

STREAM INVENTORY REPORT

Left Bank Tributary One to Alder Creek

INTRODUCTION

A stream inventory was conducted on August 25, 2003 on Left Bank Tributary One. The survey began at the confluence with Alder Creek and extended upstream 4,964 feet.

The Left Bank Tributary One 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 One. 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 One is a tributary to Alder Creek, a tributary to the Pacific Ocean, located in Mendocino County, California (Map 1). Left Bank Tributary One's legal description at the confluence with Alder Creek is T13N R15W S17. Its location is 38°59'23" north latitude and 123°32'12" west longitude. Left Bank Tributary One is a first order stream and has approximately 4,805 feet of solid blue line stream and 2,033 feet of dashed blue line stream according to the USGS Eureka Hill 7.5 minute quadrangle. Left Bank Tributary One drains a watershed of approximately 0.76 square miles. Elevations range from about 672 feet at the mouth of the creek to 1,565 feet in the headwater areas. Mixed conifer forest dominates the watershed. The watershed is entirely privately owned and is managed for timber production and rangeland. Vehicle access exists via Piper Ranch logging roads.

METHODS

The habitat inventory conducted in Left Bank Tributary One 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.

Left Bank Tributary One to Alder Creek

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 One 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 One 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

Left Bank Tributary One to Alder Creek

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 One, 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 One, 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 One, 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 One, the dominant composition type and the

Left Bank Tributary One to Alder Creek

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 One. 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 One 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

Left Bank Tributary One to Alder Creek

HABITAT INVENTORY RESULTS

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

The habitat inventory of August 25, 2003, was conducted by S. Sellars (WSP/Americorps) and B. Budnick (DFG). The total length of the stream surveyed was 4,964 feet.

Stream flow was not measured on Left Bank Tributary One.

Left Bank Tributary One is a B2 channel type for 708 feet and a B4 for 4,256 feet of the stream surveyed. B2 channels are moderately entrenched, moderate gradient, riffle dominated channels with infrequently spaced pools, very stable plan and profile, stable banks and boulder-dominated substrates. B4 channels are moderately entrenched, moderately 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 58° to 69° Fahrenheit. Air temperatures ranged from 60° to 84° Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 45% pool units, 10% riffle units, 0% flatwater units, with 44% dry (Graph 1). Based on total length of Level II habitat types there were 21% pool units, 14% riffle units, 0% flatwater units, with 65% dry (Graph 2).

Six Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were dry, 44%; mid-channel pools, 40%; and low-gradient riffles, 10% (Graph 3). Based on percent total length, dry made up 65%, mid-channel pools 15%, and low-gradient riffles 14%.

A total of 45 pools were identified (Table 3). Main-channel pools were the most frequently encountered, at 98%, and comprised 98% 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 44 measured pools (7%) had a depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 44 pool tail-outs measured, 2 had a value of 1 (5%); 21 had a value of 2 (48%); 14 had a value of 3 (32%); 0 had a value of 4 (0%); and 7 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 6 and pool habitats had a mean shelter rating of 22 (Table 1). Of the pool types, the main-channel pools had the highest mean shelter rating at 22. Scour pools had a mean shelter rating of 10 (Table 3).

Left Bank Tributary One to Alder Creek

Table 5 summarizes mean percent cover by habitat type. Boulders are the dominant cover types in Left Bank Tributary One. Graph 7 describes the pool cover in Left Bank Tributary One. Boulders are the dominant pool cover types 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 observed in 73% of pool tail-outs while small cobble was the next most frequently observed substrate type, at 41%.

The mean percent canopy density for the surveyed length of Left Bank Tributary One was 96%. The mean percentages of evergreen and deciduous trees were 82% and 14%, respectively with 4% of the canopy open. Graph 9 describes the mean percent canopy in Left Bank Tributary One.

For the stream reach surveyed, the mean percent right bank vegetated was 53%. The mean percent left bank vegetated was 52%. The dominant elements composing the structure of the stream banks consisted of 98% sand/silt/clay and 2% bedrock (Graph 10). Coniferous trees were the dominant vegetation type observed in 82% of the units surveyed. Additionally, 18% of the units surveyed had deciduous trees as the dominant vegetation type (Graph 11).

BIOLOGICAL INVENTORY RESULTS

No biological inventory was conducted on Left Bank Tributary One.

DISCUSSION

Left Bank Tributary One is a B2 channel type for 708 feet and a B4 channel type for 4,256 feet of stream surveyed. The suitability of B2 and B4 channel types for fish habitat improvement structures is as follows: B2 channels are excellent for plunge weirs, single and opposing wing-deflectors and log cover. 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 58° to 69° Fahrenheit. Air temperatures ranged from 60° to 84° Fahrenheit. Recorded water temperatures of 60° Fahrenheit and below are 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.

Pool habitat types comprised 21% of the total length of this survey and riffles 14%. The pools are relatively shallow, with only 3 of the 44 (7%) 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. 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

Left Bank Tributary One to Alder Creek

conflict with the modification of the numerous log debris accumulations (LDA's) in the stream.

