CALIFORNIA DEPARTMENT OF FISH AND GAME
STREAM INVENTORY REPORT
Salt Canyon Creek
Report Revised April 14, 2006
Report Completed 2005
Assessment Completed 2002

INTRODUCTION

A stream inventory was conducted during the summer of 2002 on Salt Canyon Creek, a stream in the Russian River Basin. The inventory was conducted in two parts: habitat inventory and biological inventory. The objective of the habitat inventory was to document the amount and condition of available habitat to fish, and other aquatic species with an emphasis on anadromous salmonids in Salt Canyon Creek. The objective of the biological inventory was to document the salmonid and other aquatic species present and their distribution.

The objective of this report is to document the current habitat conditions and, after analyzing historical and recent data, recommend options for the potential enhancement of habitat for Chinook salmon, 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

Salt Canyon Creek is located in Mendocino County, California and is a tributary of Coleman Creek, a tributary of Pieta Creek which drains into the Russian River (see Salt Canyon Creek map, APPENDIX A). The legal description at the confluence with Coleman Creek is T12N, R11W, S1. Its location is 38°55'31.26"N latitude and 123°02'29.68"W longitude. Access exist by traveling north on Hwy 101, turn on the third dirt road north of Squaw Rock, follow Pieta, go right at the fork, the mouth of Salt Canyon Creek is on the right before crossing Coleman Creek.

Salt Canyon Creek and its tributaries drain a basin of approximately 604.05 acres (0.9 square mile). Salt Canyon Creek is a maximum first order stream and has approximately 8982.9 feet (1.70 miles) of blue line stream, according to the USGS "Hopland" 7.5 minute quadrangles. Elevations range from 617 feet at the mouth of the creek to 2208 feet in the headwaters. The vegetation is primarily hardwood (54%) and shrub (40%) with some herbaceous (4%) and mixed hardwood/conifer (2%). None of the watershed is agricultural or urban. The watershed is 100% privately owned and is managed for livestock grazing.

METHODS

The habitat inventory conducted in Salt Canyon Creek follows the methodology presented in the California Salmonid Stream Habitat Restoration Manual (Flosi, et al., 1998). The California Department of Fish and Game (DFG) field crew that conducted the inventory was trained in standardized habitat inventory methods by DFG. This inventory was conducted by two person teams and was supervised by Derek Acomb, Russian River Planner (DFG).

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 Salt Canyon Creek to record measurements and observations. There are nine components to the inventory form: flow, channel type, air and water temperatures, habitat type, embeddedness, shelter rating, substrate composition, canopy, and bank composition.

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. Flows were also measured or estimated at major tributary confluences.

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:

Water and air temperatures, and time, are measured by crew members with hand held thermometers and recorded at each tenth unit typed. Temperatures are measured in 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. Salt Canyon Creek 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 were in feet to the nearest tenth. All measurements are in feet to the nearest tenth. Habitat characteristics are measured using a hip chain, and stadia rod.

5. Embeddedness:

The depth of embeddedness of the cobbles in pool tail-out reaches is measured by the percent of the cobble that is surrounded or buried by fine sediment. In Salt Canyon Creek, embeddedness was visually estimated. The values were recorded using the following ranges: 0 - 25% (value 1), 26 - 50% (value 2), 51 - 75% (value 3), 76 - 100% (value 4). Additionally, a rating of "not suitable" (value 5) was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate particle size, having a bedrock tail-out, 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. Using an overhead view, a quantitative estimate of the percentage of the habitat unit covered is made. All shelter is then classified according to a list of nine shelter types. In Salt Canyon Creek, a standard qualitative shelter value of 0 (none), 1 (low), 2 (medium), or 3 (high) was assigned according to the complexity of the shelter. The shelter rating is calculated for each habitat unit by multiplying shelter value and percent covered. 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 measured habitat units, dominant and sub-dominant substrate elements were visually estimated using a list of seven size classes which are defined in the California Salmonid Stream Habitat Restoration Manual.

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 Salt Canyon Creek, an estimate of the percentage of the habitat unit covered by canopy was made from the top 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 visually 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 Salt Canyon Creek, the dominant composition type and the dominant vegetation type of both the right and left banks for each fully measured 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 stream inventory is used to determine fish species and their distribution in the stream. Biological inventory is conducted using one or more of three basic methods: 1) stream bank observation, 2) underwater observation, 3) electro fishing. These sampling techniques are discussed in the California Salmonid Stream Habitat Restoration Manual.

IMPACT INVENTORY & ANALYSIS

Problems such as migration barriers, streambed erosion, poor water quality or temperatures are noted in the comments and landmarks section. In some cases measurements are taken, an analysis of what caused the problem is made and restoration potential and alternatives are recommended.

DATA ANALYSIS

Data from the habitat inventory form are entered into Habitat for data storage and analysis. Habitat is a Visual Basic extension to Microsoft Access, developed by Zebulon Young, University of California, Berkeley. This program processes and summarizes the data, and produces the following tables and appendices:

- 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 Salt Canyon Creek 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

HISTORICAL STREAM SURVEYS:

The Department of Fish and Game has not conducted previous surveys of Salt Canyon Creek.

HABITAT INVENTORY RESULTS FOR SALT CANYON CREEK

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

The habitat inventory of Salt Canyon Creek, 9/13/2002, was conducted by Douglas Mitchel (DFG) and Amy Livingston (Americorps) with supervision and analysis by California Department of Fish and Game (DFG). The survey began at the confluence with Coleman Creek and extended up Salt Canyon Creek to the end of survey. The total length of stream surveyed was 1285 feet.

Flows were not measured on Salt Canyon Creek.

This section of Salt Canyon Creek has one reaches with one distinct channel types: from the mouth to 1285 feet (0.24 miles) an A2. A2 channel types are steep (4-10%), narrow, cascading, step-pool streams with a high energy/debris transport associated with depositional soils and a predominantly boulder substrate.

