CALIFORNIA DEPARTMENT OF FISH AND GAME
STREAM INVENTORY REPORT
Conshea Creek
Report Revised April 14, 2006
Report Completed 1997
Assessment Completed 1996

INTRODUCTION

A stream inventory was conducted during the summer of 1996 on Conshea Creek. The inventory was conducted in two parts: habitat inventory and biological inventory. The objective of the habitat inventory was to document the amount and condition of available habitat to fish, and other aquatic species with an emphasis on anadromous salmonids in Conshea Creek. The objective of the biological inventory was to document the salmonid and other aquatic species present and their distribution.

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

Conshea Creek is a tributary to East Austin Creek which flows into Big Austin Creek, a tributary of the Russian River, located in Sonoma County, California (see Conshea Creek map, page 2). The legal description at the confluence with East Austin Creek is T9N, R11W, S28. Its location is 38°35'34" N. latitude and 123°5'7" W. longitude. Seasonal vehicle access exists via East Austin Creek Road (private) via Mill Creek Road, near Healdsburg.

Conshea Creek and its tributaries drain a basin of approximately 0.39 square miles. Conshea Creek is a second order stream and has approximately 1.3 miles of blue line stream, according to the USGS Cazadero 7.5 minute quadrangle. Tiny Creek, a tributary of Conshea Creek, was also habitat typed and is included in this report. Elevations range from about 480 feet at the mouth of the creek to 1,040 feet in the headwaters. Coniferous forest dominates the watershed, which is entirely privately owned.

METHODS

The habitat inventory conducted in Conshea Creek follows the methodology presented in the California Salmonid Stream Habitat Restoration Manual (Flosi and Reynolds, 1994). The NEAP crew 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 and was supervised by Bob Coey, Russian River Basin Planner (DFG).

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 Conshea Creek to record measurements and observations. There are nine components to the inventory form: flow, channel type, temperatures, habitat type, embeddedness, shelter rating, substrate composition, canopy, and bank composition.

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". Conshea Creek 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 Conshea Creek, embeddedness was visually 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 Conshea Creek, 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 visually 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 Conshea Creek, 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 visually 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 Conshea Creek, 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.

BIOLOGICAL INVENTORY

Biological sampling during stream inventory is used to determine fish species and their distribution in the stream. Biological inventory is conducted using one or more of three basic methods: 1) stream bank observation, 2) underwater observation, 3) electrofishing. 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, a dBASE IV 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 tables and appendices:

- Riffle, flatwater, and pool habitat types
- Habitat types and measured parameters
- Pool types
- Maximum pool depths by habitat types
- Shelter by habitat types
- Dominant substrates by habitat types
- Vegetative cover and dominant bank composition
- Fish habitat elements by stream reach

Graphics are produced from the tables using Lotus 1,2,3. Graphics developed for Conshea Creek include:

- Level II Habitat Types by % Occurrence and % Total Length
- Level IV Habitat Types by % Occurrence
- Pool Habitat Types by % Occurrence
- Maximum Depth in Pools
- Pool Shelter Types by % Area
- Substrate Composition in Low Gradient Riffles
- Percent Cobble Embeddedness by Reach
- Mean Percent Canopy
- Mean Percent Canopy by Reach
- Percent Bank Composition and Bank Vegetation

HISTORICAL STREAM SURVEYS:

The Department of Fish And Game conducted surveys of Conshea Creek in April 1962 and August 1977. The 1962 survey started at the mouth and continued to a point 0.8 miles upstream. Flows were described as continuous (1.5 cfs), except for the upper watershed, which flows intermittently. The air temperature was 78°F and the water temperature was 60°F. The average wetted width was 4' throughout the entire section. The depth averaged 5' and ranged from 2-8'. No pollution or diversions were observed, and a few springs were noted along this drainage.

The substrate consisted primarily of gravel, as well as lesser amounts of cobble, boulders, sand and silt. Spawning areas were considered to be generally fair from the mouth to the log accumulation 0.25 miles upstream. The area upstream from the accumulation was considered fair spawning habitat although it had been impacted by logging operations. Pool development was generally good in the lower section. Shelter consisted of roots, boulders, overhanging vegetation, and log debris. The only log accumulation was located 0.25 miles upstream from the mouth. It was recommended that this log jam be removed. In general, this creek sustained a good but small run of steelhead each winter in the lower 0.25 miles.

The 1977 survey of Conshea Creek started at the mouth and continued to the headwaters. The air temperature was 82°F and the water temperature was 61°F. The average wetted width was 2' and ranged from 1-10'. The depth averaged 2-4" and ranged 1" to 5'.

The substrate consisted of 5% boulder, 35% cobble, 25% gravel, 25% silt, 5% detritus, and 5% sand. In an area extending from the mouth to 0.3 miles upstream, about 20% of the stream had good spawning gravel, described as "loose and relatively clean". Pools

formed by undercut banks, log accumulations and boulders were common in areas with water. Shelter consisted of roots, boulders, undercut banks and logs. Canopy provided 60-90% overhead cover.

No pollution was observed other than heavy siltation in the upper area. Two 2" plastic pipe diversions were located 0.2 miles upstream from the mouth. Four log accumulations were observed from the mouth to 0.4 miles upstream, and removal was recommended. The upper 3 log jams caused a build up of silt in the remaining 0.9 miles. In addition to the silt, a lack of cover made this area uninhabitable to fish. In general, this creek provided good steelhead spawning and nursery habitat in the lower 0.4 miles. The upper 0.9 miles had been subject to severe logging practices leaving it with no fishery value.

HABITAT INVENTORY RESULTS FOR CONSHEA CREEK

The habitat inventory of September 9-10, 1996 was conducted by Mark Bolin and Mark Kipp (NEAP) and data analyzed by Ken Bunzel (DFG). The survey of Conshea Creek began at the confluence with East Austin Creek and continued for 2,538 feet to the confluence of Tiny Creek.

The surveyed section of Conshea Creek has an F2 channel type. These channels are entrenched meandering riffle/pool channels on low gradients (<2%) with a high width/depth ratio and a predominantly boulder substrate.

Water temperatures ranged from 57-63°F and air temperatures ranged from 60-89°F.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of **occurrence** there were 62% flatwater units, 35% pool units, and 4% riffle units. Based on total **length** there were 85% flatwater units, 10% pool units, and 5% riffle units.

Twenty-six habitat units were measured and 27% were completely sampled. Seven Level IV habitat types were identified. The data is summarized in Table 2. The most frequent habitat types by percent **occurrence** were step runs at 42%, boulder scour pools 23%, runs 19% and low gradient riffles 4% (Graph 2). By percent total **length**, step runs made up 59%, runs 25%, boulder scour pools 6%, and low gradient riffles 5%.

Nine pools were identified (Table 3). Scour pools were most often encountered at 89%, and comprised 77% of the total length of pools (Graph 3).

Table 4 is a summary of maximum pool depths by pool habitat types.

Pool quality for salmonids increases with depth. Two of the nine pools (22%) had a depth of two feet or greater (Graph 4). These deeper pools comprised 3% of the total length of stream habitat.

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 types had the highest shelter rating at 180. Pools had the lowest rating with 96 and flatwater rated 150 (Table 1). Of the pool types, the main channel pools had the highest mean shelter rating at 135, and scour pools rated 91 (Table 3).

Table 5 summarizes fish shelter by habitat type. By percent area, the dominant pool shelter types were boulders at 77%. Graph 5 describes the pool shelter in Conshea Creek.

Gravel was the dominant substrate observed in the one low gradient riffle measured. The depth of cobble embeddedness was estimated at pool tail-outs. Of the nine pool tail-outs measured, all had a value of 2.

