

STREAM INVENTORY REPORT

Gulch One

INTRODUCTION

A stream inventory was conducted July 23, 2008 on the upper reach of Abalobadiah Creek commonly known as and hereinafter referred to as Gulch One. The survey began at the confluence with Abalobadiah Creek and extended upstream 0.3 miles.

The objective of the habitat inventory was to document the habitat available to anadromous salmonids in Gulch One.

The objective of this report is to document the current habitat conditions and recommend options for the potential enhancement of habitat for 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

Gulch One is a tributary to Abalobadiah Creek, which drains to the Pacific Ocean located in Mendocino County, California (Map 1). Gulch One's legal description at the confluence with Abalobadiah Creek is T20N R17W S21. Its location is 39.5890 north latitude and 123.7574 west longitude, LLID number 1237563395889. Gulch One is a first order stream and has approximately 0.8 miles of blue line stream according to the USGS Inglenook 7.5 minute quadrangle. Gulch One drains a watershed of approximately 0.38 square miles. Elevations range from about 150 feet at the mouth of the creek to 800 feet in the headwater areas. Redwood forest dominates the watershed. The watershed is entirely privately owned and is managed for timber production. Vehicle access exists via a private gated road off Highway 1.

METHODS

The habitat inventory conducted in Gulch One follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al, 1998). The Pacific States Marine Fisheries Commission (PSMFC) Fisheries Technicians 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

Gulch One

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 Gulch One 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". Gulch One 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 Gulch One, embeddedness was

Gulch One

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

7. Substrate Composition:

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

8. Canopy:

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

Gulch One

10. Large Woody Debris Count:

Large woody debris (LWD) is an important component of fish habitat and an element in channel forming processes. In each habitat unit all pieces of LWD partially or entirely below the elevation of bankfull discharge are counted and recorded. The minimum size to be considered is twelve inches in diameter and six feet in length. The LWD count is presented by reach and is expressed as an average per 100 feet.

11. Average Bankfull Width:

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

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 Gulch One 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

Gulch One

- 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 23, 2008, was conducted by D. Wright and W. Holloway (PSMFC). The total length of the stream surveyed was 1,571 feet.

Stream flow was estimated to be less than 0.11 cfs during the survey period.

Gulch One is a B4 channel type for 1,571 feet of the stream surveyed. B4 channels are moderately entrenched, moderate gradient, riffle dominated channel with infrequently spaced pools, very stable plan and profile, stable banks and gravel-dominant substrates.

Water temperatures taken during the survey period ranged from 53 to 56 degrees Fahrenheit. Air temperatures ranged from 60 to 69 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 46% pool units, 36% flatwater units, 10% riffle units, and 8% dry units (Graph 1). Based on total length of Level II habitat types there were 66% flatwater units, 20% pool units, 10% riffle units, and 5% dry units (Graph 2).

Nine Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were step run units, 34%; mid-channel pool units, 28%; and lateral scour pool - log enhanced units, 12% (Graph 3). Based on percent total length, step run units made up 64% of the creek; mid-channel pool units, 12%; and low gradient riffle units made up 10%.

A total of 23 pools were identified (Table 3). Main channel pools were the most frequently encountered at 65% (Graph 4), and comprised 68% 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. None of the 23 pools (0%) had a residual depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 23 pool tail-outs measured, 1 had a value of 1 (4.3%); 12 had a value of 2 (52.2%); 10 had a value of 3 (43.5%) (Graph 6). On this scale, a value of 1 indicates the best spawning conditions and a value of 4 the worst.

Gulch One

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 8, flatwater habitat types had a mean shelter rating of 30, and pool habitats had a mean shelter rating of 64 (Table 1). Of the pool types, the main channel pools had the highest mean shelter rating at 65. Scour pools had a mean shelter rating of 64, and backwater pools had a mean shelter rating of 60 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Terrestrial vegetation is the dominant cover type in Gulch One. Graph 7 describes the pool cover in Gulch One. Small woody debris is the dominant pool cover type followed by terrestrial vegetation.

Table 6 summarizes the dominant substrate by habitat type. Graph 8 depicts the dominant substrate observed in pool tail-outs. Gravel was the dominant substrate observed in 91% of the pool tail-outs. Small cobble was the next most frequently observed dominant substrate type and occurred in 9% of the pool tail-outs.

The mean percent canopy density for the surveyed length of Gulch One was 97%. Three percent of the canopy was open. Of the canopy present, the mean percentages of hardwood and coniferous trees were 29% and 71%, respectively. Graph 9 describes the mean percent canopy in Gulch One.

For the stream reach surveyed, the mean percent right bank vegetated was 62%. The mean percent left bank vegetated was 70%. The dominant elements composing the structure of the stream banks consisted of 77% sand/silt/clay, 21% cobble/gravel, and 2% bedrock (Graph 10). Brush was the dominant vegetation type observed in 90% of the units surveyed. Additionally, 8% of the units surveyed had grass as the dominant vegetation type, and 2% had coniferous trees as the dominant vegetation (Graph 11).

DISCUSSION

Gulch One is a B4 channel type for the entire 1,571 feet of stream surveyed. B4 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, single and opposing wing-deflectors, and log cover.

The water temperatures recorded on the survey day July 23, 2008, ranged from 53 to 56 degrees Fahrenheit. Air temperatures ranged from 60 to 69 degrees Fahrenheit. To make 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 66% of the total length of this survey, riffles 10%, and pools 20%. None of the 23 (0%) 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

Gulch One

flow channel, and be as long as the low flow channel width. Installing structures that will increase or deepen pool habitat is recommended.

Thirteen of the 23 pool tail-outs measured had embeddedness ratings of 1 or 2. Ten 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 Gulch One should be mapped and rated according to their potential sediment yields, and control measures should be taken.

All of the 23 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 64. The shelter rating in the flatwater habitats was 30. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by terrestrial vegetation in Gulch One. Small woody debris is the dominant cover type in pools followed by terrestrial vegetation. 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 97%. In general, revegetation projects are considered when canopy density is less than 80%.

The percentage of right and left bank covered with vegetation was 62% and 70%, 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) Gulch One 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) Increase woody cover in the pools and flatwater habitat units. Most of the existing cover in the pools is from small woody debris. Adding high quality complexity with woody cover in the pools is desirable.
- 4) Active and potential sediment sources related to the road system need to be identified, mapped, and treated according to their potential for sediment yield to the stream and its tributaries.

