

STREAM INVENTORY REPORT

Right Bank Tributary One to Alder Creek

INTRODUCTION

A stream inventory was conducted beginning July 24 and ending July 28, 2003 on Right Bank Tributary One to Alder Creek. The survey began at the confluence with Alder Creek and extended upstream 4,307 feet.

The Right 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 Right 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

Right Bank Tributary One is a tributary to Alder Creek, a tributary to the Pacific Ocean, located in Mendocino County, California (Map 1). Right Bank Tributary One's legal description at the confluence with Alder Creek is T13N R16W S12. Its location is 39°00'27" north latitude and 123°34'47" west longitude. Right Bank Tributary One is a first order stream and has approximately 3,757 feet of solid blue line stream according to the USGS Cold Spring 7.5 minute quadrangle. Right Bank Tributary One drains a watershed of approximately 0.81 square miles. Elevations range from about 545 feet at the mouth of the creek to 1,617 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 Right 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.

Right 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 Right 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". Right 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

Right 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 Right 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 Right 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 Right 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 Right Bank Tributary One, the dominant composition type and the

Right 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 Right Bank Tributary One. In addition, two sites were electrofished in 2002 by Mendocino Redwood Company, aquatic biologists, using a Smith-Root Model 12 electrofisher. These 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 Right 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

Right 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 July 24 to 28, 2003, was conducted by J. Crews (DFG) and G. Trousdale (WSP/Americorps). The total length of the stream surveyed was 4,307 feet.

Stream flow was measured at the bottom of the survey reach with a Marsh-McBirney Model 2000 flowmeter at 0.03 cfs on October 21, 2003.

Right Bank Tributary One is F1 channel type for 712 feet and an F4 for 3,595 feet of the stream surveyed. F1 channels are entrenched, meandering, riffle/pool channels on low gradients with high width/depth ratios and very stable if bedrock controlled channel. F4 channels are entrenched, meandering, riffle/pool channels on low gradients with high width/depth ratios and gravel-dominant substrates.

Water temperatures taken during the survey period ranged from 59° to 61° Fahrenheit. Air temperatures ranged from 66° to 79° Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 39% riffle units, 14% flatwater units, and 44% pool units (Graph 1). Based on total length of Level II habitat types there were 61% riffle units, 19% flatwater units, and 17% pool units (Graph 2).

Fourteen Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were low-gradient riffles, 35%; mid-channel pools, 18%; and corner pools, 10% (Graph 3). Based on percent total length, low-gradient riffles made up 59%, runs 11%, and mid-channel pools 7%.

A total of 34 pools were identified (Table 3). Scour pools were the most frequently encountered, at 50%, and comprised 42% 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. Fourteen of the 32 measured pools (44%) had a depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 33 pool tail-outs measured, 2 had a value of 1 (6%); 14 had a value of 2 (42%); 11 had a value of 3 (33%); 5 had a value of 4 (15%); and 1 had a value of 5 (3%) (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 27, flatwater habitat types had a mean shelter rating of 20, and pool habitats had a mean shelter rating of 50 (Table 1). Of the pool types, the main-channel pools had the highest mean shelter rating at 53. Scour pools had a mean shelter rating of 48, and backwater pools had a mean shelter rating of 10 (Table 3).

Right Bank Tributary One to Alder Creek

Table 5 summarizes mean percent cover by habitat type. Undercut banks are the dominant cover types in Right Bank Tributary One. Graph 7 describes the pool cover in Right Bank Tributary One. 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 observed in 77% of pool tail-outs while small cobble was the next most frequently observed substrate type, at 18%.

The mean percent canopy density for the surveyed length of Right Bank Tributary One was 93%. The mean percentages of evergreen and deciduous trees were 85% and 8%, respectively with 7% of the canopy open. Graph 9 describes the mean percent canopy in Right Bank Tributary One.

For the stream reach surveyed, the mean percent right bank vegetated was 41%. The mean percent left bank vegetated was 47%. The dominant elements composing the structure of the stream banks consisted of 92% sand/silt/clay and 8% bedrock (Graph 10). Coniferous trees were the dominant vegetation type observed in 87% of the units surveyed. Additionally, 12% of the units surveyed had brush as the dominant vegetation type, and 1% had deciduous trees as the dominant vegetation (Graph 11).

BIOLOGICAL INVENTORY RESULTS

A backpack electrofisher survey was conducted at two locations on Right Bank Tributary One, by Mendocino Redwood Company, aquatic biologists in the summer 2002. All aquatic species were identified, lengths were taken of salmonids. Steelhead rainbow trout were the only salmonid species observed. Other species identified were Pacific giant salamanders (PGS) and yellow legged frogs (YLF) (Table A).

Site 89-15 produced five steelhead trout less than 70 mm in length.

Site 89-26 produced one steelhead trout between 70-130 mm in length.