The mean percent canopy density for the stream reach surveyed was 81%. The mean percentages of deciduous and evergreen trees were 16% and 84%, respectively. Graph 8 describes the canopy for the entire survey.

For the entire stream reach surveyed, the mean percent right bank vegetated and the mean percent left bank vegetated were both 91%. For the habitat units measured, the dominant vegetation types for the stream banks were: 79% evergreen trees, 14% deciduous trees, and 7% grass. The dominant substrate for the stream banks were: 64% silt/clay/sand, 21% boulder, 7% bedrock and 7% cobble/gravel (Graph 10).

HABITAT INVENTORY RESULTS FOR TINY CREEK

The habitat inventory of September 9, 1996 was conducted by Mark Bolin and Mark Kipp (NEAP) and data analyzed by Ken Bunzel (DFG). The survey began at the confluence with Conshea Creek and extended up Tiny Creek 188 feet. The last 88 feet of the survey had an intermittent flow.

Tiny Creek has an F4 channel type which is similar to F2 types (see Results for Conshea Creek), except with a gravel substrate.

The water temperature was 60°F and the air temperature was 70°F. The surveyed section had three habitat units: two runs and one root wad scour pool. Gravel was the dominant substrate observed in both units that were measured for substrate. The pool had a cobble embeddedness value of 2.

The mean percent canopy density for the stream reach surveyed was 60%. The mean percentages of deciduous and evergreen trees were 2% and 98%, respectively. The mean percent right bank vegetated was 88% and the mean percent left bank vegetated was 90%. The stream banks were primarily vegetated by grass and evergreen trees. The dominant substrates for the stream banks were silt, clay and sand.

BIOLOGICAL INVENTORY

JUVENILE SURVEYS:

In the 1962 survey, steelhead were observed in the lower 0.25 miles of the creek. Five 1+ steelhead were observed, as well as numerous young of the year. It had been reported that coho salmon utilize this portion of the creek, but none were observed. Salamanders and frogs (unidentified Spp.) were described as extremely common throughout the drainage.

In the 1977 survey, juvenile steelhead were observed starting 200 yards upstream from the mouth to Tiny Creek confluence, 5/100'. Frogs, newts and aquatic snails were described as common.

On October 8, 1996 a biological inventory was conducted in one site of Conshea Creek. The air temperature was 75°F and the water temperature was 61°F. The observers were Bolin, Kipp (NEAP) Sanchez and Campo (Americorps).

The inventory was conducted in habitat units 1-4 and covered a total of 477 feet. In riffle and pool habitat types 43 0+ and six 1+ steelhead (10/100') were observed along with 4 sculpin (Cottus Spp.), 6 Pacific Giant Salamanders, 5 Yellow-legged Frogs and 2 Rough-skinned Newts. It was noted that salmonids were present up to the confluence of Tiny Creek, which goes subterranean after 100 feet.

A summary of historical and recent data collected appears in the table below.

Species Observed in Historical and Recent Surveys			
YEARS	**SPECIES**	**SOURCE**	**Native/Introduced**
1962,1977,1996	Steelhead Trout	DFG	N
1996	Sculpin	DFG	N
1996	Pacific Giant Salamander	DFG	N
1996	Yellow-legged Frog	DFG	N
1996	Rough-skinned Newt	DFG	N

No introduced species were observed during any of the surveys and historical records reflect no hatchery stocking, transfers, or known rescues have occurred in the watershed.

DISCUSSION FOR CONSHEA CREEK

There are 2,538 feet of F2 channel type in Conshea Creek. F2 channel types are fair for low-stage weirs, single and opposing wing-deflectors and log cover. These channels are good for bank-placed boulders and fair for low-stage weirs, single and opposing wing-deflectors, channel constrictors and log cover.

The water temperatures recorded on the survey days September 9-10, 1996 ranged from 57-63°F and air temperatures ranged from 60-89°F. This temperature regime is favorable to salmonids.

Pools comprised 10% of the total **length** of this survey. 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. In Conshea Creek, the pools are relatively shallow with 22% having a maximum depth of at least 2 feet. These pools comprised 3% of the total length of stream habitat. In coastal coho and steelhead streams, it is generally desirable to have primary pools comprise approximately 50% of total habitat length.

The mean shelter rating for pools was 96. Shelter ratings in this stream were measured in regard to 0+ fish. Shelter for 1+ fish is scarce. Also, most of the pool shelter is being provided by

boulders. More log and root wad cover in the pool and flatwater habitats would improve both summer and winter salmonid habitat. Log cover provides rearing fry with protection from predation, rest from water velocity, and also divides territorial units to reduce density related competition.

The one low gradient riffle measured had gravel as the dominant substrate. This is generally considered good for spawning salmonids. All of the pool tail-crests measured for cobble embeddedness had a value of 2. This is fair since cobble embeddedness measured to be 25% or less, a rating of 1, is considered best for the needs of salmon and steelhead.

The mean percent canopy for the survey was 81%. This is a good percentage of canopy, since 80 percent is generally considered desirable. Some road related erosion was identified during the course of the inventory. One log accumulation was recorded at 1/4 mile upstream which is retaining gravel.

DISCUSSION FOR TINY CREEK

This stream is intermittent after the first 100 feet. The surveyed section has an F4 channel type. These channels are good for bank-placed boulders and fair for low-stage weirs, single and opposing wing-deflectors, channel constrictors and log cover.

The water temperature recorded (60°F) is favorable to salmonids and spawning gravel of good quality exists in this stream. Although there was one isolated hole in the intermittent section with salmonids, in general this stream has inadequate flow for salmonids. In addition, pool habitat and stream shade canopy are both low.

SUMMARY

Biological surveys were conducted to document fish distribution and are not necessarily representative of population information. Steelhead were documented consistently during each past survey year. Coho were not observed during any survey, although it was noted during the 1962 survey that coho had been reported in this stream previously. The absence of coho is likely because physiological and environmental requirements for coho are more stringent than for steelhead, or coho were absent or present only in small numbers in some years. The 1996 fall survey documented few 0+ fish and fewer 1+ fish.

Stream shade canopy is good and water temperatures are suitable to salmonids. Spawning habitat is available with adequate gravel and fairly low levels of fine sediment. Shelter ratings were poor, and most of the shelter was from boulders and large woody debris

was scarce. However, pool habitat is very low and the deep pools needed for juvenile rearing habitat are rare. Tiny Creek holds limited habitat for salmonids but provides cool water flows to Conshea Creek.

GENERAL RECOMMENDATIONS

Conshea Creek should be managed as an anadromous, natural production stream.

The winter 1995/96 storms brought down many large trees and other woody debris into the stream, which increased the number and quality of pools since the date of this survey. This woody debris, if left undisturbed, will provide fish shelter and rearing habitat, and offset channel incision. Many signs of recent and historic tree and log removal were evident in the active channel during our survey. Efforts to increase flood protection or improve fish access in the short run, have led to long term problems in the system. Landowners should be sensitive about the natural and positive role woody debris plays in the system, and encouraged not to remove woody debris from the stream, except under extreme buildup and only under guidance by a fishery professional.

SPECIFIC FISHERY ENHANCEMENT RECOMMENDATIONS

1) The log accumulation at 1/4 mile from the mouth should be modified to permit improved migration access. However, it must be done carefully to preserve the benefit of existing large woody debris, and in stages so existing gravel is metered out over time.

2) There is one site in Conshea Creek with a bank erosion problem. In addition road related erosion was identified. These sites should be treated with bank stabilization structure to reduce the amount of fine sediment entering the stream.

