

STREAM INVENTORY REPORT
Unnamed Tributary #4 to Martin Slough
2006

WATERSHED OVERVIEW

Unnamed Tributary #4 appears as the second blue line tributary on Martin Slough upstream of Swain Slough. Refer to the map of Martin Slough for the location of Unnamed Tributary #4.

Unnamed tributary #4 is a tributary to Martin Slough, tributary to Swain Slough, tributary to Elk River, tributary to Humboldt Bay, tributary to the Pacific Ocean located in Humboldt County, California. Unnamed tributary's legal description at the confluence with Martin Slough is T04N R01W S03. Its location is 40°45'40" north latitude and 124°09'58" west longitude, LLID number 1241661407611. Unnamed tributary is an ephemeral stream according to the USGS Eureka 7.5 minute quadrangle and appears as the 1st blue line tributary that enters from the right bank. Unnamed tributary drains a watershed of approximately 0.96 square miles. No flow was recorded. Elevations range from about 5 feet at the mouth of the creek to 100 feet in the headwater areas. Mixed hardwood forest dominates the watershed. The watershed is entirely privately owned and is managed for development. Vehicle access exists via private streets throughout southern Eureka, south of Harris Street.

HABITAT INVENTORY RESULTS AND DISCUSSION

The habitat inventory of August 23, 2006 to August 24, 2006 was conducted by A. Shows and B. Rahn (WSP). The total length of the stream surveyed was 3,835 feet.

Stream flow was not measured on Unnamed Tributary #4.

Unnamed Tributary #4 is an E6 channel type for the entire 3,835 feet of the stream surveyed (Reach 1). The suitability of E6 channel types for fish habitat improvement structures is described in the main body of this report.

The water temperatures recorded on the survey days August 23, 2006 and August 24, 2006, ranged from 59 to 60 degrees Fahrenheit. Air temperatures ranged from 58 to 65 degrees Fahrenheit. For a more complete and accurate water temperature profile, please refer to Appendix B – Thermograph Report at the end of this document.

Based on the total length of this survey, Level II habitat units consisted of 35% flatwater units and 28% pool units. In addition, the total length of this survey consisted of 36% no-survey units (marsh) and 1% culvert units. The pools are relatively deep, with all 4 pools having a maximum residual depth greater than 2 feet.

None of the 4 pool tail-outs measured had embeddedness ratings of 1 or 2. None of the pool tail-

outs had embeddedness ratings of 3 or 4. Cobble embeddedness of 25% or less, a rating of 1, is considered best for the needs of salmon and steelhead. In Unnamed Tributary #4, sediment sources should be mapped and rated according to their potential sediment yields, and control measures should be taken.

The mean shelter rating for pools was 9. The shelter rating in the flatwater habitats was 15. A pool shelter rating of approximately 100 is desirable.

There were no low gradient riffles.

The mean percent canopy density for the stream was 42%. In general, revegetation projects are considered when canopy density is less than 80. The percentage of right and left bank covered with vegetation was 97% and 97%, respectively. In areas where bank vegetation is not at acceptable levels planting endemic species of coniferous and hardwood trees is recommended.

BIOLOGICAL INVENTORY RESULTS

One site was electrofished on October 25th, 2006, in Unnamed Tributary #4. The units were sampled by A. Shows, B. Rahn (WSP) and S. Monday (DFG). Additionally, two sites downstream of the electrofishing site were sampled with a 30 foot seine net by A. Shows (WSP) and M. Gilroy, M. Wallace, and D. Kyle (DFG) on September 21st, 2006 and on May 25th, 2006.

The electrofishing site sampled included habitat unit #011, a run 3,000 feet from the confluence with Martin Slough. This site had a length of 218 feet. The site yielded two salamander sp. and 15 three-spined stickleback.

The seining sites sampled on September 21st, 2006 included habitat unit #006, a 736 feet long mid-channel pool located 600 feet from the confluence with Martin Slough. The site yielded numerous stickleback and one giant water bug. The site sampled on May 25th, 2006 included habitat unit #004, a 279 feet long mid-channel pool located 210 feet from the confluence with Martin Slough. This site yielded numerous sticklebacks.

