STREAM INVENTORY REPORT

Bull Team Gulch

INTRODUCTION

A stream inventory was conducted on April 2 and April 3, 2003 on an unnamed tributary to East Branch North Fork Big River commonly know as and hereinafter referred to as Bull Team Gulch. The survey began at the confluence with East Branch North Fork Big River and extended upstream 3,024 feet.

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 East Branch North Fork Big River, tributary to North Fork Big River, tributary to Big River, which drains to the Pacific Ocean, located in Mendocino County, California (Map 1). Bull Team Gulch's legal description at the confluence with East Branch North Fork Big River is T17N R15W S15. Its location is 39.3280 north latitude and 123.5263 west longitude. Bull Team Gulch is a first order stream and has approximately 4,880 feet of solid blue line stream according to the USGS Comptche 7.5 minute quadrangle. Bull Team Gulch drains a watershed of approximately 0.49 square miles. Elevations range from about 400 feet at the mouth of the creek to 800 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 Highway 20 to logging roads from approximately 17 miles east of Fort Bragg.

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 California Conservation Corps (CCC) Technical Advisor and Fish and Game Biologist 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.

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<u>SAMPLING STRATEGY</u>

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.

<u>HABITAT INVENTORY COMPONENTS</u>

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 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 bottom 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". 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.

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 unsuited 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 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. 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 Bull Team Gulch, an estimate of the percentage of the habitat unit covered by canopy was made from the top 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 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

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(including downed trees, logs, and rootwads) was estimated and recorded.

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, random sites were electrofished using a Smith-Root Model 12 electrofisher. These sampling techniques are discussed in the *California Salmonid Stream Habitat Restoration Manual*.

DATA ANALYSIS

Data from the habitat inventory form are entered into Habitat 8.4, a dBASE 4.2 data entry program developed by Tim Curtis, Inland Fisheries Division, California Department of Fish and Game. This program processes and summarizes the data, and produces the following six tables:

- Riffle, flatwater, and pool habitat types
- Habitat types and measured parameters
- Pool types
- Maximum pool depths by habitat types
- Dominant substrates by habitat types
- Mean percent shelter by habitat types

Graphics are produced from the tables using Excel. Graphics developed for Bull Team Gulch include:

- Riffle, flatwater, pool habitats by percent occurrence
- Riffle, flatwater, pool habitats by total length
- Total habitat types by percent occurrence
- Pool types by percent occurrence
- Total pools by maximum depths
- Embeddedness
- Pool cover by cover type
- Dominant substrate in pool tail-outs
- Mean percent canopy
- Bank composition by composition type
- Bank vegetation by vegetation type

HABITAT INVENTORY RESULTS

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

The habitat inventory of April 2 and April 3, 2003, was conducted by S. Monday (DFG) and B. Budnick (CCC). The total length of the stream surveyed was 3,024 feet.

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Stream flow was not measured on Bull Team Gulch.

Bull Team Gulch is an E4 channel type for the entire 3,024 feet of the stream surveyed. 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 48 to 50 degrees Fahrenheit. Air temperatures ranged from 46 to 50 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 41% flatwater units, 35% pool units, 20% riffle units, and 4% culvert units (Graph 1). Based on total length of Level II habitat types there were 67% flatwater units, 20% riffle units, 10% pool units, and 3% culvert units (Graph 2).

Eleven Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were step run units, 39%; mid-channel pool units, 18%; and low gradient riffle units, 16% (Graph 3). Based on percent total length, step run units made up 66%, low-gradient riffle units 16%, and mid-channel pool units 4%.

A total of 18 pools were identified (Table 3). Main-channel pools were the most frequently encountered, at 61%, and comprised 74% 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. Six of the 18 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 18 pool tail-outs measured, 0 had a value of 1 (0%); 6 had a value of 2 (33%); 2 had a value of 3 (11%); 1 had a value of 4 (5%); and 9 had a value of 5 (50%) (Graph 6). On this scale, a value of 1 indicates the highest quality of spawning substrate.

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 52, flatwater habitat types had a mean shelter rating of 33, and pool habitats had a mean shelter rating of 34 (Table 1). Of the pool types, the scour pools had the highest mean shelter rating at 51. Main channel pools had a mean shelter rating of 23 (Table 3).

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

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 pool the pool tail-outs. Small cobble was the next most frequently observed dominant substrate type and occurred in 17% of the pool tail-outs.

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The mean percent canopy density for the surveyed length of Bull Team Gulch was 89%. Of the canopy present, the mean percentages of evergreen and deciduous trees were 98% and 2%, respectively. Graph 9 describes the mean percent canopy in Bull Team Gulch.

For the stream reach surveyed, the mean percent right bank vegetated was 44%. The mean percent left bank vegetated was 41%. The dominant elements composing the structure of the stream banks consisted of 97% sand/silt/clay and 3% cobble/gravel (Graph 10). Evergreen trees were the dominant vegetation type observed in 94% of the units surveyed. Additionally, 6% of the units surveyed had grass as the dominant vegetation type (Graph 11).

