

STREAM INVENTORY REPORT

East Fork Scott River

INTRODUCTION

A stream inventory was conducted during the summer of 2002 on the East Fork Scott River. The survey began 3,410 below the confluence with Grouse Creek and extended upstream 1.6 miles. This starting point is 4.86 miles (25,660 feet) above the bifurcation of the Scott River into the East Fork Scott River and South Fork Scott River.

The East Fork Scott River 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 the East Fork Scott River. 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

The East Fork Scott River is a tributary to the Scott River, a tributary to the Klamath River, which drains to the Pacific Ocean. It is located in Siskiyou County, California (Map 1). The East Fork Scott River's legal description at the confluence with the Scott River is T40N R08W S17. Its location is 41°18'45' north latitude and 122°48'02" west longitude. The East Fork Scott River is a third order stream and has approximately 16.5 miles of blue line stream according to the USGS Callahan, Scott Mountain, Gazelle Mountain, and China Mountain 7.5 minute quadrangles. The East Fork Scott River drains a watershed of approximately 115 square miles. Elevations range from about 3,200 feet at the mouth of the creek to about 7,600 feet in the headwater areas. Mixed conifer forests dominate the watershed. The watershed is primarily privately owned and the National Forest land and is managed for recreation. Vehicle access exists via Highway 3 or the Gazelle-Callahan Road.

METHODS

The habitat inventory conducted in the East Fork Scott River follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al, 1998). The California Conservation Corps (CCC) Technical Advisors, and 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.

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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. All pools except step-pools are fully sampled.

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 the East Fork Scott River to record measurements and observations. There are eleven 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". The East Fork Scott River 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

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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 the East Fork Scott River, 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 the East Fork Scott River, 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 densimeters as described in the *California Salmonid Stream Habitat Restoration Manual*. Canopy density relates to the amount of stream shaded from the sun. In the East Fork Scott River, 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 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 the East Fork Scott River the dominant composition type and the dominant vegetation type of both the right and left banks for each fully-described unit were

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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.

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'.

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 the East Fork Scott River. In addition, eighteen sites were snorkel dived. These sampling techniques are discussed in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al, 1998)

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

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Graphics are produced from the tables using Microsoft Excel. Graphics developed for the East Fork Scott River 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 low gradient riffles
- 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 July 10 through July 12, 2002 was conducted by Tristan Behm and Andrew Eller (DFG). The total length of the stream surveyed was 8,407 feet with an additional 246 feet of side channel.

Stream flow was measured 125' above the start of the survey with a Marsh-McBirney Model 2000 flowmeter at 5.15 cfs on July 10, 2002.

The East Fork Scott River is a B4 channel type with an average bankfull width of 44.5 feet for the first 3,410 feet of the stream surveyed (Reach 2), and a B3 channel type with an average bankfull width of 42.25 feet for the remaining 4,497 feet (Reach 3). B4 channels are moderately entrenched riffle dominated channels with infrequently spaced pools, very stable plan and profile, stable banks on moderate gradients with low width/depth ratios and gravel dominant substrates. B3 channels are moderately entrenched riffle dominated channels with infrequently spaced pools, very stable plan and profile, stable banks on moderate gradients with low width/depth ratios and cobble dominant substrates.

Water temperatures taken during the survey period ranged from 65 to 82 degrees Fahrenheit. Air temperatures ranged from 72 to 97 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 40% riffle units, 32% pool units, and 28% flatwater units (Graph 1). Based on total length of Level II habitat types there were 54% riffle units, 29% flatwater units, and 18% pool units (Graph 2).

Eleven Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were low gradient riffle units, 39%; run units, 18%; and glide units, 9%

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(Graph 3). Based on percent total length, low gradient riffle units made up 53%, run units 18%, and glide units 8%.

A total of 18 pools were identified (Table 3). Scour pools were the most frequently encountered, at 83%, (Graph 4) and comprised 79% of the total length of all pools.

Table 4 is a summary of maximum pool depths by pool habitat types. Pool quality for salmonids increases with depth. Five of the 18 pools (28%) had a depth of three feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 18 pool tail-outs measured, four had a value of 1 (22.2%); 14 had a value of 2 (77.7%); (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 16, flatwater habitat types had a mean shelter rating of 11, and pool habitats had a mean shelter rating of 33 (Table 1). Of the pool types, the scour pools had the highest mean shelter rating at 34. Main channel pools had a mean shelter rating of 25 (Table 3).

Reach 1 was not surveyed due to lack of landowner permission. In Reach 2, the East Fork Scott River had no pieces of LWD, and in Reach 3, 0.2 pieces per 100'.

Table 5 summarizes mean percent cover by habitat type. Boulders are the dominant cover types in the East Fork Scott River. Graph 7 describes the pool cover in the East Fork Scott River. Boulders are the dominant pool cover type followed by root mass and bedrock ledges.

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 50 % of pool tail-outs while small cobble was the next most frequently observed substrate type, at 44%.

The mean percent canopy density for the surveyed length of the East Fork Scott River was 25%. The mean percentages of deciduous and coniferous trees were 9% and 16%, respectively. Seventy-five percent of the canopy was open. Graph 9 describes the mean percent canopy in the East Fork Scott River.

For the stream reach surveyed, the mean percent right bank vegetated was 51%. The mean percent left bank vegetated was 44%. The dominant elements composing the structure of the stream banks consisted of 42% cobble/gravel, 27% boulders, 18% sand/silt/clay, and 13% bedrock (Graph 10). Grass was the dominant vegetation type observed in 48% of the units surveyed. Additionally, 37% of the units surveyed had deciduous trees as the dominant vegetation type, and 5% had coniferous trees as the dominant vegetation (Graph 11).

BIOLOGICAL INVENTORY RESULTS

Eighteen sites were snorkel-dived for species composition and distribution in the East Fork Scott River on July 17-18, 2002. Water temperatures taken during the dive period ranged from 64 to

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79 degrees Fahrenheit. Air temperatures ranged from 70 to 94 degrees Fahrenheit. The sites were sampled by T. Behm and A. Eller (DFG).

The following table displays the information yielded from these sites:

Date	Site #	Approx. Dist. from start (ft.)	Hab. Unit #	Hab. Type	Reach #	Channel type	Steelhead			Coho		
							YOY	1+	2+	YOY	1+	2+
7/17/02	1	125	2	1.1	1	B4	50	0	0	8	0	0
7/17/02	2	333	3	5.4	1	B4	42	1	0	1	0	0
7/17/02	3	650	6	1.1	1	B4	195	1	0	2	0	0
7/17/02	4	1424	9	3.3	1	B4	142	0	1	2	0	0
7/17/02	5	1570	10	5.4	1	B4	57	6	4	1	0	0
7/17/02	6	1986	12	3.2	1	B4	214	0	0	78	0	0
7/17/02	7	3052	18	3.2	1	B4	84	0	0	6	0	0
7/17/02	8	3126	19	1.1	1	B4	158	1	0	7	0	0
7/17/02	9	3210	20	5.4	1	B4	103	5	2	0	0	0
7/18/02	10	3546	23	1.1	2	B3	55	0	2	7	0	0
7/18/02	11	3699	26	5.3	2	B3	110	8	1	150	0	0
7/18/02	12	4762	33	1.1	2	B3	45	0	0	0	0	0
7/18/02	13	4817	34	3.3	2	B3	117	0	0	86	1	0
7/18/02	14	5215	38	3.2	2	B3	224	2	1	23	0	0
7/18/02	15	5359	39	3.3	2	B3	175	0	0	1	0	0
7/18/02	16	5638	42	5.5	2	B3	134	2	4	17	0	0
7/18/02	17	5729	43	1.1	2	B3	134	0	0	0	0	0
7/18/02	18	7647	52	5.2	2	B3	120	23	7	220	0	1

