

Summer Steelhead Surveys  
North Fork Trinity River  
Trinity County, California  
1978 - 1997

By  
Loren Everest  
Fishery Biologist

Weaverville Ranger District  
Shasta-Trinity National Forests

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## Abstract

Summer Steelhead surveys have been conducted on the North Fork Trinity River each year from 1978 to 1997 (except 1986) during the late summer period. Adult Steelhead were observed and counted by divers with mask and snorkel. From 1990 to 1997 steelhead distribution was mapped by reach and notes were taken by divers on habitat preference. Most years 100% of the river available to anadromous fish was surveyed, however in 1978, and 1987 total run size was extrapolated from partial counts.

Results showed that adult steelhead were present and counts ranged from a low of 57 in 1985 to a high of 1037 in 1991. The 19 year mean (excluding 1986) was 421 adult steelhead. Five year mean counts (or estimates) were used to detect trends in run size. These five year means show 278 steelhead in 1978-82 decreasing to 174 steelhead in 1983-87 increasing to 586 steelhead in 1988-92 and to 617 steelhead in 1992-97.

Steelhead distribution data shows that most reaches have held approximately the same proportion of the run each year with the exception of the uppermost reach (reach 1) which held proportionately fewer fish in 1992 and 1994. Extremely low flows were noted by surveyors in 1992 and 1994. Reach 3 shows a strong decreasing trend over the last four years, possibly the result of a reduction in pool depth due to filling with fine sediment.

## Introduction

The North Fork Trinity River is a large tributary to the mainstem Trinity River in northern California. The North Fork's watershed encompasses 151 square miles, its headwaters begin near Chilkoot Pass and flow in a southerly direction to join the Trinity Rivers' main stem at river mile 72.5. The North Fork is unique in that most of the watershed is located in the Trinity Alps Wilderness thus affording it a high degree of protection. The river canyon is steep sided and difficult to travel with few level areas, confining historic development to the East Fork of the North Fork and the lowermost areas of the North Fork. Historic disturbance was very limited on the North Fork when compared with other area streams. Only three historic mines are noted above the East Fork (Jones, 1981) . The only hydraulic mining adjacent to the main North Fork was at river mile 7 where the Keystone Mine operated near the present day Keystone Flat. The Molitor Mine was a small hydraulic mine, run by a single man, on a tributary to Grizzly Creek more than 3 miles off the main North Fork. Bob's Farm Mine was a quartz mine located on a tributary about 4 miles up Grizzly Creek. This level of historic disturbance is very light when compared to the East Fork of the North Fork or Canyon Creek. The East Fork of the North Fork had nine major mines located along eight miles of river and a flume that dewatered the river completely at the mouth. Canyon Creek had continuous hydraulic mining along the lower 13 miles and there were two dams that diverted most of the creek's summertime flow to flumes and ditches. Current access to the river between the East Fork and Hobo Gulch, a distance of about 15 miles, is from only two trail crossings. A single road nears the river at the Hobo Gulch campground and trailhead. Upstream from Hobo Gulch a trail parallels the river several hundred feet upslope.

