STREAM INVENTORY REPORT

Groshong Gulch

INTRODUCTION

A stream inventory was conducted August 5, 2003 on Groshong Gulch. The survey began at the confluence with the unnamed tributary to Groshong Gulch and extended upstream 0.21 miles.

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

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

Groshong Gulch is a tributary to the South Fork Gualala River, a tributary to the Gualala River, which drains to the Pacific Ocean. It is located in Sonoma County, California (Map 1). Groshong Gulch's legal description at the confluence with the South Fork Gualala River is T11N R15W S24. Its location is 38°46′45″ north latitude and 123°29′25″ west longitude. Groshong Gulch is an intermittent stream according to the USGS McGuire Ridge 7.5 minute quadrangle. Groshong Gulch drains a watershed of approximately 0.36 square miles. Elevations range from about 70 feet at the mouth of the creek to 1,380 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 east of Gualala on Gualala Redwood, Inc. (GRI) logging roads. The unnamed South Fork Gualala tributary is accessed approximately 0.25 miles from the junction of River Road, North Fork Road, Little Red Rock Road, Mountain Road and GRI's main haul road. Foot access is available to the mouth of Groshong Gulch from the bridge over the unnamed right bank stream.

METHODS

The habitat inventory conducted in Groshong Gulch follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al., 1998). The Watershed Stewards Project/AmeriCorps (WSP/AmeriCorps) 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 Groshong Gulch to record measurements and observations. There are nine components to the inventory form.

1. Flow:

Flow is measured in cubic feet per second (cfs) at 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 (1985 rev. 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 (1988). 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". Groshong 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.

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 Groshong 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 particle size, bedrock, or other considerations.

6. Shelter Rating:

Instream shelter is composed of those elements within a stream channel that provide 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. 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 Groshong 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. 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 Groshong 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 evergreen or deciduous 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 Groshong 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.

DATA ANALYSIS

Data from the habitat inventory form are entered into Stream Habitat 1.0.37, 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:

- Summary of riffle, flatwater, and pool habitat types
- Summary of habitat types and measured parameters
- Summary of pool types
- Summary of maximum pool depths by pool habitat types
- Summary of shelter by habitat types
- Summary of dominant substrates by habitat types
- Summary of fish habitat elements by stream reach

Graphics are produced from the tables using Microsoft Excel. Graphics developed for Groshong Gulch include:

- Level II habitat types by % occurrence
- Level II habitat types by % total length
- Level IV habitat types by % occurrence
- Level I pool habitat types by % occurrence
- Maximum depth in pools
- Percent embeddedness estimated in pool tail-outs
- Mean percent cover types in pools
- Substrate composition in pool tail-outs
- Mean percent canopy
- Dominant bank composition in survey reach
- Dominant bank vegetation in survey reach

HABITAT INVENTORY RESULTS

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

The habitat inventory of August 5, 2003, was conducted by J. Breton and K. Lucey (WSP/Americorp). The total length of the stream surveyed was 1,083 feet.

Stream flow was not measured on Groshong Gulch.

Groshong Gulch

Groshong Gulch is an A3 channel type for the entire 1,083 feet of the stream surveyed. A3 channels are steep, narrow, cascading, step-pool, high energy debris transporting channels associated with depositional soils, and cobble-dominant substrates.

Water temperatures taken during the survey period ranged from 58 to 59 degrees Fahrenheit. Air temperatures ranged from 66 to 68 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 48% riffle units, 35% flatwater units, and 13% pool units (Graph 1). Based on total length of Level II habitat types there were 58% riffle units, 22% flatwater units, and 3% pool units (Graph 2).

Seven Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were low gradient riffle units, 44%; run units, 26%; step run units, 9%; and mid-channel pool units, 9% (Graph 3). Based on percent total length, low gradient riffle units made up 48%, run units 13%, and cascade units 10%.

A total of three pools were identified (Table 3). Mid-channel pools were the most frequently encountered, at 67%, and comprised 72% of the total length of all pools (Graph 4).

Table 4 is a summary of maximum pool depths by pool habitat types. Pool quality for salmonids increases with depth. One of the three measured pools (33%) had a depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the three pool tail-outs measured, 0 had a value of 1 (0%); 2 had a value of 2 (67%); 0 had a value of 3 (0%); 0 had a value of 4 (0%); and 1 had a value of 5 (33%) (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.

Riffle habitat types had a mean shelter rating of 14, flatwater habitat types had a mean shelter rating of 82, and pool habitats had a mean shelter rating of 13 (Table 1). Of the pool types, the main channel pools had the highest mean shelter rating at 15. Scour pools had a mean shelter rating of 10 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Small woody debris is the dominant cover type in Groshong Gulch. Graph 7 describes the pool cover in Groshong 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 67% of the pool tail-outs. Sand was the next most frequently observed dominant substrate type and occurred in 33% of the pool tail-outs.

