(iv) *Location: 100-Yard Zone.* All waters of Jamaica Bay within approximately 100 yards of John F. Kennedy Airport bound by the following points: Onshore east of Bergen Basin, Queens in approximate position 40°38′49.0″ N, 073°49′09.1″ W, thence to 40°38′45.1″ N, 073°49′11.6″ W, thence to 40°38′02.0″ N, 073°47′31.8″ W, thence to 40°37′52.3″ N, 073°47′55.0″ W, thence to 40°37′50.3″ N, 073°47′53.5″ W, thence to 40°38′00.8″ N, 073°47′29.4″ W, thence to 40°37′47.4″ N, 073°47′02.4″ W, thence to 40°37′19.9″ N, 073°47′25.0″ W, thence to 40°37′10.0″ N, 073°47′03.7″ W, thence to 40°37′37.7″ N, 073°46′41.2″ W, thence to 40°37′22.6″ N, 073°46′21.9″ W, thence to 40°37′05.7″ N, 073°46′34.9″ W, thence to 40°36′54.8″ N, 073°46′26.7″ W, thence to 40°37′14.1″ N, 073°46′10.8″ W, thence to 40°37′40.0″ N, 073°45′55.6″ W, thence to 40°38′02.8″ N, 073°44′57.5″ W, thence to 40°38′05.1″ N, 073°45′00.3″ W, (NAD 1983) thence along the shoreline to the point of origin.

(v) *Enforcement period.* The zones described in paragraphs (a)(8) of this section will be effective at all times. When port security conditions permit, the Captain of the Port will allow vessels to operate within that portion of the waters described in paragraph (a)(8)(iii) that lies outside of the waters described in paragraph (a)(8)(iv). Authorization to enter the waters that lie between the outer boundaries of the zones described in paragraphs (a)(8)(iii) and (a)(8)(iv) will be communicated by the Captain of the Port to the public by marine broadcast, local notice to mariners, or notice posted at *http://www.harborops.com.*

(9) *NYPD Ammunition Depot, Rodman Neck, Eastchester Bay, NY.* (i) *Location: 150-Yard Zone.* All waters of Eastchester Bay within approximately 150 yards of Rodman Neck bound by the following points: Onshore in approximate position 40°51′30.4″ N, 073°48′14.9″ W, thence to 40°51′29.9″ N, 073°48′20.7″ W, thence to 40°51′16.9″ N, 073°48′22.5″ W, thence to 40°51′07.5″ N, 073°48′18.7″ W, thence to 40°50′54.2″ N, 073°48′11.1″ W, thence to 40°50′48.5″ N, 073°48′04.6″ W, thence to 40°50′49.2″ N, 073°47′56.5″ W, thence to 40°51′03.6″ N, 073°47′47.3″ W, thence to 40°51′15.7″ N, 073°47′46.8″ W, thence to 40°51′23.5″ N, 073°47′41.9″ W, (NAD 1983) thence southwesterly along the shoreline to the point of origin.

(ii) *Location: 100-Yard Zone.* All waters of Eastchester Bay within approximately 100 yards of Rodman Neck bound by the following points: Onshore in approximate position 40°51′30.4″ N, 073°48′14.9″ W, thence to 40°51′30.1″ N, 073°48′19.0″ W, thence to 40°51′16.8″ N, 073°48′20.5″ W, thence to 40°51′07.9″ N, 073°48′16.8″ W, thence to 40°50′54.9″ N, 073°48′09.0″ W, thence to 40°50′49.7″ N, 073°48′03.6″ W, thence to 40°50′50.1″ N, 073°47′57.9″ W, thence to 40°51′04.6″ N, 073°47′48.9″ W, thence to 40°51′15.9″ N, 073°47′48.4″ W, thence to 40°51′23.5″ N, 073°47′41.9″ W, (NAD 1983) thence southwesterly along the shoreline to the point of origin.

(iii) *Enforcement period.* The zones described in paragraph (a)(9) of this section will be effective at all times. When port security conditions permit, the Captain of the Port will allow vessels to operate within that portion of the waters described in paragraph (a)(9)(i) that lies outside of the waters described in paragraph (a)(9)(ii). Authorization to enter the waters that lie between the outer boundaries of the zones described in paragraphs (a)(9)(i) and (a)(9)(ii) will be communicated by the Captain of the Port to the public by marine broadcast, local notice to mariners, or notice posted at *http://www.harborops.com.*

(10) *Port Newark/Port Elizabeth, Newark Bay, NJ.* All waters of Newark Bay bound by the following points: 40°41′49.9″ N, 074°07′32.2″ W, thence to 40°41′46.5″ N, 074°07′20.4″ W, thence to 40°41′10.7″ N, 074°07′45.9″ W, thence to 40°40′54.3″ N, 074°07′55.7″ W, thence to 40°40′36.2″ N, 074°08′03.8″ W, thence to 40°40′29.1″ N, 074°08′06.3″ W, thence to 40°40′21.9″ N, 074°08′10.0″ W, thence to 40°39′27.9″ N, 074°08′43.6″ W, thence to 40°39′21.5″ N, 074°08′50.1″ W, thence to 40°39′21.5″ N, 074°09′54.3″ W, (NAD 1983) thence northerly along the shoreline to the point of origin.

(11) *Global Marine Terminal, Upper New York Bay.* All waters of Upper New York Bay between the Global Marine and Military Ocean Terminals, west of the New Jersey Pierhead Channel.

* * * * *

Dated: July 14, 2003.

C.E. Bone,

Captain, U.S. Coast Guard, Captain of the Port, New York.

[FR Doc. 03–20023 Filed 8–6–03; 8:45 am]

BILLING CODE 4910–15–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants: Reconsidered Finding for an Amended Petition To List the Westslope Cutthroat Trout as Threatened Throughout Its Range

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of petition finding.

SUMMARY: We, the Fish and Wildlife Service (Service), announce our reconsidered 12-month finding for an amended petition to list the westslope cutthroat trout (WCT) (*Oncorhynchus clarki lewisi*) as a threatened species throughout its range in the United States, pursuant to a Court order and the Endangered Species Act (Act) of 1973, as amended. After a thorough review of all available scientific and commercial information, we find that listing the WCT as either threatened or endangered is not warranted at this time. Also pursuant to the Court order, we assert our scientifically-based conclusion about the extent to which it is appropriate to include ‘‘hybrid’’ WCT populations and populations of unknown genetic characteristics in the taxonomic group that we considered for listing.

DATES: The finding announced in this document was made on August 1, 2003.

ADDRESSES: Data, information, comments, or questions regarding this document should be sent to the Chief, Branch of Native Fishes Management, U.S. Fish and Wildlife Service, Montana Fish and Wildlife Management Assistance Office, 4052 Bridger Canyon Road, Bozeman, Montana 59715. The complete administrative file for this finding is available for inspection, by appointment and during normal business hours, at the above address. The new petition finding, the status update report for WCT, the amended petition and its bibliography, our initial status review document and petition finding, related **Federal Register** notices, the Court Order and Judgement and Memorandum Opinion, and other pertinent information, may be obtained at our Internet Web site: *http://mountain-prairie.fws.gov/endspp/fish/wct/.*

FOR FURTHER INFORMATION CONTACT: Lynn R. Kaeding, by e-mail (*Lynn_Kaeding@fws.gov*) or telephone (406–582–0717).

SUPPLEMENTARY INFORMATION:

Background

Section 4(b)(3)(B) of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*), requires that within 90 days of receipt of the petition, to the maximum extent practicable, we make a finding on whether a petition to list, delist, or reclassify a species presents substantial scientific or commercial information indicating that the requested action may be warranted. The term ‘‘species’’ includes any subspecies of fish or wildlife or plants, and any Distinct Population Segment (DPS) of any species of vertebrate fish or wildlife that interbreeds when mature. If the petition contains substantial information, the Act requires that we initiate a status review for the species and publish a 12-month finding indicating that the petitioned action is either: (a) Not warranted, (b) warranted, or (c) warranted but precluded from immediate listing proposal by other pending proposals of higher priority. A notice of such 12-month findings is to be published promptly in the **Federal Register**.

On June 6, 1997, we received a petition to list the WCT (*Oncorhynchus clarki lewisi*) as threatened throughout its range and designate critical habitat for this subspecies of fish pursuant to the Act. The petitioners were American Wildlands, Clearwater Biodiversity Project, Idaho Watersheds Project, Montana Environmental Information Center, the Pacific Rivers Council, Trout Unlimited's Madison-Gallatin Chapter, and Mr. Bud Lilly.

The WCT is 1 of 14 subspecies of cutthroat trout native to interior regions of western North America (Behnke 1992, 2002). Cutthroat trout owe their common name to the distinctive red or orange slash mark that occurs just below both sides of the lower jaw. Adult WCT typically exhibit bright yellow, orange, and red colors, especially among males during the spawning season. Characteristics of WCT that distinguish this fish from the other subspecies of cutthroat trout include a pattern of irregularly shaped spots on the body, with few spots below the lateral line except near the tail; a unique number of chromosomes; and other genetic and morphological traits that appear to reflect a distinct evolutionary lineage (Behnke 1992).

Although its extent is not precisely known, the historic (*i.e.*, native) range of WCT is considered the most geographically widespread among the 14 subspecies of inland cutthroat trout (Behnke 1992). West of the Continental Divide, the subspecies is believed to be native to several major drainages of the Columbia River basin, including the upper Kootenai River drainage from its headwaters in British Columbia, through northwest Montana, and into northern Idaho; the Clark Fork River drainage of Montana and Idaho downstream to the falls on the Pend Oreille River near the Washington-British Columbia border; the Spokane River above Spokane Falls and into Idaho's Coeur d'Alene and St. Joe River drainages; and the Salmon and Clearwater River drainages of Idaho's Snake River basin. The historic distribution of WCT also includes disjunct areas draining the east slope of the Cascade Mountains in Washington (Methow River and Lake Chelan drainages, and perhaps the Wenatchee and Entiat River drainages), the John Day River drainage in northeastern Oregon, and the headwaters of the Kootenai River and several other disjunct regions in British Columbia. East of the Continental Divide, the historic distribution of WCT is believed to include the headwaters of the South Saskatchewan River drainage (United States and Canada); the entire Missouri River drainage upstream from Fort Benton, Montana, and extending into northwest Wyoming; and the headwaters of the Judith, Milk, and Marias Rivers, which join the Missouri River downstream from Fort Benton.

Previous Federal Actions

On July 2, 1997, we notified the petitioners that our Final Listing Priority Guidance, published in the December 5, 1996, **Federal Register** (61 FR 64425), designated the processing of new listing petitions as being of lower priority than were the completion of emergency listings and processing of pending proposed listings. A backlog of listing actions, as well as personnel and budget restrictions in our Region 6 (Mountain-Prairie Region), which had been assigned primary responsibility for the WCT petition, prevented our staff from working on a 90-day finding for the petition.

On January 25, 1998, the petitioners submitted an amended petition to list the WCT as threatened throughout its range and designate critical habitat for the subspecies. The amended petition contained additional new information in support of the requested action. Consequently, we treated the amended petition as a new petition.

On June 10, 1998, we published a notice (63 FR 31691) of a 90-day finding that the amended WCT petition provided substantial information indicating that the requested action may be warranted and immediately began a comprehensive status review for WCT. In the notice, we asked for data, information, technical critiques, comments, and questions relevant to the amended petition.

In response to that notice, we received information on WCT from State fish and wildlife agencies, the U.S. Forest Service, National Park Service, tribal governments, and private corporations, as well as private citizens, organizations, and other entities. That information, subsequently compiled in a comprehensive status review document (U.S. Fish and Wildlife Service 1999), indicated that WCT then occurred in about 4,275 tributaries or stream reaches that collectively encompassed more than 37,015 kilometers (km) (23,000 miles [mi]) of stream habitat. Those WCT were distributed among 12 major drainages and 62 component watersheds in the Columbia, Missouri, and Saskatchewan River basins. In addition, WCT were determined to naturally occur in 6 lakes totaling about 72,843 hectares (ha) (180,000 acres [ac]) in Idaho and Washington and in at least 20 lakes totaling 2,164 ha (5,347 ac) in Glacier National Park in Montana. That status review also revealed that most of the habitat for extant WCT was on lands administered by Federal agencies, particularly the U.S. Forest Service. Moreover, most of the strongholds for WCT were within roadless or wilderness areas or national parks, all of which afforded considerable protection to WCT. Finally, the status review indicated that there were numerous Federal and State regulatory mechanisms that protected WCT and their habitats throughout the subspecies' range.

On April 14, 2000, we published a notice (65 FR 20120) of our finding that the WCT is not likely to become either a threatened or an endangered species within the foreseeable future. We also found that, although the abundance of the WCT subspecies had been reduced from historic levels and its extant populations faced threats in several areas of the historic range, the magnitude and imminence of those threats were small when considered in the context of the overall status and widespread distribution of the WCT subspecies. Therefore, we concluded that listing the WCT as either a threatened or an endangered species under the Act was not warranted at that time.