DISCUSSION

The East Fork Scott River is a B4 channel type for the first 3,410 feet of stream surveyed and a B3 channel type for the remaining 4,497 feet. The suitability of B4 channel types for fish habitat improvement structures is as follows: excellent for low-stage plunge weirs, boulder clusters, bank-placed boulders, single and opposing wing-deflectors, and log cover. The suitability of B3 channel types for fish habitat improvement structures is as follows: excellent for plunge weirs, boulder clusters and bank-placed boulders, single and opposing wing-deflectors, and log cover.

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The water temperatures recorded on the survey days July 10 through July 12, 2002 ranged from 65 to 82 degrees Fahrenheit. Air temperatures ranged from 72 to 97 degrees Fahrenheit. 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.

Flatwater habitat types comprised 29% of the total length of this survey, riffles 54%, and pools 18%. Five of the 18 (28%) pools had a maximum depth greater than three feet. In general, pool enhancement projects are considered when primary pools comprise less than 40% of the length of total stream habitat. In third and fourth order streams, a primary pool is defined to have a maximum depth of at least three 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.

All 18 of the pool tail-outs measured had embeddedness ratings of 1 or 2. This is a good rating since cobble embeddedness measured to be 25% or less, a rating of 1, is considered to indicate good quality spawning substrate for salmon and steelhead. Any identified sediment sources in the East Fork Scott River should be mapped and rated according to their potential sediment yields, and control measures should be taken.

Seventeen 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 rating for pools was 33. The shelter rating in the flatwater habitats was 11. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by boulders in all habitat types. Additionally, root mass and bedrock ledges 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 25%. Reach 1 was not surveyed. Reach 2 had a canopy density of 33% while Reach 3 had a canopy density of 19%. In general, revegetation projects are considered when canopy density is less than 80%.

The percentage of right and left bank covered with vegetation was moderate at 51% and 44%, respectively. In areas of stream bank erosion or where bank vegetation is not at acceptable levels, planting endemic species of coniferous and deciduous trees, in conjunction with bank stabilization, is recommended.

RECOMMENDATIONS

1. East Fork Scott River should be managed as an anadromous, natural production stream. Based on available information, favorable water temperatures, gradient and flow regimes exist in the stream to support various life history stages of salmonids.

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2. Irrigation diversions should be screened to prevent entrainment of juvenile salmonids into ditches.
3. Increase the frequency and depth of pools where such projects are suitable and have high likelihood of success.
4. Barriers within the stream blocking or impeding fish movement should be identified and treated according to their potential to increase useable habitat.
5. 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.
6. Increase woody cover in pools and flatwater habitat units.
7. In areas where the stream is impacted from cattle trampling the riparian zone, alternatives to minimize or prevent continued streambank degradation should be explored with the landowner and developed if possible.
8. Active and potential sediment sources related to streambank erosion, the road system, mining activities and landslides should be identified, mapped, and treated according to their potential for sediment yield to the stream and its tributaries.
9. Spawning and rearing distribution within the East Fork Scott River for the various species of salmonids utilizing the stream should be surveyed and mapped.

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):	Comments:
0'	Start of survey 3,410 feet below confluence with Grouse Creek. The channel type is a B4.
125'	Left bank spring. Dive site #1.
333'	Dive site #2.
650'	Dive site #3.
995'	Right bank spring.

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1424'	Dive site #4.
1570'	Dive site #5. Left bank spring.
1986'	Dive site #6
3052'	Dive site #7.
3126'	Dive site #8.
3210'	Dive site #9.
3410'	Grouse Creek confluence. Channel type changes to a B3.
3546'	Dive site #10.
3699'	Dive site #11.
3997'	One redd at pool tail crest.
4669'	Cut right bank, 117' long.
4762'	Dive site #12.
4817'	Dive site #13.
4946'	Cut bank, 135' long.
5215'	Dive site #14.
5359'	Dive site #15.
5483'	Cut left bank, 387' long.
5638'	Spring. Dive site #16. Cut right bank starts, continues for 798'.
5729'	Dive site #17.
6026'	Field run-off influence.
7149'	Masterson Road bridge.
7647'	Dive site #18. Abundant fish observed.
8016'	Ditch outlet.
8407'	End of Survey. End of access.

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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}

FLAT WATER

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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Drainage: SCOTT RIVER

Table 1 - SUMMARY OF RIFFLE, FLATWATER, AND POOL HABITAT TYPES

Survey Dates: 07/10/02 to 07/12/02

Confluence Location: QUAD: Callahan LEGAL DESCRIPTION: T40NR08WS17 LATITUDE: 41°18'45" LONGITUDE: 122°48'6"

HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	MEAN LENGTH (ft.)	TOTAL LENGTH (ft.)	TOTAL PERCENT	MEAN WIDTH (ft.)	MEAN DEPTH (ft.)	MEAN AREA (sq.ft.)	ESTIMATED TOTAL AREA (sq.ft.)	ESTIMATED TOTAL VOLUME (cu.ft.)	ESTIMATED TOTAL VOLUME (cu.ft.)	MEAN RESIDUAL POOL VOL (cu.ft.)	MEAN SHELTER RATING
23	6	RIFFLE	40	203	4664	54	28.8	0.8	2900	66708	2419	55648	0	16
16	7	FLATWATER	28	155	2472	29	24.0	1.0	3556	56899	3372	53949	0	11
18	18	POOL	32	84	1517	18	17.6	1.3	1356	24407	1751	31524	1048	33
TOTAL UNITS	31			TOTAL LENGTH (ft.)	8653				TOTAL AREA (sq. ft.)	148013		TOTAL VOL. (cu. ft.)	141121	

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Drainage: SCOTT RIVER

Table 2 - SUMMARY OF HABITAT TYPES AND MEASURED PARAMETERS

Survey Dates: 07/10/02 to 07/12/02

Confluence Location: QUAD: Callahan LEGAL DESCRIPTION: T40NR08WS17 LATITUDE:41°18'45" LONGITUDE:122°48'6"

HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	HABITAT OCCURRENCE	MEAN LENGTH	TOTAL LENGTH	TOTAL LENGTH	MEAN WIDTH	MEAN DEPTH	MEAN MAXIMUM DEPTH	AREA	AREA	TOTAL AREA	MEAN VOLUME	TOTAL VOLUME	MEAN RESIDUAL SHELTER	MEAN POOL VOL RATING	MEAN CANOPY
#			%	ft.	ft.	%	ft.	ft.	ft.	sq.ft.	sq.ft.	sq.ft.	cu.ft.	cu.ft.	cu.ft.	cu.ft.	%
22	5	LGR	38	209	4606	53	28	0.7	2.7	3237	71210	2635	57979	0	16	21	
1	1	HGR	2	58	58	1	35	1.1	4.0	1218	1218	1340	1340	0	15	3	
5	2	GLD	9	135	675	8	24	1.0	1.9	2789	13945	2704	13522	0	15	34	
10	4	RUN	17	153	1526	18	25	0.7	1.9	3691	36907	2272	22721	0	8	19	
1	1	SRN	2	271	271	3	21	2.0	0.8	4553	4553	9106	9106	0	15	42	
1	1	MCF	2	104	104	1	14	1.3	2.9	1383	1383	1798	1798	1245	30	52	
2	2	CCP	3	104	207	2	19	1.3	3.4	1706	3413	2149	4298	1263	23	16	
2	2	LSL	3	95	189	2	17	1.3	3.0	1613	3226	1902	3804	1214	70	5	
4	4	LSR	7	73	292	3	14	1.3	3.0	932	3727	1171	4685	663	60	51	
4	4	LSBk	7	75	298	3	22	1.4	3.0	1453	5814	1977	7908	1319	16	34	
5	5	LSBO	9	85	427	5	17	1.3	3.4	1369	6844	1806	9030	947	13	26	
TOTAL UNITS	TOTAL UNITS			LENGTH (ft.)		AREA (sq.ft)						TOTAL VOL. (cu.ft)					
57	31			8653		152238						136192					

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Drainage: SCOTT RIVER

Table 3 - SUMMARY OF POOL TYPES

Survey Dates: 07/10/02 to 07/12/02

Confluence Location: QUAD: Callahan LEGAL DESCRIPTION: T40NR08WS17 LATITUDE:41°18'45" LONGITUDE:122°48'6"

HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	MEAN LENGTH (ft.)	TOTAL LENGTH (ft.)	MEAN WIDTH (ft.)	MEAN DEPTH (ft.)	MEAN AREA (sq.ft.)	TOTAL AREA (sq.ft.)	MEAN VOLUME (cu.ft.)	TOTAL VOLUME (cu.ft.)	MEAN RESIDUAL POOL VOL. (cu.ft.)	MEAN SHELTER RATING
3	3	MAIN	17	104	311	21	17.0	1.3	1599	4796	2032	6097	1257
15	15	SCOUR	83	80	1206	79	17.7	1.3	1307	19611	1695	25428	1006
TOTAL UNITS	18				TOTAL LENGTH (ft.) 1517				TOTAL AREA (sq.ft.) 24407		TOTAL VOL. (cu.ft.) 31524		

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Drainage: SCOTT RIVER

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

Survey Dates: 07/10/02 to 07/12/02

Confluence Location: QUAD: Callahan LEGAL DESCRIPTION: T40NR08WS17 LATITUDE: 41°18'45" LONGITUDE: 122°48'6"

UNITS MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	<1 FOOT		<1 FOOT		1-<2 FOOT		1-<2 FOOT		2-<3 FOOT		2-<3 FOOT		3-<4 FT.		3-<4 FOOT		>=4 FEET		>=4 FEET	
			MAXIMUM	DEPTH	PERCENT	MAXIMUM	DEPTH	PERCENT	MAXIMUM	DEPTH	PERCENT	MAXIMUM	DEPTH	PERCENT	MAXIMUM	DEPTH	PERCENT	MAXIMUM	DEPTH	PERCENT	MAXIMUM	DEPTH
1	MCP	6	0	0	0	0	0	0	0	0	1	100	0	0	0	0	0	0	0	0	0	0
2	CCP	11	0	0	0	1	50	0	0	0	0	0	1	50	0	0	0	0	0	0	0	0
2	LSL	11	0	0	0	0	0	0	1	50	1	50	1	50	0	0	0	0	0	0	0	0
4	LSR	22	0	0	0	1	25	2	50	1	25	50	1	25	0	0	0	0	0	0	0	0
4	LSBK	22	0	0	0	0	0	3	75	1	25	75	1	25	0	0	0	0	0	0	0	0
5	LSBo	28	0	0	0	0	0	4	80	1	20	80	1	20	0	0	0	0	0	0	0	0
TOTAL			0	0	0	2	11	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 5 - SUMMARY OF MEAN PERCENT COVER BY HABITAT TYPE

Survey Dates: 07/10/02 to 07/12/02

Confluence Location: QUAD: Callahan LEGAL DESCRIPTION: T40NR08WS17 LATITUDE: 41°18'45" LONGITUDE: 122°48'6"

UNITS MEASURED	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
22	5	LGR	0	2	0	0	24	0	41	33	2
1	1	HGR	0	0	0	0	10	0	25	50	15
5	2	GLD	13	0	0	25	30	5	0	25	3
10	4	RUN	8	0	0	4	23	0	1	65	0
1	1	SRN	0	0	0	0	0	0	20	60	20
1	1	MCP	20	10	0	20	20	0	5	25	0
2	2	CCP	5	0	0	15	15	5	15	25	20
2	2	LSL	5	30	20	35	0	0	3	8	0
4	4	LSR	14	10	3	40	21	0	5	8	0
4	4	LSBK	0	0	0	0	3	0	6	56	35
5	5	LSBO	9	1	0	10	8	0	6	44	22

East Fork Scott River

Drainage: SCOTT RIVER

Table 6 - SUMMARY OF DOMINANT SUBSTRATES BY HABITAT TYPE

Survey Dates: 07/10/02 to 07/12/02

Confluence Location: QUAD: Callahan LEGAL DESCRIPTION: T40NR08WS17 LATITUDE: 41°18'45" LONGITUDE: 122°48'6"

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
22	5	LGR	0	0	0	40	40	20	0
1	1	HGR	0	0	0	0	0	100	0
5	2	GLD	0	0	0	50	50	0	0
10	4	RUN	0	0	0	75	0	25	0
1	1	SRN	0	0	0	0	0	100	0
1	1	MCP	0	0	0	100	0	0	0
2	2	CCP	0	0	0	0	50	50	0
2	2	LSL	0	0	0	0	100	0	0
4	4	LSR	0	0	0	100	0	0	0
4	4	LSBK	0	0	0	25	50	25	0
5	5	LSBO	0	0	20	40	40	0	0

Summary of Mean Percent Vegetative Cover for Entire Stream

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Deciduous	Mean Percent Open units	Mean Right bank % Cover	Mean Left Bank % Cover
25	63	37	16	50.6	43.5

Note: Mean percent conifer and deciduous 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.

$$63 \times .25 = 16\% \text{ coniferous}$$

$$37 \times .25 = 9\% \text{ deciduous}$$

$$100 - 25 = 75\% \text{ open canopy}$$

TABLE 8. FISH HABITAT INVENTORY DATA SUMMARY

STREAM NAME: East Fork Scott River
 SAMPLE DATES: 07/10/02 to 07/12/02
 STREAM LENGTH: 8407 ft.
 LOCATION OF STREAM MOUTH:

USGS Quad Map: Callahan
 Legal Description: T40NR08WS17

Latitude: 41°18'45"
 Longitude: 122°48'6"

SUMMARY OF FISH HABITAT ELEMENTS BY STREAM REACH

STREAM REACH 1

Channel Type: N/A	Canopy Density: *****%
Channel Length: 0 ft. (25,660 ft.)	Coniferous Component: *****%
Riffle/flatwater Mean Width: *****	Deciduous Component: *****%
Total Pool Mean Depth: **** ft.	Pools by Stream Length: *****%
Base Flow: 0.0 cfs	Pools >=3 ft.deep: *****%
Water: - °F Air: - °F	Mean Pool Shelter Rtn: *****
Dom. Bank Veg.: Grass	Dom. Shelter: Undercut Banks
Vegetative Cover: *****%	Occurrence of LOD: *****%
Dom. Bank Substrate: Cobble/Gravel	Dry Channel: 0 ft.

