

STREAM INVENTORY REPORT

Left Bank Tributary Two to Alder Creek

INTRODUCTION

A stream inventory was conducted beginning September 9 and ending September 11, 2003 on Left Bank Tributary Two. The survey began at the confluence with Alder Creek and extended upstream 3,155 feet.

The Left Bank Tributary Two 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 Left Bank Tributary Two. 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 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

Left Bank Tributary Two is a tributary to Alder Creek, a tributary to the Pacific Ocean, located in Mendocino County, California (Map 1). Left Bank Tributary Two's legal description at the confluence with Alder Creek is T13N R15W S22. Its location is 38°58'22" north latitude and 123°30'50" west longitude. Left Bank Tributary Two is a first order stream and has approximately 1,289 feet of solid blue line stream and 4,239 feet of dashed blue line stream according to the USGS Eureka Hill 7.5 minute quadrangle. Left Bank Tributary Two drains a watershed of approximately 0.61 square miles. Elevations range from about 830 feet at the mouth of the creek to 1,567 feet in the headwater areas. Mixed conifer forest dominates the watershed. The watershed is entirely privately owned and is managed for timber production. Vehicle access exists via Piper Ranch logging roads.

METHODS

The habitat inventory conducted in Left Bank Tributary Two follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al., 1998). The California Department of Fish and Game field crew and the 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.

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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.

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 Left Bank Tributary Two to record measurements and observations. There are nine components to the inventory form.

1. Flow:

Flow is measured in cubic feet per second (cfs) at 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 (1985 rev. 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 (1988). 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". Left Bank Tributary Two habitat typing used standard basin level measurement criteria. These parameters require that the minimum length of a described habitat unit must be equal to or greater than the stream's mean

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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 Left Bank Tributary Two, 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 particle size, bedrock, or other considerations.

6. Shelter Rating:

Instream shelter is composed of those elements within a stream channel that provide 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. 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 Left Bank Tributary Two, 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 Left Bank Tributary Two, 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 evergreen or deciduous 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 withstand winter flows. In Left Bank Tributary Two, the dominant composition type and the

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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.

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 Left Bank Tributary Two. Sampling techniques are discussed in the *California Salmonid Stream Habitat Restoration Manual*.

DATA ANALYSIS

Data from the habitat inventory form are entered into Habitat 8.4, a dBASE 4.2 data entry program developed by Tim Curtis, Inland Fisheries Division, California Department of Fish and Game. This program processes and summarizes the data, and produces the following seven tables:

- Summary of riffle, flatwater, and pool habitat types
- Summary of habitat types and measured parameters
- Summary of pool types
- Summary of maximum pool depths by pool habitat types
- Summary of shelter by habitat types
- Summary of dominant substrates by habitat types
- Summary of fish habitat elements by stream reach

Graphics are produced from the tables using Microsoft Excel. Graphics developed for Left Bank Tributary Two include:

- Level II habitat types by % occurrence
- Level II habitat types by % total length
- Level IV habitat types by % occurrence
- Level I pool habitat types by % occurrence
- Maximum depth in pools
- Percent embeddedness estimated in pool tail-outs
- Mean percent cover types in pools
- Substrate composition in pool tail-outs
- Mean percent canopy
- Dominant bank composition in survey reach
- Dominant bank vegetation in survey reach

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HABITAT INVENTORY RESULTS

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

The habitat inventory of September 9 to 11, 2003, was conducted by S. Monday (DFG) and G. Trousdale (WSP/Americorps). The total length of the stream surveyed was 3,155 feet.

Stream flow was not measured on Left Bank Tributary Two.

Left Bank Tributary Two is an F4 channel type for 2,187 feet and a B4 for 968 feet of the stream surveyed. F4 channels are entrenched, meandering, riffle/pool channels on low gradients with high width/depth ratios and gravel-dominant substrates. B4 channels are moderately entrenched, moderate gradient, riffle dominated channels with infrequently spaced pools; very stable plan and profile with stable banks and gravel-dominant substrates.

Water temperatures taken during the survey period ranged from 53° to 56 ° Fahrenheit. Air temperatures ranged from 54° to 61° Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 45% riffle units, 8% flatwater units, and 42% pool units (Graph 1). Based on total length of Level II habitat types there were 73% riffle units, 11% flatwater units, and 13% pool units (Graph 2).

Ten Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were low-gradient riffles, 45%; mid-channel pools, 25%; and runs and corner pools, each at 7% (Graph 3). Based on percent total length, low-gradient riffles made up 45%, runs 10%, and mid-channel pools 8%.

A total of 25 pools were identified (Table 3). Main-channel pools were the most frequently encountered, at 60%, and comprised 65% of the total length of all pools (Graph 4).

