

# STREAM INVENTORY REPORT

## Noisy Creek

### INTRODUCTION

A stream inventory was conducted on July 10, 2007 on Noisy Creek. The survey began at the confluence with Hall Creek and extended upstream 1.3 miles.

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

A biological survey of Noisy Creek was last conducted in 2003 to document the presence of juvenile salmonid species. Findings from that survey will also be included in this report.

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

Noisy Creek is a tributary to Hall Creek, tributary to Mad River, which drains to the Pacific Ocean, located in Humboldt County, California (Map 1). Noisy Creek's legal description at the confluence with Hall Creek is T6N R1E S13. Its location is 40.9004 north latitude and 124.0092 west longitude, LLID number 1240080409004. Noisy Creek is a first order stream and has approximately 4,815 miles of blue line stream according to the USGS Arcata North 7.5 minute quadrangle. Noisy Creek drains a watershed of approximately 1.1 square miles. Elevations range from about 80 feet at the mouth of the creek to 1,000 feet in the headwater areas. Redwood forest dominates the watershed. The watershed is primarily privately owned and is managed for timber production. Vehicle access exists via Highway 299 near Glendale.

### METHODS

The habitat inventory conducted in Noisy 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

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crest (measured in the thalweg), dominant substrate composing the pool tail crest, and embeddedness. Habitat unit types encountered for the first time are measured for all the parameters and characteristics on the field form. Additionally, from the ten habitat units on each field form page, one is randomly selected for complete measurement.

### HABITAT INVENTORY COMPONENTS

A standardized habitat inventory form has been developed for use in California stream surveys and can be found in the *California Salmonid Stream Habitat Restoration Manual*. This form was used in Noisy 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 were not measured during this survey.

#### 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". Noisy 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 Noisy Creek, embeddedness was

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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 Noisy Creek, a standard qualitative shelter value of 0 (none), 1 (low), 2 (medium), or 3 (high) was assigned according to the complexity of the cover. Thus, shelter ratings can range from 0-300 and are expressed as mean values by habitat types within a stream.

### 7. Substrate Composition:

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

### 8. Canopy:

Stream canopy density was estimated using modified handheld spherical densimeters as described in the *California Salmonid Stream Habitat Restoration Manual*. Canopy density relates to the amount of stream shaded from the sun. In Noisy 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 Noisy 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:

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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 is used to determine fish species and their distribution in the stream. Detailed biological sampling (electrofishing and/or underwater observation) was not conducted on Noisy Creek during the 2007 survey. Fish presence was observed from the stream banks during the 2007 habitat typing on Noisy Creek. Data from an August 13, 2003 backpack electrofishing survey is listed in the Biological Inventory Results section of this report. These sampling 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

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Graphics are produced from the tables using Microsoft Excel. Graphics developed for Noisy 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 July 10, 2007, was conducted by K. Lindke and H. Sgalitzer (WSP). The total length of the stream was 6,825 feet with an additional 58 feet of side channel. The first 3,850 feet of Noisy Creek was not surveyed due to lack of landowner access permission. The data included in this report is for the 3,033 feet actually surveyed.

Stream flow was not measured on Noisy Creek.

The channel type for the first 3,850 feet of Noisy Creek was undetermined (Reach 1). This area is a low gradient meandering channel that flows through open pastureland and empties into Hall Creek near the confluence with Mad River. Noisy Creek is a B4 channel type for the next 2,380 feet of the stream surveyed (Reach 2), an F4 channel type for 352 feet of the stream surveyed (Reach 3), and a B2 channel type for 301 feet of the stream surveyed (Reach 4).

B4 channels are moderately entrenched, riffle dominated channels with infrequently spaced pools, very stable plan and profile, stable banks on moderate gradients with low width /depth ratios and gravel-dominant substrates. F4 channels are entrenched, meandering, riffle/pool channels on low gradients with high width/depth ratios and gravel-dominant substrates. B2 channels are moderately entrenched riffle dominated channels with infrequently spaced pools, very stable plan and profile, stable banks on moderate gradients with low width /depth ratios and boulder-dominant substrates.

Water and air temperatures were not taken during this survey.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of

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occurrence there were 38% riffle units, 26% pool units, 21% flatwater units, 13% dry units, and 3% no survey units (Graph 1). Based on total length of Level II habitat types there were 47% dry units, 32% riffle units, 12% pool units, and 9% flatwater units (Graph 2).

Nine Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were 33% low gradient riffle units, 18% mid-channel pool units, and 15% run units (Graph 3). Based on percent total length of surveyed stream, dry units made up 47%, low gradient riffle units 23% and mid-channel pool units 9%.

A total of 10 pools were identified (Table 3). Main channel pools were the most frequently encountered, at 70% (Graph 4), and comprised 78% 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. Three of the 10 pools (30%) had a residual depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 10 pool tail-outs measured, 5 had a value of 2 (50%); 4 had a value of 3 (40%); 1 had a value of 4 (10%) (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 15, flatwater habitat types had a mean shelter rating of 3, and pool habitats had a mean shelter rating of 34 (Table 1). Of the pool types, the main channel pools had a mean shelter rating of 29 and scour pools had a mean shelter rating of 45 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Undercut banks are the dominant cover types in Noisy Creek. Graph 7 describes the pool cover in Noisy Creek. Undercut banks are the dominant pool cover type followed by root mass.

Table 6 summarizes the dominant substrate by habitat type. Graph 8 depicts the dominant substrate observed in pool tail-outs. Gravel was observed in 70% of pool tail-outs, a silt/clay substrate type was observed in 10% of pool tail-outs, sand was observed in 10% of pool tail-outs, and small cobble observed in 10% of pool tail-outs.

The mean percent canopy density for the surveyed length of Noisy Creek was 95%. Five 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 Noisy Creek.

For the stream reach surveyed, the mean percent right bank vegetated was 93%. The mean percent left bank vegetated was 83%. The dominant elements composing the structure of the stream banks consisted of 45% sand/silt/clay, 39% cobble/gravel, 13% boulder, and 3% bedrock (Graph 10). Deciduous trees were the dominant vegetation type observed in 53% of the units

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surveyed. Additionally, 39% of the units surveyed had brush as the dominant vegetation type, 5% of the units surveyed had coniferous trees as the dominant vegetation type, and 3% had grass as the dominant vegetation (Graph 11).

### BIOLOGICAL INVENTORY RESULTS

Noisy Creek was biologically sampled on August 13, 2003, by the California Department of Fish and Game for fish presence and identification. Using the backpack electrofisher 26 coho and 1 steelhead rainbow trout were captured and identified during the survey. The survey began approximately 5,785 feet upstream from the confluence with Hall Creek and ended at approximately 7,128 feet upstream of the confluence.

### DISCUSSION

Noisy Creek channel type was undetermined for the first 3,850 feet of stream, a B4 channel type for the next 2,380 feet surveyed, an F4 channel type for the next 352 feet, and a B2 channel type for the remaining 301 feet. The suitability of B4, F4, and B2 channel types for fish habitat improvement structures is as follows: B4 channel types are excellent for low-stage plunge weirs, boulder clusters, bank placed boulders, log cover, and single and opposing wing-deflectors. F4 channel types are good for bank-placed boulders and fair for plunge weirs, single and opposing wing-deflectors, channel constrictors, and log cover. B2 channel types excellent for plunge weirs, log cover, and single and opposing wing-deflectors.

The water and air temperatures were not recorded on the survey day of July 10, 2007.

Flatwater habitat types comprised 9% of the total length of this survey, riffles 32%, and pools 12%. Three of the 10 (30%) pools had a maximum residual depth greater than 2 feet. In general, pool enhancement projects are considered when primary pools comprise less than 40% of the length of total stream habitat. In first and second order streams, a primary pool is defined to have a maximum residual depth of at least two feet, occupy at least half the width of the low flow channel, and be as long as the low flow channel width. Installing structures that will increase or deepen pool habitat is recommended.