Embeddness Value: 1. *****% 2. *****% 3. *****% 4. *****% 5. *****%

STREAM REACH 2

Channel Type: B4	Canopy Density: 33%
Channel Length: 3410 ft.	Coniferous Component: 66%
Riffle/flatwater Mean Width: 28 ft.	Deciduous Component: 34%
Total Pool Mean Depth: 1.3 ft.	Pools by Stream Length: 13%
Base Flow: 5.2 cfs	Pools >=3 ft.deep: 33%
Water: 65 - 80 °F Air: 85 - 97 °F	Mean Pool Shelter Rtn: 12
Dom. Bank Veg.: Grass	Dom. Shelter: Boulders
Vegetative Cover: 40%	Occurrence of LOD: 0%
Dom. Bank Substrate: Cobble/Gravel	Dry Channel: 0 ft.

Embeddness Value: 1. 33% 2. 67% 3. 0% 4. 0% 5. 0%

STREAM REACH 3

Channel Type: B3	Canopy Density: 20%
Channel Length: 4997 ft.	Coniferous Component: 60%
Riffle/flatwater Mean Width: 25 ft.	Deciduous Component: 40%
Total Pool Mean Depth: 1.3 ft.	Pools by Stream Length: 21%
Base Flow: 5.2 cfs	Pools >=3 ft.deep: 25%
Water: 65 - 82 °F Air: 72 - 96 °F	Mean Pool Shelter Rtn: 43
Dom. Bank Veg.: Grass	Dom. Shelter: Boulders
Vegetative Cover: 52%	Occurrence of LOD: 3%
Dom. Bank Substrate: Cobble/Gravel	Dry Channel: 0 ft.

Embeddness Value: 1. 17% 2. 83% 3. 0% 4. 0% 5. 0%

LWD

Reach 1 Not surveyed
 Reach 2 0 pieces
 Reach 3 15 pieces

.00 pieces per 100'
 .33 pieces per 100'

BFW

Reach 2 - 44.5'
 Reach 3 - 42.25'

Mean Percentage of Dominant Substrate

Dominant Class of Substrate	Number Units Right Bank	Number Units Left Bank	Total Mean Percent
Bedrock	7	1	12.9
Boulder	6	11	27.4
Cobble/Gravel	13	13	41.9
Silt/clay	5	6	17.7

Mean Percentage of Dominant Vegetation

Dominant Class of Vegetation	Number Units Right Bank	Number Units Left Bank	Total Mean Percent
Grass	14	16	48.4
Brush	2	4	9.7
Decid. Trees	14	9	37.1
Conif. Trees	1	2	4.8
No Vegetation	0	0	0

Total stream average embeddedness value for pool 1.8

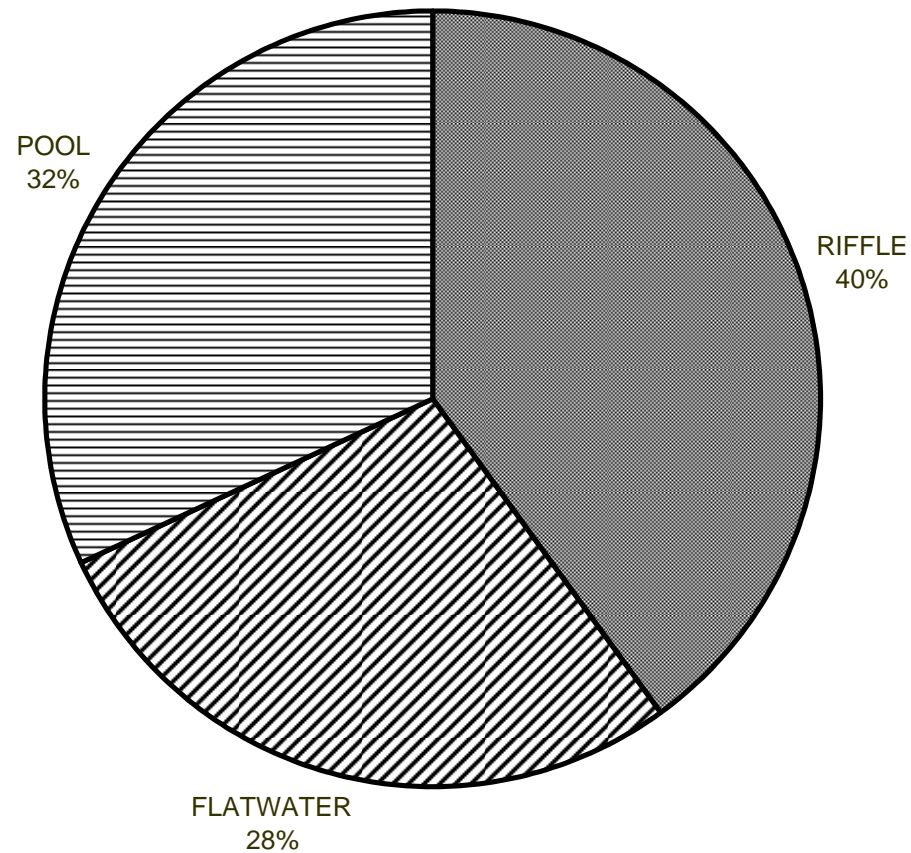
TABLE 10. MEAN PERCENT OF SHELTER COVER TYPES FOR ENTIRE STREAM

Stream: East Fork Scott RiveDrainage: SCOTT RIVER

Survey Date: 07/10/02 to 07/12/02

	RIFFLES	FLATWATER	POOLS
UNDERCUT BANKS	6.3	7.9	7.8
SMALL WOODY DEBRIS	4.0	0	6.4
LARGE WOODY DEBRIS	1.6	0	2.8
ROOTS	12.7	9.3	18.3
TERRESTRIAL VEG	15	21.4	10.3
AQUATIC VEG	0.6	1.4	0.6
WHITewater	11.9	3.6	6.4
BOULDERS	37.1	52.9	31.4
BEDROCK LEDGES	11.0	3.6	16.1