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

4) Where feasible, increase woody cover in the pool and flatwater habitat units along the entire stream. Adding high quality complexity with larger woody cover is desirable. Combination cover/scour structures constructed with boulders and woody debris would be effective in many flatwater and pool locations. In some areas the material is at hand.

PROBLEM SITES AND LANDMARKS - CONSHEA CREEK SURVEY COMMENTS

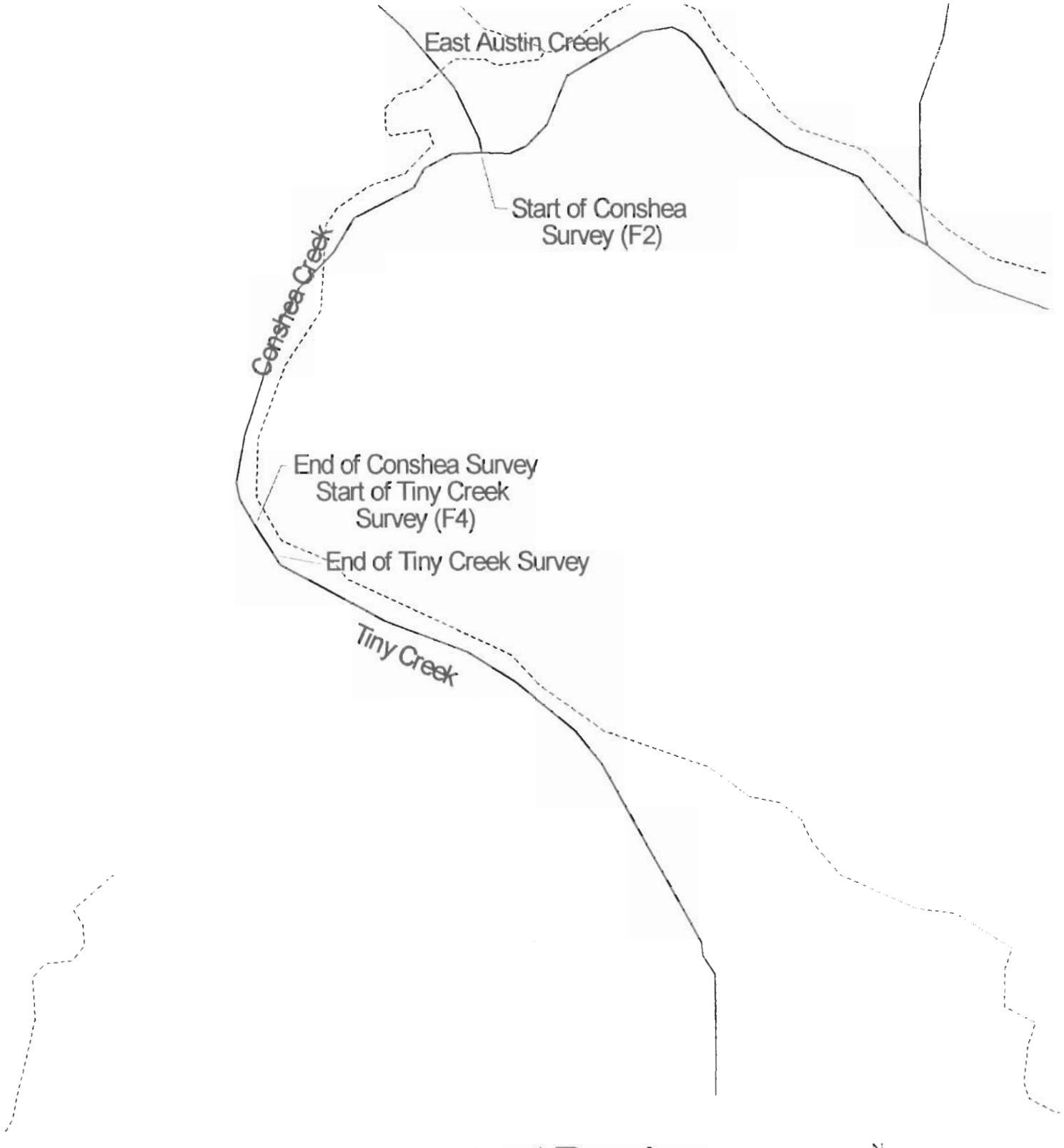
The following landmarks and possible problem sites were noted. All distances are approximate and taken from the beginning of the survey reach.

HABITAT UNIT #	STREAM LEN (FT.)	COMMENTS
1.00	90	FORD
2.00	190	SALMONIDS
4.00	477	HOUSE LF BANK
5.00	740	RAVINE RT BANK
6.00	754	SALMONIDS
8.00	979	SALMONIDS
10.00	1128	SALMONIDS; LOG ACCUMULATION
11.00	1217	ROAD RT BANK
12.00	1243	ROAD RT BANK
13.00	1410	FORD BOTTOM OF UNIT; ROAD RT BANK
14.00	1424	ROAD RT BANK
18.00	1756	2 POOLS; ROAD RT BANK
19.00	1810	8' REDWOOD BOTTOM OF UNIT; ROAD RT BANK
20.00	1839	ROAD RT BANK
22.00	1968	LOG ACCUMULATION
23.00	2023	DRY DEPOSITIONAL PLANE ABOVE LOG ACCUMULATION
24.00	2101	SALMONIDS (0+)
25.00	2238	BLOW OUT LF BANK
26.00	2538	CONFLUENCE OF TINY-AT 75', 60°F; 225' UP CONSHEA SAW NO SALMONIDS

PROBLEM SITES AND LANDMARKS - TINY CREEK SURVEY COMMENTS

HABITAT UNIT #	*STREAM LEN (FT.)*	*COMMENTS*
2.00	*59*	*SMALL POOL WITHOUT FISH*
3.00	*188*	*DRY RUN WITH SMALL POCKETS OF WATER; 1 HOLE WITH SALMONIDS - NO FLOW*

Conshea Creek



Conshea Creek

Drainage: East Austin Creek, Big Austin Creek, Russian River

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

Survey Dates: 09/09/96 to 09/10/96

Confluence Location: QUAD: CAZADERO LEGAL DESCRIPTION: T9NR11WS28 LATITUDE: 38°35'34" LONGITUDE: 123°5'7"

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
1	1	RIFFLE	4	137	137	5	2.0	0.4	137	137	55	55	0	180
16	2	FLATWATER	62	134	2148	85	4.5	0.4	345	5520	138	2208	0	150
9	4	POOL	35	28	253	10	7.3	0.9	174	1567	162	1461	131	96

TOTAL UNITS	TOTAL UNITS	TOTAL LENGTH (ft.)	TOTAL AREA (sq. ft.)	TOTAL VOL. (cu. ft.)
26	7	2538	7224	3724

Conshea Creek

Drainage: East Austin Creek, Big Austin Creek, Russian River

Table 2 - SUMMARY OF HABITAT TYPES AND MEASURED PARAMETERS

Survey Dates: 09/09/96 to 09/10/96

Confluence Location: QUAD: CAZADERO LEGAL DESCRIPTION: T9NR11WS28 LATITUDE: 38°35'34" LONGITUDE: 123°5'7"

HABITAT UNITS #	UNITS FULLY MEASURED	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 cu.ft.	TOTAL VOLUME EST. cu.ft.	MEAN RESIDUAL POOL VOL cu.ft.	MEAN SHELTER RATING	MEAN CANOPY %
1	1	LGR	4	137	137	5	2	0.4	0.9	137	137	55	55	0	180	35
5	1	RUN	19	128	641	25	4	0.4	0.7	240	1200	96	480	0	140	85
11	1	SRN	42	137	1507	59	5	0.4	0.9	450	4950	180	1980	0	160	76
1	1	STP	4	59	59	2	7	1.4	3.2	248	248	347	347	297	135	100
1	1	LSR	4	25	25	1	9	0.8	1.9	214	214	171	171	128	75	100
1	0	LSBk	4	23	23	1	6	0.9	1.6	138	138	124	124	97	90	0
6	2	LSBo	23	24	146	6	7	0.9	2.2	161	968	136	819	110	94	86

