

# STREAM INVENTORY REPORT

## Butte Creek

### INTRODUCTION

A stream inventory was conducted from June 15, 2009 to June 22, 2009 on Butte Creek. The survey began at the confluence with South Fork Eel River and extended upstream 1.8 miles.

The Butte Creek inventory was conducted in two parts: habitat inventory and biological inventory. The objective of the habitat inventory was to document the habitat available to anadromous salmonids in Butte Creek. The objective of the biological inventory was to document the presence and distribution of juvenile salmonid species.

The objective of this report is to document the current habitat conditions and recommend options for the potential enhancement of habitat for 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

Butte Creek is a tributary to South Fork Eel River, tributary to the Eel River which drains into the Pacific Ocean, located in Humboldt County, California (Map 1). Butte Creek's legal description at the confluence with South Fork Eel River is T03S R03E S10. Its location is 40.2219 north latitude and 123.8222 west longitude, LLID number 1238223402219. Butte Creek is a second order stream and has approximately 4.2 miles of blue line stream according to the USGS Miranda 7.5 minute quadrangle. Butte Creek drains a watershed of approximately 4.6 square miles. Elevations range from about 175 feet at the mouth of the creek to 1,250 feet in the headwater areas. Mixed conifer forest dominates the watershed. The watershed is entirely privately owned and is managed for rural subdivision. Vehicle access exists via Highway 101 to the Miranda/Phillipsville exit, park on Maple Hills Road.

### METHODS

The habitat inventory conducted in Butte Creek follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al, 1998). The 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

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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 Butte 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". Butte 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 Butte 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 Butte 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 Butte 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 Butte 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.

## BIOLOGICAL INVENTORY

Biological sampling during the stream inventory is used to determine fish species and their distribution in the stream. Fish presence was observed from the stream banks in Butte Creek. In addition, underwater observations were made at 21 sites using techniques discussed in the *California Salmonid Stream Habitat Restoration Manual*.

## 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

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Graphics are produced from the tables using Microsoft Excel. Graphics developed for Butte 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
- 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 15, 2009 to June 22, 2009, was conducted by M. Groff, J. Coombes and N. Talkington (WSP), and B. DeWaard (DFG). The total length of the stream surveyed was 9,253 feet with an additional 27 feet of side channel. A section of Butte Creek from 936 feet to 2,911 feet was not surveyed. The data included in this report is for the 7,278 feet actually surveyed.

Stream flow was measured near the bottom of the survey reach with a Marsh-McBirney Model 2000 flowmeter at 1.1 cfs on June 22, 2009.

Butte Creek is a B3 channel type for 936 feet of the stream surveyed (Reach 1), the next 1,975 feet of the stream was not surveyed (Reach 2), a B4 channel type for 738 feet of the stream surveyed (Reach 3), and a B3 channel type for 5,631 feet of the stream surveyed (Reach 4). B3 channels are moderately entrenched, moderate gradient, riffle dominated channel with infrequently spaced pools, very stable plan and profile, stable banks and cobble-dominant substrates. 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.

Water temperatures taken during the survey period ranged from 55 to 63 degrees Fahrenheit. Air temperatures ranged from 54 to 74 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 45% pool units, 42% riffle units and 12% flatwater units (Graph 1). Based on total length of Level II habitat types there were 46% riffle units, 37% pool units, and 13% flatwater units (Graph 2).

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Thirteen Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were high gradient riffle units, 35%; mid-channel pool units, 30%; and run units, 9% (Graph 3). Based on percent total length, high gradient riffle units made up 40%, main channel pool units, 23%, and step pool units, 8%.

A total of 104 pools were identified (Table 3). Main channel pools were the most frequently encountered at 82% (Graph 4), and comprised 86% 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. Twenty-nine of the 104 pools (28%) had a residual depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 104 pool tail-outs measured, 42 had a value of 1 (40.4%); 33 had a value of 2 (31.7%); 17 had a value of 3 (16.3%); 4 had a value of 4 (3.8%); 8 had a value of 5 (7.7%) (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 8, flatwater habitat types had a mean shelter rating of 3, and pool habitats had a mean shelter rating of 23 (Table 1). Of the pool types, the scour pools had had the highest mean shelter rating at 29. Main channel pools had a mean shelter rating of 23 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Boulders are the dominant cover type in Butte Creek. Graph 7 describes the pool cover in Butte Creek. Boulders are the dominant pool cover type followed by large woody debris.

Table 6 summarizes the dominant substrate by habitat type. Graph 8 depicts the dominant substrate observed in pool tail-outs. Small cobble was the dominant substrate observed in 45% of the pool tail outs. Gravel was the next most frequently observed dominant substrate type and occurred in 32% of the pool tail-outs.

The mean percent canopy density for the surveyed length of Butte Creek was 81%. Nineteen percent of the canopy was open. Of the canopy present, the mean percentages of hardwood and coniferous trees were 73% and 27%, respectively. Graph 9 describes the mean percent canopy in Butte Creek.

For the stream reach surveyed, the mean percent right bank vegetated was 88%. The mean percent left bank vegetated was 90%. The dominant elements composing the structure of the stream banks consisted of 48% cobble/gravel, 23% sand/silt/clay, 15% bedrock, and 14% boulder (Graph 10). Deciduous trees were the dominant vegetation type observed in 50% of the units surveyed. Additionally, 32% of the units surveyed had coniferous as the dominant

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vegetation type, and 15% had brush as the dominant vegetation type (Graph 11).

### BIOLOGICAL INVENTORY RESULTS

Twenty-one sites were sampled for species composition and distribution in Butte Creek on June 23, 2009. Water temperatures taken during the sampling period of 1045 to 1300 ranged from 57 to 57 degrees Fahrenheit. Air temperatures ranged from 65 to 70 degrees Fahrenheit. The sites were sampled by M. Groff (WSP), and I. Mikus and S. McSmith (DFG).

In Reach 1, which comprised the first 936 feet of stream, two sites were sampled. The reach sites yielded 13 young-of-the-year steelhead/rainbow trout (SH/RT), 12 coho.

Reach 2 consisted of the next 1,975 feet of stream and was unsurveyed.

In Reach 3, nine sites were sampled starting approximately 2,912 from the confluence with the South Fork Eel River and continuing upstream 738 feet. The reach sites yielded 81 young-of-the-year SH/RT, 2 age 1+ SH/RT, 2 coho and 1 Pacific giant salamander.

In Reach 4, ten sites were sampled starting approximately 3,650 from the confluence with South Fork Eel River and continuing upstream 5,604 feet. The reach sites yielded 25 young-of-the-year SH/RT, 5 age 1+ SH/RT, and 2 age 2+ SH/RT.

The following chart displays the information yielded from these sites:

2009 Butte Creek underwater observations.

Date	Survey Site #	Habitat Unit #	Habitat Type	Approx. Dist. from mouth (ft.)	SH/RT			Coho	
					YOY	1+	2+	YOY	1+
Reach 1: B3 Channel Type									
06/23/09	1	003	4.2	68	4	0	0	11	0
06/23/09	2	010	4.2	578	9	0	0	1	0
Reach 2: Not surveyed									
Reach 3: B4 Channel Type									
06/23/09	3	020	5.6	2,942	17	1	0	0	0
06/23/09	4	021	6.5	2,955	9	0	0	0	0
06/23/09	5	022	4.2	2,995	5	0	0	0	0
06/23/09	6	024	4.2	3,052	7	0	0	0	0
06/23/09	7	026	4.2	3,139	4	0	0	2	0
06/23/09	8	030	4.2	3,291	12	0	0	0	0
06/23/09	9	033	4.2	3,357	11	1	0	0	0
06/23/09	10	035	4.3	3,467	8	0	0	0	0

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06/23/09	11	038	4.2	3,649	8	0	0	0	0
Reach 3: B3 Channel Type									
06/23/09	12	043	5.6	3,878	6	1	0	0	0
06/23/09	13	078	4.2	4,979	5	0	0	0	0
06/23/09	14	081	5.6	5,128	2	2	1	0	0
06/23/09	15	109	4.2	5,767	4	0	0	0	0
06/23/09	16	111	5.6	5,816	8	1	0	0	0
06/23/09	17	133	4.2	6,673	0	0	0	0	0
06/23/09	18	135	5.6	6,722	0	1	1	0	0
06/23/09	19	139	4.2	6,807	0	0	0	0	0
06/23/09	20	145	4.4	6,995	0	0	0	0	0
06/23/09	21	149	4.2	7,113	0	0	0	0	0

## DISCUSSION

Butte Creek is a B3 channel type for the first 936 feet of stream surveyed, the next 1,975 feet was not surveyed, a B4 for the next 738 feet, and a B3 channel type for the remaining 5,631 feet. The suitability of B3 and B4 channel types for fish habitat improvement structures is as follows: B3 channel types are excellent for plunge weirs, boulder clusters and bank-placed boulders, single and opposing wing-deflectors, and log cover. B4 channel types are excellent for low-stage plunge weirs, boulder clusters, bank placed boulders, single and opposing wing-deflectors, and log cover.

