

# STREAM INVENTORY REPORT

## Ohman Creek

### INTRODUCTION

A stream inventory was conducted on July 3, 2007 on Ohman Creek. The survey began at the confluence with the South Fork Eel River and extended upstream 0.3 miles.

The Ohman 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 Ohman 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

Ohman Creek is a tributary to South Fork Eel River, tributary to Eel River which drains to the Pacific Ocean, located in Humboldt County, California (Map 1). Ohman Creek's legal description at the confluence with South Fork Eel River is T3S R4E S19. Its location is 40.1931 north latitude and 123.7692 west longitude, LLID number 1237681401933. Ohman Creek is a first order stream and has approximately 2.6 miles of blue line stream according to the USGS Miranda 7.5 minute quadrangle. Ohman Creek drains a watershed of approximately 7.2 square miles. Elevations range from about 230 feet at the mouth of the creek to 2,200 feet in the headwater. Second growth redwood and fir-broadleaf forest dominates the watershed. The watershed is primarily privately owned and is managed for timber production, rangeland and recreation. Vehicle access exists via Highway 101, off of the Phillipsville/Miranda exit.

### METHODS

The habitat inventory conducted in Ohman 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.

### 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.

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### 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 Ohman 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." Ohman 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.

#### 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 Ohman 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.

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### 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 Ohman 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 Ohman 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 Ohman 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.

### 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.

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### 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 Ohman Creek. In addition, underwater observations were made at 8 sites. These techniques are 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

Graphics are produced from the tables using Microsoft Excel. Graphics developed for Ohman 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

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- 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 July 3, 2007 was conducted by T. Fisher and M. Cavin (WSP). The total length of the stream surveyed was 1,748 feet with an additional 181 feet of side channel.

Stream flow was measured near the bottom of the survey reach with a Marsh-McBirney Model 2000 flowmeter at 0.35 cubic feet per second (cfs) on July 5, 2007.

Ohman Creek is a C4 channel type for the entire 1,929 feet of the stream surveyed (Reach 1).

C4 channels are meandering point-bar riffle/pool alluvial channels with broad well defined floodplains with gradients and gravel-dominant substrates.

Water temperatures taken during the survey period ranged from 68 to 69 degrees Fahrenheit. Air temperatures ranged from 68 to 73 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 45% riffle units, 36% pool units, 14% flatwater units, and 5% dry units (Graph 1). Based on total length of Level II habitat types there were 39% riffle units, 37% flatwater units, 21% pool units, and 3% dry units (Graph 2).

Seven Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were 32% mid-channel pool units, 18% low gradient riffle units, 18% high gradient riffle units, and 14% run units (Graph 3). Based on percent total length, run units made up 37%, mid-channel pool units 19%, and high gradient riffle units 16%.

A total of eight pools were identified (Table 3). Main channel pools were the most frequently encountered, at 100% (Graph 4), and comprised 100% 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 three pools (33%) had a residual depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the three pool tail-outs measured, two had a value of 1 (66.7%); 1 had a value of 2 (33.3%) (Graph 6). On this scale, a value of 1 indicates the best spawning conditions and a value of 4 the worst.

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 27, flatwater habitat types were not surveyed for shelter, and pool habitats had a mean

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shelter rating of 27 (Table 1). Of the pool types, the main channel pools had a mean shelter rating of 27 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Boulders are the dominant cover types in Ohman Creek. Graph 7 describes the pool cover in Ohman 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 observed in 67% of pool tail-outs and small cobble was observed in 33% of pool tail-outs.

The mean percent canopy density for the surveyed length of Ohman Creek was 59%. Forty-one percent of the canopy was open. Of the canopy present, the mean percentages of hardwood and coniferous trees were 44% and 56%, respectively. Graph 9 describes the mean percent canopy in Ohman Creek.

For the stream reach surveyed, the mean percent right bank vegetated was 82%. The mean percent left bank vegetated was 94%. The dominant elements composing the structure of the stream banks consisted of 67% boulder and 33% cobble/gravel (Graph 10). Coniferous trees were the dominant vegetation type observed in 58% of the units surveyed. Additionally, 33% of the units surveyed had deciduous trees as the dominant vegetation type, and 8% had grass as the dominant vegetation (Graph 11).

## **BIOLOGICAL INVENTORY RESULTS**

Eight sites were surveyed by mask and snorkel for species composition and distribution in Ohman Creek on September 24, 2007. Water temperatures taken during the dive survey period, 0930 to 1130, ranged from 56 to 60 degrees Fahrenheit. Air temperatures ranged from 52 to 62 degrees Fahrenheit. The sites were sampled by P. Divine (DFG) and T. Fisher (WSP).

In reach 1, which comprised the first 1,748 feet of stream, eight sites were sampled. The reach sites yielded 32 young-of-the-year (YOY) steelhead/rainbow trout (SH/RT), two age 1+ SH/RT and six coho salmon YOY.

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The following chart displays the information yielded from these sites:

### 2007 Ohman Creek Underwater Observations.

Date	Site #	Hab. Unit #	Hab. Type	Approx. Dist. from mouth (ft.)	Coho		SH/RT		
					YOY	1+	YOY	1+	2+
Reach 1: C4 Channel Type									
09/24/07	1	002	4.2	491	0	0	15	0	0
09/24/07	2	004	4.2	572	0	0	5	0	0
09/24/07	3	006	4.2	634	0	0	4	1	0
09/24/07	4	008	4.2	738	6	0	3	1	0
09/24/07	5	011	4.2	974	0	0	1	0	0
09/24/07	6	015	4.2	1323	0	0	2	0	0
09/24/07	7	017	4.4	1394	0	0	1	0	0
09/24/07	8	019	4.2	1454	0	0	0	0	0

## DISCUSSION

Ohman Creek is a C4 channel type for the entire 1,929 feet of stream surveyed. The suitability of C4 channel types for fish habitat improvement structures is as follows: C4 channel types are good for bank-placed boulders and fair for plunge weirs, single and opposing wing-deflectors, channel constrictors, and log cover.

The water temperatures recorded on the survey day July 3, 2007, ranged from 68 to 69 degrees Fahrenheit. Air temperatures ranged from 68 to 73 degrees Fahrenheit. To make any further 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 37% of the total length of this survey, riffles 39%, and pools 21%. The pools are relatively shallow with only 1 of the 3 (33%) pools having a maximum residual depth greater than 2 feet. In general, pool enhancement projects are considered when primary pools comprise less than 40% of the length of total stream habitat. In first and second order streams, a primary pool is defined to have a maximum residual depth of at least two feet, occupy at least half the width of the low flow channel, and be as long as the low flow channel width. Installing structures that will increase or deepen pool habitat is recommended.

