Appendix D. Fisheries Resources

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South Fork Clearwater River Subbasin Assessment and TMDLs

Fisheries Resources

October 2002

Fisheries Technical Advisory Group

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Fisheries Resources

Introduction

The Idaho Department of Environmental Quality, the Nez Perce Tribe, and the U.S. Environmental Protection Agency are collaborating in the development of a subbasin assessment (SBA) and Total Maximum Daily Load (TMDL) for the South Fork Clearwater River (SF CWR) Subbasin. In order to acquire the most up-to-date and professional information about the fisheries resources in the subbasin, a Fisheries Technical Advisory Group (Fish TAG) was assembled to provide input to the SBA and TMDL process. The following individuals made up the SF CWR Fish TAG:

Lillian Herger	U.S. Environmental Protection Agency	Seattle
Bob Ries/Gary Kedish	National Marine Fisheries Service	Moscow
Daniel Stewart	Idaho Department of Environmental Quality	Grangeville
Ann Storrar	Nez Perce Tribe	Lapwai
Heidi McRoberts	Nez Perce Tribe	Lapwai
Joe DuPont	Idaho Department of Lands	Coeur d'Alene
Jody Brostrom	Idaho Department of Fish and Game	Lewiston
Craig Johnson	U.S. Bureau of Land Management	Cottonwood
Scott Russell	U.S. Forest Service	Grangeville
Nick Gerhardt	U.S. Forest Service	Grangeville

Fish TAG meetings were held on March 1 and March 29, 2001, where general information about the fisheries resources in the subbasin was discussed. In addition, a report was prepared by Lillian Herger and Ann Storrar documenting the known information regarding aquatic species in the SF CWR Subbasin. That report forms the majority of this appendix.

A third meeting of the Fish TAG was held as a field trip through the SF CWR Subbasin on July 9, 2001, where factors impacting fishery resources were discussed.

On June 14, 2002, the Fish TAG met one final time to draw conclusions about the conditions of the salmonid populations and their aquatic habitat in the SF CWR Subbasin. At that meeting, Gary Kedish replaced Bob Ries from National Marine Fisheries Service. For that meeting, the Fish TAG members were provided with summaries of most of the data that had been collected for the SBA to that date. The conclusions from that final meeting have been inserted in this document as "Conclusions" sections for each of the salmonid species discussed, and as Table D-11 and Figures D-9 through D-21 at the end of this document.

Data and information regarding the aquatic species in the SF CWR Subbasin have been thoroughly reviewed and reported in the following documents. Much of the information in these reports is from Quigley and Arbelbide (1997).

- *Biological Assessment of South Fork Clearwater River* (chinook), (USFS 1995)
- *South Fork Clearwater River Subbasin Landscape Assessment* (USFS 1998)
- *South Fork Clearwater River Subbasin Bull Trout Problem Assessment* (DEQ 1998)

- *Biological Assessment of the South Fork Clearwater River Subbasin* (steelhead/bull trout) (USFS 1999)
- *Lower South Fork Clearwater River and Tributaries Biological Assessment* (BLM 1999)
- *Cottonwood Creek Total Maximum Daily Load* (DEQ, NPT, and USEPA 2000)
- *Clearwater River Subbasin Salmon and Steelhead Production Plan* (NPT and IDFG 1990)

Based on the information in these documents the following sections provide a brief overview description of most aquatic species within the SF CWR Subbasin, including their distribution, life history, status, and reasons for decline. Also, newly available data on species abundance in the watershed are presented. Communications with local biologists were used to generate life history phase timelines for each salmonid species (Attachment D-1). Although the presence and distribution of most fish species in the subbasin are commonly known, consistent long-term fisheries abundance data are not available.

Historic Influences on Fisheries Resources

Historically, land management in the subbasin has altered fish habitat. The most far-reaching activities have been in-channel placer mining and hydraulic mining on the hill slopes. These practices, which were common and widespread during the early 1900s, contributed to extreme alterations in channel morphology, particularly with respect to altered sediment loads. The signature of these practices is still evident today. Other land management practices that have influenced aquatic habitat quality include timber harvest, road system development, and agriculture. Direct human influence on habitat will be the main issue addressed in the TMDL, yet, in discussing salmonid status, it is important to recognize other human related practices that broadly influence the fish populations in the SF CWR Subbasin. These include construction/operation of dams and hatchery facilities, introduction of non-native species, and hatchery stocking.

Dams

Dams built in the early 1900s are believed to have had a major effect on anadromous species in the subbasin. On the main stem SF CWR, the earliest known dam was the Dewey Dam, built in about 1895 approximately 0.1 miles above the mouth of Mill Creek (Gerhardt 1999). It was approximately 6-8 feet high. There is no known documentation of fish passage conditions at this dam and it washed out after only a few years. The Harpster Dam, built on the SF CWR in 1911 (at river mile 22), completely excluded anadromous salmonids from the upper watershed until 1935, when a fish ladder was installed. The ladder was destroyed in 1949, once more eliminating anadromous fish passage until the dam was removed in 1963 (USFS 1995).

Dams were also located on the Clearwater River main stem. The Kooskia Flour Mill Dam, located on the Clearwater River about 1 mile above the mouth of the SF CWR, was built prior to 1910 and was in place until sometime in the 1930s (Gerhardt 1999). The dam is estimated to have been about 6 feet high. Although fish passage is not documented, it has been suggested that upstream migration of anadromous salmonids was probably not impaired

by this structure (Gerhardt 1999). A second dam was constructed on the main stem Clearwater River near Lewiston in 1927 and was removed in 1974. A fish ladder was installed on this dam in 1939, but the dam completely blocked adult chinook salmon passage (NPT and IDFG 1990).

Following dam construction, numbers of anadromous fish were typically drastically reduced. Hatchery stocking was used to supplement the fish stocks to help with their recovery following the removal of these dams. Naturally spawning stocks did eventually return to the system. The dams are believed to have contributed to a sharp decline of cutthroat and bull trout populations from the 1930s through the 1960s by eliminating their prey base and reducing connectivity of resident fish populations (USFS 1995).

Mitigation Efforts Using Hatcheries

To mitigate the effects of dam construction/operation on migration and the subsequent decline of anadromous fish stocks, hatchery produced fish were planted in the subbasin. Chinook brood stock come from the Rapid River Hatchery and the Dworshak National Fish Hatchery, and steelhead come from the Dworshak National Fish Hatchery (North Fork B-run stock). Parr and smolts are produced to mitigate fish harvest and to supplement natural production. While supplementation is a viable method to insure the continuance of a stock, hatchery production can cause problems that can further the decline of a stock in the long term. These problems include: 1) genetic introgression and associated loss of fitness and loss of local adaptations of the native stock, 2) reduced wild spawning escapement for collection of brood stock, 3) ecological interactions between hatchery and wild fish, and 4) transmission of disease. Since endemic chinook stocks were eliminated in the SF CWR Subbasin, genetic risk to the local stock was not considered an issue. Currently, stocking of chinook and steelhead occurs in areas with past out planting activity to minimize risk to locally adapted and naturally reproducing populations. Hatchery supplementation has definitely resulted in the alteration of the genetic character of steelhead.

Introduced Non-Native Species (Brook Trout)

Introduction of non-native eastern brook trout can present a significant negative influence on native trout species. In the SF CWR Subbasin, the primary species of concern for brook trout interaction are cutthroat and bull trout. Brook trout introduction often results in encroachment/competition with native westslope cutthroat trout that is detrimental to the native species. Introduced brook trout are a known risk to the persistence of cutthroat trout, particularly where populations are isolated (Griffith 1988, Behnke 1992). Brook trout can replace bull trout populations by hybridizing with bull trout, leading to a net reduction in bull trout numbers via reduced breeding success. Also, brook trout have demonstrated a competitive advantage over bull trout resulting in bull trout displacement. Brook trout have been recognized as a significant threat to the persistence of bull trout populations (Reiman and McIntyre 1993).

In the SF CWR Subbasin, brook trout were stocked in the American River, Red River, and Crooked River, and Meadow, Mill, Johns, Cottonwood, Cougar, Peasley, Rabbit, Silver,

Threemile, Sixmile, and Twentymile Creeks. Brook trout are present in the main stems of Crooked River, American River, and Newsome Creek, and in smaller tributaries to the Red, American, and Crooked Rivers. Brook trout are also strongly established in Silver Creek, both upstream and downstream of a natural barrier 0.25 miles above the mouth. Figure D-17 shows the current distribution of brook trout in the SF CWR Subbasin.

Other Trout Introductions

Yellowstone cutthroat trout have been stocked in some high lakes and tributaries in the subbasin in the past, and some loss of genetic integrity of native westslope cutthroat trout may have resulted. Since the late 1970s, only westslope cutthroat have been stocked in mountain lakes, and tributary stocking is no longer practiced. The extent of the loss of genetic integrity, if any, is unknown. Hatchery rainbow trout have also been planted in the subbasin and, likewise, the effects are unknown. Steelhead fry were planted in Silver Creek in 1996 and 1999 by U.S. Geological Service (Rubin 2001).

Salmon, Trout, and Char Species of the SF CWR

Salmon, trout, and char species that inhabit the main stem of the SF CWR are listed in Table D-1 and their known presence in selected tributary streams of the subbasin are listed in Table D-2. All are native to the subbasin except for brook trout.

Table D-1. Salmon, trout, and char species known to be present in the SF CWR main stem.

Common Name	Scientific Name
Bull trout	*Salvelinus confluentus*
Spring chinook salmon/Snake River fall chinook salmon	*Oncorhynchus tschawytscha*
Steelhead/rainbow/redband trout*	*Oncorhynchus mykiss*
Redband trout	*Oncorhynchus mykiss gibbsi*
Westslope cutthroat trout	*Oncorhynchus clarki lewisi*
Yellowstone cutthroat trout	*Oncorhynchus clarki bouveri*
Brook trout	*Salvelinus fontinalis*

* Redband trout or rainbow are the non-anadromous form of this species.

Table D-2. Salmon, trout, and char species known to be present in the SF CWR tributaries.

Subwatershed	Bull Trout	Spring Chinook Salmon*	Steelhead/ Rainbow/ Redband Trout	Westslope Cutthroat Trout	Snake River Fall Chinook Salmon**	Brook Trout
SF CWR main stem	X	X	X	X	X	X
Cottonwood Creek			X			
Threemile Creek		X	X			
Sally Ann Creek			X	X		
Butcher Creek		X	X			
Sears Creek			X			
Green Creek			X			
Lightening Creek						X
Mill Creek (off forest)		X	X	X		
Schwartz Creek			X			
Meadow Creek	--	X	X	X		X
Mill Creek	X	X	X	X		X
Johns Creek	X	X	X	X		
Cougar Creek	--	--	Lower	Lower		
Peasley Creek	--	--	--	--		
Silver Creek	Lower	--	Lower	--		X
Twenty Creek/ Wing Creek	Lower	--	--	X		
Tenmile Creek	X	X	X	X		X
Newsome Creek/ Leggett Creek	X	X	X	X		X
Crooked River	X	X	X	X		X
American River	X	X	X	X		X
Red River	X	X	X	X		X

* Spring Chinook salmon are considered a "stream" species type.

** Fall Chinook Salmon are considered "ocean type" and are found in a more restricted range tied principally to mainstem rivers and larger tributary systems.

Extirpated Species

Coho salmon historically used the Clearwater River basin for spawning and rearing. However, coho became extirpated from Idaho in the mid-1980s, with adult fish no longer returning to Idaho waters. Reports verify that historic runs of coho utilized the Clearwater

River and Lochsa River and there are anecdotal accounts of coho use of the SF CWR (Johnson 2001). In recent years the Nez Perce Tribe has been involved in supplementation releases of coho salmon. Returning adults were documented in the lower Clearwater River basin (Potlatch River and Lapwai Creek) in 1999 and 2000. Coho have not been observed or documented in the SF CWR Subbasin in recent times.

Non-Game Species Presence

The presence of many non-game fish species in the subbasin has been determined (Table D-3), but the distribution of these species has not been summarized or is not well known. Below are brief descriptions of each species that has been observed in the subbasin from Simpson and Wallace (1978). The remainder of this document will focus on the salmon, trout, and char species.

Table D-3. Non-game fish species known to occur in the SF CWR subbasin.

Common Name	Scientific Name	Origin
Pacific lamprey	*Lampetra tridentatus*	Native
Mountain whitefish	*Prosopium williamsoni*	Native
Northern pikeminnow	*Ptychocheilus oregonensis*	Native
Chiselmouth	*Acrocheilus alutaceus*	Native
Bridgelip sucker	*Catostomus columbianus*	Native
Sculpin	*Cottus sp.*	Native
Black bullhead	*Ictalurus melas*	Introduced
Redside shiner	*Richardsonius balteatus*	Native
Speckled dace	*Rhinichthys osculus*	Native
Longnose dace	*Rhinichthys cataractae*	Native
Smallmouth bass	*Micropterus dolomieui*	Introduced

The Pacific lamprey is an anadromous and parasitic lamprey widely distributed along the Pacific coast. It is found in all areas accessible to salmon and steelhead (Simpson and Wallace 1978). Waters used by Pacific lamprey in the SF CWR Subbasin include the main stem SF CWR, Red River, American River, Crooked River, Mill Creek, Meadow Creek, Johns Creek, and Tenmile Creek. The Pacific lamprey is listed as a state of Idaho endangered species and was traditionally an important ceremonial and subsistence species for native peoples. Pacific lamprey adults enter freshwater between July and September and migrate inland. They spawn in sandy gravel immediately upstream from riffles in the spring of the following year and die soon after. The juvenile lampreys (ammocoetes) remain in freshwater for up to the next six years in soft substrate as filter-feeders before emigrating to the ocean. The timing of life history stages of the Pacific lamprey in the SF CWR is outlined in Table D-4 (Brostrom 2001).

Table D-4. Pacific lamprey life history timing in the SF CWR subbasin.

Life History Stage	SF CWR Main Stem	Major Creeks and Rivers	Other Perennial Streams
Residence	All Year	All Year	All Year
Adult Migration	May 1-Sept 30	May 1-Sept 30	May 1-Sept 30
Spawning	Feb 1-May 31	Feb 1-May 31	Feb 1-May 31
Incubation and Emergence	Feb 1-June 30	Feb 1-June 30	Feb 1-June 30
Rearing	All Year	All Year	All Year

Mountain whitefish prefer cold mountain streams with deep pools. They are well distributed in most of the larger tributaries and in the main stem SF CWR. These fish mature in three years and spawn in the fall when temperatures approach 6 °C (October through November). Extensive downstream movement by pre- and post-spawning whitefish has been documented in the Clearwater River basin (Pettit and Wallace 1975, Rockhold and Berg 1995). Eggs are laid in riffles and hatch in March. The desired spawning substrate is gravel and small cobble with an adequate current to keep silt removed from the eggs. Mountain whitefish eat primarily aquatic and terrestrial insects. Waters inhabited by whitefish in the SF CWR Subbasin include Red River, American River, Crooked River, Mill Creek, Meadow Creek, Johns Creek, and Tenmile Creek. The timing of life history stages for mountain whitefish in the SF CWR is outlined in Table D- 5 (Brostrom 2001).

Table D-5. Mountain whitefish life history timing in the SF CWR subbasin.

Life History Stage	SF CWR Main Stem	Major Creeks and Rivers	Other Perennial Streams
Residence	All Year	All Year	All Year
Adult Migration	May 1-Nov 30	May 1-Nov 30	May 1-Nov 30
Spawning	Oct 1-Dec 15	Oct 1-Dec 15	Oct 1-Dec 15
Incubation and Emergence	Oct 1-Feb 28	Oct 1-Feb 28	Oct 1-Feb 28
Rearing	All Year	All Year	All Year

Northern pikeminnows spawn in shallow water on gravel substrate in late May to early June. They feed on aquatic invertebrates and fish.

Chiselmouths spawn in spring and early summer when water temperatures reach 60 °F. Spawning occurs in streams over gravel or small rubble. Adults feed exclusively on algae although the young will feed on the surface and consume insects.

Bridgelip suckers prefer the colder water of small, fast flowing rivers with gravel to rocky substrates. Spawning occurs in late May to Jane.

Sculpin species are thought to be indicators of high water quality (high dissolved oxygen, cold temperatures, and low pollution levels). Generally sculpin spawn in May and early June

with adhesive eggs deposited in rock crevices and under rocks. A single male usually protects the nest until the eggs hatch after 30 days at 50 °F. Sculpin eat insects and small fish and are an important food source for trout.

Speckled dace live in a variety of habitats, but normally prefer shallow, cool, and quiet waters. They spawn in spring and are omnivorous feeders.

Longnose dace primarily live in stream riffle areas and spawn over gravel in the spring when water temperatures reach 53 °F. Their diet consists of immature aquatic insects. They are an important forage fish for trout.

Redside shiners prefer lakes, ponds, or rivers with slow-moving currents. Spawning occurs in June or July with adults moving into spawning areas when the water temperature reaches at least 50 °F. The eggs are adhesive and attach to the substrate or submerged vegetation. The fry feed on small planktonic organisms, but by the second year of life the young fish switch to a diet of insects (mostly terrestrial).