Five of the 10 pool tail-outs measured had embeddedness ratings of 1 or 2. Five of the pool tail-outs had embeddedness ratings of 3 or 4. None 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. Sediment sources in Noisy Creek should be mapped and rated according to their potential sediment yields, and control measures should be taken.

Eight of the 10 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 34. The shelter rating in the flatwater habitats was 3. A

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pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by undercut banks in Noisy Creek. Undercut banks are the dominant cover type in pools followed by root mass. 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 95%. Reach 2 had a canopy density of 94.6%, reach 4 had a canopy density of 93.3%, and reach 5 had a canopy density of 100%. In general, revegetation projects are considered when canopy density is less than 80%.

The percentage of right and left bank covered with vegetation was 93% and 83%, 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) Noisy Creek should be managed as an anadromous, natural production stream.
- 2) 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.
- 3) Increase woody cover in the pools and flatwater habitat units. Most of the existing cover in the pools is from undercut banks. Adding high quality complexity with woody cover in the pools is desirable.
- 4) Water temperatures were not taken during the survey. 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.

### 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	Survey began at the confluence with Hall Creek. The first 3,850 feet of the creek was not surveyed due to lack of access. From the road it can be seen that the creek is a low gradient meandering channel that runs through pasture land. The channel was dry at the time of this survey.



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Culvert #1 was at the confluence with Hall Creek and it passed under an unnamed road leading to Kern Construction weigh station near Mad River. It was a double box culvert made of concrete and it measured 6' high x 17' wide x 26' long. It was in good condition and probably not a barrier. The right bank side of the box culvert was full of sediment.

Culvert #2 went under a road which leads to Kern Construction near Glendale Drive. This culvert was not measured due to lack of landowner access.

Culvert #3 went under Glendale Drive and measured 4.5' high x 5' wide x 60' long x 5' in diameter. Sediment covers the bottom 0.5' of the culvert. The culvert appears to be in good condition.

- 3850 0002.00 For 936' upstream of Glendale Drive the creek was dry. This unit marks the beginning of Reach 2, and is a B4 channel type. Throughout the dry section there were isolated pools, most of which contained large amounts of algae, and some of which contained numerous young-of-the-year (YOY) salmonids.  
Culvert #4 was 754' upstream of Glendale Drive and passed under a private road. There were 2 metal culverts in good condition. They each measured 4'6" in diameter x 25' long. The left bank culvert was filled in with 0.5' of gravel.
- 4786 0003.00 The dry unit ended here and there is flowing water.
- 5011 0008.00 On the right bank the primary substrate was concreted riprap.
- 5822 0029.00 This habitat unit was dry for the majority of the length. Sixty-four feet into this unit there was a small disconnected pool measuring 1' wide x 20' long x 0.5' deep that contained YOY salmonids. One hundred and eighty-eight feet into the unit there was another small disconnected pool measuring 7' wide x 29' long x 1.8' deep, it contained juvenile salmonids as well.
- 6230 0030.00 This unit marks the first habitat unit of Reach #3. The channel type has become a F4.
- 6414 0032.00 At this habitat unit YOY salmonids were still being observed.
- 6466 0033.00 The gradient of the creek increases from this habitat unit onwards.
- 6524 0035.00 This was the first unit of reach #4. The channel type has changed from a F4 to B2.
- 6825 0037.00 The survey ended due to extremely steep gradient (14%) for entire length of the habitat unit #036 (191'). No fish had been observed for the last 230' of the survey.

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### REFERENCES

Flosi, G., Downie, S., Hopelain, J., Bird, M., Coey, R., and Collins, B. 1998. *California Salmonid Stream Habitat Restoration Manual*, 3rd edition. California Department of Fish and Game, Sacramento, California.

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### LEVEL III and LEVEL IV HABITAT TYPES

#### RIFFLE

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

#### CASCADE

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

#### FLATWATER

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

#### MAIN CHANNEL POOLS

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

#### SCOUR POOLS

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

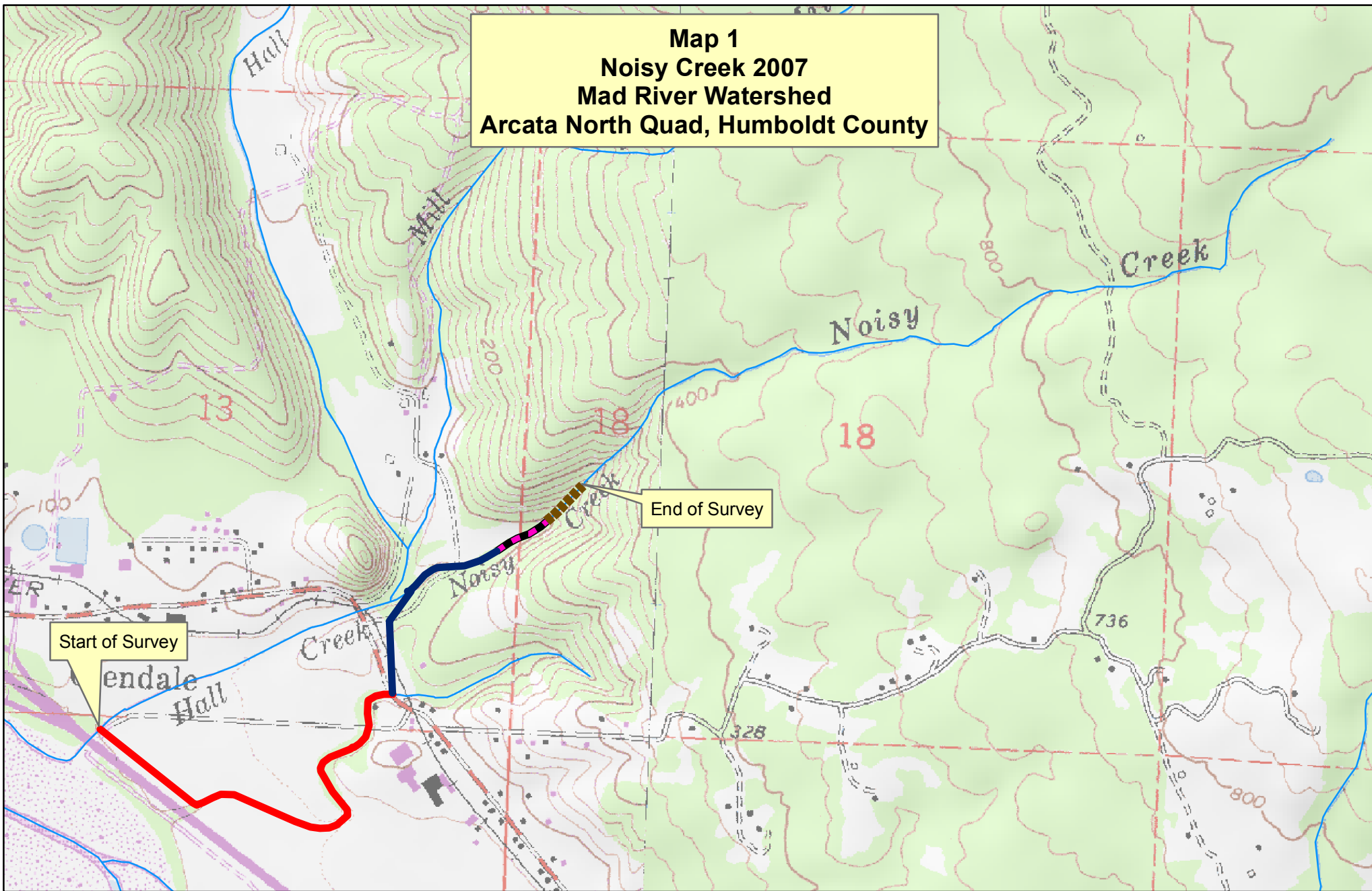
#### BACKWATER POOLS

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

#### ADDITIONAL UNIT DESIGNATIONS

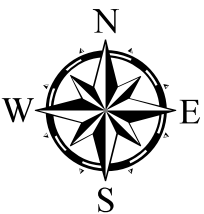
Dry	(DRY)	[7.0]	
Culvert	(CUL)	[8.0]	
Not Surveyed	(NS)	[9.0]	
Not Surveyed due to a marsh	(MAR)	[9.1]	

