

# STREAM INVENTORY REPORT

## Soda Fork

### INTRODUCTION

A California Department of Fish and Game (DFG) fisheries inventory was conducted in summer 2001 on Elk Creek and its tributaries. Habitat inventory was conducted on Soda Fork, which is a tributary to Elk Creek. The objective of the habitat inventory was to document the habitat available to anadromous salmonids. This report presents the inventory results and recommends options for potential habitat improvements for coho salmon and steelhead trout. The recommendations are based on target habitat values suitable for salmonids in California's north coast streams.

Flow measurements were taken on Soda Fork by B. Finlayson and J. Nelson on July 24, 1973. The measurement sight was about 250 feet above the confluence with Elk Creek. The flow was calculated at 0.42 cfs (unpublished DFG field note).

### WATERSHED OVERVIEW

Soda Fork, located in Mendocino County, California, is a tributary to Elk Creek. Soda Fork's legal description at the confluence with Elk Creek is T14NR15WS31. Its mouth is located at 39°1'42" north latitude and 123°33'56" west longitude. Soda Fork is a second order stream and has approximately two miles of blue line stream according to the USGS Cold Springs 7.5 minute quadrangle map. Soda Fork drains a watershed of approximately five square miles. Elevations range from about 780 feet at the mouth to 2000 feet in the headwater areas.

Mixed deciduous forest dominates the watershed. Mendocino Redwood Company owns the whole Soda Fork watershed. Past land use in the watershed was mainly timber harvests. The present land uses in the watershed are logging as well as hunting on the Wilderness Unlimited area, which is owned by MRC.

Vehicle access exists via the MRC logging road about 1 mile north of the mouth. The access road to the creek is closed to the public, and controlled by MRC. The Soda Fork Bridge is about 14.5 miles down the logging road.

### METHODS

The habitat inventory conducted in Soda Fork followed the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi *et al.*, 1998). Two-person teams of DFG Scientific Aids and AmeriCorps Watershed Stewards Project (WSP) members, trained in standardized habitat inventory methods by DFG, conducted the field inventory.

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### HABITAT INVENTORY COMPONENTS

The standardized habitat inventory protocol has nine components:

#### 1. Flow:

Flow is measured in cubic feet per second (cfs) at the bottom of the stream survey reach using standard flow measuring equipment, if available. In some cases flows are estimated.

#### 2. Channel Type:

As 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.

#### 3. Temperatures:

Water and air temperatures are taken in degrees Fahrenheit at the middle of the habitat unit, within one foot of the water surface.

#### 4. Habitat Unit Type and Dimensions:

Habitat units are numbered sequentially and assigned a habitat type selected from a standard list of 24 habitat types (Appendix 1). Dewatered units are labeled "dry". The length of a described habitat unit must be equal to or greater than the streams mean wetted width. Habitat unit dimensions of mean length, mean width, mean depth, and maximum depth are measured. In pool units, maximum depth at the pool tail crest is also measured. Measurements are taken to the nearest 1/10 foot using hip chains, measuring tapes, or stadia rods.

#### 5. Embeddedness:

Embeddedness is defined as the percent of a cobble that is surrounded or buried by fine sediment. The values are 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 is assigned to substrates deemed unsuitable for spawning due to inappropriate substrate particle size (e.g. bedrock) or other considerations. On this scale, a value of 1 indicates the highest quality of spawning substrate and a value of 5 indicates the tail crest is not suitable for spawning. Embeddedness, estimated by eye, is taken in pool habitat units at the pool tail crest.

#### 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 by multiplying shelter value and percent cover. Using an overhead view, a

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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. A standard qualitative shelter value of 0 (none), 1 (low), 2 (medium), or 3 (high) is assigned according to the complexity of the cover. Thus shelter rating can range from 0-300.

### **7. Substrate Composition:**

Substrate composition ranges from silt/clay sized particles to boulders and bedrock elements. Dominant and sub-dominant substrate elements in the habitat unit are estimated by eye using a list of seven size classes. In addition, the dominant substrate composing the pool tail outs is recorded in pool habitat units.