Black bullheads (found in upper Cottonwood Creek) have a high tolerance for turbid water with low oxygen and warm temperatures as high as 85 °F. Spring spawning occurs when water temperatures reach 65 °F. They eat primarily snails, aquatic insects, crustaceans, and plant material.

Other Aquatic Species of Concern

Amphibians, crayfish, and bivalves are additional aquatic species found in the SF CWR.

Amphibians

The following amphibians have been observed during surveys of tributaries throughout the SF CWR Subbasin: spotted frogs (*Rana pretiosa)*, tailed frogs (*Ascaphus truei*), Pacific giant salamanders *(Dicamptodon tenabrosus),* long-toed salamanders (*Ambystoma macrodactylum)*, and western toads (*Bufo boreas*). Spotted frogs are fairly common throughout the subbasin, but evidence of other frog species is limited. The current amphibian distribution has probably been altered from the historical distribution due to land management effects on aquatic habitat in the (Blair 2001). Long-toed salamanders are relatively common in many areas including timber harvest sites, but trend information is not available.

Spotted frogs are found in mountainous areas near cold streams and lakes. They breed from March to June and release free egg clusters. Tailed frogs breed from May to September with eggs attached to the downstream side of rocks in cold, swift-flowing mountain streams. Tailed frog tadpoles have sucking mouth parts used to cling to rocks. They feed on algae and invertebrates and transform in 1-3 years. Pacific giant salamanders breed in the spring in river headwaters and lay eggs on submerged timber. Larvae transform during their second or third year.

Crayfish

Freshwater crayfish are present in the SF CWR watershed and have been documented by surveys in the American River (IDFG 2000) and Butcher Creek (DEQ 1995).

Bivalves

Freshwater mussels are have been found in the main stem SF CWR as well as the American River, Crooked River, and Red River by IDFG (IDFG 2000).

Salmonid Resources

Salmonid distribution, life history, stock description, population status, and factors influencing current status are discussed below.

Spring Chinook Salmon

Spring chinook salmon distribution, life history, stock description, population status, and factors influencing current status are discussed below.

Distribution

The current distribution of spring chinook salmon is probably similar to the historic distribution in the subbasin. Areas with very high habitat potential are Red River, Crooked River, American River, and the lower reaches of Newsome Creek. Areas with high habitat potential are lower Johns Creek and Tenmile Creek. Spring chinook have been documented in all of these drainages as well as Meadow Creek, Mill Creek, and Johns Creek (USFS 1998). Spring chinook use the main stem SF CWR for juvenile and adult migration and, to a limited extent, for spawning and juvenile rearing (Figure D-1). The larger tributaries are used for spawning and juvenile rearing.

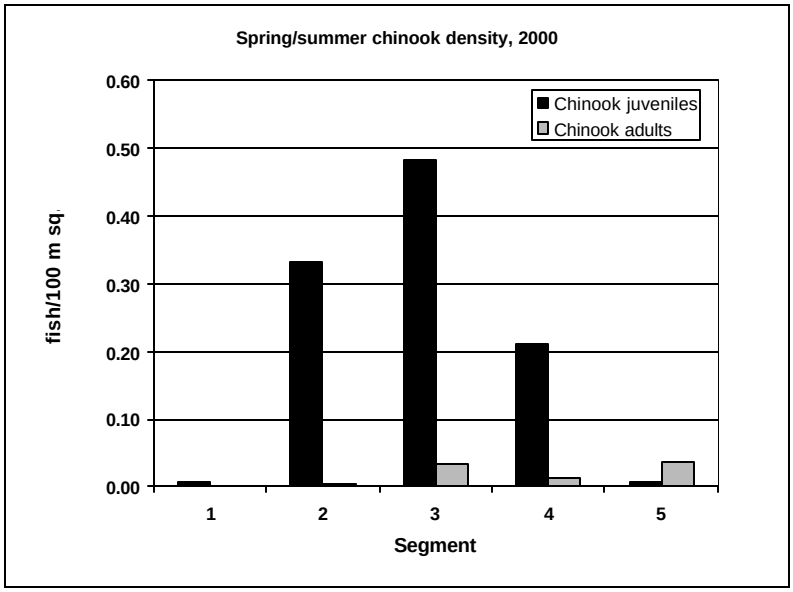

Figure D-1. Spring Chinook Salmon Density in the Main Stem SF CWR Based on 2000 Snorkel Surveys

Life History

The timing of life history stages of spring chinook within the SF CWR Subbasin are shown in Table D-6 (Brostrom 2001).

Table D-6. Spring chinook salmon life history timing in the SF CWR subbasin.

Life History Stage	SF CWR Main Stem	Major Creeks and Rivers	Other Perennial Streams
Adult Migration	April 15-Sept 15	April 15-Sept 15	
Spawning	Aug 15-Sept 30	Aug 15-Sept 30	Aug 15-Sept 30
Incubation and Emergence	Aug 15-April 30	Aug 15-April 30	Aug 15-April 30
Rearing	All Year	All Year	All Year
Juvenile Out Migration	Sept 1-June 30	Sept 1-June 30	Sept 1-June 30

Stock Description

--Stock origin and hatchery supplementation

Historically, it is likely that spring chinook of the SF CWR were a separate stock from others occurring in the Clearwater Subbasin. Currently, spring chinook have mixed hatchery and natural origin. Hatchery plants (mostly Rapid River hatchery stock) were used to mitigate the loss of spring chinook caused by dam construction/operation. Stocking for harvest mitigation and supplementation for natural production is ongoing, with satellite hatcheries with weirs and acclimation ponds at Red River and Crooked River (operated by the Idaho

Department of Fish and Game), and direct releases into Newsome Creek, Mill Creek and Meadow Creek. In most years hundreds of thousands of sub-yearlings are released in the subbasin (Stream Net 2000). Another satellite facility is being built on Newsome Creek as part of the Nez Perce Tribal Hatchery. This facility will be online in 2002. All facilities have monitoring and evaluation programs in place. Naturally produced chinook salmon return to spawn, and it is likely they have developed local adaptations.

--Population status

The spring chinook population is maintained tenuously through the use of hatchery supplementation. Although Snake River chinook salmon have been listed under the Endangered Species Act, spring chinook of the Clearwater Basin are not included in the listing. This portion of the population is exempt because the Lewiston Dam blocked all indigenous chinook from the Clearwater Basin, and mixed broodstock were used for reintroduction, thus, the genetic origin of the Clearwater stocks is questionable (see above) and probably exclusively of hatchery origin. Nevertheless, SF CWR spring chinook are considered an important meta-population within the Clearwater basin, and are listed as a species of special concern by the state of Idaho and a sensitive species by the U.S. Forest Service and Bureau of Land Management.

--Current abundance

Spring chinook numbers are severely reduced from their historic pre-dam abundance. There is a decreasing trend in the abundance of SF CWR spring chinook and the population has a high risk of extirpation. Data from trend redd surveys in Red River, American River, Crooked River, and Newsome Creek indicate low spawning activity in the SF CWR with fewer than 150 total redds in most years (Figure D-2, Attachment D-2). Hatchery return counts are also low, with less than 400 adults in most years (Figure D-3, Attachment D-3). Despite large numbers in 1997, the overall trend has declined (Stream Net 2000, Elms-Cockrum In Press).

Factors Influencing Current Status

The following factors have been identified as effecting current status of spring chinook salmon.

--Subbasin factors

- Fine sediment and channel alteration from in-channel placer mining in the areas of high habitat potential including Crooked River, American River, and Newsome Creek, and to a lesser degree Red River and the main stem SF CWR.
- High water temperatures.
- Lack of instream cover.
- Issues associated with hatchery supplementation.

--Downstream factors

- Construction and operation of the main stem dams on the Columbia and Snake River system which result in: 1) delays in both upstream and downstream migration; 2) death, injury, or disorientation of smolts passing through turbines; and 3) large-scale

riverine habitat alteration (conversion of flowing system to series of lacustrine habitats).

- Harvest of adults in Columbia River system and the ocean (coded wire tag data show less than 1% of Idaho chinook are harvested in the ocean) (IDFG 2001).
- Predation by introduced species.
- Downstream habitat degradation.

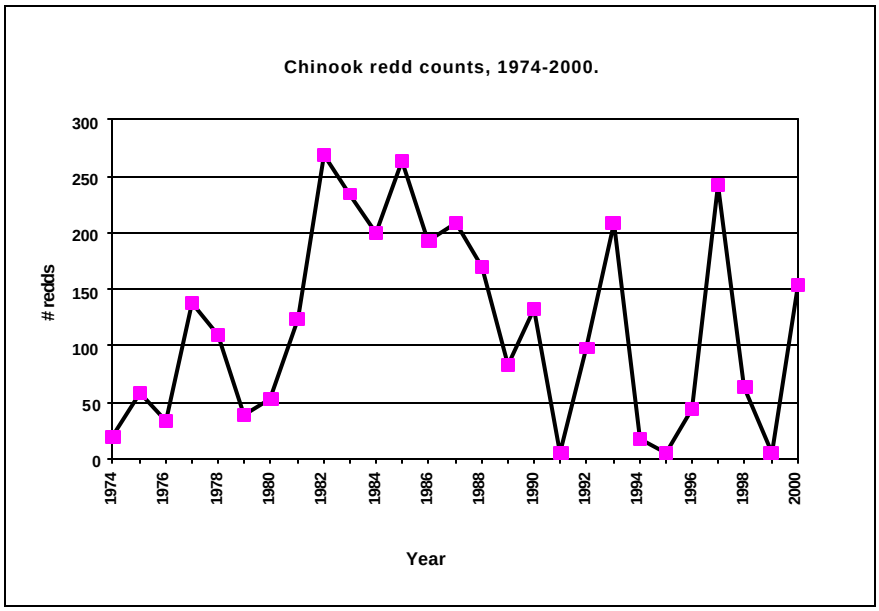

Figure D-2. Spring Chinook Redd Counts from the SF CWR Subbasin Based on Observations at Several Locations, 1974-2000

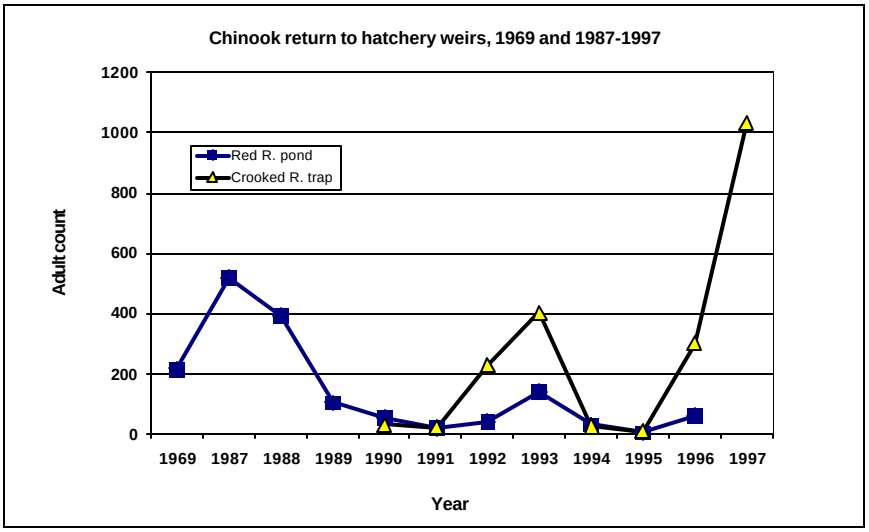

Figure D-3. Spring Chinook Adult Returns to Red River Pond and Crooked River Hatcheries of the SF CWR, 1969 and 1987-1997

Conclusions

Conclusions of the Fish TAG with respect to spring chinook salmon current distribution and potential distribution in the SF CWR Subbasin are shown in Figures D-9 and D-10, respectively. Table D-11 summarizes the conclusions for all salmonids of concern. Figure D-18 shows the general conclusions about current fish habitat conditions throughout the subbasin, while Figures D-19 and D-20 identify watersheds exhibiting sediment and temperature problems, respectively. Figure D-21 identifies areas recommended for conservation and others prioritized for restoration of salmonid habitat in the SF CWR Subbasin.

Fall Chinook Salmon

Snake River fall chinook salmon are listed as ”threatened” under the Endangered Species Act. The listed population includes all natural populations of fall-run chinook salmon in the main stem Snake River and several tributaries, including the Clearwater basin. Critical habitat for the listed environmentally significant unit (ESU) is designated to include river reaches presently or historically accessible to Snake River fall chinook. In the Clearwater system, this encompasses the main stem Clearwater River from its confluence with the Snake River upstream to its confluence with Lolo Creek and the North Fork Clearwater River from its confluence with the Clearwater River upstream to Dworshak Dam.

Anecdotal evidence suggests that fall chinook salmon were historically present in the lower portion of the SF CWR (up to Harpster). Nez Perce tribal elders reported seeing adult fall chinook in the lower section of the SF CWR. These observations suggest that many fish were seen prior to the Lewiston Dam construction and few fish were seen in the years immediately following. Currently, observations of fall chinook in the SF CWR have been very rare.

Distribution

The majority of fall chinook redds have been down river from the North Fork Clearwater River. Limited spawning occurs in the North Fork Clearwater River and SF CWR. Aerial surveys have not found any redds in the Middle Fork Clearwater River; however, historical reports have documented the occurrences of fall chinook salmon in the Middle Fork Clearwater River and Selway River. During 1999 and 2000, fall chinook salmon were documented in the Potlatch River, a tributary to Clearwater River tributary at river mile 15.1. Nez Perce tribal elders reported seeing adult fall chinook in the lower section of the SF CWR in the past.

Life History

The timing of life history stages of fall chinook within the SF CWR Subbasin are outlined in Table D-7 (Brostrom 2001).

Table D-7. Fall chinook life history timing in the SF CWR subbasin.

Life History Stage	SF CWR Main Stem
Adult Migration	Sept 15-Nov 30
Spawning	Oct 1-Dec 15
Incubation and Emergence	Oct 1-May 15
Juvenile Out Migration	May 1-Aug 31

Fall chinook salmon begin entering the Columbia River in August and continue through October, with the peak occurring in early September. Returning adults generally have spent three to four years in the ocean. Adults generally arrive in the Lower Clearwater River in October and are present through mid-December; peak spawning activity occurs during November. Spawning fall chinook salmon use shallow (e.g., 0.2 meter) to deep (e.g., 6.5 meters) waters with velocities ranging from 0.4 to 2.1 meters per second and relatively homogenous substrate, ranging in size from 2.5 to 15.0 cm (Groves and Chandler 1999). Fry emerge in April and May. After emergence, fry concentrate in shallow, slow water near the riverbanks, which provide cover. These areas are often associated with narrow bands of riparian vegetation along the margins of the rivers during high flow periods. The salmon rear in the main stem rivers before emigrating to the ocean from June through August the following year as sub-yearlings.

Abundance

Current fall chinook use of the SF CWR is very low. A total of nine redds have been observed during annual aerial surveys of the lower SF CW, which began in 1992 (mouth to Harpster). One carcass has also been found. Survey data for various portions of the Clearwater basin are in Attachment D-4.

Hatchery Supplementation

In 1997, the Nez Perce Tribe started the operation of a fall chinook satellite facility along the Clearwater River immediately down river from the mouth of Big Canyon Creek. The facility operation includes the acclimation and release of yearling smolts (from Lyons Ferry Hatchery, Washington). During 1997 and 1998, approximately 150,000 smolts were released each year, and during 1999 approximately 300,000 smolts were released. Aerial surveys conducted during 1999 and 2000 have documented high redd counts in the lower Clearwater River, which can partially be attributed to operation of this satellite facility.

Factors Influencing Current Status in the Clearwater Basin

Fine sediment deposition in the substrate will adversely impact spawning and rearing habitats, while land uses that encroach on floodplains, riparian areas, and channels will impact rearing and spawning habitats. River-based recreation (e.g., power and float boating and steelhead fishing) is a major activity occurring in the Clearwater River during the fall chinook spawning period (down river from the North Fork Clearwater River) that can disturb

spawning fish and redds. The lower Clearwater River has altered flow regimes as a result of the operation of Dworshak Dam. These altered flow regimes can result in elevated water temperatures in the main stem rivers, particularly the SF CWR during the summer, which adversely impacts sub-yearling rearing habitat.

Steelhead Trout

Distribution

Steelhead use the lower main stem and its tributaries as spawning, early rearing, and overwintering habitat. The canyon reaches of tributaries such as Johns Creek, Newsome Creek, Tenmile Creek, and Crooked River are considered the best spawning and rearing habitat. Habitat quality varies in American River, Red River, Newsome Creek, Mill Creek, and Meadow Creek due to human activities that have degraded sections of each stream. Currently, Johns Creek and Tenmile Creeks are considered areas with strong steelhead populations.

