

STREAM INVENTORY REPORT

Big Salmon Creek

INTRODUCTION

A stream inventory was conducted from June 14 to July 3, 2007 on Big Salmon Creek. The survey began at the confluence with Pacific Ocean and extended upstream 6.7 miles. Stream inventories and subsections to this report were also completed for three tributaries to Big Salmon Creek.

The objective of the habitat inventory was to document the habitat available to anadromous salmonids in Big Salmon Creek.

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

Big Salmon Creek drains to the Pacific Ocean, located in Mendocino County, California (Map 1). Big Salmon Creek's legal description at the confluence with Pacific Ocean is T16N R17W S28. Its location is 39.216 degrees north latitude and 123.769 west longitude, LLID number 1237678392157. Big Salmon Creek is a third order stream and has approximately 7.1 miles of blue line stream according to the USGS Albion 7.5 minute quadrangle. Big Salmon Creek drains a watershed of approximately 13.5 square miles. Elevations range from about 0 feet at the mouth of the creek to 600 feet in the headwater areas. Mixed conifer forest dominates the watershed. The watershed is primarily privately owned and is managed for timber production. Vehicle access exists via Highway 1 south of Albion.

METHODS

The habitat inventory conducted in Big Salmon Creek follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al, 1998). The Pacific States Marine Fisheries Commission (PSMFC) Fisheries Technician and Watershed Stewards Project/AmeriCorps (WSP) 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 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

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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 Big Salmon Creek to record measurements and observations. There are eleven components to the inventory form.

1. Flow:

Flow is measured in cubic feet per second (cfs) near 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 (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 (1990). 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". Big Salmon 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 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 Big Salmon Creek, 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 like bedrock, log sills, boulders or other considerations.

6. Shelter Rating:

Instream shelter is composed of those elements within a stream channel that provide juvenile 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 for prey. 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 Big Salmon Creek, a standard qualitative shelter value of 0 (none), 1 (low), 2 (medium), or 3 (high) was assigned according to the complexity of the cover. Thus, shelter ratings can range from 0-300 and are expressed as mean values by habitat types within a stream.

7. Substrate Composition:

Substrate composition ranges from silt/clay sized particles to boulders and bedrock elements. In all fully-described habitat units, dominant and sub-dominant substrate elements were ocularly estimated using a list of seven size classes and recorded as a one and two, respectively. In addition, the dominant substrate composing the pool tail-outs is recorded for each pool.

8. Canopy:

Stream canopy density was estimated using modified handheld spherical densimeters as described in the *California Salmonid Stream Habitat Restoration Manual*. Canopy density relates to the amount of stream shaded from the sun. In Big Salmon Creek, 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 coniferous or hardwood 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 Big Salmon Creek, 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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10. Large Woody Debris Count:

Large woody debris (LWD) is an important component of fish habitat and an element in channel forming processes. In each habitat unit all pieces of LWD partially or entirely below the elevation of bankfull discharge are counted and recorded. The minimum size to be considered is twelve inches in diameter and six feet in length. The LWD count is presented by reach and is expressed as an average per 100 feet.

11. Average Bankfull Width:

Bankfull width can vary greatly in the course of a channel type stream reach. This is especially true in very long reaches. Bankfull width can be a factor in habitat components like canopy density, water temperature, and pool depths. Frequent measurements taken at riffle crests (velocity crossovers) are needed to accurately describe reach widths. At the first appropriate velocity crossover that occurs after the beginning of a new stream survey page (ten habitat units), bankfull width is measured and recorded in the appropriate header block of the page. These widths are presented as an average for the channel type reach.

DATA ANALYSIS

Data from the habitat inventory form are entered into Stream Habitat 2.0.19, a Visual Basic data entry program developed by Karen Wilson, Pacific States Marine Fisheries Commission in conjunction with the California Department of Fish and Game. This program processes and summarizes the data, and produces the following ten tables:

- Riffle, Flatwater, and Pool Habitat Types
- Habitat Types and Measured Parameters
- Pool Types
- Maximum Residual Pool Depths by Habitat Types
- Mean Percent Cover by Habitat Type
- Dominant Substrates by Habitat Type
- Mean Percent Vegetative Cover for Entire Stream
- Fish Habitat Inventory Data Summary by Stream Reach (Table 8)
- Mean Percent Dominant Substrate / Dominant Vegetation Type for Entire Stream
- Mean Percent Shelter Cover Types for Entire Stream

Graphics are produced from the tables using Microsoft Excel. Graphics developed for Big Salmon Creek include:

- Riffle, Flatwater, Pool Habitat Types by Percent Occurrence
- Riffle, Flatwater, Pool Habitat Types by Total Length
- Total Habitat Types by Percent Occurrence
- Pool Types by Percent Occurrence
- Maximum Residual Depth in Pools

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- Percent Embeddedness
- Mean Percent Cover Types in Pools
- Substrate Composition in Pool Tail-outs
- Mean Percent Canopy
- Dominant Bank Composition by Composition Type
- Dominant Bank Vegetation by Vegetation Type

HABITAT INVENTORY RESULTS

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

The habitat inventory of June 14 to July 3, 2007, was conducted by C. Hines (PSMFC) and H. Gugino (WSP). The total length of the stream surveyed was 35,550 feet with an additional 129 feet of side channel.

Stream flow was measured near the bottom of the survey reach with a Marsh-McBirney Model 2000 flowmeter at 1.3 cfs on July 6, 2007.

Big Salmon Creek is an unknown channel type for 1,240 feet of the stream (Reach 1), a B4 channel type for 4,508 feet of the stream surveyed (Reach 2), an F2 channel type for 2,088 feet of the stream surveyed (Reach 3), an F4 channel type for 17,683 feet of the stream surveyed (Reach 4), an F1 channel type for 556 feet of the stream surveyed (Reach 5), and an F4 channel type for 9,604 feet of the stream surveyed (Reach 6). B4 channels are moderately entrenched, moderate gradient, riffle dominated channel with infrequently spaced pools, very stable plan and profile, stable banks and gravel-dominant substrates. F2 channel types are entrenched meandering riffle/pool channels on low gradients with high width/depth ratios and boulder-dominant substrates. F4 channel types are entrenched meandering riffle/pool channels on low gradients with high width/depth ratios and gravel-dominant substrates. F1 channel types are entrenched meandering riffle/pool channels on low gradients with high width/depth ratios, very stable with bedrock-dominant substrates.

Water temperatures taken during the survey period ranged from 52 to 60 degrees Fahrenheit. Air temperatures ranged from 52 to 68 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 45% pool units, 32% flatwater units and 22% riffle units (Graph 1). Based on total length of Level II habitat types there were 49% flatwater units, 39% pool units, and 12% riffle units (Graph 2).

Nine Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were mid-channel pool units, 26%; low gradient riffle units, 22%; and step run units, 19% (Graph 3). Based on percent total length, step run units made up 35%, mid-channel pool units 23%, and run units 14%.

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A total of 209 pools were identified (Table 3). Main channel pools were the most frequently encountered at 58% (Graph 4), and comprised 61% of the total length of all pools (Table 3).

Table 4 is a summary of maximum residual pool depths by pool habitat types. Pool quality for salmonids increases with depth. Forty-five of the 209 pools (22%) had a residual depth of three feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 209 pool tail-outs measured, 41 had a value of 1 (19.6%); 135 had a value of 2 (64.6%); 27 had a value of 3 (12.9%); 1 had a value of 4 (0.5%); 5 had a value of 5 (2.4%) (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 such as bedrock, log sills, boulders, or other considerations.

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 37, flatwater habitat types had a mean shelter rating of 54, and pool habitats had a mean shelter rating of 84 (Table 1). Of the pool types, scour pools had the highest mean shelter rating at 106. Main channel pools had a mean shelter rating of 69 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Large woody debris is the dominant cover type in Big Salmon Creek. Graph 7 describes the pool cover in Big Salmon Creek. Large woody debris is the dominant pool cover type followed by small 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 93% of the pool tail-outs. Small cobble, boulders and bedrock were each the next most frequently observed dominant substrate types and occurred in 2% of the pool tail-outs.

The mean percent canopy density for the surveyed length of Big Salmon Creek was 92%. Eight percent of the canopy was open. Of the canopy present, the mean percentages of hardwood and coniferous trees were 75% and 25%, respectively. Graph 9 describes the mean percent canopy in Big Salmon Creek.

For the stream reach surveyed, the mean percent right bank vegetated was 97%. The mean percent left bank vegetated was 96%. The dominant elements composing the structure of the stream banks consisted of 99% sand/silt/clay and 1% boulder (Graph 10). Hardwood trees were the dominant vegetation type observed in 68.4% of the units surveyed. Additionally, 17.4% of the units surveyed had coniferous trees as the dominant vegetation type, and 14.3% had brush as the dominant vegetation type (Graph 11).