TOTAL UNITS	TOTAL UNITS	LENGTH (ft.)	AREA (sq.ft)	TOTAL VOL. (cu.ft)
26	7	2538	7854	3976

Conshea Creek

Drainage: East Austin Creek, Big Austin Creek, Russian River

Table 3 - SUMMARY OF POOL TYPES

Survey Dates: 09/09/96 to 09/10/96

Confluence Location: QUAD: CAZADERO LEGAL DESCRIPTION: T9NR11WS28 LATITUDE: 38°35'34" LONGITUDE: 123°5'7"

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.)	TOTAL AREA EST. (sq.ft.)	MEAN VOLUME (cu.ft.)	TOTAL VOLUME EST. (cu.ft.)	MEAN RESIDUAL POOL VOL. (cu.ft.)	MEAN SHELTER RATING
1	1	MAIN	11	59	59	23	7.0	1.4	248	248	347	347	297	135
8	3	SCOUR	89	24	194	77	7.4	0.9	165	1319	139	1114	110	91

TOTAL UNITS	TOTAL UNITS	TOTAL LENGTH (ft.)	TOTAL AREA (sq.ft.)	TOTAL VOL. (cu.ft.)
9	4	253	1567	1461

Conshea Creek

Drainage: East Austin Creek, Big Austin Creek, Russian River

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

Survey Dates: 09/09/96 to 09/10/96

Confluence Location: QUAD: CAZADERO LEGAL DESCRIPTION: T9NR11WS28 LATITUDE: 38°35'34" LONGITUDE: 123°5'7"

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
1	STP	11	0	0	0	0	0	0	1	100	0	0
1	LSR	11	0	0	1	100	0	0	0	0	0	0
1	LSBk	11	0	0	1	100	0	0	0	0	0	0
6	LSBo	67	0	0	5	83	1	17	0	0	0	0

TOTAL UNITS
9

Conshea Creek | Drainage: East Austin Creek, Big Austin Creek, Russian River

Table 5 - Summary of Shelter by Habitat Type | Survey Dates: 09/09/96 to 09/10/96

Confluence Location: QUAD: CAZADERO LEGAL DESCRIPTION: T9NR11WS28 LATITUDE: 38°35'34" LONGITUDE: 123°5'7"

	UNITS MEASURED	UNITS SHELTER MEASURED	HABITAT TYPE	SQ. FT. UNDERCUT BANKS	SQ. FT. SWD	SQ. FT. LWD	SQ. FT. ROOT MASS	SQ. FT. TERR. VEGETATION	SQ. FT. AQUATIC VEGETATION	SQ. FT. WHITE WATER	SQ. FT. BOULDERS	SQ. FT. BEDROCK LEDGES
	1	1	LGR	0	33	33	0	99	0	0	0	0
	5	1	RUN	0	0	0	0	112	168	0	0	0
	11	1	SRN	0	0	0	0	108	0	0	72	108
	1	1	STP	0	9	0	0	0	0	9	167	0
	1	1	LSR	11	6	0	11	0	0	0	28	0
	1	1	LSBk	0	12	12	0	0	0	0	17	0
	6	6	LSBo	25	15	0	38	4	0	0	285	0
TOTAL	26	12		36	75	45	49	322	168	9	569	108
				3%	5%	3%	4%	23%	12%	1%	41%	8%
TOTAL OTHER POOLS	9	9		36	42	12	49	4	0	9	497	0
				6%	6%	2%	8%	1%	0%	1%	77%	0%

Conshea Creek

Drainage: East Austin Creek, Big Austin Creek, Russian River

Table 6 - SUMMARY OF DOMINANT SUBSTRATES BY HABITAT TYPE

Survey Dates: 09/09/96 to 09/10/96

Confluence Location: QUAD: CAZADERO LEGAL DESCRIPTION: T9NR11WS28 LATITUDE: 38°35'34" LONGITUDE: 123°5'7"

TOTAL HABITAT UNITS	UNITS SUBSTRATE 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
1	1	LGR	0	0	100	0	0	0	0
5	1	RUN	0	0	0	0	0	100	0
1	1	SRN	0	0	0	0	0	100	0
1	1	STP	0	0	100	0	0	0	0
1	1	LSR	0	0	0	0	0	100	0
1	0	LSBk	0	0	0	0	0	0	0
6	2	LSBo	0	100	0	0	0	0	0

Conshea Creek

APPENDIX A. Summary of Mean Percent Vegetative Cover for Entire Stream

Mean Percent Canopy	Mean Percent Evergreen	Mean Percent Deciduous	Mean Right bank % Cover	Mean Left Bank % Cover
81.00	84.33	15.67	90.71	91.43

APPENDIX B.

Mean Percentage of Dominant Substrate

Dominant Class of Substrate	Number Units Right Bank	Number Units Left Bank	Percent Total Units
Bedrock	1	0	7.14
Boulder	1	2	21.43
Cobble/Gravel	1	0	7.14
Silt/clay	4	5	64.29

Mean Percentage of Dominant Vegetation

Dominant Class of Vegetation	Number Units Right Bank	Number Units Left Bank	Percent Total Units
Grass	1	0	7.14
Brush	0	0	0
Deciduous Trees	1	1	14.29
Evergreen Trees	5	6	78.57
No Vegetation	0	0	0

APPENDIX C. FISH HABITAT INVENTORY DATA SUMMARY

STREAM NAME: Conshea Creek
SAMPLE DATES: 09/09/96 to 09/10/96
STREAM LENGTH: 2538 ft.
LOCATION OF STREAM MOUTH:
USGS Quad Map: CAZADERO — Latitude: 38°35'34"
Legal Description: T9NR11WS28 — Longitude: 123°5'7"

SUMMARY OF FISH HABITAT ELEMENTS BY STREAM REACH

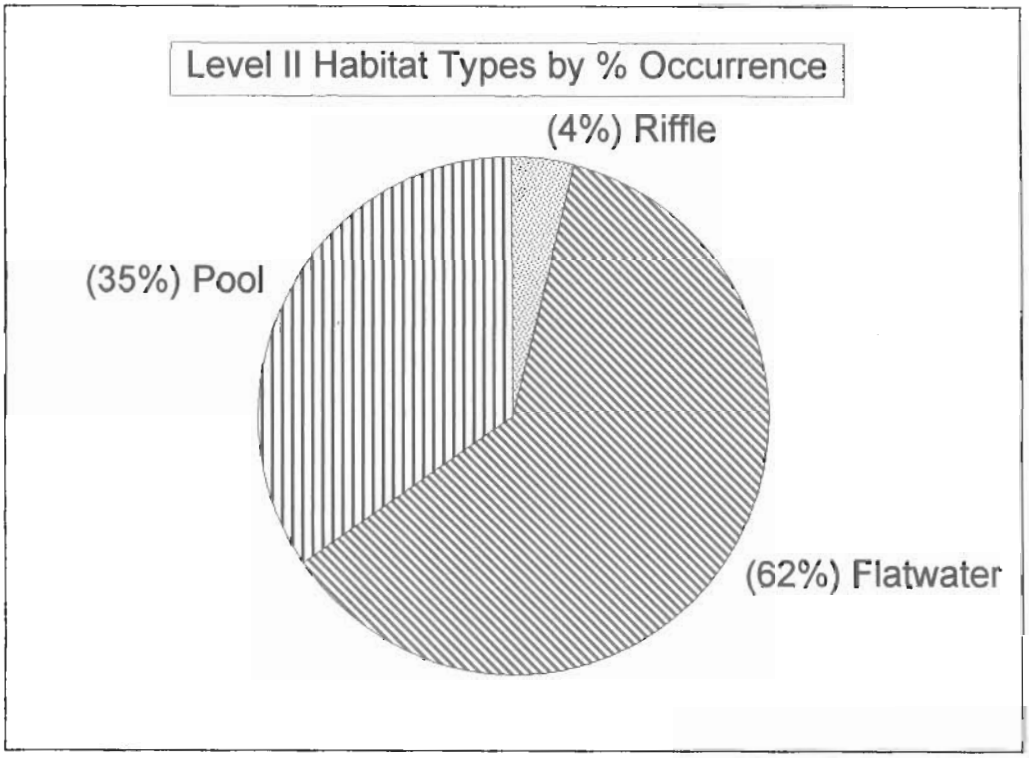
STREAM REACH 1 (Units 1-26)