Twenty-two of the 44 pool tail-outs measured had embeddedness ratings of 1 or 2. Fourteen of the pool tail-outs had embeddedness ratings of 3 or 4. Seven 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.

Thirty-eight of the 44 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 22. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by boulders in all habitat types. Additionally, undercut banks contribute a small amount. 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 96%. Reach 1 had a canopy density of 89% while Reach 2 had a canopy density of 97%.

The percentage of right and left bank covered with vegetation was low at 53% and 52%, 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 One should be managed as an anadromous, natural production stream.
- 2) The limited water temperature data available suggest that maximum temperatures are above 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) 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.
- 4) Increase woody cover in the pools and flatwater habitat units. Most of the existing cover is from boulders. Adding high quality complexity with log and root wad cover is desirable.
- 5) There are several log debris accumulations present on Left Bank Tributary One that are retaining large quantities of fine sediment. The modification of these debris

Left Bank Tributary One to Alder Creek

accumulations is desirable, but must be done carefully, over time, to avoid excessive sediment loading in downstream reaches.

- 6) There are sections where the stream is being impacted from cattle trampling the riparian zone. Alternatives should be explored with the grazier and developed if possible.

COMMENTS AND LANDMARKS

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

Position (ft):	Habitat unit #:	Comments:
0	0001	Start of survey at confluence with Alder Creek. 38°59'23.6" N, 123°32'12.6" W.
31	0002	Units 001-003 within influence of Alder Creek.
134	0004	Puddles with dry patches between.
193	0006	Dirt/gravel road crosses creek (alternate crossing to bridge).
204	0007	Evidence of cattle in creek.
243	0009	At least one fish observed in pool.
374	0013	Left bank land slide. Fish observed in a puddle before log jam. Large debris accumulation (LDA) measures 10' high x 20' wide from land slide, water can flow around LDA.
708	0014	Channel type change to B4.
894	0025	Dry right bank tributary.
1046	0030	Dirt/gravel road crosses creek.
1111	0031	Riparian vegetation: dogwood, redwood, cedar, huckleberry, tan oak, madrone. Road on left bank near creek units 031-036.
1382	0037	Left bank road higher on bank.
1563	0041	Dry, steep right bank tributary.

Left Bank Tributary One to Alder Creek

1608	0043	Small, dry, right bank tributary. Young-of-the-year (YOY) salmonids observed. LDA.
1626	0044	Small puddles present.
1728	0045	Dry right bank tributary.
1858	0049	Frogs observed.
1997	0050	YOY salmonids observed.
2026	0051	Dry right bank tributary.
2092	0053	Erosion at cow trail to pool.
2105	0054	Evidence of cattle in creek bed.
2200	0055	Herd of cows on both creek banks.
2222	0056	Dry left bank tributary. Many cow trails into creek bed.
2346	0058	Decommissioned road (from right bank) crossing.
2592	0059	Dry left bank tributary.
2684	0063	Right bank road nearing creek.
2720	0064	Bridge, 38°59'07.7" N 123°32'31.1" W. Old road crossing through creek.
2848	0065	Cows in creek.
2860	0066	Creek very sinuous.
3140	0068	Some puddles. Dry left bank tributary.
3357	0069	Many frogs observed.
3575	0071	Other riparian vegetation: poison oak and ferns.
3593	0072	Small, dry, left bank tributary.
3657	0075	Gradient increasing, still <4%, more boulders.
3755	0076	Dry right bank tributary.
3857	0081	Very small, dry, right bank tributary.

Left Bank Tributary One to Alder Creek

4197	0088	LDA measures 6' high x 10' long x 9' wide, possible barrier, logs stuck on both banks.
4207	0089	Still evidence of cows on banks and in creek.
4358	0090	38°58'52.6" N 123°32'27.1" W. Large, dry, left bank tributary. Frogs and juvenile salamanders observed.
4706	0098	Very small, dry, right bank tributary.
4886	0100	Occasional puddles not large enough for fish. End of survey: thick brush, trees fallen over creek, channel narrows, still a B4 channel, no fish observed.

Left Bank Tributary One to Alder 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]	

Left Bank Tributary One to Alder Creek

TABLES AND GRAPHS

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

Stream Name: Alder, LB Trib 1 Drainage: Point Arena
 Survey Dates: 8/25/2003 to 9/2/2003
 Confluence Location: Quad: EUREKA HILL Legal Description: T13NR15WS17 Latitude: 38:59:23.0N Longitude: 123:32:12.0W

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
44	0	DRY	44.0	73	3217	64.8									
1	0	NOSURVEY	1.0	10	10	0.2									
45	44	POOL	45.0	23	1038	20.9	4.8	0.5	1.1	100	4510	51	2300	51	16
10	4	RIFFLE	10.0	70	699	14.1	2.8	0.2	0.6	99	994	20	202		6
Total Units	Total Units Fully Measured				Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)		
100	48				4964						5504.108		2501.924		

