Federal Register

Friday,

July 5, 2002

Part II

Department of the Interior

Fish and Wildlife

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Withdrawal of Proposed Rule To List the Southwestern Washington/ Columbia River Distinct Population Segment of the Coastal Cutthroat Trout as Threatened; Proposed Rule

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018–AF45

Endangered and Threatened Wildlife and Plants; Withdrawal of Proposed Rule To List the Southwestern Washington/Columbia River Distinct Population Segment of the Coastal Cutthroat Trout as Threatened

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule; withdrawal.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), withdraw the proposed rule, published in the **Federal Register** on April 5, 1999, to list the southwestern Washington/Columbia River Distinct Population Segment (DPS) of coastal cutthroat trout as threatened. The DPS includes all coastal cutthroat trout in waters draining into Grays Harbor, Willapa Bay, and the Columbia River upstream to the Klickitat River in Washington and to Fifteen Mile Creek in Oregon, excluding the Willamette River above Willamette Falls. The coastal cutthroat trout inhabits streams, lakes, rivers, estuaries, and near-shore ocean habitats throughout the range of the DPS.

The change in forest management regulation, the latest information indicating relatively healthy-sized total populations in a large portion of the DPS, and our improved understanding of the ability of freshwater forms to produce anadromous progeny, lead us to conclude that this DPS does not meet the definition of a threatened species (in danger of becoming endangered in the foreseeable future) at this time.

ADDRESSES: The complete file for this withdrawal is available for inspection, by appointment, during normal business hours at the Oregon Fish and Wildlife Office, 2600 SE 98th Avenue, Suite 100, Portland, OR 97266.

FOR FURTHER INFORMATION CONTACT: Kemper McMaster, State Supervisor, Oregon Fish and Wildlife Office (*see* **ADDRESSES**) (telephone 503/231–6179; facsimile 503/231–6195).

SUPPLEMENTARY INFORMATION:

Background

Coastal cutthroat trout (*Oncorhynchus clarki clarki*), one of 10 formally described subspecies of cutthroat trout (Behnke 1992), are distributed along the Pacific Coast of North America from Prince William Sound in Alaska to the Eel River in California (Behnke 1992, Trotter 1997) and inland from the Coast Range of Alaska to roughly the crest of the Cascades of Washington and Oregon (Trotter 1997). The southwestern Washington/Columbia River DPS proposed for listing as threatened includes the Columbia River and its tributaries from the mouth to the Klickitat River on the Washington side of the river and Fifteenmile Creek on the Oregon side; the Willamette River and its tributaries from its confluence with the Columbia upstream to Willamette Falls; Willapa Bay and its tributaries; and Grays Harbor and its tributaries.

The DPS inhabits portions of five Ecoregions, the Coast Range, Puget Lowland, Cascades, Willamette Valley, and Eastern Cascades. Most of the DPS occurs in the Coast Range, Puget Lowland, and Cascades Ecoregions. The Coast Range Ecoregion has a maritime climate, characterized by medium to high rainfall averaging 200 to 240 centimeters (cm) (80 to 90 inches (in) per year, which peaks in the winter months, with very little precipitation in July or August. Random events, such as strong storms with heavy rains can have damaging effects, especially on a disturbed landscape. Floods and landslides triggered by these events can significantly affect aquatic resources throughout the stream system. The Puget Lowland Ecoregion experiences reduced rainfall (50 to 120 cm (20 to 47 in)), with peak flows from December to June. The area tends to have groundwater resources from bordering mountain ranges that help sustain river flows during droughts. The Cascades Ecoregion includes headwater tributaries of many coastal cutthroat streams. Precipitation can average 280 cm (110 in) per year, much of it in the form of heavy snowfall. There is little storage capacity for long-term groundwater except where porous rock substrate exists. In these porous areas, streams receive 75 to 95 percent of their average discharge as groundwater and are able to maintain flows during dry periods. Surface water flow originating in the Cascade Range influences river flows throughout this region. A smaller portion of the DPS occurs in the Willamette Valley Ecoregion, which lies in the rainshadow of the Coast Ranges and typically experiences rainfall of 120 cm (47 in), with peak flows in December and January. A small portion of the DPS occurs in the Eastern Cascades Slopes and Foothills Ecoregion, which is marked by a transition between the high rainfall areas of the Cascades Ecoregion and the drier regions to the east. This Ecoregion receives 30 to 60 cm (10 to 20 in) of precipitation. Streamflow is often intermittent, especially during the summer (Johnson *et al.* 1999).

Coastal cutthroat trout differ in appearance from other subspecies by the numerous small to medium irregularly-shaped spots evenly covering virtually the entire sides of the body, often extending to the ventral surface and anal fin (Behnke 1992). Skin color on sea-run fish is often silvery, and may mask body spots, while freshwater residents are darker with a copper or brassy sheen.

Relatively little is known about the specific life history and habitat requirements of coastal cutthroat trout. Coastal cutthroat trout spend more time in the freshwater environment and make more extensive use of this habitat, particularly small streams, than do most other Pacific salmonids (Johnson *et al.* 1999). The life history of coastal cutthroat trout may be one of the most complex of any Pacific salmonid. Coastal cutthroat trout exhibit a variety of life history strategies across their range (Northcote 1997, Johnson *et al.* 1999) that include three basic variations: Resident or primarily non-migratory; freshwater migrants; and marine migrants. Residents may stay within the same stream segment their entire life. Freshwater migrants may make migrations from small tributaries to larger tributaries or rivers, or may migrate from tributary streams to lakes or reservoirs. Marine migrations (anadromy) are generally thought to be limited to near shore marine areas; individuals may not venture out of the estuary in some cases (Trotter 1997). There are numerous exceptions to these generalized behaviors and we lack observations of definitive genetic relationships between individual or population migratory strategies (Behnke 1997). In areas above long-standing barriers, coastal cutthroat trout are limited to resident or fresh-water migratory life history strategies. In areas accessible to the ocean, all three life history strategies (resident, freshwater migratory, and anadromous) are likely to be expressed in the same area.

Coastal cutthroat trout appear to exhibit very flexible life history strategies. The extent to which individuals expressing these various strategies are isolated from other life history forms is largely unknown, though there is growing evidence that individuals may express multiple life history behaviors in their life time (Johnson *et al.* 1999). For convenience we refer to individuals that migrate to marine waters as anadromous or anadromous life form. In doing so, we do not intend to imply that they represent a separate population from freshwater forms. We are treating all forms as part of a single population in this analysis.

As a result of their wide distribution and variable life history behavior, coastal cutthroat trout are exposed to a wide range of water temperatures. Several studies concluded that cutthroat trout, like other salmonids, were not typically found in water temperatures higher than 22 degrees Celsius (C) (72 degrees Fahrenheit (F)) although they could tolerate temperatures as high as 26 to 28 degrees C (79 to 82 degrees F) for short periods. Optimum temperatures for coastal cutthroat trout spawning range from 6.1 to 17.2 degrees C (43 to 63 degrees F), and for egg incubation from 4.4 to 12.7 degrees C (40 to 55 degrees F) (Bell 1986). The preferred temperature range of adult coastal cutthroat is between 9 and 12 degrees C (48 and 54 degrees F) (Bell 1986). Giger (1972) reported that temperature was believed to be the most influential characteristic in the migration and distribution of coastal cutthroat in estuaries. Giger further states that high upper estuary temperatures (23.9 to 26.7 degrees C (75 to 80 degrees F)) probably prevent movement to cooler tributaries until later in the fall.

Coastal cutthroat trout spawn in a variety of gravel sizes from 0.6 to 30 cm (0.2 to 12 in) (Hooper 1973, Hanson 1977). Gravels free from fine sediment support higher egg to fry survival for salmonids (Irving and Bjornn 1984, Weaver and Fraley 1993). Anadromous coastal cutthroat trout spawn and complete early rearing in headwater stream sections, often above those used by other anadromous salmonids (Glova and Mason 1977, Michael 1983), and then migrate downstream eventually entering the estuary and near ocean environment to complete growth and maturation. By spawning higher in the watersheds than other salmonids, cutthroat trout may avoid competition for suitable spawning sites, reduce the likelihood of hybridization, and reduce competitive interactions between juvenile coastal cutthroat trout and other salmonids. Salmonids need water free from high levels of suspended sediment to feed and migrate. When very high sediment loads are present (greater than 4,000 parts per million (ppm)) salmonids cease movement or migration (Bjornn and Reiser 1991). Cutthroat trout are known to stop feeding and move to cover when turbidity is above 35 ppm (Pauley *et al.* 1989).

Coastal cutthroat trout are poorer swimmers than other anadromous salmonids, probably due to morphological characteristics, including their large heads and narrow caudal (tail) regions (Bisson *et al.* 1988, Hawkins and Quinn 1996). In laboratory tests of two different hatchery stocks of coastal cutthroat trout, Hawkins and Quinn (1996) found critical swimming speeds were between 5.58 to 6.69 body lengths per second, whereas steelhead (*Oncorhynchus mykiss*) had critical velocities of 7.69 body lengths per second. In field studies, two-to four-year old coastal cutthroat trout were found in streams with velocities of 0.14 to 0.20 meters per second (0.46 to 0.66 feet per second) (Hanson 1977). Coastal cutthroat trout juveniles were most often in streams where water velocities were between 0.25 and 0.50 meters per second (0.82 to 1.6 feet per second) (Pauley *et al.* 1989).

The timing of fish returns to estuary and freshwater habitat varies considerably across the range and within river basins (Trotter 1997, Behnke 1992). For example, return migrations of anadromous coastal cutthroat trout in the Columbia River system usually begin as early as late June and continue through October, with peaks in late September and October. Anadromous coastal cutthroat trout spawning typically starts in December and continues through June, with peak spawning in February.

Coastal cutthroat trout are repeat spawners. Some individuals have been documented to spawn each year for at least five years (Giger 1972), others may not spawn every year, and some do not return to seawater after spawning, remaining in fresh water for at least a year. Eggs begin to hatch within six to seven weeks of spawning, depending on temperature; fry emerge between March and June, with peak emergence in mid-April. At emergence, fry appear to seek refugia near channel margins and backwater habitats, although they may use fast water habitats (riffles and glides) when exposed to competitive interactions with other native salmonids (Johnson *et al.* 1999).

Coastal cutthroat trout juveniles generally remain in upper tributaries until they are one year of age, at which time they may begin moving more extensively throughout the river system. Juvenile salmonids on marine-directed migrations undergo physiological changes to adapt to salt water called smoltification. These individuals are called smolts. Downstream movement may begin with the first spring rains, usually in mid-April with peak movement in mid-May. Time of initial seawater entry generally begins as early as March, peaks in mid-May, and is essentially over by mid-June. Some juveniles may enter the estuary and remain there over the summer without smolting or migrating to the open ocean. Seaward migration of Columbia River smolts may occur to more protected areas at an earlier age and smaller size than migration to more exposed areas such as the outer Washington coast. Columbia River smolts generally make their first migration at age two, at a mean size of about 160 mm (6 in) (Johnson *et al.* 1999).

Upstream movement of juveniles appears to begin with the onset of winter freshets (overflows) during November and continues through the spring, frequently peaking during late winter and early spring. Many of these yearling fish may average less than 200 mm (8 in) in length and can be found in streams that run through ponds or sloughs (Hartman and Gill 1968, Garrett 1998). In winter, coastal cutthroat trout move to pool areas with dense cover such as near log jams or overhanging banks (Bustard and Narver 1975, Waters 1993).

Coastal cutthroat trout that enter nearshore marine waters reportedly move moderate distances along the shoreline. Individual marked fish have been reported to move 72 to 290 kilometers (km) (45 to 180 miles (mi)) off the Oregon Coast (Pearcy 1997). Sea-run cutthroat trout along the Oregon coast may swim or be transported with the prevailing currents long distances during the summer. It is unclear how far offshore coastal cutthroat trout migrate. Cutthroat trout have been routinely caught up to 6 km (4 mi) off the mouth of the Nestucca River (Sumner 1953, 1972). Coastal cutthroat trout have also been captured between 10 and 46 km (6 to 28 mi) offshore of the Columbia River, though it is unclear whether they were carried by the freshwater plume of the Columbia River or moved offshore in search of prey.

Resident (non-migratory) fish appear to mature earlier (two to three years) and are shorter-lived than the migratory form (Trotter 2000). Smoltification has been reported to occur from one to six years of age, most commonly at ages two through four (Trotter 1997), and at sizes of from 175 to 225 millimeters (mm) (7 to 9 in) (Behnke 1992). Sexual maturity rarely occurs before age four in anadromous coastal cutthroat trout (Johnson *et al.* 1999). Growth rates increase during the initial period of ocean residence, but decrease following the first spawning due to energy expenditures from migration and spawning (Giger 1972). Behnke (1992) reports the maximum age of sea-run cutthroat to be approximately 10 years.

The diverse life history strategies shown by coastal cutthroat trout are not well understood, but are thought to represent unique adaptations to local environments and the subspecies' response to environmental variability and unpredictability. The significance of the various life history strategies, the extent to which each strategy is controlled by genetic versus environmental factors, and the extent of isolation among individuals expressing these various strategies is largely unknown, though there is growing evidence that individuals may express multiple life history behaviors over time (Johnson *et al.* 1999). The few existing studies show that, although both allele frequencies and morphology may differ between populations above and below barriers, the portions of the population displaying different life history strategies are generally more closely related within a drainage than are populations from different drainages (Behnke 1997, Johnson *et al.* 1999). These results indicate that migratory and non-migratory portions of the population of cutthroat trout represent a single evolutionary lineage in which the various life history characteristics have arisen repeatedly in different geographic regions (Johnson *et al.* 1999).

Many coastal cutthroat populations are isolated above natural barriers. Recent studies have shown low levels of downstream migration over these natural barriers indicating that these isolated populations likely are contributing demographically and genetically to populations below them (Griswold 1996, Johnson *et al.* 1999). Furthermore, populations above natural barriers may represent genetic resources shared by populations below these barriers and therefore may constitute a significant component of diversity for the population (Johnson *et al.* 1999).

There is increasing evidence that coastal cutthroat trout isolated for long periods of time above impassable dams retain the capacity to produce marine migrants. The Washington Department of Fish and Wildlife (WDFW) (2001) reported that between 476 and 1,756 smolts were produced from the freshwater form of coastal cutthroat trout above Cowlitz Falls Dam on the Cowlitz River in 1997 and 1998. Tagging and otolith microchemistry analysis of one returning adult showed the tagged fish, originating from above the dam, migrated to salt water and returned. The report suggested that the resident portion of the population of cutthroat trout is making contributions to the anadromous portion of the population. The significance of marine migrant production from the freshwater coastal cutthroat trout, whether from above long-standing natural barriers or human-created barriers, likely varies according to river basin characteristics, the length of time barriers have been in place, and the genetic composition of coastal cutthroat trout within each basin (Johnson *et al.* 1999). In addition, the significance and long-term success of freshwater cutthroat trout contributing to the saltwater migrant cutthroat trout may be largely dependent upon the ability of downstream habitat conditions and near-shore environments to support the persistence of this life history strategy.

The effects of interspecific competition between coastal cutthroat trout and other salmonids, particularly coho salmon (*Oncorhynchus kisutch*), rainbow trout (*O. mykiss*), and steelhead (the anadromous form of rainbow trout) are well documented. In general, steelhead and coho are more commonly found in the larger river reaches and coastal cutthroat trout are more abundant in the headwater tributaries, reducing the potential for competition (Hartman and Gill 1968). However, when they do overlap, steelhead tend to dominate coastal cutthroat trout in the riffles and juvenile coho dominate cutthroat in pools and glides. As a result, coastal cutthroat trout are often displaced to less desirable habitats in the presence of other native salmonids (Griffith 1988). Coastal cutthroat trout evolved with these competitive interactions and competition with native salmonids is not anticipated to adversely affect this DPS of coastal cutthroat trout.

Population Size

Little data exist to determine the actual population size of cutthroat trout in the DPS. Most counts were conducted only in the area accessible to anadromous salmonids; include only coastal cutthroat trout moving up or down stream (mostly migrants); and were collected incidental to studies for other salmonid species using traps or collection facilities designed for salmon and steelhead. We lack information on the efficiency of these systems in capturing coastal cutthroat trout, therefore, data from most traps cannot be used to determine or estimate actual population size for coastal cutthroat trout. We have updated the population analyses using the latest data received from WDFW, as well as evaluating the accuracy of data in depicting actual coastal cutthroat trout population levels.

Two sets of data from the Grays Harbor tributaries provide some population information (WDFW 2001c). The number of migrating adult coastal cutthroat trout captured at Bingham Creek from 1983 to 2001 ranged from a low of zero to a high of 35 with a mean of eight. This trap measures all fish returning to an 8,250 hectare (ha) (20,386 acre (ac)) watershed and likely catches all coastal cutthroat trout migrating upstream. On the West Fork Hoquiam River, the number of migrating coastal cutthroat trout (wild and hatchery) captured from 1986 to 2000 ranged from 17 to 122 with a mean of 51. No hatchery cutthroat trout have been detected at this facility since 1995, and the mean number of fish since 1995 is 55. This trap measures almost all adult coastal cutthroat trout returning to a 2,166 ha (5,352 ac) watershed.

Catch data for coastal cutthroat trout were recorded incidental to creel surveys for salmon and steelhead in the Columbia River, though no data were collected on angler effort for coastal cutthroat trout. These data were collected from four points in Washington. No creel census data were received from Oregon. The number of coastal cutthroat trout recorded in the creel surveys for the lower Columbia River is likely to be strongly influenced by the change in cutthroat trout fishing regulations (WDFW 2001c). During the period when creel census data were collected, the general fishing regulation limits for coastal cutthroat trout in Washington decreased from 12 to 8 trout per angler in 1983, to 2 trout in the marine environment and 8 trout in freshwater in 1986, and finally to 2 trout in 1992. Minimum size limits also became more restrictive during this period. In addition, catch and release angling for wild cutthroat was implemented in some streams within the DPS's range starting in 1989 and expanded to all lower Columbia River streams below Portland and Vancouver in 1992 (Leider 1997). The lack of angling effort data make it impossible to determine if the decline in creel census numbers are the result of low populations or low angling effort for coastal cutthroat trout. Creel census personnel have noted reduced angler effort in traditional cutthroat trout angling areas and fewer anglers using traditional sea-run cutthroat trout gear (WDFW 2001c). Given the lack of angler effort with which to standardize the counts, we can no longer conclude that the creel census data indicate an extremely low number of anadromous cutthroat trout in the DPS as described in the proposed rule (64 FR 16397, April 5, 1999).

Trap data are similarly difficult to interpret. The Kalama River trap has detected low numbers of coastal cutthroat trout in all but four years since

1982. This trap is located above the natural, historic anadromous cutthroat trout zone, in an area blocked to upstream passage by a falls until a ladder was built in 1936. In addition, the trap is designed to catch and hold adult salmon, having a 3.8 cm (1.5 in) bar spacing. According to WDFW (2001), most adult sea-run cutthroat trout would pass through this trap undetected because of the wide bar spacing. Therefore, because the trap is above a previous natural migration barrier and has a large bar spacing, the trap likely significantly underestimates the actual number of adult cutthroat trout returning to this drainage, resulting in data that are unreliable for determining population level.

The number of adult coastal cutthroat trout trapped at the North Fork Toutle River rose from 1988 until 1995 and has declined since (WDFW 2001c). The maximum number trapped reached 153 in 1995. This increase likely tracks the recovery of the population following the eruption of Mount St. Helens in 1980 and the resulting massive mud and debris flows in the Toutle River. The recent decline in numbers of coastal cutthroat trout counted is likely a result of the continued failure of the Fish Collection Facility to handle the high sediment loads still common in this system. The trap has been closed during fall freshets in recent years due to high sediment loads, coinciding with the upstream migration of anadromous cutthroat (WDFW 2001c). A third trap was added at the Grist Mill Fish Ladder on Cedar Creek in 1998. Because adult cutthroat trout may bypass the ladder, this count is an underestimate of actual population size. The numbers of fish captured at the Grist Mill Fish Ladder ranged from 57 to 120.