The water temperatures recorded on the survey days June 15, 2009 to June 22, 2009 ranged from 55 to 63 degrees Fahrenheit. Air temperatures ranged from 54 to 74 degrees Fahrenheit. To make conclusions, temperatures would need to be monitored throughout the warm summer months, and more extensive biological sampling would need to be conducted.

Flatwater habitat types comprised 13% of the total length of this survey, riffles 46%, and pools 37%. Twenty-nine of the 104 (28%) pools had 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 large wood structures that will increase or deepen pool habitat is recommended.

Seventy-five of the 104 pool tail-outs measured had embeddedness ratings of 1 or 2. Twenty-one of the pool tail-outs had embeddedness ratings of 3 or 4. Eight 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.



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Eighty of the 104 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 23. The shelter rating in the flatwater habitats is 3. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by boulders in Butte Creek. Boulders are the dominant cover type in pools followed by large 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 81%. Reach 1 had a canopy density of 73%, Reach 2 was not surveyed, Reach 3 had a canopy density of 79%, and Reach 4 had a canopy density of 82%. In general, revegetation projects are considered when canopy density is less than 80%.

The percentage of right and left bank covered with vegetation was 88% and 90%, 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) Butte 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 boulders. Adding high quality complexity with woody cover in the pools is desirable.
- 4) Inventory and map sources of stream bank erosion and prioritize them according to present and potential sediment yield. Identified sites should then be treated to reduce the amount of fine sediments entering the stream.
- 5) Increase the canopy in Reach 1 and Reach 3 on Butte Creek by planting appropriate native vegetation like willow, alder, redwood, and Douglas fir along the stream where shade canopy is not at acceptable levels. The reaches above this survey section should be inventoried and treated as well, since the water flowing here is affected from upstream. In many cases, planting will need to be coordinated to follow bank stabilization or upslope erosion control projects.

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### 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.):	Habitat Unit #:	Comments:
0	0001.00	The survey begins at the confluence of South Fork Eel River.
58	0003.00	There are concrete culvert wing structures on the left bank.
68	0004.00	The pool tail crest consists of a concrete wall. Bottom of culvert #001 (Maple Hills Road & Highway 101).
338	0005.00	Out of the influence of South Fork Eel River. There is a concrete culvert wing on the left bank.
363	0006.00	The right bank of the creek consists of a concrete wall that bisects the culvert.
936	0019.00	This unit is not surveyed due to lack of access. The length unsurveyed is Reach 2.
2911	0020.00	The channel type changes to B4. Resume access at the bottom of the unit.
2942	0021.00	The pool tail out consists of a single log.
3433	0035.00	Coon Creek enters from the right bank. A habitat survey of Coon Creek was conducted in 2006.
3467	0036.00	Bridge #001 spans the creek.
3649	0039.00	Reach 3 begins and is a B3 channel type.
4762	0070.00	The pool tailout consists of large woody debris (LWD).
4979	0079.00	Log debris accumulation (LDA) #001 contains 38 pieces of LWD and measures 10' high x 38' wide x 80' long with water flowing through and visible gaps. Retained sediment ranges from sand to small cobble and measures 38' wide x 20' long x 6' deep. Fish are upstream of the LDA. The LDA #001 is associated with a right bank slide measuring roughly 100' long x 100' high.

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5203	0085.00	Tributary #002 enters on the left bank. The first 75' of stream is dry. The temperature downstream of the tributary is 58 degrees Fahrenheit, the temperature of the tributary is 60 degrees Fahrenheit, and the temperature upstream of the confluence is 58 degrees Fahrenheit. The slope of the tributary is 30% and fish are not observed in the 300 feet surveyed.
5258	0088.00	There is erosion on the left bank that is approximately 25' long x 80' high.
5293	0090.00	LDA #002 contains 14 pieces of LWD and measures 8.5' high x 27' wide x 11' long with water flowing through and visible gaps. There is no retained sediment.
5750	0109.00	There is erosion on the right bank that is approximately 50' long x 30' high.
5938	0115.00	LDA #003 contains 10 pieces of LWD and measures 6' high x 20' wide x 15' long with water flowing through visible gaps. Retained sediment ranges from sand to gravel and measures 15' wide x 10' long x 2' deep. Fish are upstream of the LDA.
6081	0117.00	LDA #004 contains 13 pieces of LWD and measures 4' high x 31' wide x 10' long with water flowing visible gaps. Retained sediment ranges from sand to cobble and measures 15' wide x 10' long x 2' deep. Fish are upstream of the LDA.
6117	0118.00	There is a 50' long x 40' high left bank failure that is adding sediment ranging in size from fines to cobble.
6255	0124.00	There is an LDA mid-unit that is approximately 2' high x 50' long x 20' wide.
6703	0135.00	The pool is formed by plunge over a 5' diameter log spanning the channel.
6722	0136.00	LDA #005 contains 12 pieces of LWD and measures 6.5' high x 20' wide x 52' long with water flowing through though there are no visible gaps. Retained sediment ranges from sand to cobble and measures 20' wide x 10' long x 3' deep.
6752	0137.00	This pool has a plunge height of 2.1' and has LWD for tail-out.
7047	0147.00	LDA #006 contains 3 pieces of LWD and measures 6' high x 18' wide x 10' long with water flowing through though there are no visible gaps. Retained sediment appears to be primarily gravel and measures 18' wide

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x 10' long x 3' deep. Fish are upstream of the LDA. The LDA is associated with trees deposited by a landslide on the right bank that measures 50' long x 100' high.

7202	0152.00	There is a left erosion that is approximately 50' high x 50' long.
7377	0160.00	LDA #007 contains 7 pieces of LWD and measures 7.5' high x 29' wide x 20' long with water flowing through though there no visible gaps. Retained sediment ranges from sand to cobble and measures 29' wide x 10' long x 5' deep.
7488	0166.00	Log debris is accumulating on left bank.
7826	0178.00	LDA #008 contains 4 pieces of LWD and measures 5.5' high x 25' wide x 31' long with water flowing through and visible gaps. Retained sediment ranges from sand to cobble and measures 20' wide x 15' long x 3' deep. Fish are upstream of the LDA.
7883	0181.00	LDA #009 contains 9 pieces of LWD and measures 5' high x 12' wide x 30' long with water flowing through visible gaps. Retained sediment ranges from sand to cobble and measures 20' wide x 15' long x 3' deep.
8118	0191.00	The pool tail out is LWD.
8481	0202.00	There is a left bank seep.
8617	0205.00	There is erosion on the left bank that is approximately 20' long x 60' high.
8793	0213.00	Tributary #003 enters on the right bank. The flow is less than 0.1 cfs, and it contributes to less than 1% of the downstream flow. The temperature downstream of the tributary is 55 degrees Fahrenheit, the temperature of the tributary is 57 degrees Fahrenheit, and the temperature upstream of the confluence is 54 degrees Fahrenheit. The slope of the tributary is 25% and fish are not observed in the 200 feet explored.
8891	0219.00	Tributary #004 enters on the left bank. There was no flow in the tributary for the 300' explored. The temperature downstream of the tributary is 54 degrees Fahrenheit and the temperature upstream of the confluence is 57 degrees Fahrenheit. The slope of the tributary is 20% and fish are not observed.
9253	0229.00	End of survey due to a 12' bedrock waterfall.