Groshong Gulch

The mean percent canopy density for the surveyed length of Groshong Gulch was 89%. Of the canopy present, the mean percentages of evergreen and deciduous trees were 49% and 40%, respectively. Graph 9 describes the mean percent canopy in Groshong Gulch.

For the stream reach surveyed, the mean percent right bank vegetated was 78%. The mean percent left bank vegetated was 76%. The dominant elements composing the structure of the stream banks consisted of 59% cobble/gravel, and 41% sand/silt/clay (Graph 10). Coniferous trees were the dominant vegetation type observed in 68% of the units surveyed. Additionally, 32% of the units surveyed had deciduous trees as the dominant vegetation type (Graph 11).

DISCUSSION

Groshong Gulch is an A3 channel type for the entire 1,083 feet of stream surveyed. The suitability of A3 channel types for fish habitat improvement structures is as follows: A3 channel types are good for bank-placed boulders and fair for plunge weirs, opposing wing-deflectors and log cover.

The water temperatures recorded during the survey ranged from 58 to 59 degrees Fahrenheit. Air temperatures ranged from 66 to 68 degrees Fahrenheit. These water temperatures were within the suitable range for salmonids. 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.

Riffle habitat types comprised 58% of the total length of this survey, flatwater 22%, and pools 3%. One of the 3 (33%) measured pools hae a maximum 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 depth of at least two feet, occupy at least half the width of the low flow channel, and be as long as the low flow channel width. Installing structures that will increase or deepen pool habitat is recommended for locations where their installation will not be threatened by high stream energy, or where their installation will not conflict with the modification of the numerous log debris accumulations (LDA's) in the stream.

Two of the three pool tail-outs measured had embeddedness ratings of 1 or 2. None 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 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. Sediment sources in Groshong Gulch should be mapped and rated according to their potential sediment yields, and control measures should be taken.

Two of the three pool tail-outs measured had gravel or small cobble as the dominant substrate. This is generally considered good for spawning salmonids.

The mean shelter for flatwater was 82. The mean shelter rating for pools was 13. 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 all habitat types. Additionally, large woody debris contributes a small amount. 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 89%.

The percentage of right and left bank covered with vegetation was moderate at 78% and 76%, respectively. In areas of stream bank erosion or where bank vegetation is not at acceptable levels, planting endemic trees species, in conjunction with bank stabilization, is recommended.

RECOMMENDATIONS

1) Groshong 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.

3) Where feasible, design and engineer pool enhancement structures to increase the number of pools. This must be done where the banks are stable or in conjunction with stream bank armor to prevent erosion.

4) 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.

5) 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.

6) 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.

7) There are several log debris accumulations present on Groshong Gulch that are retaining large quantities of fine sediment. The modification of these debris accumulations is desirable, but must be done carefully, over time, to avoid excessive sediment loading in downstream reaches.

Groshong Gulch

COMMENTS AND LANDMARKS

The following landmarks and possible problem sites were noted. All distances are approximate and taken from the beginning of the survey.

Position (ft.):	Habitat Unit #:	Comments:
0	0001.00	Start of survey at the confluence with the unnamed tributary to Groshong Gulch.
66	0002.00	Begin fully sampling Groshong Gulch upstream of influence of South Fork Gualala River. There is a log debris accumulation (LDA) which includes 3' diameter x 20' long log which is laying parallel to the flow and clogging channel.
658	0014.00	LDA measures 7' high x 35' long x 15' wide and is retaining sediment creating a 4' high plunge.
853	0020.00	LDA measures 20' high x 40' wide x 25' long and is creating a 4' plunge.
930	0021.00	There is a gradient which is greater than 10%.
972	0023.00	Erosion site on right bank measures 12' high x 40' long x 3' wide. Erosion site on left bank measures 20' high x 40' long x 10' wide.
1083	0023.00	End of survey due to high gradient. There is an 11’ high plunge after series of 6' cascades.

