

January 2011

The Importance of Healthy Floodplains to Puget Sound Salmon

How do floodplains contribute to healthy salmon runs?

Floodplains are vital to the health and viability of Pacific salmon runs because they provide important habitat during the freshwater phase of the salmon life cycle. In particular, healthy floodplains contribute to the biological processes necessary for salmon survival by:

- Inundating and creating access to spawning and rearing habitat during high flow seasons;
- Allowing large woody debris to accumulate for ecologically sound, complex habitat;
- Providing off-channel areas with high abundance of food;
- Allowing younger, smaller salmon into areas where there are fewer predators;
- Providing refuge for juvenile salmon to avoid high flow volume and velocities, allowing them to rear as long as necessary and conserve energy
- Providing coarse beds of sediment through which flow passes, which filters nutrients and other chemicals to maintain high water quality; and
- Providing an expanded area for depositing and storing excess sediment, particularly fine sediment. This reduces the effects of turbidity on fish.

Additionally, the water storage and recharge function of floodplains ensures a source of cold water in summer months. Water seeps into the groundwater. What does the best available science tell us about floodplains and their relationship to salmon?

Connectivity

Floodplain connectivity, forage, and natural cover in the form of undercut banks and backwaters are important for the long-term productivity of salmon rearing habitat.

Coho salmon in particular rely heavily on floodplain habitat for rearing. Juvenile coho show strong preference for pools and woody debris cover in the floodplains.

How does development impact floodplains? Large portions of floodplains no longer function in their natural form because they have been restructured to meet urban and agricultural needs. Development has a direct relationship between this loss of floodplain function and trends in declining salmon runs. In particular, altering the natural process includes:

- Elimination of off-channel habitats and refuge areas;
- Increased flow velocity during flood events;
- Increased severity and frequency of peak and low flows;
- Reduced subsurface flows and groundwater contributions to the river;
- Simplified habitat complexity, due to loss of large woody debris, meanders, and side channels; and
- Reduced shade that helps to regulate water temperatures.

When viewing these effects on a regional scale, the relationship between floodplains and salmon production is pronounced. For instance, roughly 73 percent of functioning floodplains contribute to ecosystem health.

Currently, salmon listed under the Endangered Species Act in Puget Sound include Puget Sound Chinook salmon, Puget Sound steelhead and Hood Canal chum salmon. Floodplains not only serve an important role in the freshwater phase of the salmon life cycle, but they contribute to the health of the larger ecosystem.

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For information on Puget Sound fish recovery efforts:

www.psp.wa.gov/

For information on floodplain management and the Endangered Species Act, visit FEMA's website at:

www.fema.gov/about/regions/regionx/nfipesa.shtm

Floodplain near the Olympic Mountains

U.S. Department of Commerce | National Oceanic and Atmospheric Administration | National Marine Fisheries Service

Juvenile salmonids per square meter

0.25 -
0.20 -
0.15 -
0.10 -
0.05 -
0.00 -

Mainstem

Floodplain

GLIDE

RIFFLE

POOL

In the lower Elwha River, juvenile salmon used floodplain habitat (pools, glides and riffles) more than mainstem habitats to grow.

1Pess, G. R., M. L. McHenry, T. J. Beechie, and J. Davies. 2008. Biological impacts of the Elwha River dams and potential salmonid responses to dam re

Functioning floodplains are part of healthy ecosystems

During high water episodes, floodplains provide a vast low-water-velocity area where suspended particles fall out of the water column and are deposited.