RECOMMENDATIONS

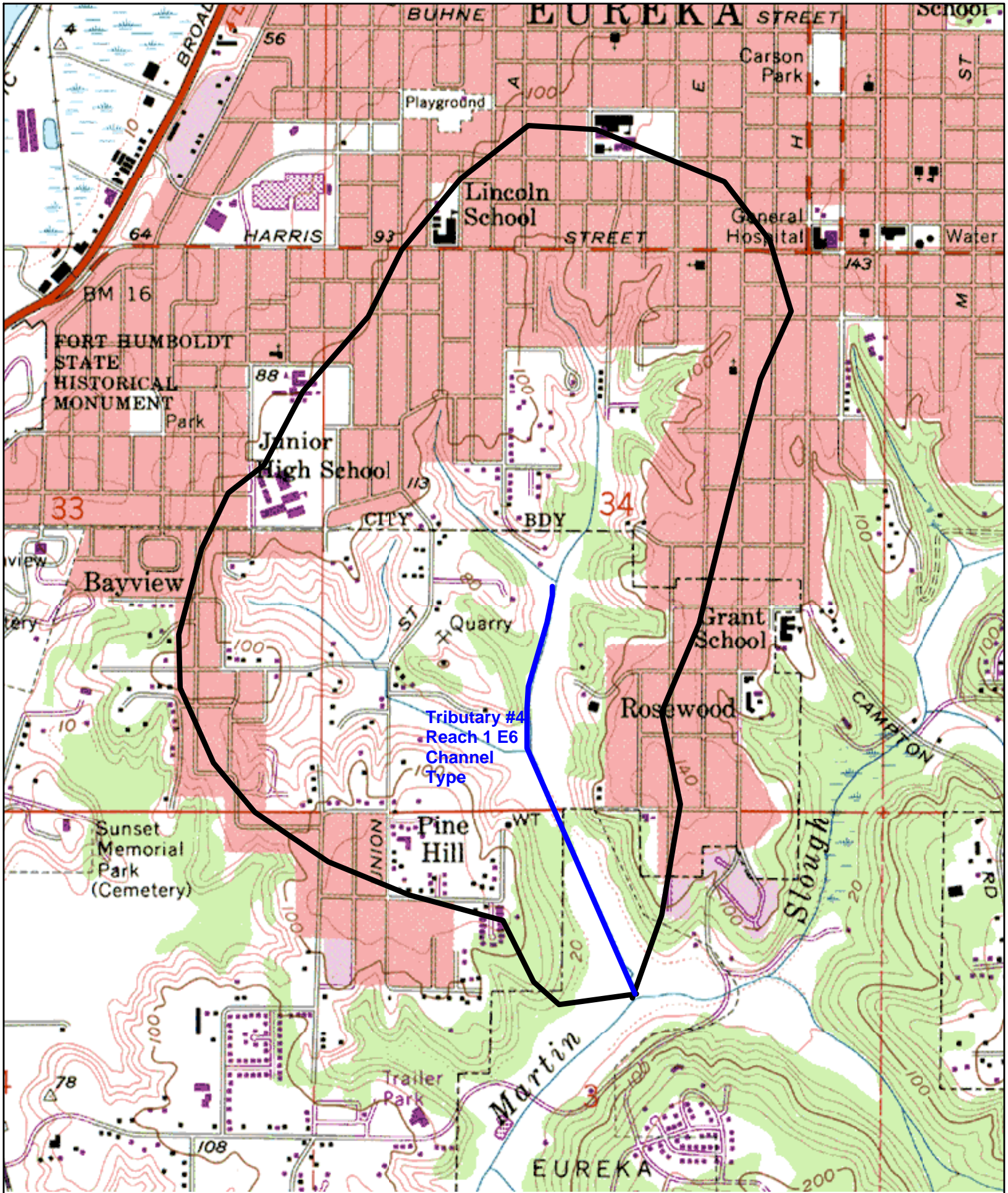
- 1) Unnamed Tributary #4 should be managed as an anadromous, natural production stream.
- 2) The limited water temperature available suggests that the maximum temperatures are within the acceptable range for juvenile salmonids. To establish more complete and meaningful temperature regime information, 24-hour monitoring during the July and August temperature extreme period should be performed for 3 to 5 years.
- 3) Increase woody cover in the pools and flatwater habitat units. Most of the existing cover is from boulders. Adding high quality complexity with woody cover is desirable and in some areas the material is at hand.
- 4) Increase the canopy on Unnamed Tributary #4 by planting willow, alder, redwood, and

Douglas fir along the stream where shade canopy is not at acceptable levels.

PROBLEM SITES 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 confluence with Martin Slough Bridge #1, wooden footbridge, 12' wide x 23' long x 5' high from surface of water; good condition.
209	0004.00	Bridge #2, wooden
597	0006.00	Seine net sampling site. Bridge #3, wooden footbridge, 8' wide x 27' long x 5.4' high from surface of water; good condition. Bridge #4, wooden footbridge, 8' wide x 27' long x 5.4' high from surface of water; good condition
1544	0008.00	End of golf course Bridge #5, wooden footbridge, 10' wide x 27' long x 3' high from surface of water; good condition
1588	0009.00	Water quality had deteriorated. Scum on surface of water and a thick (2 foot) layer of anoxic mud.
1937	0010.00	Not surveyed due to dense instream vegetation (grasses and reeds) Tributary #1 entering on right bank, flow is very low and channel is choked with reeds and grasses.
3006	0011.00	Electro-fishing sampling site
3224	0012.00	Culvert #1 is a possible fish passage barrier and sediment dam. Metal culvert goes under road crossing, downstream end of culvert is mostly below surface of water, and upstream end of culvert is completely blocked by rip-rap, mud and small woody debris; diameter is 1.3'.
3236	0013.00	Wide aggraded channel, sediment is 4' deep, backed up from blocked culvert just downstream.
3748	0015.00	Culvert #2, 2.7' diameter, corrugated metal, no baffles or weirs. Fair condition however small woody debris and sediment are partially blocking upstream end.
3768	0016.00	End of survey due to thick vegetation. Visual observations upstream revealed little change in habitat availability. Tributary runs through a 300' culvert. Erosion problems are evident. Tributaries: Tributary #2 enters from right bank, flowing. Accessible to fish.



Name: EUREKA
 Date: 12/12/2006
 Scale: 1 inch equals 1111 feet

Location: 040° 46' 17.35" N 124° 10' 13.59" W
 Caption: Martin Slough Tributary #4 Watershed Boundary and Reach Information

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

Stream Name: 1241661407611

LLID: 1241661407611

Drainage: Eureka Plain

Survey Dates: 8/23/2006 to 8/23/2006

Confluence Location: Quad: EUREKA

Legal Description: T04NR01WS03

Latitude: 40:45:40.0N

Longitude: 124:09:58.0

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
2	0	CULVERT	12.5	16	32	0.8									
5	2	FLATWATER	31.3	269	1345	35.1	8.5	0.5	0.9	3193	15965	2104	10522		15
5	1	NOSURVEY_	31.3	280	1399	36.5	10.0	1.3	2.2	1300	6500	1690	8450		180
4	4	POOL	25.0	265	1059	27.6	33.5	1.6	2.8	9976	39902	32581	130325	19630	9
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)			Total Volume (cu.ft.)		
16	7				3835					62367			149297		

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: 1241661407611

LLID: 1241661407611

Drainage: Eureka Plain

Survey Dates: 8/23/2006 to 8/23/2006

Confluence Location: Quad: EUREKA

Legal Description: T04NR01WS03

Latitude: 40:45:40.0N

Longitude: 124:09:58.0W

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 (%)
1	0	GLD	6.3	211	211	5.5										
4	2	RUN	25.0	284	1134	29.6	8	0.5	1.4	3193	12772	2104	8418		15	94
4	4	MCP	25.0	265	1059	27.6	34	1.6	3.9	9976	39902	32581	130325	19630	9	25
2	0	CUL	12.5	16	32	0.8										
5	1	MAR	31.3	280	1399	36.5	10	1.3	2.2	1300	6500	1690	8450		180	0