Of the nine adult traps with population data in southwest Washington and the Columbia River tributaries below Bonneville Dam, four have total annual counts below 10 coastal cutthroat trout in recent years. In at least one case (Kalama River trap), this may well be due to the inefficiency of the trap in collecting adult coastal cutthroat trout as described above. Five of these traps have counts (averaged for the last five years) of 50 to 1,400 adult cutthroat trout per year. These data indicate higher numbers than previously described and we no longer conclude that the annual number of adults returning to these traps in the DPS are consistently below 10 fish as described in the proposed rule (64 FR 16407).

Many juvenile fish traps are monitored in tributaries of Grays Harbor. While juvenile counts are less reliable indicators of population size than adult counts, they do provide some information on the level of production. Numbers of total juveniles produced are available from 21 traps in the Grays Harbor system, based on either total counts or estimates derived using trap efficiency data provided by the WDFW (2001). Total numbers of juveniles produced is likely affected by the amount of habitat available in the system, which varies widely. We attempted to correct for this by calculating the number of downstream migrants per square kilometer (km\2\) of watershed above the trap. The number of downstream migrants per km\2\ of watershed area in the Grays Harbor tributaries varied widely from 0.04 to 10.4 per km\2\ (0.1 to 26.8 per square mi (mi\2\)), with some watersheds producing large numbers of downstream migrants. The total estimated number of juveniles produced from Columbia River tributaries below Bonneville Dam were available from eight traps. The number of downstream migrants per km\2\ of watershed area varied from 0.5 to 38.4 per km\2\ (1.4 to 99.4 per mi\2\), with most watersheds producing more than 6 outmigrants per km\2\ (15 per mi^2).

Mongillo and Hallock (2001) conducted extensive surveys of 156 locations within the Washington portion of the DPS's range for abundance of coastal cutthroat trout. Data were collected by single-pass electrofishing, a method which likely underestimates the actual abundance, and included areas used by resident and anadromous coastal cutthroat trout. Additional data were presented by the WDFW (2001) for surveys conducted by Weyerhaeuser Company in 1994 and 1995 and from one study in the Humptulips Basin in the 1970s. The relative density for all locations below Bonneville Dam ranged from 0.009 to 0.222 fish per square meter (m^2) (0.09 to 2.4 per ft^2). These values were compared to population densities from the 1970s in the Olympic Peninsula and Puget Sound (0.009 to 0.384 fish per m^2 (0.09 to 4.1 per ft^2)), which were considered healthy (in terms of abundance) during that period (WDFW 2001c) and were not considered likely to be in danger of extinction in the foreseeable future by the Status Review Team (Johnson *et al.* 1999). Densities recorded in southwest Washington by Mongillo and Hallock (2001) were not significantly different from densities recorded in the 1970s from the Olympic Peninsula and Puget Sound.

Densities measured in Washington above Bonneville Dam were lower (0.0003 fish per m\2\ (0.003 per ft\2\)), based on coastal cutthroat trout caught at a single location in Spring Creek. Densities were calculated for all sites, whether or not cutthroat were located. The Oregon Department of Fish and Wildlife (ODFW) provided information on densities of coastal cutthroat over 85 mm in size in the Hood River above the area accessible to anadromous salmonids (ODFW 1998). While cutthroat trout were not detected in all streams sampled, cutthroat trout densities where present were relatively high, ranging from 0.003 to 0.283 fish per m\2\ (0.03 to 3.0 per ft\2\). The watersheds above Bonneville Dam are ecologically very different from the remainder of the subspecies' range. These include the only watersheds where this subspecies is found east of the Cascade Mountain Divide. This area experiences a very different hydrologic and climatic environment that may influence the densities of cutthroat.

The National Marine Fisheries Service (NMFS) Status Review (Johnson *et al.* 1999) also cited concern over ''* * * two near extinctions of anadromous runs in the Hood and Sandy Rivers'' (64 FR 16407). The Sandy River basin occupies 4 percent of the DPS's range. Data on adult cutthroat trout numbers are derived from a trap that is located on a tributary approximately 34 km (21 mi) from the mouth of the Sandy River and 3 km (2 mi) up Cedar Creek from its confluence with the Sandy River. This trap historically captured two to three dozen anadromous coastal cutthroat trout, though none have been captured in recent years (Johnson *et al.* 1999). Trap data from this off-channel location may not accurately represent the number of anadromous cutthroat in the Sandy River. As a substantial portion of the historic anadromous-accessible habitat in the Sandy River has been isolated by dams and other barriers, the number of anadromous coastal cutthroat trout is likely depressed from historic levels. However, it is difficult to extrapolate data from one trap located on a tributary to the main river to a meaningful estimate of the anadromous component of the population for the basin as a whole. Resident cutthroat trout are considered well-distributed in the Sandy River basin, occurring above and below Marmot and Little Sandy Dams (PGE 2000). Much of the upper Sandy River Basin is under Federal land management which minimizes future threats of habitat degradation that would cause population declines (see Federal Land Management Section below). We conclude that the anadromous portion of the population of coastal cutthroat trout in the Sandy River has declined from historic levels, though the limited data do not allow us to determine if they are nearly extinct in this small portion of the DPS, as described in the proposed rule. The resident portion of the population remains well distributed in the Sandy River.

Powerdale Dam, completed in 1922, lies 7.2 km (4.5 mi) up the Hood River from its confluence with the Columbia River. The area between the dam and the powerhouse (river mile (rmi) 1.5) was historically dewatered at times, though now has minimum required flows. The dam likely has affected the number of anadromous cutthroat trout using the Hood River, which comprises two percent of the DPS's range. Hood River lies upriver of Bonneville Pool and Dam, which may further impede anadromous cutthroat trout movements. Hood River lies near the eastern edge of the range of coastal cutthroat trout. No information is available as to anadromous cutthroat trout use and numbers prior to construction of Powerdale and Bonneville Dams, and only limited information exists on numbers in even recent times. Trap data from 1962 to 1971 shows variable, but significant numbers of adult cutthroat trout trapped (mean 61, range 8 to 177) followed by a gap in information until 1992. Very few adult fish have been trapped at the facility since 1992, with no fish captured in 6 of 10 years. However, in 2001, 11 adult coastal cutthroat trout returned to Powerdale Dam (Connolly *et al.* 2002). From 1994 to 1999, downstream smolt traps in the Hood River system continued to trap migrants, though at low numbers (mean of 24 fish). Given the location and long history of Powerdale Dam, it is not surprising that the anadromous portion of the population in Hood River is depressed. Resident forms within this system are in better condition, with relatively high densities (0.003 to 0.238 fish per m\2\ (0.03 to 2.56 fish per ft\2\) for fish greater than 85 mm (approximately 3 in) in length (ODFW 1998). We conclude that the anadromous portion the population of coastal cutthroat trout in the Hood River has declined severely from historic levels in this small portion of the DPS. The resident portion of the population remains well distributed at relatively high densities in the Hood River. Occasional upstream migrants continue to be trapped in some years, and in 2001, a total of 11 upstream migrants were captured (Connolly *et al.* 2002).

The proposed rule stated that NMFS was concerned about the extremely low population size of anadromous coastal cutthroat trout in lower Columbia River streams, indicated by low incidental catch of coastal cutthroat trout in salmon and steelhead recreational fisheries, and by low trap counts in a number of tributaries throughout the region and that numbers of adults returning to traps in the lower Columbia River tributaries were consistently below 10 fish in most streams over each of the past 6 years (64 FR 16407). Based on the information described in this section, we conclude that, while the anadromous portion of the population of coastal cutthroat trout is likely at lower-than-historic levels, there is little information available to determine the actual size of runs or to indicate that populations, or even the anadromous portion alone, are at extremely low levels in most areas of the DPS. The anadromous portion of the population may be at very low numbers in Hood and Sandy Rivers (6 percent of the DPS's range), though the location of the trap on the Sandy River makes it difficult to support the conclusion that anadromous coastal cutthroat trout are near extinction in this river as described in the proposed rule (64 FR 16407). Resident/freshwater forms remain well distributed and at reasonable densities in these same river systems. Coastal cutthroat trout in the southwest Washington portion of the DPS (75 percent of the land base) remain at comparable densities to other areas considered to have healthy-sized populations. Therefore, we conclude that the population of coastal cutthroat trout as a whole in the DPS is not extremely low in numbers or at levels that would lead to increased risk of extinction due to small population size in the foreseeable future.

Population Trends Across the DPS

The proposed rule stated that ''[t]rends in anadromous adults and outmigrating smolts in the southwestern Washington portion of this [DPS] are all declining'' (64 FR 16407) and that ''[r]eturns of both naturally and hatchery produced anadromous coastal cutthroat trout in almost all lower Columbia River streams have declined markedly over the last 10 to 15 years,'' with the only increase in the Toutle River (64 FR 16407).

During the public comment period we received new data from several of the fish traps operating in the DPS's range. Based on analyses of these new data, including further information on individual traps from WDFW (2001), we evaluated the trend in the population of coastal cutthroat trout in the DPS and the reliability of the trend information from each individual data set. Evaluating the reliability of the trend information is very important in determining the appropriate use of the information. The reliability of analyses in truly depicting any population trend could be affected by the collection method, length of data set, specific concerns for individual collection sites, and statistical reliability of the test results. In interpreting the results of the analyses, less weight was given to results with low statistical reliability, short data sets, and where the agency managing the trap/collection indicated specific problems that could bias or affect trend information.

Most information was collected in areas accessible to anadromous salmonids, incidental to studies for other salmonid species, using traps or collection facilities designed for other species. Information on the efficiency of these systems in detecting or collecting cutthroat trout is lacking. Therefore, these values do not represent the trends of all portions of the DPS. We carefully explored information on the individual traps or other information to ensure that potential biases that could affect use of these data as indices of population trend were minimized. Trends from short-term data sets are particularly suspect. There is naturally high variation in all adult and juvenile counts, with some apparent short-term cyclicity. The trend in a short data set is therefore more likely indicative of the particular time span of the data collection, and position in the ''cycle,'' than an indication of true long-term trend in the population. Only a few long-term data sets were available.

Data sets were analyzed for the percent annual decline using a regression of the natural log of the trap counts. Where data sets were longer than 11 years, analyses were conducted for entire data set (long term) and for the last 7 to 11 years (short term). These same methods were used by NMFS in the Status Review (Johnson *et al.* 1999). We used statistical analyses to determine the reliability of the observed trend. The accuracy of the observed trend is evaluated by the p value. A low p value indicates that the trend we calculated is likely to be an accurate representation of the true trend in the population. For example, a p value of 0.10 indicates a 90 percent probability that the observed trend is accurate, a p value of 0.5 indicates only a 50 percent probability that the observed trend is accurate. With regression statistics, we also report the r\2\ value which describes how well the straight trend line fits the observed population data. Low r\2\ values indicate that the straight trend line does not fit the data well and lowers our confidence that the observed trend accurately represents the true trend. Highly variable data often result in a low r\2\ value.

The proposed rule stated that ‘‘[t]rends in anadromous adults and outmigrating smolts in the southwestern Washington portion of this [DPS] are all declining’’ (64 FR 16407) and that ‘‘[r]eturns of both naturally and hatchery produced anadromous coastal cutthroat trout in almost all lower Columbia River streams have declined markedly over the last 10 to 15 years’’ (64 FR 16407). The latest trend data, as described below, do not support this conclusion.

Population Trends in Grays Harbor

Trends in the counts of adult coastal cutthroat trout migrants from the Grays Harbor portion of the DPS were analyzed from three available data sets. Data used in the Status Review (Johnson *et al.* 1999) indicated a declining trend for the West Fork Hoquiam River (5 percent annual decline, data through 1995). In the latest analysis there is no reliable indication of a trend, increasing or decreasing ($p = 0.44$, $r^2 = 0.05$) in the West Fork Hoquiam River. Adult migrant counts from Bingham Creek were not used in the Status Review's assessment (Johnson *et al.* 1999). Analysis of data from 1983 through 2001 show an increasing long-term trend (7 percent annual increase) that is considered relatively reliable, though the straight trend line does not fit the data well ($p = 0.05$, $r^2 = 0.2$). Additional hook and line data were available from a single individual who kept very accurate catch records over 15 years (WDFW 2001c). Such data can be biased by changes in the individual's skill and effort over time, however, these data do generally support the conclusion of an increasing trend (4 percent annual increase, p less than 0.01, $r^2 = 0.58$). WDFW also concluded, based on angler data, that the percentage of repeat spawners or larger fish in the population has also recently increased, indicating an improvement in population condition (WDFW 2001c). Based on analysis of data from the West Fork Hoquiam River, Bingham Creek, and the angler data, there is no evidence that the adult portion of the population in the Grays Harbor tributaries, which comprises 18 percent of the DPS, is declining over the long term as described in the proposed rule (64 FR 16407), and there is some indication that the adult portion of the population may be stable or increasing, at least in Bingham Creek.

Juvenile (downstream migrant) count data were available from many locations within the Grays Harbor portion of the DPS. Most of the trend analyses from these data sets are not reliable due to short time series or poor statistical results. Only the Stevens Creek data were considered relatively reliable (p less than 0.001, $r^2 = 0.67$). This population was declining at a rate of 15 percent per year as of 1994 (Johnson *et al.* 1999) and there were no additional data available for this trap. New data were available from the Chehalis River trap. Hatchery releases in this area have declined significantly and no hatchery marked coastal cutthroat trout have been recorded at the trap in recent years. The number of total coastal cutthroat trout caught at the trap appears to have declined in recent years (11 percent annual decline, $p = 0.18$, $r^2 = 0.19$). However, when only unmarked (*i.e.,* naturally spawned) coastal cutthroat trout were counted, the number of fish counted appears to have increased over the long term (10 percent annual increase, $p = 0.18$, $r^2 = 0.14$). Given the moderate p values and poor r^2 values, these data have relatively poor reliability. Therefore, the Chehalis River trap provides no strong evidence of either a long-term positive or negative population trend.

Population Trends in the Columbia River and Tributaries

Trends in the numbers of migratory adult coastal cutthroat trout returning to traps in the lower Columbia River portion of the DPS were analyzed on five available data sets discussed below. These analyses provide some indication of decline in the numbers of adult anadromous coastal cutthroat trout, though there are concerns about the reliability and confidence in the magnitude of these trends for most of the data sets. These concerns are poor statistical reliability, lack of trap efficiency data, and consistency problems that likely bias the results. No data exist specific to trends in the resident portion of coastal cutthroat trout population in the DPS.

Two of the five data sets were from a limited time period and not considered reliable indicators of trend. In addition, the North Fork Toutle River trap was considered unreliable for determining trend due to recent continued failure of the Fish Collection Facility leading to closures coinciding with the upstream migration of anadromous cutthroat trout (WDFW 2001c). Trends for wild fish returns for the Elochoman River trap were difficult to fully analyze due to a significant gap in the data. There are only seven years of data following this gap, ending in 1995 when trapping was discontinued.

The Kalama River trap has detected low numbers of coastal cutthroat trout in all but four years since 1982. The Kalama River basin occupies 1.5 percent of the DPS's range. This trap is located above the traditional anadromous cutthroat trout zone, in an area blocked to upstream passage until a ladder was built at the falls in 1936. The trap is designed for adult salmon with a 3.8 cm (1.5 in) bar spacing. According to WDFW, most adult sea-run cutthroat trout would pass through undetected (WDFW 2001c). While these factors may affect total counts at this location, it is still potentially usable for trend analyses. The data indicate a long-term declining trend (10 percent annual decline, p less than 0.001, $r^2 = 0.62$). WDFW (2000) noted that after a sharp decline in the mid-1980s, counts at the Kalama facility have been low and stable, though our analysis of data since 1987 indicates that the number of cutthroat trapped has continued to decline at a similar rate.

Creel census data for coastal cutthroat trout from the lower Columbia River were collected incidentally to studies of salmon and steelhead fisheries, and no data were collected on angler effort for coastal cutthroat trout. Based on the latest creel census data, there is an indication of an 18 percent annual rate of decline over the long term. The number of cutthroat trout recorded in the creel surveys for the lower Columbia River, and thus the calculated trend, is likely to be strongly influenced by the change in cutthroat trout fishing regulations during this period (WDFW 2001c) with a decrease in limits and an increase in minimum size (see Population Size section), as well as changes in salmon and steelhead fisheries. The lack of angler effort data make it impossible to determine if the decline in creel census numbers is the result of declining populations or declining effort. Creel census personnel have noted reduced angler effort in traditional cutthroat trout areas and fewer anglers using traditional sea-run cutthroat trout gear (WDFW 2001c). The change in regulations likely changed fishing behavior, reducing the angler effort. With reduced effort, we would expect a lower catch and therefore the appearance of a decline. While it is likely that there has been some decline in the number of adult anadromous cutthroat trout, it is impossible to determine the rate of decline with any certainty in the absence of data on angling effort (WDFW 2001c). Given the lack of angler effort with which to standardize the counts, we can no longer conclude that the creel census data indicates a specific level of decline in the anadromous portion of the cutthroat trout DPS as described in the proposed rule (64 FR 16397).

The NMFS Status Review also cited concern relative to two near extinctions of anadromous runs in the Hood and Sandy Rivers (6 percent of the DPS's range) (see Population Size section). There has been a decline in the number of anadromous cutthroat caught at the trap in the Sandy River, though it is difficult to extrapolate data from one trap located on a tributary to the main river to a meaningful population trend in this system. Captures have been very low at Powerdale Dam on the Hood River (see Population Size section). The data were insufficient to conduct any meaningful trend analysis. Given the long history of this dam, it is not surprising that the anadromous portion of the population in Hood River is severely depressed. The resident portion of the population within this system is in better condition, with relatively high densities (ODFW 1998), though no trend data exist for this portion of the population.

Data were available for the smolt to adult return rate at the Cowlitz River Hatchery. These rates have declined in the long-term (19 years) (6 percent decline per year, $p = 0.01$, $r^2 = 0.34$). In the short term (11 years), the data do not reliably show an increasing or decreasing trend ($p = 0.46$, $r^2 = 0.06$). The last return rate (1998 juveniles) was 4.1 percent, the highest value since 1988. These data are based on hatchery fish and likely underestimate natural survival rates of cutthroat in this system because of the higher levels of survival of wild over hatchery produced salmonids (Chilcote in prep).

Data on population trends for juveniles (downstream migrants) were very limited. Most data sets were short and trend could not be determined with any certainty. Trends varied from weak increases to weak declines. The Status Review noted a 16 percent decline in smolt abundance in the Kalama River. This was based on data from 7 years (1978–1984) followed by a gap of 8 years and 3 years of additional data (1992–1994). The gap and short nature of the end portion of the data make it difficult to interpret a reliable rate of decline.

Summary of Trend Analysis

Based on the above information, population trends of the DPS appear more variable than previously thought. The proposed rule stated that ''[t]rends in anadromous adults and outmigrating smolts in the southwestern Washington portion of this [DPS] are all declining'' (64 FR 16407). Based on the latest information, there is no reliable evidence that the adult population in the Grays Harbor tributaries is declining over the long term and some indication that the adult population may be stable or increasing in at least some areas. There is an indication from a single trap that juvenile outmigration may be declining, though we lack data for the past seven years. Therefore, we no longer conclude that trends of the adult anadromous portion of the population and outmigrating juveniles in the southwest Washington portion of the DPS are all declining markedly as described in the proposed rule (64 FR 16407).