Gulch One

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 Abalobadiah. Steelhead young-of-the-year (YOY) observed.
162	0005.00	Small log debris accumulation not retaining sediment or blocking flow. There is a left bank failure.
186	0006.00	The sediment retention of the log debris accumulation (LDA) creates a 4' drop. LDA #1 is 6' high x 10' wide x 26' long and includes 20 pieces of LWD. Water is flowing through visible gaps. Sediment retention measures 10' wide x 13' long x 4' deep and ranges in size from sand to small cobble.
375	0013.00	Sediment retention is 4' high x 10' wide x 20' long.
490	0020.00	There is a small log debris accumulation retaining sediment.
565	0022.00	Salmonid Y+ in this unit.
829	0026.00	YOY observed.
864	0028.00	Small sediment retention
871	0029.00	There are right and left bank failures. LDA #2 is 7' high x 15' wide x 60' long and includes 25 pieces of LWD. Water is flowing through visible gaps. Sediment is being retained ranging from silt to small cobble and is 20' wide x 40' long x 3.5' deep.
1081	0031.00	There is a small LDA retaining sediment.
1211	0038.00	More debris and sediment retention and no fish seen since LDA #2.

Gulch One

1571 0050.00 End of survey due to multiple log jams, highly sedimented stream, few decent pools for rearing, very little water, and multiple dry units increasing in number and length. No fish observed since LDA #2.

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.

Gulch One

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: Gulch One Abalobadiah Creek

LLID: 1237563395889 Drainage: Rockport

Survey Dates: 7/23/2008 to 7/23/2008

Confluence Location: Quad: INGLENOOK

Legal Description: T20NR17WS21

Latitude: 39:35:20.0N

Longitude: 123:45:23.0W

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
4	0	DRY	8.0	18	73	4.6									
18	6	FLATWATER	36.0	57	1030	65.6	3.5	0.2	0.7	153	2750	30	544		30
23	23	POOL	46.0	14	318	20.2	6.3	0.7	1.2	86	1974	79	1828	71	64
5	2	RIFFLE	10.0	30	150	9.5	3.8	0.2	0.6	181	904	20	102		8
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)			Total Volume (cu.ft.)		
50	31				1571					5628			2474		

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Gulch One Abalobadiah Creek

LLID: 1237563395889

Drainage: Rockport

Survey Dates: 7/23/2008 to 7/23/2008

Confluence Location: Quad: INGLENOOK

Legal Description: T20NR17WS21

Latitude: 39:35:20.0N

Longitude: 123:45:23.0W

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	2	LGR	10.0	30	150	9.5	4	0.2	0.6	181	904	20	102		8	96
1	1	RUN	2.0	27	27	1.7	3	0.3	0.6	77	77	23	23		5	98
17	5	SRN	34.0	59	1003	63.8	4	0.2	1	168	2855	32	539		36	97
14	14	MCP	28.0	13	184	11.7	6	0.7	1.6	74	1030	58	818	51	69	99
1	1	STP	2.0	31	31	2.0	6	0.6	1.2	186	186	130	130	112	10	98
6	6	LSL	12.0	14	82	5.2	7	0.9	1.9	105	632	128	767	118	73	97
1	1	PLP	2.0	7	7	0.4	9	0.7	1	63	63	50	50	44	10	95
1	1	BPL	2.0	14	14	0.9	4	0.9	1.3	63	63	63	63	57	60	100
4	0	DRY	8.0	18	73	4.6										98

Total Units
50

Total Units Fully Measured
31

Total Length (ft.)
1571

Total Area (sq.ft.)
5809

Total Volume (cu.ft.)
2492

Table 3 - Summary of Pool Types

Stream Name: Gulch One Abalobadiah Creek

LLID: 1237563395889

Drainage: Rockport

Survey Dates: 7/23/2008 to 7/23/2008

Confluence Location: Quad: INGLENOOK

Legal Description: T20NR17WS21

Latitude: 39:35:20.0N

Longitude: 123:45:23.0W

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
15	15	MAIN	65	14	215	68	5.9	0.7	81	1216	55	832	65
7	7	SCOUR	30	13	89	28	7.4	0.9	99	695	107	750	64
1	1	BACKWATER	4	14	14	4	4.5	0.9	63	63	57	57	60

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
23	23	318	1974	1638

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

Stream Name: Gulch One Abalobadiah Creek

LLID: 1237563395889

Drainage: Rockport

Survey Dates: 7/23/2008 to 7/23/2008

Confluence Location: Quad: INGLENOOK

Legal Description: T20NR17WS21

Latitude: 39:35:20.0N

Longitude: 123:45:23.0W

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
14	MCP	61	5	36	9	64	0	0	0	0	0	0
1	STP	4	0	0	1	100	0	0	0	0	0	0
6	LSL	26	0	0	6	100	0	0	0	0	0	0
1	PLP	4	0	0	1	100	0	0	0	0	0	0
1	BPL	4	0	0	1	100	0	0	0	0	0	0

Total Units	Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1< 2 Foot Max Resid. Depth	Total 1< 2 Foot % Occurrence	Total 2< 3 Foot Max Resid. Depth	Total 2< 3 Foot % Occurrence	Total 3< 4 Foot Max Resid. Depth	Total 3< 4 Foot % Occurrence	Total >= 4 Foot Max Resid. Depth	Total >= 4 Foot % Occurrence
23	5	22	18	78	0	0	0	0	0	0

Mean Maximum Residual Pool Depth (ft.): 1.2

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Gulch One Abalobadiah Creek

LLID: 1237563395889

Drainage: Rockport

Survey Dates: 7/23/2008 to 7/23/2008

Dry Units: 4

Confluence Location: Quad: INGLENOOK

Legal Description: T20NR17WS21 Latitude: 39:35:20.0N

Longitude: 123:45:23.0W

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	2	LGR	0	30	0	0	70	0	0	0	0
5	2	TOTAL RIFFLE	0	30	0	0	70	0	0	0	0
1	1	RUN	0	0	0	0	100	0	0	0	0
17	4	SRN	13	23	10	0	55	0	0	0	0
18	5	TOTAL FLAT	10	18	8	0	64	0	0	0	0
14	13	MCP	11	34	17	3	35	0	0	0	0
1	1	STP	20	0	0	0	80	0	0	0	0
6	6	LSL	7	58	13	0	22	0	0	0	0
1	1	PLP	60	30	0	0	10	0	0	0	0
1	1	BPL	20	40	20	0	20	0	0	0	0
23	22	TOTAL POOL	13	39	14	2	32	0	0	0	0
50	29	TOTAL	12	35	13	1	39	0	0	0	0

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Gulch One Abalobadiah Creek

LLID: 1237563395889

Drainage: Rockport

Survey Dates: 7/23/2008 to 7/23/2008

Dry Units: 4

Confluence Location: Quad: INGLENOOK

Legal Description: T20NR17WS21 Latitude: 39:35:20.0N

Longitude: 123:45:23.0W

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	2	LGR	0	0	100	0	0	0	0
1	1	RUN	0	0	100	0	0	0	0
17	5	SRN	0	20	80	0	0	0	0
14	14	MCP	0	36	57	7	0	0	0
1	1	STP	0	0	100	0	0	0	0
6	6	LSL	17	17	67	0	0	0	0
1	1	PLP	0	0	100	0	0	0	0
1	0	BPL	0	0	0	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: Gulch One Abalobadiah Creek

