STREAM INVENTORY REPORT

CHADD TRIBUTARY CREEK

WATERSHED OVERVIEW

This unnamed tributary to Chadd Creek is tributary to Chadd Creek, tributary to the Eel River, located in Humboldt County, California. The tributary's legal description at the confluence with Chadd Creek is T1S R2E S4. Its location is 40°24'24" N. latitude and 123°57'07" W. longitude. Chadd tributary Creek is a second order stream and has approximately 1.2 miles of blue line stream, according to the USGS Redcrest 7.5 minute quadrangle. The stream drains a watershed of approximately 1.1 square miles. Redwood forest dominates the watershed. The watershed is privately owned and is managed for timber production. Vehicle access exists from State Highway 101 to the Avenue of the Giants at the Pepperwood exit. The Avenue crosses Chadd Creek about two miles south of Pepperwood.

METHODS

See the 1992 Chadd Creek Stream Inventory Report.

HABITAT INVENTORY RESULTS

* ALL TABLES AND GRAPHS ARE LOCATED AT THE END OF THE REPORT *

The habitat inventory of June 25, and July 7 and 8, 1992, was conducted by Tony Sartori and Erick Elliot (CCC). The total length of the stream surveyed was 2,818 feet.

Flows were not measured on Chadd tributary Creek.

Chadd tributary Creek is a B4 channel type for the first 2,766 feet then changes to a A3 channel type for last 52 feet surveyed. B4 channels are moderate gradient (1.5-4.0%), well confined streams, with unstable stream banks. A3 channels are steep (4-10%), deeply incised channels with very stable bedrock controlled stream banks.

Water temperatures ranged from 55 to 59 degrees fahrenheit. Air temperatures ranged from 62 to 73 degrees fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool

habitat types. By percent **occurrence**, riffles made up 52%, flatwater types 31%, and pools 17% (Graph 1). Riffles made up 75.1% of the total survey **length**, flatwater types 17.3%, and pools 7.6% (Graph 2).

Ten Level IV habitat types were identified. The data are summarized in Table 2. The most frequent habitat types by percent **occurrence** were low gradient riffles, 46.0%; runs, 23.0%; and plunge pools, 12.0% (Graph 3). By percent total **length**, low gradient riffles made up 68.6%, runs 10.0%, and step runs 7.4%.

Seventeen pools were identified (Table 3). Scour pools were most often encountered at 76.5%, and comprised 68.8% of the total length of pools (Graph 4).

Table 4 is a summary of maximum pool depths by pool habitat types. Depth is an indicator of pool quality. Three of the 54 pools (18%) had a depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 14 pool tail-outs measured, two had a value of 1 (14.3%); 5 had a value of 2 (35.7%); 5 had a value of 3 (35.7%); and 2 had a value of 4 (14.3%). On this scale, a value of one is the best for fisheries (Graph 6).

A shelter rating was calculated for each habitat unit and expressed as a mean value for each habitat type within the survey using a scale of 0-300. Riffle habitat types had the highest shelter rating at 53.1. Pool habitats followed with a rating of 46.8 (Table 1). Of the pool types, the main-channel pools had the highest mean shelter rating at 80.0, and scour pools rated 40.4 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Boulders are the dominant cover type in Chadd tributary Creek and are extensive. Large wood is lacking in nearly all habitat types. Graph 7 describes the pool cover in Chadd tributary Creek.

Table 6 summarizes the dominant substrate by habitat type. Gravel was the dominant substrate observed in 18 of the 46 low gradient riffles (39.1%). Small cobble was the next most frequently observed dominant substrate type, and occurred in 37.0% of the low gradient riffles (Graph 8).

Eight percent of the survey reach lacked shade canopy. Of the 92% of the stream covered with canopy, 63% was composed of deciduous trees, and 37% was composed of coniferous trees. Graph 9 describes the canopy in Chadd tributary Creek.

Table 2 summarizes the mean percentage of the right and left stream banks covered with vegetation by habitat type. For the stream reach surveyed, the mean percent right bank vegetated was 73.1%. The mean percent left bank vegetated was 83.8%. The dominant elements composing the structure of the stream banks consisted of 1.2% bedrock, 0.7% boulder, 0.7% cobble/gravel, 14.8% bare soil, 3.2% grass, and 59.4% brush. Additionally, 5.2% of the banks were covered with deciduous trees, and 14.8% with coniferous trees, including downed trees, logs, and root wads (Graph 10).

BIOLOGICAL INVENTORY RESULTS

One site was electrofished on June 13, 1992 in Chadd tributary Creek. The unit was sampled by Tony Sartori, John Crittenden, and Russ Irvin (CCC). All measurements are fork lengths.

