

Prioritization of Coastal Streams and Embayments Along Puget Sound Shores with a Railroad

Paul Schlenger, Environmental Science Associates
Phil Bloch, Confluence Environmental Company
Andrea MacLennan, Coastal Geologic Services
Todd Zackey, Tulalip Tribes



Railroad on Shoreline



Impacts Nearshore



- Disconnects feeder bluff sediment sources
- Disconnects terrestrial to aquatic interface
- Buries intertidal habitat and can change habitat waterward

Impacts Stream Mouths



- Bisects and truncates estuaries
- Restricts fish access
- Impedes delivery of sediments to nearshore
- Impedes delivery of large wood to nearshore...and more

Creates Embayments

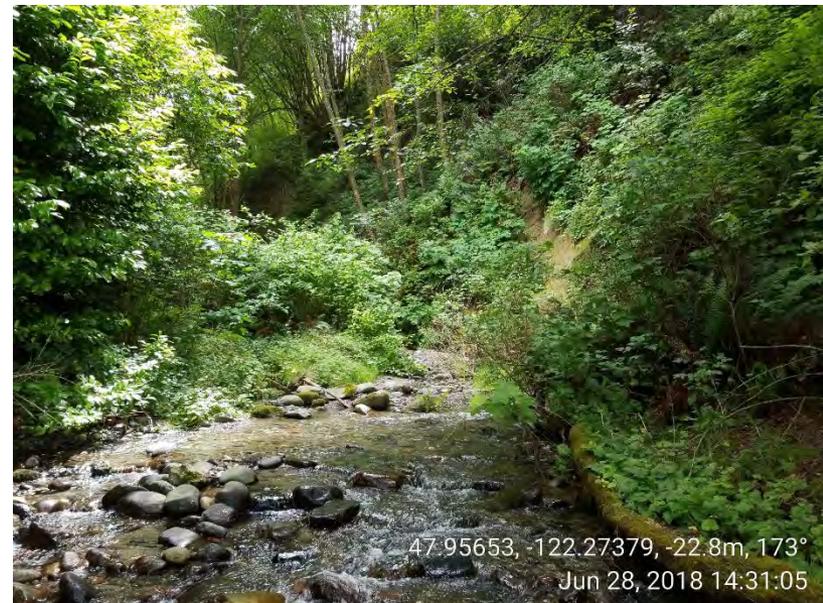
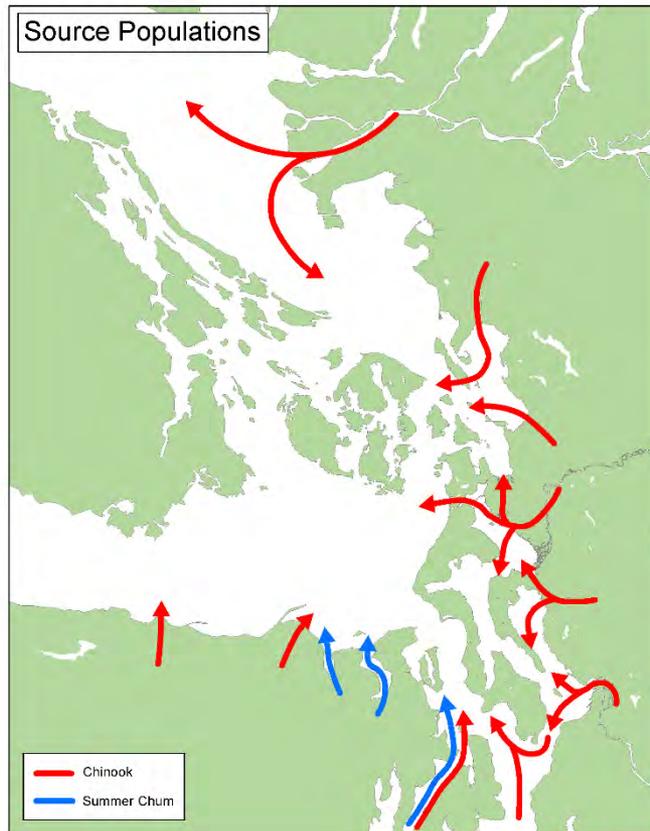


