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Working on the railroad: coastal streams prioritization to inform restoration planning

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Working on the Railroad:
Coastal Streams prioritization for restoration planning

Paul Schlenger & Phil Bloch (Confluence Environmental)
Jennifer Griffiths (WDFW)

Overview

- BNSF Railroad Context and History
- Initial Analysis of Coastal Stream Crossings
- Site Prioritization
- Planned Field Characterization
- Phase I Goals and Next Steps

BNSF Rail line

- Constructed in late 1800's

- ~125 miles of RR along shoreline

- RR crosses more than 170 coastal streams

Then and Now

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Then and Now
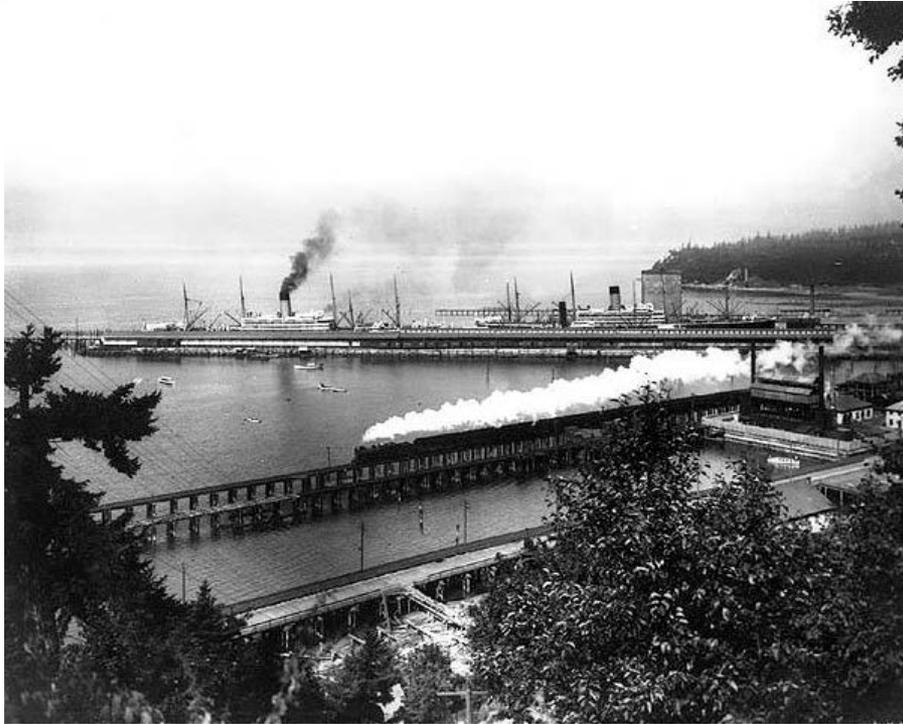
Initial Analysis

- Step 1: Identify stream crossings

- Step 2: Characterize stream watersheds

- Step 3: Characterize streams

- Step 4: Characterize stream structure type

- Step 5: Prioritize top site for Field Analysis

Inset map

0   1.5   3 Miles

N

Legend

Railroad Stream Crossing

- ● Predicted culvert location
- +—+ BNSF Railroad
- —— Puget Sound Shoreline
- Puget Sound
- —— Streams
- Washington State
- Canada

0   10   20 Miles

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Crossing Examples – Perched culvert