The site sampled was habitat unit 1, a low gradient riffle. This site had an area of 198 sq ft, and a volume of 39.6 cu ft. The unit yielded 4 steelhead, ranging from 52 to 66mm.

DISCUSSION

Chadd tributary Creek has two channel types: a B4 and an A3. The high energy and steep gradient of the A3 channel type and the unstable and relatively fine river terraces of the B4 channel type are characteristics generally not suitable for instream enhancement structures. Any structure sites must be selected with care because of the high stream energy which can create problems with stream bank erosion and structure stability.

The water temperatures recorded on the survey days June 25 and July 7 and 8, 1992 ranged from 55° F to 59° F. Air temperatures ranged from 62° F to 73° F. This is a very good water temperature regime for salmonids. To make further conclusions, temperatures would need to be monitored throughout the warm summer months, and more extensive biological sampling conducted.

Flatwater habitat types comprised 17.3% of the total **length** of this survey, riffles 75.1%, and pools 7.6%. The pools are relatively shallow with only 3 of the 17 pools having a maximum depth greater than 2 feet. However, in coastal coho and steelhead streams, it is generally desirable to have primary pools comprise approximately 50% of total habitat. Therefore, installing structures that will increase or deepen pool habitat is recommended for locations where their installation will not be threatened by high stream energy, or create stream bank

erosion.

Seven of the 14 pool tail-outs measured had embeddedness ratings of 3 or 4. Only one had a 1 rating. Embeddedness in excess of 26%, a rating of 2 or more, is considered poor quality for fish habitat. In Chadd tributary Creek, sediment sources should be mapped and rated according to their potential sediment yields, and control measures taken.
The mean shelter rating for pools was low with a rating of 46.8. The shelter rating in the flatwater habitats was slightly lower at 43.4. However, a pool shelter rating of approximately 100 is desirable. The relatively small amount of cover that now exists is being provided primarily by boulders in all habitat types. Additionally, large and small woody debris contribute a small amount. Log and root wad cover structures in the pool and flatwater habitats are needed to improve both summer and winter salmonid habitat. Log cover structure provides rearing fry with protection from predation, rest from water velocity, and also divides territorial units to reduce density related competition.

Thirty-five of the 46 low gradient riffles had gravel or small cobble as the dominant substrate. This is generally considered good for spawning salmonids.

The mean percent canopy for the stream was 92%. This is a high percentage of canopy, since 80 percent is generally considered optimum in these north coast streams. In areas of stream bank erosion, planting endemic species of coniferous and deciduous trees, in conjunction with bank stabilization, is recommended.

RECOMMENDATIONS

1) Chadd tributary Creek should be managed as an anadromous, natural production stream.

2) Where feasible, design and engineer pool enhancement structures to increase the number of pools. This must be done where the banks are stable or in conjunction with stream bank armor to prevent erosion.

3) Increase woody cover in the pools and flatwater habitat units. Most of the existing cover is from boulders. Adding high quality complexity with woody cover is desirable and in some areas the material is at hand.

4) Active and potential sediment sources related to the road system need to be identified, mapped, and treated according to their potential for sediment yield to the stream and its tributaries.

PROBLEM SITES AND LANDMARKS

The following landmarks and possible problem sites were noted. All the distances are approximate and taken from the beginning of the survey reach.

0'	Begin survey at confluence Chadd Creek. Young-of-the-year (YOY) observed.
192'	Seven log stringer bridge 8' wide x 29' long x 7' high crosses channel 26' into unit. Bridge in disrepair.
248'	Four feet high plunge over natural log weir. Log notched 1' in center.
360'	Cut in right bank 6' high with bare soil exposed, contributing fines.
542'	Large woody debris accumulation (LDA) 15' wide x 5' high x 5' long retaining gravel 5' wide x 3' high x 20' long.
639'	LDA at the upstream end of unit 15' wide x 5' high x 5' long retaining gravel 20' wide x 3' high x 15' long.
989'	Concrete raceway 10' wide x 8' tall x 14' long, with 2' x 2' notch in mouth creating a 3' drop into low gradient riffle.
1289'	Concret culvert 8' diameter x 10' long. No baffles.
1705'	Bedrock plunge 7' wide x 5' high. Gravel retention above plunge 7' high by 30' long.
1915'	Plunge 4' high over log weir.
2118'	Plunge 6' high over log.
2766'	Gradient increases to 30% over last 30 feet.
2818'	Gradient increases rapidly. Few YOY observed. End of survey.