Water temperatures ranged from 55ºF to 58ºF. Air temperatures ranged from 54ºF to 68ºF.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of **occurrence** there were 30% flatwater units, 38% riffle units, 8% pool units, 25% dry units, (Graph 1). Based on total **length** of Level II habitat types there were 56% flatwater units, 22% riffle units, 5% pool units, 17% dry units, (Graph 2).

Nine Level IV habitat types were identified (Table 2). The most frequent habitat types by percent **occurrence** were 20% Step Run units, 10% Low Gradient Riffle units, 5% Mid-Channel Pool units, 12% Bedrock Sheet units, 10% Cascade units, 2% Channel Confluence Pool units, 25% Dry units, 5% High Gradient Riffle units, 10% Glide units, (Graph 3). Based on percent total **length**, 53% Step Run units, 6% Low Gradient Riffle units, 1% Mid-Channel Pool units, 7% Bedrock Sheet units, 7% Cascade units, 4% Channel Confluence Pool units, 17% Dry units, 2% High Gradient Riffle units, 2% Glide units.

A total of 3 pools were identified (Table 3). Main Channel pools were the most frequently encountered, at 100%, and comprised 100% of the total length of all pools (Graph 4).

Table 4 is a summary of maximum residual pool depths by pool habitat types. Pool quality for salmonids increases with depth. None of the 2 pools (0%) had a residual depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the two pool tail-outs measured, one had a value of 1 (50%); one had a value of 2 (50%); (Graph 6). On this scale, a value of 1 indicates the best spawning conditions and a value of 4 the worst. Additionally, a value of 5 was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate like bedrock, log

sills, boulders.

A shelter rating was calculated for each habitat unit and expressed as a mean value for each habitat type within the survey using a scale of 0-300. Riffle habitat types had a mean shelter rating of 3, flatwater habitat types had a mean shelter rating of 5, and pool habitats had a mean shelter rating of 8 (Table 1). Of the pool types, the Main Channel pools had a mean shelter rating of 8, (Table 3).

Table 5 summarizes mean percent cover by habitat type. Boulders are the dominant cover types in Salt Canyon Creek. Graph 7 describes the pool cover in Salt Canyon Creek. Undercut Banks is the dominant pool cover type followed by boulders.

Table 6 summarizes the dominant substrate by habitat type. Graph 8 depicts the dominant substrate observed in pool tail-outs.

The mean percent canopy density for the surveyed length of Salt Canyon Creek was 87%. The mean percentages of hardwood and coniferous trees were 39% and 61%, respectively. Thirteen percent of the canopy was open. Graph 9 describes the mean percent canopy in Salt Canyon Creek.

For the stream reach surveyed, the mean percent right bank vegetated was 5%. The mean percent left bank vegetated was 8%. The dominant elements composing the structure of the stream banks consisted of 47% bedrock, 32% boulder, 15% cobble/gravel, 6% sand/silt/clay, (Graph 10). Brush was the dominant vegetation type observed in 29% of the units surveyed. Additionally, 15% of the units surveyed had hardwood trees as the dominant vegetation type, and 12% had coniferous trees as the dominant vegetation (Graph 11).

BIOLOGICAL INVENTORY

JUVENILE SURVEYS:

Department of Fish and Game has not conducted previous biological inventories of Salt Canyon Creek nor are there any records of hatchery releases or fish rescues in the Salt Canyon Creek watershed. A biological inventory was conducted in 2002.

Species Observed in Historical and Recent Surveys

YEARS	SPECIES	SOURCE	NATIVE/ INTRODUCED
2002	STEELHEAD TROUT *(Oncorhynchus mykiss)*	DFG	N

On 11/05/02 a biological inventory was conducted at one site on Salt Canyon Creek to document fish species presence at the site sampled. The site was electro-fished. Fish from the site were counted by species, and returned to the stream. The air temperature ranged from 55ºF to 57ºF and the water temperature ranged from 48ºF to 49ºF. The observers were Cassie Simons and Amy Livingston (Americorps).

The site 1 inventory began at 1620 hours in Reach 1 and ended upstream at 1710 hours. The distance sampled was approximately 200 feet. Habitat types sampled were glides and mid-channel pools. Salmonids were observed. Newts, crayfish, and frogs were also observed. The following table displays the total fish yielded from these sites.

Species Observed	Numbers recorded at Site 1
STEELHEAD 0+	2
STEELHEAD 1+	2

DISCUSSION FOR SALT CANYON CREEK

Salt Canyon Creek has one channel type: A2. According to the DFG Salmonid Stream Habitat Restoration Manual, the high energy, steep gradient A2 channel types have stable stream banks and poor gravel retention capabilities and are generally not suitable for instream enhancement structures.

The water temperatures recorded on the survey day, 9/13/2002, ranged from 55ºF to 58ºF. Air temperatures ranged from 54ºF to 68ºF. This temperature regime is favorable to salmonids.

Flatwater habitat types comprised 56% of the total length of this survey, riffles 22%, and pools 5%. The pools are relatively shallow/deep, with only none of the two (0%) pools having a maximum residual 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 residual 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 two pool tail-outs measured had embeddedness ratings of 1 or 2. None of the pool tail-outs had embeddedness ratings of 3 or 4. None 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 Salt Canyon Creek should be mapped and rated according to their potential sediment yields, and control measures should be taken.

Two of the two pool tail-outs had silt, sand, large cobble, boulders or bedrock as the dominant substrate. This is generally considered unsuitable for spawning salmonids.

The mean shelter rating for pools was 8. The shelter rating in the flatwater habitats was 5. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by Boulders in Salt Canyon Creek. Undercut Banks are the dominant cover type

in pools followed by boulders. 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 87%. Reach 1 had a canopy density of 58%, Reach 2 had a canopy density of 89.75%, . In general, revegetation projects are considered when canopy density is less than 80%.