**Map 1  
Noisy Creek 2007  
Mad River Watershed  
Arcata North Quad, Humboldt County**



Start of Survey

End of Survey



**Legend**

- Reach 1, No Channel Type
- Reach 2, B4 Channel Type
- Reach 3, F4 Channel Type
- Reach 4, B2 Channel Type

0 400 800 1,600 Feet



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

Stream Name: Noisy Creek

LLID: 1240080409004 Drainage: Blue Lake

Survey Dates: 7/10/2007 to 7/10/2007

Confluence Location: Quad: ARCATA NORTH Legal Description: T06NR01ES13 Latitude: 40:54:01.0N Longitude: 124:00:29.0

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
5	0	DRY	12.8	285	1424	47.0									
8	3	FLATWATER	20.5	36	285	9.4	6.0	0.3	0.6	213	1704	63	501		3
1	0	NOSURVEY	2.6	3850	3850										
10	10	POOL	25.6	36	358	11.8	9.3	1.2	1.8	340	3400	473	4734	425	34
15	6	RIFFLE	38.5	64	966	31.8	5.5	0.3	0.6	214	3211	116	1733		15
<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>		
39	19				6883					8315			6968		

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

Stream Name: Noisy Creek

LLID: 1240080409004 Drainage: Blue Lake

Survey Dates: 7/10/2007 to 7/10/2007

Confluence Location: Quad: ARCATA NORTH Legal Description: T06NR01ES13 Latitude: 40:54:01.0N Longitude: 124:00:29.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating	Mean Canopy (%)
13	4	LGR	33.3	54	704	23.2	4	0.2	0.6	89	1158	14	187		0	95
1	1	HGR	2.6	71	71	2.3	10	0.5	0.7	355	355	178	178		30	100
1	1	CAS	2.6	191	191	6.3	6	0.8	1.2	573	573	458	458		60	100
6	2	RUN	15.4	32	194	6.4	6	0.4	0.8	165	989	63	378		3	95
2	1	SRN	5.1	46	91	3.0	7	0.2	0.5	309	619	62	124		5	100
7	7	MCP	17.9	40	278	9.2	9	1.1	2.2	346	2424	438	3065	393	29	91
1	1	CRP	2.6	24	24	0.8	10	1.6	2.2	240	240	408	408	384	60	97
2	2	LSR	5.1	28	56	1.8	11	1.1	2.5	368	736	630	1261	557	38	98
5	0	DRY	12.8	285	1424	47.0										
1	0	NS	2.6	3850	3850											

Total Units  
39

Total Units Fully Measured  
19

Total Length (ft.)  
6883

Total Area (sq.ft.)  
7094

Total Volume (cu.ft.)  
6058

**Table 3 - Summary of Pool Types**

Stream Name: Noisy Creek

LLID: 1240080409004

Drainage: Blue Lake

Survey Dates: 7/10/2007 to 7/10/2007

Confluence Location: Quad: ARCATA NORTH

Legal Description: T06NR01ES13

Latitude: 40:54:01.0N

Longitude: 124:00:29.0W

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
7	7	MAIN	70	40	278	78	8.7	1.1	346	2424	393	2751	29
3	3	SCOUR	30	27	80	22	10.7	1.3	325	976	499	1498	45

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
10	10	358	3400	4248

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

Stream Name: Noisy Creek

LLID: 1240080409004

Drainage: Blue Lake

Survey Dates: 7/10/2007 to 7/10/2007

Confluence Location: Quad: ARCATA NORTH

Legal Description: T06NR01ES13

Latitude: 40:54:01.0N

Longitude: 124:00:29.0W

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
7	MCP	70	0	0	6	86	1	14	0	0	0	0
1	CRP	10	0	0	0	0	1	100	0	0	0	0
2	LSR	20	0	0	1	50	1	50	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
10	0	0	7	70	3	30	0	0	0	0

Mean Maximum Residual Pool Depth (ft.): 1.8



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

Stream Name: Noisy Creek

LLID: 1240080409004

Drainage: Blue Lake

Survey Dates: 7/10/2007 to 7/10/2007

Dry Units: 5

Confluence Location: Quad: ARCATA NORTH

Legal Description: T06NR01ES13

Latitude: 40:54:01.0N

Longitude: 124:00:29.0W

Habitat Units	Units Fully Measured	Habitat Type	Mean % Undercut Banks	Mean % SWD	Mean % LWD	Mean % Root Mass	Mean % Terr. Vegetation	Mean % Aquatic Vegetation	Mean % White Water	Mean % Boulders	Mean % Bedrock Ledges
13	4	LGR	0	0	0	0	0	0	0	0	0
1	1	HGR	0	0	0	0	0	0	0	100	0
1	1	CAS	0	0	0	0	0	0	0	100	0
15	6	TOTAL RIFFLE	0	0	0	0	0	0	0	100	0
6	2	RUN	0	0	0	0	0	0	0	100	0
2	1	SRN	0	0	0	0	0	0	0	100	0
8	3	TOTAL FLAT	0	0	0	0	0	0	0	100	0
7	7	MCP	73	13	0	10	3	0	0	0	0
1	1	CRP	50	10	0	40	0	0	0	0	0
2	2	LSR	5	5	0	90	0	0	0	0	0
10	10	TOTAL POOL	56	11	0	31	2	0	0	0	0
1	0	NS									
39	19	TOTAL	38	8	0	22	2	0	0	31	0

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

Stream Name: Noisy Creek

LLID: 1240080409004

Drainage: Blue Lake

Survey Dates: 7/10/2007 to 7/10/2007

Dry Units: 5

Confluence Location: Quad: ARCATA NORTH

Legal Description: T06NR01ES13

Latitude: 40:54:01.0N

Longitude: 124:00:29.0W

Habitat Units	Units Fully Measured	Habitat Type	% Total Silt/Clay Dominant	% Total Sand Dominant	% Total Gravel Dominant	% Total Small Cobble Dominant	% Total Large Cobble Dominant	% Total Boulder Dominant	% Total Bedrock Dominant
13	4	LGR	0	0	25	75	0	0	0
1	1	HGR	0	0	0	0	100	0	0
1	1	CAS	0	0	0	0	0	100	0
6	2	RUN	0	0	100	0	0	0	0
2	1	SRN	0	100	0	0	0	0	0
7	7	MCP	0	43	57	0	0	0	0
1	1	CRP	0	100	0	0	0	0	0
2	2	LSR	0	50	0	50	0	0	0

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

Stream Name: Noisy Creek

LLID: 1240080409004

Drainage: Blue Lake

Survey Dates: 7/10/2007 to 7/10/2007

Confluence Location: Quad: ARCATA NORTH

Legal Description: T06NR01ES13

Latitude: 40:54:01.0N

Longitude: 124:00:29.0W

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Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
95	4	96	0	93	83

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Note: Mean percent conifer and hardwood for the entire reach are means of canopy components from units with canopy values greater than zero.

Open units represent habitat units with zero canopy cover.