On October 23, 2000, plaintiffs filed, in the U.S. District Court for the District of Columbia, a suit alleging four claims. They alleged that our consideration of existing regulatory mechanisms was arbitrary. Plaintiffs further claimed that our consideration of hybridization as a threat to WCT was arbitrary because, while identifying hybridization as a threat to WCT, we relied on a draft Intercross policy (61 FR 4710) to include hybridized WCT in the WCT subspecies that we considered for listing under the Act. Their third claim averred that we arbitrarily considered the threats to WCT posed by the geographic isolation of some WCT populations and the loss of some WCT life-history forms. Finally, plaintiffs claimed that we failed to account for the threat of whirling disease and other important factors, and that our decision to not list the WCT as threatened was arbitrary and capricious. In the subsequent oral argument before the Court, plaintiffs conceded that their strongest argument, and the one from which their other concerns stemmed, was that we included hybridized fish in the WCT subspecies considered for listing under the Act, while also recognizing hybridization as a threat to the subspecies. The hybridization threat to WCT is posed by certain nonnative fishes that management agencies and other entities stocked into streams and lakes in many regions of the historic range of WCT, beginning more than 100 years ago. Subsequently, those nonnative fishes or their hybrid descendants became self-sustaining populations and remain as such today.

On March 31, 2002, the U.S. District Court for the District of Columbia found that our listing determination for WCT did not reflect a reasoned assessment of the Act's statutory listing factors on the basis of the best available science. The Court remanded the listing decision to us with the order that we reconsider whether to list the WCT as a threatened species, and that in so doing we evaluate the threat of hybridization as it bears on the Act's statutory listing factors. Specifically, the Court ordered us to determine: (1) The current distribution of WCT, taking into account the prevalence of hybridization; (2) whether the WCT population (*i.e.*, subspecies, as used in the present document) is an endangered or a threatened species because of hybridization; and (3) whether existing regulatory mechanisms are adequate to address the threats posed by hybridizing, nonnative fishes.

The Court also pointed out that the draft Intercross policy (61 FR 4710; February 7, 1996) in no way indicates what degree of hybridization would threaten WCT, or that the existing levels of hybridization do not presently threaten WCT. Furthermore, the Court directed the Service to present a scientifically-based conclusion about the extent to which it is appropriate to include hybrid WCT stocks (*i.e.*, populations, as used in the present document) and populations of unknown genetic characteristics in the WCT subspecies considered for listing.

On September 3, 2002, we announced (67 FR 56257) initiation of a new status review for the WCT and solicited comments from all interested parties regarding the present-day status of this fish. We were particularly interested in receiving data, information, technical critiques, and relevant comments that would help us to address the issues that had been raised by the Court.

During the subsequent comment period, we received written requests for an extension of that period from the fish and wildlife agencies of the States of Washington, Oregon, Idaho, and Montana, as well as the Kalispel Tribe of Indians and the Earthjustice Legal Foundation. In their letters, those entities indicated that they were assembling or awaiting important information relevant to the status of WCT and that those entities wanted to make such information available to us for use in the new status review. Accordingly, on December 18, 2002, we announced (67 FR 77466) that the comment period was reopened until February 15, 2003.

For the purposes of this listing determination, ''WCT subspecies'' refers explicitly to all populations of WCT within the international boundaries of the United States, although populations of WCT also occur in Canada. As part of this listing determination, the WCT subspecies many be found to consist of DPSs, as described in a subsequent section of this finding.

The Value of Hybrid Westslope Cutthroat Trout in Listing Determinations

As described in the preceding section, the U.S. District Court for the District of Columbia ruled that the Service must provide a scientifically-based conclusion about the extent to which it is appropriate to include ''hybrid WCT stocks'' and ''stocks of unknown genetic characteristics'' in the WCT subspecies considered for listing. We herewith respond to the Court.

In the past, natural hybridization between congeneric or closely-related species of fish was thought to be rare. However, during the first half of the 20th Century, Professor Carl Hubbs and his associates demonstrated that natural hybridization between morphologically distinct species, particularly for temperate-zone freshwater fishes in North America, was common in areas where the geographic ranges of those species overlap (Hubbs 1955). Such natural hybridization may be especially common among centrarchid (basses and sunfishes) and cyprinid (minnows) fishes in the central United States (Avise and Saunders 1984; Dowling and Secor 1997).

Many investigators have subsequently demonstrated that several extant species of fish most likely originated from the interbreeding of two or more ancestral or extant species (Meagher and Dowling 1991; DeMarais *et al.* 1992; Gerber *et al.* 2001). Indeed, natural hybridization between taxonomically distinct species has long been recognized as an important evolutionary mechanism for the origin of new species of plants (Rieseberg 1997). Conversely, natural hybridization has only recently been recognized as an important evolutionary mechanism for the origin of new species of animals (Dowling and Secor 1997). Natural hybridization is now acknowledged as an important evolutionary mechanism that: (a) Creates new genotypic diversity, (b) can lead to new, adaptive phenotypes, and (c) can yield new species (Arnold 1997).

Hybridization also can result in the extinction of populations and species (Rhymer and Simberloff 1996). Indeed, hybridization resulting from anthropogenic factors is considered a threat to many species of fish (Campton 1987; Verspoor and Hammar 1991; Leary *et al.* 1995; Childs *et al.* 1996; Echelle and Echelle 1997). In particular, the extensive stocking of rainbow trout (*O. mykiss*) outside their native geographic range has resulted in appreciable hybridization with other species of trout (Bartley and Gall 1991; Behnke 1992, 2002; Dowling and Childs 1992; Carmichael *et al.* 1993). This interbreeding also has occurred for WCT where natural hybridization with introduced rainbow trout and Yellowstone cutthroat trout (*O. c. bouvieri*; YCT) is considered a threat to the WCT subspecies (see subsequent section, Hybridization with Nonnative Fishes).

Hybridization also can result in the genetic introgression of genes from one species into populations of another species if F1 (*i.e.*, the first filial generation) and F2 hybrids are fertile and can interbreed, or *backcross*, with individuals of a parental species. For example, first-generation hybrids between WCT and rainbow trout appear to be fully fertile (Ferguson *et al.* 1985), and levels of genetic introgression or ''admixture'' vary widely (<1 to >50 percent) among natural populations of WCT (*e.g.*, Weigel *et al.* 2002). In this context, admixture refers to the percentage of a population's gene pool derived from rainbow trout genes (or alleles) versus WCT trout genes. In these latter situations, the Service must determine which populations represent WCT, and the genetic resources of WCT, under the Act and which populations threaten the continued existence of the WCT subspecies.

The purpose of the Act is to conserve threatened and endangered ''species'' and the ecosystems on which those species depend. The definition of ''species'' under the Act includes any taxonomic species or subspecies, and ''distinct population segments'' of vertebrate species. The issue here for this status review is not the definition of ''species'' under the Act, but rather, the scientific criteria used by professional zoologists and field biologists to taxonomically classify individuals, and populations of interbreeding individuals, as members of a particular species or subspecies.

The scientific criteria for describing and formally recognizing taxonomic species of fish are based almost entirely on morphological characters (Behnke 1992; Bond 1996; Moyle and Cech 1996). Indeed, the scientific basis for distinguishing rainbow trout and cutthroat trout (*O. clarki*) as distinct species are well-established differences in the number of scales in the lateral-line series, spotting patterns on the sides of the body, and the presence of: (a) Basibranchial teeth (*i.e.*, teeth on a series of bones behind the tongue and between the gills) and (b) a distinctive red or orange slash mark that occurs just below both sides of the lower jaw in cutthroat trout but not in rainbow trout (Miller 1950). Morphological differences, particularly external spotting patterns, also distinguish subspecies of cutthroat trout (Behnke 1992). These morphological differences among cutthroat trout subspecies are consistent with their distinct, geographic distributions (*e.g.*, Yellowstone [River] vs. Lahontan [basin] cutthroat trout [*O. c. henshawi*]). In addition, the common names of the various species of trout clearly reflect their distinctive morphological appearances, *e.g.*, rainbow trout, redband trout (*O. m. gairdneri*), cutthroat trout, and golden trout (*O. m. aguabonita*) (Behnke 2002).

The advent of molecular genetic techniques in the mid-1960s added an additional set of biological characters that can be used to distinguish species and subspecies of native trouts (*Oncorhynchus* spp.) in the western United States. In most cases, the new molecular genetic data simply confirmed the evolutionary distinctness of species and subspecies that had already been described taxonomically on the basis of morphology (Behnke 1992). One notable exception was the failure of molecular genetic techniques to distinguish fine-spotted Snake River cutthroat trout (*O. c.* subsp.) and YCT as two evolutionarily distinct forms (Loudenslager and Kitchen 1979).

Although molecular genetic data have had little impact on the taxonomic recognition of rainbow trout, cutthroat trout, and their respective subspecies, molecular genetic markers are very sensitive tools for detecting natural hybridization and small amounts of genetic introgression. For example, Campton and Utter (1985) used allozymes (proteins) to first document the incidence of natural hybridization between naturally sympatric populations of coastal cutthroat trout (*O. c. clarki*) and rainbow trout/steelhead (*O. mykiss*), although earlier morphological descriptions had suggested such interbreeding was occurring (DeWitt 1954; Hartman and Gill 1968). The sensitivity of the molecular genetic data simply provided compelling evidence that interbreeding was indeed occurring.

In general, molecular genetic methods are capable of detecting extremely small amounts of genetic introgression (*e.g.*, <1 percent) undetectable by other methods (Weigel *et al.* 2002; *see also* Fig. 2 of Kanda *et al.* 2002). For example, a large number of situations exist in the scientific literature where the mitochondrial DNA (mtDNA) from one species appears to have introgressed via hybridization into the nuclear genetic background of a closely related species (*e.g.*, Ferris *et al.* 1983; Bernatchez *et al.* 1995; Glemet *et al.* 1998; Wilson and Bernatchez 1998; Redenbach and Taylor 2002). This ability to detect very low levels of introgression raises fundamental questions regarding the criteria by which introgressed populations, and individuals in those populations, should be included with, or excluded from, their parental or morphological species. In the mtDNA situations cited above, the scientific community considers the ''introgressed'' individuals to be legitimate members of their morphological species despite the presence of mtDNA from another species. Similarly, individuals of a particular ''species'' may possess nuclear genes from another taxon detectable only by molecular genetic methods, yet those individuals may still conform morphologically, behaviorally, and ecologically to the scientific taxonomic description of the parental or native species (*e.g.*, Busack and Gall 1981; Weigel *et al.* 2002).

Previous Service positions regarding hybridization, based upon interpretations in a series of opinions by the U.S. Department of the Interior, Office of the Solicitor, generally precluded conservation efforts under the authorities of the Act for progeny, or their descendants, produced by matings between taxonomic species or subspecies (O'Brien and Mayr 1991). However, advances in biological understanding of natural hybridization (*e.g.*, Arnold 1997) prompted withdrawal of those opinions. The reasons for that action were summarized in two sentences in the withdrawal memorandum (Memorandum from Assistant Solicitor for Fish and Wildlife, U.S. Department of the Interior, to Director, U.S. Fish and Wildlife Service, dated December 14, 1990): ''New scientific information concerning genetic introgression has convinced us that the rigid standards set out in those previous opinions should be revisited. In our view, the issue of ''hybrids'' is more properly a biological issue than a legal one.''

Our increasing understanding of the wide range of possible outcomes resulting from exchanges of genetic material between taxonomically distinct species, and between entities within taxonomic species that also can be listed under the Act (*i.e.*, subspecies, DPSs), requires the Service to address these situations on a case-by-case basis. In some cases, introgressive hybridization may be considered a natural evolutionary process reflecting active speciation or simple gene exchange between naturally sympatric species. In other cases, hybridization may be threatening the continued existence of a taxon due to anthropogenic factors or natural environmental events. In many cases, introgressed populations may contain unique or appreciable portions of the genetic resources of an imperiled or listed species. For example, populations with genes from another taxon at very low frequencies may still express important behavioral, life-history, or ecological adaptations of the indigenous population or species within a particular geographic area. Consequently, the Service plans to carefully evaluate the long-term conservation implications for each taxon separately on a case-by-case basis where introgressive hybridization may have occurred. The Service shall perform these evaluations objectively based on the best scientific and commercial information available consistent with the intent and purpose of the Act.

For example, the Service may recognize that small amounts of genetic introgression do not disqualify individuals or populations from ''species membership'' or the Act's protections if those individuals or populations conform to the scientific taxonomic description of that species. A natural population of a particular species that possesses genes from another taxon at low frequency, yet retains the distinguishing morphological, behavioral, and ecological characters of the native species, may remain very valuable to the overall conservation and survival of that species.

The Service also recognizes special cases where all individuals of a ''species'' are considered hybrids. For example, the Service recognizes that deliberate hybridization may be necessary in extreme cases to prevent extinction of the genetic resources associated with a highly endangered species, as was the case for the Florida panther (*Felis concolor coryi*) (Hedrick 1995). Similarly, the Service continues to protect red wolves (*Canis rufus*) under the Act despite ongoing controversies regarding their possible hybrid origin (Nowak and Federoff 1998). In both of those cases, extending the Act's jurisdictions and protections to ''hybrids'' may contribute to the conservation of the genetic resources of those taxa, consistent with the intent and purpose of the Act.

