

# STREAM INVENTORY REPORT

## Telegraph Creek, 2006

### INTRODUCTION

A stream inventory was conducted from 7/18/2006 to 7/20/2006 on Telegraph Creek. The survey began at the confluence with Pacific Ocean and extended upstream 1.13 miles. Stream inventories and reports were also completed for Puma Creek, a tributary to Telegraph Creek.

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

Telegraph Creek is a tributary to Pacific Ocean, located in Humboldt County, California (Map 1). Telegraph Creek's legal description at the confluence with Pacific Ocean is T05S R01E S04. Its location is 40°02'51" north latitude and 124°04'44" west longitude, LLID number 1240790400475. Telegraph Creek is a second order stream and has approximately 2.7 miles of blue line stream according to the USGS Shelter Cove 7.5 minute quadrangle. Telegraph Creek drains a watershed of approximately 2.94 square miles. Elevations range from sea level at the mouth of the creek to 1,600 feet in the headwater areas. Douglas fir and tan oak forest dominates the watershed. The watershed is primarily Shelter Cove Resort Improvement District and privately owned land and managed as a source of water for the city of Shelter Cove. Vehicle access exists via Telegraph Creek Road and Beach Road in Shelter Cove. From the US 101, take the Redwood Drive exit towards Redway and follow this to Briceland Road which will take you to Shelter Cove.

### METHODS

The habitat inventory conducted in Telegraph Creek follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al, 1998). The California Conservation Corps (CCC) Technical Advisors 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.

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### SAMPLING STRATEGY

The inventory uses a method that samples approximately 10% of the habitat units within the survey reach. All habitat units included in the survey are classified according to habitat type and their lengths are measured. All pool units are measured for maximum depth, depth of pool tail crest (measured in the thalweg), dominant substrate composing the pool tail crest, and embeddedness. Habitat unit types encountered for the first time are measured for all the parameters and characteristics on the field form. Additionally, from the ten habitat units on each field form page, one is randomly selected for complete measurement.

### HABITAT INVENTORY COMPONENTS

A standardized habitat inventory form has been developed for use in California stream surveys and can be found in the *California Salmonid Stream Habitat Restoration Manual*. This form was used in Telegraph 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". Telegraph 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

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

### 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 Telegraph 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 Telegraph 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 densiometers as described in the *California Salmonid Stream Habitat Restoration Manual*. Canopy density relates to the amount of stream shaded from the sun. In Telegraph 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 Telegraph Creek, the dominant composition type and the dominant

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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.

### 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 2.0.18, 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 Telegraph Creek include:

- Riffle, Flatwater, Pool Habitat Types by Percent Occurrence

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- 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 7/18/2006 to 7/20/2006 was conducted by C. Pollastrini and S. McSmith (WSP). The total length of the stream surveyed was 9,434 feet with an additional 170 feet of side channel.

Stream flow was measured near the beginning of the survey reach with a Marsh-McBirney Model 2000 flowmeter at 1.5 cfs on 7/26/2006.

Telegraph Creek is a B3 channel type for 5,973 feet of the stream surveyed (Reach 1), and a A2 channel type for 3,461 feet of the stream surveyed (Reach 2).

B3 channels are moderately entrenched and riffle dominated with infrequently spaced pools, very stable plan and profile, and stable banks. They have moderate gradients with low width/depth ratios and cobble dominant substrates. A2 channels are steep, narrow, cascading, step-pool, high energy debris transporting channels associated with depositional soils and boulder dominant substrates.

Water temperatures taken during the survey period ranged from 59 to 64 degrees Fahrenheit. Air temperatures ranged from 60 to 78 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 24.3% flatwater units, 32.9% pool units, 41.6% riffle units, 0.6% no survey units, and 0.6% culvert units (Graph 1). Based on total length of Level II habitat types there were 37.8% flatwater units, 15.1% pool units, 46% riffle units, 0.3% no survey units, and 0.8% culvert units (Graph 2).

Eight Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were 22% high gradient riffle units, 18% low gradient riffle units and 18% step run units (Graph 3). Based on percent total length, they were 34% step run units, 27% high gradient riffle units, and 17% low gradient riffle units.

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A total of 57 pools were identified (Table 3). Main channel pools were the most frequently encountered, at 63% (Graph 4), and comprised 77% 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. One of the 57 pools (2%) had a residual depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 57 pool tail-outs measured, 22 had a value of 1 (38.6%); 21 had a value of 2 (36.8%); 12 had a value of 3 (21.1%); 1 had a value of 4 (1.8%); 1 had a value of 5 (1.8%) (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 22, flatwater habitat types had a mean shelter rating of 3 and pool habitats had a mean shelter rating of 24 (Table 1). Of the pool types, the main channel pools had a mean shelter rating of 20 and scour pools had a mean shelter rating of 31 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Boulders and whitewater are the dominant cover types in Telegraph Creek. Graph 7 describes the pool cover in Telegraph Creek. Boulders are the dominant pool cover type followed by whitewater.

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 type (observed in 53% of pool tail-outs) followed by boulders (observed in 23% of pool tail-outs).

The mean percent canopy density for the surveyed length of Telegraph Creek was 93%. Seven percent of the canopy was open. Of the canopy present, the mean percentages of hardwood and coniferous trees were 96% and 4%, respectively. Graph 9 describes the mean percent canopy in Telegraph Creek.

For the stream reach surveyed, the mean percent right bank vegetated was 98%. The mean percent left bank vegetated was 93% (Table 7). The dominant elements composing the structure of the stream banks consisted of 88% sand/silt/clay, 8% cobble/gravel, and 4% bedrock (Graph 10). Hardwood trees were the dominant vegetation type observed in 85.2% of the units surveyed. Additionally, 14.1% of the units surveyed had brush as the dominant vegetation type, and 0.7% had coniferous trees as the dominant vegetation (Graph 11).

## DISCUSSION

Telegraph Creek is a B3 channel type for the first 5,973 feet of stream surveyed and an A2 channel type for the remaining 3,461 feet. The suitability of B3 and A2 channel types for fish habitat improvement structures is as follows: A B3 channel type is excellent for plunge weirs,

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boulder clusters, bank placed boulders, single and opposing wing deflectors, as well as for log cover. An A2 channel type is generally not suitable for habitat improvement structures because it is a high energy stream with stable banks and poor gravel retention capabilities.

The water temperatures recorded on the survey days 7/18/2006 to 7/20/2006, ranged from 59 to 64 degrees Fahrenheit. Air temperatures ranged from 60 to 78 degrees Fahrenheit. To make any further conclusions, temperatures would need to be monitored throughout the warm summer months, and biological sampling would need to be conducted.

Flatwater habitat types comprised 38% of the total length of this survey, riffles 46%, and pools 15%. The pools are relatively shallow, with only 1 of the 57 (1.8%) pools having a maximum residual depth greater than 2 feet. In general, pool enhancement projects are considered when primary pools comprise less than 40% of the length of total stream habitat. In first and second order streams, a primary pool is defined to have a maximum residual depth of at least two feet, occupy at least half the width of the low flow channel, and be as long as the low flow channel width. Installing structures that will increase or deepen pool habitat in the B3 channel is recommended for locations where their installation will not be threatened by high stream energy, or where their installation will not conflict with the modification of the log debris accumulations (LDA's) in the stream.

