak Flow)
- Sediment

Aquatic Habitat Conditions

Biological Response

King County
Step 4: What is the difference between current and historical habitat potential to produce Chinook?

- Diagnosis step of Ecosystem Diagnosis and Treatment (EDT)
- Potential Capacity Model
- Context for what is possible
- Where are the greatest risks and opportunities?
Step 5: Salmon Use and Potential Synthesis

- Identify areas with high current use and/or potential use
- Focus of actions for a long-term strategy to recover salmonids
Step 6: Strategy Development

- Integrate results from all previous analyses
- Develop basin hypothesis
- Identify sub-basin strategy groupings and hypotheses
- Identify actions within individual subbasins
Sub-Basin Strategy Groups
Chinook Actions Needed

- Improve juvenile chinook survival
- Key actions: connect rivers and floodplain and increase "habitat complexity"
- Nearshore, estuary, and river mainstems are key recovery areas
Bull Trout Actions Needed

- Chinook actions also benefit bull trout foraging, migration and over-wintering.

- Bull trout spawn in only three sub-basins. Protection strategy is critical (USFS).
Coho Actions Needed

- Improve rearing habitat
- Retain forest cover and limit impervious surface
- Maintain and restore access to small, low gradient streams
Steps 7: Develop Alternatives

- Forum Needs:
  - Recovery approach - Where to focus
  - How much to do
  - Project priorities

- Technical Guidance:
  - Develop and model the recovery test case
  - Respond to Forum
Plan Recovery Approach

- **Capital projects**
  - ~ 80% in the nearshore, estuary, and mainstems
  - ~ 15% in lowland tributaries
  - ~ 5% in headwaters

- **Habitat protection**
  - Basin wide

- **Programs and technical assistance**
  - Targeted and basinwide
### How much to do: Alternatives

<table>
<thead>
<tr>
<th>Major Improvement</th>
<th>Significant improvement</th>
<th>Moderate improvement</th>
<th>Modest improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>High end of Shared Strategy planning range. High abundance, productivity, diversity, and spatial structure for all salmon populations</td>
<td>10 year milestone calculated from current path +75% of the difference between current path and test case targets over 50 years</td>
<td>10 year milestone calculated from current path +50% of the difference between current path and test case targets over 50 years</td>
<td>10 year milestone calculated from current path +35% of the difference between current path and test case targets over 50 years</td>
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</table>
Step 8: Evaluate Alternatives

- Biological Evaluation: SHIRAZ and EDT

- Socio-economic Evaluation:
  - Long-term flexibility
  - Estimated cost
  - Estimated shared benefit
  - Ability to implement
EDT Results: What gains could be achieved by reaching the 10-year habitat milestones?

- Substantial gains in VSP for both populations, with a greater increase in the Snoqualmie
- Increase in rearing capacity is critical, particularly in the estuary
- Substantial benefits from riparian planting, dike setbacks and ELJ construction
### Direct Ranking of Options (1 = most preferred option, 4 = least preferred option)

<table>
<thead>
<tr>
<th>Options</th>
<th>Participants</th>
<th>Major Improvement</th>
<th>Significant Improvement</th>
<th>Moderate Improvement</th>
<th>Modest Improvement</th>
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<tbody>
<tr>
<td>King Conservation Dist</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Cascade Land Conservancy</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
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<tr>
<td>Snohomish County PUD</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>WDFW</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
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<tr>
<td>City of Snohomish</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
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<tr>
<td>Town of Index</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
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<tr>
<td>King County</td>
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<td>2</td>
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<td>1</td>
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<td>4</td>
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<tr>
<td>Master Builders Assoc.</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td></td>
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<tr>
<td>Recreation - Trout Unlimited</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>4</td>
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<td>Stilly-Sno Task Force</td>
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<td>2</td>
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<td>3</td>
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<tr>
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<td>Cross Valley Water Dist.</td>
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<td>Coordinated Diking Council</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>4</td>
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<tr>
<td>Tulalip Tribes</td>
<td>1</td>
<td>2</td>
<td>X</td>
<td>X</td>
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<td>1</td>
<td>3</td>
<td>4</td>
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<tr>
<td>King County Agriculture</td>
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<td>2</td>
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<td>City of Seattle</td>
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<td>2</td>
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<tr>
<td>City of Everett</td>
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<tr>
<td>Snohomish Co. Agriculture (AW)</td>
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<td>2</td>
<td>1</td>
<td>3</td>
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<td>Snohomish Co. Sportmens Assoc.</td>
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<td>Boeing Company</td>
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<td>1</td>
<td>2</td>
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<tr>
<td>Pilchuck Audubon Society</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Number of Times Ranked #1</th>
<th>8</th>
<th>10</th>
<th>7</th>
<th>0</th>
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</thead>
<tbody>
<tr>
<td>Average Rank (#1 being most preferred)</td>
<td>2.4</td>
<td>1.8</td>
<td>2.2</td>
<td>3.6</td>
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<tr>
<td>Percentage</td>
<td>32%</td>
<td>40%</td>
<td>28%</td>
<td>0%</td>
</tr>
</tbody>
</table>
What’s in the Final Plan?
Vision for Recovery