A potential dichotomy thus exists under the Act between: (a) The need to protect the genetic resources of a species in which introgression has occurred and (b) the need to minimize or eliminate the threat of hybridization posed by another taxon. Implementing actions under the Act that distinguish between these two alternatives is difficult when imperiled species are involved because a large number of populations may have experienced small amounts of genetic introgression from another taxon. These decisions are further complicated for WCT because the native geographic ranges of WCT and rainbow (redband) trout overlap in portions of the Columbia River drainage. For example, as noted by Howell and Spruell (2003), ''It is apparent that WSCT [WCT] × RB [rainbow trout] hybridization can be extensive in areas, such as the John Day [River] subbasin, where both taxa are native and there have been little to no introductions of hatchery RB.''

For the purpose of providing conservation guidelines, Allendorf *et al.* (2001) have suggested that hybridization be categorized as either anthropogenic or ''natural.'' They further suggest that ''hybrid'' populations or taxa resulting from natural causes would be eligible for conservation protection, whereas genetically introgressed individuals or populations resulting from anthropogenic causes would generally not be protected unless ''hybrids'' were the last remaining genetic representatives of a hybridized species (their ''Type 6'' hybridization). Such criteria may be useful for prioritizing management options for populations or species that are not eligible for listing under the Act. However, the issue for species under potential jurisdiction of the Act is the extent to which hybridization poses a threat to the continued existence of the ''species'' regardless of whether the cause is anthropogenic or ''natural.'' Both natural evolutionary processes, including catastrophic environmental events (*e.g.*, floods, earthquakes), and anthropogenic factors can lead to secondary contact and hybridization between species. Also, distinguishing between anthropogenic and natural causes of hybridization, particularly for species with naturally overlapping geographic ranges, may be extremely difficult (*e.g.*, Campton and Utter 1985; Young *et al.* 2001; Baker *et al.* 2002). A complicating issue in these determinations is the degree to which ''natural'' hybridization may have compromised the identity of a distinct species prior to anthropogenic influences (*e.g.*, Weigel *et al.* 2002). The principal issues here under the Act are the threats and potential outcomes of hybridization, including other potential risks associated with the five statutory listing factors (*e.g.*, habitat loss, disease), and not necessarily the mechanistic causes (natural or anthropogenic) of those threats. In this context, the Act does not distinguish between natural and ''manmade'' factors that may threaten the continued existence of a species (section 4(a)(1)).

Several studies have demonstrated that natural populations, and individual fish, conforming morphologically to the scientific taxonomic description of WCT may contain genes derived from rainbow trout or YCT as the result of a past hybridization event (Leary *et al.* 1984; Marnell *et al.* 1987; Forbes and Allendorf 1991a, b; Leary *et al.* 1996; Weigel *al.* 2002, 2003). For example, Leary *et al.* (1984) reported that an introgressed population of WCT, with an estimated 20 percent of its nuclear genes derived from rainbow trout, was indistinguishable morphologically from nonintrogressed WCT populations. A subsequent study revealed a strong, positive correlation between percent rainbow trout genes in natural populations of WCT and the percent of individuals without basibranchial teeth in those populations (Table 1 in Leary *et al.* 1996). Indeed, based on this latter study, the percent of individuals without basibranchial teeth appears to be a fairly accurate predictor of the percent rainbow trout genes in natural populations where WCT are native. However, this correlation collapses in nonintrogressed populations of WCT where up to 18 percent of the individuals may not have any basibranchial teeth (Leary *et al.* 1996).

Weigel *et al.* (2002) recently conducted the most extensive study to date comparing variation in morphological characters to levels of genetic introgression in natural populations of WCT. In that study, Weigel *et al.* (2002) compared variation in morphological characters to nuclear DNA genotypes at 16 dominant marker loci (Spruell *et al.* 1999, 2001) in random samples of 20 trout from each of 100 sites in the Clearwater and Lochsa River drainages in Idaho. In that study, the presence of at least 1 rainbow trout DNA marker among the 20 individuals tested at a particular site was accepted as evidence that genetic introgression had occurred in the native WCT population inhabiting that site. According to the authors, their DNA methods and sample sizes (n = 20) allowed them to achieve 95 percent confidence (probability) of detecting genetic introgression in WCT populations with as little as 1 percent rainbow (or redband) trout genes. However, because those authors used ''dominant'' genetic markers, they could not distinguish heterozygotes from homozygotes, thus precluding calculations of allele frequencies and true estimation of admixture proportions (*i.e.*, percent rainbow trout genes) in each sample or population evaluated.

Despite those limitations, three main results pertinent to this status review can be gleaned from the paper by Weigel *et al.* (2002): (1) The percent of fish at each sample site with at least 1 rainbow trout marker was bimodally distributed among the 100 sample sites examined (see Figure 2 in Weigel *et al.* 2002); approximately 62 percent of the sites yielded population samples where zero to 30 percent of the fish showed evidence of introgression, while approximately 36 percent of the sample sites had 50 to 100 percent of the individuals showing evidence of introgression. (2) Variation in the mean values of four morphological characters among natural populations of WCT (*i.e.*, the presence or absence of red or orange slash marks, the number of basibranchial teeth, the shape of individual spots on the body, and the ratio of head length to total body length) was correlated with the amount of rainbow trout genetic introgression in those populations. (3) By employing a dichotomous morphology key, field observers attained 93 percent accuracy in morphologically detecting genetic introgression in natural populations of WCT where 50 percent or more of the fish in those populations had at least one rainbow trout DNA marker; however, those same observers were unable to accurately distinguish WCT populations with no DNA evidence of introgression from populations with low levels of introgression where less than 50 percent of the individuals expressed at least one rainbow trout DNA marker. Given the statistical power of the authors' methods and their use of dominant genetic markers, we conclude that rainbow trout genes constituted less than 25 percent of the genes in those latter WCT populations where less than 50 percent of the individuals expressed a rainbow trout DNA marker.

In a recent unpublished report to the Service, Allendorf *et al.* (2003) reviewed results from their laboratory regarding the threshold levels of rainbow trout or YCT genetic introgression (*i.e.*, threshold percent genetic admixture) detectable by morphological criteria (*see also* Leary *et al.* 1984; Marnell *et al.* 1987; Leary *et al.* 1996). Allendorf *et al.* (2003) presented data indicating that introgressed populations of WCT with less than 20 percent of their genes derived from another taxon are morphologically indistinguishable from nonintrogressed populations with zero percent genetic admixture. They also presented data indicating that introgression exceeding 50 percent non-WCT genes in natural populations of WCT would most likely be detectable by morphological methods.

Therefore, based on the best scientific and commercial data available, we conclude that natural populations of WCT may have a genetic ancestry derived by as much as 20 percent from rainbow trout or YCT when fish in those populations express a range of morphological variation that conforms to the scientific taxonomic description of WCT. In other words, a natural population of WCT with less than 20 percent of its genes derived from rainbow trout or YCT is, most likely, morphologically indistinguishable from nonintrogressed populations of WCT with no hybrid ancestry.

As noted previously, on March 31, 2002, the U.S. District Court for the District of Columbia found that our listing determination for WCT did not reflect a reasoned assessment of the Act's statutory listing factors on the basis of the best available science. The Court remanded the listing decision to us with specific instructions to evaluate the threat of hybridization as it bears on the Act's statutory listing factors and the status of the WCT subspecies. The Court also ruled that inclusion of introgressed populations or ''hybrid stock'' (Court's term) as part of the WCT subspecies in our status review, based on the visually based, professional opinions of field biologists familiar with the subspecies, ''was arbitrary and capricious.'' During the Court proceedings, we noted that the Act does not require ''100 percent genetic purity'' and the plaintiffs agreed with this proposition, noting that they were not insisting on genetic purity. The Court, in effect, concurred. ''Genetic purity'' is not a condition for including populations or individual fish with the WCT subspecies under the Act, but the conditions for including potential ''hybrid stock'' with WCT may not be arbitrary and capricious.

In reconciling the dichotomy between hybridization as a threat and the potential inclusion of ''hybrid stock'' with WCT under the Act, one must make a clear distinction between the action (hybridization) and the outcome of that action (hybrid stock). Therefore, we must define these terms more precisely. Consequently, in response to the Court order and for the purpose of this new status review for WCT, we define ''hybridization'' as the direct interbreeding between two individuals that conform morphologically to different species or subspecies, including the interbreeding between individuals conforming morphologically to WCT and individuals not conforming morphologically to WCT. We further define ''hybrid stock'' (Court's term), or introgressed population, as a group of potentially interbreeding individuals with a genetic ancestry derived from two or more extant species or subspecies. Under these definitions, ''hybridization'' may represent a ''natural or manmade factor affecting the continued existence'' of the WCT subspecies. Similarly, introgressed populations composed of individuals not conforming morphologically to the scientific taxonomic description of WCT may be a potential hybridization threat to the continued existence of the WCT subspecies.

Conversely, in accordance with the above definition of hybridization, we do not consider populations or individual fish conforming morphologically to the scientific taxonomic description of WCT to be a hybridization threat to the WCT subspecies. Although such individuals may have genes from another taxon at low frequency, we are not aware of any information to suggest that such individuals express behavioral, ecological, or life-history characteristics differently than do WCT native to the particular geographic area. Without such changes, we expect the frequency of genes from the other taxon to remain low in the population. Therefore, we do not consider such populations as contributing to the threat of hybridization to the WCT subspecies.

Therefore, in accordance with the Court's order, we provide our scientifically-based conclusion about the extent to which it is appropriate to include hybrid or genetically introgressed WCT populations, and populations of unknown genetic characteristics, in the WCT subspecies considered for listing. These criteria are specific to this listing determination for WCT under the Act and may not be applicable to other species or taxa.

To determine which natural populations we should consider as WCT under the Act, we used the best scientific data available (as described previously) to establish three principal criteria: (1) The population under consideration must first exist within the recognized, native geographic range of WCT (Behnke 1992; Shepard *et al.* 2003). The population must then satisfy one of the following two additional criteria to be considered WCT under the Act; (2) If all measured individuals in the population have morphological characters that are all within the scientific, taxonomically-recognized ranges of those characters for the WCT subspecies, then the population shall be considered WCT; or (3) if not all of the measured individuals have morphological characters that are within the scientific, taxonomically-recognized ranges of those characters for the WCT subspecies, then additional evidence of reproductive discreteness between individuals that conform morphologically to the WCT subspecies and individuals that do not conform morphologically to the subspecies will be examined. If the two forms are considered reproductively discrete (*e.g.*, naturally sympatric populations of native redband trout and WCT that may only occasionally interbreed), then we shall consider the population under consideration to be WCT under the Act. In making these latter determinations, we will consider the following additional information: (a) Whether rainbow (redband) trout are native to the geographic area under consideration; (b) the percent of measured individuals that do not conform morphologically to the taxonomic scientific description of WCT, including their range of morphological variation (*e.g.*, a single anomalous individual reflecting a congenital abnormality would not disqualify the population from inclusion); (c) the results of genetic tests that would indicate reproductive discreteness between the two forms; and (d) any other additional information that would assist with these determinations (*e.g.*, information on the locations and timing of spawning for each of the two forms).

Hence, our principal criterion for including potentially introgressed populations, and populations of unknown genetic characteristics, with the WCT subspecies under the Act is whether fish in those populations conform morphologically to the scientific taxonomic description of the WCT subspecies. As noted previously, natural populations conforming morphologically to the scientific taxonomic description of WCT are presumed to express the behavioral, ecological, and life-history characteristics of WCT native to the geographic areas where those populations occur.

The Service acknowledges that molecular genetic data also can be very useful for guiding these decisions regarding inclusion or exclusion of particular populations from the WCT subspecies under the Act. For example, on the basis of data described previously in this section, our general conclusion is that natural populations conforming morphologically to the scientific taxonomic description of WCT may have up to 20 percent of their genes derived from rainbow trout or YCT. Consequently, for populations for which molecular genetic data may be the only data available, populations with less than 20 percent introgression will be considered WCT under the Act, whereas populations with more than 20 percent introgression will generally be excluded from the WCT subspecies. However, such decisions involving possible inclusion or exclusion will need to consider other potentially important characteristics of the populations, including the ecological setting, geographic extent of the introgression across the population's range, and whether rainbow (or redband) trout are naturally sympatric with WCT in the particular region under consideration.

The Service shall evaluate natural populations for which no morphological or genetic data exist on a case-by-case basis considering their geographic relationship to natural populations for which such data do exist and any other available information pertinent to those evaluations (*e.g.*, ecological setting, degree of geographic isolation, and historical stocking records of nonnative trout species).

The species criteria described above are consistent with the best scientific and commercial data available because they are based on: (a) The criteria by which taxonomic species of fish are recognized scientifically, and (b) the biological relationship between those taxonomic criteria and levels of genetic introgression detected by molecular genetic methods in natural populations of WCT. Those criteria exclude from the WCT subspecies considered for listing genetically introgressed populations and individual fish that do not conform morphologically to the scientific taxonomic description of the subspecies.

These criteria are further justified for this subspecies because: (a) There are no generally applicable standards for the extent of hybridization considered acceptable under the Act; (b) decisions regarding status of WCT under the Act must be made for the entire subspecies and its component populations (*see* Distinct Population Segments section); (c) in most cases, the taxonomic classification of extant WCT has been based on the pattern of spots on the fish's body and the professional evaluations and experiences of fishery biologists who examined the fish in the field (*see also* Marnell *et al.* 1987); and (d) spotting pattern was chief among the morphological characteristics diagnostic of the type specimens of WCT.