LLID: 1237563395889

Drainage: Rockport

Survey Dates: 7/23/2008 to 7/23/2008

Confluence Location: Quad: INGLENOOK

Legal Description: T20NR17WS21

Latitude: 39:35:20.0N

Longitude: 123:45:23.0W

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
97	71	29	0	62	70

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: Gulch One Abalobadiah Creek LLID: 1237563395889 Drainage: Rockport
 Survey Dates: 7/23/2008 to 7/23/2008 Survey Length (ft.): 1571 Main Channel (ft.): 1571 Side Channel (ft.): 0
 Confluence Location: Quad: INGLENOOK Legal Description: T20NR17WS21 Latitude: 39:35:20.0N Longitude: 123:45:23.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type: B4	Canopy Density (%): 97.3	Pools by Stream Length (%): 20.2
Reach Length (ft.): 1571	Coniferous Component (%): 71.0	Pool Frequency (%): 46.0
Riffle/Flatwater Mean Width (ft.): 3.6	Hardwood Component (%): 29.0	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Brush	< 2 Feet Deep: 100
Range (ft.): 6 to 7	Vegetative Cover (%): 66.1	2 to 2.9 Feet Deep: 0
Mean (ft.): 7	Dominant Shelter: Terrestrial Veg.	3 to 3.9 Feet Deep: 0
Std. Dev.: 0	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 0
Base Flow (cfs.): 0.0	Occurrence of LWD (%): 12	Mean Max Residual Pool Depth (ft.): 1.2
Water (F): 53 - 56 Air (F): 60 - 69	LWD per 100 ft.:	Mean Pool Shelter Rating: 64
Dry Channel (ft): 73	Riffles: 1	
	Pools: 23	
	Flat: 7	
Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 91 Sm Cobble: 9 Lg Cobble: 0 Boulder: 0 Bedrock: 0		
Embeddedness Values (%): 1. 4.3 2. 52.2 3. 43.5 4. 0.0 5. 0.0		

Table 9 - Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Gulch One Abalobadiah Creek

LLID: 1237563395889

Drainage: Rockport

Survey Dates: 7/23/2008 to 7/23/2008

Confluence Location: Quad: INGLENOOK

Legal Description: T20NR17WS21

Latitude: 39:35:20.0N

Longitude: 123:45:23.0W

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	1	1.6
Boulder	0	0	0.0
Cobble / Gravel	9	4	21.0
Sand / Silt / Clay	22	26	77.4

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	2	3	8.1
Brush	29	27	90.3
Hardwood Trees	0	0	0.0
Coniferous Trees	0	1	1.6
No Vegetation	0	0	0.0

