

STREAM INVENTORY REPORT

Coon Creek

INTRODUCTION

A stream inventory was conducted during June 20, 2007 to June 28, 2007 on Coon Creek. The survey began at the confluence with the South Fork Eel River and extended upstream 0.6 miles.

The Coon 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 Coon 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

Coon 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). Coon Creek's legal description at the confluence with the South Fork Eel River is T2S R3E S19. Its location is 40.2777 north latitude and 123.8877 west longitude, LLID number 1238877402778. Coon Creek is a first order stream and has approximately 1.7 miles of blue line stream according to the USGS Weott 7.5 minute quadrangle. Coon Creek drains a watershed of approximately 1.7 square miles. Elevations range from about 160 feet at the mouth of the creek to 2,000 feet in the headwater areas. Redwood forest dominates the watershed. The watershed is entirely owned by the California State Department of Parks and Recreation and is managed as a park. Vehicle access exists via Highway 101 to Myers Flat, then north approximately one mile on the Avenue of the Giants, to the Williams Grove picnic area. Then foot access is available from the picnic area, across the South Fork Eel River footbridge, to the mouth of Coon Creek.

METHODS

The habitat inventory conducted in Coon 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 Coon 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". Coon 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 Coon 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 Coon 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 Coon 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 Coon 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 Coon Creek. In addition, underwater observations were made at fourteen 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 Coon 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 20, 2007 to June 28, 2007 was conducted by M. Cavin and S. Truett (WSP). The total length of the stream surveyed was 3,006 feet with an additional 334 feet of side channel.

Stream flow was measured near the bottom of the survey reach with a Marsh-McBirney Model 2000 flowmeter at 0.53 cfs on July 2, 2007.

Coon Creek is an A3 channel type for the entire 3,006 feet of the stream surveyed (Reach 1).

A3 channel types are steep, narrow cascading, step-pool streams with have high-energy/debris transport associated with depositional soils and cobble-dominant substrates.

Water temperatures taken during the survey period ranged from 52 to 58 degrees Fahrenheit. Air temperatures ranged from 54 to 68 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 52% riffle units, 38% pool units, 9% flatwater units, and 1% dry units (Graph 1). Based on total length of Level II habitat types there were 76% riffle units, 16% pool units, 7% flatwater units, and 1% dry units (Graph 2).

Twelve Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were 44% high gradient riffle units, 20% mid-channel pool units, and 9% step pool units (Graph 3). Based on percent total length, high gradient riffle units made up 59%, low gradient riffle units 12%, and mid-channel pool units 7%.

A total of 32 pools were identified (Table 3). Main channel pools were the most frequently encountered, at 78% (Graph 4), and comprised 83% of the total length of all pools (Table 3).

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Table 4 is a summary of maximum residual pool depths by pool habitat types. Pool quality for salmonids increases with depth. One of the 32 pools (3%) had a residual depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 32 pool tail-outs measured, 12 had a value of 1 (37.5%); 8 had a value of 2 (25.0%); 7 had a value of 3 (21.9%); 1 had a value of 4 (3.1%) and 4 had a value of 5 (12.5%) (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 70, flatwater habitat types had a mean shelter rating of 59, and pool habitats had a mean shelter rating of 53 (Table 1). Of the pool types, scour pools had a mean shelter rating of 76 while main channel pools had a mean shelter rating of 46 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Boulders are the dominant cover types in Coon Creek. Graph 7 describes the pool cover in Coon 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 38% of pool tail-outs while large cobble was observed in 25% of pool tail-outs.

The mean percent canopy density for the surveyed length of Coon Creek was 92% (Table 7). Eight percent of the canopy was open. Of the canopy present, the mean percentages of hardwood and coniferous trees were 49% and 51%, respectively. Graph 9 describes the mean percent canopy in Coon Creek.

For the stream reach surveyed, the mean percent right bank vegetated was 64%. The mean percent left bank vegetated was 62% (Table 7). The dominant elements composing the structure of the stream banks consisted of 48% boulder, 41% cobble/gravel, 10% sand/silt/clay and 1% bedrock (Graph 10). Coniferous trees were the dominant vegetation type observed in 45% of the units surveyed. Additionally, 38% of the units surveyed had deciduous trees as the dominant vegetation type, 16% had grass as the dominant vegetation and 1% had brush (Graph 11).

BIOLOGICAL INVENTORY RESULTS

Fourteen sites were surveyed by snorkel survey for species composition and distribution in Coon Creek on September 25, 2007. Water temperatures taken during the survey period 0949 to 1212 ranged from 53 to 56 degrees Fahrenheit. Air temperatures ranged from 51 to 58 degrees Fahrenheit. The sites were sampled by T. Fisher (CCC) and P. Divine (DFG).

In reach 1, which comprised the first 3,006 feet of stream surveyed, fourteen sites were sampled. The reach sites yielded two young-of-the-year steelhead/rainbow trout (SH/RT), four age 1+ SH/RT, and one age 2+ SH/RT.

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The following chart displays the information yielded from these sites:

2007 Coon Creek Underwater Observations.

Date	Site #	Habitat Unit #	Habitat Type	Approx. distance from mouth (ft.)	Coho		SH/RT		
					YOY	1+	YOY	1+	2+
Reach 1: A3 Channel Type									
9/25/07	1	005	4.2	502	0	0	0	0	0
9/25/07	2	007	4.2	583	0	0	0	0	0
9/25/07	3	009	4.2	653	0	0	0	1	0
9/25/07	4	011	4.2	788	0	0	0	1	1
9/25/07	5	017	4.2	1,061	0	0	0	0	0
9/25/07	6	018	1.2	1,073	0	0	0	0	0
9/25/07	7	019	5.6	1,094	0	0	1	0	0
9/25/07	8	021	4.4	1,246	0	0	0	0	0
9/25/07	9	030	4.2	1,551	0	0	0	1	0
9/25/07	10	038	4.2	1,760	0	0	0	0	0
9/25/07	11	040	4.2	1,808	0	0	0	0	0
9/25/07	12	048	4.4	2,069	0	0	1	0	0
9/25/07	13	053	4.4	2,298	0	0	0	1	0
9/25/07	14	075	4.4	2,908	0	0	0	0	0

DISCUSSION

Coon Creek is an A3 channel type for the entire 3,006 feet of stream surveyed (Reach 1). The suitability of A3 channel types for fish habitat improvement structures is as follows: A3 channel types are not considered suitable for fish habitat improvement projects.

The water temperatures recorded on the survey days June 20, 2007 to June 28, 2007, ranged from 52 to 58 degrees Fahrenheit. Air temperatures ranged from 54 to 68 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.

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Flatwater habitat types comprised 7% of the total length of this survey, riffles 76%, and pools 16%. The pools are relatively shallow, with only 1 of the 32 (3%) 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 is not recommended due to the high gradient of the stream.

Twenty of the 32 pool tail-outs measured had embeddedness ratings of 1 or 2. Eight of the pool tail-outs had embeddedness ratings of 3 or 4. Four 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.

Fifteen of the 32 pool tail-outs had silt, sand, large cobble, boulders or bedrock as the dominant substrate. This is generally considered unsuitable for spawning salmonids.

The mean shelter rating for pools was 52. The shelter rating in the flatwater habitats was 59. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by boulders in Coon 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 92%. In general, revegetation projects are considered when canopy density is less than 80%.