Table 4 is a summary of maximum pool depths by pool habitat types. Pool quality for salmonids increases with depth. Three of the 25 measured pools (12%) had a depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 25 pool tail-outs measured, 3 had a value of 1 (12%); 15 had a value of 2 (60%); 3 had a value of 3 (12%); 0 had a value of 4 (0%); and 4 had a value of 5 (16%) (Graph 6). On this scale, a value of 1 indicates the highest quality of spawning substrate.

Riffle habitat types had a mean shelter rating of 13, flatwater habitat types had a mean shelter rating of 13, and pool habitats had a mean shelter rating of 40 (Table 1). Of the pool types, the scour pools had the highest mean shelter rating at 43. Main-channel pools had a mean shelter rating of 39 (Table 3).

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Table 5 summarizes mean percent cover by habitat type. Large woody debris is the dominant cover type in Left Bank Tributary Two. Graph 7 describes the pool cover in Left Bank Tributary Two. Large woody debris is the dominant pool cover type followed by boulders.

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 observed in 68% of pool tail-outs while small cobble was the next most frequently observed substrate type, at 12%.

The mean percent canopy density for the surveyed length of Left Bank Tributary Two was 92%. The mean percentages of evergreen and deciduous trees were 90% and 2%, respectively with 8% of the canopy open. Graph 9 describes the mean percent canopy in Left Bank Tributary Two.

For the stream reach surveyed, the mean percent right bank vegetated was 40%. The mean percent left bank vegetated was 38%. The dominant elements composing the structure of the stream banks consisted of 95% sand/silt/clay and 5% bedrock (Graph 10). Coniferous trees were the dominant vegetation type observed in 89% of the units surveyed. Additionally, 11% of the units surveyed had brush as the dominant vegetation type (Graph 11).

BIOLOGICAL INVENTORY RESULTS

No biological inventory was conducted on Left Bank Tributary Two.

DISCUSSION

Left Bank Tributary Two is an F4 channel type for 2,187 feet, and a B4 channel type for 968 feet of stream surveyed. The suitability of F4 and B4 channel types for fish habitat improvement structures is as follows: F4 channels are good for bank-placed boulders and fair for plunge weirs, single and opposing wing-deflectors and channel constrictors. B4 channels are excellent for low-stage plunge weirs, boulder clusters, bank placed boulders, single and opposing wing-deflectors, and log cover.

The water temperatures recorded during the survey ranged from 53° to 56 ° Fahrenheit. Air temperatures ranged from 54° to 61° Fahrenheit. Water temperatures are within the suitable range 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.

Riffle habitat types comprised 73% of the total length of this survey, pools 13%, and flatwater 11%. The pools are relatively shallow, with only 3 of the 25 (12%) measured pools having a maximum 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 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.

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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 where their installation will not conflict with the modification of the numerous log debris accumulations (LDA's) in the stream.

Eighteen of the 25 pool tail-outs measured had embeddedness ratings of 1 or 2. Three of the pool tail-outs had embeddedness ratings of 3 or 4. Four 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.

Twenty of the 25 pool tail-outs measured had gravel or small cobble as the dominant substrate. This is generally considered good for spawning salmonids.

The mean shelter for flatwater was 13. The mean shelter rating for pools was 40. 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 all habitat types. Additionally, boulders contribute a small amount.

The mean percent canopy density for the stream was 92%. Reach 1 had a canopy density of 92% while Reach 2 had canopy density of 95%.

The percentage of right and left bank covered with vegetation was low at 40% and 38%, respectively. In areas of stream bank erosion or where bank vegetation is not at acceptable levels, planting endemic trees species, in conjunction with bank stabilization, is recommended.

RECOMMENDATIONS

- 1) Left Bank Tributary Two 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.

COMMENTS AND LANDMARKS

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

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Position (ft):	Habitat unit #:	Comments:
0	0001	Start of survey at confluence with Alder Creek. 38°58'22.9" N 123°30'52.0" W. Fish observed.
332	0007	Dry left bank tributary.
523	0010	Large debris accumulation (LDA), 10 pieces of large woody debris (LWD) plus small woody debris (SWD).
739	0013	Right bank tributary. Right bank erosion caused by old Humboldt crossing at fork.
820	0017	Left bank erosion.
877	0019	Road crossing stream at end of unit.
1052	0023	Road crossing.
1689	0032	Dry right bank tributary.
1785	0036	Steelhead observed
1868	0038	Right bank erosion site measures 40' high x 56' long. Salmonid young-of-the-year (YOY) observed above erosion site.
1980	0039	High gradient left bank tributary. 2+ steelhead observed.
1990	0040	End at decommissioned Humboldt crossing. 38°58'20.6" N 123°31'10.2" W
2043	0041	Decommissioned Humboldt crossing, metal rail in channel.
2058	0042	Significant decrease in channel width.
2187	0047	Channel type change to B4, higher gradient, narrow channel.
2195	0048	Right bank tributary. Fish observed.
2557	0049	Tan oak forest
2571	0050	38°59'24.0" N 123°31'13.6" W
2586	0051	Channel type measured. Steelhead present.

