

## Results of Mainstem Spawner Surveys Conducted from 1996 to 2000 by Hoopa Valley Tribal Fisheries Department

### Introduction

From 1996 through 2000, Hoopa Tribal Fisheries Department conducted fall surveys in the mainstem Trinity River to document spawning ground use by fall chinook. The geographical extent of the spawner surveys are listed below:

- 1996 – South Fork / Trinity River confluence to Tish Tang (23.6 km)
- 1997 – Hawkins Bar to Red Rock (52.5 km)
- 1998 – No information available
- 1999 – Hawkins Bar to Tish Tang (36.7 km)
- 2000 – Hawkins Bar to Trinity / Klamath River Confluence (63 km)

Five river reaches were defined, based on boat launch and haul-out locations and other geographical units (i.e. Willow Creek weir). Reach lengths varied from 9.4 to 15.8 kilometers. Surveys were carried out in November 1996, November and December 1997, December 1999, and October through December 2000. At least two of the river reaches were surveyed each fall, excluding 1998. All five river reaches were surveyed in the fall of 2000.

### Methods

The method of the survey was that of visual observation of spawning redds, carcasses, and live chinook from a boat. Either a 16 foot drift boat or a 14-foot cataraft was manned by a biologist and a fisheries technician, who rotated between observing or rowing. The observer was equipped with polarized glasses and was stationed at the bow of the boat. The boat was coursed down the middle of the river while the observer surveyed from bank to bank for the presence of redds, carcasses, and live fish. Locations of spawning activity were noted on maps and tabulated into field notes. To minimize subjectivity of redd determination, only areas of disturbed gravel greater than 0.5 m<sup>2</sup> were counted as redds. Water clarity, river temperature, and weather conditions were noted for each survey.

Some tasks were accomplished while wading or walking. The portion of river from Hawkins Bar Bridge to the Hawkins Bar Access is accessible for survey only from the bank. Carcasses that were recovered, were often done so while walking or wading. Carcasses were examined for spaghetti tags, adipose fin clips, and fork length was recorded. All spaghetti tags that were recovered were sent back to the California Department of Fish and Game. Heads were collected from carcasses that had an adipose clip for coded wire tag information.

Twenty-four floats were completed in the four autumns. Two river reaches were surveyed in 1996, four reaches surveyed in 1997, four reaches surveyed in 1999, and all five reaches were surveyed in 2000 (Table 1). Geographical limits of the

reaches are shown in Table 2. A float in 1996 surveyed the reach from Sandy Bar on the South Fork Trinity River to the confluence. This reach was not surveyed in subsequent years due to poor water clarity.

## **Results**

Total redds and carcasses observed in reaches for each survey are listed in tables 3 and 5. Since the reaches surveyed differ in length, relative densities of observations (observations per kilometer) are used for comparison of abundance between reaches (Table 4). The mean density of redds by reach and survey year is illustrated in figure six.

Several trends are evident from examination of the data:

- The relative abundance of redds decline from upstream to downstream.
- The year of highest abundance of redds was 2000, followed by 1997, 1999, and 1996, in that order. This trend follows escapement estimates.
- The relative abundance of redds appears to be only slightly correlated with the relative abundance of carcasses across years and reaches.

Salmon carcasses were examined for weir tags and adipose fin clips whenever possible. Many of the carcasses were decayed making observations of fin clips impossible. From all survey years only one chinook carcass from 1997 had an adipose fin clip. In 2000 a coho salmon and steelhead were recovered with weir tags, both of which were unspawned.

## **Discussion**

Relatively high densities of redds were observed for reaches A and B for all survey years (Table 3 and Figure 6). Examination of the data show that redds was concentrated between Quinby Creek and the Salyer Bridge for reach A. Reach B redds was concentrated just below the Willow Creek weir. It was noted during the 2000 survey that the Fountain Ranch area which normally is an active spawning ground contained relatively few redds. It was also noted that the Fountain Ranch area substrate had been silted over. The question has been raised previously whether or not if the Willow Creek weir stimulated spawning activity in salmon that would otherwise have spawned further upstream (perhaps to a perceived blockage of migration). Conversely, the weir could have been placed in an area that is much used for spawning. It was observed that just below the weir there were good spawning substrate and river conditions (depth and flow).