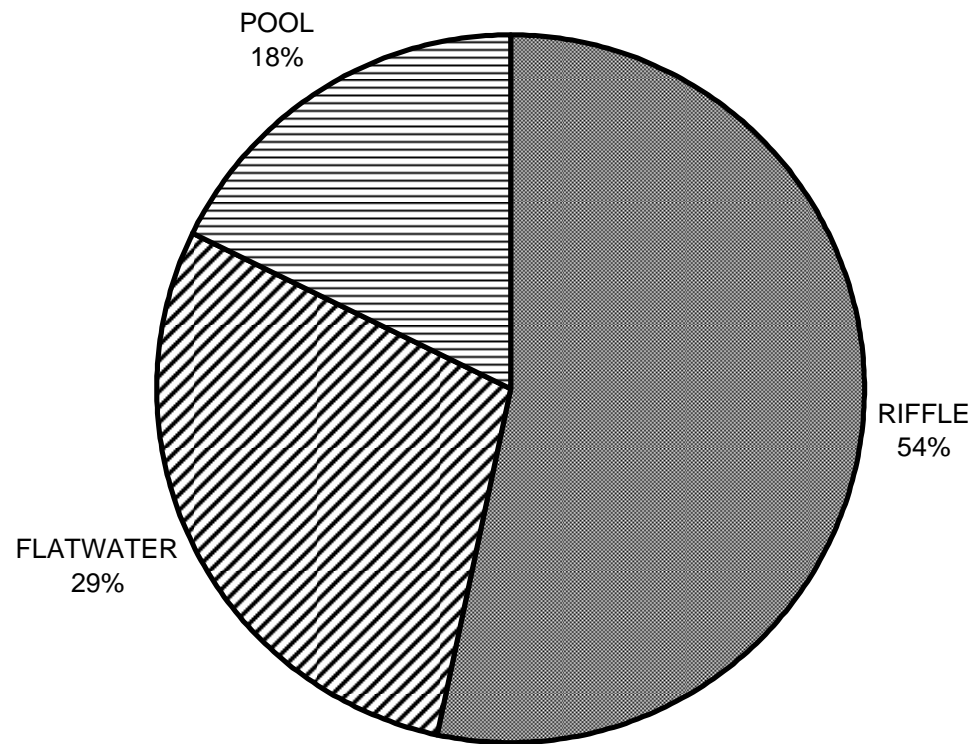
E. FORK SCOTT RIVER, 2002 HABITAT TYPES BY PERCENT OCCURENCE



GRAPH 1

E. FORK SCOTT RIVER, 2002

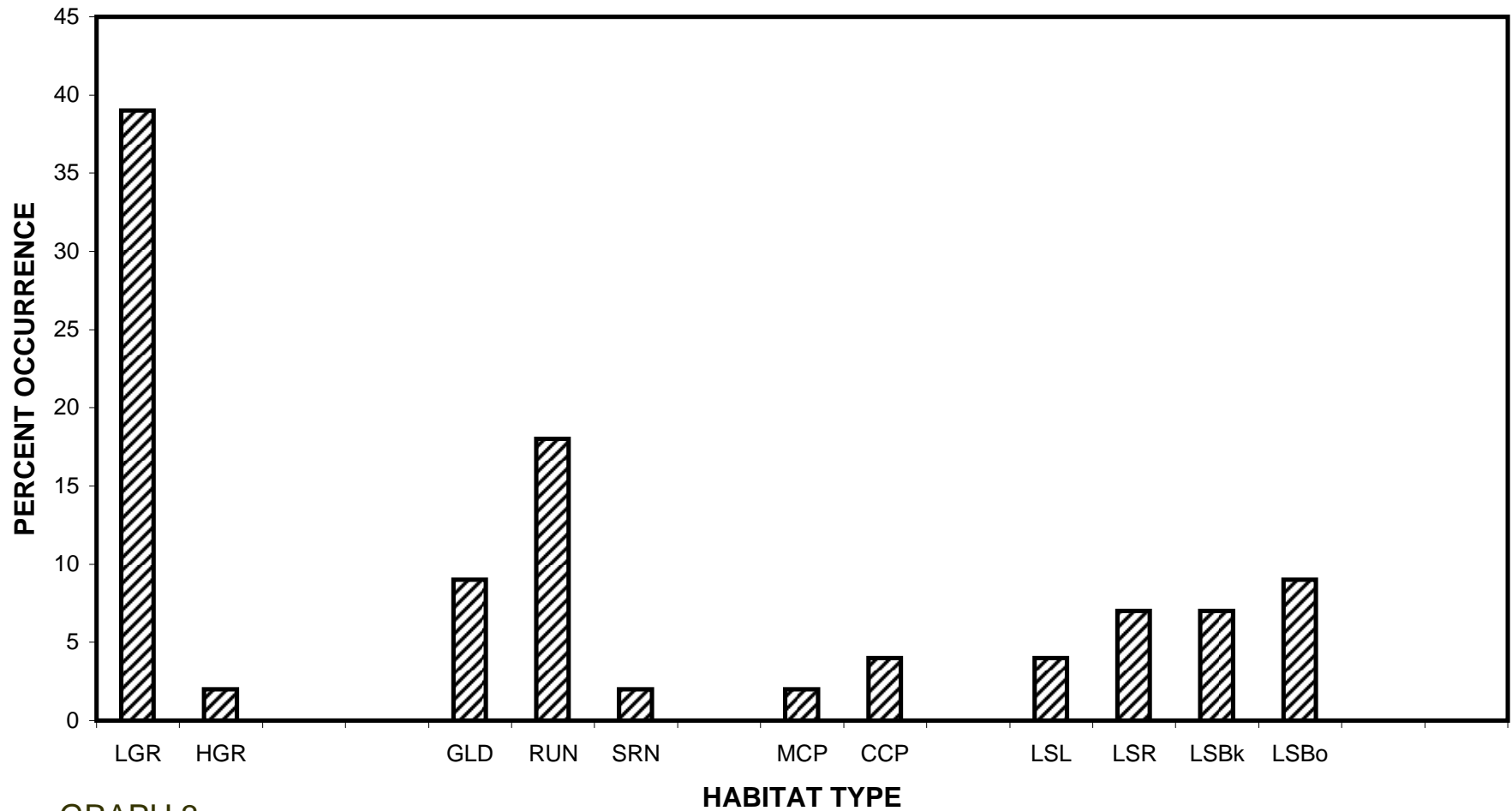
HABITAT TYPES BY PERCENT TOTAL LENGTH



GRAPH 2

E. FORK SCOTT RIVER, 2002

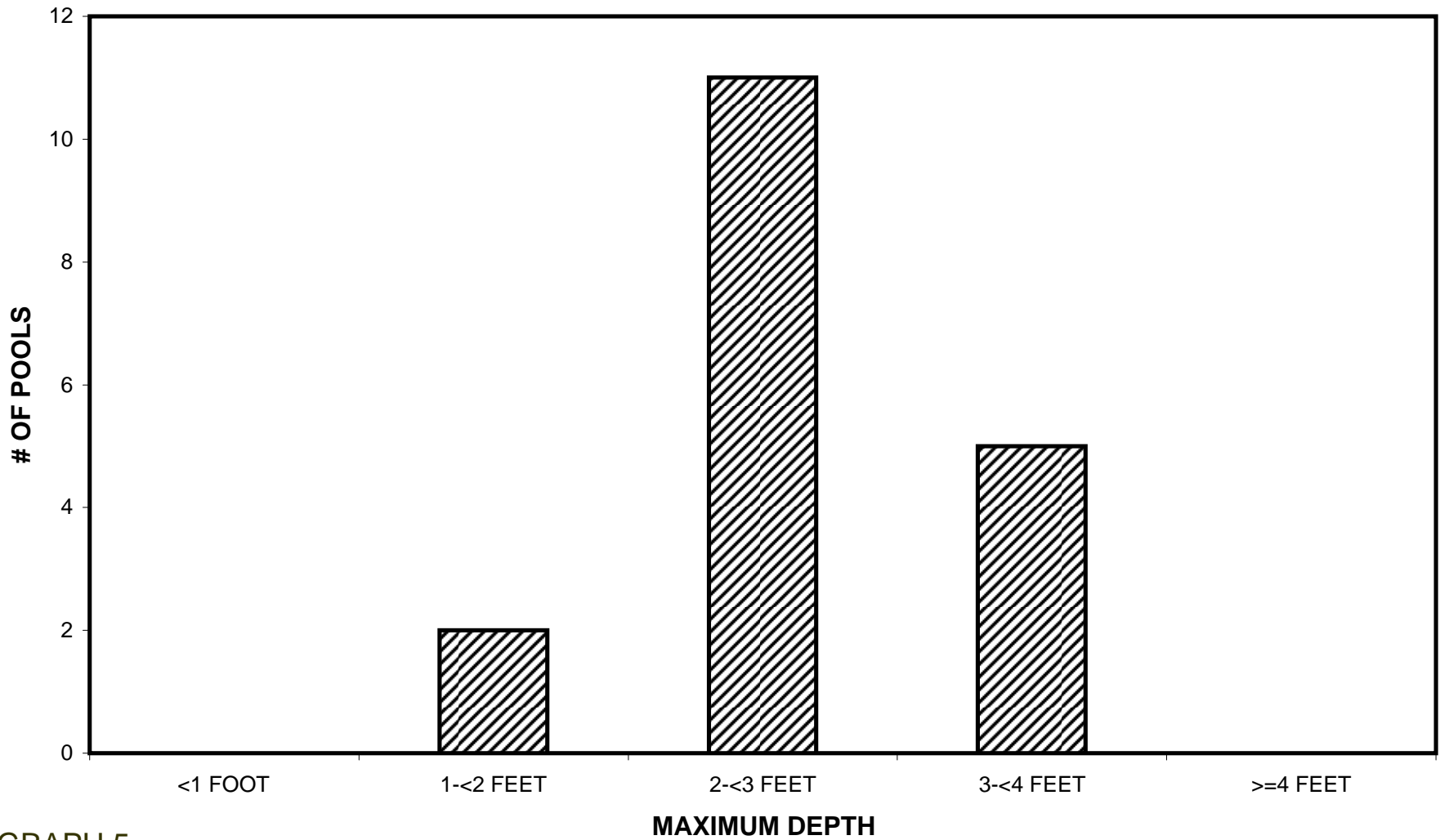
