

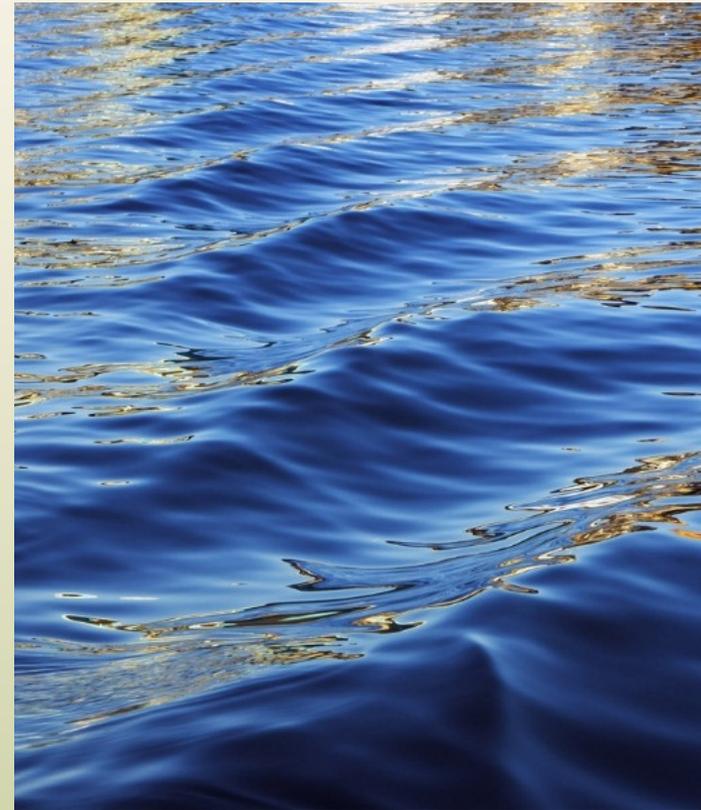
Juvenile Chinook use of non-natal tributaries in the lower Green River

Science Seminar November 2018

Water and Land Resources Division



King County



Project Background

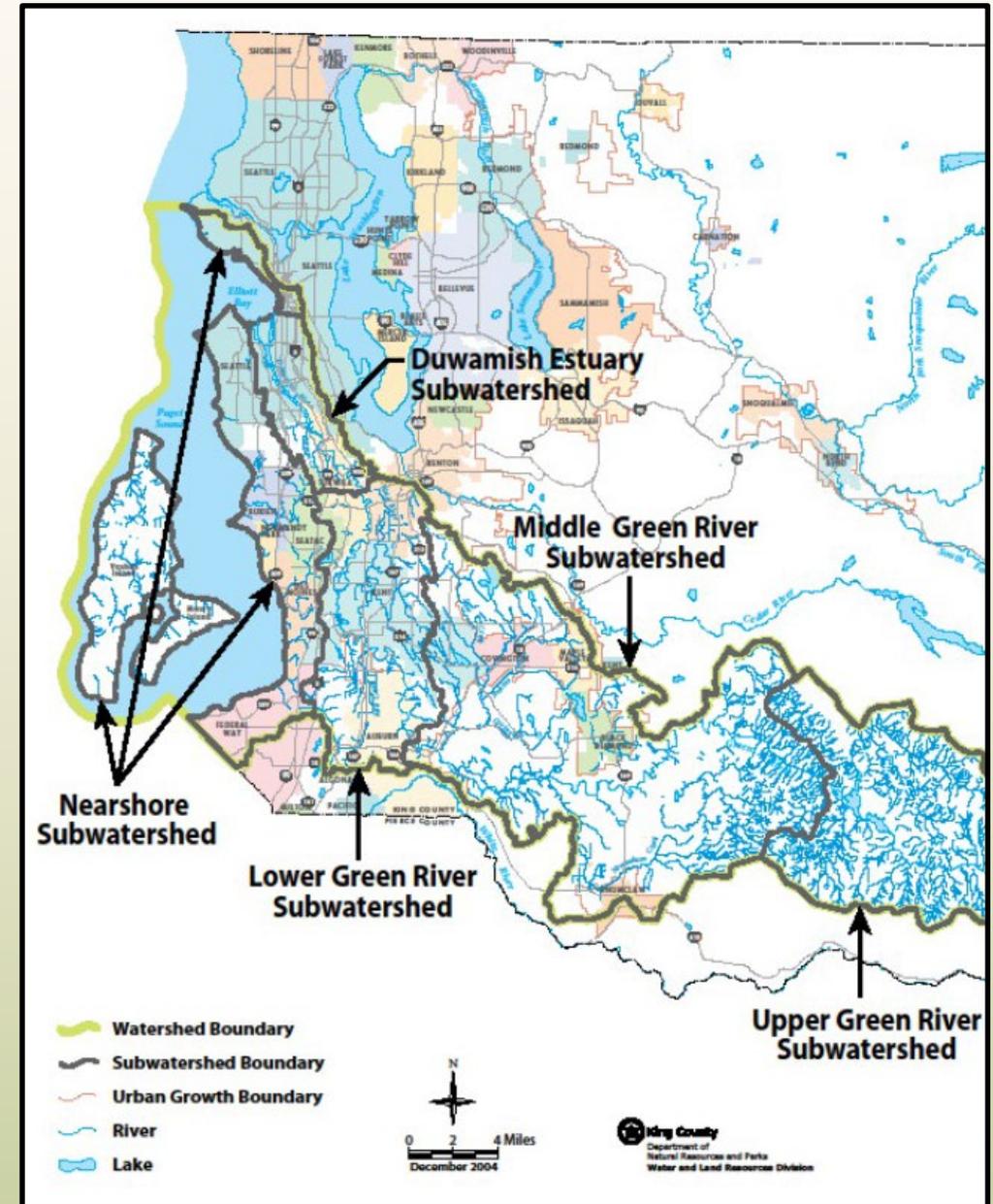
On the path to Chinook Recovery...

What we know

- Adults return to spawn in middle Green, rearing habitat limiting factor for juveniles
- Juveniles entering saltwater before rearing to larger size (those < ~60mm) not surviving to adulthood

What we don't know

- Are there specific areas that may provide rearing habitat in the heavily modified lower Green (e.g., non-natal tributaries)?