Life History

There are two runs (A-run and B-run) of steelhead that occur in the SF CWR Subbasin. The following description of these runs is from the *Clearwater Subbasin Summary* (NW Power Planning Council 2001). A-run steelhead occupy the lower Clearwater River, including the Middle Fork Clearwater River, Lower SF CWR, and tributaries (Kiefer et al. 1992). B-run steelhead occupy the Lochsa, Selway, upper SF CWRs, and were extirpated by Dworshak Dam on the North Fork Clearwater (Kiefer et al. 1992). B-run steelhead have been documented in only two subbasins in the Columbia River system, the Clearwater and Salmon (NPT and IDFG 1990). A-run steelhead trout from the Clearwater basin have typically spent one year in saltwater environments; B-run steelhead trout will have spent 1-3 years in saltwater environments before returning to spawn, with over 90% having spent two years there (Miller 2001). Due to differing lengths of ocean residence, differentiation of the two forms of Clearwater steelhead trout can be based on size; B-run fish average 75-100 mm larger than A-run fish (Columbia Basin Fish and Wildlife Authority 1991). B-run steelhead enter the Columbia River later in the year than A-run and benefit from the extra ocean time to rear, resulting in a two ocean (two years in the ocean prior to returning to spawn) A-run fish being smaller than a two ocean B-run fish (Miller 2001). The timing of life history stages of steelhead runs within the SF CWR are outlined in Table D-8 (Brostrom 2001).

Table D-8. Steelhead life history timing in the SF CWR subbasin.

Life History Stage	SF CWR Main Stem	Major Creeks and Rivers	Other Perennial Streams
A-Run (Lower SF Main Stem and its Tributaries)			
Residence	Sept 1-Feb 1		
Migration to Tributaries	Feb 1-May 15	Feb 1-May 15	
Spawning		Feb 1-May 15	Feb 1-May 15
Incubation and Emergence		Feb 1-June 1	Feb 1-June 1
Rearing	All Year	All Year	All Year
Juvenile Out Migration	Feb 1-June 1	Feb 1-June 1	Feb 1-June 1
B-Run (Middle and Upper SF Main Stem and its Tributaries)			
Residence	Dec 1-July 15		
Migration to Tributaries	Feb 1-May 15	Jan 1-May 31	
Spawning	Feb 1-May 31	Feb 1-May 31	Feb 1-May 31
Incubation and Emergence	Feb 1-July 15	Feb 1-July 15	Feb 1-July 15
Rearing	All Year	All Year	All Year
Juvenile Out Migration	Feb 1-June 30	Feb 1-June 30	Feb 1-June 30

Stock Description

--Stock origin and hatchery supplementation

Historically, it is likely that the SF CWR steelhead were a separate stock (adapted to local conditions) from others in the Clearwater system. The present population is of mixed hatchery, natural, and wild origin.

As with chinook salmon, hatchery supplementation has been used in the subbasin to mitigate the decline of steelhead populations caused by dam construction and operation. Following the removal of the Harpster dam, steelhead broodstock from the Lewiston dam and the North Fork Clearwater River were planted in the upper main stem SF CWR and tributaries of Red River, American River, Crooked River, and Newsome Creek. Smolt stocking was discontinued in the late 1980s in the upper river and tributaries with the exception of research releases. Beginning again in 2000, unmarked smolts of Dworshak (North Fork) B-run steelhead have been released in Red River, Crooked River, American River, Newsome Creek, Meadow Creek, and Mill Creek. Returning hatchery origin adults in excess of hatchery needs have also been planted in Newsome Creek, Mill Creek, Meadow Creek and American River. Genetic sampling of steelhead from Johns Creek and Tenmile Creek indicate that a portion of what might have been the endemic population remains; those creeks will be managed without hatchery supplementation (J. Brostrom 2001).

--Population status

Both A-run and B-run steelhead of the Clearwater Basin are included in the Snake River ESU of west coast steelhead (Busby et al. 1996). Declines of wild/natural adult steelhead in the ESU (including the SF CWR) are well documented and have resulted in their listing as "threatened" under the Endangered Species Act. They are considered a species of special concern by the state of Idaho and considered a sensitive species by the U.S. Forest Service. The SF CWR steelhead are an important metapopulation of the Clearwater basin.

--Current abundance

Steelhead populations in the SF CWR are considered depressed (Quigley and Arbelbide 1997). Their abundance has declined over the past seven decades through a combination of downstream and local activities. Generally, abundance of steelhead correlates with numbers of returning adults and numbers of hatchery steelhead planted in the SF CWR. Wild steelhead populations have declined in the subbasin even though hatchery supplementation has increased. Redd counts conducted in Crooked River and Red River have been relatively stable, yet low (Figure D-4, Attachment D-5) (Stream Net 2000). Data from recent years indicate a decline in returns to the Crooked River fish trap (Figure D-5, Attachment D-6) (Stream Net 2000, IDFG 2001). Steelhead were relatively numerous in the SF CWR main stem compared to other species observed during 2000 snorkel surveys (Attachment D-7), but most of the steelhead observed were likely residual unmarked hatchery steelhead (Figure D-6, Attachment D-7) (IDGF 2001).

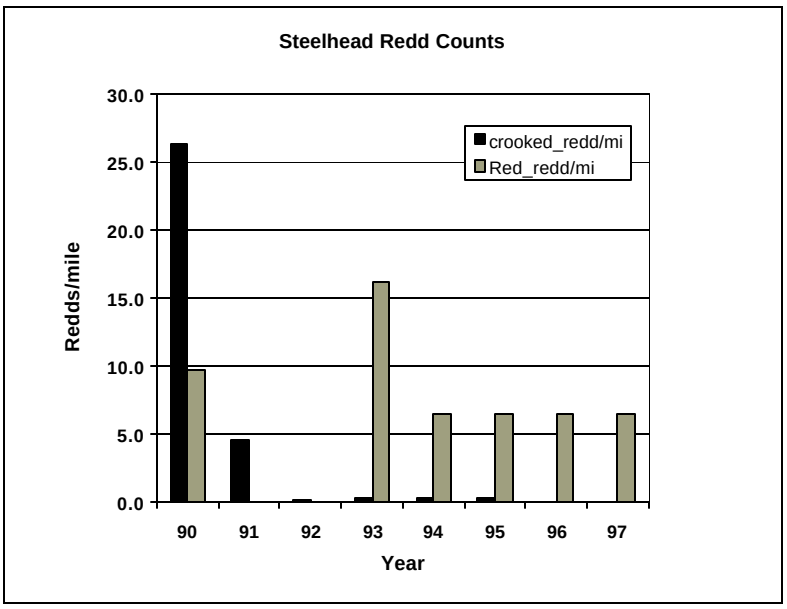

Figure D-4. Steelhead Redds per Mile from Surveys in the Crooked (1990-1997) and Red Rivers (1990, 1993-1997)

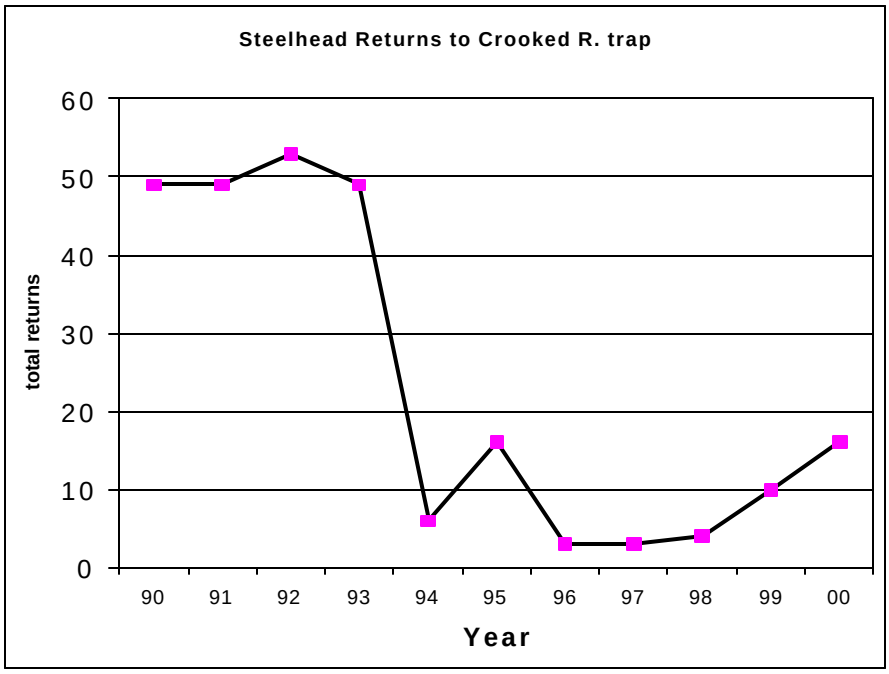

Figure D-5. Total Number of Steelhead Adults Returning to the Crooked River Fish Trap, 1990-2000

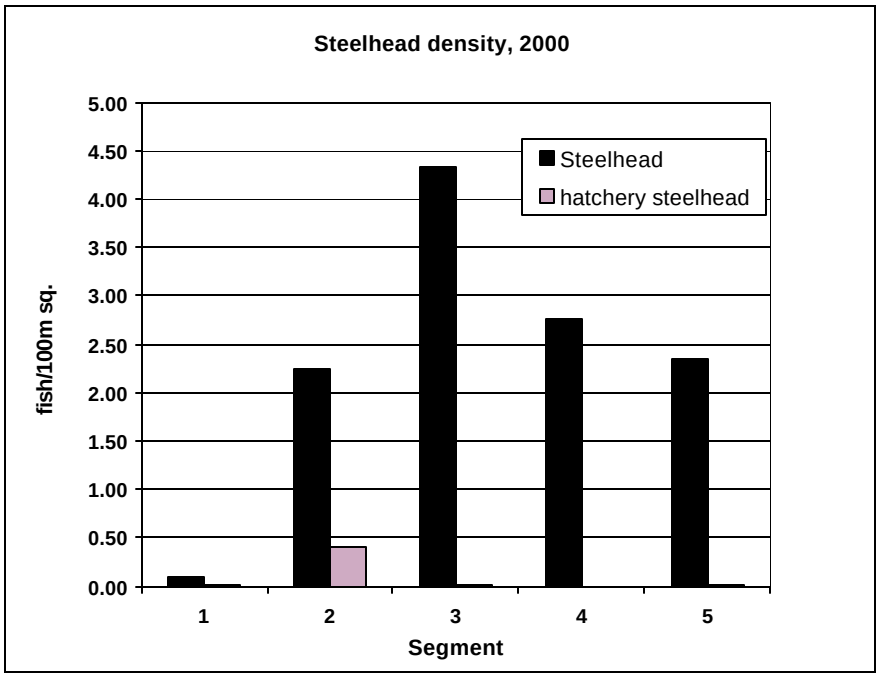

Figure D-6. Steelhead Density in the Main Stem SF CWR Based on 2000 Snorkel Surveys

Factors Influencing Current Status

--Subbasin factors

- Fine sediment and channel alteration in the main stem SF CWR, Crooked River, American River, Red River, and Newsome Creek. Exceptions are Johns Creek and Tenmile Creek, which have not had significant mining. The extensive road network also contributes to the increased sediment yield. An altered sediment regime has been noted in American River, Miller Creek, Newsome Creek, and Meadow Creek.
- High water temperature.

--Downstream factors

- Construction and operation of the main stem dams on the Columbia and Snake River system which result in: 1) delays in both upstream and downstream migration; 2) death, injury, or disorientation of smolts passing through turbines; and 3) large-scale riverine habitat alteration (conversion of flowing system to series of lacustrine habitats).
- Barriers to migration.
- Predation.
- Hatchery supplementation issues.
- Commercial fishing in the Columbia River, along the coast, and in the ocean.

Conclusions

Conclusions of the Fish TAG with respect to the current distribution and potential distribution of steelhead/rainbow trout in the SF CWR Subbasin are shown in Figures D-15 and D-16, respectively. Table D-11 summarizes the conclusions for all salmonids of concern. Figure D-18 shows the general conclusions about the current fish habitat condition throughout the subbasin, while Figures D-19 and D-20 identify watersheds exhibiting sediment and temperature problems, respectively. Figure D-21 identifies areas recommended for conservation and others prioritized for restoration of salmonid habitat in the SF CWR Subbasin.

Rainbow/Redband Trout

Rainbow or redband trout are the non-anadromous form of steelhead. Non-anadromous rainbow trout in the Upper Columbia River basin have been further divided into two groups. One group evolved in sympatry with steelhead and the other group is allopatric with steelhead, or evolved outside the historical range of steelhead. Sympatric rainbow/redband trout (termed “residuals”) are considered the non-anadromous form that is historically derived or associated with steelhead. Both anadromous and non-anadromous forms exist in sympatry in most populations. Morphologically, juveniles of both forms are indistinguishable and cannot be differentiated, especially while snorkeling. Rainbow/redband trout use the main stem SF CWR for migration and rearing (both juveniles and adults). Spawning and rearing generally occur in the tributary streams. In the main stem, rainbow/redband density ranged from 0 to 0.03 fish per 100m^2 based on snorkel studies conducted in summer 2000 (Attachment D-7). Rainbow/edband and steelhead juveniles

cannot be differentiated while snorkeling. The distribution and status of rainbow/redband populations in the SF CWR drainage is not known.

Bull Trout

Distribution

Historically, migratory bull trout are believed to have been distributed throughout the subbasin, particularly in tributary main stems. Currently, bull trout are still broadly distributed in the SF CWR. Most of the migratory fish are found in the lower portion of the subbasin, and resident fish are mostly at higher elevations. Although the residents are broadly distributed, their numbers are low.

Current important bull trout areas include Tenmile Creek and upper Johns Creek, which hold the highest populations and are considered population strongholds. Crooked River also has high habitat condition. Newsome Creek and Red River were historic strongholds that currently have good bull trout density in a few of their tributaries. The American River was also a historic stronghold but current bull trout density is low. There is abundant good habitat available at high elevations, but habitat quality is greatly reduced in the middle and low elevation areas, particularly due to increased water temperature. These are the areas that are most important to the larger migratory portion of the population.

Life History

The SF CWR Subbasin has historically supported two types of bull trout life history strategies. The large migratory component of the population uses the main stem and the larger tributaries for subadult/adult rearing. These fish migrate to smaller tributaries to spawn. Bull trout with a resident life history strategy are found in the upper reaches of the subbasin. The timing of the life history stages of bull trout within the SF CWR Subbasin are outlined in Table D-9 (Brostrom 2001).

Table D-9. Bull trout life history timing in the SF CWR subbasin.

Life History Stage	SF CWR Main Stem	Major Creeks and Rivers	Other Perennial Streams
Residence	All Year	All Year	All Year
Adult Migration (pre spawn)	April 1-July 15	April 1-July 15	April 1-July 15
Adult Migration (post spawn)	Sept 1-Oct 31	Sept 1-Oct 31	Sept 1-Oct 31
Spawning		Aug 15-Nov 30	Aug 15-Nov 30
Incubation and Emergence		Aug 15-Mar 31	Aug 15-Mar 31
Rearing	All Year	All Year	All Year

Stock Description

--Stock origin

The bull trout population is native and wild. There is no hatchery supplementation that would affect the bull trout stock. The extent of hybridization with introduced brook trout has not been documented (see below).

--Population status

Bull trout in the SF CWR Subbasin are listed as "threatened" under the Endangered Species Act and the SF CWR is identified as a key watershed for the *Idaho Bull Trout Conservation Plan* (Batt 1996). Overall, the bull trout population in the SF CWR is considered weak and depressed.

--Historic/current abundance

There is no historic data on bull trout densities, but anecdotal accounts support that large numbers of migratory bull trout used the upper subbasin. Compared to these historic accounts the current abundance is dramatically reduced and very low. While bull trout abundance in the main stem SF CWR is generally low, there is greater abundance in the upper reaches (Figure D-7, Attachment D-7) (IDGF 2001).

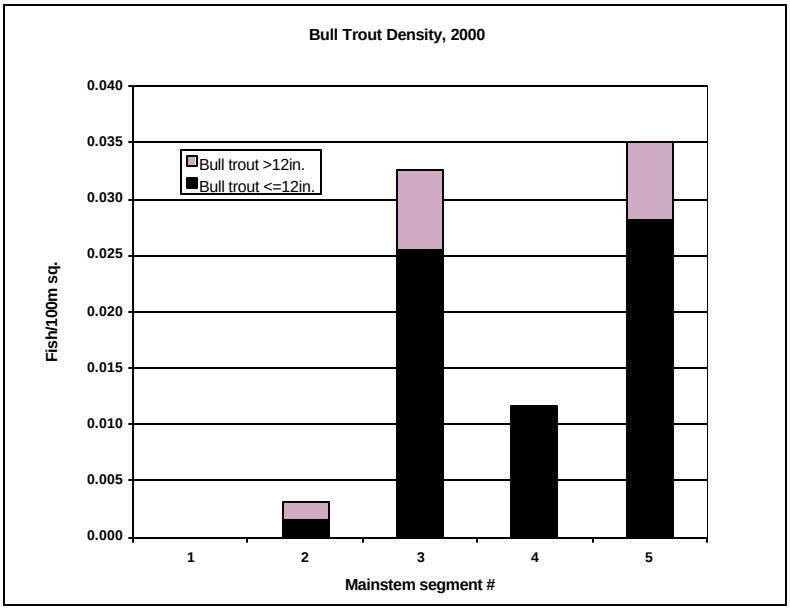

Figure D-7. Bull Trout Density in the Main Stem SF CWR Based on 2000 Snorkel Surveys

Factors Influencing Current Status

Effects to the bull trout population of the watershed from downstream activities are minor compared to effects from activities within the subbasin because bull trout do not range far

downstream from the SF CWR. Subbasin factors that have contributed to the decline of bull trout in the SF CWR Subbasin include the following:

- Habitat degradation. Although the subbasin has an inherently high capacity to support migratory bull trout, human uses (mining, roads, grazing, and timber harvest) have reduced habitat quality in the lower and middle reaches, which are most important to the migratory portion of the population. Major habitat concerns are high summer water temperatures and fine sediment intrusion that result in loss of rearing space and loss of pool habitat. Channel simplification results in low habitat complexity and reduced woody debris retention. Currently, Johns Creek and Tenmile Creek are exceptions within the watershed and have relatively high habitat quality.