### **8. Canopy:**

Canopy density relates to the amount of stream shaded from the sun. Stream canopy density in the habitat unit is estimated using a handheld spherical densiometer. In addition, the area of canopy is estimated by eye into percentages of coniferous and deciduous trees.

### **9. Streambank Substrate and Vegetation:**

Streambank substrate ranges from bedrock to silt/clay/sand, and may be covered with vegetation that enhances streambank stability. The dominant substrate type and the dominant vegetation type of both the right and left banks of the habitat unit are estimated by eye and recorded. Additionally, the percent of each bank covered by vegetation is estimated by eye and recorded.

## **SAMPLING STRATEGY**

The sampling protocol calls for partial sampling of all habitat units within the survey reach and full sampling in approximately 10% of the habitat units. All habitat units are classified according to habitat type and their lengths are measured. All pool units are measured for maximum depth, depth of pool tail crest, dominant substrate composing the pool tail crest, and embeddedness. Habitat types encountered for the first time are fully sampled for all parameters on the field form. Additionally, from the ten habitat units on each field form page, one is randomly selected for full sampling. Canopy density is recorded for every third unit, in addition to every fully described unit, giving an approximate 30% sub-sample. Air temperature, water temperature, and time of day are recorded at every tenth habitat unit (once per field form page).

## **DATA ANALYSIS**

Data from the habitat inventory form are entered into *Habitat*, a dBASE 4.2 data entry program developed by Tim Curtis, Inland Fisheries Division, DFG. This program processes and summarizes the data, and produces the following tables:

- Summary of riffle, flatwater, and pool habitat types
- Summary of habitat types and measured parameters

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- Summary of pool types
- Summary of maximum pool depths by pool habitat types
- Summary of mean percent cover by habitat type
- Summary of dominant substrates by habitat type
- Summary of mean percent vegetative cover for entire stream
- Fish habitat inventory data summary
- Summary of streambank substrate and vegetation, and pool tail crest cobble embeddedness
- Mean percent of shelter cover types for entire stream

A standard set of graphics is produced from the tables for selected habitat parameters. Those included in this report are:

- Riffle, flatwater, pool habitats by percent total length
- Total pools by maximum depths
- Embeddedness
- Dominant substrate in the pool tail crests

## HABITAT INVENTORY RESULTS

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

Kristi Knechtle of DFG and Josh Carron and Bethany Lourie (WSP/AmeriCorps) conducted the habitat inventory field survey from August 23 & 24, 2001. The total length of stream surveyed was 5187 feet.

Flow measurements were not taken for Soda Fork.

Soda Fork was classified as an F3 channel type for the whole reach surveyed. F3 channel types are generally entrenched meandering riffle/pool channel on low gradients with high width/depth ratio dominated by cobble.

Water temperatures taken during the survey period ranged from 57 to 58 degrees Fahrenheit. Air temperatures ranged from 65 to 69 degrees Fahrenheit.

Based on frequency of occurrence of Level II habitat types there were 23% riffle units, 28% flatwater units, and 48% pool units (Table 1). Based on total length of Level II habitat types there were 22% riffle units, 57% flatwater units, and 20% pool units (Table 1, Graph 2).

Twelve Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were low gradient riffles 22%, step-runs 18%, and lateral-scour bedrock pools and mid-channel pools both at 13%. Based on percent total length, step runs comprised 47%; low gradient riffles 21%, and lateral-scour bedrock at 8%.

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A total of 46 pools were identified (Table 3). Scour pools were most frequently encountered at 65% and comprised 67% of the total length of all pools followed by mid-channel pools at 35% and comprised 33% of the total length. Of the 46 pools, 29 (63%) had a depth of two feet or greater (Table 4, Graph 5).

A primary pool is defined as a pool with a maximum depth of at least 2 feet, occupies at least half the width of the low flow channel, and is as long as the low flow channel width. In Soda Fork, primary pools totaled 1062 feet, or 20% of the total stream surveyed.

Of the 46 pool tail crest embeddedness estimates, none had a value of 1 (0%), 15 had a value of 2 (32%), 21 had a value of 3 (45%), 1 had a value of 4 (2%), and 9 had a value of 5 (19%) (Table 8, Graph 6). The 9 pool tail crests with an embeddedness value of 5 were rated unsuitable for spawning due to the amount of sedimentation found within the gravel, boulders and bedrock.

