UWR Chinook salmon & UWR steelhead status, life history, ecology, etc.

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Corresponding Summary Page(s): 7-8
Salmon and Steelhead in the Upper Willamette River

Winter Steelhead

Spring Chinook Salmon

Bull Trout
## Winter Steelhead

<table>
<thead>
<tr>
<th>Life History Trait</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Willamette Falls timing</td>
<td>Ascend Willamette Falls February* - May</td>
</tr>
<tr>
<td>Spawn timing</td>
<td>March – June, peak April - May</td>
</tr>
<tr>
<td>Spawning habitat type</td>
<td>High gradient tributaries, mainstems</td>
</tr>
<tr>
<td>Emergence timing</td>
<td>April - August</td>
</tr>
<tr>
<td>Rearing habitat</td>
<td>Rears primarily in upper portions of subbasins in small to medium streams</td>
</tr>
<tr>
<td>Duration in freshwater</td>
<td>2-3 years</td>
</tr>
<tr>
<td>Estuarine use</td>
<td>Days to several weeks</td>
</tr>
<tr>
<td>Life history type</td>
<td>Stream</td>
</tr>
<tr>
<td>Ocean migration</td>
<td>Predominately north, as far as southeast Alaska and Kamchatka Peninsula</td>
</tr>
<tr>
<td>Age at return</td>
<td>3-6 years; primarily 4 years</td>
</tr>
</tbody>
</table>
General Life History – Spring Chinook Salmon

Spawn: late August – late October

Peak migration over Willamette Falls:
April – May

Incubation and emergence:
December – April

Rear 5 – 15 months
Migrate to ocean as smolts

Rear 2 – 4 years in North Pacific
Most Willamette Chinook: 4 – 5 years old when they return
# Spring Chinook Salmon in the Willamette

<table>
<thead>
<tr>
<th>Life History Trait</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Willamette Falls timing</td>
<td>Ascend Willamette Falls April – August</td>
</tr>
<tr>
<td>Spawn timing</td>
<td>August – October; peaking in September</td>
</tr>
<tr>
<td>Spawning habitat type</td>
<td>Larger headwater streams</td>
</tr>
<tr>
<td>Emergence timing</td>
<td>December – March</td>
</tr>
<tr>
<td>Rearing habitat</td>
<td>Rears in larger tributaries and mainstem Willamette</td>
</tr>
<tr>
<td>Duration in freshwater</td>
<td>12-14 months; sometimes 2-5 months</td>
</tr>
<tr>
<td>Estuarine use</td>
<td>Days to several weeks</td>
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Salmon and Steelhead Populations in the Upper Willamette River
After ESA listing...

- Regulatory framework to ensure that agency activities are not likely to jeopardize the continued existence of listed species or adversely modify designated critical habitats.
- Section 4 – Listing, Critical Habitat, and Recovery
- Section 4(d)- Fishery Management (FMEP), Hatchery Management (HGMP)
- Section 7 Consultations – protection from adverse effects of Federal activities
- Section 10 Hatchery Management (HGMP)
Willamette Biological Opinion
2008
Percent of Chinook spawning habitat blocked by dams in the Willamette Basin.
Upper Willamette Conservation and Recovery Plan for Chinook Salmon and Steelhead

2011

- Upper Willamette Chinook ESU (listed 1999)
- Upper Willamette steelhead DPS (listed 1999)
- Joint plan prepared by ODFW and NMFS
- Adopted in August 2011
- State or Oregon’s conservation plan under our Native Fish Conservation Policy and recovery plan under the Federal ESA
Recovery Goals and Criteria

- Conservation road map to remove both species from the ESA Threatened list
- ESA/Delisting Recovery Goals:
  - Biological criteria
  - Threats criteria
- Broad Sense Recovery
Viable Salmonid Population (VSP) Improvements

- Abundance
- Productivity
- Diversity
- Spatial Structure
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Middle Fork Chinook</th>
<th>McKenzie Chinook</th>
<th>North Santiam Steelhead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abundance/Productivity</td>
<td>VH L</td>
<td>VL VL</td>
<td>L VL</td>
</tr>
<tr>
<td>Spatial Structure</td>
<td>H L</td>
<td>M L</td>
<td>H L</td>
</tr>
<tr>
<td>Diversity</td>
<td>H L</td>
<td>M L</td>
<td>M L</td>
</tr>
<tr>
<td>Total Score</td>
<td>VH L</td>
<td>L VL</td>
<td>L VL</td>
</tr>
<tr>
<td>Desired abundance</td>
<td>5,820</td>
<td>10,916</td>
<td>8,362</td>
</tr>
</tbody>
</table>
Listing Factors/Threats Criteria

A. Present or threatened destruction, modification or curtailment of its habitat or range –
   - Habitat limiting factors
   - Hydropower limiting factors – passage, PSM, flow, water quality

B. Overutilization for commercial, recreational, scientific, or educational purposes –
   - Harvest related threats

C. Disease or predation
   - Marine mammals, avian, fish
   - Hatchery impacts related to disease

D. Adequacy and inadequacy of regulatory mechanisms and protective efforts
   - Land use, instream flows, fisheries management, invasive species, habitat protection

E. Other natural or manmade factors affecting its continued existence
   - Hatchery related threats – RME, pHOS, operations
2016 Status Review

- Recovery criteria still appropriate/adequate
- Listing factors addressed in the recovery criteria
- Upper Willamette River steelhead DPS remains listed as threatened
- Upper Willamette River Chinook salmon ESU remains listed as threatened
VSP Status

- **UWR Steelhead DPS**
  - Continued declines in abundance – need additional analysis to determine which fish are part of DPS
  - Hatchery summer steelhead introgression concern
  - Accessibility of historical spawning habitat limited
  - Accessible habitat degraded and under development pressure

- **UWR Chinook Salmon ESU**
  - Abundance estimates limited by PSM between falls and tributaries; high PSM in lower tributary reaches
  - Access to historical spawning and rearing areas; confined to lower reaches with development, water temp and water quality issues
  - TDG below high head dams
  - Overall decrease in VSP status, but magnitude not sufficient to change risk category
Listing Factors

Listing Factor A – Present or threatened destruction, modification or curtailment of its habitat or range –
- Habitat improvements have not lead to change in viability – needs to be monitored and evaluated going forward
- No change in risk to species’ persistence because of habitat destruction or modification

Listing Factor B – Overutilization for commercial, recreational, scientific, or educational purposes –
- Harvest-related impacts for Chinook and steelhead remain low
- No change in effect since last review

Listing Factor C – Disease or predation
- Increase in avian and pinniped predation
- Pinniped predation
  - Predation by pinnipeds on listed salmon and steelhead has increased at an unprecedented rate
  - Need to expand monitoring to assess predator-prey interactions between pinnipeds and listed species
  - Complete life-cycle/extinction risk modeling to quantify predation rates by predatory pinnipeds
- Disease risks not expected to affect extinction risks
Listing Factors (continued)

Listing Factor D – Adequacy and inadequacy of regulatory mechanisms and protective efforts

- Risk based on adequacy of existing regulatory mechanisms has decreased slightly

Listing Factor E – Other natural or manmade factors affecting its continued existence

- Climate change (likely population decline as mean temps rise)
- Ocean conditions/marine survival (El Niño, blob; full impact not known)
- Hatchery impacts (some concern over impacts from summer steelhead)
- Chinook impacts stable with potential benefits from recent actions