- Angling. Roads adjacent to the river make the main stem accessible to anglers and poachers. Bull trout have been closed to sport harvest since 1994, but are still caught incidentally during seasons open for other species. Also, tribal harvest does occur but the extent is not known.

- Interactions with introduced brook trout. Brook trout have been recognized as a significant threat to the persistence of bull trout populations (Reiman and McIntyre 1993). In the SF CWR Subbasin, brook trout are present in almost every subwatershed except Johns Creek and Twentymile Creek. Brook trout have the ability to hybridize with bull trout, and hybridization leads to net reductions in bull trout numbers via reduced breeding success. In addition, brook trout have a competitive advantage over bull trout, which results in bull trout displacement.

- Population isolation. The loss of the migratory component of the population due to harvest (angling/poaching) and habitat degradation in the middle and low elevation reaches of the river results in long distances between resident population strongholds. This loss of connection by the migratory component results in isolation of resident populations, which increases the extinction risk to the overall population.

Conclusions

Conclusions of the Fish TAG with respect to bull trout current distribution and potential distribution in the SF CWR Subbasin are shown in Figures D-13 and D-14, respectively. Table D-11 summarizes the conclusions for all salmonids of concern. Figure D-18 shows the general conclusions about current fish habitat conditions throughout the subbasin, while Figures D-19 and D-20 identify watersheds exhibiting sediment and temperature problems, respectively. Figure D-21 identifies areas recommended for conservation and others prioritized for restoration of salmonid habitat in the SF CWR Subbasin.

Westslope Cutthroat Trout

Distribution

Westslope cutthroat trout historically ranged throughout western Montana, central and northern Idaho, the southern Canadian provinces, and a small portion of Wyoming. They were also found in isolated populations in Washington (Lake Chelan) and Oregon (John Day basin) (Behnke 1992). The current range and abundance of this interior cutthroat stock have been drastically reduced over the past 100 years, and it is estimated that only 2.5% of the historic range is still occupied by genetically pure westslope cutthroat trout (Liknes and Graham 1988).

Historically, westslope cutthroat were the dominant salmonid in streams of central Idaho (Likens and Graham 1988). In the SF CWR they are the most widely distributed salmonid species, using a range of habitats including both main stem and smaller high gradient reaches. The current distribution in the subbasin is thought to be similar to the historic distribution, but current abundance is reduced from historic levels. Although there are numerous sub-populations, the migratory portion of the population that used to inhabit the main stem and larger tributaries (Newsome Creek and Crooked River) has probably been extirpated. Resident populations in many of the upper reaches persist with varying population strengths. Currently, the upper portions of Johns Creek, Tenmile Creek, Crooked River, Meadow Creek and Mill Creek are considered population strongholds.

Life History

The westslope cutthroat trout in the SF CWR Subbasin exhibit two general life history patterns. The migratory component of the population uses the main stem as adults year-round, and only moves to smaller tributaries for spawning (Behnke 1992). Conversely, the resident component spends its entire life in tributaries. Use of different areas of the watershed by life history phase is not distinct for westslope cutthroat trout as the majority of these fish are residents and use the drainages where they occur for all life history phases. In contrast, the migratory component of the population use the main stem of the SF CWR and larger tributaries to rear and grow, and then migrates to smaller tributaries for spawning. The timing of the life history stages of westslope cutthroat trout within the SF CWR Subbasin are outlined in Table D-10 (Brostrom 2001).

Stock Description

--Stock origin

Westslope cutthroat trout of the SF CWR are considered to be mostly a native (nonintroduced) and wild population. Some hybridization has occurred due to the planting of hatchery Yellowstone cutthroat trout in Johns Creek, Tenmile Creek, Mill Creek, Meadow Creek, and Crooked River. This hatchery stocking may have resulted in some genetic introgression (repeated back-crossing of hybrid descendants with a parental species), which can lead to decreased population of native cutthroat trout populations in these drainages.

Table D-10. Westslope cutthroat trout life history timing in the SF CWR subbasin.

Life History Stage	SF CWR Main Stem	Major Creeks and Rivers	Other Perennial Streams
Residence	All Year	All Year	All Year
Adult Migration	March 1-June 30	Mar 1-July 15	Mar 1-July 15
Spawning		Mar 15-June 30	Mar 15-June 30
Incubation and Emergence		Mar 15-Aug 15	Mar 15-Aug 15
Rearing	All Year	All Year	All Year

--Population status

Currently, westslope cutthroat trout are not listed under the federal Endangered Species Act. This species is considered a sensitive species by the U.S. Forest Service (Region 1) and is a species of special concern in the state of Idaho.

--Current abundance

Year 2000 sampling verified that westslope cutthroat trout are distributed throughout the main stem CWR. Larger, migratory fish appear to be rare based on these data (Figure D-8, Attachment D-7) (IDGF 2000).

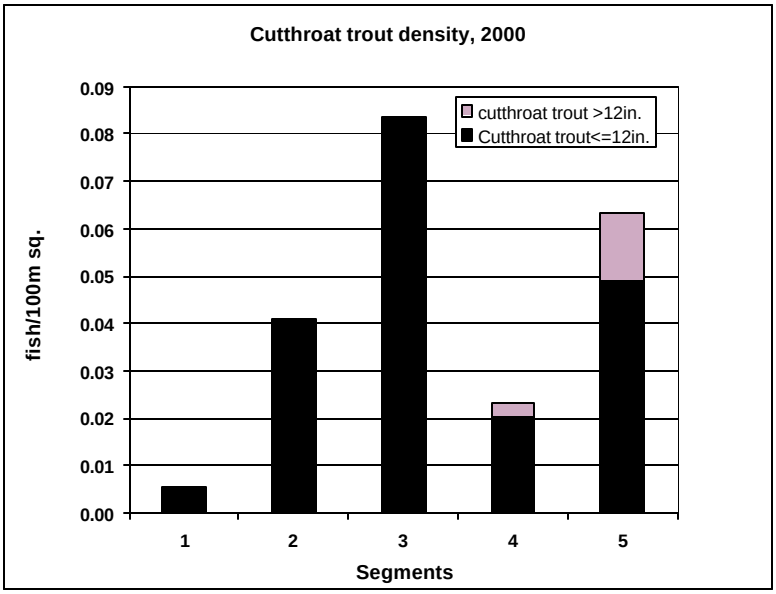

Figure D-8. Cutthroat Trout Density in the Main Stem SF CWR Based on 22 June through 8 August 2000 Snorkel Surveys

Factors Influencing Current Status

Because westslope cutthroat trout are not anadromous, downstream activities only indirectly influence their population (e.g., reduced forage source and reduced nutrients to stream due to a reduced number of migration to the subbasin). Subbasin factors that have contributed to the decline of westslope cutthroat trout include the following:

- Habitat degradation. Loss of stream riparian area integrity results in high summer water temperatures. Fine sediment intrusion results in loss of rearing space and loss of pool habitat. Channel simplification results in low habitat complexity and reduced woody debris retention. Habitat degradation is most profound in Red River, American River, Newsome Creek, and Crooked Creek.

- Angling. Angling has reduced the large migratory component of the population due to easy access to the middle and lower portions of the watershed (river adjacent road) and the vulnerability of these fish to angling efforts.

- Competition with introduced species. Introduction of non-native brook trout has led to the displacement of westslope cutthroat trout. Brook trout strongholds in the watershed are the Red River and Silver Creek drainages. They are also present in Crooked River, Newsome Creek, and American River.

- Hybridization. This is a risk where Yellowstone cutthroat trout have been stocked (Johns Creek, Tenmile Creek, and Crooked River).

- Population isolation. Loss of the migratory component of the population due to harvest (angling/poaching) and habitat degradation in the middle and low elevation reaches results in long distances between resident population strongholds. This loss of connection by the migratory component results in isolation of resident populations, which increases the risk to the overall population.

Conclusions

Conclusions of the Fish TAG with respect to westslope cutthroat trout current distribution and potential distribution in the SF CWR Subbasin are shown in Figures D-11 and D-12, respectively. Table D-11 summarizes the conclusions for all salmonids of concern. Figure D-18 shows the general conclusions about the current fish habitat condition throughout the subbasin, while Figures D-19 and D-20 identify watersheds exhibiting sediment and temperature problems, respectively. Figure D-21 identifies areas recommended for conservation and others prioritized for restoration of salmonid habitat in the SF CWR Subbasin.

Fisheries Management

The SF CWR main stem and most tributaries are currently managed under a six-trout catch limit throughout the Memorial Day to November 30 general fishing season. Streams known

to have wild steelhead populations (Crooked River, Johns Creek, and Tenmile Creek) have a two-trout limit. In addition, the SF CWR main stem is managed for exploitation of hatchery steelhead and surplus hatchery chinook when the numbers of returning adults are high enough to allow a season.

The Idaho Department of Fish and Game has established programs and management objectives that pertain to the SF CWR (IDFG 2001). Program directions include increasing emphasis on habitat protection, continuing emphasis on protection and enhancement of wild trout, and continuing emphasis on protection and enhancement of salmon and steelhead. Objectives that pertain to the SF CWR Clearwater include:

- Maintain and improve fish habitat and water quality.
- Maintain a diversity of fishing opportunity to meet angler demand.
- Increase fishing access.
- Maintain existing populations of chinook salmon and steelhead trout.
- Maintain or restore wild native populations of fish in suitable waters.
- Fully utilize fish habitat capabilities by increasing populations of suitable fish species to carrying capacity of the habitat.

Hatchery Facilities in the SF CWR Subbasin

Nez Perce Tribe Fish Facilities

The following facilities are managed by the Nez Perce Tribe in the SF CWR subbasin with the goal of increasing production of spring and fall chinook.

Newsome Creek

A smolt trap at the mouth of Newsome Creek is operated by the Nez Perce Tribal Hatchery Monitoring and Evaluation (NPTH M&E) Project. The trap is a rotary screw trap and its function is to monitor the out migration of juvenile spring chinook. The trap is operated from late spring to early fall, dependent on stream flows and fish movements. Upstream approximately 300 yards, NPTH M&E also operate a temporary fish weir and trap. It is a picket style weir and its function is to monitor adult spring chinook upstream passage. Beginning in 2002, this trap will also collect spring chinook broodstock to be held and spawned at the NPTH Newsome Creek Acclimation Facility. Information collected from the smolt trap and weir will be used to improve the management and operation of the acclimation facility now under construction near the Newsome town site. This facility will be operational May through mid-October and will contain two flow- through ponds: an adult holding raceway and a juvenile acclimation pond with a total water requirement of 1.24 cubic feet per second (cfs). The acclimation pond will rear 75,000 parr and the adult holding pond will contain up to 84 fish. The overall goal of these projects is to establish a self-perpetuating population of spring chinook in Newsome Creek.

Lukes Gulch

The Lukes Gulch facility will be operational in early 2002. Portable, circular tanks will be installed for acclimation of 200,000 sub-yearling fall chinook smolts, February through mid-June, with a total surface water requirement of 2.5 cfs. Up to 1.0 cfs of ground water will be pumped from one well to raise the water temperature to 54 °F in the rearing pond. Pumping will cease once the river water temperature reaches 54 °F.

The number of fish held at these satellite facilities is below the threshold limit for state and federal regulations that require water quality monitoring. However, the tribe will monitor influent and effluent bimonthly during the operating period for total suspended solids, settled solids, and dissolved oxygen. Additional sampling for nutrients may be implemented based on water quality concerns.

Idaho Department of Fish and Game/Lower Snake River Compensation Program Facilities in the Subbasin

Extensive descriptions of hatchery facilities in the Clearwater Basin are given in the *Clearwater Subbasin Summary* (NW Power Planning Council 2001). This information can be reviewed at the following Web site: http://www.cbfwf.org.

Conclusions

Conclusions by the Fish TAG are displayed in Table D-11 and a series of maps (Figures D-9 through D-21) showing the distribution of salmonid species throughout the SF CWR Subbasin.

Table D-11. Results of fish tag assessments of salmonid and habitat conditions in the SF CWR subbasin.

WB ID	WATER BODY NAME	ACRES	Current Fish Population Presence*					Current Habitat Condition**	Natural Inherent Conditions**				Pollutant Problems			Conservation Preservation
			BUT	CUT	SCH	ST RBT	BRT	Salmonids	BUT	CUT	SCH	ST RBT	SED	TEMP	NUTR	Priority***
1	Lower SF CWR	19,722.51	Y	Y	Y	Y	Y	P	F	F	F	F	Y	Y	Y?	M (main stem)
2	L. Cottonwood Creek	16,928.92	N	N	N	Y	N	P	P	P	P	G	Y	Y		L
3	U. Cottonwood Creek	21,222.86	N	N	N	Y	N	P	P	P	P	F	Y	N		L
4	L. Red Rock Creek	2,968.83	N	N	N	N	N	P	P	P	P	G	Y	N		L
5	U. Red Rock Creek	23,480.76	N	N	N	N	N	P	P	P	P	F	Y	N		L
6	Stockney Creek	19,977.77	N	N	N	N	N	P	P	P	P	F	Y	N		L
7	Shebang Creek	18,380.20	N	N	N	N	N	P	P	P	P	F	Y	N		L
8	SF Cottonwood Cr.	12,676.30	N	N	N	N	N	P	P	P	P	F	Y	N		L
9	Long Haul Creek	8,811.76	N	N	N	N	N	P	P	P	P	F	Y	N		L
10	Threemile Creek	21,474.81	N	N	Y	Y	N	P	P	P	P	F	Y	Y	Y	L
11	Butcher Creek	10,723.48	N	N	Y	Y	N	P	P	P	P	F	Y	Y	Y	M
12	Mid-Lower SF CWR	56,691.11	Y	Y	Y+	Y	Y	P	F	F	F	F	Y	Y		M (main stem)
13	Mill Creek	23,410.24	Y	Y	Y+	Y	N	F	F	G	F	G	Y	Y		M
14	Lower Johns Creek	26,377.99	Y+	Y	Y	Y	N	G	G	G	F	G	N	N		C/H
15	Gospel Creek	10,831.77	Y	Y	N	Y	N	G	G	G	P	G	N	N		C/H
16	West Fork Gospel Cr.	4,467.34	Y	Y	N	N	N	G	G	G	P	F	N	N		C/H
17	Middle Johns Creek	10,199.89	Y+	Y	Y	Y	N	G	G	G	F	G	N	N		C/H
18	Upper Johns Creek	8,673.57	Y+	Y	N	Y	N	G	G	G	P	G	N	N		C/H
19	Moores Creek	3,987.19	Y+	Y	N	Y	N	G	G	G	P	G	N	N		C/H
20	Square Mountain Cr.	2,289.02	Y	Y	N	Y	N	G	G	G	P	F	N	N		C/H
21	Hagen Creek	5,537.44	Y	Y	N	Y	N	G	G	G	P	F	N	N		C/H
22	Middle SF CWR	18,952.46	Y	Y	Y+	Y	Y	F	F	F	F	G	Y	Y		M (main stem)
23	Wing Creek	5,329.18	N	Y	N	N	N	F	P	F	P	F	N	N		L
24	Twentymile Creek	14,640.67	Y	Y	N	Y	N	G	F	G	P	F	N	N		C/M
25	Lower Tenmile Creek	2,447.18	Y+	Y	Y	Y	N	G	F	F	F	G	N	N		C/H
26	Middle Tenmile Creek	7,227.17	Y+	Y	Y+	Y	N	G	G	G	F	G	N	N		C/H
27	Upper Tenmile Creek	13,617.29	Y+	Y	Y	Y	N	G	G	G	F	G	N	N		C/H
28	Williams Creek	5,890.59	Y	Y	N	Y	N	G	F	G	F	G	N	N		C/H
29	Sixmile Creek	5,129.97	Y	Y	Y	Y	N	F	F	G	F	G	Y	N		M
30	Mid-Upper SF CWR	17,165.37	Y	Y	Y+	Y	Y	F	F	F	G	G	Y	Y		M

Table D-11. Results of fish tag assessments of salmonid and habitat conditions in the SF CWR subbasin.

