

STREAM INVENTORY REPORT

Bull Team Gulch

INTRODUCTION

A stream inventory was conducted on August 1, 2012 on Bull Team Gulch. The survey began at the confluence with the South Fork Albion River and extended upstream 0.4 miles.

The Bull Team Gulch inventory was conducted in two parts: habitat inventory and biological inventory. The objective of the habitat inventory was to document the habitat available to anadromous salmonids in Bull Team Gulch. The objective of the biological inventory was to document the presence and distribution of juvenile salmonid species.

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

Bull Team Gulch is a tributary to the South Fork Albion River, a tributary to the Albion River, which drains to the Pacific Ocean. It is located in Mendocino County, California (Map 1). Bull Team Gulch's legal description at the confluence with the South Fork Albion River is T16N R16W S23. Its location is 39.2388 degrees north latitude and 123.6160 degrees west longitude, LLID number 1236148392389. Bull Team Gulch is an intermittent stream according to the USGS Navarro 7.5 minute quadrangle. Bull Team Gulch drains a watershed of approximately 0.7 square miles. Elevations range from about 260 feet at the mouth of the creek to 620 feet in the headwater areas. Mixed conifer forest dominates the watershed. The watershed is entirely privately owned and is managed for timber production. Vehicle access exists via Flynn Creek Road or Comptche-Ukiah Road outside of Comptche, CA.

METHODS

The habitat inventory conducted in Bull Team Gulch follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al, 1998). The Watershed Stewards Project/AmeriCorps (WSP) members that conducted the inventory were trained in standardized habitat inventory methods by the California Department of Fish and Wildlife (CDFW). 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 Bull Team Gulch 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". Bull Team Gulch habitat typing used standard basin level measurement criteria. These parameters require that the minimum length of a described habitat unit must be equal to or greater than the stream's mean wetted width. All measurements are in feet to the nearest tenth. Habitat characteristics are measured using a clinometer, hip chain, and stadia rod.

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5. Embeddedness:

The depth of embeddedness of the cobbles in pool tail-out areas is measured by the percent of the cobble that is surrounded or buried by fine sediment. In Bull Team Gulch, 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 not suitable 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. Using an overhead view, a quantitative estimate of the percentage of the habitat unit covered is made. All cover is classified according to a list of nine cover types. In Bull Team Gulch, a standard qualitative shelter value of 0 (none), 1 (low), 2 (medium), or 3 (high) was assigned according to the complexity of the cover. The shelter rating is then calculated for each fully-described habitat unit by multiplying shelter value and percent 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 Bull Team Gulch, 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 Bull Team Gulch, the dominant composition type and the dominant vegetation type of both the right and left banks for each fully-described unit were selected from the habitat inventory form. Additionally, the percent of each bank covered by vegetation (including downed trees, logs, and rootwads) was estimated and recorded.

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10. Large Woody Debris Count:

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

11. Average Bankfull Width:

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

BIOLOGICAL INVENTORY

Biological sampling during the stream inventory is used to determine fish species and their distribution in the stream. Fish presence was observed from the stream banks in Bull Team Gulch. In addition, underwater observations were made at nine sites using techniques discussed in the *California Salmonid Stream Habitat Restoration Manual*.

DATA ANALYSIS

Data from the habitat inventory form are entered into Stream Habitat 2.0.19, a Visual Basic data entry program developed by Karen Wilson, Pacific States Marine Fisheries Commission in conjunction with the California Department of Fish and Wildlife. 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 Bull Team Gulch 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 August 1, 2012 was conducted by R. Spencer and A. Garcia (WSP). The total length of the stream surveyed was 1,889 feet with an additional 66 feet of side channel.

Stream flow was not measured on Bull Team Gulch.

Bull Team Gulch is an E4 channel type for the entire length of the survey, 1,889 feet. E4 channels are low gradient, meandering riffle/pool streams with low width/depth ratios and little deposition. They are very efficient and stable with a high meander width ratio and gravel-dominant substrates.

Water temperatures taken during the survey period ranged from 52 to 54 degrees Fahrenheit. Air temperatures ranged from 52 to 73 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 48% pool units, 21% flatwater units, 19% riffle units, and 12% dry units (Graph 1). Based on total length of Level II habitat types there were 54% pool units, 25% flatwater units, 12% riffle units, and 10% dry units (Graph 2).

Eight Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were mid-channel pool units, 44%; low gradient riffle units, 14%; step run units, 12%; and dry units, 12% (Graph 3). Based on percent total length, mid-channel pool units made up 49%, step run units 18%, and dry units 10%.

A total of 43 pools were identified (Table 3). All of the pools encountered were main channel pools (Graph 4).

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Table 4 is a summary of maximum residual pool depths by pool habitat types. Pool quality for salmonids increases with depth. Five of the 43 pools (12%) had a residual depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 43 pool tail-outs measured, 25 had a value of 1 (58%); 15 had a value of 2 (35%); one had a value of 3 (2%); two had a value of 4 (5%); (Graph 6). On this scale, a value of 1 indicates the best spawning conditions and a value of 4 the worst. Additionally, a value of 5 was assigned to tail-outs deemed not suitable 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 1, flatwater habitat types had a mean shelter rating of 5, and pool habitats had a mean shelter rating of 24 (Table 1).

Table 5 summarizes mean percent cover by habitat type. Small woody debris is the dominant cover type in Bull Team Gulch. Graph 7 describes the pool cover in Bull Team Gulch. Small woody debris is the dominant pool cover type followed by undercut banks.

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 65% of the pool tail-outs. Silt/clay was the next most frequently observed dominant substrate type and occurred in 26% of the pool tail-outs

The mean percent canopy density for the surveyed length of Bull Team Gulch was 99%. One percent of the canopy was open. Of the canopy present, the mean percentages of hardwood and coniferous trees were 18% and 82%, respectively. Graph 9 describes the mean percent canopy in Bull Team Gulch.

For the stream reach surveyed, the mean percent right bank vegetated was 98%. The mean percent left bank vegetated was 100%. The dominant elements composing the structure of the stream banks consisted of 94% sand/silt/clay, 6% bedrock, and 1% cobble/gravel (Graph 10). Coniferous trees were the dominant vegetation type observed in 80% of the units surveyed. Additionally, 14% of the units surveyed had deciduous trees as the dominant vegetation type, and 7% had brush as the dominant vegetation type (Graph 11).

BIOLOGICAL INVENTORY RESULTS

Survey teams conducted a snorkel survey at nine sites for species composition and distribution in Bull Team Gulch on August 23, 2012. The sites were sampled by I. Mikus and M. Groff (CDFW).