The percentage of right and left bank covered with vegetation was moderately high at 64% and 62%, 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) Coon Creek should be managed as an anadromous, natural production stream.
- 2) 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.
- 3) 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.

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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 at the confluence with the South Fork Eel River.
422	0004.00	Coon creek left the influence of South Fork Eel River at this habitat unit.
880	0013.00	Log Debris Accumulation (LDA) #1 was about 11' high x 11' wide x 45' long and consisted of about five pieces of large woody debris (LWD). There were visible gaps and water flowed through the LDA. There was also sediment retention estimated to be about 11' wide x 11' long x 4.5' deep and the sediment size ranged from sand to large cobble
1094	0019.00	There was 3.5' plunge at the top of this unit.
1380	0025.00	There was a 1+ salmonid observed and a 1' plunge at the top of this unit.
1760	0038.00	There was a 5' plunge at the top of this unit.
1760	0038.00	LDA #2 was about 5' high x 10' wide x 6' long and consisted of three pieces of LWD. There were visible gaps in the LDA and water was flowing through it. There was also sediment retention that consisted of sand to large cobble; which was estimated to be about 14' wide x 11' long x 5' deep.
1930	0042.01	There was a 2' and 3' plunge.
1930	0043.00	There was a 1' and 2' plunge.
2148	0050.00	LDA #3 was about 5' high x 17' wide x 11' long and consisted of three pieces of LWD. There were visible gaps and water was flowing through the LDA. The LDA had sediment retention estimated of about 14' wide x 11' long x 4' deep and consisted of silt to large cobble substrates. The LDA could be a possible barrier to both juvenile and adult salmonids due to a 4' high plunge and lack of a jump pool.
2298	0053.00	LDA #4 was about 5.5' high x 19' wide x 8' long and consisted of one piece of LWD. There were visible gaps in the LDA and water was flowing through it. There was sediment retention estimated to be about 14' wide x 10' long x 5' deep and consisted of sand and small cobble substrates. The LDA could be a possible barrier to both juvenile and adult salmonids. There was a 1.5' and 3.5' plunge.
2390	0055.01	There was a seep on the right bank.

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2445	0059.00	There was erosion on the left bank that was 30' long x 50' high. This erosion continued through habitat unit #063. LDA #5 was about 8' high x 36' wide x 22' long and consisted of about 14 pieces of large woody debris. There were visible gaps in the LDA and water was flowing through it. The LDA had sediment retention estimated to be about 38' wide x 16' long x 8' deep and sediment sizes ranged from sand to gravel. The LDA could be a possible barrier to both juvenile and adult salmonids.
2725	0070.00	LDA #6 was about 30' high x 45' wide x 114' long and had about 49 pieces of LWD. There were visible gaps in the LDA and water was flowing through it. There was also sediment retention estimated to be about 45' wide x 114' long x 26' deep and sediments ranged from silt to boulder substrates. The LDA could be a possible barrier to both juvenile and adult salmonids during normal flows. Throughout the LDA, there were several shallow riffles and multiple plunges about 1' - 6' high. This LDA is a possible end of anadromy.
2839	0071.00	There was a 3' plunge.
2908	0075.00	There was a 2' plunge at bottom of this habitat unit.
3006	0079.00	The survey ended due to a 60% gradient and a 10' high plunge. A massive LDA was just upstream of the final habitat unit consisting of regular 10' high alternating plunges.

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 }

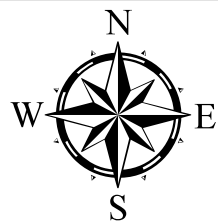
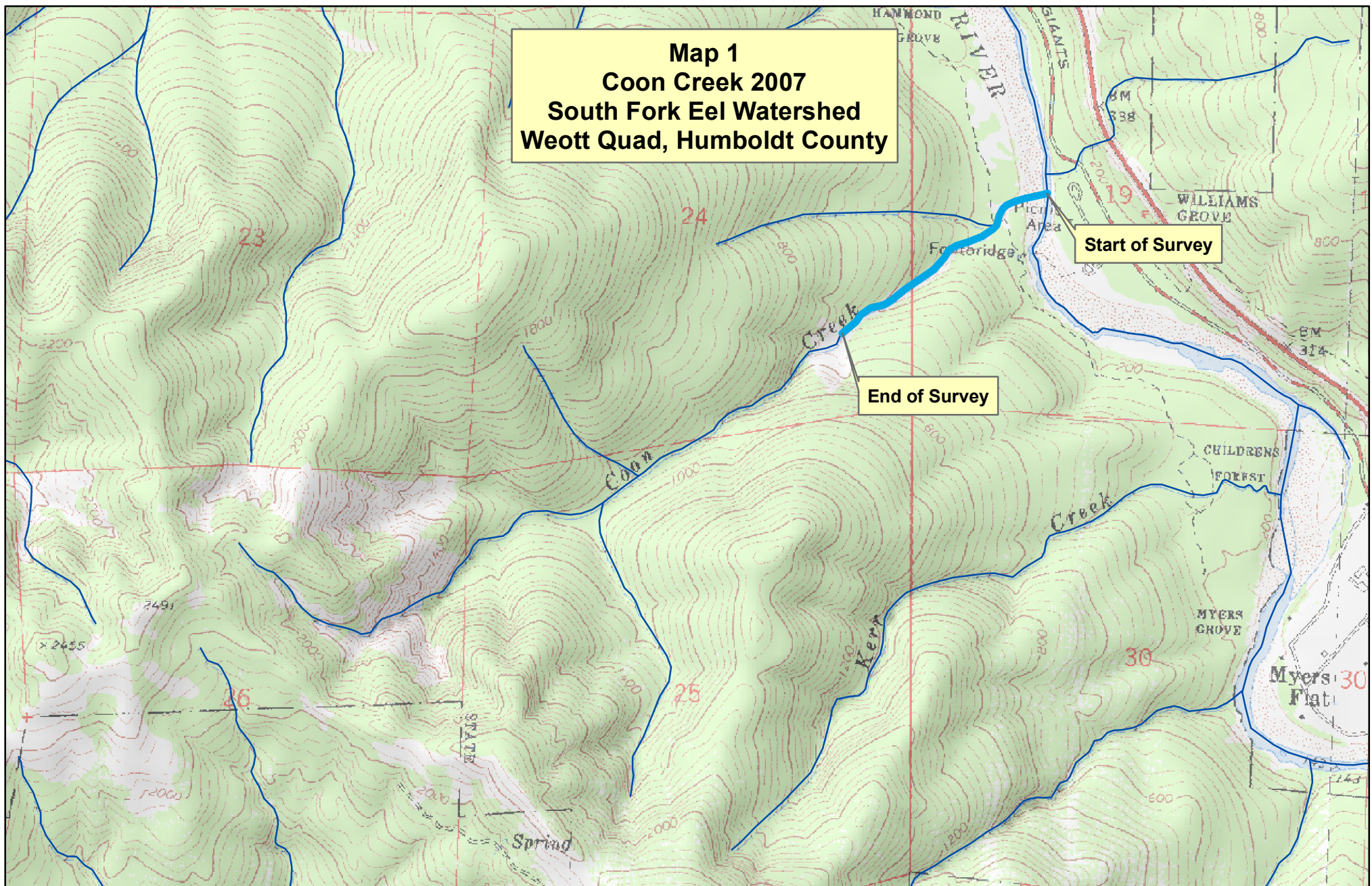
BACKWATER POOLS

