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Transactions of the American Fisheries Society 1997;126:230–239**Effects of Residual Hatchery-Reared Steelhead on Growth of Wild Rainbow Trout and Spring Chinook Salmon**

GEOFFREY A. MCMICHAEL

*Washington Department of Fish and Wildlife, 600 Capitol Way North, Olympia,
Washington 98501, USA*

CAMERON S. SHARPE

*Department of Fisheries and Wildlife, Oregon State University, 104 Nash Hall, Corvallis,
Oregon 97331, USA*

TODD N. PEARSONS

Washington Department of Fish and Wildlife

Abstract.—We investigated the effects of nonmigrant (residual) juvenile hatchery steelhead (anadromous rainbow trout *Oncorhynchus mykiss*) on growth of wild rainbow trout and juvenile spring Chinook salmon *O. tshawytscha* to examine how increased densities of residual hatchery steelhead might affect the growth of preexisting wild rainbow trout and Chinook salmon. We used screened enclosures in a natural stream to examine food utilization and physiological stress, factors that might affect fish growth. The presence of residual hatchery steelhead led to reduced growth of wild rainbow trout (1993: $P = 0.019$; 1994: $P = 0.020$) but not of spring Chinook salmon ($P = 0.360$). Enclosures did not reduce the total number of food items available but did influence the species composition of aquatic and terrestrial invertebrates. The food habits of paired and unpaired fish differed; however, the power of those tests was low. Cortisol level, a measure of physiological stress, did not differ between paired and unpaired fish held in enclosures. Cortisol levels were significantly lower in fish confined for 42 d than in wild fish outside the enclosures at the end of the experiment. Our results suggest that adverse effects on wild rainbow trout growth resulting from high densities (a doubling) of residual juvenile steelhead from hatchery releases may be significant.

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Tel: 301/897-8616 . Fax: 301/897-8096 . E-mail: main@fisheries.org