Riffle habitat types had a mean shelter rating of 11, flatwater habitat types had a mean shelter rating of 9, and pool habitats had a mean shelter rating of 3 (Table 1). Lateral-scour pools, the dominant pool type, had a mean shelter rating of 5 (Table 2).

Cover in Soda Fork is provided mainly by a mix of boulders, bedrock ledges, small and large woody debris, root masses, and undercut banks (Table 5). Boulders, bedrock ledges, large and small woody debris, and undercut banks provided the main cover in pools (Table 10).

Gravel was the dominant substrate in the main habitat types (Table 6). Two lateral scour log pools were fully measured with gravel dominating both (100%). Three low-gradient riffles were fully measured with large cobble dominating 67% and small cobble dominating 33%. Gravel was the dominant pool tail crest substrate in 26 of the 46 pool units (56%).

The mean percent canopy density for the stream reach surveyed was 89%, with deciduous and coniferous trees comprising 57% and 43%, respectively (Table 7).

Sand/silt/clay dominated the streambank substrate in 57% of the fully measured units, followed by bedrock dominating in 22% and cobble/gravel dominating 12% (Table 9). In the fully measured units, right streambanks had a mean vegetative cover of 75%. Left streambanks had a mean vegetative cover of 83% (Table 7). Streambank vegetation was mainly composed of deciduous trees (45%) followed by coniferous trees (50%) (Table 9).

## DISCUSSION

The suitability of F3 channel types for fish habitat improvement structures is: good for bank-placed boulders, single and opposing wing-deflectors. Fair for plunge weirs, boulder clusters, channel constrictors, and log cover. Numerous locations show evidence that the creek is down cutting through debris slide material, and is thus recovering from past land use practices. This kind of recovery is evident on numerous north coast streams purging themselves of excess sediment.

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Water temperatures, for Soda Fork, recorded on the survey days (57 – 58 F) were within the suitable ranges for rearing of coho salmon and steelhead. But continuous monitoring of temperature throughout the warm season would be needed to verify temperature suitability. Given Soda Fork's location near the coast and the canopy density (87%), it is doubtful that the stream temperatures are unsuitable for coho or steelhead.

For Soda Fork, riffles comprised 22% flatwater comprised 57%, and pools comprised 20% of the total length of this survey (Table 1, Graph 2). Primary pools composed 20% of the total length surveyed. DFG data indicates that the better coastal coho streams have as much as 40% of their total habitat length in primary pools. Pool enhancement should be considered when primary pools comprise less than that percentage.

The mean shelter ratings for flatwater, riffle, and especially pool habitats for Soda Fork are all much below the desirable rating of 100 (Tables 1 and 2).

The prevalence of gravel (56%) as the dominant pool tail crest substrate is generally considered suitable for spawning salmonids (Table 6, Graph 8). However, frequencies of embeddedness ratings of 3, 4, or 5 (Table 8) in Soda Fork indicate lower spawning substrate quality due to the presence of fine sediments, boulders, and bedrock.

The mean percent canopy density for Soda Fork was 87%.

## RECOMMENDATIONS

- 1) Soda Fork should be managed as an anadromous, natural production stream. If habitat conditions sufficiently recover, consideration should be given to introduction of a compatible strain of coho salmon.
- 2) Active and potential sediment delivery from roads and other sources in the watershed should be identified, mapped, and quantified. Sources should be treated according to their potential for sediment yield to the stream and its tributaries. This kind of source control will hasten stream recovery from excess sedimentation.
- 3) Greatly increase instream wood to improve shelter rating, help sort sediments, and increase the depths of existing pools.

## COMMENTS AND LANDMARKS

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

Position

(ft):            Comments:

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20            Begin survey about 20 feet up from the confluence with Elk Creek.

