

Abstract: Hooking mortality and behavior of a Puget Sound population

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Recently Puget Sound wild steelhead populations were listed as threatened under the Endangered Species Act. Because wild and hatchery fish return at the same time, there is a need to identify the mortality impacts to wild fish that result from mark selective sport fisheries on hatchery fish. Despite many sport fishing mortality studies, the range of estimates is extensive, from 0% to 100%, and limitations to existing studies include that almost none use a control to estimate mortality. Finally, to our knowledge no studies have estimated wild steelhead hooking mortality in Puget Sound.

For two years, sport fishers captured wild winter steelhead in the Samish River, a Puget Sound tributary, using legal fishing gear (n=54). During the same time period, control fish were captured in fish traps (n=19). Radio telemetry tags were surgically inserted into both treatment and control fish and the migration and movement patterns were tracked using fixed and mobile receivers. The survival results indicate that although immediate and post-release survival to presumed spawning was 100%, there is a cost to being captured with sport gear following spawning. Although both treatment and control fish outmigrated, significantly fewer treatment fish outmigrated. Because it is difficult to verify that fish spawned successfully we used kelting behavior as a proxy for successful spawning, and this give an average mortality of 14.7% for sport captured fish. Ideally this estimate will be combined with encounter rate to estimate the total impact of sport fishing on wild Puget Sound steelhead.

To verify that the unmarked fish used in this study were wild, DNA analysis was performed. The results indicate that a fair percentage of fish were hatchery fish and included summer and winter run fish. No fish captured on sport gear were captured more than once during this project.