

Lakes WCT hatchery population maintained by the State of Washington. However, as those authors point out, the Twin Lakes population is not the only population of hatchery WCT that was stocked in Washington during the past century. Moreover, random genetic drift, which has a greater probability of occurring in small, isolated populations, could have resulted in genetic differences among populations of introduced WCT, and perhaps in the Twin Lakes hatchery population itself.

Howell and Spruell (2003) describe their study as a "work in progress." We agree and suggest that their caveat should be applied to both the recent and ongoing investigations of WCT populations in Washington. Extensive discussions of the available data and their interpretations among members of the scientific community, as part of the normal, peer-review process, will be required to determine whether any of the putative, native WCT populations that Trotter *et al.* (1999, 2001) and Howell and Spruell (2003) have identified in Washington are native to the streams from which the fish were collected. However since these populations are putative, we did not include them as part of this listing decision. Rather in our assessment we relied on those populations that the best scientific data currently indicate are native (as described by Behnke 1992 and Shepard *et al.* 2003).

Distribution of Westslope Cutthroat Trout and the Prevalence of Hybridization

New, definitive information on both the probable historic and present-day range-wide distributions of WCT was provided in the status update report (Shepard *et al.* 2003). That information indicated WCT historically occupied about 90,928 km (56,500 mi) of stream in the United States and now occupy about 33,500 (59 percent) of those stream miles. About 33,000 (58 percent) of the historically occupied stream miles were in Montana, 19,000 (34 percent) in Idaho, 1,000 (2 percent) in Oregon, 3,000 (5 percent) in Washington, and 161 km (100 mi) (<1 percent) in Wyoming (*i.e.*, Yellowstone National Park). Shepard *et al.* (2003) also concluded that several river drainages, including the Milk Headwaters, Upper Milk, Willow, Bullwhacker-Dog, Box Elder, and the Upper, Middle, and Lower Musselshell in the Missouri River basin, the Hangman River watershed in the Spokane River drainage, and the North John Day River drainage in Oregon, were outside the historic range of WCT. On the basis of the less definitive

information available prior to the WCT status update report, preceding assessments (*e.g.*, U.S. Fish and Wildlife Service 1999) had treated the streams in those drainages, except Hangman River, as historic WCT habitat. Today, WCT occupy over 28,968 km (18,000 mi) of stream in Idaho (95 percent of historic range in Idaho), about 20,922 km (13,000 mi) in Montana (39 percent of historic range in Montana), about 402 km (250 mi) in Oregon (21 percent of historic range in Oregon), and about 3,219 km (2,000 mi) of stream in Washington (66 percent of historic range in Washington). In our initial status review (U.S. Fish and Wildlife Service 1999), we reported that WCT occupied about 37,015 km (23,000 mi) of stream in the United States.

Information provided in the WCT status update report (Table 9 of Shepard *et al.* 2003) also indicated that laboratory-based genetic testing has been performed on samples of WCT collected from locations representative of about 6,100 (18 percent) of the occupied stream miles and that nonintrogressed (*i.e.*, showing no evidence of introgressive hybridization) WCT are known to inhabit about 3,500 of those stream miles (57 percent of tested stream miles; 10 percent of occupied miles). An additional 1,669 km (1,037 mi) of stream contained a mixture of individual WCT that were either nonintrogressed or introgressed. Finally, based on the absence of nonnative, potentially hybridizing fish species, we conclude WCT inhabiting an additional 14,645 km (9,100 mi) of stream, for which genetic testing of the WCT therein has not yet been performed (Table 9 of Shepard *et al.* 2003), are most likely not introgressed (see preceding section on the Value of Hybrid Westslope Cutthroat Trout in Listing Determinations). Thus, nonintrogressed WCT are known to inhabit 5,633 km (3,500 mi) of stream and probably inhabit as many as 20,278 km (12,600 mi) of stream in which no potentially hybridizing fishes occur. In our initial status review (U.S. Fish and Wildlife Service 1999), we reported that: (1) WCT occupied about 37,015 km (23,000 mi) of stream; (2) data on the genetic characteristics of WCT were limited and available mainly for Montana; and (3) nonintrogressed WCT were known to occupy 4,237 km (2,633 mi) of stream.

The WCT status update report (Shepard *et al.* 2003) grouped most of the WCT in the occupied miles of stream into 563 separate "conservation" populations. Those conservation populations collectively occupied 39,349 km (24,450 mi) of stream or 72

percent of the occupied habitat; WCT in the remaining 28 percent of occupied habitat did not satisfy the criteria of "conservation" populations and are thus being managed as "sport fish" populations, as described previously (Utah Division of Wildlife Resources 2000). Individual conservation populations ranged in geographic extent from small, nonintrogressed, isolated populations (*i.e.*, isolets) to large metapopulations that included numerous populations and encompassed hundreds of stream miles. According to Shepard *et al.* (2003), 457 (81.2 percent) of the 563 WCT conservation populations were isolets that were often restricted to headwater areas and represented 11.5 percent of the total occupied stream miles. Most of the occupied stream miles (88.5 percent) were habitat for WCT in metapopulations.

Finally, the status update report (Shepard *et al.* 2003) revealed that 70 percent of the habitat occupied by extant WCT populations lies on lands managed by Federal agencies, including lands designated as national parks (2 percent of occupied habitat), wilderness areas (19 percent), or U.S. Forest Service roadless areas (40 percent). Although we could not distinguish wilderness and roadless areas from other Federal lands in our initial status review (U.S. Fish and Wildlife Service 1999), we reported that most of the habitat for extant WCT populations was on lands administered by Federal agencies, particularly the U.S. Forest Service.

Occurrence of Westslope Cutthroat Trout Life-History Forms

Biologists commonly recognize three WCT life-history forms: resident fish do not move long distances and spend their lives entirely in their natal stream, where they themselves were produced; fluvial fish spawn in small tributaries and their young migrate downstream to larger rivers, where they grow and mature; and adfluvial fish spawn in streams and their young migrate downstream (or upstream, in the case of outlet-spawning populations) to mature in lakes. All three life-history forms may occur in a single drainage and whether they represent opportunistic behaviors, heritable (*i.e.*, genetically-based) traits, or a combination of these factors is unknown.

In our initial status review (U.S. Fish and Wildlife Service 1999), we found that adfluvial WCT occur naturally in 6 lakes in Idaho and Washington that total about 72,843 ha (180,000 ac) and at least 20 lakes that total 2,164 ha (5,347 ac) in Glacier National Park in Montana. Most of those populations receive the high