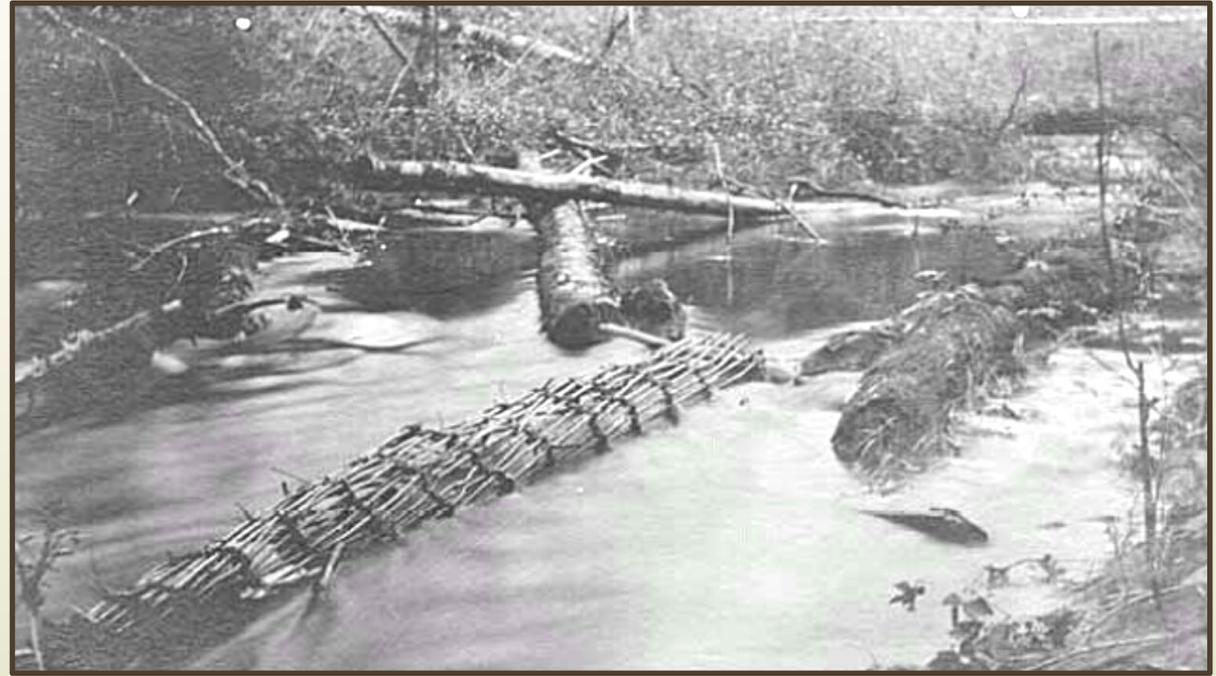


Why Tributaries?

- Tributaries thought to be historically important rearing and flood refuge habitats in lower Green
- Juvenile Chinook found to use non-natal tributaries in other locations (scattered findings in the Green).



Example of tributary restoration- lower Boise Creek

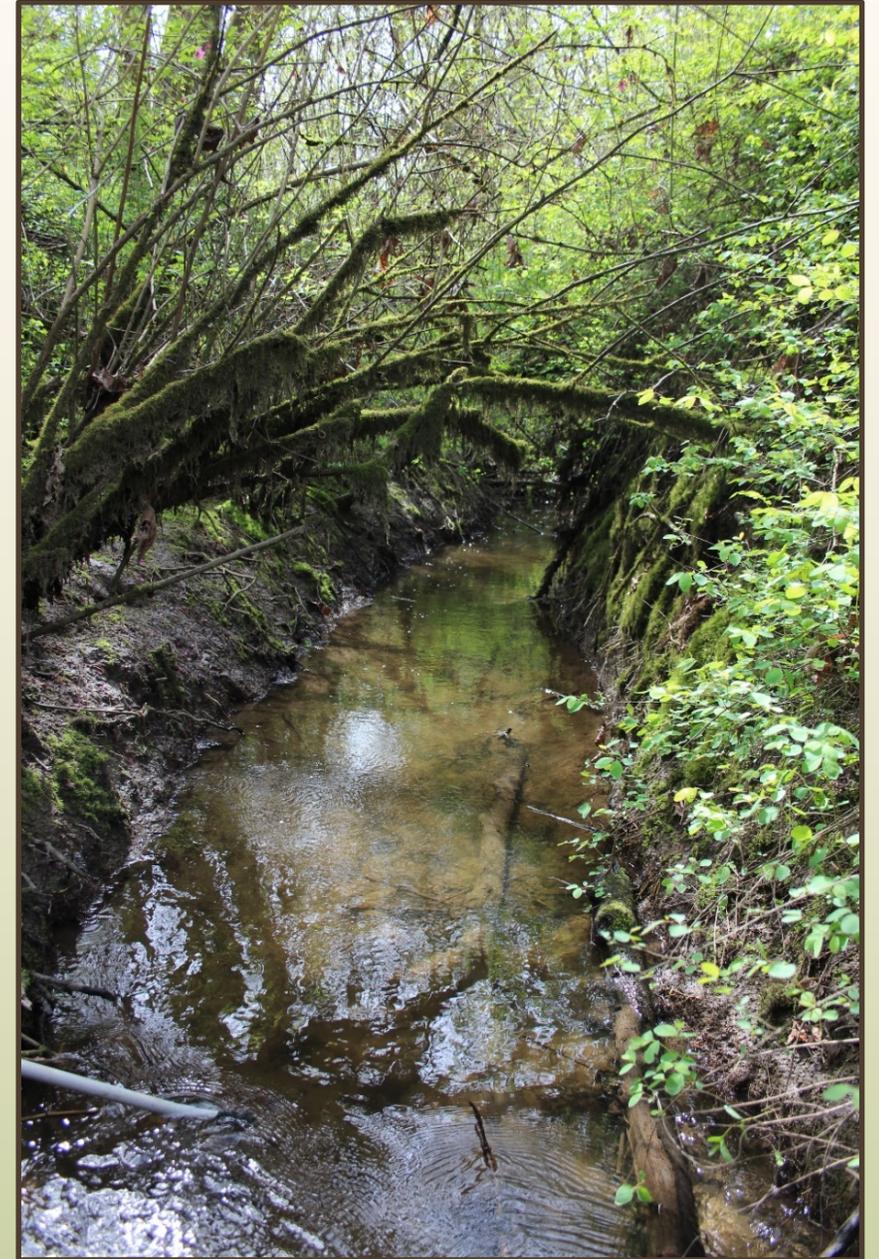


Lower Green trib in 1923 (White River Historical Society)

- Habitat restoration opportunities in the lower Green are limited and expensive.
- Tributary restoration may present more opportunities with a lower price tag and fewer hurdles.

