

STREAM INVENTORY REPORT
Unnamed Tributary to Durphy Creek
LLID# 1238116400196

INTRODUCTION

A stream inventory was conducted on 9/7/2006 on an unnamed tributary to Durphy Creek, LLID# 1238116400196. The survey began at the confluence with Durphy Creek and extended upstream 0.5 miles.

The objective of the habitat inventory was to document the habitat available to anadromous salmonids in the unnamed tributary to Durphy Creek, LLID# 1238116400196.

WATERSHED OVERVIEW

The unnamed tributary to Durphy Creek, 1238116400196 is tributary to Durphy Creek, tributary to South Fork Eel River, tributary to Eel River, which ultimately flows into the Pacific Ocean, located in Humboldt County, California (Map 1). The legal description at its confluence with Durphy Creek is T05S R03E S14. Its location is 40°01'11" north latitude and 123°48'42" west longitude. It is a 1st order stream and has approximately 0.8 miles of blue line stream according to the USGS Garberville 7.5 minute quadrangle. The stream drains a watershed of approximately 0.72 square miles. Elevations range from about 650 feet at the mouth of the creek to 1,450 feet in the headwater areas. Douglas fir forest dominates the watershed. The watershed is entirely state park and is managed for recreation. Vehicle access exists via US Highway 101 to the Richardson Grove Campground parking lot. Follow the Durphy Creek trail to the confluence of the unnamed tributary.

METHODS

The habitat inventory conducted in the unnamed tributary to Durphy Creek, 1238116400196 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.

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 the survey of the unnamed tributary to Durphy Creek, 1238116400196 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". Habitat typing uses 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 the unnamed tributary to Durphy Creek, 1238116400196, 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 the unnamed tributary to Murphy Creek, 1238116400196, 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 the unnamed tributary to Murphy Creek, 1238116400196, 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 the unnamed tributary to Murphy Creek, 1238116400196, 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

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twelve inches in diameter and six feet in length. The LWD count is presented by reach and is expressed as an average per 100 feet.

11. Average Bankfull Width:

Bankfull width can vary greatly in the course of a channel type stream reach. This is especially true in very long reaches. Bankfull width can be a factor in habitat components like canopy density, water temperature, and pool depths. Frequent measurements taken at riffle crests (velocity crossovers) are needed to accurately describe reach widths. At the first appropriate velocity crossover that occurs after the beginning of a new stream survey page (ten habitat units), bankfull width is measured and recorded in the appropriate header block of the page. These widths are presented as an average for the channel type reach.

DATA ANALYSIS

Data from the habitat inventory form are entered into Stream Habitat 2.0.19, 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 the unnamed tributary to Durphy Creek, 1238116400196 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

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HABITAT INVENTORY RESULTS

* ALL TABLES AND GRAPHS ARE LOCATED AT THE END OF THE REPORT *

The habitat inventory of 9/7/2006, was conducted by Sean K. McSmith (WSP) and Dave Heaton (WSP). The total length of the stream surveyed was 2,587 feet.

Stream flow was not measured.

The unnamed tributary to Murphy Creek, 1238116400196, is an A2 channel type for the entire 2,587.00 feet of the stream surveyed.

A2 channels are steep, narrow, cascading, step-pool, high energy debris transporting channels associated with depositional soils, and boulder dominant substrates.

Water temperatures taken during the survey period ranged from 58 to 61 degrees Fahrenheit. Air temperatures ranged from 56 to 71 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 35% riffle units, 32% pool units, 20% flatwater units and 13% dry units (Graph 1). Based on total length of Level II habitat types there were 41% riffle units, 27% flatwater units, 24% dry units and 8% pool units (Graph 2).

Nine Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were 18% step run units, 18% high gradient riffle units, 12% dry units, 12% mid-channel pool units, 12% low gradient riffle units and 12% plunge pool units (Graph 3). Based on percent total length, 30% were high gradient riffle units, 26% were step run units and 24% were dry units.

A total of 13 pools were identified (Table 3). Main channel pools were the most frequently encountered, at 62% (Graph 4), and comprised 76% 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 13 pools (8%) had a residual depth of two feet or greater (Graph 5). None of the 13 pools (0%) had a residual depth of three feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 13 pool tail-outs measured, 5 had a value of 1 (38.5%); 2 had a value of 2 (15.4%); 5 had a value of 3 (38.5%); 1 had a value of 5 (7.7%) (Graph 6). On this scale, a value of 1 indicates the best spawning conditions and a value of 4 the worst. Additionally, a value of 5 was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate such as bedrock, log sills, boulders, or other considerations.

A shelter rating was calculated for each habitat unit and expressed as a mean value for each habitat type within the survey using a scale of 0-300. Riffle habitat types had a mean shelter rating of 2, flatwater habitat types had a mean shelter rating of 8, and pool habitats had a mean

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shelter rating of 11 (Table 1). Of the pool types, the main channel pools had a mean shelter rating of 15 and scour pools had a mean shelter rating of 5 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Boulders are the dominant cover type in the unnamed tributary to Murphy Creek, 1238116400196. Graph 7 describes the pool cover in the surveyed stream. Large woody debris is the dominant pool cover type followed by boulders.

Table 6 summarizes the dominant substrate by habitat type. Graph 8 depicts the dominant substrate observed in pool tail-outs. Gravel was observed in 62% of pool tail-outs and small cobble in 31% of pool tail-outs.

The mean percent canopy density for the surveyed length of the unnamed tributary to Murphy Creek, 1238116400196 was 79%. Twenty-one percent of the canopy was open. The mean percentages of hardwood and coniferous trees were 90% and 10%, respectively. Graph 9 describes the mean percent canopy in the unnamed tributary to Murphy Creek, 1238116400196.

For the stream reach surveyed, the mean percent right bank vegetated was 74%. The mean percent left bank vegetated was 72%. The dominant elements composing the structure of the stream banks consisted of 58% sand/silt/clay, 39% bedrock and 3% boulder (Graph 10). Hardwood was the dominant vegetation type observed in 80.6% of the units surveyed. Additionally, 19.4% of the units surveyed had coniferous as the dominant vegetation type (Graph 11).

DISCUSSION

The unnamed tributary to Murphy Creek, 1238116400196, is an A2 channel type for the entire 2,587 feet of stream surveyed. The suitability of A2 channel types for fish habitat improvement structures is as follows: generally not suitable for structures, the high energy flows with the stable banks are poor for gravel retention.