WB ID	WATER BODY NAME	ACRES	Current Fish Population Presence*					Current Habitat Condition**	Natural Inherent Conditions**				Pollutant Problems			Conservation Preservation
			BUT	CUT	SCH	ST RBT	BRT	Salmonids	BUT	CUT	SCH	ST RBT	SED	TEMP	NUTR	Priority***
31	Lower Crooked River	9,480.90	Y	Y	Y+	Y	Y	P	F	G	G	G	Y	Y		H
32	Upper Crooked River	14,487.38	Y+	Y	Y+	Y	Y	F	G	G	G	G	Y	Y		H
33	West Fork Crooked R.	7,594.45	Y+	Y	Y	Y	Y+	G	G	G	G	G	N	N		C/H
34	East Fork Crooked R.	6,688.73	Y+	Y	Y	Y	N	G	G	G	G	G	N	N		C/H
35	Relief Creek	7,484.49	Y	Y	Y+	Y	N	F	F	G	G	G	Y	Y		M
36	Upper SF CWR	2,695.17	Y	Y	Y+	Y	Y	P	F	F	G	G	Y	Y		H
37	Lower Red River	10,333.34	Y	Y	Y+	Y	Y	P	F	G	G	G	Y	Y		M
38	Middle Red River	16,041.61	Y	Y	Y+	Y	Y	P	F	G	G	G	Y	Y	Y?	H
39	Moose Butte Creek	7,087.55	Y	Y	Y+	Y	Y	F	F	G	G	G	Y	Y		H
40	Lower Red River	3,153.83	Y+	Y	Y+	Y	Y	F	G	G	G	G	Y	Y		H
41	Middle Red River	2,791.15	Y+	Y	Y+	Y	Y	F	G	G	G	G	Y	N		H
42	West Fork Red River	6,405.94	Y+	Y	Y	Y	Y	G	G	G	G	G	N	N		C/H
43	Upper Red River	4,744.28	Y+	Y	Y	Y	Y	F	G	G	G	G	Y	N		H
44	Trapper Creek	7,076.77	Y	Y	N	Y	Y+	F	G	G	F	G	Y	N		H
45	Upper Red River	19,249.68	Y	Y	Y+	Y	Y+	F	G	G	G	G	Y	Y		H
46	Soda Creek	3,353.28	N	Y	N	N	Y+	F	F	G	F	G	Y	N		H
47	Bridge Creek	2,380.29	N	Y	N	N	Y+	G	F	G	F	G	N	N		C/M
48	Otterson Creek	2,488.27	Y	Y	Y	N	Y+	G	F	G	F	G	N	N		C/M
49	Trail Creek	4,560.11	Y	Y	Y	N	Y+	F	F	G	F	G	Y	N		H
50	Siegel Creek	7,783.69	Y	Y	Y	Y	Y+	F	F	G	G	G	Y	Y		H
51	Red Horse Creek	5,806.21	Y	Y	Y	Y	Y+	F	F	G	G	G	Y	Y		H
52	Lower American R.	7,215.12	Y	Y	Y+	Y	Y	P	F	G	G	G	Y	Y	Y?	H
53	Kirks Fork	6,257.49	Y	Y	Y	Y	Y	F	F	G	G	G	Y	Y		H
54	EF American River	11,444.75	Y	Y	Y+	Y	Y+	F	G	G	G	G	Y	N		H
55	Upper American R.	15,275.05	Y	Y	Y+	Y	Y+	F	F	G	G	G	Y	Y		H
56	Elk Creek	2,323.89	Y	Y	Y+	Y	Y+	P	F	G	G	G	Y	Y	Y	H
57	Little Elk Creek	5,081.05	Y	Y	Y	Y	Y+	F	F	G	G	G	Y	Y		H
58	Big Elk Creek	8,820.95	Y	Y	Y+	Y	Y+	F	F	G	G	G	Y	Y		H
59	Buffalo Gulch	2,138.81	N	Y	N	Y	N	P	P	G	F	G	Y	Y		M
60	Whiskey Creek	1,659.19	Y	Y	Y	Y	Y	F	F	G	F	G	Y	Y		M

Table D-11. Results of fish tag assessments of salmonid and habitat conditions in the SF CWR subbasin.

WB ID	WATER BODY NAME	ACRES	Current Fish Population Presence*					Current Habitat Condition**	Natural Inherent Conditions**				Pollutant Problems			Conservation Preservation
			BUT	CUT	SCH	ST RBT	BRT	Salmonids	BUT	CUT	SCH	ST RBT	SED	TEMP	NUTR	Priority***
61	Maurice Creek	1,093.79	N	Y	N	Y	N	P	P	G	F	G	Y	Y		M
62	Lower Newsome Cr.	4,145.33	Y	Y	Y+	Y	Y	P	F	G	G	G	Y	Y		H
63	Bear Creek	3,832.48	Y	Y	Y	Y	N	F	F	G	G	G	Y	Y?		H
64	Nugget Creek	1,451.46	Y	Y	N	N	N	F	F	G	F	G	Y	Y?		M
65	Beaver Creek	3,733.24	Y	Y	N	Y	N	F	F	G	F	G	Y	Y?		H
66	Middle Newsome Cr.	1,135.41	Y	Y	Y+	Y	N	F	F	G	G	G	Y	Y		H
67	Mule Creek	5,497.49	Y	Y	Y	Y	N	F	F	G	G	G	Y	Y?		H
68	Upper Newsome Cr.	6,355.59	Y	Y	Y+	Y	N	F	F	G	G	G	Y	Y		H
69	Haysfork Creek	3,171.89	N	Y	Y	Y	N	F	F	G	G	G	Y	Y?		H
70	Baldy Creek	2,724.18	Y+	Y	Y	Y	N	F	G	G	G	G	Y	Y?		H
71	Pilot Creek	3,917.87	Y+	Y	Y	Y	N	G	G	G	G	G	N	Y?		C/H
72	Sawmill Creek	1,769.33	Y	Y	Y	Y	N	G	F	G	G	G	N	Y?		C/M
73	Sing Lee Creek	1,555.92	N	Y	Y	Y	N	F	F	G	G	G	N	Y?		M
74	WF Newsome Creek	3,304.66	Y	Y	Y	Y	N	F	F	G	G	G	N	Y		H
75	Leggett Creek	4,992.17	N	Y	Y	Y	N	F	F	G	F	G	Y	Y		M
76	Fall Creek	2,333.69	N	Y	N	N	N	F	P	F	P	G	Y	N		L
77	Silver Creek	16,516.61	Y	N	N	Y	Y+	G	F	G	P	F	N	N		C/L
78	Peasley Creek	9,092.74	N	Y	N	Y	N	F	F	G	F	G	Y	Y?		M
79	Cougar Creek	7,737.01	N	Y	N	N	N	P	P	F	P	F	Y	Y?		L
80	Meadow Creek	24,009.74	Y	Y	Y+	Y	Y+	P	F	G	F	G	Y	Y		M
81	Sally Ann Creek	8,891.48	Y	Y	N	Y	N	P	F	F	P	F	Y	Y		M
82	Rabbit Creek	6,190.89	Y	Y	N	Y	Y	P	F	F	P	F	Y	Y		L

* Y+ = known spawning and rearing population

BUT = Bull Trout CUT = Cutthroat Trout SCH = Spring Chinook

ST RBT = Steelhead/Rainbow Trout BRT = Brook Trout

** G = Good, F = Fair, P = Poor

*** L = Low, M = Medium, H = High; C/L, C/M, and C/H = ratings for conservation rather than restoration. All other ratings in this column are priorities for restoration

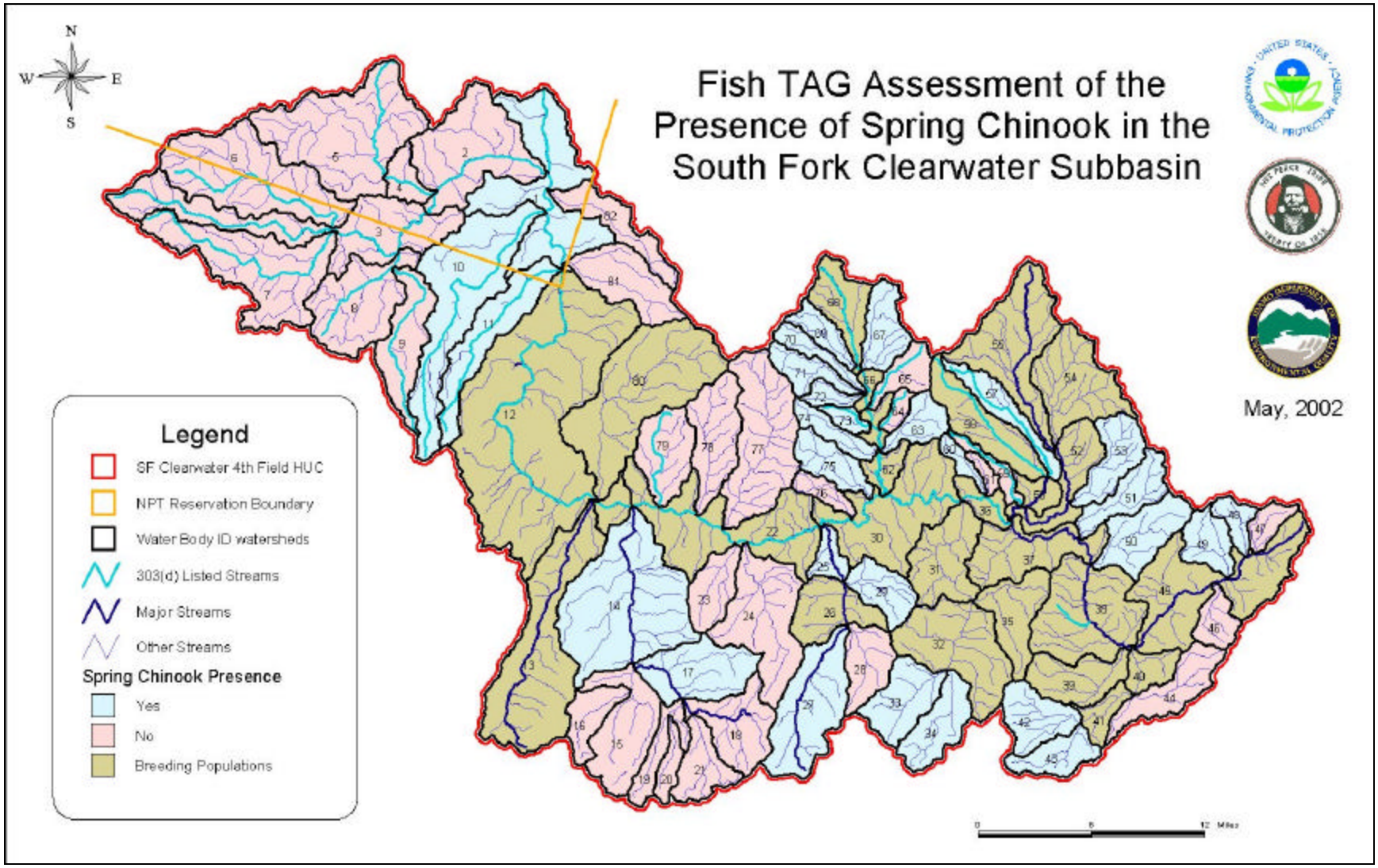

Figure D-9. Fish TAG Assessment of the Presence of Spring Chinook in the SF CWR Subbasin

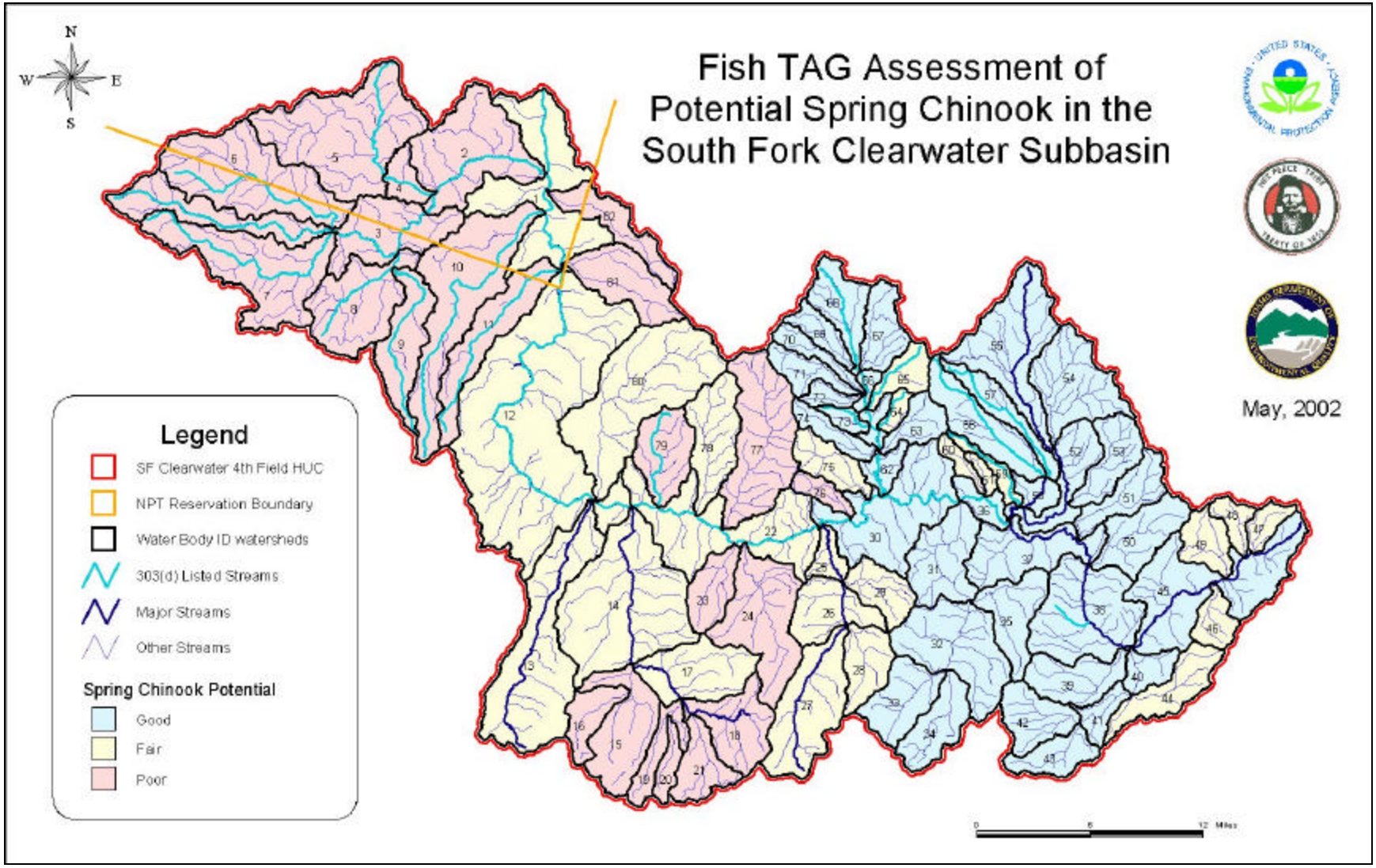

Figure D-10. Fish TAG Assessment of Potential Spring Chinook in the SF CW Subbasin