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
Coon Creek 2007
South Fork Eel Watershed
Weott Quad, Humboldt County



Legend

 Reach 1, A3 Channel Type

0 1,000 2,000 4,000 Feet



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

Stream Name: Coon Creek

LLID: 1238877402778

Drainage: Eel River - South Fork

Survey Dates: 6/20/2007 to 6/28/2007

Confluence Location: Quad: WEOTT

Legal Description: T02SR03ES19

Latitude: 40:16:40.0N

Longitude: 123:53:16.0

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	1.2	36	36	1.1									
8	4	FLATWATER	9.4	28	227	6.8	8.5	0.8	1.2	127	1020	105	841		59
32	32	POOL	37.6	17	544	16.3	8.7	0.5	1.0	126	4026	137	4377	60	53
44	9	RIFFLE	51.8	58	2533	75.8	8.0	0.5	1.1	220	9693	142	6243		70
Total Units	Total Units Fully Measured			Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)			
85	45			3340						14739		11461			

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Coon Creek

LLID: 1238877402778

Drainage: Eel River - South Fork

Survey Dates: 6/20/2007 to 6/28/2007

Confluence Location: Quad: WEOTT

Legal Description: T02SR03ES19

Latitude: 40:16:40.0N

Longitude: 123:53:16.0W

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 (%)
2	0	LGR	2.4	195	390	11.7										73
37	7	HGR	43.5	54	1982	59.3	9	0.6	1.5	245	9050	159	5897		58	92
4	1	CAS	4.7	37	147	4.4	7	0.6	1.4	268	1071	161	643		75	98
1	1	BRS	1.2	14	14	0.4	0	0.2	0.3	3	3	1	1		160	86
2	2	RUN	2.4	14	27	0.8	10	0.9	1.3	120	240	108	216		20	88
5	1	SRN	5.9	37	183	5.5	7	0.8	1.3	157	784	125	627		180	97
1	1	EDW	1.2	17	17	0.5	7	0.7	0.9	113	113	79	79		15	97
17	17	MCP	20.0	14	237	7.1	8	0.5	1.9	103	1754	108	1840	48	44	93
8	8	STP	9.4	27	215	6.4	8	0.5	2.1	193	1547	227	1818	108	51	95
1	1	LSBo	1.2	14	14	0.4	4	0.4	0.8	50	50	71	71	20	120	82
6	6	PLP	7.1	13	78	2.3	11	0.3	1	113	675	108	648	34	68	87
1	0	DRY	1.2	36	36	1.1										

Total Units
85

Total Units Fully Measured
45

Total Length (ft.)
3340

Total Area (sq.ft.)
15287

Total Volume (cu.ft.)
11840

Table 3 - Summary of Pool Types

Stream Name: Coon Creek

LLID: 1238877402778

Drainage: Eel River - South Fork

Survey Dates: 6/20/2007 to 6/28/2007

Confluence Location: Quad: WEOTT

Legal Description: T02SR03ES19

Latitude: 40:16:40.0N

Longitude: 123:53:16.0W

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
25	25	MAIN	78	18	452	83	8.3	0.5	132	3301	67	1681	46
7	7	SCOUR	22	13	92	17	9.9	0.3	104	726	32	225	76
Total Units 32	Total Units Fully Measured 32				Total Length (ft.) 544					Total Area (sq.ft.) 4026		Total Volume (cu.ft.) 1906	

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

Stream Name: Coon Creek

LLID: 1238877402778

Drainage: Eel River - South Fork

Survey Dates: 6/20/2007 to 6/28/2007

Confluence Location: Quad: WEOTT

Legal Description: T02SR03ES19

Latitude: 40:16:40.0N

Longitude: 123:53:16.0W

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
17	MCP	53	9	53	8	47	0	0	0	0	0	0
8	STP	25	2	25	5	63	1	13	0	0	0	0
1	LSBo	3	1	100	0	0	0	0	0	0	0	0
6	PLP	19	5	83	1	17	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
32	17	53	14	44	1	3	0	0	0	0

Mean Maximum Residual Pool Depth (ft.): 1

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Coon Creek

LLID: 1238877402778

Drainage: Eel River - South Fork

Survey Dates: 6/20/2007 to 6/28/2007

Dry Units: 1

Confluence Location: Quad: WEOTT

Legal Description: T02SR03ES19

Latitude: 40:16:40.0N

Longitude: 123:53:16.0W

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
2	0	LGR									
37	8	HGR	0	18	22	3	8	0	29	20	0
4	1	CAS	0	5	10	0	10	0	50	25	0
1	1	BRS	0	0	0	0	0	0	100	0	0
44	10	TOTAL RIFFLE	0	15	19	3	7	0	39	19	0
2	2	RUN	3	0	0	0	48	0	30	20	0
5	1	SRN	0	5	0	0	85	0	5	5	0
1	1	EDW	0	5	10	0	0	0	15	70	0
8	4	TOTAL FLAT	1	3	3	0	45	0	20	29	0
17	17	MCP	8	7	3	11	2	0	26	43	0
8	8	STP	3	14	13	10	7	0	34	20	0
1	1	LSBo	10	0	30	0	20	0	20	20	0
6	6	PLP	7	5	0	0	0	0	45	43	0
32	32	TOTAL POOL	6	8	6	9	3	0	31	37	0
85	46	TOTAL	4	9	8	7	8	0	32	32	0

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Coon Creek

LLID: 1238877402778

Drainage: Eel River - South Fork

Survey Dates: 6/20/2007 to 6/28/2007

Dry Units: 1

Confluence Location: Quad: WEOTT

Legal Description: T02SR03ES19

Latitude: 40:16:40.0N

Longitude: 123:53:16.0W

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
2	0	LGR	0	0	0	0	0	0	0
37	8	HGR	0	0	0	13	63	25	0
4	1	CAS	0	0	0	0	0	100	0
1	1	BRS	0	0	0	0	0	0	100
2	2	RUN	0	50	0	0	50	0	0
5	1	SRN	0	0	0	0	0	100	0
1	1	EDW	0	0	0	0	100	0	0
17	17	MCP	6	18	6	6	18	47	0
8	8	STP	0	0	0	0	38	63	0
1	1	LSBo	0	100	0	0	0	0	0
6	6	PLP	0	17	17	0	50	17	0

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: Coon Creek

LLID: 1238877402778

Drainage: Eel River - South Fork

Survey Dates: 6/20/2007 to 6/28/2007

Confluence Location: Quad: WEOTT

Legal Description: T02SR03ES19

Latitude: 40:16:40.0N

Longitude: 123:53:16.0W

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
92	51	49	0	64	62

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: Coon Creek	LLID: 1238877402778	Drainage: Eel River - South Fork
Survey Dates: 6/20/2007 to 6/28/2007	Survey Length (ft.): 3340	Main Channel (ft.): 3006
		Side Channel (ft.): 334
Confluence Location: Quad: WEOTT	Legal Description: T02SR03ES19	Latitude: 40:16:40.0N
		Longitude: 123:53:16.0W

