

A Case Study for A River Atlas Program with the National Park Service et al.

The FishViews Team is bringing a unique set of expertise to the National Park Service, U.S. Geological Survey, NOAA Northwest Fishery Science Center, U.S. Fish and Wildlife Service and the Lower Elwha Klallam Tribe. These agencies are undertaking a Riverscape Atlas project to catalog and locate the biota and habitat features of the major rivers on the Olympic Peninsula. FishViews is joining the team to provide the fundamental digital viewing platform that will enhance access, monitoring, communication and data analysis for the information being collected and mapped. Using today's remote-sensing collection technology, cloud-based servers and innovative web-based delivery designs, the FishViews Team will create intelligent maps of these waterways that enhance the goals of this multi-agency venture. Not only will these FishViews assist with project scoping, online data collection, habitat monitoring, restoration design, and ecosystem modeling, they will provide a portal for public access to these rivers, fulfilling a public relations purpose for the National Park Service as well.

Below is an abstract of the Riverscape work. FishViews looks forward to assisting in the next iteration of this work on the South Fork of the Hoh River in the Olympic National Park.

A Riverscape perspective of Pacific salmonids and aquatic habitats prior to largescale dam removal in the Elwha River, Washington, USA

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Abstract

Dam removal has been increasingly proposed as a river restoration technique. In 2011, two large hydroelectric dams will be removed from Washington State's Elwha River. Ten anadromous fish populations are expected to recolonize historical habitats after dam removal. A key to understanding watershed recolonization is the collection of spatially continuous information on fish and aquatic habitats. A riverscape approach with an emphasis on biological data has rarely been applied in mid-sized, wilderness rivers, particularly in consecutive years prior to dam removal. Concurrent snorkel and habitat surveys were conducted from the headwaters to the mouth (rkm 65–0) of the Elwha River in 2007 and 2008. This riverscape approach characterized the spatial extent, assemblage structure and patterns of relative density of Pacific salmonids. The presence of dams influenced the longitudinal patterns of fish assemblages, and species richness was the highest downstream of the dams, where anadromous salmonids still have access. The percent composition of salmonids was similar in both

years for rainbow trout, *Oncorhynchus mykiss* (Walbaum), coastal cutthroat trout, *Oncorhynchus clarkii clarkii* (Richardson) (89%; 88%), Chinook salmon, *Oncorhynchus tshawytscha* (Walbaum) (8%; 9%), and bull trout, *Salvelinus confluentus* (Suckley) (3% in both years). Spatial patterns of abundance for rainbow and cutthroat trout ($r = 0.76$) and bull trout ($r = 0.70$) were also consistent between years. Multivariate and univariate methods detected differences in habitat structure along the river profile caused by natural and anthropogenic factors. The riverscape view highlighted species-specific biological hotspots and revealed that 60–69% of federally threatened bull trout occurred near or below the dams. Spatially continuous surveys will be vital in evaluating the effectiveness of upcoming dam removal projects at restoring anadromous salmonids.

<http://www.fishviews.com/riverscape.pdf>