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Alder, LB Trib 1 Drainage: Point Arena
 Survey Dates: 8/25/2003 to 9/2/2003
 Confluence Location: Quad: EUREKA HILL Legal Description: T13NR15WS17 Latitude: 38:59:23.0N Longitude: 123:32:12.0W

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 (%)
10	4	LGR	10.0	70	699	14.1	3	0.2	0.7	99	994	20	202		8	95
40	39	MCP	40.0	19	749	15.1	5	0.4	2.3	84	3356	41	1624	40	15	96
4	4	STP	4.0	66	266	5.4	5	0.6	1.6	250	1001	146	582	146	21	96
1	1	LSBo	1.0	23	23	0.5	6	0.6	1.6	138	138	83	83	83	10	94
44	0	DRY	44.0	73	3217	64.8										96
1	0	NS	1.0	10	10	0.2										
Total Units	Total Units Fully Measured				Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)			
100	48				4964						5487.764		2491.42			

Left Bank Tributary One to Alder Creek

Table 3 - Summary of Pool Types

Stream Name: Alder, LB Trib 1

Drainage: Point Arena

Survey Dates: 8/25/2003 to 9/2/2003

Confluence Location: Quad: EUREKA HILL

Legal Description: T13NR15WS17

Latitude: 38:59:23.0N

Longitude: 123:32:12.0W

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
44	43	MAIN	98	23	1015	98	4.8	0.4	99	4372	50	2190	16
1	1	SCOUR	2	23	23	2	6.0	0.6	138	138	83	83	10

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
45	44	1038	4509.604	2272.875

Left Bank Tributary One to Alder Creek

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

Stream Name: Alder, LB Trib 1 Drainage: Point Arena
 Survey Dates: 8/25/2003 to 9/2/2003
 Confluence Location: Quad: EUREKA HILL Legal Description: T13NR15WS17 Latitude: 38:59:23.0N Longitude: 123:32:12.0W

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
39	MCP	89	20	51	16	41	3	8	0	0	0	0
4	STP	9	1	25	3	75	0	0	0	0	0	0
1	LSBo	2	0	0	1	100	0	0	0	0	0	0

Total Units	Total 1 Foot Max Resid. Depth	<Total 1 Foot % Occurrence	Total 1 < 2 Foot Max Resid. Depth	Total 1 < 2 Foot % Occurrence	Total 2 < 3 Foot Max Resid. Depth	Total 2 < 3 Foot % Occurrence	Total 3 < 4 Foot Max Resid. Depth	Total 3 < 4 Foot % Occurrence	Total >= 4 Foot Max Resid. Depth	Total >= 4 Foot % Occurrence
44	21	48	20	45	3	7	0	0	0	0

Mean Maximum Residual Pool Depth (ft.): 1.1

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Alder, LB Trib 1 Drainage: Point Arena
 Survey Dates: 8/25/2003 to 9/2/2003 Dry Units: 44
 Confluence Location: Quad: EUREKA HILL Legal Description: T13NR15WS17 Latitude: 38:59:23.0N Longitude: 123:32:12.0W

Habitat Units	Units Fully Measured	Habitat Type	Mean % Undercut Banks	Mean % SWD	Mean % LWD	Mean % Root Mass	Mean % Terr. Vegetation	Mean % Aquatic Vegetation	Mean % White Water	Mean % Boulders	Mean % Bedrock Ledges
10	4	LGR	21	10	5	0	1	0	0	63	0
10	4	TOTAL RIFFLE	21	10	5	0	1	0	0	63	0
0	0	TOTAL FLAT									
40	39	MCP	26	14	3	8	0	0	0	18	0
4	4	STP	0	16	0	3	0	0	0	81	0
1	1	LSBo	0	0	0	0	0	0	0	100	0
45	44	TOTAL POOL	23	14	3	7	0	0	0	26	0
1	0	NS									
100	48	TOTAL	23	13	3	7	0	0	0	29	0

Left Bank Tributary One to Alder Creek

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Alder, LB Trib 1			Drainage: Point Arena							
Survey Dates: 8/25/2003 to 9/2/2003			Dry Units: 44							
Confluence Location: Quad: EUREKA HILL			Legal Description: T13NR15WS17 Latitude: 38:59:23.0N Longitude: 123:32:12.0W							
Habitat Units	Units Fully Measured	Habitat Type	% Total Silt/Clay Dominant	% Total Sand Dominant	% Total Gravel Dominant	% Total Small Cobble Dominant	% Total Large Cobble Dominant	% Total Boulder Dominant	% Total Bedrock Dominant	
10	4	LGR	0	25	75	0	0	0	0	
40	39	MCP	0	3	97	0	0	0	0	
4	4	STP	0	0	100	0	0	0	0	
1	1	LSBo	0	0	100	0	0	0	0	