The percentage of right and left bank covered with vegetation was low at 5% and 8%, respectively. In areas of stream bank erosion or where bank vegetation is sparse, planting endemic species of coniferous and hardwood trees, in conjunction with bank stabilization, is recommended.

GENERAL MANAGEMENT RECOMMENDATIONS

Salt Canyon Creek should be managed as an anadromous, natural production stream.

Winter storms often bring down large trees and other woody debris into the stream, which increases the number and quality of pools. This woody debris, if left undisturbed, will provide fish shelter and rearing habitat, and offset channel incision. Landowners should be sensitive about the natural and positive role woody debris plays in the system, and encouraged not to remove woody debris from the stream, except under extreme buildup and only under guidance by a fishery professional.

PRIORITY FISHERY ENHANCEMENT OPPORTUNITIES

1) There are sections in Reach 1 where the stream is being impacted from livestock in the riparian zone. Livestock in streams generally inhibit the growth of new trees, exasperate erosion, and reduce summertime survival of juvenile fish by defecating in the water. Alternatives to limit cattle access, control erosion and increase canopy, should be explored with the landowner, and developed if possible.

2) Where feasible, increase woody cover in the pool and flatwater habitat units along the entire stream. Most of the existing shelter is from vegetation and undercut banks. Adding high quality complexity with larger woody cover is desirable. Combination cover/scour structures constructed with boulders and woody debris would be effective in many flatwater and pool locations in the upper reaches. This must be done where the banks are stable or in conjunction with stream bank armor to prevent erosion. In some areas the material is at hand.

3) Where feasible, design and engineer pool enhancement structures to increase the number of pools in the upper reaches. This must be done where the banks are stable or in conjunction with stream bank armor to prevent erosion.

4) In Salt Canyon Creek, active and potential sediment sources related to the road system need to be mapped and treated according to their potential for sediment yield to the stream and its tributaries.

5) Increase the canopy on Salt Canyon Creek by planting willow, alder, redwood, and Douglas fir

along the stream where shade canopy is not at acceptable levels. The reach above the survey section should be assessed for planting and treated as well, since water temperatures throughout are effected from upstream. In many cases, planting will need to be coordinated to follow bank stabilization or upslope erosion control projects.

