

Jun 19th, 1:30 PM - 1:30 PM

Tokul Creek Intake Diversion Dam and Fishway Replacement

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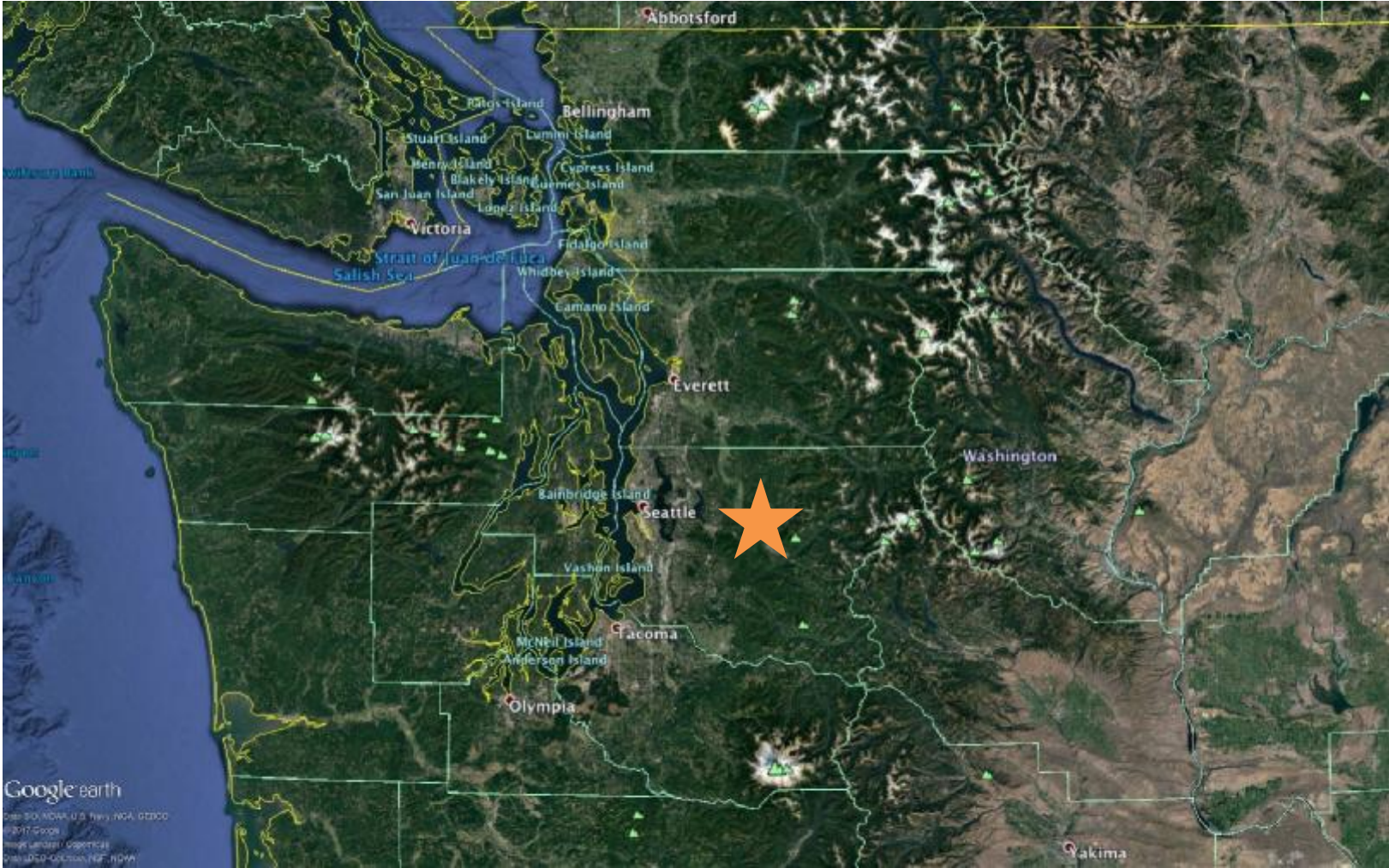
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Tokul Creek Intake Diversion Dam and Fishway Replacement