Table 8 - Fish Habitat Inventory Data Summary

Stream Name: Alder, LB Trib 1		Drainage: Point Arena			
Survey Dates: 8/25/2003 to 9/2/2003		Survey Length (ft.): 4964		Main Channel (ft.): 4964	Side Channel (ft.): 0
Confluence Location: Quad: EUREKA HILL		Legal Description: T13NR15WS17 Latitude: 38:59:23.0N Longitude: 123:32:12.0W			

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

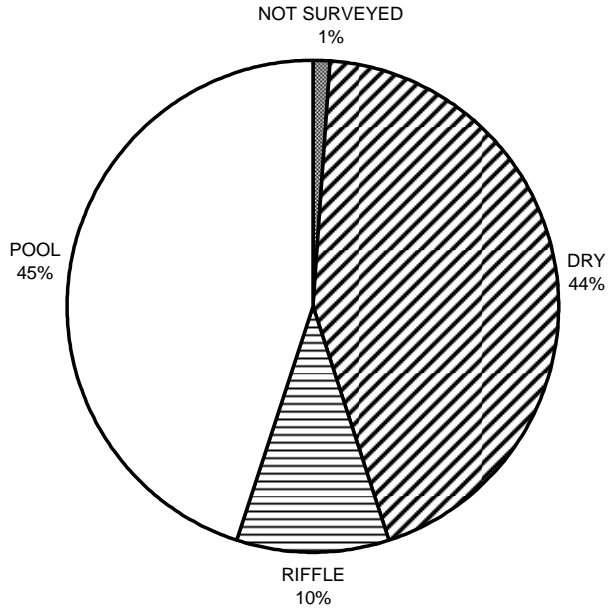
Channel Type: B2	Canopy Density (%): 89	Pools by Stream Length (%): 14
Reach Length (ft.): 708	Coniferous Component (%): 41	Pool Frequency (%): 38
Riffle/Flatwater Mean Width (ft.): 2.5	Deciduous Component (%): 59	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Evergreen Trees	< 2 Feet Deep: 75
Range (ft.): 15 to 21	Vegetative Cover (%): 70	2 to 2.9 Feet Deep: 25
Mean (ft.): 19	Dominant Shelter: Boulders	3 to 3.9 Feet Deep: 0
Std. Dev.: 2	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 0
Base Flow (cfs.): 0.0	Occurrence of LWD (%): 0	Mean Max Residual Pool Depth (ft.): 1.0
Water (F): 60 - 60	Air (F): 70 - 72	Mean Pool Shelter Rating: 5
Dry Channel (ft): 510	LWD per 100 ft.:	
	Riffles: 0	
	Pools: 0	
	Flat:	
Pool Tail Substrate (%): Silt/Clay: 0	Sand: 0	Gravel: 50
	Sm Cobble: 0	Lg Cobble: 50
	Boulder: 0	Bedrock: 0
Embeddedness Values (%): 1. 0	2. 25	3. 25
	4. 0	5. 50

STREAM REACH: 2

Channel Type: B4	Canopy Density (%): 97	Pools by Stream Length (%): 22
Reach Length (ft.): 4256	Coniferous Component (%): 90	Pool Frequency (%): 46
Riffle/Flatwater Mean Width (ft.): 3.0	Deciduous Component (%): 10	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Evergreen Trees	< 2 Feet Deep: 95
Range (ft.): 8 to 16	Vegetative Cover (%): 73	2 to 2.9 Feet Deep: 5
Mean (ft.): 11	Dominant Shelter: Undercut Banks	3 to 3.9 Feet Deep: 0
Std. Dev.: 3	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 0
Base Flow (cfs.): 0.0	Occurrence of LWD (%): 4	Mean Max Residual Pool Depth (ft.): 1.1
Water (F): 58 - 69	Air (F): 60 - 84	Mean Pool Shelter Rating: 17
Dry Channel (ft): 2707	LWD per 100 ft.:	
	Riffles: 0	
	Pools: 1	
	Flat:	
Pool Tail Substrate (%): Silt/Clay: 0	Sand: 2	Gravel: 75
	Sm Cobble: 15	Lg Cobble: 5
	Boulder: 2	Bedrock: 0
Embeddedness Values (%): 1. 5	2. 50	3. 32
	4. 2	5. 10