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### 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: Butte Creek

LLID: 1238223402219 Drainage: Eel River - South Fork

Survey Dates: 6/15/2009 to 6/22/2009

Confluence Location: Quad: MIRANDA

Legal Description: T03SR03ES10

Latitude: 40:13:19.0N

Longitude: 123:49:20.0

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
1	0	CULVERT	0.4	270	270	3.7									
28	9	FLATWATER	12.2	35	982	13.4	9.1	0.5	0.9	412	11527	184	5166		3
1	0	NOSURVEY	0.4	1975	1975										
104	104	POOL	45.2	26	2699	36.9	11.6	0.8	1.6	296	30774	383	39831	280	23
96	19	RIFFLE	41.7	35	3354	45.9	11.6	0.4	0.8	375	36031	169	16251		8
<b>Total Units</b>	<b>Total Units Fully Measured</b>				<b>Total Length (ft.)</b>					<b>Total Area (sq.ft.)</b>			<b>Total Volume (cu.ft.)</b>		
230	132				9280					78332			61248		

**Table 2 - Summary of Habitat Types and Measured Parameters**

Stream Name: Butte Creek

LLID: 1238223402219

Drainage: Eel River - South Fork

Survey Dates: 6/15/2009 to 6/22/2009

Confluence Location: Quad: MIRANDA

Legal Description: T03SR03ES10

Latitude: 40:13:19.0N

Longitude: 123:49:20.0W

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 (%)
13	5	LGR	5.7	28	360	4.9	16	0.4	0.9	591	7679	259	3367		12	75
81	12	HGR	35.2	36	2954	40.4	10	0.4	1.2	322	26115	144	11684		2	72
1	1	CAS	0.4	19	19	0.3	7	0.8	1.2	120	120	96	96		60	100
1	1	BRS	0.4	21	21	0.3	10	0.5	1.1	189	189	95	95		5	94
20	5	RUN	8.7	28	556	7.6	9	0.5	1.2	371	7412	163	3264		1	83
8	4	SRN	3.5	53	426	5.8	9	0.5	1.1	463	3704	211	1689		5	74
70	70	MCP	30.4	24	1695	23.2	11	0.7	3.1	260	18186	290	20272	206	22	80
1	1	CCP	0.4	34	34	0.5	15	1.7	2.5	510	510	1020	1020	867	0	86
14	14	STP	6.1	41	580	7.9	12	0.7	3.1	433	6060	559	7822	332	30	85
1	1	LSL	0.4	19	19	0.3	8	0.4	0.9	137	137	82	82	55	5	97
1	1	LSR	0.4	30	30	0.4	10	0.3	0.8	300	300	180	180	90	20	89
15	15	PLP	6.5	21	315	4.3	15	1.3	5.3	360	5405	685	10277	591	31	92
2	2	DPL	0.9	13	26	0.4	7	0.7	1.9	88	177	89	179	60	15	74
1	0	CUL	0.4	270	270	3.7										
1	0	NS	0.4	1975	1975	0.0										

Total Units  
230

Total Units Fully Measured  
132

Total Length (ft.)  
9280

Total Area (sq.ft.)  
75993

Total Volume (cu.ft.)  
60026



**Table 3 - Summary of Pool Types**

Stream Name: Butte Creek

LLID: 1238223402219

Drainage: Eel River - South Fork

Survey Dates: 6/15/2009 to 6/22/2009

Confluence Location: Quad: MIRANDA

Legal Description: T03SR03ES10

Latitude: 40:13:19.0N

Longitude: 123:49:20.0W

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
85	85	MAIN	82	27	2309	86	11.2	0.7	291	24756	235	19730	23
17	17	SCOUR	16	21	364	13	14.6	1.2	344	5842	530	9008	29
2	2	BACKWATER	2	13	26	1	7.0	0.7	88	177	60	120	15

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
104	104	2699	30774	28859

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

Stream Name: Butte Creek

LLID: 1238223402219

Drainage: Eel River - South Fork

Survey Dates: 6/15/2009 to 6/22/2009

Confluence Location: Quad: MIRANDA

Legal Description: T03SR03ES10

Latitude: 40:13:19.0N

Longitude: 123:49:20.0W

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
70	MCP	67	19	27	35	50	15	21	1	1	0	0
1	CCP	1	0	0	0	0	1	100	0	0	0	0
14	STP	13	3	21	8	57	1	7	2	14	0	0
1	LSL	1	1	100	0	0	0	0	0	0	0	0
1	LSR	1	1	100	0	0	0	0	0	0	0	0
15	PLP	14	1	7	5	33	3	20	5	33	1	7
2	DPL	2	1	50	1	50	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
104	26	25	49	47	20	19	8	8	1	1

Mean Maximum Residual Pool Depth (ft.): 1.6

**Table 5 - Summary of Mean Percent Cover By Habitat Type**

Stream Name: Butte Creek

LLID: 1238223402219

Drainage: Eel River - South Fork

Survey Dates: 6/15/2009 to 6/22/2009

Dry Units: 0

Confluence Location: Quad: MIRANDA

Legal Description: T03SR03ES10

Latitude: 40:13:19.0N

Longitude: 123:49:20.0W

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
13	5	LGR	23	0	0	10	50	0	0	18	0
81	12	HGR	0	5	10	0	0	0	0	85	0
1	1	CAS	0	0	0	0	0	0	50	50	0
1	1	BRS	0	0	0	0	0	0	0	100	0
96	19	TOTAL RIFFLE	6	2	4	3	14	0	7	63	0
20	5	RUN	100	0	0	0	0	0	0	0	0
8	4	SRN	0	2	10	0	0	0	0	88	0
28	9	TOTAL FLAT	25	1	7	0	0	0	0	66	0
70	70	MCP	4	18	26	5	0	0	7	35	6
1	1	CCP	0	0	0	0	0	0	0	0	0
14	14	STP	8	17	17	4	0	0	10	44	1
1	1	LSL	0	30	30	10	0	0	0	30	0
1	1	LSR	10	10	0	80	0	0	0	0	0
15	15	PLP	6	10	38	7	4	0	15	17	4
2	2	DPL	0	15	50	0	0	0	0	35	0
104	104	TOTAL POOL	5	17	27	6	1	0	8	33	4
1	0	CUL									
1	0	NS									
230	132	TOTAL	6	15	24	5	2	0	8	36	4

**Table 6 - Summary of Dominant Substrates By Habitat Type**

Stream Name: Butte Creek

LLID: 1238223402219

Drainage: Eel River - South Fork

Survey Dates: 6/15/2009 to 6/22/2009

Dry Units: 0

Confluence Location: Quad: MIRANDA

Legal Description: T03SR03ES10

Latitude: 40:13:19.0N

Longitude: 123:49:20.0W

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
13	5	LGR	0	0	100	0	0	0	0
81	12	HGR	0	0	25	25	33	8	8
1	1	CAS	0	0	0	0	0	100	0
1	1	BRS	0	0	0	0	0	0	100
20	5	RUN	0	0	80	20	0	0	0
8	4	SRN	0	0	50	25	0	25	0
70	70	MCP	0	1	86	4	3	4	1
1	1	CCP	0	0	100	0	0	0	0
14	14	STP	0	0	71	0	7	21	0
1	1	LSL	0	0	100	0	0	0	0
1	1	LSR	0	0	100	0	0	0	0
15	15	PLP	0	0	73	0	0	20	7
2	2	DPL	0	0	0	0	50	50	0

**Table 7 - Summary of Mean Percent Canopy for Entire Stream**

Stream Name: Butte Creek

LLID: 1238223402219

Drainage: Eel River - South Fork

Survey Dates: 6/15/2009 to 6/22/2009

Confluence Location: Quad: MIRANDA

Legal Description: T03SR03ES10

Latitude: 40:13:19.0N

Longitude: 123:49:20.0W

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Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
81	27	73	0	88	90

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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: Butte Creek LLID: 1238223402219 Drainage: Eel River - South Fork  
 Survey Dates: 6/15/2009 to 6/22/2009 Survey Length (ft.): 9280 Main Channel (ft.): 9253 Side Channel (ft.): 27  
 Confluence Location: Quad: MIRANDA Legal Description: T03SR03ES10 Latitude: 40:13:19.0N Longitude: 123:49:20.0W