STREAM REACH: 1									
Channel Type:	A3				Canopy Density (%):	91.8		Pools by Stream Length (%):	16.3
Reach Length (ft.):	3006				Coniferous Component (%):	51.2		Pool Frequency (%):	37.6
Riffle/Flatwater Mean Width (ft.):	8.2				Hardwood Component (%):	48.8		Residual Pool Depth (%):	
BFW:					Dominant Bank Vegetation:	Coniferous Trees		< 2 Feet Deep:	97
Range (ft.):	11	to	23		Vegetative Cover (%):	63.1		2 to 2.9 Feet Deep:	3
Mean (ft.):	17				Dominant Shelter:	Boulders		3 to 3.9 Feet Deep:	0
Std. Dev.:	4				Dominant Bank Substrate Type:	Boulder		>= 4 Feet Deep:	0
Base Flow (cfs.):	0.5				Occurrence of LWD (%):	8		Mean Max Residual Pool Depth (ft.):	1.0
Water (F):	52 - 58	Air (F):	54 - 68		LWD per 100 ft.:			Mean Pool Shelter Rating:	53
Dry Channel (ft):	36				Riffles:	6			
					Pools:	6			
					Flat:	4			
Pool Tail Substrate (%):	Silt/Clay: 0	Sand: 13	Gravel: 38	Sm Cobble: 16	Lg Cobble: 25	Boulder: 9	Bedrock: 0		
Embeddedness Values (%):	1. 37.5	2. 25.0	3. 21.9	4. 3.1	5. 12.5				

Table 9 - Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Coon Creek

LLID: 1238877402778

Drainage: Eel River - South Fork

Survey Dates: 6/20/2007 to 6/28/2007

Confluence Location: Quad: WEOTT

Legal Description: T02SR03ES19

Latitude: 40:16:40.0N

Longitude: 123:53:16.0W

Mean Percentage of Dominant Stream Bank Substrate

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Bedrock	1	0	1.1
Boulder	22	22	47.8
Cobble / Gravel	19	19	41.3
Sand / Silt / Clay	4	5	9.8

Mean Percentage of Dominant Stream Bank Vegetation

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Grass	6	9	16.3
Brush	1	0	1.1
Hardwood Trees	17	18	38.0
Coniferous Trees	22	19	44.6
No Vegetation	0	0	0.0

Total Stream Cobble Embeddedness Values:

2

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

StreamName: Coon Creek

LLID: 1238877402778

Drainage: Eel River - South Fork

Survey Dates: 6/20/2007 to 6/28/2007

Confluence Location: Quad: WEOTT

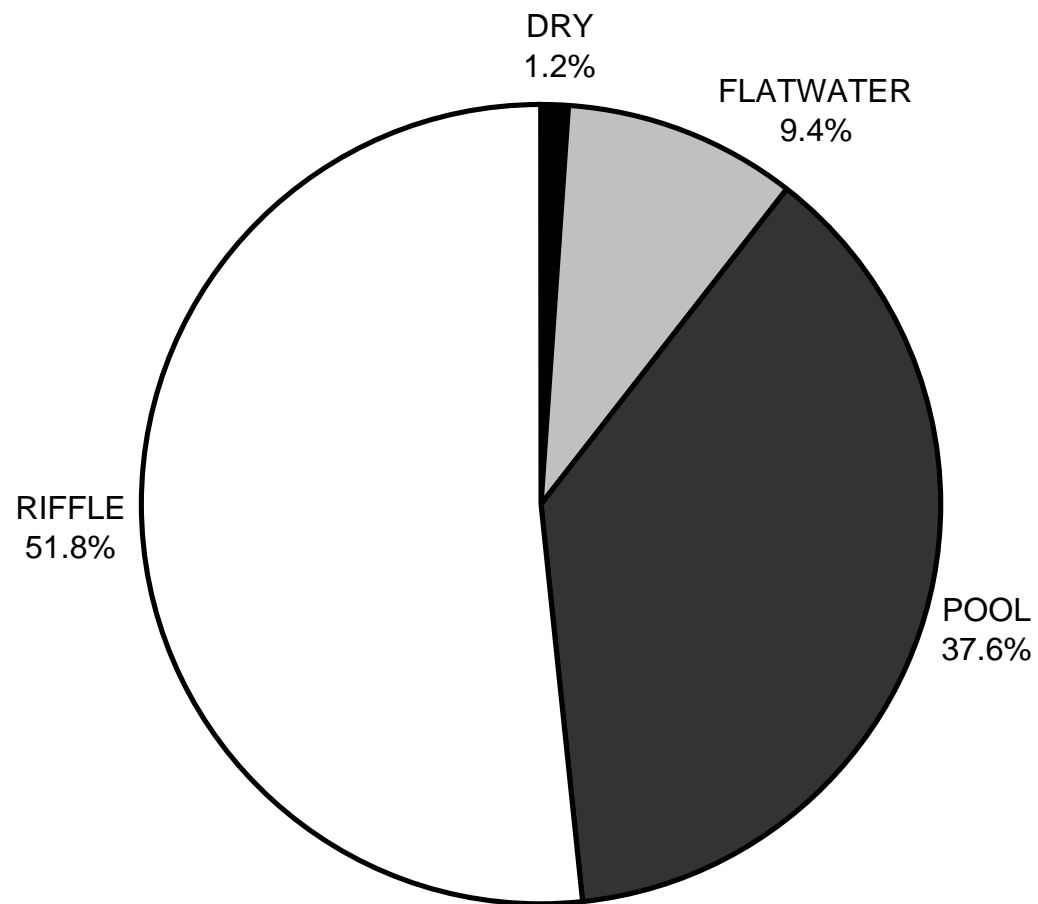
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Longitude: 123:53:16.0W

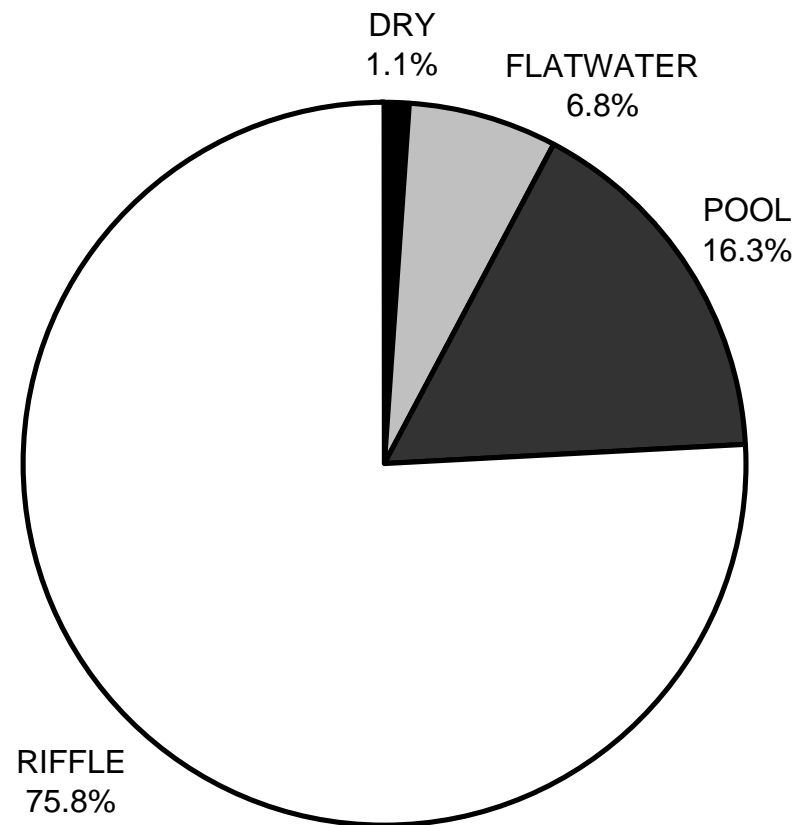
	Riffles	Flatwater	Pools
<hr/>			
UNDERCUT BANKS (%)	0	1	6
SMALL WOODY DEBRIS (%)	15	3	8
LARGE WOODY DEBRIS (%)	19	3	6
ROOT MASS (%)	3	0	9
TERRESTRIAL VEGETATION (%)	7	45	3
AQUATIC VEGETATION (%)	0	0	0
WHITEWATER (%)	39	20	31
BOULDERS (%)	19	29	37
BEDROCK LEDGES (%)	0	0	0