Nine sites were sampled within the first 981 feet of Bull Team Gulch. The reach sites yielded 23 young-of-the-year (YOY) steelhead/rainbow trout (SH/RT), and two YOY coho salmon.

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The following chart displays the information yielded from these sites:

2012 Bull Team Gulch underwater observations.

Date	Survey Site #	Habitat Unit #	Habitat Type	Approx. Dist. from mouth (ft.)	SH/RT			Coho	
					YOY	1+	2+	YOY	1+
E4 Channel Type									
08/23/12	1	003	Pool	32	1	0	0	2	0
	2	004	Pool	40	0	0	0	0	0
	3	006	Pool	91	6	0	0	0	0
	4	010	Pool	168	4	0	0	0	0
	5	016	Pool	268	2	0	0	0	0
	6	019	Pool	347	7	0	0	0	0
	7	027	Pool	539	3	0	0	0	0
	8	041	Pool	945	0	0	0	0	0
	9	043	Pool	981	0	0	0	0	0

DISCUSSION

Bull Team Gulch is an E4 channel type. The suitability of E4 channel types for fish habitat improvement structures is as follows: E4 channel types are good for bank-placed boulders and fair for opposing wing-deflectors.

The water temperatures recorded on the survey day August 1, 2012 ranged from 52 to 54 degrees Fahrenheit. Air temperatures ranged from 52 to 73 degrees Fahrenheit. This is a good water temperature range for salmonids. To make any conclusions, temperatures need to be monitored throughout the warm summer months, and more extensive biological sampling needs to be conducted.

Flatwater habitat types comprised 25% of the total length of this survey, riffles 12%, and pools 54%. Five of the 43 (12%) pools had a maximum residual depth greater than two 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.

Forty of the 43 pool tail-outs measured had embeddedness ratings of 1 or 2. Three 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 not suitable 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.

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Twenty-nine of the 43 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 is 24. The shelter rating in the flatwater habitats is 5. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by small woody debris in Bull Team Gulch. Small woody debris is the dominant cover type in pools followed by undercut banks. Log and root wad cover structures in the pool and flatwater habitats would enhance both summer and winter salmonid habitat. Log cover structures provide rearing fry with protection from predation, rest from water velocity, and also divide territorial units to reduce density related competition.

The mean percent canopy density for the stream was 99%. The percentage of right and left bank covered with vegetation was 98% and 100%, respectively.

RECOMMENDATIONS

- 1) Bull Team Gulch 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.

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 South Fork Albion River. The channel is an E4 for the entire length of the survey.
32	0004.00	Woody debris is accumulating in the channel.
205	0012.00	There is a 3' high plunge over large woody debris (LWD). The channel is dry for eight feet above the LWD.
824	0038.00	There is a 14' long bedrock sheet with 50% slope. This is a probable barrier to anadromous salmonids.
838	0039.00	There is a 3' high plunge over root mass.

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- 1287 0060.00 Tributary #01 enters on the left bank. It contributes approximately 30% to Bull Team Gulch's flow. The water temperature of the tributary is 56 degrees Fahrenheit, the water temperature downstream of the tributary is 53 degrees Fahrenheit, and the water temperature upstream of the confluence is 54 degrees Fahrenheit. The tributary is not accessible to salmonids.
- 1878 0086.00 End of survey due to diminished habitat.

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: Bull Team Gulch

LLID: 1236148392389 Drainage: Albion River

Survey Dates: 8/1/2012 to 8/1/2012

Confluence Location: Quad: MATHISON PEAK Legal Description: T16NR16WS23 Latitude: 39:14:20.0N Longitude: 123:36:53.0W

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
11	0	DRY	12.2	18	202	10.3									
19	5	FLATWATER	21.1	25	479	24.5	4.3	0.3	0.5	65	1232	25	482		5
43	43	POOL	47.8	24	1046	53.5	5.1	0.6	1.3	120	5170	98	4203	83	24
17	6	RIFFLE	18.9	13	228	11.7	1.8	0.2	0.2	17	293	3	54		1
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)			Total Volume (cu.ft.)		
90	54				1955					6695			4739		

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Bull Team Gulch

LLID: 1236148392389

Drainage: Albion River

Survey Dates: 8/1/2012 to 8/1/2012

Confluence Location: Quad: MATHISON PEAK

Legal Description: T16NR16WS23

Latitude: 39:14:20.0N

Longitude: 123:36:53.0W

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	14.4	13	164	8.4	2	0.1	0.3	13	172	1	19		1	100
2	1	HGR	2.2	11	22	1.1	2	0.1	0.2	8	17	1	2		0	95
2	1	BRS	2.2	21	42	2.1	2	0.3	0.5	42	84	13	25		0	100
8	3	RUN	8.9	17	133	6.8	4	0.3	0.8	61	491	25	197		5	100
11	2	SRN	12.2	31	346	17.7	4	0.4	0.7	70	771	26	290		5	98
40	40	MCP	44.4	24	964	49.3	5	0.6	2.8	121	4857	100	3993	85	24	99
3	3	STP	3.3	27	82	4.2	4	0.6	1.7	105	314	70	209	64	18	98
11	0	DRY	12.2	18	202	10.3										

Total Units
90

Total Units Fully Measured
54

Total Length (ft.)
1955

Total Area (sq.ft.)
6705

Total Volume (cu.ft.)
4736

Table 3 - Summary of Pool Types

Stream Name: Bull Team Gulch

LLID: 1236148392389

Drainage: Albion River

Survey Dates: 8/1/2012 to 8/1/2012

Confluence Location: Quad: MATHISON PEAK

Legal Description: T16NR16WS23

Latitude: 39:14:20.0N

Longitude: 123:36:53.0W

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
43	43	MAIN	100	24	1046	100	5.1	0.6	120	5170	83	3581	24

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
43	43	1046	5170	3581

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

Stream Name: Bull Team Gulch

LLID: 1236148392389

Drainage: Albion River

Survey Dates: 8/1/2012 to 8/1/2012

Confluence Location: Quad: MATHISON PEAK

Legal Description: T16NR16WS23

Latitude: 39:14:20.0N

Longitude: 123:36:53.0W

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
40	MCP	93	10	25	25	63	5	13	0	0	0	0
3	STP	7	1	33	2	67	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
43	11	26	27	63	5	12	0	0	0	0

