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NOOKSACK SALMONID DISTRIBUTIONS AND LIFE HISTORIES

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Nooksack Tribe**

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GENERAL

- **Presented by species – wild fish**
- **Oversimplified life histories**
- **Simple species to complex**
 - **Salmon then trout**
- **Lifestages by when, where, and how long**
- **Migrations, Spawning and incubation, freshwater rearing, smolting**

PINK SALMON

- **Adult Migration**
 - **2 year life cycle**
 - **July and August on *odd* years (2011, 2013), small numbers even years**
 - **To forks and medium/large streams Poor jumpers**
 - **Brief adult holding**
- **Spawning and Incubation**
 - **Spawn in the mainstems and streams with sufficient discharge in August and September -**
 - **Late winter/early spring emergence**
- **Freshwater Rearing: Very brief**

Pink salmon



Currence: Nksk Salmon

WRIA 1 Climate Change Workshop

CHUM SALMON

- **Adult Migration**
 - Mature ages 3 to 5; mostly 4
 - Fall migrations (Oct. to Dec.) Migrate to mainstems and large easy to access streams. Poor leapers.
- **Spawning and Incubation**
 - Spawn soon after river entry
 - Spawn in side channels, groundwater upwelling
 - Fry emergence Feb. to June
- **Rearing**
 - Up to a month or so; many go to estuary sooner

Chum salmon



Currence: Nksk Salmon

WRIA 1 Climate Change Workshop

COHO SALMON

“Silvers”

- **Adult Migration**

- Most mature as 3 year olds (roughly 15 months freshwater, 18 months at sea)
- River entry timing August – Jan. w/ Oct. peak
- Migrate further upstream, into smaller, and somewhat steeper streams, side channels (good at migration)

- **Spawning and Incubation**

- Often hold a month or more before spawning
- Spawn in smaller streams with cover, side channels
- Fry emerge late winter/early spring

Coho Salmon

(continued)

- **Freshwater Rearing**
 - **More than a year: late winter - the next spring**
 - **Post emergence through summer rear in pools with cover (especially w/ wood and root wads)**
 - **Some post emergence re-distribution, major re-distribution with onset of winter high flows (generally downstream), into floodplain habitats**
 - **They winter here, then smolt in May**

Coho salmon



SOCKEYE

- **Life History (most mature as 4 year olds)**
 - **river/sea type by DNA**
 - **Small numbers spawn in all 3 forks of Nooksack & medium and larger tribs.**
 - **Migrate upstream summer/early fall**
 - **Spawn late July-October**
 - **Emerge late winter/spring**
 - **Rear in floodplain habitats, most outmigrate as yearlings, a few smolt as sub-yearlings**

Sockeye salmon



CHINOOK

mature as 3-5 year olds

- **2 early entry populations (S Fk, N/M Fks)**
- **Migrate upriver to forks & big creeks spring/summer. Good jumpers**
- **Lengthy adult holding prior to spawning**
- **N/M Fk spawn July-Sept; S Fk Aug-Sept.**
- **Juvenile Life Histories - both pops include:**
 - **Ocean type: smolt as sub-yearlings (rear days to few months)**
 - **Stream-type: smolt as yearlings (rear a year)**

CHINOOK

(CONTINUED)

- **Spawning and Incubation**
 - **Earlier races spawn earlier (July through Sept.), and further upstream in mainstems and large tributaries.**
 - **Fall races don't hold in freshwater very long, and utilize more downstream portions of mainstems and large tributaries that are lower in the watershed.**

Chinook salmon



STEELHEAD

- **Two runs: Summer run (upper S Fk); Winter run**
 - **Summer runs mature after 1-2 years at sea**
 - **Winter runs mature after 2-3 years at sea**
 - **Summer runs enter freshwater May through Sept. hold for many months, spawn late winter.**
 - **S Fk summer runs migrate further upstream than winter runs (upstream of 12 foot falls). Great leapers.**
 - **Winter runs enter Nov-May, spawn Jan. – June**
 - **Spawn in forks and medium & larger creeks**
 - **Can be repeat spawners**

STEELHEAD

(CONTINUED)

- **Freshwater Rearing**
 - **Juveniles spend 1-3 years in fresh water (usually 2)**
 - **Rear in riffles and pools in smaller tributaries that are steeper than coho juveniles use, also for winter rearing where cover and coarse substrate occur.**
- **Rainbow Trout:** non-anadromous form.

Steelhead



CUTTHROAT

- **Life Histories**

- Anadromous

- Resident

- True resident (rarely move more a few hundred meters during entire life)

- Adfluvial (spawn in small tributaries; migrate into a lake after 1-3 years)

- Fluvial (migrate from tributary into a river)

- **Anadromous Adult and sub-adult Migrations**

- Rear in coastal near-shore marine waters in summers (or within river plumes further off-shore), and return to freshwater to overwinter. Outmigrate as adults in late spring every year, and re-enter freshwater in late summer. Most reach sexual maturity at age 4 or older, are repeat spawners, and large fish are very old.

CUTTHROAT

(CONTINUED)

- **Spawning and Incubation**
 - All forms spawn in small streams
 - Anadromous spawn Jan. through April (Feb. peak).
 - Adfluvial and true resident spawning Jan. - July.
- **Freshwater Rearing**
 - After fry emergence spring/early summer, rear in shallow pools and riffles. Anadromous juveniles move downstream into floodplain tributaries and low gradient habitats to winter (off-channel habitats including riverine ponds, side channels, beaver ponds). First smolt as 1-3 year olds.