DISCUSSION

The first 1,240 feet of Big Salmon Creek were not surveyed. Big Salmon Creek is a B4 channel type for the next 4,508 feet, an F2 channel type for the next 2,088 feet, an F4 channel type for the

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next 17,683, an F1 for the next 556 feet, and an F4 for the remaining 9,604 feet. The suitability of B4, F2, F4 and F1 channel types for fish habitat improvement structures is as follows: B4 channel types are excellent for low-stage plunge weirs, boulder clusters, bank placed boulders, single and opposing wing-deflectors, and log cover. F2 channel types are fair for plunge weirs, single and opposing wing-deflectors, and log cover. F4 channel types are good for bank-placed boulders and fair for plunge weirs, single and opposing wing-deflectors, channel constrictors, and log cover. F1 channel types are good for bank-placed boulders and fair for single wing-deflectors and log cover.

The water temperatures recorded on the survey days June 14 to July 3, 2007, ranged from 52 to 60 degrees Fahrenheit. Air temperatures ranged from 52 to 68 degrees Fahrenheit. To make any conclusions, temperatures need to be monitored throughout the warm summer months, and more extensive biological sampling needs to be conducted.

Flatwater habitat types comprised 49% of the total length of this survey, riffles 12%, and pools 39%. Forty-five of the 209 (22%) pools had a maximum residual depth greater than 3 feet. In general, pool enhancement projects are considered when primary pools comprise less than 40% of the length of total stream habitat. In third and fourth order streams, a primary pool is defined to have a maximum residual depth of at least three feet, occupy at least half the width of the low flow channel, and be as long as the low flow channel width. Installing large wood structures that will increase or deepen pool habitat is recommended.

One hundred seventy-six of the 209 pool tail-outs measured had embeddedness ratings of 1 or 2. Twenty-eight of the pool tail-outs had embeddedness ratings of 3 or 4. Five 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.

Two hundred of the 209 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 is 84. The shelter rating in the flatwater habitats is 54. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by large woody debris in Big Salmon Creek. Large woody debris is the dominant cover type in pools followed by small woody debris. 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 92%. Reach 2 had a canopy density of 77.8%, Reach 3 had a canopy density of 98.3%, Reach 4 had a canopy density of 93.2%, Reach 5 had a canopy density of 97.4%, and Reach 6 had a canopy density of 97%. In general, revegetation projects are considered when canopy density is less than 80%.

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The percentage of right and left bank covered with vegetation was 97% and 96%, 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.

RECOMMENDATIONS

- 1) Big Salmon Creek should be managed as an anadromous, natural production stream.
- 2) The limited water temperature data available suggest that maximum temperatures are within the acceptable range for juvenile salmonids. To establish more complete and meaningful temperature regime information, 24-hour monitoring during the July and August temperature extreme period should be performed for 3 to 5 years.
- 3) Increase woody cover in the pools and flatwater habitat units. Most of the existing cover in the pools is from large woody debris. Adding high quality complexity with woody cover in the pools is desirable.

COMMENTS AND LANDMARKS

Position (ft.):	Habitat Unit #:	Comments:
0	0001.00	Start of survey at the Pacific Ocean. The first 1,240 feet of stream were not surveyed.
1240	0002.00	Begin sampling 1,240 feet upstream from the confluence with the Pacific Ocean.
1689	0007.00	Log debris accumulation (LDA) #01 contains 4 pieces of large woody debris (LWD) and measures 2' high x 23' wide x 7' long. Water flows through and there are visible gaps. There is no retained sediment. Fish are present above the LDA.
1814	0009.00	There are old railroad trestle supports.
4380	0057.00	LDA #02 contains 13 pieces of LWD and measures 3.5' high x 24' wide x 12' long. Water flows through visible gaps. There is no retained sediment. Fish are present above the LDA.
4521	0061.00	Juvenile salmonids were observed throughout habitat units 051 to 060.
7169	0091.00	LDA #03 contains 9 pieces of LWD and measures 8' high x 20' wide x 25' long. Water flows through though there are no visible gaps. Retained sediment is sand and measures 7' wide x 8' long x 3' deep.

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Fish are present above the LDA. The LDA created a side channel. The slope of this unit is 4.5%.

- 7197 0107.00 Tributary #01 enters on the left bank. It contributes to less than 1% of the flow of Big Salmon Creek. The water temperature downstream of the tributary is 60 degrees Fahrenheit, the water temperature of the tributary is 60 degrees Fahrenheit, and the water temperature upstream of the confluence is 60 degrees Fahrenheit. The slope of the tributary is 5% and fish are not observed in the 100 feet explored.
- 8381 0108.00 Juvenile salmonids were observed in this unit.
- 8849 0116.00 LDA #04 contains 10 pieces of LWD and measures 12' high x 24' wide x 15' long. Water flows through visible gaps. Retained sediment ranges from sand to gravel and measures 10' wide x 19' long x 3' deep. Fish are present above the LDA.
- 9584 0126.00 There is left bank erosion that measures 50' long x 4' high.
- 9882 0131.00 Tributary #02 enters on the left bank. Flow is estimated at 0.1 cfs, and it contributes to approximately 1% of Big Salmon Creek's flow. The water temperature downstream of the tributary is 58 degrees Fahrenheit, the water temperature of the tributary is 57 degrees Fahrenheit, and the water temperature upstream of the confluence is 54 degrees Fahrenheit. The slope of the tributary is 55% and fish are not observed in the 30 feet explored. The tributary is not passable to fish due to extreme slope.
- 11167 0154.00 LDA #05 contains 11 pieces of LWD and measures 9' high x 35' wide x 19' long. Water flows through though there are no visible gaps. Retained sediment ranges from fines to gravel and measures 8' wide x 30' long x 3' deep. The LDA spans the channel and is tightly woven with LWD and small woody debris (SWD). Fish are present above the LDA.
- 13441 0188.00 Tributary #03 enters on the left bank. The estimated flow is 0.1 cfs, and it contributes to approximately 1% of Big Salmon Creek's flow. The water temperature downstream of the tributary is 57 degrees Fahrenheit, the water temperature of the tributary is 54 degrees Fahrenheit, and the water temperature upstream of the confluence is 58 degrees Fahrenheit. The slope of the tributary is 65% and fish are not observed in the 50 feet explored.
- 14365 0198.00 Tributary #04 enters on the right bank. The estimated flow is 0.1 cfs, and it contributes to approximately 10% of Big Salmon Creek's flow. The water temperature downstream of the tributary is 58 degrees Fahrenheit, the water temperature of the tributary is 55 degrees

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		Fahrenheit, and the water temperature upstream of the confluence is 58 degrees Fahrenheit. The slope of the tributary is 30% and fish are not observed in the 30 feet explored.
15006	0207.00	LDA #06 contains 20 pieces of LWD and measures 10' high x 25' wide x 81' long. Water flows through though there are no visible gaps. Retained sediment ranges from fines to gravel and measures 15' wide x 21' long x 3' deep. Fish are present above the LDA.
15133	0209.00	There is a water temperature gage in this habitat unit.
20548	0265.00	Tributary #05 enters on the left bank. The estimated flow is less than 0.1 cfs, and it contributes to approximately 3% of Big Salmon Creek's flow. The water temperature downstream of the tributary is 56 degrees Fahrenheit, the water temperature of the tributary is 53 degrees Fahrenheit, and the water temperature upstream of the confluence is 56 degrees Fahrenheit. The slope of the tributary is 30% and fish are not observed in the 30 feet explored.
23472	0299.00	Tributary #06 enters on the left bank. The estimated flow is less than 0.1 cfs, and it contributes to approximately 5% of Big Salmon Creek's flow. The water temperature downstream of the tributary is 54 degrees Fahrenheit, the water temperature of the tributary is 52 degrees Fahrenheit, and the water temperature upstream of the confluence is 54 degrees Fahrenheit. The slope of the tributary is 5% and fish are not observed in the 50 feet explored.
24074	0307.00	Bridge #01 is an unnamed logging road, and is 12' high x 20' wide x 25' long. It is a railcar bridge made of steel.
24668	0317.00	Tributary #07 enters on the right bank. The estimated flow is less than 1 cfs, and it contributes to approximately 10% of Big Salmon Creek's flow. The water temperature downstream of the tributary is 55 degrees Fahrenheit, the water temperature of the tributary is 55 degrees Fahrenheit, and the water temperature upstream of the confluence is 55 degrees Fahrenheit. The slope of the tributary is 10% and fish are not observed in the 50 feet explored.
25155	0325.00	Bridge #02 is an unnamed private logging road, and is 14' high x 20' wide x 24' long. It is a railcar bridge made of steel.
25883	0334.00	LDA #07 contains 9 pieces of LWD and measures 7' high x 8' wide x 24' long. Water flows through though there are no visible gaps. Retained sediment consists primarily of sand and measures 10' wide x 24' long x 1' deep. Fish are present above the LDA.

