Abstract

The depressed status of Puget Sound populations of steelhead Oncorhynchus mykiss contrasts with the healthier condition of those along the coast of Washington and suggests that there is substantial smolt mortality during the migration through Puget Sound to the Pacific Ocean. Acoustic telemetry transmitters and stationary receivers were used to investigate the survival, migration timing, and migratory behavior of 159 steelhead smolts in 2006 and 187 smolts in 2007 from four Hood Canal (part of Puget Sound) streams and one stream flowing into the Strait of Juan de Fuca. The estimated population-specific survival rates for wild and hatchery smolts from the river mouths to the northern end of Hood Canal (28.1–75.4 km) ranged from 55% to 86% in 2006 and from 62% to 84% in 2007. Survival was much lower from the northern end of Hood Canal to the Strait of Juan de Fuca (135 km) in 2006 (23–49%) and could not be reliably measured in 2007. Travel rates through Hood Canal (8–10 km/d) were significantly lower than those estimated as the fish migrated through northern Puget Sound and the Strait of Juan de Fuca (26–28 km/d), while the mortality rates per unit of distance traveled were very similar in the two segments. The high daily mortality rates estimated during the early marine phase of the steelhead life cycle (2.7%/d) suggest that mortality rates decrease substantially after steelhead enter the Pacific Ocean.