**Table 8 - Fish Habitat Inventory Data Summary**

Stream Name: Noisy Creek LLID: 1240080409004 Drainage: Blue Lake  
 Survey Dates: 7/10/2007 to 7/10/2007 Survey Length (ft.): 6883 Main Channel (ft.): 6825 Side Channel (ft.): 58  
 Confluence Location: Quad: ARCATA NORTH Legal Description: T06NR01ES13 Latitude: 40:54:01.0N Longitude: 124:00:29.0W

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

<b>STREAM REACH: 1</b>						
Channel Type:	NA	Canopy Density (%):	Pools by Stream Length (%): 0.0			
Reach Length (ft.):	3850	Coniferous Component (%):	Pool Frequency (%): 0.0			
Riffle/Flatwater Mean Width (ft.):		Hardwood Component (%):	Residual Pool Depth (%):			
BFW:		Dominant Bank Vegetation:	< 2 Feet Deep:			
Range (ft.):	14 to 14	Vegetative Cover (%): 0.0	2 to 2.9 Feet Deep:			
Mean (ft.):	14	Dominant Shelter:	3 to 3.9 Feet Deep:			
Std. Dev.:	0	Dominant Bank Substrate Type:	>= 4 Feet Deep:			
Base Flow (cfs.):		Occurrence of LWD (%):	Mean Max Residual Pool Depth (ft.):			
Water (F):	0 - 0	Air (F): 0 - 0	LWD per 100 ft.:	Mean Pool Shelter Rating:		
Dry Channel (ft):	0	Riffles:				
		Pools:				
		Flat:				
Pool Tail Substrate (%):	Silt/Clay:	Sand:	Gravel:	Sm Cobble:	Lg Cobble:	Boulder: Bedrock:
Embeddedness Values (%):	1.	2.	3.	4.	5.	0.0

<b>STREAM REACH: 2</b>						
Channel Type:	B4	Canopy Density (%): 94.6	Pools by Stream Length (%): 15.0			
Reach Length (ft.):	2380	Coniferous Component (%): 1.9	Pool Frequency (%): 35.7			
Riffle/Flatwater Mean Width (ft.):	5.0	Hardwood Component (%): 98.1	Residual Pool Depth (%):			
BFW:		Dominant Bank Vegetation: Hardwood Trees	< 2 Feet Deep: 70			
Range (ft.):	14 to 22	Vegetative Cover (%): 87.1	2 to 2.9 Feet Deep: 30			
Mean (ft.):	16	Dominant Shelter: Undercut Banks	3 to 3.9 Feet Deep: 0			
Std. Dev.:	4	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 0			
Base Flow (cfs.):		Occurrence of LWD (%): 0	Mean Max Residual Pool Depth (ft.): 1.8			
Water (F):	0 - 0	Air (F): 0 - 0	LWD per 100 ft.:	Mean Pool Shelter Rating: 34		
Dry Channel (ft):	1344	Riffles: 0				
		Pools: 0				
		Flat: 0				
Pool Tail Substrate (%):	Silt/Clay: 10	Sand: 10	Gravel: 70	Sm Cobble: 10	Lg Cobble: 0	Boulder: 0 Bedrock: 0
Embeddedness Values (%):	1. 0.0	2. 50.0	3. 40.0	4. 10.0	5. 0.0	

### Summary of Fish Habitat Elements By Stream Reach

#### STREAM REACH: 3

Channel Type: F4	Canopy Density (%): 93.3	Pools by Stream Length (%): 0.0
Reach Length (ft.): 294	Coniferous Component (%): 0.0	Pool Frequency (%): 0.0
Riffle/Flatwater Mean Width (ft.): 5.0	Hardwood Component (%): 100.0	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Brush	< 2 Feet Deep:
Range (ft.): 14 to 22	Vegetative Cover (%): 95.0	2 to 2.9 Feet Deep:
Mean (ft.): 16	Dominant Shelter: Boulders	3 to 3.9 Feet Deep:
Std. Dev.: 4	Dominant Bank Substrate Type: Cobble/Gravel	>= 4 Feet Deep:
Base Flow (cfs.):	Occurrence of LWD (%): 0	Mean Max Residual Pool Depth (ft.):
Water (F): 0 - 0    Air (F): 0 - 0	LWD per 100 ft.:	Mean Pool Shelter Rating:
Dry Channel (ft): 80	Riffles: 0	
	Pools:	
	Flat: 0	
Pool Tail Substrate (%): Silt/Clay:    Sand:    Gravel:    Sm Cobble:    Lg Cobble:    Boulder:    Bedrock:		
Embeddedness Values (%): 1.    2.    3.    4.    5. 0.0		

#### STREAM REACH: 4

Channel Type: B2	Canopy Density (%): 100.0	Pools by Stream Length (%): 0.0
Reach Length (ft.): 301	Coniferous Component (%): 25.0	Pool Frequency (%): 0.0
Riffle/Flatwater Mean Width (ft.): 8.0	Hardwood Component (%): 75.0	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Hardwood Trees	< 2 Feet Deep:
Range (ft.): 14 to 14	Vegetative Cover (%): 82.5	2 to 2.9 Feet Deep:
Mean (ft.): 14	Dominant Shelter: Boulders	3 to 3.9 Feet Deep:
Std. Dev.: 0	Dominant Bank Substrate Type: Boulder	>= 4 Feet Deep:
Base Flow (cfs.):	Occurrence of LWD (%): 0	Mean Max Residual Pool Depth (ft.):
Water (F): 0 - 0    Air (F): 0 - 0	LWD per 100 ft.:	Mean Pool Shelter Rating:
Dry Channel (ft): 0	Riffles: 0	
	Pools:	
	Flat: 0	
Pool Tail Substrate (%): Silt/Clay:    Sand:    Gravel:    Sm Cobble:    Lg Cobble:    Boulder:    Bedrock:		
Embeddedness Values (%): 1.    2.    3.    4.    5. 0.0		

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

Stream Name: Noisy Creek

LLID: 1240080409004

Drainage: Blue Lake

Survey Dates: 7/10/2007 to 7/10/2007

Confluence Location: Quad: ARCATA NORTH

Legal Description: T06NR01ES13

Latitude: 40:54:01.0N

Longitude: 124:00:29.0W

**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	2.6
Boulder	3	2	13.2
Cobble / Gravel	7	8	39.5
Sand / Silt / Clay	8	9	44.7

**Mean Percentage of Dominant Stream Bank Vegetation**

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Grass	0	1	2.6
Brush	9	6	39.5
Hardwood Trees	9	11	52.6
Coniferous Trees	1	1	5.3
No Vegetation	0	0	0.0

