STREAM INVENTORY REPORT

DOCTORS CREEK, 1991

INTRODUCTION

A stream inventory was conducted during the summer of 1991 on Doctors Creek to assess habitat conditions for anadromous salmonids. The objective of the habitat inventory was to document the habitat available to anadromous salmonids in Doctors Creek. After analysis of the information and data gathered, stream restoration and enhancement recommendations are presented.

There is no known record of adult spawning surveys being conducted on Doctors Creek. The objective of this report is to document the current habitat conditions, and recommend options for the potential enhancement of habitat for coho salmon and steelhead trout.

WATERSHED OVERVIEW

Doctors Creek is a tributary to Lynch Creek, tributary to Michaels Creek, tributary to Hollow Tree Creek, tributary to the South Fork Eel River, located in Mendocino County, California (Figure 1). The legal description at the confluence with Lynch Creek is T22N R17W S14. Doctors Creek is a first order stream. The total length of blue line stream, according to the USGS Leggett quadrangle is 0.6 miles.

Doctors Creek drains a watershed of approximately 0.54 square miles. A mixed redwood and douglas fir forest dominates the watershed. The watershed is owned by the Louisiana-Pacific Corporation and is managed for timber production. Vehicle access to Doctors Creek exists from State Highway 1, via the Hales Grove Road, and is approximately eight miles beyond a locked gate controlled by Louisiana-Pacific Corporation.

METHODS

The habitat inventory conducted in Doctors Creek follows the methodology as presented in the California Salmonid Stream Habitat Restoration Manual (Flosi and Reynolds). The California Conservation Corps (CCC) Technical Advisors conducting the inventory were trained in standardized habitat inventory methods by the California Department of Fish and Game (DFG). Doctors Creek personnel were trained in May and June, 1991, by Gary Flosi and Scott Downie.

HABITAT INVENTORY COMPONENTS

A standardized habitat inventory form has been developed for use in California stream surveys

and can be found in the California Salmonid Stream Habitat Restoration Manual. This form was used in Doctors Creek to record measurements and observations. There are nine components to the inventory form. For specific information on the methodology used see the Michaels Creek Report.

DATA ANALYSIS

Data from the habitat inventory form is entered into Habtype, a dBASE 3+ data entry program developed by the Department and Fish and Game. From Habtype, the data is summarized by Habtab a dBASE 4.1 program in development by DFG.

The Habtab program produces the following summary tables:

- Riffle, flatwater, and pool habitat types
- Habitat types and measured parameters
- Pool types
- Maximum pool depths by habitat types
- Dominant substrates by habitat types
- Mean percent shelter by habitat types

Graphics are produced from the tables using Lotus 1,2,3. Graphics developed for Doctors Creek include:

- Riffle, flatwater, pool habitats by percent occurrence
- Riffle, flatwater, pool habitats by total length
- Total habitat types by percent occurrence
- Pool types by percent occurrence
- Total pools by maximum depths
- Embeddedness
- Pool cover by cover type
- Dominant substrate in low gradient riffles
- Percent canopy
- Bank composition by composition type

HABITAT INVENTORY RESULTS

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

The habitat inventory of July 23 and 24, 1991, was conducted by Shea Monroe and John Crittenden (CCC). The total length of the stream surveyed was 823 feet.

Doctors Creek is a B3 channel type for the 823 feet surveyed. B3 channels have a moderate gradient (1.5 - 4.0%), have unstable rejuvenating slopes, are well confined, and have a cobble/gravel channel.

Water temperatures ranged from 57 to 58 degrees fahrenheit. Air temperatures ranged from 72 to 82 degrees fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. By **percent occurrence**, riffles make up 32.4%, flatwater types make up 20.6%, pools make up 38.2%, and dry make up 8.8%. (Graph 1). Flatwater habitat types made up 32.3% of the total **survey length**, riffles 36.7%, pools 21.9%, and 9.1% was dry (Graph 2).

Eight 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, 32.4%; mid-channel pools, 29.4%; and step runs, 11.8% (Graph 3). By percent **total length**, low gradient riffles made up 36.7%, mid-channel pools 17.0%, and step runs 27.2%.