The proposed rule stated that ''[r]eturns of both naturally and hatchery produced anadromous coastal cutthroat trout in almost all lower Columbia River streams have declined markedly over the last 10 to 15 years,'' with the only increase in the Toutle River (64 FR 16407). The petition to list sea-run cutthroat trout (ONRC 1998) stated that ''[i]f angler catch truly mirrors run size, * * * then the latest surveys suggest a decline of close to 99 percent in sea-run cutthroat trout numbers from historical levels in the lower Columbia River and its tributaries.'' As described above, due to changes in regulations and the lack of angler effort data, we conclude that angler catch data for the lower Columbia River is likely not a true representation of run size. Data for the lower Columbia River are limited and there are significant concerns about the reliability of the results. There are indications of declines in the anadromous component of the adult portion of the population in the Columbia River, though the rate of the decline is uncertain due to concerns over the reliability of the analyses and potential biases in the data sets. While the number of anadromous coastal cutthroat trout have likely declined in the Columbia River, we do not have sufficient data to determine a reliable rate of recent decline and, therefore, no longer conclude that returns of anadromous cutthroat trout in almost all lower Columbia River streams have ''declined markedly over the last 10 to 15 years'' as described in the proposed rule (64 FR 16407). There is little information on population trends for resident or freshwater forms of cutthroat trout in the DPS, though populations in the Washington portion of the DPS appear to remain at levels comparable to healthy-sized populations, indicating that large-scale, long-term declines have not occurred at a landscape level. Based on these data, we do not find that the population trends indicate that coastal cutthroat trout are likely to be extirpated from any significant portion of their range in the foreseeable future.

Life History Diversity

The proposed rule stated that ''[a] significant risk factor for coastal cutthroat trout in this [DPS] was a reduction of life-history diversity'' (64 FR 16407), based on serious declines in anadromous life history forms and near extirpation in at least two rivers on the Oregon side of the basin. The proposed rule does acknowledge that freshwater forms remained well distributed and in relative high abundance (64 FR 16407). The proposed rule indicated that habitat degradation in stream reaches accessible to anadromous cutthroat trout, and poor ocean and estuarine conditions, likely have combined to severely deplete the anadromous life history form throughout the lower Columbia River Basin. Finally, the proposed rule further stated that ''Reduced abundance in anadromous fish will tend to restrict connectivity of populations in different watersheds, which can increase genetic and demographic risks. * * * The significance of this reduction in life-history diversity to the [*sic*] both the integrity and the likelihood of this [DPS's] long-term persistence is a major concern to NMFS'' (64 FR 16407).

ODFW and WDFW presented preliminary evidence to the Status Review team that freshwater cutthroat trout could produce anadromous migrants, which could mitigate risks to the anadromous portion of the population. The proposed rule did note that the presence of well distributed freshwater forms in relatively high abundance, coupled with the possibility that freshwater forms could produce anadromous progeny ''* * * could act to mitigate risk to anadromous forms of coastal cutthroat trout,'' though the observation that sea-run coastal cutthroat trout population sizes remained consistently low remained a cause for concern (64 FR 16407).

Anadromous cutthroat trout, particularly in the lower Columbia River, are the most negatively affected portion of the DPS. The degree to which the reduced numbers of the anadromous portion of the population of coastal cutthroat trout represent a risk to the DPS as a whole depends, in part, on the importance of this life history strategy and the extent to which the expression of life history strategies are genetically versus environmentally controlled.

The anadromous life history strategy is likely important to the DPS for genetic mixing in the long-term and for potential recolonization after catastrophic events. Genetic exchange can be important in evolutionary time scales to maintain diversity within populations, but requires that only a few individuals interbreed successfully over time. The Pacific Northwest is subject to periodic catastrophic events such as volcanic eruptions and stand replacement fires that can seriously depress, and even extirpate, local populations. These types of events occur on very long time scales and at watershed or sub-basin scales. Anadromous cutthroat represent one possible source of individuals for recolonization, the other being resident cutthroat trout above or outside the area of the catastrophic event. The ability of anadromous cutthroat trout to recolonize is limited by barriers and they cannot provide rescue to populations above large, natural barriers.

The extent to which each life history expression is partitioned or isolated among and within populations is largely unknown, though there is growing evidence that individuals may express multiple life history behaviors over time (Johnson *et al.* 1999). Coastal cutthroat trout that were believed to be freshwater forms one year may migrate to the sea another year; some individuals may not make their initial migration to sea until age six (Sumner 1962, Geiger 1972). Some sea-run cutthroat trout may not enter saltwater every year after their initial seaward migration (Tomasson 1978).

Both ODFW (1998) and WDFW (2001) presented information showing evidence of production of anadromous progeny by freshwater resident cutthroat trout. Studies of brown trout have demonstrated that non-anadromous adults can produce anadromous offspring, though at lower levels than anadromous adults. For other salmonids with multiple life history forms, Jonsson and Jonsson (1993) suggested that in a single mating, parents may produce offspring with different migratory strategies, though this has not been confirmed experimentally for coastal cutthroat trout (Johnson *et al.* 1999).

WDFW (2001) provided additional information on the production of downstream migrants by cutthroat trout entrained above dams on the Cowlitz River. A downstream migrant trap at Mayfield Dam recorded between 60 and 812 migrants per year from 1978 to 1999. There was a single release of hatchery-derived anadromous cutthroat trout above Mayfield Dam in 1981, but all cutthroat trout currently above the dam are considered to be freshwater forms (WDFW 2001c). Mayfield Dam was built in 1962, blocking upstream migration. WDFW has marked coastal cutthroat trout smolts produced by upstream freshwater fish at Cowlitz Falls, which lies above Mayfield Dam. Two adults returned from smolts tagged in 1997, one of which was sacrificed and microchemistry results confirmed it had migrated to salt water and returned. Eight fish from smolts tagged returned in 1998. While this portion of the DPS may contain residualized anadromous cutthroat trout trapped behind the dam, it has continued to produce downstream migrants for over 40 years (more than 10 generations). These results are consistent with the hypothesis that resident fish in anadromous fish zones are capable of producing migratory juveniles (*i.e.,* smolts) and ''sea-run'' adults.

The few existing studies show that, although both allele frequencies and morphology may differ between populations above barriers and populations below barriers with access to the sea, these different life history forms are generally more closely related within a drainage than are populations from different drainages (Behnke 1997, Johnson *et al.* 1999). These results indicate that the migratory and non-migratory portions of the population of cutthroat trout represent a single evolutionary lineage in which the various life history characteristics have arisen repeatedly in different geographic regions. These relationships for coastal cutthroat trout are similar to those for other salmonid fishes, particularly sockeye salmon (*Oncorhynchus nerka*) and its non-anadromous form, kokanee.

NMFS (Johnson *et al.* 1999) acknowledged that if freshwater coastal cutthroat trout can produce smolts, this could mitigate the risks to the anadromous portion of the population, though at the time they lacked information on the length of isolation of populations above Mayfield Dam to fully evaluate this phenomenon. They did note that even if smolts were being produced, the anadromous portion of the population remains consistently low in many areas which is cause for concern. Coastal cutthroat trout above Mayfield Dam have been isolated for over 40 years, representing many generations, and continue to produce appreciable numbers of downstream migrants. The fact that they continue to produce smolts after long isolation suggests that even if the anadromous portion of the population continues to experience low number and declines, smolts will be produced that can supplement the anadromous portion of the population and take advantage of any improvement in anadromous habitat (*e.g.*, ocean, estuary, mainstem rivers). In addition, there is no evidence at this time that coastal cutthroat trout pursuing the anadromous life history strategy are segregated from the remainder of the population. In fact, studies show that individuals above barriers and below barriers with access to the sea are more closely related within a drainage than are individuals from different drainages (Behnke 1997, Johnson *et al.* 1999). This further supports the conclusion that anadromous and non-anadromous individuals are not substantially separate subpopulations. Therefore, based on the evidence that freshwater and isolated portions of the population are capable of producing anadromous migrants, we now conclude that freshwater and isolated portions of the coastal cutthroat trout population are mitigating risks to anadromous forms to some degree. The ability for non-anadromous cutthroat trout to produce anadromous progeny reduces the risk of loss of the anadromous life history strategy in the foreseeable future.

Distinct Population Segment

The analysis for this listing determination is based on the DPS as described in the April 5, 1999, **Federal Register** proposed rule (64 FR 16397). In that proposed rule, the DPS was defined to include naturally spawned cutthroat trout below long-standing, naturally-impassable barriers. However, at that time we indicated that, prior to the final listing, we would examine the relationship between hatchery and naturally spawned cutthroat trout, and cutthroat trout above barriers to assess whether any of these populations warrant inclusion in the DPS. In the proposed rule, we indicated that this could result in the inclusion of specific hatchery populations or populations above barriers as part of the DPS.

Only one coastal cutthroat trout hatchery remains active in the DPS's range, the Cowlitz River Hatchery. We examined the relationship between this hatchery and unmarked fish from the DPS. Genetically, the remaining hatchery population appears more similar to other populations within the DPS than to populations from outside the DPS (Johnson *et al.* 1999). Stock for this hatchery came initially from the now closed Beaver Creek Hatchery, which in turn was initiated using a mixed stock of fish from within the DPS (Crawford 1979). We have no information that would lead us to exclude the Cowlitz River Hatchery stock from the DPS at this time. Therefore, all further analyses were conducted including the Cowlitz River Hatchery stock.

As described in the proposed rule, we indicated that populations above barriers that permit some one-way migration should generally be included in the DPS. Populations above such barriers may contribute demographically and genetically to populations below barriers. The genetic similarity observed between populations above and below barriers supports this interpretation (Johnson *et al.* 1999). Few, if any, natural barriers prevent some one-way migration. Therefore, we have included all above-barrier populations as part of the DPS for the following analysis. Therefore, the DPS analyzed in this listing determination includes all coastal cutthroat trout, whether naturally spawned, from hatcheries, or above barriers, within the area described above.

Previous Federal Actions

NMFS published a Status Review of coastal cutthroat trout in Washington, Oregon, and California in January 1999. On April 5, 1999, NMFS and the Service published a proposed rule in the **Federal Register** (64 FR 16397) proposing to list the coastal cutthroat trout population in southwestern Washington and the Columbia River, excluding the Willamette River above Willamette Falls, as threatened pursuant to the Endangered Species Act of 1973 (Act). We published a document in the **Federal Register** (65 FR 20123) on April 14, 2000, extending the deadline from April 5, 2000, to October 5, 2000 for the final action on the proposed rule to list this population in Washington and Oregon, and to provide a 30-day comment period. On April 21, 2000, NMFS and the Service published a notice of our assumption of jurisdiction for coastal cutthroat trout. We published a document on June 2, 2000 (65 FR 35315), reopening the public comment period and announcing a public hearing in Illwaco, WA, on June 20, 2000. On July 14, 2000, we published a proposed rule in the **Federal Register** (65 FR 43730) to clarify the take prohibitions for coastal cutthroat trout and provide for a 30-day public comment period. This proposed rule was necessary to answer questions we had received regarding the application of the take prohibitions of section 9 of the Act to the proposed listing of the coastal cutthroat trout as threatened. The comment period was again reopened September 6, 2000 (65 FR 53974), and a hearing was held September 21, 2000, in Aberdeen, WA, based on a request during the public comment period. In November 2000, we suspended work on the proposed listing of the coastal cutthroat trout due to budgetary limitations. On August 29, 2001, we issued a press release announcing that, as part of a settlement agreement with conservation groups, we would commence work on the final listing decision for the Southwestern Washington/Columbia River coastal cutthroat trout DPS (*Center for Biological Diversity, et al.* v. *Norton*, Civ. No. 01–2063 (JR) (D.D.C.)). This was followed by another proposed rule announcing an additional 30-day comment period, published in the **Federal Register** (66 FR 58706) on November 23, 2001. We requested any new information related to the status and biology of the coastal cutthroat trout population in southwestern Washington and the Columbia River, any threats to the species, and any efforts being made to protect native, naturally reproducing populations.

Summary of Comments and Recommendations

In the April 5, 1999, proposed rule and associated notifications, all interested parties were requested to submit factual reports or information that might contribute to the development of a final rule. Additional requests for public comment were published on April 14, 2000 (65 FR 20123); July 14, 2000 (65 FR 43730); September 6, 2000 (65 FR 53974); and November 23, 2001 (66 FR 58706). Appropriate Federal and State agencies, county governments, scientific organizations, and other interested parties were contacted and requested to comment. During the five open comment periods, a total of 127 comments were received from 96 different government agencies, organizations, or individuals, including oral testimony at the four hearings held during the process. Many government agencies, organizations, and individuals provided comments during more than one public comment period or hearing.

Issue 1: Several commenters stated that coastal cutthroat trout should not be listed as a DPS, but should be considered for listing at the subspecies levels and then only if it is reasonably certain that it constitutes a separate subspecies based on significant characteristics.

Service Response: The Act defines species as ''any species of fish or wildlife or plants, and any DPS of any species of vertebrate fish or wildlife that interbreeds when mature.'' 16 U.S.C. 1532(15). A DPS is a population of a vertebrate species that is distinct from, and significant to, the remainder of the species or subspecies to which it belongs (61 FR 4721). This definition specifically allows for the recognition of DPSs at levels below taxonomically recognized species or subspecies. The coastal cutthroat trout is a recognized subspecies of cutthroat trout (Behnke 1992).

Issue 2: Two commenters suggested that all life history forms, including populations above long-standing, naturally-impassable barriers should be included in the DPS. Two commenters suggested that resident coastal cutthroat trout may contribute to anadromous smolt production, supporting the inclusion of resident fish in the DPS.

Service Response: We fully evaluated information on the relationship between populations above and below long-standing, naturally-impassable barriers and agree with the commenters (see Distinct Population Segment section). Based on the latest information provided by WDFW (2001), we concur that there are data showing that cutthroat trout above long-standing barriers produce offspring that migrate to the estuary or ocean and return. We have considered this information fully in the Life History Diversity section above. We have included all life history forms and populations above long-standing, naturally-impassable barriers in the final analysis of the DPS.

Issue 3: One commenter questioned the delineation of the DPS, suggesting that observed minor differences in genetic makeup, life history, phenotypic traits, and habitat characteristics did not support multiple DPSs for coastal cutthroat trout. Several commenters suggested the DPS did not meet the requirement for discreteness from other populations beyond the DPS.

Service Response: DPSs of vertebrate populations may be listed under the Act if they satisfy the following two elements: (1) discreteness of the population segment in relation to the remainder of the species or subspecies to which it belongs; and (2) significance of the population segment to the species or subspecies to which it belongs (61 FR 4721).

To be considered discrete, a DPS must be markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors. Quantitative measures of genetic or morphological discontinuity may provide evidence of this separation. Genetic tests of samples from coastal cutthroat trout in the DPS show that populations within the DPS are more closely related to each other than to populations in adjacent areas. This indicates some level of reproductive isolation. As it only requires interbreeding of a few individuals between populations to effectively keep the population genetics from diverging significantly, the differences described in the Status Review (Johnson *et al.* 1999) demonstrate marked separation of the coastal cutthroat trout in the DPS from other adjacent areas.

The second requirement for DPS status is the biological and ecological significance of the population to the subspecies. Significance includes, but is not limited to the following: (1) persistence of the DPS in an ecological setting unusual or unique for the taxon; (2) evidence that loss of the discrete population segment would result in a significant gap in the range of a taxon; or (3) evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics (61 FR 4721). The DPS has unique ecological characteristics that distinguish it from other portions of the range. The DPS occupies aquatic systems that feed three large estuaries with extensive intertidal mud and sandflats, very different from estuaries north and south of the DPS. Loss of coastal cutthroat in the DPS would result in a significant gap in the range of the taxon. Populations may be reproductively isolated because of limited migratory range and timing. The loss of these populations would negatively affect the genetic resources of coastal cutthroat.

Based on a review of available information, we concluded that the DPS meets the criteria for discreteness and significance. Available data demonstrate that both environmental and genetic factors indicate that the DPS is different from other populations of coastal cutthroat trout. Further, we concluded that the available information supports the conclusion that the southwest Washington/Columbia River DPS of coastal cutthroat is biologically and ecologically significant to the subspecies.

Issue 4: Several commenters recommended splitting the DPS into smaller segments. Most commenters suggested separating the Grays Harbor/ Willapa Bay area from the Columbia River because of physical, geographic, and/or biological isolating mechanisms. One commenter provided an alternative genetic analysis that indicated the DPS should be split into three separate DPSs.

Service Response: There are significant ecological and genetic similarities between the Columbia River, Willapa Bay, and Grays Harbor portions of the DPS. All three occupy large estuary systems. One commenter pointed to the relatively long distances between the Willapa Bay and Columbia River tributaries (approximately 80 km (50 mi)), and the fact that coastal cutthroat trout are not thought to cross large open water as potential isolating factors that would support smaller DPSs. However, the same commenter did provide evidence that isolation between Grays Harbor, Willapa Bay and/or Lower Columbia coastal cutthroat is not complete, because hatchery marked coastal cutthroat are frequently observed at Willapa Bay salmon hatcheries. WDFW (2000) suggested that the hatchery marked fish originated from either Lower Columbia River or Grays Harbor because there were no hatchery plants of coastal cutthroat in Willapa Bay during this time period. Therefore, we conclude that the distance between Willapa Bay and Columbia River coastal cutthroat trout populations would not prevent anadromous cutthroat from interacting across these systems.

The alternative genetic analysis presented by WDFW (2001) actually revealed a slightly higher genetic similarity between Willapa Bay and Lower Columbia River populations than between the former populations and Grays Harbor. We agree that populations of coastal cutthroat trout in the DPS appear to be substructured according to major geographic areas. However, the magnitude of this substructuring, relative to the amount of genetic divergence among the six DPSs identified by NMFS (Johnson *et al.* 1999), does not warrant further partitioning into two or more separate DPSs. WDFW also presented observed differences regarding life history characteristics of juvenile anadromous coastal cutthroat (smoltification age) comparing a single stream in the Columbia River portion to a combined data set from three streams in Willapa Bay. While there were differences in the percentage of individuals making their first marine migration at age two (86 versus 61 percent), this may well be evidence of minor local adaptations to the specific conditions in these few individual streams. Without a more extensive study, it is impossible to determine if this difference is indicative of these portions of the DPS.

Based on the latest information, we conclude that the DPS as defined in the proposed rule (64 FR 16397) meets the requirements of a DPS, and that alternative smaller DPSs are not supported by the information available at this time.

Issue 5: Several commenters questioned the analysis and interpretation of genetic data based on sample size, limited collection period, lack of information on the resident portion of the population in the analysis, treatment of outliers and hybrids, analysis procedures (*e.g.,* measures of genetic distance), presence of hatchery and mixed origin stocks in the samples, and the potential effect of hatchery stock on local population genetics. WDFW provided an alternative analysis and conclusion of the genetic information.

Service Response: The principal purpose of genetic analyses for Endangered Species Act evaluations is to understand the magnitude of genetic diversity among populations throughout the range of the species considered for listing under the Act. The goal of such evaluations is not to identify every genetically isolated (or diverged) population, but rather to identify geographic subsets of the species conforming to the definition of a DPS (61 FR 4721). The pattern of genetic diversity throughout the range of the species is evaluated geographically to identify potential subsets for further evaluation as DPSs.

In the genetic analysis, Johnson *et al.* (1999) excluded some outlier populations from the statistical analysis. None of the populations within the DPS were excluded. Most of the excluded populations were from the Upper Willamette DPS, and only one was from an adjacent DPS with anadromous components. Therefore, the exclusion of outlier populations is unlikely to have significantly affected the interpretation of the genetic information relative to the DPS.