Project Purpose

- 1. Do juvenile Chinook use non-natal streams in the lower Green for rearing?**
 - Fill data gap in WRIA 9 Salmon Habitat Plan
 - Inform restoration priorities, project design
- 2. If juvenile Chinook are found in these tributaries, is there evidence of any temporal or spatial patterns occurring?**
 - Changes throughout rearing period
 - Differences among tributaries



Midway Creek

Project Approach

- Select subset of lower Green tributaries
- Identify and sample all habitat types
- Sample throughout the rearing period
- Sample longitudinally

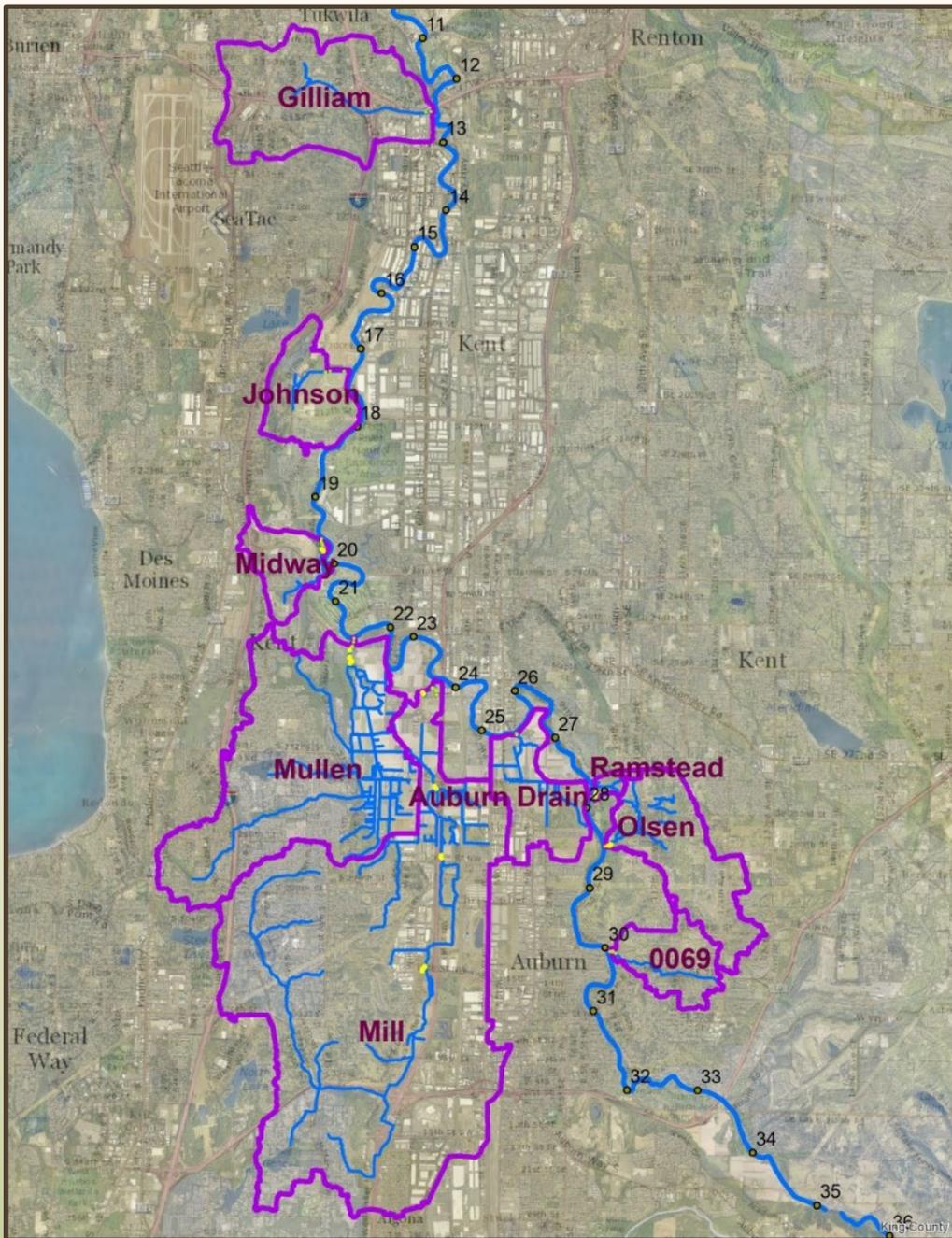


Lower Green Tributary 0069



Sampling Ramstead creek

Are juvenile Chinook using these tributaries?