Mean Maximum Residual Pool Depth (ft.): 1.3

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Bull Team Gulch

LLID: 1236148392389

Drainage: Albion River

Survey Dates: 8/1/2012 to 8/1/2012

Dry Units: 11

Confluence Location: Quad: MATHISON PEAK

Legal Description: T16NR16WS23

Latitude: 39:14:20.0N

Longitude: 123:36:53.0W

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	100	0	0	0	0	0	0	0
2	1	HGR	0	0	0	0	0	0	0	0	0
2	1	BRS	0	0	0	0	0	0	0	0	0
17	6	TOTAL RIFFLE	0	100	0	0	0	0	0	0	0
8	3	RUN	0	60	0	40	0	0	0	0	0
11	2	SRN	0	50	0	50	0	0	0	0	0
19	5	TOTAL FLAT	0	57	0	43	0	0	0	0	0
40	40	MCP	17	49	13	9	7	0	0	1	4
3	3	STP	0	67	25	8	0	0	0	0	0
43	43	TOTAL POOL	16	51	14	9	7	0	0	1	4
90	54	TOTAL	14	52	13	11	6	0	0	0	4

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Bull Team Gulch

LLID: 1236148392389

Drainage: Albion River

Survey Dates: 8/1/2012 to 8/1/2012

Dry Units: 11

Confluence Location: Quad: MATHISON PEAK

Legal Description: T16NR16WS23

Latitude: 39:14:20.0N

Longitude: 123:36:53.0W

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	75	25	0	0	0
2	1	HGR	0	0	100	0	0	0	0
2	1	BRS	0	0	0	0	0	0	100
8	3	RUN	67	0	33	0	0	0	0
11	2	SRN	100	0	0	0	0	0	0
40	40	MCP	53	5	33	3	0	0	8
3	3	STP	100	0	0	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: Bull Team Gulch

LLID: 1236148392389

Drainage: Albion River

Survey Dates: 8/1/2012 to 8/1/2012

Confluence Location: Quad: MATHISON PEAK

Legal Description: T16NR16WS23

Latitude: 39:14:20.0N

Longitude: 123:36:53.0W

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
99	82	18	0	98	100

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 9 - Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Bull Team Gulch

LLID: 1236148392389

Drainage: Albion River

Survey Dates: 8/1/2012 to 8/1/2012

Confluence Location: Quad: MATHISON PEAK

Legal Description: T16NR16WS23

Latitude: 39:14:20.0N

Longitude: 123:36:53.0W

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	5	5.6
Boulder	0	0	0.0
Cobble / Gravel	1	0	0.9
Sand / Silt / Clay	52	49	93.5

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	6	1	6.5
Hardwood Trees	9	6	13.9
Coniferous Trees	39	47	79.6
No Vegetation	0	0	0.0