Total Units
16

Total Units Fully Measured
7

Total Length (ft.)
3835

Total Area (sq.ft.)
59174

Total Volume (cu.ft.)
147193

Table 3 - Summary of Pool Types

Stream Name: 1241661407611

LLID: 1241661407611

Drainage: Eureka Plain

Survey Dates: 8/23/2006 to 8/23/2006

Confluence Location: Quad: EUREKA

Legal Description: T04NR01WS03

Latitude: 40:45:40.0N

Longitude: 124:09:58.0W

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
4	4	MAIN	100	265	1059	100	33.5	1.6	9976	39902	19630	78520	9

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
4	4	1059	39902	78520

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

Stream Name: 1241661407611

LLID: 1241661407611

Drainage: Eureka Plain

Survey Dates: 8/23/2006 to 8/23/2006

Confluence Location: Quad: EUREKA

Legal Description: T04NR01WS03

Latitude: 40:45:40.0N

Longitude: 124:09:58.0W

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
4	MCP	100	0	0	0	0	3	75	1	25	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
4	0	0	0	0	3	75	1	25	0	0

Mean Maximum Residual Pool Depth (ft.): 2.8

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: 1241661407611

LLID: 1241661407611

Drainage: Eureka Plain

Survey Dates: 8/23/2006 to 8/23/2006

Dry Units: 0

Confluence Location: Quad: EUREKA

Legal Description: T04NR01WS03

Latitude: 40:45:40.0N

Longitude: 124:09:58.0W

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
0	0	TOTAL RIFFLE									
1	0	GLD									
4	2	RUN	0	35	0	0	15	50	0	0	0
5	2	TOTAL FLAT	0	35	0	0	15	50	0	0	0
4	4	MCP	0	0	0	0	13	63	0	0	0
4	4	TOTAL POOL	0	0	0	0	13	63	0	0	0
2	0	CUL									
5	1	MAR	0	0	0	0	0	100	0	0	0
16	7	TOTAL	0	10	0	0	11	64	0	0	0

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: 1241661407611

LLID: 1241661407611

Drainage: Eureka Plain

Survey Dates: 8/23/2006 to 8/23/2006

Dry Units: 0

Confluence Location: Quad: EUREKA

Legal Description: T04NR01WS03

Latitude: 40:45:40.0N

Longitude: 124:09:58.0W

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
1	0	GLD	0	0	0	0	0	0	0
4	2	RUN	100	0	0	0	0	0	0
4	4	MCP	100	0	0	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: 1241661407611

LLID: 1241661407611

Drainage: Eureka Plain

Survey Dates: 8/23/2006 to 8/23/2006

Confluence Location: Quad: EUREKA

Legal Description: T04NR01WS03

Latitude: 40:45:40.0N

Longitude: 124:09:58.0W

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
42	28	73	56	97	97

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: 1241661407611 LLID: 1241661407611 Drainage: Eureka Plain
 Survey Dates: 8/23/2006 to 8/23/2006 Survey Length (ft.): 3835 Main Channel (ft.): 3835 Side Channel (ft.): 0
 Confluence Location: Quad: EUREKA Legal Description: T04NR01WS03 Latitude: 40:45:40.0N Longitude: 124:09:58.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type: E6	Canopy Density (%): 42.3	Pools by Stream Length (%): 27.6
Reach Length (ft.): 3835	Coniferous Component (%): 27.5	Pool Frequency (%): 25.0
Riffle/Flatwater Mean Width (ft.): 8.5	Hardwood Component (%): 72.5	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Grass	< 2 Feet Deep: 0
Range (ft.): 11 to 13	Vegetative Cover (%): 97.1	2 to 2.9 Feet Deep: 75
Mean (ft.): 12	Dominant Shelter: Aquatic Vegetation	3 to 3.9 Feet Deep: 25
Std. Dev.: 1	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 0
Base Flow (cfs.): 0.0	Occurrence of LWD (%): 0	Mean Max Residual Pool Depth (ft.): 2.8
Water (F): 59 - 60 Air (F): 58 - 65	LWD per 100 ft.:	Mean Pool Shelter Rating: 9
Dry Channel (ft): 0	Riffles:	
	Pools: 0	
	Flat: 0	
Pool Tail Substrate (%): Silt/Clay: 100 Sand: 0 Gravel: 0 Sm Cobble: 0 Lg Cobble: 0 Boulder: 0 Bedrock: 0		
Embeddedness Values (%): 1. 0.0 2. 0.0 3. 0.0 4. 0.0 5. 100.0		

Table 9 - Mean Percentage of Dominant Substrate and Vegetation

Stream Name: 1241661407611

LLID: 1241661407611

Drainage: Eureka Plain

Survey Dates: 8/23/2006 to 8/23/2006

Confluence Location: Quad: EUREKA

Legal Description: T04NR01WS03

Latitude: 40:45:40.0N

Longitude: 124:09:58.0W

Mean Percentage of Dominant Stream Bank Substrate

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Bedrock	0	0	0.0
Boulder	0	0	0.0
Cobble / Gravel	0	0	0.0
Sand / Silt / Clay	7	7	100.0

Mean Percentage of Dominant Stream Bank Vegetation

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Grass	4	4	57.1
Brush	0	0	0.0
Hardwood Trees	3	2	35.7
Coniferous Trees	0	1	7.1
No Vegetation	0	0	0.0

Total Stream Cobble Embeddedness Values:

5

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

StreamName: 1241661407611

LLID: 1241661407611

Drainage: Eureka Plain

Survey Dates: 8/23/2006 to 8/23/2006

Confluence Location: Quad: EUREKA

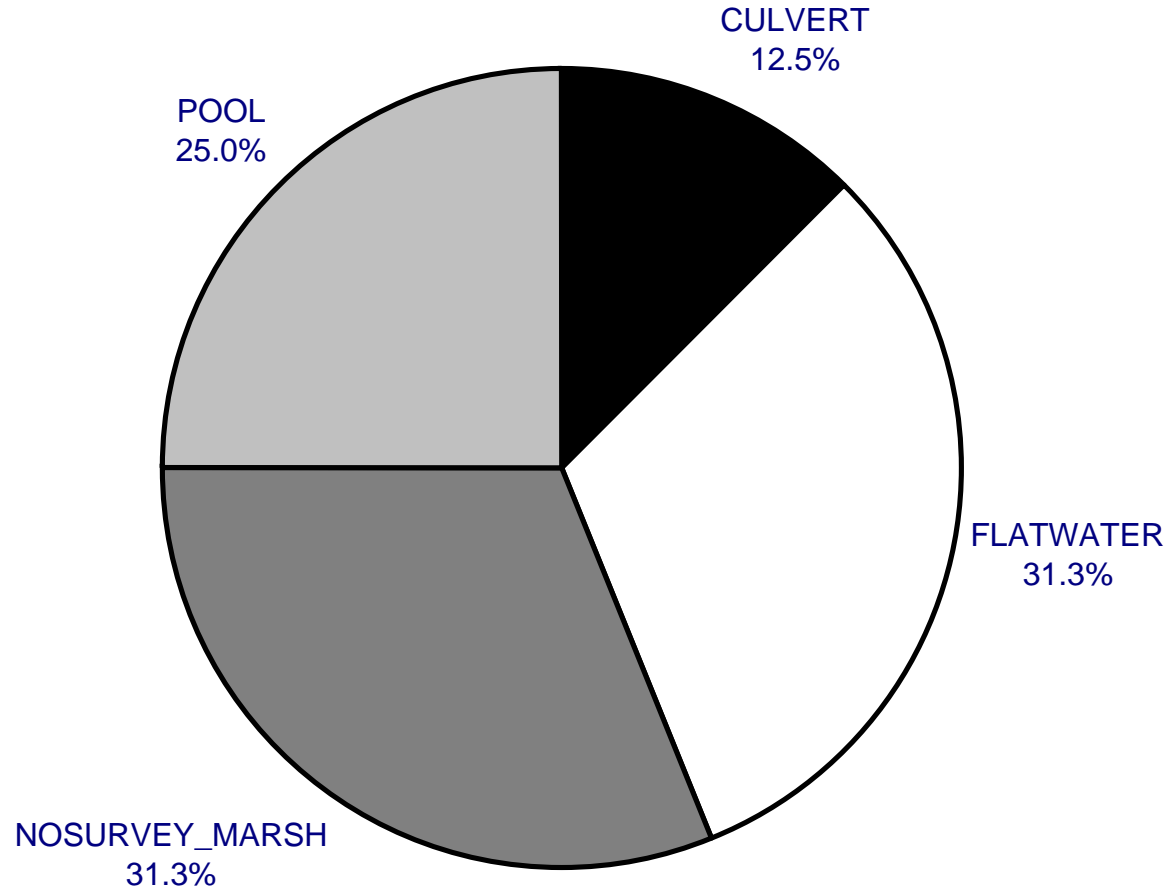
Legal Description: T04NR01WS03

Latitude: 40:45:40.0N

Longitude: 124:09:58.0W

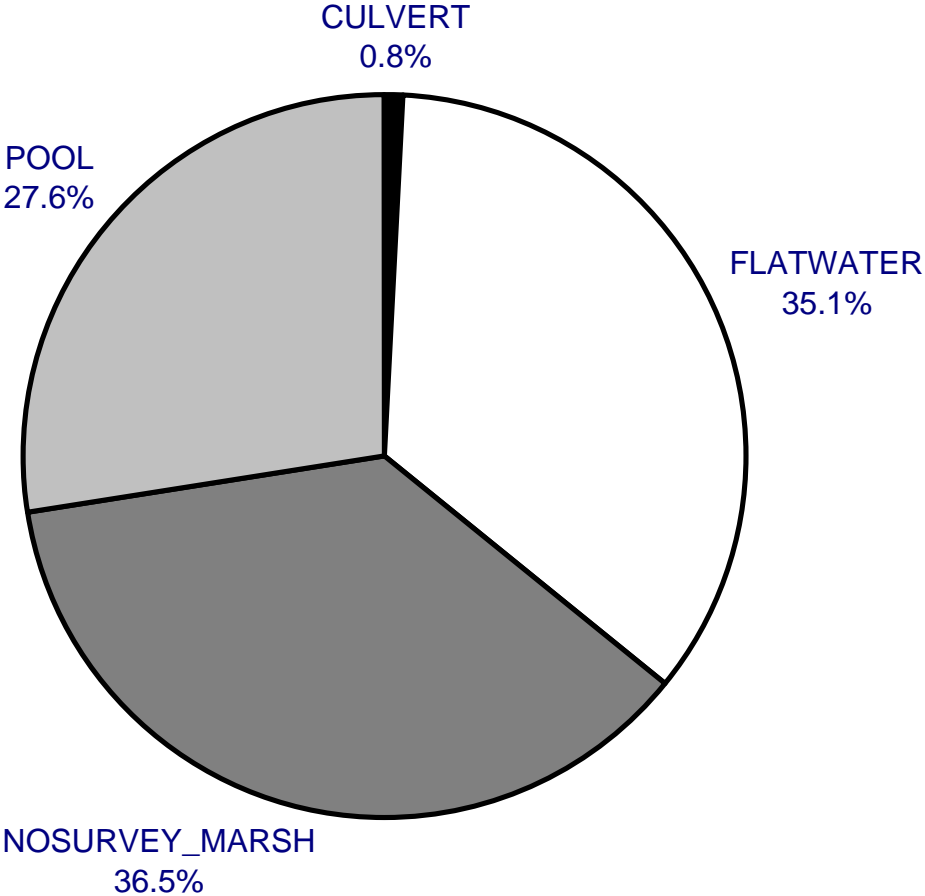
	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)		0	0
SMALL WOODY DEBRIS (%)		35	0
LARGE WOODY DEBRIS (%)		0	0
ROOT MASS (%)		0	0
TERRESTRIAL VEGETATION (%)		15	13
AQUATIC VEGETATION (%)		50	63
WHITEWATER (%)		0	0
BOULDERS (%)		0	0
BEDROCK LEDGES (%)		0	0