Streams Sampled

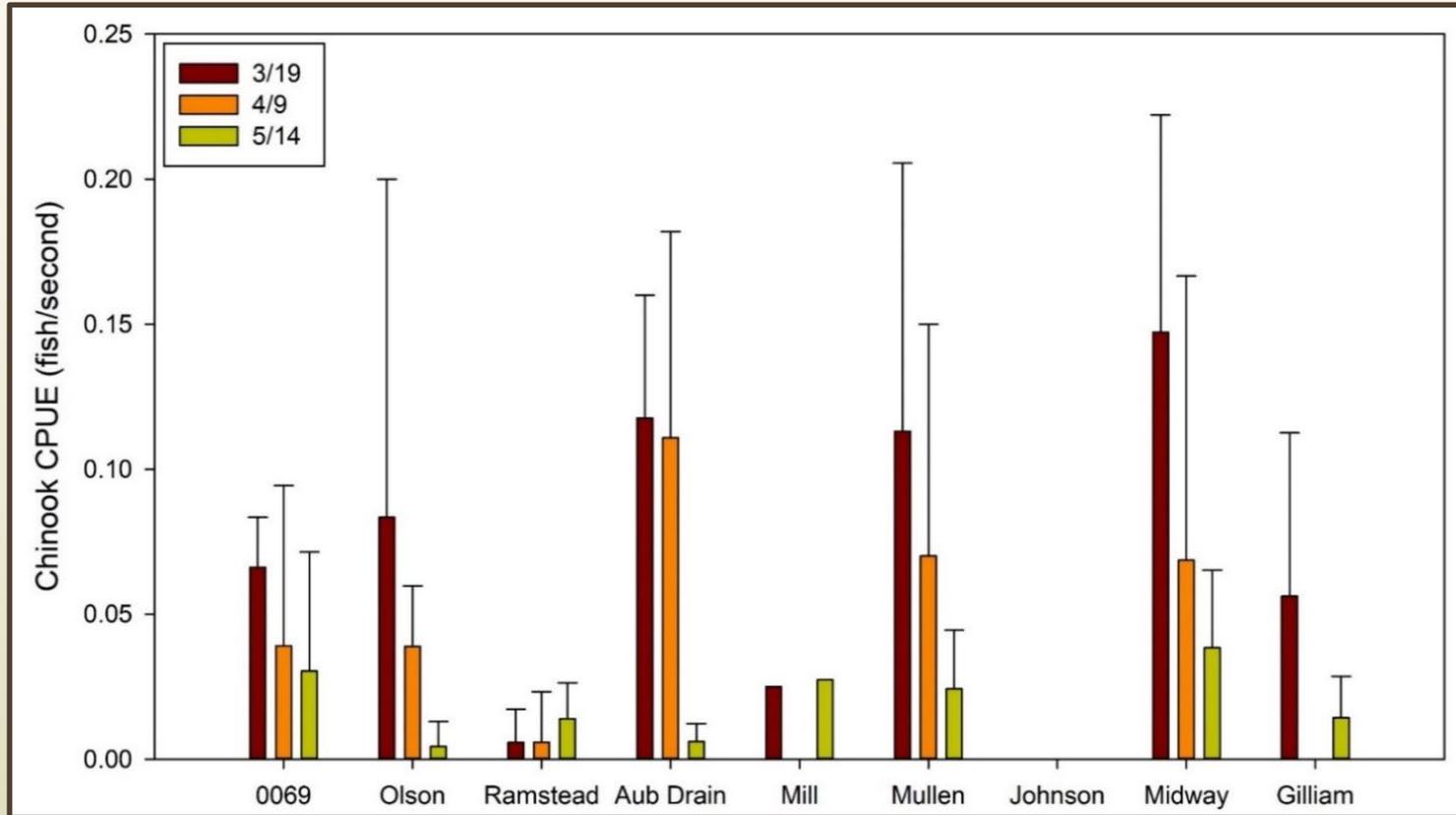
- Trib 0069
- Olson Creek
- Ramstead Creek
- NE Auburn Drain
- Mill Creek
- Mullen Slough
- Midway Creek
- Johnson Creek
- Gilliam Creek



Chinook present

- Trib 0069
- Olson Creek
- Ramstead Creek
- NE Auburn Drain
- Mill Creek
- Mullen Slough
- Midway Creek
- Gilliam Creek