Forty-three of the 57 pool tail-outs measured had embeddedness ratings of 1 or 2. Thirteen of the pool tail-outs had embeddedness ratings of 3 or 4. One 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.

Thirty-two of the 57 pool tail-outs measured had gravel or small cobble as the dominant substrate. This is generally considered good for spawning salmonids.

The mean shelter rating for pools was 24. The shelter rating in the flatwater habitats was 3. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by boulders in Telegraph Creek. Boulders are the dominant cover type in pools followed by whitewater. 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 93%. Reach 1 had a canopy density of 93.5%, Reach 2 had a canopy density of 92.4%. In general, revegetation projects are considered when canopy density is less than 80%. The percentage of right and left bank covered with vegetation was 98% and 93%, 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.



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### RECOMMENDATIONS

- 1) Telegraph 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) The dam at 5,650 feet and the culvert at 5,750 feet create potential access problems for migrating salmonids. Good water temperature and flow regimes exist in the stream and it offers good conditions for rearing fish. Fish passage should be assessed, monitored and improved where possible.
- 4) In the B3 channel, where feasible, design and engineer pool enhancement structures to increase the number of pools. This must be done where the banks are stable or in conjunction with stream bank armor to prevent erosion.
- 5) Increase woody cover in the pools and flatwater habitat units. Most of the existing cover in the pools is from boulders and whitewater. Adding high quality complexity with woody cover in the pools is desirable.
- 6) 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.

### 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 #:	Comment:
0	0001.00	Start of survey: Entire unit is on the beach and is a 760 feet long channel composed of sand and gravel
1440	0021.00	Tributary #1 Right bank; flow estimated 0.05 cfs, contributes approximately 1% to downstream flow; water temperature of tributary 59° F; not accessible to fish, checked up tributary 50 feet; no fish observed
3413	0048.00	Log debris accumulation (LDA) #1; 2.8' high x 17' wide x 10' long; composed of 4 pieces large wood; water flows through; visible gaps; some sediment retention; partially blown out; sand to cobble substrate; fish seen above LDA; not a barrier to juvenile/adult salmonids

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Position (ft.):	Habitat Unit #:	Comment:
3634	0052.00	Tributary #2 Right bank; flow estimated 0.1 cfs, contributes approximately 4% of downstream flow; water temperature of tributary 58° F; not accessible to fish, checked up tributary 100 feet; 30% slope estimated with hand level; no fish observed
3980	0058.00	Tributary #3 Left bank; flow estimated 0.05 cfs, contributes approximately 1% to downstream flow; water temperature of tributary 61°F; not accessible to fish; checked up tributary 100 feet, 20% slope estimated with hand level, no fish observed
5088	0074.00	Wooden foot bridge; 4' wide x 4' high x 18 long
5429	0081.00	Barbed wire fence spanning creek
5650	0086.00	Concrete dam; 8.5' high x 10' long x 60' wide; Denil fish ladder attached to dam (approximately 2' high x 1.5' wide x 30' long)
5750	0088.00	Triple culvert; 6' diameter x 73' long; outlet plunge height 2.3 feet; no baffles; corrugated steel; possible barrier to juvenile/adult salmonids; rusted/corroded; one pipe partially plugged
5904	0090.00	Dry side channel 69' long
6070	0094.00	Fish observed
6445	0104.00	Tributary #4 Left bank; flow estimated 0.2 cfs, contributes approximately 15% to downstream flow; water temperature of tributary 61°F; accessible to fish, checked up tributary 100'; 15% slope estimated with hand level; no fish observed
6844	0115.00	Tributary #5; Puma Creek; Right bank; flow estimated 0.1 cfs. contributes approximately 10% to downstream flow; water temperature of tributary 61°F; accessible to fish; 5% slope estimated with hand level; no fish observed
7584	0130.00	Culvert enters right bank high up on bank.
7684	0132.00	Left bank seep and bank erosion, 20' high x 50' long
7849	0135.00	Left bank seep and bank erosion, 30' high x 40' long
7892	0137.00	Right bank drainage pipe high up on bank entering creek. Creek access at culvert.

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Position Habitat Comment:

(ft.): Unit #:

- 8330 0148.00 Tributary #6 Right bank; flow estimated 0.1 cfs, contributes approximately 3% to downstream flow; not accessible to fish; 60% slope estimated with hand level; no fish observed; enters stream from a 4 foot diameter drainage pipe.
- 8629 0153.00 Tributary #7 Right bank; flow estimated 0.05 cfs contributes approximately 1%; Water temperature of tributary 59°F; not accessible to fish, checked up tributary 100 feet; 30% slope estimated with hand level; no fish observed
- 8784 0155.00 Plunge of 2 feet over boulder tail-out of pool
- 8888 0158.01 Left bank erosion, approximately 120' long x 20' high
- 8902 0160.00 Young of the year salmonid observed
- 8918 0161.00 Tributary #8 Left bank; flow estimated 0.05 cfs, contributes approximately 1% to downstream flow; water temperature of tributary 59°F; not accessible to fish, checked up tributary 100 feet; 30% slope estimated with hand level; no fish observed
- 9262 0167.00 End of survey; multiple waterfalls/cascades, total length 66 feet, overall height 18.5 ft, approximate slope = 28%; 2 main waterfalls; 1<sup>st</sup> 4.7 feet high, without jump pool at bottom; 2<sup>nd</sup> 8 feet high, with insufficient jump pool at bottom having a maximum depth of 1.5 ft; both falls spill onto boulders; unknown fish observed above cascade

## 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: Telegraph Creek

LLID: 1240790400475 Drainage: Mattole River

Survey Dates: 7/18/2006 to 7/20/2006

Confluence Location: Quad: SHELTER COVE Legal Description: T05SR01ES04 Latitude: 40:02:51.0N Longitude: 124:04:44.0

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	0.6	73	73	0.8									
42	5	FLATWATER	24.3	86	3626	37.8	9.8	0.6	1.0	506	21255	321	13494		3
1	0	NOSURVEY	0.6	30	30	0.3									
57	57	POOL	32.9	26	1455	15.1	10.9	0.5	1.2	282	16064	306	17448	168	24
72	9	RIFFLE	41.6	61	4420	46.0	11.9	0.5	1.0	413	29720	199	14362		22
<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>		
173	71				9604					67039			45305		