Table A. Alder Creek, Right Bank Tributary One biological sampling data.

Date	Site ID	Species	70-130			Other species
			<70 mm	mm	>130 mm	
9/27/2002	89-15	SH	5	0	0	PGS, YLF
9/27/2002	89-26	SH	0	0	1	PGS

DISCUSSION

Right Bank Tributary One is an F1 channel type for 712 feet, and an F4 channel type for 3,595 feet of stream surveyed. The suitability of F1 and F4 channel types for fish habitat improvement structures is as follows: F1 channel types are good for bank-placed boulders and fair for single and opposing wing-deflectors. F4 channel types are good for bank-placed boulders and fair for plunge weirs, single and opposing wing-deflectors, channel constrictors, and log cover.

Right Bank Tributary One to Alder Creek

The water temperatures recorded during the survey ranged from 59° to 61° Fahrenheit. Air temperatures ranged from 66° to 79° Fahrenheit. Recorded water temperatures below 60° Fahrenheit 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.

Riffle habitat types comprised 61% of the total length of this survey, flatwater 19%, and pools 17%. The pools are relatively shallow, with only 14 of the 32 (44%) 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 conflict with the modification of the numerous log debris accumulations (LDA's) in the stream.

Sixteen of the 33 pool tail-outs measured had embeddedness ratings of 1 or 2. Fifteen of the pool tail-outs had embeddedness ratings of 3 or 4. One 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-two of the 33 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 20. The mean shelter rating for pools was 50. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by undercut banks in all habitat types. Additionally, large woody debris contributes 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 93%. Reach 1 had a canopy density of 92% while Reach 2 had a canopy density of 93%.

The percentage of right and left bank covered with vegetation was low at 41% and 47%, 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.

Right Bank Tributary One to Alder Creek

RECOMMENDATIONS

- 1) Right Bank Tributary One should be managed as an anadromous, natural production stream.
- 2) There are several log debris accumulations present on Right Bank Tributary One that are retaining large quantities of fine sediment. The modification of these debris accumulations is desirable, but must be done carefully, over time, to avoid excessive sediment loading in downstream reaches.
- 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 undercut banks. Adding high quality complexity with log and root wad cover is desirable.
- 5) 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.

Position (ft):	Habitat unit #:	Comments:
0	0001	Start of survey at confluence with Alder Creek. 39°00'26.1" N, 123°34'44.6" W.
179	0005	Salmonids observed. Large debris accumulation (LDA) from failed stringer bridge.
204	0006	Subterranean flow through LDA, retaining sediment.
375	0009	6' high jump up from pool (2.8' deep).
712	0017	Channel changes to an F4.
1115	0025	Left bank erosion
1412	0027	Right bank erosion, trees leaning.

Right Bank Tributary One to Alder Creek

1708	0031	2.5' high jump up to retained sediment.
1924	0038	Left bank tributary. Right bank erosion. LDA.
1932	0039	LDA.
2199	0042	Salmonids observed.
2287	0044	LDA retaining sediment.
2591	0049	LDA retaining sediment.
2851	0055	Left bank tributary.
3114	0060	Road crossing.
3615	0066	LDA.
4014	0073	LDA measures 50' long.
4307	0077	End of survey at fork. Left bank branch is dry. No fish observed in right branch.

Right 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]	

Right Bank Tributary One to Alder Creek

TABLES AND GRAPHS

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

Stream Name: Alder, RB Trib 1 Drainage: Point Arena
 Survey Dates: 7/24/2003 to 7/28/2003
 Confluence Location: Quad: COLD SPRING Legal Description: T13NR16WS12 Latitude: 39:00:27.0N Longitude: 123:34:47.0W

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
1	0	DRY	1.3	28	28	0.7									
11	5	FLATWATER	14.3	74	816	18.9	7.0	0.5	1.1	273	3002	140	1541		16
1	0	NOSURVEY	1.3	119	119	2.8									
34	33	POOL	44.2	21	721	16.7	8.3	0.9	1.9	169	5752	179	5892	152	48
30	5	RIFFLE	39.0	87	2623	60.9	5.3	0.4	0.9	240	7210	107	3220		13
Total Units	Total Units Fully Measured				Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)		
77	44				4307						15964.06		10554.18		

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Alder, RB Trib 1 Drainage: Point Arena
 Survey Dates: 7/24/2003 to 7/28/2003
 Confluence Location: Quad: COLD SPRING Legal Description: T13NR16WS12 Latitude: 39:00:27.0N Longitude: 123:34:47.0W

