

STREAM INVENTORY REPORT

South Fork Redwood Creek

INTRODUCTION

A stream inventory was conducted from 7/1/2003 to 7/22/2003 on South Fork Redwood Creek. The survey began at the confluence with Redwood Creek and extended upstream 1.9 miles. A stream inventory and subsection to this report were also completed for one tributary to South Fork Redwood Creek.

The South Fork Redwood Creek 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 South Fork Redwood Creek. The objective of the biological inventory was to document the presence and distribution of juvenile salmonid species.

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. Recommendations for habitat improvement activities are based upon target habitat values suitable for salmonids in California's north coast streams.

WATERSHED OVERVIEW

South Fork Redwood Creek is a tributary to Redwood Creek, a tributary to Hollow Tree Creek, a tributary to South Fork Eel River, a tributary to Pacific Ocean, located in Mendocino County, California (Map 1). South Fork Redwood Creek's legal description at the confluence with Redwood Creek is T22N R17W S09. Its location is 39°46'26.0" north latitude and 123°45'24.0" west longitude. South Fork Redwood Creek is a second order stream and has approximately 2.3 miles of blue line stream according to the USGS Hales Grove 7.5 minute quadrangle. South Fork Redwood Creek drains a watershed of approximately 1.44 square miles. Elevations range from about 1,100 feet at the mouth of the creek to 1,800 feet in the headwater areas. Redwood/Douglas fir and mixed hardwood forest dominates the watershed. The watershed is entirely privately owned and is managed for timber production. Vehicle access exists via Westside Road, 5.5 miles off of Highway 1.

METHODS

The habitat inventory conducted in South Fork Redwood Creek follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al, 1998). The California Conservation Corps (CCC) Technical Advisors and Watershed Stewards Project/AmeriCorps (WSP/AmeriCorps) Members that conducted the inventory were trained in standardized habitat inventory methods by the California Department of Fish and Game (DFG). This inventory was conducted by a two-person team.

SAMPLING STRATEGY

The inventory uses a method that samples approximately 10% of the habitat units within the survey reach. All habitat units included in the survey are classified according to habitat type and their lengths are measured. All pool units are measured for maximum depth, depth of pool tail crest (measured in the thalweg), dominant substrate composing the pool tail crest, and embeddedness. Habitat unit types encountered for the first time are measured for all the parameters and characteristics on the field form. Additionally, from the ten habitat units on each field form page, one is randomly selected for complete measurement. All pools except step-pools are fully sampled.

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 Redwood Creek to record measurements and observations. There are eleven components to the inventory form.

1. Flow:

Flow is measured in cubic feet per second (cfs) near the bottom of the stream survey reach using a Marsh-McBirney Model 2000 flow meter.

2. Channel Type:

Channel typing is conducted according to the classification system developed and revised by David Rosgen (1994). This methodology is described in the *California Salmonid Stream Habitat Restoration Manual*. Channel typing is conducted simultaneously with habitat typing and follows a standard form to record measurements and observations. There are five measured parameters used to determine channel type: 1) water slope gradient, 2) entrenchment, 3) width/depth ratio, 4) substrate composition, and 5) sinuosity. Channel characteristics are measured using a clinometer, hand level, hip chain, tape measure, and a stadia rod.

3. Temperatures:

Both water and air temperatures are measured and recorded at every tenth habitat unit. The time of the measurement is also recorded. Both temperatures are taken in degrees Fahrenheit at the middle of the habitat unit and within one foot of the water surface.

4. Habitat Type:

Habitat typing uses the 24 habitat classification types defined by McCain and others (1990). Habitat units are numbered sequentially and assigned a type identification number selected from a standard list of 24 habitat types. Dewatered units are labeled "dry". South Fork Redwood Creek habitat typing used standard basin level measurement criteria. These parameters require

South Fork Redwood Creek

that the minimum length of a described habitat unit must be equal to or greater than the stream's mean wetted width. All measurements are in feet to the nearest tenth. Habitat characteristics are measured using a clinometer, hip chain, and stadia rod.

5. Embeddedness:

The depth of embeddedness of the cobbles in pool tail-out areas is measured by the percent of the cobble that is surrounded or buried by fine sediment. In South Fork Redwood Creek, embeddedness was ocularly estimated. The values were recorded using the following ranges: 0 - 25% (value 1), 26 - 50% (value 2), 51 - 75% (value 3) and 76 - 100% (value 4). Additionally, a value of 5 was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate like bedrock, log sills, boulders or other considerations.

