
TRENDS IN CHARACTERISTICS OF YELLOWSTONE LAKE CUTTHROAT TROUT, ASSOCIATED FACTORS, AND EVIDENCE OF A POPULATION SHIFT

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Comprehensive time-series data for Yellowstone cutthroat trout (*Oncorhynchus clarkii bouvieri*; YCT) based on samples taken between 1977 and 2007 from the spawning run (spring; $n = 29$ yrs) of a tributary (Clear Creek) of Yellowstone Lake or caught in gill nets set (fall; $n = 30$ years) at established locations in the lake were examined to identify (1) associations between population characteristics within and between capture methods, as well as temporal trends in those characteristics, (2) evidence of informative shifts in population characteristics, and (3) factors that may have importantly affected the dynamics of the lacustrine-adfluvial YCT population of the tributary. Temporal increases in mean TL of YCT in the spawning run and of prespawners, i.e., YCT whose gonads indicated the fish would have spawned the next year, in the gillnet catch and concurrent declines in run size and prespawner catch were suggestive of an effect of YCT population density on the somatic growth of the fish. Similarly, a concurrent increase in mean TL of gillnetted YCT 100-199 mm long was indicated by the polynomial regression results, which also suggested statistical change points in the temporal trends for each of those variables. Contrasting those trends was that for mean TL of gillnetted YCT 200-299 mm long, whose general decline during the past two decades was attributed to predation by nonnative lake trout (*Salvelinus namaycush*). Collectively, these trends provided evidence of a YCT population shift. Correlation results indicated YCT in the spawning run could not be unequivocally assigned to any particular lake region. Multiple regression analyses showed that Clear Creek run size was strongly affected by parental run size 5 yrs earlier and a measure of climate 5 yrs earlier.