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

Stream Name: Telegraph Creek

LLID: 1240790400475

Drainage: Mattole River

Survey Dates: 7/18/2006 to 7/20/2006

Confluence Location: Quad: SHELTER COVE

Legal Description: T05SR01ES04

Latitude: 40:02:51.0N

Longitude: 124:04:44.0W

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 (%)
31	4	LGR	17.9	53	1643	17.1	11	0.5	0.9	585	18120	270	8383		9	89
38	4	HGR	22.0	67	2556	26.6	12	0.5	1.2	270	10255	126	4801		25	95
3	1	CAS	1.7	74	221	2.3	17	0.7	1.6	298	893	208	625		60	98
10	2	RUN	5.8	33	327	3.4	10	0.7	1.2	448	4476	293	2925		0	98
32	3	SRN	18.5	103	3299	34.4	9	0.6	1.1	545	17442	340	10895		5	91
29	29	MCP	16.8	27	772	8.0	11	0.5	2.3	329	9543	392	11382	211	18	95
7	7	STP	4.0	50	347	3.6	11	0.5	1.9	464	3249	409	2864	225	27	96
21	21	PLP	12.1	16	336	3.5	11	0.5	1.9	156	3272	152	3202	89	31	90
1	0	CUL	0.6	73	73	0.8										
1	0	NS	0.6	30	30	0.3										

Total Units  
173

Total Units Fully Measured  
71

Total Length (ft.)  
9604

Total Area (sq.ft.)  
67249

Total Volume (cu.ft.)  
45077

**Table 3 - Summary of Pool Types**

Stream Name: Telegraph Creek

LLID: 1240790400475

Drainage: Mattole River

Survey Dates: 7/18/2006 to 7/20/2006

Confluence Location: Quad: SHELTER COVE

Legal Description: T05SR01ES04

Latitude: 40:02:51.0N

Longitude: 124:04:44.0W

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
36	36	MAIN	63	31	1119	77	11.1	0.5	355	12792	214	7698	20
21	21	SCOUR	37	16	336	23	10.5	0.5	156	3272	89	1874	31

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
57	57	1455	16064	9572

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

Stream Name: Telegraph Creek

LLID: 1240790400475

Drainage: Mattole River

Survey Dates: 7/18/2006 to 7/20/2006

Confluence Location: Quad: SHELTER COVE

Legal Description: T05SR01ES04

Latitude: 40:02:51.0N

Longitude: 124:04:44.0W

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
29	MCP	51	11	38	17	59	1	3	0	0	0	0
7	STP	12	1	14	6	86	0	0	0	0	0	0
21	PLP	37	4	19	17	81	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
57	16	28	40	70	1	2	0	0	0	0

Mean Maximum Residual Pool Depth (ft.): 1.2



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

Stream Name: Telegraph Creek

LLID: 1240790400475

Drainage: Mattole River

Survey Dates: 7/18/2006 to 7/20/2006

Dry Units: 0

Confluence Location: Quad: SHELTER COVE

Legal Description: T05SR01ES04

Latitude: 40:02:51.0N

Longitude: 124:04:44.0W

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
31	4	LGR	0	0	0	10	25	0	20	20	0
38	4	HGR	0	0	0	0	0	0	40	35	0
3	1	CAS	0	0	0	20	0	0	40	40	0
72	9	TOTAL RIFFLE	0	0	0	7	11	0	31	29	0
10	2	RUN	0	0	0	0	0	0	0	0	0
32	3	SRN	0	23	10	17	0	0	0	17	0
42	5	TOTAL FLAT	0	14	6	10	0	0	0	10	0
29	28	MCP	9	8	8	8	2	0	9	44	2
7	7	STP	3	12	3	11	0	0	29	40	2
21	20	PLP	2	1	8	3	0	0	56	31	0
57	55	TOTAL POOL	6	6	7	6	1	0	28	39	1
1	0	CUL									
1	0	NS									
173	69	TOTAL	4	6	6	7	2	0	27	35	1

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

Stream Name: Telegraph Creek

LLID: 1240790400475

Drainage: Mattole River

Survey Dates: 7/18/2006 to 7/20/2006

Dry Units: 0

Confluence Location: Quad: SHELTER COVE

Legal Description: T05SR01ES04

Latitude: 40:02:51.0N

Longitude: 124:04:44.0W

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
31	4	LGR	0	0	25	25	50	0	0
38	4	HGR	0	0	0	50	0	50	0
3	1	CAS	0	0	0	0	0	100	0
10	2	RUN	0	0	50	50	0	0	0
32	3	SRN	0	0	67	0	33	0	0
29	29	MCP	0	0	79	7	7	7	0
7	7	STP	0	0	57	0	0	43	0
21	21	PLP	0	0	71	5	0	24	0

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

Stream Name: Telegraph Creek

LLID: 1240790400475

Drainage: Mattole River

Survey Dates: 7/18/2006 to 7/20/2006

Confluence Location: Quad: SHELTER COVE

Legal Description: T05SR01ES04

Latitude: 40:02:51.0N

Longitude: 124:04:44.0W

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
93	4	96	0	98	93

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: Telegraph Creek LLID: 1240790400475 Drainage: Mattole River  
 Survey Dates: 7/18/2006 to 7/20/2006 Survey Length (ft.): 9604 Main Channel (ft.): 9434 Side Channel (ft.): 170  
 Confluence Location: Quad: SHELTER COVE Legal Description: T05SR01ES04 Latitude: 40:02:51.0N Longitude: 124:04:44.0W

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

**STREAM REACH: 1**

Channel Type: B3	Canopy Density (%): 93.5	Pools by Stream Length (%): 14.2
Reach Length (ft.): 5973	Coniferous Component (%): 5.5	Pool Frequency (%): 33.0
Riffle/Flatwater Mean Width (ft.): 10.6	Hardwood Component (%): 94.5	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Hardwood Trees	< 2 Feet Deep: 97
Range (ft.): 14 to 30	Vegetative Cover (%): 96.5	2 to 2.9 Feet Deep: 3
Mean (ft.): 21	Dominant Shelter: Boulders	3 to 3.9 Feet Deep: 0
Std. Dev.: 4	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 0
Base Flow (cfs.): 1.5	Occurrence of LWD (%): 6	Mean Max Residual Pool Depth (ft.): 1.2
Water (F): 59 - 78	Air (F): 60 - 78	LWD per 100 ft.:
Dry Channel (ft): 0	Riffles: 1	Mean Pool Shelter Rating: 19
	Pools: 2	
	Flat: 1	
Pool Tail Substrate (%): Silt/Clay: 0	Sand: 0	Gravel: 67
	Sm Cobble: 3	Lg Cobble: 13
	Boulder: 17	Bedrock: 0
Embeddedness Values (%): 1. 56.7	2. 23.3	3. 20.0
	4. 0.0	5. 0.0

**STREAM REACH: 2**

Channel Type: A2	Canopy Density (%): 92.6	Pools by Stream Length (%): 16.8
Reach Length (ft.): 3461	Coniferous Component (%): 2.4	Pool Frequency (%): 32.9
Riffle/Flatwater Mean Width (ft.): 12.5	Hardwood Component (%): 97.6	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Hardwood Trees	< 2 Feet Deep: 100
Range (ft.): 14 to 30	Vegetative Cover (%): 93.9	2 to 2.9 Feet Deep: 0
Mean (ft.): 19	Dominant Shelter: Boulders	3 to 3.9 Feet Deep: 0
Std. Dev.: 5	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 0
Base Flow (cfs.): 1.5	Occurrence of LWD (%): 7	Mean Max Residual Pool Depth (ft.): 1.2
Water (F): 59 - 62	Air (F): 62 - 69	LWD per 100 ft.:
Dry Channel (ft): 0	Riffles: 3	Mean Pool Shelter Rating: 29
	Pools: 4	
	Flat: 4	
Pool Tail Substrate (%): Silt/Clay: 0	Sand: 0	Gravel: 37
	Sm Cobble: 4	Lg Cobble: 26
	Boulder: 30	Bedrock: 4
Embeddedness Values (%): 1. 18.5	2. 51.9	3. 22.2
	4. 3.7	5. 3.7

