STREAM INVENTORY REPORT

LOST CANYON CREEK

INTRODUCTION

A stream inventory was conducted during the summer of 1992 on Lost Canyon 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 Lost Canyon 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 Lost Canyon 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

Lost Canyon Creek is tributary to the Little Van Duzen River, tributary to the Van Duzen River, tributary to the Eel River, located in Humboldt County, California. Lost Canyon Creek's legal description at the confluence with Little Van Duzen River is T1S R5E S35. Its location is 40°19'45" N. latitude and 123°37'15" W. longitude. Lost Canyon Creek is a first order stream and has approximately 1.7 miles of blue line stream, according to the USGS Black Lassic 7.5 minute quadrangle. Lost Canyon Creek drains a watershed of approximately 1.2 square miles. Elevations range from about 3,000 feet at the mouth of the creek to 4,000 feet in the headwater areas. Grass, oak, and Douglas fir forest dominate the watershed. The watershed is federally owned by Six Rivers National Forest, Mad River Ranger District, and is managed for multiple use. Vehicle access exists from State Highway 36 to the Mad River Ranger District. From here, take Forest Service Road 511 to Black Lassic, then take jeep road 1S07 to the Little Van Duzen River along Blanket Creek.

METHODS

The habitat inventory conducted in Lost Canyon Creek follows the methodology presented in the California Salmonid Stream Habitat Restoration Manual (Flosi and Reynolds, 1991). The California Conservation Corps (CCC) Technical Advisors and contract seasonals that conducted the inventory were trained in standardized habitat inventory methods by the California Department of Fish and Game (DFG). Lost Canyon 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 Lost Canyon 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 not conducted in Lost Canyon Creek.

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 Lost Canyon 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 October 26-28, 1992, was conducted by Warren Mitchell and Ed Davis (CCC). The total length of the stream surveyed was 7,511 feet, with an additional 80 feet of side channel.

Flows were not measured on Lost Canyon Creek.

This section of Lost Canyon Creek has three channel types: from the mouth to 4,333 a C1; next 2,069 feet a B2; and the upper 1,109 feet an A3. C1 channels are low gradient (1.00-1.5%), slightly confined streams, with cobble/gravel beds. B2 channels are moderate gradient (1.0-2.5%), moderately confined, cobble/gravel channels. A3 channels are steep (4-10% gradient), well confined, coarse-grained channels.

Water temperatures ranged from 50 to 53 degrees Fahrenheit. Air temperatures ranged from 52 to 60 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. By percent **occurrence**, riffles made up 36.0%, flatwater types 36.0%, and pools 25.0% (Graph 1). Riffle habitat types made up 43.9% of the total survey **length**, flatwater types

37.1%, and pools 9.1% (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, 26.5%; step runs, 22.1%; and runs, 13.2% (Graph 3). By percent total **length**, step runs made up 30.4%, low gradient riffles 27.2%, and high gradient riffles 16.7%.

Thirty-four pools were identified (Table 3). Main channel pools were most often encountered at 61.8%, and comprised 66.1% 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-eight of the 34 pools (82%) had a depth of less than two feet (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 31 pool tail-outs measured, one had a value of 1 (3.2%); 10 had a value of 2 (32.3%); 16 had a value of 3 (51.6%); and 4 had a value of 4 (12.9%). 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 39.0. Flatwater habitats followed with a rating of 26.4 (Table 1). Of the pool types, the scour pools had the highest mean shelter rating at 46.9, and main channel pools rated 34.1 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Boulders comprise the dominant cover type in Lost Canyon Creek. Large and small woody debris are the next most common cover types. Graph 7 describes the pool cover in Lost Canyon Creek.

Table 6 summarizes the dominant substrate by habitat type. Gravel was the dominant substrate observed in 19 of the 36 low gradient riffles (52.8%). Small cobble was the next most frequently observed dominant substrate type, and occurred in 47.2% of the low gradient riffles (Graph 8).

Twenty-one percent of the survey reach lacked shade canopy. Of

the 79% of the stream covered with canopy, 17% was composed of deciduous trees, and 83% was composed of coniferous trees.
Graph 9 describes the canopy in Lost Canyon 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 41.8%. The mean percent left bank vegetated was 38.1%. The dominant elements composing the structure of the stream banks consisted of 4.0% bedrock, 2.6% boulder, 20.2% cobble/gravel, 8.8% bare soil, 4.8% grass, 39.7% brush. Additionally, 11.8% of the banks were covered with deciduous trees, and 8.1% with coniferous trees, including downed trees, logs, and root wads (Graph 10).

