

**BURNED AREA EMERGENCY RESPONSE  
YOLLA BOLLY FIRES  
FISHERIES ASSESSMENT**

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22 September 2008

**GENERAL BACKGROUND**

- Assessment area - “Yolla Bolly Fires”, includes the Trough Fire and all portions of fires that burned in the Yolla Bolly – Middle Eel Wilderness within the administrative boundary of the Shasta-Trinity National Forest (STNF).
- Only public lands administered by the USDA Forest Service are included in this assessment.

**I. OBJECTIVES**

- Assess immediate impacts of the Yolla Bolly Fires on fisheries and aquatic resources within and directly downstream of the burned areas.
- Inventory and evaluate future impacts caused or enhanced by the Yolla Bolly Fires on fisheries within and downstream of the burned areas and determine what emergency response is necessary.

**II. ISSUES**

- Anadromous fisheries and aquatic habitat in South Fork Cottonwood Creek and Upper South Fork Trinity River watersheds.
- Possible sediment increase in South Fork Trinity River watershed, which is listed as a 303(d) watershed under the California Clean Water Act. A sediment TMDL (Total Maximum Daily Load) document for the SFTR was completed by the EPA in 1998.

**III. OBSERVATIONS**

Background

a. South Fork Cottonwood Creek Watershed

Cottonwood Creek is the largest undammed tributary in the northern Central Valley. Approximately 130 miles of anadromous fish habitat provide important spawning and rearing areas for listed species including spring-run Chinook salmon (*Oncorhynchus tshawytscha*, federal and state listed as Threatened), Central Valley steelhead (*O. mykiss*, federally listed as Threatened), as well as fall- and late-fall run Chinook salmon (federally listed as Species of Concern). According to the CALFED Ecosystem Restoration Program, Cottonwood Creek is the primary source of spawning gravel for the Sacramento River, providing almost 85% of the gravel introduced between Redding and Red Bluff (Brenda Olson, personal communication).

The South Fork of Cottonwood Creek originates in the Yolla Bolly Mountains and joins mainstem Cottonwood Creek approximately 56 miles downstream. The drainage area of the South Fork is approximately 397 mi<sup>2</sup>. Slides Creek, a tributary to the South Fork flows through a major landslide that was triggered by seismic activity during the mid 1990's. Slides Creek enters the South Fork near the Yolla Bolly Wilderness boundary and presents a major source of sediment that is readily transportable to the South Fork. Erosion related to the Skinner Mill Fire (1976) contributed a large amount of sediment to the system and caused a fish kill through much of the South Fork and mainstem of Cottonwood Creek below the confluence. Recent fish surveys indicate that the South Fork maintains populations of fall-, late-fall and spring-run Chinook salmon as well as steelhead and resident trout.

- Spring-run Chinook salmon – Although exact timing of entry by adult spring-run Chinook salmon into Cottonwood Creek is unknown, observations from other area watersheds suggest that adult fish enter in late April/early May. In Cottonwood Creek, adult fish over-summer in Beegum Gorge and to some extent, in the headwaters of the South Fork. Adult fish spawn in late September/early October. Summer surveys have been consistently done to determine number of adults holding in Beegum Creek since 1998. Table 1 displays the numbers observed during those surveys (data from Brenda Olson, USFWS Grandtab database).

Table 1. Numbers of Observed Adult Spring-run Chinook Salmon in Beegum Creek.

Year	Adults observed
1998	477
1999	102
2000	122
2001	245
2002	125
2003	73
2004	17
2005	47
2006	55
2007	34
2008	No Fish Observed

- Fall-run and late fall-run Chinook salmon – An estimated 1,250 fall-run Chinook returned to Cottonwood Creek to spawn in 2007. Compared to historic survey data from Cottonwood Creek and other local watersheds, this was a relatively low return. Even with this low return, it is estimated that Cottonwood Creek contributed 1.3% of the total escapement of fall-run Chinook to California's Central Valley in 2007. In 2007, fall-run Chinook entered Cottonwood Creek in early October when temperature and flows permitted. By mid-November the run

into Cottonwood Creek was finished. Spawning is usually completed by late November. The timing of this run and the subsequent emergence of their offspring does make them vulnerable to possible fire-related increased in sediment during precipitation events.