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26442	0342.00	There is a small left bank landslide 20' long x 9' high.
27298	0353.00	There is right bank erosion that is 40' long x 7' wide.
27379	0354.00	There is right bank erosion 40' long x 9' high.
28052	0364.00	Tributary #08 enters on the right bank. The water temperature downstream of the tributary is 54 degrees Fahrenheit, the water temperature of the tributary is 54 degrees Fahrenheit, and the water temperature upstream of the confluence is 54 degrees Fahrenheit. The slope of the tributary is 15% and fish are not observed in the 120 feet explored. The tributary flows through a culvert which is rusted through. There is a 2' jump with no jump pool at the culvert outlet.
28304	0367.00	The right bank is being stabilized with redwood logs where a section of road is failing.
28482	0369.00	Tributary #09 (Kitchen Gulch) enters on the right bank. The estimated flow is less than 0.1 cfs, and it contributes to approximately 12% of Big Salmon Creek's flow. The water temperature downstream of the tributary is 54 degrees Fahrenheit, the water temperature of the tributary is 54 degrees Fahrenheit, and the water temperature upstream of the confluence is 54 degrees Fahrenheit. The slope of the tributary is 4%. Reference the sub report for Kitchen Gulch for further information.
29209	0375.00	Tributary #10 (Ketty Gulch) enters on the left bank. The estimated flow is less than 0.1 cfs, and it contributes to approximately 8% of Big Salmon Creek's flow. The water temperature downstream of the tributary is 54 degrees Fahrenheit, the water temperature of the tributary is 54 degrees Fahrenheit, and the water temperature upstream of the confluence is 54 degrees Fahrenheit. The slope of the tributary is 7%. Reference the sub report for Ketty Gulch for further information.
30306	0388.00	Tributary #11 enters on the right bank. The estimated flow is less than 0.1 cfs, and it contributes to approximately 2% of Big Salmon Creek's flow. The water temperature downstream of the tributary is 55 degrees Fahrenheit, the water temperature of the tributary is 55 degrees Fahrenheit, and the water temperature upstream of the confluence is 55 degrees Fahrenheit. The slope of the tributary is 7% and fish are not observed.
33077	0420.00	The channel is becoming choked with vegetation.
33693	0427.00	There is erosion that is 20' long x 8' high.

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- 33861 0432.00 Tributary #12 enters on the right bank. The estimated flow is less than 0.1 cfs, and it contributes to approximately 10% of Big Salmon Creek's flow. The water temperature downstream of the tributary is 58 degrees Fahrenheit, the water temperature of the tributary is 56 degrees Fahrenheit, and the water temperature upstream of the confluence is 58 degrees Fahrenheit. The slope of the tributary is 6% and fish are not observed in the 150 feet explored though it appears to be accessible.
- 34796 0448.00 There is a left bank spring 49' into the habitat unit that contributes 3% to the flow of Big Salmon Creek.
- 34920 0451.00 There is a small debris accumulation. One piece of LWD and much SWD is choking channel and retaining sediment measuring 20' long x 5' wide x 3' deep. The sediment is mostly small gravel.
- 35068 0453.00 There are juvenile steelhead and coho salmon observed in this habitat unit and throughout much of the surveyed units.
- 35550 0461.00 End of survey at the confluence with Hazel Gulch and Donnelly Gulch.

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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LEVEL III and LEVEL IV HABITAT TYPES

RIFFLE

Low Gradient Riffle	(LGR)	[1.1]	{ 1 }
High Gradient Riffle	(HGR)	[1.2]	{ 2 }

CASCADE

Cascade	(CAS)	[2.1]	{ 3 }
Bedrock Sheet	(BRS)	[2.2]	{24}

FLATWATER

Pocket Water	(POW)	[3.1]	{21}
Glide	(GLD)	[3.2]	{14}
Run	(RUN)	[3.3]	{15}
Step Run	(SRN)	[3.4]	{16}
Edgewater	(EDW)	[3.5]	{18}

MAIN CHANNEL POOLS

Trench Pool	(TRP)	[4.1]	{ 8 }
Mid-Channel Pool	(MCP)	[4.2]	{17}
Channel Confluence Pool	(CCP)	[4.3]	{19}
Step Pool	(STP)	[4.4]	{23}

SCOUR POOLS

Corner Pool	(CRP)	[5.1]	{22}
Lateral Scour Pool - Log Enhanced	(LSL)	[5.2]	{10}
Lateral Scour Pool - Root Wad Enhanced	(LSR)	[5.3]	{11}
Lateral Scour Pool - Bedrock Formed	(LSBk)	[5.4]	{12}
Lateral Scour Pool - Boulder Formed	(LSBo)	[5.5]	{20}
Plunge Pool	(PLP)	[5.6]	{ 9 }

BACKWATER POOLS

Secondary Channel Pool	(SCP)	[6.1]	{ 4 }
Backwater Pool - Boulder Formed	(BPB)	[6.2]	{ 5 }
Backwater Pool - Root Wad Formed	(BPR)	[6.3]	{ 6 }
Backwater Pool - Log Formed	(BPL)	[6.4]	{ 7 }
Dammed Pool	(DPL)	[6.5]	{13}

ADDITIONAL UNIT DESIGNATIONS

Dry	(DRY)	[7.0]	
Culvert	(CUL)	[8.0]	
Not Surveyed	(NS)	[9.0]	
Not Surveyed due to a marsh	(MAR)	[9.1]	

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

Stream Name: Big Salmon Creek

LLID: 1237678392157 Drainage: Albion River

Survey Dates: 6/14/2007 to 7/3/2007

Confluence Location: Quad: ALBION

Legal Description: T16NR17WS28

Latitude: 39:12:57.0N

Longitude: 123:46:04.0

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
150	28	FLATWATER	32.4	112	16864	49.0	15.3	0.7	1.4	1550	232519	1106	165854		54
1	0	NOSURVEY		1240	1240										
209	209	POOL	45.1	63	13255	38.5	17.8	1.2	2.3	1149	240233	1841	384690	1476	84
104	18	RIFFLE	22.5	42	4320	12.5	11.7	0.3	0.6	436	45340	123	12810		37
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)			Total Volume (cu.ft.)		
464	255				35679					518092			563354		

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Big Salmon Creek

LLID: 1237678392157

Drainage: Albion River

Survey Dates: 6/14/2007 to 7/3/2007

Confluence Location: Quad: ALBION

Legal Description: T16NR17WS28

Latitude: 39:12:57.0N

Longitude: 123:46:04.0W

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 (%)
104	18	LGR	22.5	42	4320	12.5	12	0.3	1.7	436	45340	123	12810		37	95
1	1	GLD	0.2	45	45	0.1	31	2.1	3	1395	1395	2930	2930		15	27
60	8	RUN	13.0	78	4675	13.6	19	0.8	2.5	1359	81528	1217	73044		48	94
89	19	SRN	19.2	136	12144	35.3	13	0.6	2.4	1639	145858	963	85677		58	94
122	122	MCP	26.3	66	8109	23.5	19	1.3	4.8	1265	154326	2177	265549	1774	69	91
1	1	CRP	0.2	84	84	0.2	28	2.1	3.6	2234	2234	6703	6703	4692	50	92
64	64	LSL	13.8	61	3890	11.3	17	1.0	3.4	1019	65229	1347	86195	1045	110	90
11	11	LSR	2.4	53	581	1.7	17	1.1	2.8	865	9516	1184	13029	934	101	96
11	11	LSBo	2.4	54	591	1.7	16	1.0	3.9	812	8928	1201	13213	968	94	95
1	0	NS		1240	1240											

Total Units
464

Total Units Fully Measured
255

Total Length (ft.)
35679

Total Area (sq.ft.)
514353

Total Volume (cu.ft.)
559151

Table 3 - Summary of Pool Types

Stream Name: Big Salmon Creek

LLID: 1237678392157

Drainage: Albion River

Survey Dates: 6/14/2007 to 7/3/2007

Confluence Location: Quad: ALBION

Legal Description: T16NR17WS28

Latitude: 39:12:57.0N

Longitude: 123:46:04.0W

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
122	122	MAIN	58	66	8109	61	18.5	1.3	1265	154326	1774	214630	69
87	87	SCOUR	42	59	5146	39	16.8	1.0	987	85907	1063	92459	106