The water temperatures recorded on 9/7/2006, ranged from 58 to 61 degrees Fahrenheit. Air temperatures ranged from 56 to 71 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 27% of the total length of this survey, riffles 41%, and pools 8% and 24% dry units. The pools are relatively shallow, with only 1 of the 13 (8%) pools having a maximum residual depth greater than 2 feet. In general, pool enhancement projects are considered when primary pools comprise less than 40% of the length of total stream habitat. In first and second order streams, a primary pool is defined to have a maximum residual depth of at least two feet, occupy at least half the width of the low flow channel, and be as long as the low flow channels width. Installing structures that will increase or deepen pool habitat is often recommended for locations where their installation will not be threatened by high stream energy, or where their installation will not conflict with the modification of log debris accumulations (LDA's) in the stream.

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Seven of the 13 pool tail-outs measured had embeddedness ratings of 1 or 2. Five of the pool tail-outs had embeddedness ratings of 3 or 4. One of the pool tail-outs had a rating of 5, which is considered unsuitable for spawning. Cobble embeddedness measured to be 25% or less, a rating of 1, is considered to indicate good quality spawning substrate for salmon and steelhead. Sediment sources in the unnamed tributary to Murphy Creek, 1238116400196 should be mapped and rated according to their potential sediment yields, and control measures should be taken.

Twelve of the 13 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 11. The shelter rating in the flatwater habitats was 8. A pool shelter rating of approximately 100 is desirable. The amount of cover in the watershed that now exists is being provided primarily by boulders in the unnamed tributary to Murphy Creek, 1238116400196. Large woody debris is the dominant cover type in pools followed by boulders. 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 79%. In general, revegetation projects are considered when canopy density is less than 80%.

The percentage of right and left bank covered with vegetation was relatively high at 74% and 72%, 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) The unnamed tributary to Murphy Creek, 1238116400196 should be managed as an anadromous, natural production stream.
- 2) The limited water temperature data available suggest that maximum temperatures are within the acceptable range for juvenile salmonids. To establish more complete and meaningful temperature regime information, 24-hour monitoring during the July and August temperature extreme period should be performed for 3 to 5 years.
- 3) Inventory and map sources of stream bank erosion and prioritize them according to present and potential sediment yield. Identified sites should then be treated to reduce the amount of fine sediments entering the stream.

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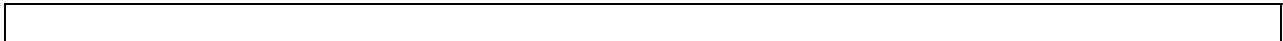
COMMENTS AND LANDMARKS

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 Durphy Creek.
144	0003.00	Log debris accumulation (LDA), retaining large cobble and small woody debris; potential juvenile barrier.
317	0006.00	Step pool with 2.0' and 1.6' plunges divided by 7.0' of subsurface flow.

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317	0006.00	LDA, 23' long x 24' wide x 5' high; composed of 3 pieces LWD; water flows subsurface; retaining sediment 24' long x 100' wide x 4' high composed of sand to large cobble; potential fish passage barrier at low flows.
340	0007.00	Right bank erosion, 40' high x 55' long; contributing fines to gravel.
519	0010.00	Erosion on both banks contributing LWD, SWD, and fines to large cobble.
902	0013.00	Young of the year salmonid (YOY) observed.
969	0015.00	Log plunge 0.6' high.
1078	0017.00	Log plunge 1.1' high.
1103	0019.00	Bedrock/LDA plunge 3' high.
1114	0020.00	LDA on bedrock, 5' long x 25' wide x 6' high'; composed of 4 four pieces of LWD and a rootwad ; retaining sediment 78' long x 25' wide x 6' high including sand to large cobble; potential fish passage barrier.
1192	0021.00	Left bank seep.
1385	0022.00	YOY observed.
1440	0024.00	Right bank erosion, 100'long x 220' high; channel filled by slide debris (rootwads and 0.5' dbh trees) and sediment (fines to large cobble).



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Position (ft.)	Habitat Unit #	Comments:
1621	0025.00	YOY observed upstream of the slide.
1739	0026.00	Right bank dry tributary.
1765	0027.00	Channel slope is 15%.
1765	0027.00	LDA
1816	0028.00	Bedrock plunge 2.0' high.
2040	0033.00	Bedrock plunge 4.0' high. Channel slope is 14% for approximately 80'; potential fish passage barrier.
2077	0036.00	Left bank tributary. Flow estimated at <0.1cfs with a water temperature of 60°F. No fish access. Channel for the first 100' is comprised of large cobble and boulder cascades with a slope of 23%.
2587	0040.00	End of survey due to a gradient of 12-14% and a 12' waterfall 100' upstream.

REFERENCES

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

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LEVEL III and LEVEL IV HABITAT TYPES

RIFFLE

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

CASCADE

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

FLATWATER

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

MAIN CHANNEL POOLS

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

SCOUR POOLS

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

BACKWATER POOLS

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

ADDITIONAL UNIT DESIGNATIONS

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

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

Stream Name: 1238116400196

LLID: 1238116400196 Drainage: Eel River - South Fork

Survey Dates: 9/7/2006 to 9/7/2006

Confluence Location: Quad: GARBERVILLE Legal Description: T05SR03ES14 Latitude: 40:01:11.0N Longitude: 123:48:42.0

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	12.5	122	612	23.7									
8	2	FLATWATER	20.0	88	701	27.1	2.8	0.4	0.8	98	781	36	286		8
13	13	POOL	32.5	17	216	8.3	7.0	0.6	1.3	84	1093	62	806	52	11
14	3	RIFFLE	35.0	76	1058	40.9	1.7	0.2	0.4	6	81	2	23		2
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)			Total Volume (cu.ft.)		
40	18				2587					1955			1116		

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: 1238116400196

LLID: 1238116400196

Drainage: Eel River - South Fork

Survey Dates: 9/7/2006 to 9/7/2006

Confluence Location: Quad: GARBERVILLE

Legal Description: T05SR03ES14

Latitude: 40:01:11.0N

Longitude: 123:48:42.0W

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 (%)
5	0	LGR	12.5	52	259	10.0										
7	1	HGR	17.5	111	775	30.0	2	0.3	0.7	16	112	5	34		5	94
2	2	BRS	5.0	12	24	0.9	1	0.2	0.3	1	1	0	0		0	80
1	1	RUN	2.5	26	26	1.0	3	0.3	0.6	66	66	20	20		0	88
7	1	SRN	17.5	96	675	26.1	2	0.4	1	129	903	52	361		15	90
5	5	MCP	12.5	13	67	2.6	7	0.6	1.6	86	432	65	326	54	17	84
3	3	STP	7.5	32	97	3.7	5	0.6	1.7	90	271	58	174	51	11	59
5	5	PLP	12.5	10	52	2.0	8	0.6	2.1	78	391	61	306	50	5	80
5	0	DRY	12.5	122	612	23.7										80