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]	

Groshong Gulch

TABLES AND GRAPHS

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

Stream Name: Groshong Gulch Drainage: Gualala River

Survey Dates: 8/5/2003 to 8/5/2003

Confluence Location: Quad: MCGUIRE RIDGE Legal Description: T11NR15WS24 Latitude: 38:46:45.0N Longitude: 123:29:25.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Percent 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
1	0	DRY	4.3	193	193	17.8									
8	3	FLATWATER	34.8	29	233	21.5	4.7	0.3	0.9	169	1349	60	483		82
3	3	POOL	13.0	10	29	2.7	8.0	0.8	1.3	79	236	77	230	69	13
11	4	RIFFLE	47.8	57	628	58.0	2.5	0.2	0.6	77	852	20	216		14

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
23	10	1083	2437.008	929.1425

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Groshong Gulch Drainage: Gualala River

Survey Dates: 8/5/2003 to 8/5/2003

Confluence Location: Quad: MCGUIRE RIDGE Legal Description: T11NR15WS24 Latitude: 38:46:45.0N Longitude: 123:29:25.0W

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 (%)
10	4	LGR	43.5	52	517	47.7	2	0.2	0.9	77	774	20	197		8	91
1	0	CAS	4.3	111	111	10.2									30	93
6	2	RUN	26.1	24	143	13.2	4	0.3	0.6	106	636	32	191		63	82
2	1	SRN	8.7	45	90	8.3	7	0.4	1.4	294	588	118	235		120	81
2	2	MCP	8.7	10	21	1.9	8	0.9	2.1	90	180	98	196	89	15	91
1	1	PLP	4.3	8	8	0.7	7	0.5	0.9	56	56	34	34	28	10	97
1	0	DRY	4.3	193	193	17.8										

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
23	10	1083	2234.25	852.275

Table 3 - Summary of Pool Types

Stream Name: Groshong Gulch Drainage: Gualala River

Survey Dates: 8/5/2003 to 8/5/2003

Confluence Location: Quad: MCGUIRE RIDGE Legal Description: T11NR15WS24 Latitude: 38:46:45.0N Longitude: 123:29:25.0W

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
2	2	MAIN	67	11	21	72	8.5	0.9	90	180	89	178	15
1	1	SCOUR	33	8	8	28	7.0	0.5	56	56	28	28	10

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
3	3	29	236	206

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

Stream Name: Groshong Gulch Drainage: Gualala River

Survey Dates: *8/5/2003 to 8/5/2003*

Confluence Location: Quad: MCGUIRE RIDGE Legal Description: T11NR15WS24 Latitude: 38:46:45.0N Longitude: 123:29:25.0W

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
2	MCP	67	1	50	0	0	1	50	0	0	0	0
1	PLP	33	1	100	0	0	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
3	2	67	0	0	1	33	0	0	0	0

Mean Maximum Residual Pool Depth (ft.): 1.3

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Groshong Gulch Drainage: Gualala River

Survey Dates: 8/5/2003 to 8/5/2003 Dry Units: 1

Confluence Location: Quad: MCGUIRE RIDGE Legal Description: T11NR15WS24 Latitude: 38:46:45.0N Longitude: 123:29:25.0W

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
10	3	LGR	3	73	17	0	0	0	3	3	0
1	1	CAS	10	0	0	0	0	0	50	40	0
11	4	TOTAL RIFFLE	5	55	13	0	0	0	15	13	0
6	2	RUN	10	60	30	0	0	0	0	0	0
2	1	SRN	20	50	20	0	0	0	10	0	0
8	3	TOTAL FLAT	13	57	27	0	0	0	3	0	0
2	2	MCP	28	48	0	25	0	0	0	0	0
1	1	PLP	0	0	0	0	0	0	50	50	0
3	3	TOTAL POOL	18	32	0	17	0	0	17	17	0
23	10	TOTAL	12	49	13	5	0	0	12	10	0

Groshong Gulch

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Groshong Gulch   Drainage: Gualala River

Survey Dates: 8/5/2003 to 8/5/2003   Dry Units: 1

Confluence Location: Quad: MCGUIRE RIDGE   Legal Description: T11NR15WS24   Latitude: 38:46:45.0N   Longitude: 123:29:25.0W

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
10	4	LGR	0	0	75	25	0	0	0
1	1	CAS	0	0	0	0	0	100	0
6	2	RUN	0	0	100	0	0	0	0
2	1	SRN	0	0	100	0	0	0	0
2	2	MCP	0	50	50	0	0	0	0
1	1	PLP	0	100	0	0	0	0	0

Groshong Gulch

Table 8 - Fish Habitat Inventory Data Summary

Stream Name: Groshong Gulch | Drainage: Gualala River

Survey Dates: 8/5/2003 to 8/5/2003 | Survey Length (ft.): 1083 | Main Channel (ft.): 1083 | Side Channel (ft.): 0

Confluence Location: Quad: MCGUIRE RIDGE | Legal Description: T11NR15WS24 | Latitude: 38:46:45.0N | Longitude: 123:29:25.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