The three pool tail-outs measured had embeddedness ratings of 1 or 2. 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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The three 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 27. The mean shelter for flatwater habitats was not measured. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by boulders in Ohman 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 59%. In general, revegetation projects are considered when canopy density is less than 80%.

The percentage of right and left bank covered with vegetation was high at 82% and 94%, 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) Ohman Creek should be managed as an anadromous, natural production stream.
- 2) The limited water temperature data available suggest that maximum temperatures are above the acceptable range for juvenile coho salmon. 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) 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.
- 4) 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.
- 5) Increase the canopy on Ohman 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	Start of Survey: Young-of-the-year (YOY) salmonids were observed. Bridge #01 was the Avenue of the Giants concrete highway bridge. The bridge measured 24' wide x 30' high x 163' long. There was boulder rip-rap on the left bank.
634	0006.00	Tributary #01 entered Ohman Creek from the right bank. It had an increasingly steep gradient averaging 22% and was contributing to <1% of Ohman Creek's flow. The water temperature of the tributary was 56 degrees Fahrenheit, the water temperature of Ohman Creek downstream of the tributary was 64 degrees Fahrenheit and upstream it was 62 degrees Fahrenheit. The tributary was not accessible to fish due to a high gradient and a culvert ~150' upstream from the mouth which had a 12' plunge. No fish were observed in tributary #1.
849	0010.00	The slope in the creek here was 9%.
974	0011.00	YOY were observed here and so was a 1+ SH mortality.
1082	0013.00	This habitat unit marks the end of South Fork Eel River's influence.
1323	0015.00	There was a left bank slide 122' long x 60' high.
1491	0020.00	About three 1+ steelhead were observed within the cascade pools. The survey continued ~200' past probable end of anadromy (HU #020) where increasingly steep gradient and boulder substrate continue the ability for salmonids to migrate.
1491	0020.00	There was erosion due to a slide on the left bank measuring 257' long x 250' high.
1748	0020.00	Survey ended due to increasingly steep gradient (~70%) with bedrock and enormous boulder substrate. Cascade length is at least 300' with several 10'+ plunges. Possible end of anadromy.

### 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 }

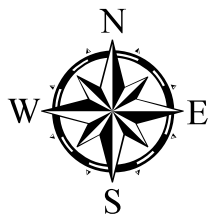
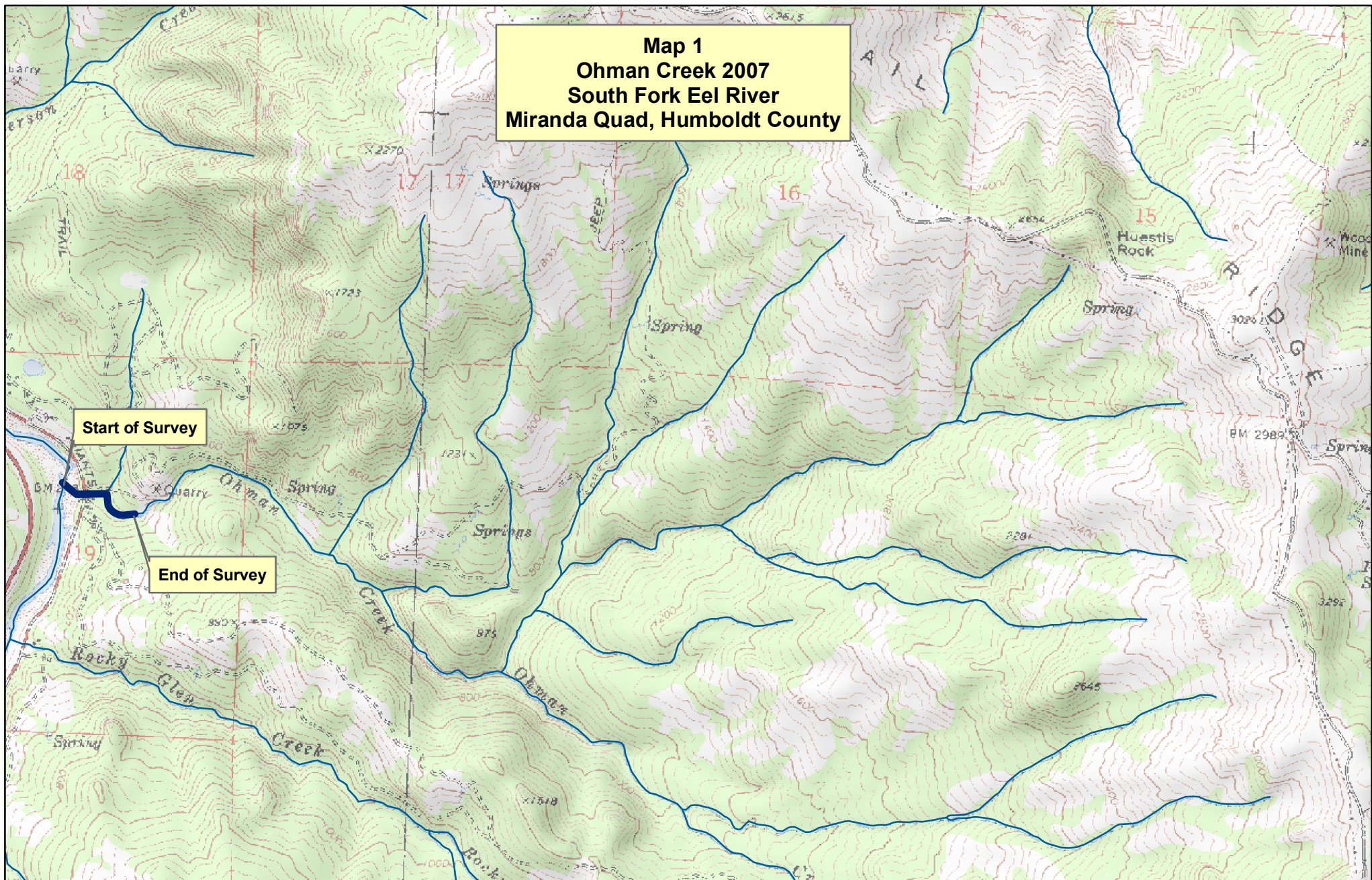
#### BACKWATER POOLS

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]	