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	4	LGR	35.1	94	2532	58.8	6	0.4	1.7	315	8512	147	3981		20	90
3	2	BRS	3.9	30	91	2.1	4	0.3	0.7	90	271	27	81		0	96
4	1	GLD	5.2	48	191	4.4	12	0.7	1.3	240	960	168	672		20	93
5	3	RUN	6.5	92	460	10.7	6	0.5	1.2	183	914	82	408		13	93
2	1	SRN	2.6	82	165	3.8	5	0.5	1.2	576	1152	288	576		20	94
14	14	MCP	18.2	21	283	6.8	9	0.8	3.6	202	2834	246	3446	207	59	94
2	2	STP	2.6	60	121	2.8	10	1.3	2.3	348	697	336	336	291	10	95
8	8	CRP	10.4	18	145	3.4	6	0.9	2.7	114	916	109	875	94	47	93
3	3	LSL	3.9	14	43	1.0	6	0.9	1.9	87	260	84	251	75	80	91
1	1	LSR	1.3	18	18	0.4	8	0.6	1.5	144	144	115	115	86	80	94
5	4	PLP	6.5	19	96	2.2	9	0.8	2.7	171	854	160	801	140	15	95
1	1	DPL	1.3	5	5	0.1	10	0.9	1.4	50	50	55	55	45	10	97
1	0	DRY	1.3	28	28	0.7										
1	0	NS	1.3	119	119	2.8										97
Total Units	Total Units Fully Measured				Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)			
77	44				4307						17563.74		11597.68			

Right Bank Tributary One to Alder Creek

Table 3 - Summary of Pool Types

Stream Name: Alder, RB Trib 1

Drainage: Point Arena

Survey Dates: 7/24/2003 to 7/28/2003

Confluence Location: Quad: COLD SPRING

Legal Description: T13NR16WS12

Latitude: 39:00:27.0N

Longitude: 123:34:47.0W

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
16	16	MAIN	47	26	414	57	9.4	0.9	221	3530	212	3182	53
17	16	SCOUR	50	18	302	42	7.0	0.8	125	2128	101	1723	45
1	1	BACKWATER	3	5	5	1	10.0	0.9	50	50	45	45	10

Total Units 34
Total Units Fully Measured 33

Total Length (ft.) 721

Total Area (sq.ft.) 5708.481

Total Volume (cu.ft.) 4950.567

Right Bank Tributary One to Alder Creek

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

Stream Name: Alder, RB Trib 1

Drainage: Point Arena

Survey Dates: 7/24/2003 to 7/28/2003

Confluence Location: Quad: COLD SPRING

Legal Description: T13NR16WS12

Latitude: 39:00:27.0N

Longitude: 123:34:47.0W

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
14	MCP	44	0	0	6	43	7	50	1	7	0	0
1	STP	3	0	0	0	0	1	100	0	0	0	0
8	CRP	25	0	0	5	63	3	38	0	0	0	0
3	LSL	9	0	0	3	100	0	0	0	0	0	0
1	LSR	3	0	0	1	100	0	0	0	0	0	0
4	PLP	13	0	0	2	50	2	50	0	0	0	0
1	DPL	3	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
32	0	0	18	56	13	41	1	3	0	0

Mean Maximum Residual Pool Depth (ft.): 1.9

Right Bank Tributary One to Alder Creek

Table 8 - Fish Habitat Inventory Data Summary

Stream Name: Alder, RB Trib 1 Drainage: Point Arena
 Survey Dates: 7/24/2003 to 7/28/2003 Survey Length (ft.): 4307 Main Channel (ft.): 4307 Side Channel (ft.): 0
 Confluence Location: Quad: COLD SPRING Legal Description: T13NR16WS12 Latitude: 39:00:27.0N Longitude: 123:34:47.0W