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- 165 Considerable shelter from a log/tree that is still alive in the channel.
- 508 135 feet into this unit is an old Humboldt bridge. It's about five to eight feet above the water surface. The logs are beginning to sag down. Sediment is being deposited into the stream.
- 540 Neither the right nor left banks were vegetated in this unit. The left bank was composed of log bank stabilizers. Bank erosion is contributing fines into the pool.
- 885 Large woody debris (LWD) pile is seven feet high, 30 feet wide, and four feet long. Pile is also retaining small woody debris (SWD).
- 1290 Possible restoration project. Four-five pieces of LWD cabled together.
- 2460 Increase in amount of sedimentation in the channel.
- 2639 Spring enters on the left bank. Seeps down a 20-foot cliff face.
- 3365 Tributary enters from the right bank.
- 3918 Three-foot riffle over bedrock between the pools.
- 4505 Tributary enters on the left bank about 124 feet into the unit.
- 4878 Three-foot waterfall entering a pool.
- 4918 15-foot waterfall entering pool. Possible fish barrier.
- 4935 Four-foot waterfall entering pool.
- 5019 Tributary enters on the right bank about 12 feet into the unit.
- 5129 Nine-foot waterfall entering the pool.
- 5144 Seven-foot waterfall entering pool.
- 5187 End of survey. Multiple fish barriers and substantial gradient increase. Tributary enters on the right bank just up from where the survey was ended.

## REFERENCES

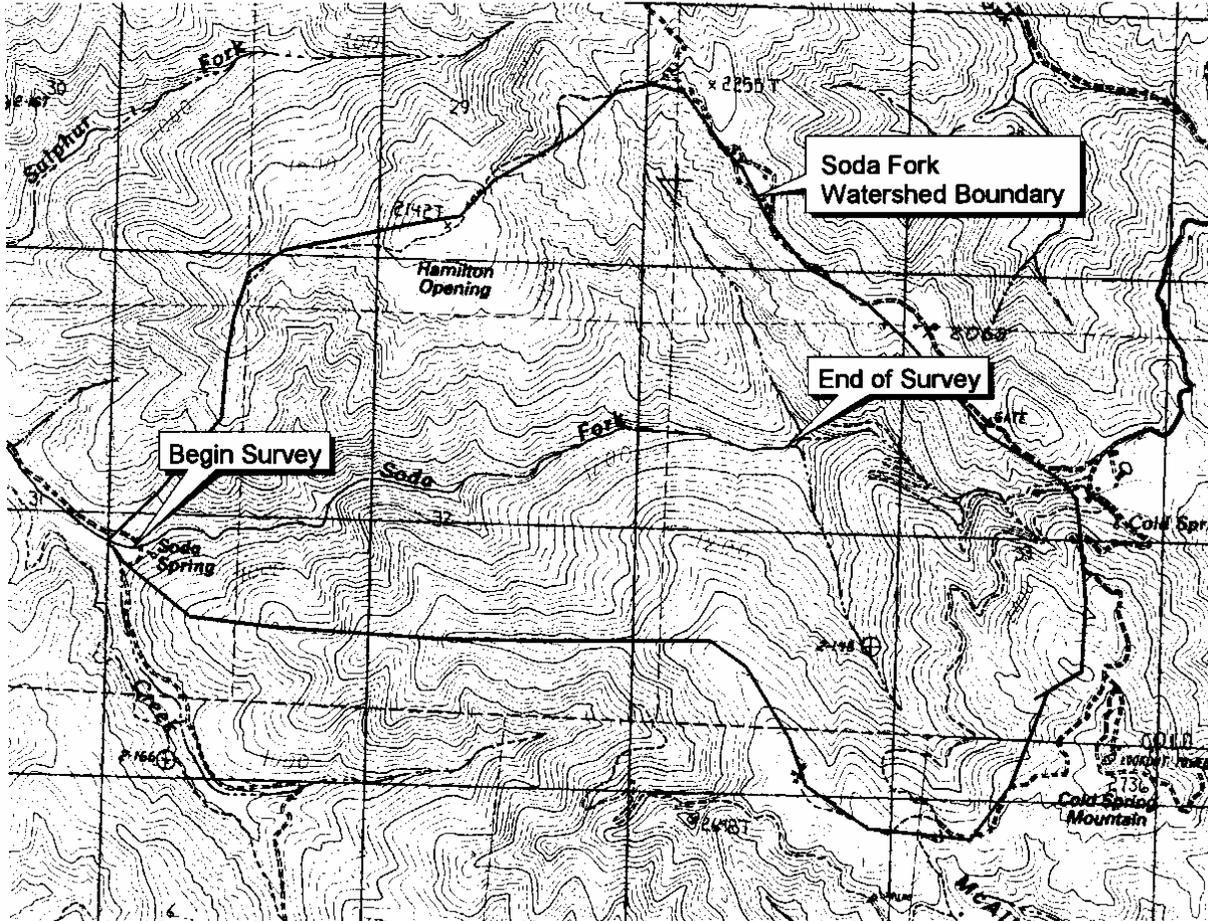
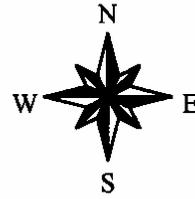
Flosi, Gary, S. Downie, J. Hopelain, M. Bird, R. Coey, and B. Collins. 1998. *California Salmonid Stream Habitat Restoration Manual*, 3rd edition. California Department of Fish and Game, Sacramento, California.