**Map 1**  
**Ohman Creek 2007**  
**South Fork Eel River**  
**Miranda Quad, Humboldt County**



**Legend**

 Reach 1, C4 Channel Type

0 1,050 2,100 4,200 Feet



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

Stream Name: Ohman Creek

LLID: 1237681401933

Drainage: Eel River - South Fork

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

Confluence Location: Quad: MIRANDA

Legal Description: T03SR04ES19

Latitude: 40:11:36.0N

Longitude: 123:46:05.0

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	DRY	4.5	63	63	3.3									
3	0	FLATWATER	13.6	239	718	37.2									
8	3	POOL	36.4	50	399	20.7	12.7	0.7	1.8	468	3746	443	3540	320	27
10	3	RIFFLE	45.5	75	749	38.8	6.7	0.4	0.8	160	1598	64	642		27
Total Units	Total Units Fully Measured			Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)			
22	6			1929						5345		4183			

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

Stream Name: Ohman Creek

LLID: 1237681401933

Drainage: Eel River - South Fork

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

Confluence Location: Quad: MIRANDA

Legal Description: T03SR04ES19

Latitude: 40:11:36.0N

Longitude: 123:46:05.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating	Mean Canopy (%)
4	1	LGR	18.2	40	159	8.2	5	0.5	1	68	270	34	135		5	55
4	2	HGR	18.2	79	317	16.4	8	0.4	0.9	206	824	79	318		38	49
2	0	CAS	9.1	136	273	14.2										65
3	0	RUN	13.6	239	718	37.2										79
7	2	MCP	31.8	51	357	18.5	12	0.7	2.1	438	3065	426	2980	294	25	65
1	1	STP	4.5	42	42	2.2	14	0.7	1.9	529	529	476	476	370	30	46
1	0	DRY	4.5	63	63	3.3										31

Total Units	Total Units Fully Measured
22	6

Total Length (ft.)
1929

Total Area (sq.ft.)
4688

Total Volume (cu.ft.)
3909

Table 3 - Summary of Pool Types

Stream Name: Ohman Creek

LLID: 1237681401933

Drainage: Eel River - South Fork

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

Confluence Location: Quad: MIRANDA

Legal Description: T03SR04ES19

Latitude: 40:11:36.0N

Longitude: 123:46:05.0W

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
8	3	MAIN	100	50	399	100	12.7	0.7	468	3746	320	2558	27

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
8	3	399	3746	2558

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

Stream Name: Ohman Creek

LLID: 1237681401933

Drainage: Eel River - South Fork

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

Confluence Location: Quad: MIRANDA

Legal Description: T03SR04ES19

Latitude: 40:11:36.0N

Longitude: 123:46:05.0W

Habitat Units	Habitat Type	Habitat Occurrence (%)	< 1 Foot Maximum Residual Depth	< 1 Foot Percent Occurrence	1 < 2 Feet Maximum Residual Depth	1 < 2 Feet Percent Occurrence	2 < 3 Feet Maximum Residual Depth	2 < 3 Feet Percent Occurrence	3 < 4 Feet Maximum Residual Depth	3 < 4 Feet Percent Occurrence	>= 4 Feet Maximum Residual Depth	>= 4 Feet Percent Occurrence
2	MCP	67	0	0	1	50	1	50	0	0	0	0
1	STP	33	0	0	1	100	0	0	0	0	0	0

Total Units	Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1< 2 Foot Max Resid. Depth	Total 1< 2 Foot % Occurrence	Total 2< 3 Foot Max Resid. Depth	Total 2< 3 Foot % Occurrence	Total 3< 4 Foot Max Resid. Depth	Total 3< 4 Foot % Occurrence	Total >= 4 Foot Max Resid. Depth	Total >= 4 Foot % Occurrence
3	0	0	2	67	1	33	0	0	0	0

Mean Maximum Residual Pool Depth (ft.): 1.8

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

Stream Name: Ohman Creek

LLID: 1237681401933

Drainage: Eel River - South Fork

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

Dry Units: 1

Confluence Location: Quad: MIRANDA

Legal Description: T03SR04ES19

Latitude: 40:11:36.0N

Longitude: 123:46:05.0W

Habitat Units	Units Fully Measured	Habitat Type	Mean % Undercut Banks	Mean % SWD	Mean % LWD	Mean % Root Mass	Mean % Terr. Vegetation	Mean % Aquatic Vegetation	Mean % White Water	Mean % Boulders	Mean % Bedrock Ledges
4	1	LGR	0	0	0	0	0	0	0	100	0
4	2	HGR	0	0	0	0	0	0	13	88	0
2	0	CAS									
10	3	TOTAL RIFFLE	0	0	0	0	0	0	8	92	0
3	0	RUN									
3	0	TOTAL FLAT									
7	2	MCP	10	0	5	0	0	0	3	83	0
1	1	STP	0	0	0	0	0	0	20	80	0
8	3	TOTAL POOL	7	0	3	0	0	0	8	82	0
22	6	TOTAL	3	0	2	0	0	0	8	87	0



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

Stream Name: Ohman Creek

LLID: 1237681401933

Drainage: Eel River - South Fork

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

Dry Units: 1

Confluence Location: Quad: MIRANDA

Legal Description: T03SR04ES19

Latitude: 40:11:36.0N

Longitude: 123:46:05.0W

Habitat Units	Units Fully Measured	Habitat Type	% Total Silt/Clay Dominant	% Total Sand Dominant	% Total Gravel Dominant	% Total Small Cobble Dominant	% Total Large Cobble Dominant	% Total Boulder Dominant	% Total Bedrock Dominant
4	1	LGR	0	0	0	0	0	100	0
4	2	HGR	0	0	0	0	0	100	0
2	0	CAS	0	0	0	0	0	0	0
3	0	RUN	0	0	0	0	0	0	0
7	2	MCP	50	0	0	50	0	0	0
1	1	STP	0	0	100	0	0	0	0

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

Stream Name: Ohman Creek

LLID: 1237681401933

Drainage: Eel River - South Fork

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

Confluence Location: Quad: MIRANDA

Legal Description: T03SR04ES19

Latitude: 40:11:36.0N

Longitude: 123:46:05.0W

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
59	56	44	0	82	94

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.