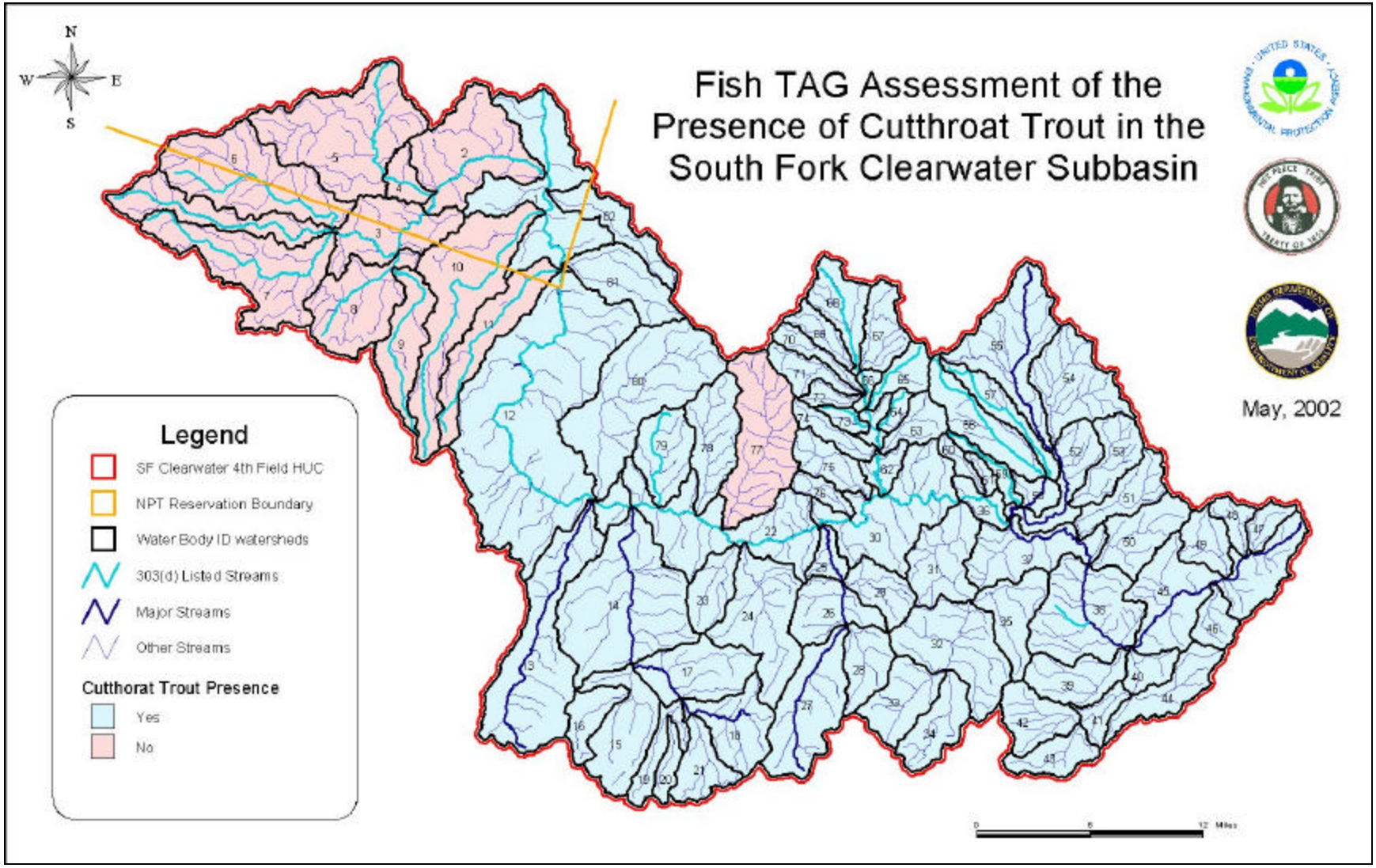

Figure D-11. Fish TAG Assessment of the Presence of Cutthroat Trout in the SF CWR Subbasin

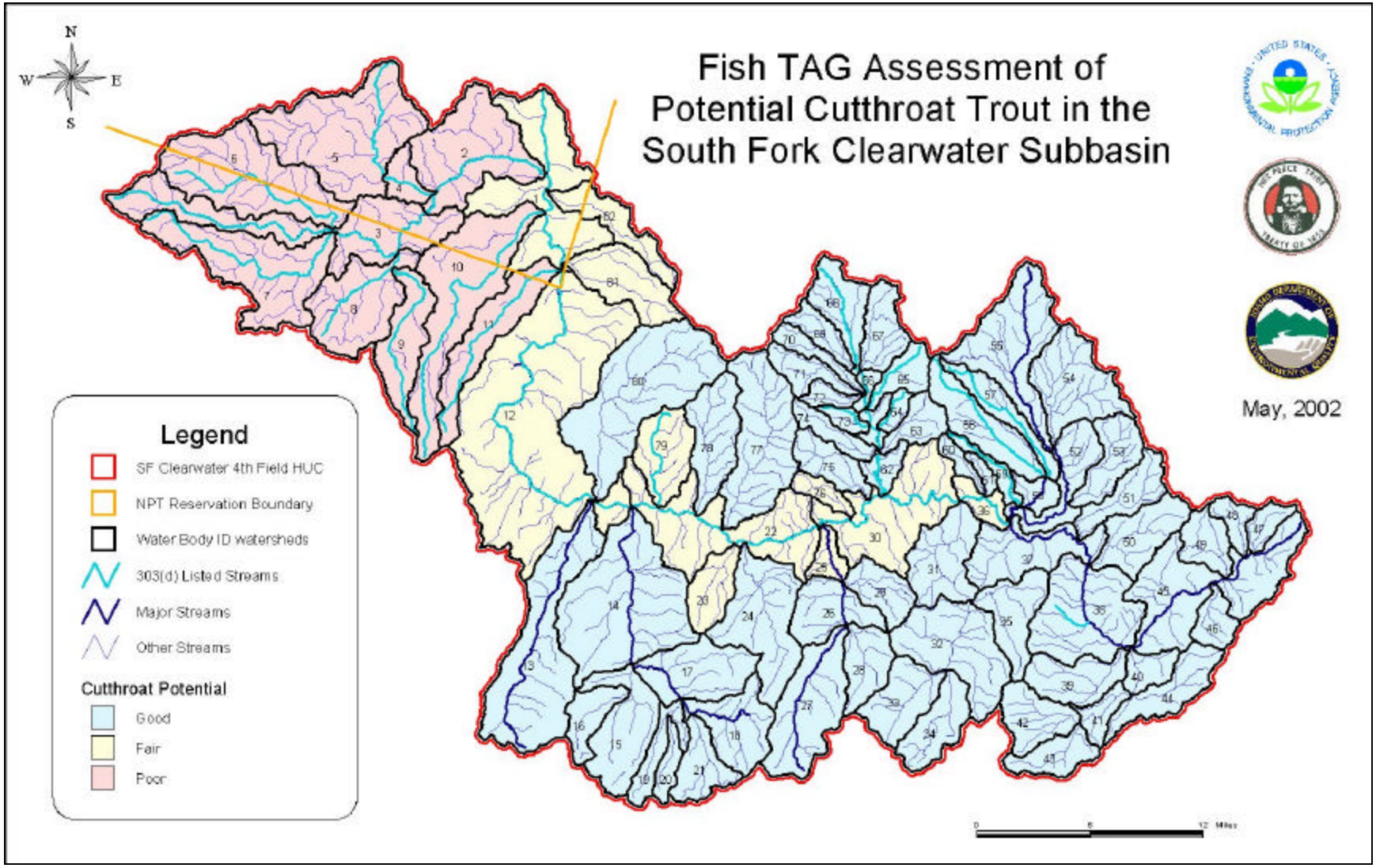

Figure D-12. Fish TAG Assessment of Potential Cutthroat Trout in the SF CWR Subbasin

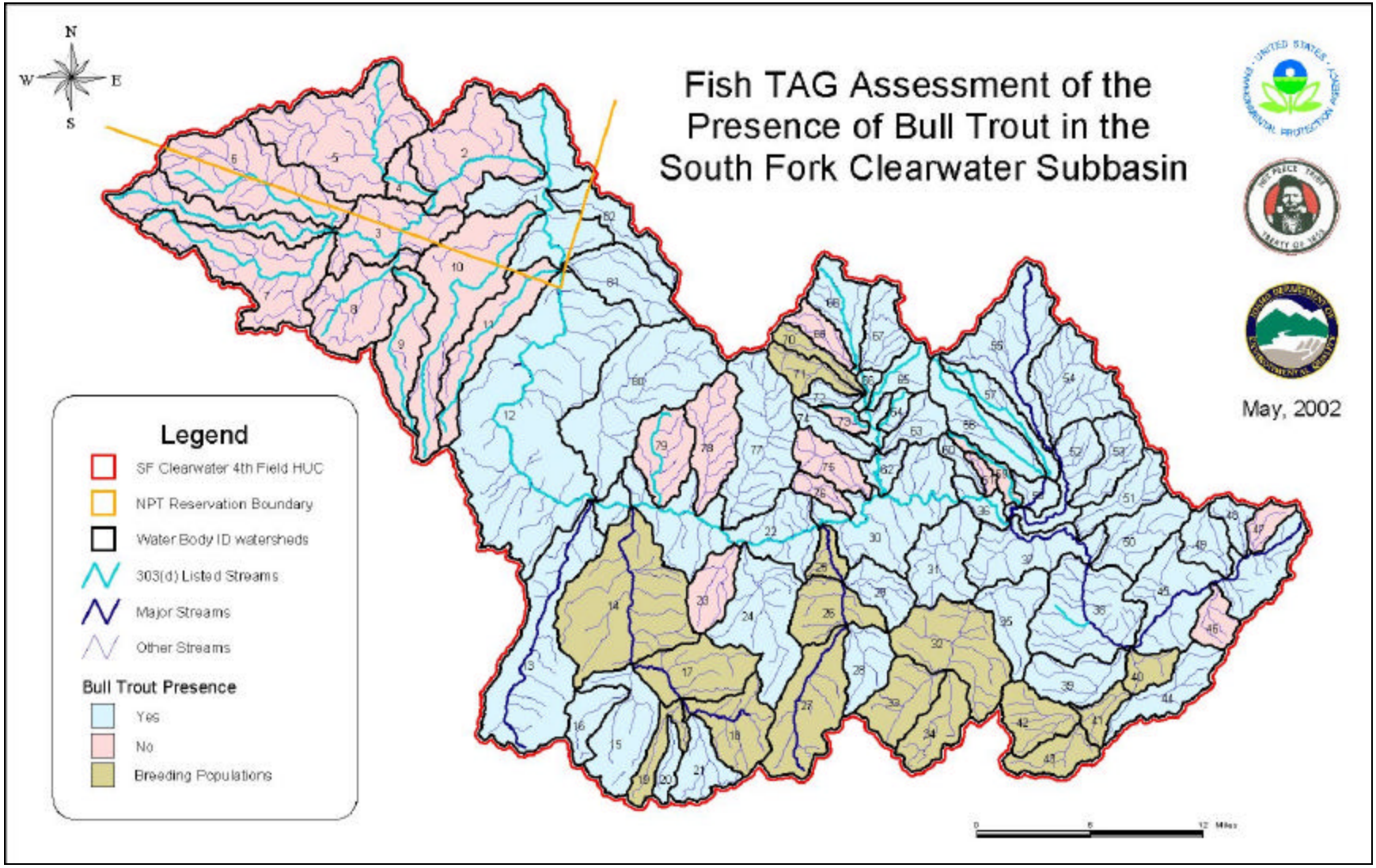

Figure D-13. Fish TAG Assessment of the Presence of Bull Trout in the SF CWR Subbasin

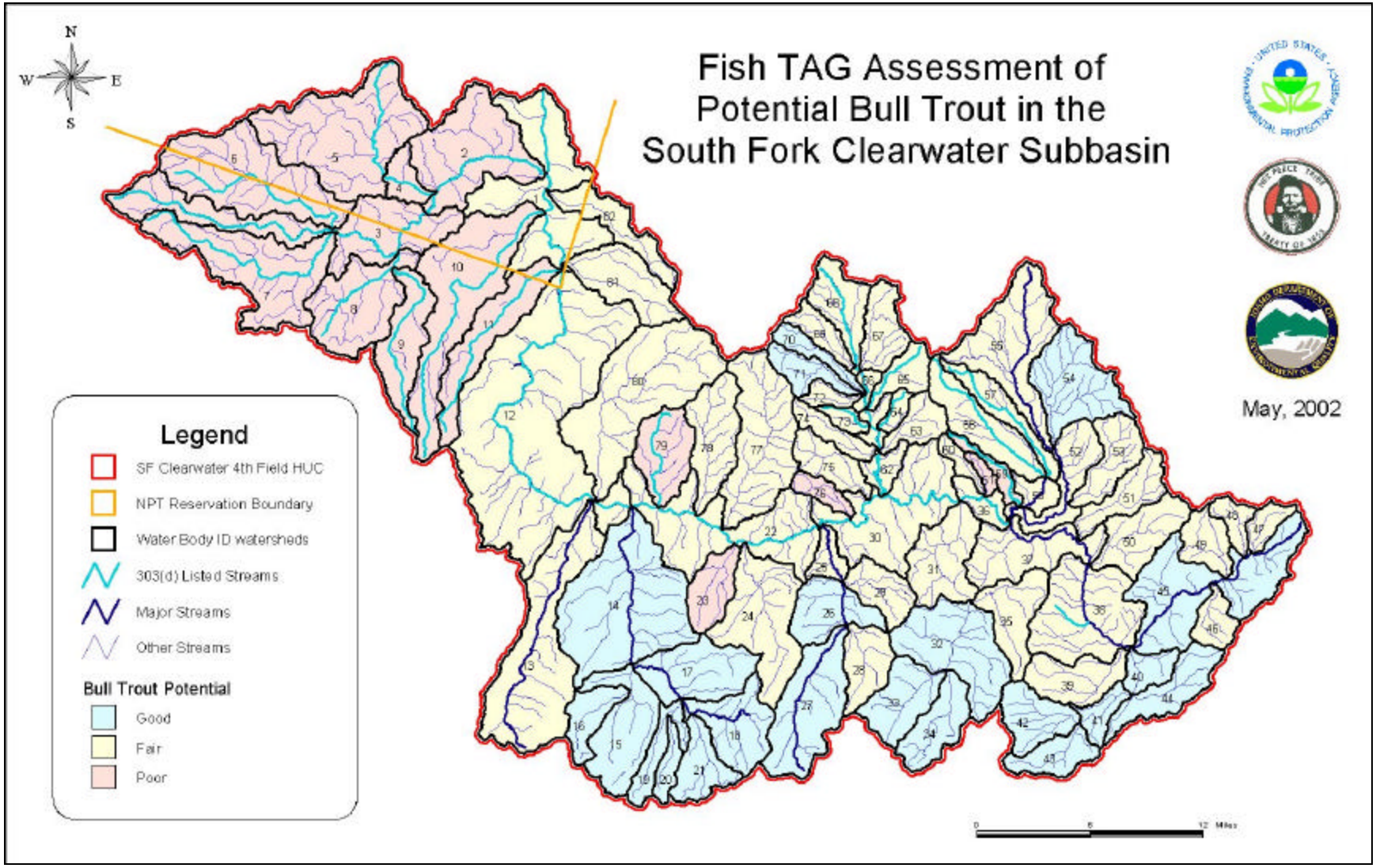

Figure D-14. Fish TAG Assessment of Potential Bull Trout in the SF CWR Subbasin

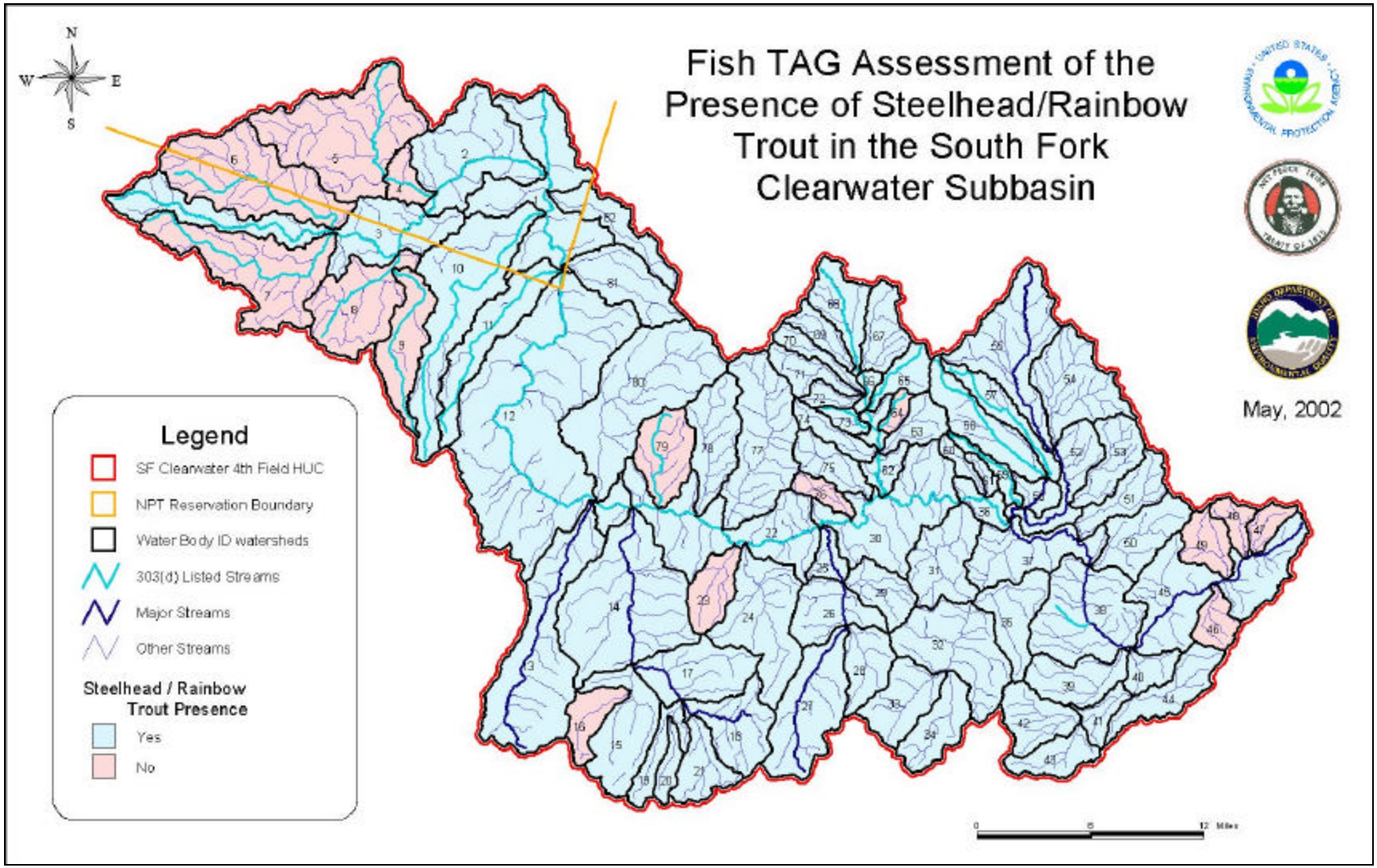

Figure D-15. Fish TAG Assessment of the Presence of Steelhead/Rainbow Trout in the SF CWR Subbasin