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2777	0052	Dry left bank tributary. Road on left bank, 50' up, heavy use.
3066	0058	Possible channel type change to "A" type channel, high gradient. LDA, possible fish barrier
3116	0059	Stream is silty. Dry left bank tributary.
3144	0060	End of survey due to high gradient. 38°58'27.5" N 123°31'18.2" W Plastic pipes in water. No fish observed. 6' high jump up to next unit. Road crosses creek 50' upstream.

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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]	

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TABLES AND GRAPHS

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat Types

Stream Name: Alder, LB Trib 2		Drainage: Point Arena														
Survey Dates: 9/9/2003 to 9/11/2003																
Confluence Location: Quad: EUREKA HILL		Legal Description: T13NR15WS22		Latitude: 38.58:22.0N		Longitude: 123.30:50.0W										
Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Percent Total Length	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating	
2	0	DRY	3.3	12	23	0.7										
5	4	FLATWATER	8.3	68	339	10.7	4.5	0.4	0.8	294	1468	135	676		6	
1	0	NOSURVEY	1.7	63	63	2.0										
25	25	POOL	41.7	16	412	13.1	6.0	0.7	1.5	97	2424	85	2160	72	36	
27	3	RIFFLE	45.0	86	2318	73.5	3.3	0.3	0.7	320	8652	136	3682		8	
Total Units				Total Length (ft.)		Total Area (sq.ft.)		Total Volume (cu.ft.)								
60		32		3155		12543.2		6517.756								

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Alder, LB Trib 2		Drainage: Point Arena														
Survey Dates: 9/9/2003 to 9/11/2003																
Confluence Location: Quad: EUREKA HILL		Legal Description: T13NR15WS22		Latitude: 38.58:22.0N		Longitude: 123.30:50.0W										
Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating	Mean Canopy (%)
27	3	LGR	45.0	86	2318	73.5	3	0.3	1.2	320	8652	136	3682		8	93
1	1	GLD	1.7	31	31	1.0	5	0.2	0.4	155	155	31	31		5	92
4	3	RUN	6.7	77	308	9.8	4	0.5	1.1	340	1359	170	679		7	98
15	15	MCP	25.0	18	268	8.5	6	0.7	3	109	1628	98	1475	61	37	89
4	4	CRP	6.7	17	67	2.1	6	0.8	2.5	102	406	98	391	62	30	93
1	1	LSL	1.7	15	15	0.5	4	0.6	1.3	60	60	48	48	36	60	100
3	3	LSBo	5.0	14	41	1.3	6	0.6	1.9	77	230	58	174	49	33	94
2	2	PLP	3.3	10	21	0.7	5	0.7	1.85	50	101	36	72	35	30	99
2	0	DRY	3.3	12	23	0.7										93
1	0	NS	1.7	63	63	2.0										88
Total Units				Total Length (ft.)		Total Area (sq.ft.)		Total Volume (cu.ft.)								
60		32		3155		12589.37		6552.463								

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Table 3 - Summary of Pool Types

Stream Name: Alder, LB Trib 2

Drainage: Point Arena

Survey Dates: 9/9/2003 to 9/11/2003

Confluence Location: Quad: EUREKA HILL Legal Description: T13NR15WS22 Latitude: 38:58:22.0N Longitude: 123:30:50.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Residual Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Residual Pool Vol (cu.ft.)	Estimated Total Resid.Vol. (cu.ft.)	Mean Shelter Rating
15	15	MAIN	60	18	268	65	6.3	0.7	109	1628	81	1217	37
10	10	SCOUR	40	14	144	35	5.6	0.7	80	796	58	578	34

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
25	25	412	2424	1794.625

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Table 4 - Summary of Maximum Residual Pool Depths By Pool Habitat Types