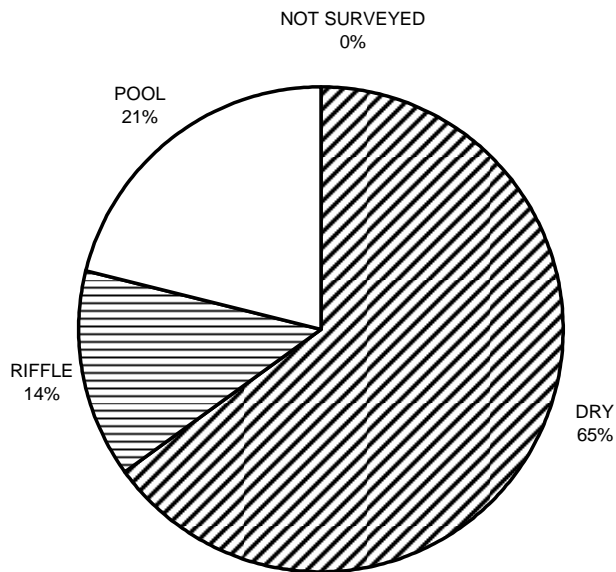
Left Bank Tributary One to Alder Creek

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



GRAPH 1

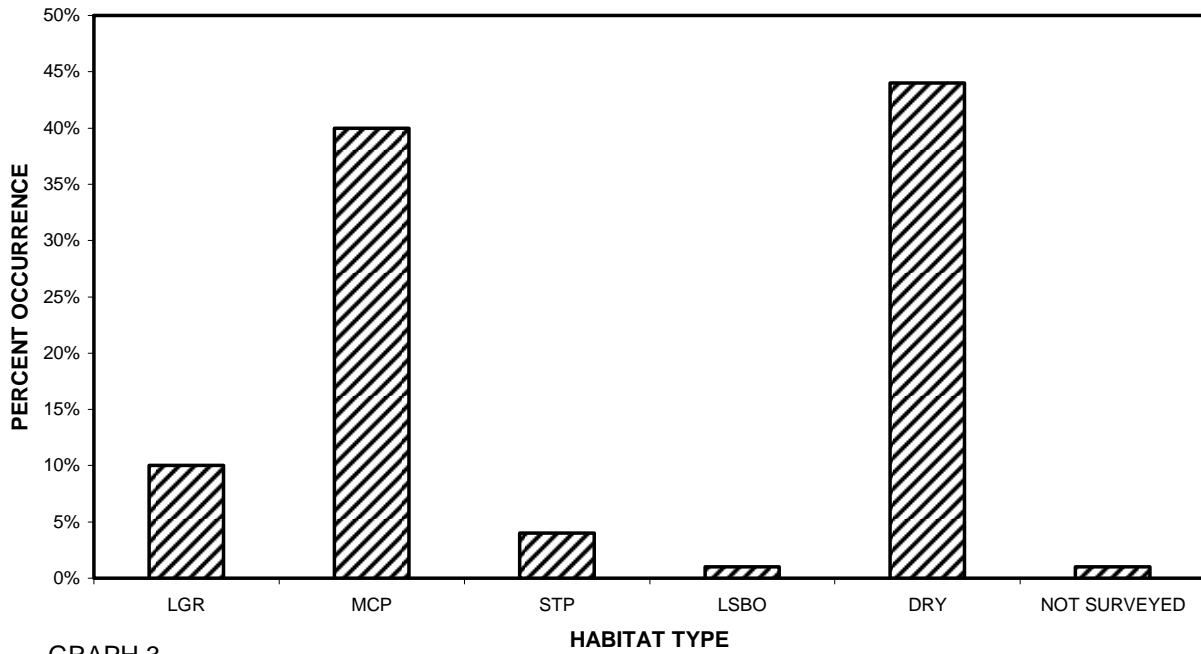
**ALDER CREEK, LEFT BANK TRIBUTARY ONE
HABITAT TYPES BY PERCENT TOTAL LENGTH**



GRAPH 2

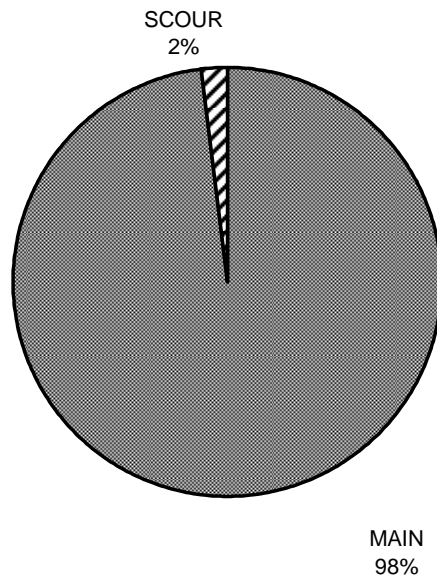
Left Bank Tributary One to Alder Creek

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



GRAPH 3

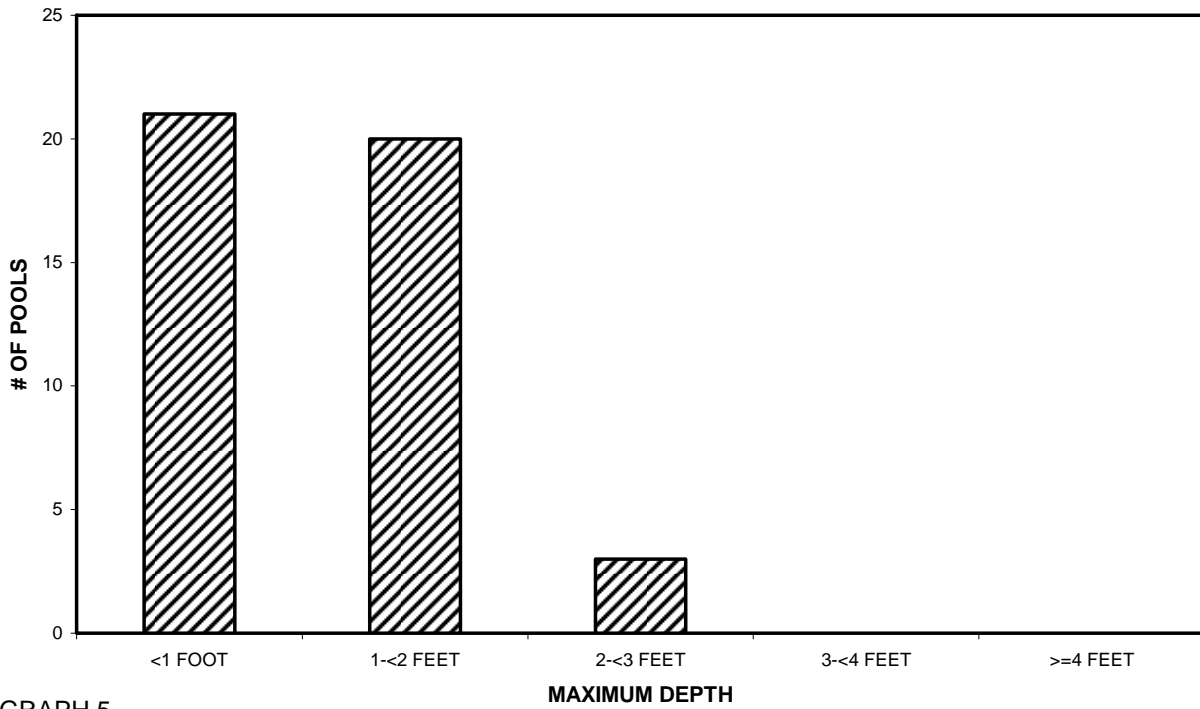
**ALDER CREEK, LEFT BANK TRIBUTARY ONE
POOL HABITAT TYPES BY PERCENT OCCURRENCE**



