

Risk management of non-target fish taxa as related to salmon supplementation

Gabriel M. Temple, Timothy D. Webster, Scott A. Coil, and Cade Lillquist

Contacts:

gabriel.temple@dfw.wa.gov, timothy.webster@dfw.wa.gov,
scott.coil@dfw.wa.gov, cade.lillquist@dfw.wa.gov

Abstract

Salmon supplementation and reintroduction programs have the potential to negatively impact other valued fish taxa, which are not the target of enhancement (non-target taxa). We evaluated the impacts of spring Chinook Salmon *Oncorhynchus tshawytscha* supplementation and Coho Salmon *O. kisutch* reintroduction (hereafter supplementation) to non-target fish taxa in the upper Yakima Basin following implementation of a production scale salmon supplementation program. Field methods included backpack electrofishing and snorkeling in tributaries, and drift-boat electrofishing in the main stem. We used three sequential steps in our evaluation: First, we determined if spatial overlap in distribution occurred between supplementation fish and non-target taxa. Second, if overlap occurred, we determined if a change in abundance, size, or biomass occurred during supplementation. Lastly, if a change occurred we determined if the change could be reasonably attributed to supplementation. Spatial overlap and changes in abundance, size, or biomass were determined to be significant if they exceeded containment objectives. Salmon rarely overlapped Cutthroat Trout *O. clarkii* and Bull Trout *Salvelinus confluentus* in tributaries, but some overlap of Cutthroat Trout occurred in relatively high elevations of the main stem, and considerable overlap with Rainbow Trout occurred in tributaries and the main stem. Salmon overlapped Mountain Whitefish *Prosopium williamsoni* and sucker species (Catostomidae) in the main stem, and dace (Cyprinidae) and sculpin (Cottidae) species in tributaries. With the exception of steelhead *O. mykiss*, the lower 90% confidence limit of abundance, size, and biomass was above the containment objective for non-target taxa that overlapped significantly with salmon. We used Rainbow Trout as an analog for steelhead. The lower 90% confidence limit of Rainbow Trout size in both tributaries and in the main stem, were below our containment objectives for steelhead. Comparisons of Rainbow Trout size in tributaries, and size in main stem sections with relatively high and low salmon abundance revealed that these changes were unlikely to be the result of supplementation (before-after-control-impact analysis: $P > 0.05$). The weight of evidence indicates that salmon supplementation and reintroduction has not impacted valued species in the upper Yakima Basin beyond predetermined containment objectives and thus, risk containment actions are not warranted at this time.