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### Appendix 1: HABITAT TYPE KEY

<b><u>LEVEL II</u></b> <i>Name</i>	<b><u>LEVEL III</u></b> <i>Name</i>	<b><u>LEVEL IV</u></b> <i>Name</i>	<i>Letter, Number</i>
<b>RIFFLE</b>	<b>Riffle</b>	Low Gradient Riffle	[LGR] 1.1
		High Gradient Riffle	[HGR] 1.2
	<b>Cascade</b>	Cascade	[CAS] 2.1
		Bedrock Sheet	[BRS] 2.2
<b>FLATWATER</b>	<b>Flatwater</b>	Pocket Water	[POW] 3.1
		Glide	[GLD] 3.2
		Run	[RUN] 3.3
		Step Run	[SRN] 3.4
		Edgewater	[EDW] 3.5
<b>POOL</b>	<b>Main Channel Pool</b>	Trench Pool	[TRP] 4.1
		Mid-Channel Pool	[MCP] 4.2
		Channel Confluence Pool	[CCP] 4.3
		Step Pool	[STP] 4.4
	<b>Scour Pool</b>	Corner Pool	[CRP] 5.1
		Lateral Scour Pool - Log Enhanced	[LSL] 5.2
		Lateral Scour Pool - Root Wad Enhanced	[LSR] 5.3
		Lateral Scour Pool - Bedrock Formed	[LSBk] 5.4
		Lateral Scour Pool - Boulder Formed	[LSBo] 5.5
		Plunge Pool	[PLP] 5.6
	<b>Backwater Pool</b>	Secondary Channel Pool	[SCP] 6.1
		Backwater Pool - Boulder Formed	[BPB] 6.2
		Backwater Pool - Root Wad Formed	[BPR] 6.3
		Backwater Pool - Log Formed	[BPL] 6.4
		Dammed Pool	[DPL] 6.5

# Soda Fork Watershed Tributary to Elk Creek



# Soda Fork

SODA FORK TRIB TO ELK CRK

Drainage: Elk Creek to Pacific Ocean

Table 1 - SUMMARY OF RIFFLE, FLATWATER, AND POOL HABITAT TYPES

Survey Dates: 08/23/01 to 08/24/01

Confluence Location: QUAD: COLD SPRIN LEGAL DESCRIPTION: T14NR15WS31 LATITUDE:39°1'42" LONGITUDE:123°33'56"

HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	MEAN LENGTH (ft.)	TOTAL LENGTH (ft.)	PERCENT TOTAL LENGTH	MEAN WIDTH (ft.)	MEAN DEPTH (ft.)	MEAN AREA (sq.ft.)	TOTAL ESTIMATED AREA (sq.ft.)	MEAN ESTIMATED VOLUME (cu.ft.)	TOTAL ESTIMATED VOLUME (cu.ft.)	MEAN RESIDUAL POOL VOL (cu.ft.)	MEAN SHELTER RATING
22	4	RIFFLE	23	52	1154	22	11.8	0.4	795	17494	248	5459	0	11
27	5	FLATWATER	28	110	2971	57	8.2	0.6	543	14667	300	8100	0	9
46	46	POOL	49	23	1062	20	10.6	1.6	241	11073	414	19030	319	3
<b>TOTAL UNITS</b>	<b>TOTAL UNITS</b>				<b>TOTAL LENGTH (ft.)</b>					<b>TOTAL AREA (sq. ft.)</b>		<b>TOTAL VOL. (cu. ft.)</b>		
95	55				5187					43235		32589		

