

Threads in the Web -
A Brief Introduction to Olympic Peninsula
Streams

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for
Streamkeepers
June, 2013





Major themes for tonight's talk:

- Salmon are an important link in the ecological web of life
- Salmon and their aquatic habitats are adapted to each other
- Wood is good for salmon and other aquatic life
- Large wood is the best!

Salmon habitat includes the physical, chemical, and biological components of the environment that support salmon.

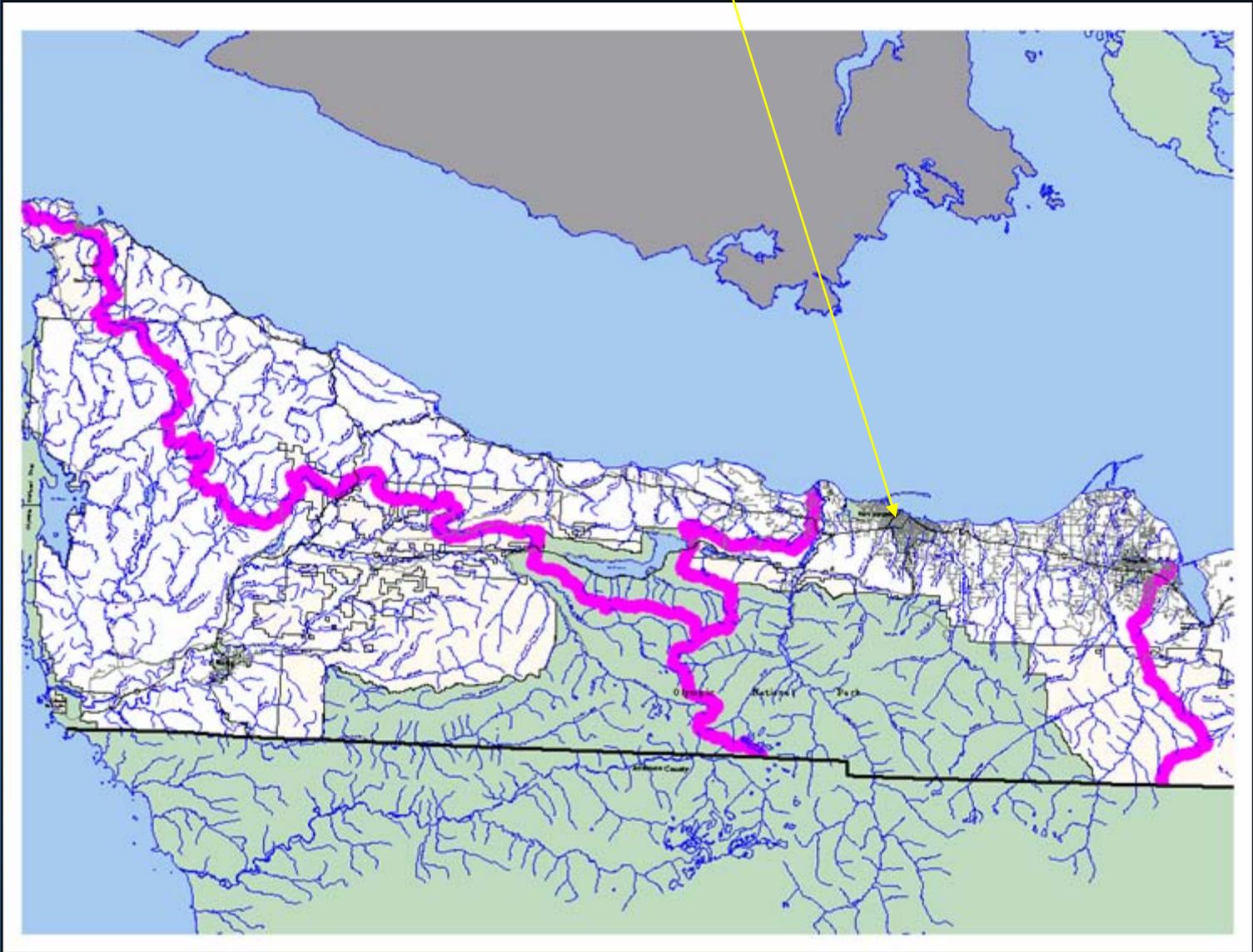


A photograph of a forest stream with a rocky bed and mossy logs. The water is clear and flows over the rocks, creating small white rapids. The surrounding forest is dense with green foliage and moss-covered logs.

**As a part of the Olympic Peninsula ecosystem,
aquatic life evolved with:**

- **clean, cool water**
- **food**
- **safe passage**
- **adequate stream flow**
- **cover**
- **suitable substrate**

We are here



...and our weather (generally) arrives from out here



Summer

Winter

**Precipitation falls on the mountains
(to become glaciers and snowfields)**



...or on the forest canopy itself



**Large woody
debris**



Some of the water finds its way to rivulets



Which join to become streams



Large
woody
debris
(LWD)

LWD



Which join to become rivers

Future
LWD



Which meet the marine environment at the estuary

????