**Summary of Fish Habitat Elements By Stream Reach**

**STREAM REACH: 1**

Channel Type: B3	Canopy Density (%): 73.0	Pools by Stream Length (%): 13.9
Reach Length (ft.): 936	Coniferous Component (%): 35.6	Pool Frequency (%): 22.2
Riffle/Flatwater Mean Width (ft.): 14.8	Hardwood Component (%): 64.4	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Coniferous Trees	< 2 Feet Deep: 50
Range (ft.): 16 to 52	Vegetative Cover (%): 89.0	2 to 2.9 Feet Deep: 50
Mean (ft.): 36	Dominant Shelter: Undercut Banks	3 to 3.9 Feet Deep: 0
Std. Dev.: 18	Dominant Bank Substrate Type: Cobble/Gravel	>= 4 Feet Deep: 0
Base Flow (cfs.): 1.1	Occurrence of LWD (%): 6	Mean Max Residual Pool Depth (ft.): 1.8
Water (F): 59 - 59 Air (F): 62 - 64	LWD per 100 ft.:	Mean Pool Shelter Rating: 29
Dry Channel (ft): 0	Riffles: 1	
	Pools: 5	
	Flat: 2	
Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 25 Sm Cobble: 75 Lg Cobble: 0 Boulder: 0 Bedrock: 0		
Embeddedness Values (%): 1. 50.0 2. 25.0 3. 25.0 4. 0.0 5. 0.0		

**STREAM REACH: 2**

Channel Type: NA	Canopy Density (%):	Pools by Stream Length (%): 0.0
Reach Length (ft.): 1975	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.): 16 to 16	Vegetative Cover (%): 0.0	2 to 2.9 Feet Deep:
Mean (ft.): 16	Dominant Shelter:	3 to 3.9 Feet Deep:
Std. Dev.: 0	Dominant Bank Substrate Type:	>= 4 Feet Deep:
Base Flow (cfs.): 1.1	Occurrence of LWD (%):	Mean Max Residual Pool Depth (ft.):
Water (F): 59 - 59 Air (F): 64 - 64	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		

### Summary of Fish Habitat Elements By Stream Reach

#### STREAM REACH: 3

Channel Type: B4	Canopy Density (%): 78.6	Pools by Stream Length (%): 37.1
Reach Length (ft.): 738	Coniferous Component (%): 18.5	Pool Frequency (%): 47.4
Riffle/Flatwater Mean Width (ft.): 13.5	Hardwood Component (%): 81.5	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Hardwood Trees	< 2 Feet Deep: 67
Range (ft.): 16 to 30	Vegetative Cover (%): 88.8	2 to 2.9 Feet Deep: 33
Mean (ft.): 29	Dominant Shelter: Large Woody Debris	3 to 3.9 Feet Deep: 0
Std. Dev.: 3	Dominant Bank Substrate Type: Cobble/Gravel	>= 4 Feet Deep: 0
Base Flow (cfs.): 1.1	Occurrence of LWD (%): 37	Mean Max Residual Pool Depth (ft.): 1.6
Water (F): 59 - 62    Air (F): 60 - 68	LWD per 100 ft.:	Mean Pool Shelter Rating: 23
Dry Channel (ft): 0	Riffles: 1	
	Pools: 8	
	Flat: 3	
Pool Tail Substrate (%): Silt/Clay: 0    Sand: 0    Gravel: 22    Sm Cobble: 67    Lg Cobble: 0    Boulder: 0    Bedrock: 11		
Embeddedness Values (%): 1. 66.7    2. 22.2    3. 0.0    4. 0.0    5. 11.1		

#### STREAM REACH: 4

Channel Type: B3	Canopy Density (%): 82.3	Pools by Stream Length (%): 40.8
Reach Length (ft.): 5604	Coniferous Component (%): 26.9	Pool Frequency (%): 47.4
Riffle/Flatwater Mean Width (ft.): 9.5	Hardwood Component (%): 73.1	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Hardwood Trees	< 2 Feet Deep: 74
Range (ft.): 16 to 52	Vegetative Cover (%): 88.7	2 to 2.9 Feet Deep: 16
Mean (ft.): 24	Dominant Shelter: Boulders	3 to 3.9 Feet Deep: 9
Std. Dev.: 8	Dominant Bank Substrate Type: Cobble/Gravel	>= 4 Feet Deep: 1
Base Flow (cfs.): 1.1	Occurrence of LWD (%): 18	Mean Max Residual Pool Depth (ft.): 1.6
Water (F): 55 - 63    Air (F): 54 - 74	LWD per 100 ft.:	Mean Pool Shelter Rating: 23
Dry Channel (ft): 0	Riffles: 5	
	Pools: 10	
	Flat: 3	
Pool Tail Substrate (%): Silt/Clay: 0    Sand: 0    Gravel: 33    Sm Cobble: 42    Lg Cobble: 9    Boulder: 9    Bedrock: 8		
Embeddedness Values (%): 1. 37.4    2. 33.0    3. 17.6    4. 4.4    5. 7.7		

**Table 9 - Mean Percentage of Dominant Substrate and Vegetation**

Stream Name: Butte Creek

LLID: 1238223402219

Drainage: Eel River - South Fork

Survey Dates: 6/15/2009 to 6/22/2009

Confluence Location: Quad: MIRANDA

Legal Description: T03SR03ES10

Latitude: 40:13:19.0N

Longitude: 123:49:20.0W

**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	17	22	14.8
Boulder	24	14	14.4
Cobble / Gravel	62	65	48.1
Sand / Silt / Clay	29	31	22.7

**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	2	1	1.1
Brush	19	20	14.8
Hardwood Trees	64	69	50.4
Coniferous Trees	45	39	31.8
No Vegetation	2	3	1.9