Total Units
40

Total Units Fully Measured
18

Total Length (ft.)
2587

Total Area (sq.ft.)
2176

Total Volume (cu.ft.)
1221

Table 3 - Summary of Pool Types

Stream Name: 1238116400196

LLID: 1238116400196

Drainage: Eel River - South Fork

Survey Dates: 9/7/2006 to 9/7/2006

Confluence Location: Quad: GARBERVILLE

Legal Description: T05SR03ES14

Latitude: 40:01:11.0N

Longitude: 123:48:42.0W

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	8	MAIN	62	21	164	76	6.4	0.6	88	703	53	424	15
5	5	SCOUR	38	10	52	24	7.8	0.6	78	391	50	250	5

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
13	13	216	1093	674

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

Stream Name: 1238116400196 LLID: 1238116400196 Drainage: Eel River - South Fork

Survey Dates: 9/7/2006 to 9/7/2006

Confluence Location: Quad: GARBERVILLE Legal Description: T05SR03ES14 Latitude: 40:01:11.0N Longitude: 123:48:42.0W

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
5	MCP	38	0	0	5	100	0	0	0	0	0	0
3	STP	23	0	0	3	100	0	0	0	0	0	0
5	PLP	38	3	60	1	20	1	20	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
13	3	23	9	69	1	8	0	0	0	0

Mean Maximum Residual Pool Depth (ft.): 1.3

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: 1238116400196

LLID: 1238116400196

Drainage: Eel River - South Fork

Survey Dates: 9/7/2006 to 9/7/2006

Dry Units: 5

Confluence Location: Quad: GARBERVILLE

Legal Description: T05SR03ES14

Latitude: 40:01:11.0N

Longitude: 123:48:42.0W

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
5	0	LGR									
7	1	HGR	0	0	0	0	0	0	0	100	0
2	2	BRS	0	0	0	0	0	0	0	0	0
14	3	TOTAL RIFFLE	0	0	0	0	0	0	0	33	0
1	1	RUN	0	0	0	0	0	0	0	0	0
7	1	SRN	0	0	0	0	0	0	0	100	0
8	2	TOTAL FLAT	0	0	0	0	0	0	0	50	0
5	5	MCP	0	0	34	20	0	0	0	6	0
3	3	STP	0	0	33	0	0	0	0	33	0
5	5	PLP	25	0	5	0	0	0	9	5	16
13	13	TOTAL POOL	10	0	23	8	0	0	3	12	6
40	18	TOTAL	7	0	16	6	0	0	3	20	4

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: 1238116400196

LLID: 1238116400196

Drainage: Eel River - South Fork

Survey Dates: 9/7/2006 to 9/7/2006

Dry Units: 5

Confluence Location: Quad: GARBERVILLE

Legal Description: T05SR03ES14

Latitude: 40:01:11.0N

Longitude: 123:48:42.0W

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
5	0	LGR	0	0	0	0	0	0	0
7	1	HGR	0	0	0	100	0	0	0
2	2	BRS	0	0	0	0	0	0	100
1	1	RUN	0	0	0	0	0	0	100
7	1	SRN	0	0	0	100	0	0	0
5	5	MCP	0	20	40	0	0	0	40
3	3	STP	0	0	67	0	0	0	33
5	5	PLP	0	0	80	0	0	0	20

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: 1238116400196 LLID: 1238116400196 Drainage: Eel River - South Fork

Survey Dates: 9/7/2006 to 9/7/2006

Confluence Location: Quad: GARBERVILLE Legal Description: T05SR03ES14 Latitude: 40:01:11.0N Longitude: 123:48:42.0W

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
79	10	90	0	74	72

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: 1238116400196

LLID: 1238116400196

Drainage: Eel River - South Fork

Survey Dates: 9/7/2006 to 9/7/2006

Survey Length (ft.): 2587

Main Channel (ft.): 2587

Side Channel (ft.): 0

Confluence Location: Quad: GARBERVILLE

Legal Description: T05SR03ES14

Latitude: 40:01:11.0N

Longitude: 123:48:42.0W

Summary of Fish Habitat Elements By Stream Reach**STREAM REACH: 1**

Channel Type: A2

Canopy Density (%): 79.4

Pools by Stream Length (%): 8.3

Reach Length (ft.): 2587

Coniferous Component (%): 9.6

Pool Frequency (%): 32.5

Riffle/Flatwater Mean Width (ft.): 2.1

Hardwood Component (%): 90.4

Residual Pool Depth (%):

BFW:

Dominant Bank Vegetation: Hardwood Trees

< 2 Feet Deep: 92

Range (ft.): 12 to 23

Vegetative Cover (%): 73.1

2 to 2.9 Feet Deep: 8

Mean (ft.): 16

Dominant Shelter: Boulders

3 to 3.9 Feet Deep: 0

Std. Dev.: 4

Dominant Bank Substrate Type: Sand/Silt/Clay

>= 4 Feet Deep: 0

Base Flow (cfs.): 0.0

Occurrence of LWD (%): 16

Mean Max Residual Pool Depth (ft.): 1.3

Water (F): 58 - 61 Air (F): 56 - 71

LWD per 100 ft.:

Mean Pool Shelter Rating: 11

Dry Channel (ft): 612

Riffles: 3

Pools: 7

Flat: 3

Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 62 Sm Cobble: 31 Lg Cobble: 0 Boulder: 0 Bedrock: 8

Embeddedness Values (%): 1. 38.5 2. 15.4 3. 38.5 4. 0.0 5. 7.7

Table 9 - Mean Percentage of Dominant Substrate and Vegetation

Stream Name: 1238116400196

LLID: 1238116400196

Drainage: Eel River - South Fork

Survey Dates: 9/7/2006 to 9/7/2006

Confluence Location: Quad: GARBERVILLE

Legal Description: T05SR03ES14

Latitude: 40:01:11.0N

Longitude: 123:48:42.0W

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	6	8	38.9
Boulder	1	0	2.8
Cobble / Gravel	0	0	0.0
Sand / Silt / Clay	11	10	58.3

Mean Percentage of Dominant Stream Bank Vegetation

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Grass	0	0	0.0
Brush	0	0	0.0
Hardwood Trees	14	15	80.6
Coniferous Trees	4	3	19.4
No Vegetation	0	0	0.0

Total Stream Cobble Embeddedness Values:

2

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

StreamName: 1238116400196

LLID: 1238116400196

Drainage: Eel River - South Fork

Survey Dates: 9/7/2006 to 9/7/2006

Confluence Location: Quad: GARBERVILLE

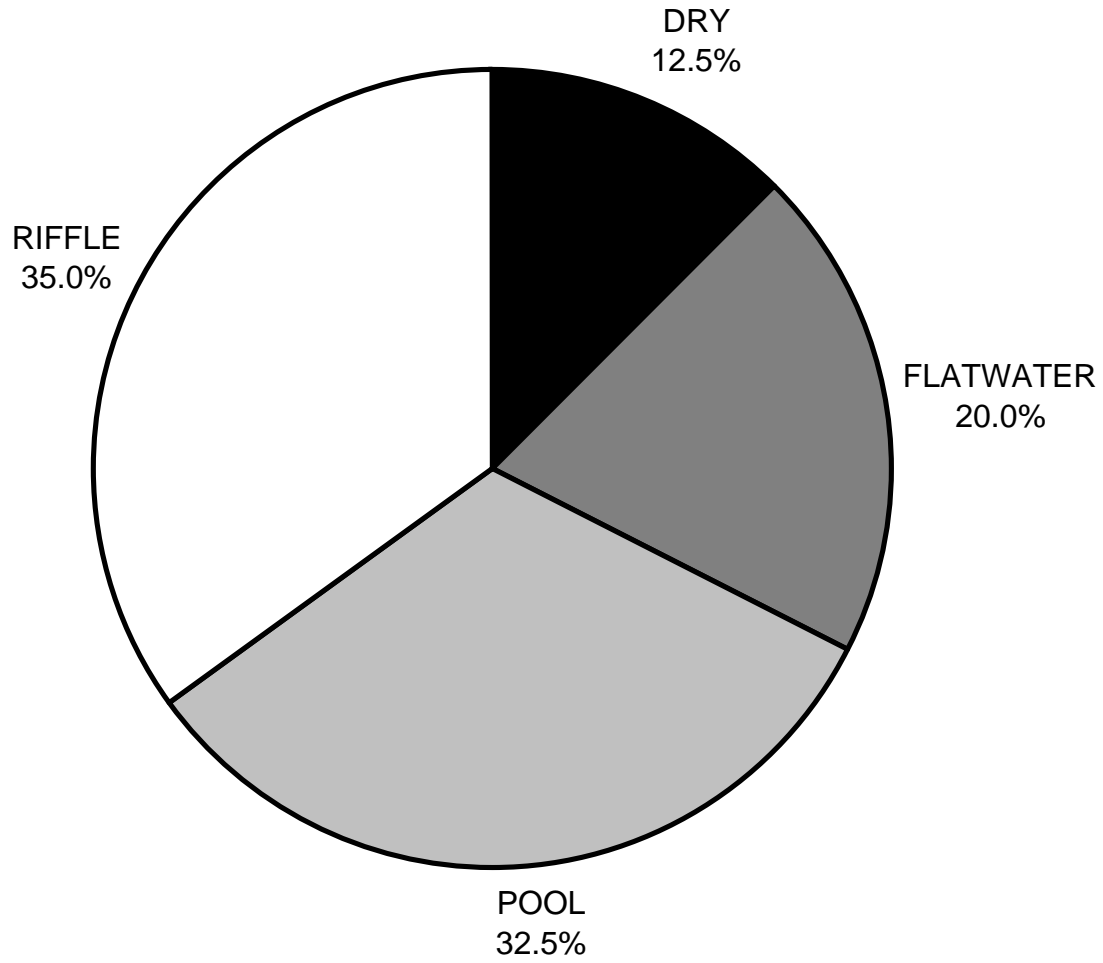
Legal Description: T05SR03ES14

Latitude: 40:01:11.0N

Longitude: 123:48:42.0W

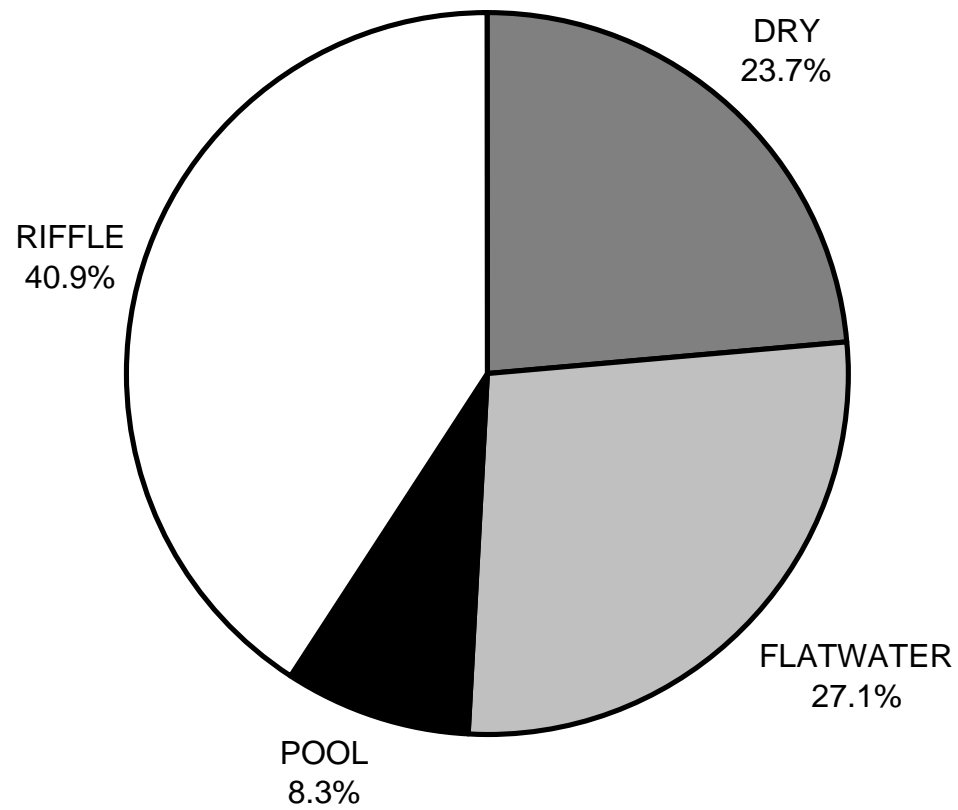
	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	0	10
SMALL WOODY DEBRIS (%)	0	0	0
LARGE WOODY DEBRIS (%)	0	0	23
ROOT MASS (%)	0	0	8
TERRESTRIAL VEGETATION (%)	0	0	0
AQUATIC VEGETATION (%)	0	0	0
WHITEWATER (%)	0	0	3
BOULDERS (%)	33	50	12
BEDROCK LEDGES (%)	0	0	6