Total Stream Cobble Embeddedness Values: 2

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

StreamName: Gulch One Abalobadiah Creek

LLID: 1237563395889

Drainage: Rockport

Survey Dates: 7/23/2008 to 7/23/2008

Confluence Location: Quad: INGLENOOK

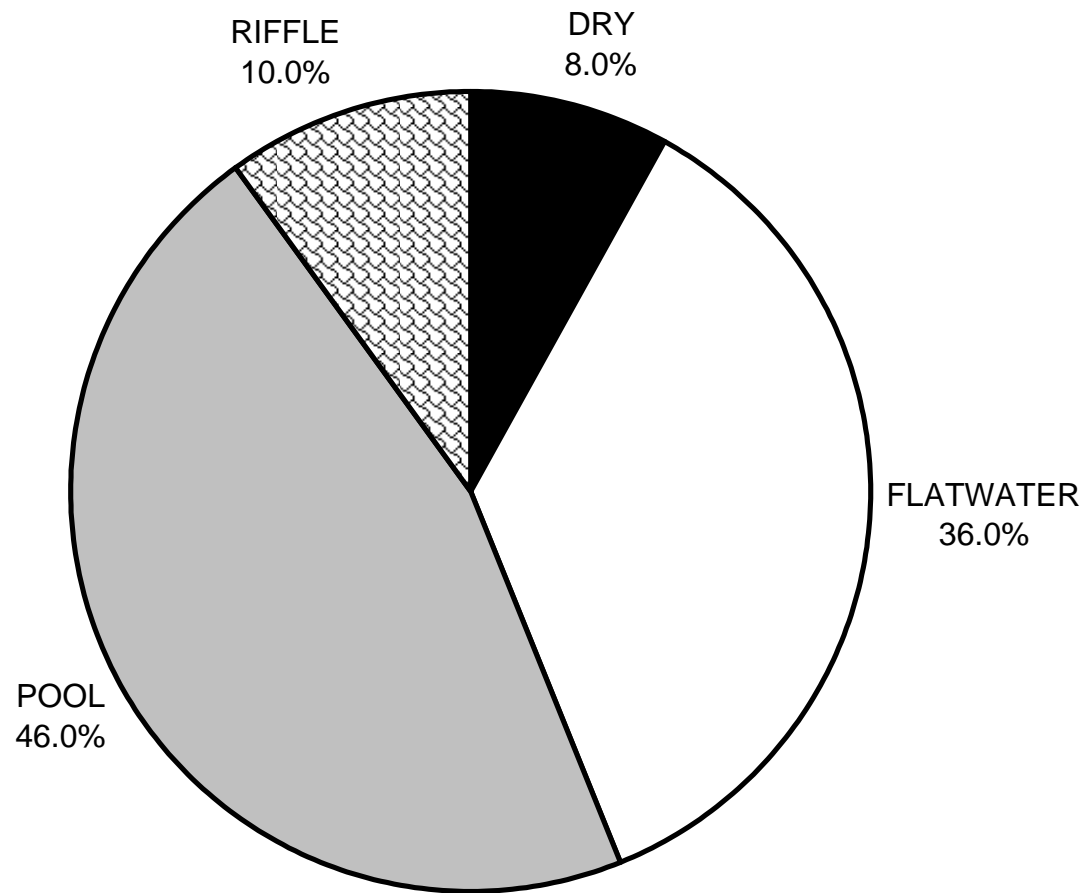
Legal Description: T20NR17WS21

Latitude: 39:35:20.0N

Longitude: 123:45:23.0W

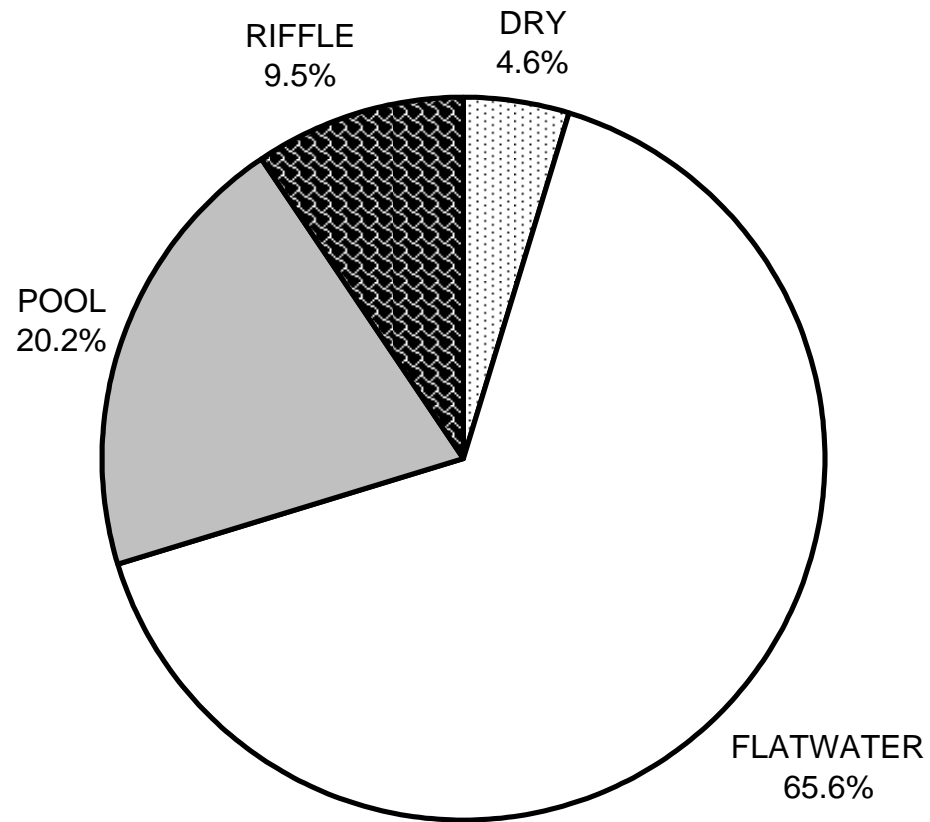
	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	10	13
SMALL WOODY DEBRIS (%)	30	18	39
LARGE WOODY DEBRIS (%)	0	8	14
ROOT MASS (%)	0	0	2
TERRESTRIAL VEGETATION (%)	70	64	32
AQUATIC VEGETATION (%)	0	0	0
WHITEWATER (%)	0	0	0
BOULDERS (%)	0	0	0
BEDROCK LEDGES (%)	0	0	0