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
209	209	13255	240233	307089

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

Stream Name: Big Salmon Creek LLID: 1237678392157 Drainage: Albion River
 Survey Dates: 6/14/2007 to 7/3/2007
 Confluence Location: Quad: ALBION Legal Description: T16NR17WS28 Latitude: 39:12:57.0N Longitude: 123:46:04.0W

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
122	MCP	58	3	2	37	30	46	38	30	25	6	5
1	CRP	0	0	0	0	0	0	0	1	100	0	0
64	LSL	31	1	2	29	45	28	44	6	9	0	0
11	LSR	5	0	0	4	36	7	64	0	0	0	0
11	LSBo	5	0	0	5	45	4	36	2	18	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
209	4	2	75	36	85	41	39	19	6	3

Mean Maximum Residual Pool Depth (ft.): 2.3

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Big Salmon Creek

LLID: 1237678392157

Drainage: Albion River

Survey Dates: 6/14/2007 to 7/3/2007

Dry Units: 0

Confluence Location: Quad: ALBION

Legal Description: T16NR17WS28

Latitude: 39:12:57.0N

Longitude: 123:46:04.0W

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
104	14	LGR	13	15	26	0	35	0	0	11	0
104	14	TOTAL RIFFLE	13	15	26	0	35	0	0	11	0
1	1	GLD	0	20	0	0	80	0	0	0	0
60	7	RUN	6	33	16	0	29	0	0	17	0
89	19	SRN	9	32	20	3	18	1	0	15	3
150	27	TOTAL FLAT	8	32	18	2	23	0	0	15	2
122	120	MCP	19	28	27	5	13	0	0	7	1
1	1	CRP	0	80	10	0	10	0	0	0	0
64	61	LSL	10	32	47	4	7	0	0	1	0
11	10	LSR	3	25	5	57	10	0	0	0	0
11	11	LSBo	12	15	17	18	4	0	0	32	1
209	203	TOTAL POOL	15	28	31	8	11	0	0	6	1
1	0	NS									
464	244	TOTAL	14	28	30	7	13	0	0	8	1

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Big Salmon Creek LLID: 1237678392157 Drainage: Albion River
 Survey Dates: 6/14/2007 to 7/3/2007 Dry Units: 0
 Confluence Location: Quad: ALBION Legal Description: T16NR17WS28 Latitude: 39:12:57.0N Longitude: 123:46:04.0W

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
104	18	LGR	0	0	83	11	0	0	6
1	1	GLD	0	0	100	0	0	0	0
60	8	RUN	0	0	88	0	0	0	13
89	19	SRN	0	0	79	0	0	5	16
122	122	MCP	1	5	89	2	0	2	2
1	1	CRP	0	0	100	0	0	0	0
64	64	LSL	0	8	92	0	0	0	0
11	11	LSR	0	9	91	0	0	0	0
11	11	LSBo	0	0	73	0	9	18	0

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: Big Salmon Creek

LLID: 1237678392157

Drainage: Albion River

Survey Dates: 6/14/2007 to 7/3/2007

Confluence Location: Quad: ALBION

Legal Description: T16NR17WS28

Latitude: 39:12:57.0N

Longitude: 123:46:04.0W

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
92	25	75	0	97	96

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 8 - Fish Habitat Inventory Data Summary

Stream Name: Big Salmon Creek LLID: 1237678392157 Drainage: Albion River
 Survey Dates: 6/14/2007 to 7/3/2007 Survey Length (ft.): 35679 Main Channel (ft.): 35550 Side Channel (ft.): 129
 Confluence Location: Quad: ALBION Legal Description: T16NR17WS28 Latitude: 39:12:57.0N Longitude: 123:46:04.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type: NA	Canopy Density (%):	Pools by Stream Length (%): 0.0
Reach Length (ft.): 1240	Coniferous Component (%):	Pool Frequency (%): 0.0
Riffle/Flatwater Mean Width (ft.):	Hardwood Component (%):	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation:	< 2 Feet Deep:
Range (ft.): to	Vegetative Cover (%): 0.0	2 to 2.9 Feet Deep:
Mean (ft.):	Dominant Shelter:	3 to 3.9 Feet Deep:
Std. Dev.:	Dominant Bank Substrate Type:	>= 4 Feet Deep:
Base Flow (cfs.):	Occurrence of LWD (%):	Mean Max Residual Pool Depth (ft.):
Water (F): 0 - 0 Air (F): 0 - 0	LWD per 100 ft.:	Mean Pool Shelter Rating:
Dry Channel (ft): 0	Riffles:	
	Pools:	
	Flat:	
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: B4	Canopy Density (%): 77.8	Pools by Stream Length (%): 50.3
Reach Length (ft.): 4444	Coniferous Component (%): 0.0	Pool Frequency (%): 47.5
Riffle/Flatwater Mean Width (ft.): 20.3	Hardwood Component (%): 100.0	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Hardwood Trees	< 2 Feet Deep: 45
Range (ft.): 24 to 32	Vegetative Cover (%): 98.8	2 to 2.9 Feet Deep: 32
Mean (ft.): 28	Dominant Shelter: Small Woody Debris	3 to 3.9 Feet Deep: 21
Std. Dev.: 3	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 3
Base Flow (cfs.): 1.3	Occurrence of LWD (%): 23	Mean Max Residual Pool Depth (ft.): 2.3
Water (F): 52 - 59 Air (F): 57 - 62	LWD per 100 ft.:	Mean Pool Shelter Rating: 66
Dry Channel (ft): 0	Riffles: 0	
	Pools: 2	
	Flat: 1	
Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 100 Sm Cobble: 0 Lg Cobble: 0 Boulder: 0 Bedrock: 0		
Embeddedness Values (%): 1. 21.1 2. 52.6 3. 23.7 4. 2.6 5. 0.0		

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 3

Channel Type: F2	Canopy Density (%): 98.3	Pools by Stream Length (%): 28.6
Reach Length (ft.): 2023	Coniferous Component (%): 7.9	Pool Frequency (%): 40.0
Riffle/Flatwater Mean Width (ft.): 18.0	Hardwood Component (%): 92.1	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Hardwood Trees	< 2 Feet Deep: 38
Range (ft.): 25 to 25	Vegetative Cover (%): 96.1	2 to 2.9 Feet Deep: 50
Mean (ft.): 25	Dominant Shelter: Boulders	3 to 3.9 Feet Deep: 13
Std. Dev.: 0	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 0
Base Flow (cfs.): 1.3	Occurrence of LWD (%): 8	Mean Max Residual Pool Depth (ft.): 2.3
Water (F): 54 - 56 Air (F): 54 - 58	LWD per 100 ft.:	Mean Pool Shelter Rating: 81
Dry Channel (ft): 0	Riffles: 1	
	Pools: 1	
	Flat: 1	
Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 13 Sm Cobble: 38 Lg Cobble: 0 Boulder: 50 Bedrock: 0		
Embeddedness Values (%): 1. 0.0 2. 37.5 3. 62.5 4. 0.0 5. 0.0		

STREAM REACH: 4

Channel Type: F4	Canopy Density (%): 93.2	Pools by Stream Length (%): 44.8
Reach Length (ft.): 17683	Coniferous Component (%): 28.5	Pool Frequency (%): 48.1
Riffle/Flatwater Mean Width (ft.): 12.0	Hardwood Component (%): 71.5	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Hardwood Trees	< 2 Feet Deep: 20
Range (ft.): 17 to 33	Vegetative Cover (%): 96.3	2 to 2.9 Feet Deep: 50
Mean (ft.): 24	Dominant Shelter: Large Woody Debris	3 to 3.9 Feet Deep: 25
Std. Dev.: 4	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 5
Base Flow (cfs.): 1.3	Occurrence of LWD (%): 33	Mean Max Residual Pool Depth (ft.): 2.6
Water (F): 52 - 60 Air (F): 52 - 64	LWD per 100 ft.:	Mean Pool Shelter Rating: 94
Dry Channel (ft): 0	Riffles: 1	
	Pools: 4	
	Flat: 1	
Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 98 Sm Cobble: 2 Lg Cobble: 0 Boulder: 0 Bedrock: 0		
Embeddedness Values (%): 1. 27.9 2. 64.0 3. 8.1 4. 0.0 5. 0.0		