BIOLOGICAL INVENTORY RESULTS

A backpack electrofisher survey was conducted at one location within Bull Team Gulch by Mendocino Redwood Company, aquatic biologists, in the summer of 2002. All aquatic species were identified and lengths were taken of salmonids. Steelhead rainbow trout and coho salmon were the salmonid species observed. No other aquatic species were identified (Table A).

Site 75-09 produced one steelhead trout between 70-130 mm, two coho salmon between 70-130 mm, and one coho salmon greater that 130 mm in length.

Table A. Bull Team Gulch biological sampling data.

Date	Site	Species	<70 mm	70-130 mm	>130 mm
9/4/2002	75-09	SH	0	1	0
9/4/2002	75-09	COHO	0	2	1

DISCUSSION

Bull Team Gulch is an E4 channel type for the entire 3,024 feet of stream surveyed. 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 days April 2 and April 3, 2003, were within the suitable range for salmonids. To make any 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 67% of the total length of this survey, riffle 20%, and pools 10%. The pools are relatively shallow, with only 6 of the 18 (33%) measured pools having 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.

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Six of the 18 pool tail-outs measured had embeddedness ratings of 1 or 2. Three of the pool tail-outs had embeddedness ratings of 3 or 4. Nine 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 Bull Team Gulch should be mapped and rated according to their potential sediment yields, and control measures should be taken.

Fifteen of the 18 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 33. The mean shelter rating for pools was 34. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by large woody debris in all habitat types. Additionally, undercut banks contribute 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%. In general, revegetation projects are considered when canopy density is less than 80%.

The percentage of right and left bank covered with vegetation was low at 44% and 41%, 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)   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.

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 large woody debris. Adding high quality complexity with woody cover in the pools is desirable.

5)   Active and potential sediment sources need to be identified, mapped, and treated according to their potential for sediment yield to the stream and its tributaries.

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6)   Due to the high gradient of the culvert near the mouth of Bull Team Gulch, access for migrating salmonids is an ongoing potential problem. Good water temperature and flow regimes exist in the stream and it offers good conditions for rearing fish. Fish passage should be monitored and improved where possible.

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):	Comments:
0'	Begin survey at confluence with East Fork North Fork Big River. Channel type is an E4. First unit is within the influence of the confluence. Flowing right bank tributary at 34 feet.
117'	Twenty-four inch culvert, 20 feet up left bank and about 20 feet from stream. Cascade is from rock armor below the upstream culvert.
133'	There is a 72" diameter metal culvert with a high gradient. The boulder cascade created at the culvert outlet is a possible migration barrier to juvenile and adult salmonids.
259'	One unidentified frog.
299'	One unidentified salamander.
346'	Channel type taken at this location. Channel type above culvert is an E4.
600'	There is an LDA consisting of 4 pieces of large wood creating a 3' plunge.
782'	At 80' into the unit there is an active slide 10' high x 10' long on the left bank stemming from a road. There is an LDA with 3 pieces of large wood retaining sediment.
965'	At 10' there are 10 pieces of LWD.
1015'	There is a 5' jump over large wood. This is a possible barrier for migrating juvenile and adult salmonids.
1496'	Side channel separated from main channel by live redwood tree greater than 20 feet tall.
1506'	There are logs lying along both stream banks with dirt fill on top. The fill is stable.

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1778' On the left bank, there is a slide from the road down to the stream and is approximately 15' long x 20' high.

2124' There is a 50" culvert at a 90 degree angle to the stream. The culvert is under a dirt road crossing. At the midpoint the top of the culvert is crushed.

2164'. One salamander observed

2214' This section is in an open canopy area between two roads.

2227' Multiple LDAs retaining sediment and creating potential migration barriers for juvenile and adult salmonids.

2612' Right bank tributary at 139 feet is flowing. Ended unit at confluence with an unnamed tributary.

2809' End of survey due to high gradient and congested vegetation. Many log jams with LWD retaining sediment. The right bank tributary was walked for 50 feet until it spread out into a marsh area.

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.

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]

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TABLES AND GRAPHS

Bull Team Gulch   Drainage: East Branch North Fork Big River

Table 1 - SUMMARY OF RIFFLE, FLATWATER, AND POOL HABITAT TYPES   Survey Dates: 04/02/03 to 04/03/03

Confluence Location: QUAD: Comptche   LEGAL DESCRIPTION: T17NR15WS15   LATITUDE:39°19'41" LONGITUDE:123°31'35"

HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	MEAN LENGTH (ft.)	TOTAL LENGTH (ft.)	PERCENT TOTAL LENGTH	MEAN WIDTH (ft.)	MEAN 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
10	3	RIFFLE	20	60	598	20	4.5	0.6	147	1469	108	1075	0	52
21	6	FLATWATER	41	98	2049	67	4.0	0.6	222	4669	148	3114	0	33
18	18	POOL	35	16	295	10	5.7	1.0	86	1543	87	1571	65	34
2	2	CULVERT	4	51	101	3	2.3	0.2	111	222	22	44	0	0

TOTAL UNITS	TOTAL UNITS			TOTAL LENGTH (ft.)					TOTAL AREA (sq.ft.)			TOTAL VOL. (cu.ft.)		
51	29			3043					7904			5804		

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Drainage: East Branch North Fork Big River