1241661407611 2006
HABITAT TYPES BY PERCENT OCCURRENCE



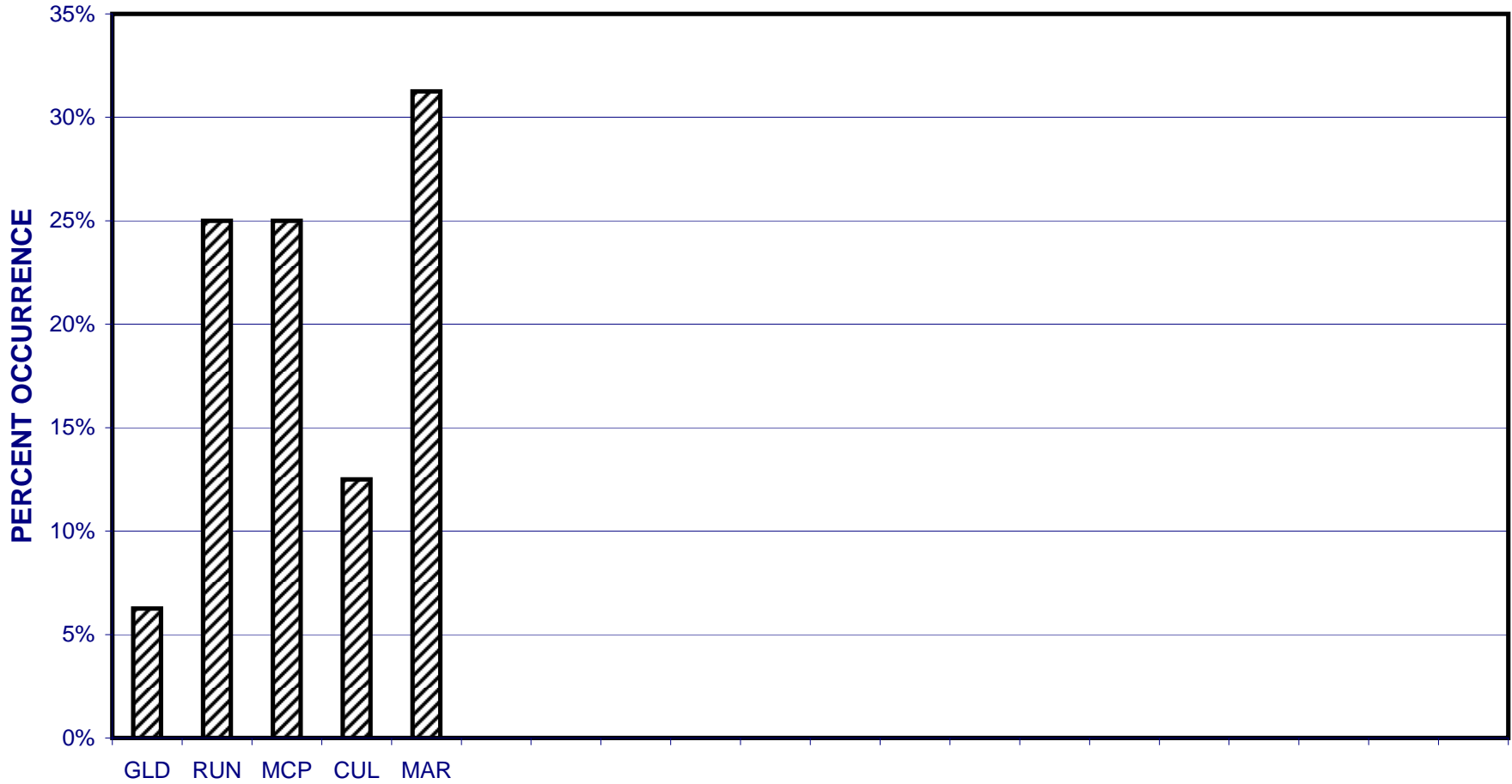
GRAPH 1

1241661407611 2006
HABITAT TYPES BY PERCENT TOTAL LENGTH



GRAPH 2

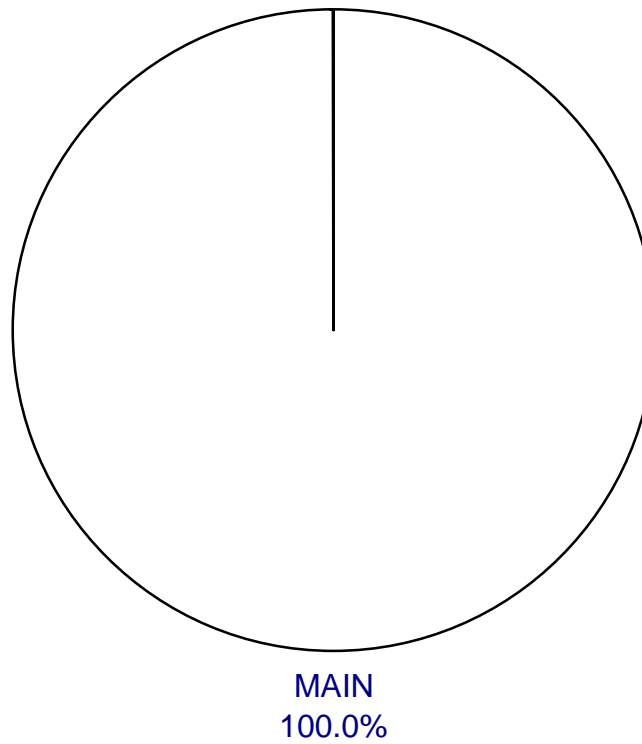
1241661407611 2006
HABITAT TYPES BY PERCENT OCCURRENCE



