STREAM INVENTORY REPORT

Left Bank Tributary Three to Alder Creek

INTRODUCTION

A stream inventory was conducted on September 18, 2003 on Left Bank Tributary Three. The survey began at the confluence with Alder Creek and extended upstream 1,043 feet.

The Left Bank Tributary Three 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 Three. 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 Three is a tributary to Alder Creek, a tributary to the Pacific Ocean, located in Mendocino County, California (Map 1). Left Bank Tributary Three's legal description at the confluence with Alder Creek is T13N R15W S26. Its location is 38°58′08″ north latitude and 123°29′49″ west longitude. Left Bank Tributary Three is a first order stream and has approximately 7,242 feet of solid blue line stream according to the USGS Zeni Ridge 7.5 minute quadrangle. Left Bank Tributary Three drains a watershed of approximately 0.58 square miles. Elevations range from about 1,000 feet at the mouth of the creek to 2,449 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 Three 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.

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

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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 Three 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 Three 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 wetted width.   All measurements are in feet to the nearest tenth. Habitat characteristics are measured using a clinometer, hip chain, and stadia rod.

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

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<u>BIOLOGICAL INVENTORY</u>

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 Three. Sampling techniques are discussed in the *California Salmonid Stream Habitat Restoration Manual*.

<u>DATA ANALYSIS</u>

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 Three 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

<u>HABITAT INVENTORY RESULTS</u>

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

The habitat inventory of September 18, 2003, was conducted by S. Monday (DFG) and G. Trousdale (WSP/Americorp). The total length of the stream surveyed was 1,043 feet.

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Stream flow was not measured on Left Bank Tributary Three.

Left Bank Tributary Three is an F4 channel type for 609 feet and an A4 for 434 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. A4 channels are steep, narrow, cascading, step-pool streams; high energy/debris transport associated with depositional soils and gravel–dominant substrates.

Water temperatures taken during the survey period ranged from 52° to 53° Fahrenheit. Air temperatures ranged from 56° to 64° Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 38% riffle units, 0% flatwater units, and 42% pool units (Graph 1). Based on total length of Level II habitat types there were 43% riffle units, 0% flatwater units, and 6% pool units (Graph 2).

Seven Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were low-gradient riffles, 33%; mid-channel pools, 33%; and dry, 17% (Graph 3). Based on percent total length, low-gradient riffles made up 42%, dry 41%, and mid-channel pools 10%.

A total of 10 pools were identified (Table 3). Main-channel pools were the most frequently encountered, at 90%, and comprised 93% 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. None of the 10 measured pools had a depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 10 pool tail-outs measured, 0 had a value of 1 (0%); 2 had a value of 2 (20%); 2 had a value of 3 (20%); 0 had a value of 4 (0%); and 6 had a value of 5 (60%) (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 and pool habitats had a mean shelter rating of 26 (Table 1). Of the pool types, the scour pools had the highest mean shelter rating at 30. Main-channel pools had a mean shelter rating of 26 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Boulders are the dominant cover types in Left Bank Tributary Three. Graph 7 describes the pool cover in Left Bank Tributary Three. Boulders are the dominant pool cover types followed by large woody debris.

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 50% of pool tail-outs while boulders were the next most frequently observed substrate type, at 30%.

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The mean percent canopy density for the surveyed length of Left Bank Tributary Three was 91%. The mean percentages of evergreen and deciduous trees were 86% and 5%, respectively with 9% of the canopy open. Graph 9 describes the mean percent canopy in Left Bank Tributary Three.

For the stream reach surveyed, the mean percent right bank vegetated was 41%. The mean percent left bank vegetated was 45%. The dominant elements composing the structure of the stream banks consisted of 4% bedrock and 96% sand/silt/clay (Graph 10). Coniferous trees were the dominant vegetation type observed in 100% of the units surveyed (Graph 11).

BIOLOGICAL INVENTORY RESULTS

No biological inventory was conducted on Left Bank Tributary Three.

DISCUSSION

Left Bank Tributary Three is an F4 channel type for 609 feet, and an A4 channel type for 434 feet of stream surveyed. The suitability of F4 and A4 channel types for fish habitat improvement structures is as follows: F4 channel types are good for bank-placed boulders; fair for plunge weirs, single and opposing wing-deflectors, channel constrictors, and log cover. A4 channel types are good for bank-placed boulders; fair for plunge weirs, opposing wing-deflectors, and log cover.