6. Shelter Rating:

Instream shelter is composed of those elements within a stream channel that provide juvenile salmonids protection from predation, reduce water velocities so fish can rest and conserve energy, and allow separation of territorial units to reduce density related competition for prey. The shelter rating is calculated for each fully-described habitat unit by multiplying shelter value and percent cover. Using an overhead view, a quantitative estimate of the percentage of the habitat unit covered is made. All cover is then classified according to a list of nine cover types. In South Fork Redwood Creek, a standard qualitative shelter value of 0 (none), 1 (low), 2 (medium), or 3 (high) was assigned according to the complexity of the cover. Thus, shelter ratings can range from 0-300 and are expressed as mean values by habitat types within a stream.

7. Substrate Composition:

Substrate composition ranges from silt/clay sized particles to boulders and bedrock elements. In all fully-described habitat units, dominant and sub-dominant substrate elements were ocularly estimated using a list of seven size classes and recorded as a one and two, respectively. In addition, the dominant substrate composing the pool tail-outs is recorded for each pool.

8. Canopy:

Stream canopy density was estimated using modified handheld spherical densimeters as described in the *California Salmonid Stream Habitat Restoration Manual*. Canopy density relates to the amount of stream shaded from the sun. In South Fork Redwood Creek, an estimate of the percentage of the habitat unit covered by canopy was made from the center of approximately every third unit in addition to every fully-described unit, giving an approximate 30% sub-sample. In addition, the area of canopy was estimated ocularly into percentages of coniferous or hardwood trees.

9. Bank Composition and Vegetation:

Bank composition elements range from bedrock to bare soil. However, the stream banks are usually covered with grass, brush, or trees. These factors influence the ability of stream banks to

South Fork Redwood Creek

withstand winter flows. In South Fork Redwood Creek, the dominant composition type and the dominant vegetation type of both the right and left banks for each fully-described unit were selected from the habitat inventory form. Additionally, the percent of each bank covered by vegetation (including downed trees, logs, and rootwads) was estimated and recorded.

10. Large Woody Debris Count:

Large woody debris (LWD) is an important component of fish habitat and an element in channel forming processes. In each habitat unit all pieces of LWD partially or entirely below the elevation of bankfull discharge are counted and recorded. The minimum size to be considered is twelve inches in diameter and six feet in length. The LWD count is presented by reach and is expressed as an average per 100 feet.

11. Average Bankfull Width:

Bankfull width can vary greatly in the course of a channel type stream reach. This is especially true in very long reaches. Bankfull width can be a factor in habitat components like canopy density, water temperature, and pool depths. Frequent measurements taken at riffle crests (velocity crossovers) are needed to accurately describe reach widths. At the first appropriate velocity crossover that occurs after the beginning of a new stream survey page (ten habitat units), bankfull width is measured and recorded in the appropriate header block of the page. These widths are presented as an average for the channel type reach.

BIOLOGICAL INVENTORY

Biological sampling during the stream inventory is used to determine fish species and their distribution in the stream. Fish presence was observed from the stream banks in South Fork Redwood Creek. In addition, eight sites were surveyed via underwater observation. This sampling technique is discussed in the *California Salmonid Stream Habitat Restoration Manual*.

DATA ANALYSIS

Data from the habitat inventory form are entered into Stream Habitat 1.0.35, a Visual Basic data entry program developed by Karen Wilson, Pacific States Marine Fisheries Commission in conjunction with the California Department of Fish and Game. This program processes and summarizes the data, and produces the following ten tables:

- Riffle, Flatwater, and Pool Habitat Types
- Habitat Types and Measured Parameters
- Pool Types
- Maximum Residual Pool Depths by Habitat Types
- Mean Percent Cover by Habitat Type
- Dominant Substrates by Habitat Type
- Mean Percent Vegetative Cover for Entire Stream

South Fork Redwood Creek

- Fish Habitat Inventory Data Summary by Stream Reach (Table 8)
- Mean Percent Dominant Substrate / Dominant Vegetation Type for Entire Stream
- Mean Percent Shelter Cover Types for Entire Stream

Graphics are produced from the tables using Microsoft Excel. Graphics developed for South Fork Redwood Creek include:

- Riffle, Flatwater, Pool Habitat Types by Percent Occurrence
- Riffle, Flatwater, Pool Habitat Types by Total Length
- Total Habitat Types by Percent Occurrence
- Pool Types by Percent Occurrence
- Maximum Residual Depth in Pools
- Percent Embeddedness
- Mean Percent Cover Types in Pools
- Substrate Composition in Pool Tail-outs
- Mean Percent Canopy
- Dominant Bank Composition by Composition Type
- Dominant Bank Vegetation by Vegetation Type

HABITAT INVENTORY RESULTS

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

The habitat inventory of 7/1/2003 to 7/22/2003 was conducted by Elizabeth Pope, and Kevin Lucey (WSP). The total length of the stream surveyed was 9,844 feet.