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 5

Channel Type: F1	Canopy Density (%): 97.4	Pools by Stream Length (%): 11.2
Reach Length (ft.): 556	Coniferous Component (%): 9.0	Pool Frequency (%): 20.0
Riffle/Flatwater Mean Width (ft.): 14.8	Hardwood Component (%): 91.0	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Hardwood Trees	< 2 Feet Deep: 100
Range (ft.): 22 to 22	Vegetative Cover (%): 94.5	2 to 2.9 Feet Deep: 0
Mean (ft.): 22	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.): 1.3	Occurrence of LWD (%): 14	Mean Max Residual Pool Depth (ft.): 1.4
Water (F): 55 - 55	Air (F): 56 - 56	LWD per 100 ft.:
Dry Channel (ft): 0	Riffles: 0	Pools: 0
	Pools: 0	Flat: 4
	Flat: 4	
Pool Tail Substrate (%): Silt/Clay: 0	Sand: 0	Gravel: 100
	Sm Cobble: 0	Lg Cobble: 0
	Boulder: 0	Bedrock: 0
Embeddedness Values (%): 1. 0.0	2. 100.0	3. 0.0
	4. 0.0	5. 0.0

STREAM REACH: 6

Channel Type: F4	Canopy Density (%): 97.0	Pools by Stream Length (%): 25.1
Reach Length (ft.): 9604	Coniferous Component (%): 37.3	Pool Frequency (%): 40.2
Riffle/Flatwater Mean Width (ft.): 11.1	Hardwood Component (%): 62.7	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Hardwood Trees	< 2 Feet Deep: 71
Range (ft.): 10 to 22	Vegetative Cover (%): 95.8	2 to 2.9 Feet Deep: 25
Mean (ft.): 16	Dominant Shelter: Large Woody Debris	3 to 3.9 Feet Deep: 4
Std. Dev.: 3	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 0
Base Flow (cfs.): 1.3	Occurrence of LWD (%): 29	Mean Max Residual Pool Depth (ft.): 1.7
Water (F): 53 - 59	Air (F): 56 - 68	LWD per 100 ft.:
Dry Channel (ft): 0	Riffles: 0	Pools: 4
	Pools: 4	Flat: 1
	Flat: 1	
Pool Tail Substrate (%): Silt/Clay: 0	Sand: 0	Gravel: 90
	Sm Cobble: 0	Lg Cobble: 0
	Boulder: 0	Bedrock: 10
Embeddedness Values (%): 1. 3.9	2. 78.4	3. 7.8
	4. 0.0	5. 9.8

Table 9 - Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Big Salmon Creek

LLID: 1237678392157

Drainage: Albion River

Survey Dates: 6/14/2007 to 7/3/2007

Confluence Location: Quad: ALBION

Legal Description: T16NR17WS28

Latitude: 39:12:57.0N

Longitude: 123:46:04.0W

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	1	1	0.4
Boulder	3	1	0.8
Cobble / Gravel	0	0	0.0
Sand / Silt / Clay	252	254	98.8

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	0	0	0.0
Brush	42	31	14.3
Hardwood Trees	170	180	68.4
Coniferous Trees	44	45	17.4
No Vegetation	0	0	0.0

Total Stream Cobble Embeddedness Values: 2

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

StreamName: Big Salmon Creek

LLID: 1237678392157

Drainage: Albion River

Survey Dates: 6/14/2007 to 7/3/2007

Confluence Location: Quad: ALBION

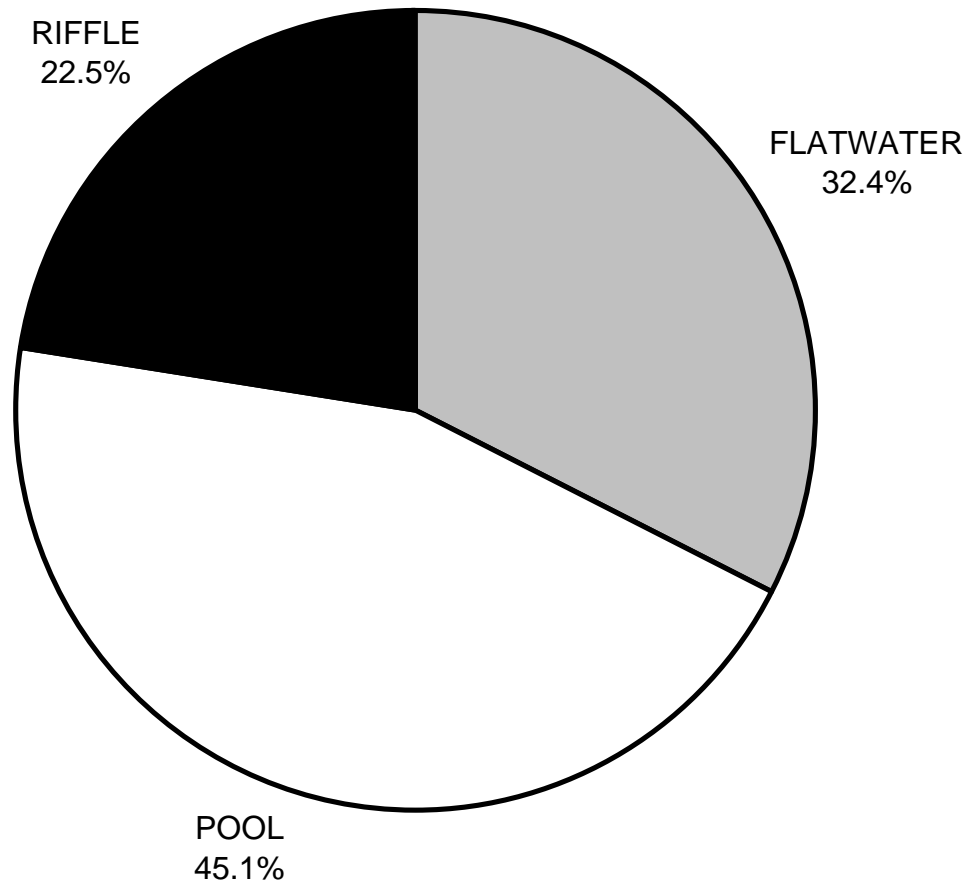
Legal Description: T16NR17WS28

Latitude: 39:12:57.0N

Longitude: 123:46:04.0W

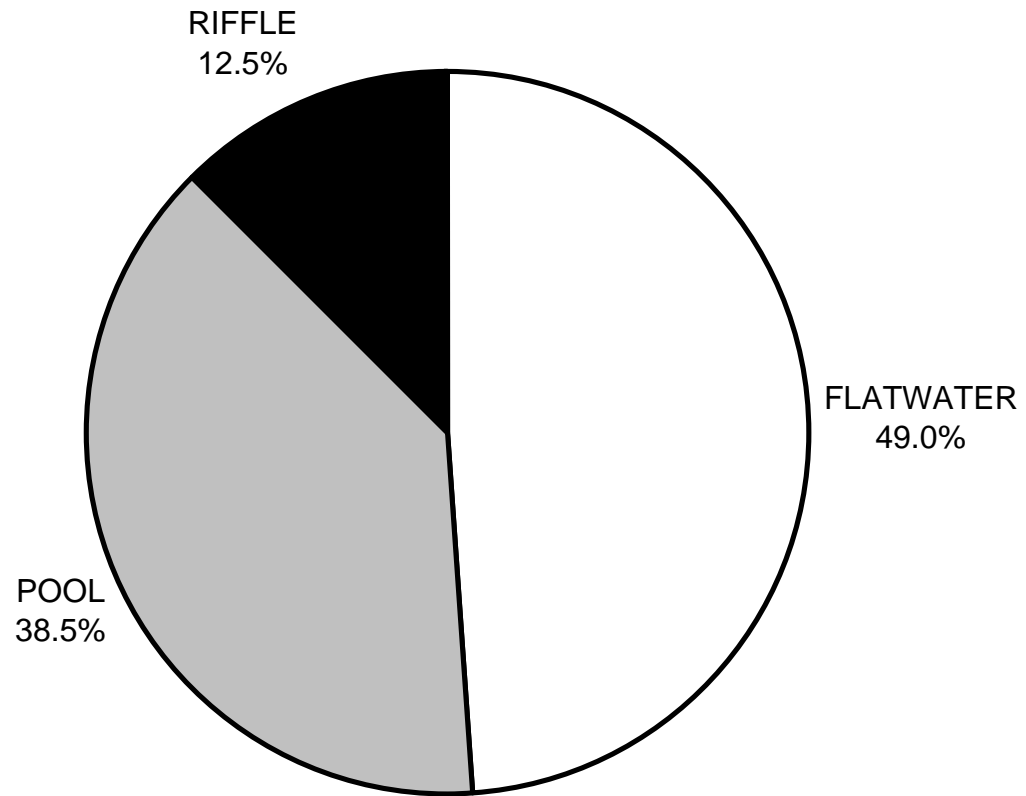
	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	13	8	15
SMALL WOODY DEBRIS (%)	15	32	28
LARGE WOODY DEBRIS (%)	26	18	31
ROOT MASS (%)	0	2	8
TERRESTRIAL VEGETATION (%)	35	23	11
AQUATIC VEGETATION (%)	0	0	0
WHITEWATER (%)	0	0	0
BOULDERS (%)	11	15	6
BEDROCK LEDGES (%)	0	2	1