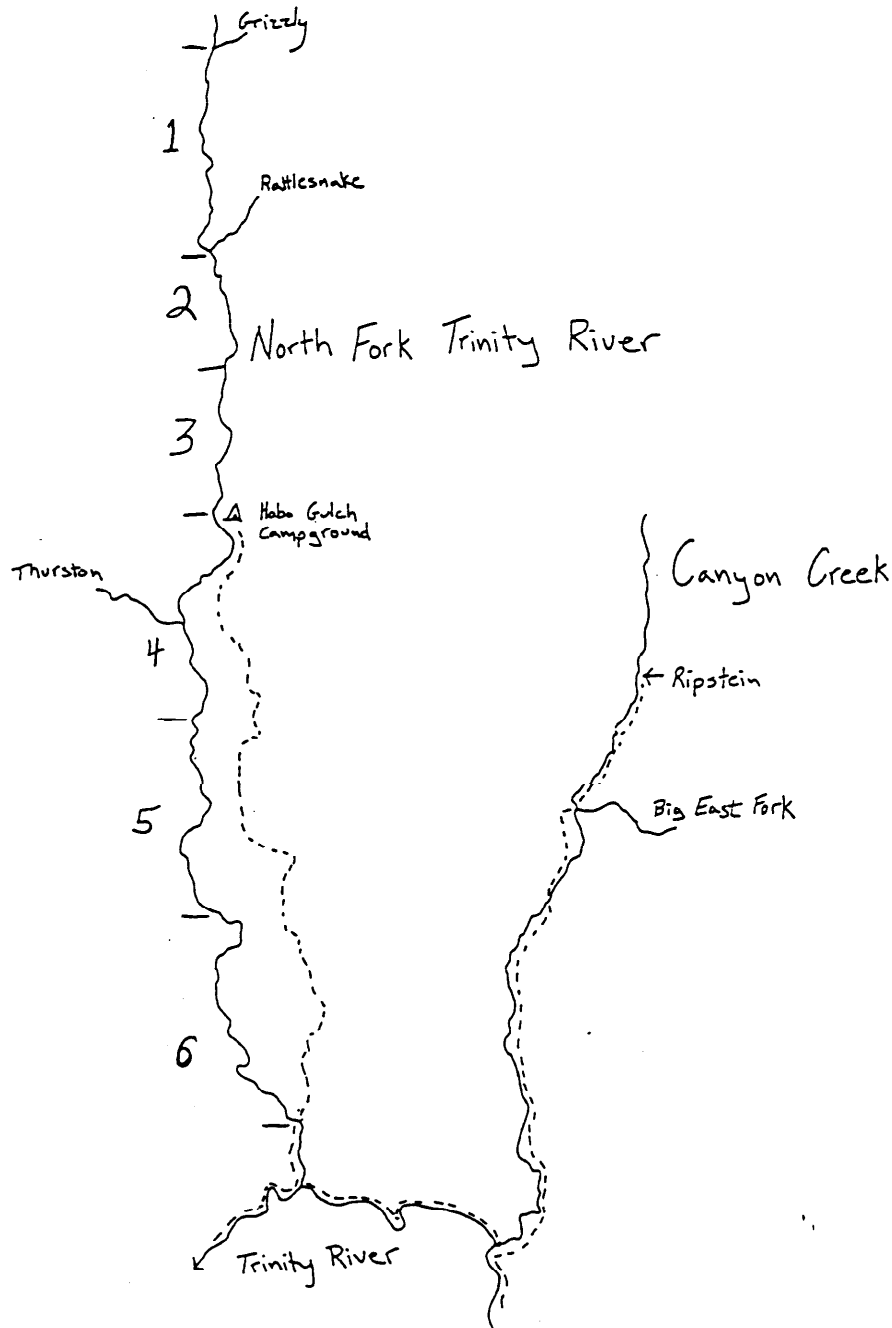
Fishes of the North Fork Trinity River include summer and fall run Steelhead (Oncorhynchus mykiss), spring and fall run Chinook salmon (Oncorhynchus tshawytscha), Coho salmon (Oncorhynchus kisutch), Brown trout (Salmo trutta), Klamath smallscale sucker (Catostomus rimiculus), and Speckled dace (Rhinichthys osculus). Several tributaries to the North Fork are large enough for anadromous fish to ascend and are occasionally surveyed, however few adults have ever been found.

## Methods

Methods varied slightly by year due to different agencies and personnel, but in general the snorkel survey was begun at the upper extent of anadromous fish use and snorkelers counted fish in a downstream direction. Some years a single team of divers have counted fish in the entire river over several days, some years several teams of divers have surveyed individual reaches to cover the entire river in a single day. The surveys occurred in the late summer, usually in August. The river was not surveyed in 1986. Two years, 1978 and 1987, population estimates were made from less than a 100% survey of the river. Several years fish were counted by two different agencies (Forest Service and California Department of Fish and Game), the higher count is reported here.