Stream flow was not measured on South Fork Redwood Creek.

South Fork Redwood Creek is a G5 channel type for the first 8,528 feet of the stream surveyed (Reach 1), and a B4 channel type for the remaining 1,316 feet of the stream surveyed (Reach 2). G5 channel types are entrenched “gully” step-pool channels with low width/depth ratio on moderate gradients. B4 channel types are moderately entrenched riffle dominated channels with infrequently spaced pools, very stable plan and profile, stable banks on moderate gradients with low width /depth ratios and gravel dominant substrates.

Water temperatures taken during the survey period ranged from 52 to 63 degrees Fahrenheit. Air temperatures ranged from 54 to 76 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 35% flatwater units, 34% riffle units and 30% pool units (Graph 1). Based on total length of Level II habitat types there were 43% flatwater units 34% pool units and 22% riffle units (Graph 2).

South Fork Redwood Creek

Nine Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were 34% run units 33% low gradient riffle units and 30% mid-channel pool units (Graph 3). Based on percent total length there were, 42% run units, 33% mid-channel pool units and 22% low gradient riffle units.

A total of 85 pools were identified (Table 3). Main channel pools comprised 100% of the total length of all pools (Graph 4).

Table 4 is a summary of maximum residual pool depths by pool habitat types. Pool quality for salmonids increases with depth. Fifty-seven of the 85 pools (67%) had a residual depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 85 pool tail-outs measured, 18 had a value of 2 (21.2%); 45 had a value of 3 (52.9%); 10 had a value of 4 (11.8%); 12 had a value of 5 (14.1%); (Graph 6). On this scale, a value of 1 indicates the best spawning conditions and a value of 4 the worst. Additionally, a value of 5 was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate like bedrock, log sills, boulders, etc.

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. Riffle habitat types had a mean shelter rating of 0, flatwater habitat types had a mean shelter rating of 8, and pool habitats had a mean shelter rating of 25 (Table 1). Of the pool types, the main channel pools had a mean shelter rating of 25 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Large woody debris and undercut banks are the dominant cover types in South Fork Redwood Creek. Graph 7 describes the pool cover in South Fork Redwood Creek. Large woody debris is the dominant pool cover type followed by undercut banks.

Table 6 summarizes the dominant substrate by habitat type. Graph 8 depicts the dominant substrate observed in pool tail-outs. Gravel was the dominant substrate in 62% of pool tail-outs and small cobble was dominant in 21% of pool tail-outs.

The mean percent canopy density for the surveyed length of South Fork Redwood Creek was 92%. The mean percentages of hardwood and coniferous trees were 57% and 43%, respectively. Eight percent of the canopy was open. Graph 9 describes the mean percent canopy in South Fork Redwood Creek.

For the stream reach surveyed, the mean percent right bank vegetated was 60%. The mean percent left bank vegetated was 60%. The dominant elements composing the structure of the stream banks consisted of 98% sand/silt/clay and 2% bedrock (Graph 10). Deciduous trees were the dominant vegetation type observed in 44% of the units surveyed. Additionally, 44% of the units surveyed had coniferous trees as the dominant vegetation type (Graph 11).

South Fork Redwood Creek

BIOLOGICAL INVENTORY RESULTS

Eight sites were surveyed via underwater observation for species composition and distribution in South Fork Redwood Creek on August 12, 2003. Water temperatures taken during the dive survey, from 1100 to 1420, ranged from 55 to 56 degrees Fahrenheit. The sites were surveyed by Trevor Tollefson and Janelle Breton (DFG).

In reach one, five sites were surveyed between habitat units 001 and 241, a distance of approximately 8,528 feet from the confluence with Redwood Creek. Fish observed at these sites included one young-of-year steelhead trout, one age 1+ steelhead trout, one hundred thirty-six young-of-year coho salmon and five age 1+ coho salmon.

In reach two, three sites were surveyed between habitat units 245 and 251. This section of the survey covered a portion of the stream from approximately 8,652 feet to 8,840 feet upstream of the confluence with Redwood Creek. No salmonids were observed at these sites.