Stream Name:	Ohman Creek	LLID:	1237681401933	Drainage:	Eel River - South Fork
Survey Dates:	7/3/2007 to 7/3/2007	Survey Length (ft.):	1929	Main Channel (ft.):	1748
				Side Channel (ft.):	181
Confluence Location:	Quad: MIRANDA	Legal Description:	T03SR04ES19	Latitude:	40:11:36.0N
				Longitude:	123:46:05.0W

STREAM REACH: 1									
Channel Type: C4			Canopy Density (%): 58.7				Pools by Stream Length (%): 20.7		
Reach Length (ft.): 1748			Coniferous Component (%): 56.4				Pool Frequency (%): 36.4		
Riffle/Flatwater Mean Width (ft.): 6.7			Hardwood Component (%): 43.6				Residual Pool Depth (%):		
BFW:			Dominant Bank Vegetation: Coniferous Trees				< 2 Feet Deep: 67		
Range (ft.): 43 to 60			Vegetative Cover (%): 87.9				2 to 2.9 Feet Deep: 33		
Mean (ft.): 51			Dominant Shelter: Boulders				3 to 3.9 Feet Deep: 0		
Std. Dev.: 8			Dominant Bank Substrate Type: Boulder				>= 4 Feet Deep: 0		
Base Flow (cfs.): 0.4			Occurrence of LWD (%): 2				Mean Max Residual Pool Depth (ft.): 1.8		
Water (F): 68 - 69			Air (F): 68 - 73				LWD per 100 ft.:		
Dry Channel (ft): 63			Riffles: 4				Mean Pool Shelter Rating: 27		
			Pools: 3						
			Flat: 1						
Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 67 Sm Cobble: 33 Lg Cobble: 0 Boulder: 0 Bedrock: 0									
Embeddedness Values (%): 1. 66.7 2. 33.3 3. 0.0 4. 0.0 5. 0.0									

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

Stream Name: Ohman Creek

LLID: 1237681401933

Drainage: Eel River - South Fork

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

Confluence Location: Quad: MIRANDA

Legal Description: T03SR04ES19

Latitude: 40:11:36.0N

Longitude: 123:46:05.0W

**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	0	0.0
Boulder	4	4	66.7
Cobble / Gravel	2	2	33.3
Sand / Silt / Clay	0	0	0.0

**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	1	0	8.3
Brush	0	0	0.0
Hardwood Trees	4	0	33.3
Coniferous Trees	1	6	58.3
No Vegetation	0	0	0.0

**Total Stream Cobble Embeddedness Values:** 1

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

StreamName: Ohman Creek

LLID: 1237681401933

Drainage: Eel River - South Fork

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

Confluence Location: Quad: MIRANDA

Legal Description: T03SR04ES19

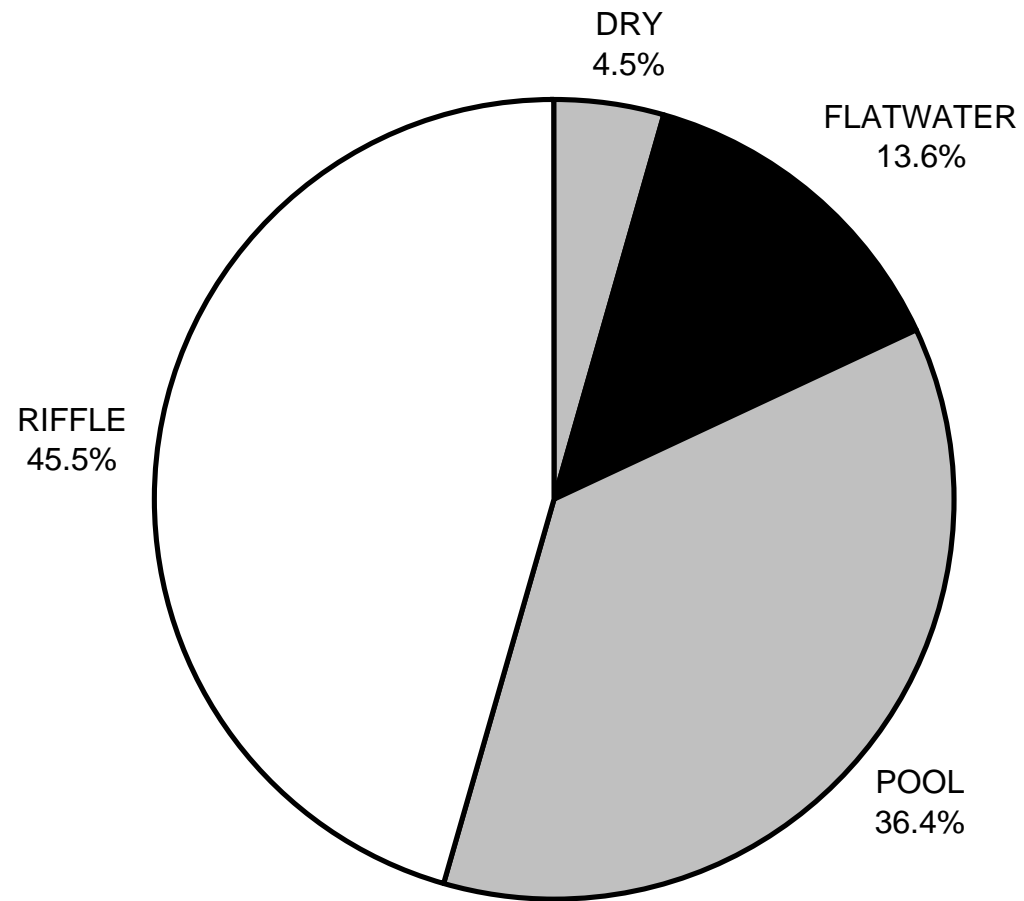
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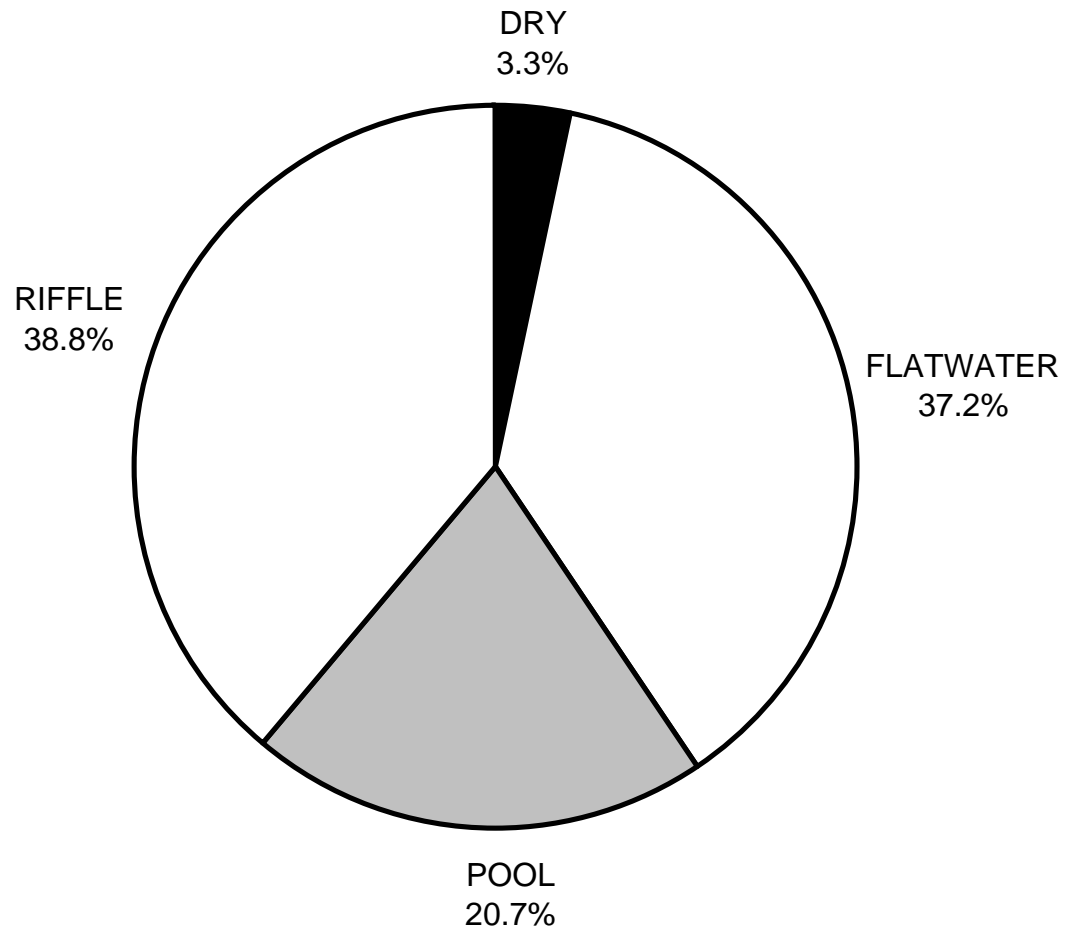
	<b>Riffles</b>	<b>Flatwater</b>	<b>Pools</b>
<hr/>			
UNDERCUT BANKS (%)	0		7
SMALL WOODY DEBRIS (%)	0		0
LARGE WOODY DEBRIS (%)	0		3
ROOT MASS (%)	0		0
TERRESTRIAL VEGETATION (%)	0		0
AQUATIC VEGETATION (%)	0		0
WHITEWATER (%)	8		8
BOULDERS (%)	92		82
BEDROCK LEDGES (%)	0		0