Our approach further acknowledges that a significant proportion of the genetic resources associated with WCT throughout its native geographic range may be represented by populations with low-frequency genes from other taxa (*e.g.*, rainbow trout) detectable only by molecular genetic methods. Such populations, if they conform morphologically to the scientific taxonomic description of WCT, are considered part of the WCT subspecies under the Act. As noted previously, individual fish or populations conforming to the scientific taxonomic description of WCT shall not be considered a threat to the continued existence of the subspecies.

Conversely, we will consider genetically introgressed populations not classified as WCT as potential hybridization threats to the WCT subspecies. By definition, these latter populations do not conform morphologically to the scientific taxonomic description of WCT, or—in the absence of morphological data—we would expect them to not conform morphologically to WCT based on the level of introgression detected by a molecular genetic test or other available information.

As a result, the Service must determine which natural populations represent potential hybridization ''threats'' to the future existence of the WCT subspecies and which populations represent potential genetic resources of the subspecies itself. The criteria we use to make such decisions must not only be consistent with previous Service rulings dealing with ''hybrids'' under the Act, but decisions resulting from those criteria also must be consistent with the intent and purpose of the Act itself. The Service has concluded that, in such situations, the intent and purpose of the Act is to be inclusionary, not exclusionary. Consequently, any natural population conforming to the scientific taxonomic description of WCT, as conditioned by the criteria stated previously, will be considered WCT under the Act. The Service also has concluded that alternative approaches would either be arbitrary and capricious (*e.g.*, ≥90 percent genetic ''purity'' required for inclusion) or inconsistent with the intent and purpose of the Act (*e.g.*, 100 percent genetic ''purity'' required for inclusion). For example, the best scientific and commercial data available indicate that WCT populations with 1 percent to 20 percent of their genes derived from another taxon are indistinguishable morphologically from nonintrogressed populations of WCT. Hence, establishing a threshold of ''90 percent genetic purity'' would be arbitrary and capricious because no scientific or commercial data exist to support that threshold based on the morphological criteria by which species are described taxonomically. In contrast, the ''80 percent genetic threshold'' described previously is based on the best scientific and commercial data available, although, as we have described, that threshold is not the principal criterion by which populations are included or excluded from the WCT subspecies. Similarly, as noted previously, the Solicitor's Office for Department of the Interior overturned (withdrew)—in December 1990—the Service's old ''hybrid policy'' which precluded federal protections to hybrid offspring or their descendants under the Act (O'Brien and Mayr 1991). Moreover, the court in the present WCT case ruled that ''100 percent genetic purity'' is not a condition for including populations or individual fish with the WCT subspecies under the Act.

Our criteria for including potentially introgressed populations of WCT with the WCT subspecies considered for listing under the Act also are consistent with a recent Position Paper developed by the fish and wildlife agencies of the intermountain western States (Utah Division of Wildlife Resources 2000). That document identifies, for all subspecies of inland cutthroat trout, three tiers of natural populations for prioritizing conservation and management options under the States' fish and wildlife management authorities: (1) Core conservation populations composed of ≥99 percent cutthroat trout genes; (2) conservation populations that generally ''have less than 10 percent introgression, but [in which] introgression may extend to a greater amount depending upon circumstances and the values and attributes to be preserved''; and (3) cutthroat trout sport fish populations that, ''at a minimum, meet the species (*e.g.*, WCT) phenotypic expression defined by morphological and meristic characters of cutthroat trout.'' Conservation populations of cutthroat trout also include those believed to have uncommon, or important, genetic, behavioral, or ecological characteristics relative to other populations of the subspecies under consideration. Sport fish populations are those that conform morphologically (and meristically) to the scientific taxonomic description of the subspecies under consideration but do not meet the additional criteria of ''conservation'' or ''core'' populations. Consequently, the Service's criteria for including potentially introgressed populations of WCT with the WCT subspecies considered for listing under the Act include the first two tiers, as defined by the intermountain State fish and wildlife agencies, as well as those sport fish populations in the third tier for which morphological or genetic data are available. The implicit premise of the Position Paper is that populations must conform, ''at a minimum,'' to the morphological and meristic characters of a particular cutthroat trout subspecies in order for those populations to be included in a State's conservation and management plan for that subspecies. Signatories to the Position Paper are the Colorado Division of Wildlife, Idaho Department of Fish and Game, Montana Department of Fish, Wildlife and Parks, Nevada Division of Wildlife, New Mexico Game and Fish Department, Utah Division of Wildlife Resources, and the Wyoming Game and Fish Department.

Molecular genetic methods for estimating percent introgression, or genetic admixture proportions, in natural populations of WCT need to be consistent to help guide the conservation decisions described here under the Act. The continual development of new types of molecular genetic markers for population-level evaluations complicates estimation of genetic admixture proportions in introgressed populations (*e.g.*, Weigel *et al.* 2002). The most accurate estimates are obtained with codominant genetic markers in which heterozygotes and homozygotes at single loci can be distinguished. Allozymes and alleles at microsatellite nuclear DNA (nDNA) loci meet this ''codominance'' criterion. ''Amplified fragment-length polymorphisms'' (AFLPs) and ''paired interspersed nuclear elements'' (PINES; Weigel *et al.* 2002) do not. Also, a minimum of four or five codominantly-expressed, diagnostic loci are usually required to attain sufficient statistical power in evaluations of introgressive hybridization (Fig. 2 in Campton 1990; Figure 1 in Epifanio and Phillip 1997; Figure 2 in Kanda *et al.* 2002). Under these conditions, percent introgression (P) in a population can be calculated as $P = (N_A/2LN) \times 100$, where L = the number of diagnostic, codominantly expressed loci that distinguish the two taxa or species, N = the number of individual fish in a random sample of individuals from the population, and N_A = the number of alleles from another taxon observed at the diagnostic loci in the sample of individuals. This estimator is equally applicable to allozyme and microsatellite nDNA markers and is identical to the statistic proposed by the State fish and wildlife agencies (Utah Division of Wildlife Resources 2000). Consequently, this estimator provides a standardized approach for evaluating genetic introgression in natural populations. Evaluations of introgression based on dominant markers (Weigel *et al.* 2002) should computationally convert the observed data (*e.g.*, percent of individuals with one or more rainbow trout alleles) into estimates of percent introgression on the basis of explicitly stated assumptions (*e.g.*, that a single, random-mating population was sampled). If one or more codominantly expressed loci are not diagnostic between species, then the statistical methods of least squares or maximum likelihood can be used to estimate admixture proportions in introgressed populations (Campton 1987; Bertorelle and Excoffier 1998).

Further support for the morphological and genetic criteria developed by the Service and the State fish and wildlife agencies for classifying natural populations as WCT comes from field observations of the effects of natural and artificial selection in genetically introgressed populations of other taxa. Gerber *et al.* (2001) note that natural selection may act to retain the morphological phenotypes of native species despite introgressive hybridization resulting from secondary contact of a colonizing, congeneric species. Busack and Gall (1981) note a similar outcome resulting from artificial selection (*i.e.*, selective removal of ''hybrid-looking'' individuals) for the Paiute cutthroat trout (*O. c. seleniris*) phenotype within introgressed populations of this latter subspecies. Those results suggest the lack of a genetic correlation between morphological phenotypes (*i.e.*, the genes affecting those phenotypes) and molecular genetic markers used to detect introgression in natural populations. In other words, molecular genetic markers (*e.g.*, microsatellite DNA alleles, DNA fingerprint patterns) provide very sensitive methods for evaluating ancestral or pedigree relationships among populations, species, or individuals independent of the genes affecting morphology and other species-specific characters.

We now perform our new status review for WCT based on the described criteria for including potentially introgressed populations and populations of unknown genetic characteristics with the WCT subspecies considered for possible listing under the Act.

New Status Review

Background

In response to our September 3 and December 18, 2002, **Federal Register** notices, we received comments and information on WCT from several State fish and wildlife agencies, the U.S. Forest Service, private citizens and organizations, and other entities. Among the materials that we received, the most important was a status update report for WCT, a comprehensive document (Shepard *et al.* 2003) prepared by the fish and wildlife agencies of the States of Idaho, Montana, Oregon and Washington, and the U.S. Forest Service.

The WCT status update report (Shepard *et al.* 2003) and the comprehensive database that is the report's basis, presented to us the best scientific and commercial information available that describes the present-day rangewide status of WCT in the United States. To compile that important information, 112 professional fishery biologists from 12 State, Federal, and Tribal agencies and private firms met at 9 workshops held across the range of WCT in fall 2002. Those fishery biologists had a combined 1,818 years of professional experience, 63 percent of which involved work with WCT or other subspecies of cutthroat trout. At the workshops, the biologists submitted essential information on the WCT in their particular geographic areas of professional responsibility or expertise, according to standardized protocols. Presentation of information directly applicable to addressing the issues raised by the Court, as well as other concerns that we consider when making listing determinations under the Act, was central to those protocols.

In conducting the new status review for WCT in the United States described in the present document, we considered our initial review (U.S. Fish and Wildlife Service 1999) to be the foundational compendium of information on the present-day status of WCT. In turn, the more-recent WCT status update report (Shepard *et al.* 2003), as well as the other materials that we received or otherwise obtained while conducting the new review, clarified and improved our understanding of the present-day status of WCT and also helped us to address the important issues that had been raised by the Court. While describing our findings in the present document, we will often compare the recently received information for WCT to that found during our initial status review.

Findings of the New Status Review

Distinct Population Segments

The Service and the National Marine Fisheries Service have adopted criteria (61 FR 4722; February 7, 1996) for designation of DPSs for vertebrate organisms, such as WCT, under the Act. To constitute a DPS, a population or group of populations must be: (1) Discrete (*i.e.*, spatially, ecologically, or behaviorally separated from other populations of the taxonomic group [*i.e.*, taxon]); (2) significant (*e.g.*, ecologically unique for the taxon, extirpation would produce a significant gap in the taxon's range, the only surviving native population of the taxon, or substantial genetic divergence occurs between the population and other populations of the taxon); and (3) the population segment's conservation status must meet the Act's standards for listing.

In our initial status review, we found no morphological, physiological, or ecological data for WCT that indicated unique adaptations of individual WCT populations or groups of populations that inhabit discrete areas within the subspecies' historic range. Although the disjunct WCT populations in Washington and Oregon, as well as the populations in Montana's upper Missouri River basin, met the first criterion for DPS designation (*i.e.*, discreteness), scientific evidence in support of the second criterion (significance) was absent or insufficient to conclude that any of those populations represented a DPS (U.S. Fish and Wildlife Service 1999).

Extant WCT show a remarkably large amount of genetic variation at the molecular level, both within and among WCT populations across the subspecies' historic range (Allendorf and Leary 1988; Leary *et al.* 1997). Leary *et al.* (1997) found that 65 percent of the total measured genetic variation in the WCT genome is within WCT populations, 34 percent is among the populations themselves, and about 1 percent is between the aggregates of populations in the Columbia and Missouri River basins. Those authors also found that there can be genetic differences among WCT populations that are separated by short geographic distances. In the context of DPS designation, those differences suggest reproductive isolation among populations that may be indicative of ''discreteness.'' Nevertheless, because of the large amount of genetic variation in the WCT subspecies, the occurrence of a WCT population with molecular genetic characteristics that differ statistically (with adequate sample sizes) from those of other WCT populations is often sufficient to meet the discreteness criterion but not sufficient to meet the significance criterion indicative of unique morphological, behavioral, physiological, or ecological attributes.

Recently, the Northwest Environmental Defense Center (2002) argued that the WCT populations in Oregon's John Day River drainage merited listing as a DPS; however, the Northwest Environmental Defense Center provided no supportive, empirical evidence for that contention and only speculated as to why those populations may be significant in the context of DPS designation. Congress has made clear that DPSs should be used ''sparingly'' in the context of the Act (*see* Senate Report 151, 96th Congress, 1st Session). While conducting the new status review for WCT, we found no compelling evidence for recognizing DPSs of WCT. Instead, for purposes of the new status review, we recognize WCT as a single taxon in the contiguous United States.

Disjunct Westslope Cutthroat Trout Populations in Washington

In addition to the historic range of WCT previously described (*see* Background), Behnke (1992) speculated that the WCT is native to the Wenatchee and Entiat River drainages in Washington. Because Behnke's conclusion was largely speculative, we did not consider those two drainages as being within the historic range of WCT in our initial status review (U.S. Fish and Wildlife Service 1999). Similarly, those drainages were not included in the WCT status update report (Shepard *et al.* 2003) because the Washington Department of Fish and Wildlife did not consider those drainages to be within the historic range of WCT.

Because of the extensive introductions of hatchery-produced WCT (and the probable human transport and stocking of native WCT into waters outside the subspecies' historic range) during the 20th Century, WCT populations are more numerous and widely distributed in Washington today than prior to European settlement (U.S. Fish and Wildlife Service 1999). Those populations now occur in over 493 streams and 311 lakes in Washington (Fuller 2002). Similarly, some WCT populations have been intentionally established in Oregon's John Day River drainage (Unterwegner 2002). However, as was done during our initial status review (U.S. Fish and Wildlife Service 1999), our decision whether or not to recommend listing the WCT as a threatened or an endangered species, as described in the present document, will be based entirely on WCT that presently occur within the formally recognized historic range of the subspecies (Behnke 1992), as modified by Shepard *et al.* (2003) in their status update report.