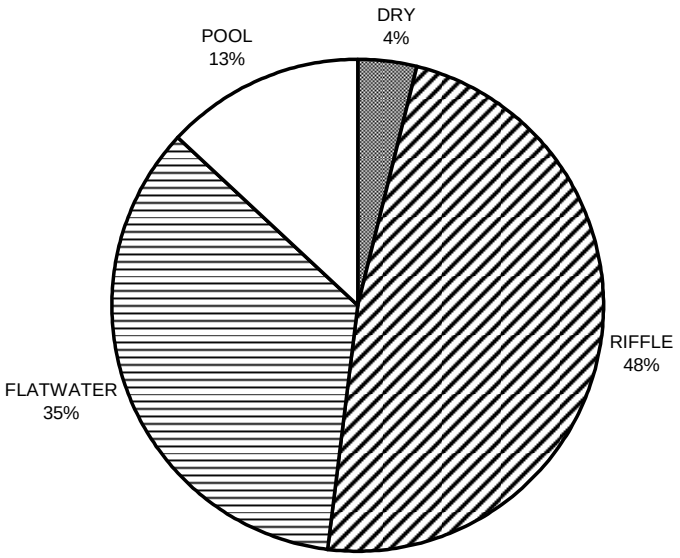
Channel Type: A3	Canopy Density (%): 89	Pools by Stream Length (%): 3
Reach Length (ft.): 1083	Coniferous Component (%): 55	Pool Frequency (%): 13
Riffle/Flatwater Mean Width (ft.): 3.4	Deciduous Component (%): 45	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Evergreen Trees	< 2 Feet Deep: 67
Range (ft.): 6 to 10	Vegetative Cover (%): 84	2 to 2.9 Feet Deep: 33
Mean (ft.): 8	Dominant Shelter: Small Woody Debris	3 to 3.9 Feet Deep: 0
Std. Dev.: 2	Dominant Bank Substrate Type: Cobble/Gravel	>= 4 Feet Deep: 0
Base Flow (cfs.): 0.0	Occurrence of LWD (%): 12	Mean Max Residual Pool Depth (ft.): 1.3
Water (F): 58 - 59 Air (F): 66 - 68	LWD per 100 ft.:	Mean Pool Shelter Rating: 13
Dry Channel (ft): 193	Riffles: 6	
	Pools: 10	
	Flat: 6	

Pool Tail Substrate (%): Silt/Clay: 0 Sand: 33 Gravel: 67 Sm Cobble: 0 Lg Cobble: 0 Boulder: 0 Bedrock: 0