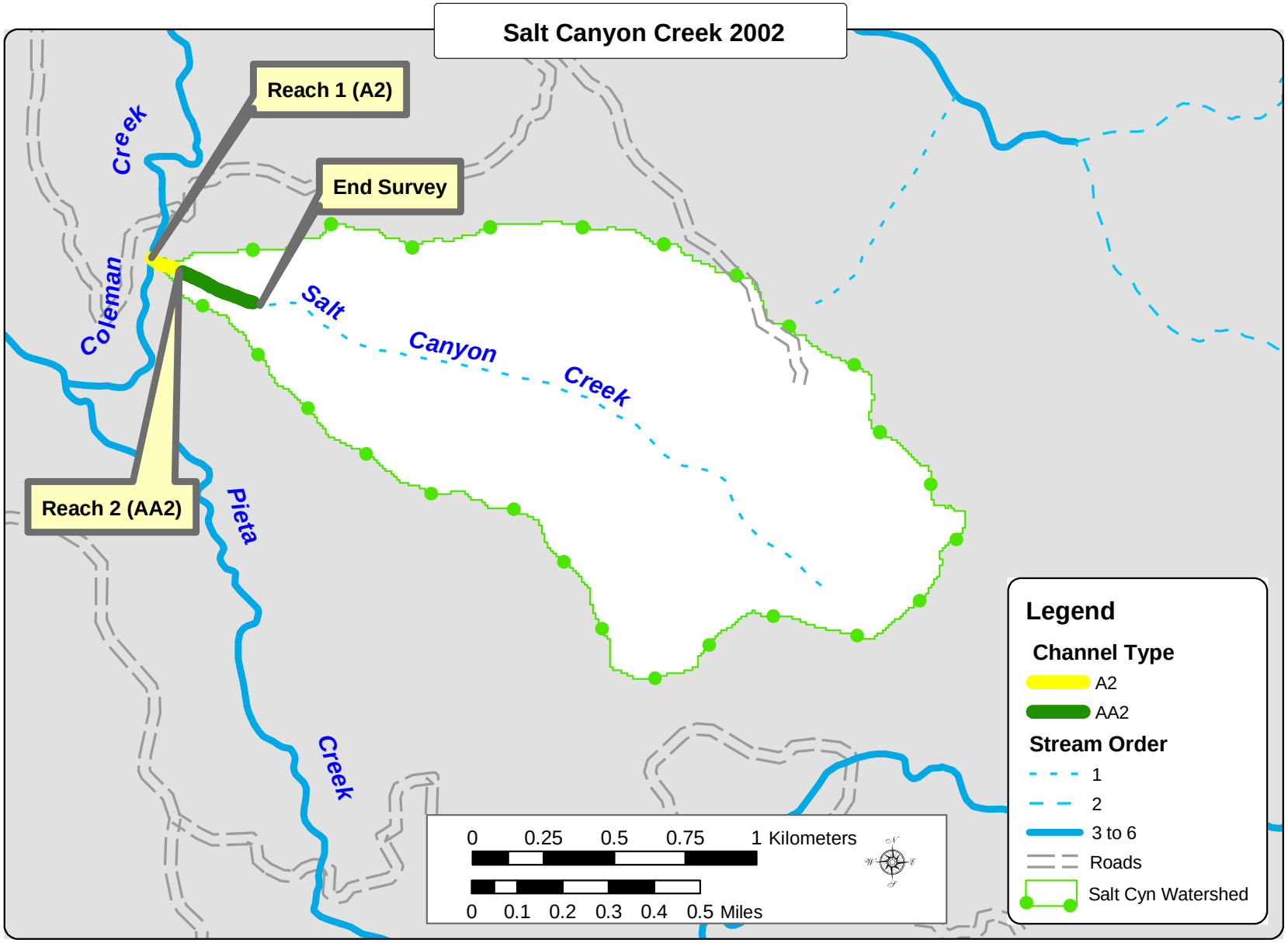
COMMENTS AND LANDMARKS

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

0'	Steelhead 0+ observed from 0' to 482'. Significant algae observed. Cattle presence for the first 300'.
461'	Left bank spring at top of unit, minor right bank EROSION.
482'	4' jump within this step run.
529'	3' jump in unit.
582'	Left bank SLIDE dumping fines into the creek: 10'W x 30'H x 15' D.
681'	Jump(photo 20). Tallest jump is 12'.
712'	RB EROSION/tributary: 30'W x 40'L x 2'D, dumping fine to cobble sized material.
720'	Erosion has caused aggradation in the creek bed on the RB side. This is one of the reasons this unit is dry. Water is flowing beneath the substrate.
731'	3'jump.
767'	There is a large boulder in this glide.
775'	Active LB EROSION 40' x 30' x 25' deep, dumping fines through boulders into creek (sliding at the time of the survey). Jumps average between 5-8 ft. The pools between the jumps are insufficient now, it is questionable whether the pools would be deep enough in the wet season.
902'	Lots of macroinvertebrates. There is 1' of dry before the next unit.
914'	A dry cascade with a 5' jump at the top of the unit, small pool at the base of the cascade.
924'	10' tall, Photo #23, no water in the pool below.
963'	3' jump at the top of this unit. There is a big leaf maple snag on the LB. EROSION is dumping fines to boulders into the creek, dimensions: 25'L x 80'H x 25'D. A piece of large woody debris, 2' above the water level is holding back substrate.
1077'	LB EROSION, 75' into unit: 30'L x 40'H x 10'D, is dumping dirt and fines. There are some dry areas in this run. The water is a trickle in some areas, the water smells anaerobic and there is a strong sulfur smell. A milky white substance is coating the substrate in the water, beneath that is a brown algae, beneath that is black anaerobic sludge, there is an abundance of macroinvertabrates.
1230'	Continued LB EROSION, dimensions: 200'L x 115'H x 50'D, and is a sediment source.
1250'	END OF SURVEY: The creek becomes steep and gets narrower into the canyon. Fish have been absent for a very long time. Above the end of the survey, for a few hundred feet, is channelized then after that bedrock sheet/trench pool for 50'. After 50', the creek is channelized, no fish, extremely steep banks/walls, ravine like, narrow channel, more erosion on RB.

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.



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Prepared by: Jacob Newell, May 16, 2003

Salt Canyon Creek Tables Graphs Map
Assessment Completed 2002

APPENDIX B: GRAPHS

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

Stream Name: Salt Canyon Creek

LLID: 1230416389255

Drainage: Russian River - Upper

Survey Dates: 9/13/2002 to 9/13/2002

Confluence Location: Quad: HOPLAND Legal Description: T12NR11WS01 Latitude: 38:55:32.0N Longitude: 123:02:30.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	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
10	0	DRY	25.0	22	219	17.0									
12	4	FLATWATER	30.0	60	717	55.8	3.0	0.3	0.7	131	1573	39	469		5
3	2	POOL	7.5	21	64	5.0	7.0	0.8	1.6	67	200	60	181	54	8
15	9	RIFFLE	37.5	19	285	22.2	1.4	0.2	0.5	10	155	2	35		3

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
40	15	1285	1928	685

Salt Canyon Creek Tables Graphs Map
Assessment Completed 2002

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Salt Canyon Creek

LLID: 1230416389255

Drainage: Russian River - Upper

Survey Dates: 9/13/2002 to 9/13/2002

Confluence Location: Quad: HOPLAND Legal Description: T12NR11WS01 Latitude: 38:55:32.0N Longitude: 123:02:30.0W

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 (%)
4	2	LGR	10.0	18	73	5.7	2	0.1	0.2	8	31	1	3		0	76
2	2	HGR	5.0	16	31	2.4	1	0.2	0.5	3	6	1	1			97
4	2	CAS	10.0	24	96	7.5	2	0.2	0.9	22	88	6	25		5	92
5	3	BRS	12.5	17	85	6.6	1	0.2	1.4	9	45	2	10		5	93
4	2	GLD	10.0	8	30	2.3	4	0.3	0.6	30	118	9	35		5	75
8	2	SRN	20.0	86	687	53.5	2	0.3	1.4	233	1862	69	554		5	75
2	2	MCP	5.0	10	19	1.5	7	0.8	1.6	67	133	60	120	54	8	90
1	0	CCP	2.5	45	45	3.5										90
10	0	DRY	25.0	22	219	17.0										93

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
40	15	1285	2283	750

Salt Canyon Creek Tables Graphs Map
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Table 3 - Summary of Pool Types

Stream Name: Salt Canyon Creek LLID: 1230416389255 Drainage: Russian River - Upper

Survey Dates: 9/13/2002 to 9/13/2002

Confluence Location: Quad: HOPLAND Legal Description: T12NR11WS01 Latitude: 38:55:32.0N Longitude: 123:02:30.0W

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
3	2	MAIN	100	21	64	100	7.0	0.8	67	200	54	161	8

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
3	2	64	200	161

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

Stream Name: Salt Canyon Creek LLID: 1230416389255 Drainage: Russian River - Upper

Survey Dates: 9/13/2002 to 9/13/2002

Confluence Location: Quad: HOPLAND Legal Description: T12NR11WS01 Latitude: 38:55:32.0N Longitude: 123:02:30.0W

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
2	MCP	100	0	0	2	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
2	0	0	2	100	0	0	0	0	0	0

Mean Maximum Residual Pool Depth (ft.): 1.6

Salt Canyon Creek Tables Graphs Map
Assessment Completed 2002

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Salt Canyon Creek LLID: 1230416389255 Drainage: Russian River - Upper