Summary of Fish Habitat Elements By Stream Reach

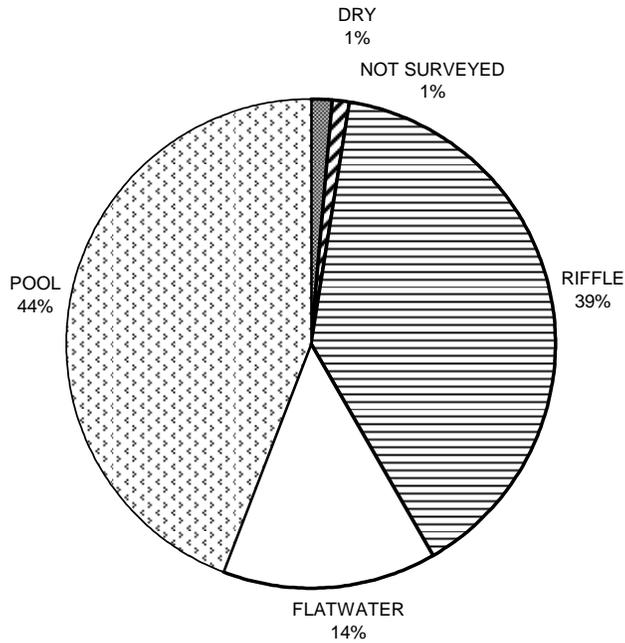
STREAM REACH: 1

Channel Type: F1	Canopy Density (%): 92	Pools by Stream Length (%): 18
Reach Length (ft.): 712	Coniferous Component (%): 95	Pool Frequency (%): 38
Riffle/Flatwater Mean Width (ft.): 5.1	Deciduous Component (%): 5	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Evergreen Trees	< 2 Feet Deep: 40
Range (ft.): 11 to 11	Vegetative Cover (%): 57	2 to 2.9 Feet Deep: 60
Mean (ft.): 11	Dominant Shelter: Large Woody Debris	3 to 3.9 Feet Deep: 0
Std. Dev.: 0	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 0
Base Flow (cfs.): 0.0	Occurrence of LWD (%): 22	Mean Max Residual Pool Depth (ft.): 2.0
Water (F): 59 - 60 Air (F): 66 - 68	LWD per 100 ft.:	Mean Pool Shelter Rating: 37
Dry Channel (ft): 28	Riffles: 0	
	Pools: 6	
	Flat: 2	
Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 83 Sm Cobble: 0 Lg Cobble: 0 Boulder: 0 Bedrock: 17		
Embeddedness Values (%): 1. 17 2. 50 3. 0 4. 17 5. 17		

STREAM REACH: 2

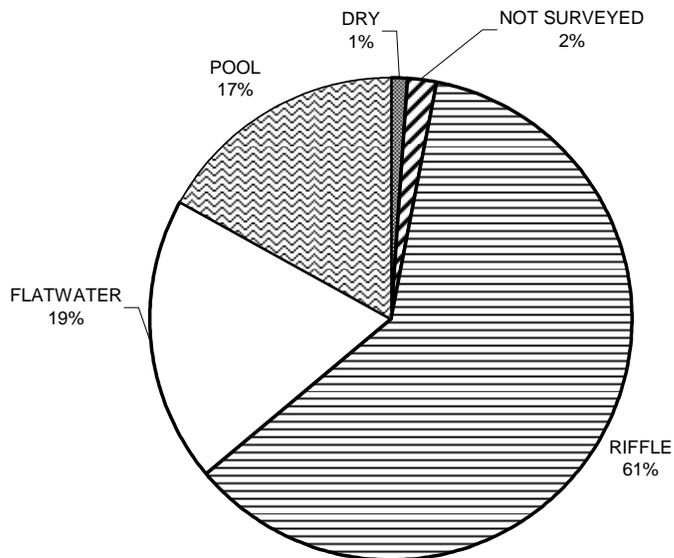
Channel Type: F4	Canopy Density (%): 93	Pools by Stream Length (%): 16
Reach Length (ft.): 3595	Coniferous Component (%): 90	Pool Frequency (%): 46
Riffle/Flatwater Mean Width (ft.): 7.2	Deciduous Component (%): 10	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Evergreen Trees	< 2 Feet Deep: 59
Range (ft.): 7 to 11	Vegetative Cover (%): 56	2 to 2.9 Feet Deep: 37
Mean (ft.): 8	Dominant Shelter: Undercut Banks	3 to 3.9 Feet Deep: 4
Std. Dev.: 1	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 0
Base Flow (cfs.): 0.0	Occurrence of LWD (%): 33	Mean Max Residual Pool Depth (ft.): 1.8
Water (F): 59 - 61 Air (F): 66 - 79	LWD per 100 ft.:	Mean Pool Shelter Rating: 51
Dry Channel (ft): 0	Riffles: 2	
	Pools: 7	
	Flat: 0	
Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 78 Sm Cobble: 22 Lg Cobble: 0 Boulder: 0 Bedrock: 0		
Embeddedness Values (%): 1. 4 2. 30 3. 52 4. 15 5. 0		