SODA FORK TRIB TO ELK CRK

Drainage: Elk Creek to Pacific Ocean

Table 2 - SUMMARY OF HABITAT TYPES AND MEASURED PARAMETERS

Survey Dates: 08/23/01 to 08/24/01

Confluence Location: QUAD: COLD SPRIN LEGAL DESCRIPTION: T14NR15WS31 LATITUDE:39°1'42" LONGITUDE:123°33'56"

HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	MEAN LENGTH (ft.)	TOTAL LENGTH (ft.)	PERCENT TOTAL LENGTH	MEAN WIDTH (ft.)	MEAN DEPTH (ft.)	MEAN MAXIMUM DEPTH (ft.)	MEAN AREA (sq.ft.)	TOTAL AREA EST. (sq.ft.)	MEAN VOLUME (cu.ft.)	TOTAL VOLUME EST. (cu.ft.)	MEAN RESIDUAL POOL VOL (cu.ft.)	MEAN SHELTER RATING	MEAN CANOPY
21	4	LGR	22	53	1111	21	12	0.4	0.9	795	16699	248	5211	0	11	87
1	0	CAS	1	43	43	1	0	0.0	0.0	0	0	0	0	0	0	89
6	2	POW	6	58	347	7	6	0.5	1.6	244	1461	131	788	0	5	93
4	1	RUN	4	44	174	3	10	0.8	1.2	409	1634	327	1307	0	5	87
17	2	SRN	18	144	2450	47	10	0.5	1.4	910	15475	455	7738	0	15	88
12	12	MCP	13	23	277	5	13	1.7	5.6	293	3517	583	6995	468	2	84
4	4	STP	4	18	72	1	10	1.4	2.3	196	785	300	1198	232	1	92
1	1	CRP	1	25	25	0	15	1.2	1.5	375	375	450	450	300	5	95
4	4	LSL	4	30	119	2	12	1.5	2.3	336	1345	470	1879	339	8	90
12	12	LSBK	13	33	392	8	8	1.5	2.9	262	2138	374	4489	244	1	71
6	6	LSBO	6	13	76	1	11	1.4	2.7	130	778	179	1075	135	3	90
7	7	PLF	7	14	101	2	11	2.1	5.0	159	1115	421	2944	391	10	89
<b>TOTAL UNITS</b>	<b>TOTAL UNITS</b>				<b>TOTAL LENGTH (ft.)</b>						<b>TOTAL AREA (sq.ft)</b>		<b>TOTAL VOL. (cu.ft.)</b>			
95	55				5187						46342		34074			

SODA FORK TRIB TO ELK CRK

Drainage: Elk Creek to Pacific Ocean

Table 3 - SUMMARY OF POOL TYPES

Survey Dates: 08/23/01 to 08/24/01

Confluence Location: QUAD: COLD SPRIN LEGAL DESCRIPTION: T14NR15WS31 LATITUDE:39°1'42" LONGITUDE:123°33'56"

HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	MEAN LENGTH (ft.)	TOTAL LENGTH (ft.)	PERCENT TOTAL LENGTH	MEAN WIDTH (ft.)	MEAN DEPTH (ft.)	MEAN AREA (sq.ft.)	TOTAL AREA EST. (sq.ft.)	MEAN VOLUME (cu.ft.)	TOTAL VOLUME EST. (cu.ft.)	MEAN RESIDUAL POOL VOL (cu.ft.)	MEAN SHELTER RATING
16	16	MAIN	35	22	349	33	12.0	1.6	269	4302	512	8193	409	2
30	30	SCOUR	65	24	713	67	9.9	1.6	226	6770	361	10837	271	5
<b>TOTAL UNITS</b>	<b>TOTAL UNITS</b>				<b>TOTAL LENGTH (ft.)</b>					<b>TOTAL AREA (sq.ft.)</b>		<b>TOTAL VOL. (cu.ft.)</b>		
46	46				1062					11073		19030		

