Competition as a Factor in Displacement of Native Cut throat Trout by Nonnative Rainbow and Hybrid Trout

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Native salmonid fishes have been displaced worldwide by nonnatives through competition and hybridization, but dynamics of these factors are poorly understood. We apply a Lotka-Volterra population model to displacement of cutthroat trout (*Oncorhynchus clarkii*) by rainbow (*Oncorhynchus mykiss*)/hybrid trout in the Snake River, USA. Cutthroat trout are susceptible to hybridization in the river but are reproductively isolated in tributaries via removal of migratory rainbow/hybrid spawners at weirs. Hybridization is the primary mechanism for initial growth of the rainbow/hybrid trout population, but a model with hybridization alone does not explain observed trends. Two models, in which competition occurs 1) among river-spawned fish only and 2) among all fish, explain observed trends, but are indistinguishable from one another based on fit to data. When tributary-spawned cutthroat trout out-migrate as fry, competition with rainbow/hybrid trout results in extinction of cutthroat trout, even though reproductive segregation is maintained.