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



GRAPH 1

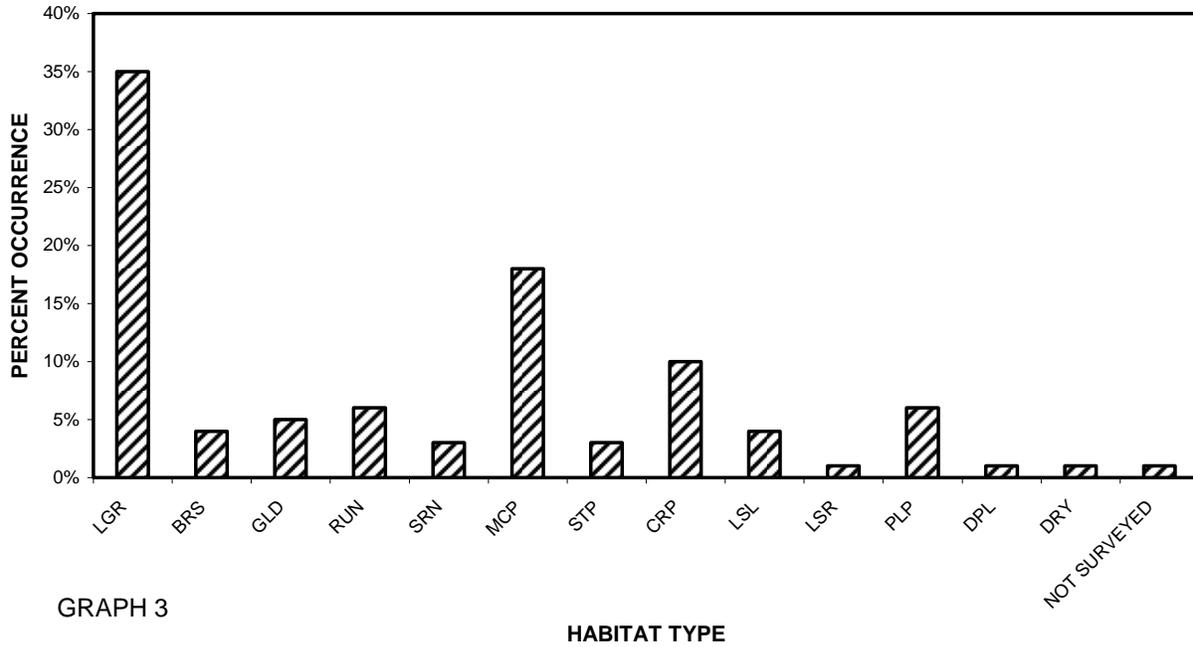
**ALDER CREEK, RIGHT BANK TRIBUTARY ONE
HABITAT TYPES BY PERCENT TOTAL LENGTH**



GRAPH 2

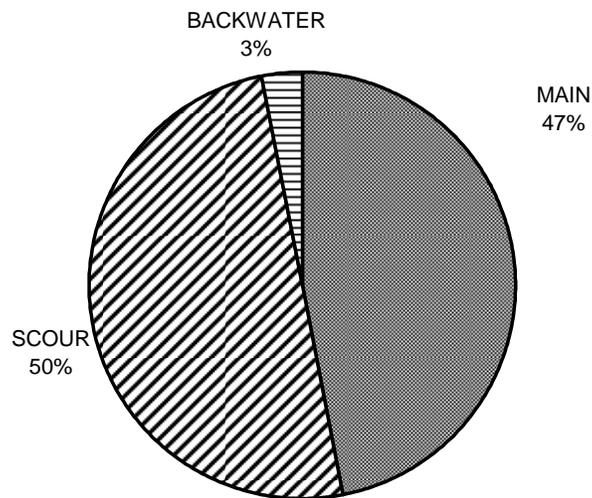
Right Bank Tributary One to Alder Creek

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



GRAPH 3

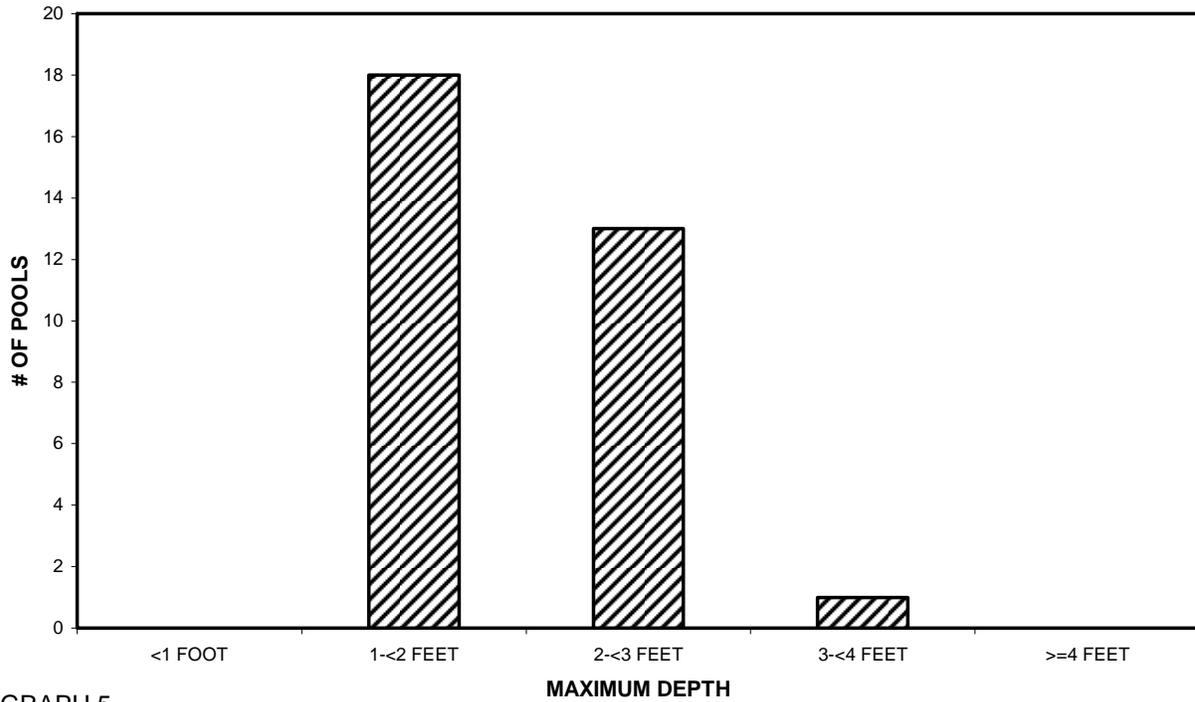
**ALDER CREEK, RIGHT BANK TRIBUTARY ONE
POOL HABITAT TYPES BY PERCENT OCCURRENCE**



