

Conceptual Framework and an Action Plan for Conserving Westslope Cutthroat Trout in Canada

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Abstract: The westslope cutthroat trout (*Oncorhynchus clarki lewisi*) has declined markedly throughout its range in the United States and Canada. This paper outlines a conceptual framework for recovering and conserving westslope cutthroat trout in Canada based on what is presently known of the subspecies' historical and present distribution, its biology, the factors leading to its decline, and potential threats to it in the future, interpreted from a conservation biology standpoint. The conceptual framework derived from these considerations can be summarized as follows. The westslope cutthroat trout was once widespread and abundant in southeastern British Columbia and southwestern Alberta, primarily in mainstem rivers and their tributaries below barriers to upstream dispersal. Many of the large-system populations existed as metapopulations, composed of numerous stocks exhibiting a variety of life-history forms. Stocks were genetically and morphologically distinct, the stock structure of the subspecies reflecting specialization and resource partitioning analogous to that exhibited by richer full-species assemblages that evolved beyond Pleistocene glacial limits. With European settlement, westslope cutthroat trout declined rapidly from a combination of overfishing, habitat degradation and loss, introgressive hybridization with introduced *Oncorhynchus*, and competitive and predatory replacement by non-native species. Distribution (and apparently abundance) of the subspecies within the native range is now much reduced, hybridized populations are widespread, and genetically-pure populations appear to be rare. Large numbers of stocks have been lost; a very few genetically-depauperate stocks have been transplanted widely within and outside of the native range. The habitats of most stocks outside of protected areas have been dramatically altered by human land-use patterns and dams. Many stocks are continuing to trend toward extinction. In the existing state the remaining cutthroat populations are less fit and use the habitat less efficiently or less completely than was the case under pristine conditions. These weakened remnants are confronted with artificial habitats and habitat changes that the subspecies has never encountered before, while having to deal with new predators and competitors. The subspecies as a whole has lost much of its adaptive potential with loss of so many genetically-distinct stocks. The function of westslope cutthroat trout has not necessarily been replaced completely by introduced species or stocks. Accordingly, major goals of recovery and conservation programs should be (1) to retain the remaining stock structure and genetic diversity of as much of the subspecies remnant as possible; (2) to restore to a more natural structure and function the habitats used by the remaining populations; (3) to limit the spread of, and if possible remove, populations of non-native fishes influencing remaining westslope cutthroat stocks; and (4) to protect entire intact watershed ecosystems holding remnant cutthroat stocks as models, refuges and sources of stocks for reintroduction. Research is required to test all elements of this model and to develop methods for meeting the above goals. A plan is presented with specific recommendations for action.

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