Embeddedness Values (%): 1. 0 2. 67 3. 0 4. 0 5. 33

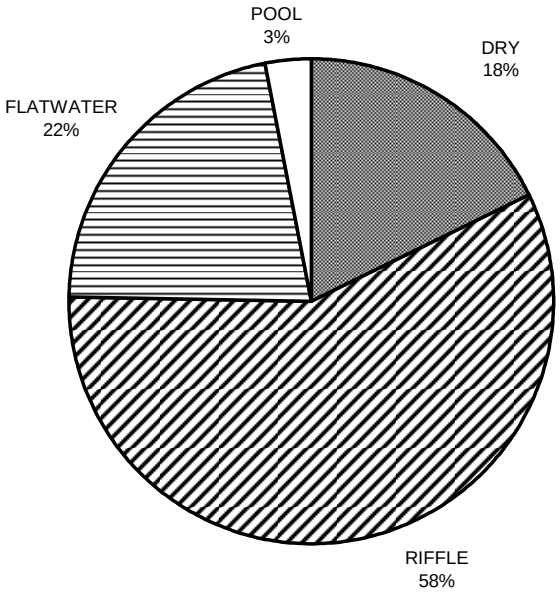
GROSHONG GULCH

HABITAT TYPES BY PERCENT OCCURRENCE



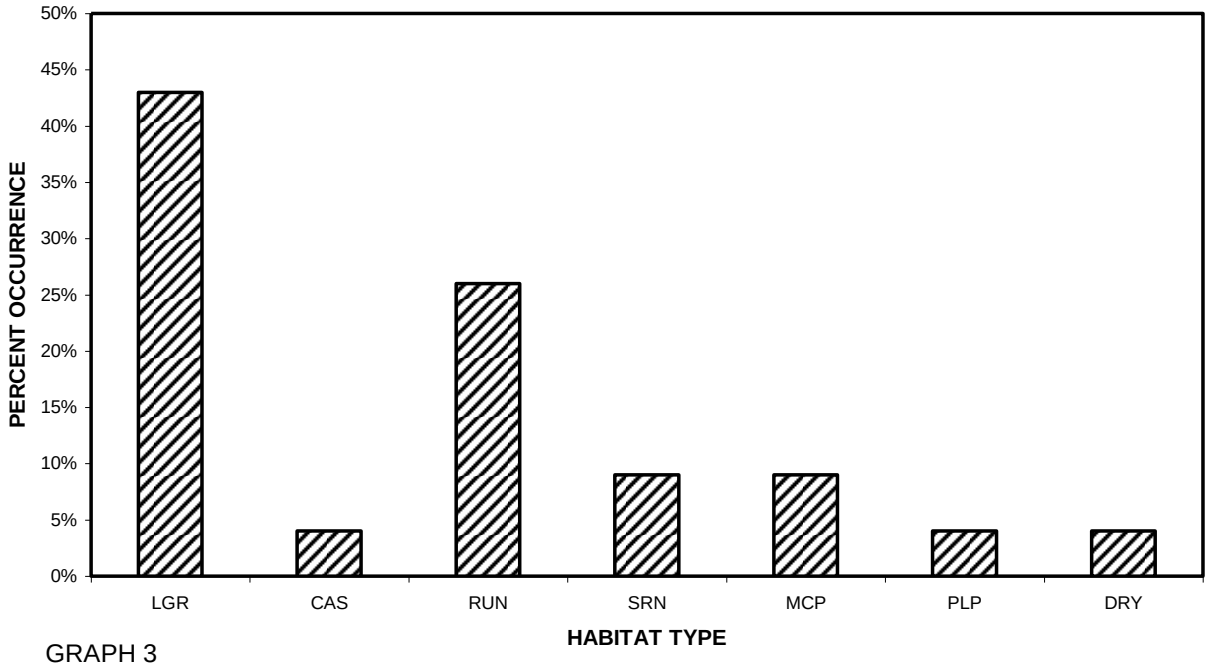
GRAPH 1

GROSHONG GULCH
HABITAT TYPES BY PERCENT TOTAL LENGTH