The water temperatures recorded on during the survey during the survey period ranged from 52° to 53 ° Fahrenheit. Air temperatures ranged from 56° to 64° Fahrenheit. Water temperatures were within a 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 43% of the total length of this survey and pools 13%. The pools are relatively shallow, with only none of the 10 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.

Two of the 10 pool tail-outs measured had embeddedness ratings of 1 or 2. Two of the pool tail-outs had embeddedness ratings of 3 or 4. Six of the pool tail-outs had a rating of 5, which is considered unsuitable for spawning. Cobble embeddedness measured to be 25% or less, a rating of 1, is considered to indicate good quality spawning substrate for salmon and steelhead. Sediment sources in Left Bank Tributary Three should be mapped and rated according to their

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potential sediment yields, and control measures should be taken.

Six of the 10 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 26. 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, 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 91%. Reach 1 had a canopy density of 88% while Reach 2 had a canopy density of 98%.

The percentage of right and left bank covered with vegetation was low at 41% and 45%, 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)   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.

2)   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.

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.

4)   Active and potential sediment sources need to be identified, mapped, and treated according to their potential for sediment yield to the stream and its tributaries.

COMMENTS AND LANDMARKS

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

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Position (ft):	Habitat unit #:	Comments:
0	0001	Start of survey at confluence with Alder Creek, which is intermittent. Left Bank Tributary Three is dry at the confluence. 38°58'7.86"N 123°29'48.83"W.
170	0003	Pool nearly dry, surrounded by large woody debris (LWD). No fish observed.
389	0010	Two right bank gullies caused by a ditch relief culvert at road above.
398	0011	Channel type measured F4; gradient may be greater than 2%, but not yet an "A" channel type.
416	0012	No fish observed.
541	0017	Right bank erosion from tributary, 30' high x 30' wide.
609	0019	Channel change to A4.
624	0020	Road on left bank, up 25'.
696	0022	5' high jump up over boulders, which are retaining sediment.
708	0023	Dry left bank tributary. 10' high jump up boulders and large debris accumulation (LDA). Channel substrate returns to gravel above LDA.
1043	0024	End of survey, no fish observed. 38°57'58.36" N 123°29'44" W. Dry left bank tributary.

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<u>LEVEL III and LEVEL IV HABITAT TYPES</u>

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}

<u>ADDITIONAL UNIT DESIGNATIONS</u>
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 3   Drainage: Point Arena

Survey Dates: 9/18/2003 to 9/18/2003

Confluence Location: Quad: ZENI RIDGE   Legal Description: T13NR15WS26   Latitude: 38:58:08.0N   Longitude: 123:29:49.0W

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
4	0	DRY	16.7	107	427	40.9									
1	0	NOSURVEY	4.2	30	30	2.9									
10	10	POOL	41.7	14	135	12.9	5.7	0.5	1.0	75	752	43	429	39	26
9	4	RIFFLE	37.5	50	451	43.2	2.4	0.3	0.7	71	637	27	243		20

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
24	14	1043	1388.975	671.32

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Alder, LB Trib 3   Drainage: Point Arena

Survey Dates: 9/18/2003 to 9/18/2003

Confluence Location: Quad: ZENI RIDGE   Legal Description: T13NR15WS26   Latitude: 38:58:08.0N   Longitude: 123:29:49.0W

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 (%)
8	3	LGR	33.3	54	436	41.8	3	0.4	1	94	751	36	267		27	80
1	1	HGR	4.2	15	15	1.4	1	0.2	0.4	2	2	0	0		0	98
8	8	MCP	33.3	13	101	9.7	6	0.5	1.45	72	573	40	323	35	24	95
1	1	STP	4.2	24	24	2.3	6	0.7	1.6	130	130	91	91	91	40	95
1	1	LSR	4.2	10	10	1.0	5	0.3	0.7	50	50	15	15	15	30	94
4	0	DRY	16.7	107	427	40.9										95
1	0	NS	4.2	30	30	2.9										98

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
24	14	1043	1504.392	715.7575

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Table 3 - Summary of Pool Types

Stream Name: Alder, LB Trib 3   Drainage: Point Arena

Survey Dates: 9/18/2003 to 9/18/2003

Confluence Location: Quad: ZENI RIDGE   Legal Description: T13NR15WS26 Latitude: 38:58:08.0N   Longitude: 123:29:49.0W