BIG SALMON CREEK 2007 HABITAT TYPES BY PERCENT OCCURRENCE



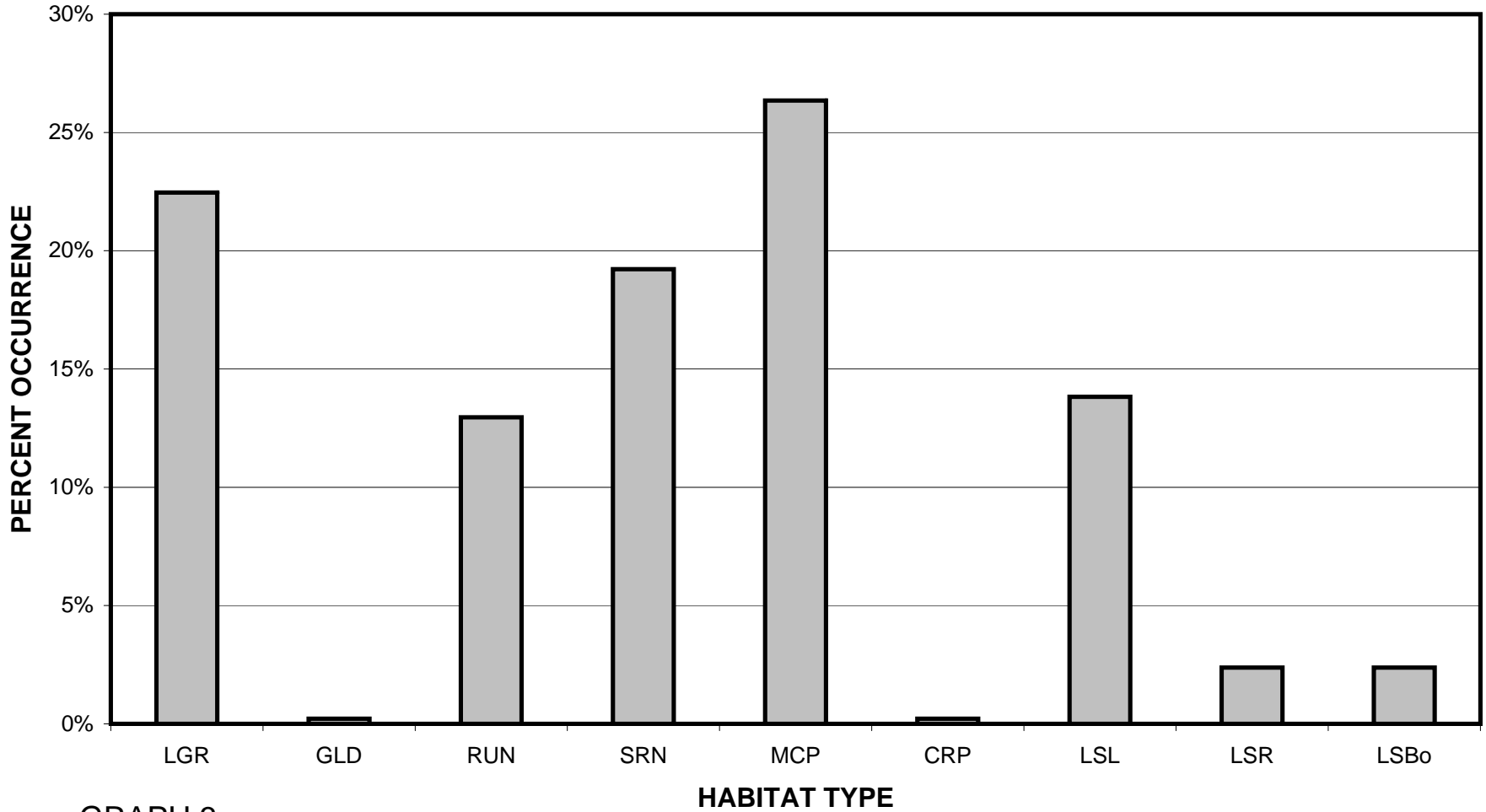
GRAPH 1

BIG SALMON CREEK 2007 HABITAT TYPES BY PERCENT TOTAL LENGTH



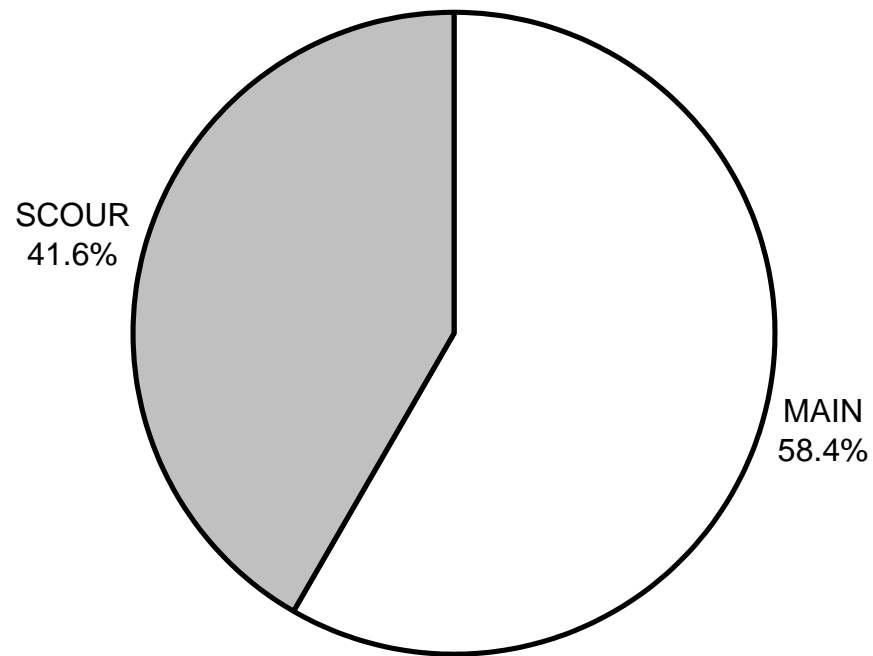
GRAPH 2

BIG SALMON CREEK 2007 HABITAT TYPES BY PERCENT OCCURRENCE



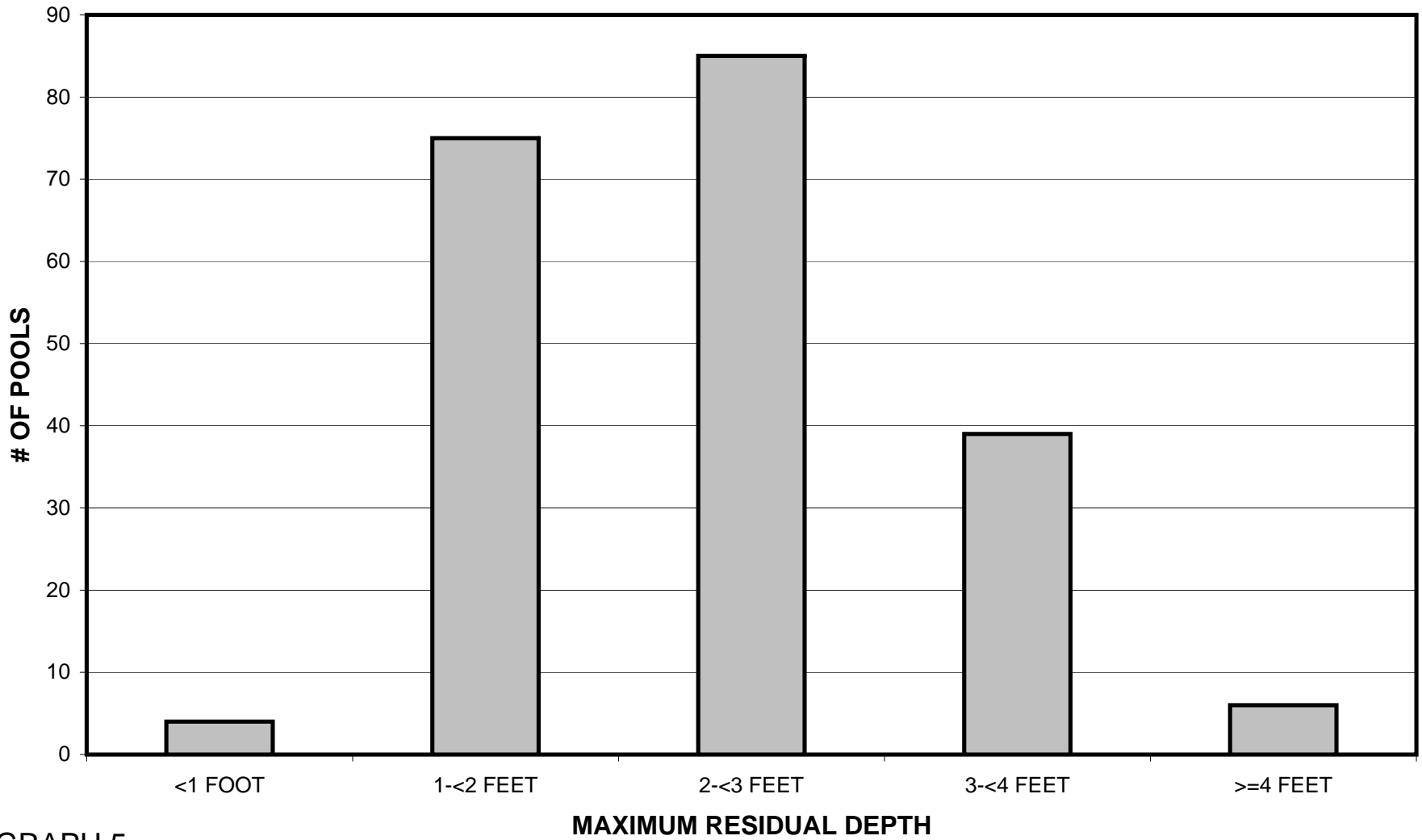
GRAPH 3

**BIG SALMON CREEK 2007
POOL TYPES BY PERCENT OCCURRENCE**