1238116400196 2006
HABITAT TYPES BY PERCENT OCCURRENCE



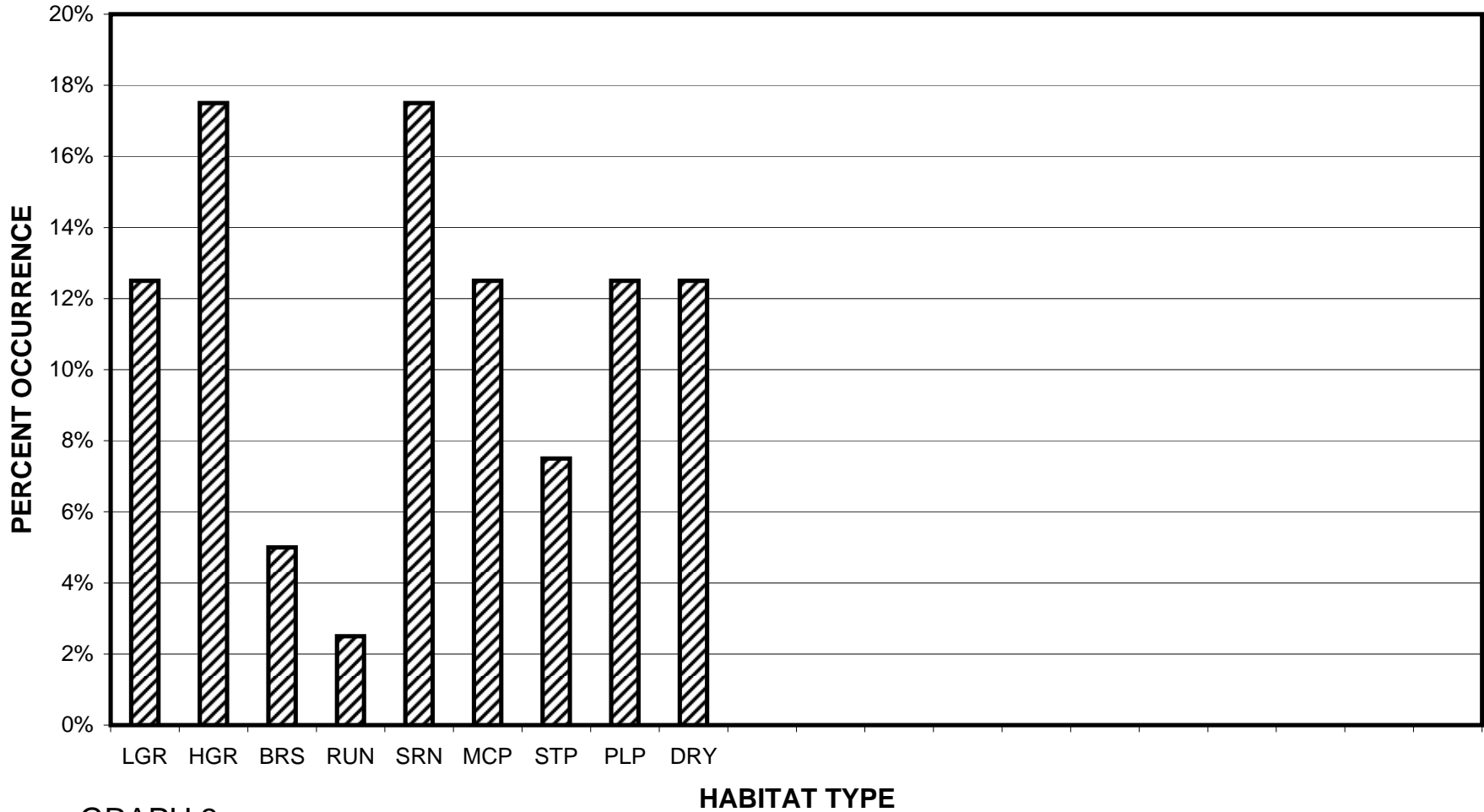
GRAPH 1

1238116400196 2006
HABITAT TYPES BY PERCENT TOTAL LENGTH



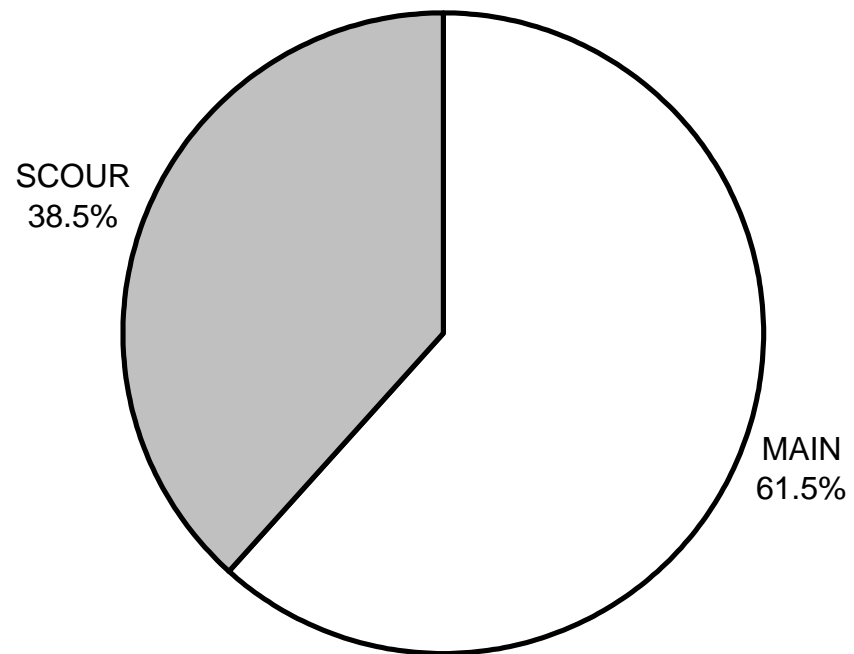
GRAPH 2

1238116400196 2006
HABITAT TYPES BY PERCENT OCCURRENCE