GRAPH 4

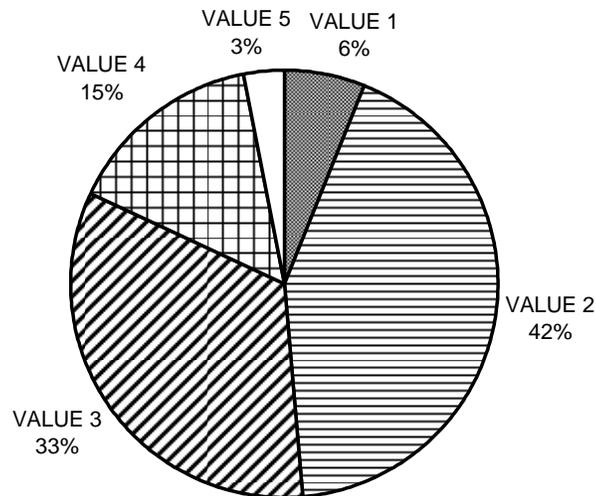
Right Bank Tributary One to Alder Creek

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



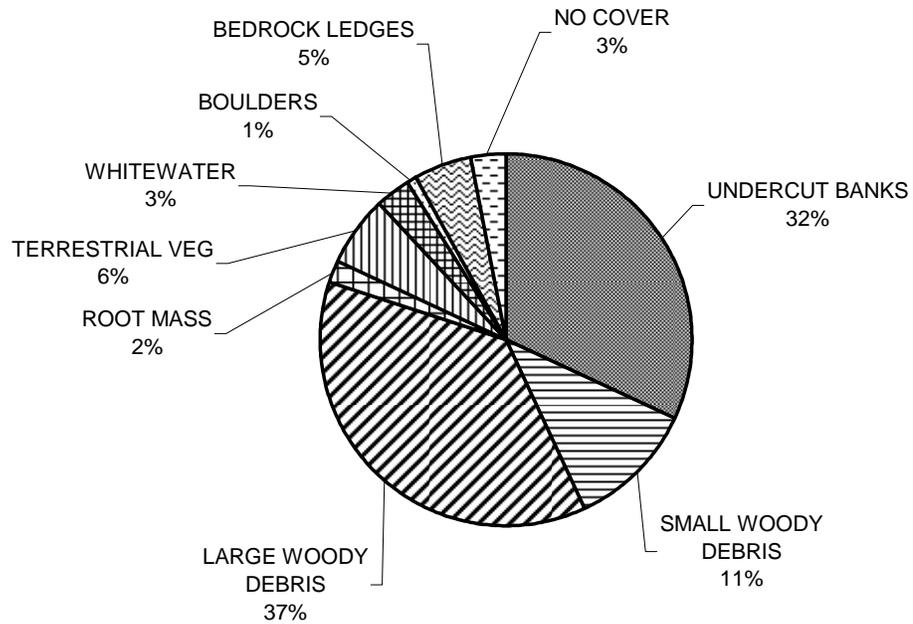
GRAPH 5

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