Table 2 - SUMMARY OF HABITAT TYPES AND MEASURED PARAMETERS   Survey Dates: 04/02/03 to 04/03/03

Confluence Location: QUAD: Comptche   LEGAL DESCRIPTION: T17NR15WS15   LATITUDE:39°19'41" LONGITUDE:123°31'35"

HABITAT UNITS FULLY MEASURED #	UNITS	HABITAT TYPE	HABITAT OCCURRENCE %	MEAN LENGTH ft.	TOTAL LENGTH ft.	TOTAL LENGTH %	MEAN WIDTH ft.	MEAN DEPTH ft.	MAXIMUM DEPTH ft.	MEAN AREA sq.ft.	TOTAL AREA EST. sq.ft.	MEAN VOLUME EST. cu.ft.	TOTAL VOLUME cu.ft.	MEAN RESIDUAL POOL VOL cu.ft.	MEAN SHELTER RATING cu.ft.	MEAN CANOPY %
8	1	LGR	44	63	500	169	3	0.3	0.4	53	420	16	126	0	0	92
1	1	HGR	6	82	82	28	5	0.8	2.1	369	369	295	295	0	80	78
1	1	CAS	6	16	16	5	6	0.6	1.0	19	19	12	12	0	75	50
1	1	GLD	6	44	44	15	5	0.6	1.0	198	198	119	119	0	0	76
20	5	SRN	111	100	2005	680	4	0.6	1.8	227	4544	154	3084	0	40	93
9	9	MCP	50	14	129	44	5	1.0	2.2	69	618	77	690	60	22	83
2	2	STP	11	45	89	30	4	1.1	2.1	184	369	173	345	136	25	96
1	1	LSL	6	15	15	5	5	0.7	1.1	75	75	53	53	38	25	95
1	1	LSR	6	12	12	4	9	1.2	1.5	108	108	130	130	76	60	95
5	5	PLP	28	10	50	17	7	1.0	2.8	75	374	71	354	51	55	98
2	2	CUL	11	51	101	34	2	0.2	1.5	111	222	22	44	0	0	0

TOTAL UNITS	TOTAL UNITS	
51	29	

	LENGTH (ft.)	AREA (sq.ft)	TOTAL VOL. (cu.ft)
	3043	7316	5251

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Survey Dates: 04/02/03 to 04/03/03

Table 3 - SUMMARY OF POOL TYPES

Confluence Location: QUAD: Comptche LEGAL DESCRIPTION: T17NR15WS15 LATITUDE:39°19'41" LONGITUDE:123°31'35"

HABITAT UNITS FULLY MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	MEAN LENGTH (ft.)	TOTAL LENGTH (ft.)	PERCENT TOTAL LENGTH	MEAN WIDTH (ft.)	MEAN DEPTH (ft.)	MEAN AREA (sq.ft.)	TOTAL AREA EST. (sq.ft.)	MEAN VOLUME (cu.ft.)	TOTAL VOLUME EST. (cu.ft.)	MEAN RESIDUAL POOL VOL. (cu.ft.)	MEAN SHELTER RATING
11	MAIN	61	20	218	74	4.8	1.0	90	986	94	1035	74	23
7	SCOUR	39	11	77	26	7.0	1.0	80	557	77	536	53	51

TOTAL UNITS	TOTAL LENGTH (ft.)	TOTAL AREA (sq.ft.)	TOTAL VOL. (cu.ft.)
18	295	1543	1571

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Drainage: East Branch North Fork Big River

Survey Dates: 04/02/03 to 04/03/03

Table 4 - SUMMARY OF MAXIMUM POOL DEPTHS BY POOL HABITAT TYPES

Confluence Location: QUAD: Comptche   LEGAL DESCRIPTION: T17NR15WS15   LATITUDE:39°19'41" LONGITUDE:123°31'35"

UNITS MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	<1 FOOT MAXIMUM DEPTH	<1 FOOT PERCENT OCCURRENCE	1-<2 FT. MAXIMUM DEPTH	1-<2 FOOT PERCENT OCCURRENCE	2-<3 FT. MAXIMUM DEPTH	2-<3 FOOT PERCENT OCCURRENCE	3-<4 FT. MAXIMUM DEPTH	3-<4 FOOT PERCENT OCCURRENCE	>=4 FEET MAXIMUM DEPTH	>=4 FEET PERCENT OCCURRENCE
9	MCP	50	0	0	6	67	3	33	0	0	0	0
2	STP	11	0	0	1	50	1	50	0	0	0	0
1	LSL	6	0	0	1	100	0	0	0	0	0	0
1	LSR	6	0	0	1	100	0	0	0	0	0	0
5	PLP	28	1	20	2	40	2	40	0	0	0	0

TOTAL UNITS
18

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Drainage: East Branch North Fork Big River

Table 5 - SUMMARY OF MEAN PERCENT COVER BY HABITAT TYPE   Survey Dates: 04/02/03 to 04/03/03

Confluence Location: QUAD: Comptche   LEGAL DESCRIPTION: T17NR15WS15   LATITUDE:39°19'41" LONGITUDE:123°31'35"