Recent data from ongoing studies suggest that native WCT populations do occur in the Yakima, Entiat, and Wenatchee River drainages of Washington (Trotter *et al.* 1999, 2001; Howell and Spruell 2003). In assessing the origins of the cutthroat trout they collected from selected streams in those drainages, Trotter *et al.* (1999, 2001) assumed that the absence of a written stocking record for WCT, particularly in the studied streams where those fish are now present, was evidence that WCT are native to those areas. However, as pointed out by Howell and Spruell (2003), who are presently conducting a similar study of the WCT in those drainages as well as in Oregon's John Day River drainage, the historic stocking records of management agencies in Washington and Oregon are incomplete and have ''large gaps.'' Moreover, as Trotter *et al.* (2001) indicate, during the 20th century it was common for the representatives of many Federal, State, and county agencies, and even private citizens, to stock hatchery-produced fish. Those fish were often readily obtained from nearby fish hatcheries, whose managers took advantage of the willingness of citizens to haul hatchery fish to remote areas by whatever means. Moreover, angler conservationists often moved fish from established populations to nearby ostensibly fishless streams.

Howell and Spruell (2003) concluded that WCT in the Yakima, Wenatchee, Entiat, and Methow River drainages of Washington are probably native WCT because populations from each of those drainages possessed some genetic characteristics (*i.e.*, allozyme alleles) that were absent from those of the Twin

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

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

Distribution of Westslope Cutthroat Trout and the Prevalence of Hybridization

New, definitive information on both the probable historic and present-day range-wide distributions of WCT was provided in the status update report (Shepard *et al.* 2003). That information indicated WCT historically occupied about 90,928 km (56,500 mi) of stream in the United States and now occupy about 33,500 (59 percent) of those stream miles. About 33,000 (58 percent) of the historically occupied stream miles were in Montana, 19,000 (34 percent) in Idaho, 1,000 (2 percent) in Oregon, 3,000 (5 percent) in Washington, and 161 km (100 mi) (<1 percent) in Wyoming (*i.e.*, Yellowstone National Park). Shepard *et al.* (2003) also concluded that several river drainages, including the Milk Headwaters, Upper Milk, Willow, Bullwhacker-Dog, Box Elder, and the Upper, Middle, and Lower Musselshell in the Missouri River basin, the Hangman River watershed in the Spokane River drainage, and the North John Day River drainage in Oregon, were outside the historic range of WCT. On the basis of the less definitive information available prior to the WCT status update report, preceding assessments (*e.g.*, U.S. Fish and Wildlife Service 1999) had treated the streams in those drainages, except Hangman River, as historic WCT habitat. Today, WCT occupy over 28,968 km (18,000 mi) of stream in Idaho (95 percent of historic range in Idaho), about 20,922 km (13,000 mi) in Montana (39 percent of historic range in Montana), about 402 km (250 mi) in Oregon (21 percent of historic range in Oregon), and about 3,219 km (2,000 mi) of stream in Washington (66 percent of historic range in Washington). In our initial status review (U.S. Fish and Wildlife Service 1999), we reported that WCT occupied about 37,015 km (23,000 mi) of stream in the United States.

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

The WCT status update report (Shepard *et al.* 2003) grouped most of the WCT in the occupied miles of stream into 563 separate ''conservation'' populations. Those conservation populations collectively occupied 39,349 km (24,450 mi) of stream or 72 percent of the occupied habitat; WCT in the remaining 28 percent of occupied habitat did not satisfy the criteria of ''conservation'' populations and are thus being managed as ''sport fish'' populations, as described previously (Utah Division of Wildlife Resources 2000). Individual conservation populations ranged in geographic extent from small, nonintrogressed, isolated populations (*i.e.*, isolets) to large metapopulations that included numerous populations and encompassed hundreds of stream miles. According to Shepard *et al.* (2003), 457 (81.2 percent) of the 563 WCT conservation populations were isolets that were often restricted to headwater areas and represented 11.5 percent of the total occupied stream miles. Most of the occupied stream miles (88.5 percent) were habitat for WCT in metapopulations.

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

Occurrence of Westslope Cutthroat Trout Life-History Forms

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

In our initial status review (U.S. Fish and Wildlife Service 1999), we found that adfluvial WCT occur naturally in 6 lakes in Idaho and Washington that total about 72,843 ha (180,000 ac) and at least 20 lakes that total 2,164 ha (5,347 ac) in Glacier National Park in Montana. Most of those populations receive the high level of protection afforded by Glacier National Park. We also reported that about 37,015 km (23,000 mi) of stream were occupied by WCT, most of which were of either the resident or fluvial life-history form. More recently, the status update report (Shepard *et al.* 2003) indicated that WCT populations that include resident and fluvial fish, both of which live entirely in streams, presently occur in 53,913 km (33,500 mi) of stream habitat. In preparing that report, the lake habitats occupied by WCT were necessarily treated as stream habitat because of the limitations of the hydrologic database used in the geographic information systems-based analyses. Consequently, perhaps several hundred of the stream miles that Shepard *et al.* (2003) reported as occupied by WCT were actually lake habitats. The WCT in those lakes have the adfluvial life history. In addition, the extensive WCT conservation populations that function as metapopulations encompass hundreds of stream miles and frequently exhibit all three life-history forms. Nonetheless, WCT with the adfluvial life history probably constitute the smallest proportion of the WCT subspecies today, and this may have been true historically.

Analysis of Extant Threats to Westslope Cutthroat Trout

The Act identifies five factors of potential threats to a species: (1) The present or threatened destruction, modification, or curtailment of the species' habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; and (5) other natural or manmade factors affecting the species' continued existence.

We examined each of these factors in the context of present-day WCT. We also used the database of Shepard *et al.* (2003) to more closely examine the effects of several specific threats (*i.e.*, whirling disease, nonnative predators, competition from nonnative brook trout [*Salvelinus fontinalis*], and hybridization) to WCT in two categories of extant populations: (1) Nonintrogressed and suspected nonintrogressed WCT populations and (2) introgressed and suspected introgressed WCT classified as ''conservation'' populations (Utah Division of Wildlife Resources 2000). Collectively, those two categories exclude introgressed ''sport fish'' populations and thus are a subset of the populations we defined previously as WCT under the Act (*see* section on The Value of Hybrid Westslope Cutthroat Trout in Listing Determinations). We applied our analyses of threats to this more restricted subset of WCT populations to take advantage of the States' detailed database and to be conservative regarding the status and viability of extant WCT populations. This approach also avoided classification uncertainties associated with possible marginal populations managed primarily as sport fisheries (*i.e.*, populations that may not explicitly meet our stated criteria of WCT under the Act but for which detailed morphological or genetic analyses have not been performed). Detailed geographic summaries of biological information pertinent to each of the drainages within the historic range of WCT were provided in our initial status review (U.S. Fish and Wildlife Service 1999). Our evaluations of the five factors of potential threats to the aforementioned subset of WCT populations are presented below.

(A) Present or Threatened Destruction, Modification, or Curtailment of the Species' Habitat or Range

Our initial status review revealed that most of the habitat for extant WCT populations lies on lands administered by Federal agencies, particularly the U.S. Forest Service (U.S. Fish and Wildlife Service 1999). Moreover, most of the strongholds for WCT populations occurred within roadless or wilderness areas or national parks, all of which afforded considerable protection to WCT. More recently, the information that we received during the two comment periods, in particular the information provided in the status update report (Shepard *et al.* 2003), entirely supported our earlier conclusions and clearly indicated that WCT populations are widespread across the subspecies' historic range, abundant in several regions, and that many of those populations receive the appreciable protections afforded by roadless and wilderness areas and national parks (*see* also Hagener 2002). The status update report (Shepard *et al.* 2003) indicated that 70 percent of the habitat occupied by extant WCT populations lies on lands managed by Federal agencies, including lands designated as national parks (2 percent of occupied habitat), wilderness (19 percent), or U.S. Forest Service roadless areas (40 percent). In addition, the regulatory mechanisms in place to prevent the destruction or adverse modification of WCT habitat on those Federal lands and elsewhere are extensive (*see* subsequent section, Regulatory Mechanisms Involving Land Management).

The best scientific and commercial information available to us indicates that the WCT subspecies is not threatened by the present or threatened destruction, modification, or curtailment of its habitat or range.

(B) Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Our initial status review revealed that each of the States and the National Park Service greatly restricted the harvest of WCT and that in many regions only catch-and-release angling was allowed (U.S. Fish and Wildlife Service 1999). However, catch-and-release-only angling regulations are not essential to protecting WCT from excessive harvest by anglers. Instead, the angling regulations must not allow harvests that cause adverse population depletion and thereby threaten population survival. Our initial status review also revealed that, where there was collection of WCT for educational or scientific purposes, such collection was highly regulated and had a negligible effect on the WCT subspecies.

The additional information that we received while conducting this new status review confirmed our earlier conclusions. In Montana, recreational fishing and scientific collecting are highly regulated and have become increasingly restrictive. Enforcement of regulations pertaining to native fishes is a priority, and regulations limit the locations, dates, bag limits, and methods of fishing. In many WCT waters in the Columbia River basin, and in all waters in the Missouri River basin in Montana, fishing is restricted to catch-and-release (Hagener 2002; Shepard *et al.* 2003). In Idaho, nearly all WCT populations are managed with restrictive fishing regulations (Moore 2002). In Oregon, angling regulations in areas occupied by WCT are designed to protect Endangered Species Act-listed Mid-Columbia steelhead and Columbia Basin bull trout (*Salvelinus confluentus*). There is little angling pressure in the John Day River drainage, particularly in areas occupied by WCT (Unterwegner 2002). In Washington, the sportfishing rules for 2003–2004 allow the daily harvest of 2 trout longer than 20 centimeters (8 inches) from most streams, and 5 trout of any size from lakes, with the exception that all wild cutthroat trout caught from Lake Chelan and its tributaries, as well as from the Methow River, must be released alive.

The best scientific and commercial information available to us indicates that the WCT subspecies is not threatened by overutilization for commercial, recreational, scientific, or educational purposes.

(C) Disease or Predation

Threats from Disease—As part of both the initial and new status reviews, we considered the threat that diseases may pose to WCT. Perhaps the most important of the contemporary diseases is whirling disease, which is caused by an exotic myxozoan parasite. That microscopic parasite was introduced to the eastern United States from Europe in the 1950s and has since been found in many western States. Two separate host organisms are necessary for completion of the parasite's life cycle, a salmonid (*i.e.*, salmon, trout, and their close relatives) fish and a specific aquatic oligochaete worm. Within the range of WCT, whirling disease was first found in Idaho in 1987 and in Montana in 1994 (Bartholomew and Reno 2002).

The WCT status update report (Shepard *et al.* 2003) concluded that the threats to extant WCT populations from diseases in general were greater for the extensive WCT metapopulations than for the smaller WCT populations that occur as isolets. The key assumption made in reaching that conclusion was that, because the ranges of individual metapopulations were naturally much larger and encompassed habitats more diverse than those of isolets, the probability that diseases may be introduced and become established in WCT populations was greater for metapopulations than isolets. As noted previously, we examined the database of Shepard *et al.* (2003) to assess the disease risk to two groups of extant WCT: (1) Nonintrogressed or suspected nonintrogressed populations and (2) introgressed or suspected introgressed fish classified as ''conservation'' populations. Results indicated that only about 10 percent of the 1,944 stream miles occupied by nonintrogressed and suspected nonintrogressed WCT populations occurring in isolets were at moderately high or high risk of disease, whereas 69 percent of the 9,999 stream miles occupied by nonintrogressed WCT in the considerably more-extensive metapopulations were considered to be at similar risk. Similarly, introgressed or suspected introgressed WCT ''conservation'' populations occurring as isolets were at moderately high or high risk of disease in about 20 percent of their 751 occupied stream miles, whereas introgressed WCT in metapopulations were considered at similar risk in 88 percent of their 11,775 occupied stream miles.

However, we believe that the procedures used by Shepard *et al.* (2003) to assemble their database inevitably led to inflated estimates of the proportions of stream miles in which the WCT are at moderately high or high risk of disease. Moreover, as we will describe, the available scientific information indicates whirling disease is not a substantial threat to the majority of populations constituting the WCT subspecies. Although the whirling disease parasite continues to spread in many waters of the western United States (Bartholomew and Reno 2002), few outbreaks of whirling disease in resident fishes (mainly rainbow trout) have occurred. Studies summarized by Downing *et al.* (2002) indicated that presence of the whirling disease parasite does not portend outbreaks of the disease in resident fishes. For example, although 46 of 230 sites tested in Montana were positive for the parasite, disease outbreaks were known to have occurred at only 6 of those sites. Downing *et al.* (2002) provided evidence that the frequent absence of manifest whirling disease in resident trout, despite presence of the parasite, is due to complex interactions among the timing and spatial locations of important host-fish life-history events (*e.g.*, spawning, fry emergence from stream gravels, and early-life growth) and spatial and temporal variation in the occurrence of the parasite itself. Only under specific conditions, which evidently occur only in a small proportion of the locations where the parasite has been found, are those interactions such that disease outbreaks occur in resident fishes. The available scientific information specific to whirling disease thus indicates considerable variation in the probable disease threat among individual WCT populations and provides evidence that the disease is not a significant threat to the majority of populations constituting the WCT subspecies. The database procedures used by Shepard *et al.* (2003) necessarily resulted in entire WCT metapopulations being treated at the same level of risk from disease, even though that risk applied only to specific populations within those metapopulations. Thus, we conclude that the percent of stream miles in which Shepard *et al.* (2003) reported that WCT are at moderately high or high risk of disease is inflated to an extent that cannot be quantified with the available data.