**OHMAN CREEK 2007**  
**HABITAT TYPES BY PERCENT OCCURRENCE**



GRAPH 1

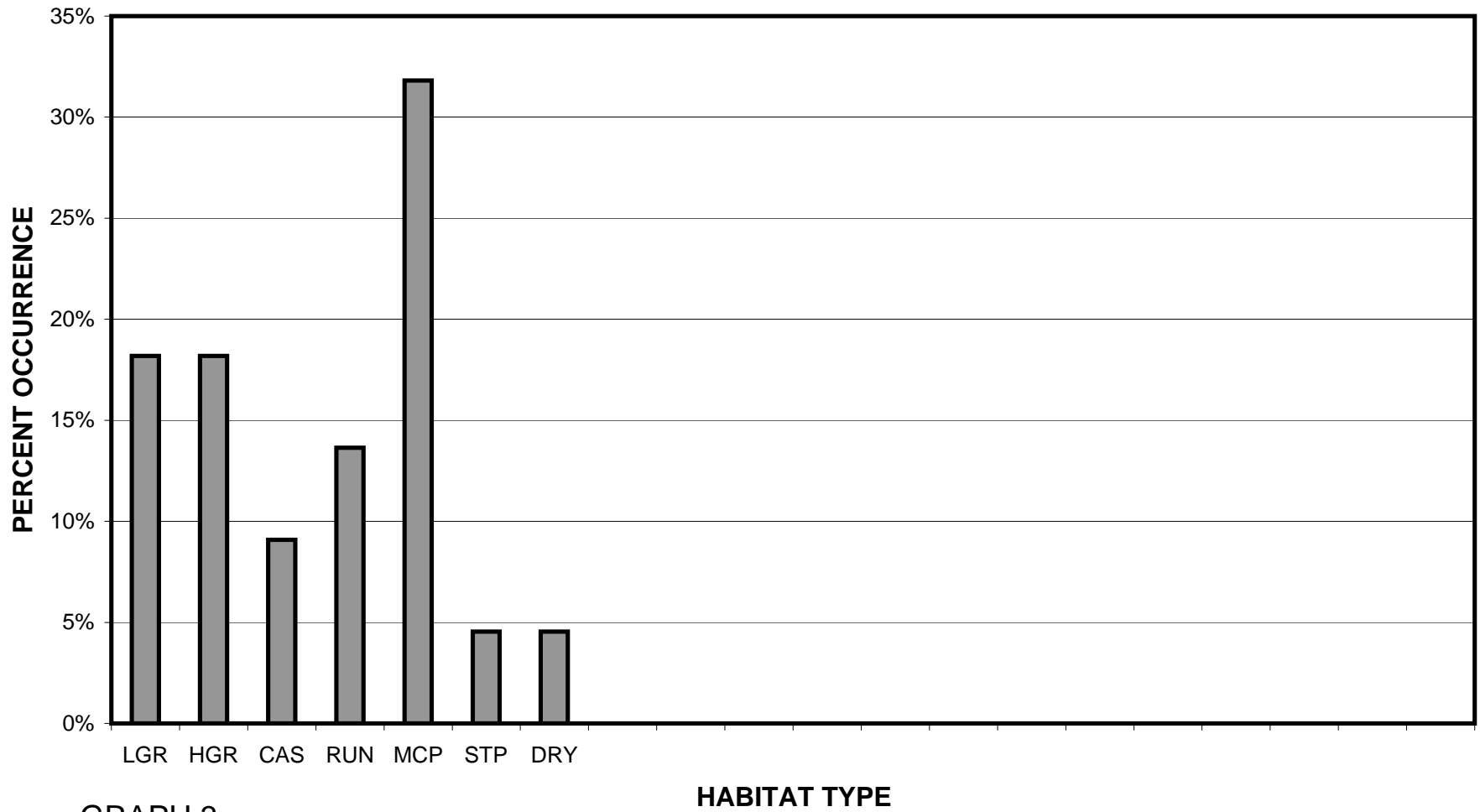
**OHMAN CREEK 2007**  
**HABITAT TYPES BY PERCENT TOTAL LENGTH**