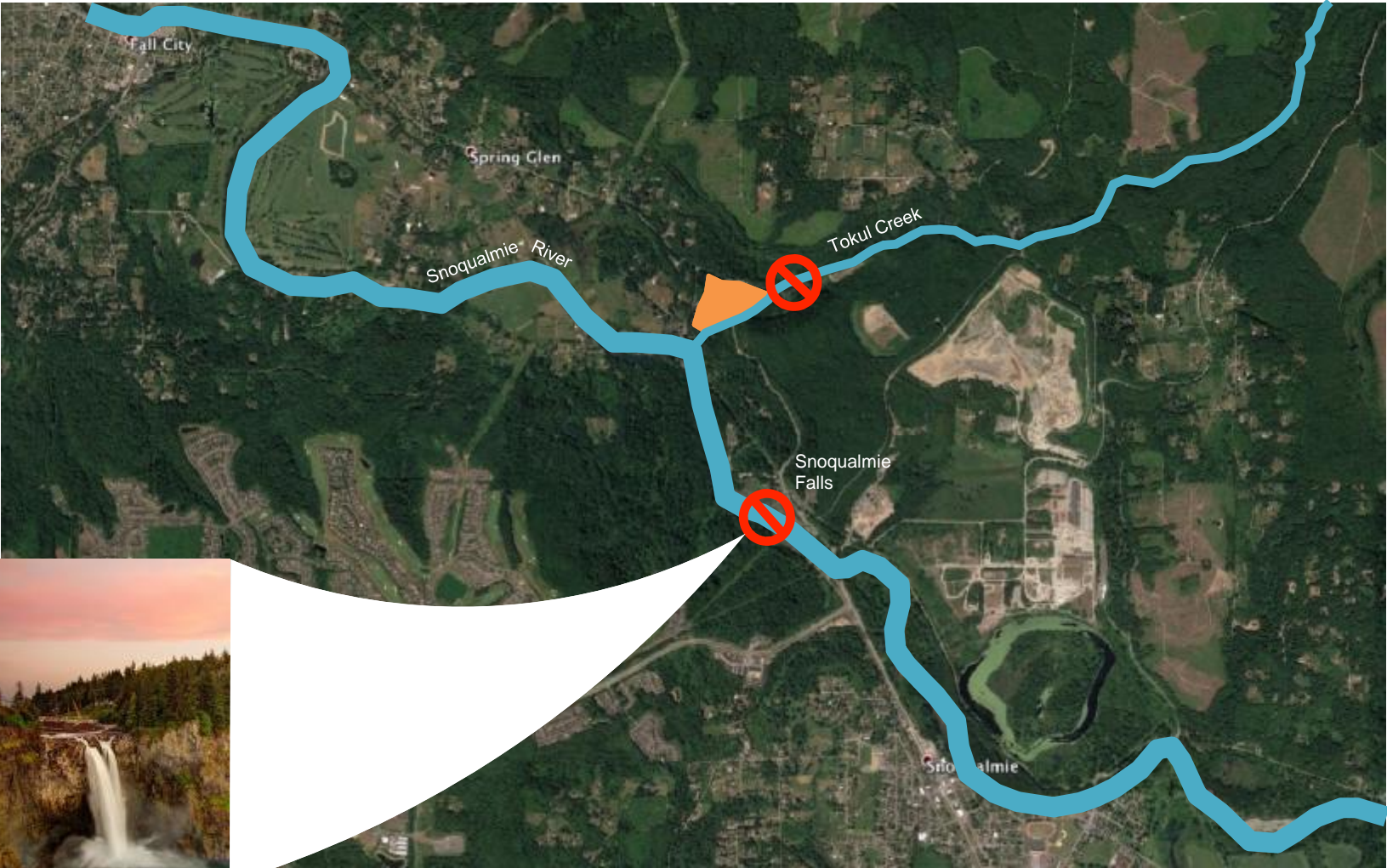
Steve Kingsley, PE
Chelsea Bennett
KPFf Consulting Engineers