HABITAT TYPES BY PERCENT OCCURRENCE



GRAPH 3

E. FORK SCOTT RIVER, 2002

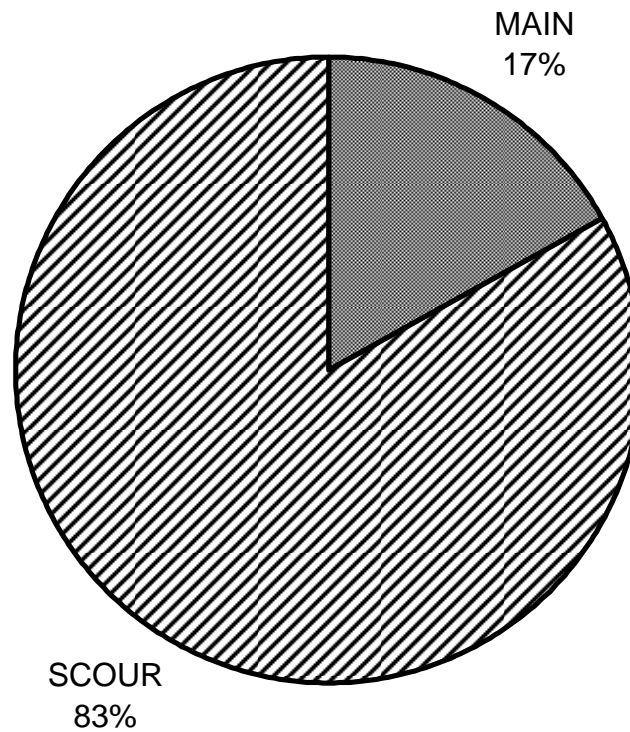
MAXIMUM DEPTH IN POOLS



GRAPH 5

E. FORK SCOTT RIVER, 2002

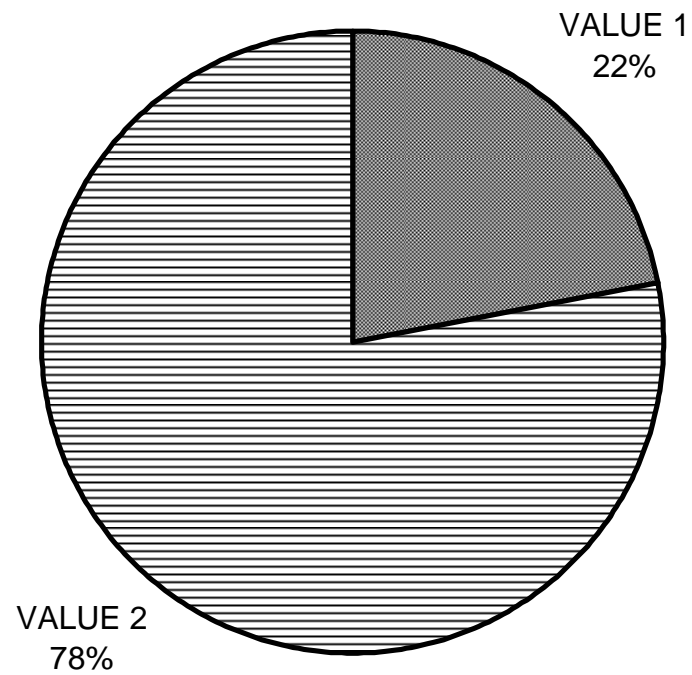
POOL HABITAT TYPES BY PERCENT OCCURRENCE