GRAPH 2

# OHMAN CREEK 2007

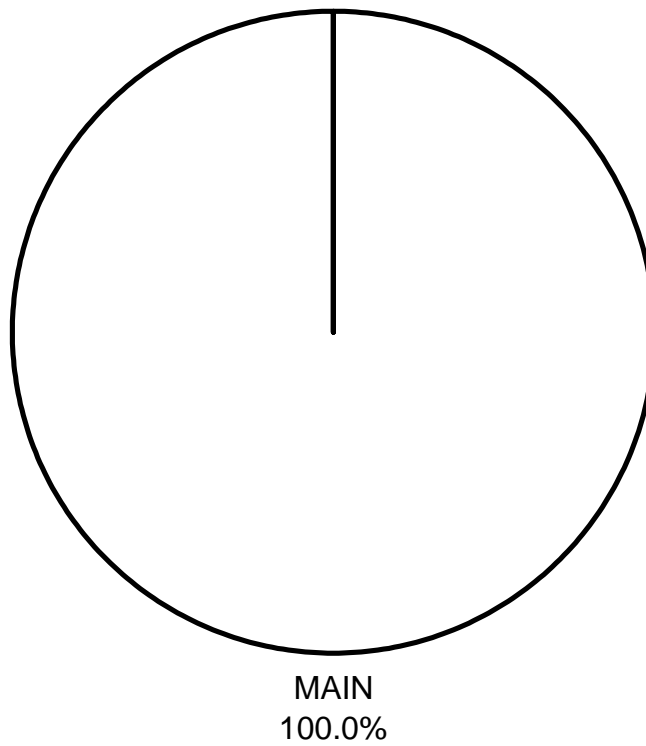
## HABITAT TYPES BY PERCENT OCCURRENCE



GRAPH 3

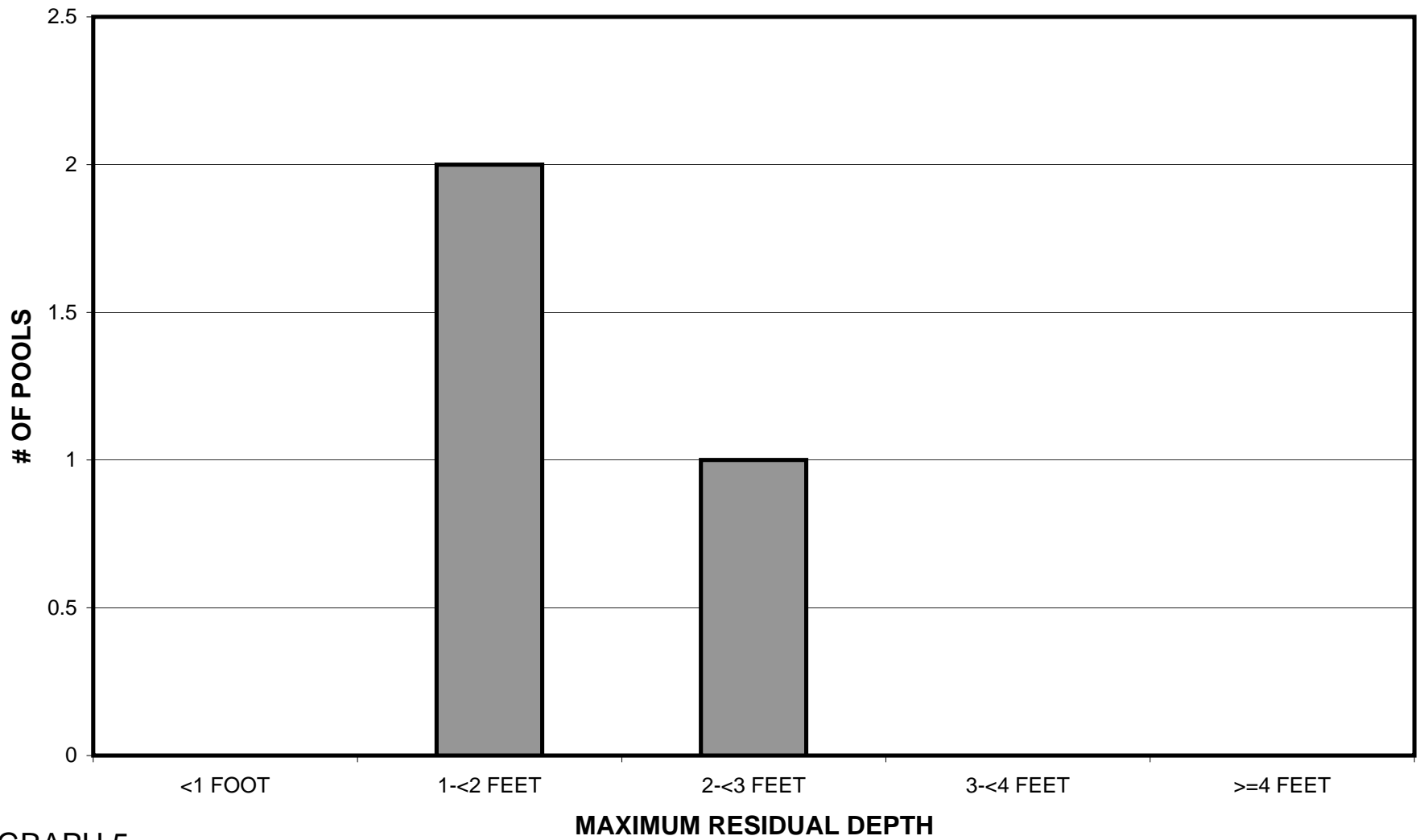


**OHMAN CREEK 2007**  
**POOL TYPES BY PERCENT OCCURRENCE**



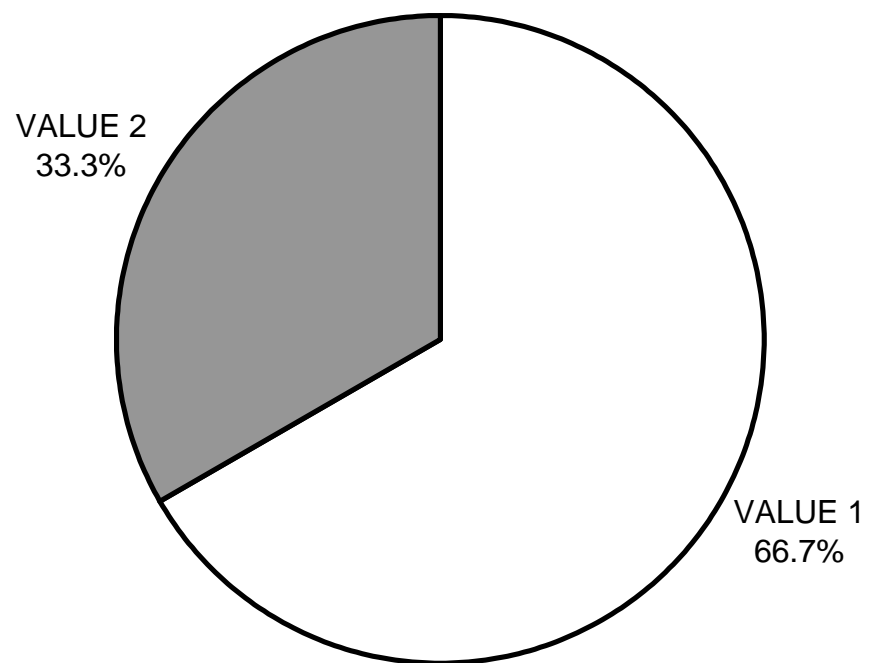
GRAPH 4

**OHMAN CREEK 2007  
MAXIMUM DEPTH IN POOLS**



