Coastal Cutthroat Trout Symposium: Status, Management, Biology, and Conservation
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Life History Diversity and Protection of the Southwestern Washington/Columbia River Distinct Population Segment of the Coastal Cutthroat Trout

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Based on a January, 1999 status review, the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) jointly proposed to list the Southwestern Washington/Columbia River Distinct Population Segment (DPS) of the coastal cutthroat trout as a threatened species under the U.S. Endangered Species Act (Johnson et al. 1999; NMFS/USFWS 1999). On July 5, 2002, USFWS withdrew the proposed rule concluding that although some populations "are likely at lower-than-historic levels and probably still declining, recent changes in regulations have reduced threats," and "the latest information" indicates "relatively healthy-sized total populations (all life history strategies) in a large portion (75 percent) of the DPS's range" (USFWS 2002, pg 44862). In addition, USFWS believed that "production of anadromous trout from residents" ensures the security of anadromous populations. To evaluate these claims, we comprehensively reviewed all information cited in the status review, proposed listing, and USFWS withdrawal.

Much of the information cited in the withdrawal was also cited in the status review and proposal, indicating that the withdrawal was based as much on a reinterpretation of existing data as new information. The withdrawal and proposal differed on the importance of the anadromous portion of the population to the viability of the DPS as a whole. Both the NMFS status review and proposed rule concluded that listing was warranted based on the status of the anadromous portion of the population alone (Johnson et al. 1999, NMFS/USFWS 1999). For example, the NMFS status review concluded: "Team members concurred that the loss of any individual life history form could increase risk to the ESU [evolutionary significant unit] as a whole" (Johnson et al. 1999, pg xiv).

In withdrawing the proposed rule, however, USFWS focused much of its analysis on the DPS as a whole without considering individual life history strategies. To conclude that coastal cutthroat trout populations are "relatively healthy-sized," USFWS relied on surveys conducted by the Washington Department of Fish and Wildlife (WDFW) that did not separate anadromous and resident fish when estimating population densities (WDFW 2001). In comments on the proposed listing, WDFW strongly advocated for lumping populations from all life history strategies, stating that "the status review of these fish should be based on all forms of coastal cutthroat across the entire DPS" (WDFW 2001). USFWS extensively relied on these comments, citing them 20 times in the withdrawal (USFWS 2002).

By analyzing both resident and anadromous populations together, USFWS was able to argue that threats, which have a greater impact on anadromous populations, have a minimal impact on the DPS as a whole. In discussing the impacts of forest management, for example, USFWS concluded that "despite the long-term, widespread impacts to aquatic and riparian conditions, coastal cutthroat trout have survived in all portions of the DPS for many generations, and apparently remain at densities comparable to healthy-sized populations elsewhere" (USFWS 2002, pg 44947). Likewise, when discussing the impacts of urban and industrial development, USFWS acknowledged that urban areas "have a proportionally greater effect on the anadromous and migratory portions of the coastal cutthroat trout population." Yet USFWS ultimately minimized these impacts, concluding that urban areas "include only about three percent of the current land base in the DPS" (USFWS 2002, pg 44949).

USFWS also argued that the DPS is covered by adequate regulations by deemphasizing the anadromous population. Many resident populations occur entirely on federal lands, where they are protected by the Northwest Forest Plan and other regulations, whereas anadromous populations are dependent on estuaries and lower reaches of rivers that occur primarily on private lands and are far less likely to be protected (USFWS 2002). By employing this methodology, USFWS never analyzed the extent of threats to or protection of anadromous populations, never determined whether the viability of this portion of the DPS was in question, and did not determine whether declines within and threats to the anadromous population affect the viability of the DPS as a whole.

USFWS based its reversal of the proposed rule in large part on the fact that resident cutthroat can occasionally produce anadromous progeny (Griswold 1996; Johnson et al. 1999; WDFW 2001; USFWS 2002). The same information was available to NMFS when it conducted the status review and proposed to list the DPS, but NMFS still concluded listing was warranted for several reasons (Johnson et al. 1999; NMFS/USFWS 1999). First, smolts observed by WDFW in 1997 and 1998, as cited in WDFW 2001, come from a population above a dam and it is unclear whether these smolts were produced by purely resident fish or the descendents of anadromous fish that were trapped by construction of the dam (Johnson et al. 1999). Second, if poor habitat conditions are suppressing anadromous

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populations, any anadromous progeny produced by resident fish will face the same habitat limitations. Finally, even if smolts are produced by resident fish, this reproduction "has not resulted in demonstrably successful reestablishment of anadromous forms" (NMFS/USFWS 1999, pg 16407). In withdrawing the proposal, USFWS never addressed these issues.

NMFS's status review concluded that concern over the anadromous portion of the DPS alone warranted listing in large part because migratory fish are a source of colonists to new habitat and can rescue populations following local extirpations. The review concluded (Johnson et al. 1999, pg 145):

> *Reduced opportunities for dispersal among coastal cutthroat trout populations due to reductions in the anadromous form could cause dramatic increases in local population extinctions due to the demographic and genetic effects of isolation. If too many local populations are extirpated, the metapopulation dynamics in a region may be severely disrupted, leading to the eventual extinction of an entire ESU.*

NMFS's status review also concluded that loss of anadromous populations could "reduce the number of larger and more fecund individuals in the population," potentially "have significant effects on the population age structure, spawn timing, age and size at first reproduction, degree of iteroparity, sex ratio, spatial distribution of individuals, and mate selection," and lead to a reduction in life history variability, a measure that NMFS considered to constitute perhaps the "most reliable indicator of population resilience and ESU status" (Johnson et al. 1999, pgs 48-49).

Several recent scientific reviews have likewise concluded that maintaining all life histories in *Oncorhynchus* spp. is critical to ESU viability (SRSRP 2004; Hey et al. 2005; ISAB 2005). ISAB (2005), for example, concluded:

> *To be viable an ESU needs more than simple persistence over time; it needs to be in an ecologically and evolutionarily functional state. Evaluation of ESU viability should not only rest on the numbers of component populations or on the abundance and productivity of those individual populations, but also should be based on the integration of population dynamics within the ecosystem as a whole. This concept of ESU viability does not accommodate the loss of populations or the anadromous or resident life history form from any given ESU, because that loss would represent a loss in diversity for the ESU that would put its long-term viability at risk. This argument is based on evidence that an ESU needs to contain viable populations inhabiting a variety of different habitats, interconnected as a metapopulation, if that ESU is to fulfill the entire complement of ecological and evolutionary interactions and functions.*

In reversing the proposed listing, USFWS did not explicitly address these issues, nor explain why the concerns about viability of the anadromous population alone were not sufficient to warrant listing. These failings run counter to existing scientific consensus and potentially compromise the viability of the Southwestern Washington/Columbia River Distinct Population Segment of coastal cutthroat trout.

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