The following chart displays the information yielded from these sites:

2003 South Fork Redwood Creek Dive Observations.

Date	Site #	Hab. Unit #	Hab. Type	Approx. Dist. from mouth (ft.)	Coho		Steelhead		
					YOY	1+	YOY	1+	2+
Reach 1 G5 Channel Type									
08/12/2003	1	014	4.2	294	47	0	0	0	0
08/12/2003	2	015	4.2	399	62	4	0	1	0
08/12/2003	3	082	4.2	2,746	4	0	0	0	0
08/12/2003	4	102	4.2	3,402	19	1	1	0	0
08/12/2003	5	241	4.2	8,528	4	0	0	0	0
Reach 2 B4 Channel Type									
08/12/2003	1	245	3.3	8,652	0	0	0	0	0
08/12/2003	2	247	3.3	8,709	0	0	0	0	0
08/12/2003	3	251	3.3	8,790	0	0	0	0	0

DISCUSSION

South Fork Redwood Creek is a G5 channel type for the first 8,528 feet of the stream surveyed (Reach 1), and a B4 channel type for the remaining 1,316 feet of the stream surveyed (Reach 2). The suitability of G5 channel types for fish habitat improvement structures is as follows: Good for bank-placed boulders, fair for plunge weirs; opposing wing deflectors and log cover, and poor for boulder clusters and single wing-deflectors. The suitability of B4 channel types for fish habitat improvement structures is as follows: Excellent for low-stage plunge weirs; boulder clusters; bank placed boulders; single and opposing wing deflectors; and log cover.

The water temperatures recorded on the survey days 7/1/2003 to 7/22/2003, ranged from 52 to 63 degrees Fahrenheit. Air temperatures ranged from 54 to 76 degrees Fahrenheit. These temperatures are generally considered suitable for salmonids. To make any further conclusions, temperatures would need to be monitored throughout the warm summer months, and more extensive biological sampling would need to be conducted.

Flatwater habitat types comprised 43% of the total length of this survey, riffles 22%, and pools 34%. The pools are relatively deep, with 57 of the 85 (67%) pools having a maximum residual depth greater than 2 feet. In general, pool enhancement projects are considered when primary pools comprise less than 40% of the length of total stream habitat. In first and second order streams, a primary pool is defined to have a maximum residual depth of at least two feet, occupy at least half the width of the low flow channel, and be as long as the low flow channel width.

Eighteen of the 85 pool tail-outs measured had embeddedness ratings of 1 or 2. Fifty-five of the 85 pool tail-outs had embeddedness ratings of 3 or 4. Twelve of the pool tail-outs had a rating of 5, which is considered unsuitable for spawning. Cobble embeddedness measured to be 25% or less, a rating of 1, is considered to indicate good quality spawning substrate for salmon and steelhead. Sediment sources in South Fork Redwood Creek should be mapped and rated according to their potential sediment yields, and control measures should be taken.

Seventy-one of the 85 pool tail-outs measured had gravel or small cobble as the dominant substrate. This is generally considered good for spawning salmonids.

The mean shelter rating for pools was 25. The shelter rating in the flatwater habitats was 8. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by large woody debris in South Fork Redwood Creek. Large woody debris is the dominant cover type in pools followed by undercut banks. Log and root wad cover structures in the pool and flatwater habitats would enhance 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.

The mean percent canopy density for the stream was 92%. Reach 1 had a canopy density of 92% and Reach 2 had a canopy density of 92%. In general, revegetation projects are considered when canopy density is less than 80%.

South Fork Redwood Creek

The percentage of right and left bank covered with vegetation was 60% and 60%, respectively. In areas of stream bank erosion or where bank vegetation is sparse, planting endemic species of coniferous and hardwood trees, in conjunction with bank stabilization, is recommended.

RECOMMENDATIONS

- 1) South Fork Redwood Creek should be managed as an anadromous, natural production stream.
- 2) The limited water temperature data available suggest that maximum temperatures are within the acceptable range for juvenile salmonids. To establish more complete and meaningful temperature regime information, 24-hour monitoring during the July and August temperature extreme period should be performed for 3 to 5 years.
- 3) Increase woody cover in the pools and flatwater habitat units. Adding high quality complexity with woody cover is desirable.
- 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) Active and potential sediment sources related to the road system need to be identified, mapped, and treated according to their potential for sediment yield to the stream and its tributaries.

COMMENTS AND LANDMARKS

The following landmarks and possible problem sites were noted. All distances are approximate and taken from the beginning of the survey reach.