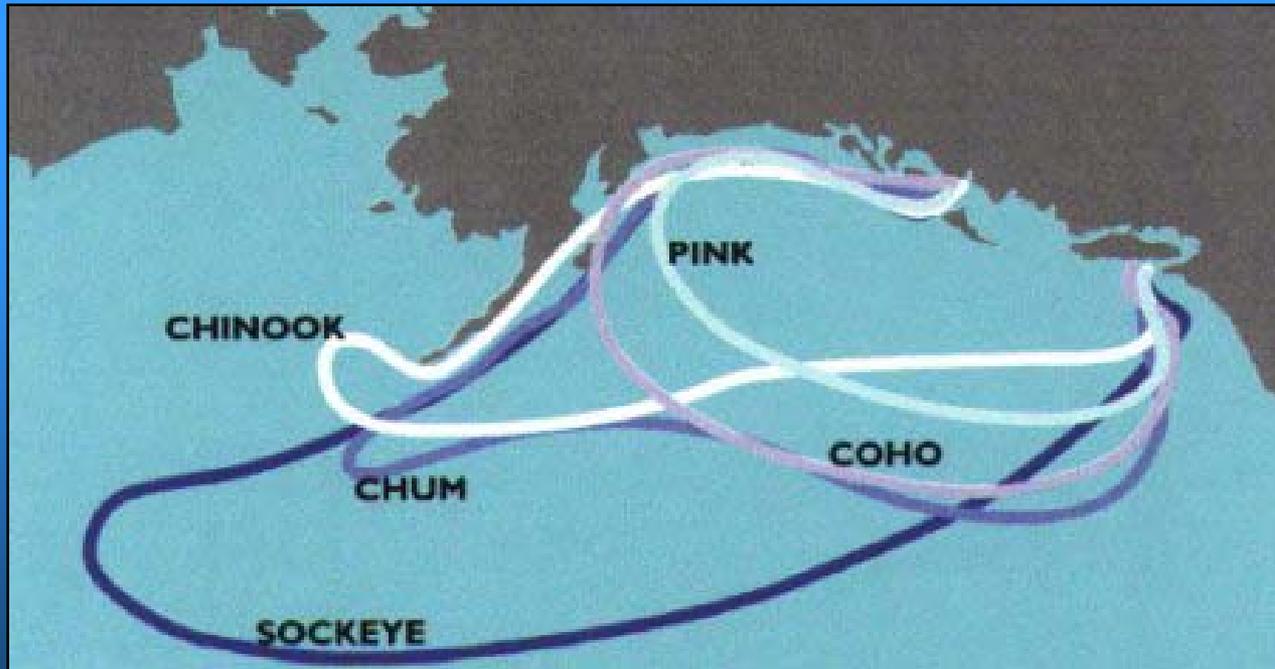


Estuaries: critical nurseries for juveniles



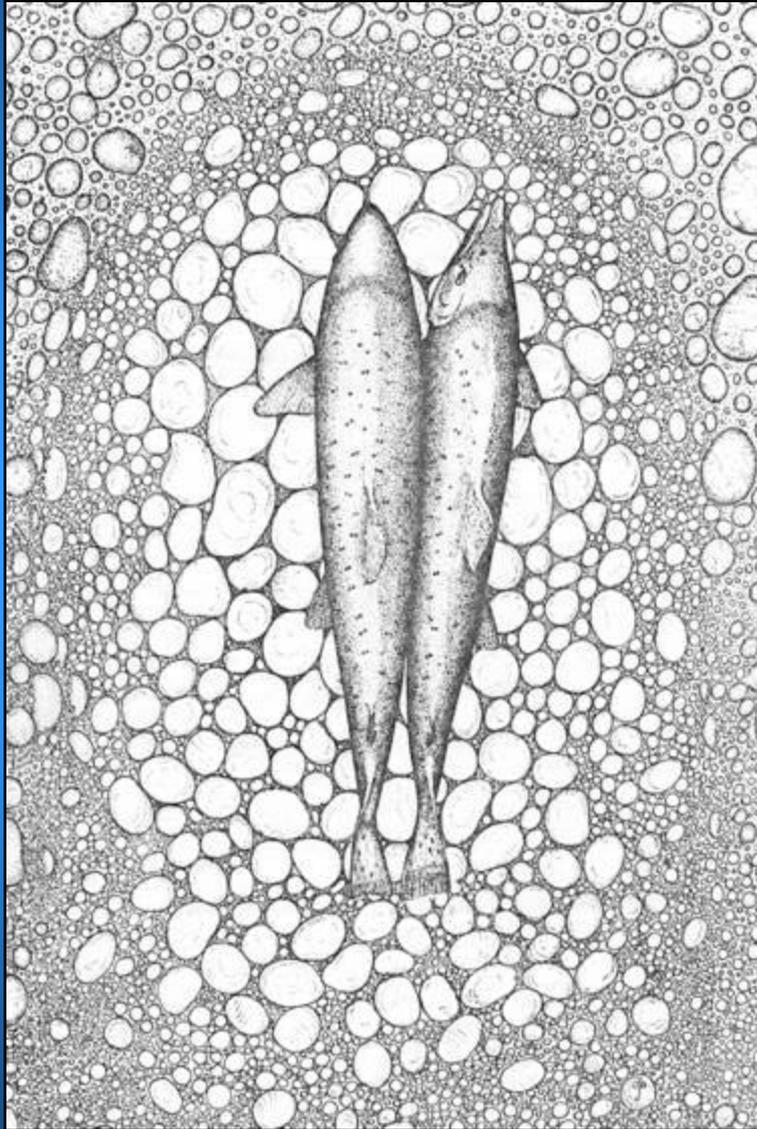
Juvenile Chinook Salmon

Mighty fish from little alevins grow



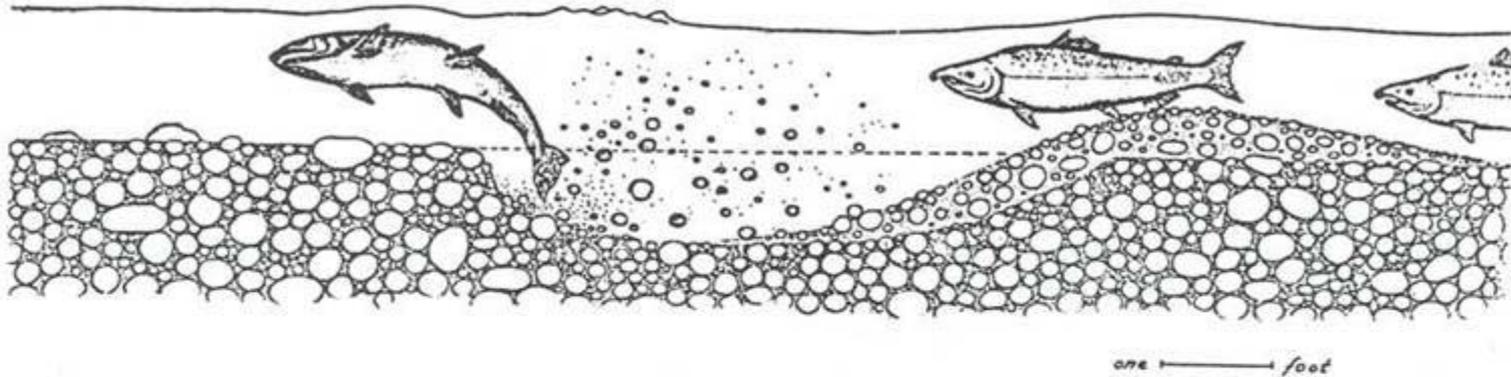
Fisherman on Quillayute River



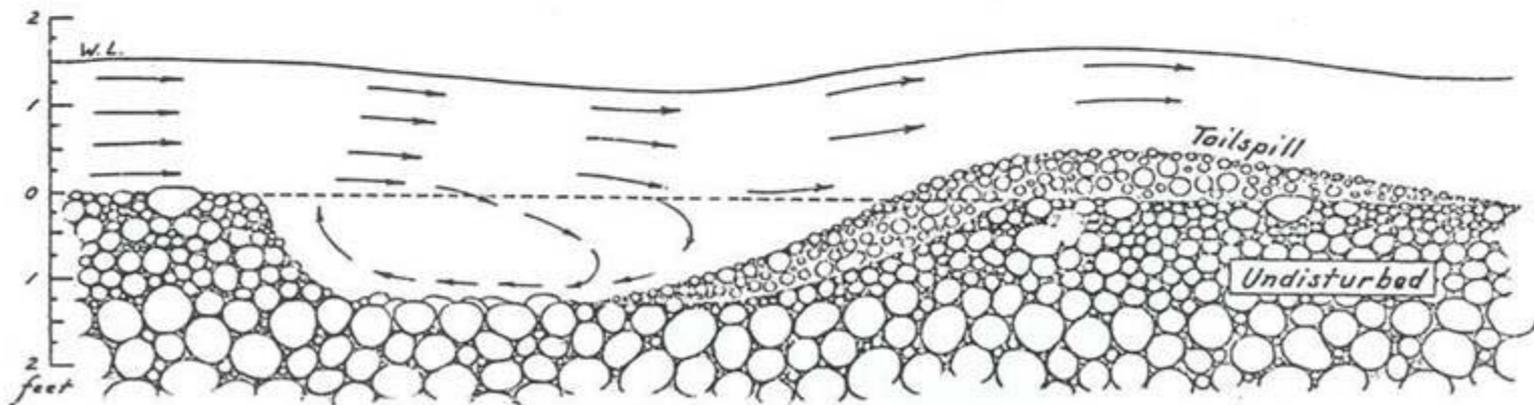


**Salmon on
a redd**

Digging a redd



Redd making - female digging

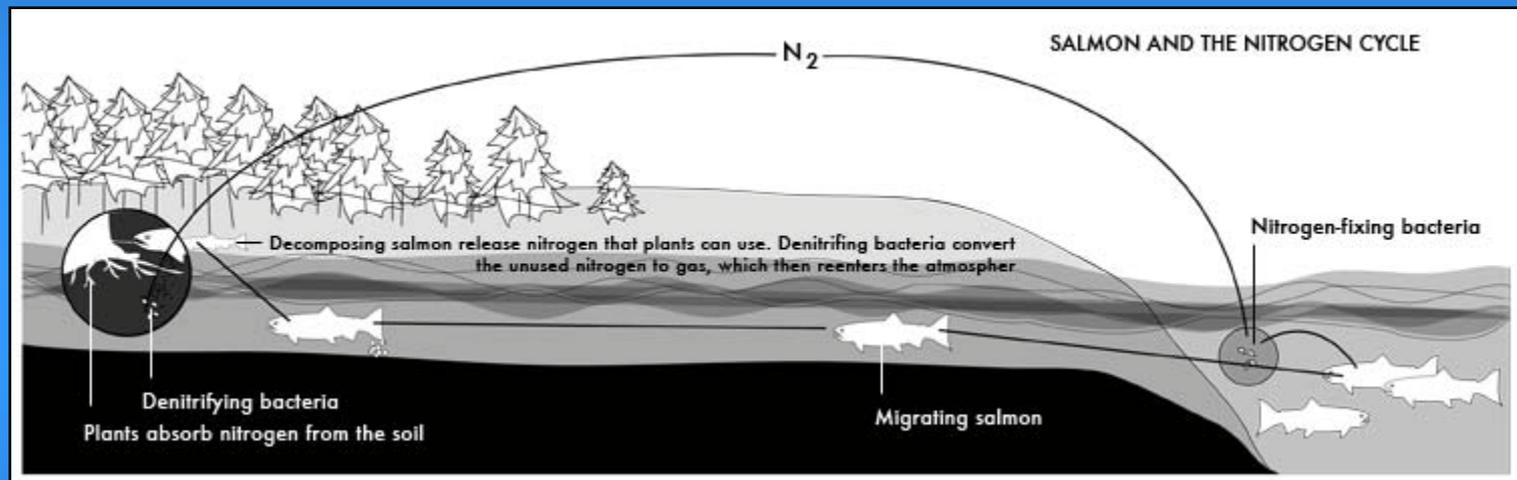


Typical currents in a redd

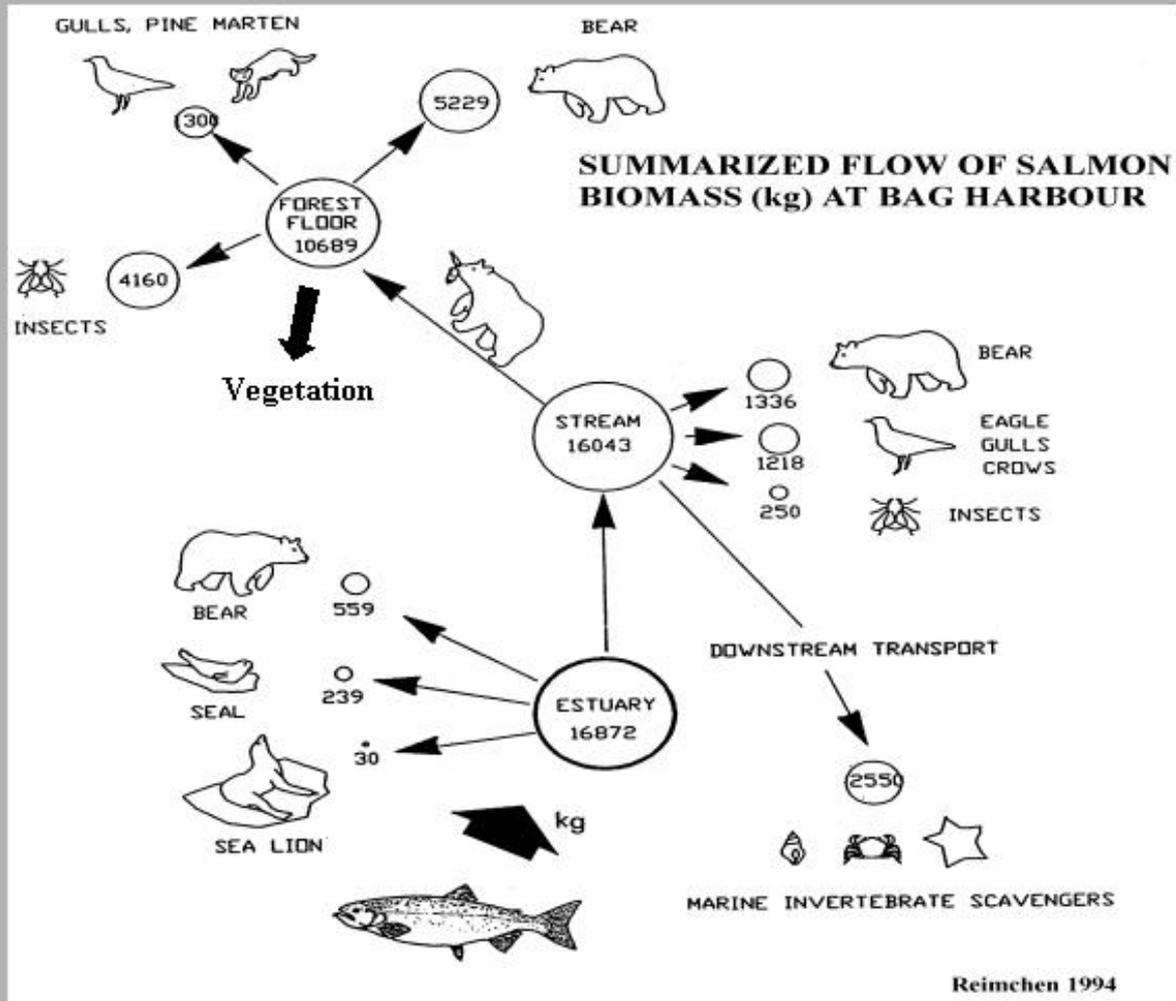


Salmon Redd

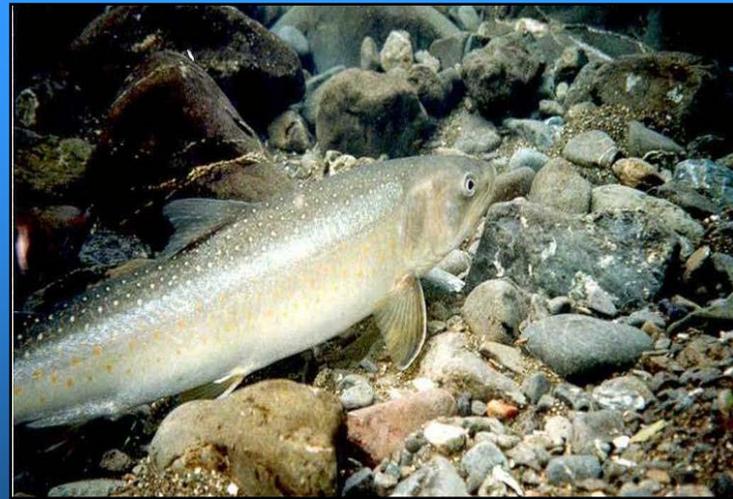
Threads in the nutrient web: salmon bring marine-derived nutrients to the fresh water and terrestrial environment



A more complex tapestry



**Just a reminder: Olympic Peninsula streams, salmon, and
temperate rainforests evolved together**



Coastal temperate rainforest and its river valley: the Queets





'Deep Forest' courtesy of Ray Troll

Large woody debris: Why?

- **Forms habitat (pools)**
- **Traps and holds sediment**
- **Helps to attenuate high flows**
- **Provides cover for migrating and spawning adults, juveniles, and migrating juveniles**
- **Food (even in the estuary!)**



Riparian zone: where land and water meet



West Twin,
tributary to the Hoh River

LWD in channel



Barnes Creek

In Clallam County, 5 salmonids are considered "Threatened" under the federal Endangered Species Act:

- Lake Ozette Sockeye**
- Puget Sound Chinook**
- Eastern Strait of Juan de Fuca
Summer Chum**
- Bull Trout**
- Puget Sound Winter Steelhead**



Changes in the Dungeness Delta, 1855 to 1998

Human impacts contributing to these changes include 1) diking of the salt marsh, 2) channelization of the lower river and 3) river diking.