- Working towards co-manager’s targets for long term recovery (~50 years)
- Targeted 10-year approach in highest-priority areas
- 10-year milestones for habitat condition improvements
- Recognition of past accomplishments
# 10-Year Habitat Condition Milestones: Key Areas

<table>
<thead>
<tr>
<th>Sub-basin Strategy Group and habitat condition</th>
<th>Current Intact</th>
<th>Needed gain in next 10 years (including current path gains)</th>
<th>Total needed at Year 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nearshore beaches and shoreline</td>
<td>8.4 miles</td>
<td>At least 1 mile</td>
<td>At least 9.4 miles</td>
</tr>
<tr>
<td>Estuary: Tidal Marsh</td>
<td>1,483 acres</td>
<td>1237 acres</td>
<td>2,720 acres</td>
</tr>
<tr>
<td>Mainstem Primary Restoration:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restored Edge Habitat</td>
<td>236 miles</td>
<td>10.4 miles</td>
<td>246.4 miles</td>
</tr>
<tr>
<td>Restored Riparian Habitat</td>
<td>5,991 acres</td>
<td>256 acres</td>
<td>6,247 acres</td>
</tr>
<tr>
<td>Restored Off-Channel Habitat</td>
<td>350 acres</td>
<td>167 acres</td>
<td>517 acres</td>
</tr>
<tr>
<td>Large Woody Debris</td>
<td>N/A</td>
<td>41 new log jams</td>
<td></td>
</tr>
</tbody>
</table>
10-Year Milestones: Basin Wide

- **Culverts** – Address 60 blockages
- **Forest roads** – Decrease overall length
- **Forest cover** – Minimize losses and make gains outside Urban Growth Areas
- **Riparian areas** – Make habitat gains
- **Impervious surfaces** – Minimize net gains outside Urban Growth Areas
- **Water quality** – Improve
Recommended Approaches for Land Uses

- Agriculture
- Roads and Utilities
- Rural Residential
- Urban
- Forestry
Example: Recommended Approach for Working with Agriculture

- Cooperative
- Keep farming viable
- Focus on:
  - Technical assistance
  - Incentives
  - On-the-ground projects
- Demonstration projects
Basin-Wide Tools

- Regulatory and programmatic actions
- Mitigation funding, noxious weeds
- Stewardship and implementation capacity
- Technical assistance
- Incentives and innovation
- Compliance
Geographic Recommendations

- Estuary
- Nearshore
- Mainstems
- Tributaries
- Headwaters
Example: Mainstem Recommendations

Lower Snohomish River

Snoqualmie River

Lower Skykomish River
Harvest, Hatchery and Integration

- Hypotheses developed, summaries
- Harvest – Puget Sound Chinook Harvest Management Plan
- Hatchery – HSRG recommendations
- Integration – actions are interdependent with habitat improvements

4 Levels
- Implementation
- Project Effectiveness
- Cumulative Effectiveness
- Validation

Aspects
- Ecological
- Socio-economic
  - Monitoring
  - Evaluation
  - Adjustment
Implementation Strategy

- **10-year estimate cost**: Plan $133.6 Million
  - $92.9 M Capital
  - $15.7 M Acquisition
  - $25 M Non-Capital ($5.6 M for monitoring and adaptive management and $1.0 M data gaps)

- **Actions for the future**
- **Funding policies**
- **Implementation commitments**
Discussion