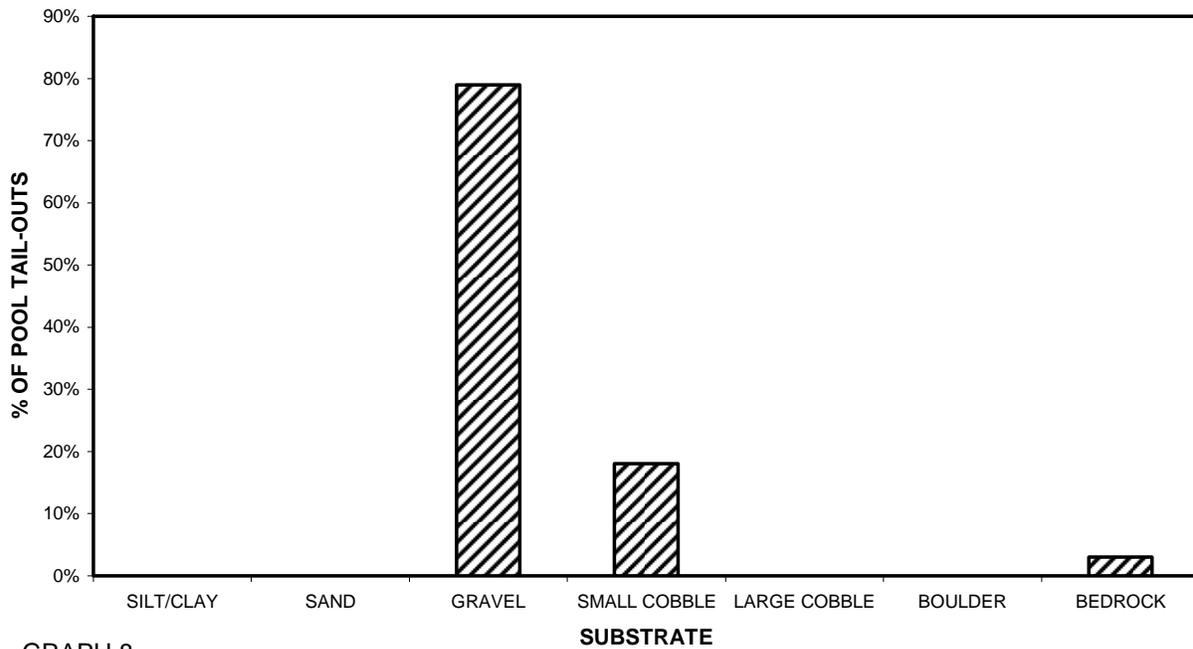
GRAPH 6

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



GRAPH 7

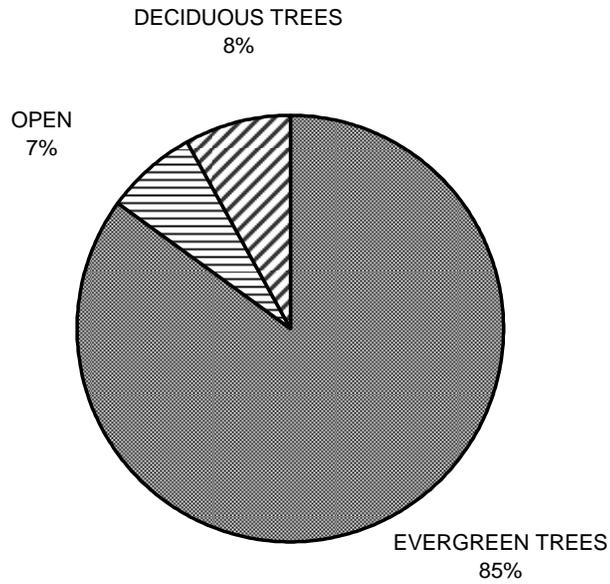
ALDER CREEK, RIGHT BANK TRIBUTARY ONE SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