Chinook catch among tributaries and sampling dates



Chinook CPUE among all habitat types and dates



Chinook from Mullen Slough



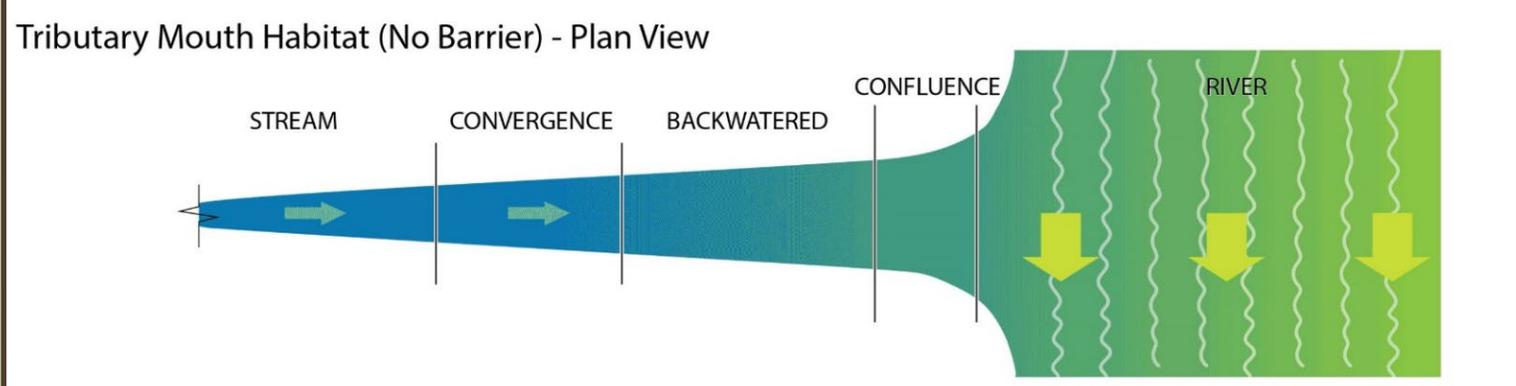
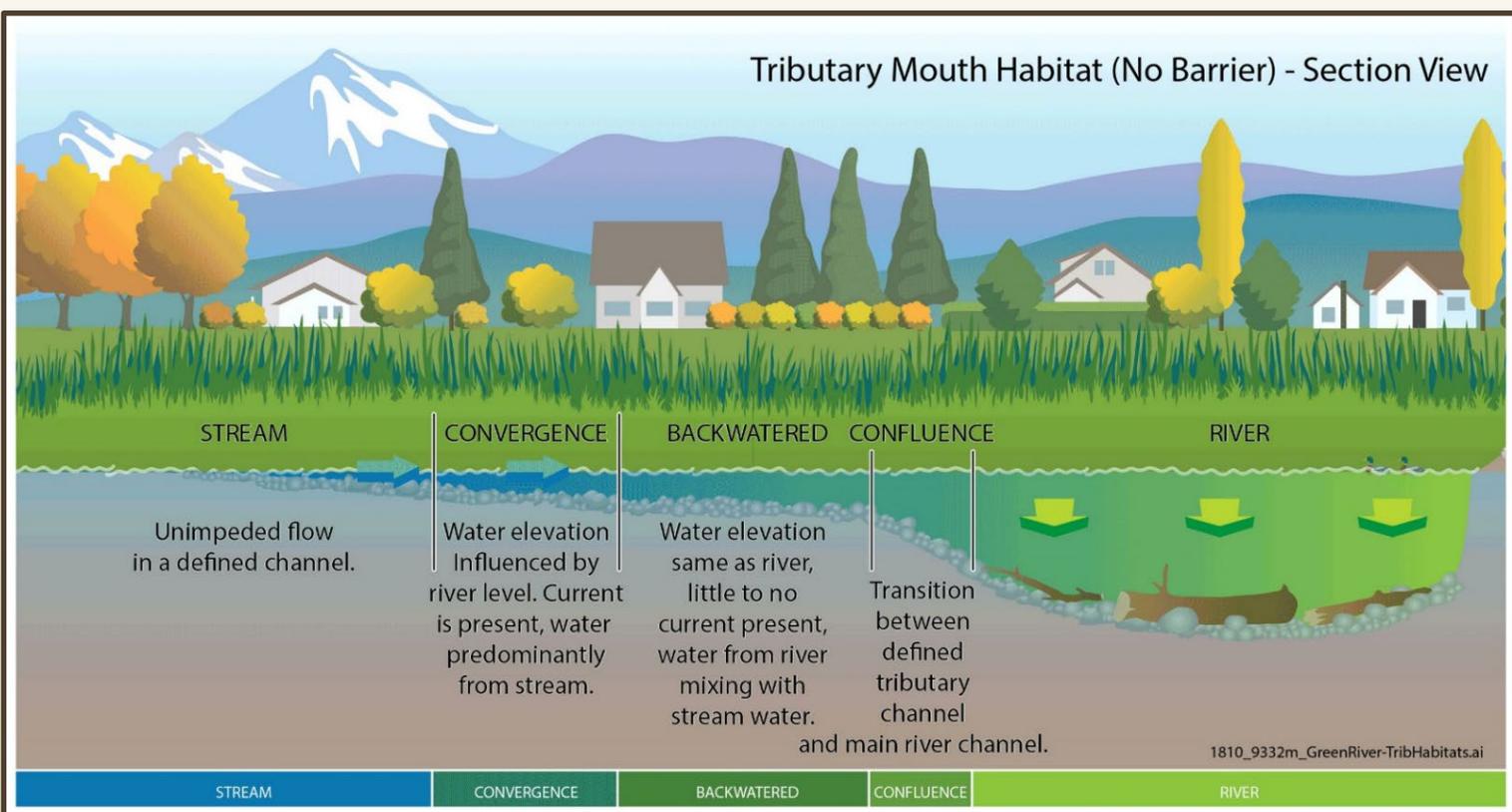
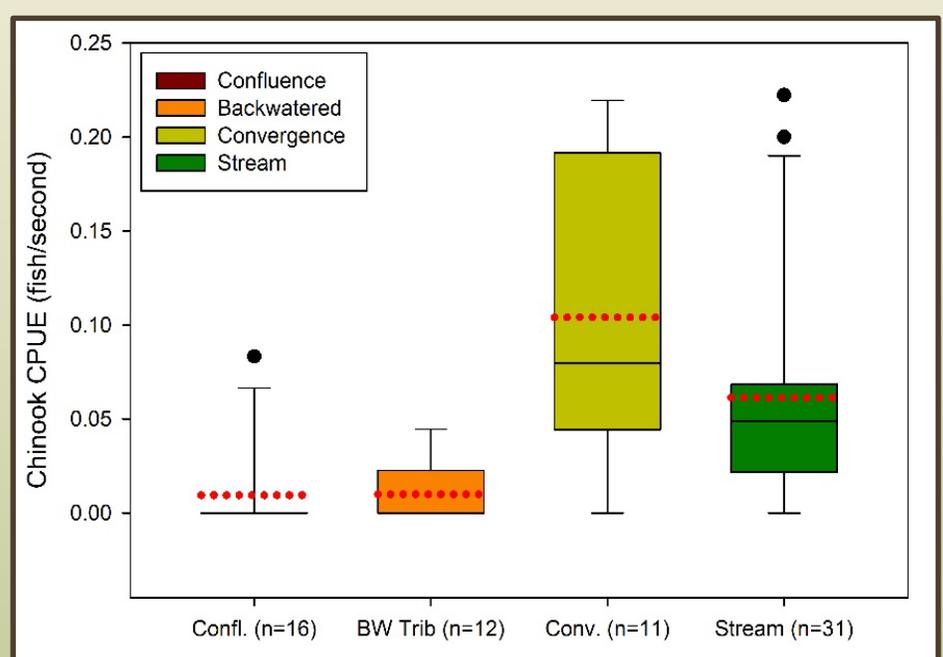
Chinook (L), coho (M), and chum (R) from Olson Creek