GRAPH 4

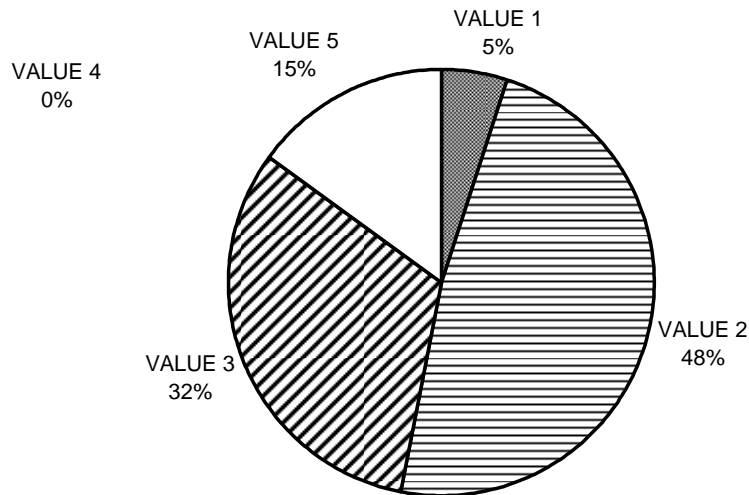
Left Bank Tributary One to Alder Creek

**ALDER CREEK, LEFT BANK TRIBUTARY ONE
MAXIMUM DEPTH IN POOLS**



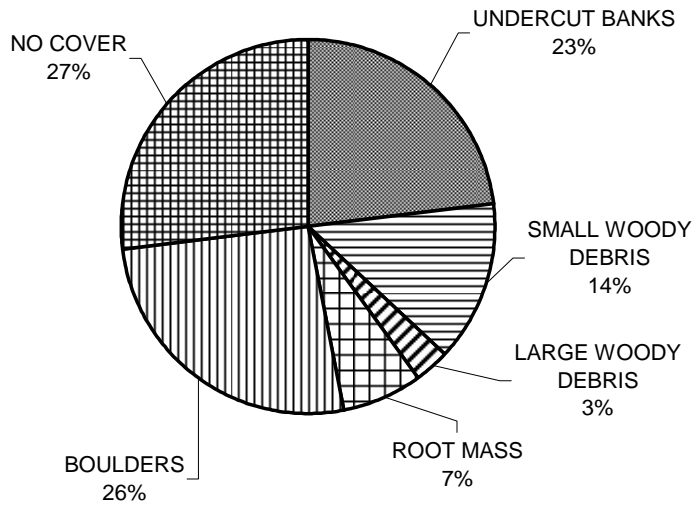
GRAPH 5

**ALDER CREEK, LEFT BANK TRIBUTARY ONE
PERCENT EMBEDDEDNESS**



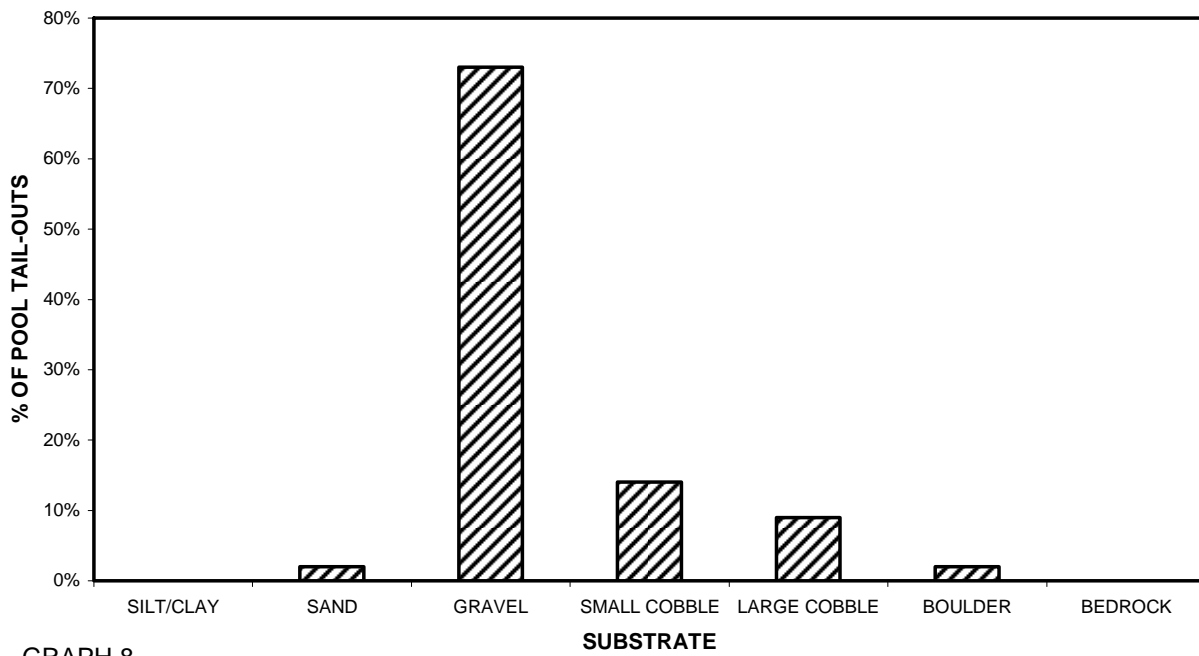
GRAPH 6