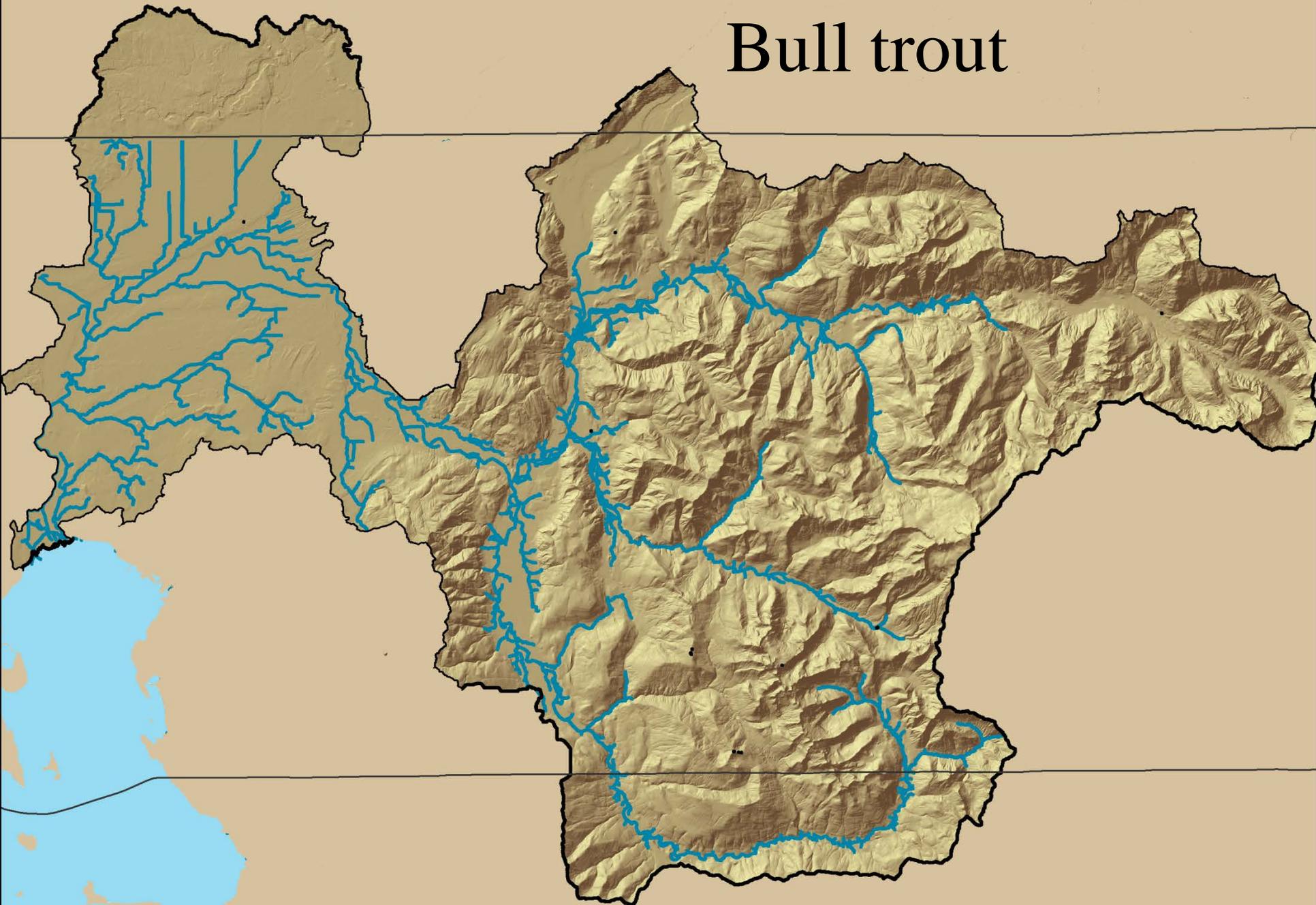
Sea-run Cutthroat



BULL TROUT

- **Native char only spawn in cold water systems**
- **Life histories**
 - **Anadromous**
 - **Resident**
 - **True resident, Fluvial, Adfluvial (not in Nooksack)**
- **Adult and sub-adult anadromous migrations**
 - **Anadromous adults enter freshwater in late spring to mid-summer. Excellent at migration and reach spawning areas late summer. Spawn when temps drop to 8-9 dec. C. Smolts outmigrate in spring as 2 year olds, return to lower rivers in fall to overwinter as sub-adults till next smolt.**

Bull trout



DOLLY VARDEN CHAR

- **Isolated resident populations (Bell Cr. Pine Cr in S Fk, Canyon in N Fk)**
 - **Small fish, eat aquatic insects, high water quality requirements**
 - **Fall spawners**

S Fk climate change risk

- Floods: pinks, chum, chinook, sockeye, BT
- Summer adult migration/holding: chinook, summer steelhead, bull trout, sockeye, pinks
- Summer spawning: late winter steelhead incubation, chinook, sockeye, pinks
- Summer juv. rearing: streamtype chinook, steelhead/rainbows, coho, cutthroat, bull trout, cutthroat, Dolly Varden char