COON CREEK 2007
HABITAT TYPES BY PERCENT OCCURRENCE



GRAPH 1

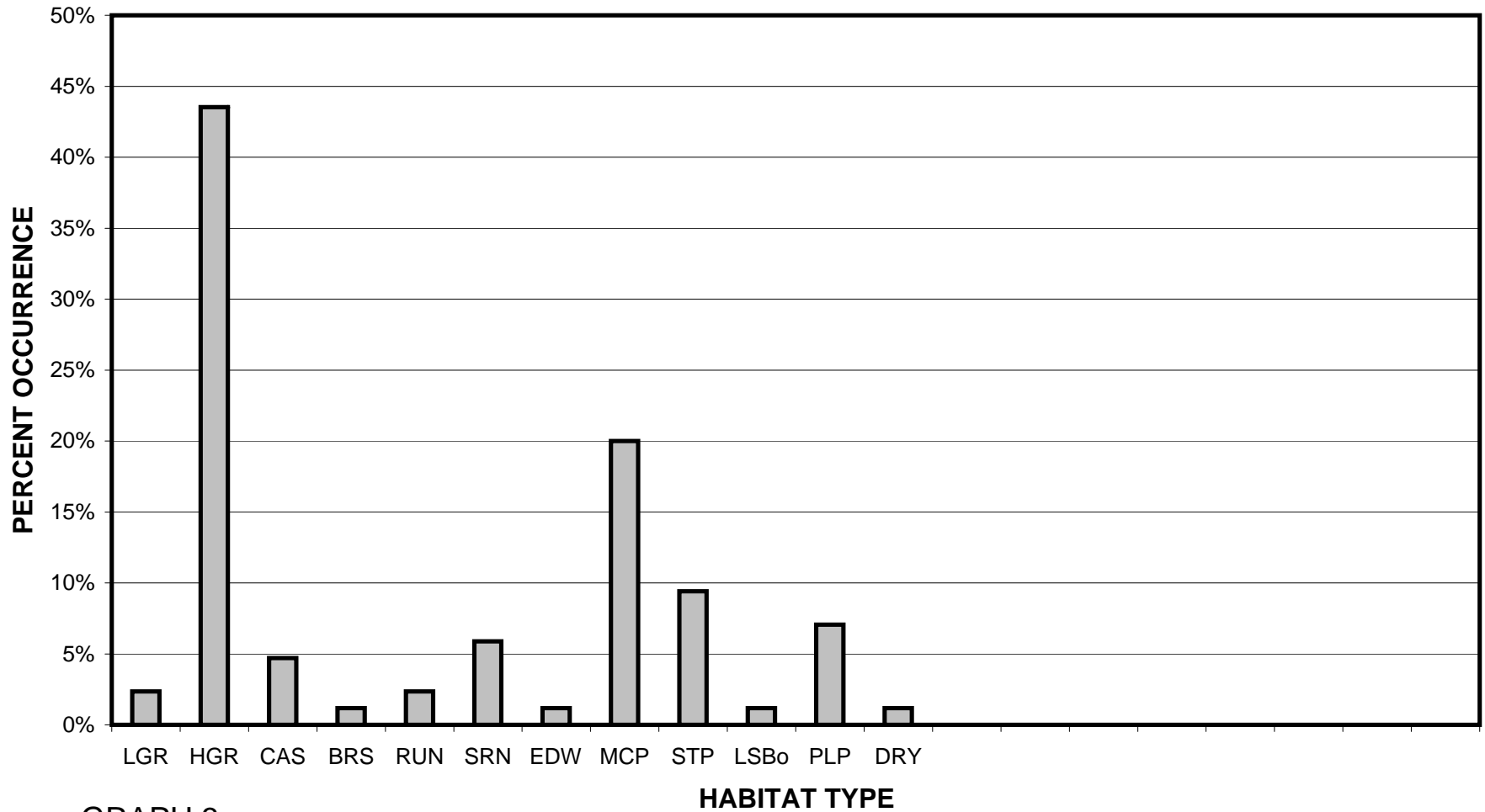
COON CREEK 2007
HABITAT TYPES BY PERCENT TOTAL LENGTH