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
9	9	MAIN	90	14	125	93	5.7	0.5	78	702	42	374	26
1	1	SCOUR	10	10	10	7	5.0	0.3	50	50	15	15	30

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
10	10	135	752.225	389.4167

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

Stream Name: Alder, LB Trib 3 Drainage: Point Arena
Survey Dates: 9/18/2003 to 9/18/2003
Confluence Location: Quad: ZENI RIDGE Legal Description: T13NR15WS26 Latitude: 38:58:08.0N Longitude: 123:29:49.0W

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
8	MCP	80	5	63	3	38	0	0	0	0	0	0
1	STP	10	0	0	1	100	0	0	0	0	0	0
1	LSR	10	1	100	0	0	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
10	6	60	4	40	0	0	0	0	0	0

Mean Maximum Residual Pool Depth (ft.): 1

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Alder, LB Trib 3 Drainage: Point Arena
Survey Dates: 9/18/2003 to 9/18/2003 Dry Units: 4
Confluence Location: Quad: ZENI RIDGE Legal Description: T13NR15WS26 Latitude: 38:58:08.0N Longitude: 123:29:49.0W

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
8	3	LGR	0	0	3	0	0	0	0	90	7
1	1	HGR	0	0	0	0	0	0	0	0	0
9	4	TOTAL RIFFLE	0	0	3	0	0	0	0	68	5
0	0	TOTAL FLAT									
8	8	MCP	4	3	11	0	0	0	0	78	5
1	1	STP	0	0	0	0	0	0	0	100	0
1	1	LSR	0	0	0	0	0	0	0	100	0
10	10	TOTAL POOL	3	2	9	0	0	0	0	82	4
1	0	NS									
24	14	TOTAL	2	1	7	0	0	0	0	78	4

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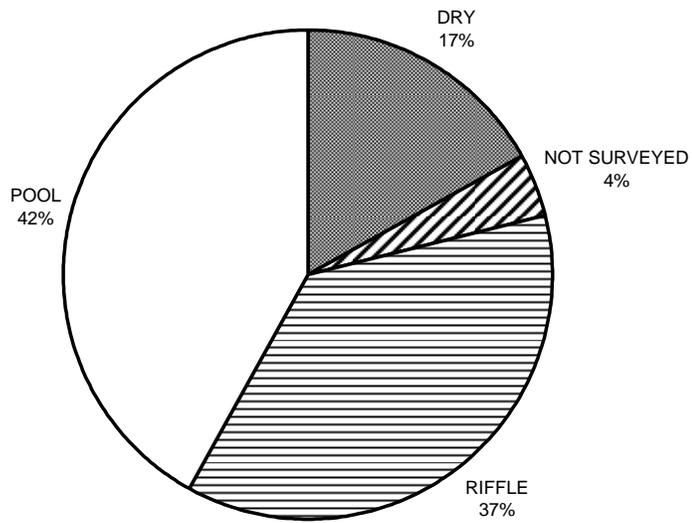
Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Alder, LB Trib 3
Survey Dates: 9/18/2003 to 9/18/2003
Confluence Location: Quad: ZENI RIDGE

Drainage: Point Arena
Dry Units: 4
Legal Description: T13NR15WS26   Latitude: 38:58:08.0N   Longitude: 123:29:49.0W

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
8	3	LGR	0	0	33	0	0	33	33
1	1	HGR	0	0	0	0	0	100	0
8	8	MCP	0	13	63	0	0	25	0
1	1	STP	0	0	0	0	0	100	0
1	1	LSR	0	0	100	0	0	0	0

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Table 8 - Fish Habitat Inventory Data Summary

Stream Name: Alder, LB Trib 3   Drainage: Point Arena

Survey Dates: 9/18/2003 to 9/18/2003   Survey Length (ft.): 1043   Main Channel (ft.): 1043   Side Channel (ft.): 0