Location



Location



Location



History and Setting

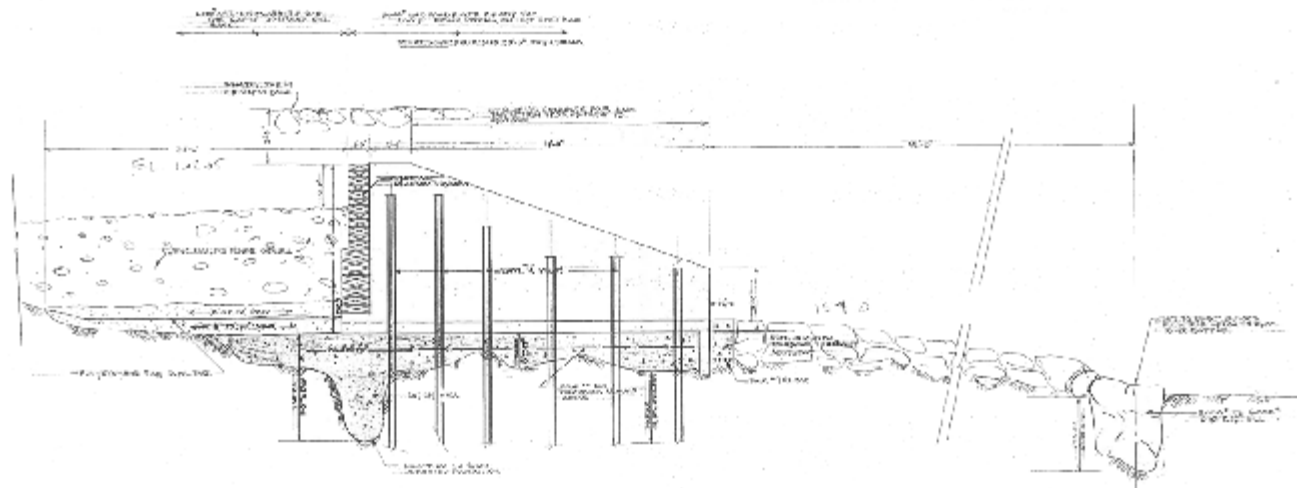
- Hatchery established in 1901 by King County
- Hatchery established primarily for steelhead and trout production
- Transferred to Washington Department of Game in 1930's
- 32.2 sq. mi. (8,340 ha) watershed
- Healthy populations of coho and pink, depressed populations of winter steelhead and fall Chinook - summer steelhead in the Snoqualmie River



Historical photos courtesy of Snoqualmie Valley Museum and Museum of History and Industry

Original Intake and Fish Passage

- Built in 1951
- Diversion dam
 - H-Piles
 - Concrete horses
 - Cyclopiian concrete / riprap slab
 - Timber weir wall
- Intake
 - Inclined horizontal screens