GRAPH 2

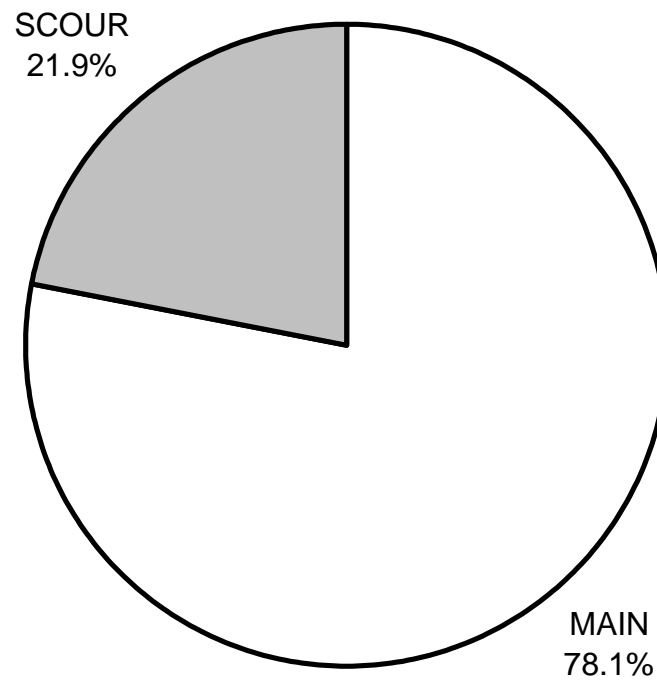
COON CREEK 2007

HABITAT TYPES BY PERCENT OCCURRENCE



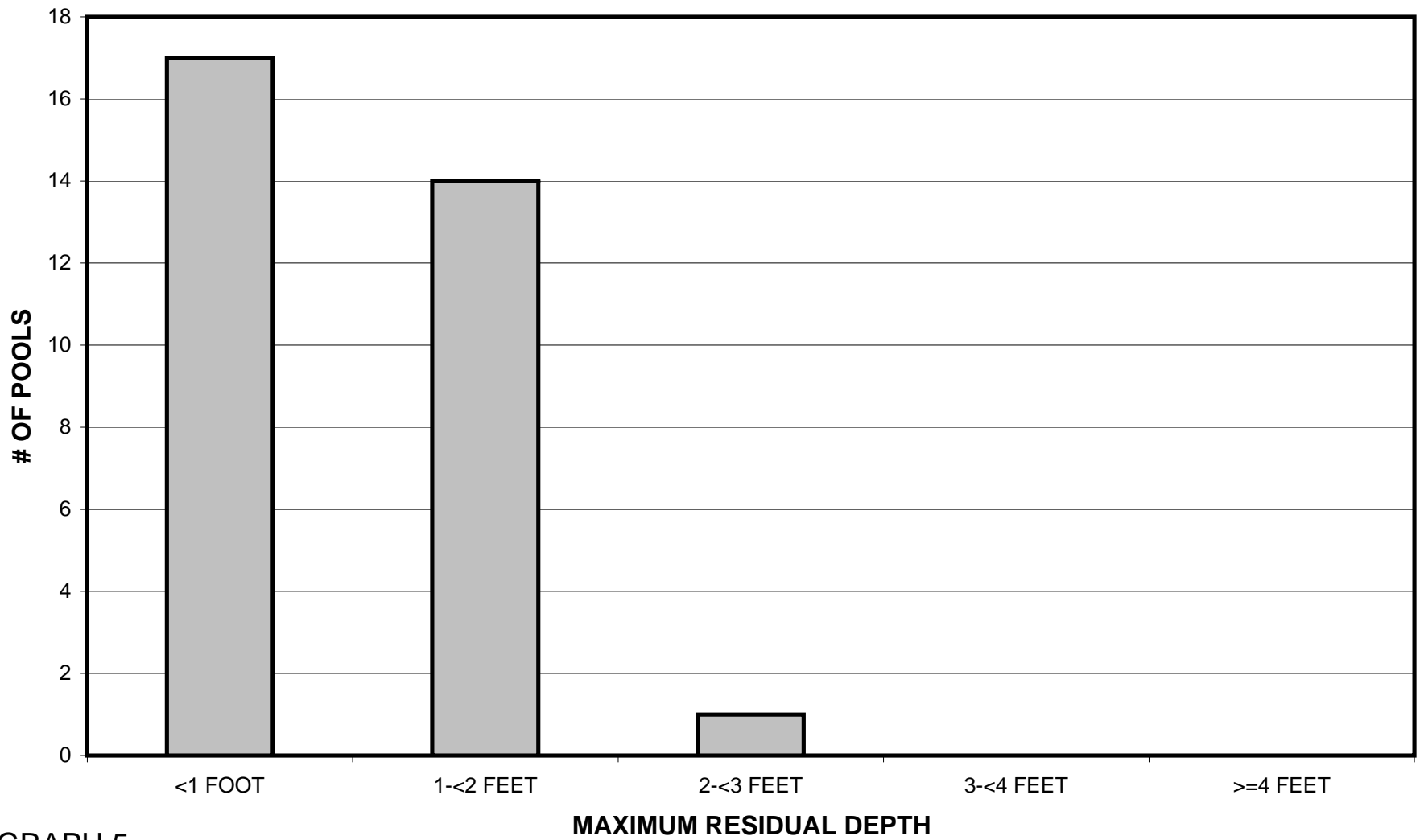
GRAPH 3

COON CREEK 2007
POOL TYPES BY PERCENT OCCURRENCE



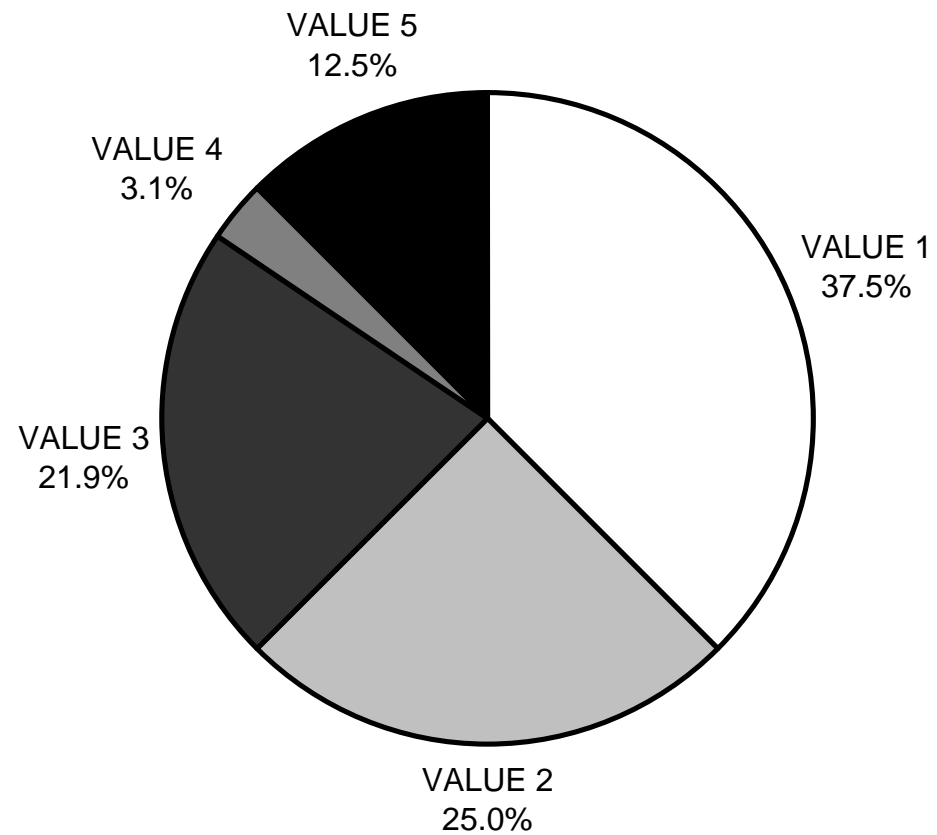
GRAPH 4

COON CREEK 2007 MAXIMUM DEPTH IN POOLS