Position (ft.)	Habitat Unit #	Comments:
0	0001.00	South Fork Redwood Creek survey begins at the confluence with Redwood Creek.
112	0008.00	Good access from rock quarry area along road.
262	0013.00	Corrugated metal culvert, 32' long x 5' diameter in very poor condition with a plunge height of 0.2 feet. Culvert is filled with debris and has 0.1' of standing water. Culvert is causing the creek to change courses.
294	0014.00	Underwater observation, forty-seven young-of-the-year (YOY) coho salmon observed.
399	0015.00	Underwater observation, sixty-two YOY coho salmon, four age 1+ coho salmon, and one age 1+ steelhead trout observed.
751	0022.00	Roads on both banks provide good access. Left bank road drivable.

South Fork Redwood Creek

Position (ft.)	Habitat Unit #	Comments:
969	0032.00	Channel type taken
969	0032.00	CCC structure with associated log debris accumulation (LDA) 8' high x 3' wide x 10' long, composed of 3 pieces of large wood. Water flows through, has visible gaps and no sediment retention. Fish observed above LDA.
1,031	0033.00	LDA, 12' high x 15' wide x 25' long, composed of ten pieces of large wood. Water flows through with no visible gaps in LDA and retains silt 6' wide x 20' long x 1' deep. Fish observed above LDA.
1,589	0048.00	Flag "Bot. site #77 PWA"
1,698	0052.00	Seven foot cascade over bedrock and boulders
1,862	0058.00	CCC structure
1,862	0058.00	Left bank failure, 35' long x 10' high x 3' deep and right bank failure, 20' long x 8' high x 1' deep.
1,862	0058.00	LDA, 13' high x 25' wide x 35' long, composed of 16 pieces of large wood. LDA is retaining silt 24' wide x 8' long x 3' deep.
1,902	0059.00	Salamanders observed
2,433	0074.00	Root mass in channel with trees growing on it is retaining sediment 5' long x 8' high x 4' wide.
2,589	0077.00	Right bank failure, 8' high x 65' long x 3' deep
2,680	0080.00	Left bank failure, 5' deep x 30' long x 12' high.
2,680	0080.00	LDA, 2' high x 4' wide x 8' long, no sediment retention, and fish seen above.
2,746	0082.00	LDA, 7' high x 10' wide x 20' long, composed of 5 pieces of large wood. Salmonids observed upstream.
2,746	0082.00	Underwater observation, four YOY coho salmon observed.
2,919	0088.00	CCC structure resulting in 1' plunge and channel constriction.
3,082	0093.00	Four foot cascade
3,402	0102.00	Underwater observation, nineteen YOY coho salmon, one age 1+ coho salmon, and one YOY steelhead trout observed.
3,797	0109.00	LDA, 4' high x 4' wide x 10' long, composed of seven pieces of large wood. The LDA is retaining silt 10' wide x 6' long x 1' deep.
4,169	0117.00	LDA, 10' high x 8' wide x 13' long, composed of three pieces of large wood. LDA is retaining silt 1' wide x 2' long x 1' deep.
4,252	0119.00	LDA, 8' high x 6' wide x 60' long, composed of seven pieces large wood. The LDA is retaining small woody debris.
4,354	0121.00	LDA, 6' high x 13' wide x 12' long, composed of three pieces large wood. LDA is retaining silt 1' wide x 3' long x 1' deep. Dry side channel on left bank.
4,472	0124.00	LDA, 5' high x 13' wide x 20' long, composed of nine pieces large wood. LDA is retaining silt 5' high x 13' wide x 20' long. Dry side channel.
4,656	0129.00	LDA, 6' high x 13' wide x 20' long, composed of eight pieces of large wood. The LDA is retaining silt 4' wide x 6' long x 2' deep.
5,407	0152.00	CCC flag "5070' 3/12/92"