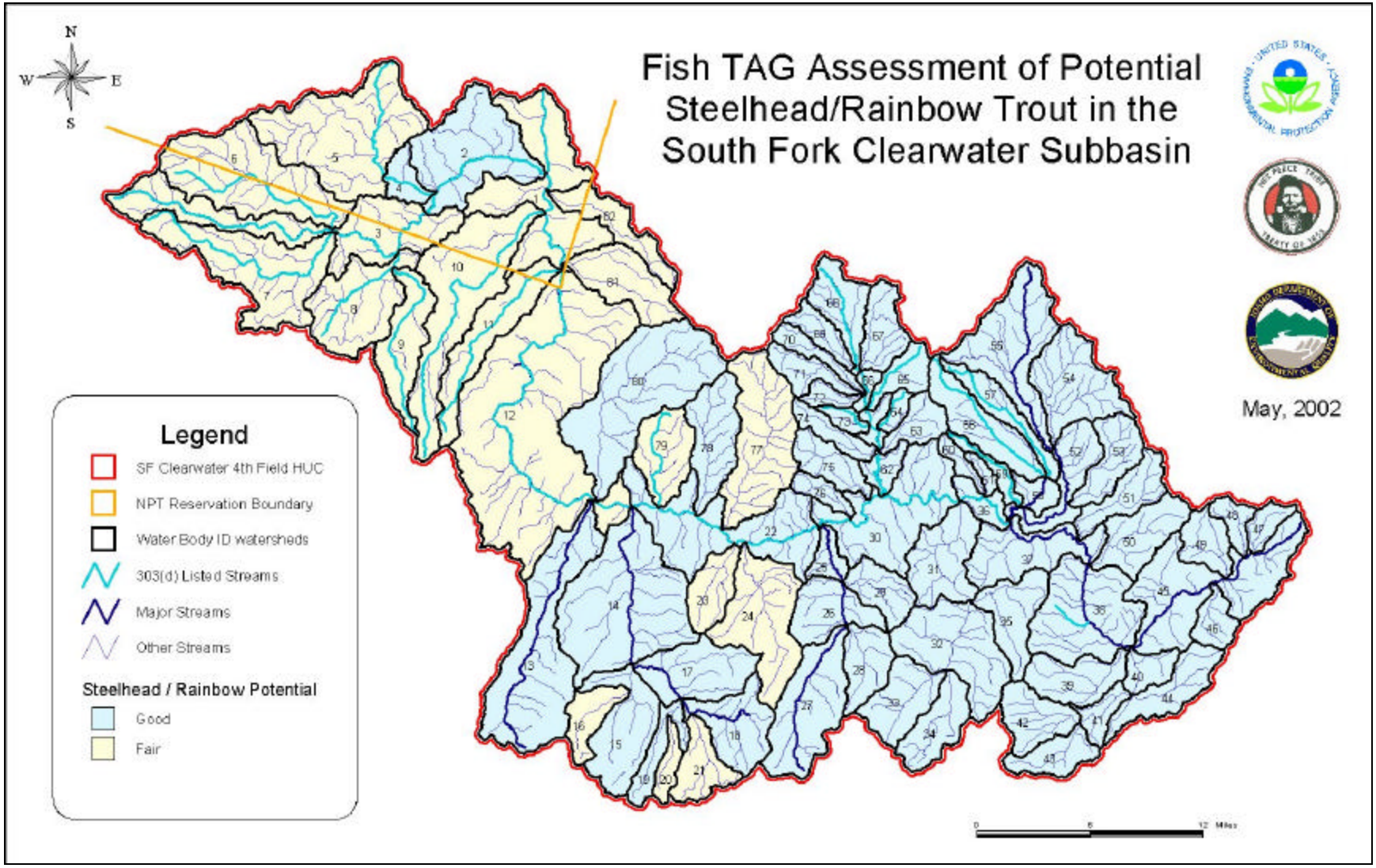

Figure D-16. Fish TAG Assessment of Potential Steelhead/Rainbow Trout in the SF CWR Subbasin

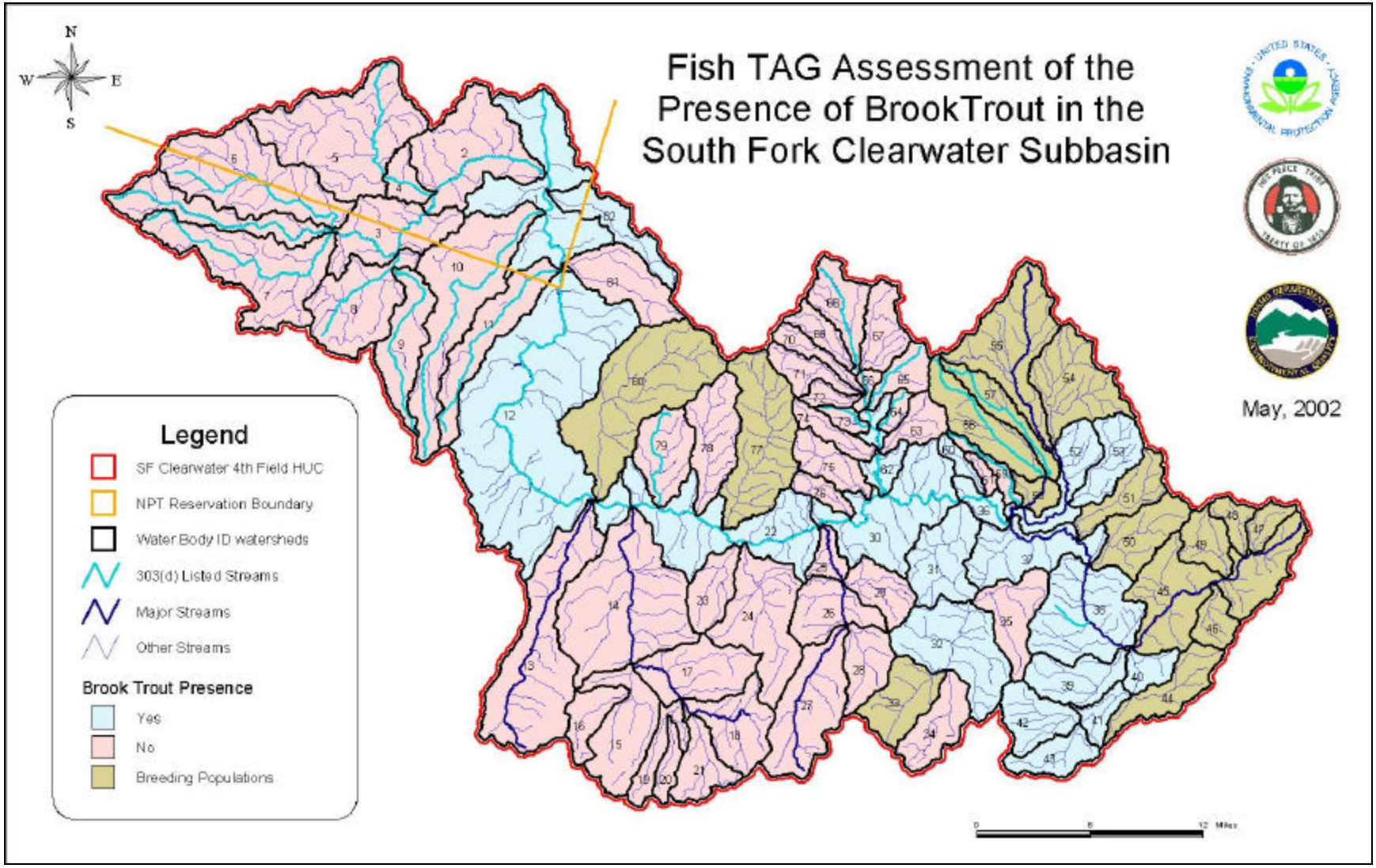

Figure D-17. Fish TAG Assessment of the Presence of Brook Trout in the SF CWR Subbasin

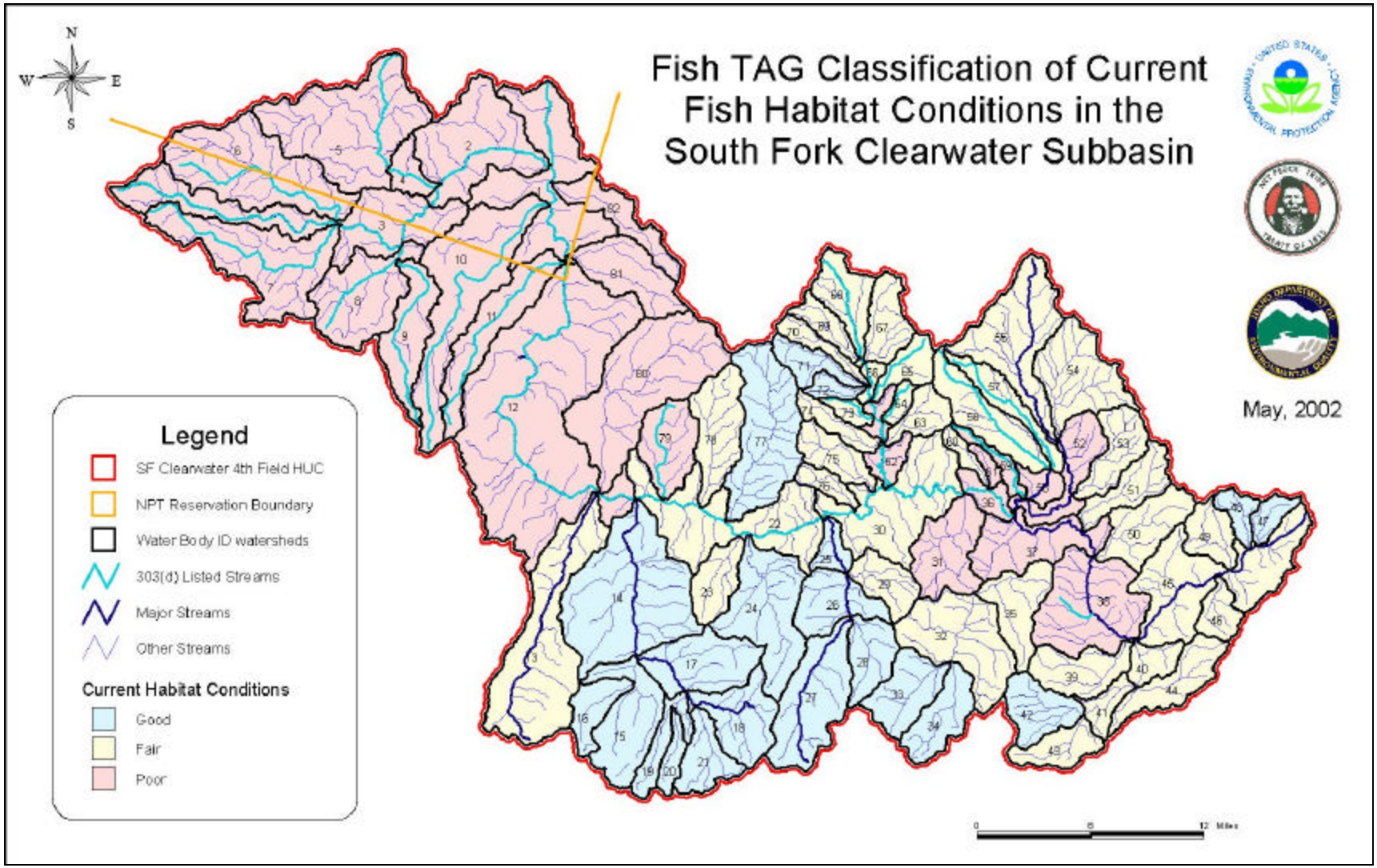

Figure D-18. Fish TAG Classification of Current Fish Habitat Conditions in the SF CWR Subbasin