Total Stream Cobble Embeddedness Values: 2

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

StreamName: Bull Team Gulch

LLID: 1236148392389

Drainage: Albion River

Survey Dates: 8/1/2012 to 8/1/2012

Confluence Location: Quad: MATHISON PEAK

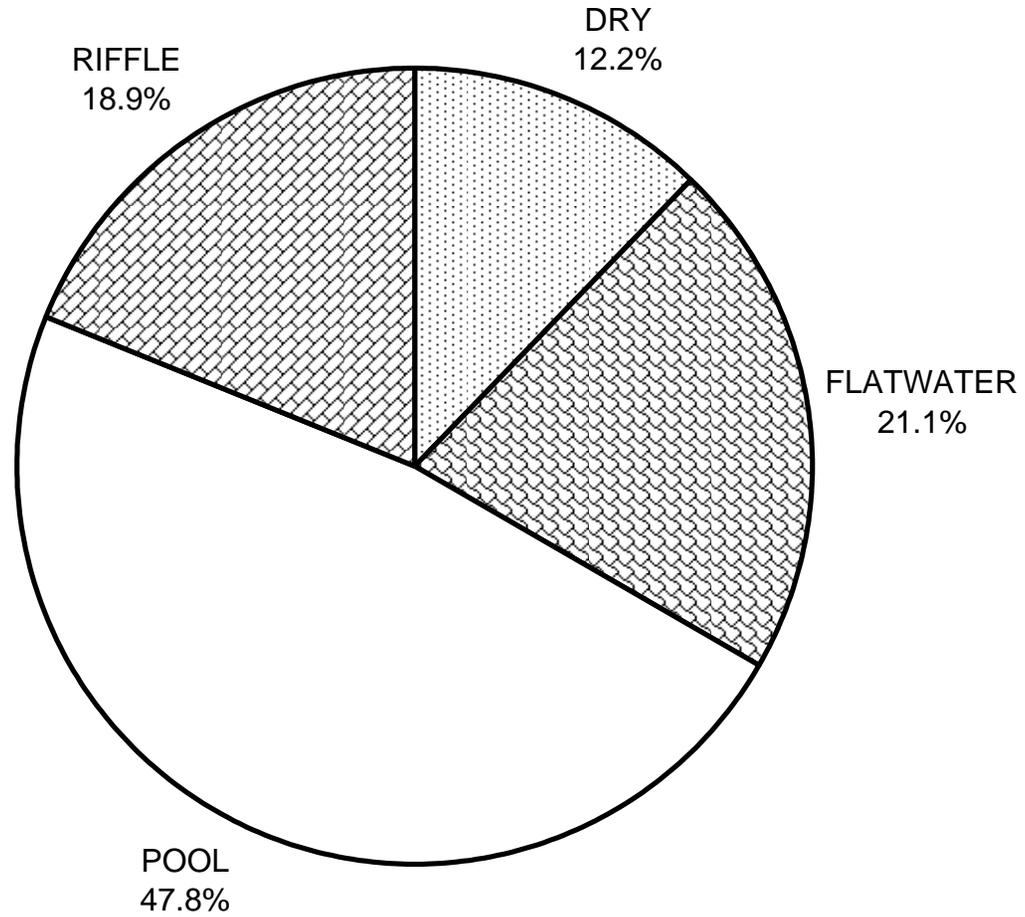
Legal Description: T16NR16WS23

Latitude: 39:14:20.0N

Longitude: 123:36:53.0W

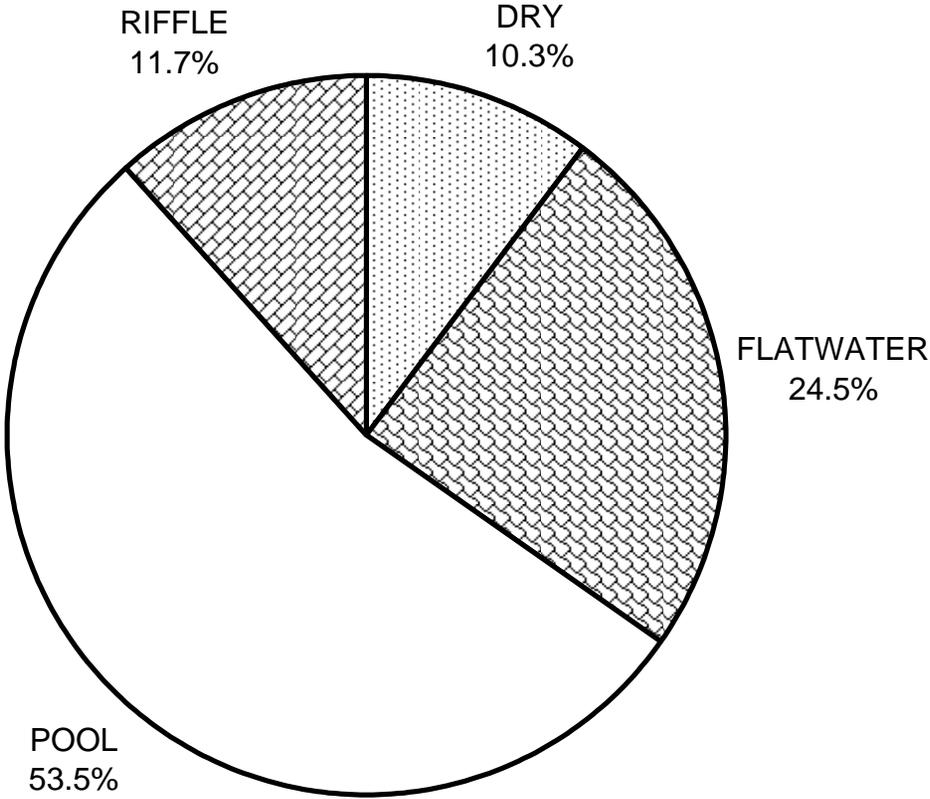
	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	0	16
SMALL WOODY DEBRIS (%)	100	57	51
LARGE WOODY DEBRIS (%)	0	0	14
ROOT MASS (%)	0	43	9
TERRESTRIAL VEGETATION (%)	0	0	7
AQUATIC VEGETATION (%)	0	0	0
WHITEWATER (%)	0	0	0
BOULDERS (%)	0	0	1
BEDROCK LEDGES (%)	0	0	4

BULL TEAM GULCH 2012 HABITAT TYPES BY PERCENT OCCURRENCE



GRAPH 1

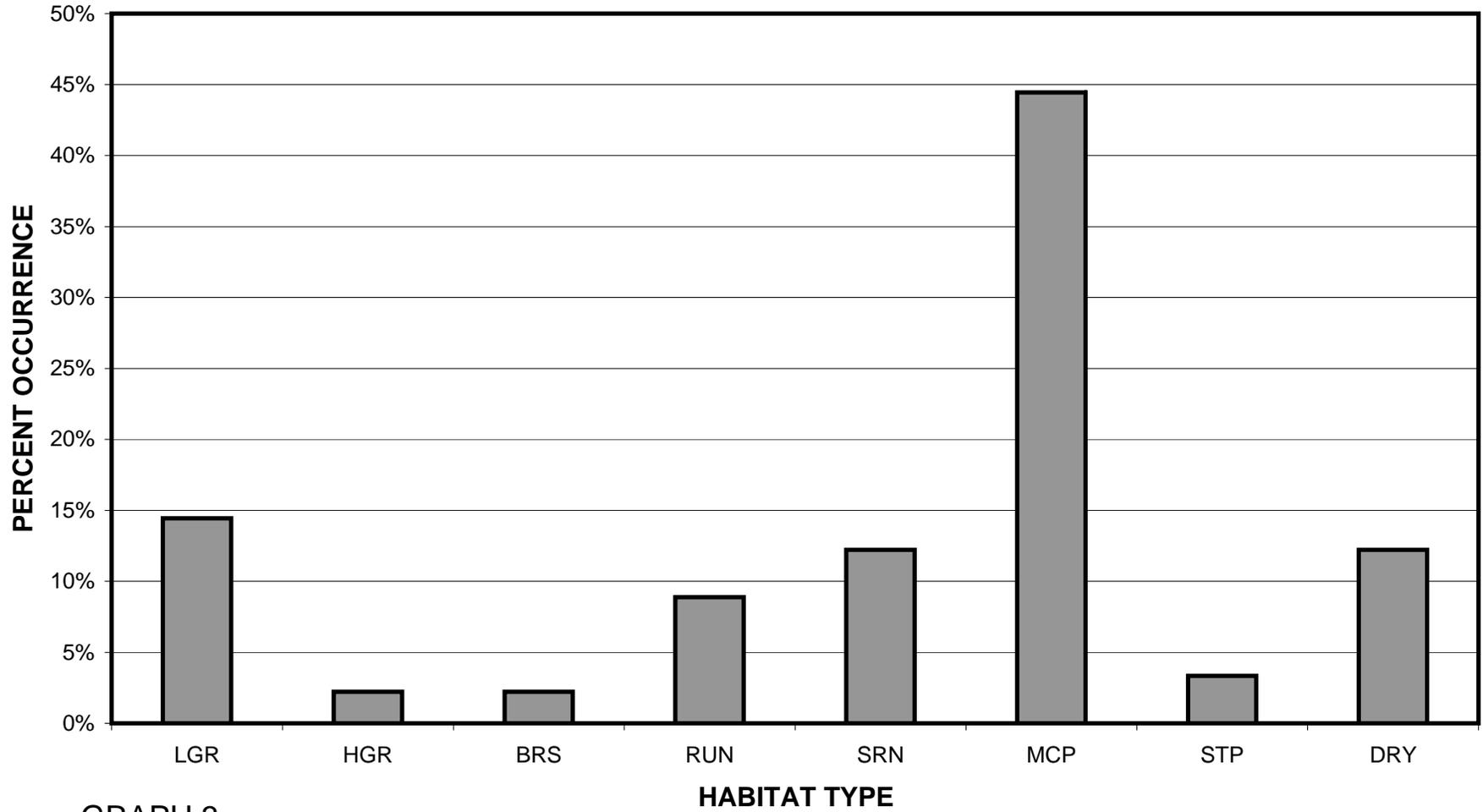
**BULL TEAM GULCH 2012
HABITAT TYPES BY PERCENT TOTAL LENGTH**



