Population dynamics of steelhead in Hood Canal rivers following new hatchery methods

Jessica Wolford · Erik McDonald

Abstract Artificial propagation of steelhead (*Oncorhynchus mykiss*) in hatcheries has operated with the primary goal of producing large quantities of fish to mitigate wild population loss. The traditional practices associated with hatcheries are known to produce steelhead that are less fit than wild conspecifics. This study took place in three Hood Canal rivers, one supplemented and two controlled, to assess new hatchery techniques aimed to help rebuild the wild populations of steelhead. These techniques address some of the concerns by hydraulically pumping eyed eggs directly from wild steelhead redds, eliminating the human selection of mating pairs. Steelhead were then raised for two years before being released as smolts, simulating a natural cycle. Steelhead smolts were sampled daily from rotary screw traps each Spring from 2016 to 2020. The success of these new techniques was analyzed by comparing the smolt populations and the marine survival between the controlled and supplemented rivers. In these years, smolt populations increased in the Tahuya, a control river. Smolt populations remained relatively unchanged in the Little Quilcene River, also a control, and in the Dewatto, the supplemented river. Marine survival decreased in all three rivers. The Little Quilcene and Dewatto rivers followed a similar trend and the Tahuya population experienced a smaller decline in marine survival. These results suggest that the supplementation in the Dewatto River did not affect the population during this study.