Distribution data was recorded by USFS crews from 1990 to 1997. From 1990 to 1995 the locations of individual fish were marked on 1:24,000 topographic maps. In 1996 and 1997 standardized reaches that one crew could cover in one day were used and fish counts were reported by reach. Reaches are numbered downstream (Figure 1). Reach 1 runs from Grizzly Creek to Rattlesnake Creek, Reach 2 runs from Rattlesnake Cr. to China Creek, Reach 3 runs from China Creek to Hobo Gulch, Reach 4 runs from Hobo Gulch to Raymond Flat, Reach 5 runs from Raymond Flat to Waldorf Crossing, Reach 6 runs from Waldorf Crossing to the Helena Bridge. Counts from 1990 to 1995 were converted to the 1996-97 reaches.

Temperature measurements have been taken during some of the recent surveys but this data is spotty and incomplete. Through temperature investigations are presently being conducted.



Results

Counts for each year are presented in figure 2, 1978 and 1987 are not actual counts but are run estimates developed from partial surveys.

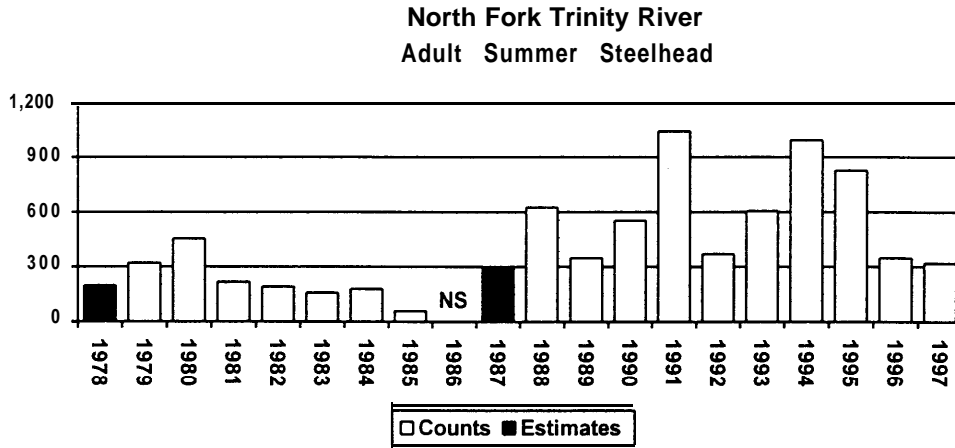


Figure 2. Steelhead counts by Year

Figures 2 through 7 show the proportion of the total count that was present in each reach at the time of survey in 1990-1997.

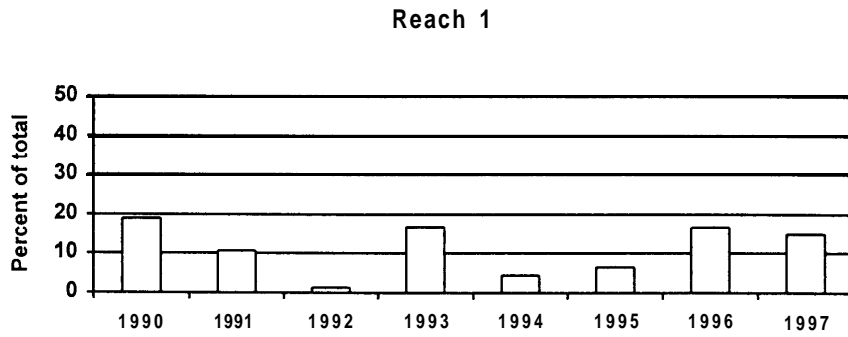


Figure 3.  
Percent of total count observed in reach 1, Grizzly Creek to Rattlesnake Creek.

### Reach 2

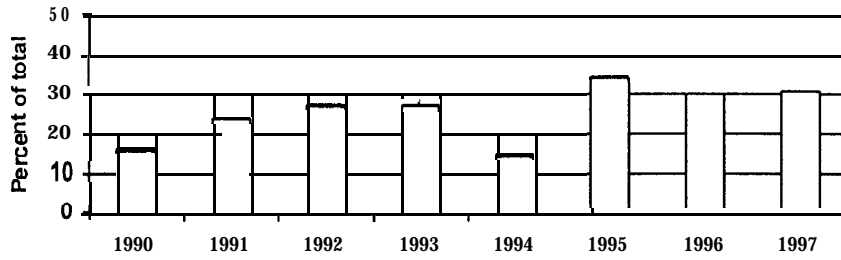


Figure 4.