GULCH ONE (ABALOBADIAH CREEK) 2008 HABITAT TYPES BY PERCENT OCCURRENCE



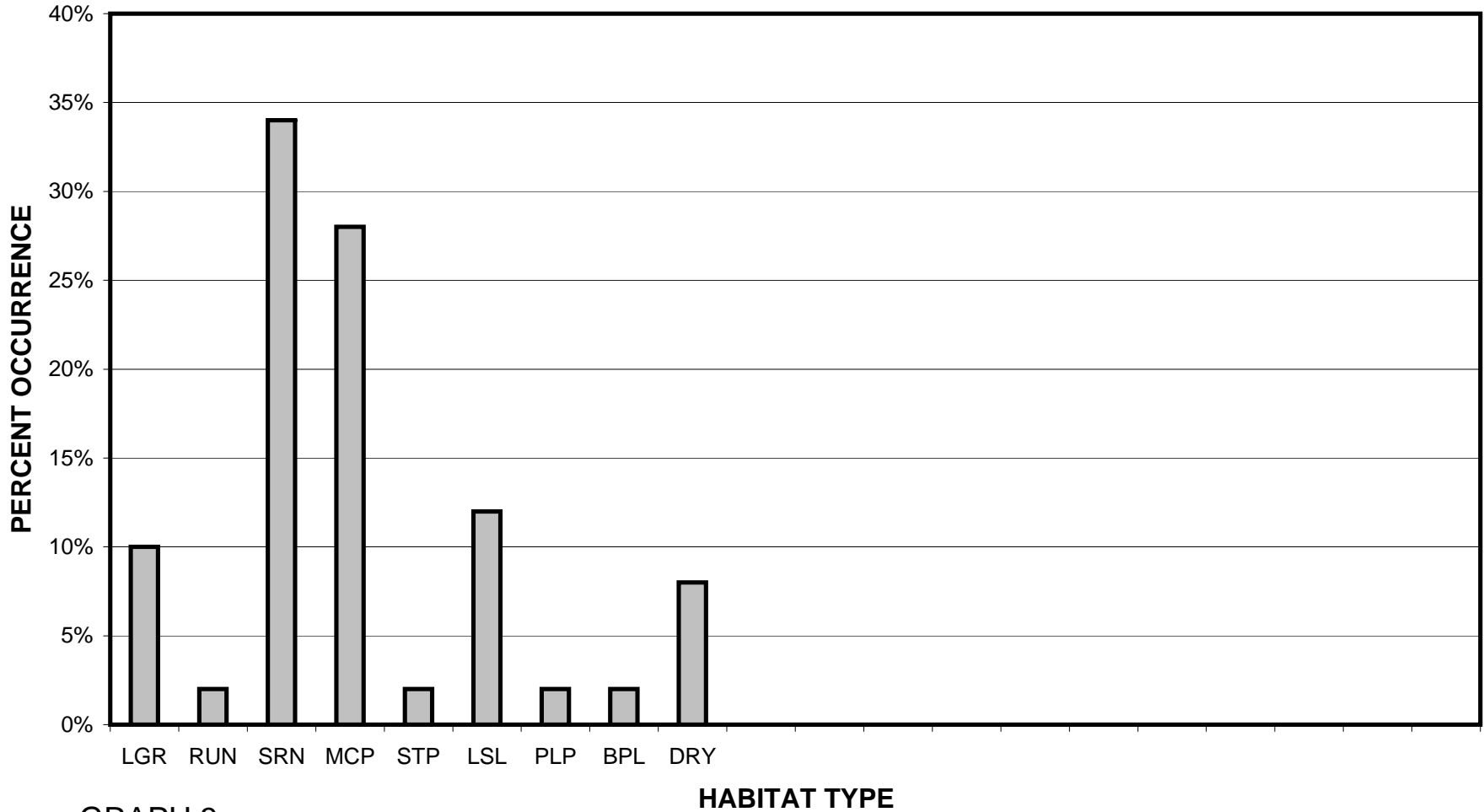
GRAPH 1

GULCH ONE (ABALOBADIAH CREEK) 2008 HABITAT TYPES BY PERCENT TOTAL LENGTH



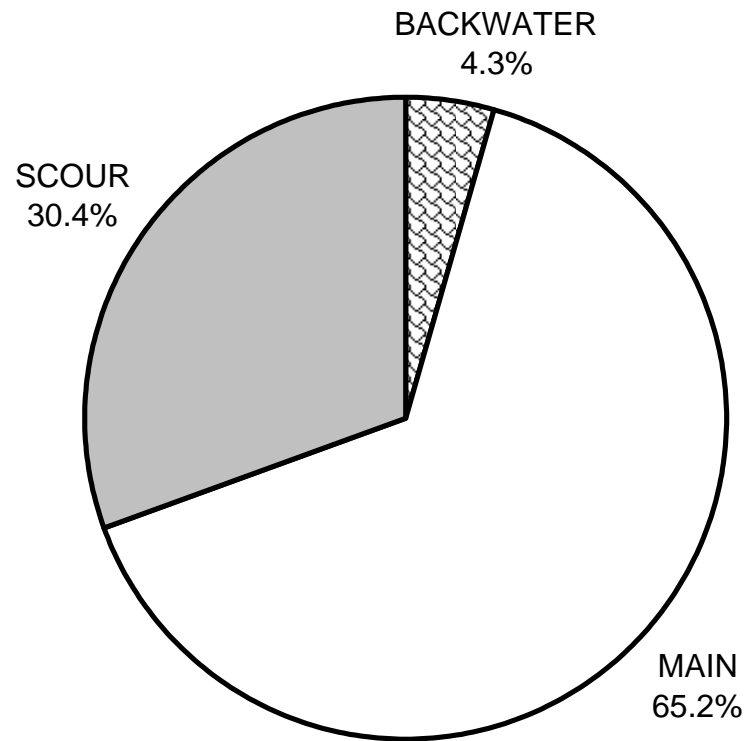
GRAPH 2

GULCH ONE (ABALOBADIAH CREEK) 2008 HABITAT TYPES BY PERCENT OCCURRENCE