- Disconnects habitats
- Impounds freshwater



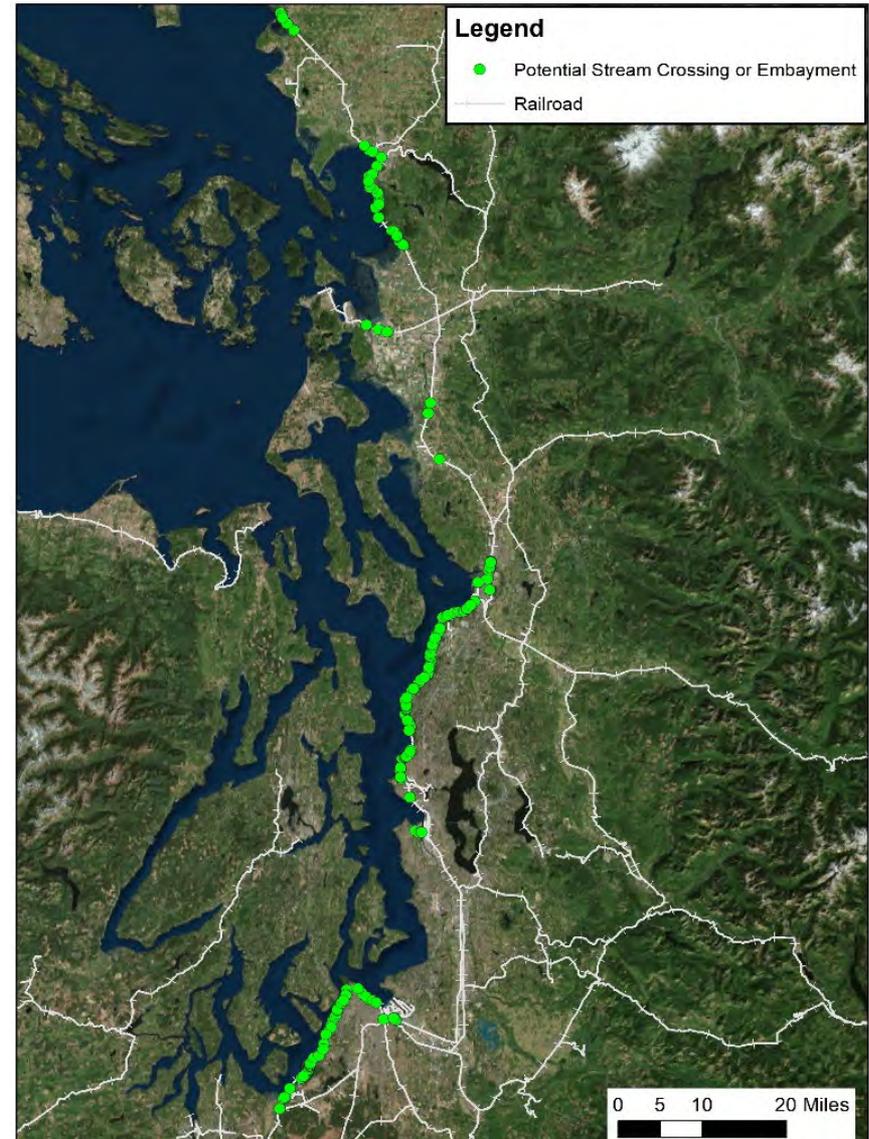
Impacts Juvenile Salmon Rearing

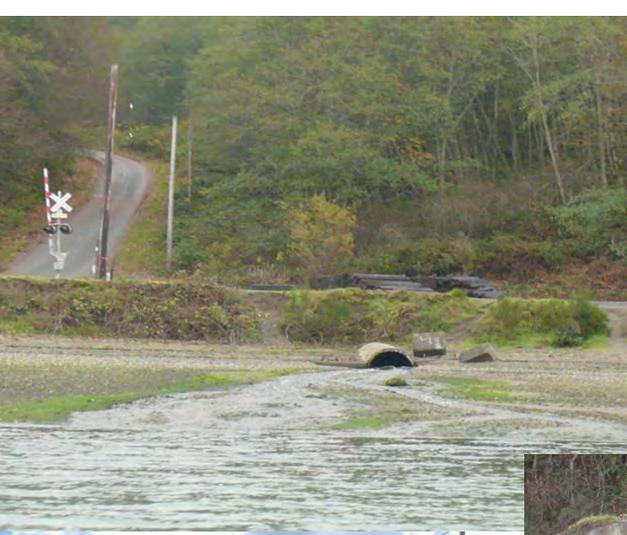
- Juvenile chinook salmon use freshwater habitats of non-natal streams and pocket estuaries



Scale of the Issue

- There are approximately 52 miles of railroad along the Puget Sound shoreline
 - Another 73 miles within 200 feet of shoreline
- Railroad crosses approximately 125 perennial coastal streams
 - Another 50-75 culverts draining non-perennial streams or primarily stormwater drainage