Confluence Location: Quad: ZENI RIDGE   Legal Description: T13NR15WS26   Latitude: 38:58:08.0N   Longitude: 123:29:49.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type: F4	Canopy Density (%): 88	Pools by Stream Length (%): 17
Reach Length (ft.): 609	Coniferous Component (%): 95	Pool Frequency (%): 44
Riffle/Flatwater Mean Width (ft.): 2.5	Deciduous Component (%): 5	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Evergreen Trees	< 2 Feet Deep: 100
Range (ft.): 8 to 9	Vegetative Cover (%): 60	2 to 2.9 Feet Deep: 0
Mean (ft.): 8	Dominant Shelter: Boulders	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 (%): 9	Mean Max Residual Pool Depth (ft.): 1.0
Water (F): 52 - 52 Air (F): 56 - 56	LWD per 100 ft.:	Mean Pool Shelter Rating: 25
Dry Channel (ft): 227	Riffles: 0	
	Pools: 2	
	Flat:	

Pool Tail Substrate (%): Silt/Clay: 0   Sand: 0   Gravel: 50   Sm Cobble: 12   Lg Cobble: 0   Boulder: 25   Bedrock: 12

Embeddedness Values (%): 1. 0   2. 25   3. 12   4. 0   5. 62

STREAM REACH: 2

Channel Type: A4	Canopy Density (%): 98	Pools by Stream Length (%): 7
Reach Length (ft.): 434	Coniferous Component (%): 90	Pool Frequency (%): 33
Riffle/Flatwater Mean Width (ft.): 2.3	Deciduous Component (%): 10	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Evergreen Trees	< 2 Feet Deep: 100
Range (ft.): 8 to 8	Vegetative Cover (%): 62	2 to 2.9 Feet Deep: 0
Mean (ft.): 8	Dominant Shelter: Boulders	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 (%): 2	Mean Max Residual Pool Depth (ft.): 1.2
Water (F): 52 - 53 Air (F): 56 - 64	LWD per 100 ft.:	Mean Pool Shelter Rating: 30
Dry Channel (ft): 200	Riffles: 0	
	Pools: 3	
	Flat:	

Pool Tail Substrate (%): Silt/Clay: 0   Sand: 0   Gravel: 50   Sm Cobble: 0   Lg Cobble: 0   Boulder: 50   Bedrock: 0

Embeddedness Values (%): 1. 0   2. 0   3. 50   4. 0   5. 50

ALDER CREEK, LEFT BANK TRIBUTARY THREE
HABITAT TYPES BY PERCENT OCCURRENCE

DRY
17%

NOT SURVEYED
4%

POOL
42%

RIFFLE
37%

GRAPH 1

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

POOL
13%

DRY
41%

RIFFLE
43%

NOT SURVEYED
3%

GRAPH 2

ALDER CREEK, LEFT BANK TRIBUTARY THREE
HABITAT UNIT TYPES BY PERCENT OCCURRENCE
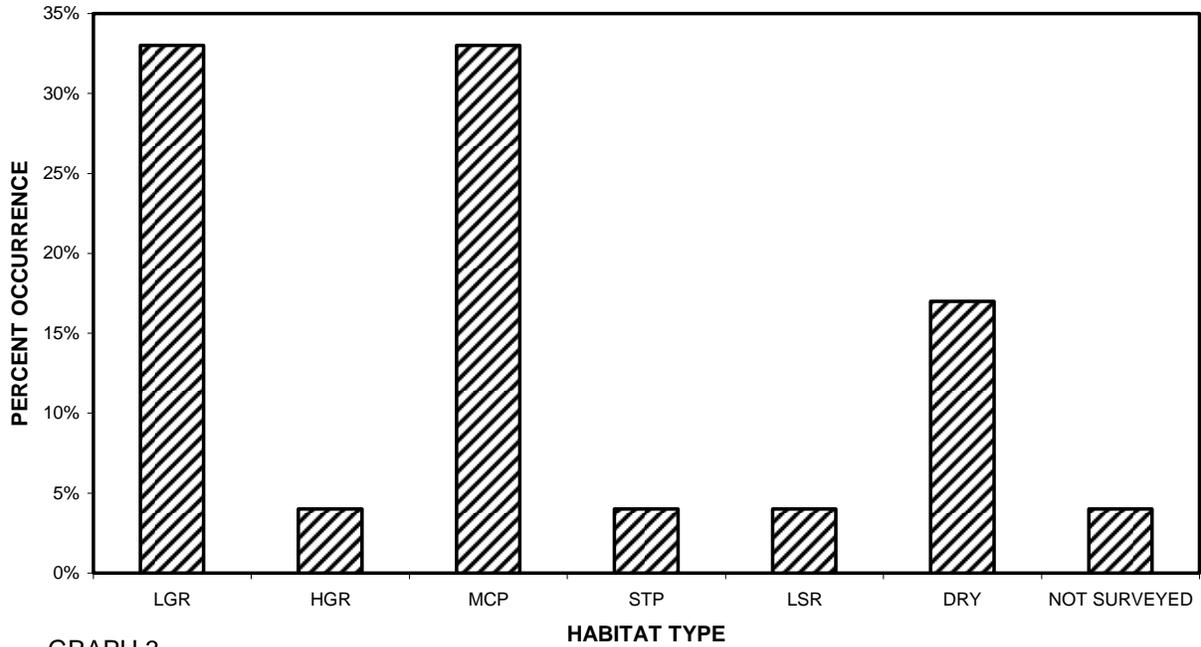
GRAPH 3

