

Elwha and Glines Canyon dam removals: nearshore restoration and salmon recovery of the central Strait of Juan de Fuca

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Abstract

The nearshore of the central Strait of Juan de Fuca is a critical component to the marine ecosystem of Washington. The central Strait nearshore is largely defined by sediment processes which have been severely degraded by shoreline armoring and damming of the Elwha River. The removal of the Elwha and Glines Canyon Dams, scheduled to begin in 2008, will result in the transport and delivery of approximately 8 million cubic yards of sediment to the nearshore environment within approximately five years of dam removal, but this will provide for only partial restoration of nearshore ecosystem processes. This paper provides an overview of our approach to monitoring the nearshore response to removal of the Elwha River dams, with an emphasis on monitoring priorities and the strategy for defining additional restoration needs associated with salmon recovery.

Background

The Elwha River Ecosystem and Fisheries Restoration Act (Public Law 102-495, signed October 24, 1992 (106 Stat. 3173) provides for efforts to restore the fisheries and ecosystem of the Elwha River basin in Washington State via the removal of the Elwha and Glines Canyon Dams, which is deemed necessary for full restoration of the Elwha River ecosystem and fisheries. Dam removal on the Elwha River, scheduled to begin in 2008, will be the focus of the single largest river restoration action in the country. Within five years of the beginning of dam removal, approximately 8 million cubic yards of sand and silt will be delivered to the nearshore habitat. Within this timeframe it is estimated that 4.9-5.6 million cubic yards of fine material (silt and clay < 0.075 mm) and approximately 1.2- 2.7 mcu of coarse material (sand, gravel, cobble) will be delivered (Randle¹ pers comm.; Warrick and Gelfenbaum², USGS unpublished data).

Sediment loading and transport is a defining process of the Elwha nearshore habitat. The primary Elwha drift cell is estimated to be approximately 13 miles long and extend from the western portion of Freshwater Bay to the east tip of Ediz Hook (Figure 1; Clallam County 2004). The nearshore within this drift cell is defined by the area of tidal influence from the riparian zone to -30 m MLLW. It includes the lower estuary located at the river mouth, as well as the adjoining marine shorelines.

The Elwha nearshore is a complex ecosystem that exhibits high physical and biological variability within both geographic and temporal scales (Carter and VanBlaricom 1998; Shaffer 2000; VanBlaricom and Chambers 2003). It includes a river associated estuary, rocky, sandy, and bluff shorelines, kelp forests, and eelgrass beds (Figure 1). Numerous salmonid stocks, including Puget Sound Chinook, Hood Canal summer chum, bull trout, pink, coho, and steelhead depend on the Elwha nearshore. It is also used heavily by forage fish, a critical resource for salmon, for migration and spawning (Miller et al 1980; Shaffer 2000; 2004a)

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