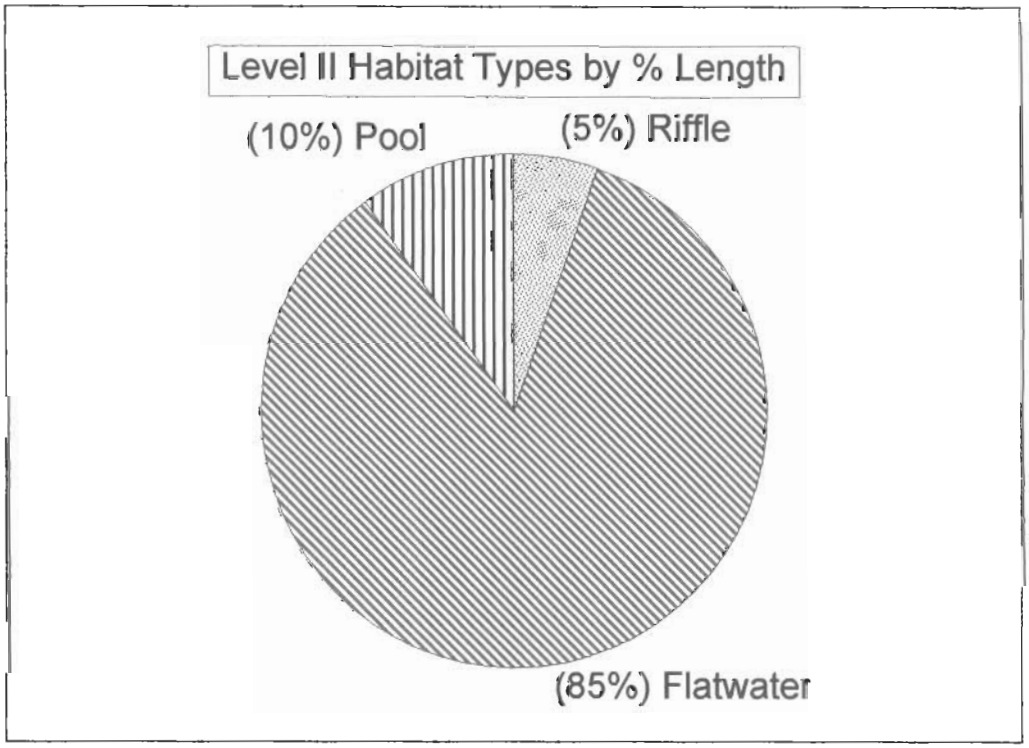
Channel Type: F2	Mean Canopy Density: 81%
Channel Length: 2538 ft.	Evergreen Component: 84%
Riffle/Flatwater Mean Width: 4 ft.	Deciduous Component: 16%
Total Pool Mean Depth: 0.9 ft.	Pools by Stream Length: 10%
Base Flow: 0.0 cfs	Pools >=3 ft. deep: 11%
Water: 57-63°F Air: 60-89°F	Mean Pool Shelter Rtn: 96
Dom. Bank Veg.: Evergreen Trees	Dom. Shelter: Boulders
Bank Vegetative Cover: 91%	Occurrence of LOD: 17%
Dom. Bank Substrate: Silt/Clay/Sand	Dry Channel: 0 ft.

