Snoqualmie River Juvenile Yearling Chinook Observations
Snoqualmie Chinook Life Cycle

Adapted from Myers et al. 1998
Snoqualmie Sub-Yearling Chinook

- Egg
- Fry
- Parr
- Yearling+
- Non-Migrating Male
- Mature Fish
- Freshwater
- Smoltification
- Marine - Estuary
- Ocean Feeding

Return to Freshwater in Fall

Adapted from Myers et al. 1998
Snoqualmie Yearling Chinook

Egg → Fry → Parr → Yearling

Freshwater → Smoltification → Marine - Ocean

Ocean Feeding

Return to Freshwater in Fall

Adapted from Myers et al. 1998
Tulalip Tribes Juvenile Salmon Out-Migration Data

Snoqualmie Juvenile Chinook Abundance

Abundance (catch/hour)

Out-Migration Year


Yearling
Sub-Yearling

Sub-Yearling
Yearling

Tulalip Tribes Juvenile Salmon Out-Migration Data
Up to 30% of returning adults.
• Yearling Chinook are an integral component of the Snoqualmie Chinook population
• Diversity in rearing strategies and migration patterns can buffer inter-annual variability in freshwater and marine environmental conditions

What habitats are they using and what influences their distribution in the Snoqualmie River?

Up to 30% of returning adults
Objectives

• Regional observations specific to juvenile Chinook with extended freshwater rearing

• Observations of juvenile yearling Chinook in the Snoqualmie River watershed

• 2017 pilot study observations of juvenile yearling Chinook in the Snoqualmie River

• Follow-up study aimed at evaluating juvenile yearling Chinook habitat use and distribution throughout the Snoqualmie River watershed
Regional Observations

Habitat use and distribution

- Mainstem edges
- Tributaries and confluences
- Mid-channel pools
- Large log jams
- Secondary channels
- Floodplain channels
Regional Observations

• Seasonal shifts in habitat use
• Day/Night variation in habitat use among habitats and across seasons
• Feeding occurring at dawn and dusk (near margins of rivers)
Snoqualmie River Observations

- Ames Creek
- Cherry Creek
- Deer Creek
- Patterson Creek
- Tolt River
- Tuck Creek
- Floodplain-wetland channels
- Mainstem Snoqualmie
2017 Exploratory Pilot Study

- Investigate juvenile yearling Chinook presence
- Late summer surveys (Aug. 30\textsuperscript{th} - Sept. 12\textsuperscript{th})
- Mainstem focus using new electrofishing cataraft
- Select tributary locations
Snoqualmie Sub-Yearling Chinook Out-Migration

Abundance (catch/hour)

February  July

Sub-Yearling
Chinook captured after July

Kubo et al. 2013

Snoqualmie Sub-Yearling Chinook Out-Migration

Abundance (catch/hour)

February  July
Sampling Methods

Mainstem (night) →

← Tributaries (daytime)
Late summer 2017 (Aug. 30th - Sept. 12th)

Mainstem Snoqualmie
- Raging River to Neal Road
- Chinook Bend to NE 124th St.

Tributaries
- Cherry Creek
- Tolt River
- Griffin Creek
- Raging River
- 40 Chinook observed
- 10 of 18 mainstem sample sites
<table>
<thead>
<tr>
<th>Waterbody</th>
<th>Habitat Type</th>
<th>Habitat Replicates in Each Waterbody</th>
<th>Juvenile Chinook Count</th>
<th>Juvenile coho Count</th>
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</thead>
<tbody>
<tr>
<td>Cherry Creek Pool</td>
<td>2</td>
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<td>Griffin Creek Pool</td>
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<td>Raging River Pool</td>
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<td>8</td>
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<td>Tolt River Pool</td>
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<td>Rip-Rap Edge</td>
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<td>Sand/Gravel Bar Edge</td>
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<tr>
<td>Glide</td>
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</table>
Juvenile Chinook and coho

- Differences in species-specific emergence timing
- Potential differential growth rates
Juvenile coho

- Potential differential growth rates across watershed
- Variation in temperature regimes and resources
Mainstem edge habitats are utilized by juvenile Chinook during late summer periods.

Appear to display evening/night activity (possibly foraging) associated with edge habitats.

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2017 Snoqualmie Observations
Comprehensive Follow-Up Study

- Habitat use and distribution across channel types, habitat types, seasons, and day/night periods
Comprehensive Follow-Up Study

- Habitat use and distribution information
  - Inform restoration strategies
  - Inform juvenile rearing strategies and their contribution to populations
  - Support for coordinated WRIA 7 efforts
Salmon Conservation Implications

Habitat Connectivity: increase connectivity across channel types and seasons lower in the Snoqualmie watershed
Salmon Conservation Implications

Bank Conditions: increase edge complexity during summer low flow and overwintering periods
Salmon Conservation Implications

Summer Habitat Conditions:

- Protect and/or restore headwaters, cooler tributaries, mainstem areas of hyporheic exchange and groundwater inputs
- Riparian buffers along various channel types
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