

Oregon Department of Fish and Wildlife
Oregon Conservation and Recreation Fund (OCRF)
Project Number: OCRF 2020-02
Project Title: Upper Klamath Basin Juvenile Chinook Salmon Release Study
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Project Lead: Mark Hereford, Klamath District Office

Final Report

PROJECT OBJECTIVE

The objective of this project is to tag hatchery-reared juvenile Chinook Salmon with VHF radio transmitters. Tagged fish will be released in streams within the Upper Klamath Basin and re-detected at key locations via radio receivers as well as mobile receivers. Detection data of released fish will be summarized to inform the movement behavior and survival of radio-tagged fish as they migrate through the Upper Klamath Basin system. This project is part of a larger effort that is investigating a hypothetical outmigration of juvenile Chinook Salmon in the Upper Klamath Basin.

SCOPE AND DESCRIPTION OF WORK

A team of state (ODFW and CDFW), federal (NMFS), Tribal (Klamath Tribes of Oregon), and research (UC Davis and Cal Poly Humboldt) biologists intend to learn how juvenile Chinook salmon may move through the Upper Basin during a hypothetical outmigration event, using methods consistent with ODFW and The Klamath Tribes' Reintroduction Implementation Plan as described in Phase 1. By out-planting groups of tagged fish in various tributaries and other key locations (above and below dams), the team hopes to use existing PIT tag antenna arrays and telemetry (e.g., radio and acoustic) throughout the Basin to "recapture" individuals. These data can provide insight regarding the timing of outmigration for various tributaries and may indicate if additional challenges to migration or survival exist in some locations (e.g., reach-specific survival). Ultimately, these data will help inform how to proceed to Phase 2 of the active reintroduction with the goal of repopulating habitat above Upper Klamath Lake with spring-run Chinook salmon and will help identify areas needing future habitat improvements.

METHODS

1. Obtain appropriate number of fertilized spring-run Chinook salmon gametes from Trinity River Hatchery and transfer to ODFW's Klamath Hatchery or other appropriate facility for rearing.
2. Tag one-year-old juvenile spring-run Chinook salmon with PIT tags and a subsample of each release group with radio and acoustic tags. Exact tagging protocol to be determined over the next year with input from other organizations using similar methods so that detections of tagged fish can be maximized. Locations of receivers will be determined in a similar manner with existing infrastructure maximized to support this study.
3. Release groups of tagged fish will be released to each Upper Basin tributary location that is included in the study at a time that is presumed consistent with a natural outmigration event (e.g., March). Selected tributaries should provide year-round rearing and suitable spawning habitat such as North Fork Sprague River, Williamson River, and Wood River sub-basins.
4. Capitalize on the existing downstream PIT tag antenna arrays and telemetry equipment to track movement of each release group of Chinook salmon where possible, add new arrays and tracking sites for appropriate spatial coverage.
5. Review these data to examine temporal and spatial patterns of fish movement within and among the release groups and describe any detectable patterns in terms of movement and survival.
6. If fish are recaptured in hand, consider conducting fish health assessments.
7. Develop additional experiments, monitoring, and restoration objectives associated with recolonization that are guided by the results of this experiment.

OUTCOMES AND ACCOMPLISHMENTS

The Funds provided by the Oregon Conservation and Recreation Fund (OCRF) were used for the purchase 59 VHF radio transmitting tags. These tags were implanted by trained biologists at the ODFW Klamath Hatchery. Tagged fish were released at locations within the Upper Klamath Basin in the spring of 2022 and tracked via radio receivers throughout the spring and summer of 2022.

650 PIT tag fish were released above and below Link River Dam and above Keno Dam. A subsample of these fish (56 above Link River Dam, 113 below Link River Dam, and 19 above Keno Dam) were tagged with radio transponders. 7 stationary radio receivers were placed from Link River Dam to below Keno Dam to detect these fish. Mobile tracking radio tagged fish can also be used to detect radio tagged fish on the landscape.

As of June 2022, fish were being detected at all PIT detection arrays, acoustic receivers located in the tributaries and above and below Link River Dam and stationary radio receivers below Link River dam and below Keno Dam. Radio tagged fish were also mobile tracked weekly from Link River Dam to below Keno Dam. This data will be processed and analyzed in a reach-specific survival model to determine the survival of fish from the release location through the lake, and through Link River and Keno Dams.