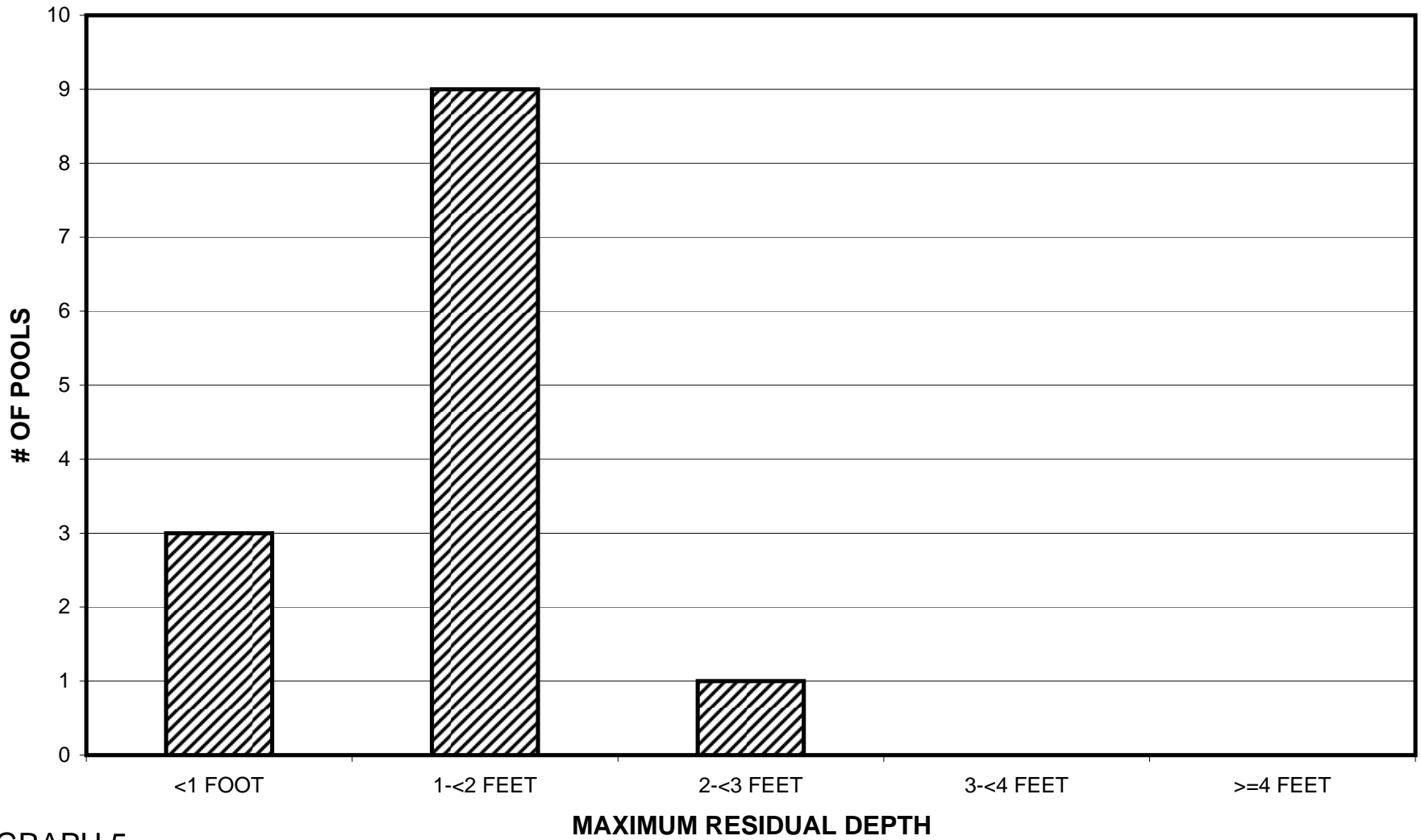
GRAPH 3

1238116400196 2006
POOL TYPES BY PERCENT OCCURRENCE



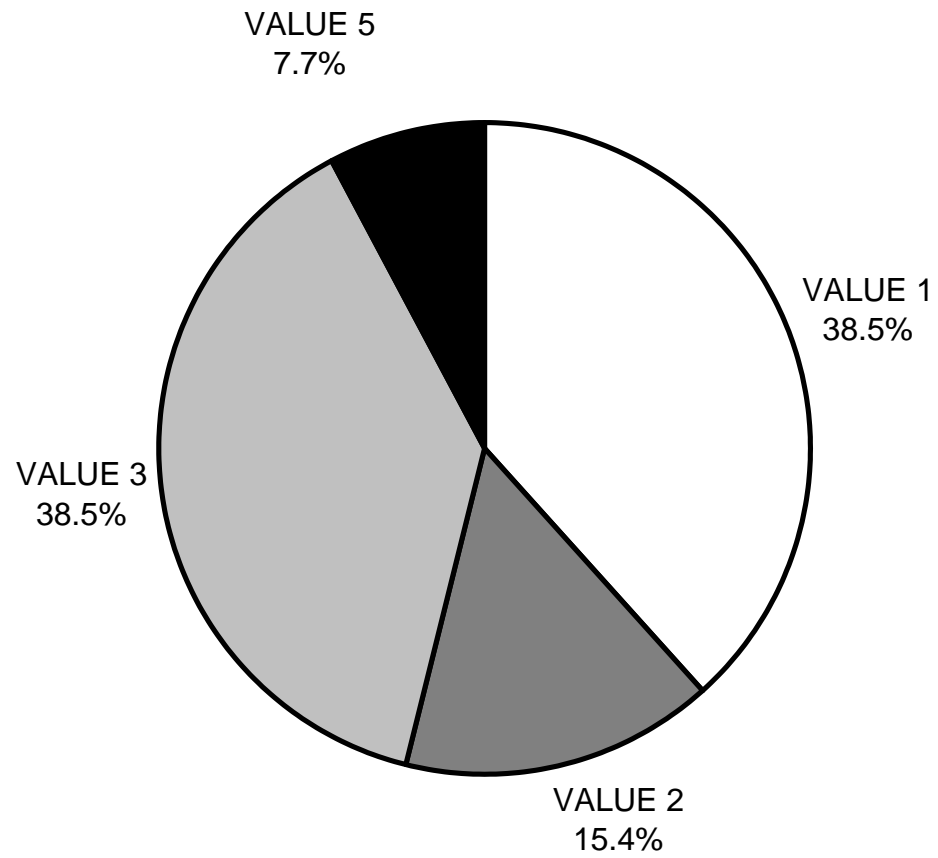
GRAPH 4

1238116400196 2006
MAXIMUM DEPTH IN POOLS



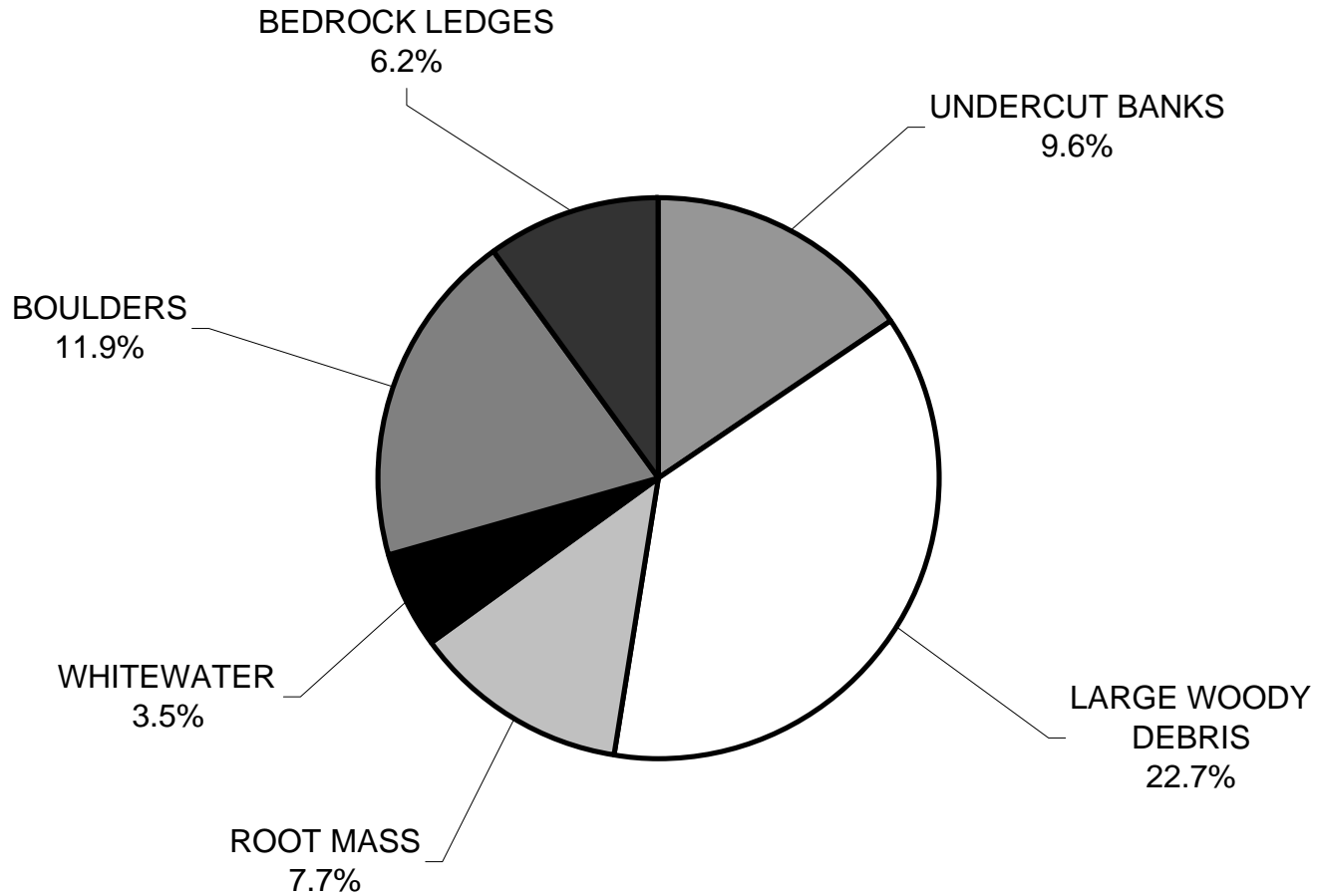
GRAPH 5

**1238116400196 2006
PERCENT EMBEDDEDNESS**