UNITS MEASURED	UNITS FULLY MEASURED	HABITAT TYPE	MEAN % UNDERCUT BANKS	MEAN % SWD	MEAN % LWD	MEAN % ROOT MASS VEGETATION	MEAN % TERR. VEGETATION	MEAN % AQUATIC VEGETATION	MEAN % WHITE WATER	MEAN % BOULDERS	MEAN % BEDROCK LEDGES
3	0	LGR	0	0	0	0	0	0	0	0	0
1	1	HGR	0	5	80	0	5	0	10	0	0
1	1	CAS	0	0	0	0	0	0	0	100	0
1	0	GLD	0	0	0	0	0	0	0	0	0
20	2	SRN	10	8	60	5	3	0	10	0	5
9	9	MCP	37	26	22	3	3	1	8	0	0
2	2	STP	40	25	30	0	0	0	0	5	0
1	1	LSL	10	10	80	0	0	0	0	0	0
1	1	LSR	0	0	30	60	0	10	0	0	0
5	5	PLP	50	3	26	0	0	0	16	5	0
2	0	CUL	0	0	0	0	0	0	0	0	0

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Table 6 - SUMMARY OF DOMINANT SUBSTRATES BY HABITAT TYPE   Survey Dates: 04/02/03 to 04/03/03

Confluence Location: QUAD: Comptche   LEGAL DESCRIPTION: T17NR15WS15   LATITUDE:39°19'41" LONGITUDE:123°31'35"

TOTAL HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	% TOTAL SILT/CLAY DOMINANT	% TOTAL SAND DOMINANT	% TOTAL GRAVEL DOMINANT	% TOTAL SM COBBLE DOMINANT	% TOTAL LG COBBLE DOMINANT	% TOTAL BOULDER DOMINANT	% TOTAL BEDROCK DOMINANT
8	1	LGR	0	0	100	0	0	0	0
1	1	HGR	0	0	100	0	0	0	0
1	1	CAS	0	0	0	0	0	100	0
1	1	GLD	0	0	100	0	0	0	0
20	5	SPN	0	20	60	20	0	0	0
9	2	MCP	50	0	50	0	0	0	0
2	1	STP	0	0	100	0	0	0	0
1	1	LSL	0	0	100	0	0	0	0
1	1	LSR	0	0	100	0	0	0	0
5	2	PLP	0	50	50	0	0	0	0
2	0	CUL	0	0	0	0	0	0	0

```
TABLE 8.  FISH HABITAT INVENTORY DATA SUMMARY

STREAM NAME: Bull Team Gulch
SAMPLE DATES: 04/02/03 to 04/03/03
STREAM LENGTH: 3024 ft.
LOCATION OF STREAM MOUTH:
  USGS Quad Map: Comptche          Latitude: 39°19'41"
  Legal Description: T17NR15WS15    Longitude: 123°31'35"


        SUMMARY OF FISH HABITAT ELEMENTS BY STREAM REACH

STREAM REACH 1
  Channel Type: E4                 Canopy Density: 89%
  Channel Length: 3024 ft.         Coniferous Component: 98%
  Riffle/flatwater Mean Width: 4 ft. Deciduous Component: 2%
  Total Pool Mean Depth: 0.9 ft.   Pools by Stream Length: 10%
  Base Flow: 0.0 cfs               Pools >=3 ft.deep: 0%
  Water: 048- 050°F  Air: 046-050°F Mean Pool Shelter Rtn: 34
  Dom. Bank Veg.: Coniferous Trees Dom. Shelter: Large Woody Debris
  Vegetative Cover: 43%            Occurrence of LOD: 32%
  Dom. Bank Substrate: Silt/Clay/Sand Dry Channel: 0 ft.

  Embeddness Value: 1. 0%   2.33%   3. 11%  4. 6%   5.  50%
```