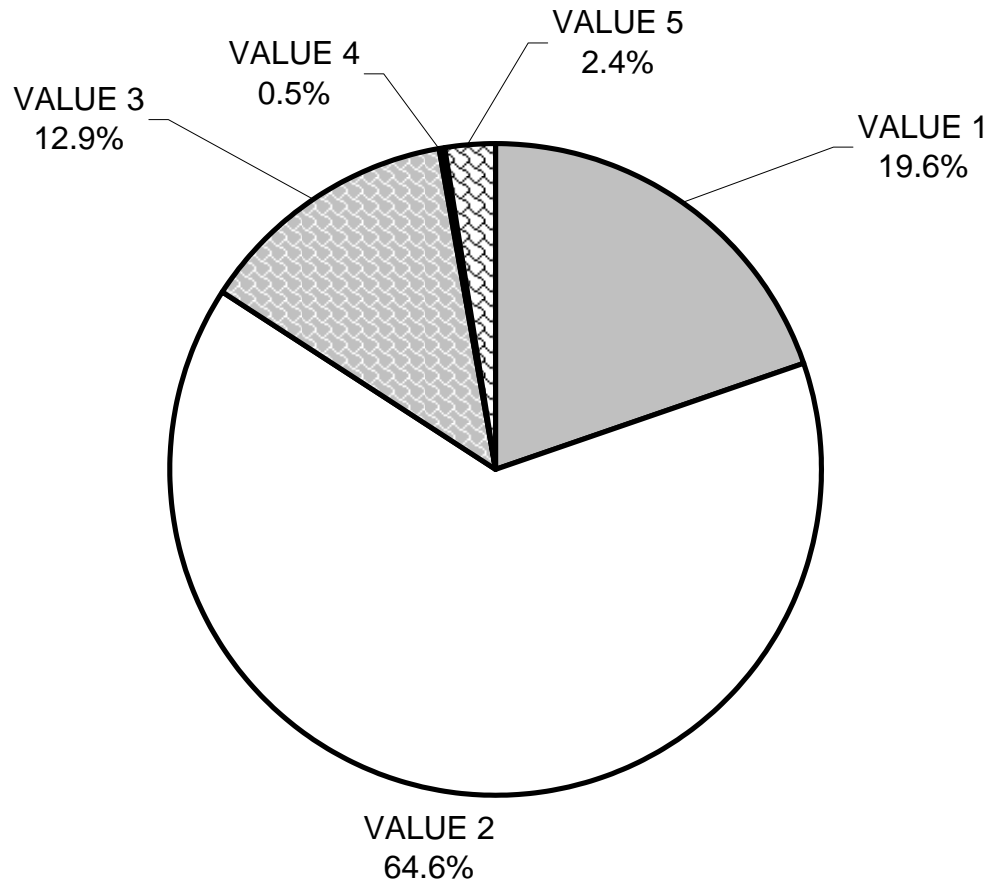
GRAPH 4

BIG SALMON CREEK 2007 MAXIMUM DEPTH IN POOLS



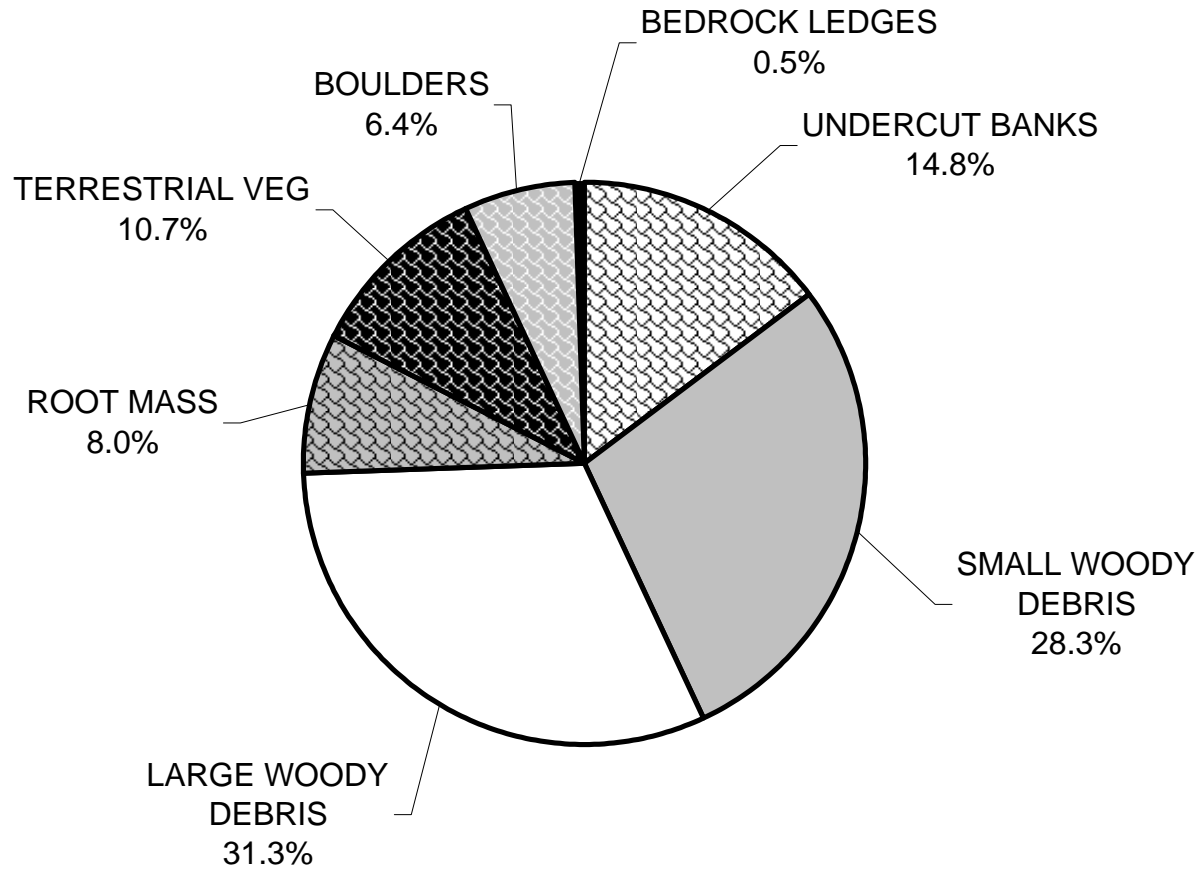
GRAPH 5

BIG SALMON CREEK 2007 PERCENT EMBEDDEDNESS



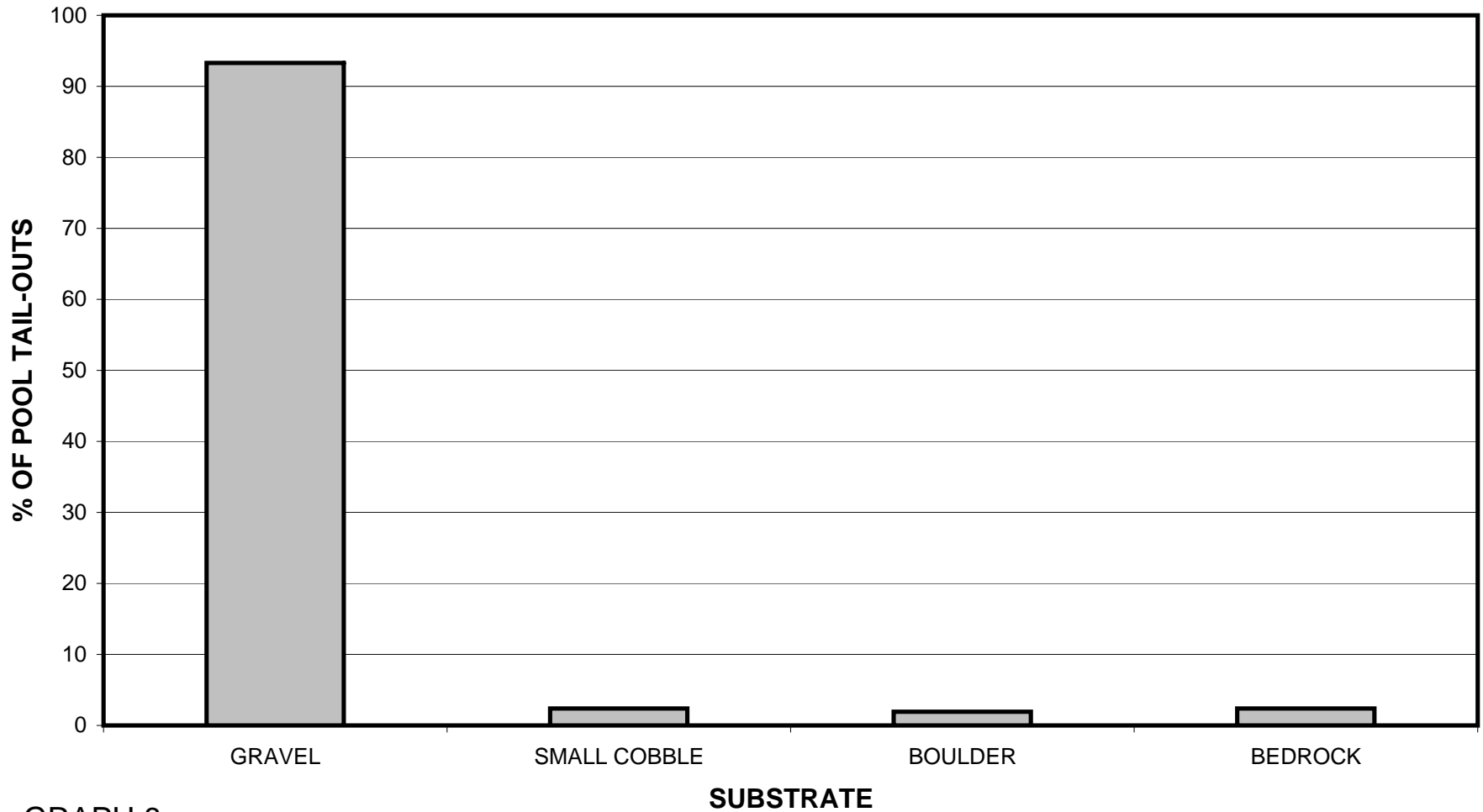
GRAPH 6

BIG SALMON CREEK 2007 MEAN PERCENT COVER TYPES IN POOLS



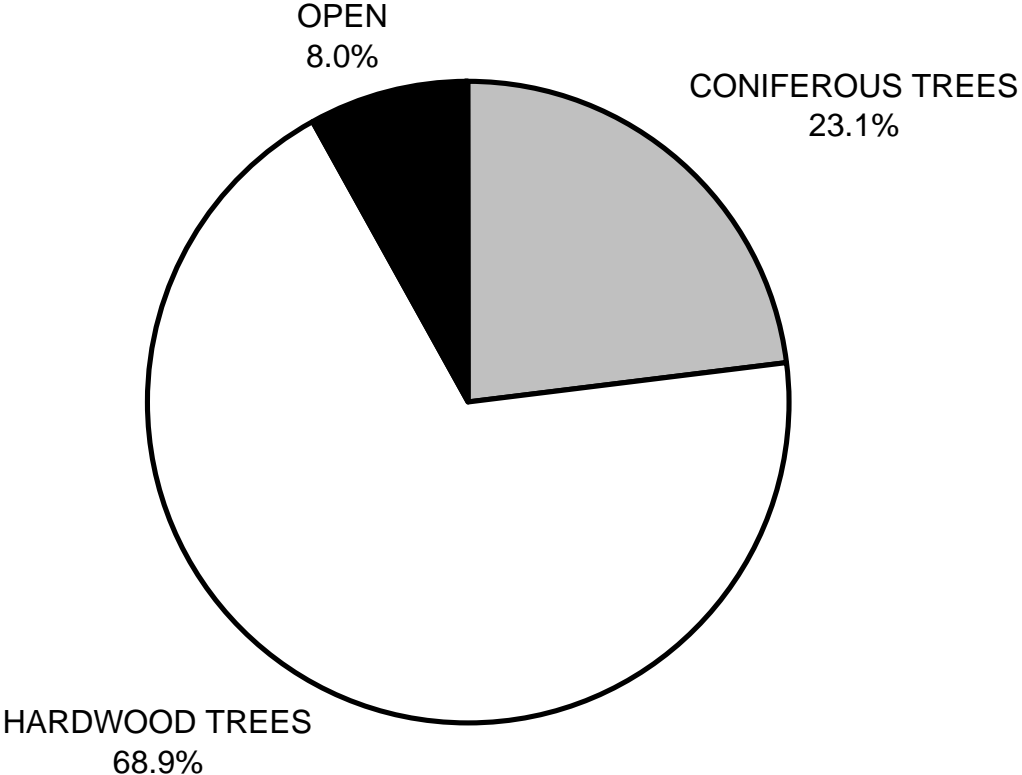