**Total Stream Cobble Embeddedness Values:** 2



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

StreamName: Butte Creek

LLID: 1238223402219

Drainage: Eel River - South Fork

Survey Dates: 6/15/2009 to 6/22/2009

Confluence Location: Quad: MIRANDA

Legal Description: T03SR03ES10

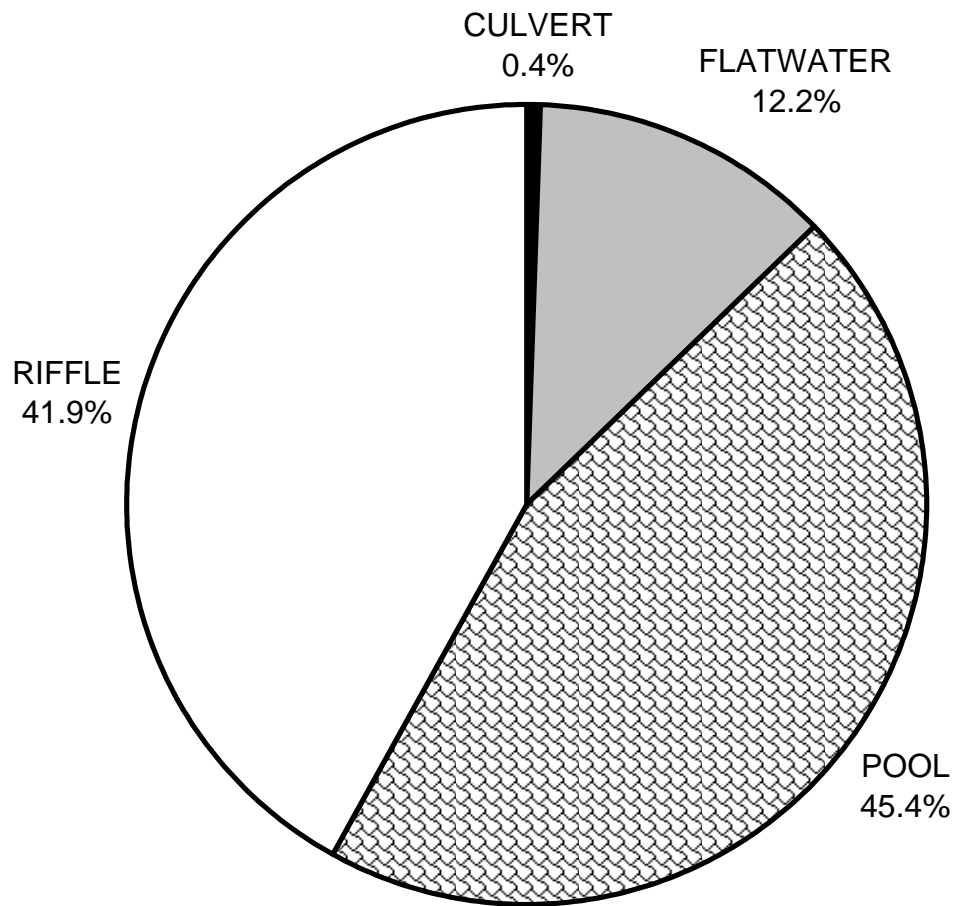
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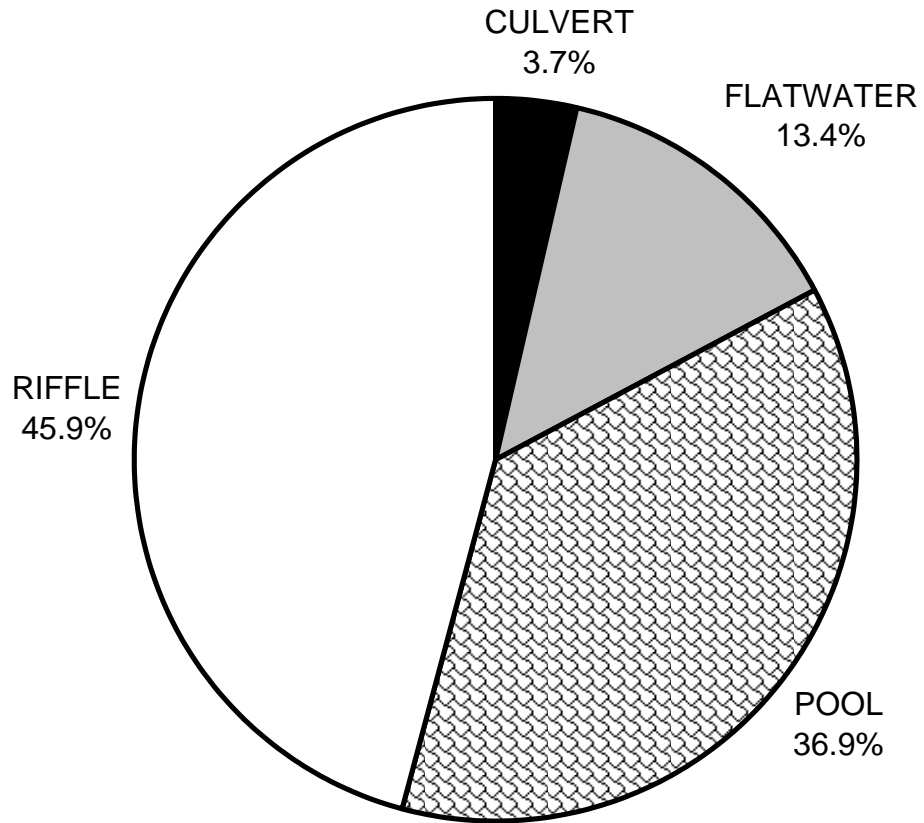
	<b>Riffles</b>	<b>Flatwater</b>	<b>Pools</b>
UNDERCUT BANKS (%)	6	25	5
SMALL WOODY DEBRIS (%)	2	1	17
LARGE WOODY DEBRIS (%)	4	7	27
ROOT MASS (%)	3	0	6
TERRESTRIAL VEGETATION (%)	14	0	1
AQUATIC VEGETATION (%)	0	0	0
WHITEWATER (%)	7	0	8
BOULDERS (%)	63	66	33
BEDROCK LEDGES (%)	0	0	4

# BUTTE CREEK 2009 HABITAT TYPES BY PERCENT OCCURRENCE



GRAPH 1

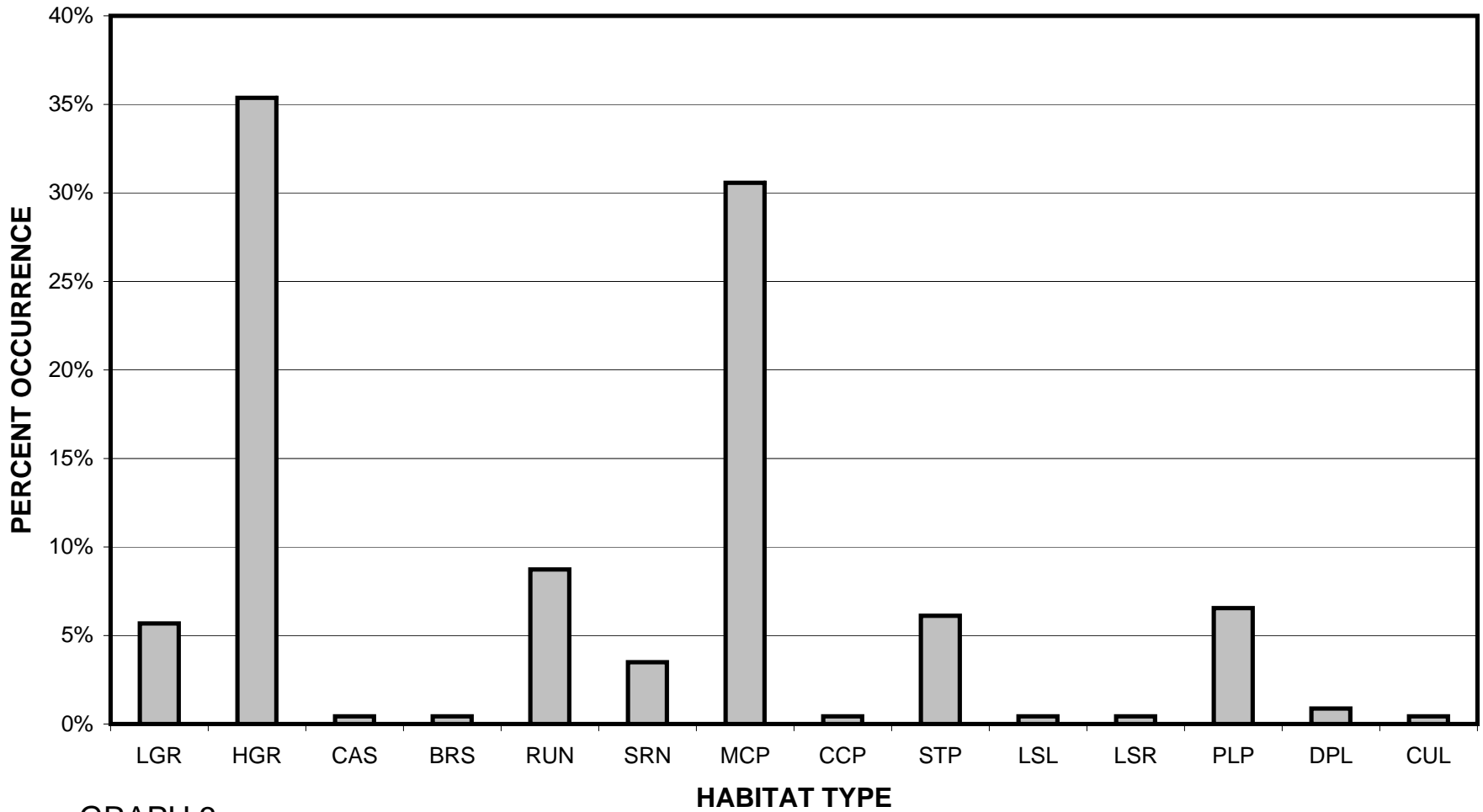
# BUTTE CREEK 2009 HABITAT TYPES BY PERCENT TOTAL LENGTH