BULL TEAM GULCH
HABITAT TYPES BY PERCENT OCCURRENCE
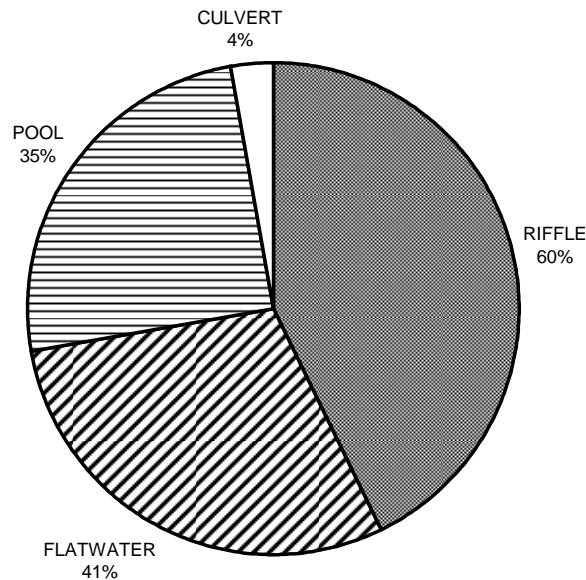
GRAPH 1

BULL TEAM GULCH
HABITAT TYPES BY PERCENT TOTAL LENGTH
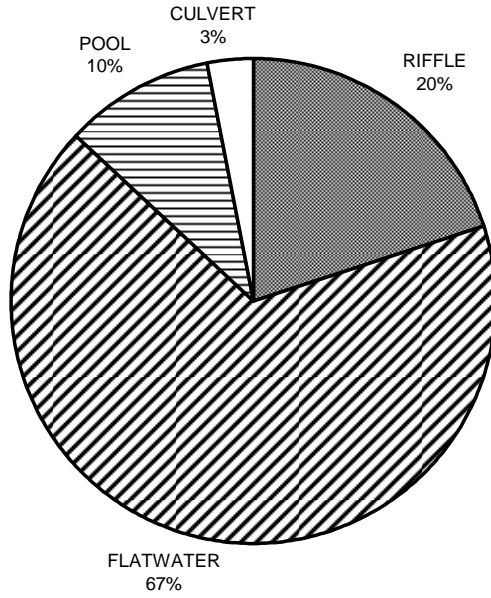
GRAPH 2

BULL TEAM GULCH
HABITAT TYPES BY PERCENT OCCURRENCE
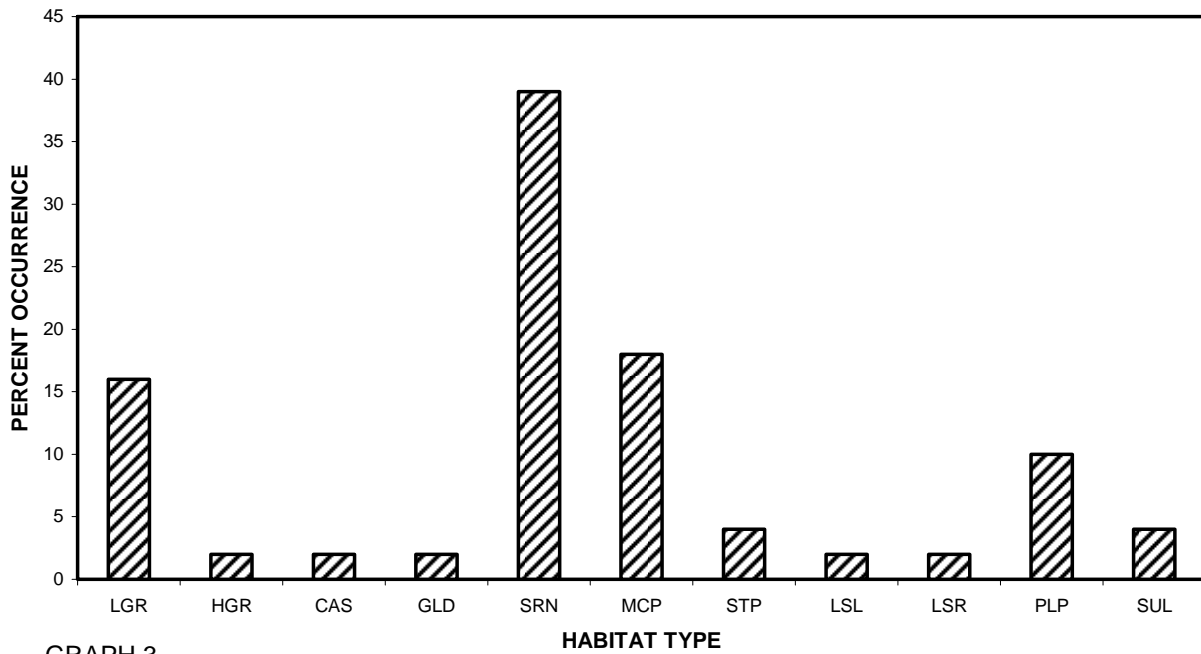