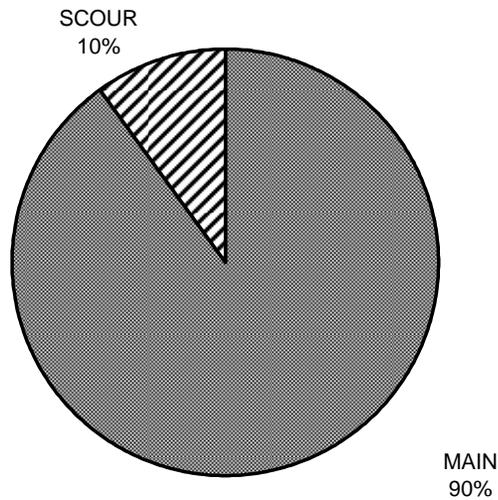## ALDER CREEK, LEFT BANK TRIBUTARY THREE
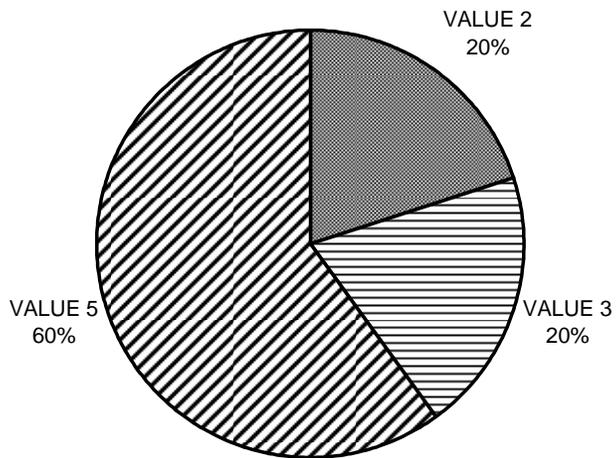### POOL HABITAT TYPES BY PERCENT OCCURRENCE