The question still remains about spawner abundance in Reach E (Red Rock to Weitchpec). This reach was surveyed once in 1992 and more thoroughly in 2000, with no information for other years. Only a few sections in Reach E have adequate spawning substrate, which are near Norton and Bull Creeks. Most of Reach E substrate can be characterized as cobble or sand. Reach E can be

hazardous during high flows, making surveys possible during the early part of the fall salmon run or in years with low river flow.

Table 1. Trinity River mainstem spawner surveys; 1996, 1997, 1999, and 2000.

Date	Reach				
	A	B	C	D	E
<b>1996</b>					
5-Nov		X	X		
<b>1997</b>					
7-Nov	X	X			
13-Nov			X		
30-Dec				X	
<b>1999</b>					
7-Dec	X				
15-Dec			X		
17-Dec	X	X			
29-Dec			X		
<b>2000</b>					
4-Oct	X	X	X	X	
11-Oct					X
18-Oct	X	X	X	X	
26-Oct					X
2-Nov	X	X	X	X	
8-Nov					X
15-Nov	X	X			
16-Nov			X	X	
22-Nov					X
4-Dec	X	X			
6-Dec			X	X	
7-Dec					X
13-Dec	X	X			

Table 2. Geographical extents of spawner survey floats.

REACH	Geographical Extent	Distance
A	Hawkins Bar to Willow Creek Weir	13.5
B	Willow Creek Weir to Kimtu	9.4
C	Kimtu to Tish Tang	13.8
D	Tish Tang to Red Rock	15.8
E	Red Rock to Weitchpec	10.5

km

Table 3. Redds observed during surveys of Trinity River mainstem; 1996, 1997, 1999, and 2000.

Date	Reach				
	A	B	C	D	E
<b>1996</b> 5-Nov		1	30		
<b>1997</b> 7-Nov 13-Nov 30-Dec	72	134	38	11	
<b>1999</b> 7-Dec 15-Dec 17-Dec 29-Dec	17 42	13	2 0		
<b>2000</b> 4-Oct 11-Oct 18-Oct 26-Oct 2-Nov 8-Nov 15-Nov 16-Nov 22-Nov 4-Dec 6-Dec 7-Dec 13-Dec	7 3 9 30 83 109	0 2 24 58 76 90	12 4 17 35 182	1 0 0 12 74	19 5 11 4 10

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E	Red Rock to Weitchpec	10.5

Table 4. Density of redds observed during mainstem Trinity River spawner surveys.

Date	Redds per Kilometer				
	A	B	C	D	E
<b>1996</b> 5-Nov		0.11	2.17		
<b>1997</b> 7-Nov 13-Nov 30-Dec	5.33	14.26	2.75	0.70	
<b>1999</b> 7-Dec 15-Dec 17-Dec 29-Dec	1.26 3.11	1.38	0.14 0		
<b>2000</b> 4-Oct 11-Oct 18-Oct 26-Oct 2-Nov 8-Nov 15-Nov 16-Nov 22-Nov 4-Dec 6-Dec 7-Dec 13-Dec	0.52 0.22 0.67 2.22 6.15 8.07	0 0.21 2.55 6.17 8.09 9.57	0.87 0.29 1.23 2.54 13.19	0.06 0 0 0.76 4.68	1.81 0.48 1.05 0.38 0.95

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Table 5. Chinook carcasses observed during surveys of Trinity River mainstem; 1996, 1997, 1999, and 2000.

Date	Reach				
	A	B	C	D	E
<b>1996</b>					
5-Nov		0	3		
<b>1997</b>					
7-Nov	8	5			
13-Nov			13		
30-Dec				0	
<b>1999</b>					
7-Dec	0				
15-Dec			0		
17-Dec	6	0			
29-Dec			0		
<b>2000</b>					
4-Oct	1	0	0	0	
11-Oct					0
18-Oct	2	0	0	0	
26-Oct					0
2-Nov	0	0	0	0	
8-Nov					0
15-Nov	2	4			
16-Nov			1	0	
22-Nov					0
4-Dec	7	5			
6-Dec			0	6	
7-Dec					0
13-Dec	1	0			

REACH	Geographical Extent	Distance <sup>km</sup>
A	Hawkins Bar to Willow Creek Weir	13.5
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Figure 6. Redd density per kilometer by reach and year.