GRAPH 8

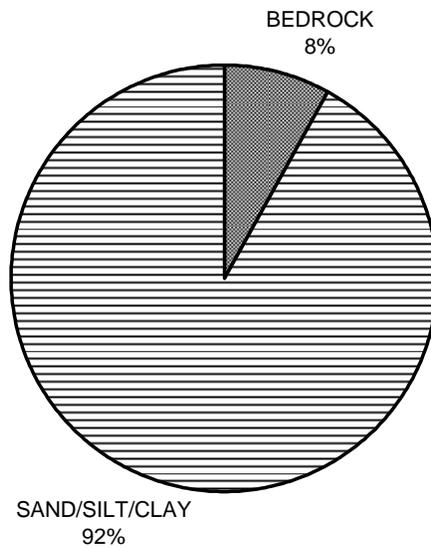
Right Bank Tributary One to Alder Creek

**ALDER CREEK, RIGHT BANK TRIBUTARY ONE
MEAN PERCENT CANOPY**



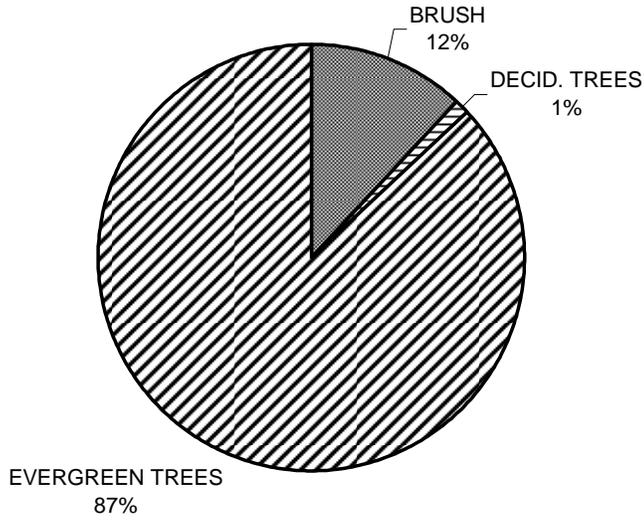
GRAPH 9

**ALDER CREEK, RIGHT BANK TRIBUTARY ONE
DOMINANT BANK COMPOSITION IN SURVEY REACH**



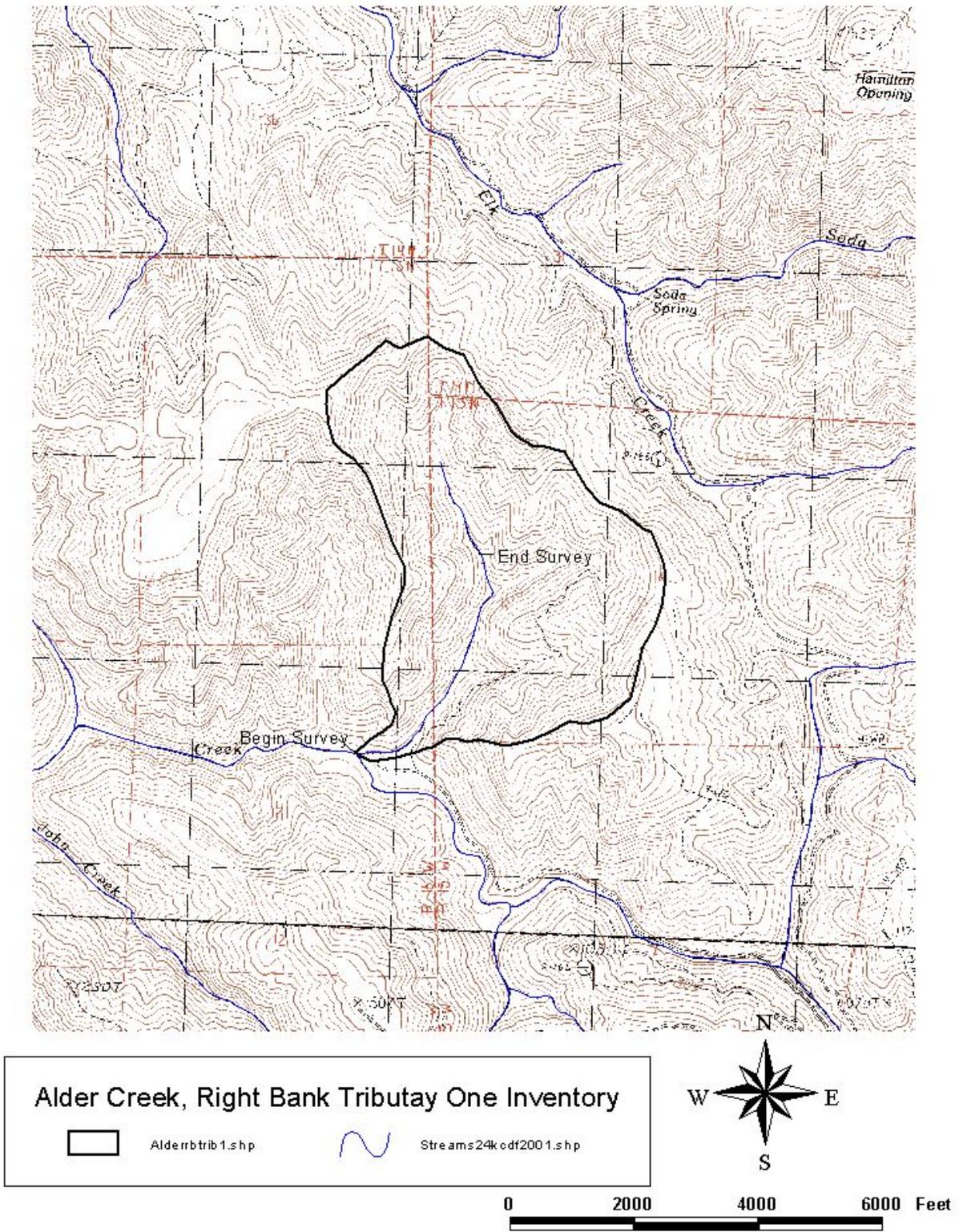
GRAPH 10

**ALDER CREEK, RIGHT BANK TRIBUTARY ONE
DOMINANT BANK VEGETATION IN SURVEY REACH**



GRAPH 11

Right Bank Tributary One to Alder Creek



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

Right 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.