GRAPH 3

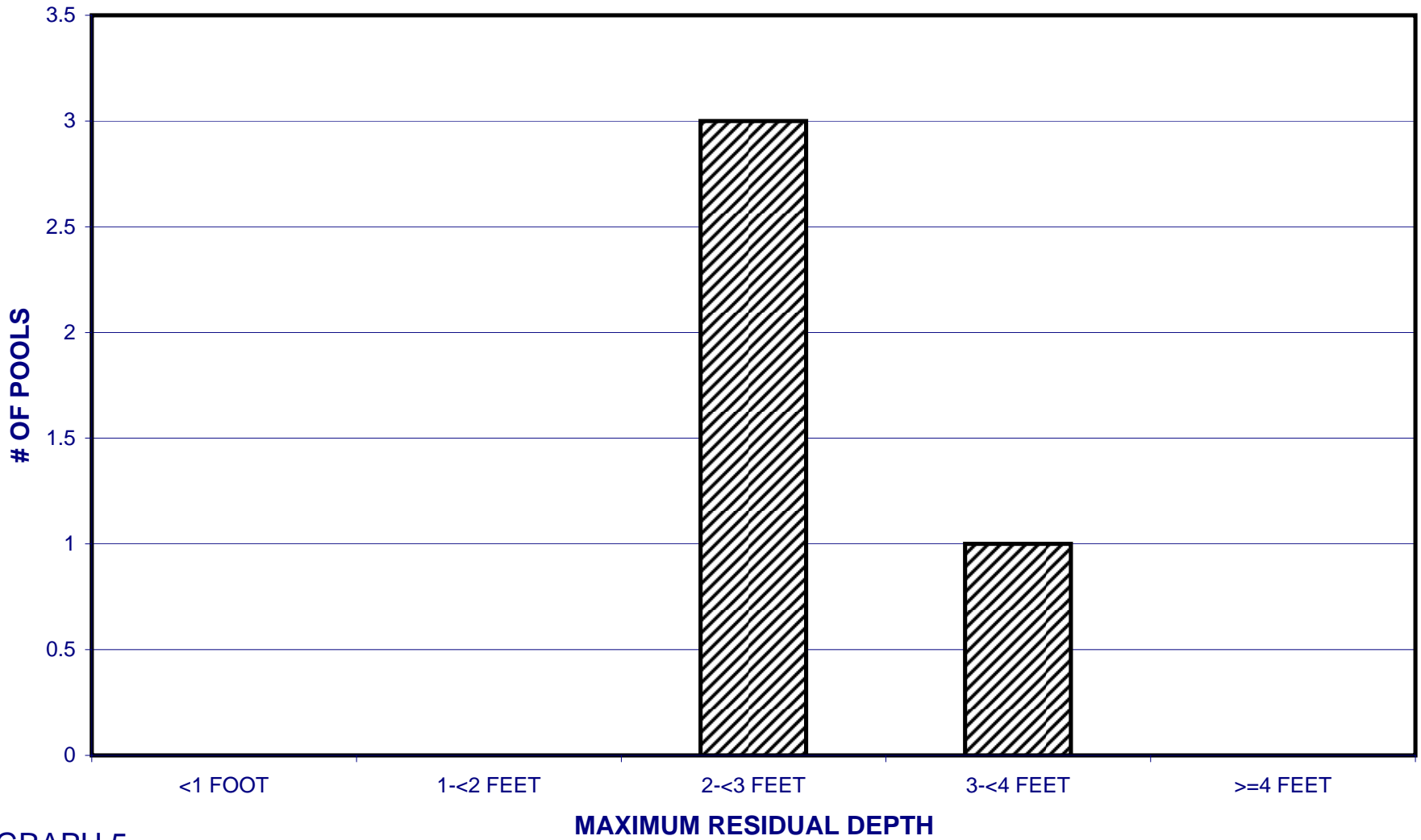
HABITAT TYPE

1241661407611 2006
POOL TYPES BY PERCENT OCCURRENCE



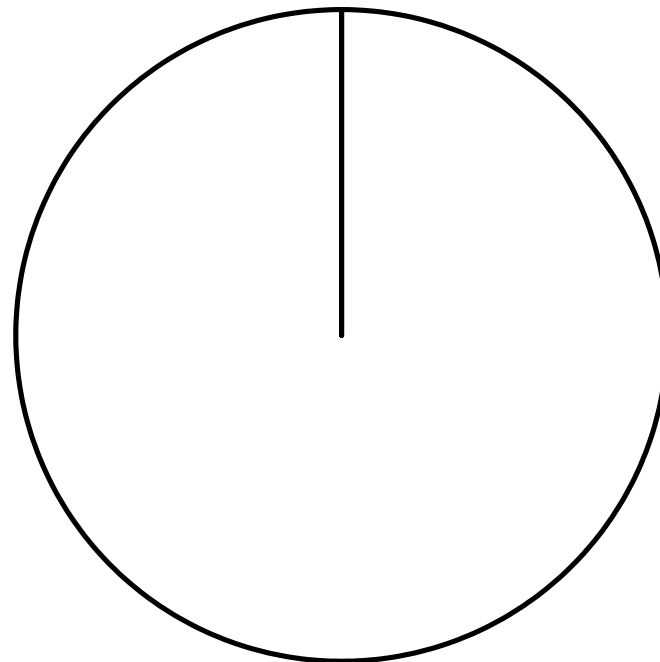
GRAPH 4

**1241661407611 2006
MAXIMUM DEPTH IN POOLS**



GRAPH 5

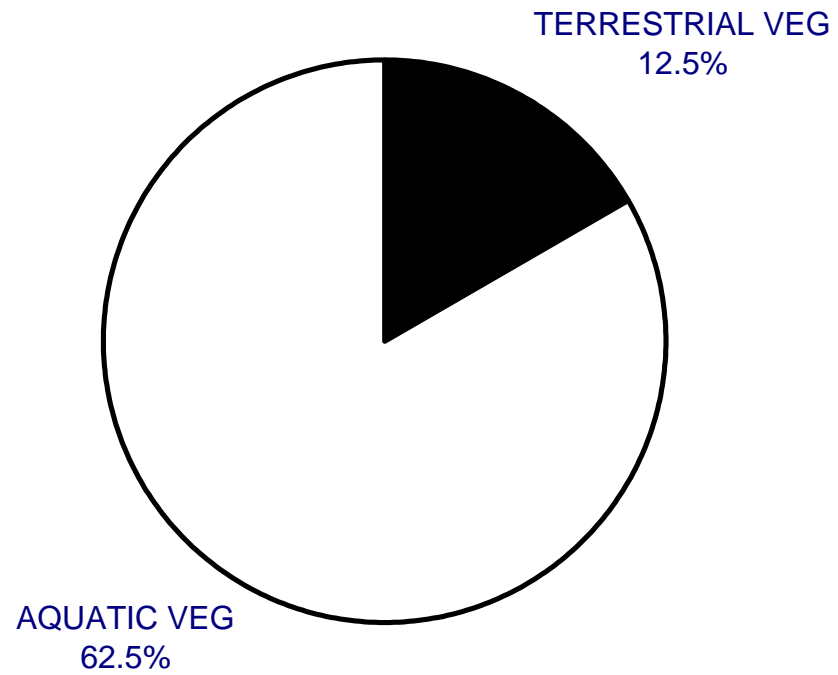
**1241661407611 2006
PERCENT EMBEDDEDNESS**