Embeddedness Value: 1. 0% 2. 100% 3. 0% 4. 0%

Conshea Creek

Level II Habitat Types

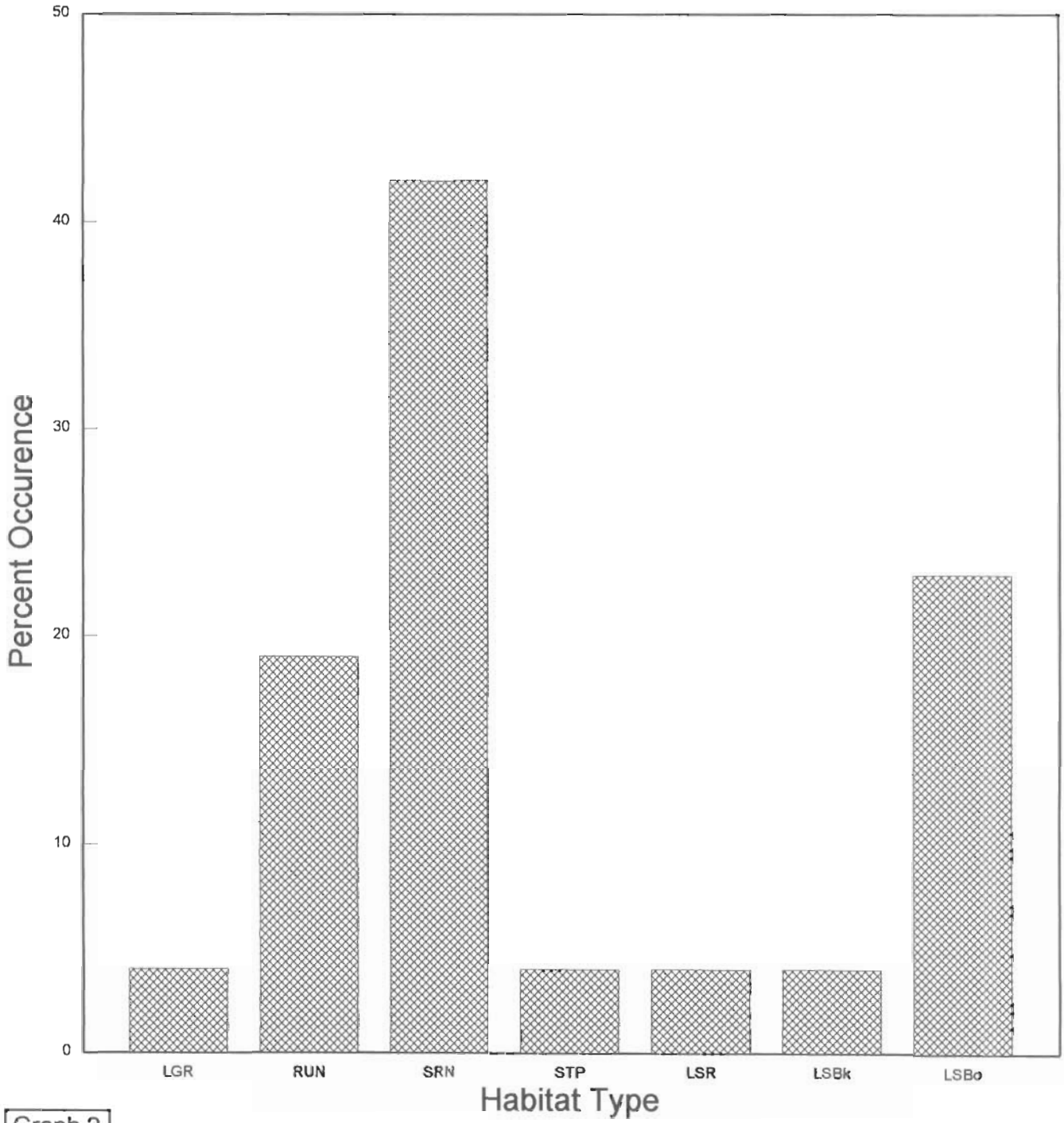




Graph 1

Conshea Creek

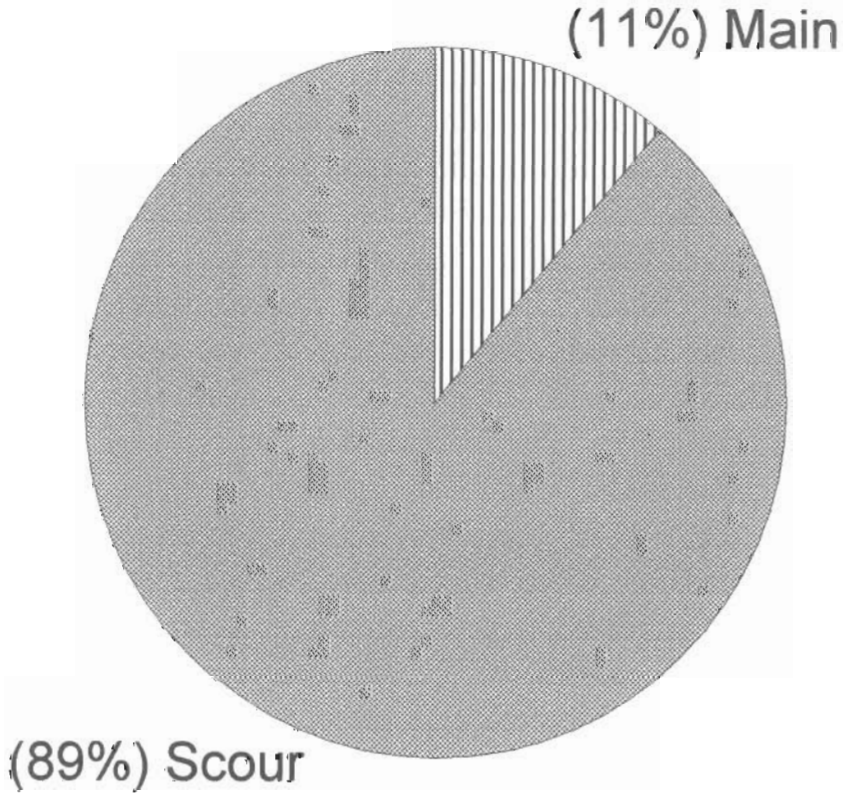
Level IV Habitat Types by % Occurrence



Graph 2

Conshea Creek

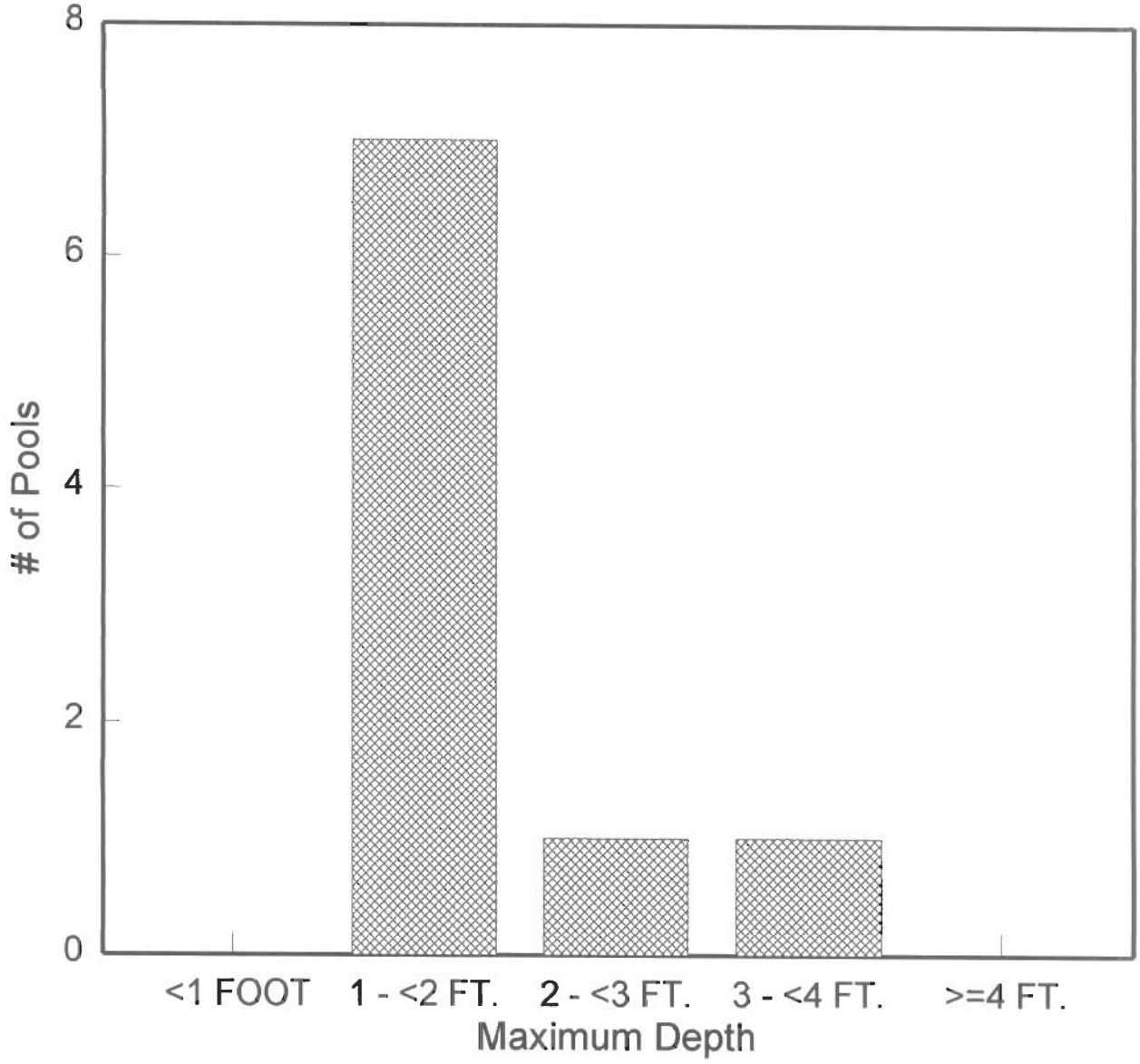
