

Fine Scale movements of Coastal Cutthroat in Marine Water

Background

Results from recent research in South Puget Sound suggests that coastal cutthroat trout exhibit high site fidelity in the marine water, remaining or returning to specific beaches across various life stages. This past work has helped to identify marine nearshore habitats important to cutthroat trout and raises questions about the location of fish that either do not exhibit site fidelity or are recaptured at multiple beaches throughout their life. In addition, fine-scale tracking at sites of high recapture rates will clarify the behavior of cutthroat trout at these beaches.

Study Goals

The aims of this are to 1) describe the fine scale movement of cutthroat trout in the nearshore marine environment 2) describe temporal patterns of inter-habitat (freshwater, estuarine, nearshore) movements 3) and the role physical variables (temperature, salinity, tide) play in determining movement patterns.

Study Area and Fish Collection

This study will be focused around Evergreen Beach in south Puget Sound but will allow for the tracking of fish leaving this beach and for neighboring beaches or streams. In 2015 researchers from WDFW captured 131 cutthroat trout over a 3-month period (December-February) at Evergreen Beach and recaptured 55% of them at this same location throughout a 12 month study period consisting of monthly sampling events. This study will capture and acoustically tag adult cutthroat trout in December of 2021 and January of 2022. 28 acoustic receivers destined to detect and communicate with these tags will be deployed throughout Puget Sound (Figure 1). In addition to fish movements, each receiver will be also collecting temperature data of the surrounding environment where it resides. Tracking results will be compared with temperature data throughout the study area to better understand the role temperature plays in predicting cutthroat movements and habitat use.

Draft Methods

Acoustic receivers (VR2 receivers), will be placed throughout south Puget Sound as well as one at the mouth of Kennedy Creek (Figure 1) in October of 2020, prior to fish tagging. In addition, partners throughout the Puget Sound area and beyond operating acoustic receivers (Salish Sea marine survival) have the potential to collect data on tagged cutthroat trout that leave the study area. Fish will be caught using beach seine in December and January of 2020/21 by staff at Washington Department of Fish and Wildlife. Cutthroat greater than 250mm fork length will be tagged (Vemco V9-6L acoustic tags) in the field. Specifically, they will be anesthetized with MS-222 (0.07 g/L) with baking soda buffer and supported upside down by a spongy foam block during surgery, during which they will be given anesthetic by gravity feed over the gills (0.02g/L). After an incision is made in the abdomen forward of the pelvic girdle muscle, a tag will be inserted, antibiotic injected (25 mg/kg oxytetracycline), and the incision sutured with 2-3 stitches (4-0 RB-1 Taper antibacterial Ethicon Vicryl Plus violet braided). The wound will be dabbed with antibacterial ointment (Bacitracin), weight and length will be recorded and fin clip

and scale samples collected. Following tagging, fish will be held at capture location with supplemental oxygen until swimming upright and responsive. All tags and surgery tools will be disinfected with Nolvasan (chlorhexidine diacetate) and rinsed in saline solution before use and between fish.

Budget:

28 receivers=

- 8 receivers purchased by University of Washington=\$17,480
- 8 Receivers purchased by Coastal Cutthroat Coalition=\$17,480
- 12 Receivers provided by Umea Telemetry Group, Swedish University of Agricultural Sciences Gustav Hellström = ~ \$25,920
- Anchors, buoys, temperature loggers, suture material

Team:

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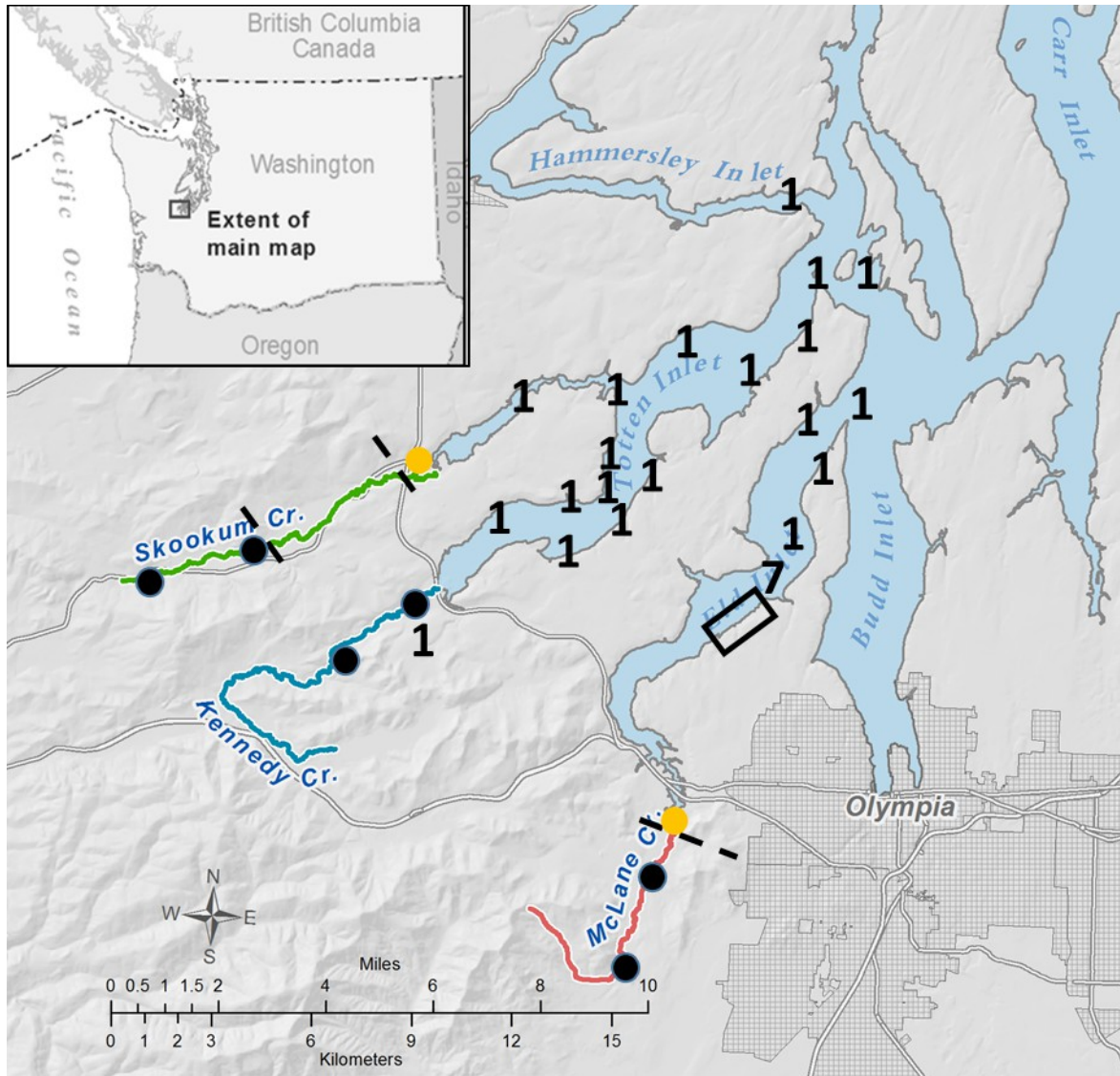


Figure 1. Study area in South Puget Sound. Colors indicate streams included in baselines samples for genetic assignment for Coastal Cutthroat Trout. Black dots indicate locations of spawning ground surveys. Orange dots indicate temperature loggers. Black boxes indicates location of high resolution movement study areas. Numbers identify the location and number of acoustic receivers to be deployed.