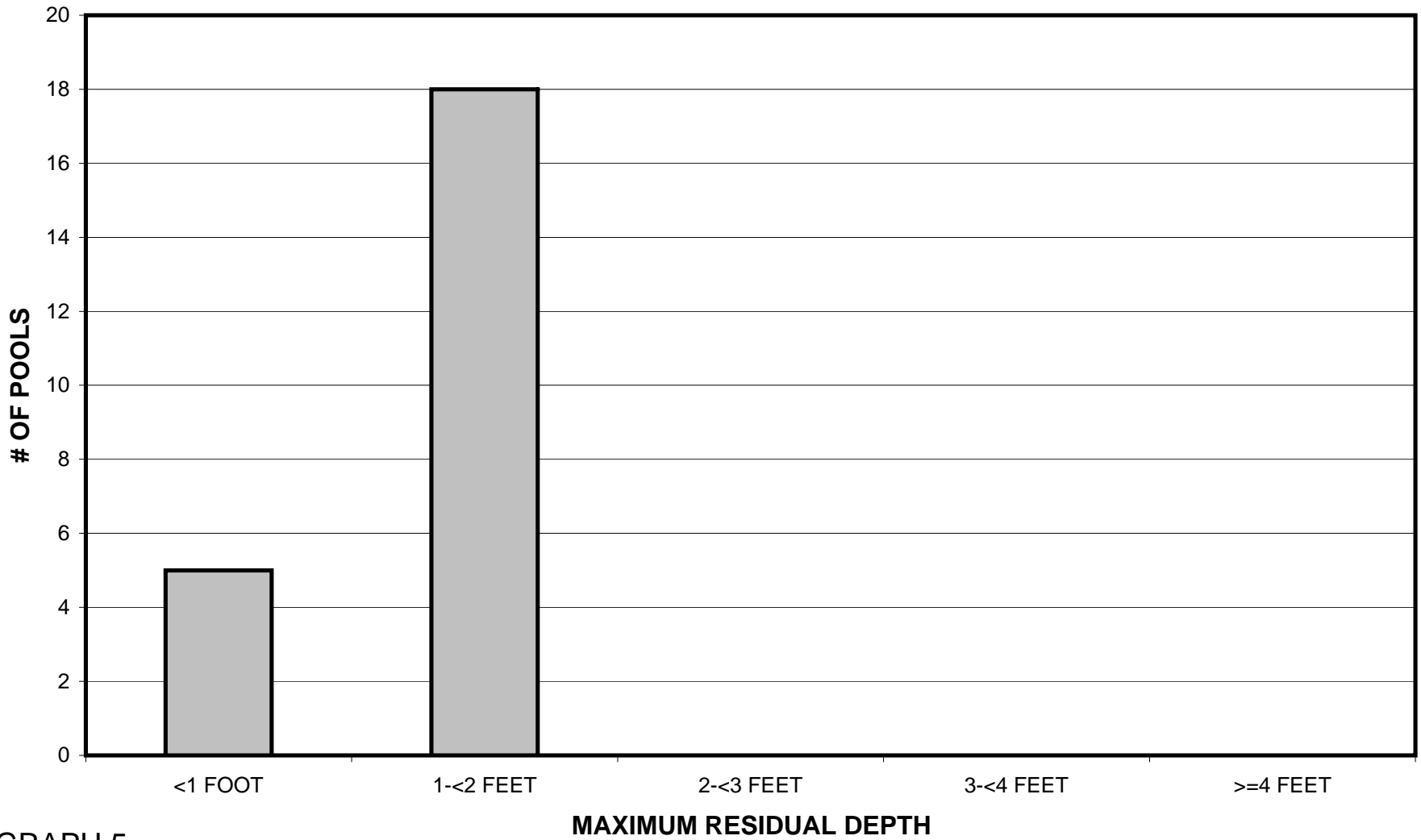
GRAPH 3

GULCH ONE (ABALOBADIAH CREEK) 2008 POOL TYPES BY PERCENT OCCURRENCE



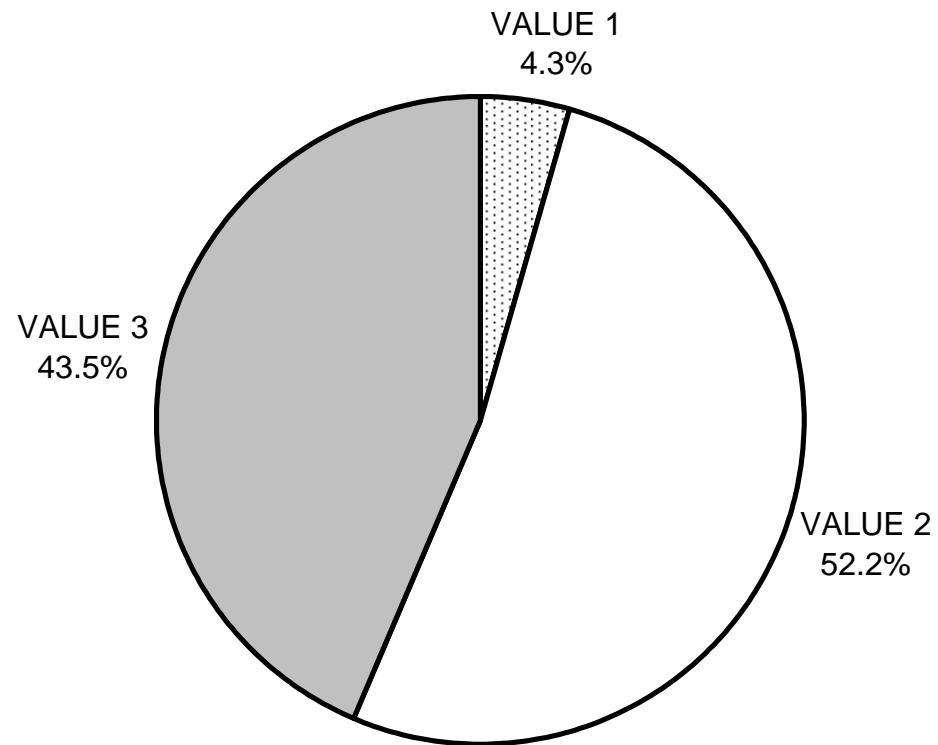
GRAPH 4

GULCH ONE (ABALOBADIAH CREEK) 2008 MAXIMUM DEPTH IN POOLS



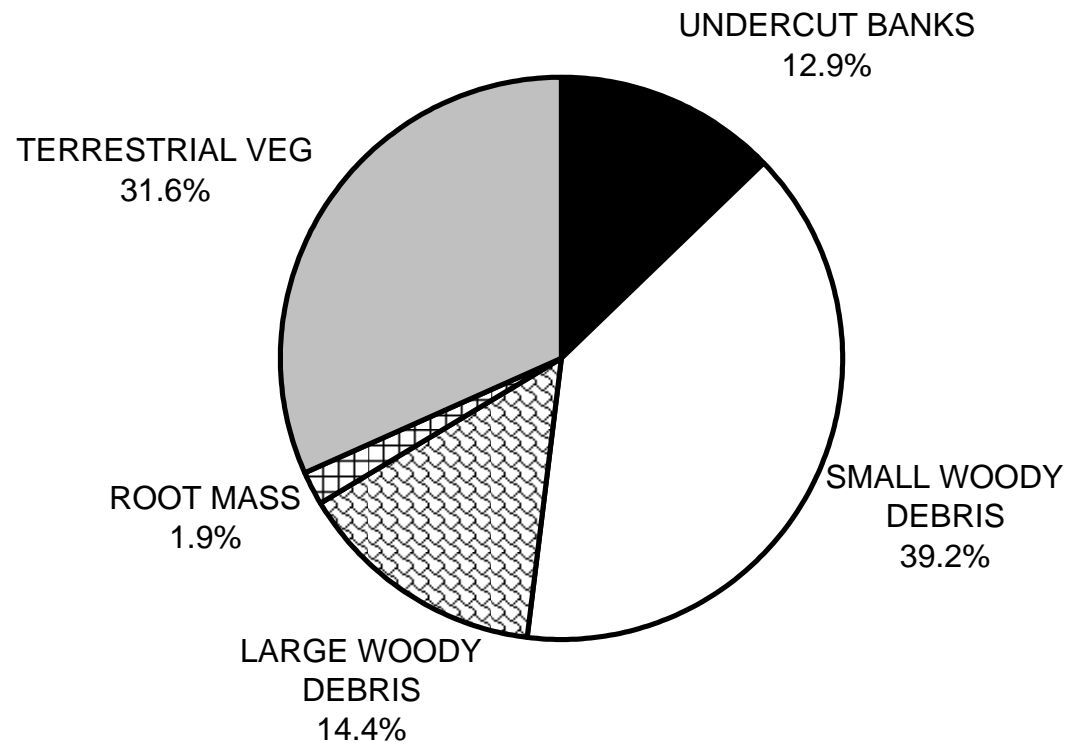
GRAPH 5