**Total Stream Cobble Embeddedness Values:** 3

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

StreamName: Noisy Creek

LLID: 1240080409004

Drainage: Blue Lake

Survey Dates: 7/10/2007 to 7/10/2007

Confluence Location: Quad: ARCATA NORTH

Legal Description: T06NR01ES13

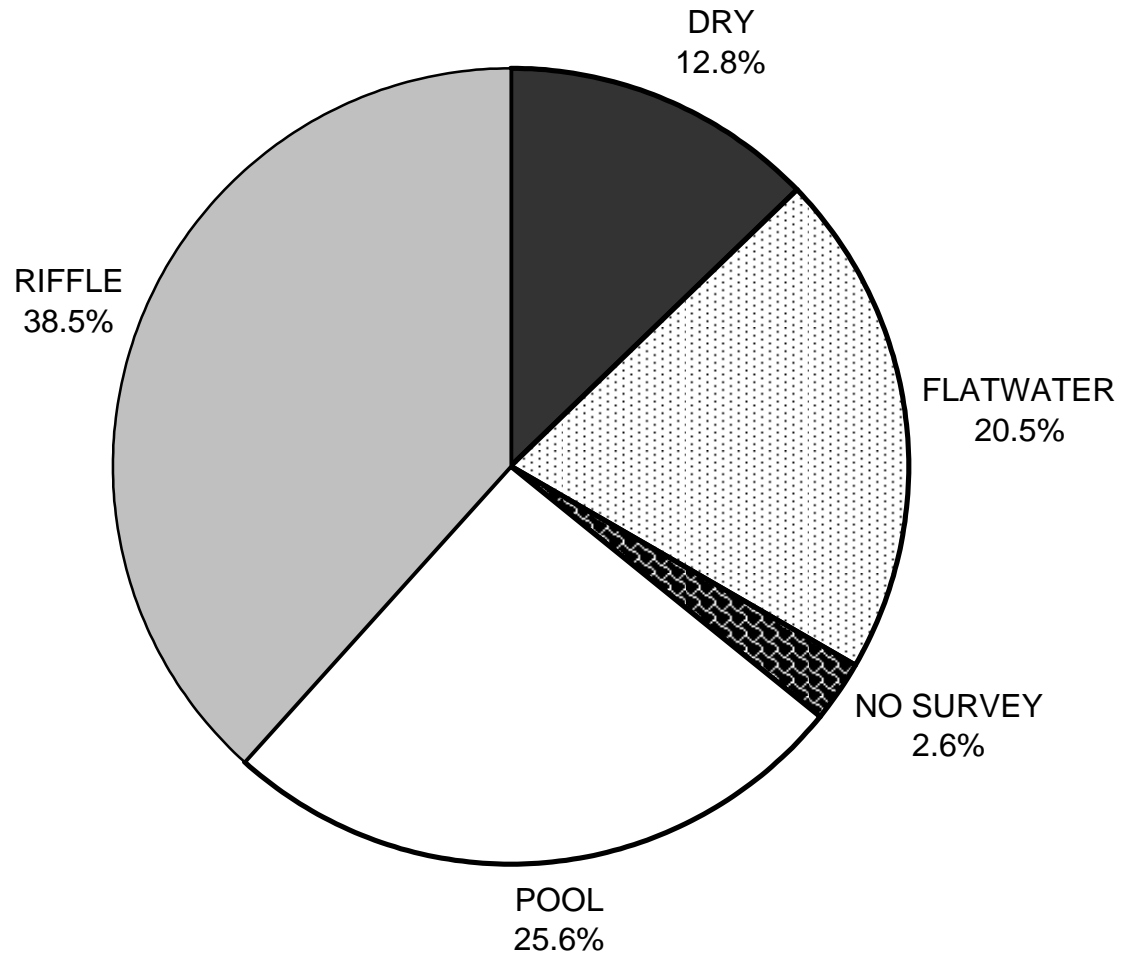
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Longitude: 124:00:29.0W

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	<b>Riffles</b>	<b>Flatwater</b>	<b>Pools</b>
UNDERCUT BANKS (%)	0	0	56
SMALL WOODY DEBRIS (%)	0	0	11
LARGE WOODY DEBRIS (%)	0	0	0
ROOT MASS (%)	0	0	31
TERRESTRIAL VEGETATION (%)	0	0	2
AQUATIC VEGETATION (%)	0	0	0
WHITEWATER (%)	0	0	0
BOULDERS (%)	100	100	0
BEDROCK LEDGES (%)	0	0	0

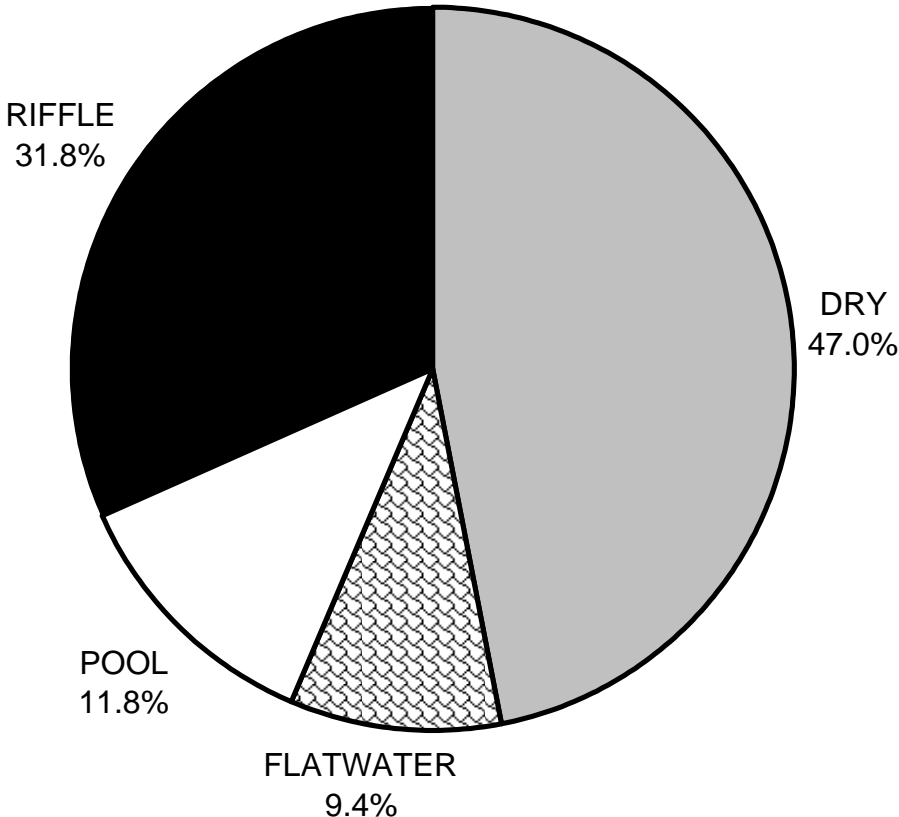
# NOISY CREEK 2007 HABITAT TYPES BY PERCENT OCCURRENCE