Stream Name: Alder, LB Trib 2

Drainage: Point Arena

Survey Dates: 9/9/2003 to 9/11/2003

Confluence Location: Quad: EUREKA HILL

Legal Description: T13NR15WS22

Latitude: 38:58:22.0N

Longitude: 123:30:50.0W

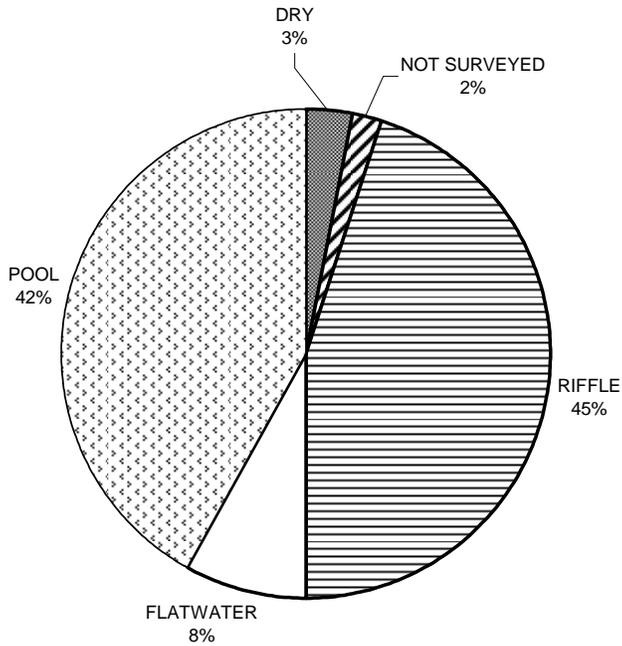
Habitat Units	Habitat Type	Habitat Occurrence (%)	< 1 Foot Maximum Residual Depth	< 1 Foot Percent Occurrence	1 < 2 Feet Maximum Residual Depth	1 < 2 Feet Percent Occurrence	2 < 3 Feet Maximum Residual Depth	2 < 3 Feet Percent Occurrence	3 < 4 Feet Maximum Residual Depth	3 < 4 Feet Percent Occurrence	>= 4 Feet Maximum Residual Depth	>= 4 Feet Percent Occurrence
15	MCP	60	3	20	10	67	1	7	1	7	0	0
4	CRP	16	0	0	3	75	1	25	0	0	0	0
1	LSL	4	0	0	1	100	0	0	0	0	0	0
3	LSBo	12	0	0	3	100	0	0	0	0	0	0
2	PLP	8	0	0	2	100	0	0	0	0	0	0

Total Units	Total 1 Foot Max Resid. Depth	Total % Occurrence	Total 1 < 2 Foot Max Resid. Depth	Total % Occurrence	Total 2 < 3 Foot Max Resid. Depth	Total % Occurrence	Total 3 < 4 Foot Max Resid. Depth	Total % Occurrence	Total >= 4 Foot Max Resid. Depth	Total % Occurrence
25	3	12	19	76	2	8	1	4	0	0

Mean Maximum Residual Pool Depth (ft): 1.5

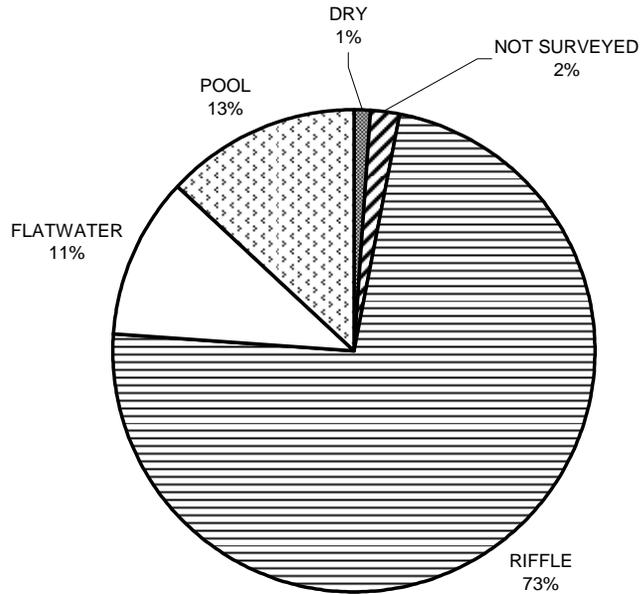
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**ALDER CREEK, LEFT BANK TRIBUTARY TWO
HABITAT TYPES BY PERCENT OCCURRENCE**



