Potential Consequences of Climate Change to Persistence of Cutthroat Trout Populations

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Warmer water, changes in stream flows, and increasing frequency and intensity of disturbances are among the factors associated with climate change that are likely to impact native trout populations in the western U.S. We analyzed three of these factors—increased summer temperatures, uncharacteristic winter flooding, and increased wildfires—that are likely to affect broad-scale population persistence among subspecies of cutthroat trout, (*Oncorhynchus clarkii)*. Our models suggest that risk will vary substantially among and within subspecies. Up to 78 percent of currently occupied habitat of Bonneville cutthroat trout (*O. c. utah)*, 65 percent of westslope cutthroat trout (*O. c. lewisi)*, and 29 percent of Colorado River cutthroat trout (*O. c. pleuriticus)* will be at high risk from one or more of the three factors examined. Each subspecies contains two or more river ub-basins (Geographic Management Units) where all remaining populations either fail to meet basic persistence criteria and/or are at high risk from climate-associated impacts, indicating a high likelihood of genetic and life history losses within those areas. Stress from climate change is likely to compound existing problems associated with habitat degradation and introgression from introduced salmonids. Recognition of the increased risk from climate change may alter the management paradigm of isolation and require increased control efforts for invasive non-native species. Regardless of the management avenue chosen, more populations are likely to become isolated and vulnerable in the near future. We argue for early intervention within certain sub-basins to increase resistance and resiliency to at-risk populations and habitats prior to further disturbances associated with a rapidly changing climate.