VALUE 5
100.0%

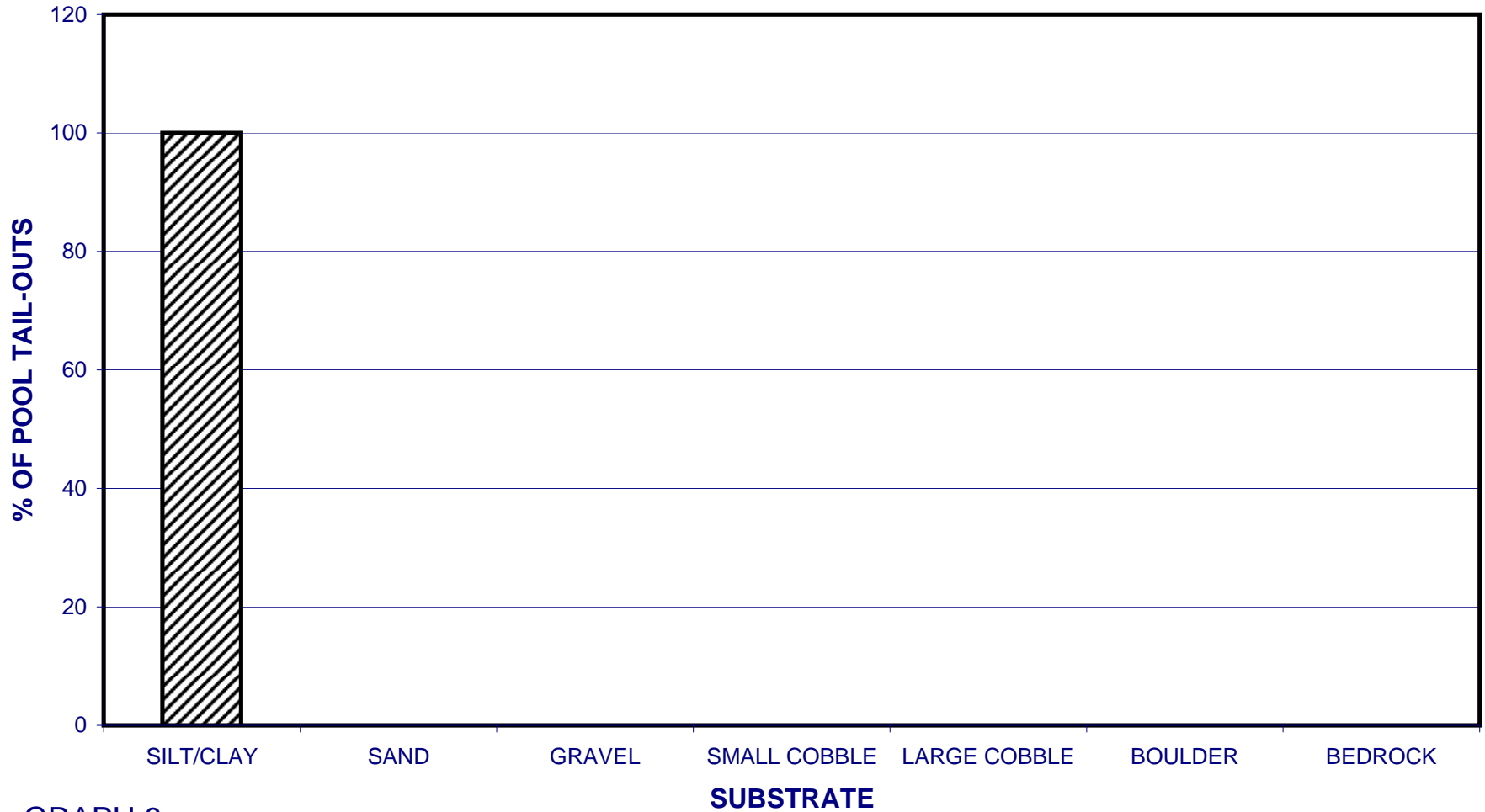
GRAPH 6

1241661407611 2006
MEAN PERCENT COVER TYPES IN POOLS



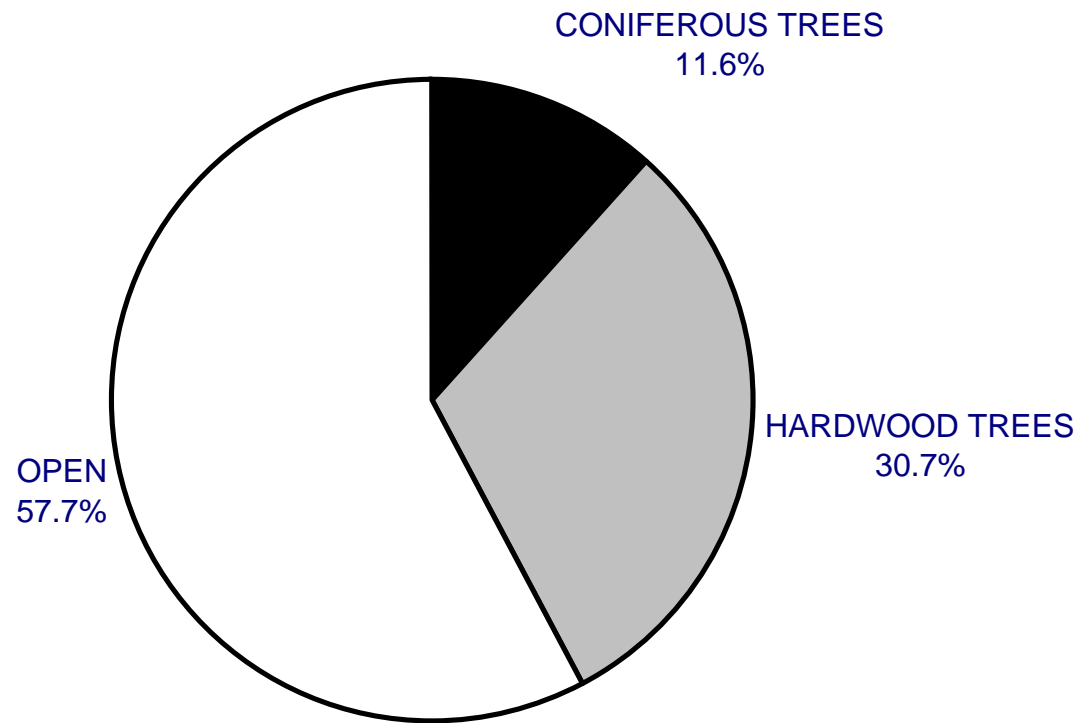
GRAPH 7

1241661407611 2006
SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



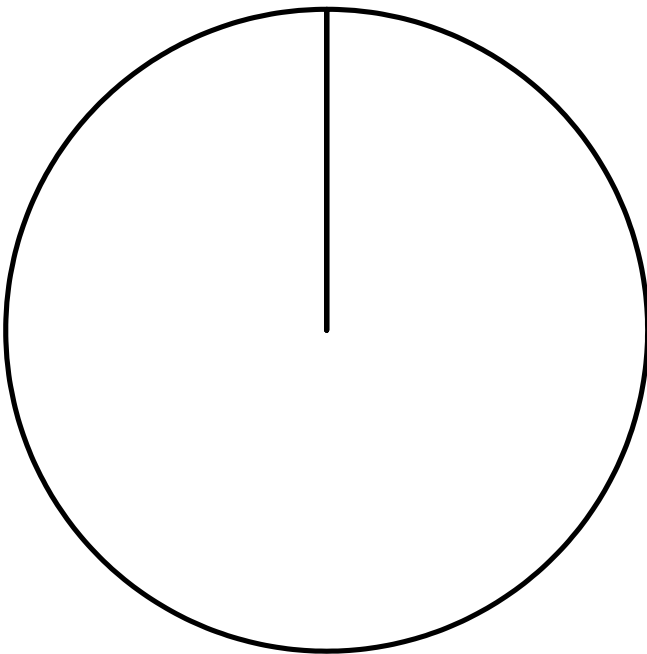
