

STREAM INVENTORY SUB-SECTION REPORT

Salmon Creek, 2003

WATERSHED OVERVIEW

Salmon Creek is a tributary to North Fork Yager Creek, tributary to Yager Creek, tributary to the Van Duzen River, tributary to the Eel River, located in Humboldt County, California (Map 1). Salmon Creek's legal description at the confluence with North Fork Yager Creek is Township 03N, Range 03E, Section 30. Its location is 40°36'55.0" north latitude and 123°52'20.0" west longitude. Salmon Creek is a second order stream according to the Yager Junction and Mad River Buttes 7.5 minute USGS Quadrangles. Salmon Creek drains a watershed of approximately 0.56 square miles. Elevations range from about 1,200 feet at the mouth of the creek to 2,000 feet in the headwater areas. A mixed hardwood forest and grassland dominates the watershed. The watershed is entirely privately owned and is managed for timber production and rangeland. Vehicle access exists via Kneeland-Bridgeville Road.

HABITAT INVENTORY RESULTS AND DISCUSSION

The habitat inventory of August 12, 2003, was conducted by Elizabeth Pope and Kevin Lucey (WSP/AmeriCorps). The total length of the stream surveyed was 944 feet.

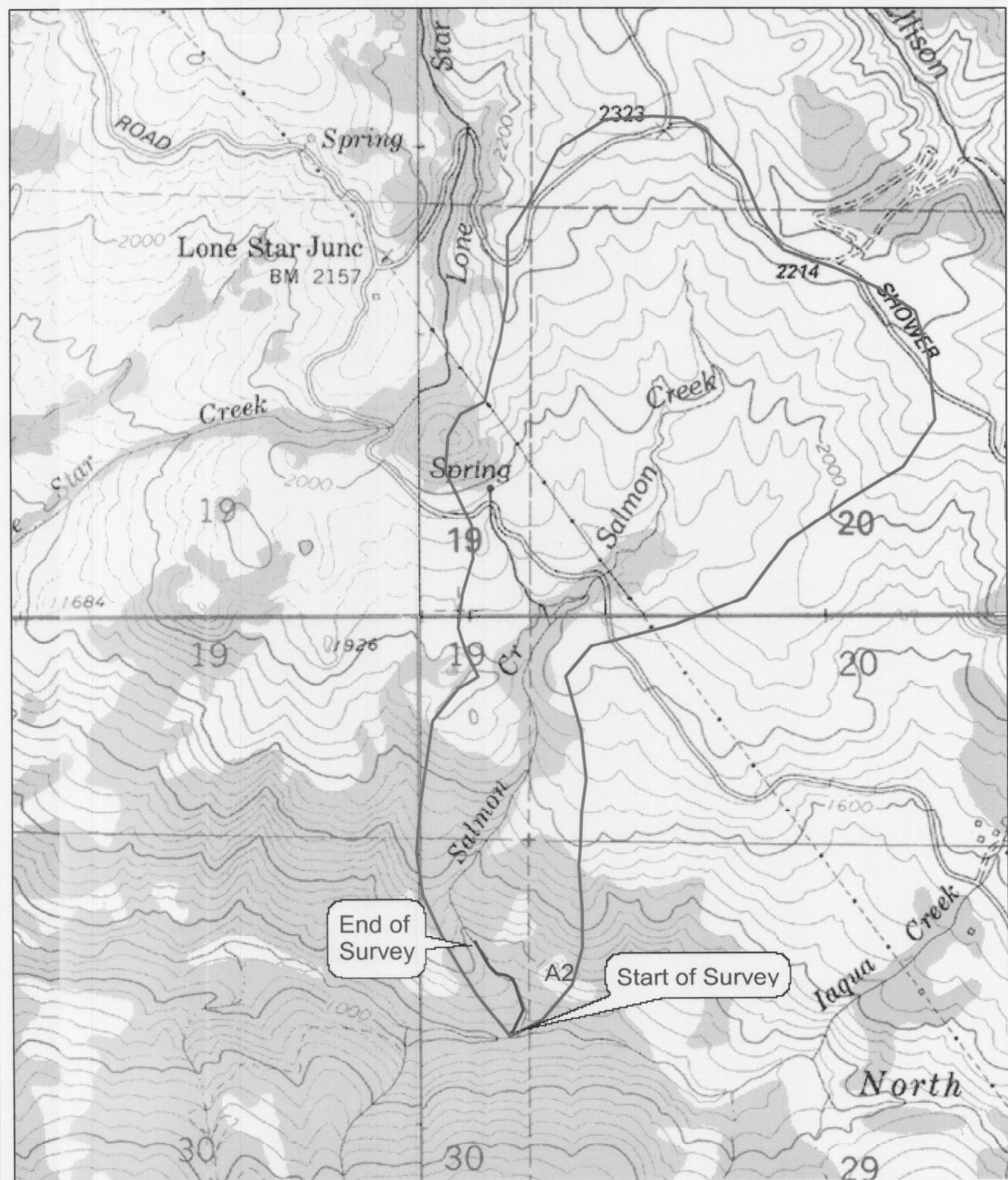
Flows were not measured on Salmon Creek.