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



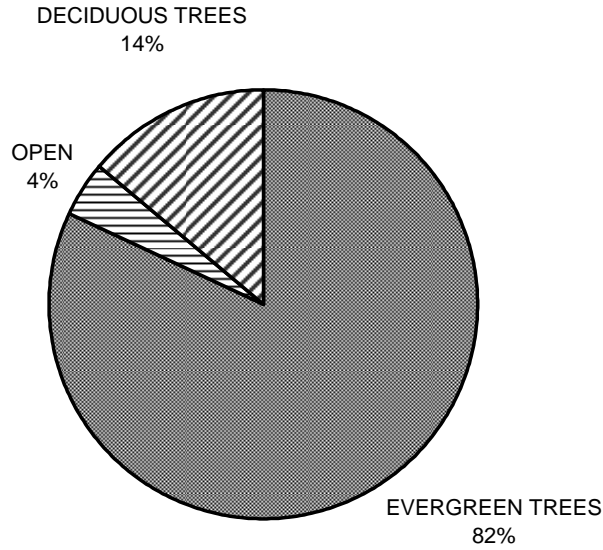
GRAPH 7

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



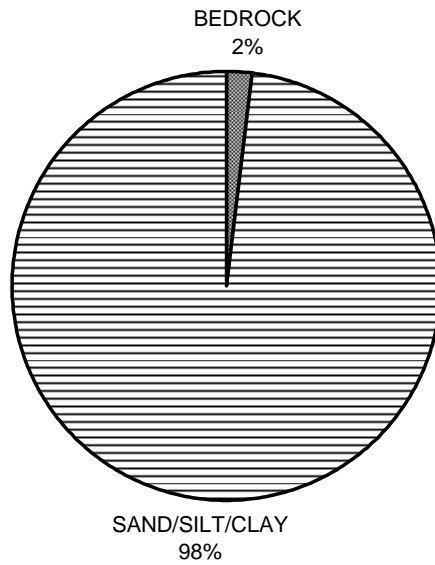
GRAPH 8

ALDER CREEK, LEFT BANK TRIBUTARY ONE MEAN PERCENT CANOPY



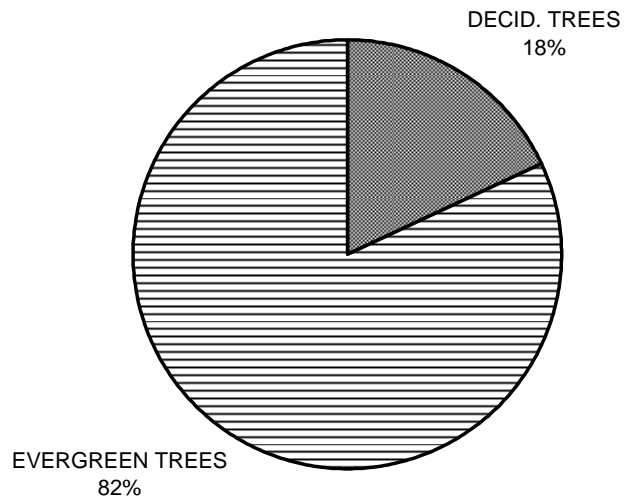
GRAPH 9

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