GRAPH 4

ALDER CREEK, LEFT BANK TRIBUTARY THREE
MAXIMUM DEPTH IN POOLS
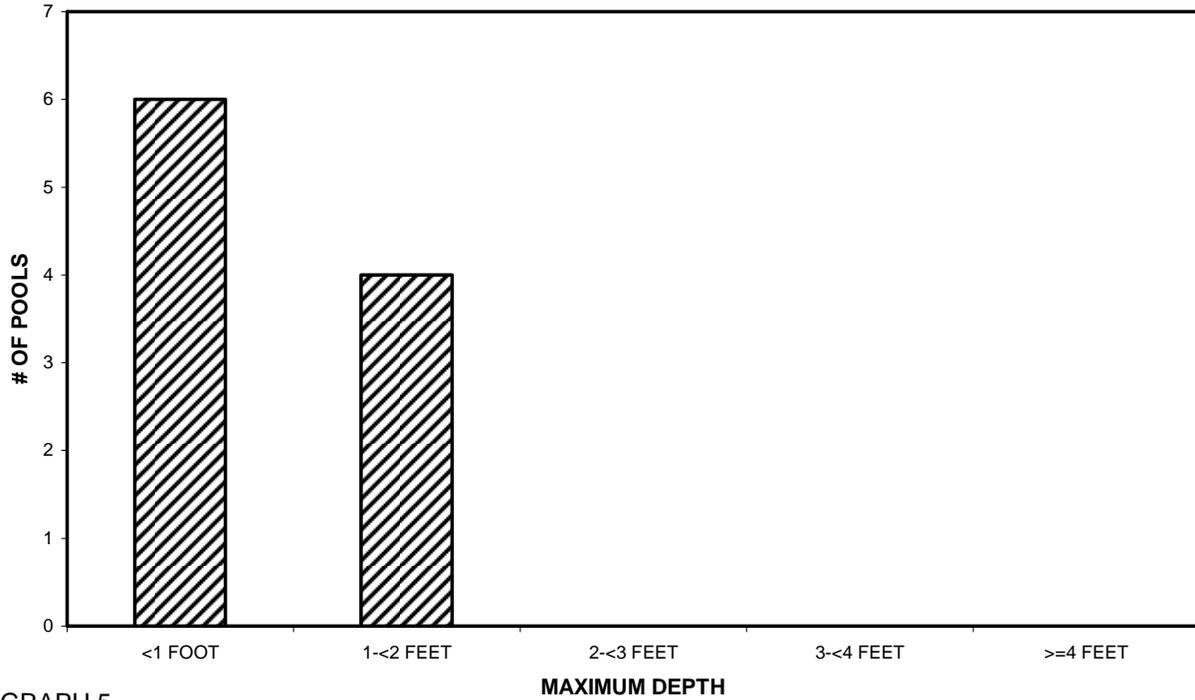
GRAPH 5

ALDER CREEK, LEFT BANK TRIBUTARY THREE
PERCENT EMBEDDEDNESS

GRAPH 6

17

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

UNDERCUT BANKS