Pool Habitat Types by % Occurrence



Graph 3

Conshea Creek

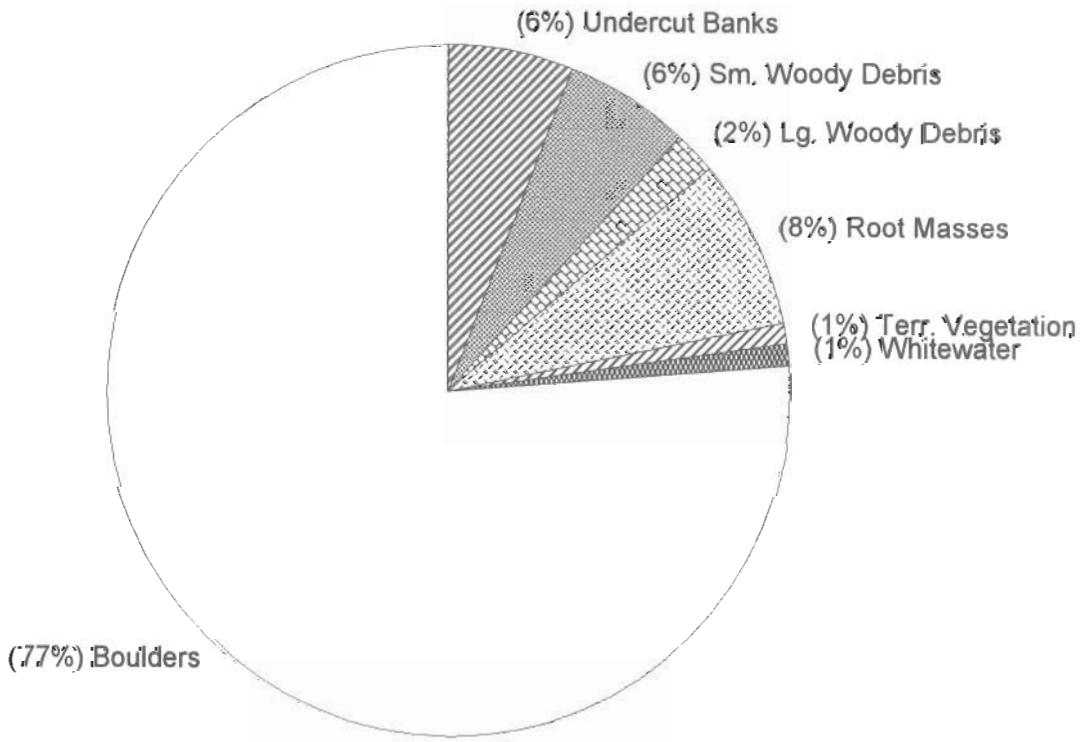
Maximum Depth in Pools



Graph 4

Conshea Creek

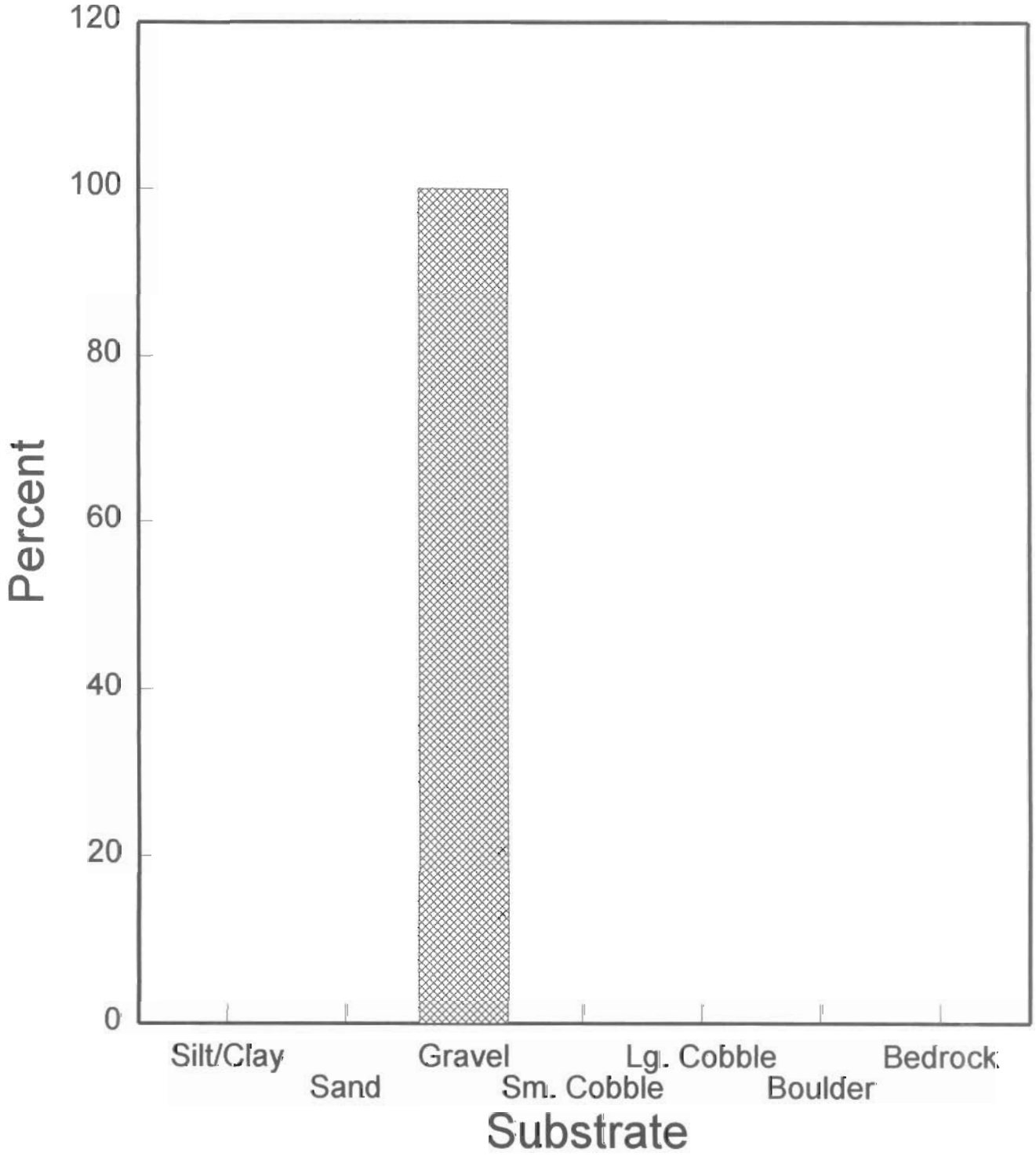
Pool Shelter Types by % Area



Graph 5

Conshea Creek

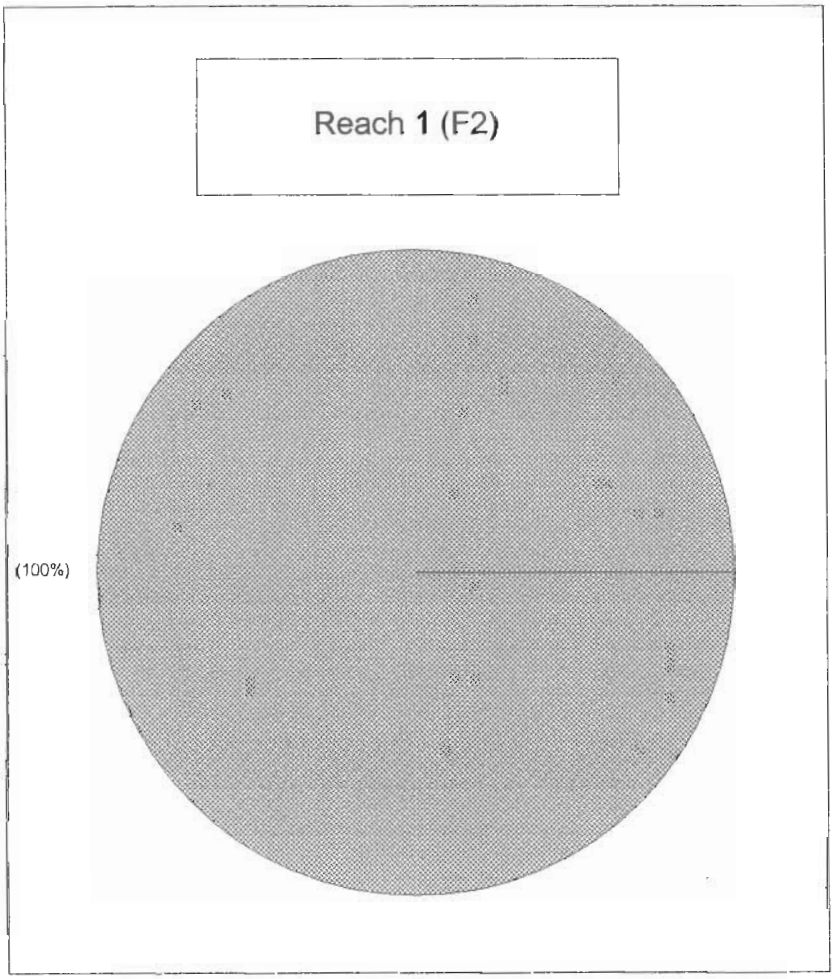
Substrate Composition in Low Gradient Riffles