Percent of total count observed in reach 2, Rattlesnake Creek to China Creek.

### Reach 3

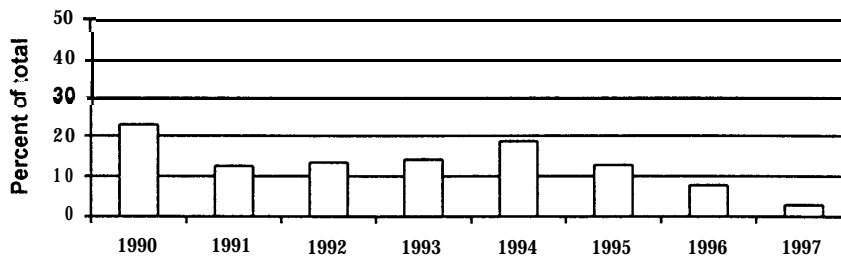


Figure 5.

Percent of total count observed in reach 3, China Creek to Hobo Gulch.

### Reach 4

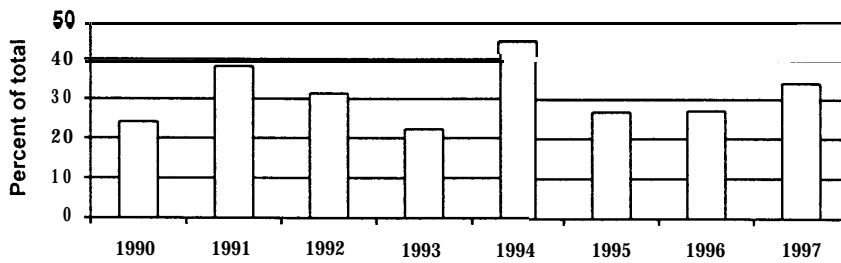


Figure 6.

Percent of total count observed in reach 4, Hobo Gulch to Raymond Flat.

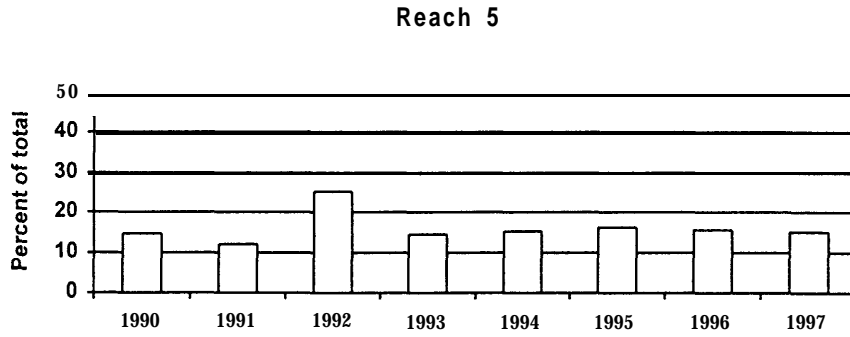


Figure 7.  
Percent of total count observed in reach 5, Raymond Flat to Waldorf Crossing.

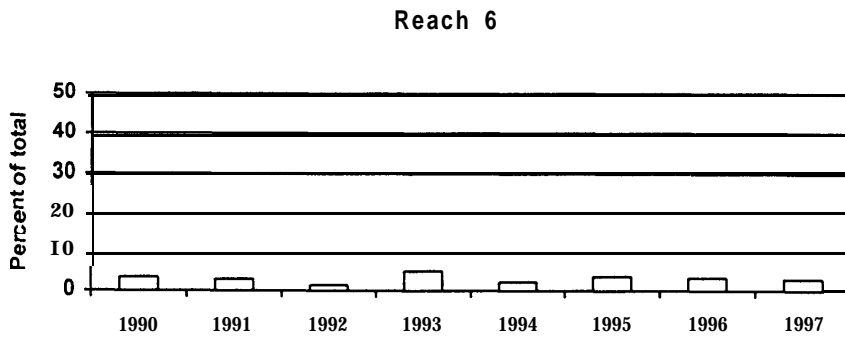


Figure 8.  
Percent of total count observed in reach 6, Waldorf Crossing to Helena Bridge.