Survey Dates: 9/13/2002 to 9/13/2002 Dry Units: 10

Confluence Location: Quad: HOPLAND Legal Description: T12NR11WS01 Latitude: 38:55:32.0N Longitude: 123:02:30.0W

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
4	1	LGR	0	0	0	0	0	0	0	0	0
2	0	HGR									
4	1	CAS	0	0	0	0	0	0	0	100	0
5	1	BRS	0	0	0	0	0	0	0	100	0
15	3	TOTAL RIFFLE	0	0	0	0	0	0	0	67	0
4	1	GLD	0	0	0	0	0	0	0	0	100
8	1	SRN	0	0	0	0	10	0	0	90	0
12	2	TOTAL FLAT	0	0	0	0	5	0	0	45	50
2	2	MCP	45	10	0	0	0	0	0	25	20
1	0	CCP									
3	2	TOTAL POOL	45	10	0	0	0	0	0	25	20
40	7	TOTAL	13	3	0	0	1	0	0	49	20

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Salt Canyon Creek LLID: 1230416389255 Drainage: Russian River - Upper

Survey Dates: 9/13/2002 to 9/13/2002 Dry Units: 10

Confluence Location: Quad: HOPLAND Legal Description: T12NR11WS01 Latitude: 38:55:32.0N Longitude: 123:02:30.0W

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
4	1	LGR	0	0	100	0	0	0	0
2	2	HGR	0	0	50	0	0	50	0
4	1	CAS	0	0	100	0	0	0	0
5	2	BRS	0	0	50	0	0	50	0
4	2	GLD	50	0	50	0	0	0	0
8	1	SRN	0	0	100	0	0	0	0
2	0	MCP	0	0	0	0	0	0	0
1	0	CCP	0	0	0	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: Salt Canyon Creek LLID: 1230416389255 Drainage: Russian River - Upper

Survey Dates: 9/13/2002 to 9/13/2002

Confluence Location: Quad: HOPLAND Legal Description: T12NR11WS01 Latitude: 38:55:32.0N Longitude: 123:02:30.0W

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
87	61	39	0	5	8

Note: Mean percent conifer and hardwood 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 9 - Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Salt Canyon Creek LLID: 1230416389255 Drainage: Russian River - Upper

Survey Dates: 9/13/2002 to 9/13/2002

Confluence Location: Quad: HOPLAND Legal Description: T12NR11WS01 Latitude: 38:55:32.0N Longitude: 123:02:30.0W

Mean Percentage of Dominant Stream Bank Substrate

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Bedrock	7	9	47.1
Boulder	6	5	32.4
Cobble / Gravel	3	2	14.7
Sand / Silt / Clay	1	1	5.9

Mean Percentage of Dominant Stream Bank Vegetation

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Grass	1	3	11.8
Brush	2	8	29.4
Hardwood Trees	2	3	14.7
Coniferous Trees	2	2	11.8
No Vegetation	10	1	32.4

Total Stream Cobble Embeddedness Values: 2

Table 10 - Mean Percent of Shelter Cover Types For Entire Stream

StreamName: Salt Canyon Creek LLID: 1230416389255 Drainage: Russian River - Upper

Survey Dates: 9/13/2002 to 9/13/2002

Confluence Location: Quad: HOPLAND Legal Description: T12NR11WS01 Latitude: 38:55:32.0N Longitude: 123:02:30.0W

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	0	45
SMALL WOODY DEBRIS (%)	0	0	10
LARGE WOODY DEBRIS (%)	0	0	0
ROOT MASS (%)	0	0	0
TERRESTRIAL VEGETATION (%)	0	5	0
AQUATIC VEGETATION (%)	0	0	0
WHITEWATER (%)	0	0	0
BOULDERS (%)	67	45	25
BEDROCK LEDGES (%)	0	50	20

Appendix C - Fish Habitat Inventory Data Summary

Stream Name: Salt Canyon Creek LLID: 1230416389255 Drainage: Russian River -
Survey Dates: 9/13/2002 to 9/13/2002 Survey Length (ft.): 1285 Main Channel (ft.): 1285 Side Channel (ft.): 0
Confluence Location: Quad: HOPLAND Legal Description: T12NR11WS01 Latitude: 38:55:32.0N Longitude: 123:02:30.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type: A2
Reach Length (ft.): 400
Riffle/Flatwater Mean Width (ft.): 2.0
BFW:
Range (ft.): to
Mean (ft.):
Std. Dev.:
Base Flow (cfs): 0
Water (F): 56 - 56 Air (F): 54 - 54
Dry Channel (ft.): 0

Canopy Density (%): 58.0
Coniferous Component (%): 82.5
Hardwood Component (%): 17.5
Dominant Bank Vegetation: Coniferous Trees
Vegetative Cover (%): 18.8
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Boulder
Occurrence of LWD (%): 0.0
LWD per 100 ft.:
Riffles:
Pools:
Flat:

Pools by Stream Length (%): 0.0
Pool Frequency (%): 0.0
Residual Pool Depth (%):
< 2 Feet Deep:
2 to 2.9 Feet Deep:
3 to 3.9 Feet Deep:
>= 4 Feet Deep:
Mean Max Residual Pool Depth (ft.):
Mean Pool Shelter Rating:

Pool Tail Substrate (%):	Silt/Clay:	Sand:	Gravel:	Sm Cobble:	Lg Cobble:	Boulder:	Bedrock:
Embeddedness Values (%):	1.	2.	3.	4.	5. 0.0		

STREAM REACH: 2

Channel Type: AA2
Reach Length (ft.): 885
Riffle/Flatwater Mean Width (ft.): 1.9
BFW:
Range (ft.): to
Mean (ft.):
Std. Dev.:
Base Flow (cfs): 0
Water (F): 55 - 58 Air (F): 54 - 68
Dry Channel (ft.): 219

