STREAM INVENTORY REPORT

BLANKET CREEK

INTRODUCTION

A stream inventory was conducted during the summer of 1992 on Blanket 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 Blanket 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 Blanket Creek. The objective of this report is to document the current habitat conditions, and recommend options for the potential enhancement of habitat for chinook salmon, coho salmon and steelhead trout.

WATERSHED OVERVIEW

Blanket Creek is tributary to the South Fork Van Duzen River (Little Van Duzen River), tributary to the Van Duzen River, tributary to the Eel River, located in Humboldt County, California (Figure 1). Blanket Creek's legal description at the confluence with the South Fork Van Duzen River is T1S R5E S22. Its location is 40°21'51" N. latitude and 123°36'50" W. longitude. Blanket Creek is a second order stream and has approximately 5.4 miles of blue line stream, according to the USGS Black Lassic 7.5 minute quadrangle. Blanket Creek drains a watershed of approximately 4.3 square miles. Elevations range from about 2,800 feet at the mouth of the creek to 4,200 feet in the headwater areas. Grass, oak, and Douglas fir forest dominate the watershed. The lower 1.1 miles of the stream are in private ownerships and are managed primarily for rangeland and timber production. The upper 4.3 miles of the stream are federally owned by Six Rivers National Forest, Mad River Ranger District, and are managed for multiple use. Vehicle access exists from State Highway 36, approximately 33 miles east from Alton and Highway 101 to the Little Van Duzen River bridge, and then via a private road controlled by the Cottrell Ranch.

METHODS

The habitat inventory conducted in Blanket Creek follows the methodology presented in the California Salmonid Stream Habitat Restoration Manual (Flosi and Reynolds, 1991). The California Conservation Corps (CCC) and contract seasonal Technical Advisors that conducted the inventory were trained in standardized habitat inventory methods by the California Department of Fish and Game (DFG). Blanket Creek personnel were trained in May, 1992, by Gary Flosi and Scott Downie. This inventory was conducted by a two person team.

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 Blanket Creek to record measurements and observations. There are nine components to the inventory form. For specific information on the methods used, see the Little Van Duzen River report.

BIOLOGICAL INVENTORY

Biological sampling during stream inventory is used to determine fish species and their distribution in the stream. Biological inventory is conducted using one or more of three basic methods: 1) stream bank observation, 2) underwater observation, 3) electrofishing. These sampling techniques are discussed in the California Salmonid Stream Habitat Restoration Manual.

Biological inventory was conducted in Blanket Creek to document the fish species composition and distribution. One site was electrofished in Blanket Creek using a Smith Root Model 12 electrofisher. The site was end-blocked with nets to contain the fish within the sample reach. Fish from the site were counted by species, measured, and returned to the stream.

SUBSTRATE SAMPLING

Gravel sampling is conducted using a 9 inch diameter standard McNeil gravel sampler. Sample sites are identified numerically beginning at the most upstream site in the stream. Gravel samples are separated and measured to determine respective percent volume using five sieve sizes (25.4, 12.5, 4.7, 2.37, and 0.85mm).

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 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 Blanket 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 REPORT *

The habitat inventory of September 1-3, 1992, was conducted by Shea Monroe and Russ Irvin (CCC and contract seasonal). The total length of the stream surveyed was 6,625 feet, with an additional 201 feet of side channel.

Flows were not measured on Blanket Creek.

Blanket Creek is a B1 channel type for the entire 6,625 feet of stream reach surveyed. B1 channels are moderate gradient (2.5-4.0%), moderately confined streams, with stable stream banks.

Water temperatures ranged from 53 to 61 degrees fahrenheit. Air temperatures ranged from 62 to 75 degrees fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. By percent **occurrence**, riffles made up 40.4%, pools 32.3%, and flatwater 24.2% (Graph 1). Riffle habitat

types made up 55.4% of the total survey **length**, pools 21.8%, and flatwater 20.8% (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, 23.2%; mid-channel pools, 17.2%; high gradient riffles, 15.2%; and step runs, 14.1% (Graph 3). By percent total **length**, high gradient riffles made up 26.9%, low gradient riffles 26.1%, step runs 15.2%, and mid-channel pools 10.4%.