South Fork Redwood Creek

Position (ft.)	Habitat Unit #	Comments:
5,515	0156.00	Right bank failure 20' long x 30' high x 4' deep.
5,804	0162.00	LDA, 8' high x 10' wide x 18' long. The LDA is retaining silt 1' wide x 1' long x 1' deep.
5,879	0164.00	CCC flag 5545'.
5,879	0164.00	LDA, 8' high x 15' wide x 12' long
6,209	0171.00	Creek dry.
6,689	0185.00	Right bank tributary (dry).
7,098	0201.00	LDA, 8' high x 12' wide x 35' long, consisting of seven pieces of large wood. The LDA is retaining silt 6' wide x 4' long x 1' deep.
7,270	0207.00	LDA, 10' high x 15' wide, composed of seven pieces of large wood. The LDA is retaining silt 4' wide x 15' long x 1' deep.
7,328	0208.00	CCC Flag 6700'
8,112	0230.00	LDA, 10' high x 8' wide x 15' long, composed of five pieces of large wood. The LDA is retaining silt 2' wide x 3' long x 1' deep.
8,138	0231.00	CCC Flag: HU # 152
8,138	0231.00	Left bank road crosses over creek, good access point.
8,296	0233.00	LDA, 10' high x 18' wide x 25' long, composed of five pieces of large wood. LDA is retaining silt 6' wide x 5' long x 1' deep.
8,430	0238.00	Left bank tributary is completely dry; 250 feet of the fork was inspected before a LDA completely blocked access.
8,502	0240.00	CCC Flag: HU #162 7/91
8,528	0241.00	Channel type changes to B4 and creek forks
8,528	0241.00	Underwater observation, four YOY coho salmon observed.
8,652	0245.00	Underwater observation; no salmonids observed.
8,702	0247.00	Underwater observation; no salmonids observed.
8,790	0251.00	Access becomes extremely difficult and the creek begins to show signs of becoming intermittent.
8,790	0251.00	Underwater observation; no salmonids observed.
9,459	0275.00	LDA, 5' high x 4' wide x 6' long, composed of two pieces of large woody debris and small woody debris. The LDA is retaining silt 3' high x 10' long x 2' deep.
9,774	0280.00	Right bank failure, 10' high x 3' deep x 20' long. It appears as if a road crossing was removed as the bank was covered with hay.
9,774	0280.00	LDA, 17' high x 20' wide x 30' long, composed of nine pieces of large wood. LDA is retaining silt and small woody debris 8' wide x 6' long x 3' deep.
9,844	0280.00	End of survey. Creek is completely choked and constricted and almost goes dry. Large LDA with persistent vegetation (trees) growing on it in middle of channel. It is barely distinguishable between the creek and the ridge. A distinguishable channel forms again upstream.

South Fork Redwood Creek

REFERENCES

Flosi, G., Downie, S., Hopelain, J., Bird, M., Coey, R., and Collins, B. 1998. *California Salmonid Stream Habitat Restoration Manual*, 3rd edition. California Department of Fish and Game, Sacramento, California.

South Fork Redwood Creek

LEVEL III and LEVEL IV HABITAT TYPES

RIFFLE

Low Gradient Riffle	(LGR)	[1.1]	{ 1 }
High Gradient Riffle	(HGR)	[1.2]	{ 2 }

CASCADE

Cascade	(CAS)	[2.1]	{ 3 }
Bedrock Sheet	(BRS)	[2.2]	{24}

FLATWATER

Pocket Water	(POW)	[3.1]	{21}
Glide	(GLD)	[3.2]	{14}
Run	(RUN)	[3.3]	{15}
Step Run	(SRN)	[3.4]	{16}
Edgewater	(EDW)	[3.5]	{18}

MAIN CHANNEL POOLS

Trench Pool	(TRP)	[4.1]	{ 8 }
Mid-Channel Pool	(MCP)	[4.2]	{17}
Channel Confluence Pool	(CCP)	[4.3]	{19}
Step Pool	(STP)	[4.4]	{23}

SCOUR POOLS

Corner Pool	(CRP)	[5.1]	{22}
Lateral Scour Pool - Log Enhanced	(LSL)	[5.2]	{10}
Lateral Scour Pool - Root Wad Enhanced	(LSR)	[5.3]	{11}
Lateral Scour Pool - Bedrock Formed	(LSBk)	[5.4]	{12}
Lateral Scour Pool - Boulder Formed	(LSBo)	[5.5]	{20}
Plunge Pool	(PLP)	[5.6]	{ 9 }

BACKWATER POOLS

Secondary Channel Pool	(SCP)	[6.1]	{ 4 }
Backwater Pool - Boulder Formed	(BPB)	[6.2]	{ 5 }
Backwater Pool - Root Wad Formed	(BPR)	[6.3]	{ 6 }
Backwater Pool - Log Formed	(BPL)	[6.4]	{ 7 }
Dammed Pool	(DPL)	[6.5]	{13}

ADDITIONAL UNIT DESIGNATIONS

Dry	(DRY)	[7.0]	
Culvert	(CUL)	[8.0]	
Not Surveyed	(NS)	[9.0]	
Not Surveyed due to a marsh	(MAR)	[9.1]	