GRAPH 1

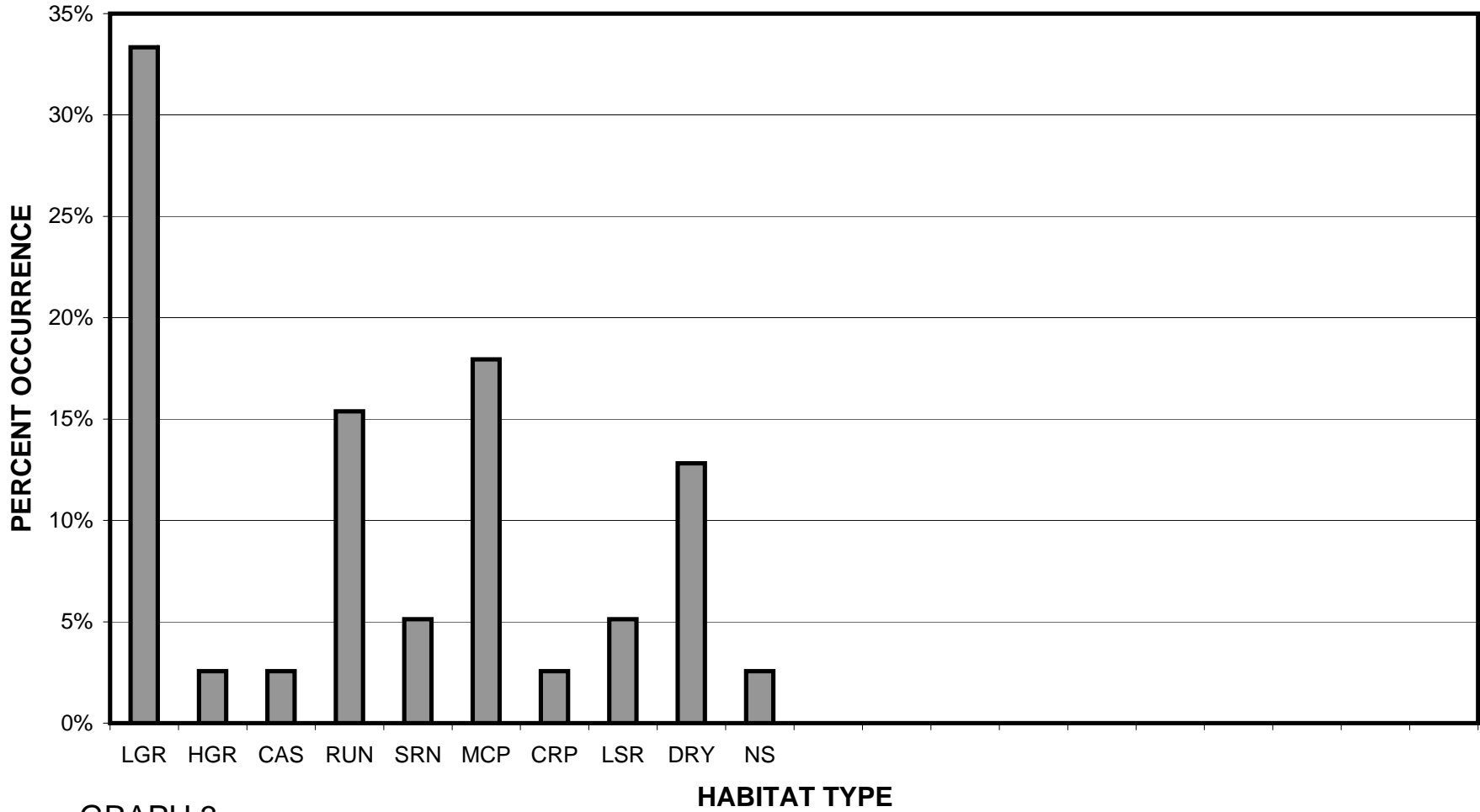


**NOISY CREEK 2007  
HABITAT TYPES BY PERCENT TOTAL LENGTH**



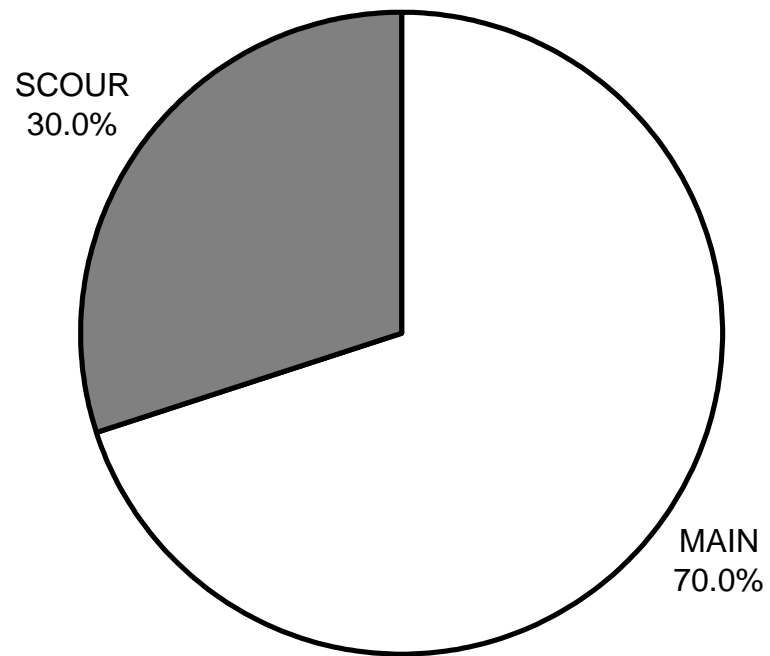
GRAPH 2

# NOISY CREEK 2007 HABITAT TYPES BY PERCENT OCCURRENCE



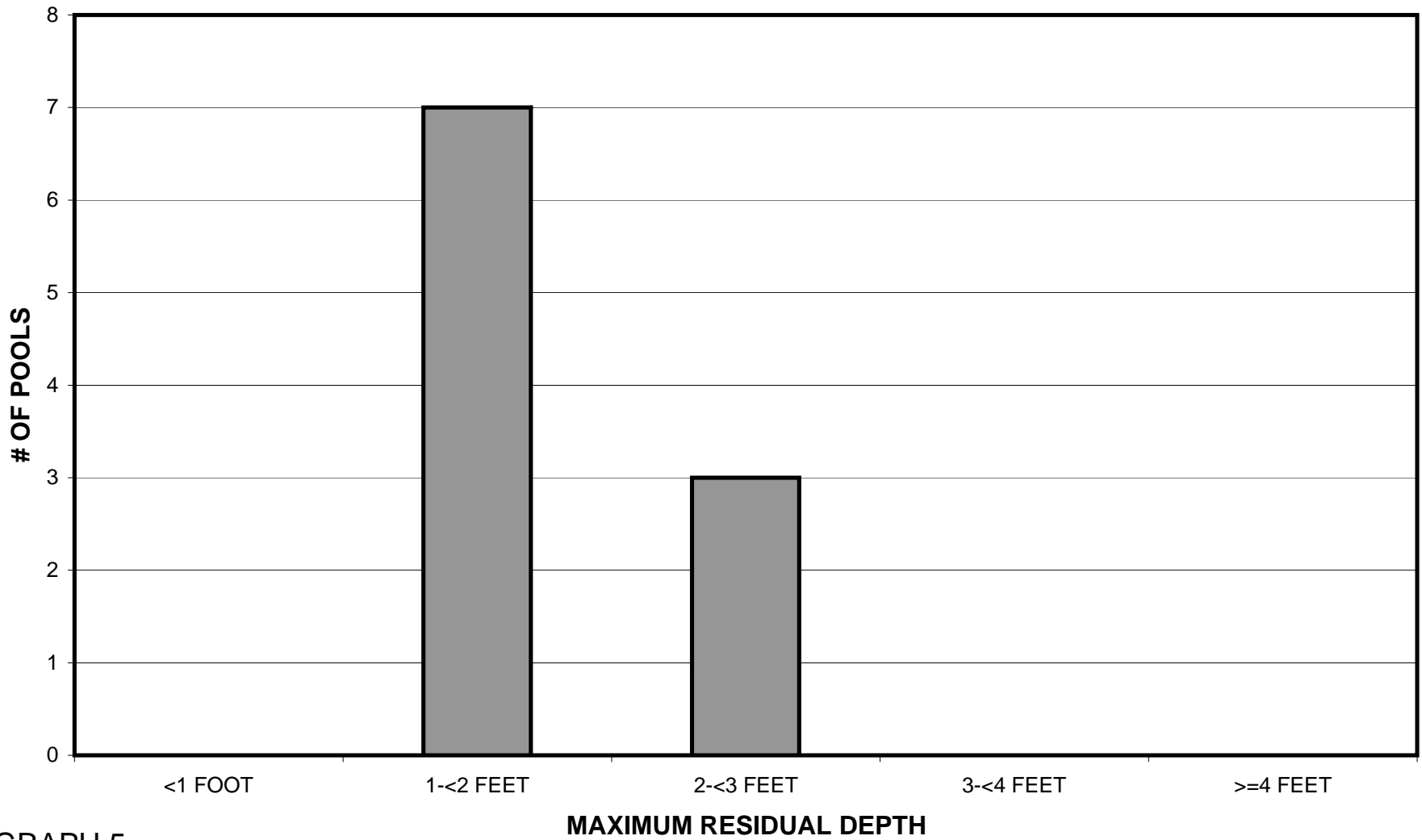
GRAPH 3

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