GRAPH 2

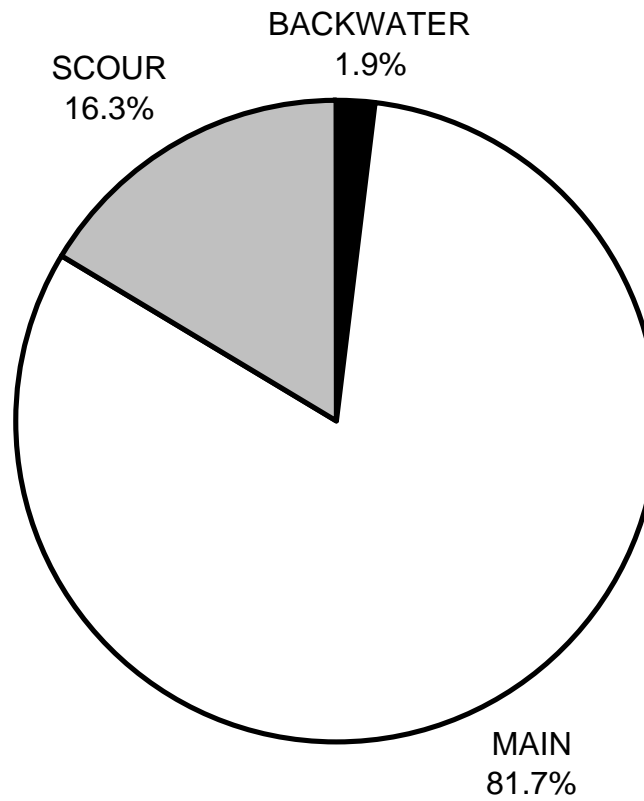
# BUTTE CREEK 2009

## HABITAT TYPES BY PERCENT OCCURRENCE



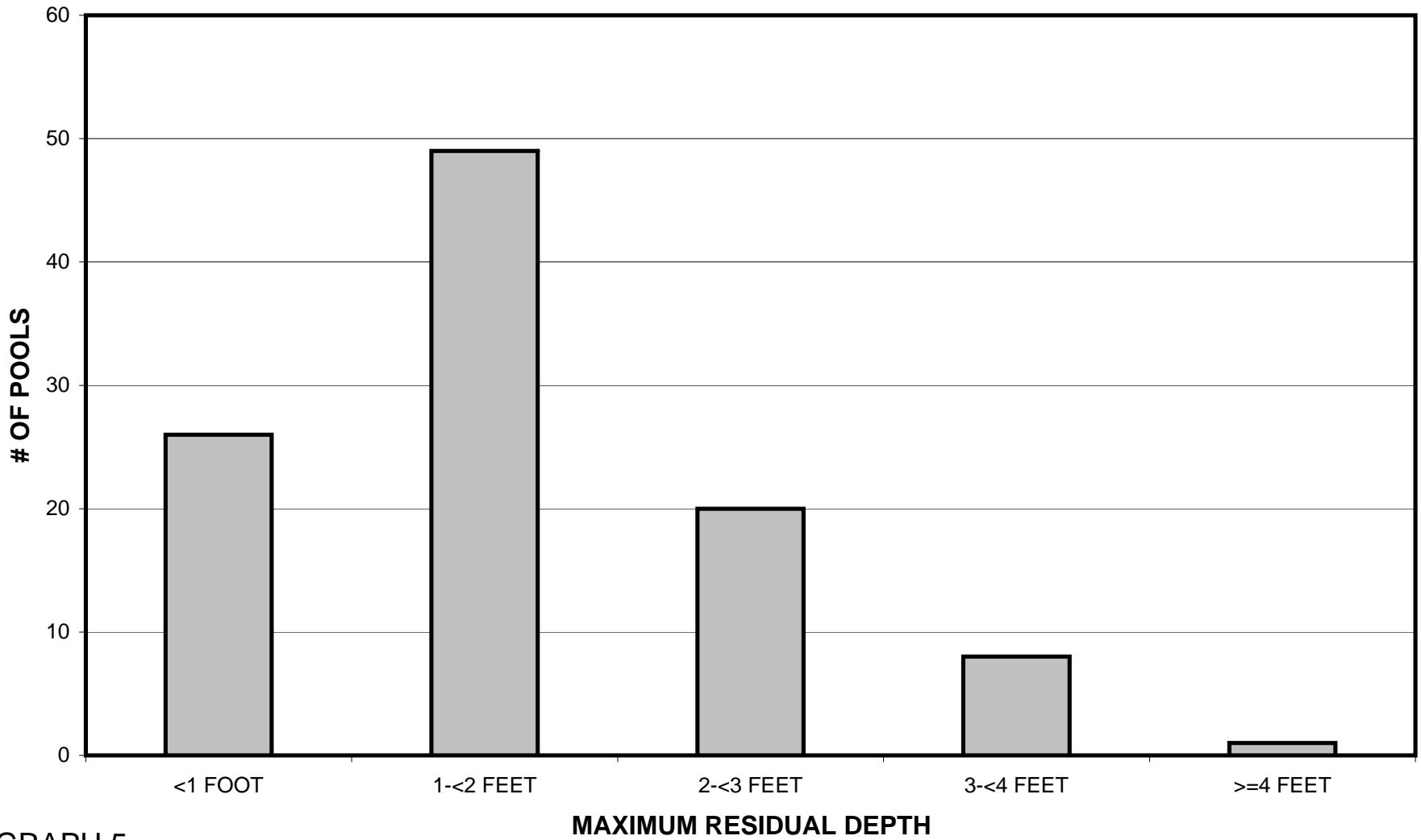
GRAPH 3

# BUTTE CREEK 2009 POOL TYPES BY PERCENT OCCURRENCE



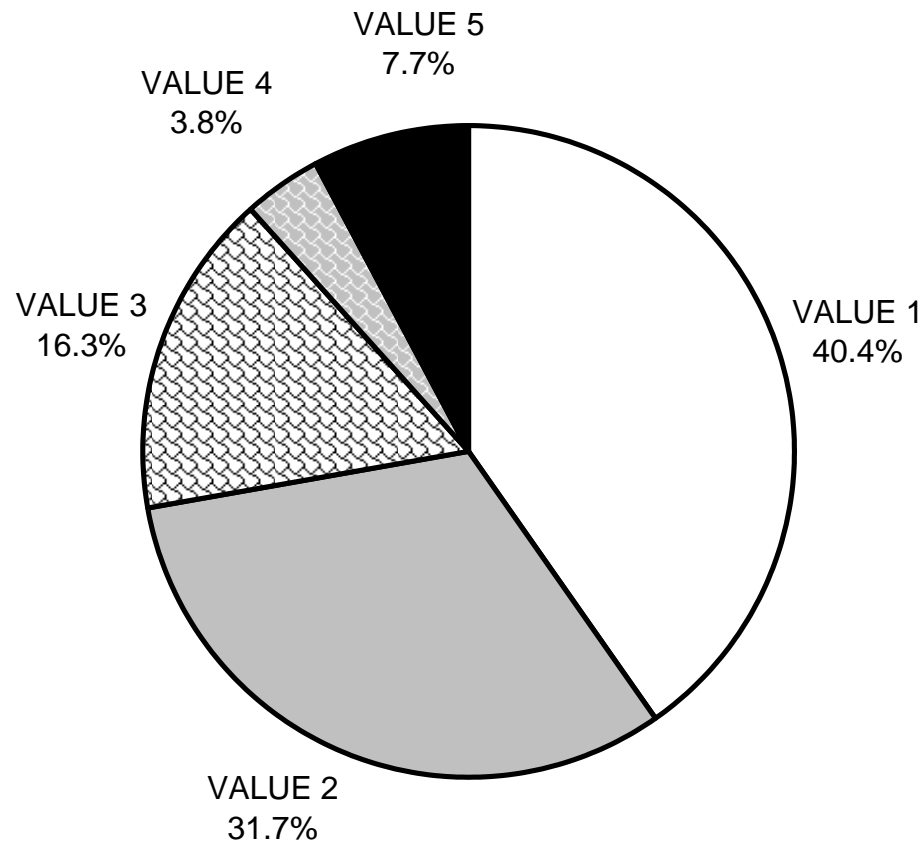