   Reference Points



Loss of forest cover

Roads





Road impacts

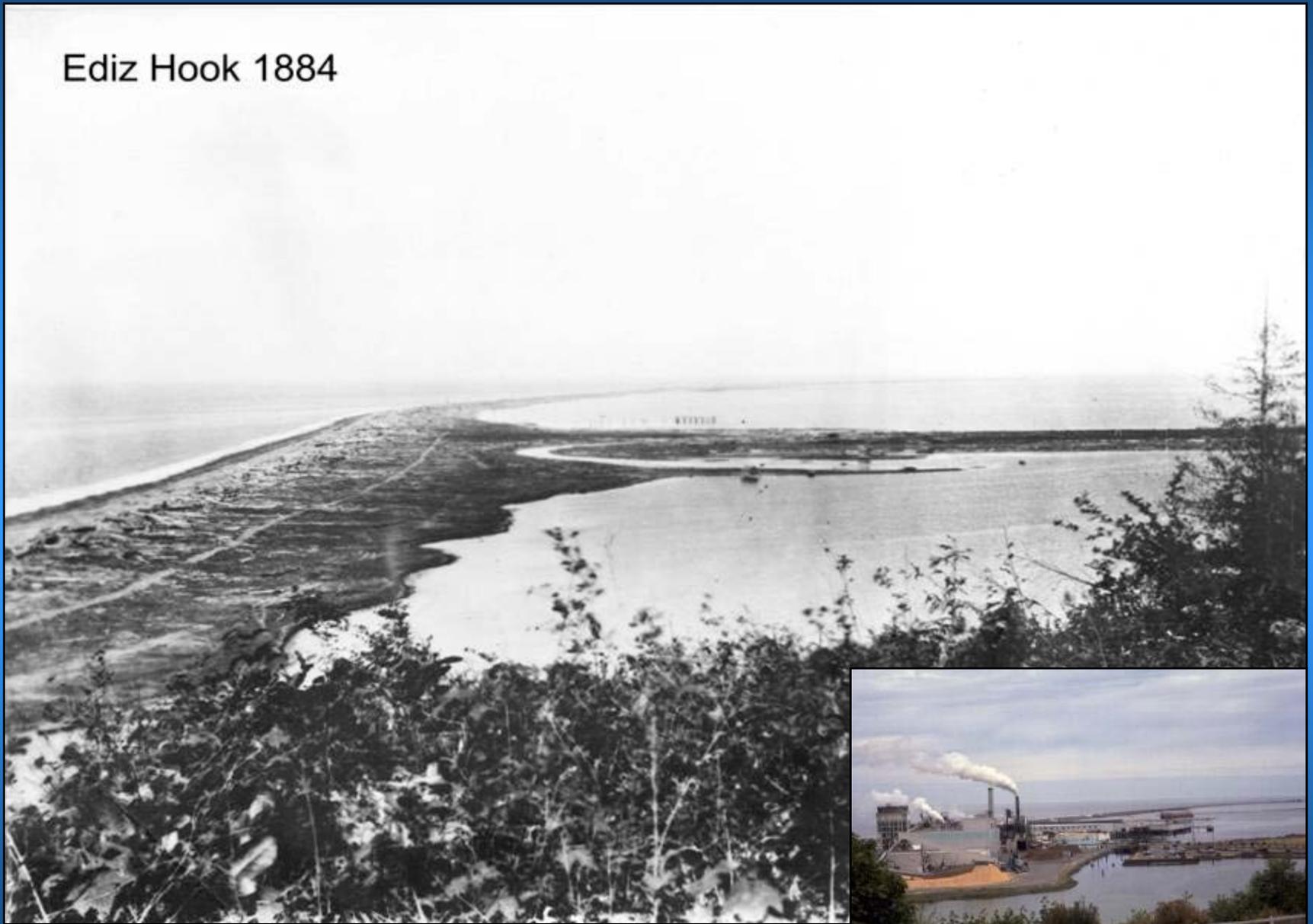


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Ediz Hook 1884



Loss of cover

Channel straightening

Water quality





Riparian condition

LWD deficiency

Water View.