BIOLOGICAL INVENTORY RESULTS

Biological inventory was not conducted in Lost Canyon Creek.

GRAVEL SAMPLING RESULTS

No gravel samples were taken on Lost Canyon Creek.

DISCUSSION

Lost Canyon Creek has three channel types: A3, B2, and C1. The high energy and steep gradient of the A3 channel type is generally not suitable for instream enhancement structures. The B2 channel type is excellent for many types of low and medium stage instream enhancement structures. There are 2,069 feet of this type of channel in Lost Canyon Creek. Many site specific projects can be designed within this channel type, especially to increase pool frequency, volume and pool cover.

The lower 4,333 feet of Lost Canyon Creek is a C1 channel type. C1 channels have suitable gradients and the stable stream banks that are necessary for the installation of instream structures designed to increase pool habitat, trap spawning gravels, and provide protective cover for fish. Well placed and engineered structures that constrict the channel to form pool habitat or cover structures are usually appropriate and have a good chance of success in this channel type.

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The water temperatures recorded on the survey days October 26-28, 1992 ranged from 50° F to 53° F. Air temperatures ranged from 52° F to 60° F. This is a very good water temperature regime for salmonids. However, to make any further conclusions, temperatures would need to be monitored throughout the warm summer months, and biological sampling conducted.

Riffle habitat types comprised 43.9% of the total **length** of this survey, flatwater 37.1%, and pools 20.4%. The pools are relatively shallow with only 6 of the 34 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 of the 31 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 Lost Canyon 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 39.0. The shelter rating in the flatwater habitats was lower at 26.4. 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. 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.

All of the 36 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 79%. 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) Lost Canyon 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) 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.

0'	Begin survey at confluence with the Little Van Duzen River. Reach #1 is a C1 channel type.
1233'	Small tributary enters from the right bank.
1692'	Small tributary enters from the left bank.
3007'	Three 6" steelhead observed.
3642'	Old Humboldt crossing 22' long x 18' wide x 6' high.

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3725'	Pool is formed by culvert drainage. Culvert is 8' diameter x 57' long. Numerous salmonids observed.
4333'	Channel type changes from a C1 to a B2 (reach #2).
5425'	Small log and debris accumulation (LDA) 15' wide x 6' long x 5' high; no barrier.
5712'	Small tributary enters from the left bank.
6402'	Log fallen across the channel is retaining small woody debris 10' long x 7' wide x 5' high; no barrier.
6403'	Tributary enters from the right bank. Channel type changes from a B2 to an A3 (reach #2).
6884'	Fallen tree in the channel is retaining gravel.
7151'	Young-of-the-year salmonids (YOY) observed.
7511'	Channel is dry for the next 350'. Gradient increases to 30%, and a small tributary enters from the left bank. End of survey reach.

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LEVEL III and LEVEL IV HABITAT TYPE KEY:

HABITAT TYPE	LETTER	NUMBER
RIFFLE		
Low Gradient Riffle	[LGR]	1.1
High Gradient Riffle	[HGR]	1.2
CASCADE		
Cascade	[CAS]	2.1
Bedrock Sheet	[BRS]	2.2
FLATWATER		
Pocket Water	[POW]	3.1
Glide	[GLD]	3.2
Run	[RUN]	3.3
Step Run	[SRN]	3.4
Edgewater	[EDW]	3.5
MAIN CHANNEL POOLS		
Trench Pool	[TRP]	4.1
Mid-Channel Pool	[MCP]	4.2
Channel Confluence Pool	[CCP]	4.3
Step Pool	[STP]	4.4
SCOUR POOLS		
Corner Pool	[CRP]	5.1
Lateral Scour Pool - Log Enhanced	[LSL]	5.2
Lateral Scour Pool - Root Wad Enhanced	[LSR]	5.3

Lateral Scour Pool - Bedrock Formed	[LSBk]	5.4
Lateral Scour Pool - Boulder Formed	[LSBo]	5.5
Plunge Pool	[PLP]	5.6

BACKWATER POOLS

Secondary Channel Pool	[SCP]	6.1
Backwater Pool - Boulder Formed	[BPB]	6.2
Backwater Pool - Root Wad Formed	[BPR]	6.3
Backwater Pool - Log Formed	[BPL]	6.4
Dammed Pool	[DPL]	6.5