GRAPH 4

# BUTTE CREEK 2009 MAXIMUM DEPTH IN POOLS



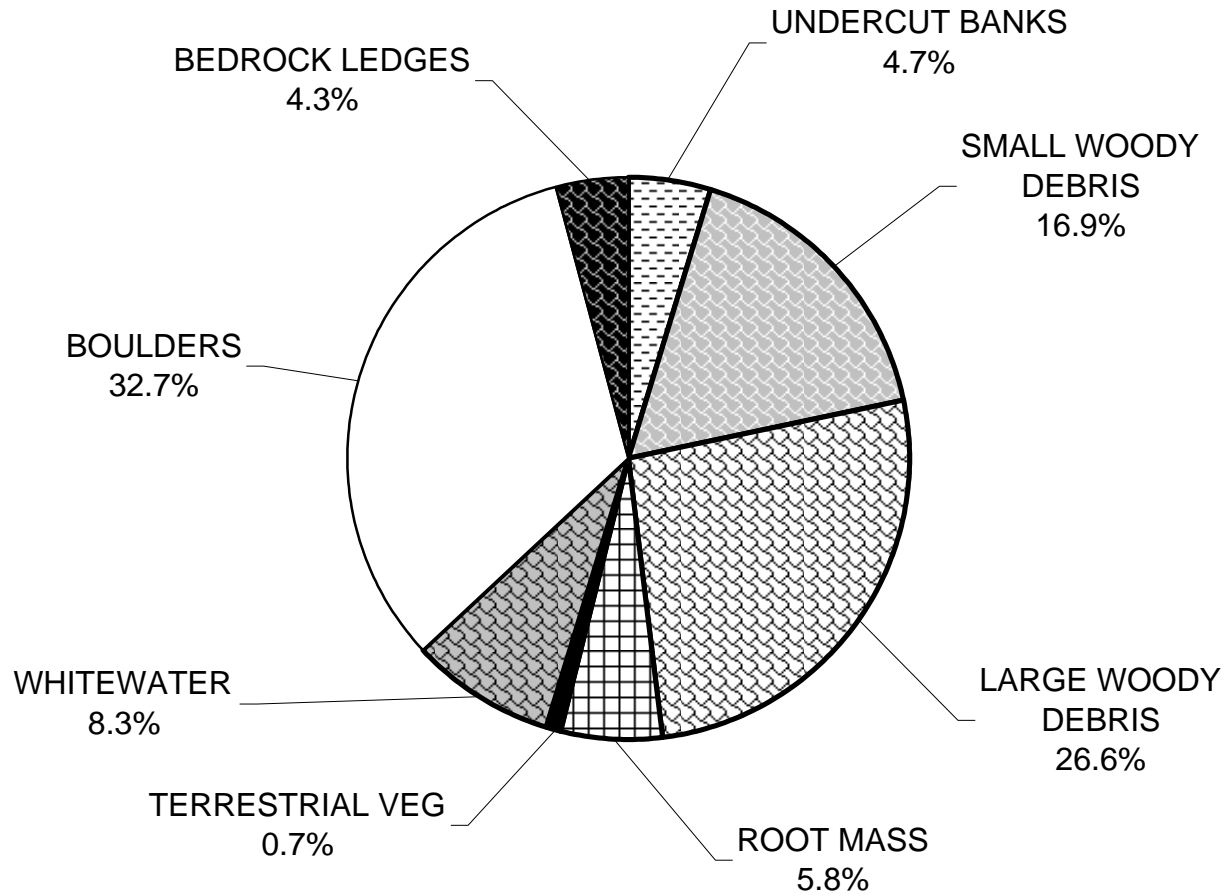
GRAPH 5

# BUTTE CREEK 2009 PERCENT EMBEDDEDNESS



GRAPH 6

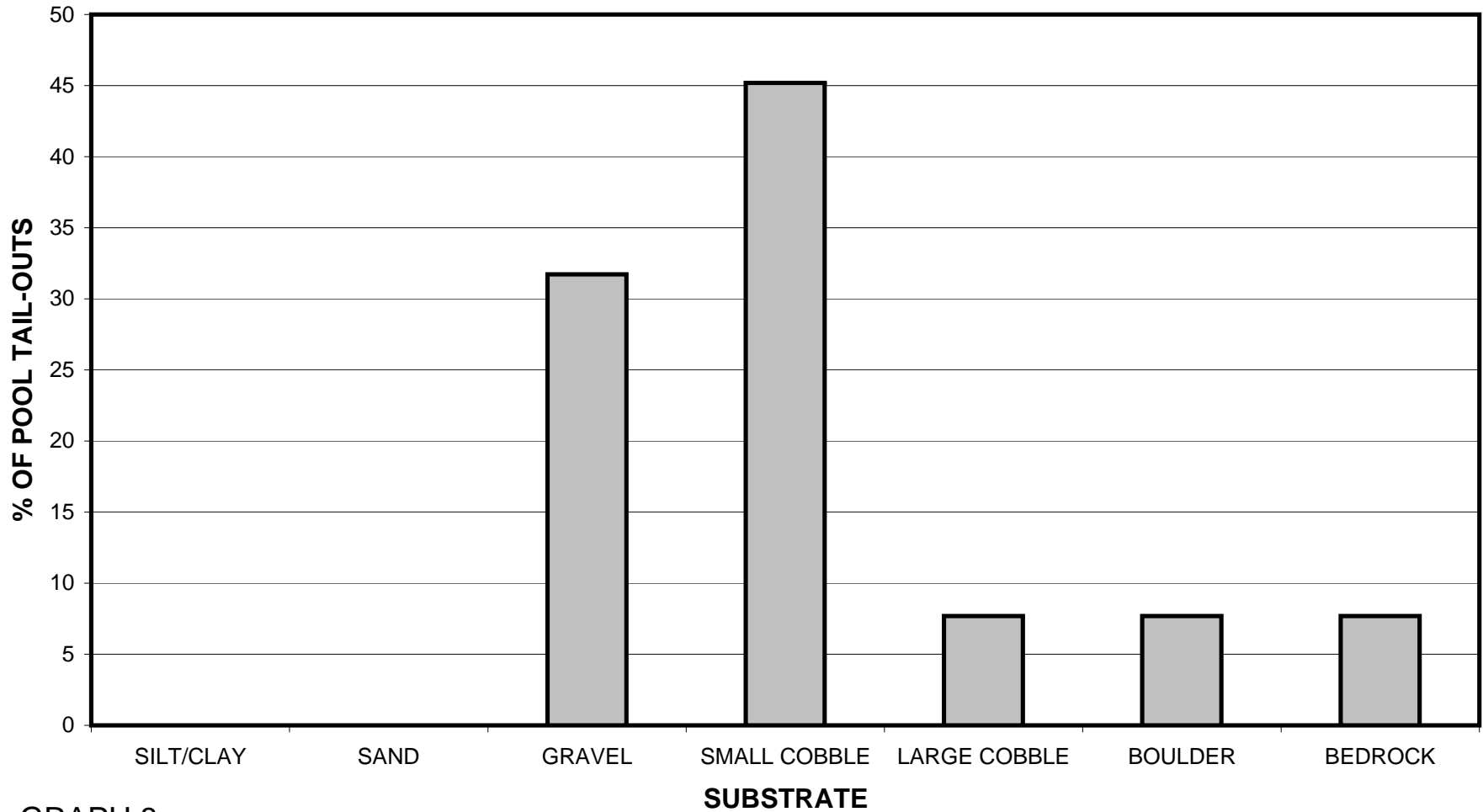
# BUTTE CREEK 2009 MEAN PERCENT COVER TYPES IN POOLS