We recognize that exclusion of ''hybrids'' from the population genetic analyses conducted by the Status Review Team may be more problematic. NMFS used a qualitative, genotypic approach in their genetic analyses to classify each individual fish as either a cutthroat trout, a rainbow/steelhead trout, or a ''hybrid'' (Johnson *et al.* 1999). It is necessary to remove hybrids to accurately analyze regional genetic patterns for coastal cutthroat trout, especially where hybrids are common. We are currently re-analyzing the data with a more quantitative approach based on multivariate statistical analyses. These analyses are not yet complete, but preliminary analyses indicate that the quantitative and qualitative approaches are classifying most individuals consistently.

Issue 6: Several commenters reported that coastal cutthroat (especially resident forms) are distributed throughout the DPS and are locally abundant in most areas.

Service Response: Since obtaining sole jurisdiction for this subspecies (64 FR 21376), we have assembled an extensive database regarding distribution (presence) of coastal cutthroat in the DPS. For example, in Washington, we have documented that coastal cutthroat occur in over 1,300 locations within the DPS. This data set includes the year 2001 sampling effort conducted by WDFW in Lower Columbia River streams. With this new distribution information, we now have a high degree of certainty that this subspecies is well distributed throughout suitable habitats in the DPS. From these data, it is now apparent that the historical distribution of coastal cutthroat has not contracted appreciably in the DPS (see Range and Distribution section below).

Issue 7: Several commenters suggested that the biological information presented in the Status Review and proposed rule was not adequate to proceed with a final listing. Several commenters requested that we extend the time for the decision on the proposed rule to list, in part to better assess or gather additional biological information.

Service Response: We are fully aware of limited data available for the coastal cutthroat trout in the DPS. The proposed rule (64 FR 16397) specifically addressed this issue in a section entitled, Data Limitations and Scientific Uncertainty. In the proposed rule and subsequent **Federal Register** proposed rules, we specifically requested additional information to aid us in acquiring the best scientific and commercial data available. In 2001, WDFW biologists, with some funding from the Service, sampled over 130 locations to determine presence/absence and relative abundance of coastal cutthroat in Lower Columbia River tributaries. They also compiled other fish survey data sets from the year 2000 to increase the sample size to over 150 locations. The data collected from these surveys were extremely valuable in assessing presence/absence and relative abundance, and in the analysis of the five threat factors for much of the DPS. In 2001 we also funded a study that helped resolve issues of hybridization with rainbow/steelhead trout in Washington. We have made every effort to gather all available information to complete this listing determination.

The Act requires us to complete a final listing decision within one year of the publication of a proposed listing, though it does allow for an extension of not more than six months if there is ‘‘ * * * substantial disagreement among scientists knowledgeable about the species concerned regarding the sufficiency or accuracy of the available data relevant to the determination concerned* * *.’’ On April 14, 2000, we invoked this provision to help resolve substantial scientific disagreement concerning above-barrier coastal cutthroat and hatchery populations of coastal cutthroat (65 FR 20123). In addition, the current listing decision is part of a settlement agreement with conservation groups that requires the final listing decision by June 23, 2002. Therefore, we are using the best available scientific and commercial information to reach a listing decision, as required by the Act, and by the court agreed deadline.

The Act requires that listing determinations be based on the best available commercial and scientific information. We have received new information since the proposed listing specific to coastal cutthroat trout in the DPS. While information on this species is not as rigorous and complete as is available for some other salmonids, we believe we have sufficient information and evidence to support a final listing determination at this time.

Issue 8: Several commenters requested that we provide specific numeric values for distribution and population thresholds. They stated that these values were essential to determine threatened status and future recovery for this subspecies.

Service Response: Distribution and population levels were evaluated in determining the status of the species in the context of the historic condition of the DPS, rather than in the context of predetermined specific numerical thresholds. We did not find any significant change in distribution of coastal cutthroat trout in this DPS. As with most species, actual population numbers were not available for most of the DPS. Indices of population levels and trends were used to evaluate these aspects of the DPS and are described in the Population Size section above. Perhaps of more value in determining current condition and threats to the DPS than actual numbers are the trends in these index values and in potential threats to the DPS, which were also used in this determination and described in the Population Trend section above.

Issue 9: One commenter suggested that because resident cutthroat trout populations are generally healthy-sized, one could conclude that human and natural factors resulting in adverse marine conditions, rather than freshwater conditions, are the cause of declines in anadromous forms.

Service Response: We agree that the latest information indicates that the resident portion of the population exists in range and densities comparable to populations that are thought to be healthy-sized outside the DPS. However, this does not prove that freshwater conditions have not contributed to declines in the anadromous portions of the coastal cutthroat trout population. Conditions in spawning areas used by anadromous individuals and barriers to historic anadromous spawning areas likely contributed to declines, as have changes in the migration corridors (large rivers), estuaries, and marine conditions.

Issue 10: Several commenters described the impact of continued effects of logging to coastal cutthroat trout populations, including effects on large woody debris availability, increased disease, altered timing of juvenile migrations, increased predation, smothering of eggs and fry in gravels, and adverse effects to benthic (bottom dwelling) invertebrates that provide food for cutthroat trout.

Service Response: We agree that logging activities may have adverse effects on coastal cutthroat trout and have fully evaluated the past, current, and future threats from these activities. Our analysis is described in the Forest Management section below. The completion of two large-scale forest HCPs and Washington Forest Practices Regulations have significantly reduced the threats to coastal cutthroat trout from logging in the DPS. Collectively, remnant high quality habitat, ongoing forest recovery, active efforts to identify and correct legacies of past management, improved standards for future management actions, and the ability of coastal cutthroat trout to survive for long periods in degraded aquatic and riparian systems provide the basis for maintenance of habitat for the DPS of coastal cutthroat trout. Therefore, forest management is not likely to result in the DPS of coastal cutthroat trout becoming endangered in the foreseeable future.

Issue 11: One commenter expressed concern about the potential impacts of municipal discharges and its impact to water quality; instream and adjacent gravel pit operations and its effects on spawning gravels; water withdrawals reducing flows at critical periods; sedimentation as a result of road building near spawning beds; and development resulting in reduced riparian zones. Another commenter pointed out the potential effects of agriculture and urban/rural development on habitat conditions for coastal cutthroat trout.

Service Response: We agree that all of these activities may adversely affect coastal cutthroat trout. We have fully evaluated the past, current, and future threats from these activities (Agriculture and Grazing Management, Mining, and Urban and Industrial Development sections below). While these activities have affected aquatic and riparian conditions in the DPS's range, they are generally localized in impact and do not affect the majority of the DPS. Under current regulations, continued impacts from these activities are not likely to lead to the endangerment of the coastal cutthroat trout in the foreseeable future.

Issue 12: Several commenters described the potential effects of barriers (dams and culverts) to anadromous cutthroat trout, including blockage of historic habitat and significant declines in all major tributaries above dams, with the likely extinction of populations in the Wind and Klickitat Rivers. One commenter pointed out that coastal cutthroat trout have generally not been included in the trucking efforts for other salmonids, increasing the impact of barriers to these fish.

Service Response: We agree that barriers can adversely affect migratory coastal cutthroat trout (see Dams and Barriers section below). Existing dams block upstream access in several portions of the DPS's range. The anadromous portion of the population is most likely affected by these large dams, while resident and some freshwater migratory portions are likely little affected as their habitat remains substantially intact above dams and diversions. Culverts are the most widespread potential barriers to upstream migration. Again, anadromous and migratory portions of the coastal cutthroat trout population are the most likely affected by these barriers, while the resident portion of the population likely remains extant above most barriers. Blockage of upstream migration is not likely to increase given current regulations, and some improvements are likely through dam removal and culvert improvements. Despite existing barriers, coastal cutthroat trout remain well distributed throughout the DPS's range and at levels apparently comparable to healthy-sized populations in many areas. Based on the current and likely future effects, existing dams and other barriers are not likely to result in endangerment of the DPS of coastal cutthroat trout in the foreseeable future.

Issue 13: Two commenters indicated that fishing pressure for anadromous coastal cutthroat has decreased under the current restricted regulations. Another commenter indicated that hooking mortality from steelhead and salmon fishing is a threat to coastal cutthroat trout.

Service Response: We are aware that increasing restrictions of harvest for coastal cutthroat trout in the DPS have likely decreased angler effort, in turn reducing direct and indirect mortality of coastal cutthroat trout in the DPS. Information obtained during the public comment periods supports the observation that angler effort has decreased over time (see Overutilization for Commercial, Recreational, Scientific, or Educational Purposes section below). We are aware that coastal cutthroat trout are susceptible to hook and handling mortality. While there are no studies that have specifically evaluated the hooking mortality from bycatch of cutthroat trout in steelhead and salmon fisheries, we anticipate that mortality from this bycatch would generally be small because of differences in the gear used and timing of these fisheries.

Issue 14: Several commenters expressed concern about the potential effects of the introduction of non-native predators, including brook trout (*Salvelinus fontinalis*), shad (*Alosa sapidissima*), largemouth bass (*Micropterus dolomieui*), smallmouth bass (*Micropterus salmoides*), and walleye (*Stizostedion vitreum*). Several commenters were also concerned about the potential effects of competition from hatchery-stocked cutthroat trout, coho, and steelhead; hybrid cutthroat/steelhead; and introduced non-native fish.

Service Response: We agree that introduced predators or competitors can adversely affect coastal cutthroat trout (see Disease and Predation section below). Some of the non-native fish species listed by the commenters are known to prey on, or compete with, salmonids in the DPS's range (Poe *et al.* 1994). However, no specific information exists regarding predation impacts by introduced predatory fishes on coastal cutthroat trout and we have no evidence that introduced predators represent a major threat to the DPS of coastal cutthroat trout at this time.

We agree that competition with hatchery salmonids or non-native fish could adversely affect cutthroat trout (see Disease and predation, Hatchery management, and Other Factors sections below). Only one hatchery still produces and stocks cutthroat trout within the DPS's range. This hatchery produces anadromous cutthroat trout in a system with several barrier dams that have reduced natural access to historic freshwater habitat for anadromous cutthroat trout which is considered part of the DPS. Hatchery steelhead and coho are stocked in several streams in the DPS's range. Cutthroat trout and coho are naturally sympatric and have likely evolved mechanisms to coexist. However, release of hatchery-raised steelhead and coho could affect cutthroat trout in localized areas, depending on the location and magnitude of the releases. Releases in areas outside of historic coho habitat or in numbers that greatly exceed natural levels could have negative effects on cutthroat trout in the area of the release. However, information demonstrating effects to the DPS from coho releases is limited and the extent to which hatchery management affects coastal cutthroat as a whole is uncertain.

Interactions with hybrid steelhead/cutthroat trout are likely limited. Hybrid fish are no longer stocked in the DPS's range. Cutthroat trout and steelhead are naturally sympatric and have likely evolved mechanisms to avoid hybridization. Recent genetic data indicate that high levels of hybridization are limited to a few areas. This is not currently considered a significant threat to the DPS of coastal cutthroat trout.

Issue 15: Several commenters suggested that we had not fully evaluated the contribution of existing conservation efforts and regulatory mechanisms to potential future conditions for the coastal cutthroat trout, including the Oregon Salmon Plan, the Healthy Streams Partnership, Oregon Land Use Planning regulations, Washington Growth Management Planning, Federal and State Clean Water laws, Federal listing of other species under the Act, recent changes in Oregon and Washington Forest Practices Regulations, changes in fishing regulations, and actions of local governments to protect and restore watersheds.

Service Response: We fully evaluated information on the most recent regulations and their implementation, including the State Forest Practices Regulations and Clean Water Act (CWA). There have been significant changes in the Washington Forest Practices Regulations since the publication of the proposed rule. We also evaluated all other conservation efforts for salmonids, many of which are non-regulatory in nature. In all cases, we evaluated the likelihood that the regulation or program would be implemented and would prove effective in reducing threats to the coastal cutthroat trout (see Inadequacy of Existing Regulatory Mechanisms and Foreseeable Conservation Measures sections below).

Issue 16: One commenter described the impacts from dredging, filling, and diking, all of which can affect important staging and feeding areas for outmigrating trout, and thus adversely affect populations. Another commenter stated that current guidelines for permitting programs (dredging, wetland filling, etc.) lack a method for assessing cumulative impacts.

Service Response: We agree that dredging, filling, and diking can adversely affect coastal cutthroat trout (see Inadequacy of Existing Regulatory Mechanisms section below). However, based on the implementation of current laws and regulatory programs, we conclude that the regulation of dredge, fill, and in-water construction activities through the section 404 and section 10 permit processes and through State programs will provide some protection and support of aquatic resources, though they may not fully remove the risk of some losses to cumulative effects from small individual projects. The remaining risks from cumulative effects are likely to be small in the short term and we do not anticipate that cumulative effects of these small projects will reach a level at which they would be likely to result in the DPS of coastal cutthroat trout becoming endangered in the foreseeable future.

Issue 17: One commenter requested that we propose critical habitat at the time of listing.

Service Response: When we list a species as threatened or endangered, the Act requires that the listing rule specify, ''* * * to the maximum extent prudent and determinable,'' the species' critical habitat. However, critical habitat is no longer an issue as we are withdrawing the proposed rule to list the coastal cutthroat trout.

Issue 18: Grays Harbor County suggested that we are required to complete an Environmental Impact Statement under the National Environmental Policy Act (NEPA) on the proposed listing and asked to be designated as the lead organization for writing the document.

Service Response: In regards to NEPA, we have determined that Environmental Assessments and Environmental Impact Statements, as defined under the authority of the NEPA of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act, as amended. A notice outlining our reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

Summary of Factors Affecting the Species

Section 4(a)(1) of the Act and regulations implementing the listing provisions of the Act (50 CFR part 424) set forth the procedures for adding species to the Federal list of threatened and endangered species. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). If, upon consideration of these five factors, the species is found to meet the definition of either a threatened or endangered species, then listing is called for. The proposed rule summarized the ''* * * findings regarding the principal factors for decline across the range of coastal cutthroat trout'' (64 FR 16402) (hereafter referred to as subspecies-wide review). These were generalized for the entire range of the six DPSs of the subspecies, and were not specific to the southwestern Washington/Columbia River DPS that was proposed for listing. The specific factors relevant to the proposed rule to list the Southwestern Washington/Columbia River DPS are described in a separate section of the proposed rule (64 FR 16407, 16408). These factors and their application to our decision to withdraw the proposed rule to list the coastal cutthroat trout in southwest Washington and the Columbia River are described below. The following specifically addresses conditions and threats within the DPS's range.

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range.

Threats to Coastal Cutthroat Trout Habitat

Six types of activities or land use have potential to affect coastal cutthroat trout habitat, including forest management, agriculture and livestock management, dams and barriers, urban and industrial development, mining, and estuary degradation. Only forest management and estuary degradation were described as principal factors for declines across the range of coastal cutthroat trout in the subspecies-wide review in the proposed rule (64 FR 16402) and only estuary degradation was specifically mentioned specific to the southwestern Washington/Columbia River DPS (64 FR 16407).

Specific to the southwestern Washington/Columbia River DPS, the proposed rule stated that ''* * * severe habitat degradation throughout the lower Columbia River has contributed to dramatic declines in anadromous coastal cutthroat trout populations and two near extinctions of anadromous runs in the Hood and Sandy Rivers'' (64 FR 16407). The proposed rule also stated that ''[h]abitat degradation in stream reaches accessible to anadromous coastal cutthroat trout, and poor ocean and estuary conditions, likely combined to severely deplete this life-history form throughout the lower Columbia River Basin'' (64 FR 16407). While neither of these references specify habitat loss due to forest management, this is the principal factor for decline described in the proposed rule related to freshwater habitat loss.

Forest Management

The proposed rule to list the DPS as threatened stated that ''[h]abitat degradation and impacts associated with logging and related land management activities, in particular, have likely contributed to the decline of coastal cutthroat trout'' (64 FR 16402). The potential effects of logging and related practices described in the proposed rule included changes in water temperature leading to potential disease outbreaks, altered timing of migration, and accelerated maturation; changes in stream flow regimes potentially leading to adverse water velocities and depth characteristics; loss of potential for new large woody debris potentially increasing predation rates on cutthroat trout; loss of riparian areas leading to decreased invertebrate production and detritus sources, key components in the food chain; and siltation which may hinder fry emergence and production of benthic invertebrates. Indirect effects of logging could also reduce dissolved oxygen reducing egg and fry survival.

Past and current forest management is the most widespread source of modification of aquatic, riparian, and watershed conditions within the DPS's range, as forests cover 66 percent of the land base. Past timber management practices such as the use of splash dams (early 1900s), extensive riparian harvest, concentrated upland harvest, riparian and mid-slope roads, and sidecast road construction have modified aquatic and riparian conditions in many portions of the DPS's range. These practices have reduced current and future large woody debris, reduced pool quality, decreased stream shading resulting in increased water temperature, and increased the prevalence of landslides in some areas. This is of particular concern in areas where watersheds have been fully harvested in the past, such as some Grays Harbor tributaries (1940s and 1950s), and in areas where harvest did not peak until the late 1970s, such as some Willapa Bay tributaries. Most of these practices are no longer allowed under recent and current forest management regulations, and splash dams have not been used for many decades.

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 (WDFW 2001), indicating that they are capable of surviving long periods under these conditions. There is no reason to believe that they will not continue to do so. We have no specific evidence of disease outbreaks, altered timing of migration, and accelerated maturation resulting from water temperature changes, or of significantly increased predation rates, which were described in the proposed rule as principal factors for declines across the range of coastal cutthroat trout (64 FR 16402) as the consequences of logging and related land management activities. Nor do we have any evidence of decreased invertebrate production in forested areas leading to decreases in available food or reduced egg or fry survival, also described in the proposed rule as the consequences of logging and related land management activities.

Conditions of the riparian and aquatic systems in some forest lands are actually in the long-term process of recovery from past forest management practices, though the total area of improvement is unrecorded. For example, some flow regimes are already beginning to improve as forest cover has increased and some riparian areas are revegetated with 40-year-old conifers that will provide large woody debris sources in the future. Some areas of high quality aquatic and riparian systems remain. Approximately eight percent of the DPS's range is in wilderness or National Parks and is in good condition. High quality aquatic and riparian areas remain on other lands, ranging from 13 percent in narrow valleys to 31 percent in wider, forested valleys.

Over time, aquatic and riparian habitats important to coastal cutthroat trout are likely to continue to improve. Federal forest management and Washington Forest Practices Regulations have been revised significantly in recent years so that habitat modification of the magnitude or type experienced over the past 70 years is no longer likely to occur. Current regulations, mainly aimed at improving stream habitat for salmon and steelhead, impose more restrictive standards for riparian harvest, harvest on unstable slopes, road construction, and road maintenance; and reduce the likelihood of large-scale removal of forest cover in a watershed on Federal lands, and State and private timberlands in Washington. These changes have greatly reduced the long-term risk of continued modification of aquatic and riparian habitats in 57 percent of the DPS's range (*see* Inadequacy of Existing Regulatory Mechanisms section). Collectively, remnant high quality habitat, ongoing forest recovery, active efforts to identify and correct legacies of past management, improved standards for future management actions (Inadequacy of Existing Regulatory Mechanisms section), and the ability of coastal cutthroat trout to survive for long periods in degraded aquatic and riparian systems provide the basis for maintenance of habitat for the DPS of coastal cutthroat trout. Therefore, forest management is not likely to result in the DPS of coastal cutthroat trout becoming endangered in the foreseeable future.