Chinook and coho fry from Auburn Drain

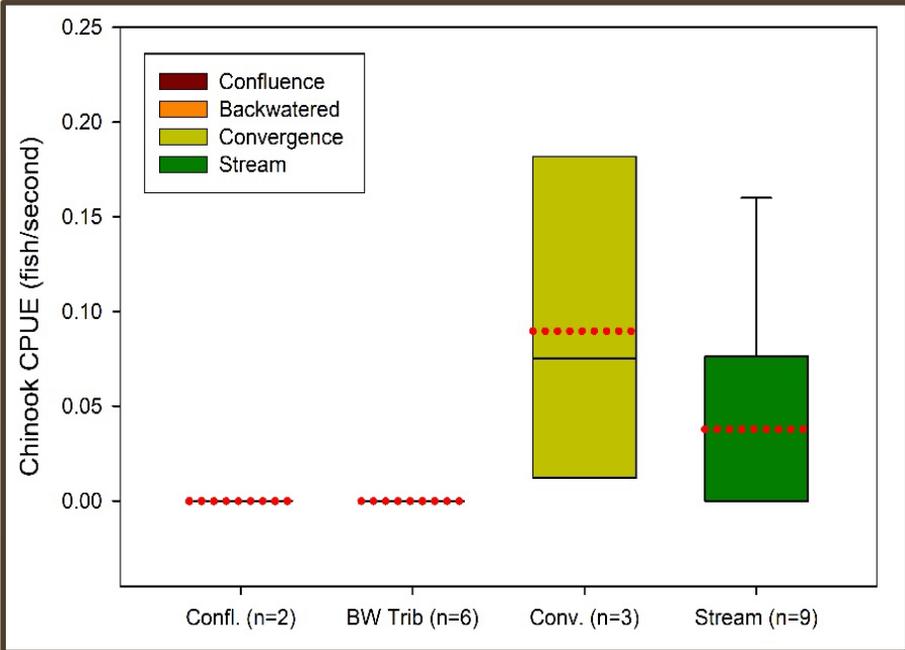
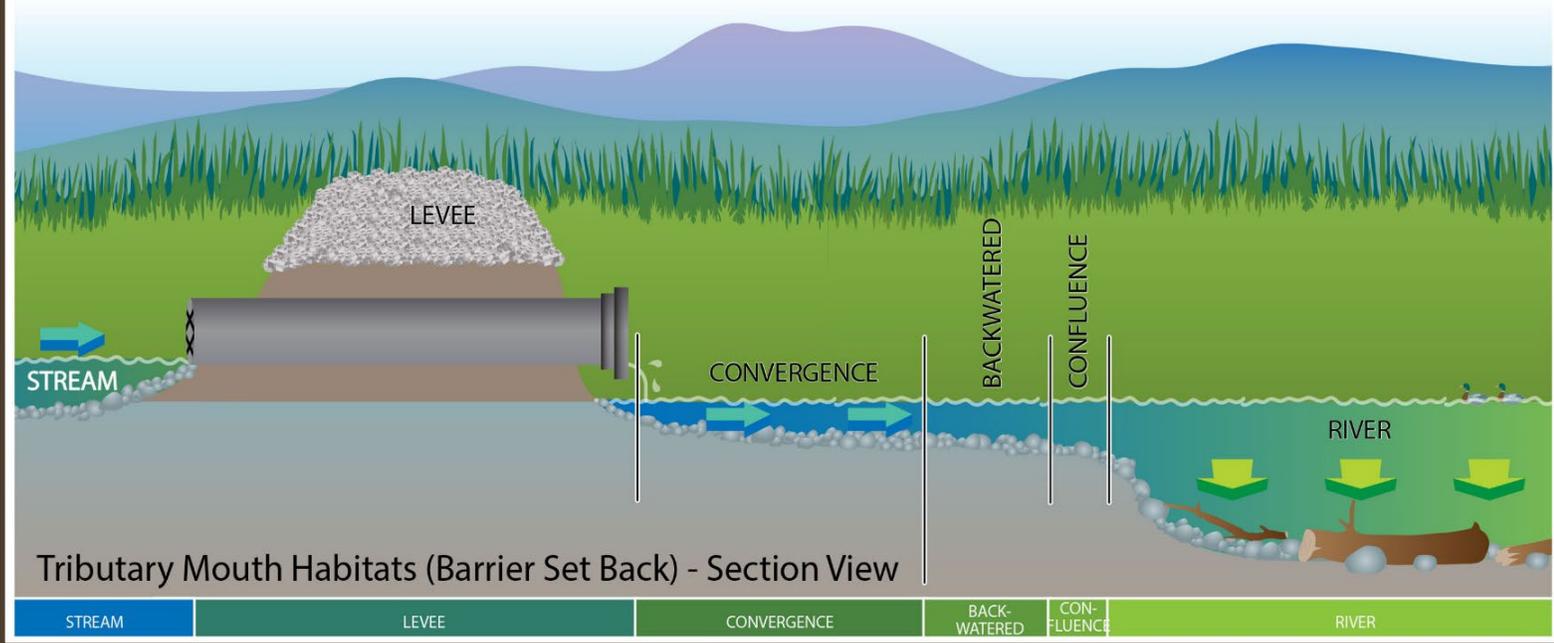
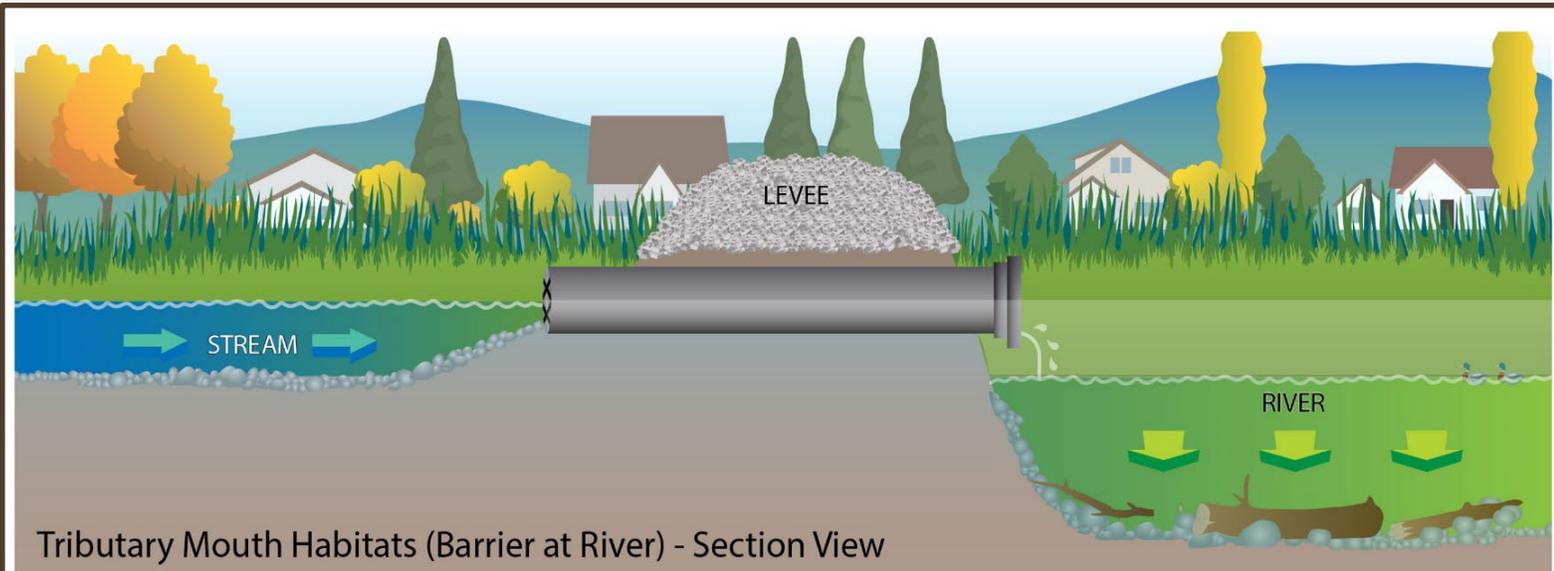
Are Chinook using tributary habitats differently?