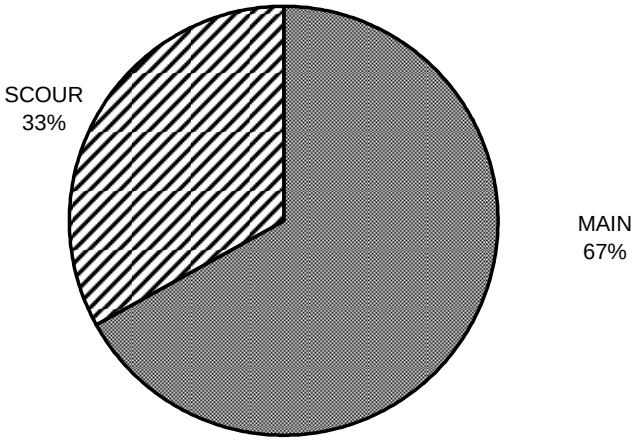
GRAPH 2

GROSHONG GULCH
HABITAT UNIT TYPES BY PERCENT OCCURRENCE



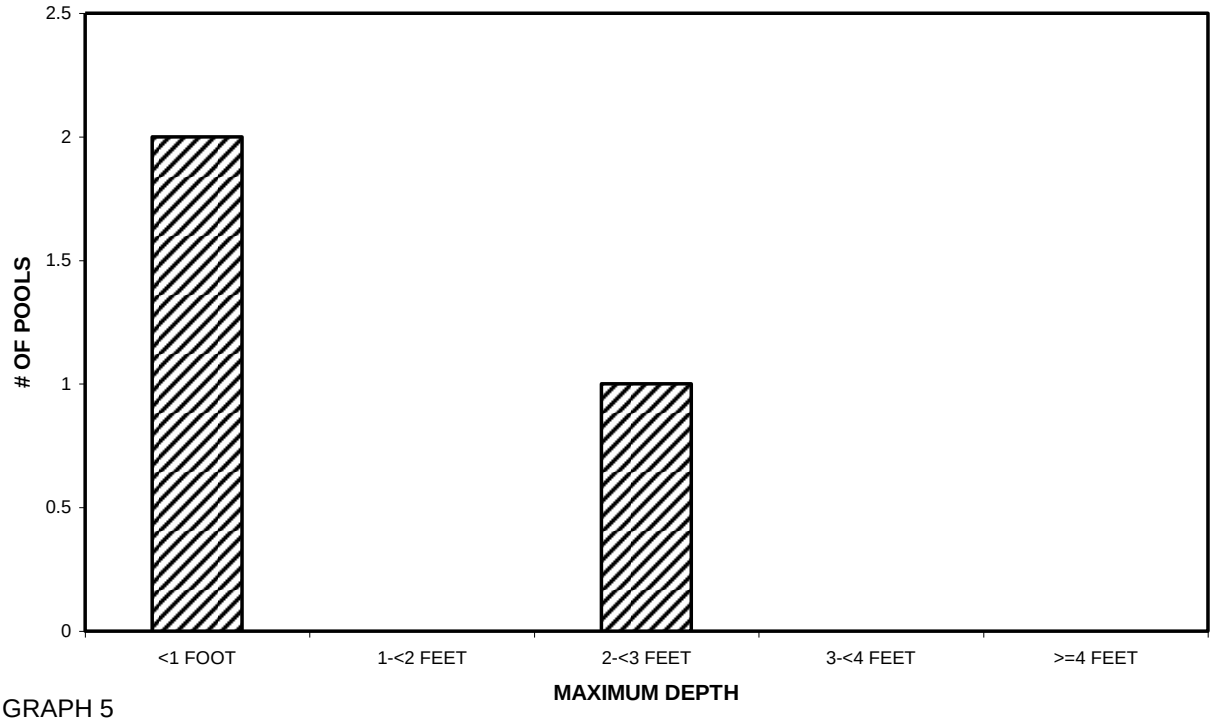
GRAPH 3

GROSHONG GULCH
POOL HABITAT TYPES BY PERCENT OCCURRENCE



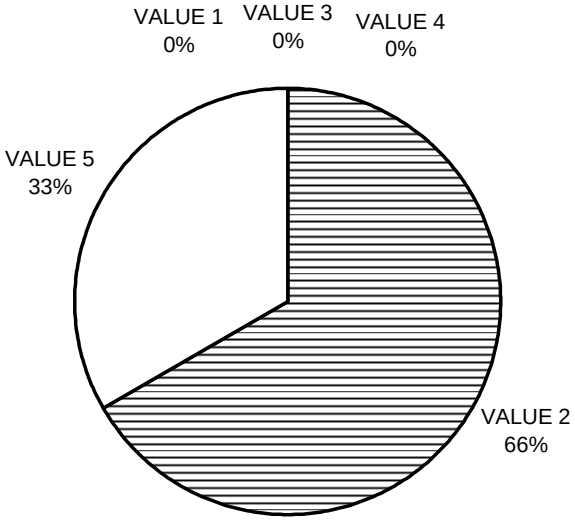
GRAPH 4

GROSHONG GULCH