A broad suite of variables has been shown to influence the incidence and intensity of infections of salmonid fishes by the whirling disease parasite, including host-fish species and age, parasite dose, and water temperature (Kerans and Zale 2002; MacConnell and Vincent 2002). Among the salmonid fishes that have been examined under controlled conditions, rainbow trout has been found to be the most susceptible to whirling disease (Bartholomew and Wilson 2002). Studies conducted on various salmonids by Vincent (2002) revealed that WCT were moderately susceptible to whirling disease and had the lowest susceptibility of the three cutthroat trout subspecies examined. We are unaware of any studies of the susceptibility of the hybrids of rainbow trout and WCT to whirling disease.

In addition, although the parasite's essential oligochaete host, *Tubifex tubifex*, can be found in a wide variety of habitats and is considered ubiquitous across the diversity of freshwater habitats used by trout, *T. tubifex* has a much higher probability of occurring at locations with abundant fine sediments in eutrophic (*i.e.*, nutrient-rich) lakes and streams (Granath and Gilbert 2002). The mountain streams that WCT often inhabit are cold and have low biological productivity, factors that make those streams much less suited to both the whirling disease parasite and *T. tubifex* (Bartholomew and Wilson 2002).

Extensive research is being conducted to determine the distribution of whirling disease, the susceptibility of WCT and other fishes to whirling disease, infection rates, and possible control measures (Bartholomew and Wilson 2002). Although no means have been found to eliminate the whirling disease parasite from streams and lakes, the States have established statutes, policies, and protocols that prevent the human-caused spread of extant pathogens and the introduction of new pathogens (*e.g.*, Hagener 2002). Except for whirling disease, the fish pathogens that occur in the natural habitats of WCT are mainly benign in wild populations and cause death only when the fish are stressed by severe environmental conditions.

On the basis of the best scientific and commercial information available to us, we conclude that the WCT subspecies is not threatened by whirling disease, although some specific populations may be at higher risk.

Threats From Predation—The instances when predation by other fishes may negatively affect extant WCT populations are few and limited to a few large rivers, lakes and reservoirs (U.S. Fish and Wildlife Service 1999; Hagener 2002). However, as reported in the initial status review, predacious, nonnative fishes in Idaho's Coeur d'Alene Lake, Montana's Flathead Lake, and other lakes have negatively affected resident WCT. In those instances, predation has reduced the abundance of WCT that have the adfluvial life history.

We examined the database of Shepard *et al.* (2003) to assess the extent that nonnative fishes, including recognized predacious species, co-occur (*i.e.*, are sympatric) with extant WCT for: (1) Nonintrogressed or suspected nonintrogressed populations and (2) introgressed or suspected introgressed ''conservation'' populations. Results indicated that two predacious species, brown trout (*Salmo trutta*) and lake trout (*Salvelinus namaycush*), each occur in only small proportions of the habitat occupied by WCT, mainly WCT that occur in metapopulations. However, for reasons related to the database and described previously for whirling disease, those small proportions are inflated to an extent that cannot be quantified using the available data. Brown trout occur primarily in mainstem rivers and their major tributaries, whereas lake trout occur almost exclusively in lakes. When one or the other species occurred in the range of a WCT metapopulation, the procedures of Shepard *et al.* (2003) necessarily resulted in the entire WCT metapopulation being treated as sympatric with the nonnative species, although the actual region of species overlap within that range may be small.

The best scientific and commercial information available to us indicates that the WCT subspecies is not threatened by predation from brown trout, lake trout, or other predaceous, nonnative fishes. However, where such predation does occur, it is mainly on WCT that have either the fluvial or adfluvial life history. The remaining, nonnative fishes sympatric with WCT will be discussed in subsequent sections of this document.

(D) Inadequacy of Existing Regulatory Mechanisms

The Act requires us to examine the adequacy of existing regulatory mechanisms with respect to those extant threats that place the species in danger of becoming either threatened or endangered. Our initial status review (U.S. Fish and Wildlife Service 1999) revealed that there are numerous existing Federal and State regulatory mechanisms whose purpose is to protect WCT and their habitats throughout the subspecies' range. Neither our initial nor our new status review revealed information to indicate that those mechanisms were not working or will not work to protect the WCT subspecies.

Regulatory Mechanisms Involving Land Management—During our initial status review (U.S. Fish and Wildlife Service 1999), we found numerous laws and regulations that help to prevent the adverse effects of land-management activities on WCT. More recently, Hagener (2002) reiterated that Montana laws that benefit WCT include the Montana Stream Protection Act, the Streamside Management Zone Law, the Montana Natural Streambed and Land Preservation Act, and the Montana Pollutant Discharge Elimination System. Federal laws that protect WCT and their habitats in Montana and elsewhere include the CWA, Federal Land Management Protection Act (FLMPA), and the National Environmental Policy Act (NEPA). Much of the habitat of extant WCT is managed by Federal agencies, including the U.S. Forest Service and the Bureau of Land Management. Those Federal agencies have adopted the Inland Native Fish Strategy (INFISH) that includes standards and guidelines that protect watersheds. Furthermore, because the broad distribution of bull trout—listed as a threatened species under the Act in 1999—considerably overlaps the distribution of WCT, the WCT will benefit from the Act's section 7 protective actions for bull trout in areas where the two species coexist.

In addition, the U.S. Forest Service recently reported (McAllister 2002) that existing regulatory mechanisms that protect WCT habitat include the Northwest Forest Plan; the Interim Strategies for managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (*i.e.*, PACFISH); INFISH; the Wilderness Act; and the Upper Missouri (River) Memorandum of Understanding and Land Use Strategy (in draft). In Idaho (Moore 2002), regulatory mechanisms that protect WCT habitat include the Stream Channel Protection Act, the Lake Protection Act, and the Forest Practices Act. At the Federal level, protection is afforded by the CWA, the National Forest Management Act, NEPA, Wild and Scenic Rivers legislation, and the Wilderness Act. The St. Joe and Lochsa rivers are protected by ''Wild and Scenic'' designation and nearly all of the Middle Fork Salmon and Selway rivers and their watersheds are protected by Wilderness Act designations. In addition, the range of WCT in Idaho is almost entirely overlapped by that of one or more federally listed fish species, namely, bull trout, Kootenai River white sturgeon (*Acipenser transmontanus*), chinook salmon (*O. tshawytscha*), sockeye salmon (*O. nerka*), or steelhead. Protective measures under the Act for those listed fishes also benefit WCT.

During our initial status review, we found Federal regulations and guidelines that protect WCT and their habitat in Oregon and Washington included CWA, NEPA, FLPMA, INFISH, PACFISH, and National Forest Management Plans (U.S. Fish and Wildlife Service 1999). More recently, information received from Oregon (Unterwegner 2002) indicated that the Oregon Plan for Salmon and Watersheds (ORS 541.405) mandates restoration of watersheds and the recovery of fish and wildlife populations therein to productive and sustainable levels in a manner that provides substantial environmental, cultural, and economic benefits; the Oregon Forest Practices Act (ORS 527.610) mandates the protection, maintenance, and, where appropriate, improvement of functions and values of streams, lakes, wetlands, and riparian management areas; State fill and removal laws (ORS 196.800–990) require that a permit be obtained before materials are moved and mitigation measures be implemented if stream habitats will be negatively affected; a water right must be obtained before any surface water is diverted from a stream for beneficial use; and a Water Quality Management Plan is being written that addresses nonpoint source water-quality issues in the mainstem John Day River, identifies nonpoint source pollution, and ensures that agricultural producers do not degrade water quality as prescribed by the CWA. In Oregon, WCT inhabit a number of protected areas, including the Strawberry and North Fork John Day Wilderness Areas, and the Vinegar Hill-Indian Rock Scenic Areas.

In Washington, the Act's section 7 protections accorded to bull trout and Pacific salmon also benefit WCT. The same holds true for Oregon, where bull trout and mid-Columbia River steelhead are listed fishes.

Hitt and Frissell (2001) used data from the Interior Columbia (River) Basin Ecosystem Management Project (ICBEMP) to assess the degree of spatial overlap between populations of bull trout and populations of WCT that were both considered ''strong'' by the ICBEMP. Those authors found that about 75 percent of the WCT populations did not co-occur with bull trout. Accordingly, Hitt and Frissell (2001) concluded that the bull trout may not be a good ''umbrella'' species, *i.e.*, a species whose protections accorded by the Act's section 7 also would serve to protect WCT. However, our conclusion stated herein that the Act's section 7 protections accorded bull trout and other listed fish species also would benefit WCT is not based on the assumption that all extant WCT populations co-occur with one or more of those listed fishes. Rather, we believe that in those instances of co-occurrence, the WCT will derive protections from the section 7 protections that are accorded the listed species.

Regulatory Mechanisms That Address Threats From Hybridizing, Nonnative Fishes—Montana has a number of laws and regulatory mechanisms that address threats posed by the unlawful stocking of potentially hybridizing, nonnative fishes (Hagener 2002). These include statutes, rules, and policies that restrict the capture, possession, transportation, and stocking of live fish, including fishes that may hybridize with WCT, as well as rigorous fish-health policies that restrict the transport or stocking of live fish. The stocking of private ponds also is closely regulated. Furthermore, although the stocking of rivers and streams with a variety of nonnative fishes was routine early in the 20th Century, it no longer occurs in Montana. In 1976, Montana adopted a policy that prohibits the stocking of hatchery fish in rivers and streams. Consequently, unless done for government-sponsored conservation purposes, no other trout or nonnative fish may be stocked in rivers and streams inhabited by WCT.

In Idaho, regulatory mechanisms that protect extant WCT from hybridization are in place (Moore 2002, 2003). The Idaho Department of Fish and Game helped develop and has adopted the interstate position paper on genetic considerations associated with cutthroat trout management (Utah Division of Wildlife Resources 2000). Department of Fish and Game management direction, as described in its Fisheries Management Plan (a publicly reviewed, Commission-adopted document), gives priority in management decisions to wild, native populations of fish. The Department of Fish and Game has redirected almost all of its hatchery rainbow trout program to the production of sterile, triploid fish, and only triploid rainbow trout are now stocked in waters connected to or near WCT habitat. In addition, the transport of live fish to, within, and from Idaho is regulated by the Department of Fish and Game and the Idaho Department of Agriculture. The Department of Fish and Game regulates private ponds in the State and applies the same criteria to private-pond stocking that it does to the stocking of public waters, *i.e.*, stocking of potentially hybridizing fishes that may pose a hybridization threat to native cutthroat trout is prohibited.

In Washington, the Department of Fish and Wildlife no longer stocks resident rainbow trout in tributaries that contain native WCT populations. In areas where stocking occurs in mainstem river reaches (*e.g.*, the Pend Oreille River), only sterile (*i.e.*, triploid) rainbow trout are stocked (Fuller 2002). In Oregon, the Department of Fish and Wildlife exclusively manages all streams within the John Day River drainage for wild fish production and none of those streams has been stocked with hatchery fish since 1997 (Unterwegner 2002).

The best scientific and commercial information available to us indicates that the WCT subspecies is not threatened by the inadequacy of existing regulatory mechanisms related to the stocking of potentially hybridizing, nonnative fishes. However, as described in a subsequent section (*see* Hybridization with Nonnative Fishes), hybridization with introduced, nonnative fishes that have become established as self-sustaining populations does pose a threat to WCT. As discussed in that subsequent section, there are no regulatory mechanisms that would prevent hybridization from self-sustaining populations of an introduced species. However, in some instances, certain management actions may serve as preventative actions and there also may be natural factors that limit the spread of hybridization in the WCT subspecies.

(E) Other Natural or Manmade Factors Affecting the Species' Continued Existence

Fragmentation and Isolation of Small Westslope Cutthroat Trout Populations in Headwater Areas—Our initial status review (U.S. Fish and Wildlife Service 1999) revealed that extant WCT populations are not necessarily small or limited to headwater streams. Instead, that review indicated that many river drainages had numerous, interconnected miles of stream habitat occupied by WCT. Those areas included Montana's Clark Fork River drainage (8,314 stream km [5,166 stream mi]) and Idaho's Salmon River drainage (6,563 stream km [4,078 stream mi]). Furthermore, our initial review revealed no evidence that the isolation of some WCT populations had resulted in either deleterious inbreeding (see also Caro and Laurenson 1994) or stochastic extirpations that threatened the WCT subspecies.

Information provided in the WCT status update report (Shepard *et al.* 2003) substantiated our earlier conclusions and indicated that, although 457 (81.2 percent) of the 563 WCT conservation populations were isolets that were often restricted to headwater areas, those isolets represented only 11.5 percent of the total stream miles occupied by WCT. Thus, the small WCT populations in headwater areas were numerous but they occupied a small proportion of the total habitat occupied by WCT. Most of the occupied stream miles (88.5 percent) were habitat for WCT in metapopulations. Consequently, the best scientific and commercial information available to us indicates that the WCT subspecies is not threatened by the fragmentation and isolation of small WCT populations in headwater areas.