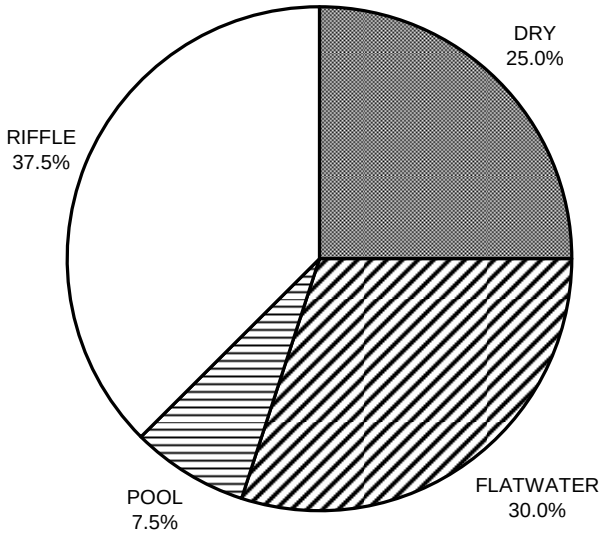
Canopy Density (%): 89.8
Coniferous Component (%): 59.4
Hardwood Component (%): 40.6
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 4.7
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Bedrock
Occurrence of LWD (%): 0.0
LWD per 100 ft.:
Riffles:
Pools:
Flat:

Pools by Stream Length (%): 7.2
Pool Frequency (%): 8.1
Residual Pool Depth (%):
< 2 Feet Deep: 100.0
2 to 2.9 Feet Deep: 0.0
3 to 3.9 Feet Deep: 0.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 1.6
Mean Pool Shelter Rating: 8

Pool Tail Substrate (%):	Silt/Clay:	Sand:	Gravel:	Sm Cobble:	Lg Cobble:	Boulder:	Bedrock:
Embeddedness Values (%):	1. 50.0	2. 50.0	3. 0.0	4. 0.0	5. 0.0		

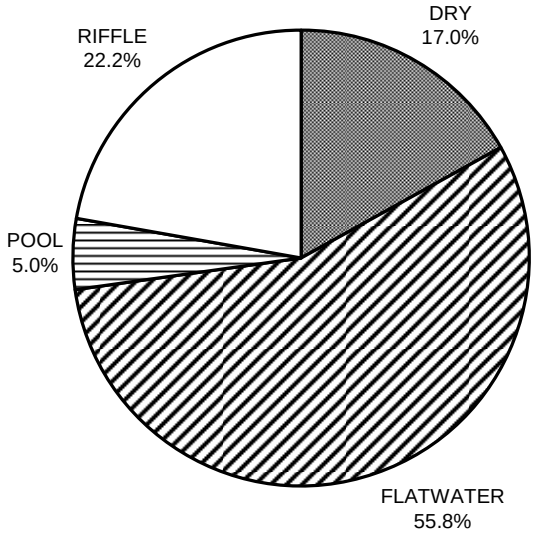
APPENDIX D: GRAPHS

SALT CANYON CREEK 2002
HABITAT TYPES BY PERCENT OCCURRENCE



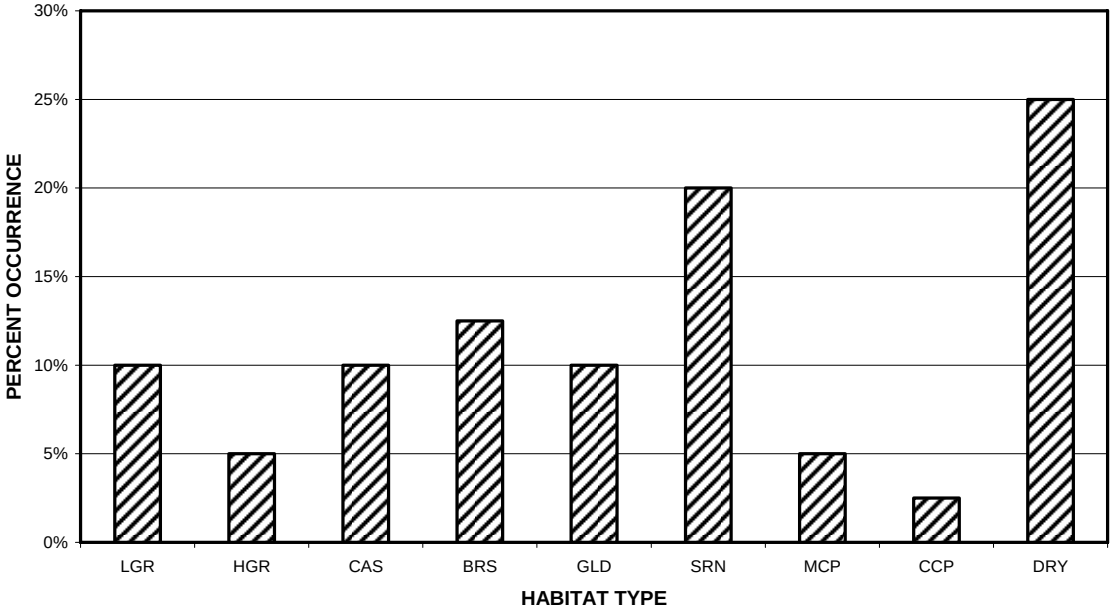
GRAPH 1: Level II habitat types by percent occurrence

SALT CANYON CREEK 2002
HABITAT TYPES BY PERCENT TOTAL LENGTH



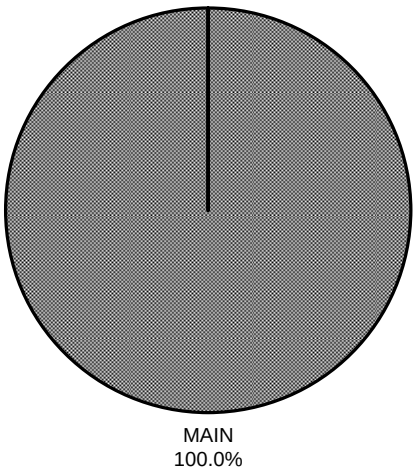
GRAPH 2: Level II habitat types by percent total length