GRAPH 1

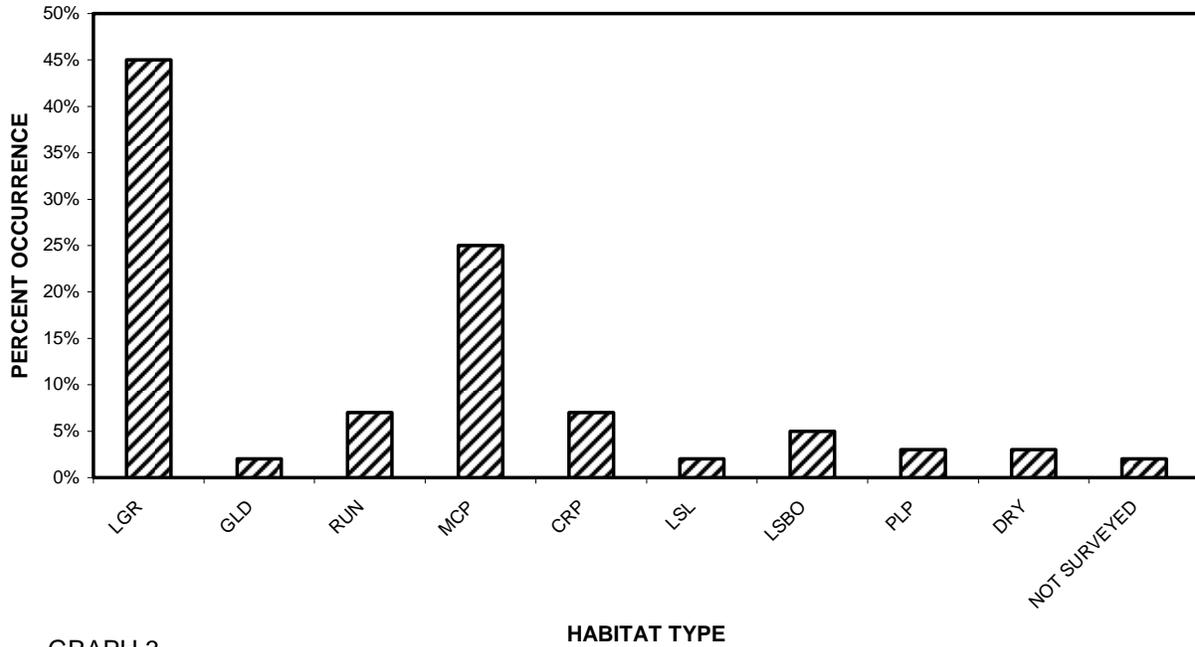
**ALDER CREEK, LEFT BANK TRIBUTARY TWO
HABITAT TYPES BY PERCENT TOTAL LENGTH**



GRAPH 2

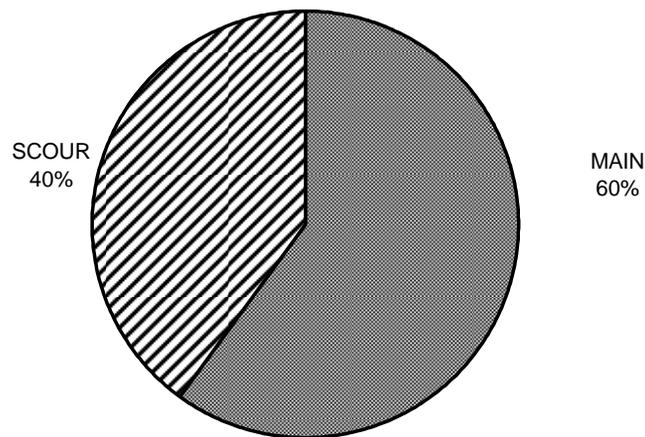
Left Bank Tributary Two to Alder Creek