GRAPH 2

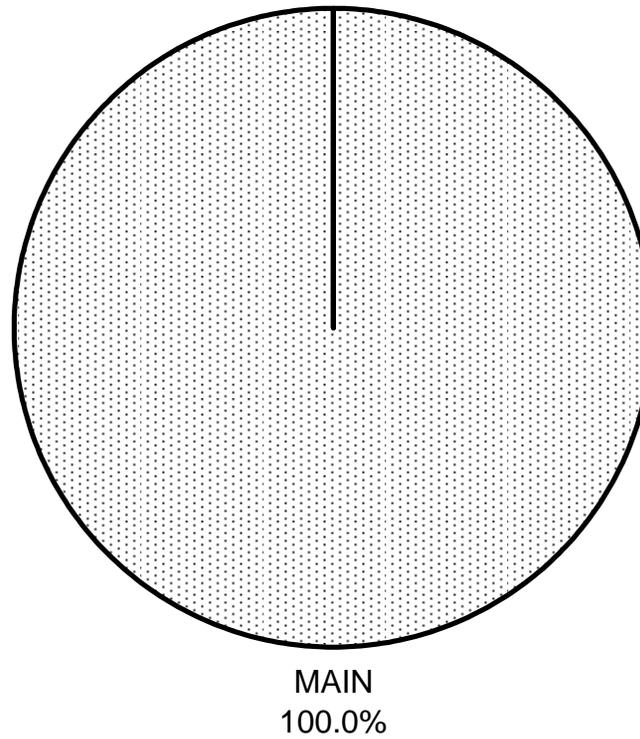
BULL TEAM GULCH 2012

HABITAT TYPES BY PERCENT OCCURRENCE



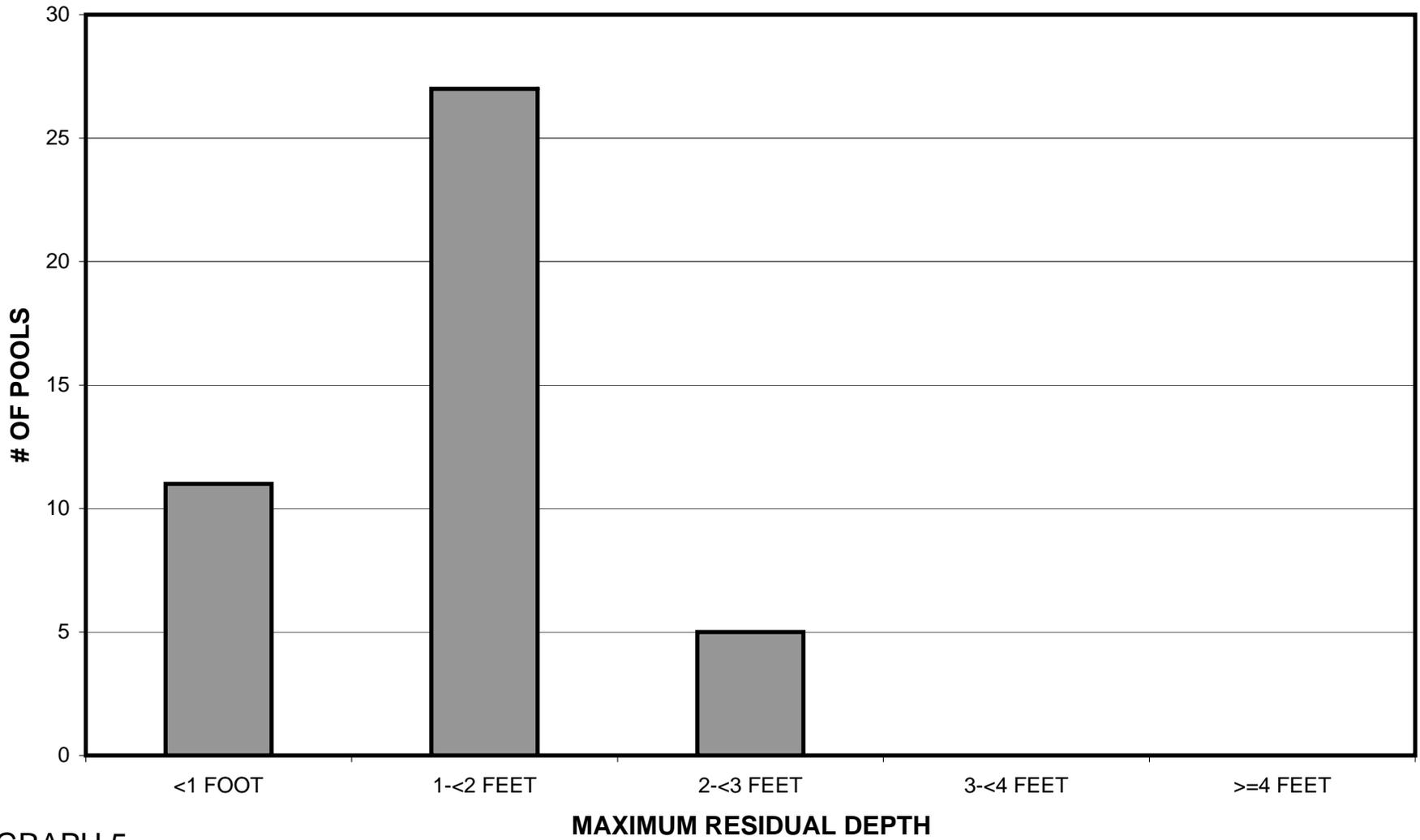
GRAPH 3

**BULL TEAM GULCH 2012
POOL TYPES BY PERCENT OCCURRENCE**



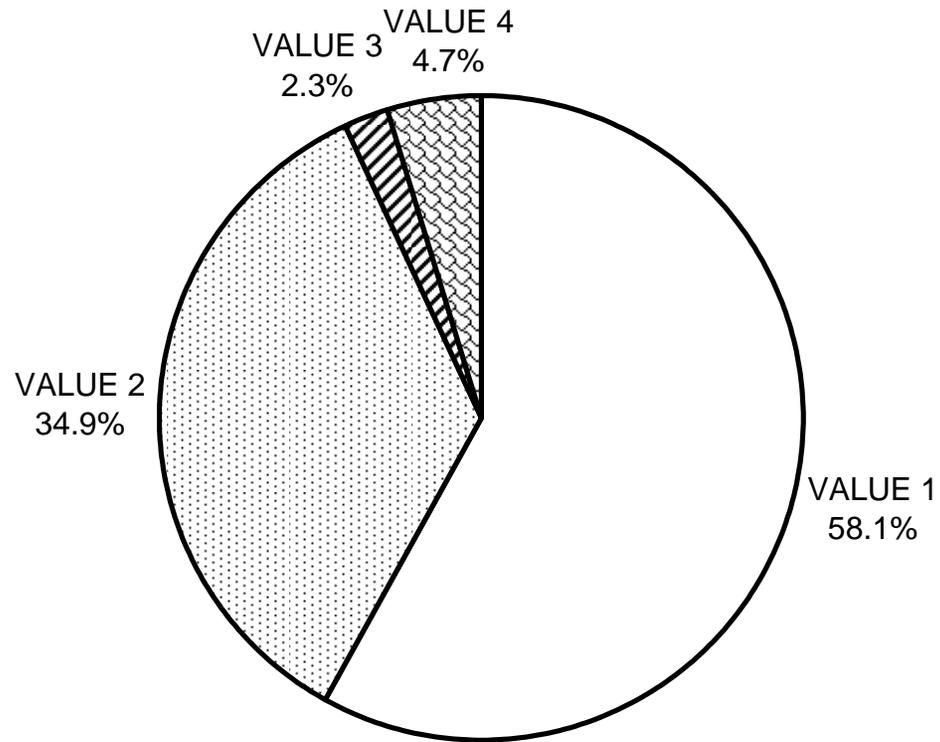
GRAPH 4