Competition From Introduced Brook Trout—Brook trout, a nonnative species that can adversely compete with WCT (*e.g.*, Griffith 1988), have been stocked in numerous areas throughout the range of WCT. We examined the database of Shepard *et al.* (2003) to assess the extent that brook trout co-occur (*i.e.*, are sympatric) with extant WCT. Results indicated that in the: (1) Combined nonintrogressed and suspected nonintrogressed WCT populations and (2) the introgressed or suspected introgressed WCT conservation populations, both of which occur as either isolets or metapopulations, brook trout are sympatric with a substantial proportion of those populations (41 to 90 percent of the collective stream miles for each category). However, as was the case for assessments of other threats made using this database, it was not possible to determine the extent that brook trout are distributed throughout the range of an individual WCT population, nor was it possible to quantify the competitive effect of brook trout on the abundance or viability of WCT. Nonetheless, it is evident from their longstanding coexistence in some streams that complete competitive exclusion of WCT by brook trout is not inevitable where the two fishes co-occur. In addition, the database did not provide conspicuous insights into how far upstream brook trout may eventually move in the various drainages in which they now occur. Nonetheless, as we will describe, the available scientific information indicates brook trout are not a substantial threat to the majority of extant populations constituting the WCT subspecies.

Adams *et al.* (2000) assessed the ability of brook trout to move upstream in four headwater streams in a mountainous area of northern Idaho. They concluded that the upstream movement of brook trout was inhibited, but not precluded, by stream gradients up to 13 percent. That study did not involve the experimental introduction of brook trout into streams in which they were absent; instead, brook trout were already established in the study streams. The study design involved mechanical removal of brook trout in certain stream reaches; the marking of brook trout in neighboring reaches; and the subsequent assessment of movement of marked brook trout into the stream reaches that had been mechanically depopulated. Because they were already inhabited by brook trout, the four streams examined by Adams *et al.* (2000) may have been among streams especially conducive to colonization by brook trout. Thus, it is not possible to extrapolate the results of Adams *et al.* (2000) to the broad array of headwater streams in which WCT presently occur but brook trout do not, even though brook trout occur in the downstream portions of those drainages.

More recently, Adams *et al.* (2002) assessed historic changes in the upstream limits of distribution of brook trout in 17 streams accessible by the fish in the upper South Fork Salmon River drainage in central Idaho. Brook trout already inhabited portions of 10 of the streams in 1971–1985. In 1996, their upstream-distribution limit remained unchanged in 8 streams that historically contained brook trout and 5 of 6 streams that did not (*i.e.*, one stream was invaded by brook trout). In the remaining 4 streams, the distribution of brook trout had moved upstream 1.9 to 3.1 km (1.2 to 1.9 mi). There was no detectable increase in the upstream distribution of brook trout in 10 streams that had no obvious physical barriers to such movement. The authors concluded that upstream colonization by brook trout is not continuously progressing throughout much of the drainage, and that the absence of brook trout in streams with no apparent barriers to the upstream movement of fish indicated that other factors were limiting the upstream expansion of brook trout. Consequently, the best scientific and commercial information available to us indicates that the WCT subspecies is not threatened by competition from introduced brook trout, although some populations may be at higher risk.

Risks Associated With Catastrophic, Natural Events—Our initial status review found that the geographic isolation of some extant WCT populations had not resulted in stochastic extirpations of such populations (due, for example, to floods, landslides, or wildfires) to a degree that threatened the WCT subspecies (U.S. Fish and Wildlife Service 1999).

Information provided in the WCT status update report (Shepard *et al.* 2003) ranked each of four measures of population viability that could make WCT vulnerable to catastrophic, natural events or adverse human effects on the aquatic environment: (1) Population productivity, (2) temporal variability, (3) isolation, and (4) population size. That analysis suggested that about 76 percent of the stream miles occupied by WCT conservation populations considered isolets were at high risk from catastrophic events because WCT would not be available to naturally recolonize those habitats. In contrast, only a small (~2 percent) proportion of the stream miles occupied by WCT conservation populations considered metapopulations were at moderately high or high risk from catastrophic or human events with respect to the four measures of population viability. However, on the basis of empirical information, Rieman and Dunham (2000) reported that none of the small WCT populations they studied in the Coeur d'Alene River drainage were extirpated by a large winter flood that was considered a once-in-100-years event and affected more than 50 watersheds. Similarly, despite large wildfires in 1996 and 2002 in Oregon's Indian Creek and Roberts Creek drainages, respectively, WCT populations in those streams have exhibited no immediate negative effects of the fires (Unterwegner 2002). The widespread geographic distribution of WCT across the subspecies' range further mitigates potential negative effects resulting from local population extinctions following future catastrophic natural events, as no single event is likely to impact a significant percent of the overall number of isolated populations. Moreover, given the widespread efforts for the conservation of these fish (*see* ''Evaluation of Ongoing Conservation Efforts,'' below), any such local extirpation is likely to be followed by reintroduction efforts if WCT were not available naturally to recolonize those habitats.

Kruse *et al.* (2001) assessed the possible demographic and genetic consequences of purposely isolating the populations of another cutthroat trout, the YCT, in headwater streams in the Absaroka Mountains, Wyoming. Such isolation may actually result, for example, from intentional placement of a movement barrier to prevent nonnative fishes downstream from invading upstream reaches. Kruse *et al.* (2001) made estimates of population size for YCT in each of 23 streams, then compared those estimates to minimum criteria that the authors considered necessary to prevent population extirpation. Kruse *et al.* (2001) acknowledged that their minimum-viability criteria had not been confirmed for YCT and that there was debate among researchers regarding the applicability of those criteria. Despite those limitations, 21 of 23 YCT populations met 2 of the 3 criteria, and the third criterion (*i.e.*, a population size of at least 500 fish) was met by 7 of the 23 populations. Nevertheless, the authors speculated that isolated YCT populations are vulnerable to chance extinctions, although they also pointed out that ''there has been little opportunity to observe the real effects of small population size and isolation on native, extant Yellowstone cutthroat trout populations.'' We believe those limitations of knowledge also apply to WCT in isolated headwater streams across the subspecies' range. Consequently, the best scientific and commercial information available to us indicates that the WCT subspecies is not threatened at the present time by risks associated with catastrophic, natural events.

Threats to Any of the Three Westslope Cutthroat Trout Life-History Forms—The three WCT life-history forms occur in numerous areas across the subspecies' range. In our initial status review, we found that WCT naturally occur in 6 lakes in Idaho and Washington that total about 72,843 ha (180,000 ac) and in least 20 lakes that total 2,164 ha (5,347 ac) in Glacier National Park, Montana (U.S. Fish and Wildlife Service 1999). All of those WCT in lakes are adfluvial (*i.e.*, migratory) populations and many of them receive the high level of protection afforded by Glacier National Park. However, outside the park, protections accorded WCT in most lakes are less rigorous (U.S. Fish and Wildlife Service 1999). Today, WCT with the adfluvial life history probably constitute the smallest proportion of the WCT subspecies, and probably did so historically.

We also found (U.S. Fish and Wildlife Service 1999) that resident (*i.e.*, showing little movement) and fluvial (*i.e.*, migratory) WCT populations, which live entirely in streams, constitute the most common WCT life-history forms and occur in about 4,275 tributaries or stream reaches that collectively encompass more than 37,015 km (23,000 linear mi) of stream habitat. Those WCT populations are distributed among 12 major drainages and 62 component watersheds in the Columbia, Missouri, and Saskatchewan River basins, within the international boundaries of the United States. As described in the preceding section Occurrence of Westslope Cutthroat Trout Life-history Forms, the information recently provided to us (Shepard *et al.* 2003) indicates even greater abundance of WCT across the subspecies' range than we had estimated during the initial status review. The available data do not suggest the future loss of any of the three life-history forms represented by WCT. Consequently, we conclude that the WCT subspecies is not threatened by the loss of one or more of its life-history forms throughout all or a significant portion of its historic range.

Hybridization With Nonnative Fishes—Hybridization with introduced, nonnative fishes, particularly rainbow trout and their hybrid descendants that have established self-sustaining populations, is recognized as an appreciable threat to the WCT subspecies. Hybridization requires that the nonnative species invade the WCT habitat, the two species interbreed, and the resulting hybrids themselves survive and reproduce. If the hybrids backcross with one or both of the parental species, genetic introgression can occur. Continual introgression can eventually lead to the loss of genetic identity of one or both parent species, thus resulting in a ''hybrid swarm'' consisting entirely of individual fish that each contain genetic material from both of the parental species.

The WCT is known to interbreed with rainbow trout and YCT, both of which were first stocked into many regions of the historic range of WCT more than 100 years ago. Nonetheless, the limited data available at the time of our initial status review revealed that numerous, nonintrogressed WCT populations inhabited more than 4,184 km (2,600 mi) of stream (U.S. Fish and Wildlife Service 1999). Moreover, in the present document, we have concluded that nonintrogressed WCT are known to inhabit 5,633 km (3,500 mi) of stream and probably inhabit as many as 20,278 km (12,600 mi) of stream in which no potentially hybridizing fishes occur. Clearly, not all nonintrogressed WCT populations have been equally vulnerable to introgressive hybridization. In Idaho, WCT in many populations are sympatric with potentially hybridizing, native redband trout but remain nonintrogressed (Moore 2002). Thus, the occurrence of potentially hybridizing fishes does not portend their imminent hybridization with WCT.

The WCT status update report (Shepard *et al.* 2003) concluded that the threats to extant WCT populations from introgressive hybridization were greater for the extensive WCT metapopulations than for the smaller WCT populations that occurred as isolets. As pointed out by Shepard *et al.* (2003), the vulnerability to hybridization of WCT in metapopulations stems from the key characteristic of the metapopulation itself, *i.e.*, the ability of its member fish to move (and interbreed) among the various WCT populations that constitute the metapopulation. It is assumed that potentially hybridizing fishes are similarly unencumbered in their movements throughout the geographic area occupied by the metapopulation and, accordingly, WCT metapopulations can inevitably become completely introgressed as a hybrid swarm.

We examined the database of Shepard *et al.* (2003) to assess the introgressive hybridization risk to extant WCT that consist of: (1) Nonintrogressed or suspected nonintrogressed populations and (2) introgressed or suspected introgressed ''conservation'' populations. Results indicated that nonintrogressed and suspected nonintrogressed WCT populations occurring as isolets were at moderately high or high risk of introgression in about 16 percent of their 1,944 occupied stream miles, whereas nonintrogressed populations occurring in metapopulations were considered to be at similar risk in 89 percent of their 9,999 occupied stream miles. Similarly, WCT in introgressed or suspected introgressed conservation populations occurring as isolets were at moderately high or high risk of introgression in about 38 percent of their 751 occupied stream miles, whereas introgressed populations occurring in metapopulations were considered at similar risk in 99 percent of their 11,775 occupied stream miles. The WCT in introgressed or suspected introgressed populations inhabited a total 19,262 km (11,943 mi) of stream, 1,060 km (657 mi) less than reported by Shepard *et al.* (2003). However, those authors also reported the 563 WCT ''conservation'' populations collectively occupied 39,349 km (24,450 mi) of stream, nearly identical to the amount that we found (*i.e.*, 39,466 km or 24,469 mi) when the database was examined. The reason for the small discrepancy (5.2 percent) in the total amounts of habitat occupied by WCT in introgressed or suspected introgressed populations is unknown but may be due to differences in the specific database queries.

The hybridization risk to WCT is almost entirely from rainbow trout, YCT, and the hybrid offspring and descendants of those fishes that have established self-sustaining populations within the range of extant WCT populations. We examined the database of Shepard *et al.* (2003) to assess the extent that rainbow trout and ''other cutthroat trout'' (primarily YCT) co-occur (*i.e.*, are sympatric) with extant WCT in: (1) Nonintrogressed or suspected nonintrogressed populations and (2) introgressed or suspected introgressed ''conservation'' populations. Rainbow trout or YCT occur in 47 to 91 percent of the stream miles occupied by WCT metapopulations but only 0 to 22 percent of the stream miles occupied by WCT isolets.

In most cases today, it is not technologically possible to eliminate the self-sustaining populations of potentially hybridizing, nonnative fishes from entire drainages or even individual streams. Consequently, perceived threats to extant WCT posed by nonnative fishes in streams are sometimes met by installing barriers to the upstream movement of the nonnative fishes into stream reaches occupied by WCT. In a few cases, usually involving small streams that provide the greatest opportunity for success, fish toxins may be used to completely remove all fishes upstream from such barriers, after which WCT may be stocked (*e.g.*, Hagener 2002). In either case, because of technological, budgetary, and other limitations, such actions are now being taken for only a small proportion of WCT populations across the subspecies' range.

