STREAM INVENTORY REPORT

SOUTH FORK PANTHER CREEK, 1991

INTRODUCTION

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

An adult carcass survey was conducted on South Fork Panther Creek on February 9, 1988. No fish or redds were observed. 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

South Fork Panther Creek is tributary to Bull Creek, tributary to the Eel River, located in Humboldt County, California (Figure 1). South Fork Panther Creek's legal description at the confluence with Bull Creek is T02S R01E S24. Its location is 40°17'20" latitude and 124°00'41" longitude. South Fork Panther Creek is a first order stream and has approximately 1.2 miles of blue line stream, according to the USGS Bull Creek 7.5 minute quadrangle. South Fork Panther Creek drains a watershed of approximately 1.58 square miles. Elevations range from about 940 feet at the mouth of the creek to 2,600 feet in the headwater areas. Douglas fir and hardwood forest dominates the watershed. The watershed is owned by the State of California and is managed as part of Humboldt Redwoods State Park. Vehicle access exists from Highway 101 at Dyerville, via the Bull Creek-Mattole Road. From it, Kemp Road provides access to the mouth of South Fork Panther Creek. The access roads have locked gates controlled by the park.

METHODS

The habitat inventory conducted in South Fork Panther Creek follows the methodology presented in the California Salmonid Stream Habitat Restoration Manual (Flosi and Reynolds, 1991). The California Conservation Corps (CCC) Technical Advisors that

conducted the inventory were trained in standardized habitat inventory methods by the California Department of Fish and Game (DFG). South Fork Panther Creek personnel were trained in May and June, 1991, by Gary Flosi and Scott Downie. This inventory was conducted by two person teams.

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 South Fork Panther Creek to record measurements and observations. See the West Fork Panther Creek report for specific details of the nine components to the inventory form.

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 (DFG). This program also processes and summarizes the data.

The Habitat Runtime program 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 South Fork Panther 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

South Fork Panther Creek

HABITAT INVENTORY RESULTS:

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

The habitat inventory of November 4, 6, 8, 13, and 14, 1991, was conducted by Shea Monroe, Brian Humphrey and Erick Elliott (CCC). The total length of the stream surveyed was 7,361 feet, with an additional 227 feet of side channel.

South Fork Panther Creek is an A3 channel type for the entire 7,361 feet of stream reach surveyed. A3 channels are steep (4-10% gradient), very well confined streams, with unstable stream banks.

Water temperatures ranged from 44 to 53 degrees fahrenheit. Air temperatures ranged from 50 to 68 degrees fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. By percent **occurrence**, flatwater made up 34.9%; pool types were 33.3%; and riffles 31.3% (Graph 1). Flatwater habitat types made up 57.8% of the total survey **length**, riffles were 27.4%, and pools 14.7% (Graph 2).

Seventeen Level IV habitat types were identified. The data are summarized in Table 2. The most frequent habitat types by percent **occurrence** were step runs, 30.3%, mid-channel pools, 15.2%, low gradient riffles, 14.1%, and high gradient riffles, 13.6% (Graph 3). By percent total **length**, step runs made up 54.7%, high gradient riffles 15.5%, low gradient riffles 9.8%, and mid-channel pools 5.8% (Table 2).

Sixty-six pools were identified (Table 3). Main channel pools were most often encountered at 60.6%, and comprised 64.8% 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. Sixty of the 66 pools (91%) had a depth of less than two feet (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 51 pool tail-outs measured, one had a value of 1 (2.0%); 12 had a value of 2 (23.5%); 22 had a value of 3 (43.1%); and 16

had a value of 4 (31.4%). 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 25.1. Flatwater habitats followed with a rating of 15.5 (Table 1). Of the pool types, the scour pools had the highest mean shelter rating at 25.3, and main-channel pools rated 24.9 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Boulders are the dominant cover type in South Fork Panther Creek and are extensive. Graph 7 describes the pool cover in South Fork Panther Creek.

Table 6 summarizes the dominant substrate by habitat type. Gravel was the dominant substrate observed in 8 of the 28 low gradient riffles (28.6%). Boulders were also dominant in 8 of the low gradient riffles. Small cobble was the next most frequently observed dominant substrate type, and occurred in 25.0% of the low gradient riffles (Graph 8).