BULL TEAM GULCH 2012 MAXIMUM DEPTH IN POOLS



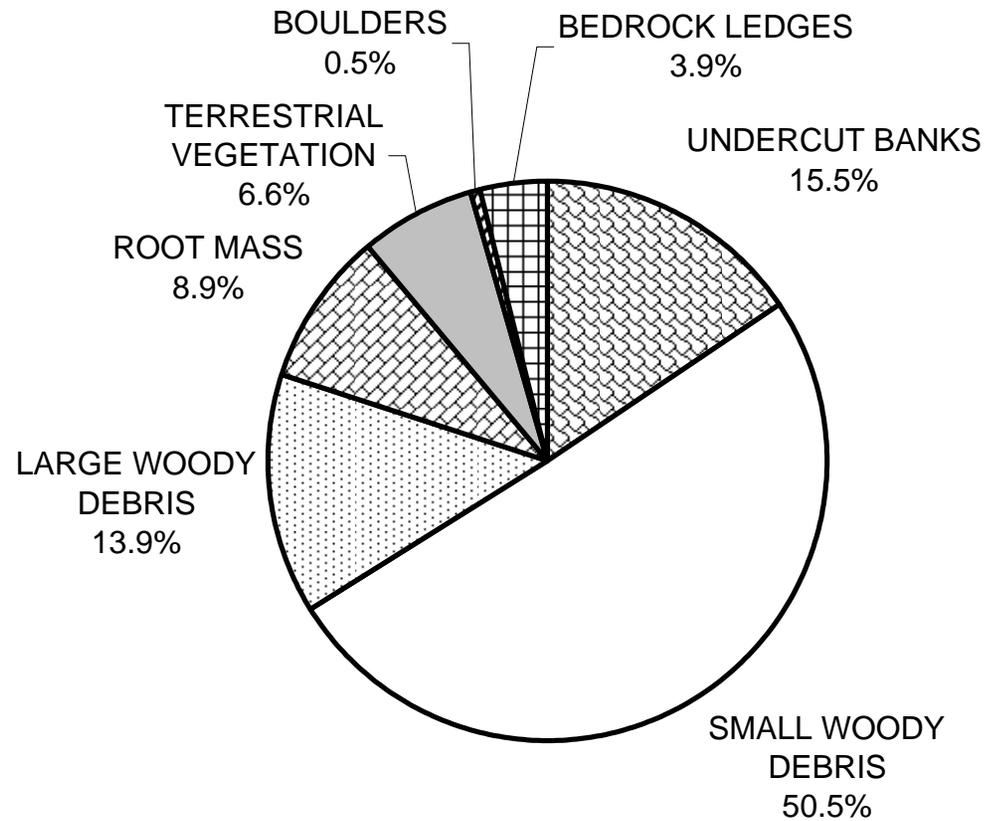
GRAPH 5

BULL TEAM GULCH 2012 PERCENT EMBEDDEDNESS



GRAPH 6

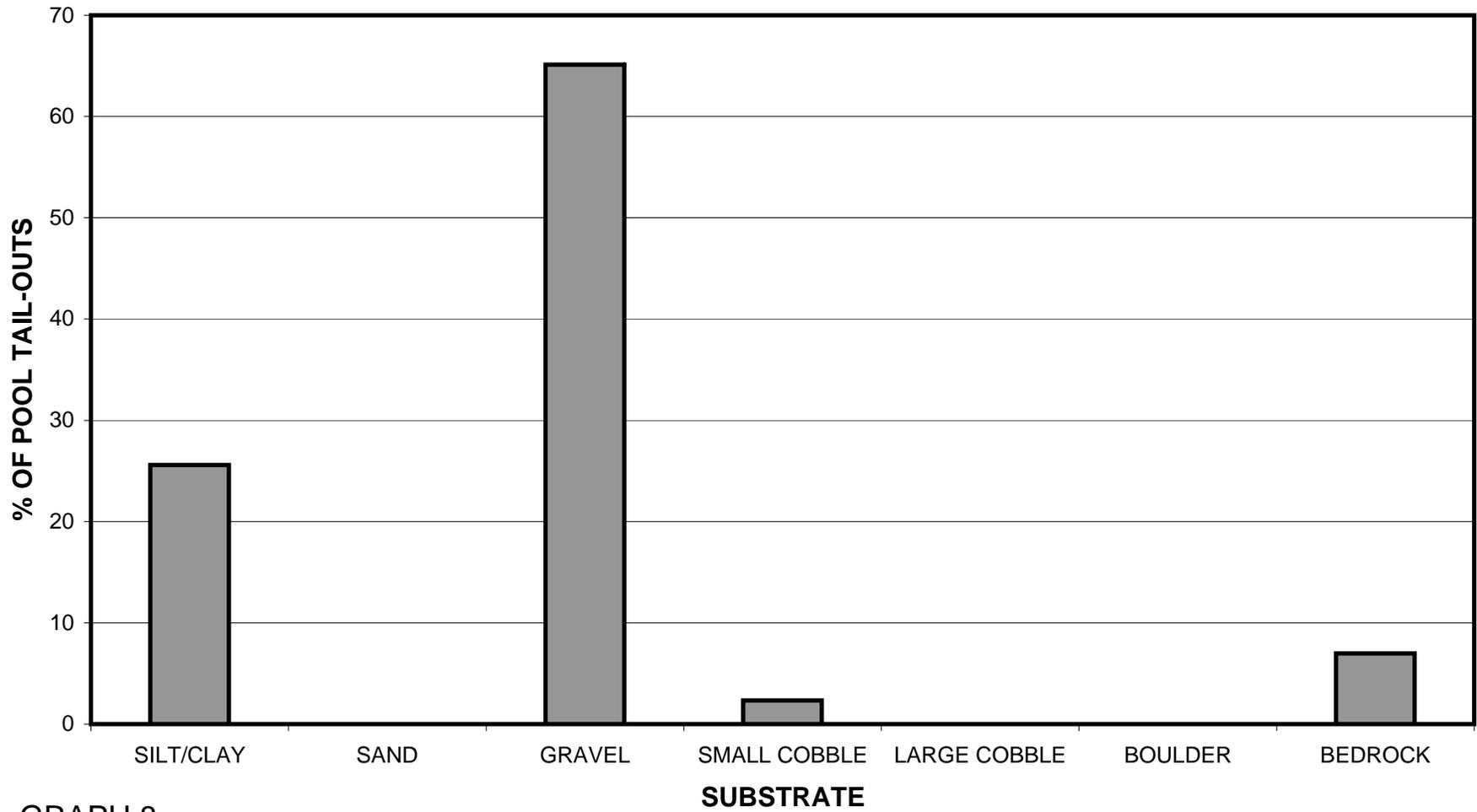
BULL TEAM GULCH 2012 MEAN PERCENT COVER TYPES IN POOLS



GRAPH 7

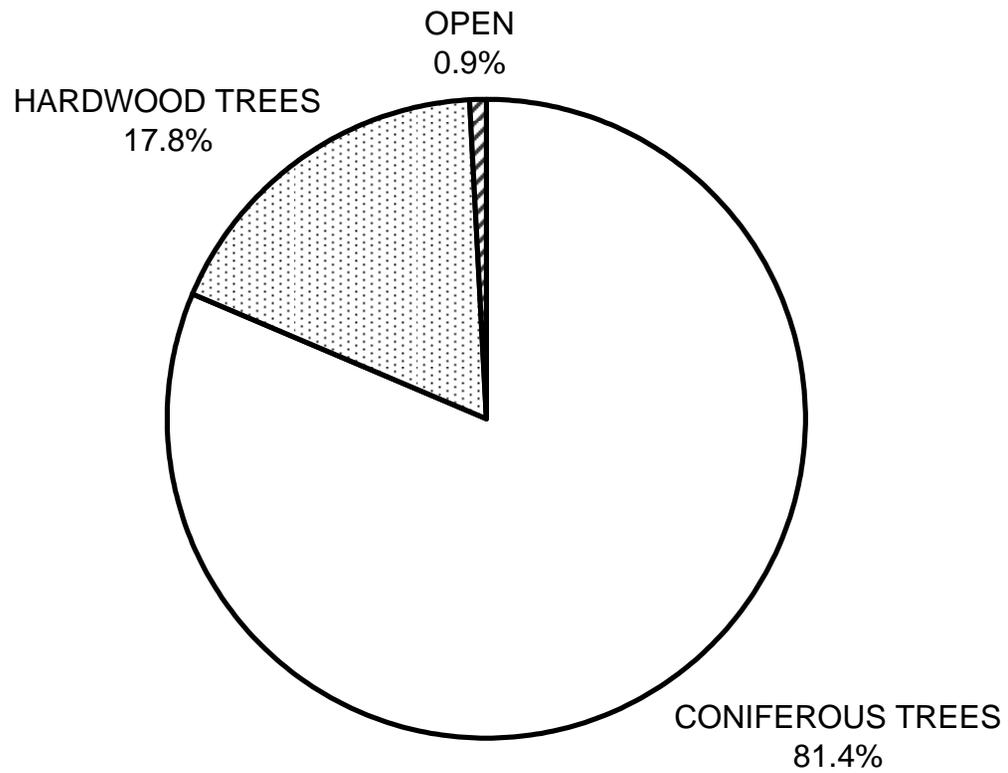