Agriculture and Livestock Management

Agriculture and livestock management occur on at least 16 percent of the lands in the southwestern Washington/Columbia River DPS, with relatively greater representation in the Grays Harbor tributaries. Neither of these activities were identified as a threat to coastal cutthroat trout in the subspecies-wide review of listing factors (64 FR 16402) or the DPS-specific review for the southwestern Washington/Columbia River DPS (64 FR 16407). Some of the aquatic and riparian impacts associated with agriculture are locally severe and very long-term, such as diking, filling, riparian conversions, channelization, sediment and flow regime changes, and persistent toxic chemicals. In addition, agricultural areas are often located in the lowest stream sections which are often the most productive portions of the streams. Impacts to these stream sections have a proportionally greater effect on the anadromous and migratory portions of the DPS of coastal cutthroat trout, which use these sections for migration, overwintering, and rearing young, while much of the resident portion of the population resides in the upper watershed areas where agriculture is not generally prevalent.

Most lands suitable for agriculture and grazing management have already been converted and it is unlikely that there will be any significant increase in the amount of agricultural and grazing lands in the future. While agriculture and grazing management may have had significant localized and long-term effects to riparian and aquatic systems in the DPS's range, coastal cutthroat trout remain extant in all the affected watersheds. Based on the limited extent of agricultural lands, agriculture and grazing are not likely to result in the southwestern Washington/Columbia River DPS of coastal cutthroat trout becoming endangered in the foreseeable future. Agriculture and livestock management was not identified as a primary threat to the subspecies or the DPS in the proposed rule and is not considered a significant threat at this time.

Dams and Barriers

Within the DPS, migratory coastal cutthroat trout access and movements are blocked in some areas by dams, diversions, dikes, tide gates, poorly-designed culverts, and poor water quality, though dams and barriers were not identified as threats in the subspecies-wide review of listing factors (64 FR 16402) or the DPS-specific review for the southwestern Washington/Columbia River DPS (64 FR 16407). Existing dams have blocked access for upstream migration to several portions of the DPS. Even dams with fish passage structures result in some mortality and may delay migrations. The anadromous portion of the DPS is the most likely affected by dams and diversions, as these often limit access to historic spawning areas. Resident and some freshwater migratory portions of the DPS are likely little affected by large barriers, as their access to habitat remains intact above the dam. Road culverts, especially on forest roads, present widely-dispersed potential barriers to upstream movements of coastal cutthroat trout in the DPS, though most culverts allow for downstream movements, and some allow upstream movement seasonally. Existing information indicates that culverts have limited upstream access to a portion of historic habitat though the extent of this limitation is not fully documented. Again, anadromous and migratory portions of the coastal cutthroat trout population are the most likely affected by these barriers, while the resident portion of the population likely remains extant above most barriers.

Current Washington and Oregon State Forest Management Regulations and fish passage standards will minimize the threat that new culverts will block fish passage (see Inadequacy of Regulatory Mechanisms section). In addition, under the latest Washington Forest Practices Regulations, forest managers are required to develop road maintenance and management plans within 5 years and implement such plans within 15 years. Blockage of upstream migration is not likely to increase given current regulations. Despite existing barriers, coastal cutthroat trout remain well distributed throughout the DPS's range and at levels apparently comparable to healthy-sized populations in many areas. The greatest threat from barriers is interference with recolonization of areas after catastrophic disturbances, though these are very long-term concerns. Floods and related events, in particular, tend to remove roads and barrier culverts. Based on the current and likely future effects, and the low potential for significant additional barriers to be created under current regulations, dams and barriers are not likely to result in endangerment of the DPS of coastal cutthroat trout in the foreseeable future. Dams and barriers, other than those potentially associated with logging practices, were not identified as a primary threat in the proposed rule and are not considered a significant threat at this time.

Urban and Industrial Development

Although the direct aquatic and riparian impacts of urbanization in the southwestern Washington/Columbia River DPS are not widespread, they are locally severe and essentially permanent. Urban and industrial development was not specifically identified as a threat in the subspecies-wide review of listing factors (64 FR 16402) or the DPS-specific review for the southwestern Washington/Columbia River DPS (64 FR 16407), although it was identified as a potential effect in the range of the species where it occurs within estuaries. ''Dredging, filling, and diking of estuarine areas for * * * commercial or municipal uses have resulted in loss of many estuary habitats'' (64 FR 16402). This element of development is addressed in the Estuary Degradation section. Many of the largest urban areas in this DPS lie above the estuaries, and therefore have not resulted in physical changes to the estuaries.

Urban areas are expected to expand in some areas as human populations increase, particularly in the Portland Metropolitan area. The long-term effects of urbanization include diking, filling, riparian conversion, channelization, sediment and flow regime changes, water storage, and persistent toxic chemicals. These urban areas are often located in the lowest stream sections where flood plains are wide and stream gradients are low, and therefore have a proportionally greater effect on the anadromous and migratory portions of the coastal cutthroat trout population that use these sections for migration, overwintering, and rearing. Much of the resident portion of the population resides in the upper watershed areas where urbanization is not prevalent. While urbanization and associated industrial development have potentially substantial effects on aquatic and riparian habitats in localized areas, these include only about three percent of the current land base in the DPS. Expansion of urban areas is likely to occur primarily within the areas already impacted and is not likely to substantially increase the impacts to the DPS. The vast majority of the DPS is not significantly affected by urbanization. Therefore, urbanization and industrial development are not likely to result in the DPS of coastal cutthroat trout becoming endangered in the foreseeable future.

Mining

Gravel mining has degraded some stream channels in portions of the DPS's range as a result of past, unregulated removal. Mining was not identified as a threat in the subspecies-wide review of listing factors (64 FR 16402) or the DPS-specific review for the southwestern Washington/Columbia River DPS (64 FR 16407). Current regulations and permit requirements have reduced, though not totally eliminated, the impact of gravel mining (see Inadequacy of Existing Regulatory Mechanisms section). While some continued problems may occur, these will be fairly small and localized, and do not represent a major threat to the DPS of coastal cutthroat trout at this time. There is a single coal mine in the Skookumchuck basin (WSCC 2001) and no known plans for additional coal or hardrock mining in the DPS's range. Other mining activity in the DPS's range is very limited and does not represent a major threat to the coastal cutthroat trout. Mining was not identified as a primary threat in the proposed rule and is not considered a significant threat at this time.

Estuary Degradation

The proposed rule described the potential loss of important estuary habitat through the ''[d]redging, filling, and diking of estuarine areas for agricultural, commercial, or municipal uses'' (64 FR 16402) and stated that ''reductions in the quantity and quality of estuarine * * * habitat have probably contributed to declines, but the relative importance of these risks is not well understood'' (64 FR 16408).

Anadromous coastal cutthroat trout likely make use of estuaries for growth and development, though we have little information on how individual trout use the various portions of the estuary, especially the large estuaries included in this DPS. The Columbia River estuary has lost 12 percent of its area since 1868, including 65 to 75 percent of off-channel habitats. Thirty percent of the historical wetland habitat in Grays Harbor estuary has been lost, as well as 31 percent of the historical Willapa Bay estuary wetlands. Without information on how coastal cutthroat trout use the estuary habitats, we cannot predict the effect of this loss on the coastal cutthroat trout population. However, the loss of estuary habitat has likely contributed to the lower-than-historical numbers of the anadromous portion of the DPS, though anadromous cutthroat trout remain extant in all three major basins within the DPS. Resident and freshwater migratory portions of the population do not use, and therefore are not affected by changes in, the estuaries.

Given current laws and regulations on wetland dredge and fill (see Inadequacy of Existing Regulatory Mechanisms section), we do not anticipate additional large-scale conversion or loss of estuary or off-channel areas, though some small scale impacts are still likely, and the legacy of past actions will result in some continued changes. The only large-scale project currently proposed is the Columbia River Channel Improvement Project which will deepen 166 km (103 mi) of the already-dredged, narrow navigation channel. This project is anticipated to have limited short-term impacts to estuarine and riverine conditions, and will be monitored carefully in the future to minimize any impacts to known fish habitat (USFWS 2002). The resident portion of the population is completely unaffected by estuary conditions and changes. The current condition, limited likelihood of continued degradation or loss of estuary habitat, and remaining populations of cutthroat trout lead us to conclude that estuary conditions are not likely to result in the DPS of coastal cutthroat trout becoming endangered in the foreseeable future.

The proposed rule described the potential loss of important estuary habitat and stated that reductions in the quantity and quality of estuarine habitat probably contributed to declines of anadromous cutthroat trout, but the relative importance of these risks was not well understood (64 FR 16402). This is further complicated by the lack of information on how coastal cutthroat trout use these large estuary systems. Significant portions of the estuarine wetlands remain intact in the Willapa Bay and Grays Harbor systems and, to a lesser degree, the Columbia River estuary. Given current regulations, we do not anticipate additional large-scale conversion or loss of estuary or off-channel areas. While past losses of estuaries may have contributed to a reduction in the anadromous portion of the coastal cutthroat trout population over historic levels, we do not have evidence that the past and potential future losses are likely to result in the DPS of coastal cutthroat trout as a whole becoming endangered in the foreseeable future.

Conclusion

The proposed rule stated that ''* * * severe habitat degradation throughout the lower Columbia River has contributed to dramatic declines in anadromous coastal cutthroat trout populations and two near extinctions of anadromous runs in the Hood and Sandy Rivers,'' and that ''[h]abitat degradation in stream reaches accessible to anadromous coastal cutthroat trout, and poor ocean and estuary conditions, likely combined to severely deplete this life-history form throughout the lower Columbia River Basin'' (64 FR 16407). Based on analysis of the latest data, we now conclude that, while the anadromous portion of the population of coastal cutthroat trout is likely at lower-than-historic levels, there is little specific information indicating that populations, even of the anadromous portion of the DPS, are at extremely low levels in most areas of the DPS (see Population Size section). Relative to the two near extinctions cited in the proposed rule, the data do not support this conclusion (see Population Size section). The trap location on a side channel in the Sandy River system makes it impossible to extrapolate to the entire River system. Anadromous cutthroat trout are still occasionally trapped at Powerdale Dam on the Hood River, including 11 upstream migrants in 2001 (Connolly *et al.* 2002).

The proposed rule's conclusions assumed that the anadromous component of the population of coastal cutthroat trout is effectively isolated from other portions of the population and that the anadromous component represents a significant portion of the DPS. However, new data indicate that fish with these various life strategies do interact and that anadromous progeny may be produced by non-anadromous parents, even after many generations of isolation above barriers (see Life History Diversity section). Therefore, coastal cutthroat trout populations are more appropriately evaluated including all life history strategies, anadromous, migratory and resident. Resident/freshwater forms remain well distributed and at reasonable densities in the lower Columbia River, including areas accessible to anadromous fish, and in the Sandy and Hood Rivers where the anadromous portion of the population is low.

While aquatic and riparian systems have been heavily altered in some areas, the latest information does not support the conclusion that this has severely affected the habitat of the coastal cutthroat trout throughout the range of this DPS. Some areas have begun to recover from past forest practices and new regulations are in place that reduce the risk of continued adverse impacts to much of the DPS. Conditions in many parts of the DPS's range are expected to continue to improve over time and many of the most damaging past practices (*e.g.,* splash dams, large-scale wetland conversion) are not expected to occur in the future due to current laws and regulations. Given that coastal cutthroat trout have not only survived the long-term and widespread impacts of these past practices to aquatic and riparian conditions in large portions of the DPS's range for many generations, but apparently remain well distributed at densities comparable to healthy-sized populations elsewhere, the condition of aquatic and riparian systems is not likely to result in endangerment of the DPS of coastal cutthroat trout in the foreseeable future. Therefore, we no longer conclude that past habitat degradation has led to severe declines in the population of coastal cutthroat trout in the southwestern Washington/Columbia River DPS. In addition, current regulations (described in the Forest Management and State Land Use Practices sections) greatly reduce the risk that significant additional modification of habitat will occur in the foreseeable future.

Curtailment of Range

According to WDFW (2001), the southwestern Washington-lower Columbia River region historically supported healthy, highly productive coastal cutthroat trout populations. Coastal cutthroat trout, especially the freshwater forms, are still well distributed in most river basins in this geographic region, although probably in lower numbers relative to historical population sizes (Johnson *et al.* 1999). Based on over 1,300 locations from 5 data sources (WDFW 2001a (Resident Fish Database 1987–97), WDFW 2001b (Priority Habitat Species database 1989–90), Washington Department of Natural Resources (WDNR) 2001 (Last Fish, Last Fish Habitat Database 2001), Mongillo and Hallock 2001, U.S. Forest Service Watershed Analysis Documents 1995–2001), cutthroat trout remain extant throughout their historic range in the Washington portion of the DPS. Little systematic information is available for the Oregon portion of the DPS, though cutthroat trout, particularly resident forms, are known to occur throughout the DPS in Oregon (Hooton 1997).

Mongillo and Hallock (2001) conducted extensive surveys of 156 locations within the Washington portion of the DPS for presence and abundance of coastal cutthroat trout. Additional data were presented by WDFW (2001) for surveys conducted by Weyerhaeuser Company in 1994–95. The percentage of locations with cutthroat trout from both studies was compared to data collected in the 1970s from the Olympic Peninsula and Puget Sound areas. Populations in these areas were considered healthy-sized during this time period (WDFW 2001c). The percentage of sample sites with coastal cutthroat trout within the DPS's range below Bonneville Dam (Mongillo and Hallock 2001, WDFW 2001c) was not significantly different than the early data from the apparently healthy-sized populations in the Olympic Peninsula and Puget Sound DPSs, indicating that populations in the DPS are still well distributed.

The percentage of sites where cutthroat trout were found in the Washington portion of the DPS above Bonneville Dam was very low when compared to the rest of the DPS. No similar information was available for Oregon portions of the DPS. The area above the Bonneville Dam is ecologically very different from the remainder of the subspecies' range and is the only area within its range where the subspecies is found east of the Cascade Mountain Divide. This area experiences a very different hydrologic and climatic environment than the rest of the subspecies' range, which may influence the abundance of coastal cutthroat trout. In addition, many sample sites from the Mongillo and Hallock study (2001) in the Washington portion of the DPS above Bonneville Dam included areas outside the likely historic range of the species, which would have artificially depressed the percentage of locations with cutthroat trout. Based on these factors, the calculated percentage of sites with cutthroat trout from the Mongillo and Hallock study (2001) above Bonneville Dam likely under-represents the true density of coastal cutthroat trout in this area.

There has been a change in the accessibility of some areas to anadromous cutthroat trout due to barriers created by dams, diversions, culverts, dikes, tidegates, and water quality. Some streams within the DPS's range have been lost to development, such as streams in the more developed portions of Portland, Oregon. The total amount of currently inaccessible habitat is unknown, but it includes only a very small percentage of the total available habitat within the DPS's range and is interspersed with occupied habitat. Despite the long-term, widespread impacts to aquatic and riparian conditions, coastal cutthroat trout have survived in these areas for many generations and remain well distributed at densities comparable to healthy-sized populations in large portions of the DPS's range. There is no reason to believe that they will not continue to do so. Based on the above information, there is no significant present or identifiable threat of curtailment of the range of the DPS.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes.

Cutthroat trout are not harvested commercially. Scientific and educational programs have probably had little or no impact on the DPS.

The proposed rule to list the Southwestern Washington/Columbia River coastal cutthroat trout DPS stated that ''* * * cutthroat trout are a popular gamefish throughout the Pacific Northwest, and available information indicates that recreational fishing may have contributed to the general decline of cutthroat trout populations (Gresswell and Harding 1997)'' (64 FR 16402). This information was not specific to coastal cutthroat trout, or to the southwestern Washington/Columbia River DPS, and the referenced paper does not indicate that angling is a direct cause of decline.

Cutthroat trout are among the salmonids most vulnerable to overharvest by angling (Gresswell and Harding 1997, Johnson *et al.* 1999), especially during post-spawning outmigrations to summer feeding areas. In many areas, coastal cutthroat trout harvest is primarily incidental in recreational fisheries for other species of salmonids. Because of harvest restrictions on naturally produced coastal cutthroat trout in many areas and the lack of targeted fisheries, direct mortality due to fishing pressure is thought to be relatively low, at least in recent years (Hooton 1997, Gerstung 1997, WDFW 1998a). In addition, fishing regulations establishing size and bag limits are relatively recent, and biologists familiar with coastal cutthroat trout feel that in some areas their abundance has begun to increase only recently due to imposition of these more restrictive fishing limits (WDFW 1998b).

The Washington and Oregon trout fishing regulations have become incrementally more restrictive in the past two decades. Several types of recreational fishing for coastal cutthroat trout are allowed under current fishing regulations in these States. However, catch and keep fisheries on wild coastal cutthroat trout are limited to some portions of the DPS in Washington. Washington's current fishing regulations, particularly the more restrictive ''special rules'' which affect nearly all of the DPS, provide protection to coastal cutthroat while allowing fishing opportunities that can promote conservation of this subspecies. We believe that carefully regulated fishing can promote awareness and conservation of coastal cutthroat trout by maintaining public support for its conservation. Continued recreational fishing conducted in a manner consistent with the conservation of the coastal cutthroat trout helps to maintain a broad support base for the conservation of aquatic resources, including coastal cutthroat trout.

Leider (1997) provided a summary of WDFW ''special regulation'' changes that were developed to protect coastal cutthroat in Washington. In the DPS's range, major special regulations occurred in 1983 (limit reduced from 12 to 8 trout per angler), 1986 (limit further reduced to 5 fish), 1992 (limit reduced to 2 fish). Minimum size limits also increased during this time. In addition, wild cutthroat release was required in some streams within the DPS's range starting in 1989 and expanded to all lower Columbia River streams below Portland/Vancouver in 1992 (Leider 1997). Currently, in the Chehalis River Basin, most streams allow a 2-fish daily limit with a 36 cm (14 in) minimum size limit and, in Willapa Bay and Lower Columbia tributaries, wild cutthroat release is generally required. The exceptions to this wild cutthroat release regulation are mainly in the mainstem Columbia River above Bonneville Dam, above the Cowlitz River Dams, and in the Toutle River Drainage (WDFW 2001d).

The proposed rule stated that ''* * * coastal cutthroat trout are especially susceptible to hooking mortality and incidental catch in recreational and commercial fisheries targeting Pacific salmon and steelhead'' (64 FR 16402). Studies of anadromous cutthroat trout show variable susceptibility to baited hook mortality, from 6 to 58 percent (Gresswell and Harding 1997). There is no current evidence that recreational harvest, whether targeted or incidental to other fisheries, is contributing to declines in the DPS. There is also no evidence that bycatch of coastal cutthroat trout in commercial salmon and steelhead fisheries is a significant source of mortality in this DPS.

The proposed rule stated that ''* * * poaching may pose a significant threat to depressed populations of cutthroat trout in some areas'' (64 FR 16402), though it did not indicate where this might occur and this was not identified as a specific threat in the southwestern Washington/Columbia River DPS (64 FR 16407). There is no evidence that poaching is a significant threat to the DPS of cutthroat trout.

There is no information to indicate that commercial or recreational fishing represents a threat to the DPS of coastal cutthroat trout. Overutilization, including recreational and commercial fishing, was not identified in the proposed rule as a threat to this DPS and is not considered a threat at this time. The States of Washington and Oregon have continued to modify regulations in response to changes in cutthroat trout populations.

C. Disease or Predation

The proposed rule stated that ''[d]isease may be a factor contributing to the decline of cutthroat trout populations,'' including the parasite *Ceratomyxa shasta* in the Columbia and Willamette Rivers (ODFW 1998), though the extent to which this and other diseases affect cutthroat trout populations was unknown (64 FR 16402). Disease or parasites were not listed as a specific threat to the majority of the DPS (64 FR 16407). Predation by non-native fish and pinnipeds (seals and sea lions) was also identified as a potential threat, though the extent to which this was a factor in coastal cutthroat trout declines was unknown (64 FR 16402) and predation was not listed as a specific threat to the DPS (64 FR 16407).