MAXIMUM DEPTH IN POOLS



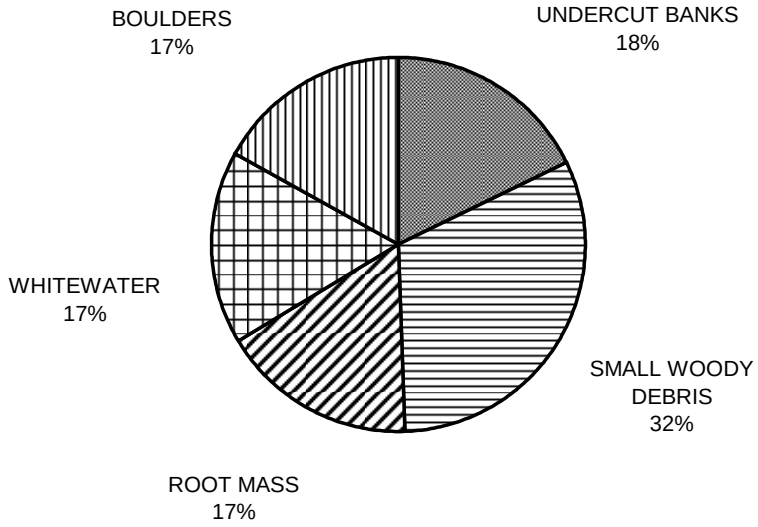
GRAPH 5

GROSHONG GULCH
PERCENT EMBEDDEDNESS

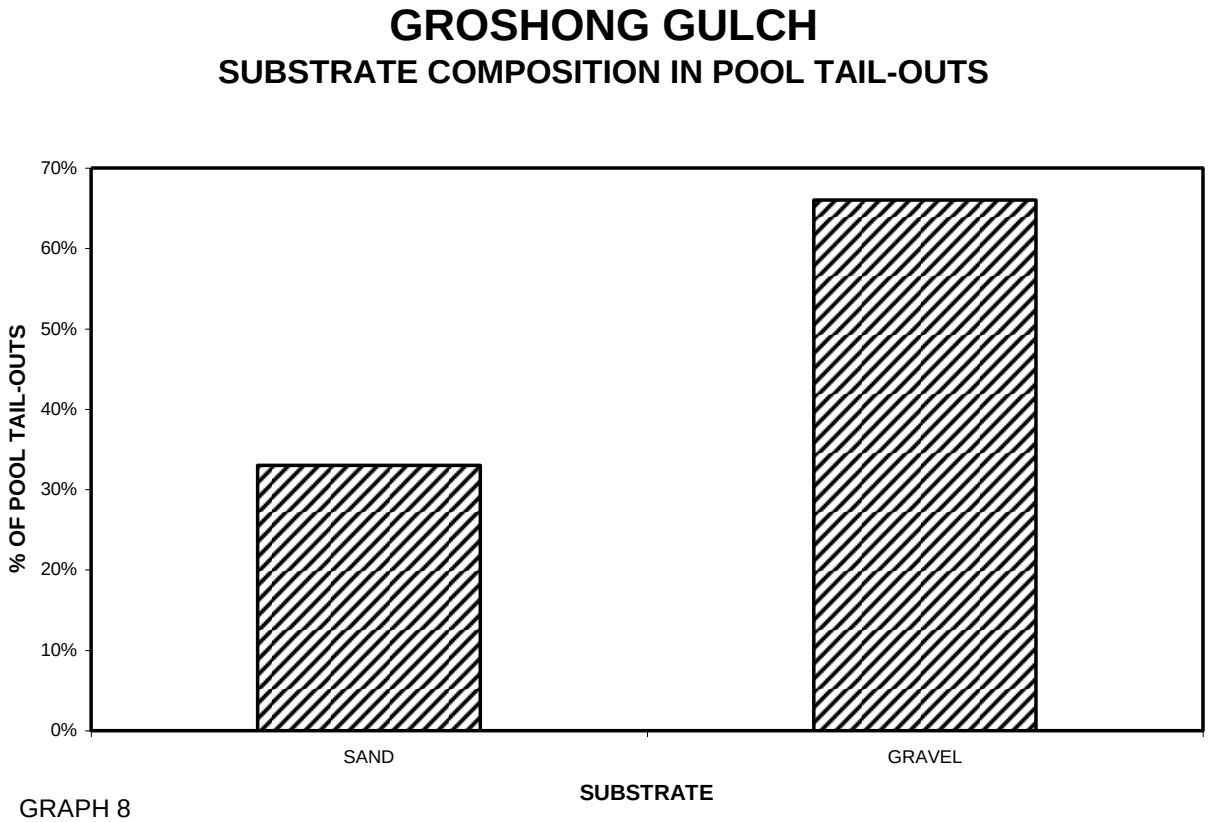


GRAPH 6

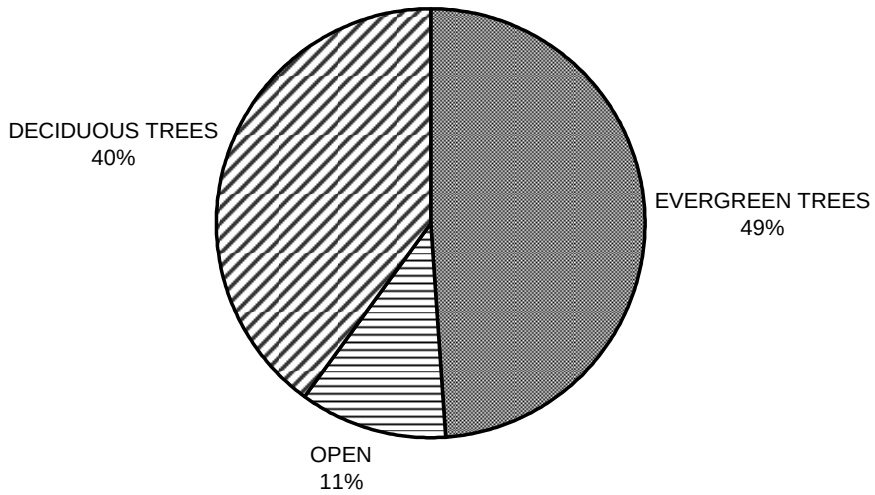
GROSHONG GULCH
MEAN PERCENT COVER TYPES IN POOLS