Graph 6

Conshea Creek

Percent Cobble Embeddedness by Reach

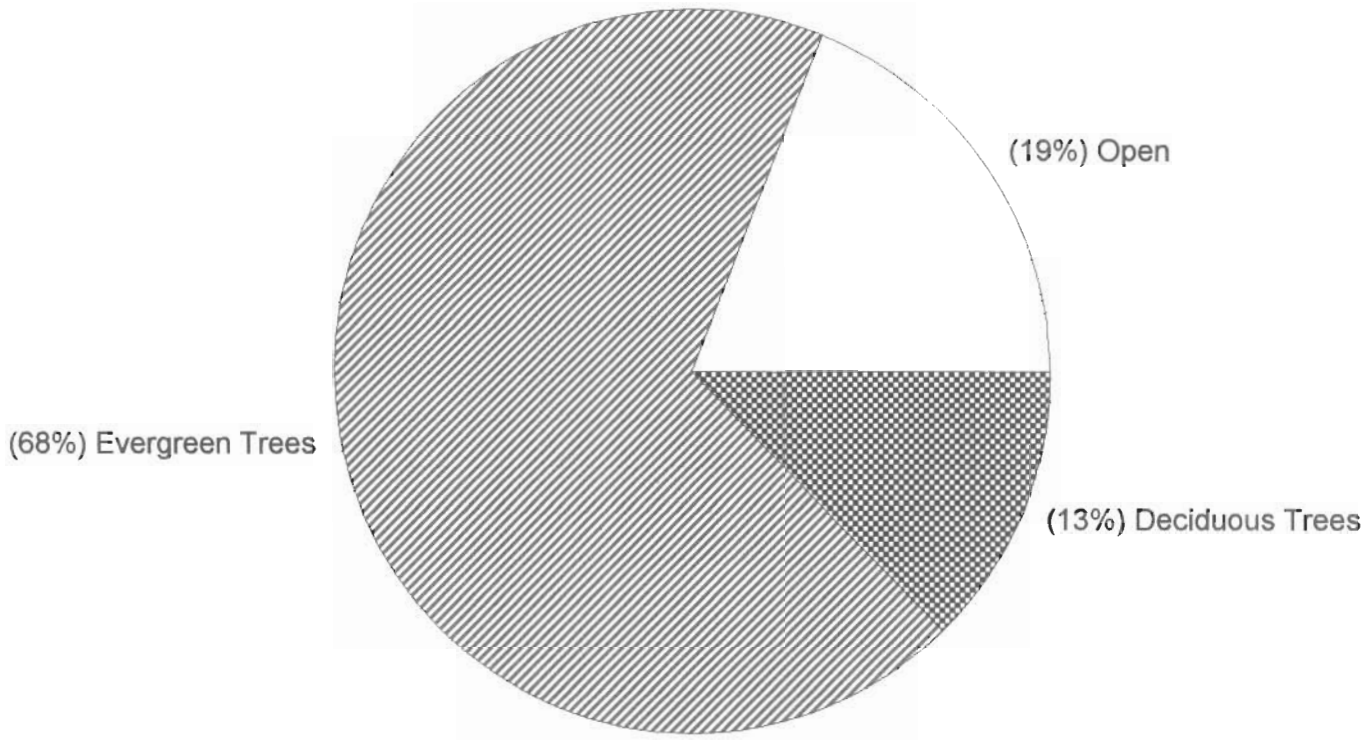


Value 1 = <25% Value 2 = 25-50% Value 3 = 51-75% Value 4 = >76%

Graph 7

Conshea Creek

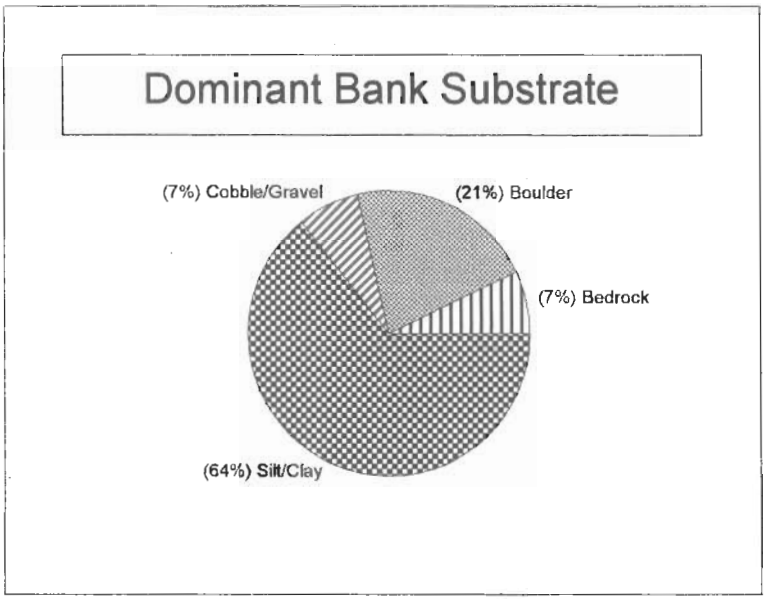
Mean Percent Canopy

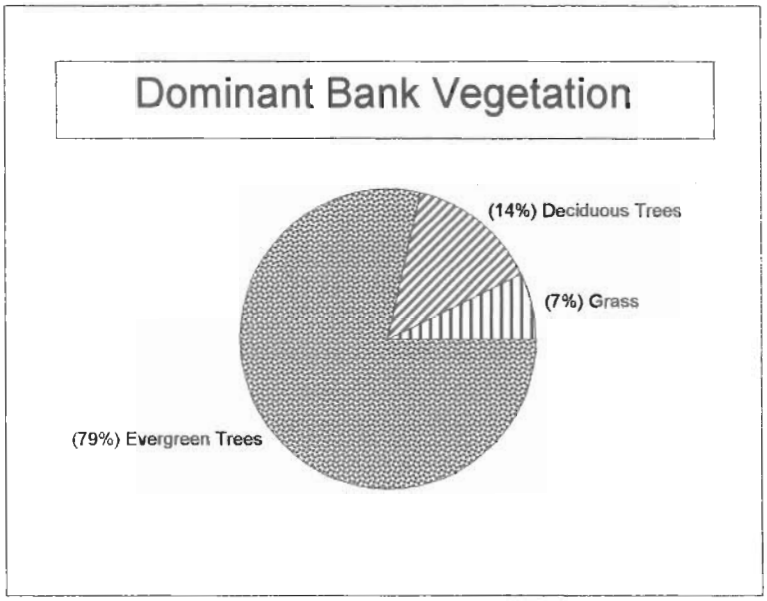


Graph 8

Conshea Creek

Percent Bank Composition





Graph 10