NEW
51 LOT SUBDIVISION

WATER • POWER • PHONE • CABLE

Stormwater Runoff



Soil compaction and loss of vegetative cover



Channel Simplification

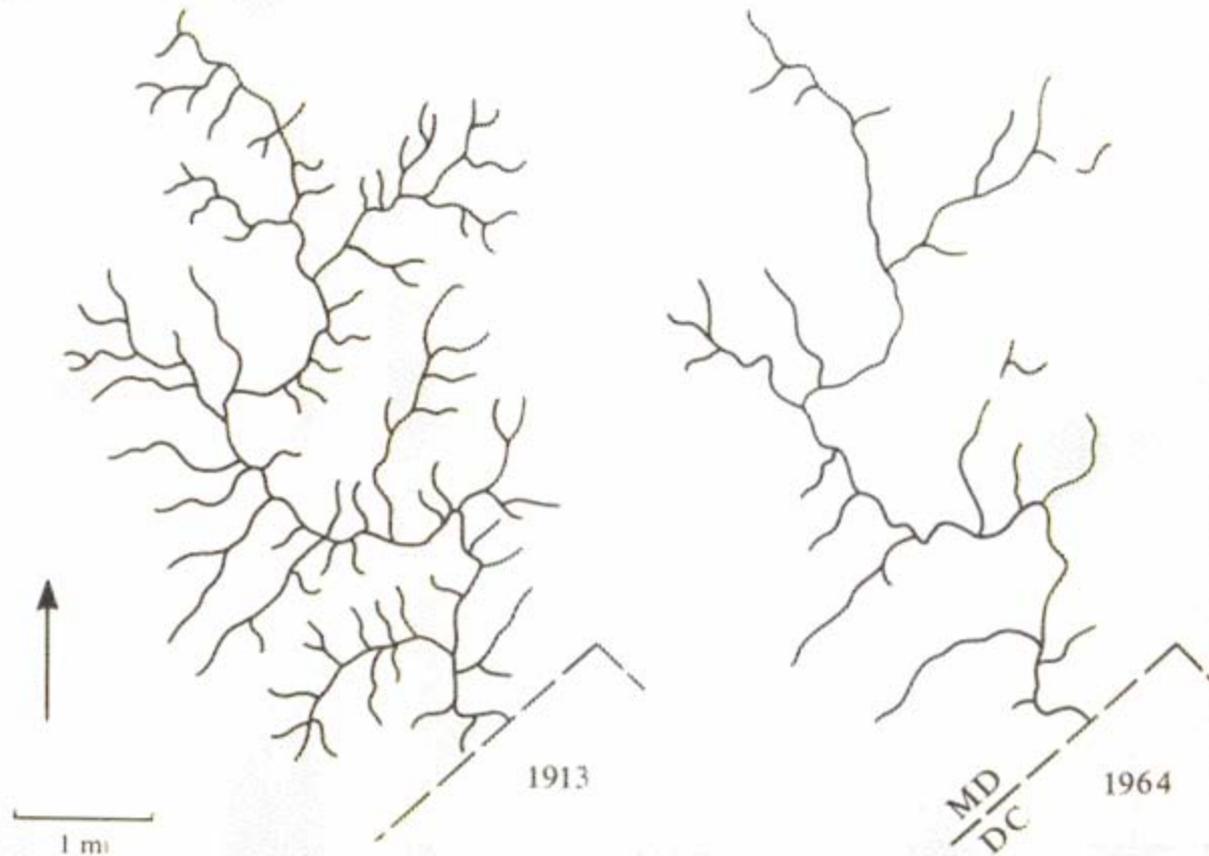
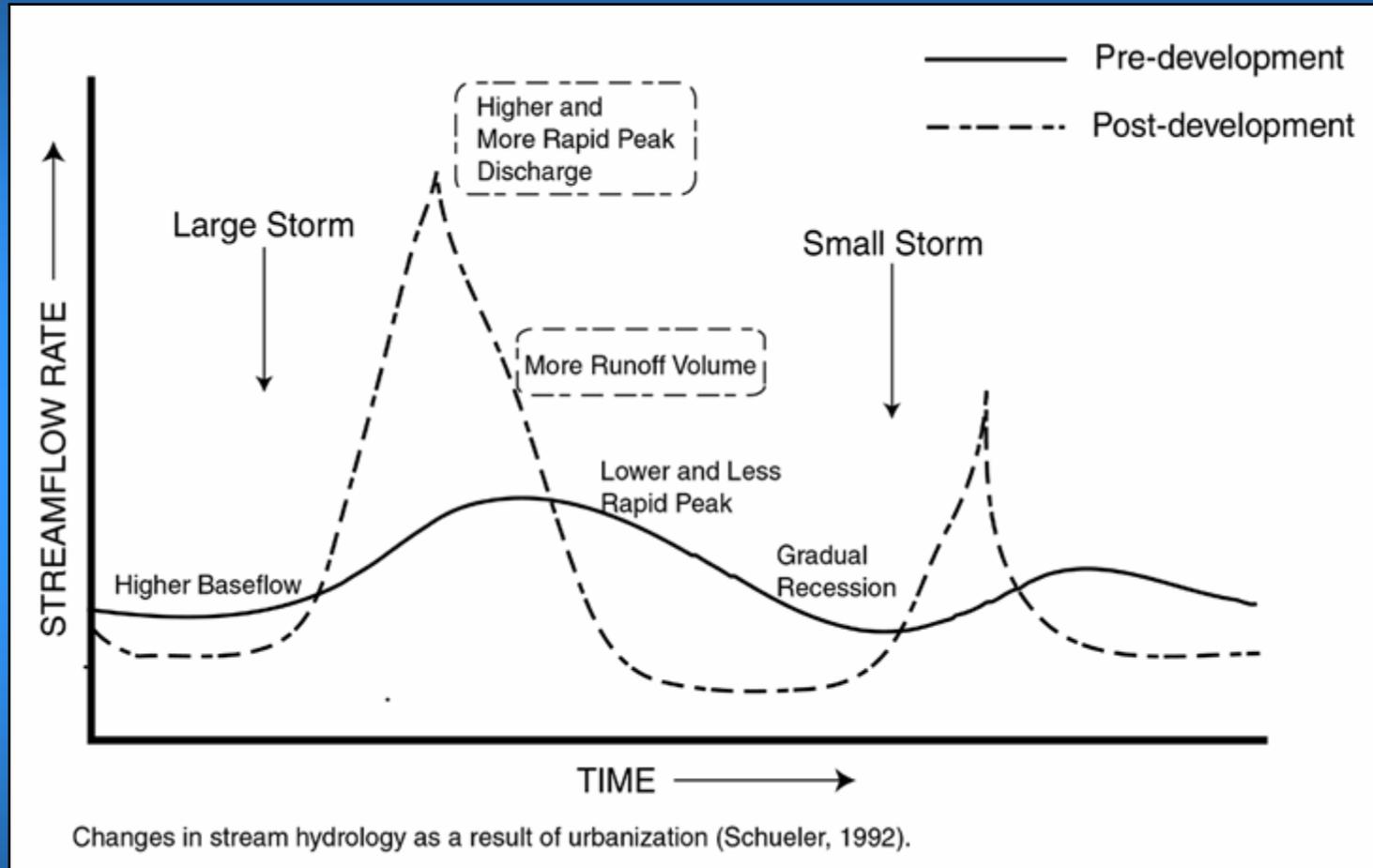
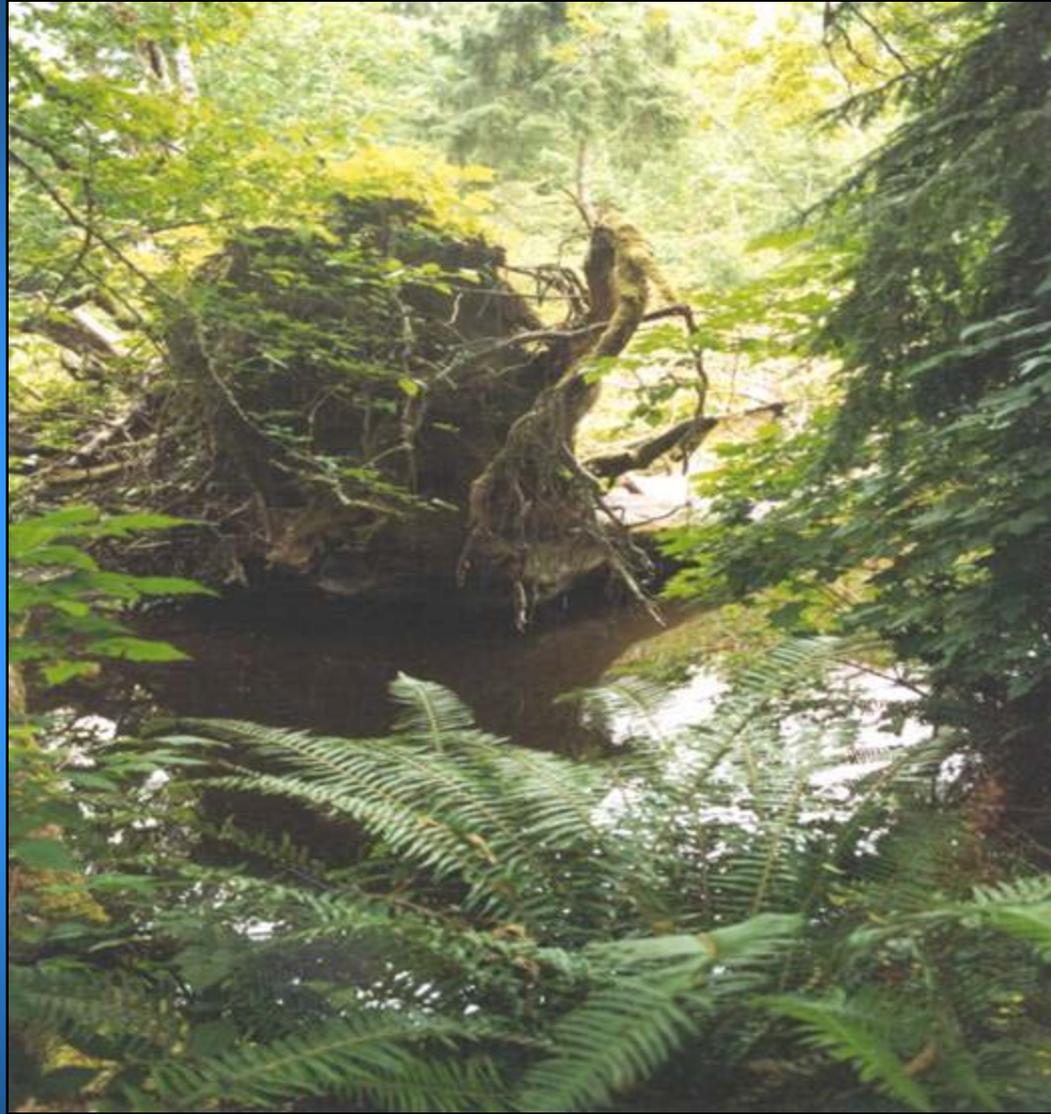