GRAPH 7

BIG SALMON CREEK 2007 SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



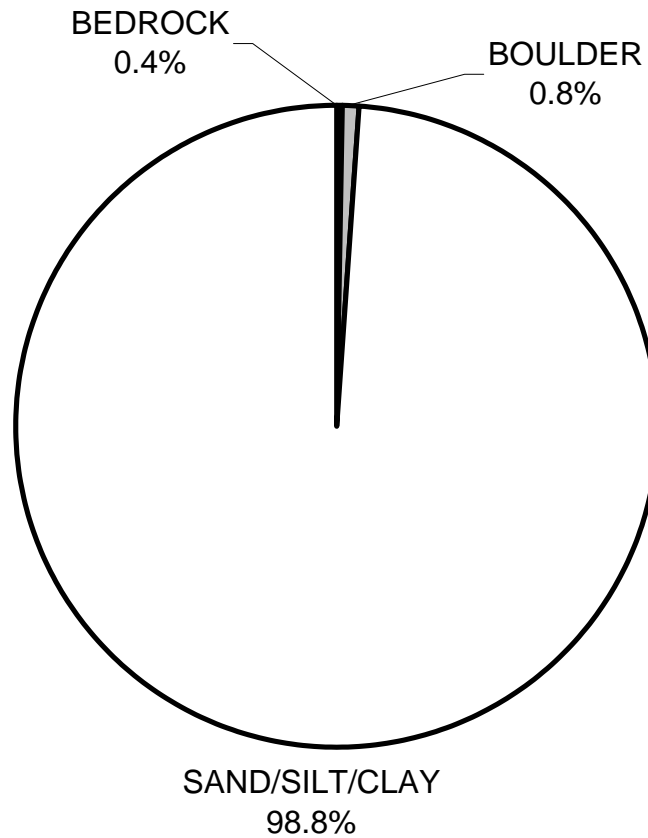
GRAPH 8

**BIG SALMON CREEK 2007
MEAN PERCENT CANOPY**



GRAPH 9

**BIG SALMON CREEK 2007
DOMINANT BANK COMPOSITION IN SURVEY REACH**



GRAPH 10

BIG SALMON CREEK 2007 DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11