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

Stream Name: Telegraph Creek

LLID: 1240790400475

Drainage: Mattole River

Survey Dates: 7/18/2006 to 7/20/2006

Confluence Location: Quad: SHELTER COVE

Legal Description: T05SR01ES04

Latitude: 40:02:51.0N

Longitude: 124:04:44.0W

**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	0	5	3.5
Boulder	0	0	0.0
Cobble / Gravel	5	7	8.5
Sand / Silt / Clay	66	59	88.0

**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	4	16	14.1
Hardwood Trees	67	54	85.2
Coniferous Trees	0	1	0.7
No Vegetation	0	0	0.0

**Total Stream Cobble Embeddedness Values:** 2

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

StreamName: Telegraph Creek

LLID: 1240790400475

Drainage: Mattole River

Survey Dates: 7/18/2006 to 7/20/2006

Confluence Location: Quad: SHELTER COVE

Legal Description: T05SR01ES04

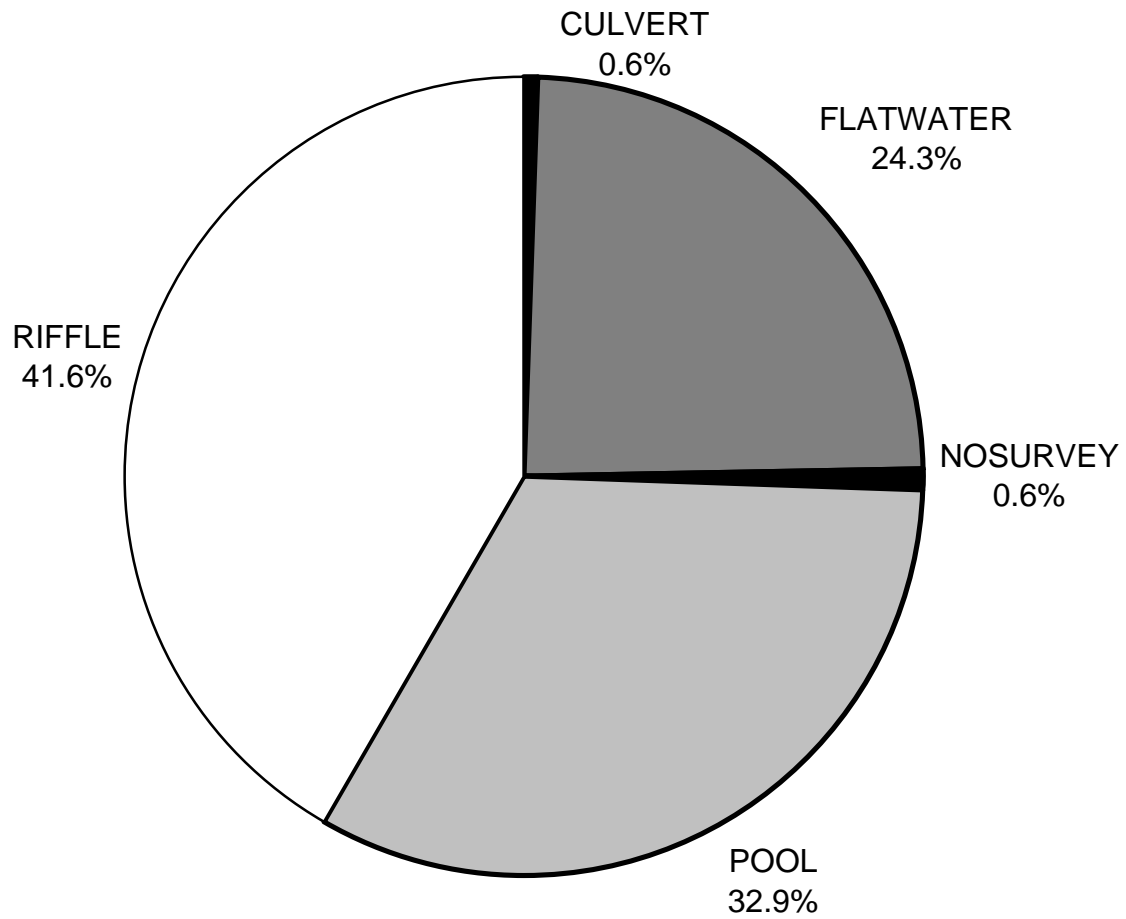
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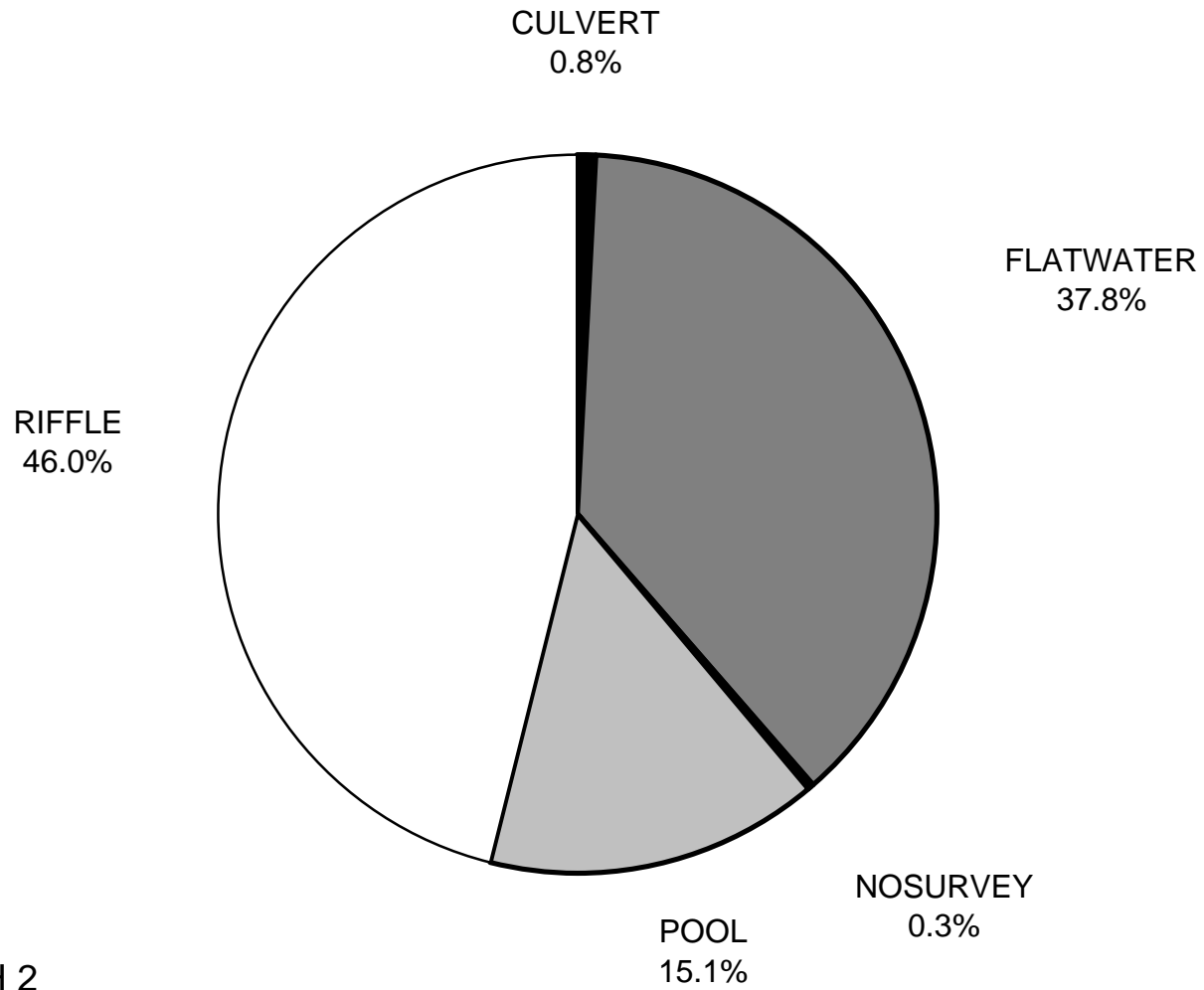
	<b>Riffles</b>	<b>Flatwater</b>	<b>Pools</b>
UNDERCUT BANKS (%)	0	0	6
SMALL WOODY DEBRIS (%)	0	14	6
LARGE WOODY DEBRIS (%)	0	6	7
ROOT MASS (%)	7	10	6
TERRESTRIAL VEGETATION (%)	11	0	1
AQUATIC VEGETATION (%)	0	0	0
WHITEWATER (%)	31	0	28
BOULDERS (%)	29	10	39
BEDROCK LEDGES (%)	0	0	1