**ALDER CREEK, LEFT BANK TRIBUTARY TWO
HABITAT UNIT TYPES BY PERCENT OCCURRENCE**



GRAPH 3

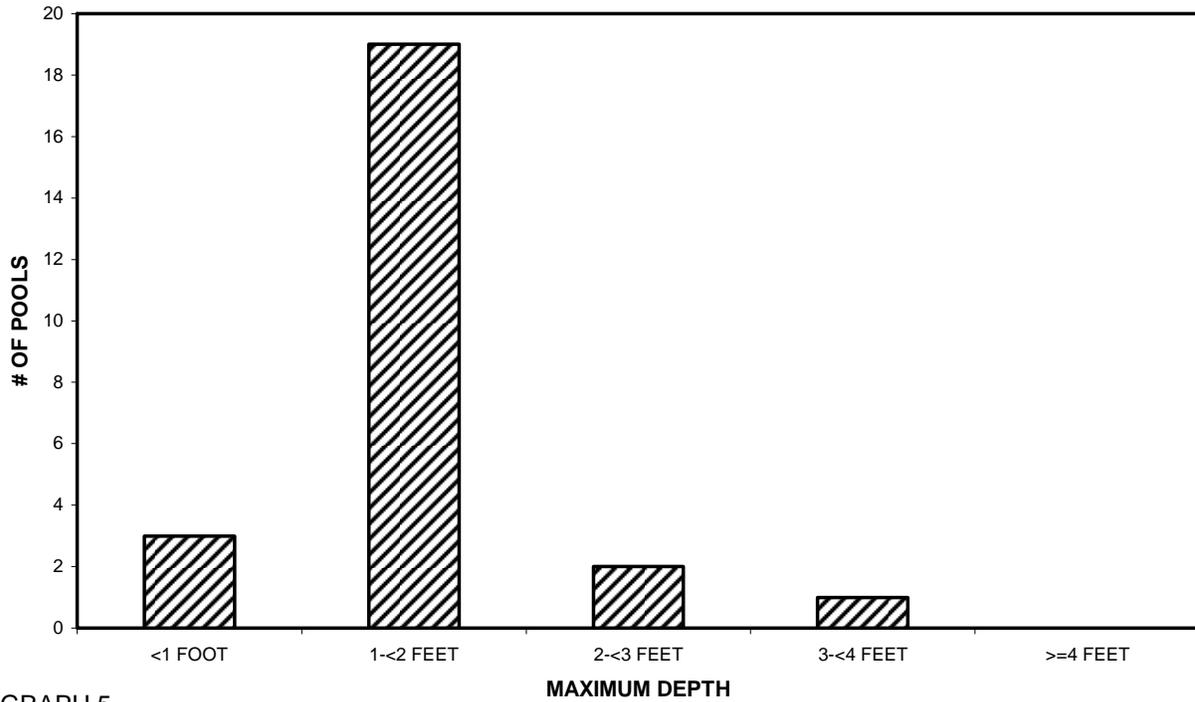
**ALDER CREEK, LEFT BANK TRIBUTARY TWO
POOL HABITAT TYPES BY PERCENT OCCURRENCE**



