

Spatial and temporal overlap of hatchery and wild spring Chinook salmon spawning: effects of hatchery acclimation sites

Andy Dittman, NOAA Fisheries, Northwest Fisheries Science Center, 2725 Montlake Blvd E., Seattle, WA 98112 USA

Unwanted straying of hatchery salmon into spawning areas utilized by wild salmon can have major ecological and genetic impacts on wild salmon populations. To mitigate for potential negative consequences associated with these interactions, many hatchery reform measures are being implemented to segregate wild and hatchery adults. On the other hand, most supplementation hatchery programs are specifically designed to integrate hatchery-reared fish with wild adults on spawning grounds to increase the numbers of naturally spawning adults. Off-site acclimation and release facilities have been used extensively in hatchery programs to control the distribution of returning hatchery adults to achieve specific management and conservation goals. We examined the efficacy of acclimation facilities for returning salmon to specific locations within a watershed. Specifically, we examined the spatial patterns of homing and spawning by wild salmon and hatchery-reared spring Chinook salmon (*Oncorhynchus tshawytscha*) released from acclimation facilities in the Yakima River, Washington. From 2002- 2009, we comprehensively surveyed the spawning area of Yakima River spring Chinook and GPS mapped every carcass recovered ($n=12,851$). The results of this study indicated that site of acclimation and release significantly affected the distribution of adult spawning but a large percentage (55.1 %) of hatchery fish were recovered in areas far from their release sites suggesting tradeoffs between homing and spawning site selection. There was considerable overlap of hatchery and wild fish but reach-scale analysis suggests that spatial and temporal interactions between wild and hatchery adults vary significantly within a watershed and may have major implications for metapopulation dynamics.