Coastal cutthroat trout in the Columbia and other large rivers with hydroelectric dams are potentially vulnerable to gas bubble disease caused by increased gas saturation levels associated with the spilling of water at dams. The disease's effects can range from temporary debilitation to mortality. Because of variability in water temperature, depth, flow, and other factors, the biological effects of a given level of dissolved gas saturation are likely to vary in different areas at various times of the year. Increased gas saturation levels have been identified at the Bonneville and Dalles dams, and can adversely affect fish downstream of these dams. In recent years, NMFS has proposed to balance the needs of juvenile salmonid migrants by increasing spill levels to reduce turbine-related mortalities, resulting in elevated gas supersaturation levels in the Columbia River. Spill levels of up to 120 percent of saturation at ambient temperature and pressure have occurred in recent years during managed spills, with involuntary spill episodes resulting in levels as high as 140 percent at some sites (NMFS 2000). At levels of 120 percent, gas bubble disease affects a maximum of 0.7 percent of fish exposed, and near 140 percent, over 3 percent of fish exposed are affected (NMFS 2000). While this could cause the loss of some individuals, it is not considered a significant threat at this time.

Ceratomyxa shasta, a native parasite that can kill cutthroat trout when water temperatures are high, occurs in the lower Columbia River drainages (Hoffmaster *et al.* 1988) and has been a factor in the loss of cutthroat trout at hatcheries in this area. The effect of the parasite increases as water temperature increases. *Ceratomyxa shasta* is a native parasite in the Pacific Northwest and coastal cutthroat trout have likely developed strategies or life history adaptations to cope with this parasite. Parasites and diseases were not listed in the proposed rule as specific threats in the DPS (64 FR 16407) and are still not anticipated to threaten wild coastal cutthroat trout in the DPS. No introduced diseases have been documented in the DPS. There is no evidence of significant loss of wild cutthroat trout to parasites or disease in the DPS at this time.

Several non-native fish species are known to prey on, or compete with, salmonids within the DPS's range (Poe *et al.* 1991). However, no specific information exists regarding predation impacts by predatory fishes on cutthroat trout, though it is reasonable to assume some predation does occur. We have no evidence that aquatic predators have significantly reduced coastal cutthroat trout populations or represent a major threat to coastal cutthroat trout. Non-native predators were not identified in the proposed rule as a threat to this DPS (64 FR 16407) and are not considered a significant threat at this time.

The proposed rule stated that while pinniped populations are increasing on the West Coast, ''* * * the extent to which pinnipeds predation is a factor causing the decline of coastal cutthroat trout is unknown'' (64 FR 16402). Pinnipeds are potential natural predators of cutthroat trout that use the estuaries and near-shore marine environment (NMFS 1997, Beach *et al.* 1985). In addition, mustelids, such as otter and mink, and other mammals are natural predators in both salt and freshwater environments, though there are no studies of the level of predation by any mammals. Piscivorus birds, such as terns and cormorants, are also natural predators of coastal cutthroat trout. There is information indicating that terns and cormorants may take significant numbers of salmonids in the Columbia River estuary near artificial islands in the Columbia River, though there is no information on the vulnerability of cutthroat trout in this situation. There is no evidence that mammal or bird predation represents a significant threat to the DPS of coastal cutthroat trout at this time. Predation was not identified in the proposed rule as a specific threat to this DPS (64 FR 16407) and is not considered a threat at this time.

D. The Inadequacy of Existing Regulatory Mechanisms.

Federal Land Management Practices

The proposed rule indicated that the Northwest Forest Plan's management policy provided important benefits for salmonids, including coastal cutthroat trout, though its effectiveness in conserving cutthroat trout was limited by the extent and distribution of Federal land ownership (64 FR 16397).

Approximately 27 percent of the land base within the DPS's range is Federal land, managed by the Forest Service, Bureau of Land Management, National Park Service, and Fish and Wildlife Service. One percent of the DPS's range is in National Parks or National Wildlife Refuges, both of which are managed under laws and regulations that should provide adequate management for the conservation of the cutthroat trout. The remaining 26 percent is managed under the requirements of the Northwest Forest Plan. The Northwest Forest Plan contains important benefits to, and conservation measures for, salmonids, including cutthroat trout. The overall effectiveness of the Northwest Forest Plan in conserving the DPS of cutthroat trout is somewhat limited by the extent of Federal lands and by the fact that Federal land ownership is not uniformly distributed. Most of the lands in the DPS's range are located in the upper watersheds, providing habitat primarily for freshwater forms of the cutthroat trout. Two components of the Northwest Forest Plan provide conservation for salmonids, the Aquatic Conservation Strategy and land allocations with their associated standards and guidelines.

The Aquatic Conservation Strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within lands administered by the Bureau of Land Management and Forest Service. It consists of four primary elements: (1) riparian reserves; (2) key watersheds; (3) watershed analyses; and (4) watershed restoration. All four of these components are designed to operate together to maintain and restore the productivity and resiliency of riparian and aquatic ecosystems.

Riparian reserves apply to all lands managed under the Northwest Forest Plan and are intended to maintain and restore riparian structures and functions. They occur at the margins of standing and flowing water, intermittent stream channels, ephemeral ponds, and wetlands, though they may also include upland areas necessary for maintaining ecological processes. Key watersheds serve as refugia for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species.

Watershed analyses are the principal tool for implementation of the Aquatic Conservation Strategy and play a critical role in providing for aquatic and riparian habitat protection. Watershed analyses should identify processes that are active within a watershed, how those processes are distributed in time and space, the current upland and riparian conditions of the watershed, and how all of these factors influence riparian habitat and other beneficial uses. Watershed analyses provide the contextual basis at the site level for decision makers to set appropriate boundaries of Riparian Reserves, plan land use activities compatible with disturbance patterns, design road transportation networks that pose minimal risk, identify high priority restoration activities, and establish specific parameters and activities to be monitored. Watershed restoration is also an integral part of a program to aid recovery of fish habitat, riparian habitat, and water quality, and is based on watershed analyses and planning.

All lands within the Northwest Forest Plan are placed into one of six land use allocations. These allocations dictate the type and standards for activities within the allocation. Congressionally Reserved Areas (*e.g.,* wilderness areas) constitute 22 percent of the Federal lands within the DPS's range and are the most protected type of allocation. Administratively Withdrawn Areas are designated for a variety of reasons and are generally fairly protective of aquatic and riparian systems. Administratively Withdrawn Areas constitute 5.7 percent of the Federal lands within the DPS's range. There is a low likelihood of short- or long-term adverse effects to cutthroat trout in Congressionally Reserved Areas or Administratively Withdrawn Areas due to the low likelihood of activities occurring that impact resident or anadromous coastal cutthroat trout or their habitat.

Late-Successional Reserves are intended to maintain a functional, interactive, late-successional and old growth forest ecosystem. In the long term, Late-Successional Reserves and their associated Standards and Guidelines, will likely prove extremely beneficial to resident and anadromous fish by providing islands of functional reserves in late seral (older) forest condition with high water quality and habitat complexity. Late-Successional Reserves constitute 31.2 percent of the Federal land allocations in the DPS's range. Managed Late-Successional Areas are similar to Late-Successional Reserves, but constitute less than one percent of the Federal lands in the DPS's range. Management activities in both of these allocations may result in some latent impacts due to present baseline conditions (existing riparian and upslope roads, past timber management activity), silviculture, road-related impacts, and short-term impacts associated with restoration activities. However, these impacts will be reduced over time as Riparian Reserves and forests mature.

Adaptive Management Areas are landscape units designated to encourage the development and testing of technical and social approaches to achieving desired ecological, economic, and social objectives. Activities may vary greatly, depending on the individual management plans of these areas. Adaptive Management Areas comprise seven percent of the Federal land in the DPS's range. Matrix lands constitute 33.4 percent of the Federal land in the DPS's range. This allocation focuses on providing for timber harvest and commodity resources and will have the highest level of management activities. Riparian Reserve and other Aquatic Conservation Strategy requirements do apply to Matrix lands. Management activities on Matrix lands are expected to have somewhat greater impacts to aquatic systems than in reserve land allocations due to the latent effects of past management (existing riparian and upslope roads, past timber management activity), ongoing silvicultural activities, road-related impacts, and short-term impacts associated with restoration activities. However, impacts to aquatic and riparian systems will be reduced over time as Riparian Reserves mature. Some long-term indirect impacts from management activity may occur due to timber management and silvicultural activities in upslope areas. Both short- and long-term road-related impacts may result from new and existing roads used to implement management direction. We expect that the level of road-related impacts will be reduced over time through reduced road densities and correction of site-specific road impacts (culvert replacement, drainage problems, etc.).

Based on the Aquatic Conservation Strategy and management guidelines for the individual land allocations, Federal lands within the DPS's range (27 percent of the land base) should be managed in a manner that provides long-term improvement in aquatic habitat and limits short-term habitat quality declines. These lands should provide significant contributions to the conservation of the coastal cutthroat trout in the foreseeable future. These lands typically lie in the upper portions of the watersheds, above the areas generally used by the anadromous portion of the population.

State Land Use Practices

Washington

The proposed rule concluded that the Washington Forest Practices Regulations did ''* * * not provide for properly functioning riparian and instream habitats,'' including failure to address large woody debris recruitment, tree retention to maintain stream band and channel integrity, and chronic and episodic inputs of coarse and fine sediments (64 FR 16402).

Washington's Growth Management Act requires counties and cities in the State to designate natural resource lands and to designate and protect critical areas (such as wetlands, fish and wildlife habitat conservation areas, frequently flooded areas, geologically hazardous areas, and aquifer recharge areas) consistent with overall State-level guidelines and objectives. The cities and counties are required to review and implement development regulations relative to these designations on a five-year cycle. Development regulations include a zoning code, subdivision ordinance, clearing and grading ordinance, critical areas ordinance and other regulations as necessary. Recent amendments to the Growth Management Act require the use of ''best available science'' and consideration of salmonid habitat in developing these regulations. However, recent reviews of Growth Management Act implementation (State of Washington 1998 and 1999) have indicated that protection of water quality and aquatic and riparian resources have not been prioritized in local planning, many cities and counties have not yet adopted the required designations and regulations, and most local plans have not yet incorporated the best available data. Additionally, the ability of the State to impose sanctions on the cities and counties for failure to comply with the Growth Management Act is limited, and minimum guidelines established by the State for designating natural resource lands and procedural criteria to guide the development of comprehensive plans are not mandatory for the cities and counties.

The Washington Forest Practices Act (WFPA) regulates timber management and related activities on most non-Federal forest lands in the Washington portion of the DPS's range (30 percent of DPS's range). The WFPA was improved in 2001 to address water quality concerns and conservation of listed salmonids which will also contribute to coastal cutthroat trout conservation. The new rules set standards for timber harvest activities in and around riparian areas and unstable slopes, and for road use, construction, and maintenance related to forest management. These rules include regulations requiring increased riparian buffer widths, reduced level of management activities within the buffers, and an increase in the percentage of the stream network subject to these buffers. Under the new regulations, virtually all perennial streams will receive some level of protection. Landowners will be required to develop plans for ensuring that existing forest roads meet improved standards for fish passage, protection of unstable slopes, minimization of sediment and runoff within 15 years. These new rules represent a substantial improvement over previous practices and should substantially reduce the adverse impacts of current and future management activities to aquatic and riparian systems supporting coastal cutthroat trout compared to those that would have occurred under previous standards. Revegetation and natural regeneration will result in the long-term process of recovery of these areas from past forest management practices. Standards for construction of new roads are also designed to meet water quality goals.

We and others have noted some uncertainty about the effects of portions of this regulatory program, especially as related to non-fish bearing streams, road practices, and management of cumulative watershed impacts. A comprehensive, long-term research, monitoring, and adaptive management program has been established to determine the validity of these and other concerns, and to remedy any identified shortfalls of the WFPA in a timely fashion. This adaptive management includes a formal, structured process with the Service as a participant. Specific questions and issues related to concerns raised during the development of these rules have been identified and prioritized. Both Federal and State agencies have funded the adaptive management monitoring and research to date, and support for continued funding remains high.

Approximately 325,450 ha (804,202 ac) (8.7 percent of the DPS's range) within the Washington portion of the DPS are managed through the provisions of HCPs approved under section 10 of the Act. The most significant of these include those developed by Simpson Timber (61,638 ha (152,311 ac)) (USFWS and NMFS 2000) and the WDNR (263,812 ha (651,891 ac)) (WDNR 1997). These HCPs include riparian management standards somewhat different from those normally applied under the WFPA. The WDNR HCP was approved in 1997, though not fully addressed in the original listing proposal, and is scheduled to remain in effect through 2093. This HCP contains a Riparian Conservation Strategy designed to maintain the integrity and function of freshwater stream habitat necessary for the health and persistence of aquatic species, including coastal cutthroat trout. The strategy includes stream, lake, and wetland buffers of various widths managed under standards that must ''maintain or restore salmonid habitat'' (WDNR 1997). The HCP also includes road maintenance and network planning standards, protection of disturbance-sensitive sites, and overall landscape-level forest habitat condition standards. Collectively, these HCP measures should minimize the adverse effects to coastal cutthroat trout of future forest management activities on WDNR lands in the DPS's range. However, even with the HCP in place, ''adverse impacts to salmonid habitat will continue to occur because past forest management practices have left a legacy of degraded riparian ecosystems, deforested unstable slopes, and a poorly planned and maintained road network'' (WDNR 1997). While the HCP will address some of these legacy threats, implementation of the full suite of necessary corrective and restorative actions on WDNR land is subject to the WFPA and other State programs and policies.

The Simpson Timberlands HCP was approved in 2000 and is scheduled to remain in effect through 2050. It contains elements similar to those in the WDNR HCP, including a riparian conservation strategy; buffers for streams, lakes, wetlands, and other disturbance-sensitive sites; and road maintenance and network planning standards. The HCP is unique in that buffers and management standards for riparian resources are tailored to the geomorphology and hydrologic function of specific stream classes. This was designed to provide greater certainty that they would identify and conserve areas with direct and indirect influence on the streams and associated salmonids, including cutthroat trout. Overall, the HCP should result in stream protections similar to, or greater than, those required under Washington Forest Practices Regulations, and improved remediation or closure of problematic forest roads (USDI 2000). Collectively, the HCP measures should minimize the adverse effects of future forest management activities on Simpson Timberlands in the DPS.

Changes in the WFPA since the original proposed rule to list the coastal cutthroat trout as threatened in the southwestern Washington/Columbia River DPS (64 FR 16397) and provisions of two long-term forest HCPs completed in the Washington portion of the DPS should greatly reduce the risk of continued degradation of aquatic and riparian systems on forest lands in 30 percent of the DPS's range. The proposed rule concluded that the WFPA did ''* * * not provide for properly functioning riparian and instream habitats,'' with specific concerns about failure to address large woody debris recruitment, tree retention to maintain stream band and channel integrity, and chronic and episodic inputs of coarse and fine sediments (64 FR 16402). Based on the new provisions addressing: (1) Timber harvest activities in and around riparian areas and unstable slopes; (2) road use, construction, and maintenance related to forest management; and (3) increased riparian buffer widths, reduced level of management activities within the buffers and an increase in the percentage of the stream network subject to these buffers, we no longer conclude, as described in the proposed rule (64 FR 16402), that the Washington Forest Practices Regulations do not provide for the conservation of coastal cutthroat trout and their habitat. While some degradation of aquatic and riparian systems will continue as a legacy of past management activities, and some elements of the riparian/aquatic systems are naturally slow to recover, these conservation efforts should significantly improve the long-term conditions for coastal cutthroat trout in a significant portion of the DPS's range.

Within the Washington portion of the DPS, there are two additional regulatory programs that apply to all of the non-federal land use activities discussed above, the Shoreline Management Act and State Environmental Policy Act. The Shoreline Management Act applies statewide to all water bodies, except for small streams and lakes. Every local government with shorelines is required to adopt a local shoreline plan which must be reviewed and approved by the Department of Ecology for consistency with State-level Shoreline Management Act guidelines. Most of the local shoreline master programs in effect today were originally adopted in the mid-to late-1970s and are based on guidelines that do not reflect current scientific understanding or the current emphasis on salmonid conservation. Recent efforts by the Washington Department of Ecology to ensure that local plans were revised consistent with current science and priorities have been subject to litigation and have not been finalized. Thus, the extent to which the Shoreline Management Act can be used as a tool to support salmonid conservation is uncertain. Under the State Environmental Policy Act, an agency may deny permits or other approvals if the proposed rule would likely result in significant adverse environmental impacts and if mitigation measures would be insufficient to avoid or reduce those impacts. The use of the State Environmental Policy Act in this fashion by local and State agencies has been extremely limited and, as a result, has not effectively served as a conservation mechanism or to address the inadequacies of other regulatory programs (State of Washington 1999).

Oregon

The proposed rule stated that the Oregon Forest Practices Act did not adequately protect salmonid habitat, specifically including production and introduction of large woody debris into medium, small, and non-fish bearing streams; timber harvest and road construction on unstable slopes subject to mass wasting; and cumulative effects (64 FR 16403).

Oregon was the first State to adopt comprehensive land-use planning laws and these remain among the strongest in the nation. Under this regulatory program, the State's 36 counties and 240 municipalities were required to develop comprehensive plans that addressed applicable statewide planning goals, including several related to maintenance of natural resource lands (agriculture and forest), critical fish and wildlife habitats, and protection of water quality and supply. The planning goals themselves do not regulate individual land development decisions, but are implemented through county and local comprehensive plans, ordinances, and standards which, in turn, regulate individual land use and development decisions. The comprehensive plans typically involve tradeoffs to balance numerous goals and objectives, some of which may conflict. Most local plans now in effect have not prioritized goals related to water quality and aquatic habitat protection, and have not been based on the best currently available data; therefore, they may not eliminate adverse effects to the riparian and aquatic environment and provide protection for some areas of cutthroat habitat (State of Oregon 2000a).

The Oregon Forest Practices Act (OFPA) regulates timber management and related activities on most non-Federal forest lands in the Oregon portion of the DPS (8 percent of DPS's range). The OFPA sets standards for timber harvest activities in and around riparian areas, and was improved in 1995 to better protect aquatic resources and address water quality concerns. Additional improvements were recently recommended to better support watershed health and conservation of listed salmonids (State of Oregon 2000b). While some of these recommendations may be implemented as regulations through the OFPA in the future, others will likely be implemented voluntarily and through various incentive-based programs. Even considering possible near-term improvements, there is substantial concern about whether the types and levels of management activities allowed within and adjacent to riparian zones under the regulatory component of the OFPA will adequately support riparian processes and conditions crucial to salmonid habitat. Specifically, there is concern for how well current OFPA regulations address tree retention to maintain stream bank integrity and channel networks within flood plains; chronic and episodic inputs of coarse and fine sediment processes; and the recruitment of large woody debris into the aquatic systems, all of which are critical to maintaining functioning habitat for all life stages of cutthroat trout. Much of the concern focuses on management standards for medium, small, and non-fish bearing streams. The OFPA does not adequately manage timber harvest and road construction on sensitive, unstable slopes subject to mass wasting, and the lack of consideration for cumulative effects is of concern, especially in light of current harvest rotation schedules (approximately 50 years).

While potential changes are on the horizon, we are still concerned that the OFPA may not adequately provide for large woody debris input into medium, small, and non-fish bearing streams; address timber harvest and road construction on unstable slopes subject to mass wasting; and cumulative effects, as described in the proposed rule (64 FR 16403). However, as the OFPA affects a relatively small portion of the DPS (8 percent of the land base), it is not likely to result in the DPS of coastal cutthroat trout becoming endangered in the foreseeable future.