47.97052, -122.23082, 22.1m, 134°
Jun 28, 2018 09:29:23

47.97055, -122.23082, 15.1m, 154°
Jun 28, 2018 09:24:18

Prioritizing Opportunities

- Can be big, expensive projects
- Preparing a prioritization tool to inform where there are greatest potential benefits to salmon
- Potential avenues to implementation
 - Restoration
 - Improvements incorporated into BNSF maintenance activities
 - Mitigation for BNSF or others

Prioritization Approach

- Convened Advisory Group



**ESTUARY & SALMON
RESTORATION PROGRAM**



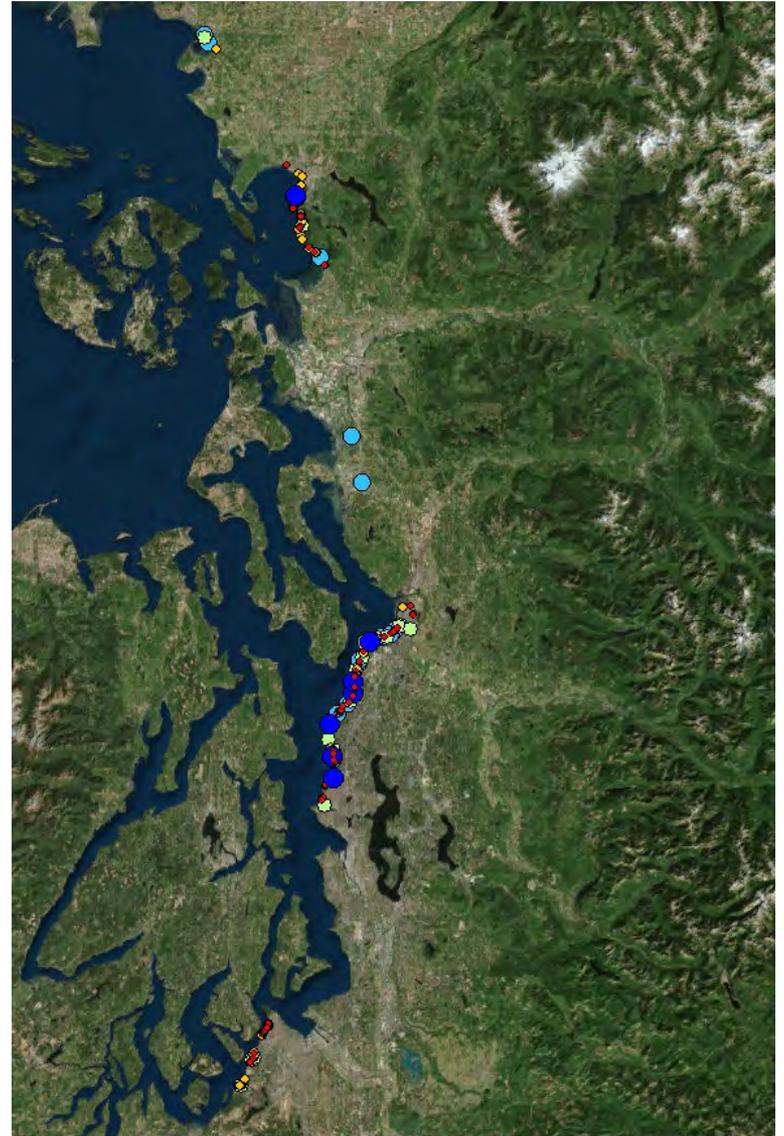
- Helpful, constructive input by all participants
- BNSF input
 - Very supportive; they have wanted a list of high priority sites for years
 - Installation of box culverts can be made more readily than switching to bridges
 - Site feasibility is important (recommendations requiring blasting bedrock are infeasible)

Prioritization Approach

- In the process of developing a prioritization framework that considers
 - Likelihood of use by juvenile salmon
 - e.g., proximity to major chinook river, presence of pocket estuary/delta
 - Upstream habitat quality
 - e.g., length of accessible stream, water quality, habitat conditions
 - Feasibility screening
 - e.g., apparent construction challenges, infrastructure in close proximity

Preliminary Observations

- 160 sites in database (more south Sound sites to be added)
- 15-20 sites stand out as possible high priorities based on watershed size, gradient, and tidal inundation



Next Steps

- More data collection of streams in South Puget Sound
- Desktop work for embayments characterization
- Refining prioritization tool
- Final report and webinar by end of 2019

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