GRAPH 3

BULL TEAM GULCH
POOL HABITAT TYPES BY PERCENT OCCURRENCE
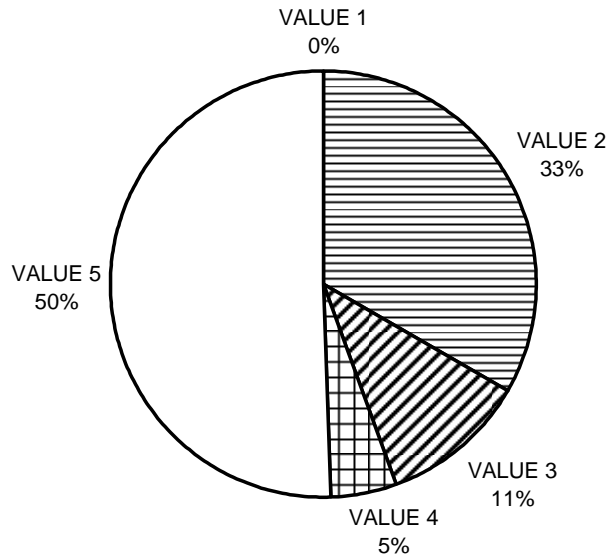

SCOUR
39%

MAIN
61%
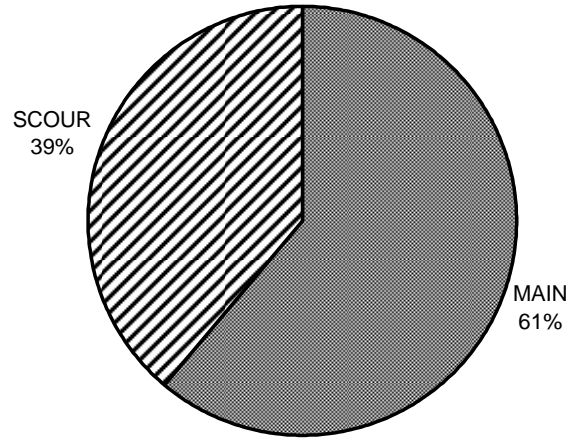
GRAPH 4

BULL TEAM GULCH
MAXIMUM DEPTH IN POOLS
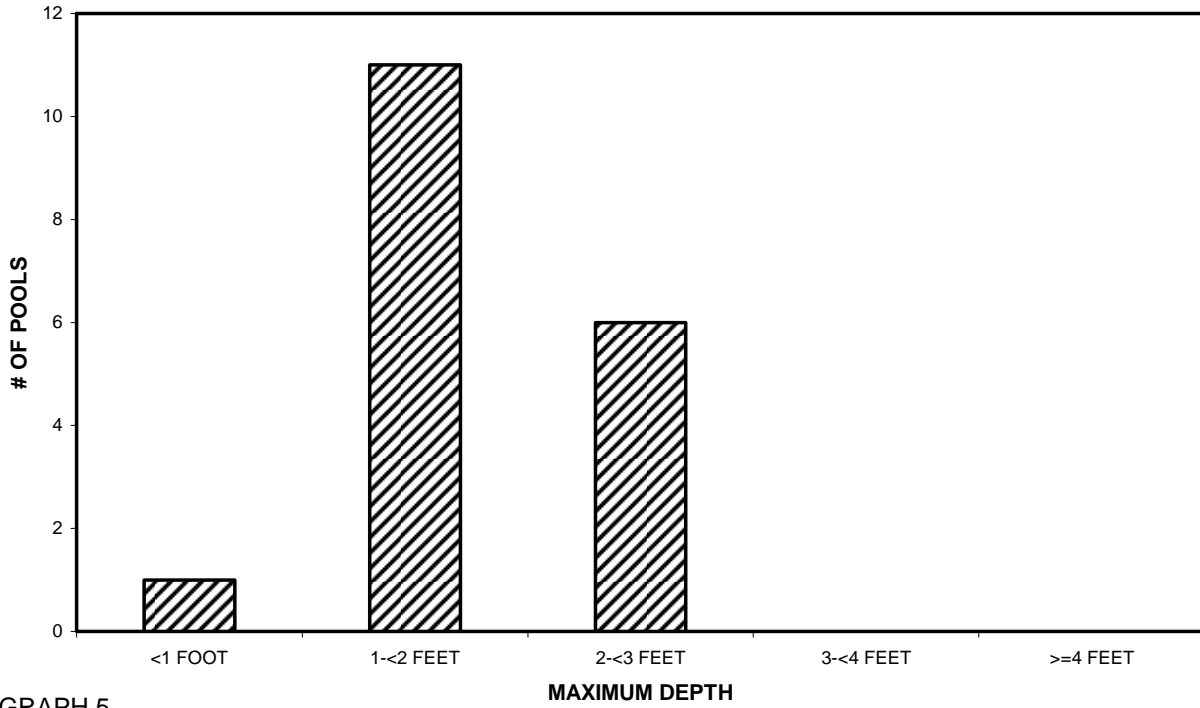
GRAPH 5