GRAPH 4

E. FORK SCOTT RIVER, 2002

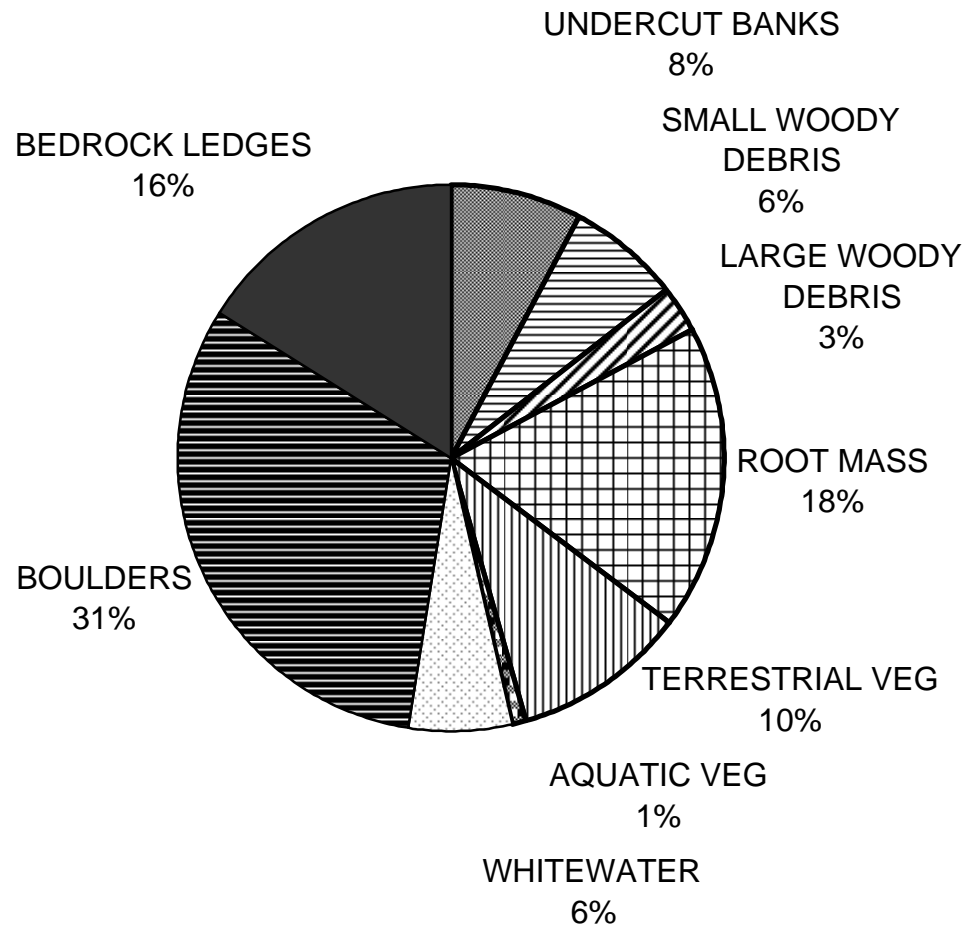
PERCENT EMBEDDEDNESS



GRAPH 6

E. FORK SCOTT RIVER, 2002

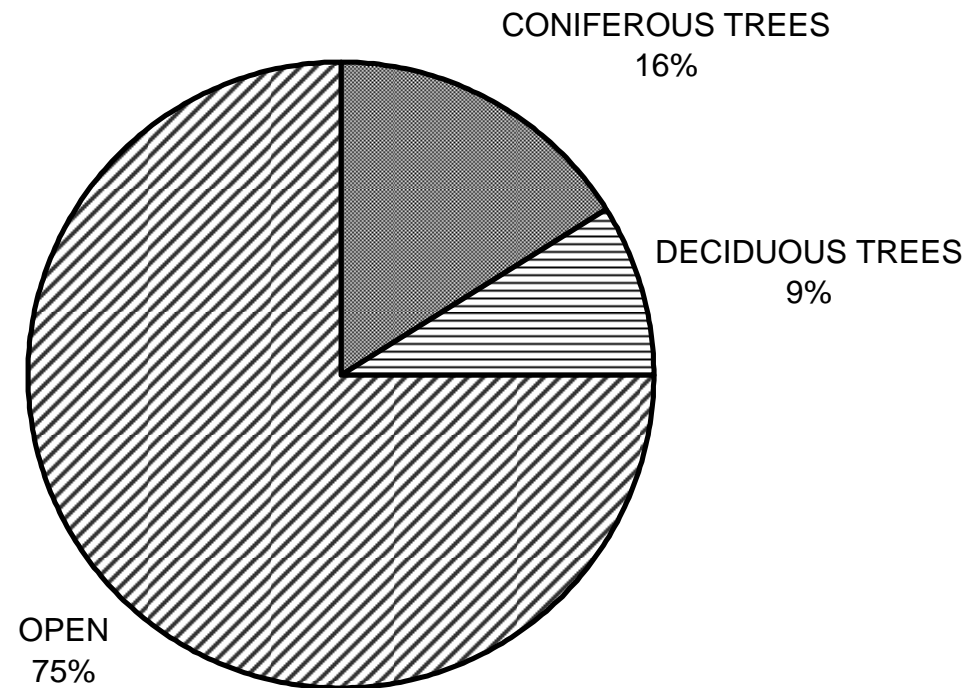
MEAN PERCENT COVER TYPES IN POOLS



GRAPH 7

E. FORK SCOTT RIVER, 2002

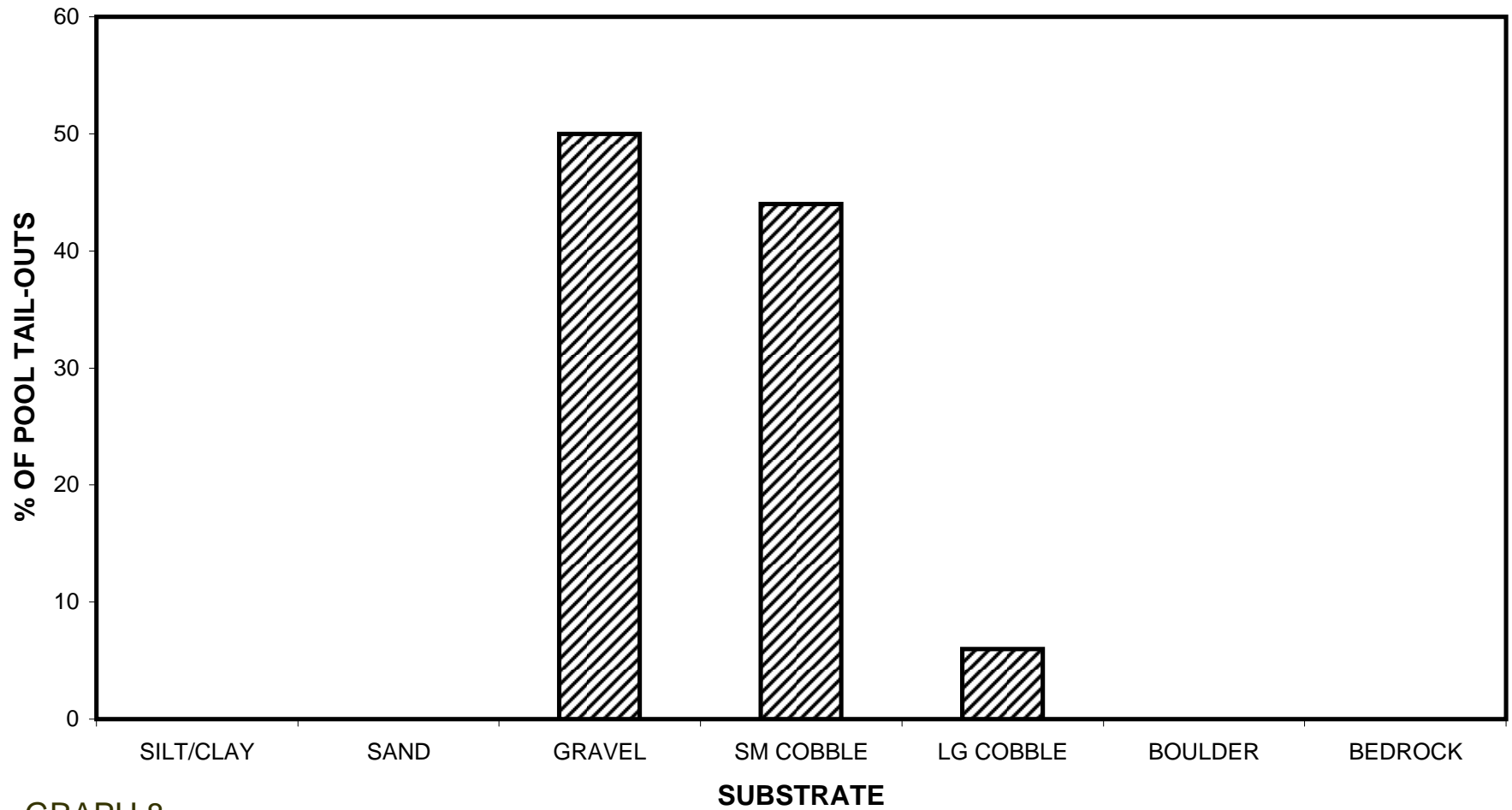
MEAN PERCENT CANOPY



GRAPH 9

E. FORK SCOTT RIVER, 2002

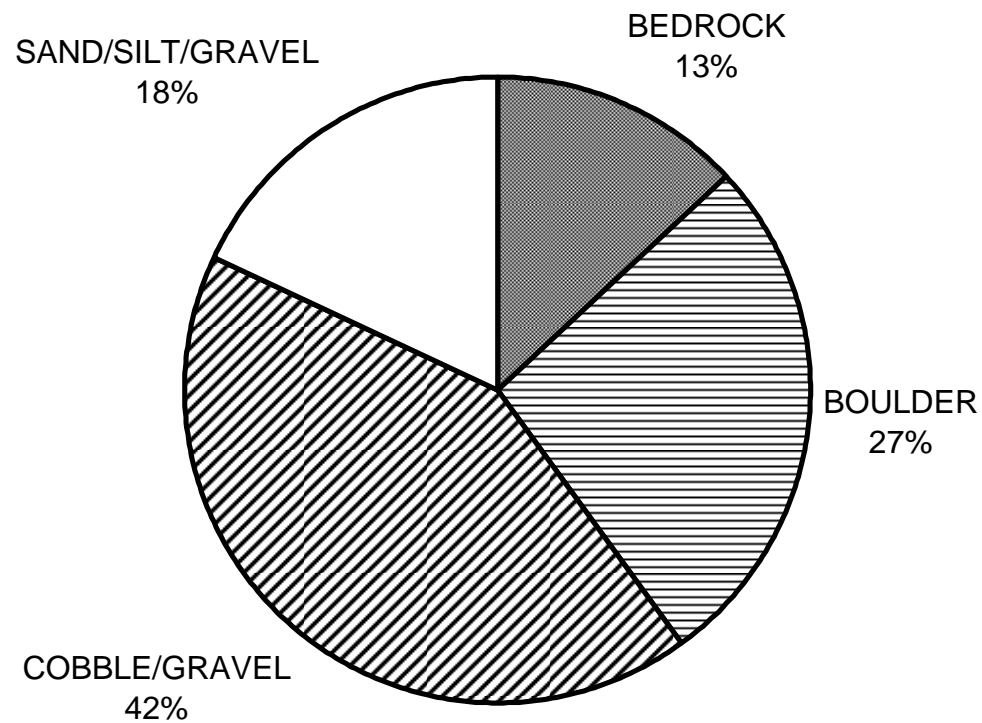
SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



GRAPH 8

E. FORK SCOTT RIVER, 2002

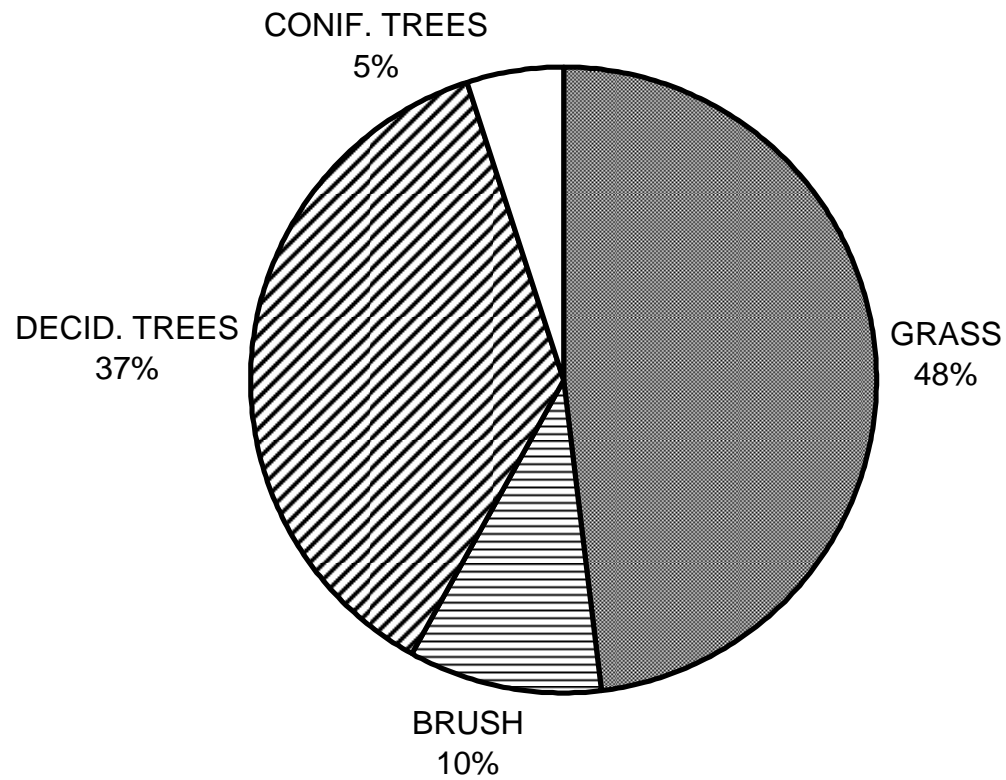
DOMINANT BANK COMPOSITION IN SURVEY REACH



GRAPH 10

E. FORK SCOTT RIVER, 2002

DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11



Name: MT SHASTA
 Date: 7/31/2004
 Scale: 1 inch equals 1.753 miles

Location: 041° 21' 03.7" N 122° 40' 50.5" W
 Caption: East Fork Scott River
 2002 Survey