STREAM INVENTORY REPORT

NORTH FORK CUNEO CREEK

INTRODUCTION

A stream inventory was conducted during the summer of 1991 on the North Fork of Cuneo Creek to assess habitat conditions for anadromous salmonids. The inventory was conducted in two parts: habitat inventory and biological inventory. The objective of the habitat inventory was to document the habitat available to anadromous salmonids in North Fork Cuneo Creek. The objective of the biological inventory was to document the salmonid species present and their distribution. After analysis of the information and data gathered, stream restoration and enhancement recommendations are presented.

There is no known record of adult spawning surveys having been conducted on the North Fork Cuneo Creek. The objective of this report is to document the current habitat conditions, and recommend options for the enhancement of habitat for chinook salmon, coho salmon and steelhead trout.

WATERSHED OVERVIEW

North Fork Cuneo Creek is a tributary to Cuneo Creek, a tributary to Bull Creek, a tributary to the South Fork of the Eel River, located in Humboldt County, California (Figure 1). North Fork Cuneo Creek's legal description at the confluence with Cuneo Creek is T01S R01E S35. Its location is 40°20'16" latitude and 124°02'14" longitude. North Fork Cuneo Creek is a second order stream. The total length of blue line stream, according to the USGS Bull Creek 7.5 minute quadrangle is 2.1 miles. North Fork Cuneo Creek drains a watershed of approximately 1.67 square miles. Elevations range from about 520 feet at the mouth of the creek to 2,500 feet in the headwater areas. Redwood forest dominates the watershed. The watershed is owned by the State of California and is part of Humboldt Redwoods State Park. Vehicle access exists from State Highway 101, via the Bull Creek/Mattole Road to the Cuneo Campground Road, approximately seven miles west of Highway 101. After approximately one mile, this road ends and foot access to the mouth of the North Fork Cuneo Creek exists by crossing the main stem Cuneo Creek.

METHODS

The habitat inventory conducted in North Fork Cuneo Creek follows the methodology as presented in the California Salmonid Stream Habitat Restoration Manual (Flosi and Reynolds). The inventory was conducted by two person teams. 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). North Fork Cuneo 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 North Fork Cuneo Creek to record measurements and observations. There are nine components to the inventory form. For specific information on the methods used see the Cuneo Creek report.

BIOLOGICAL INVENTORY

For specific information on the methods used for biological inventory see the Cuneo Creek report.

DATA ANALYSIS

Data from the habitat inventory form are entered into Habitat Runtime, a dBASE 4.1 data entry program developed by the California Department of Fish and Game. This program processes and summarizes the data, and produces the following six 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 North Fork Cuneo 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

North Fork Cuneo Creek

- Percent canopy
- Bank composition by composition type

HABITAT INVENTORY RESULTS

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

The habitat inventory of July 12, 15, and 16, 1991, was conducted by Jay Miller, Steve Liebhardt, Craig Mesman, and Jerry Suissa (CCC). The total length of the stream surveyed was 4,149 feet, with an additional 251 feet of side channel.

North Fork Cuneo Creek is a B2 channel type for the first 3,721 feet from the confluence with Cuneo Creek, then it changes to an A2 for the remaining 428 feet of the stream reach surveyed. B2 channels are moderate gradient (1.0 - 2.5%), moderately confined streams, with stable stream banks. A2 channels are steep and very well confined, and also have stable banks.

Water temperatures ranged from 57 to 64 degrees fahrenheit. Air temperatures ranged from 63 to 85 degrees fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. By percent **occurrence**, riffles make up 35.7%, flatwater types make up 32.1%, and pools make up 32.1% (Graph 1). Riffles make up 38.8% of the total **length**, flatwater habitats make up 40.6%, pools make up 20.6% (Graph 2).

Eleven 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, 27.7%, step runs, 19.6%, and mid-channel pools, 16.1% (Graph 3). By percent total **length**, low gradient riffles made up 31.4%, step runs made up 32.6%, and mid-channel pools made up 7.7%.

Table 3 summarizes the pool habitat types. Of these pools, 77.8% were main channel pools. These main channel pool types comprised 86.6% of the total length for all pools (Graph 4).

Table 4 (Graph 5) is a summary of maximum pool depths by pool habitat types. Depth is an indicator of pool quality. The maximum depth for 28 of the 36 pools (77.8%) was less than two feet.

The depth of cobble embeddedness was estimated at the pool tail-outs. Of the 36 pool tail-outs, 1 (3.3%) had a value of 1; 21 (70.0%) had a value of 2; 5 (16.7%) had a value of 3; and 3

(10.0%) had a value of 4. Graph 6 describes embeddedness.

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 types had the highest shelter rating at 36.11 (Table 1). For the pool types, the scour pools had the highest mean shelter rating at 52.5, main channel pools had a mean shelter rating of 34.5, and backwater pools had a rating of 22.7 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Boulders are the dominant cover type in North Fork Cuneo Creek. White water is the next most common cover type. Graph 7 describes the pool cover in North Fork Cuneo Creek.

Table 6 (Graph 8) describes the dominant substrate by habitat type. Small cobble was the dominant substrate observed in 51.6% of the low gradient riffles. Large cobble was the next most frequently observed dominant substrate type, and occurred in 25.8% of the 31 low gradient riffles.