# TELEGRAPH CREEK 2006 HABITAT TYPES BY PERCENT OCCURRENCE



GRAPH 1

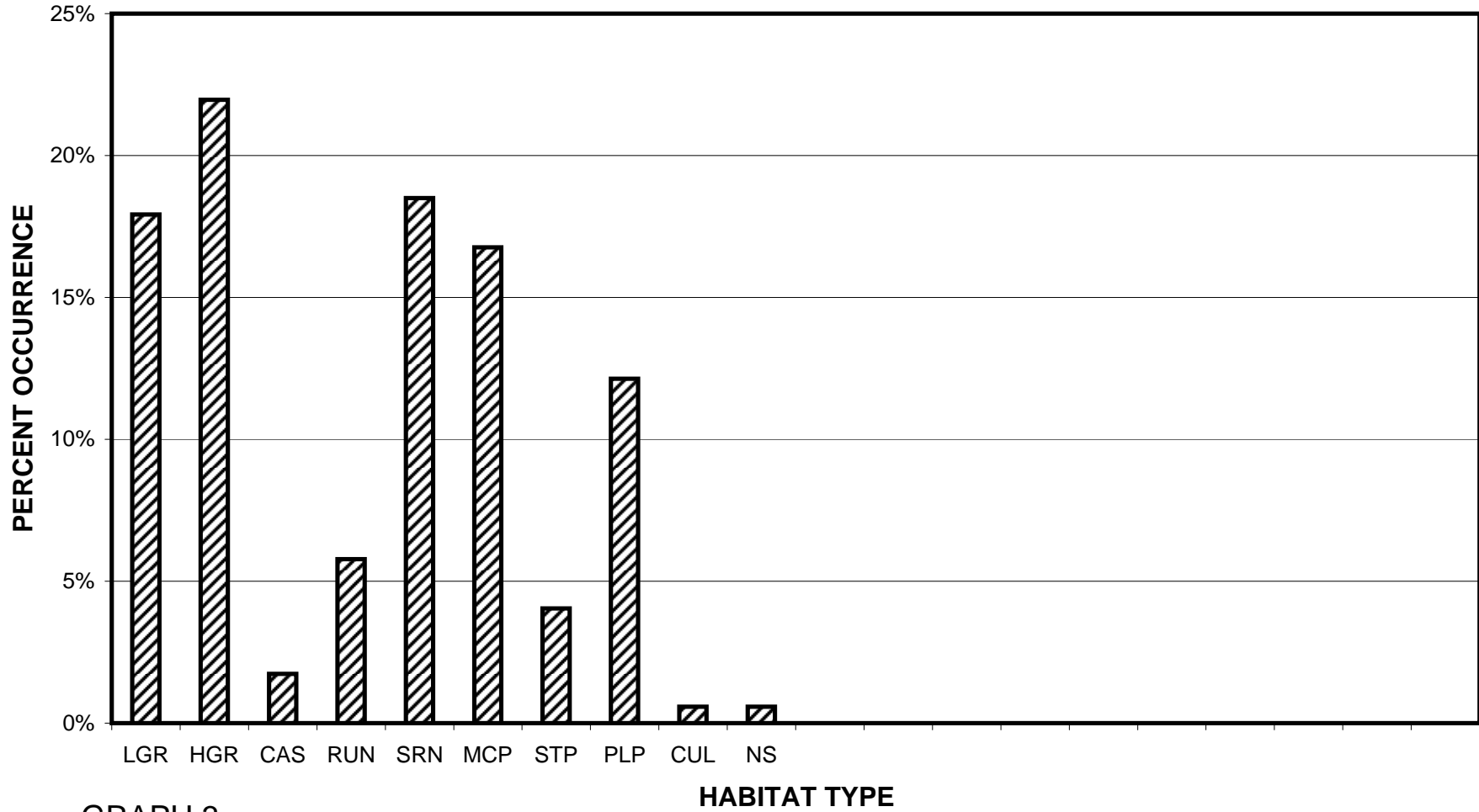
# TELEGRAPH CREEK 2006 HABITAT TYPES BY PERCENT TOTAL LENGTH



GRAPH 2

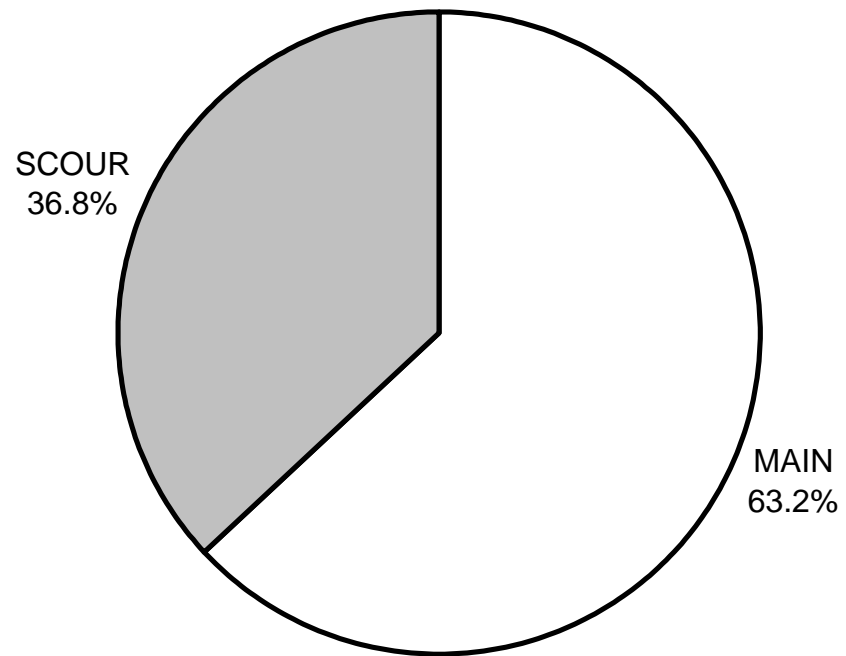


# TELEGRAPH CREEK 2006 HABITAT TYPES BY PERCENT