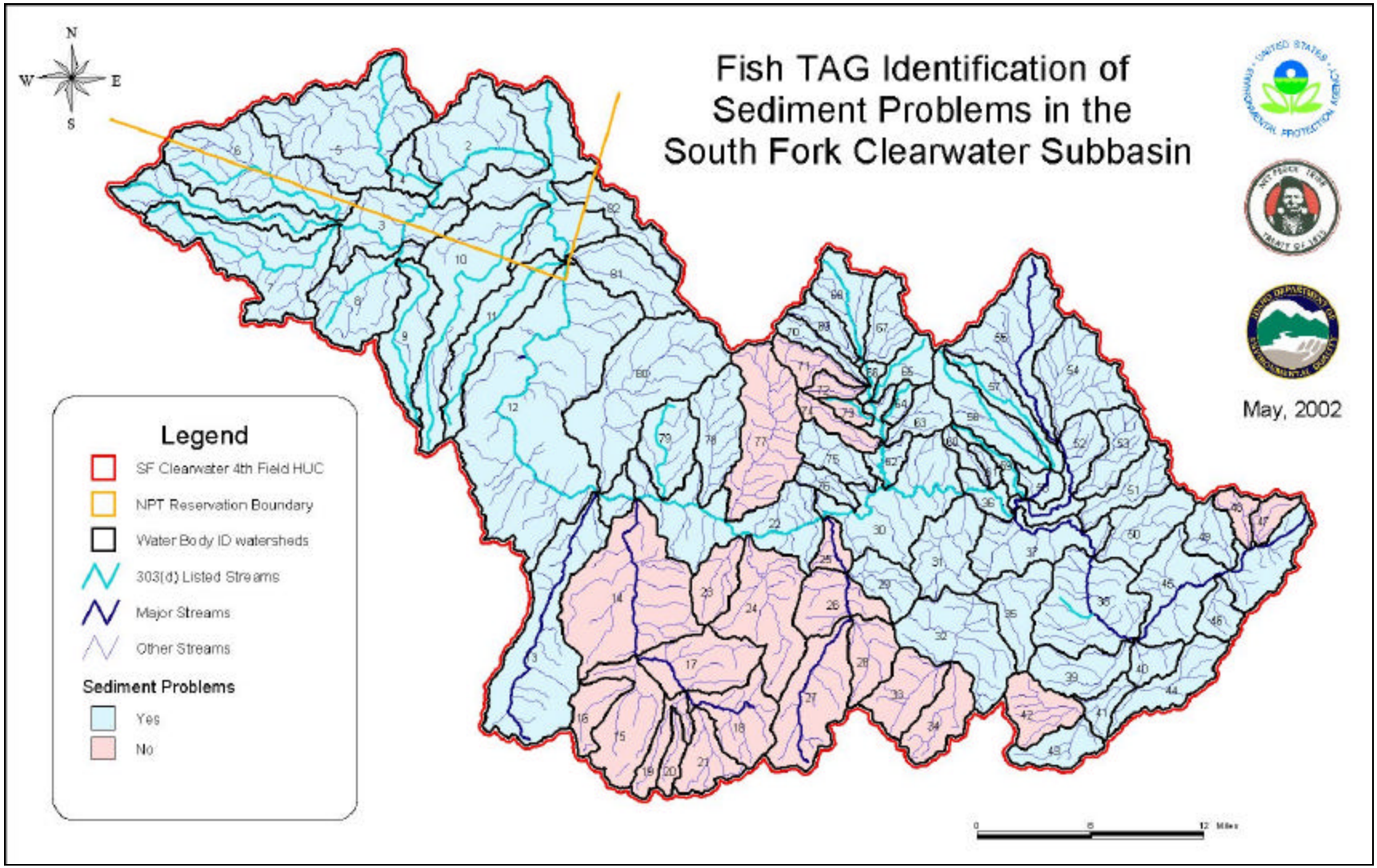

Figure D-19. Fish TAG Identification of Sediment Problems in the SF CWR Subbasin

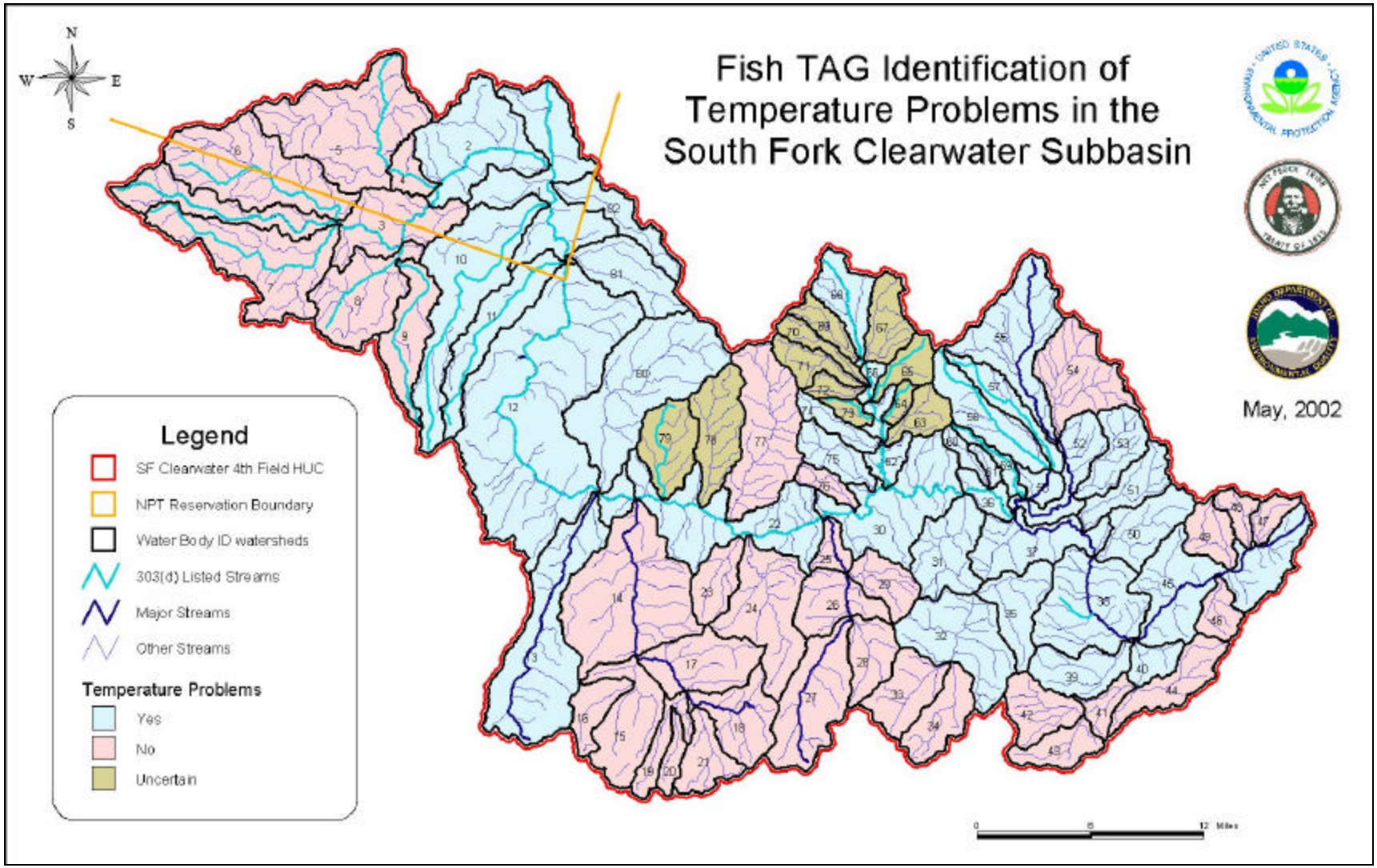

Figure D-20. Fish TAG Identification of Temperature Problems in the SF CWR Subbasin

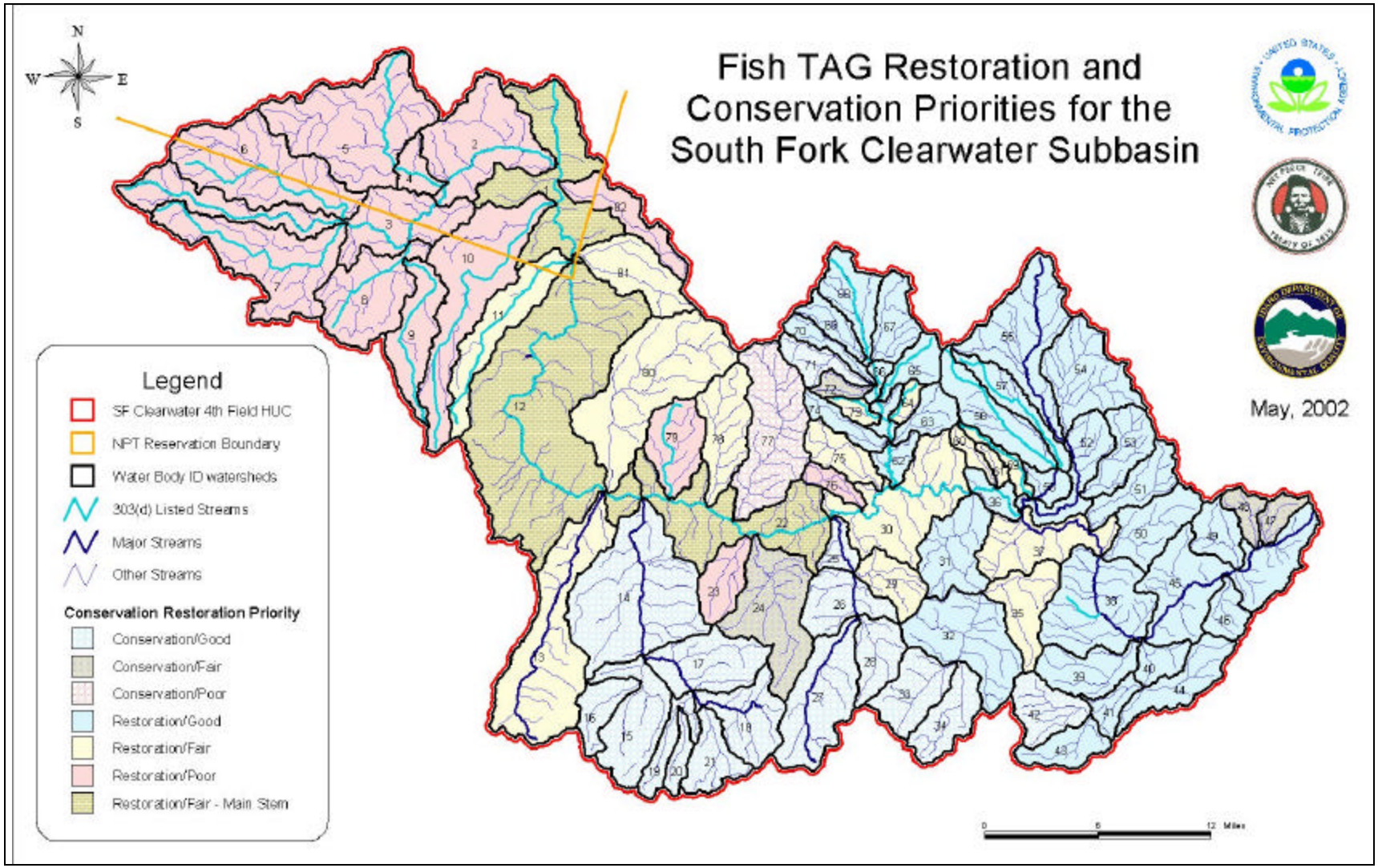

Figure D-21. Fish TAG Restoration and Conservation Recommendations for the SF CWR Subbasin

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Attachments

Attachment D-1. Timing of life history stages of salmonids within the SF CWR Subbasin.

Life History Stage	SF CWR Main Stem	Major Creeks and Rivers	Other Perennial Streams
A-Run Steelhead (Lower SF Main Stem and its Tributaries)			
Residence	Sept 1-Feb 1		
Migration to Tributaries	Feb 1-May 15	Feb 1-May 15	
Spawning		Feb 1-May 15	Feb 1-May 15
Incubation and Emergence		Feb 1-June 1	Feb 1-June 1
Rearing	All Year	All Year	All Year
Juvenile Out Migration	Feb 1-June 1	Feb 1-June 1	Feb 1-June 1
B-Run Steelhead (Middle and Upper SF Main Stem and its Tributaries)			
Residence	Dec 1-July 15		
Migration to Tributaries	Feb 1-May 15	Jan 1-May 31	
Spawning	Feb 1-May 31	Feb 1-May 31	Feb 1-May 31
Incubation and Emergence	Feb 1-July 15	Feb 1-July 15	Feb 1-July 15
Rearing	All Year	All Year	All Year
Juvenile Out Migration	Feb 1-June 30	Feb 1-June 30	Feb 1-June 30
Fall Chinook			
Adult Migration	Sept 15-Nov 30		
Spawning	Oct 1-Dec 15		
Incubation and Emergence	Oct 1-May 15		
Juvenile Out Migration	May 1-Aug 31		
Spring Chinook			
Adult Migration	April 15-Sept 15	April 15-Sept 15	
Spawning	Aug 15-Sept 30	Aug 15-Sept 30	Aug 15-Sept 30
Incubation and Emergence	Aug 15-April 30	Aug 15-April 30	Aug 15-April 30
Rearing	All Year	All Year	All Year
Juvenile Out Migration	Sept 1-June 30	Sept 1-June 30	Sept 1-June 30
Bull Trout			

Life History Stage	SF CWR Main Stem	Major Creeks and Rivers	Other Perennial Streams
Residence	All Year	All Year	All Year
Adult Migration (pre spawn)	April 1-July 15	April 1-July 15	April 1-July 15
Adult Migration (post spawn)	Sept 1-Oct 31	Sept 1-Oct 31	Sept 1-Oct 31
Spawning		Aug 15-Nov 30	Aug 15-Nov 30
Incubation and Emergence		Aug 15-Mar 31	Aug 15-Mar 31
Rearing	All Year	All Year	All Year
Westslope Cutthroat Trout			
Residence	All Year	All Year	All Year
Adult Migration	March 1-June 30	Mar 1-July 15	Mar 1-July 15
Spawning		Mar 15-June 30	Mar 15-June 30
Incubation and Emergence		Mar 15-Aug 15	Mar 15-Aug 15
Rearing	All Year	All Year	All Year
Mountain Whitefish			
Residence	All Year	All Year	All Year
Adult Migration	May 1-Nov 30	May 1-Nov 30	May 1-Nov 30
Spawning	Oct 1-Dec 15	Oct 1-Dec 15	Oct 1-Dec 15
Incubation and Emergence	Oct 1-Feb 28	Oct 1-Feb 28	Oct 1-Feb 28
Rearing	All Year	All Year	All Year
Pacific Lamprey			
Residence	All Year	All Year	All Year
Adult Migration	May 1-Sept 30	May 1-Sept 30	May 1-Sept 30
Spawning	Feb 1-May 31	Feb 1-May 31	Feb 1-May 31
Incubation and Emergence	Feb 1-June 30	Feb 1-June 30	Feb 1-June 30
Rearing	All Year	All Year	All Year
Brook Trout			
Residence	All Year	All Year	All Year
Spawning		Aug 15-Oct 31	Aug 15-Oct 31
Incubation and Emergence		Aug 15-Feb 28	Aug 15-Feb 28

(Source: Brostrom 2001).
Note: Major creeks and rivers include the Red, American, and Crooked Rivers, and Mill, Meadow, Johns, and Tenmile Creeks.

Attachment D-2. Spring chinook redd counts from the SF CWR subbasin based on observations in several locations, 1974-1997.

Year	# of Observation Locations	Total	Mean
1974	3	20	6
1975	3	59	19
1976	3	33	11
1977	4	138	34
1978	4	109	27
1979	4	39	9
1980	4	53	13
1981	5	124	24
1982	5	269	53
1983	5	234	46
1984	5	200	40
1985	5	264	52
1986	5	192	38
1987	5	208	41
1988	5	170	34
1989	5	83	16
1990	5	133	26
1991	5	6	1
1992	5	98	19
1993	5	209	41
1994	5	17	3
1995	5	6	1
1996	5	44	8
1997	5	187	37

(Source: Stream Net 2000)

Attachment D-2. Cont. Observation locations for spring chinook redd surveys.

Years	Location	River Mile
1974-1997	Crooked River	0-11.7
1974-1997	Red River	0-28.5
1977-1997	SF of Red River	0-11.7
1981-1997	American River	0-21.6
1974-1997	Newsome Creek	0-15.7

(Source: Stream Net 2000)

Attachment D-3. Adult spring chinook returns to the Red River pond hatchery, 1969-1996.

Red River Pond Hatchery Trap				
Year	**Unknown**	**Females**	**Males**	**Total Returns**
1969	215	--	--	215
1987		220	299	519
1988		209	185	394
1989		49	55	104
1990		16	37	53
1991		7	11	18
1992		16	23	39
1993		65	74	139
1994		13	18	31
1995		2	2	4
1996		14	48	62
Crooked River Hatchery Trap				
Year	**Unknown**	**Females**	**Males**	**Total Returns**
1990		10	19	29
1991		5	15	20
1992		94	134	228
1993		211	191	402
1994		18	8	26
1995		0	6	6
1996		94	205	299
1997	1034			1034

(Source: Stream Net 2000)

Attachment D-4. Number of fall chinook salmon redds counted in the Clearwater River subbasin, 1988-2000.

River	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Clearwater (RM 0-41)	21	10	4	4	25	36	30	20	66	58	78	179	163	285
Clearwater (RM 41-74)					1	0	0	0	0	0	0	2	8	16
M.F. Clearwater (RM 74-98)							0	0	0	0	0	0	0	0
N.F. Clearwater					0	0	7	0	2	14	0	1	0	1
S.F. Clearwater					0	0	0	0	1	0	0	2	1*	5
Totals	21	10	4	4	26	36	37	20	69	72	78	184	172	307

* A fall chinook salmon carcass was found in the SF CWR

An empty cell indicates no searches were conducted in the corresponding river segments during a specific year.

Attachment D-5. Steelhead redd count data from the Crooked and Red Rivers.

Year	Stream	Count	Survey River Mile	Redd/mile
90	Crooked	219	8.3	26.4
91	Crooked	50	10.8	4.6
92	Crooked	2	10.8	0.2
93	Crooked	4	10.4	0.4
94	Crooked	3	10.4	0.3
95	Crooked	4	10.4	0.4
96	Crooked	0	10.4	0.0
97	Crooked	0	12.8	0.0
90	Red	2	9.8	0.2
93	Red	5	16.3	0.3
94	Red	6	6.5	0.9
95	Red	6	6.5	0.9
96	Red	2	6.5	0.3
97	Red	0	6.5	0.0

(Source: Stream Net 2000)

Attachment D-6. Number of steelhead adults returning to the Crooked River fish trap, 1991-1996.

Year	Weir Catch	Wild	Hatchery
90	49	17	32
91	49	5	44
92	53	19	34
93	49	17	22
94	6	5	1
95	16	15	2
96	3	2	1
97	3	3	0
98	4	2	2
99	10	3	7
00	16	6	10

(Source: Stream Net 2000)

Attachment D-7. Summary of SF CWR main stem snorkel data collected summer 2000.

Segment	SECTION (KM)*	TYPE	AREA_m^2	sum_sthd	sum_stac	sum_RBT	sum_ct<=12	sum_ct>12	sum_ct_all	sum_bkt
1	end 18.2	mix b-c	35,622.626	0.10	0.02	0.00	0.01	0.00	0.01	0.00
2	end 56.4	C-Meadow	63,570.987	2.24	0.39	0.03	0.04	0.00	0.04	0.00
3	end 75.7	B-Canyon	27,558.280	4.32	0.00	0.02	0.08	0.00	0.08	0.01
4	end 95.3	B-Canyon	34,355.668	2.76	0.00	0.01	0.02	0.00	0.02	0.00
5	end 103.2	B-Canyon	14,237.941	2.35	0.01	0.02	0.05	0.01	0.06	0.01

Segment	SECTION*	TYPE	AREA_m^2	bull_sum<=12	bull_sum>12	sum_bull_all	sum_wht	sum_ch_juv	sum_ch_adult	sum_coho
1	end 18.2	mix b-c	35,622.626	0.00	0.00	0.00	0.19	0.01	0.00	0.00
2	end 56.4	C-Meadow	63,570.987	0.00	0.00	0.00	0.98	0.33	0.00	0.00
3	end 75.7	B-Canyon	27,558.280	0.03	0.01	0.03	0.76	0.48	0.03	0.00
4	end 95.3	B-Canyon	34,355.668	0.01	0.00	0.01	0.59	0.21	0.01	0.00
5	end 103.2	B-Canyon	14,237.941	0.03	0.01	0.04	0.67	0.01	0.04	0.00

(Source: IDFG 2000)
RBT= hatchery origin rainbow trout (as determined by fin erosion)
Sthd= wild/natural steelhead/rainbow trout
Stac=adipose fin-clipped steelhead
Ct= cutthroat trout
Bkt= brook trout
Bull= bull trout
Wht= whitefish
Ch= chinook

SF CWR Main Stem Segment Designations

Segment #	Start Landmark	End Landmark	Start River km	End River km
1	SF CWR Mouth	Butcher Creek Confluence	0	18.2
2	Butcher Creek Confluence	Johns Creek Confluence	18.2	56.4
3	Johns Creek Confluence	Ten Mile Creek Confluence	56.4	75.7
4	Ten Mile Creek Confluence	Crooked River Confluence	75.7	95.3
5	Crooked River Confluence	Beginning of SF CWR	95.3	103.2