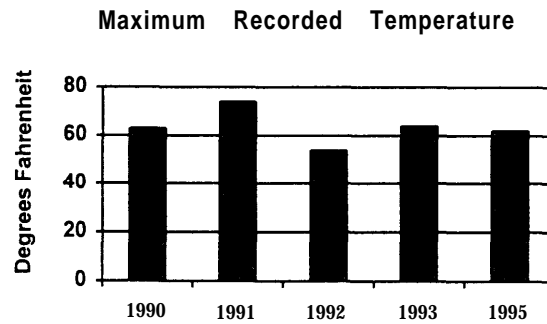


Figure 9.  
Maximum afternoon water temperatures 1990- 1995. No temperature measurements were taken in 1994.

## Discussion

### Total Count

Results of the counts showed that adult steelhead were present and the number of fish counted ranged from a low of 57 in 1985, to a high of 1037 in 1991. These numbers cannot be considered a true count of the run because time constraints limit the amount of searching that can occur. It is likely that run sizes may be slightly higher due to fish hiding under boulders and in undercut banks. Counts of very large runs may vary due to the difficulty of counting individual fish when there may be 70 or more individuals holding in a single pool. Other methods have not been used to validate the counts due to the poor access and sensitivity of the fish. However this does not detract from the usefulness of using these counts as a index to be compared year to year. The 20 year mean (excluding 1986) was 421 adult steelhead. Five year mean counts (or estimates) were used to detect trends in run size.

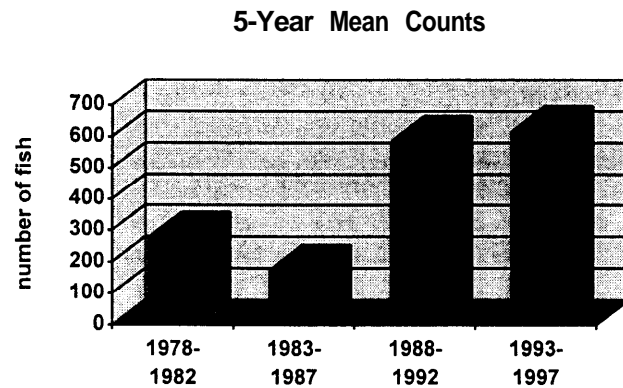


Figure 10.

These five year mean counts show 278 steelhead in 1978-82 decreasing to 174 steelhead in 1983-87 increasing to 586 steelhead in 1988-92 and to 617 steelhead in 1992-97. The North Fork Trinity river has consistently ranked in the top 5 rivers in the state (except in 1982, when it was 8th) in summer steelhead counts. Mean rank was calculated for each 5 year period used in trend analysis and the North Fork has moved up in mean rank each time (Table 1).

Period	Mean rank
1978-1982	4.6
1983-1987	4.0
1988-1992	2.0
1993-1997	2.0

Table 1.



The improvement in mean rank is a function of both the increasing runs on the North Fork and decreasing runs on other summer steelhead rivers in California. The North Fork had the highest summer steelhead counts recorded in the state in 1990, 1991, and 1994.

#### Fish Distribution

Results of the distribution analysis indicate that the distribution of fish in the North Fork changes relative little from year to year and that the most important habitat for the summer steelhead is in reaches two and four. Use of reach one appears to be influenced by water level, extreme low flows were noted by surveyors in 1992 and 1994, the years of lowest use. Reach three requires more investigation as use has dropped dramatically in the last several years, surveyors have reported that pools are being filled with fine sediment, losing both depth and volume. Low use of reach six may be related to temperature as the highest measurements have come from this reach. Some years temperatures have exceeded 70 degrees Fahrenheit.

## References

Jones, Alice Goen, 1981. Trinity County Historic Sites. Intercollegiate Press, Shawnee Mission, Kansas. 422 pg.

# NF Trinity River Summer Steelhead

Moving Average