Thirty-two pools were identified (Table 3). Main channel pools were most often encountered at 62.5%, and comprised 64.2% 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. Twenty-seven of the 32 pools (84%) had a depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 30 pool tail-outs measured, zero had a value of 1; 5 had a value of 2 (16.7%); 9 had a value of 3 (30.0%); and 16 had a value of 4 (53.3%). 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. Pool habitat types had the highest shelter rating at 64.1. Riffle habitats followed with a rating of 40.9 (Table 1). Of the pool types, the main channel pools had the highest mean shelter rating at 72.3, and scour pools rated 50.4 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Boulders comprise the dominant cover type in Blanket Creek and are extensive. All other cover types are lacking in most habitat types. Graph 7 describes the pool cover in Blanket Creek.

Table 6 summarizes the dominant substrate by habitat type. Boulder was the dominant substrate observed in 17 of the 23 low gradient riffles (73.9%). Large cobble was the next most frequently observed dominant substrate type, and occurred in 13.0% of the low gradient riffles (Graph 8).

Seventeen percent of the survey reach lacked shade canopy. Of the 83% of the stream covered with canopy, 69% was composed of deciduous trees, and 31% was composed of coniferous trees. Graph 9 describes the canopy in Blanket 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 28.0%. The mean percent left bank vegetated was 27.8%. The dominant elements composing the structure of the stream banks consisted of 21.7% bedrock, 41.4% boulder, 12.6% cobble/gravel, 0.5% bare soil, 14.1% grass, 0.5% brush. Additionally, 7.1% of the banks were covered with deciduous trees, and 2.0% with coniferous trees, including downed trees, logs, and root wads (Graph 10).

BIOLOGICAL INVENTORY RESULTS

One site was electrofished on September 10, 1992 in Blanket Creek. The unit was sampled by John Crittenden and Russ Irvin (CCC and contract seasonal). All measurements are fork lengths unless noted otherwise.

The site sampled included Habitat Units 50 and 51, a pool/run sequence located 3236' above the stream's mouth. The unit yielded 19 steelhead, ranging from 64 to 160mm FL.

GRAVEL SAMPLING RESULTS

No gravel samples were taken on Blanket Creek.

DISCUSSION

The B1 channel type is excellent for many types of low and medium stage instream enhancement structures. 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 September 1-3, 1992, ranged from 53° F to 61° F. Air temperatures ranged from 62° F to 75° F. This is a good water temperature regime for salmonids. However, to make any further conclusions, temperatures would need to be monitored throughout the warm summer months, and more extensive biological sampling conducted.

Riffle habitat types comprised 55.4% of the total **length** of this survey, pools 21.8%, and flatwater 20.8%. The pools are relatively deep with 27 of the 32 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.

Twenty-five of the 30 pool tail-outs measured had embeddedness ratings of 3 or 4. Zero had a 1 rating. Embeddedness in excess of 26%, a rating of 2 or more, is considered poor quality for fish habitat. In Blanket 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 64. The shelter rating in the flatwater habitats was lower at 38. However, a pool shelter rating of approximately 100 is desirable. The cover that now exists is being provided primarily by boulders in all habitat types.

Seventeen of the 23 low gradient riffles had boulders as the dominant substrate. This is generally considered poor for spawning salmonids.

The mean percent canopy for the stream was 83%. This is a relatively 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) Blanket 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) 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.

4) Spawning gravels on Blanket Creek are limited to relatively few reaches. Projects should be designed at suitable sites to trap and sort spawning gravels in order to expand redd site distribution in 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.

0'	Begin survey at confluence with the Little Van Duzen River. Channel type is a B1 for the entire survey reach.
534'	Left bank erosion 50' high x 165' long, contributing fines and gravel into the channel.
820'	Small tributary enters from the right bank.
897'	Right bank erosion 60' high x 70' long, contributing large woody debris into the channel; no barrier.
1153'	Log and debris accumulation (LDA) 30' wide x 20' long x 10' high, causing a side channel.
1898'	LDA 50' wide x 25' long x 12' high, causing left bank side channel and erosion.
2200'	Young-of-the-year steelhead (YOY) observed.
3236'	Tributary enters from the left bank.
5182'	Right bank erosion 30' high x 60' long, contributing large woody debris into the channel.
6625'	Gradient increases with 10' diameter boulders. No fish observed in bedrock pool. End of survey.