SALT CANYON CREEK 2002
HABITAT TYPES BY PERCENT OCCURRENCE



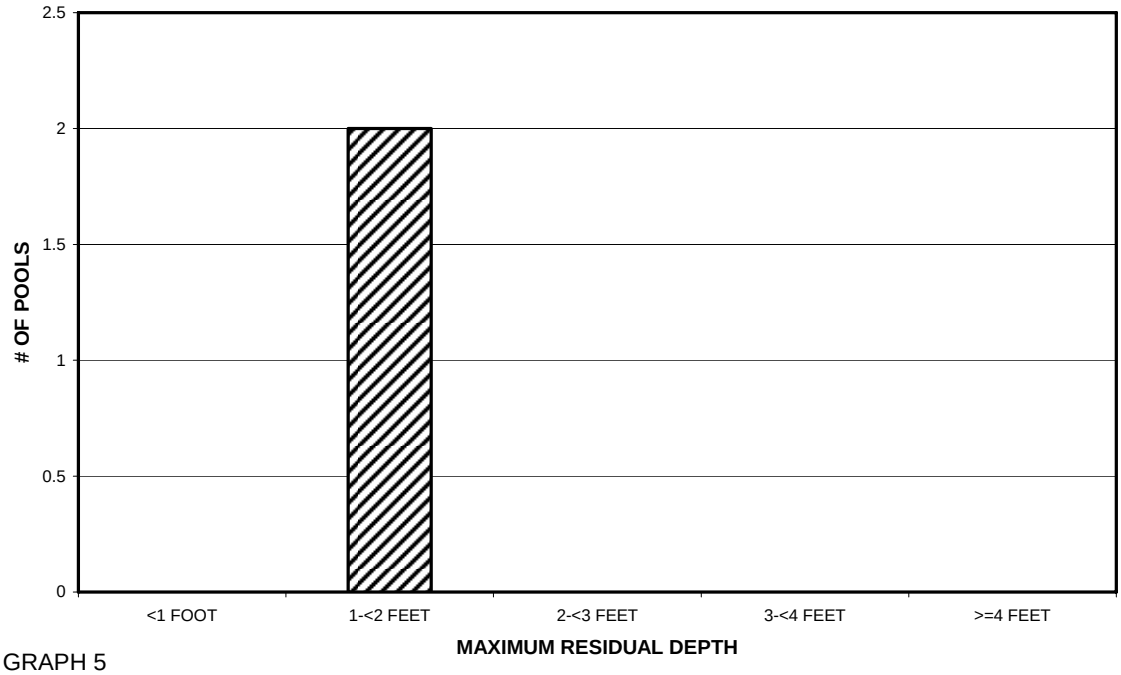
GRAPH 3: Level IV habitat types by percent occurrence

SALT CANYON CREEK 2002
POOL TYPES BY PERCENT OCCURRENCE



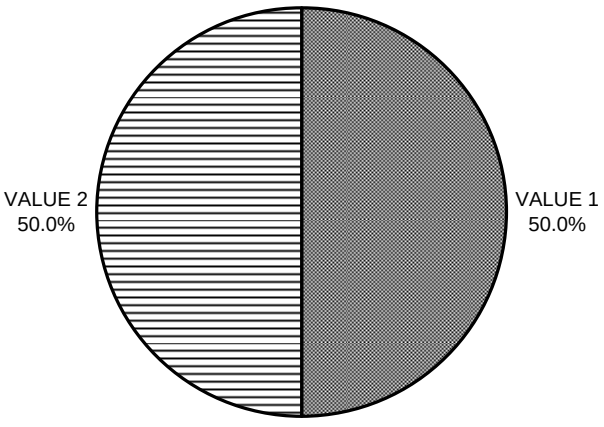
Graph 4: Level I pool types by percent occurrence