- Steelhead – Little is known regarding the steelhead population or distribution in Cottonwood Creek; however we do know there is spawning and rearing in the upper watershed. Steelhead have been observed in the mainstem, South Fork, North Fork, Middle Fork, and Beegum Creek. Adults typically enter Cottonwood Creek beginning in November. Spawning can last from January through April.

b. Upper South Fork Trinity River Watershed (Trough fire)

The South Fork Trinity River basin is approximately 970 mi<sup>2</sup> in size, undammed, and is the largest tributary of the Mainstem Trinity River. The terrain is predominately mountainous and forested with elevations in the basin ranging from more than 7,800 feet above sea level in the headwater areas, to less than 400 feet at the confluence with the Trinity River (TCRCD 2003). The largest flood on record for the SFTR occurred in 1964. Following the flood, fish populations declined severely and continue to remain below pre-flood levels. The continued high rates of erosion and sedimentation are considered a major contributor to the depressed anadromous fish runs in the river basin (PWA 1994). The SFTR has one of the highest sediment loads in northern California. The high sediment loads have been attributed to unstable geology, management activities, and storm activity. In 1994, the SFTR was added to the Clean Water Act §303(d) list for sediment impairment triggering the development of a Total Maximum Daily Load (TMDL) threshold for sediment that was completed in 1998. Anadromous fish currently found in the SFTR include Southern Oregon/Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*), spring-run Upper Klamath/Trinity River (UKTR) Chinook salmon (*O. tshawytscha*), fall-run Upper Trinity River (UTR) Chinook salmon (*O. tshawytscha*), and Klamath Mountain Province Steelhead (*O. mykiss*).

- Coho salmon – SONCC coho salmon are federally listed as threatened under the Endangered Species Act. The frequency and size of current coho salmon runs in the SFTR are not well documented, though they have been reported to migrate as far upstream as Hyampom, CA (well downstream of the Upper SFTR watershed). Coho salmon Critical Habitat (CH) was designated in 1999 and includes all water within the historical range of coho salmon that is still accessible and can be occupied by any life history stage. This designation included the section of the SFTR adjacent to, and downstream of the Trough Fire.
- Spring-run Chinook Salmon – UKTR Chinook Salmon are a USDA Forest Service Sensitive Species. Prior to the 1964 flood estimates of spring-run Chinook populations in the SFTR exceeded 10,000 fish. In the 16 years between 1989 and 2004, SFTR counts of adult spring-run chinook salmon averaged 290 fish annually, ranging from 1,097 fish in 1996, to 7 fish in 1989 (CDFG 2004a). The low number of spring-run chinook salmon in the SFTR is

largely a response to the 1964 flood, which triggered landslides that filled in holding pools and covered spawning beds (Moyle 2002).

- Fall-run Chinook Salmon - UTR Chinook Salmon are a USDA Forest Service Sensitive Species. They occur in substantially larger numbers than do spring-run Chinook in the SFTR, but generally occur in a much shorter section of the river. Hyampom, located at the confluence of the SFTR and Hayfork Creek is loosely considered the break between the distribution of spring and fall chinook salmon on the SFTR (with fall-run fish generally occurring downstream of this point). However, during years of drought or years having above average precipitation and higher fall flows, there may be considerable overlap in the distribution and use of spawning areas.
  
- Steelhead – KMP steelhead area a USDA Forest Service Sensitive Species. The National Marine Fisheries Service recognizes two distinct ecotypes of steelhead in the Klamath-Trinity system. Ocean maturing (often referred to as Winter-run) steelhead enter the river sexually mature and spawn shortly after entering freshwater. Winter-run steelhead are not at risk of extinction but their numbers have been reduced from historic levels. Local anglers on the SFTR reported a substantial decline in the abundance of winter steelhead following the 1964 flood. There are no current adult return estimates for winter-run steelhead. River maturing (referred to as Summer) steelhead enter freshwater sexually immature and need several months in freshwater before they are ready to spawn. Between 1989 and 2004, SFTR counts of adult summer steelhead averaged 41 fish annually, ranging from 8 fish in 1991, to 95 fish in 1997 (CDFG 2004a). Summer steelhead populations remain highly imperiled in the Klamath-Trinity system and have been reduced to a small number of populations. In addition to all the usual causes of decline, they are exceptionally vulnerable to poaching when oversummering in pools. It is believed that the current summer steelhead population is 10% or less of the historical average.

### Reconnaissance Method

All reconnaissance was completed by vehicle and foot access. No fisheries biologists were present on helicopter flights. The following list includes the date(s) that each fire was visited. Areas of high and moderate burn severity were the priority for field survey work.