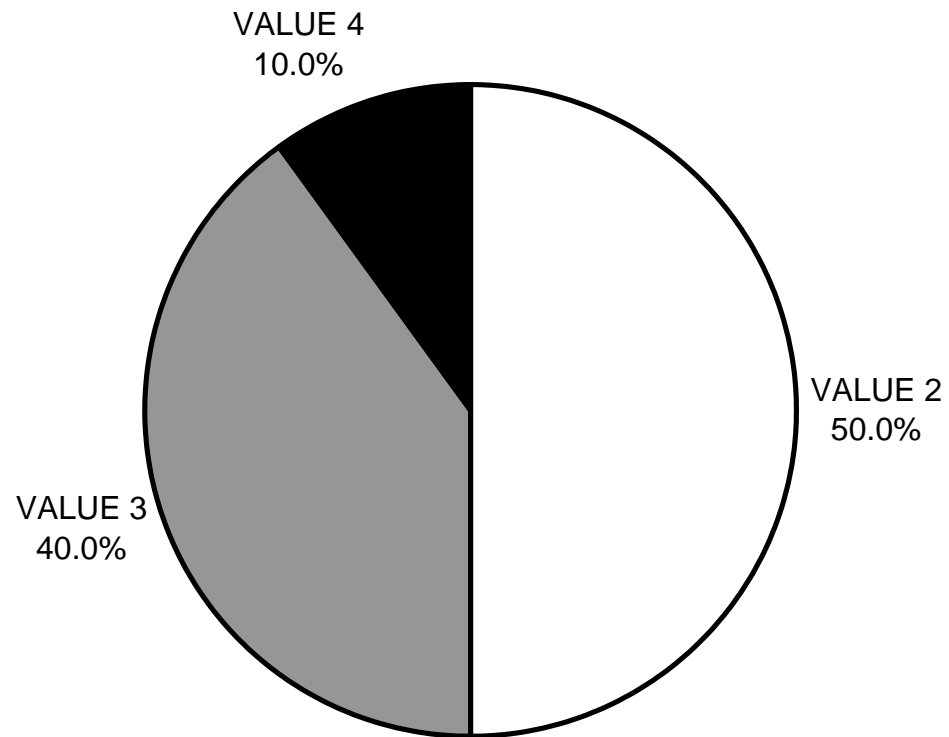
GRAPH 4

# NOISY CREEK 2007 MAXIMUM DEPTH IN POOLS



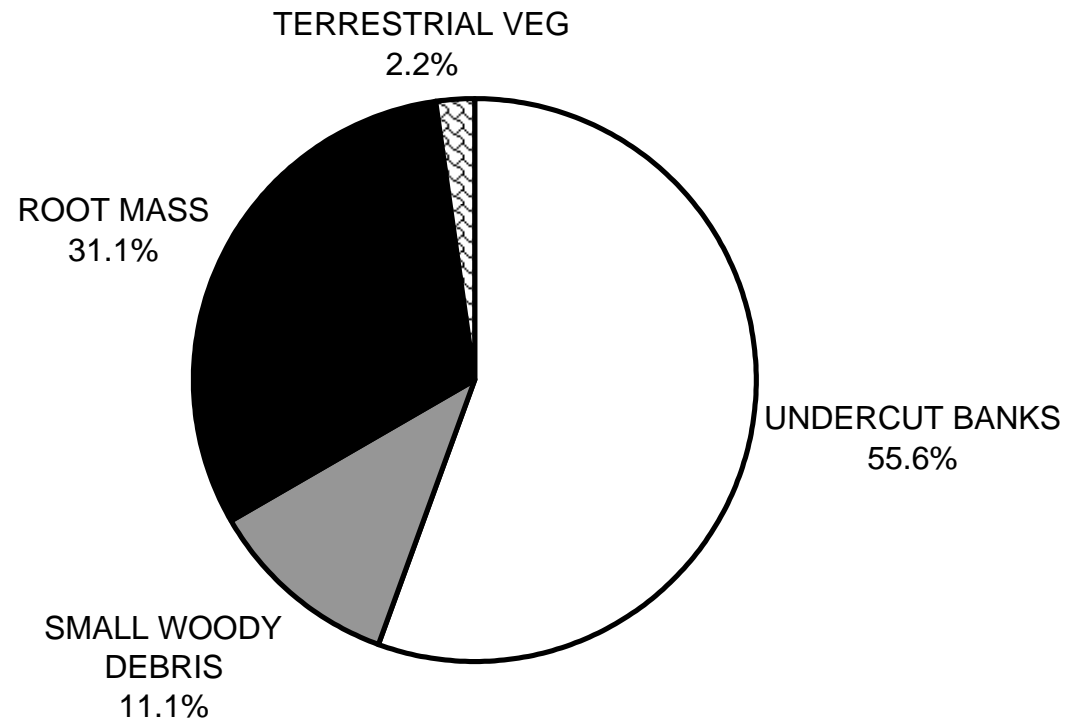
GRAPH 5

# NOISY CREEK 2007 PERCENT EMBEDDEDNESS



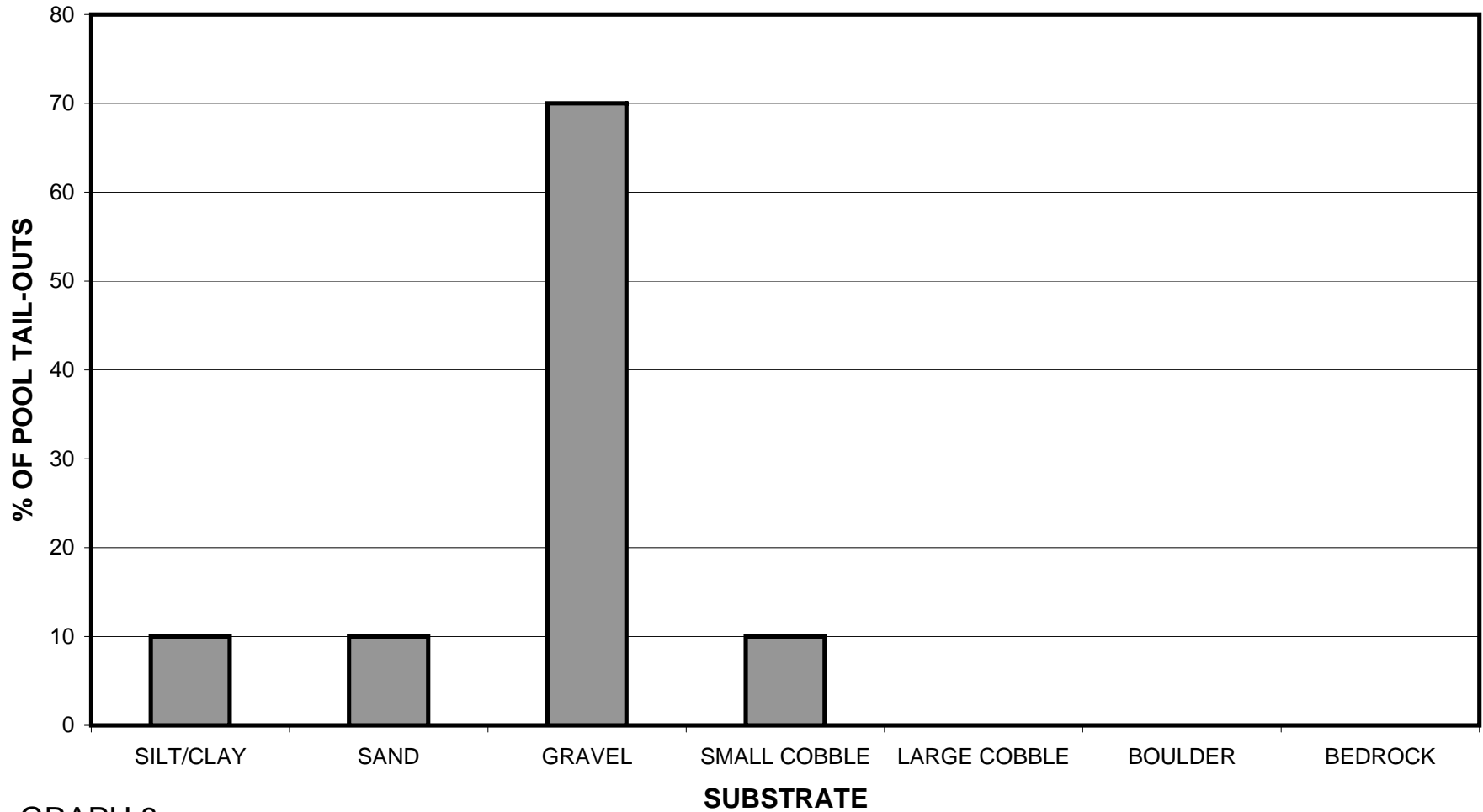
GRAPH 6

# NOISY CREEK 2007 MEAN PERCENT COVER TYPES IN POOLS



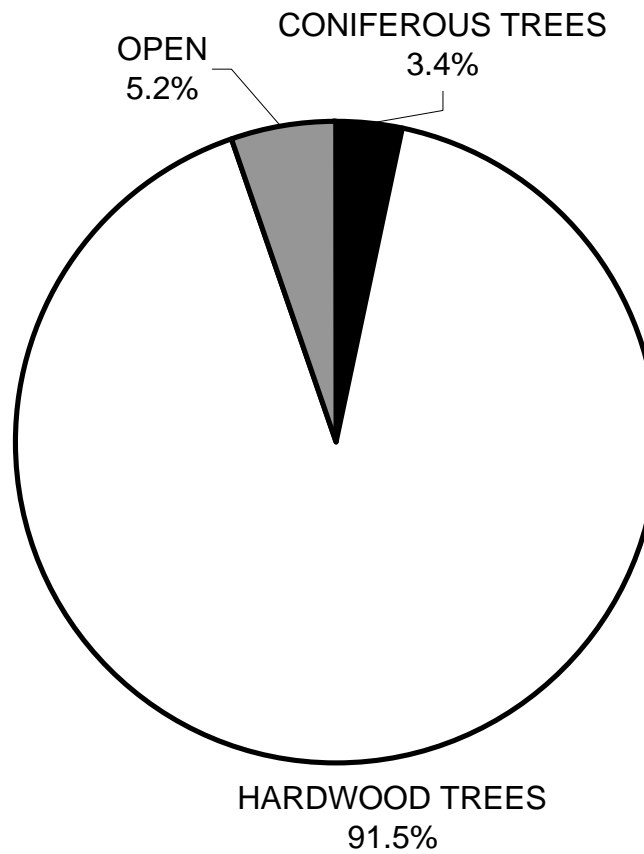
GRAPH 7