GRAPH 4

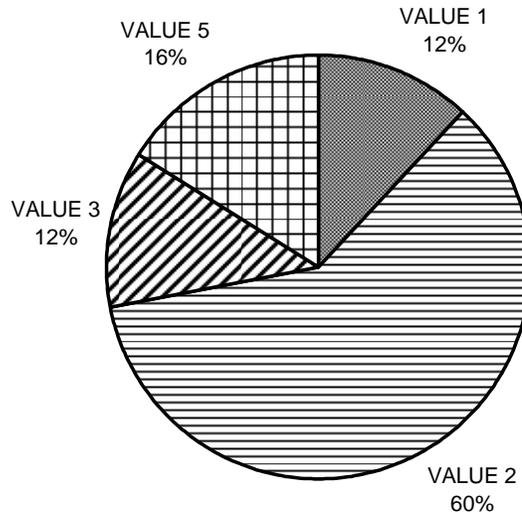
Left Bank Tributary Two to Alder Creek

ALDER CREEK, LEFT BANK TRIBUTARY TWO MAXIMUM DEPTH IN POOLS



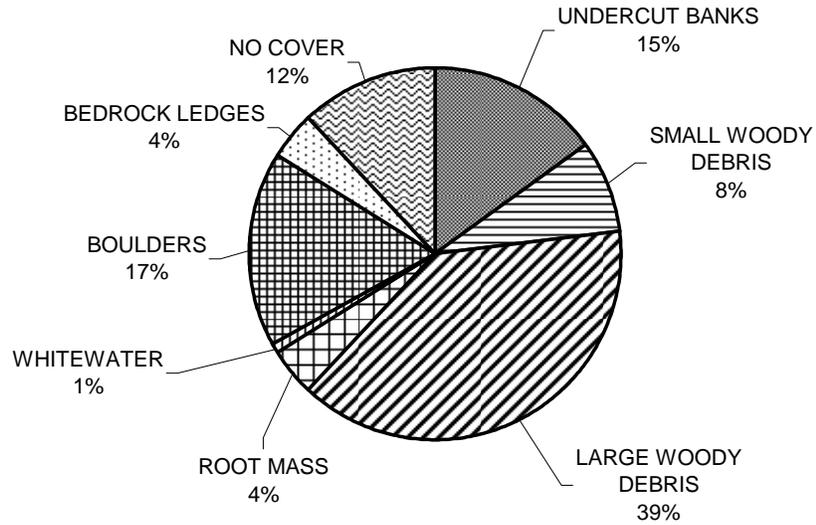
GRAPH 5

ALDER CREEK, LEFT BANK TRIBUTARY TWO PERCENT EMBEDDEDNESS



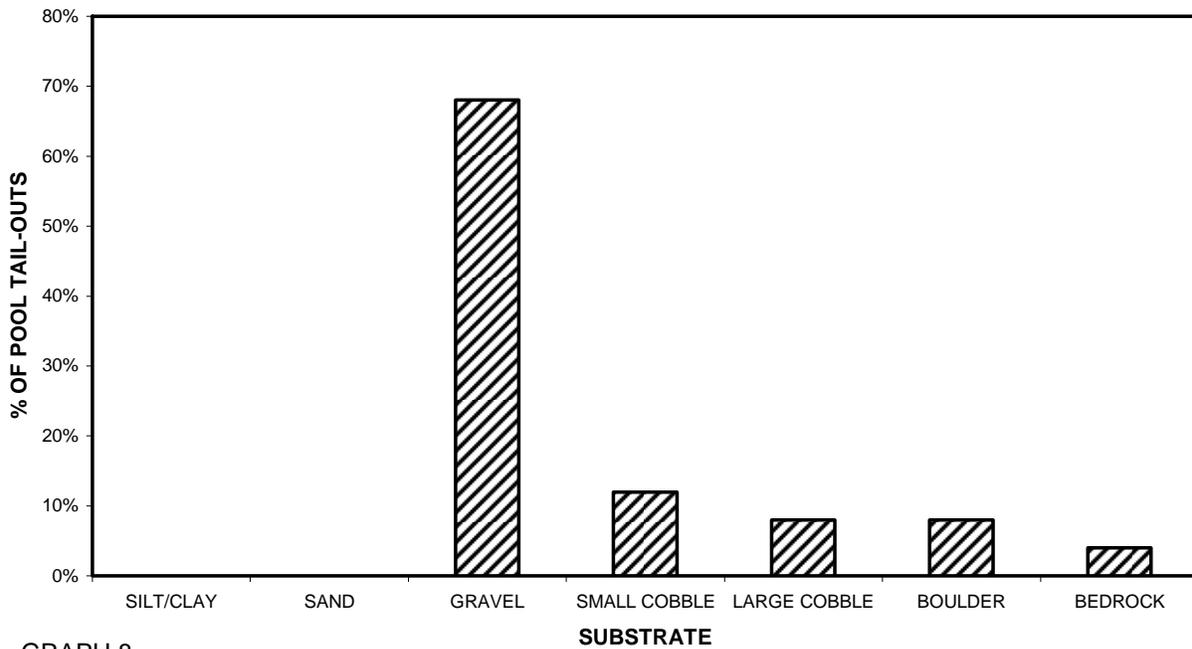
GRAPH 6

ALDER CREEK, LEFT BANK TRIBUTARY TWO MEAN PERCENT COVER TYPES IN POOLS



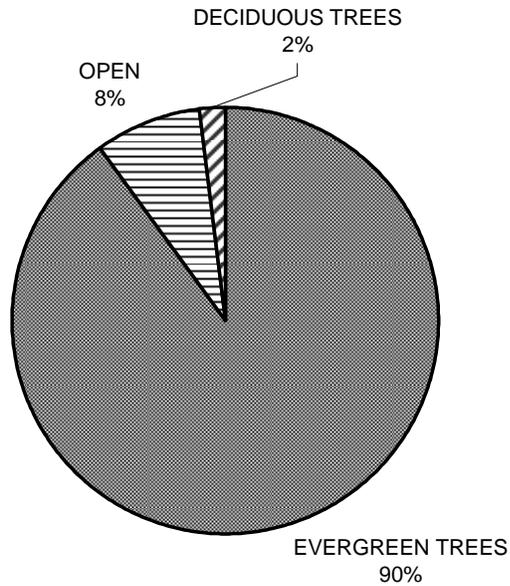
GRAPH 7

ALDER CREEK, LEFT BANK TRIBUTARY TWO SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