Twenty-seven percent of the survey reach lacked shade canopy. Of the 73% of the stream covered with canopy, 86% was composed of deciduous trees, and 14% was composed of coniferous trees. Graph 9 describes the canopy in South Fork Panther 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 52.8%. The mean percent left bank vegetated was 57.5%. The dominant elements composing the structure of the stream banks consisted of 1.5% bedrock, 21.7% boulder, 0.0% cobble/gravel, 15.2% bare soil, 3.0% grass, 1.5% brush. Additionally, 44.9% of the banks were covered with deciduous trees, and 12.1% with coniferous trees, including downed trees, logs, and root wads (Graph 10).

DISCUSSION

South Fork Panther Creek

The A3 channel type is generally not suitable for fish habitat improvement structures. A3 channels are found in high energy, steep gradient stream reaches. They have channels dominated by coarse-grained materials and have unstable stream banks. Usually within the A3 channel there are zones of lower gradient where structures designed to trap gravel can be constructed. This seems to be the case in South Fork Panther Creek, but 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 ranged from 44° F to 53° F. Air temperatures ranged from 50° F to 68° F. This is a very good water temperature regime for salmonids. However, the survey was conducted in November; therefore, temperatures are not indicative of summer thermal conditions. 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 57.8% of the total **length** of this survey, riffles 27.4%, and pools 14.7%. The pools are relatively shallow with only 6 of the 66 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 conflict with the unstable stream banks of the A3 channel type.

Thirty-eight of the 51 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 South Fork Panther 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 25.1. The shelter rating in the flatwater habitats was even lower at 15.5. 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.

South Fork Panther Creek

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.

Fifteen of the 28 low gradient riffles had gravel or small cobble as the dominant substrates. This is generally considered fair for spawning salmonids.

The mean percent canopy for the stream was 73%. This is a relatively high percentage of canopy, since 80 percent is generally considered desirable. In areas of stream bank erosion, planting endemic species of coniferous and deciduous trees, in conjunction with bank stabilization, is recommended.

RECOMMENDATIONS

1) South Fork Panther 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.

5) Due to the high gradient of the stream, access for migrating salmonids is an ongoing potential problem. Good water temperature and flow regimes exist in the stream and it offers good conditions for rearing fish. Fish passage should be monitored, and improved where possible.

South Fork Panther Creek

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 Bull Creek. Braided mouth, 17' wide. Entire survey reach is an A3 channel type.
61'	Small spring enters left bank.
136'	Right bank slide 25' high x 15' wide.
311'	Old Humboldt crossing.
390'	Left bank erosion 8' high x 50' wide.
480'	Dry side-channel, 20' long, on right bank.
747'	Dry side-channel on left bank.
989'	Left bank exposed and eroding, apparently has been bulldozed, contributing sediments.
1199'	Left bank slide, 20' to 35' high to 1425', contributing silt and gravel.
1491'	Fallen log across channel causing a log debris accumulation (LDA) and creating a 4' fall.
1745'	Right bank slide, 50' high to 1907', contributing sediments.
2607'	Logs embedded along right bank, 7' high, preventing slide from entering stream.
2942'	Erosion on both banks.
2966'	Road along stream.
3081'	Right bank erosion contributing sediments.
3103'	Dry over flow channel on right bank.

South Fork Panther Creek

3385' Over flow channel on right bank. Left bank slide, 40' high.

3771' Right bank slide, 60' high x 70' wide. Young-of-the-year (YOY) salmonids observed.

3875' Dry side-channel on left bank. Fallen log spanning channel, 4' above stream.

4191' Left bank slide 50' high.

4306' Left bank slide 40' high.

4539' Log along left bank holding back erosion.

4807' LDA, (50' long x 30' wide), scattered throughout unit.

4876' Right bank slide, 50' high x 60' wide, being partially held in check by fallen log along Right bank. Left bank erosion, 12' high x 7' wide.

4975' Left bank erosion 40' high, contributing sediments.

5090' LDA covers unit and retains gravel, creating 3'-5' plunges.

5394' Left bank slide, 25' high x 60' wide, contributing sediments.

5403' Erosion on both banks. YOY observed.

5619' Massive slides on both banks, extends to 5773', contributing sediments. YOY observed.

5888' Massive right bank slide, 50' - 70' high to 6137', contributing sediments.

6330' Fallen log across channel, 2' above stream.

6692' Right bank slide, 70 high x 120 wide. YOY observed.

7014' Massive slides; left bank, 80' high x 100' wide, and

right bank, 60' high x 120' wide, contributing sediments.

7033' Massive right bank slide 80' high x 295' wide, contributing sediments.

7307' Left bank slide, 80' high x 60' wide, partially vegetated.

7361' Series of 5' and 6' plunges in this and previous unit in addition to the steep gradient make fish passage doubtful. End of survey.