Salmon Creek is an A2 channel type for the entire 944 feet of stream surveyed. A2 channel types are generally not suitable for fish habitat improvement structures.

The water temperatures recorded on the survey day August 12, 2003, ranged from 60 to 62 degrees Fahrenheit. Air temperatures ranged from 63 to 68 degrees Fahrenheit. This is an acceptable water temperature range for salmonids but for a more complete and accurate water temperature profile 24-hour temperatures would need to be monitored throughout the warm summer months.

Based on the total length of this survey, Level II habitat units consisted of 46% flatwater units, 31% riffle units, 15% dry units, and 8% pool units. The one pool unit within the surveyed reach is relatively shallow, having a maximum depth of less than 2 feet.

The one pool tail-out measured had an embeddedness rating of 5. Cobble embeddedness of 25% or less, a rating of 1, is considered best for the needs of salmon and steelhead. In Salmon Creek, sediment sources should be mapped and rated according to their potential sediment yields, and control measures should be taken.



Name: MAD RIVER BUTTES
Date: 5/25/2004
Scale: 1 inch equals 1000 feet

Location: 040° 37' 31.43" N 123° 52' 20.34" W
Caption: Salmon Creek 2003 Habitat Survey

Salmon Creek

The mean shelter rating for pools was 30. The shelter rating in the flatwater habitats was 70. A pool shelter rating of approximately 100 is desirable.

The one pool tail-out measured had bedrock as the dominant substrate. This is considered unsuitable for spawning salmonids.

The mean percent canopy density for the stream was 83. In general, revegetation projects are considered when canopy density is less than 80%.

The percentage of right and left bank covered with vegetation was 65% and 67.5%, 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.

BIOLOGICAL INVENTORY RESULTS

No biological inventory was taken on Salmon Creek.

RECOMMENDATIONS

- 1) Although Salmon Creek has only a short reach suitable for salmonids, it should be managed as an anadromous, natural production stream since it discharges into North Fork Yager Creek.
- 2) The limited water temperatures available suggest that the 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) There is a steep boulder rough at 88' on Salmon Creek that is retaining large quantities of fine sediment. The modification of this feature is desirable, but must be done carefully, over time, to avoid excessive sediment loading in downstream reaches.
- 4) Increase woody cover in the pools and flatwater habitat units. All of the existing cover is from boulders. Adding high quality complexity with woody cover is desirable and in some areas the material is at hand.
- 5) Active and potential sediment sources related to the road system need to be identified, mapped, and treated according to their potential for sediment yield to the stream and its tributaries.
- 6) Due to the high gradient of the stream, access for migrating salmonids is an ongoing potential problem. Good water temperature and flow regimes exist in the

Salmon Creek

stream and it offers good conditions for rearing fish. Fish passage should be monitored and improved where possible.

PROBLEM SITES AND LANDMARKS

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

- 0' Begin survey at confluence with North Fork Yager Creek.
- 88' Boulder accumulation (25'Lx5'W) is retaining large cobble and causing channel redirection.
- 263' 23% channel gradient with a 6 foot cascade at top of unit.
- 662' Stream gradient is approximately 23% for past 400 feet and no fish have been observed throughout stream reach.
- 694' 36% stream gradient. Sixteen feet rise in stream bed with a 9' plunge – the channel is blocked by large (car sized) boulders on both banks and in channel, forming a cave with bats.
- 944' End of Survey due to impassable conditions. No fish observed.

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

Stream Name: Salmon Creek

Drainage: Van Duzen River

Survey Dates: 8/12/2003 to 8/12/2003

Confluence Location: Quad: MAD RIVER BUTTES Legal Description: T03NR03ES30

Latitude: 40:36:55.0N

Longitude: 123:52:20.0

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Percent Total Length	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Estimated Total Area (sq.ft.)	Mean Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating
2	0	DRY	15.4	169	338	35.8									
6	2	FLATWATER	46.2	57	340	36	5.0	0.4	1.1	462	2772	148	889		70
1	1	POOL	7.7	10	10	1.1	8.0	0.2	0.7	80	80	32	32	16	30
4	2	RIFFLE	30.8	64	256	27.1	2.0	0.2	0.4	60	240	12	48		48