SALT CANYON CREEK 2002
MAXIMUM DEPTH IN POOLS



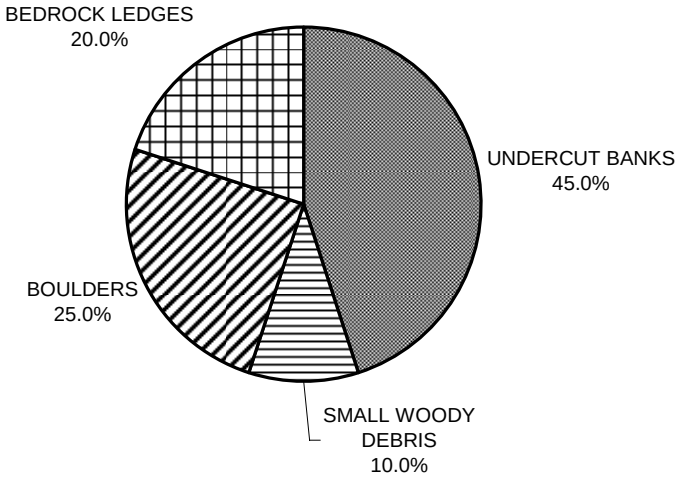
GRAPH 5

SALT CANYON CREEK 2002
PERCENT EMBEDDEDNESS



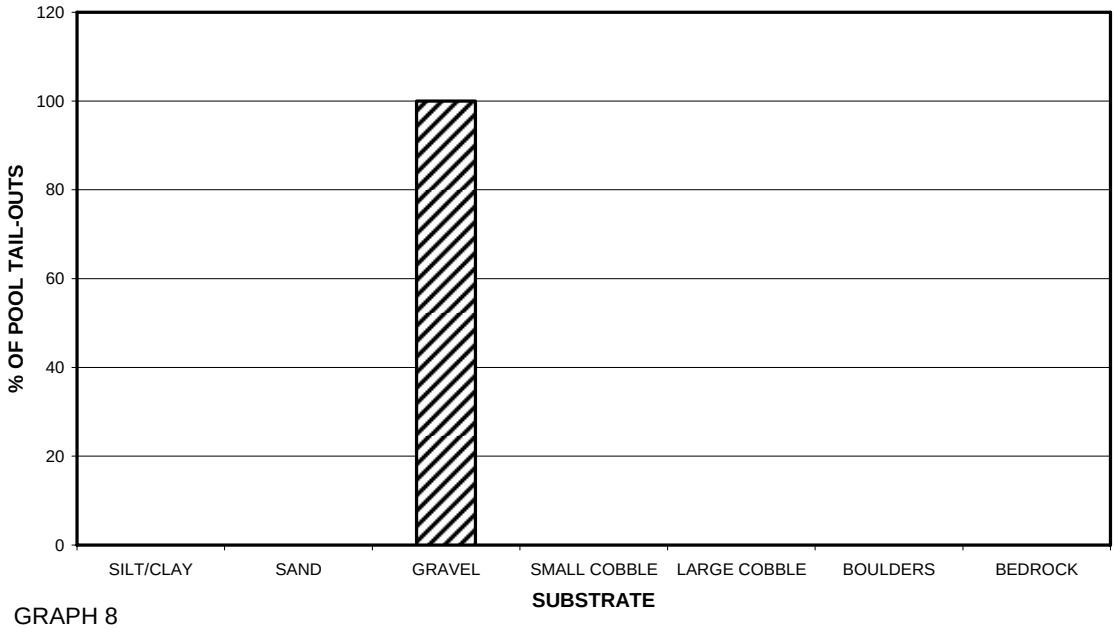
GRAPH 6

SALT CANYON CREEK 2002
MEAN PERCENT COVER TYPES IN POOLS



GRAPH 7

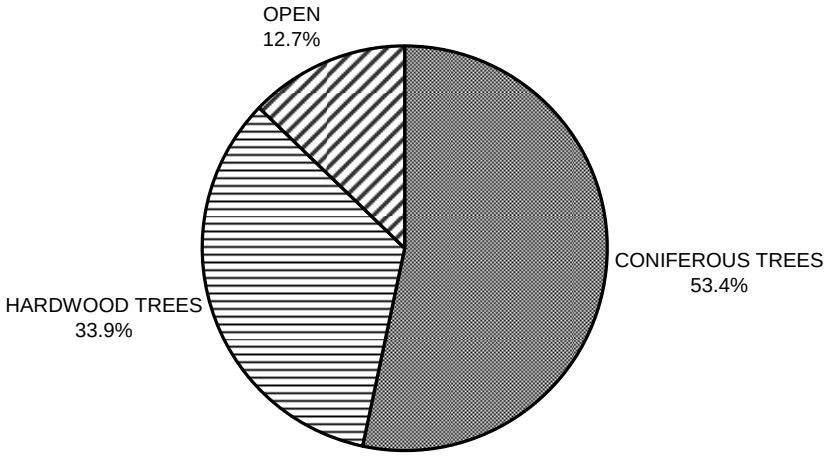
SALT CANYON CREEK 2002
SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



GRAPH 8

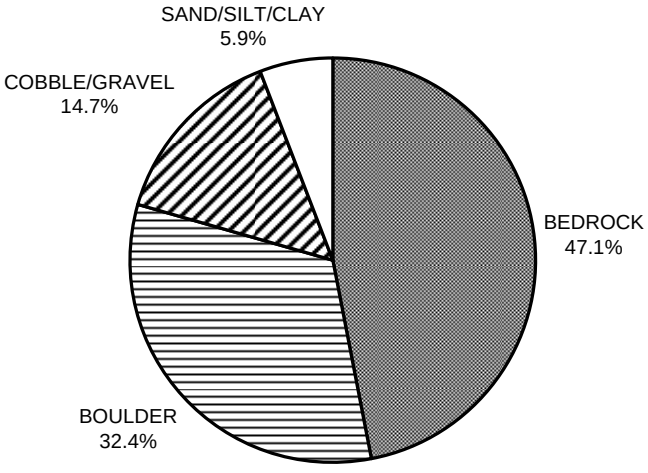
Salt Canyon Creek Tables Graphs Map
Assessment Completed 2002

SALT CANYON CREEK 2002
MEAN PERCENT CANOPY



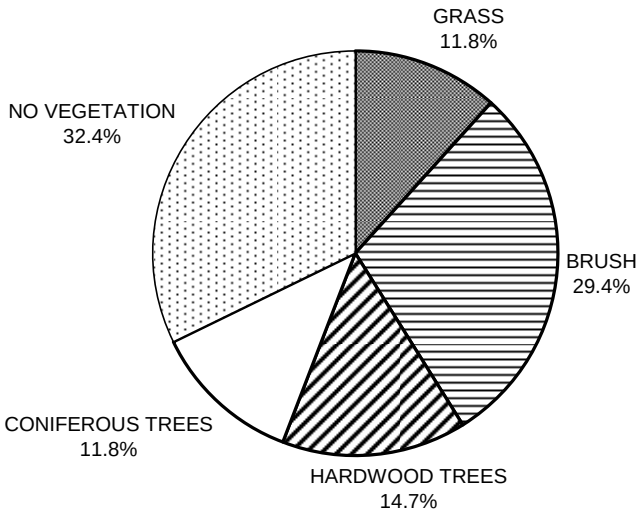
GRAPH 9

SALT CANYON CREEK 2002
DOMINANT BANK COMPOSITION IN SURVEY REACH



GRAPH 10

SALT CANYON CREEK 2002
DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11