# Soda Fork

SODA FORK TRIP TO ELK CRK

Drainage: Elk Creek to Pacific Ocean

Table 4 - SUMMARY OF MAXIMUM POOL DEPTHS BY POOL HABITAT TYPES

Survey Dates: 08/23/01 to 08/24/01

Confluence Location: QUAD: COLD SPRIN LEGAL DESCRIPTION: T14NR15WS31 LATITUDE:39°1'42" LONGITUDE:123°33'56"

UNITS MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	<1 FOOT MAXIMUM DEPTH	<1 FOOT PERCENT OCCURRENCE	1-<2 FT. MAXIMUM DEPTH	1-<2 FOOT PERCENT OCCURRENCE	2-<3 FT. MAXIMUM DEPTH	2-<3 FOOT PERCENT OCCURRENCE	3-<4 FT. MAXIMUM DEPTH	3-<4 FOOT PERCENT OCCURRENCE	>=4 FEET MAXIMUM DEPTH	>=4 FEET PERCENT OCCURRENCE
12	MCP	26	0	0	5	42	5	42	1	0	1	0
4	STP	9	0	0	2	50	2	50	0	0	0	0
1	CRP	2	0	0	1	100	0	0	0	0	0	0
4	LSL	9	0	0	1	25	3	75	0	0	0	0
12	LSBk	26	0	0	5	42	7	58	0	0	0	0
6	LSBo	13	0	0	1	17	5	93	0	0	0	0
7	PLP	15	0	0	2	29	2	29	1	14	2	29
TOTAL UNITS			46									

SODA FORK TRIP TO ELK CRK

Drainage: Elk Creek to Pacific Ocean

Table 5 - SUMMARY OF MEAN PERCENT COVER BY HABITAT TYPE

Survey Dates: 08/23/01 to 08/24/01

Confluence Location: QUAD: COLD SPRIN LEGAL DESCRIPTION: T14NR15WS31 LATITUDE:39°1'42" LONGITUDE:123°33'56"

UNITS MEASURED	UNITS MEASURED	HABITAT TYPE	MEAN % UNDERCUT BANKS	MEAN % SAND	MEAN % LMD	MEAN % ROOT MASS VEGETATION	MEAN % TERR. VEGETATION	MEAN % AQUATIC VEGETATION	MEAN % WHITE WATER	MEAN % BOULDERS	MEAN % BEDROCK LEDGES
21	3	LGR	8	0	0	7	0	0	0	85	0
1	0	CAS	0	0	0	0	0	0	0	0	0
6	2	POW	0	10	0	0	0	0	0	90	0
4	1	RUN	0	80	0	0	0	0	0	20	0
17	2	SEN	15	5	0	10	5	0	0	65	0
12	1	MCP	25	0	0	20	0	0	0	20	35
4	1	STP	0	0	0	0	0	0	10	20	70
1	1	CRP	70	0	0	10	0	0	0	20	0
4	2	LSL	13	0	70	5	0	0	0	13	0
12	3	LSBk	0	8	0	0	0	0	0	67	25
6	3	LSBo	0	3	0	0	0	0	10	53	0
7	2	PLP	5	0	0	13	0	0	5	78	0

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SODA FORK TRIB TO ELK CRK

Drainage: Elk Creek to Pacific Ocean

Table 6 - SUMMARY OF DOMINANT SUBSTRATES BY HABITAT TYPE

Survey Dates: 08/23/01 to 08/24/01

Confluence Location: QUAD: COLD SPRIN LEGAL DESCRIPTION: T14NR15WS31 LATITUDE:39°1'42" LONGITUDE:123°33'56"