3%

SMALL WOODY
DEBRIS
2%

NO COVER
4%

LARGE WOODY
DEBRIS
9%

BOULDERS
82%
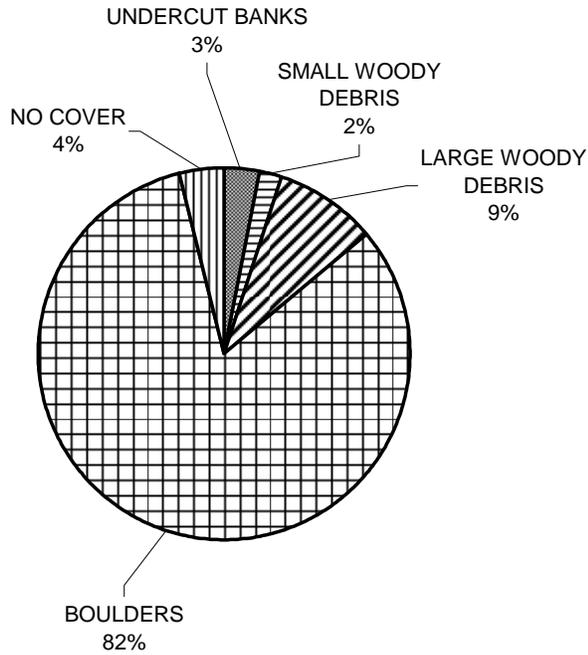
GRAPH 7

ALDER CREEK, LEFT BANK TRIBUTARY THREE
SUBSTRATE COMPOSITION IN POOL TAIL-OUTS
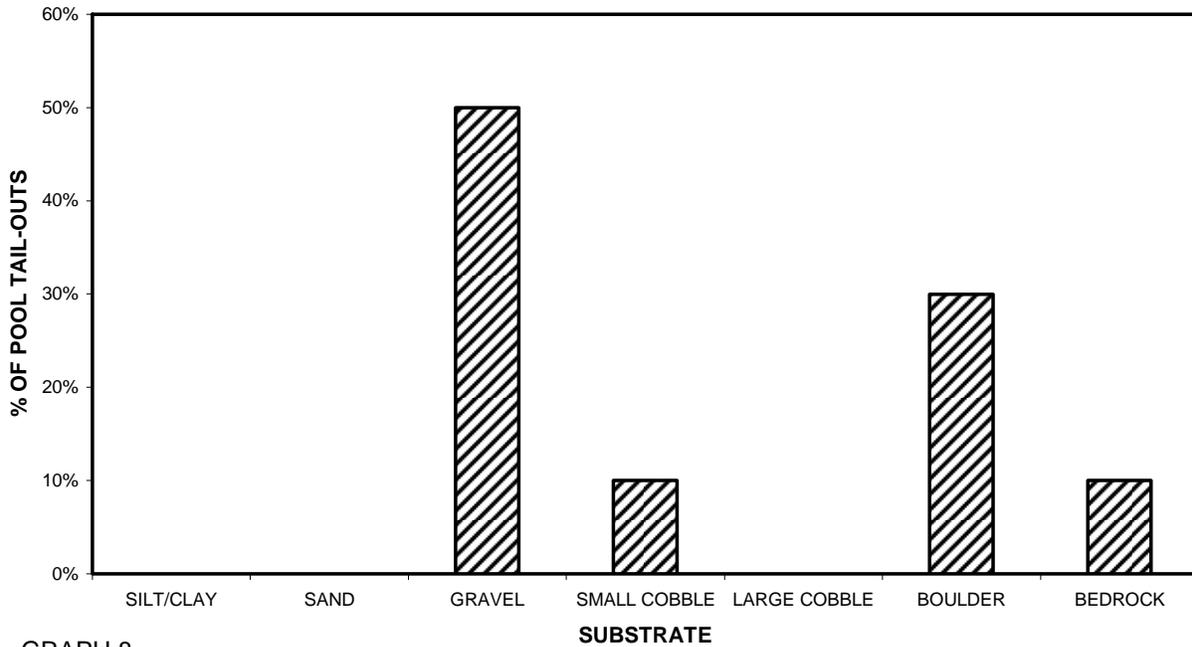
% OF POOL TAIL-OUTS

