

A SPATIALLY EXPLICIT APPROACH FOR EVALUATING RELATIONSHIPS AMONG COASTAL CUTTHROAT TROUT, HABITAT, AND DISTURBANCE IN HEADWATER STREAMS^{AFS}

Robert E. Gresswell, Northern Rocky Mountain Science Center, U.S. Geological Survey, P.O. Box 172780, Bozeman, MT 59717, bgresswell@usgs.gov

Douglas S. Bateman, Department of Forest Sciences, Oregon State University, 3200 SW Jefferson Way, Corvallis, OR 97331

Christian E. Torgersen, Forest and Rangeland Ecosystem Science Center, U.S. Geological Survey, 3200 SW Jefferson Way, Corvallis, OR 97331

Troy Guy, Steve Hendricks, and J. E. B. Wofford, Department of Fisheries and Wildlife, Oregon State University, Corvallis, OR 97331

Headwater stream systems are complex networks that form a physicochemical template governing the persistence of aquatic species such as coastal cutthroat trout. Individual portions of the network can function as conduits or receptacles for sediments, wood, and nutrients from terrestrial areas. Temporal and spatial changes in the delivery of these constituents can substantially alter the habitat template and its ability to support this native fish. Our study of 40 mid-sized watersheds (500-1500 hectares) in western Oregon is providing new insights into the factors affecting the distribution of coastal cutthroat trout within, and among, headwater stream networks. For example, data suggest that coastal cutthroat trout move throughout the accessible portions of headwater streams for reproductive, feeding, and refuge purposes. Fish congregate in these areas and form local populations that may exhibit unique phenotypic and genetic attributes. At times, coastal cutthroat trout move into larger downstream portions of the network where they may contribute to the persistence and genetic character of anadromous or local potamodromous assemblages. Variations in distribution patterns among watersheds reflect diverse environments and selective factors, such as geology, geomorphology, climate, and land-management history. According to our research findings, human activities that impede movement among suitable habitat patches can have lasting consequences for local assemblages of coastal cutthroat trout and may ultimately affect persistence.