

The Elwha River: vision of a restored ecosystem

When the dams were constructed, they disabled what was once a chaotic, noisy, life-filled river. The salmon could no longer swim upriver to spawn. Trees were no longer nourished by the nitrogen-rich remains of salmon dragged into the woods by predators and scavengers. Eagles and otters dwindled in the upper reaches. Restoring the river and watershed is a complicated process that could take as long as 100 years.

POPULATIONS

Salmon are expected to vigorously recolonize the river once habitat is available. On land, animals are expected to come back to take advantage of returning salmon. Native plants will be restored, and weeds controlled in bare areas when reservoirs drain.

PROCESSES

Dam removal will restore the river to its role as conveyor belt, transporting large woody debris, sediment, cobbles and gravel from the mountains to the sea.

SHAPE

Unimpeded by the dams, the Elwha will be more able to meander back and forth across the floodplain, cut side channels, build log jams, pools and gravel bars, and deposit gravel spawning beds and sandy beaches.

POPULATIONS: Plants

Native species will naturally recolonize or be replanted, including cottonwood, red alder and Douglas fir. Woody plants such as snowberry can spread fast and help stabilize new ground. Invaders, including knotweed, Himalayan blackberry, reed canary grass and herb Robert, will be controlled.

POPULATIONS: Fish

Salmon are a food source for wildlife in the Elwha watershed, from eagles and osprey to black bears and river otters. Fish bring marine-derived nutrients back to the watershed, connecting the land, the river and the sea. It's hoped the river will once again be home to robust runs of all five species of salmon.

PROCESSES: Sediment

Dam removal will release sediment, cobbles, sand and other substrates trapped behind the dams. Salmon need gravel to build their nests, and beaches have been starved for sand.

SHAPE: Multiple channels

Scientists have mapped more than 23 miles of side channels in the floodplain of the Elwha, and the river is expected to make more when the dams come down. They are fed both by ground and surface water, adding to the river's diversity of habitat.

PROCESSES: Speed, temperature

Dams slow river currents, allowing water to heat and reach sometimes lethal temperatures for cold-water fish like salmon. The natural, free-flowing river will run fast and cold.

Carcasses and feces left on the forest floor by salmon predators and scavengers feed plants, bugs and other animals.

Roosevelt elk

Bald eagle

River otter

Black bear

SHAPE: Side channels

Side channels give salmon refuge from the cold, fast-moving waters of the main stem. Side channels are expected to be an important refuge for salmon during the first 10 years of dam removal, when the river is flushing out heavy sediment loads trapped behind the dams.

Salmon

Biologists are tracking river otters to see if their behavior changes when salmon return to the river.

Biologists radio-collared 13 bears and learned that without salmon, bears stay in the high country, eating berries.

Side channels give young salmon a chance to grow bigger, boosting their chances of survival.

PROCESSES: Woody debris

Natural rivers move around and chew their banks, felling trees that jam in the channel and create gravel bars, pools and side channels. The log jams built by the river create islands of stability where a new forest can grow.