BULL TEAM GULCH 2012

SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



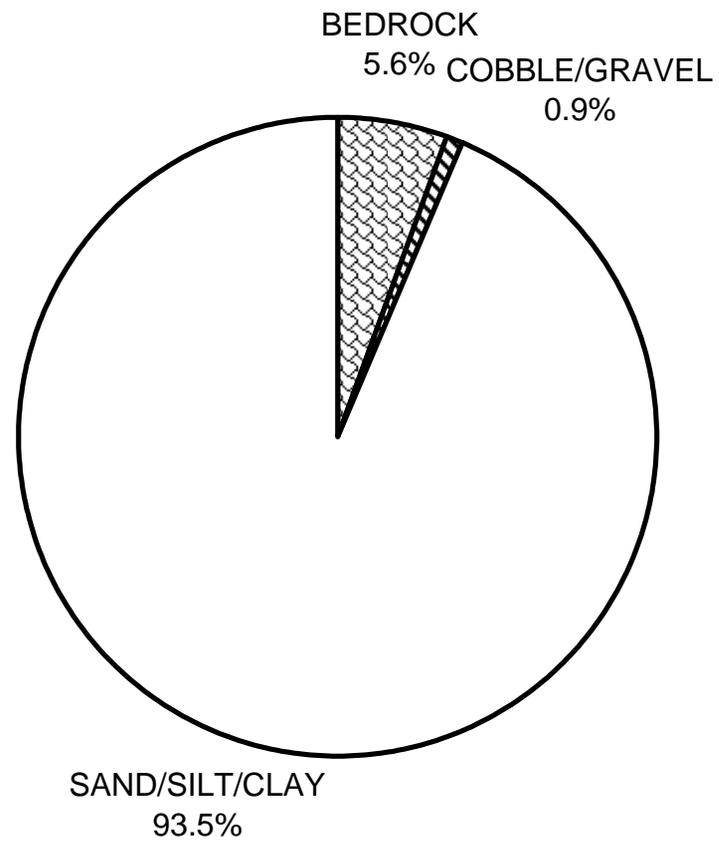
GRAPH 8

**BULL TEAM GULCH 2012
MEAN PERCENT CANOPY**



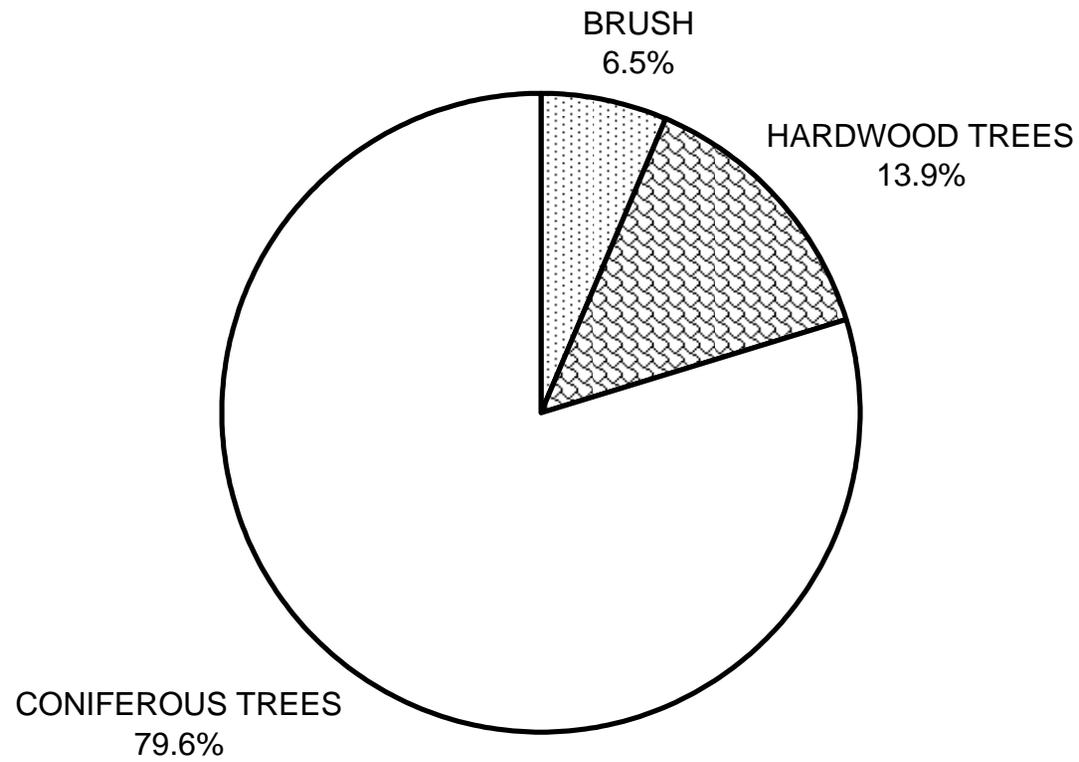
GRAPH 9

BULL TEAM GULCH 2012
DOMINANT BANK COMPOSITION IN SURVEY REACH