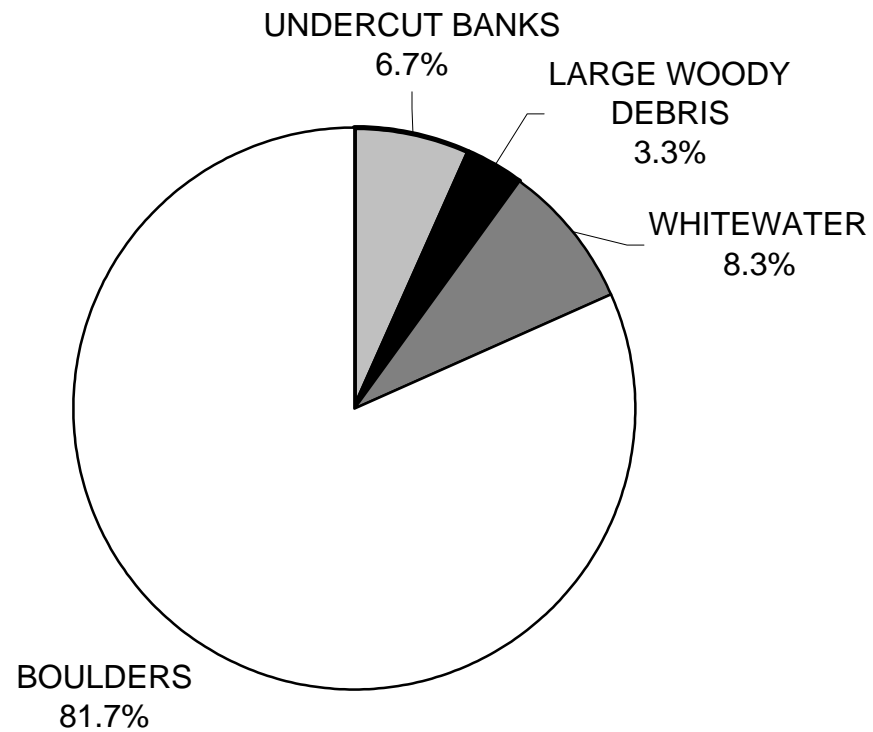
GRAPH 5

# OHMAN CREEK 2007 PERCENT EMBEDDEDNESS



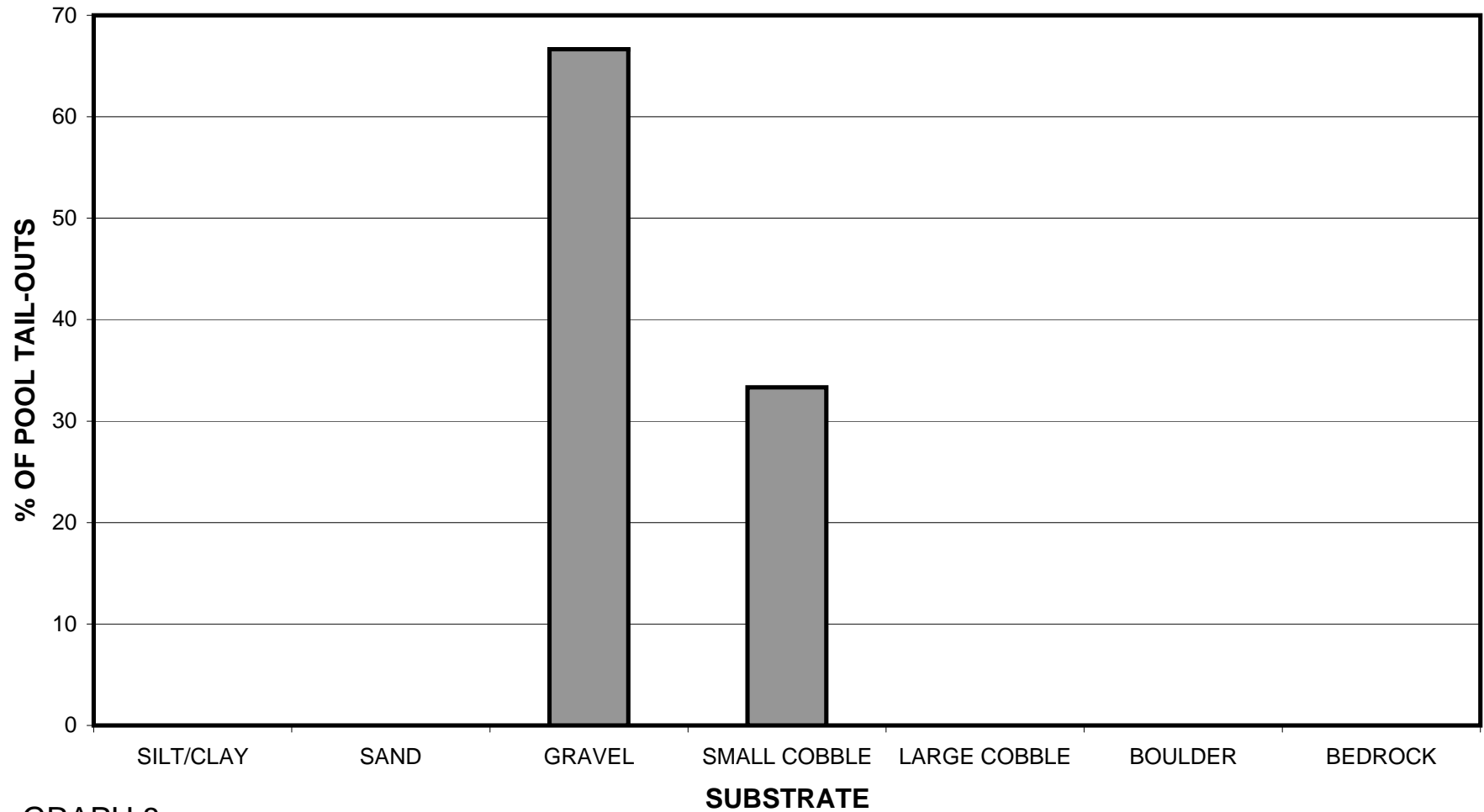
GRAPH 6

# OHMAN CREEK 2007 MEAN PERCENT COVER TYPES IN POOLS



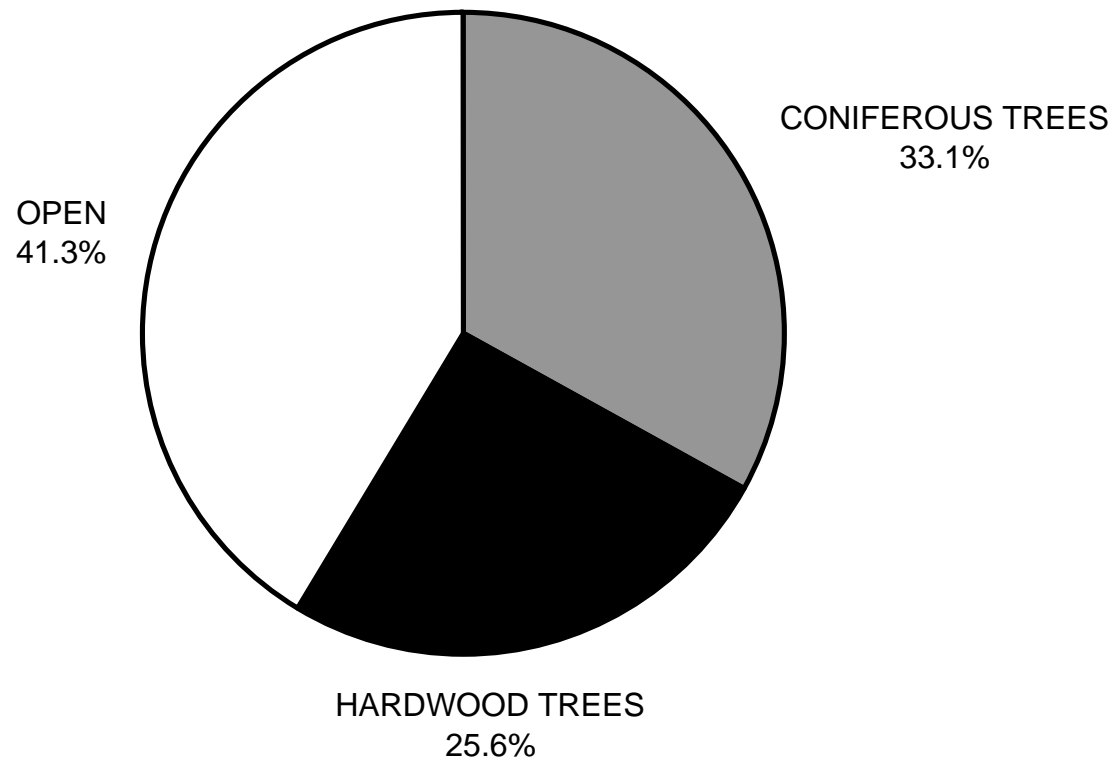
GRAPH 7