- Four habitat types identified and sampled
- Sampling efficiency greater in stream and convergence habitats
- Chinook found from 80-480 meters upstream



Are Chinook using tributary habitats differently?

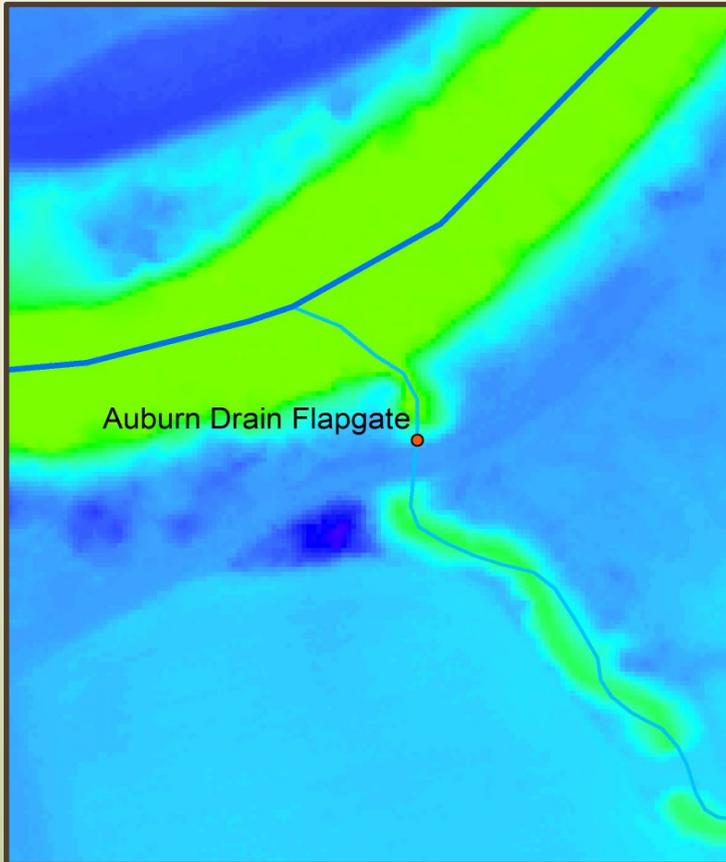
- Barriers influence the presence, location, amount, and accessibility of tributary habitats



Are Chinook using tributary habitats differently?