Dredge, Fill, and Inwater Construction Programs

The proposed rule described the potential protection of aquatic systems under section 404 of the CWA, though there was concern for the lack of a specific methodology to address cumulative effects and additive effects of continued development (64 FR 16403). Dredge, fill, and inwater construction programs were not listed as a specific threat to the DPS (64 FR 16407), though they may have contributed to some past habitat loss, particularly in the estuaries and large rivers.

A wide variety of instream and near-stream activities are regulated under section 404 of the CWA and section 10 of the Rivers and Harbors Act of 1899, which are administered by the U.S. Army Corps of Engineers (COE). Examples include wetland fills; channel dredging; bank stabilization; pipeline trenches; road and bridge construction; survey activities; outfall construction; and boat ramps, pilings and other structures. Section 404 of the CWA requires that the COE not permit such activities if they ''cause or contribute to significant degradation of the waters of the United States.'' The States also play a role in CWA implementation by reviewing and conditioning proposed section 404 permits relative to State water quality standards and State coastal zone management policies. These joint State/Federal CWA determinations focus primarily on water quality and pollution. COE guidelines do lack a specific methodology for assessing cumulative impacts in the decision-making process, or for minimizing and mitigating the additive effects of the continued development of waterfront, riverine, coastal, and wetland properties.

Many of the activities regulated under the CWA are also controlled by State-level regulatory programs. In Oregon, work which may modify the bed or banks of rivers, lakes, streams, estuaries and wetlands of the State must receive a permit under the Removal-Fill Law administered by the Division of State Lands. Permits are conditioned to reduce adverse impacts to water quality and aquatic resources or to mitigate those impacts. A standard condition stipulates that riparian vegetation removal be limited to the minimum amount needed to complete the project; and replacement, re-establishment and replanting riparian vegetation is an essential permit condition. As with CWA permits, removal-fill permits are also reviewed by the Department of Environmental Quality for consistency with State water quality standards. Protection and restoration of salmonid habitat has recently received increased emphasis in administration of this law. In Washington, similar activities are regulated under the State Hydraulics Code, which is administered by the WDFW through its Hydraulic Project Approval program. Hydraulic Project Approval program standards and guidelines are specifically focused on the protection of fish life and aquatic habitats, and are subject to review every five years to ensure consistency with these objectives.

Based on the implementation of current laws and regulatory programs, we conclude that the regulation of dredge, fill, and in-water construction activities through the section 404 and section 10 permit processes, and through State programs, will provide some protection and support of aquatic resources, though they may not fully remove the risk of some losses to cumulative effects from small individual projects. The remaining risks from cumulative effects are likely to be small in the short term, and we do not anticipate that the cumulative effects of these small projects will reach a level at which they would be likely to result in the DPS of coastal cutthroat trout becoming endangered in the foreseeable future. Dredge, fill, and inwater construction programs were not identified in the proposed rule as a threat to this DPS (64 FR 16407) and are not considered a significant threat at this time.

Water Quality Programs

The proposed rule stated that ''* * * implementation [of the Federal CWA] has not been effective in adequately protecting fishery resources, particularly with respect to non-point sources of pollution''(64 FR 16403), though this was not listed as a specific threat to the DPS (64 FR 16407). The proposed rule did describe the long-term benefits of developing Total Maximum Daily Loads (TMDLs) and the ability of these to protect cutthroat trout in the long term, though they would be difficult to develop in the short term and their efficacy in protecting salmonid habitat would be unknown for years (64 FR 16403).

Under section 303(c) of the CWA, States are required to adopt water quality standards to restore and maintain the chemical, physical and biological integrity of the nation's waters. As part of this process, the States develop standards for TMDLs of pollutants relative to particular water quality standards. TMDLs offer a method for quantitatively assessing environmental problems in a watershed and identifying pollution reductions needed to protect drinking water, aquatic life, recreation, and other uses of rivers, lakes, and streams. TMDLs address pollution sources, including such point sources as sewage or industrial plant discharges, and such non-point discharges as runoff from roads, farm fields, and forests. The CWA gives State governments the primary responsibility for establishing TMDLs. Section 303(d) of the CWA requires States to identify surface waters that do not meet State water quality standards.

The Oregon Department of Environmental Quality (ODEQ) submitted revised water quality standards to the U.S. Environmental Protection Agency (EPA) for review and approval on July 11, 1996. EPA considered approval of Oregon's water quality standards for dissolved oxygen, temperature, and pH as submitted, with the exception of the temperature criterion for the Willamette River from the river's mouth to river mile 50. Consideration of the temperature criterion for this reach of the Willamette River was deferred until a final action (approval of a revised State criterion or a new criterion promulgated by EPA) is proposed by EPA. ODEQ has recently finalized the 1998 303(d) list and submitted to EPA a schedule for completing TMDLs by the year 2007.

Unless specifically allowed under an ODEQ-approved surface water temperature management plan, no measurable surface water temperature increase resulting from anthropogenic activities is allowed in the following cases: (1) In a basin for which salmonid fish rearing is a designated beneficial use, and in which surface water temperatures exceed 17.8 degrees C (64 degrees F); (2) in waters and periods of the year determined by the ODEQ to support native salmonid spawning, egg incubation, and fry emergence from the egg and from the gravels in a basin which exceeds 12.8 degrees C (55.0 degrees F); (3) in waters determined by the ODEQ to be ecologically significant cold-water refugia; (4) in stream segments containing Federally-listed threatened or endangered species if the increase would impair the biological integrity of the threatened or endangered population; and (5) in Oregon waters when the dissolved oxygen levels are within 0.5 ppm or 10 percent saturation of the water column or intergravel dissolved oxygen criterion for a given stream reach or sub-basin, or in natural lakes. In addition to revising numeric standards, Oregon incorporated language to address water bodies exceeding the relevant numeric temperature criterion and included on the State's 303(d) list. Oregon rules require development and implementation of a surface water temperature management plan which describes the best management practices, measures, and/or control technologies which will be used to reverse the warming trend of the basin, watershed, or stream segment identified as water quality limited for temperature.

Washington has submitted, and is implementing, a TMDL schedule running through 2013. As of May 2000, TMDLs had been established for approximately 249 stream/water body segments and additional TMDLs are under development. A memorandum of agreement between EPA and the Washington Department of Ecology stipulates that time frames for meeting water quality standards, a plan to implement control actions, and a monitoring plan will be developed by 2003.

Inadequacy of water quality regulatory mechanisms was not identified in the proposed rule as a specific threat to this DPS (64 FR 16407) and is not considered a significant threat at this time. The current standards established by Oregon, and the ongoing efforts by both States, to establish TMDLs and rectify water quality problems should result in significant improvements in habitat conditions for cutthroat trout in the long term. However, until TMDLs are finalized and remediation efforts implemented for a period of time, adverse water quality may continue in some portions of the DPS's range. The ability of these TMDLs to protect cutthroat trout should be significant in the long term, and significant increases in water quality problems should not occur in the interim. Water quality regulations and programs should reduce the risk of continued habitat degradation, and water quality concerns are not likely to increase to a level at which they are likely to result in the DPS of coastal cutthroat trout becoming endangered in the foreseeable future.

Hatchery Management

The proposed rule stated that ''* * * the impact of [hatchery] programs on native, naturally spawned stocks are not well understood,'' but noted that ''[c]ompetition, genetic introgression, and disease transmission resulting from hatchery introductions may significantly reduce the production and survival of native, naturally-spawned cutthroat trout'' (64 FR 16403). The proposed rule described potential effects of introduction of rainbow/steelhead trout outside their historic range where cutthroat trout had not evolved in concert with these species (64 FR 16403) and discussed the past loss of interior strains of cutthroat trout to hybridization due to these hatchery releases. However, this is not true for the DPS or the coastal subspecies in general. This subspecies has evolved with rainbow/steelhead trout and has not suffered the impacts from hatchery introductions described for interior subspecies (see Hybridization section for more information).

Specific to this DPS, the proposed rule stated that ''[n]egative effects of hatchery coastal cutthroat trout may be contributing to the risks facing naturally spawned coastal cutthroat trout in this [DPS]'' (64 FR 16407). They noted that lower Columbia River tributaries were the only streams receiving hatchery-origin coastal cutthroat trout, and that the number of trout released has been substantially curtailed. The proposed rule stated that ''[t]he ultimate effects of hatchery fish depend on the relative size of hatchery and naturally spawned populations, the spatial and temporal overlap of hatchery and naturally spawned fish throughout their life cycles and the actual extent to which hatchery fish spawn naturally and interbreed with naturally produced fish'' (64 FR 16407), as well as the level of incidental harvest of naturally spawned fish in fisheries targeting hatchery salmonids. The proposed rule provided no estimate or evaluation of these factors.

In an attempt to mitigate the loss of habitat, hatchery programs were implemented by the States throughout the range of coastal cutthroat trout. Until recently, the transfer of hatchery stocks of coastal cutthroat trout between distant watersheds and facilities was a common management practice in Oregon and Washington watersheds (Crawford 1979, Kostow 1995). Growing concern about the genetic and ecological consequences of this practice prompted management agencies to institute policies to reduce the exchange of coastal cutthroat trout stocks among watersheds, primarily by terminating releases of fish in all but a few locations. Appendix A–1 of the Status Review (Johnson *et al.* 1999) contains detailed records of the stocking history of the DPS's range. Only the Cowlitz River Hatchery continues to produce and release coastal cutthroat trout within the

DPS, and this at substantially reduced levels. This hatchery produces anadromous cutthroat trout in a system with several barrier dams that have reduced natural access to historic freshwater habitat for anadromous cutthroat trout.

There is no evidence that competition, genetic introgression, or disease transmission from hatchery introductions which were described in the proposed rule as the potential consequences of the release of hatchery raised cutthroat trout (64 FR 16403) have significantly reduced the production and survival of native, naturally spawned cutthroat trout in the DPS. Coastal cutthroat trout production has been reduced to a single hatchery and there is no information at this time to indicate that the limited ongoing coastal cutthroat hatchery releases have an adverse effect on the DPS of coastal cutthroat trout. Therefore, we conclude that release of hatchery coastal cutthroat trout in this DPS does not represent a significant risk to naturally spawning cutthroat trout in this DPS.

The proposed rule also described the potential ''* * * negative consequences of interactions between coho salmon fry released from hatcheries and coastal cutthroat trout'' (64 FR 16403), though this was not identified as a specific threat to the DPS (64 FR 16407). Coho fry can compete with cutthroat trout for feeding and rearing habitat. Release of hatchery coho and steelhead may have adverse effects to local cutthroat trout populations, especially if they are stocked in headwater tributaries above traditional coho or steelhead habitat. Juvenile coho are dominant over juvenile cutthroat trout (Chapman 1962, Glova 1987, Rosenau and McPhail 1987, Trotter *et al.* 1993, Johnson *et al.* 1999) and coastal cutthroat trout are often displaced to less desirable habitats in the presence of other native salmonids (Hartman and Gill 1968, Griffith 1988). Coho and steelhead are natural competitors of cutthroat trout and cutthroat trout are likely adapted to some levels of competition from these species. The effect of coho and steelhead stocking is dependent on the location and magnitude of the releases. Releases in areas outside of historic coho habitat or in numbers that greatly exceed natural levels could have negative effects on cutthroat trout in the area of the release. Effects are likely to be limited to the stocked area and downstream migration habitats.

Hatchery coho and steelhead releases are likely to have a proportionally greater effect on the anadromous portion of the coastal cutthroat trout population because releases of these anadromous fish are likely to be concentrated in the anadromous-accessible areas. The resident portion of the population in the upper portions of the watersheds is not likely to be affected by these hatchery releases. However, information demonstrating effects from coho releases is limited within the DPS's range, and the extent to which hatchery management affects the DPS of coastal cutthroat as a whole is unknown. We have no evidence that coho releases in the DPS are producing competition above natural levels or represent a significant risk to the DPS. Competition from hatchery releases of coho salmon was not identified as a specific threat to the DPS (64 FR 16407) and is still not considered a significant threat to the DPS at this time.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Climate and Catastrophic Natural Events

The proposed rule stated that ''[p]ersistent drought conditions have reduced the already limited spawning, rearing, and migration habitat'' (64 FR 16403), though this was not listed as a specific threat to the DPS (64 FR 16407). The proposed rule also stated that climate conditions appeared to have resulted in decreased ocean productivity, which might have compounded degraded freshwater habitat (64 FR 16403). Juvenile and adult anadromous cutthroat trout use tidal rivers and low-gradient estuarine sloughs and tributaries during spawning and feeding migrations (Kostow 1995). These nearshore areas can be influenced by ocean productivity. The El Niño-Southern Oscillation cycle (commonly known as El Nino), causes periodic declines in ocean productivity that could affect the survival and productivity of anadromous coastal cutthroat trout during low periods. During periods of warm ocean conditions, freshwater habitat conditions may also be affected due to reduced rainfall with associated impacts on streamflows and increasing river temperatures (Greenland 1998). These types of climate changes are natural, long-term cycles, and coastal cutthroat trout are likely adapted to this variation. Therefore, these climate cycles would not be expected to significantly threaten coastal cutthroat trout in the foreseeable future. There is no evidence that drought or other climate cycles have significantly reduced spawning, rearing, or migration habitat for the DPS. Climate change, specifically persistent drought, was not identified in the proposed rule as a specific threat to this DPS (64 FR 16407) and is not considered a significant threat at this time.

Fire events in Pacific northwest coastal zones are generally of low frequency (more than 200 years between disturbances) and high severity (*e.g.,* a high proportion of the trees are killed) (Agee 1993). Although fires can be large and intense, unburned patches and refugia often persist. These refugia provide a source of fish to recolonize other areas once the habitat recovers. The effects of fire are likely to be episodic, dispersed through time and space. Coastal cutthroat trout appear to be well adapted to such natural pulsed disturbances. This process historically may have posed little threat to most local and regional populations.

Coastal cutthroat trout are well distributed within the all three major drainage areas within the DPS's range. This wide distribution reduces the likelihood that catastrophic natural events would severely deplete populations throughout the DPS's range. Stochastic events such as fire, flood, and volcanic eruptions, are likely to impact coastal cutthroat trout at a watershed or sub-basin scale and would not affect all portions of the DPS concurrently. Therefore, even if portions of the DPS are depressed, the risk of a catastrophic event severely impacting the DPS as a whole is very limited and is not anticipated to significantly threaten coastal cutthroat trout in the foreseeable future.

Hybridization

The proposed rule stated that ''[h]ybridization between coastal cutthroat trout and *Oncorhynchus mykiss* may prose serious risks for this species'' (64 FR 16403), though it was not listed as a threat to the DPS (64 FR 16407). The proposed rule described the potential adverse effects of the widespread release of hatchery rainbow trout throughout the range of interior cutthroat trout; resulting hybridization between the species could pose serious risks for cutthroat trout (64 FR 16403). However, this is specific to interior subspecies that did not evolve in contact with rainbow/steelhead trout. The coastal cutthroat trout differs from these interior subspecies as they evolved with the presence of rainbow/steelhead trout and therefore have developed mechanisms to limit hybridization.

Hybridization of coastal cutthroat trout among subspecies and with other species of trout, particularly rainbow trout, is known to occur, and has long been implicated in the decline of other cutthroat subspecies (Busack and Gall 1981, Young 1995, Willers 1991). Unlike interior subspecies of cutthroat trout that evolved in the absence of other salmonids, coastal cutthroat trout evolved in sympatry with a suite of other Pacific salmonids, their range closely overlapping with steelhead in coastal drainages of western North America. Behnke (1992) concluded that cutthroat and rainbow trout shared a common ancestor as recently as two million years ago. As a result, it is likely that the long evolutionary association of rainbow and coastal cutthroat trout would have led to isolating mechanisms that would minimize the occurrence of hybridization.

Recent information (Campton 1981, Campton and Utter 1985, Hawkins and Quinn 1996, Williams *et al.* 1997, Johnson *et al.* 1999) suggests that hybridization of coastal cutthroat trout with steelhead may be more prevalent in the Pacific Northwest than previously believed. Hybridization appears to occur in a mosaic pattern at naturally low levels in areas where coastal cutthroat trout and steelhead spawn in the same streams, but the conditions triggering this apparent interbreeding are unknown. Hubbs (1955) and Campton (1987) suggest that anthropogenic factors can cause or stimulate natural hybridization where it previously was rare or uncommon. However, biologists studying this issue cannot determine whether the observed occurrences of hybridization result from anthropogenic factors (*e.g.,* stocking of hatchery-origin steelhead, habitat modifications, etc.) or simply reflect a natural evolutionary process that has been ongoing for hundreds, perhaps thousands of years.

The most recent hybridization studies within southwest Washington and the Columbia River indicate that hybridization occurs in scattered locations, but generally at low levels throughout the range of coastal cutthroat. In 2000 and 2001, U.S. Geological Service-Biological Resources Division investigators analyzed a total of 230 coastal cutthroat tissue samples from coastal cutthroat trout captured within southwest Washington and the Columbia River (Carl Ostberg, U.S. Geologic Survey, pers. comm., 2001). Fourteen streams were sampled including six streams within the Grays Harbor drainage, three streams in the Willapa Bay drainage, and one stream each from the Lower Columbia, Upper Cowlitz, Kalama, East Fork Lewis, and Upper Washougal rivers. Only 1 of the 14 streams sampled contained hybrids (the Green Fork of the East Fork Lewis River (4 of 25 individuals) (USFWS 2001). Spruell *et al.* (1998) examined incidence of hybridization between coastal cutthroat trout and rainbow/steelhead trout in tributaries of the Columbia River and found hybridization to be common, though at low levels in most samples. Only a few isolated locations showed high levels of hybridization.

Although the data on hybridization between coastal cutthroat trout and rainbow/steelhead trout are limited, indications are that hybridization has likely been occurring for at least several decades at low levels where these two species co-exist. Much scientific uncertainty currently surrounds the causes of hybridization and its evolutionary consequences. In view of the limited nature of hybridization in the DPS and the natural co-occurrence of these species, hybridization between cutthroat trout and rainbow/steelhead trout is not currently considered a significant threat to the DPS of coastal cutthroat trout. Low levels of hybridization may represent natural interaction between rainbow/steelhead trout and coastal cutthroat trout. Populations with high levels of hybridization are few and isolated. Hybridization was not identified in the proposed rule as a specific threat in the DPS, and is not considered a significant threat at this time.

Foreseeable Conservation Measures

Numerous conservation efforts related to maintenance and protection of threatened salmonids, riparian and aquatic habitats, and overall watershed health are underway in Oregon and Washington. These are being driven by the overall salmonid recovery frameworks in place in the States and by specific growth management and Endangered Species Act considerations. Efforts range from broad scale application undertaken by State or regional authorities to site-specific projects implemented by individual landowners or local action groups such as watershed councils. These are generally non-regulatory in nature, relying on incentives or voluntary compliance, or are still in development. Therefore, while they may contribute to conservation of coastal cutthroat trout, we have not assumed any specific contribution in the listing determination.

Several factors make it difficult to predict the extent to which these efforts will result in improved implementation of the non-federal land use practices described above, or redress problems associated with past activities, including: (1) Many specific regulatory changes and on-ground projects have not yet been implemented either because related negotiation and rule-making are in the formative stages, or because specific proposals are subject to ongoing legal challenges; (2) the ecological effects of practices and projects that are implemented may not be realized for years or even decades; and (3) for some suites of activities, there is no readily available information regarding the nature or distribution of on-ground practices or projects.