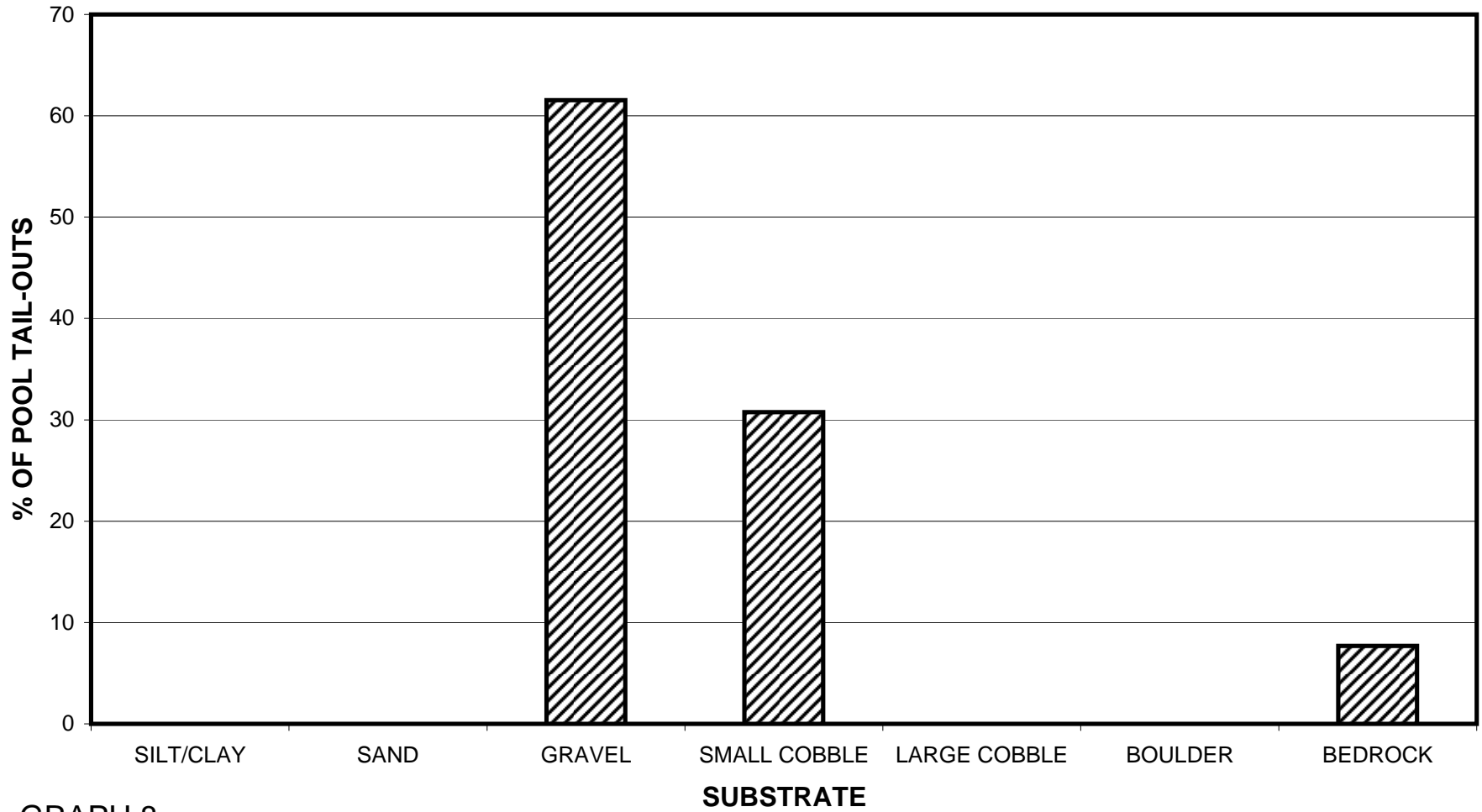
GRAPH 6

1238116400196 2006
MEAN PERCENT COVER TYPES IN POOLS



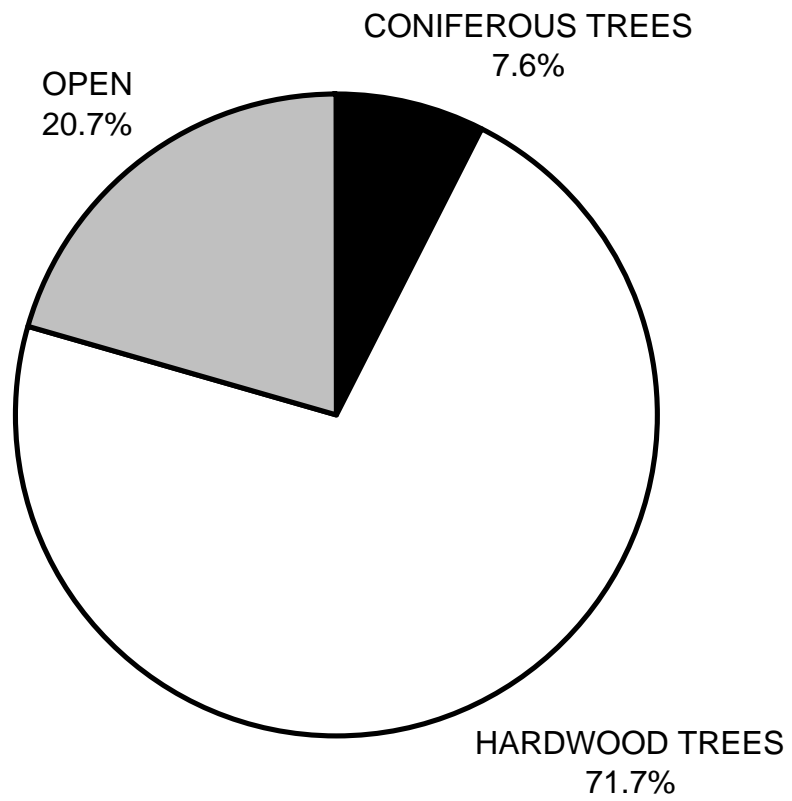
GRAPH 7

1238116400196 2006
SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



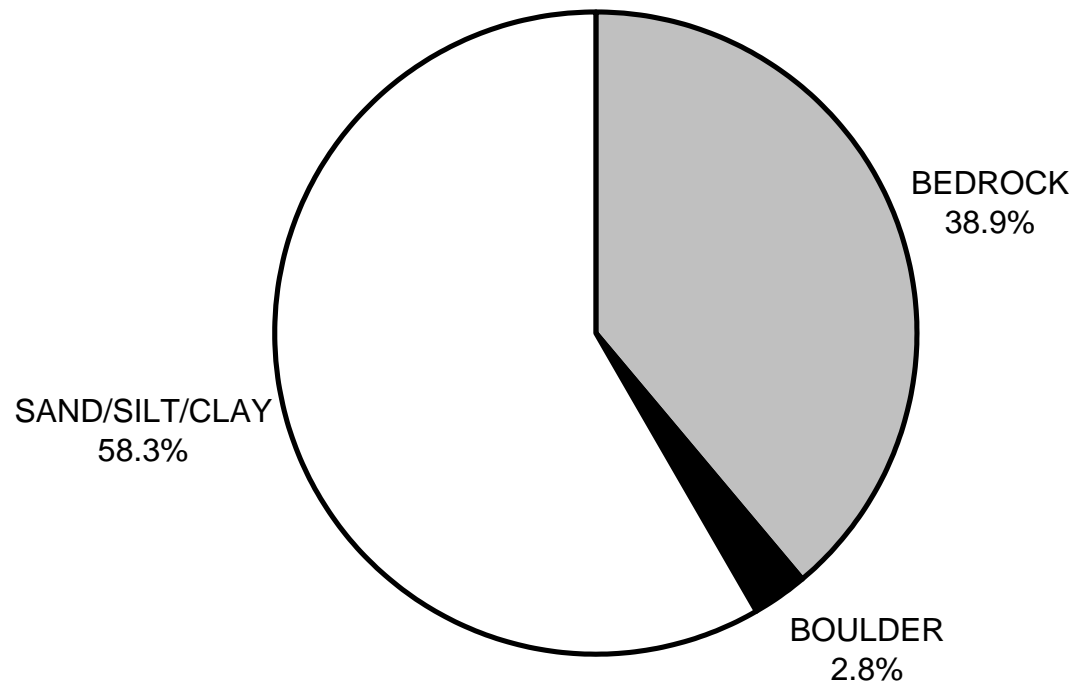