**OHMAN CREEK 2007**  
**SUBSTRATE COMPOSITION IN POOL TAIL-OUTS**



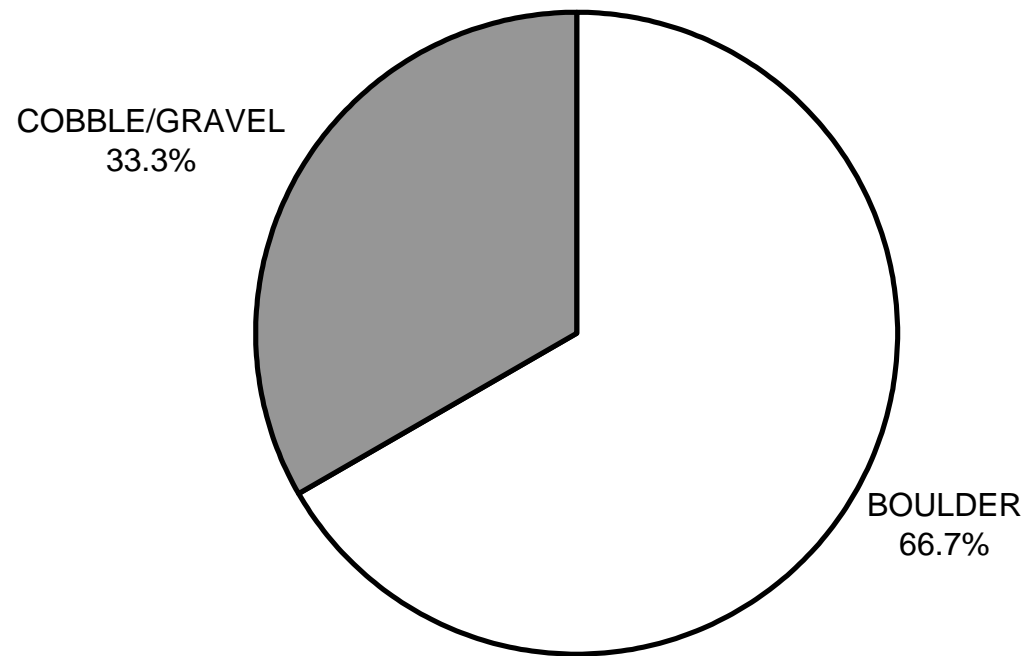
GRAPH 8

**OHMAN CREEK 2007  
MEAN PERCENT CANOPY**



GRAPH 9

**OHMAN CREEK 2007**  
**DOMINANT BANK COMPOSITION IN SURVEY REACH**



GRAPH 10

**OHMAN CREEK 2007**  
**DOMINANT BANK VEGETATION IN SURVEY REACH**



GRAPH 11