The States' overall recovery frameworks are contained within the Oregon Plan for Salmon and Watersheds (Oregon Plan) and the Washington Statewide Strategy to Recover Salmon: ''Extinction is not an Option'' (Washington Strategy). Both of these frameworks emphasize improved implementation and enforcement of existing regulations, greater coordination and prioritization of conservation projects, and voluntary and incentive-based measures to provide greater site-specific protection. Based on recent implementation of these recovery frameworks, there will likely be some level of widespread effort to identify and correct existing fish passage problems (and to prevent future obstacles), and to restore previously degraded riparian and aquatic habitats on a site-specific basis. The Oregon Plan and the Washington Strategy also encourage or otherwise support a handful of larger, more comprehensive, restoration-oriented conservation projects within the DPS's range, such as the multi-stakeholder Sandy River Basin Agreement in Oregon. These projects will likely continue under the auspices of scientifically credible watershed assessments that minimize the likelihood of inappropriate ''fixes'' and undesirable adverse effects. Such restoration-oriented projects have the potential to substantially improve conditions for this species in many watersheds in the DPS's range. However, such improvements may not be sufficient, and in many cases may be negated, unless the broader suite of land-use activities occurring within the watersheds are modified to reduce future adverse effects.

The Washington Strategy targets a number of specific land-use regulatory programs for improvement, and in general supports consideration of improved regulatory standards, either through formal rule-making or through stakeholder negotiation processes. In addition to the previously mentioned Hydraulic Project Approval program revisions, examples include efforts to strengthen the Shoreline Management Act and State water policies, and to develop more consistent and reliable standards for agricultural practices and pesticide use. These efforts may lead to at least some improvement in statewide standards for agricultural practices and urban and rural development, and redress some of the previously noted problems with these practices.

In limited portions of the DPS's range in both States, regional and local efforts to address growth management issues and Federal Endangered Species Act issues for other listed species may improve programmatic standards or landowner-specific practices beyond those likely under the broad State recovery frameworks. In the Washington portion of the DPS's range, several forestry and agricultural planning efforts are underway, including the Cowlitz Tree Farm HCP, Tagshinny Safe-Harbor and Candidate Conservation Agreement, Scatter Creek HCP, and Lewis County Family Forest Conservation project. In addition, Clark County has initiated an Endangered Species Act Response Program that will address water quality, aquatic and riparian habitat protection, and conservation of listed salmonids for a number of development and urban land-use activities under the county's purview. Ongoing and future components of this effort include assessments of biological resources and potential impacts of various activities; review and revision of development codes, ordinances, and operating procedures; and prioritization and implementation of restoration and acquisition projects.

In the Oregon portion of the DPS's range, a large number of municipalities and counties in the Portland metropolitan area have initiated efforts to revise comprehensive plans and address Endangered Species Act issues in a fashion similar to those described for Clark County, Washington. Primary examples include Clackamas County, the City of Lake Oswego, City of Gresham, the Metro regional government, and the City of Portland. These efforts are in various stages of development and are likely to evolve incrementally (*i.e.,* sets of measures to address road management followed by measures to address stormwater management or streamside development, etc.) over the next several years.

Notwithstanding the formative and uncertain nature of most of these local level planning efforts, we are encouraged by the efforts. Most of the sponsoring entities have continued to commit staff and financial resources to the projects despite recent budget limitations. The issues and approaches comprising many of the projects appear consistent with conservation objectives for cutthroat trout. Finally, the handful of projects that are more evolved show promise in terms of some of the measures under consideration. For example, under the City of Portland's ''Healthy Portland Streams'' program and Metro's Statewide Planning Goal 5 program, new rules are being developed to protect important streamside areas and vulnerable upslope habitats from inappropriate development and to facilitate restoration of some previously degraded areas. Similarly, the Portland Water Bureau's Bull Run Watershed Management program is close to finalizing proposals to more appropriately manage water quality, flow, temperature, and other impacts associated with the City's water supply and distribution operations. In these programs, the measures being considered represent improvements over previous practices, and could be an important contribution to ensuring that the activities of local governments and their constituents in the Portland metropolitan region are consistent with the conservation of this species. Once fully in force, these programs may also contribute significantly to the conservation of other sensitive species and help preclude the need to list them as threatened or endangered.

Continuation and successful implementation of conservation efforts such as those mentioned above, and expansion of these efforts to additional activities and areas will be necessary to fully address concerns associated with previous management legacies and with the existing regulatory framework. Such efforts will be a critical determinant of whether current cutthroat trout habitats and populations are maintained and improved in the long run to an extent that supports long-term conservation. As such, we will continue to monitor and review the progress of these efforts very carefully to determine their impact on the future status of the species. However, because these are non-regulatory programs or are still in development, we did not base our final listing determination on the assumption that these programs would be implemented.

Finding and Withdrawal

As described in the proposed rule (64 FR 16407), some portions of the proposed coastal cutthroat trout DPS are likely at lower-than-historic levels and are probably still declining. However, new information and recent changes in regulations have changed our conclusion about the risk that the species may become endangered in the foreseeable future. This withdrawal is based on: (1) New data indicating that coastal cutthroat trout are more abundant in southwest Washington than previously thought and that population sizes are comparable to those of healthy populations in other areas; (2) new information and analyses calling into question past interpretation of the size of the anadromous portion of the population in the Columbia River and indicating higher numbers than previously described; (3) new data and analyses no longer showing declining adult populations in the Grays Harbor tributaries; (4) new analyses that call into question the past interpretation of trend data, and therefore the magnitude of the trend in the anadromous portion of the population in the Columbia River; (5) new information about the production of anadromous progeny by above-barrier cutthroat trout; and (6) two large-scale Habitat Conservation Plans (HCPs) and significant changes in Washington Forest Practices Regulations substantially reducing threats to aquatic and riparian habitat on forest lands in Washington.

The proposed rule stated that ''NMFS remains concerned about the extremely low population size of anadromous coastal cutthroat trout in lower Columbia River streams, indicated by low incidental catch of coastal cutthroat trout in salmon and steelhead recreational fisheries, and by low trap counts in a number of tributaries throughout the region,'' and that ''* * * numbers of adults returning to traps in the lower Columbia River tributaries were consistently below 10 fish in most streams over each of the past 6 years'' (64 FR 16407). Despite extensive changes to aquatic and riparian condition in many portions of the DPS's range, coastal cutthroat trout remain extant throughout their historic habitat and populations in a large portion of the DPS are found in densities comparable to populations considered to be healthy-sized. The anadromous portion of the DPS is likely depressed from historic levels, though it also appears to remain extant in all accessible portions of the DPS's range. There is little specific information indicating the actual size of the anadromous portion of the population or that these populations are extremely low. Coastal cutthroat trout as a whole, in the Washington portion of the DPS, remain at comparable densities to other areas considered to have healthy-sized populations. There is no information that leads us to conclude that coastal cutthroat trout populations in a significant portion of the DPS's range are at levels that would lead to risk of extinction due to small population size in the foreseeable future.

The proposed rule stated that ''[t]rends in anadromous adults and outmigrating smolts in the southwestern

Washington portion of this [DPS] are all declining'' (64 FR 16407) and that ''[r]eturns of both naturally and hatchery produced anadromous coastal cutthroat trout in almost all lower Columbia River streams have declined markedly over the last 10 to 15 years,'' with the only increase in the Toutle River (64 FR 16407). The most recent data indicate variable population trends throughout the DPS and do not support the conclusion that trends of anadromous adults and outmigrating smolts in the DPS are all declining, as described in the proposed rule. There is no evidence that the adult portion of the population in the Grays Harbor tributaries is declining over the long term, and some indication that the adult portion of the population may be stable or increasing. Therefore, we no longer conclude that trends in anadromous adults and outmigrating smolts in southwest Washington are all declining as described in the proposed rule. There are indications of declines in the adult portion of the population in the Columbia River tributaries, though the rate of the decline is uncertain due to concerns over the reliability of the analyses and potential biases in the data sets. Therefore, we no longer conclude that returns of anadromous cutthroat trout in ''almost all'' lower Columbia River streams have declined markedly over the last 10 to 15 years as described in the proposed rule (64 FR 16407). There is little information on population trends for the resident or freshwater portion of the population in the DPS, though populations in the Washington portion of the DPS appear to remain at levels comparable to healthy-sized populations, indicating that large-scale declines have not occurred at a landscape level. Based on these data, we do not find that population trends indicate that coastal cutthroat trout are likely to be extirpated from any significant portion of their range in the foreseeable future.

The degree to which the reductions in the anadromous portion of the coastal cutthroat trout population represent a risk to the population in the DPS as a whole depends, in part, on the extent to which various coastal cutthroat trout life history strategies are genetically versus environmentally controlled. The proposed rule stated that ''* * * a significant risk factor for coastal cutthroat trout in this [DPS] was a reduction of life-history diversity'' and that ''[r]educed abundance in anadromous fish will tend to restrict connectivity of populations in different watersheds, which can increase genetic and demographic risk'' (64 FR 16407). ''The significance of this reduction in life-history diversity to both the integrity and the likelihood of this [DPS's] long-term persistence is a major concern to NMFS'' (64 FR 16407). WDFW (2001) provided additional information demonstrating the capability of resident coastal cutthroat trout to produce anadromous progeny after long isolation (40 years), suggesting that even if the anadromous portion of the population continues to experience low number and declines, smolts will be produced that can supplement the anadromous portion of the population and take advantage of any improvement in anadromous habitat. There is no evidence at this time that coastal cutthroat trout pursuing the anadromous life history strategy are segregated from the remainder of the population. In fact, studies show that individuals above barriers and below barriers with access to the sea are more closely related within a drainage than are individuals from different drainages (Behnke 1997, Johnson *et al.* 1999). This further supports the conclusion that anadromous and non-anadromous individuals are not substantially separate subpopulations. Therefore, based on the evidence that freshwater and isolated portions of the population are capable of producing anadromous migrants, we now conclude that freshwater and isolated portions of the coastal cutthroat trout population are contributing to the anadromous portion of the population and mitigating risks to anadromous portion of the population to some degree. The ability for non-anadromous cutthroat trout to produce anadromous progeny reduces the risk of loss of the anadromous life history strategy in the foreseeable future.

Specific to the southwestern Washington/Columbia River DPS, the proposed rule stated that ''* * * severe habitat degradation throughout the lower Columbia River has contributed to dramatic declines in anadromous coastal cutthroat trout populations and two near extinctions of anadromous runs in the Hood and Sandy Rivers' (64 FR 16407). The proposed rule also stated that ''[h]abitat degradation in stream reaches accessible to anadromous coastal cutthroat trout, and poor ocean and estuary conditions, likely combined to severely deplete this life-history form throughout the lower Columbia River Basin'' (64 FR 16407). While aquatic and riparian systems have been heavily altered in some areas, the latest information does not support the conclusion that this has severely affected the habitat of the coastal cutthroat trout in this DPS as a whole. Some areas have begun to recover from past forest practices and new regulations are in place that reduce the risk of continued adverse impacts to much of the DPS. Conditions in many parts of the DPS's range are expected to continue to improve over time and many of the most damaging past practices (*e.g.,* splash dams, large-scale wetland conversion) are not expected to occur in the future due to current laws and regulations. Despite the long term, widespread impacts to aquatic and riparian conditions, coastal cutthroat trout have survived in these areas for many generations and remain at densities comparable to healthy-sized populations in large portions of the DPS's range. Therefore, there is no significant present or identifiable threat of curtailment of the range of the DPS. Given that coastal cutthroat trout have survived the long-term and widespread impacts of these past practices on aquatic and riparian conditions in large portions of the DPS's range for many generations, and apparently remain well distributed at densities comparable to healthy-sized populations elsewhere, the condition of aquatic and riparian systems is not likely to result in endangerment of the DPS of coastal cutthroat trout in the foreseeable future. Therefore, we no longer conclude that past habitat degradation has led to severe declines in the population of coastal cutthroat trout in the southwestern Washington/Columbia River DPS.

All Federal lands within the DPS's range (27 percent) are managed in a manner conducive to the conservation of coastal cutthroat trout. The proposed rule concluded that the Washington Forest Practices Regulations did ''* * * not provide for properly functioning riparian and instream habitats,'' including failure to address large woody debris recruitment, tree retention to maintain stream band and channel integrity, and chronic and episodic inputs of coarse and fine sediments (64 FR 16402). The Washington Forest Practices Regulations were updated since the proposed rule. These new regulations include improvements to: (1) Timber harvest activities in and around riparian areas and unstable slopes; (2) road use, construction, and maintenance related to forest management; and (3) increased riparian buffer widths, reduced level of management activities within the buffers, and an increase in the percentage of the stream network subject to these buffers. Given these improvements, we no longer conclude that the Washington Forest Practices

Regulations do not provide for the conservation of coastal cutthroat trout and their habitat. The lands affected by the WFPA and two long-term forest HCPs completed in the Washington portion of the DPS's range should greatly reduce the risk of continued cutthroat habitat degradation and loss in an additional 30 percent of the DPS's range. Therefore, 57 percent of the DPS's range is under management and regulations that should greatly reduce the rate of future habitat impacts and provide for long-term improvement of coastal cutthroat trout habitat in the DPS's range. Collectively, remnant high quality habitat, ongoing forest recovery, active efforts to identify and correct legacies of past management, improved standards for future management actions, and the ability of coastal cutthroat trout to survive for long periods in degraded aquatic and riparian systems provide the basis for maintenance of habitat for coastal cutthroat trout within the DPS's range. Therefore, forest management is not likely to result in the DPS of coastal cutthroat trout becoming endangered in the foreseeable future.

The proposed rule described the potential loss of important estuarine habitat and stated that reductions in the quantity and quality of estuarine habitat probably contributed to declines of anadromous cutthroat trout, but the relative importance of these risks was not well understood (64 FR 16402). This is further complicated by the lack of information on how coastal cutthroat trout use large estuary systems. Significant portions of the estuarine wetlands in the Willapa Bay and Grays Harbor systems, and to a lesser degree in the Columbia River estuary, remain intact. Given current regulations, we do not anticipate additional large-scale conversion or loss of estuary or off-channel areas. While past losses of estuaries may have contributed to a reduction in the anadromous portion of the coastal cutthroat trout population over historic levels, we do not have evidence that the past and potential future losses are likely to result in the DPS of coastal cutthroat trout becoming endangered in the foreseeable future.

Specific to this DPS, the proposed rule stated that ''[n]egative effects of hatchery coastal cutthroat trout may be contributing to the risks facing naturally spawned coastal cutthroat trout in this [DPS]'' (64 FR 16407), though the ultimate effects of hatchery practices depend on the relative size of the populations, the overlap of hatchery and naturally spawned fish, and the actual extent to which hatchery fish interbreed with naturally produced fish (64 FR 16407), as well as the level of incidental harvest of naturally spawned fish in fisheries targeting hatchery salmonids. The proposed rule provided no estimate or evaluation of these factors. Coastal cutthroat trout production has been reduced to a single hatchery. Analysis of the remaining hatchery stock history and genetics indicate that the hatchery stock is similar to the naturally spawned stock. There is no information at this time to indicate that the limited ongoing coastal cutthroat hatchery releases have an adverse effect on the DPS of coastal cutthroat trout. Therefore, we conclude that the release of hatchery coastal cutthroat trout in this DPS does not represent a significant risk to naturally spawning cutthroat trout in this DPS.

Several other potential threats were described in the Summary of Factors Affecting the Species section of the proposed rule (64 FR 16402) as principal factors for decline in the subspecies-wide review of listing factors (64 FR 16402), but were not identified as a specific threat to the southwestern Washington/Columbia River DPS (64 FR 16407). These include overutilization for commercial, recreational, scientific, or educational purposes (recreational angling, by catch in recreational and commercial harvest of other species, and scientific or educational uses); predation; some regulatory mechanisms (dredge, fill, and inwater construction programs and water quality programs); climate and catastrophic natural events, and hybridization. We evaluated the latest information on each of these potential threats and conclude that they are still not considered a threat at this time.

Cutthroat trout are not harvested commercially within the DPS. Scientific and educational programs likely have little impact on these populations and recreational fishing under current regulations does not represent a significant threat to the DPS of cutthroat trout. No introduced diseases have been documented in coastal cutthroat trout populations within the DPS and there is no evidence of significant, elevated loss of wild cutthroat trout to native disease in the DPS at this time. No specific information exists regarding predation impacts by predatory fishes on cutthroat trout, though it is reasonable to assume some predation does occur. We have no evidence that aquatic predators have significantly reduced coastal cutthroat trout populations or represent a major threat to coastal cutthroat trout at this time. There is no evidence that mammal or bird predation represents a significant threat to the DPS of cutthroat trout at this time.

While regulation of dredge, fill, and in-water construction activities through the section 404 permit process in the DPS's range may not eliminate all adverse effects to the riparian and aquatic environment, we conclude that it should provide significant protection for aquatic resources, and the ability for us to track continuing effects through the review of permit applications. The remaining risks from cumulative effects are likely to be small in the short term and we do not anticipate that the cumulative effects of these small projects will reach a level at which they would be likely to result in the DPS of coastal cutthroat trout becoming endangered in the foreseeable future. Current standards established by Oregon under the CWA should result in significant improvements in habitat conditions for native fish.

The proposed rule stated that drought and climate condition resulting in decreased ocean productivity might have compounded degraded freshwater habitat (64 FR 16403). These types of climate changes are natural, long-term cycles and coastal cutthroat trout are likely adapted to this variation. Therefore, these climate cycles would not be expected to significantly threaten coastal cutthroat trout in the foreseeable future. There is no evidence that drought or other climate cycles have significantly reduced spawning, rearing, or migration habitat for the DPS.

Hybridization with other species could affect coastal cutthroat trout. The most recent hybridization studies within southwest Washington and the Columbia River indicate that hybridization occurs in scattered locations, but generally at low levels throughout the range of coastal cutthroat. Coastal cutthroat trout, unlike most other cutthroat trout subspecies, evolved in contact with rainbow/steelhead trout and it is likely that the long evolutionary association of rainbow and coastal cutthroat trout would have led to isolating mechanisms that would minimize the occurrence of hybridization. This means there is a low potential risk of hybridization significantly affecting coastal cutthroat trout. The few areas observed with high levels of hybridization are isolated and scattered, and do not appear to represent a widespread threat to coastal cutthroat trout at this time.

A few potential threats were not described in the subspecies-wide review of listing factors in the proposed rule (64 FR 16402) or identified as a DPS-specific threat to the southwestern Washington/Columbia River DPS. These include losses of habitat to agriculture and livestock management, dams and barriers, urban and industrial development, and mining. We evaluated the latest information on each of these potential threats and concluded that they are still not a significant threat at this time.

While populations of some portions of the DPS of coastal cutthroat trout are likely at lower-than-historic levels and probably still declining, recent changes in regulations have reduced threats to the DPS as a whole. This, and the latest information indicating relatively healthy-sized total populations (all life history strategies) in a large portion (75 percent) of the DPS's range, and the production of anadromous trout from residents, lead us to conclude that the DPS of coastal cutthroat trout is not in danger of becoming endangered in the foreseeable future and, therefore, does not meet the definition of a threatened species at this time. Therefore, we withdraw the April 5, 1999, proposed rule (64 FR 16397) to list the coastal cutthroat trout population in southwestern Washington and the Columbia River, excluding the Willamette River above Willamette Falls, as threatened. We will continue to monitor the conditions of the coastal cutthroat trout in southwest Washington and the Columbia River. In the event that conditions or threats change and the species becomes imperiled, we could again propose to list the species as endangered or threatened under the Act. We will continue to provide technical assistance to Federal, State, and other entities and encourage them to address the conservation needs of the coastal cutthroat trout. We will continue to work with these agencies and entities to collect additional biological information, monitor the status of coastal cutthroat trout, and monitor the progress of conservation efforts for the DPS.

References Cited

A complete list of all references cited is available upon request from the Oregon Fish and Wildlife Office (*see* **ADDRESSES**).

Authors

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Authority

The authority for this action is section 4(b)(6)(B)(ii) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: June 24, 2002.

Steve Williams,

Director, Fish and Wildlife Service.

[FR Doc. 02–16579 Filed 7–3–02; 8:45 am]

BILLING CODE 4310–55–P