Figure 18-3 Drainage net of Rock Creek upstream of the District of Columbia-Maryland line in 1913, before modern urbanization and again in 1964. (From U.S. Geological Survey in Dept. Interior 1964.)

Changes in hydrograph



**Good things
are happening
– and
Streamkeepers
play a role**





Constructed Log Jam: Sekiu River

Constructed Log Jam: Sekiu River



Valley Creek within Port Angeles City Limits



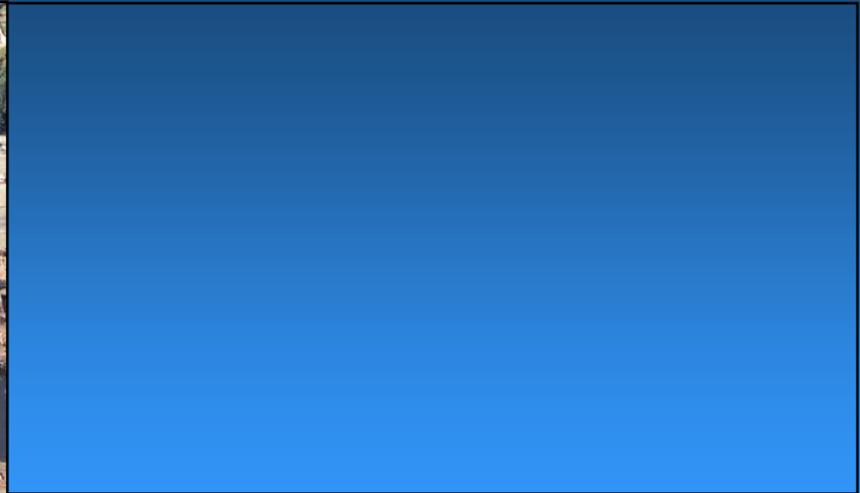
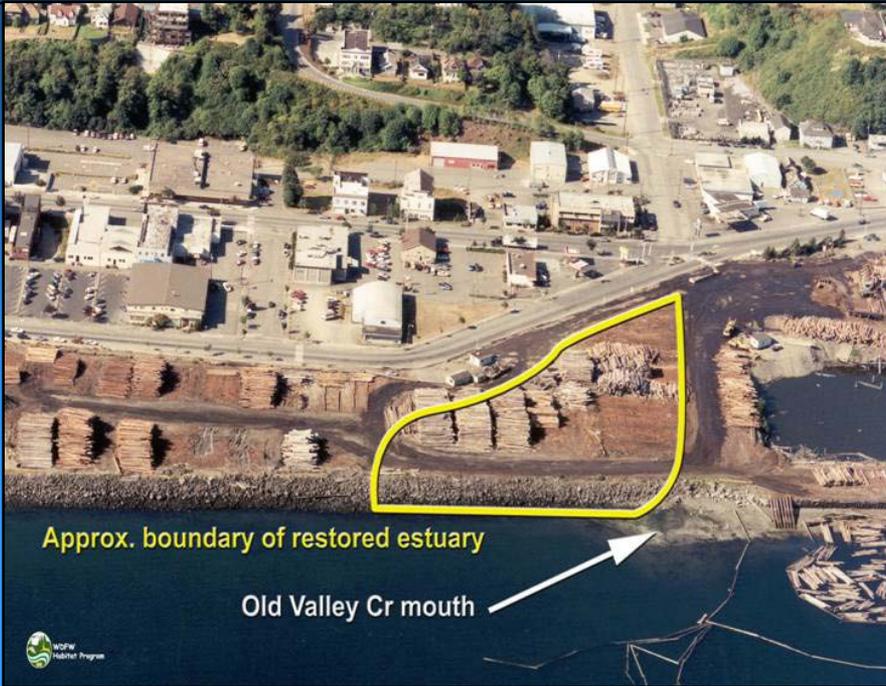
0.3 0 0.3 0.6 Miles

