Tenmile Creek – a natural laboratory helping to restore salmon and trout habitat

By Chris Lorion, Oregon Department of Fish and Wildlife

Since 1991, the Oregon Department of Fish and Wildlife (ODFW), in cooperation with the USDA Forest Service, Audubon Society of Portland, and other stakeholders, has been conducting fish research and monitoring at Tenmile Creek on the central Oregon coast. One of the primary goals of this work is to evaluate the effects of stream restoration activities, specifically the addition of large wood (logs and other woody debris), on juvenile salmon and trout populations.

Young fish like these coho smolts use submerged woody debris as a place to feed, hide from predators and take refuge from high flows (Photo: Cacophony).

In order to accomplish this goal, both stream habitat and fish populations were monitored at Tenmile Creek for several years before and after the intentional introduction of wood. Researchers estimated the total number of juvenile salmon and trout rearing in the stream during the summer, and the number of smolts (young fish) that migrated out of the stream to the ocean annually. Cummins Creek, a wilderness watershed near Tenmile Creek was monitored as well but did not receive a wood addition. In 1996, over 200 trees from the surrounding ridges were placed in Tenmile Creek using a helicopter, with the trees arranged in groups to produce small log jams. By chance, a similar amount of large wood entered Tenmile Creek naturally during a large storm in February 1996. The total amount of wood added to Tenmile Creek in 1996 raised the abundance of large logs in the stream channel to a level that was similar to Cummins Creek.

Helicopter bringing in a log to Tenmile Creek (Photo:ODFW).

Habitat surveys conducted in Tenmile Creek after the wood addition showed an increase in pool and side channel habitats that are important rearing areas for juvenile salmon and steelhead. A similar increase was not observed at Cummins Creek, indicating that

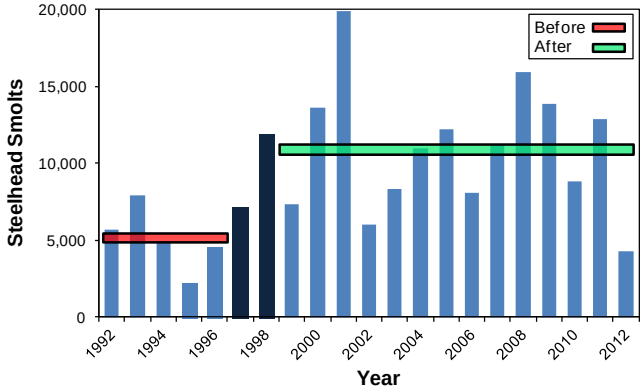
the change in habitat at Tenmile Creek was associated with the large wood addition. Summer fish populations of coho salmon and steelhead trout did not show a significant increase in Tenmile Creek after the wood addition in 1996, but the percentage of fish that survived to migrate to the ocean as smolts did increase. This increase in survival during the freshwater rearing period was not observed in Cummins Creek, and appeared to be a result of the wood addition and associated changes in stream habitat in Tenmile Creek.

Large wood in Tenmile Creek provides important habitat for young fish (photo: J. Liebezeit)

The Tenmile Creek study concluded in 2003, but ODFW continues to monitor the number of coho salmon, steelhead and cutthroat trout smolts that migrate out of Tenmile to the ocean each year.

Long-term monitoring of salmon and trout continues at Tenmile Creek using a smolt trap (Photo: ODFW).

This long-term monitoring indicates that the number of steelhead smolts produced in Tenmile Creek in the 14 years following the wood addition in 1996 was significantly higher than before the wood was added.



Steelhead smolt abundance increased in Tenmile Creek after wood introduction in 1996.

Research at Tenmile Creek has provided valuable information on the benefits of habitat restoration for salmon and trout populations, the role of wood in streams, and natural variability in fish populations over time. Through cooperation between the Audubon Society of Portland and ODFW staff, Tenmile Creek also serves as an outdoor classroom where students and a wide variety of visiting groups have come to learn about coastal streams and the fish that inhabit them.

Paul Engelmeyer, Audubon Society of Portland, discusses salmon fry survival issues with Lincoln County elementary school students (Photo: I. Olson).