Thirteen pools were identified (Table 3). Main channel pools were most often encountered at 76.9% and comprised 77.8% 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. Two of the 13 pools (15.4%) had a depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at 10 of the 11 pool tail-outs. Of the pool tail-outs measured, 3, or 30% had a value of 2; 5, or 50.0% had a value of 3; and 2, or 20.0% had a value of 4. 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. Pool habitat types had the highest shelter rating at 68.5. Flatwater habitats followed with a rating of 46.4 (Table 1). For the pool types, the main channel pools had the highest mean shelter rating at 83.5, scour pools had a mean shelter rating of 25.0, and backwater pools had a rating of 5.0 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Large and small woody debris are the dominant cover types in Doctors Creek. Graph 7 describes the pool cover in Doctors Creek.

Table 6 summarizes the dominant substrate by habitat type. Gravel was the dominant substrate observed in 8 of the 11 low gradient riffles (72.7%). Large cobble was the next most frequently observed dominant substrate type, and occurred in 18.2% of the low gradient riffles (Graph 8).

Nearly 34% of Doctors Creek lacked shade canopy. Of the 66.5% of the stream that was covered with canopy, 44.9% was composed of deciduous trees, and 21.6% was composed of coniferous trees. Graph 9 describes the canopy in Doctors Creek.

Table 2 summarizes the mean percent of the right and left stream banks covered with vegetation by habitat unit type. For the stream reach surveyed, the mean percent right bank vegetated was 79.9%. The mean percent left bank vegetated was 67.6%. The elements composing the structure of the stream banks consisted of 11.8% bedrock, 16.2% bare soil, 33.8% grass, 25.0% brush. Additionally, 2.9% of the banks were composed of deciduous trees, and 10.3% of coniferous trees, including downed trees, logs, and root wads (Graph 10).

DISCUSSION

The B3 channel type is unsuitable for most stream enhancement structures. For the most part B3 channels are found in moderate gradient stream reaches, with unstable stream banks, and a high sediment supply.

The water temperatures recorded on the survey days ranged from 57 F to 58 F. Air temperatures ranged from 72 F to 82 F. This is a very good temperature regime for salmonids. To make any further conclusions, temperatures would need to be monitored throughout the warm summer months.

Riffle habitat types comprised 36.7% of the total length of this survey, flatwater 32.3%, and pools 21.9%. The pools are relatively shallow with 2 of the 13 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. Structures designed to increase the number of pools are not recommended due to the unsuitability of the B3 channel type for stream enhancement structures and the numerous log debris accumulations.

Seven of the 11 pool tail-outs measured had embeddedness ratings of 3 or 4. No pool tail-outs had a 1 rating. Embeddedness in excess of 26%, a rating of 2 or more, is considered poor quality for fish habitat. In Doctors 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 68.5. The shelter rating in the flatwater habitats was 46.4. A pool shelter rating of approximately 100 is desirable. The majority of the cover is provided by large and small woody debris. Additional 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.

Eight of the eleven low gradient riffles had gravel as the dominant substrate. Gravel is defined as 0.08 to 2.5" in diameter. This is generally on the low end of the size substrate considered desirable for spawning salmonids.

The mean percent canopy for the stream was 67%. This is a relatively high percentage of canopy, since 80 percent is generally considered optimum in these streams. In areas of stream bank erosion, planting endemic species of coniferous and deciduous trees, in conjunction with bank stabilization projects, is recommended.

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 with Lynch Creek.

155 Log debris accumulation (LDA) retaining gravel and small cobble.

164 (LDA) 14' wide x 5' long x 6' high.

318 5' bedrock plunge entire width of channel into pool.

335 Fallen log (23' x 3') retaining gravel and sand at top of pool.

379 LDA 20' wide x 15' long x 6' high, retaining gravel and small woody debris.

450 LDA 30' wide x 40' long x 10' high, retaining fines and small woody debris. Left bank erosion 30' long x 30' high, depositing fines and gravel. Spring in left bank.

557 LDA 13' wide x 15' long x 4' high.

811 LDA 25' wide x 7' long x 3' high.

823 End of survey.

RECOMMENDATIONS

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

2) There are numerous log debris accumulations present on Doctors Creek that are retaining fine sediment. The modification of these debris accumulations is desirable, but must be done in a manner that will not release an overabundance of fine sediment into the system.

3) Identified sources of stream bank erosion should be treated to reduce the amount of fine sediments entering the stream.

4) Increase woody cover in the pools and flatwater habitat units. Adding high quality complexity with woody cover is desirable and in some areas the material is at hand.