- Highways
- Roads
- Parcels
- Streams (24k)
- Open Water (24k)
- 100k Boundaries
- Salt water
- Other Counties
- Canada





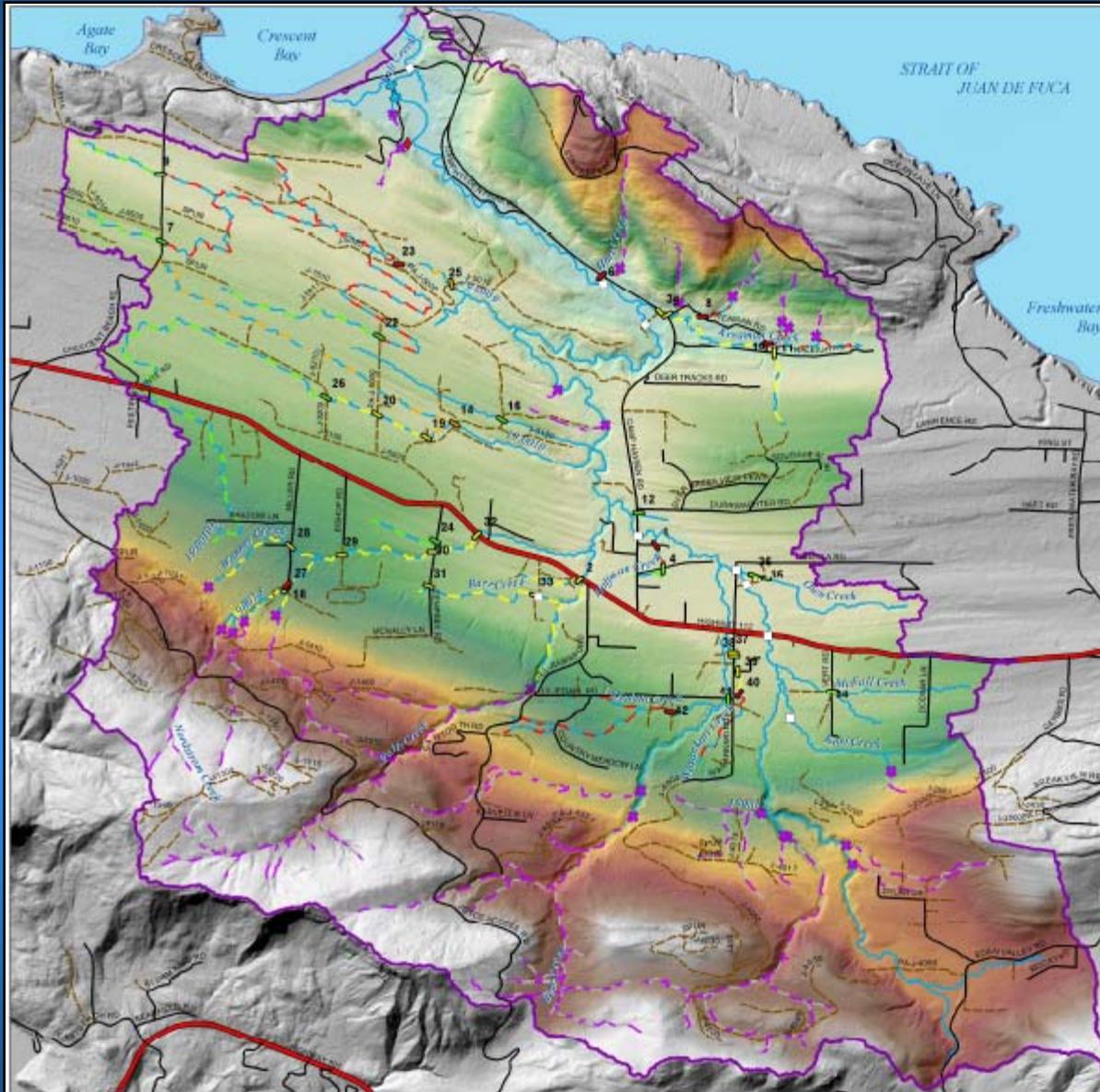
**Valley Creek
culvert -
under Valley
Street**





Valley Creek
Channel
Re-Meander

Salt Creek Fish Passage Project



Salt Creek Culvert Inventory '04

Legend

Salt Creek Watershed '04

Boundary (~19 sq. mi.)

Barrier, % Fish Passage

24 Natural Barriers, 0 %

1 Dam, 0 %

8 Culverts, 0 %

2 Culverts, 33 %

16 Culverts, 66 %

12 Culverts, 100 %

2 Tide Gates, 100 %

9 Bridges, 100 %

Stream Accessibility

Inaccessible (>20% gradient)

Currently Accessible (<20% gradient)

Potentially Accessible (<20% gradient)

County Roads

Highway

Roadway

Service



Location



0 2,000 4,000 8,000

Scale in Feet

Lower Elwha Klallam Tribe - G.I.S. Department
Map prepared by: Randall E. McCoy on 11/2/04
Filename: Salt Creek 04 (final).msd



Salt Creek culvert replacement

Jimmycomelately Creek: Consensus, vision, teamwork



2000

2000



2006

2006

JCL Re-created channel



JCL Restored estuary



Guess what this is??



'Salmon Life Cycle' © Ray Troll/Smithsonian

Thank you