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



GRAPH 8

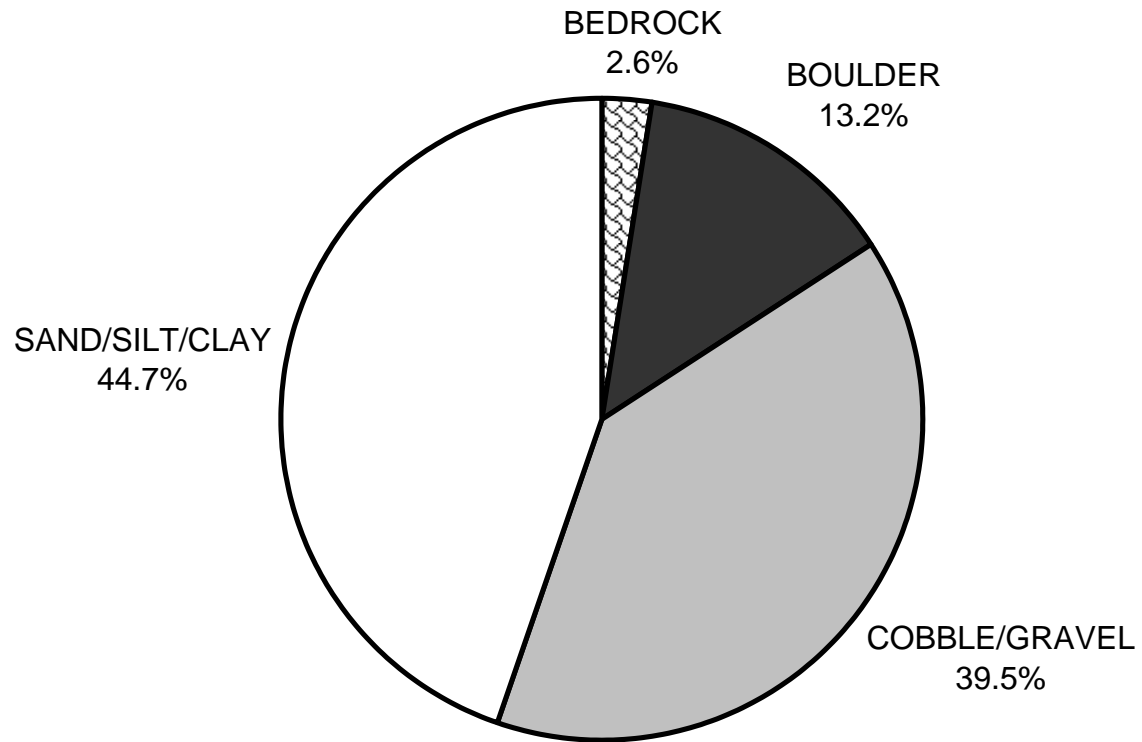
# NOISY CREEK 2007 MEAN PERCENT CANOPY



GRAPH 9

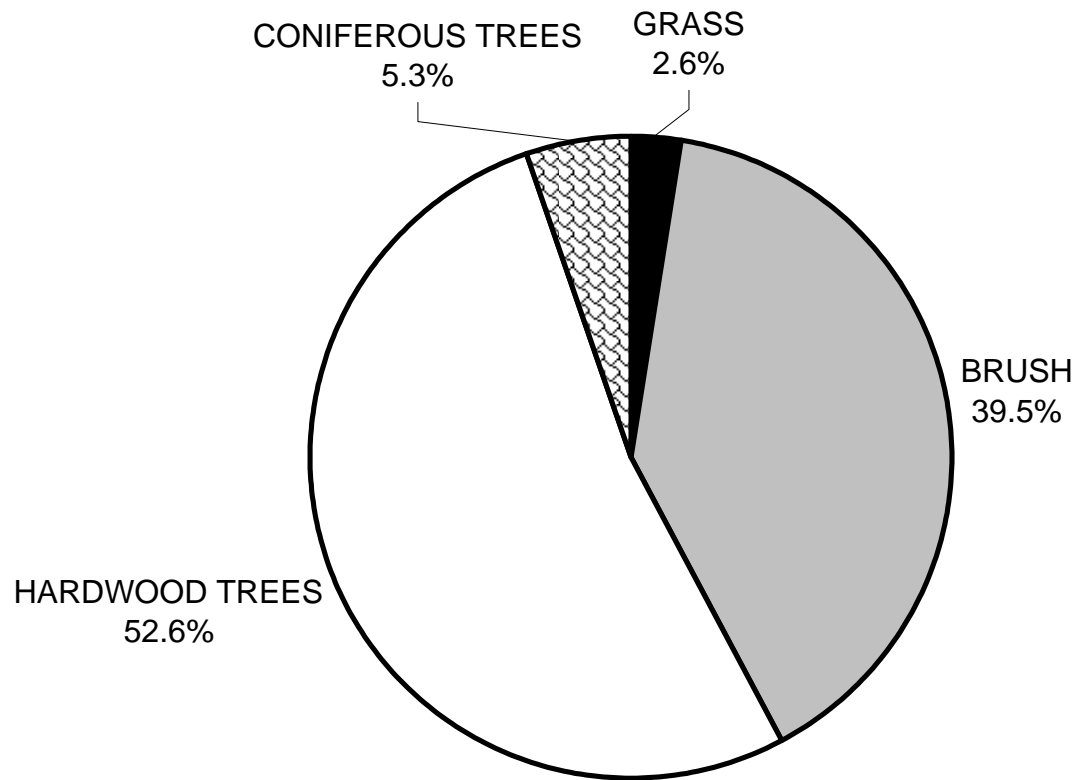


**NOISY CREEK 2007  
DOMINANT BANK COMPOSITION IN SURVEY REACH**



GRAPH 10

# NOISY CREEK 2007 DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11