OCCURRENCE



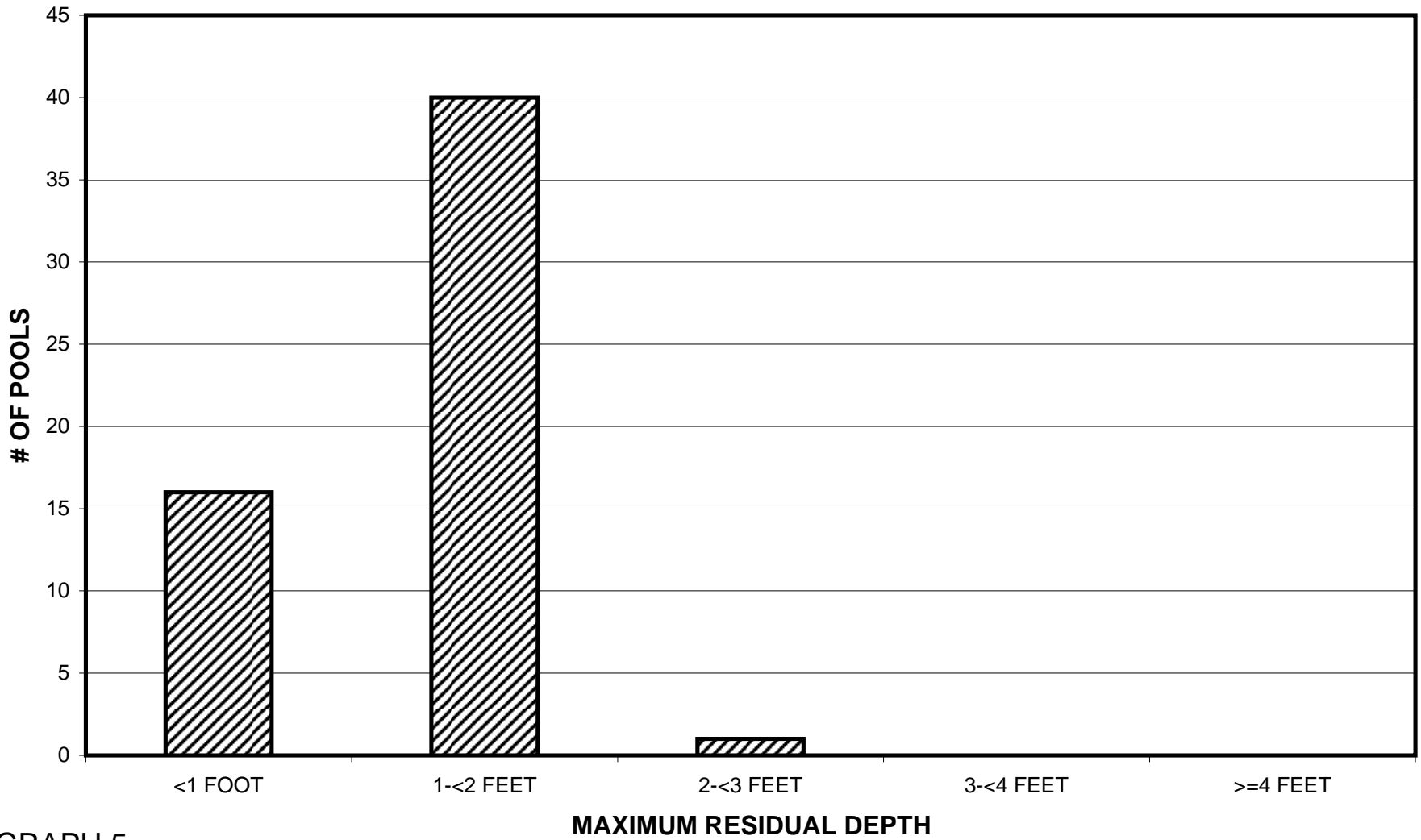
GRAPH 3

**TELEGRAPH CREEK 2006  
POOL TYPES BY PERCENT OCCURRENCE**



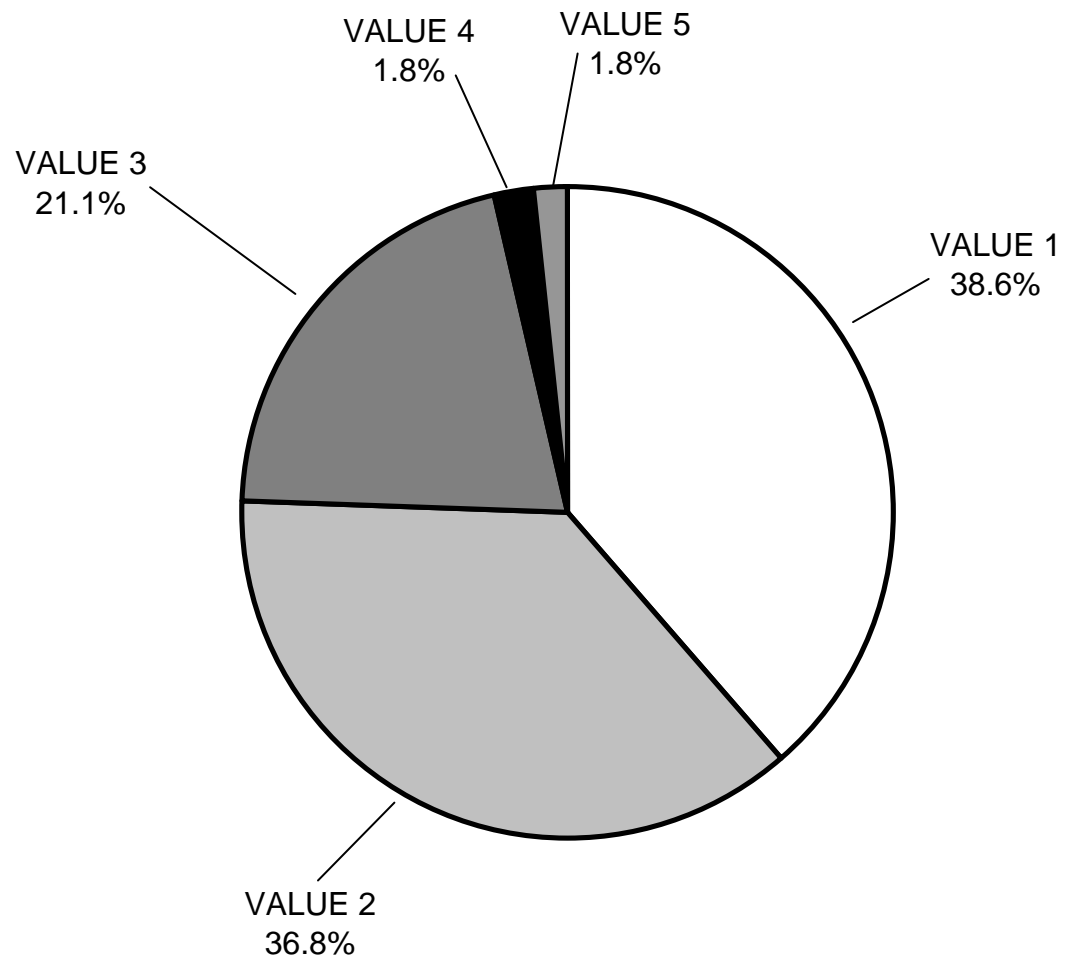
GRAPH 4

# TELEGRAPH CREEK 2006 MAXIMUM DEPTH IN POOLS



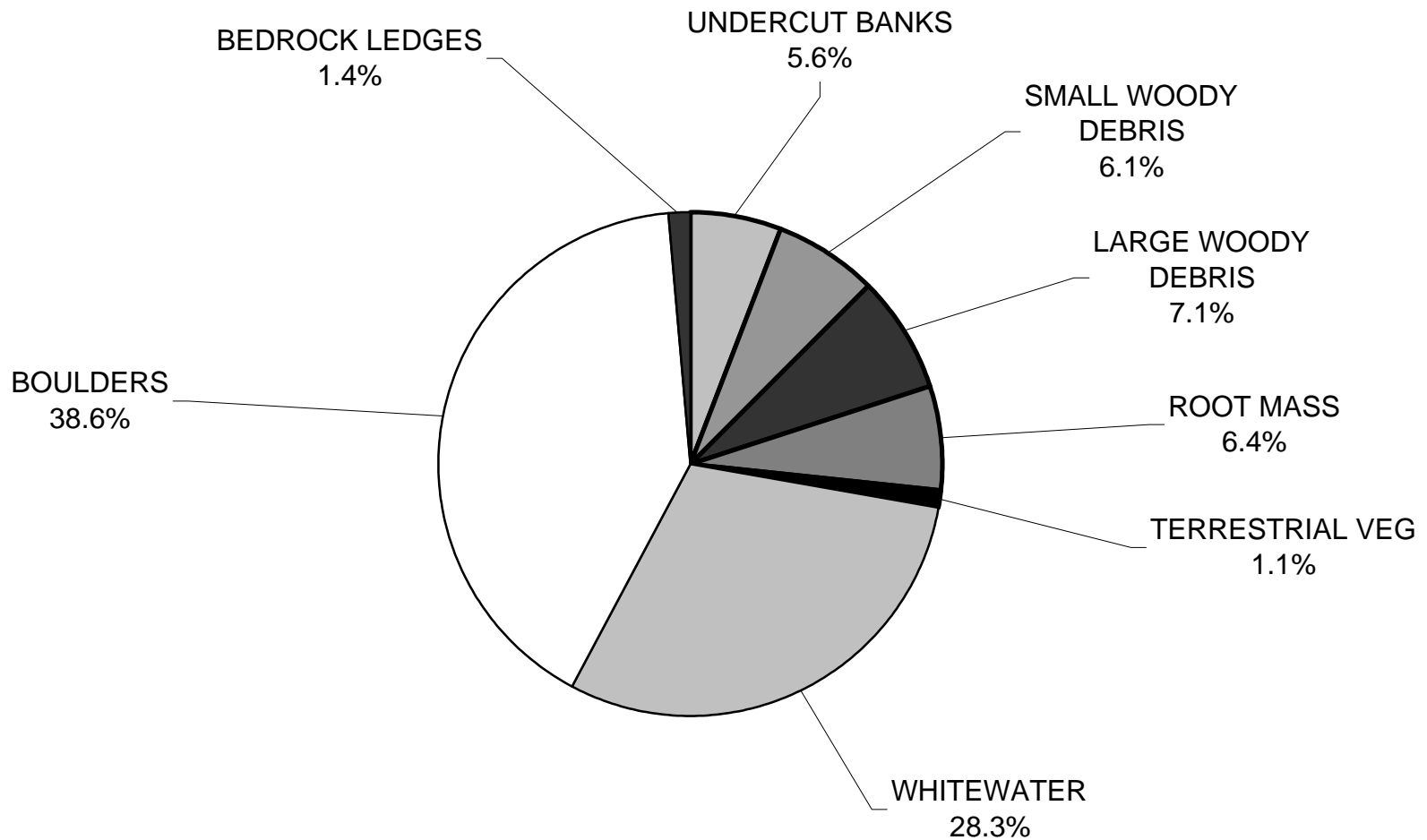
GRAPH 5