GULCH ONE (ABALOBADIAH CREEK) 2008 PERCENT EMBEDDEDNESS



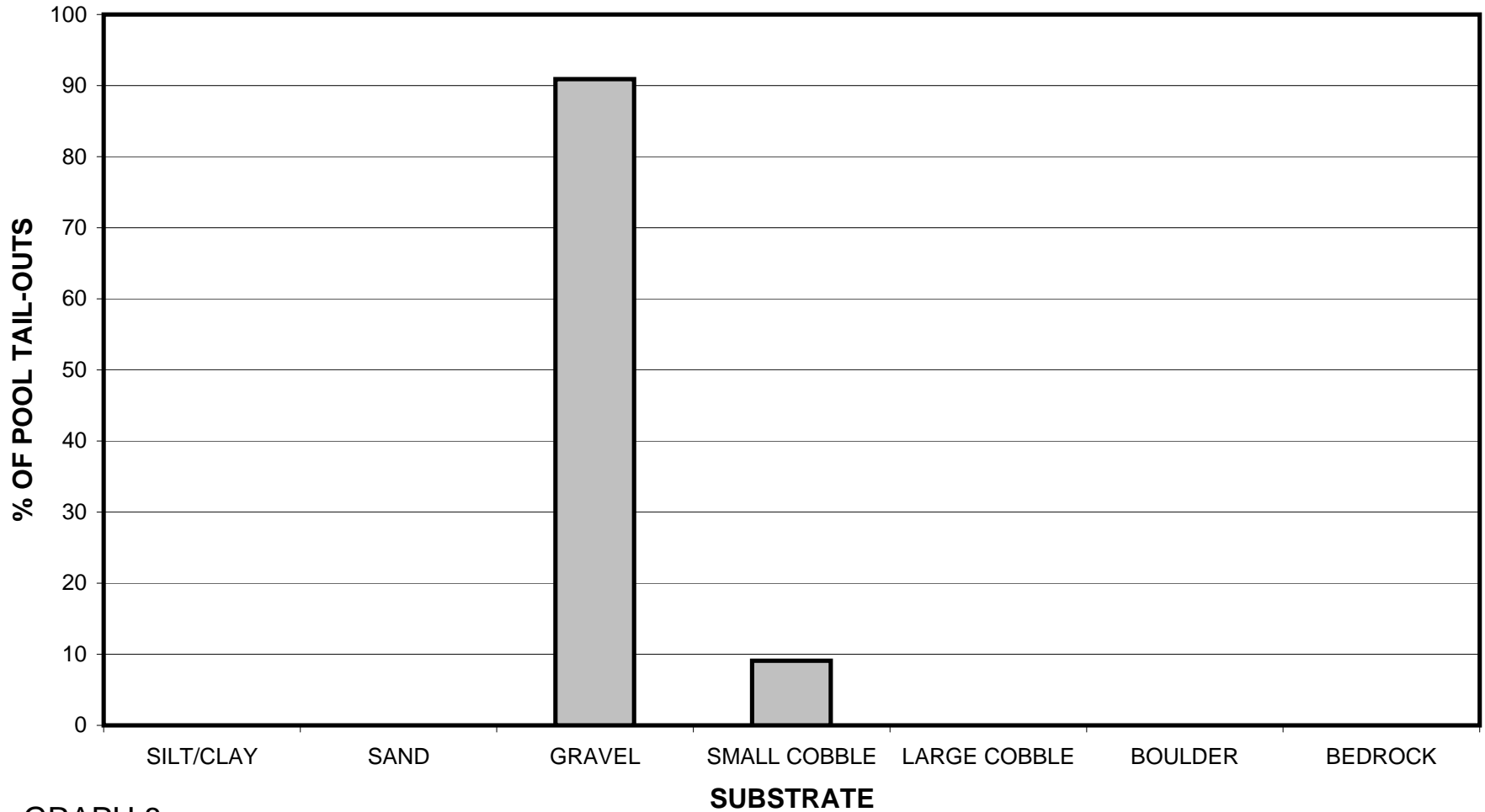
GRAPH 6

GULCH ONE (ABALOBADIAH CREEK) 2008 MEAN PERCENT COVER TYPES IN POOLS



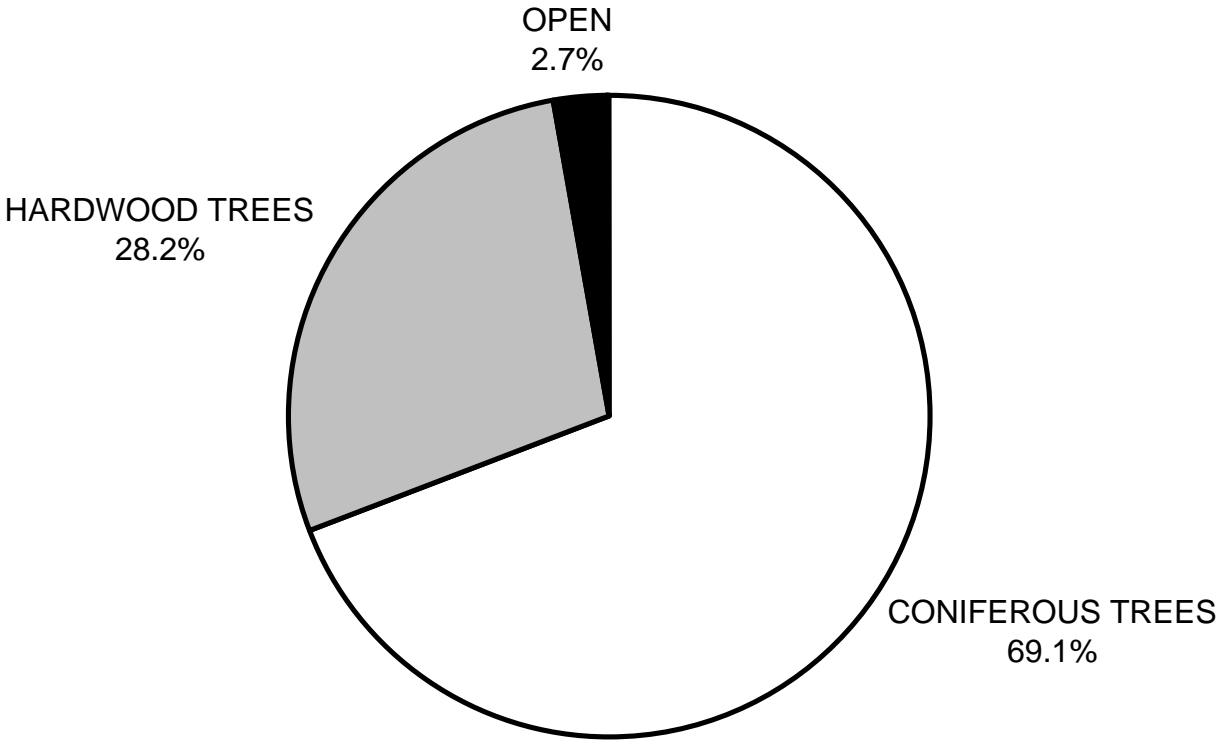
GRAPH 7

GULCH ONE (ABALOBADIAH CREEK) 2008 SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