GRAPH 8

**1241661407611 2006
MEAN PERCENT CANOPY**



GRAPH 9

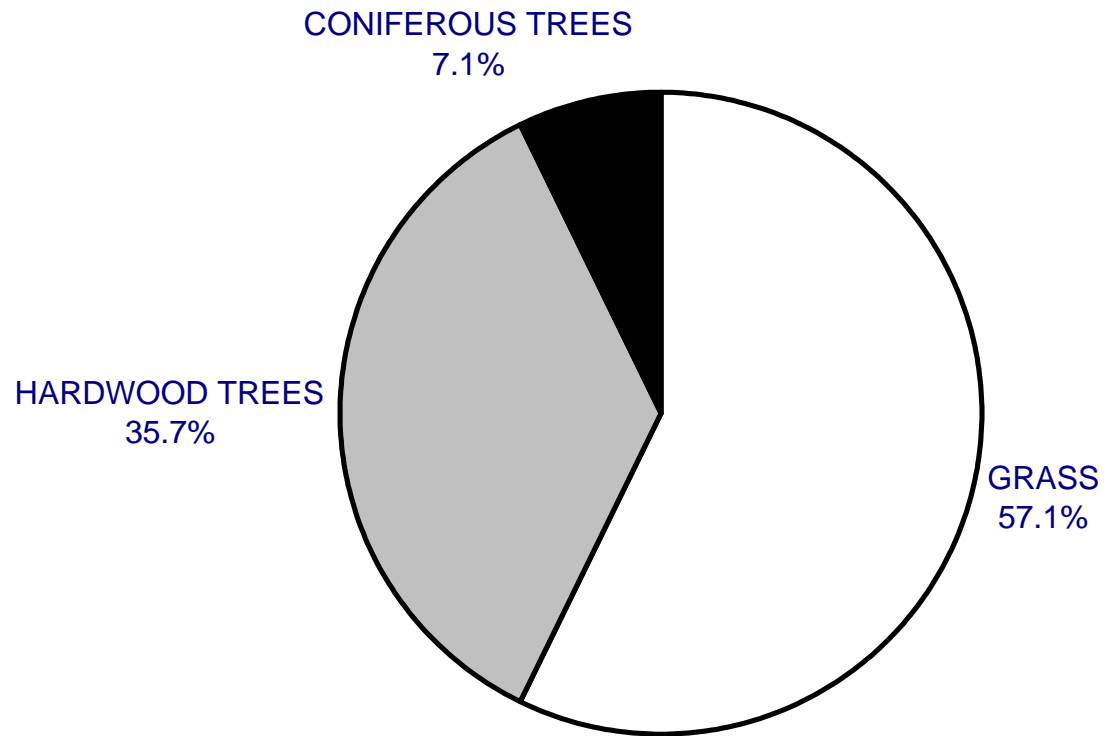
1241661407611 2006
DOMINANT BANK COMPOSITION IN SURVEY REACH



SAND/SILT/CLAY
100.0%

GRAPH 10

1241661407611 2006
DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11