- Trough – 09/13 and 09/15
- Yolla Bolly Wilderness Fires (STNF section only) – 09/14

### Findings/Description of Emergency

South Fork Cottonwood Creek Watershed – No areas of concern for anadromous fish were identified due to the presence of an impassable barrier downstream of burnt areas, the limited amount of moderate and high severity burn areas near stream channels and the pre-existing

elevated background sediment load of this system. Limited amounts of sediment are expected to reach South Fork Cottonwood Creek, but the lightly burned and unburned areas of hillslope and riparian vegetation will greatly reduce the amount of sediment transported to the creek. Treatments proposed by other resource specialists to limit erosion at drainage-trail crossings are expected to further reduce impacts to fish related to sediment transport to fish-bearing streams.

Upper South Fork Trinity River – The primary area of emergency concern identified is the unnamed tributary watershed that lies between Rainbow and Trough ridges. This watershed is tributary to Schell Mountain Creek, which is then confluent with the South Fork Trinity River. Several areas of moderate to high severity burn were identified along the minor tributaries and hillslopes that lie south of the tributary creek and north of Rainbow Ridge. We also observed steep slopes and historic hillslope instability. This section shows a high potential to deliver sediment directly to the unnamed tributary creek, Shell Mountain Creek and eventually the South Fork Trinity River.

#### **IV. TREATMENT RECOMMENDATIONS**

##### **a. Management Treatments**

South Fork Cottonwood Creek Watershed – Based on field review and assessment, no immediate fisheries related treatments are proposed in this area. It is however recommended, that trail/stream intersections within the Yolla Bolly Wilderness be assessed and treated as needed to reduce the amount of sediment entering drainages.

Upper South Fork Trinity River Watershed – Straw mulching treatment areas were identified in the moderate and high burn severity areas north of Rainbow Ridge and south of the main unnamed tributary to Shell Mountain Creek (as described above). This treatment was developed by the soils specialist and fisheries concerns were incorporated into the design (see Soils specialist report for specific treatment proposal). It is recommended that all areas of appropriate slope that burned at moderate and high severity be treated. Treating these areas will address the majority of fine sediment source material. Erosion along untreatable steeper slopes is expected to occur, but will have a much lower impact to fish and aquatic resources as these areas consist of larger rock and limited fine sediments.

Roads in the Trough Fire area were assessed by the BAER team Engineer. Fisheries input was provided and consisted of recommendations to improve road drainage. Specific treatments were designed and described in the engineering report.

##### **b. Monitoring**

South Fork Cottonwood Creek Watershed – Based on field review and assessment, no immediate fisheries related monitoring is proposed in this area.

Upper South Fork Trinity River Watershed – Based on field review and assessment, no immediate fisheries related monitoring is proposed in this area.

c. Long-term project proposals / NFP

Cottonwood Creek Watershed – Support the continuation of long-term monitoring projects conducted by all federal, state and private groups. At this time we do not anticipate requesting any fisheries-specific funding.

Upper South Fork Trinity River Watershed – It is highly recommended that turbidity and sedimentation monitoring be implemented by the Shasta-Trinity National Forest near the confluence of Shell Mountain Creek and the South Fork. This could be easily accomplished by qualitative methods, such as photo points. This area has a history of erosion and debris slides and any increase in sediment delivered to the South Fork, as a result of the Trough Fire should be monitored.

## V. CONSULTATION

At this time, no formal consultation has been initiated, as it is not required by an assessment team. However, informal consultation did occur between U.S. Fish and Wildlife Service and the interagency BAER assessment team. Future activities (including BAER implementation) may require further consultation.

## VI. REFERENCES

- Brenda Olson. Personal Communication. 2007. U.S. Fish and Wildlife Service, Fisheries Biologist.
- CDFG (California Department of Fish and Game). 2004. South Fork Trinity River spring Chinook/Summer Steelhead Snorkel Survey Totals. (Unpublished memo to file by Patrick Garrison, Biologist, Department of Fish and Game - Northern California, North Coast Region). September 2, 2004
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- PWA (Pacific Watershed Associates). 1994. Action Plan for Restoration of the South Fork Trinity River Watershed and its Fisheries. Prepared for the U.S. Bureau of Reclamation and the Trinity River Task Force.
- (TCRCD) Trinity County Resource Conservation District. 2003. South Fork Trinity River Water Quality Monitoring Project - Agreement No. P0010340 Final Report. Prepared for California Department of Fish and Game by TCRCD, with assistance from Graham Matthews . Weaverville, CA. 77 pp.