# TELEGRAPH CREEK 2006 PERCENT EMBEDDEDNESS



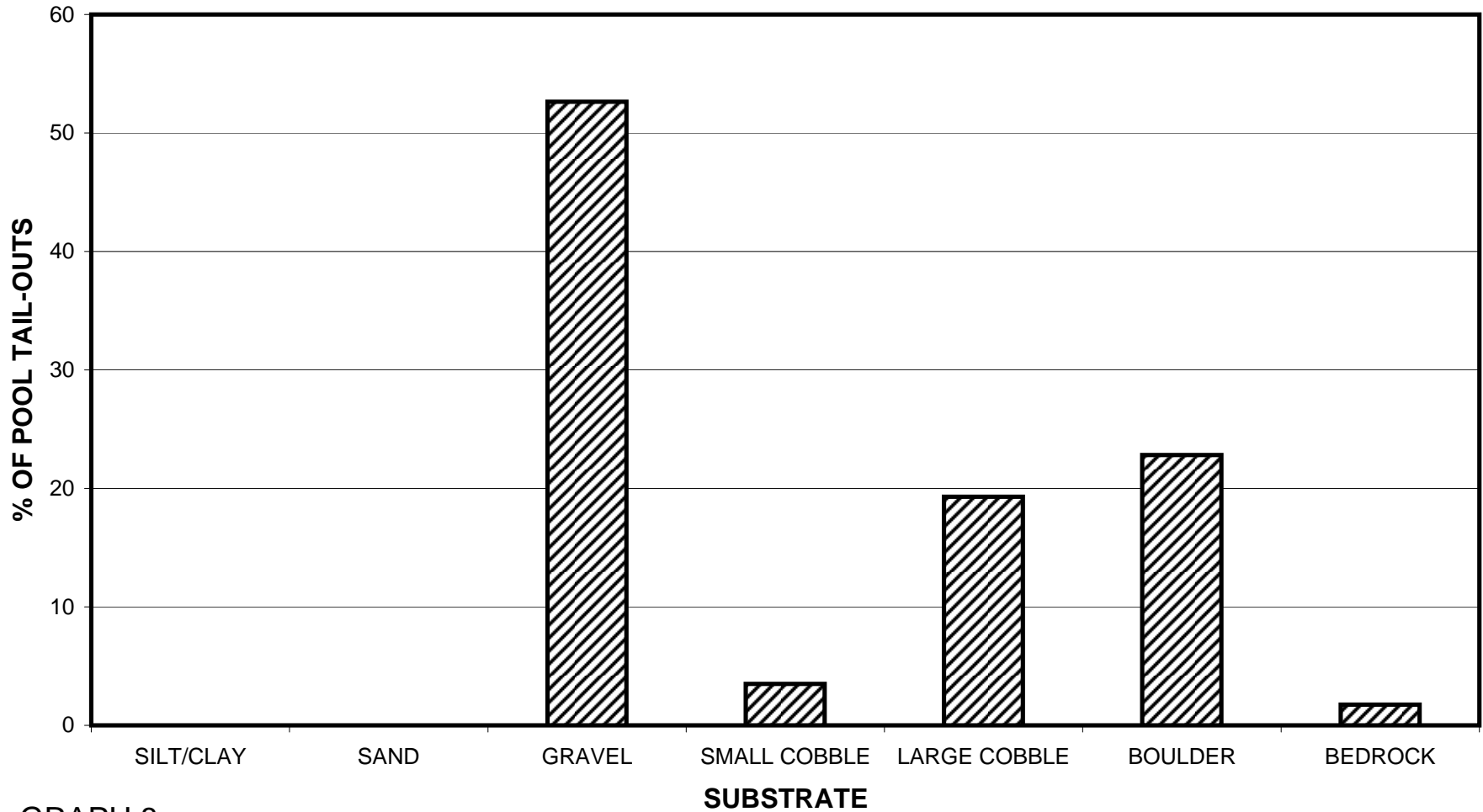
GRAPH 6

# TELEGRAPH CREEK 2006 MEAN PERCENT COVER TYPES IN POOLS



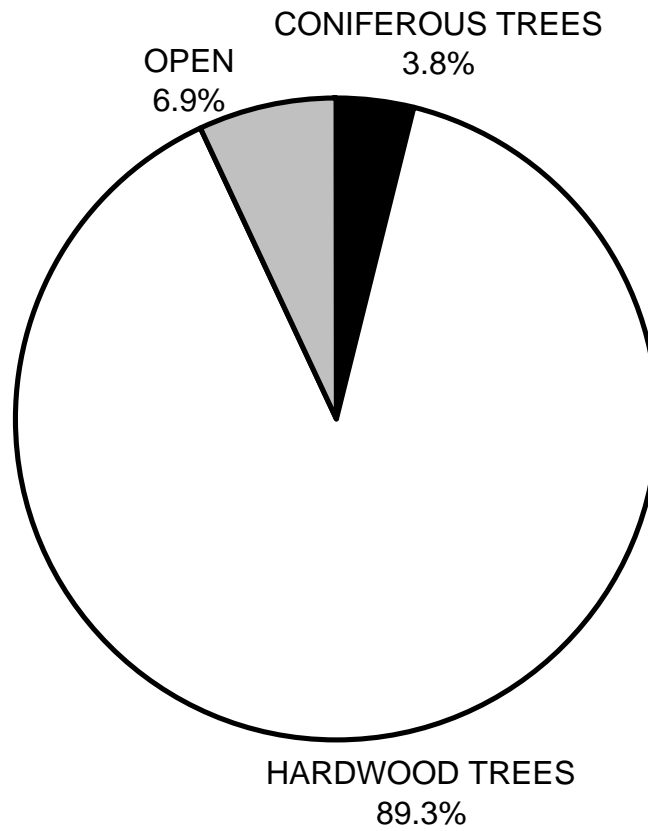
GRAPH 7

# TELEGRAPH CREEK 2006 SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