Nearly 49% of North Fork Cuneo Creek lacked shade canopy. Of the 51% of the stream that was covered with canopy, 95% was composed of deciduous trees, and 5% was composed of coniferous trees. Graph 9 describes the canopy in North Fork Cuneo 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 71.1%. The mean percent left bank vegetated was 70.6%. The elements composing the structure of the stream banks consisted of 0.9% bedrock, 21.6% boulder, 0.9% cobble/gravel, 4.5% bare soil, 4.5% grass and 4.5% brush. Additionally, 60.4% of the banks were composed of deciduous trees, and 2.7% of coniferous trees, including downed trees, logs, and root wads (Graph 10).

BIOLOGICAL INVENTORY RESULTS

One electrofishing survey was conducted on North Fork Cuneo Creek, on July 25, 1991 by Craig Mesman and Tony Sartori (CCC). The unit sampled was habitat unit 072, a plunge pool, approximately 2,889' upstream from the confluence with Cuneo Creek. This site had an area of 99.0 sq ft and a volume of 79.2 cu ft. Nineteen steelhead were sampled. They ranged from 33 to 132mm fork length.

DISCUSSION

North Fork Cuneo Creek

The surveyed reach of the North Fork Cuneo Creek has two channel types: A2 and B2. The A2 channel type is generally not suitable for fish habitat improvement structures. A2 channels are found in high energy, steep gradient stream reaches. They have channels dominated by boulders, do not retain gravels very well, but do have stable stream banks. The B2 channel type is suitable for many types of low and medium stage instream enhancement structures. There are 3,721 feet of this type of channel in the North Fork Cuneo Creek. Many site specific projects can be designed within this channel type, especially to increase pool frequency, volume and pool cover.

The water temperatures recorded on the survey days ranged from 57° F to 64° F. Air temperatures ranged from 63° F to 85° F. This is a good water temperature regime for salmonids. However, 64° F, if sustained, is near the threshold stress level for salmonids. To make any further conclusions, temperatures would need to be monitored throughout the warm summer months, and more extensive biological sampling conducted.

Flatwater habitat types comprised 40.6% of the total **length** of this survey, riffles 38.8%, and pools 20.6%. The pools are relatively shallow with only 8 of the 36 pools having a maximum depth of two feet or greater. 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.

Eight of the 36 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 the North Fork Cuneo 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 moderate with a rating of 36.1. The shelter rating in the flatwater habitats was lower at 24.2. 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, white water contributes 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.

Sixteen of the 31 low gradient riffles had small cobble as the dominant substrate. The remaining 15 low gradient riffles had large cobble or boulder as the dominant substrate, which is generally considered on the high end of the substrate size suitable for spawning salmonids.

The mean percent canopy for the stream was 51%. Eighty percent canopy 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)The North Fork Cuneo Creek should be managed as an anadromous, natural production stream.

2)Increase the canopy on North Fork Cuneo Creek by planting willow, alder, redwood, and Douglas fir along the stream where shade canopy is not at acceptable levels. The reaches above this survey section should be inventoried and treated as well, since the water flowing here is effected from upstream. In many cases, planting will need to be coordinated to follow bank stabilization or upslope erosion control projects.

3) 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.

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

5)Inventory and map sources of stream bank erosion, and prioritize them according to present and potential sediment yield. Identified sites should then be treated to reduce the amount of fine sediments entering the stream.

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.

North Fork Cuneo Creek

0' Begin survey at confluence with main stem Cuneo Creek. Reach #1 is a B2 channel type.

380'Young-of-the-year (YOY) observed.

461'Log debris accumulation (LDA) 6' x 10' x 5' piled and embedded in the right bank.

598'Redwood stump on right bank contributing fines and gravel.

682'Bare vertical left bank 20' high x 6' long, contributing gravel and fines into the channel.

807'Bare vertical left bank 20' high x 8' long, with cobble and gravel 3' from water.

842'YOY observed.

1023'Old stump with two horizontal logs supports left bank.

1043'YOY observed.

1473'Right bank of bare soil 20' high x 8' long, coniferous trees above bare area.

1673'LDA, 15' long x 13' wide x 4' high, covers part of stream.

1686'Two fallen logs across stream retaining large cobbles and boulders.

1696'Water plunges 1.5' into boulders held behind fallen log.

1731'Three trees have fallen across stream, providing pool cover, but not blocking flow.

1868' Two fallen logs protect right bank.

1896' Fallen log and boulders protect right bank.

1976' YOY observed.

2103'Three fallen logs on left bank, one in stream and one over channel.

2126' Small tributary enters from left bank.

North Fork Cuneo Creek

2153' Dry overflow channel off right bank.

2288' 3' plunge, channel rise of 5' over 80'.

2380' Right bank protected by fallen log, 4' plunge at upper end of unit. Vertical left bank 30' x 20' contributing boulders, cobble and gravel.

2404' Erosion 20' x 20' contributing boulders and cobble.

2631' Small cascade at upper end of pool, YOY observed.

2696' Three logs across stream retaining boulders and cobble creating a 4' plunge.

2765' Right bank held together by roots of deciduous tree.

2832' Fallen log across channel 2' above stream.

2900' Steep left bank held together by roots.

2948' Two logs fallen across stream providing cover.

3019' Fallen log across channel 7' above water.

3721' Channel type changes to an A2 (reach #2).

3914' Stump on right bank providing cover, YOY observed.

4040' 6' high cascade at beginning of unit.

4067' Right bank erosion 20' high x 30' long contributing fines and cobbles into the channel.

4149' End of survey.