GRAPH 7

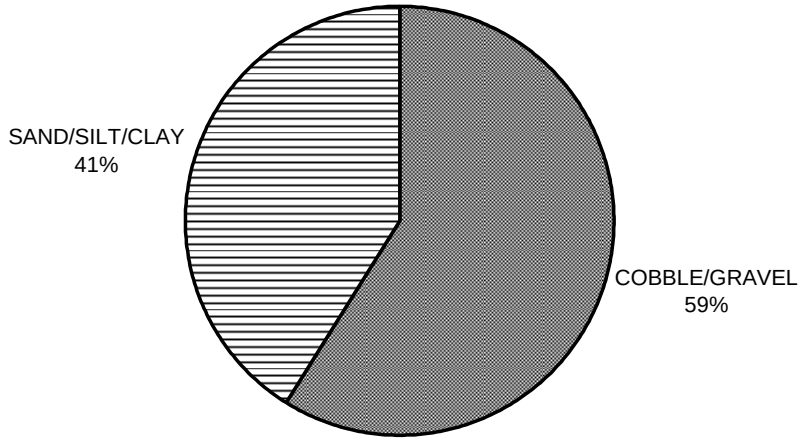


GRAPH 8



GRAPH 9

GROSHONG GULCH
DOMINANT BANK COMPOSITION IN SURVEY REACH

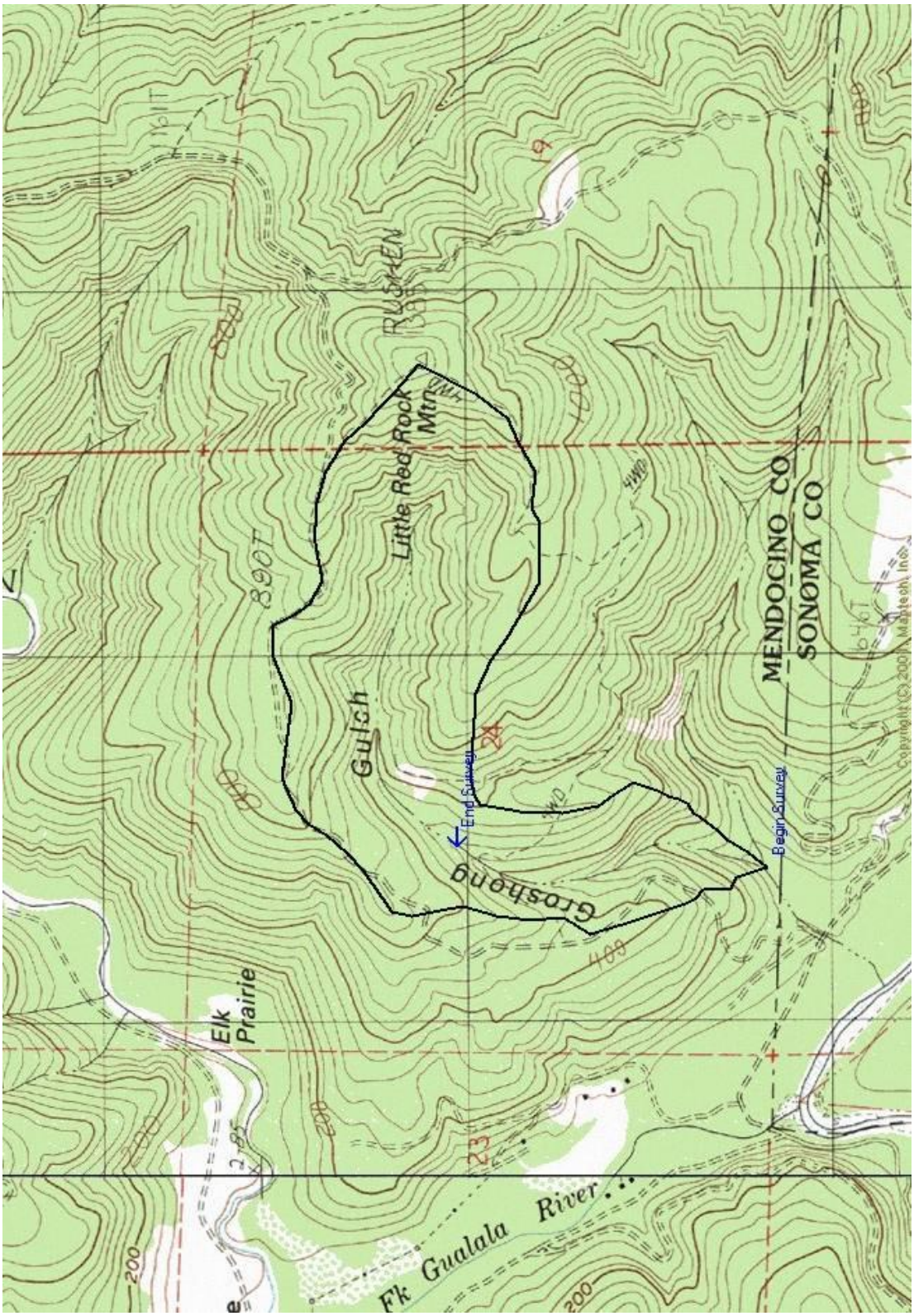


GRAPH 10

GROSHONG GULCH
DOMINANT BANK VEGETATION IN SURVEY REACH

GRAPH 11

Groshong Gulch



Map 1. Groshong Gulch.