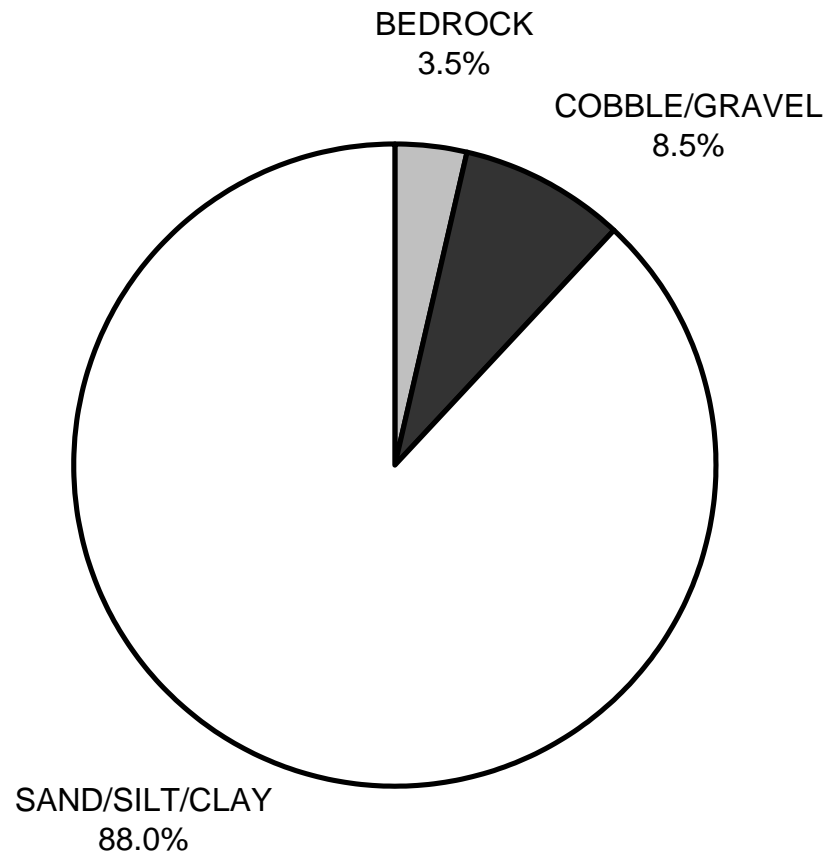
GRAPH 8

# TELEGRAPH CREEK 2006 MEAN PERCENT CANOPY



GRAPH 9

**TELEGRAPH CREEK 2006  
DOMINANT BANK COMPOSITION IN SURVEY REACH**



GRAPH 10



# TELEGRAPH CREEK 2006 DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11