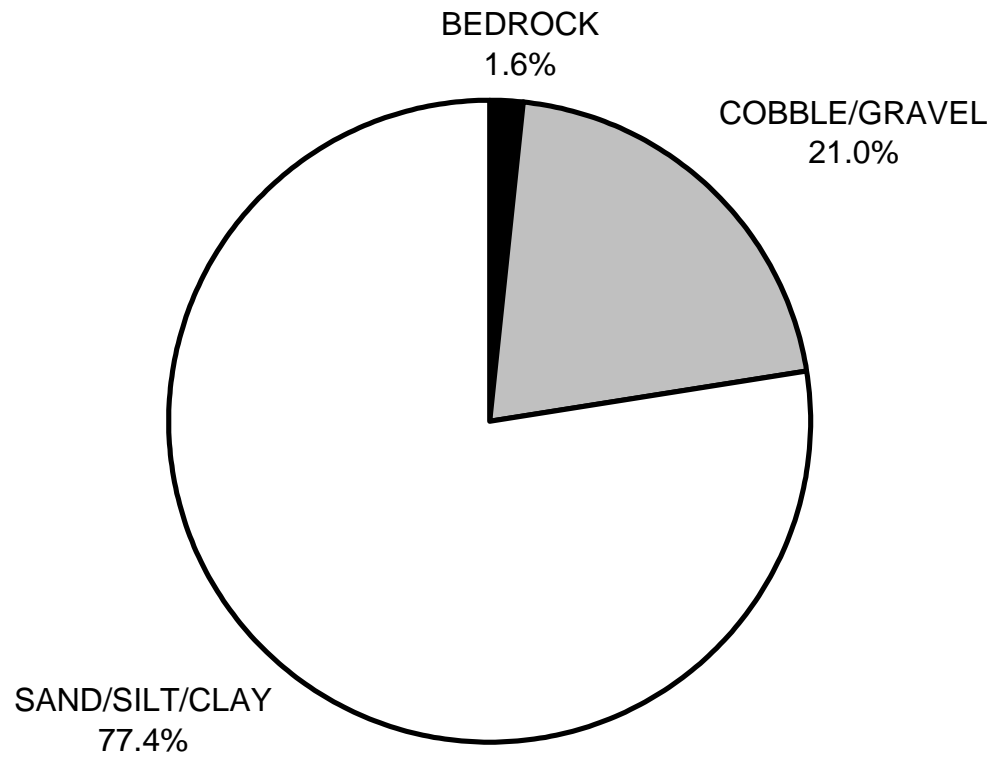
GRAPH 8

**GULCH ONE (ABALOBADIAH CREEK) 2008
MEAN PERCENT CANOPY**



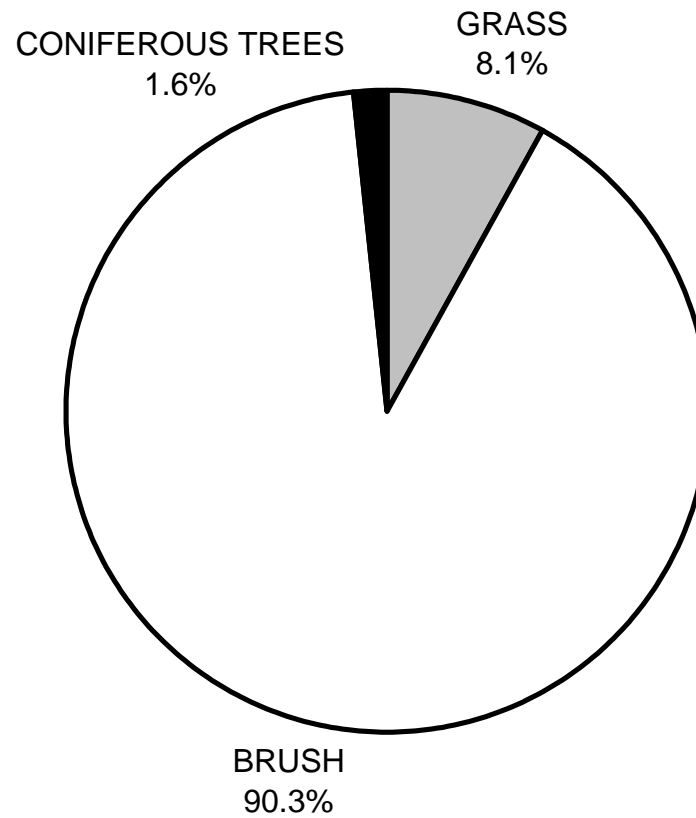
GRAPH 9

**GULCH ONE (ABALOBADIAH CREEK) 2008
DOMINANT BANK COMPOSITION IN SURVEY REACH**



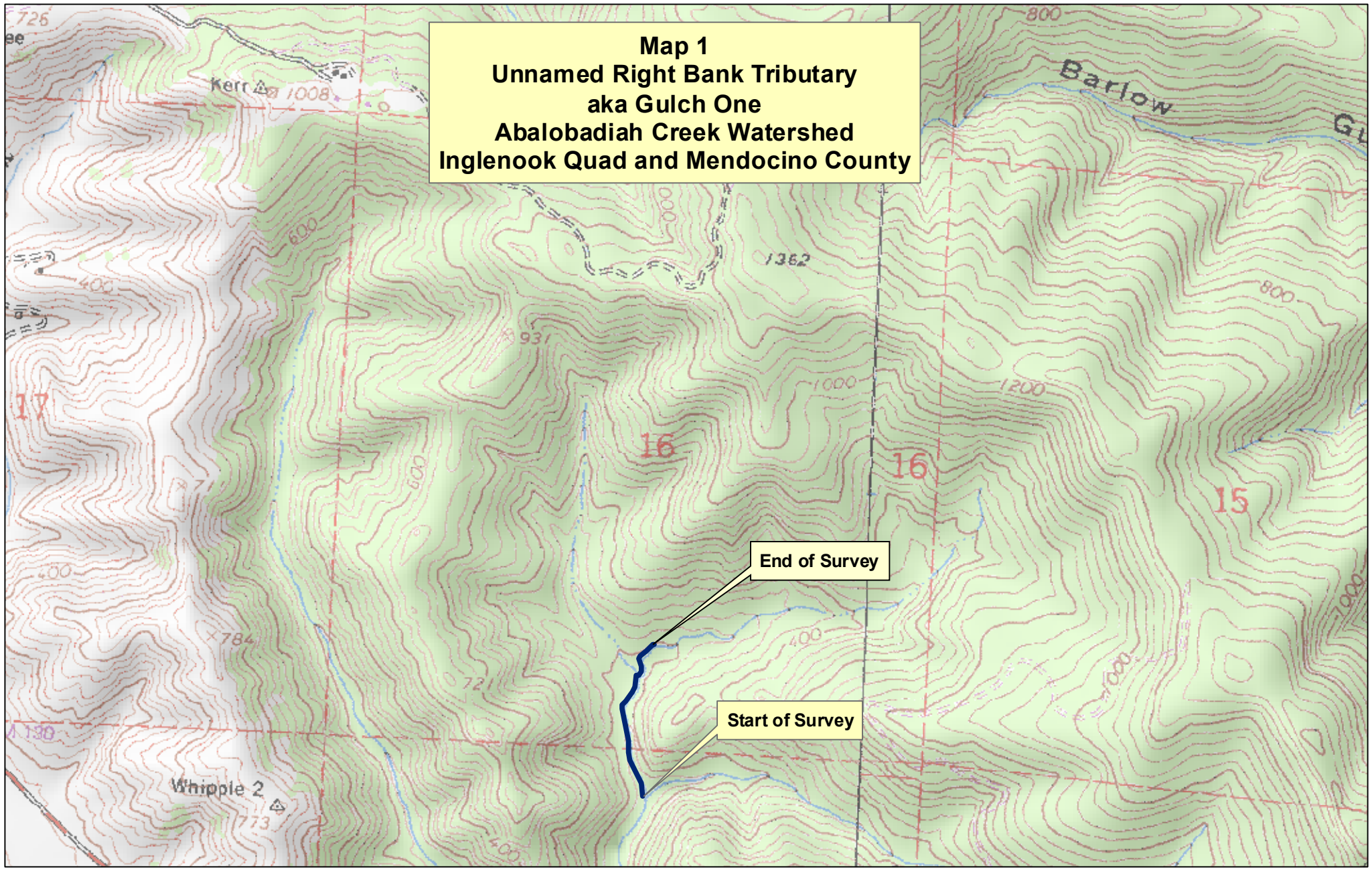
GRAPH 10

**GULCH ONE (ABALOBADIAH CREEK) 2008
DOMINANT BANK VEGETATION IN SURVEY REACH**



GRAPH 11

Map 1
Unnamed Right Bank Tributary
aka Gulch One
Abalobadiah Creek Watershed
Inglenook Quad and Mendocino County



Legend

 Gulch One Survey 2008

0 670 1,340 Feet