Because self-sustaining populations of nonnative fishes pose the greatest hybridization threat to WCT and few of those populations can be eliminated or appreciably reduced, a key concern is for the extent that introgressive hybridization may eventually pervade extant, nonintrogressed or suspected nonintrogressed WCT populations, particularly those that inhabit headwater streams in high-elevation areas. Hitt (2002) reported that 55 percent of 40 WCT populations examined in the Flathead River drainage in Montana showed evidence of introgressive hybridization with rainbow trout, and that introgression had progressed upstream in several tributaries during the past 2 decades. Additional evidence suggested that the upstream introgression of rainbow trout genes would eventually be halted by diminished stream size, as evidenced by the observation that rainbow trout usually inhabit larger streams than cutthroat trout. However, Hitt (2002) further speculated that the stream reaches upstream from those potentially limiting locations would be too small to support viable WCT populations.

In the Clearwater River drainage in Idaho, Weigel *et al.* (2003) similarly found that WCT at 64 percent of the 80 sample sites showed evidence of introgression with rainbow trout or native redband trout. The incidence and intensity of that introgression was negatively associated with stream elevation, which the authors believed resulted from the interaction of low water temperatures or other characteristics of the high-elevation hydrologic regimes and either the physiological or habitat requirements of rainbow trout and their hybrids with WCT. In a study conducted in the Kootenay (= Kootenai) River, British Columbia, Rubidge *et al.* (2001) found that WCT introgressive hybridization with rainbow trout had become more widespread in the drainage since the mid-1980s, which the authors attributed to the ongoing stocking of rainbow trout into Koocanusa Reservoir in British Columbia.

In addition, many extant WCT populations occur upstream from barriers that entirely prevent the upstream movements of nonnative fishes, including those that may potentially hybridize with WCT. We examined the database of Shepard *et al.* (2003) to determine the extent that extant, nonintrogressed or suspected nonintrogressed WCT populations occur upstream from such ''complete'' barriers. Results indicated that 48 percent of the 1,944 stream miles inhabited by WCT in isolets are protected by such barriers, whereas about 6 percent of the 9,999 stream miles inhabited by nonintrogressed WCT in metapopulations are similarly protected. Thus, nonintrogressed or suspected nonintrogressed WCT populations inhabiting 2,454 km (1,525 mi) of stream are protected from introgressive hybridization by barriers to the upstream movement of nonnative fishes.

The available empirical evidence and speculations by many fishery scientists indicate that rainbow trout genes are expected to continue moving upstream into many stream reaches presently inhabited by nonintrogressed WCT, although, as we have discussed, there may be limits to that upstream dispersal set by low stream temperatures or other factors. However, the observation that numerous nonintrogressed WCT populations persist today despite both the longstanding occurrence (*i.e.*, more than 100 years) of potentially hybridizing fishes in regions downstream and the absence of obvious intervening barriers to the upstream movement of those fish suggests that not all nonintrogressed WCT populations have been and are equally vulnerable to introgression. Behnke (1992, 2002) provides evidence that phenotypically true, native cutthroat trout of several subspecies persist in many essentially undisturbed, natural habitats because they have fitness superior to that of nonnative fishes, including potentially hybridizing species and their hybrid descendants. Thus, the eventual extent that rainbow trout, or YCT, genes move upstream may be stream-specific and unpredictable. Nonetheless, as noted previously (see previous section, ''The Value of Hybrid Westslope Cutthroat Trout in Listing Determinations''), small amounts of genetic introgression do not disqualify individual WCT or their populations from species membership under the Act. Finally, nonintrogressed or suspected nonintrogressed populations of WCT inhabiting 2,454 km (1,525 mi) of stream are considered secure from genetic introgression because those populations occur upstream from barriers to the upstream movement of nonnative fishes or their hybrid descendants. Therefore, the best scientific and commercial information available to us indicates that the WCT subspecies is not threatened by introgressive hybridization.

Evaluation of Ongoing Conservation Efforts

In the initial status review (U.S. Fish and Wildlife Service 1999), we identified numerous, ongoing conservation efforts that benefitted WCT and their habitats. For example, the U.S. Forest Service, State fish and wildlife agencies, and National Park Service reported more than 700 ongoing projects directed toward the protection and restoration of WCT and their habitats.

Recent information indicates that these important conservation efforts are ongoing and increasing in number. At the time of the initial status review, the four State fish and wildlife agencies, the U.S. Forest Service, and other entities were implementing WCT conservation actions in a minimally coordinated manner. The State of Montana had developed a formalized conservation program for WCT that included a State-wide conservation agreement, a conservation strategy with specific goals and objectives, a steering committee consisting of representatives from various key agencies and other concerned entities, and a technical oversight group. At that time, Idaho, Oregon, and Washington also were implementing WCT conservation actions as an integral part of their fisheries management programs. The U.S. Forest Service also was protecting WCT habitat as specified under INFISH and PACFISH, and had established a new professional position whose incumbent focused entirely on inland cutthroat trout conservation in the western United States.

More recently, the conservation efforts for WCT have been enhanced by formalized coordination among the four State fish and wildlife agencies, the U.S. Forest Service, and the Service. Beginning in June 2001, formal coordination meetings have been held under the leadership of a representative of the Idaho Department of Fish and Game. A formal coordination agreement is now being developed, consistent conservation goals and objectives for WCT have been identified, and an emphasis on consistency and continuity in WCT conservation among the agencies has emerged. An indication of the important level of coordination that has been achieved is provided by the recent WCT status update report (Shepard *et al.* 2003), which was completed through a concerted effort among the parties to the coordination agreement. To complete that report, 112 biologists—working with 19 geographic information systems and data-entry specialists—completed the task of updating the current information on WCT in a timely and comprehensive manner.

In Idaho, hundreds of conservation efforts have been undertaken in recent years to protect WCT and their habitats (Moore 2003). Those efforts include initiation of a study to determine movement patterns of WCT in the Middle Fork of the Salmon River basin (this study will be expanded into the upper Salmon River basin), accelerated genetic sampling of fishes in central and northern Idaho streams, addition of a qualified geneticist to Department of Fish and Game staff, and implementation of joint efforts with the U.S. Forest Service focused on protection and enhancement of WCT habitat and populations. Montana Fish, Wildlife and Parks continues to implement its conservation agreement and plan. In Montana, more than 200 projects that directly benefit WCT have now been completed, many of which were accomplished as part of a Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout in Montana, and numerous, additional projects are ongoing (Hagener 2002). Included in the Montana Fish, Wildlife and Parks efforts are removal of nonnative trout through both physical and chemical means, installation of fish-passage barriers, and coordinated efforts with U.S. Forest Service and other management authorities focused on WCT habitat protection and enhancement.

Oregon and Washington fishery agencies are likewise planning and implementing WCT conservation actions. In Oregon (Unterwegner 2002), the Department of Fish and Wildlife is developing a Native Fish Conservation

Policy in response to a Governor's Executive Order to review the existing Wild Fish Management Policy. The Oregon Department of Fish and Wildlife also has an active fish-screening program for irrigation diversions in the John Day River drainage and elsewhere. That program began in the 1950s and more than 300 fish screens are now in place and operated during the annual irrigation season. The Oregon Department of Fish and Wildlife also has accomplished several habitat-restoration projects throughout the drainage, funded mainly by the Bonneville Power Administration and Oregon Watershed Enhancement Board.

The U.S. Forest Service has a very active conservation program in place for WCT. Between 1998 and 2002, the U.S. Forest Service, in partnership with the States and others, implemented 324 projects that benefit WCT. The total investment of funds for these projects was approximately $9,665,000 (McAllister 2002). During the 2002 Fiscal Year, the U.S. Forest Service accomplished 54 on-the-ground restoration projects, inventories, evaluations, and public outreach efforts at a cost of $1.6 million (Johnston 2003).

The conservation efforts presently being accomplished as part of the routine management objectives of State and Federal agencies, and as part of formal interagency agreements and plans, provide substantial assurance that the WCT subspecies is being conserved. The best information available to us indicates that numerous, ongoing conservation efforts for WCT are being implemented across the subspecies' range. These ongoing conservation efforts are commendable and they contribute to the certainty that WCT can be conserved and protected.

Listing Determinations Made Under the Act

In the context of the Act, the term ''threatened species'' means any species (or subspecies or, for vertebrates, DPS) that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The term ''endangered species'' means any species that is in danger of extinction throughout all or a significant portion of its range. The Act does not indicate threshold levels of historic population size at which, as the population of a species declines, listing as either ''threatened'' or ''endangered'' becomes warranted. Instead, the principal considerations in the determination of whether or not a species warrants listing as a threatened or an endangered species under the Act are the threats that now confront the species and the probability that the species will persist in ''the foreseeable future.'' The Act does not define the term ''foreseeable future.'' However, the WCT interagency conservation team, the group that produced the WCT status update report, considered the ''foreseeable future'' to be 20 to 30 years (approximately 4 to 10 WCT generations) beyond the present time (Shepard *et al.* 2003), a measure that we believe is both reasonable and appropriate for the present listing determination.

In our initial status review, we provided evidence from the Missouri River basin that indicated a conspicuous decline in the WCT subspecies occurred early in the 20th Century (U.S. Fish and Wildlife Service 1999). We attributed that decline to rapid, abundant colonization of mainstem rivers and their major tributaries by one or more introduced nonnative fish species (*e.g.*, brown trout, rainbow trout, and brook trout) that had adverse effects on WCT. Our analysis also showed that the rate of decline in the WCT subspecies is markedly lower today than it was early in the 20th century. We believe that the evidence from the Missouri River basin provided a model for the historic decline of WCT that was applicable to WCT in many other regions of the subspecies' historic range.

Conclusions

The information that we have summarized in this document, particularly that obtained from the status update report (Shepard *et al.* 2003), indicates even greater abundance of WCT across the subspecies' range than we had estimated during the initial status review (U.S. Fish and Wildlife Service 1999). Today, 563 extant WCT ''conservation'' populations collectively occupy 39,349 km (24,450 mi) of stream in Idaho, Montana, Oregon, Washington, and Wyoming. Those WCT populations are distributed among 12 major drainages and 62 component watersheds in the Columbia, Missouri, and Saskatchewan River basins, within the international boundaries of the United States. In our initial status review (U.S. Fish and Wildlife Service 1999), we reported that WCT occupied about 37,015 km (23,000 mi) of stream in the United States. In addition, nonintrogressed WCT are now known to inhabit 5,633 km (3,500 mi) of stream and probably inhabit as many as 20,278 km (12,600 mi) of stream in which no potentially hybridizing fishes occur. In our initial status review (U.S. Fish and Wildlife Service 1999), we reported that nonintrogressed WCT were known to occupy 4,237 km (2,633 mi) of stream.

Although the WCT subspecies has been reduced from historic levels and its extant populations face threats in several areas of the historic range, we find that the magnitude and imminence of those threats do not jeopardize the continued existence of the subspecies within the foreseeable future. Many former threats to WCT, such as those posed by excessive harvest by anglers or the widespread stocking of nonnative fishes, are no longer factors that threaten the continued existence of the WCT subspecies. The effects of other extant threats are being effectively countered by the management actions of State and Federal agencies, in conjunction with existing regulatory mechanisms. Nonetheless, hybridization with nonnative rainbow trout or their hybrid progeny and descendants, both of which have established self-sustaining populations in many areas in the range of WCT, remains the greatest threat to WCT. The available empirical evidence and speculations of many fishery scientists indicate that introgression of rainbow trout genes will continue to move upstream into many stream reaches presently inhabited by WCT, although there may be limits to that upstream spread set by environmental factors and the superior fitness of extant WCT populations in their native habitats. The eventual extent that such hybridization moves upstream may be stream-specific and impossible to predict. Nonetheless, the criteria that we provided for inclusion of individual fishes in the WCT subspecies, in response to the Court's order, allow for the limited presence in WCT of genetic material from other fish species, consistent with the intent and purpose of the Act.

The WCT subspecies is widely distributed and there are numerous, robust WCT populations and aggregates of populations throughout the subspecies' historic range. Moreover, numerous nonintrogressed WCT populations are distributed in secure habitats throughout the subspecies' historic range. In addition, despite the frequent occurrence of introgressive hybridization, we find that numerous WCT populations are nonintrogressed or nearly so, and thus retain substantial portions of their genetic ancestry. We consider slightly introgressed WCT populations, with low amounts of genetic introgression detectable only by molecular genetic methods, to be a potentially important and valued component of the overall WCT subspecies.

Finally, the numerous ongoing WCT conservation efforts clearly demonstrate the broad interest in protecting WCT held by State, Federal, local, and nongovernmental organizations and other entities. Nonetheless, those ongoing conservation efforts, while important, are not pivotal to our decision whether or not to list the WCT as either a threatened or an endangered species under the Act. That decision is based mainly on the present-day status of the WCT subspecies, and the occurrence of the numerous extant laws and regulations that work to prevent the adverse effects of land-management and other activities on WCT, particularly on those lands administered by Federal agencies.

On the basis of the best available scientific and commercial information, which has been broadly discussed in this notice and detailed in the documents contained in the Administrative Record for this decision, we conclude that the WCT is not likely to become either a threatened or an endangered species within the foreseeable future. Therefore, listing of the WCT as a threatened or an endangered species under the Act is not warranted at this time.

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The primary author of this document is Lynn R. Kaeding (*see* **ADDRESSES** section).

Authority

The authority for this action is the Endangered Species Act (16 U.S.C. 1531 *et seq.*).

Dated: August 1, 2003.

Steve Williams,

Director, Fish and Wildlife Service.

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