GRAPH 8

**1238116400196 2006
MEAN PERCENT CANOPY**



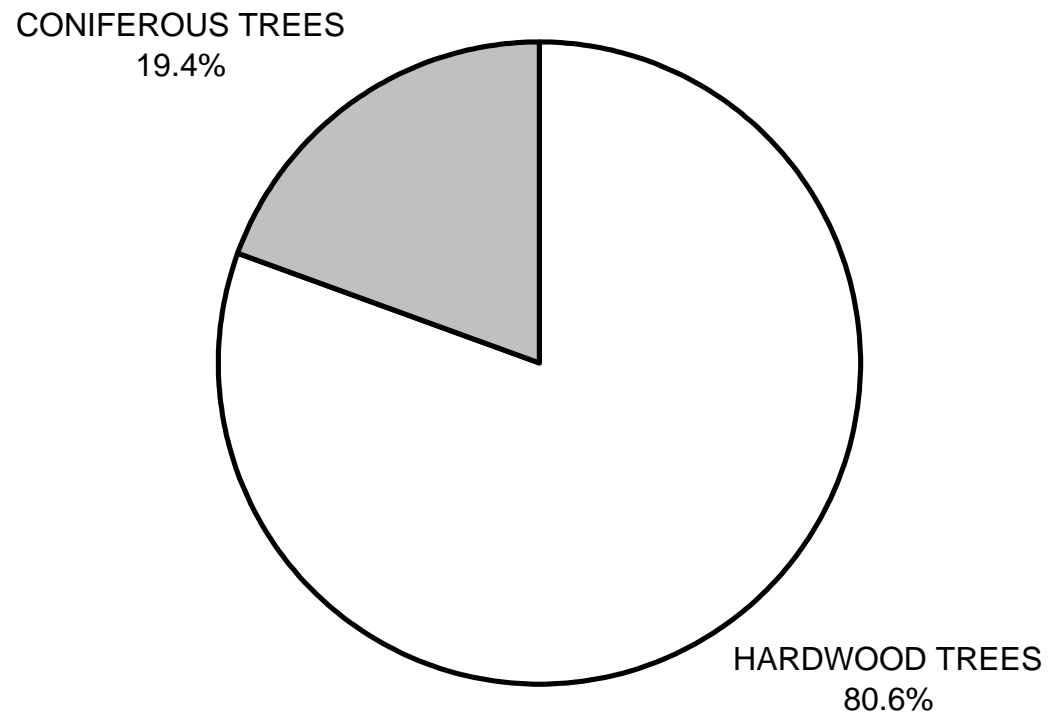
GRAPH 9

1238116400196 2006
DOMINANT BANK COMPOSITION IN SURVEY REACH



GRAPH 10

1238116400196 2006
DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11