BULL TEAM GULCH
PERCENT EMBEDDEDNESS

GRAPH 6
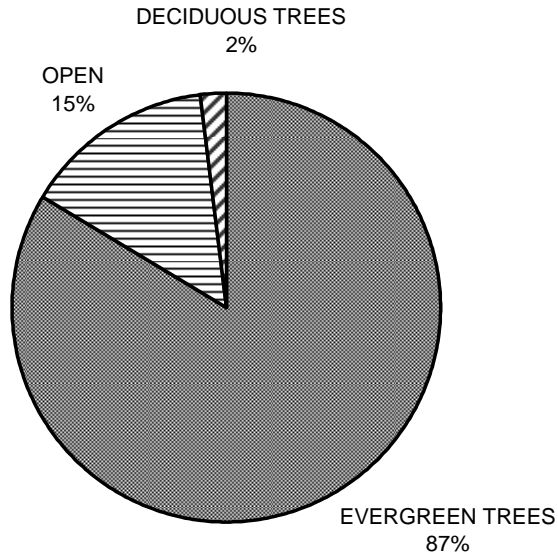
BULL TEAM GULCH
MEAN PERCENT COVER TYPES IN POOLS

WHITEWATER
8%

AQUATIC VEG
1%

BOULDERS
2%

TERRESTRIAL VEG
2%

UNDERCUT BANKS
38%

ROOT MASS
5%

LARGE WOODY
DEBRIS
28%

SMALL WOODY
DEBRIS
17%
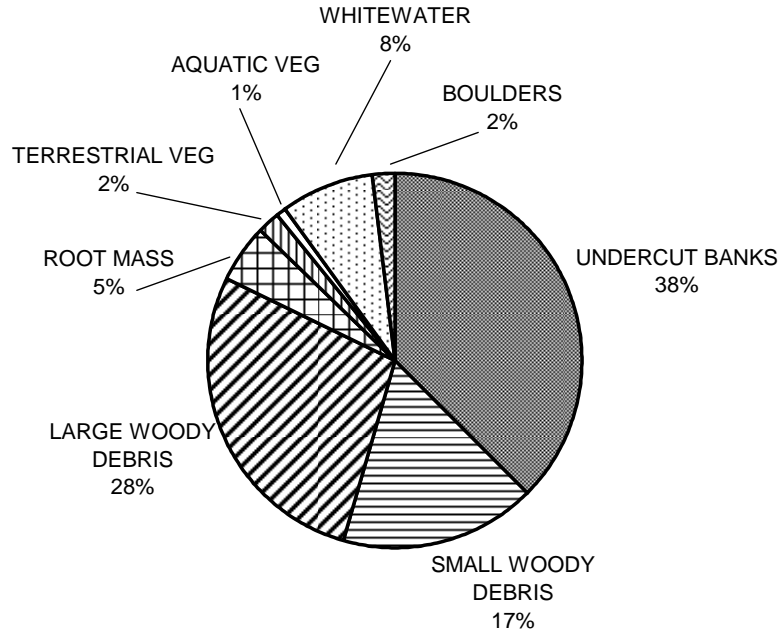
GRAPH 7

BULL TEAM GULCH
SUBSTRATE COMPOSITION IN POOL TAIL-OUTS
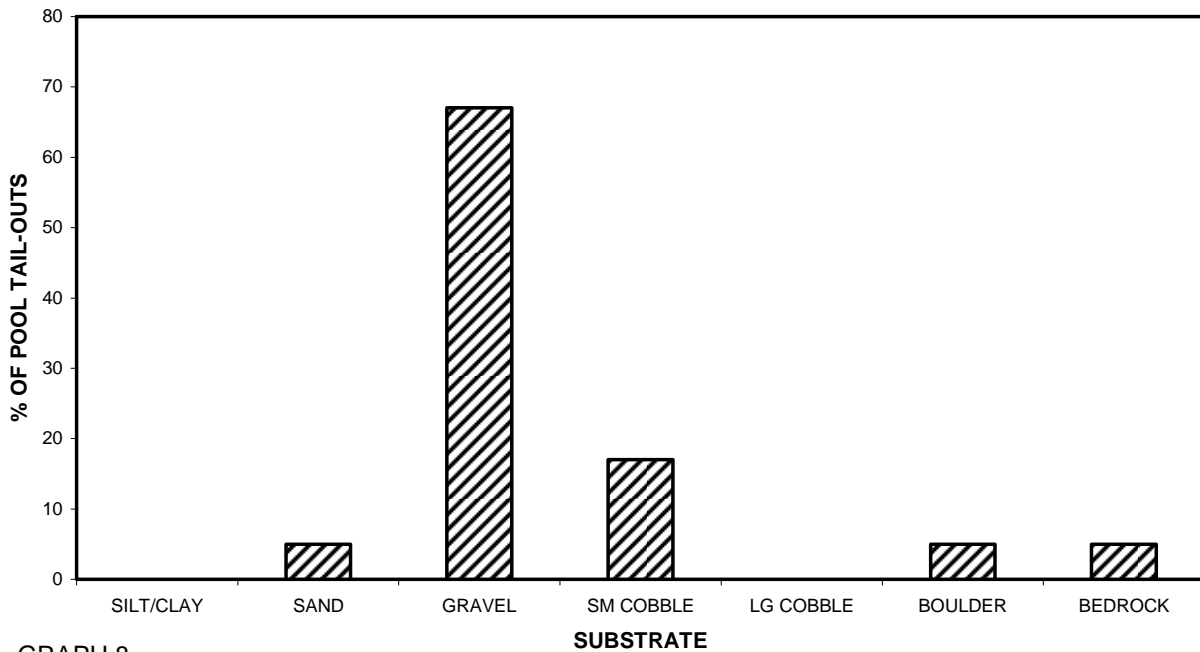
GRAPH 8

BULL TEAM GULCH
MEAN PERCENT CANOPY

DECIDUOUS TREES
