Splash Dams and Log Drives: The Stream Remembers

Environmental legacies are past events that can be detected in modern-day environments. Historical ecologists use clues from the past to piece together what an area might have looked like, what management practices took place, and to what degree those practices still influence current conditions. Splash damming and log driving were among the earliest reported management disturbances in rivers of the Pacific Northwest. Splash dams operated in western Oregon streams from the 1880s through the 1950s to transport timber to downstream mills before extensive logging roads were constructed. A splash dam would span the width of a river and create an upstream reservoir in which water and logs were stored until the spillway was opened to release a large flood (Figure 1).

(a)

(b)

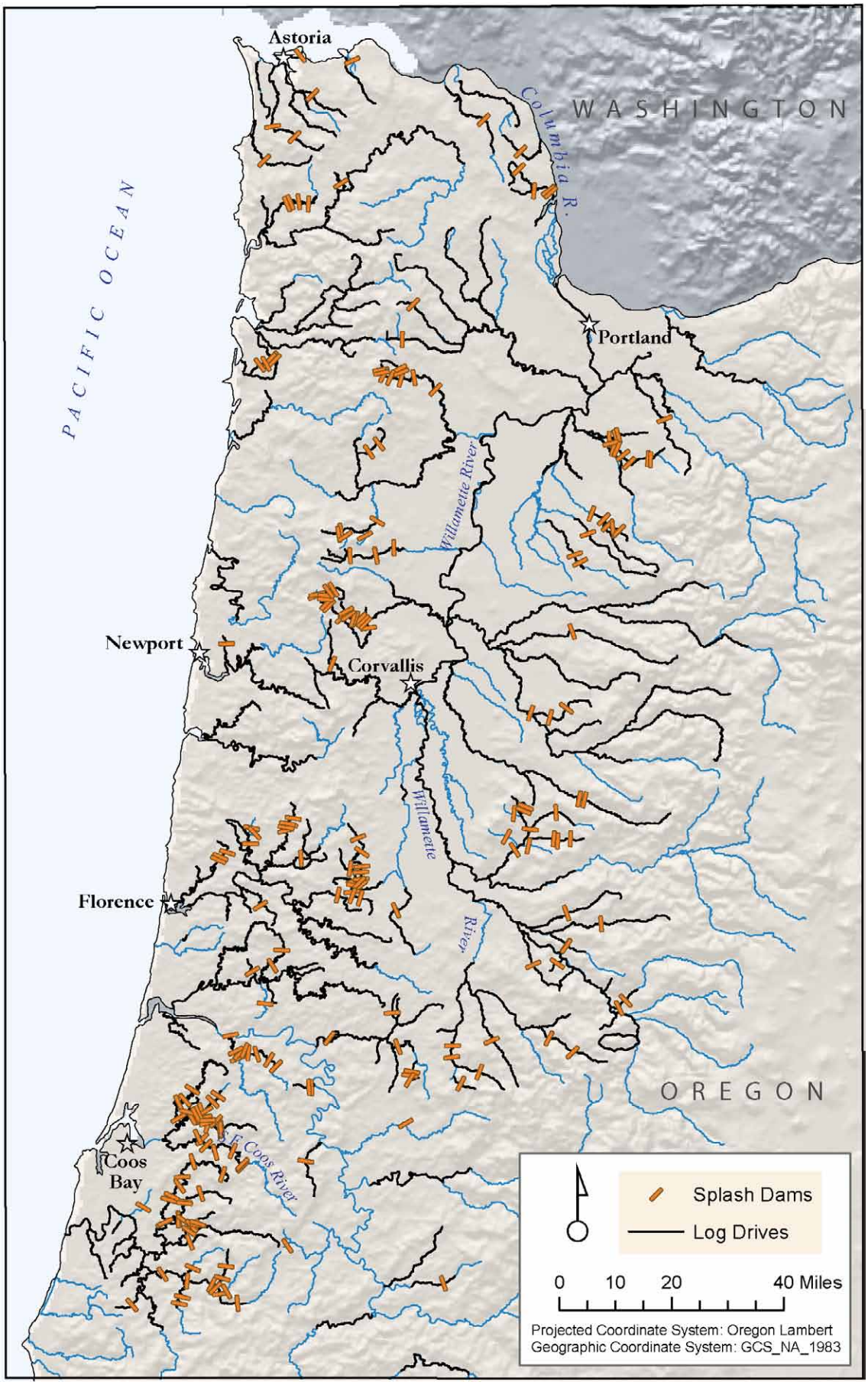
Figure 1. Upper dam on the South Fork Coos River, circa 1947. Length, 256 feet, height, 40 feet, it was built by the Irwin & Lyons Logging Company. (a) Closed. (b) Opening. Photos courtesy of Jake Flitcroft.

While effective at moving logs, these floods highly altered streams, with historical photographs of splashed streams showing long stretches scoured to bedrock and little habitat complexity for salmon (Figure 2).

Figure 2. The Middle Fork Coquille River, Oregon, was splash dammed from 1923-1941 and scoured to bedrock. Photograph source Port of Coquille 1929. Top and lower left photos, Port of Coquille. Lower right, Camp Creek, Oregon. Photo courtesy of the Gerald Williams Collection, Corvallis, Oregon.

To facilitate log transport, downstream obstacles such as large boulders and natural logjams were removed by dynamiting. Recent literature identifies splash damming as a key culprit in the decline of salmon population abundances and suggests that habitats in splash-dammed streams have yet to recover. Yet, few formal studies have quantified the potential of splash dams to leave an environmental legacy and none considered a large area. Building on previous efforts that illustrated the prevalence of splash damming in western Oregon and Washington, this project (Miller 2010) mapped and created a database of 232 splash dams and 213 log drives in western Oregon (Figure 3).

Figure 3. Splash dams and log drives located in western Oregon, identified through archive searches and local meetings.



Although remnants of splash dams were seen in historical aerial photographs and in the field (Figure 4), searching archived documents and maps was the only practical means for regional mapping of splash dams and log drives. The existence of splash-dam remnants suggested that the effects of their operation on stream habitats may also persist. Thus, we compared splashed and unsplashed streams to see if an environmental legacy of splash damming could still be detected 50 to 130 years after the practice ceased. We found that splashed streams generally had more exposed bedrock, fewer deep pools, and fewer pieces of key large wood than unsplashed reaches, which may have lingering consequences for salmon. This study demonstrates the importance of considering archival information in modern-day studies and that history can account for significant variation in stream environments.

Figure 4. The Little Fall Creek splash dam was the most intact structure found during searches. Splash-dam cribbing and boards are still present. Remnant is approximately 12 m across, 1.5 m high, and structural cribbing extends 20 m downstream; note notched spillway (center) allows for fish passage. Photograph taken in 2009 by R. Danehy.

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