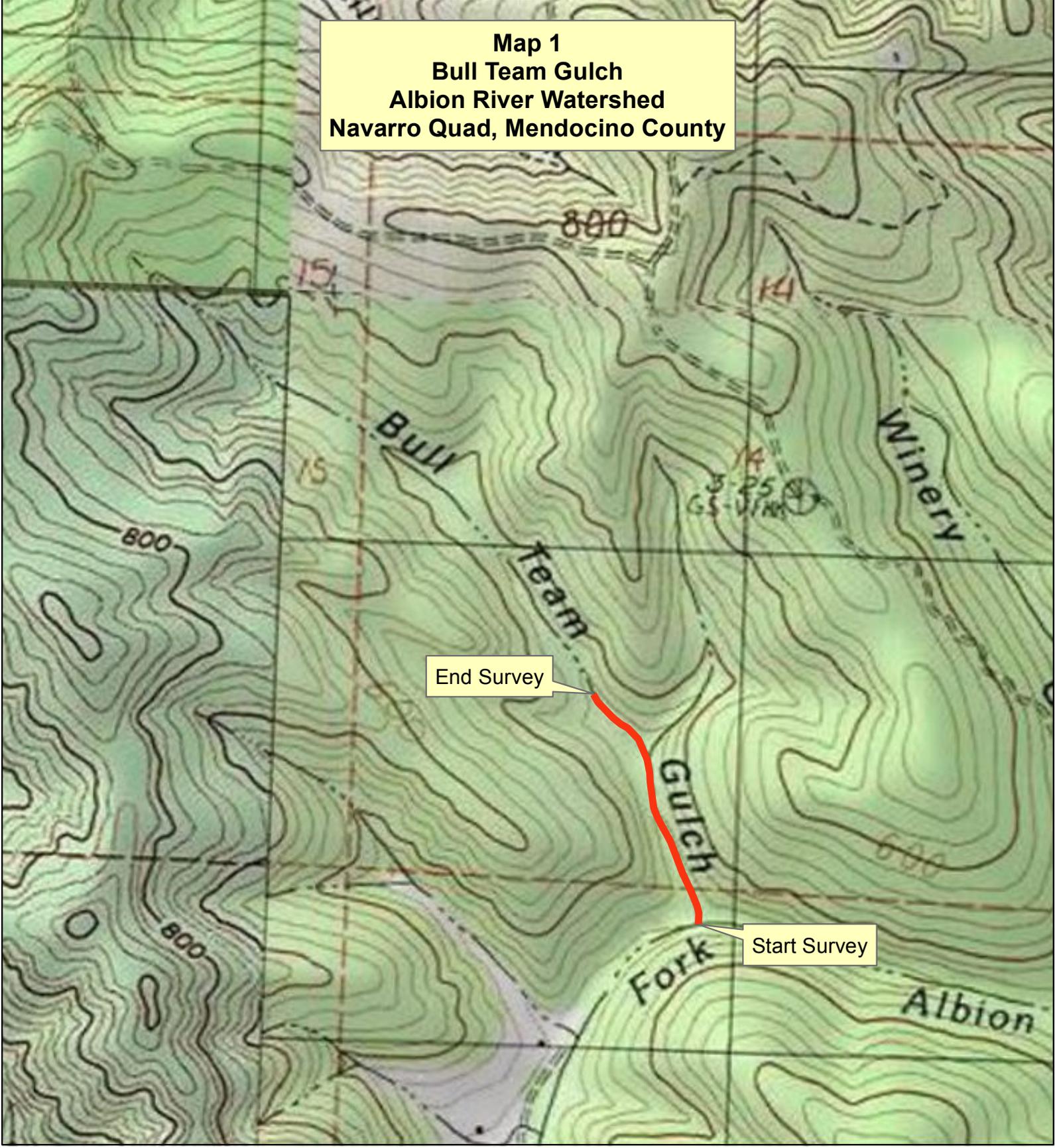
GRAPH 10

BULL TEAM GULCH 2012
DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11

**Map 1
Bull Team Gulch
Albion River Watershed
Navarro Quad, Mendocino County**



End Survey

Start Survey



 Channel Type E4