TOTAL HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	% TOTAL SILT/CLAY DOMINANT	% TOTAL SAND DOMINANT	% TOTAL GRAVEL DOMINANT	% TOTAL SM COBBLE DOMINANT	% TOTAL LG COBBLE DOMINANT	% TOTAL BOULDER DOMINANT	% TOTAL BEDROCK DOMINANT
21	3	LGR	0	0	0	33	67	0	0
1	0	CAS	0	0	0	0	0	0	0
6	2	POW	0	50	50	0	0	0	0
4	1	RUN	0	0	100	0	0	0	0
17	2	SRN	0	0	0	50	50	0	0
12	1	MCP	0	0	0	100	0	0	0
4	1	STP	0	0	0	0	0	0	100
1	1	CRP	0	100	0	0	0	0	0
4	2	LGL	0	0	100	0	0	0	0
12	3	LEBK	0	0	0	33	33	0	33
6	2	LSBO	0	50	50	0	0	0	0
7	2	FLP	0	100	0	0	0	0	0

TABLE 7

## SODA FORK - ELK CREEK

### Summary of Mean Percent Vegetative Cover for Entire Stream

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Deciduous	Mean Percent Open Units	Mean Right Bank Percent Cover	Mean Left Bank Percent Cover
89	43	57	0	75	83

Note: Mean percent conifer and deciduous for the entire reach are means of canopy components from units with canopy values greater than zero.

Open units represent habitat units with zero canopy cover.

TABLE 8. FISH HABITAT INVENTORY DATA SUMMARY

STREAM NAME: SODA FORK TRIB TO ELK CRK

SAMPLE DATES: 08/23/01 to 08/24/01

STREAM LENGTH: 5187 ft.

LOCATION OF STREAM MOUTH:

USGS Quad Map: COLD SPRIN  
Legal Description: T14NR15WS31

Latitude: 39°1'42"  
Longitude: 123°33'56"

### SUMMARY OF FISH HABITAT ELEMENTS BY STREAM REACH

#### STREAM REACH 01

Channel Type: F3  
Channel Length: 5187 ft.  
Riffle/flatwater Mean Width: 10 ft.  
Total Pool Mean Depth: 1.6 ft.  
Base Flow: 0.0 cfs  
Water: 057- 058°F Air: 065-069°F  
Dom. Bank Veg.: Coniferous Trees  
Vegetative Cover: 80%  
Dom. Bank Substrate: Silt/Clay/Sand

Canopy Density: 87%  
Coniferous Component: 44%  
Deciduous Component: 56%  
Pools by Stream Length: 20%  
Pools >=3 ft. deep: 11%  
Mean Pool Shelter Rtn: 12  
Dom. Shelter: Boulders  
Occurrence of LOD: 7%  
Dry Channel: 0 ft.

Embeddness Value: 1. 0% 2. 33% 3. 46% 4. 2% 5. 20%

Soda Fork

TABLE 9

SODA FORK

Mean Percentage of Dominant Substrate

Dominant Class of Substrate	Number Units Right Bank	Number Units Left Bank	Total Mean Percent
Bedrock	6	3	22.50
Boulder	3	0	7.50
Cobble/Gravel	2	3	12.50
Silt/clay	9	14	57.50

Mean Percentage of Dominant Vegetation

Dominant Class of Vegetation	Number Units Right Bank	Number Units Left Bank	Total Mean Percent
Grass	0	0	0
Brush	0	0	0
Decid. Trees	9	9	45
Conif. Trees	10	10	50
No Vegetation	1	1	5

Total stream average embeddedness value for pool 3.09

TABLE 10. MEAN PERCENT OF SHELTER COVER TYPES FOR ENTIRE STREAM

Stream: SODA FORK TRIB TO ELDrainage: Elk Creek to Pacific Ocean  
 Survey Date: 08/23/01 to 08/24/01

	RIFFLES	FLATWATER	POOLS
UNDERCUT BANKS	8.41	6	10
SMALL WOODY DEBRIS	6.59	22	2.69
LARGE WOODY DEBRIS	6.36	0	10.77
ROOTS	4.77	4	5
TERRESTRIAL VEG	0.45	2	0
AQUATIC VEG	0	0	0
WHITewater	2.27	0	3.85
BOULDERS	58.41	66	46.15
BEDROCK LEDGES	8.18	0	13.85

# Soda Fork

Soda Fork: Substrate Composition in Pool Tail-Outs