GRAPH 5

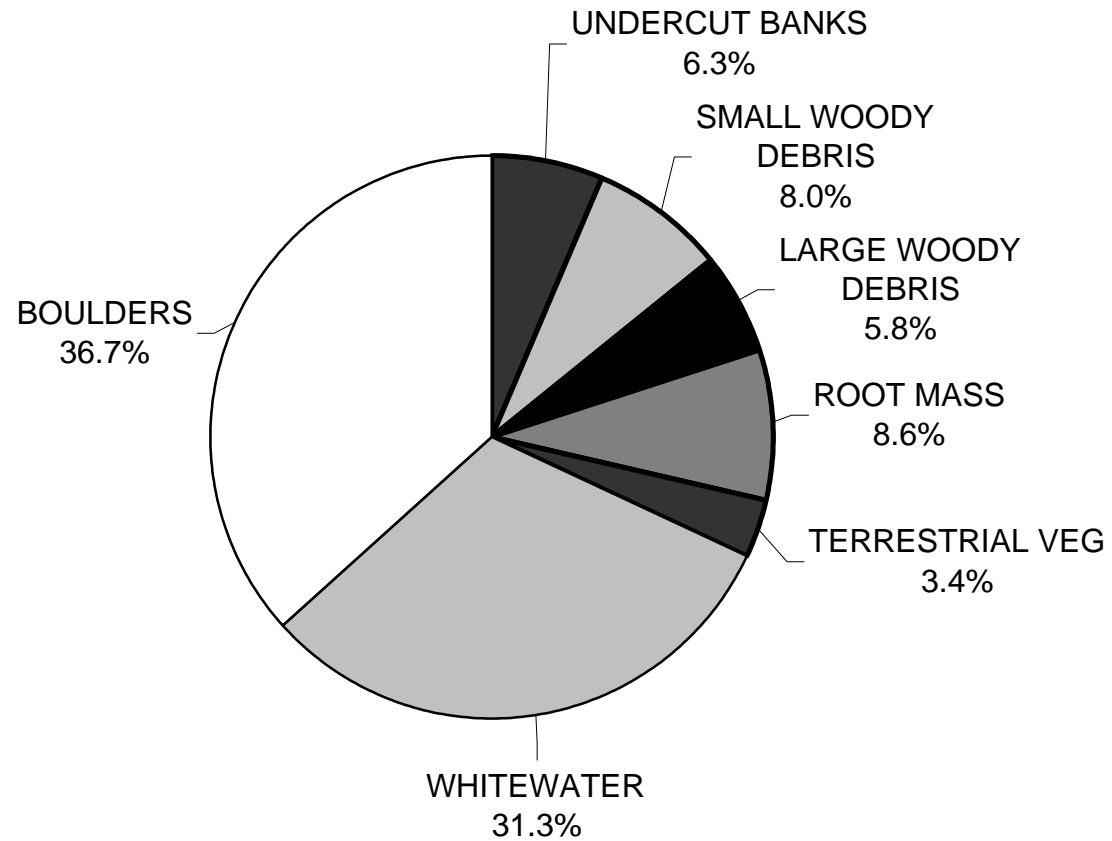
COON CREEK 2007 PERCENT EMBEDDEDNESS



GRAPH 6

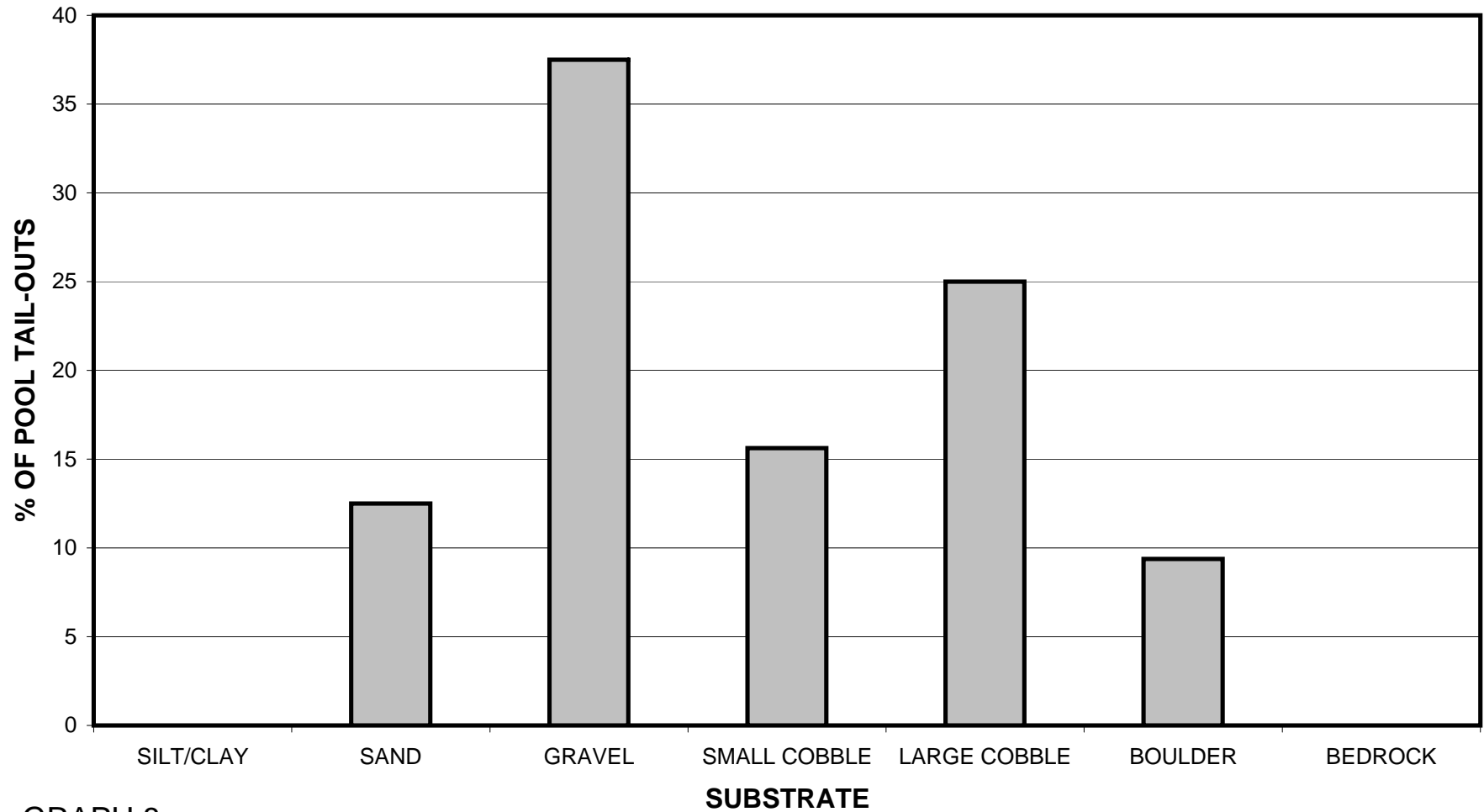
COON CREEK 2007

MEAN PERCENT COVER TYPES IN POOLS



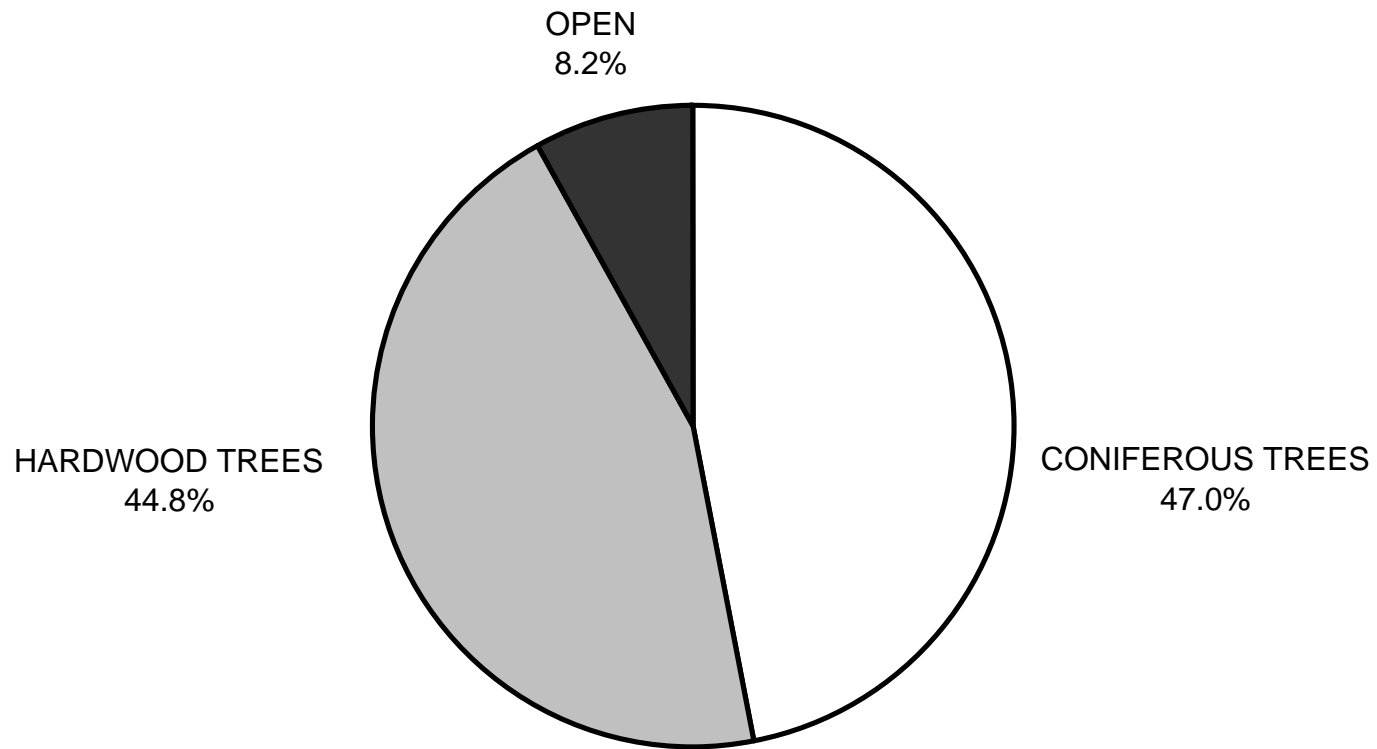
GRAPH 7

COON CREEK 2007
SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