GRAPH 7

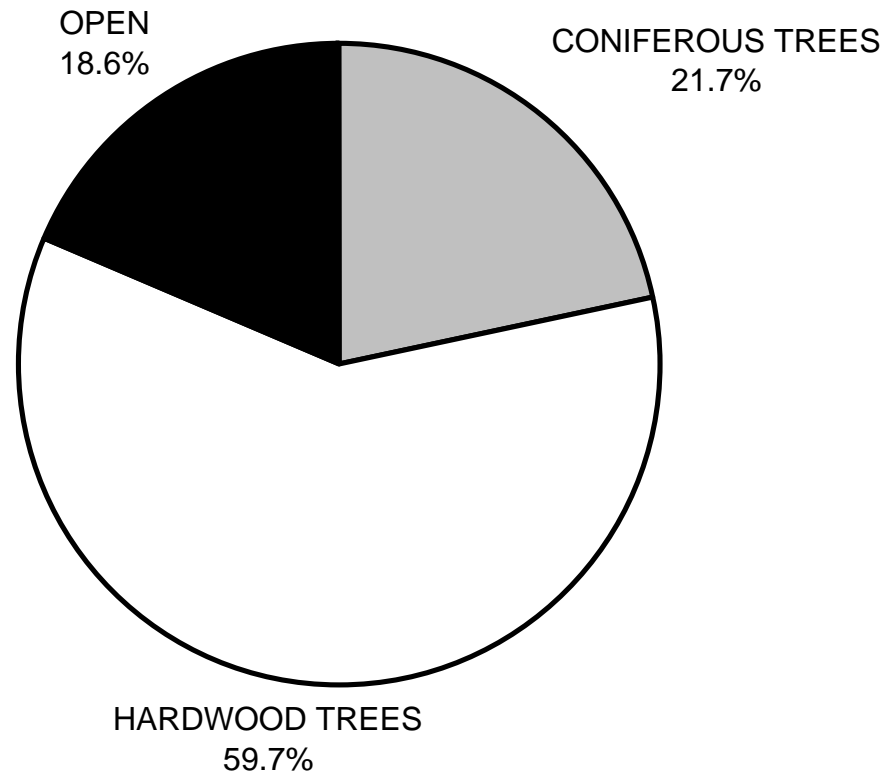


# BUTTE CREEK 2009 SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



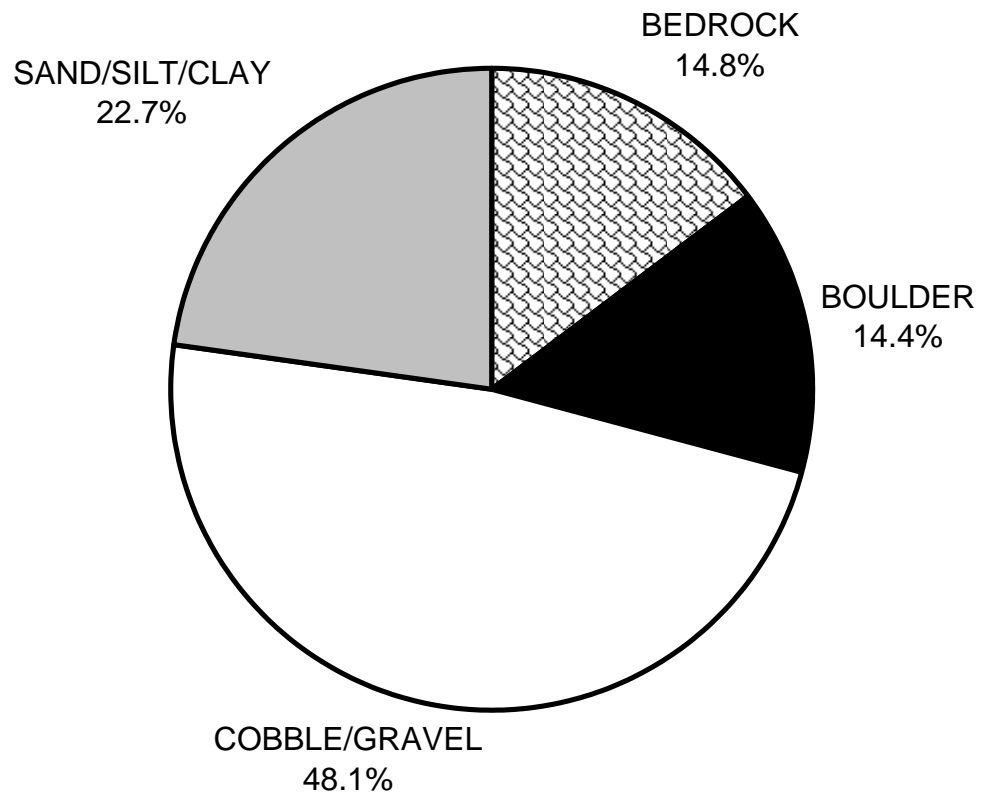
GRAPH 8

# BUTTE CREEK 2009 MEAN PERCENT CANOPY



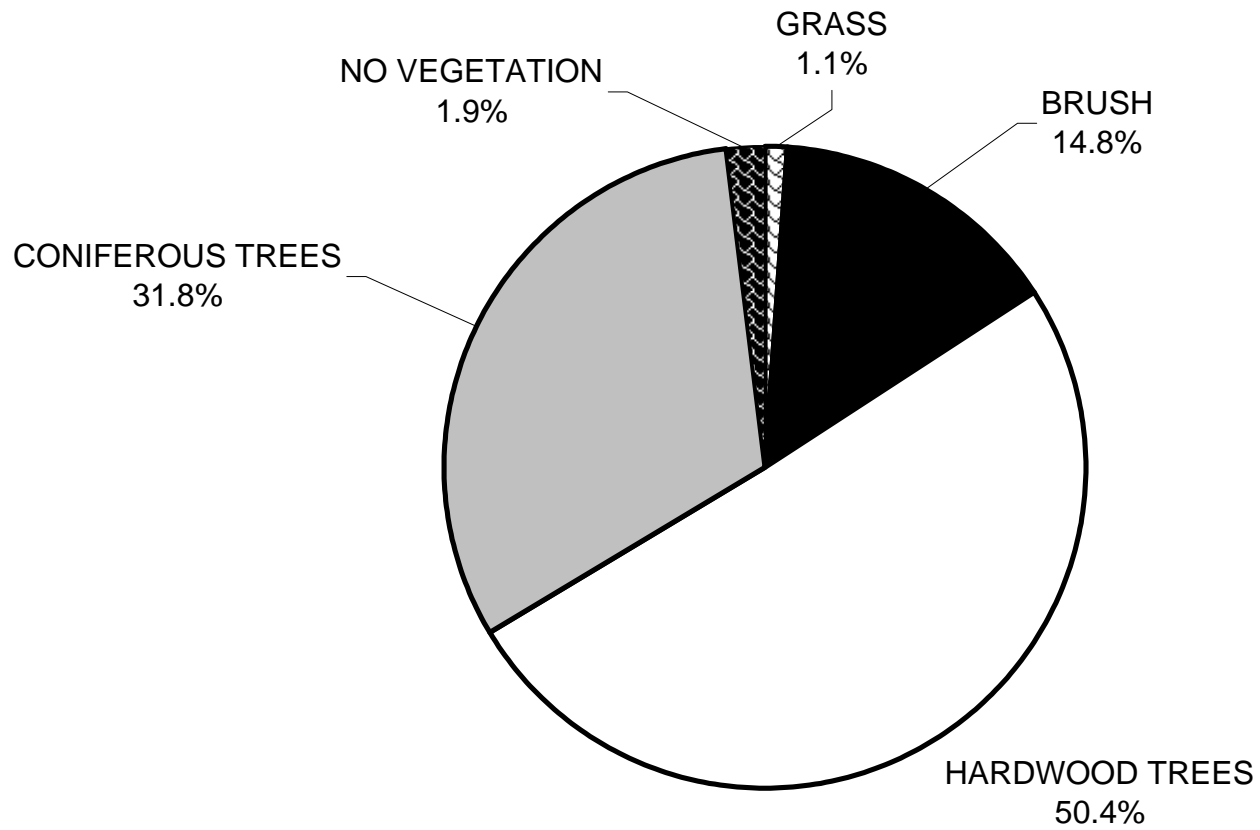
GRAPH 9

**BUTTE CREEK 2009  
DOMINANT BANK COMPOSITION IN SURVEY REACH**



GRAPH 10

# BUTTE CREEK 2009 DOMINANT BANK VEGETATION IN SURVEY REACH

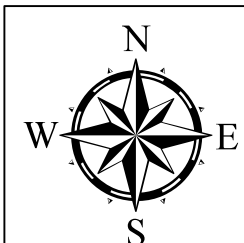


GRAPH 11

**Map 1  
Butte Creek  
South Fork Eel Watershed  
Miranda Quad and Humboldt County**

Start of Survey

End of Survey



**Legend**

- Reach 1, B3 Channel Type
- Reach 2, Not Surveyed
- Reach 3, B4 Channel Type
- Reach 4, B3 Channel Type