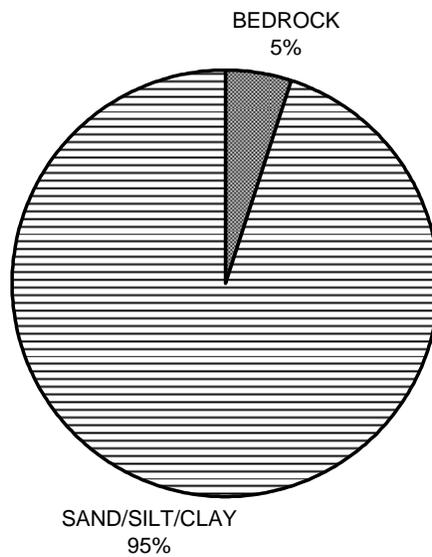
GRAPH 8

ALDER CREEK, LEFT BANK TRIBUTARY TWO MEAN PERCENT CANOPY



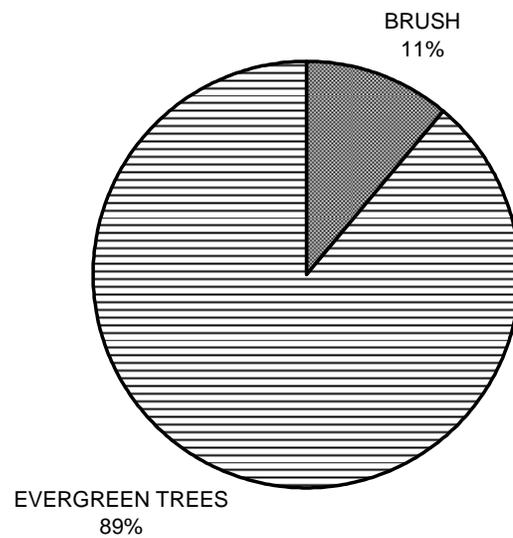
GRAPH 9

ALDER CREEK, LEFT BANK TRIBUTARY TWO DOMINANT BANK COMPOSITION IN SURVEY REACH



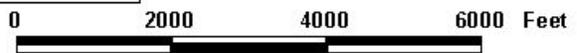
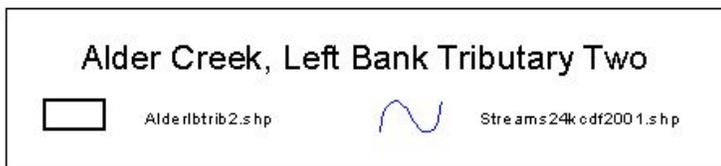
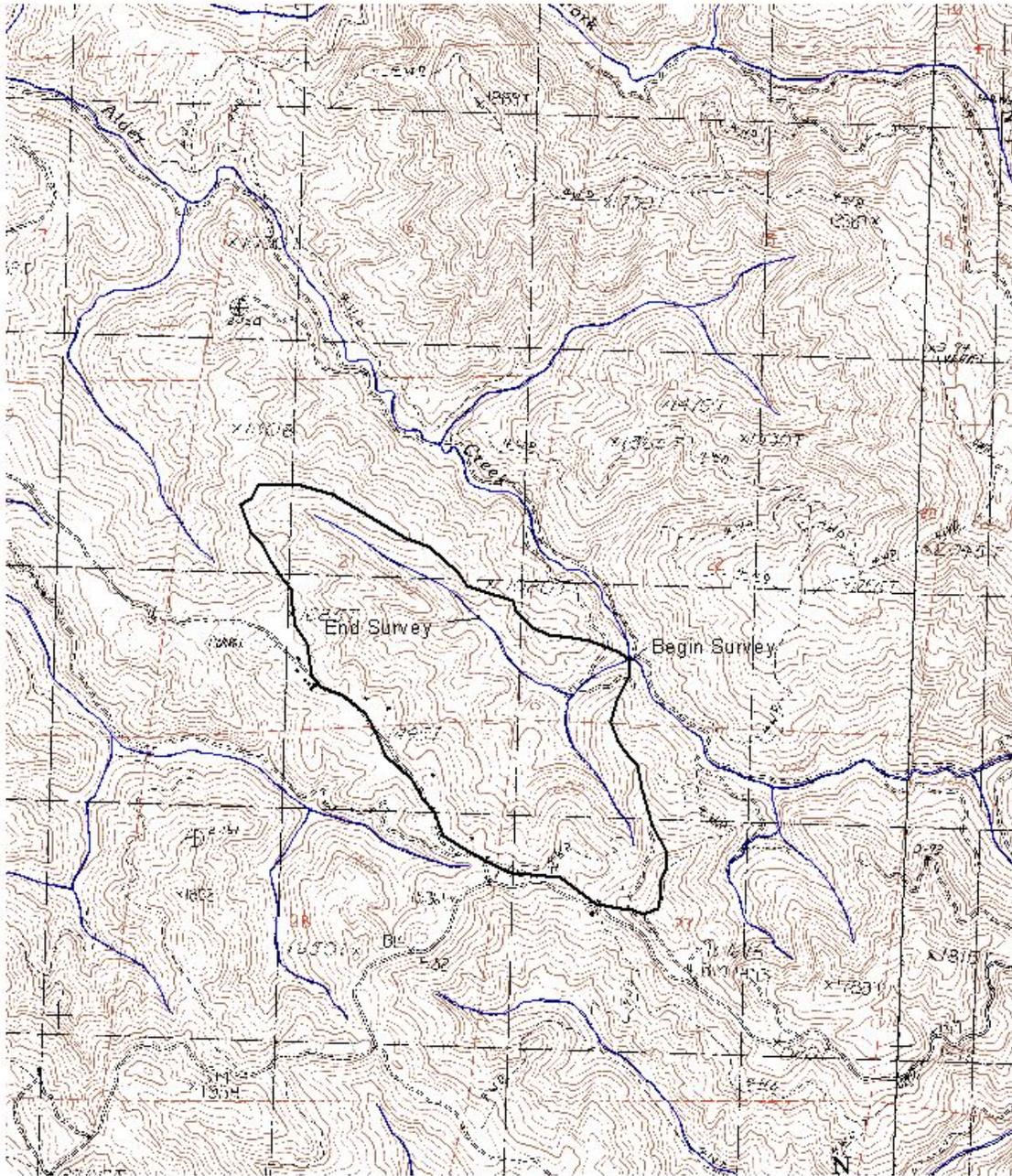
GRAPH 10

ALDER CREEK, LEFT BANK TRIBUTARY TWO DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11

Left Bank Tributary Two to Alder Creek



MAP 1. Map of Alder Creek, Left Bank Tributary Two showing the stream habitat inventory reach and watershed boundary.

Left Bank Tributary Two to Alder 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.