Crossing Examples – Culvert

Crossing Examples – Trestle

Crossing Examples – Embayments

Planned Field Analysis

Upstream habitat

Stream Structure

Nearshore Characteristics
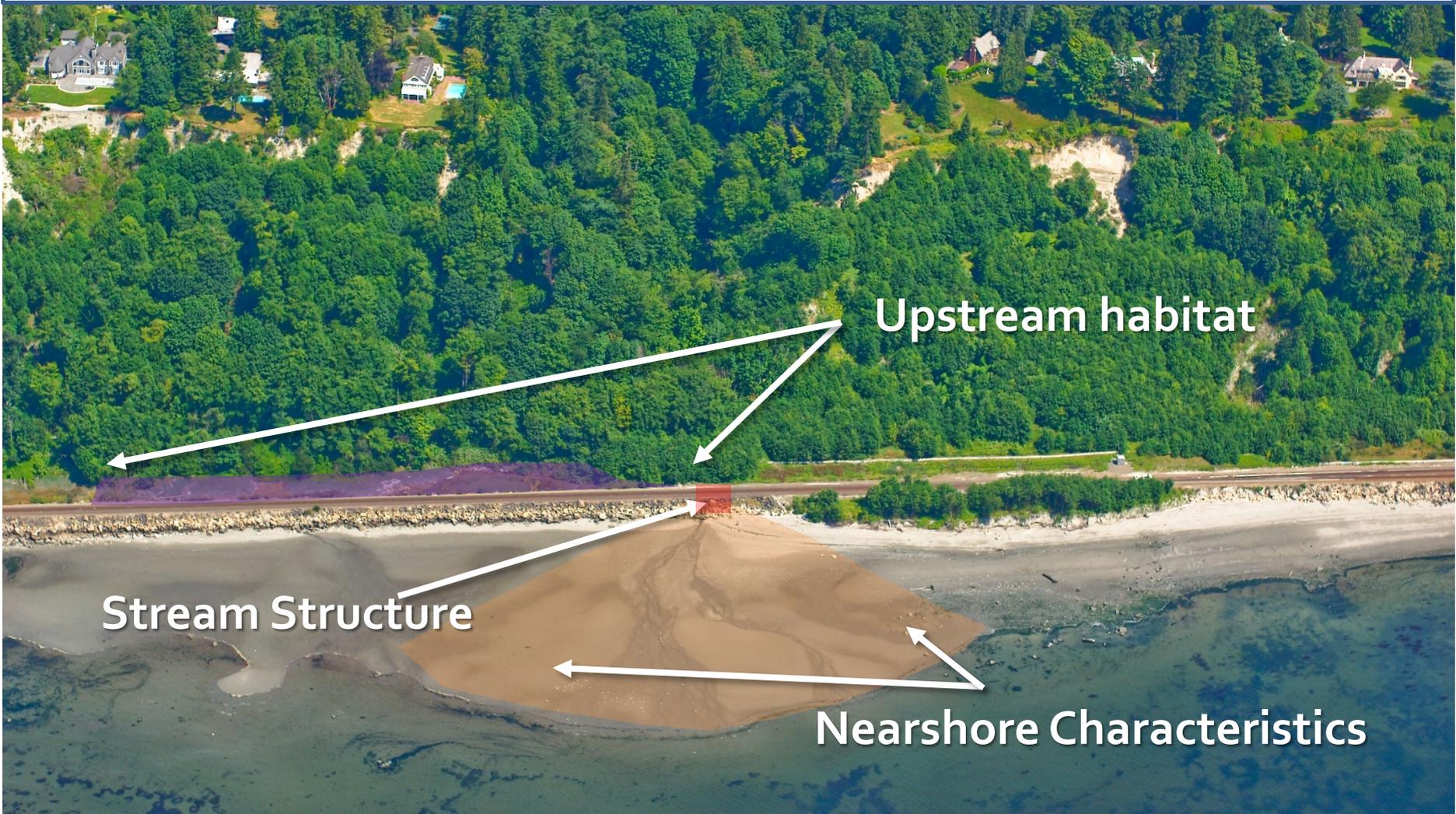
Prioritization

- Chinook centric
  - Watersheds greater than 45 hectares
  - Channel slope of less than 6.5%
  - Proximity to natal streams/rivers
  - Condition of stream mouth/structure for fish access
  - Accessible stream length
  - Watershed condition
  - Presence of estuarine or freshwater wetlands

Phase I Goals

- Complete inventory of stream crossings and embayments
- Prioritize stream crossings for potential benefits to Chinook
- Initial estimates of potential for improving
  - Fish access
  - Chinook use
  - Stream processes
  - Access to wetland habitats

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Phase II (Unfunded)

- Communication/engagement strategy
- Implementation plan with BNSF
- Planning level restoration design concepts for tidal crossings along railroad
- Advanced mitigation/mitigation banking valuation

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Partners

- Tulalip Tribes
- Coastal Geologic Services
- Technical Advisory Panel

Questions?

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Chuckanut Bay - Then

Chuckanut Drive
near Bellingham, Wash.
Jukes, photo.

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