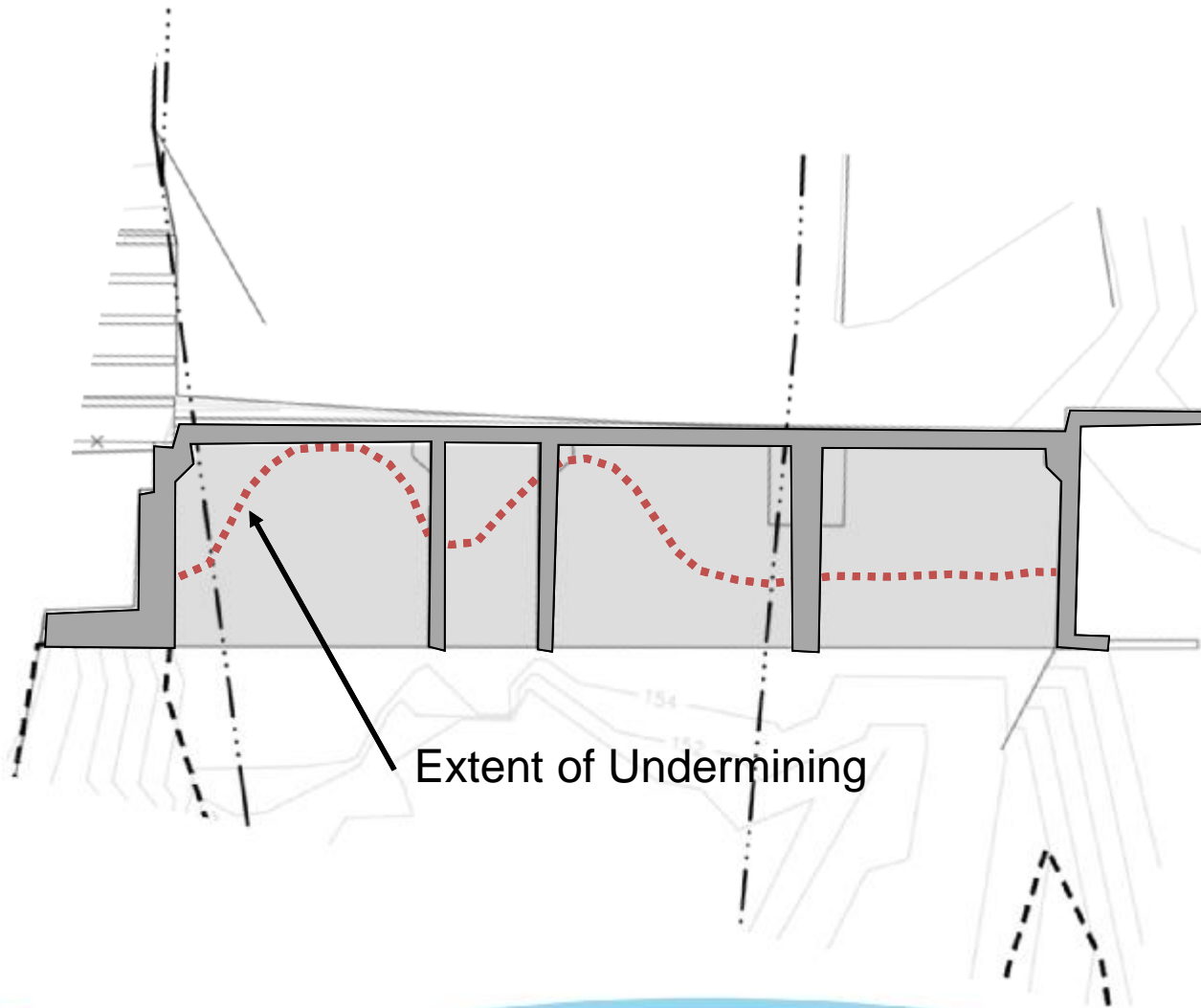
Condition Four Decades Later



Condition Four Decades Later



Condition Four Decades Later



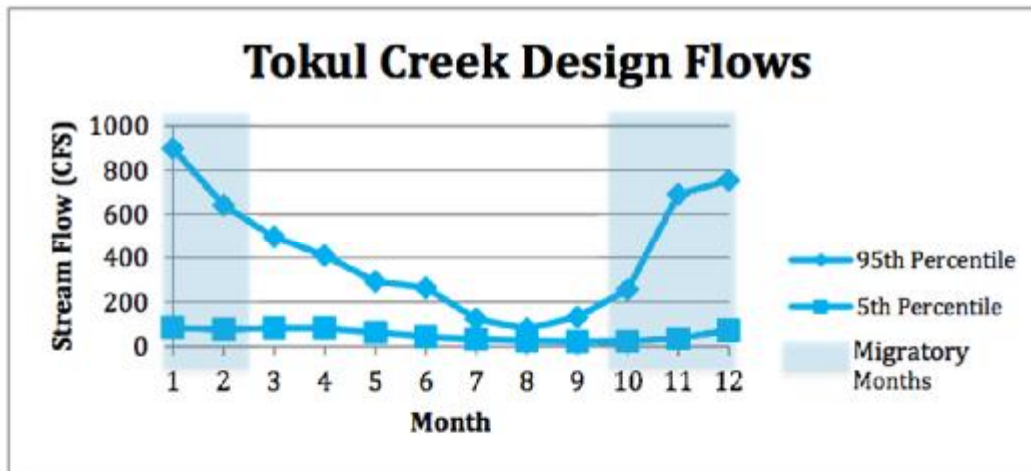
Undermining and exposed pile

Project Objectives

- Provide access to 0.9 miles of fish habitat upstream of the diversion dam, blocked since 1990
- Improve downstream passage
- Maintain water supply to Tokul Creek Hatchery
- Address substructure erosion and long term stability
- Stabilize stream channel downstream

Design Challenges and Criteria

- Flow variation
- Sediment passage
- NMFS/WDFW salmonid passage and screening criteria
- Increase resiliency in floods and large debris impacts



Design Challenges and Criteria

- Sustaining hatchery operation
- Limited construction window
- Construction access
- SR-202 Bridge stability and preservation



Design Solutions

- Schedule, structure configuration and sequence tightly integrated



Design Solutions

- Structure configured for uncertain rock and soil conditions
- Further compressed construction duration after bidding



Design Solutions

Adjustable Weir

- Improve passage of sands and gravels in low flow conditions
- Create scour at fish passage exit
- Reduce sediment intrusion in fish passage
- Create concentrated flow near fish passage entrance in low flow conditions



Design Solutions

Fish Passage

- Originally designed as a roughened channel with retaining baffles and option to convert to vertical slot
- Vertical slot in final design in part due to concerns regarding length



Design Solutions

Apron

- Approximately 18 feet longer and 5 feet lower than existing
- Lowered to streambed elevation
- Lengthened to dissipate energy in high flow conditions
- Small plunge pool on “low flow” side of weir – adjustable and removable



Design Solutions

Screens

- Vertical traveling screens fabricated by WDFW
- Chosen due to recent experience
- Structure designed for fixed vertical screens with a traveling brush system



Result



Result



Result



Result



Result



Result



Result



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