

Movement of Juvenile Redband Trout from Spencer Creek, Klamath River in 2004: Preliminary Findings

Native Fish Investigations Project Oregon Department of Fish and Wildlife

Study Objective: Determine migratory patterns of juvenile redband trout originating from Spencer Creek through J. C. Boyle Dam and Hydropower Complex.

Methods

Yearling redband trout were captured and radio tagged at a downstream migrant trap in Spencer Creek. From April 21 to June 7, inter-peritoneal radio transmitters were surgically implanted in 80 juvenile trout. The mean fish fork length was 107 mm and the transmitters had a battery life of approximately 45 days.

We installed fixed receiver stations on J.C. Boyle Dam, the powerhouse diversion canal, and the powerhouse outflow (8 km downstream of the dam). The antennae at each station monitored distinct non-overlapping zones and were tested at least monthly during the tracking period. We were able to determine if radio-tagged juveniles entered Topsy Reservoir or passed the dam via the juvenile bypass, the fish ladder, or the powerhouse diversion canal. Antennae also monitored the powerhouse outflow and the Klamath River at two locations - 150 m and 8 km downriver of the dam.

In addition to the fixed stations, we also tracked fish by boat (on Topsy Reservoir) and truck. From May 10 to July 5, a crew traveled a fixed route with a mobile receiver on a weekly basis. This route covered the lower end of the Keno Reach of the Klamath River, the lower mile of Spencer Creek, Topsy Reservoir, and the Klamath River below of J. C. Boyle Dam downstream to Frain Ranch (river mile 215).

Results and Conclusions

Radio-tagged fish showed very little movement. The fixed stations detected some fish movement (2 fish) into the reservoir forebay, but no movement over J.C. Boyle Dam. Through mobile tracking (Figure 1), 73 fish were detected and most were observed in Spencer Creek. Five days after release on Spencer Creek, one fish was located below J.C. Boyle Dam; however, the transmitter was not detected by the fixed receiver stations and was found near a known osprey nesting site. It is possible that this fish was preyed upon and transported below the dam. Eight of the tagged fish were re-located in Topsy Reservoir upstream of the Spencer Creek confluence, and two of these fish were re-located farther upstream in the Keno Reach.

Preliminary results suggest that radio-tagged juvenile trout migrating out of Spencer Creek do not move downstream from J. C. Boyle Dam and this dam may act as a barrier to downstream juvenile migration. Radio-tagged juveniles appeared to reside in Spencer Creek and Topsy Reservoir, or move upstream into the Keno Reach. However, it is unlikely that Topsy Reservoir is used extensively for rearing because of extreme fluctuations in pool height and high water temperatures during summer. It is more likely that juvenile trout migrate upstream into the Keno Reach, which is known to be productive trout habitat.

It is probable that we underestimated upstream movement into the Keno Reach because upstream tracking was limited to weekly intervals and did not occur beyond road access upstream end of Topsy Reservoir. Furthermore, the short battery life (45 days) of the transmitters and small sample size of the study may also contribute to underestimating the extent of fish movement, including juvenile passage over J.C. Boyle Dam.

In 2005, we plan to continue by radio tagging in spring another 80 juvenile trout in Spencer Creek. In order to correct these limitations, we plan to install a fixed station at the upstream end of the reservoir to better assess upstream movement into the Keno Reach. We also plan to mark several hundred outmigrating juvenile trout in Spencer Creek with passive integrated transponder (PIT) tags and install PIT-tag receiver stations at the mouth of Spencer Creek and downstream of J.C. Boyle Dam.

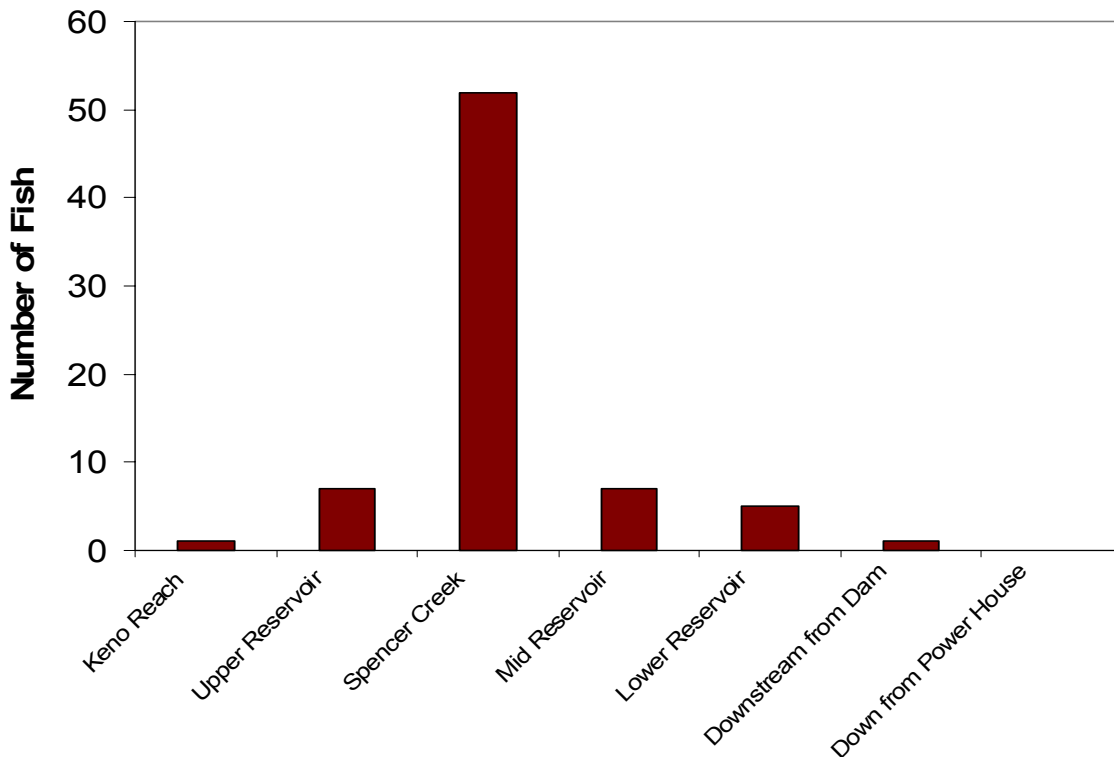


Figure 1. Final observation of juvenile redband trout radio-tagged on Spencer Creek through mobile tracking.