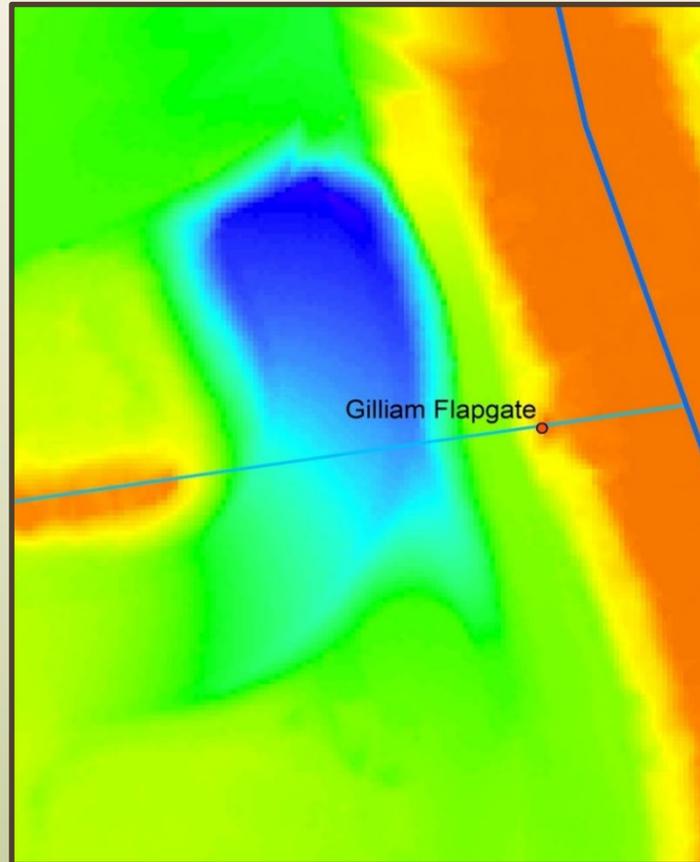
Auburn Drain

- Set back from river
 - Perched
- Most Chinook found



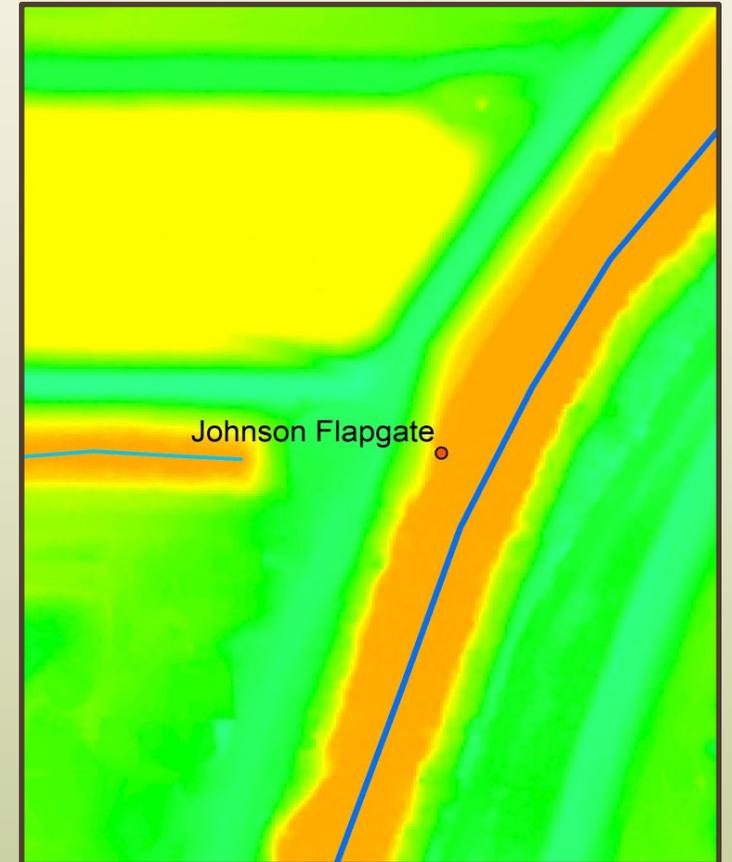
Gilliam

- Slightly set back from river
 - Slightly perched
- Chinook found



Johnson

- Even with river
 - Not perched
- No Chinook found



Evidence for long-term rearing

- Juvenile Chinook found above Auburn Drain Flapgate. What does this say?

Flapgate barrier @
1090cfs (3/19)



Velocity barrier
@ 3500cfs (4/9)

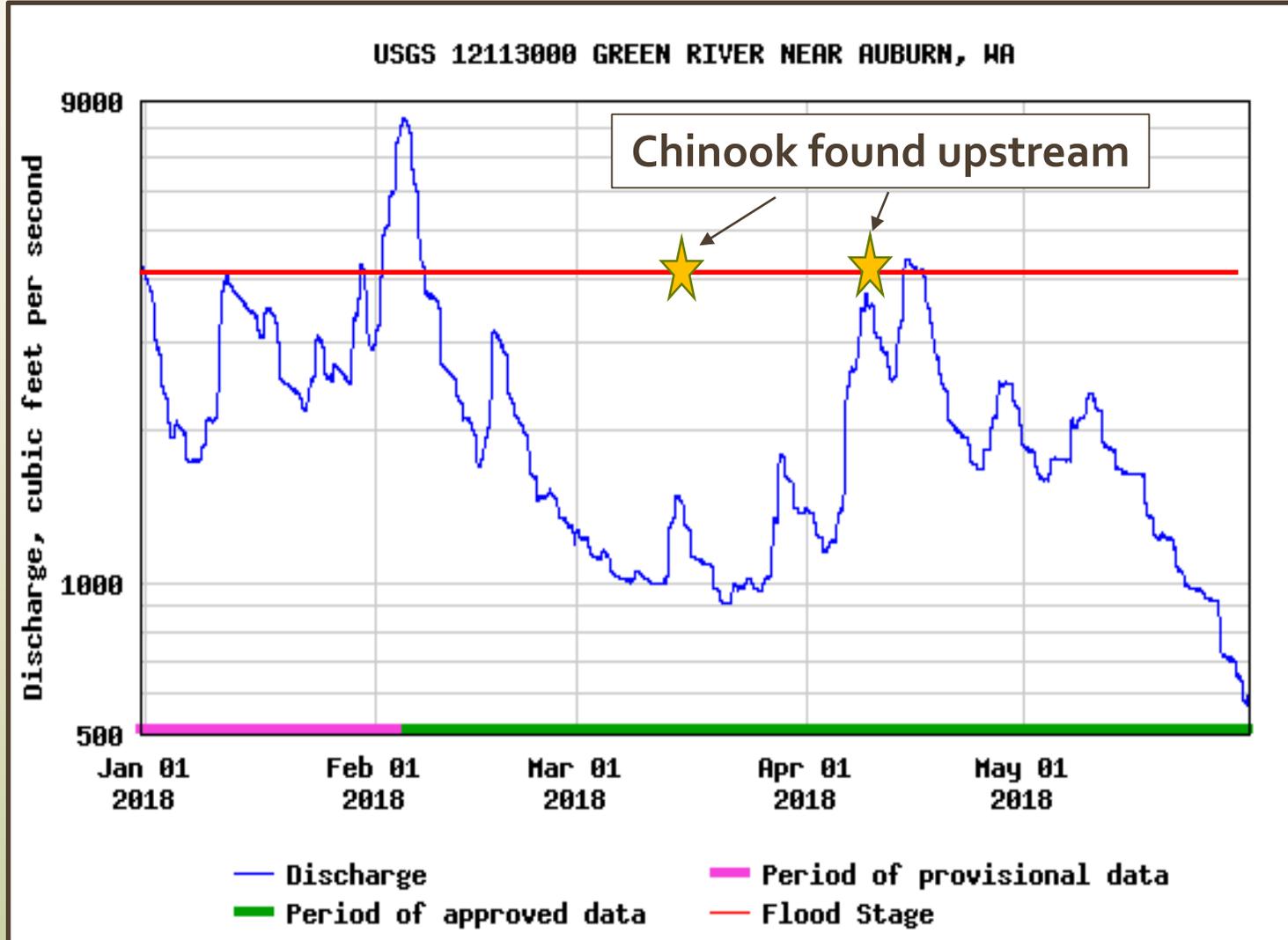


Fry in flapgate outlet @
3500cfs (4/9)



Evidence for long-term rearing

Upstream access impeded below ~4000cfs



*Auburn
Drain*



*Chinook sampled
in Auburn Drain*

Salmon Recovery Implications

What does this work mean?

What can we do?

Tributaries are important for juvenile Chinook rearing in the lower Green

Support tributary enhancement projects

Even impaired streams are capable of supporting juvenile Chinook rearing

Provide access to all tributaries and off channel areas regardless of habitat quality

Juvenile fish passage barriers important consideration for Chinook

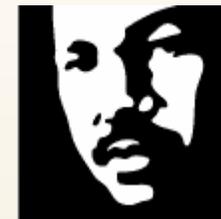
Identify and address juvenile passage barriers

Variability in flapgate performance for juvenile Chinook

Assess flapgate performance and identify potential fixes/retrofits



Josh Kubo measuring juvenile Chinook at Olson Creek



King County



Thank you.

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