2%

OPEN
15%

EVERGREEN TREES
87%

GRAPH 9

BULL TEAM GULCH
DOMINANT BANK COMPOSITION IN SURVEY REACH

COBBLE/GRAVEL
3%

SAND/SILT/CLAY
97%

GRAPH 10

22
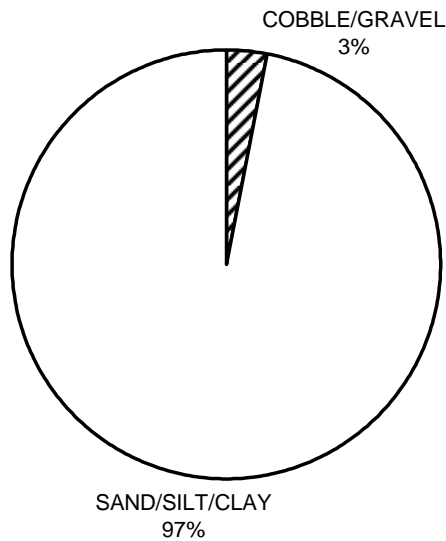
BULL TEAM GULCH
DOMINANT BANK VEGETATION IN SURVEY REACH

GRASS
6%

EVERGREEN TREES
94%

GRAPH 11

23
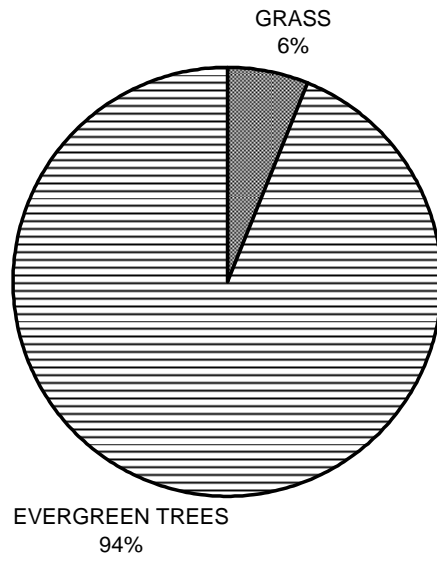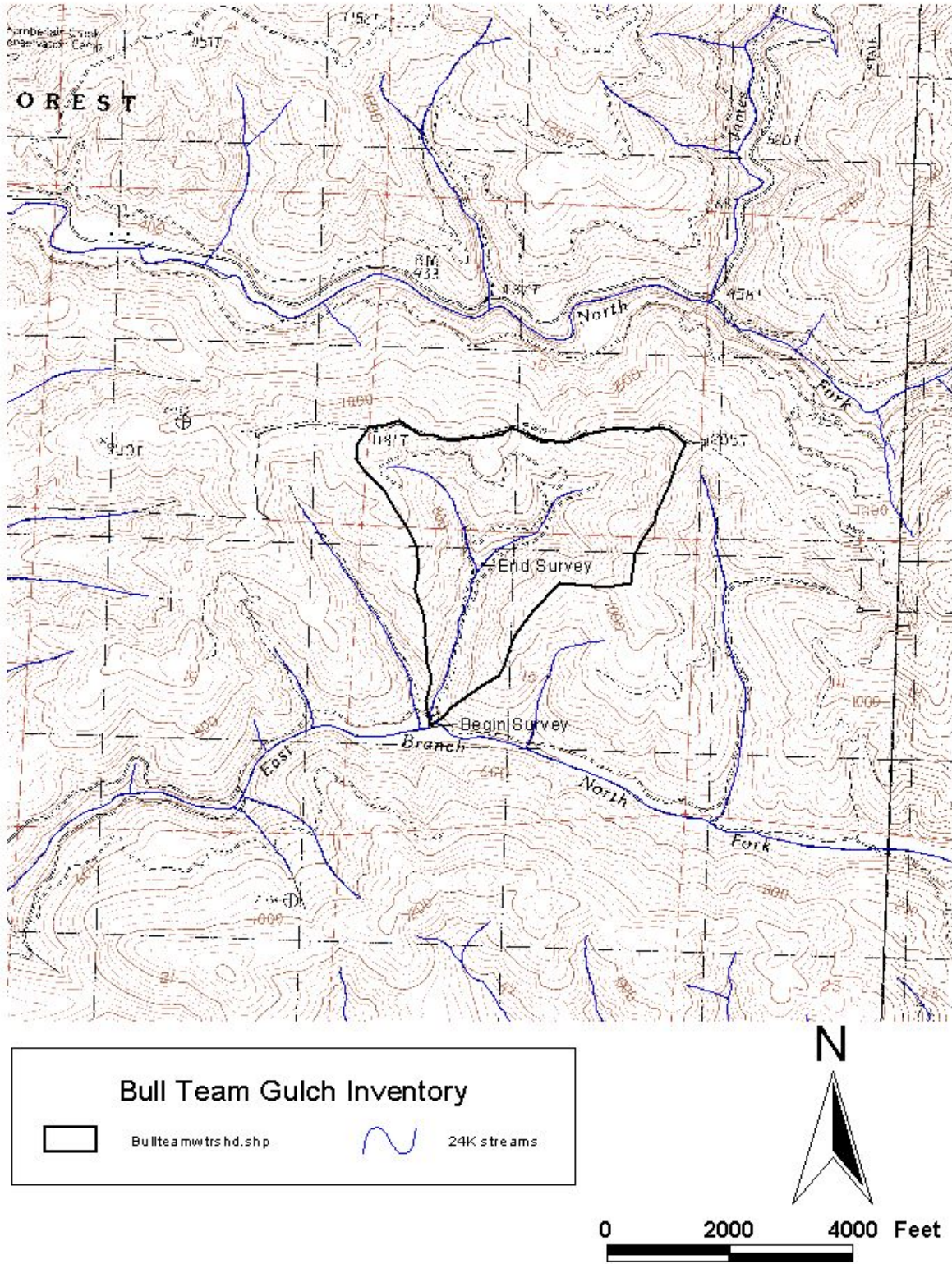
Bull Team Gulch

Map 1. Map of Bull Team Gulch showing the stream habitat inventory reach and watershed boundary.