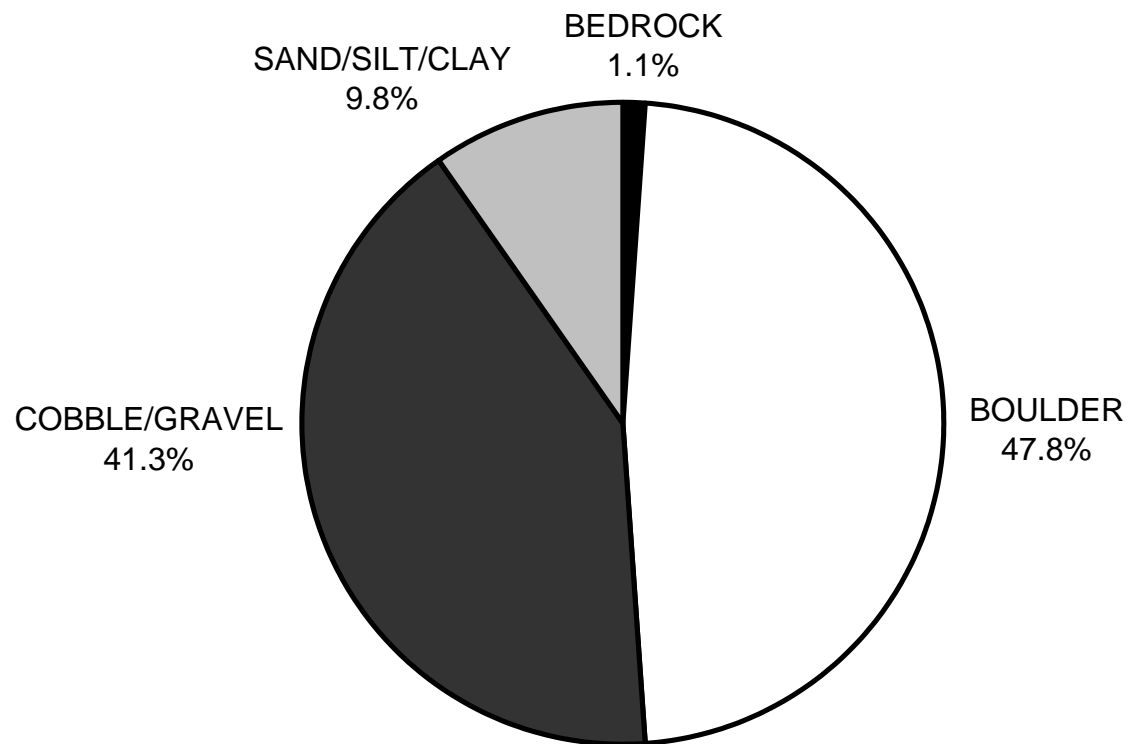
GRAPH 8

**COON CREEK 2007
MEAN PERCENT CANOPY**



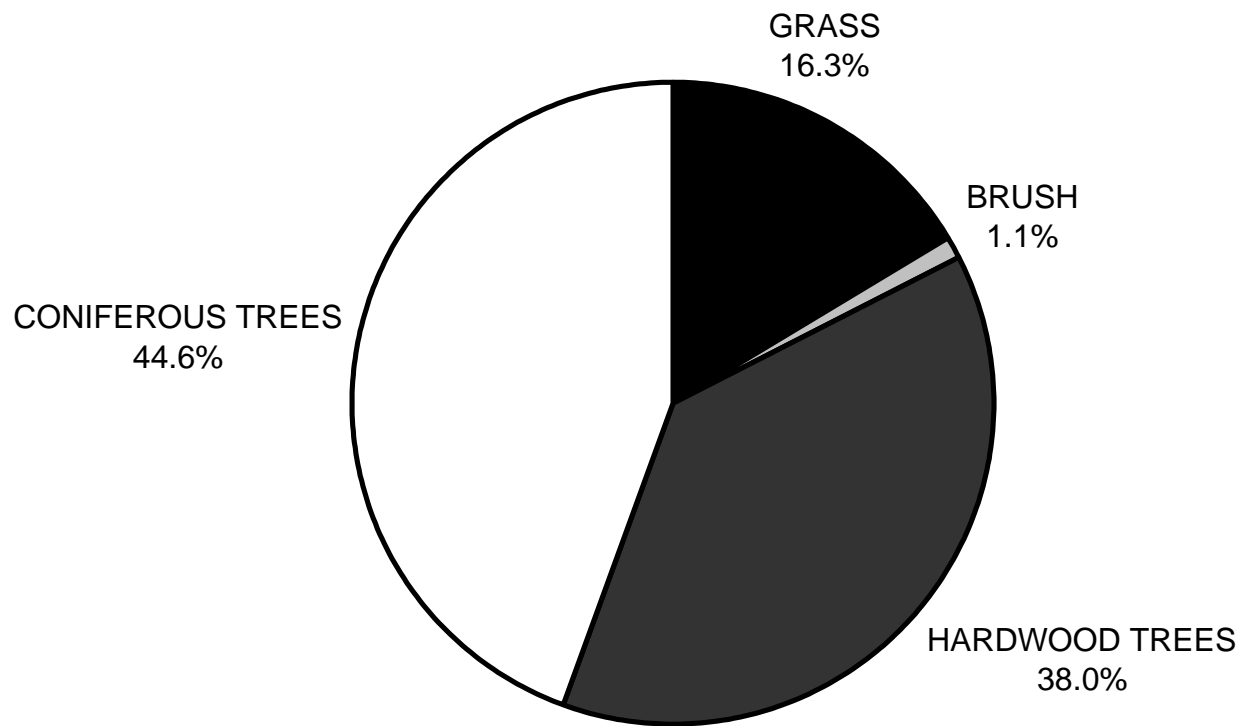
GRAPH 9

COON CREEK 2007
DOMINANT BANK COMPOSITION IN SURVEY REACH



GRAPH 10

COON CREEK 2007
DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11