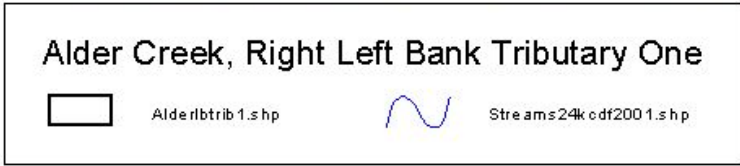
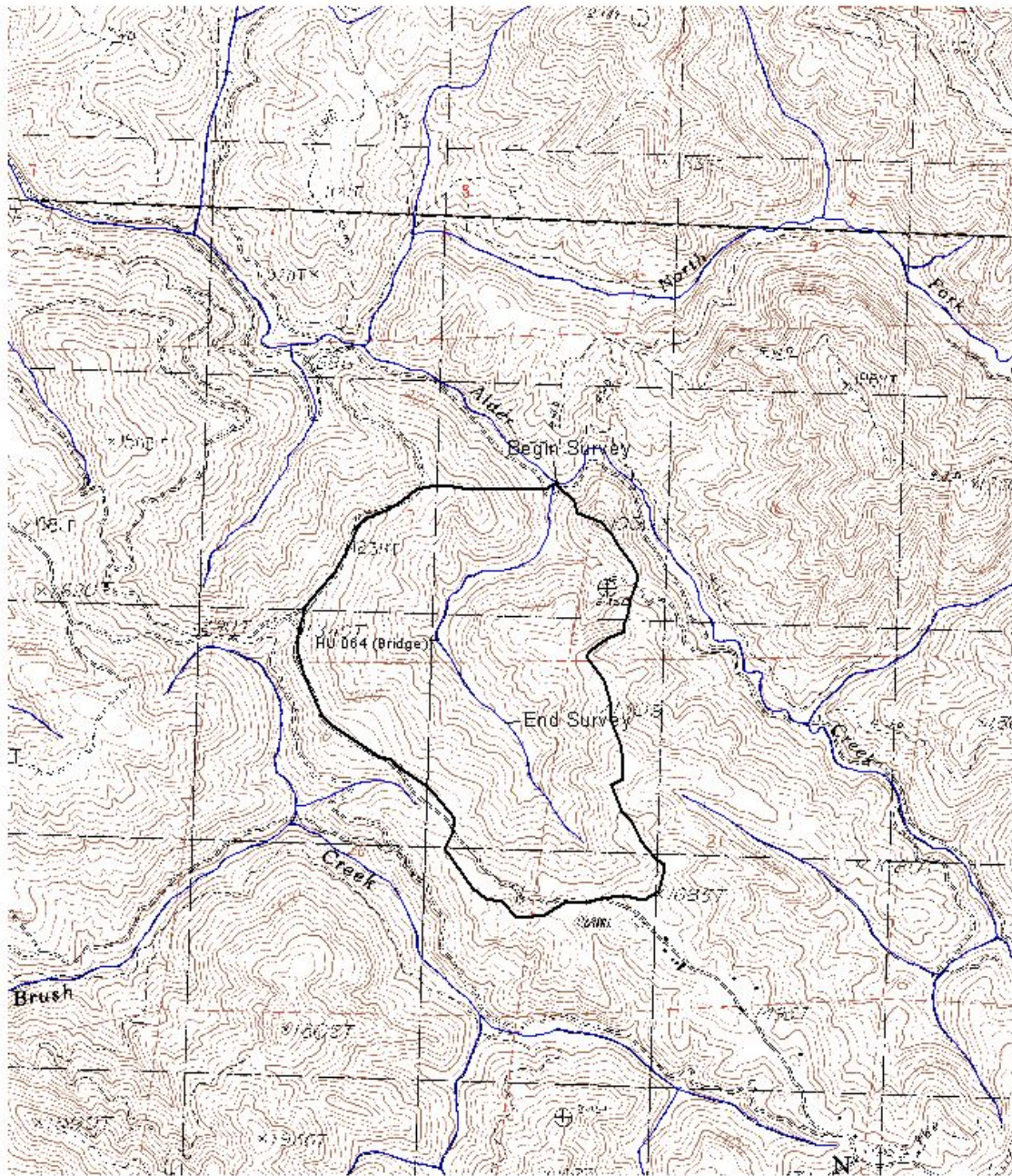
GRAPH 10

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



GRAPH 11

Left Bank Tributary One to Alder Creek



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

Left Bank Tributary One 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.