SILT/CLAY   SAND   GRAVEL   SMALL COBBLE   LARGE COBBLE   BOULDER   BEDROCK

SUBSTRATE

GRAPH 8

ALDER CREEK, LEFT BANK TRIBUTARY THREE
MEAN PERCENT CANOPY

DECIDUOUS TREES
5%

OPEN
9%

EVERGREEN TREES
86%
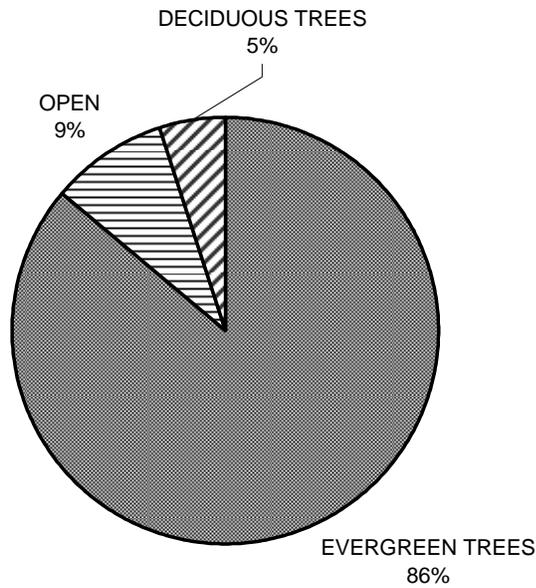
GRAPH 9

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

BEDROCK
4%

SAND/SILT/CLAY
96%
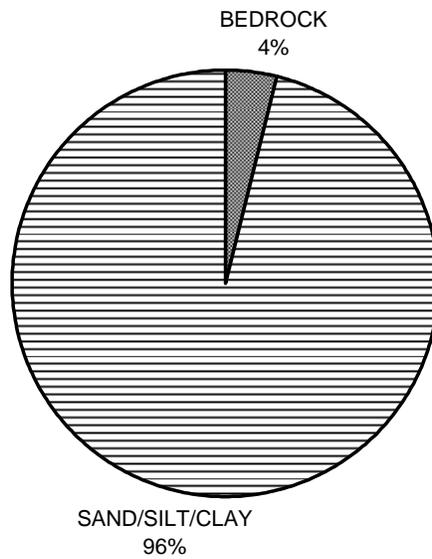
GRAPH 10

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

EVERGREEN TREES
100%
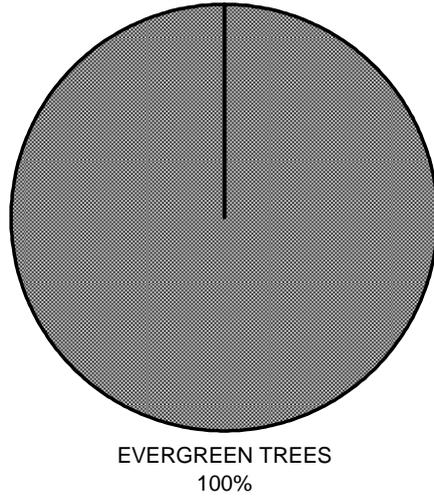
GRAPH 11

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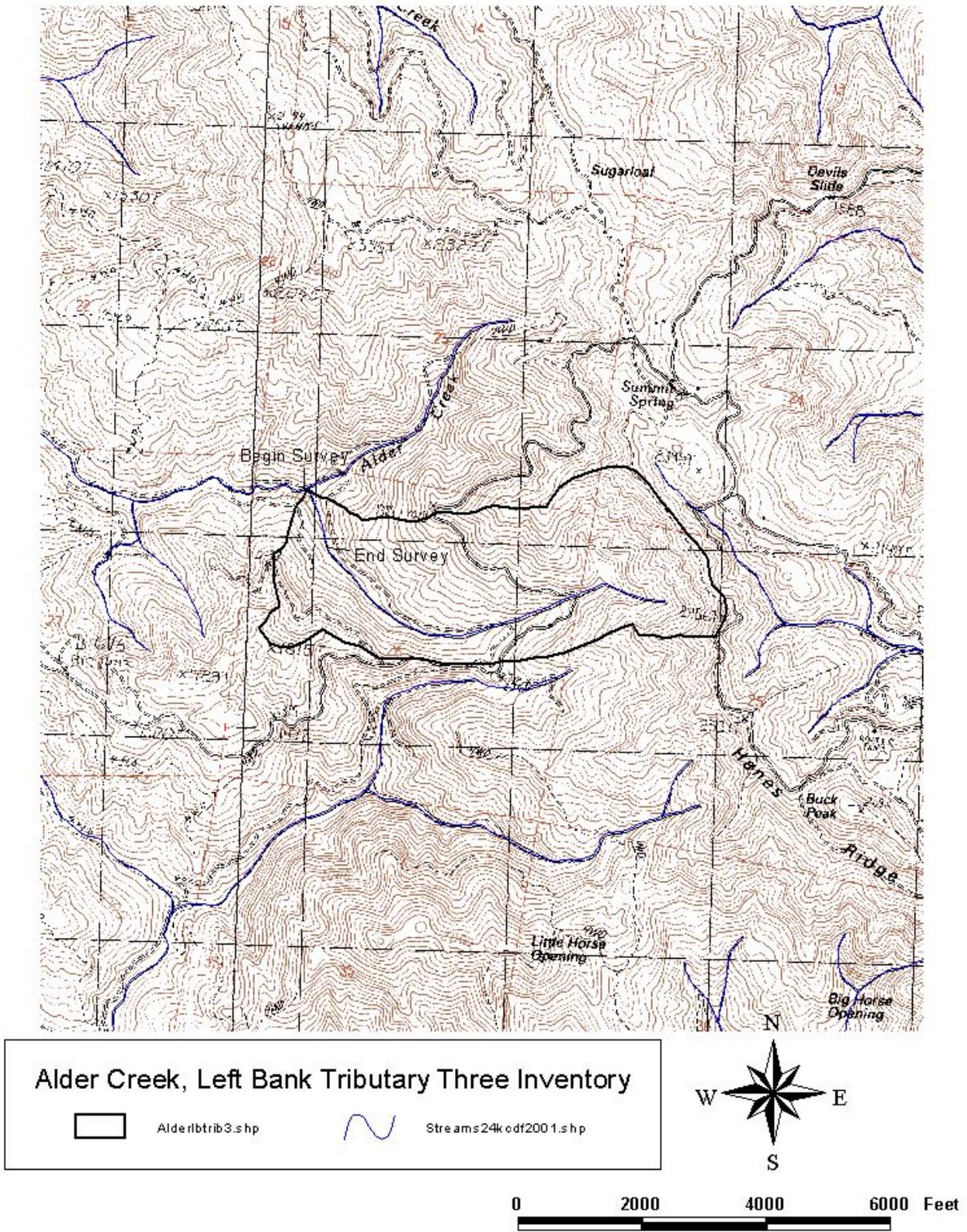
MAP 1. Map of Alder Creek, Left Bank Tributary Three showing the stream habitat inventory reach and watershed boundary.

Left Bank Tributary Three

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.