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
13	5	944	3092	969.2

Table2 - Summary of Habitat Types and Measured Parameters

Stream Name: Salmon Creek

Drainage: Van Duzen River

Survey Dates: 8/12/2003 to 8/12/2003

Confluence Location: Quad: MAD RIVER BUTTES Legal Description: T03N R03E S30

Latitude: 40:36:55.0N

Longitude: 123:52:20.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Total Length (cu.ft.)	Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating	Mean Canopy (%)
1	0	LGR	8	175	175	19	2	0.2	0.4	60	180	12	36	48	78	
3	2	HGR	23	27	81	9	6	4	0.4	192	384	77	154	60	98	
2	1	RUN	15	30	60	6	4	0.4	1.3	732	2928	220	878	80	89	
4	1	SRN	31	70	280	30	6	0.3	0.8	80	80	32	32	30	66	
1	1	MCP	8	10	10	1	8	0.2	0.7	138	338	36	36			
2	0	DRY	15	169	338	36										

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
13	5	944	3572	1100

Table 3 - Summary of Pool Types

Stream Name: Salmon Creek

Survey Dates: 8/12/2003 to 8/12/2003

Confluence Location: Quad: MAD RIVER BUTTES Legal Description: T03NR03ES30 Latitude: 40:36:55.0N Longitude: 123:52:20.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Residual Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Residual Pool Vol (cu.ft.)	Estimated Total Resid.Vol (cu.ft.)	Mean Shelter Rating
1	1	MAIN	100	10	100	8.0	0.2	80	80	16	16	30	

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
1	1	10	80	16

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

Stream Name: Salmon Creek

Drainage: Van Duzen River

Survey Dates: 8/12/2003 to 8/12/2003

Confluence Location: Quad: MAD RIVER BUTTES Legal Description: T03NR03ES30

Latitude: 40:36:55.0N Longitude: 123:52:20.0W

Habitat Units	Habitat Type	Habitat Occurrence (%)	< 1 Foot Maximum Residual Depth	< 1 Foot Percent Occurrence	1 < 2 Feet Maximum Residual Depth	1 < 2 Feet Percent Occurrence	2 < 3 Feet Maximum Residual Depth	2 < 3 Feet Percent Occurrence	3 < 4 Feet Maximum Residual Depth	3 < 4 Feet Percent Occurrence	>= 4 Feet Maximum Residual Depth	>= 4 Feet Percent Occurrence
1	MCP	100	1	100	0	0	0	0	0	0	0	0

Total Units	Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1 < 2 Foot Max Resid. Depth	Total 1 < 2 Foot % Occurrence	Total 2 < 3 Foot Max Resid. Depth	Total 2 < 3 Foot % Occurrence	Total 3 < 4 Foot Max Resid. Depth	Total 3 < 4 Foot % Occurrence	Total >= 4 Foot Max Resid. Depth	Total >= 4 Foot % Occurrence
1	1	100	0	0	0	0	0	0	0	0

Mean Maximum Residual Pool Depth (ft.): 0.7

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name:	Salmon Creek			Drainage:	Van Duzen River		
Survey Dates:	8/12/2003 to 8/12/2003			Dry Units:	2		
Confluence Location:	Quad: MAD RIVER BUTTES			Legal Description:	T03NR03ES30		
Habitat Units	Fully Measured Units	Habitat Type	% Total Silt/Clay Dominant	% Total Sand Dominant	% Total Gravel Dominant	% Total Cobble Dominant	% Total Large Cobble Dominant
1	0	LGR	0	0	0	0	0
3	2	HGR	0	0	0	0	100
2	1	RUN	0	0	0	0	100
4	1	SRN	0	0	0	0	100
1	1	MCP	0	0	0	0	100
2	0	DRY	0	0	0	0	0

Latitude: 40:36:55.0N

Longitude: 123:52:20.0W

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name:	Salmon Creek			Drainage:	Van Duzen River		
Survey Dates:	8/12/2003 to 8/12/2003						
Confluence Location:	Quad: MAD RIVER BUTTES			Legal Description:	T03NR03ES30		
Mean Percent Canopy	Mean Percent Conifer	Mean Percent Deciduous	Mean Percent Open Units		Latitude:	40:36:55.0N	Longitude:
83	12	88	0				123:52:20.0W

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.

Table 8 - Fish Habitat Inventory Data Summary

Stream Name: Salmon Creek Drainage: Van Duzen River
 Survey Dates: 8/12/2003 to 8/12/2003 Survey Length (ft.): 944 Main Channel (ft.): 944 Side Channel (ft.): 0
 Confluence Location: Quad: MAD RIVER BUTTES Legal Description: T03N R03E S30 Latitude: 40:36:55.0N Longitude: 123:52:20.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1		Pools by Stream Length (%): 1					
Channel Type:	A2	Canopy Density (%):	83	Pool Frequency (%):	8		
Reach Length (ft.):	944	Coniferous Component (%):	12	Residual Pool Depth (%):			
Riffle/Flatwater Mean Width (ft.):	3.5	Deciduous Component (%):	88	< 2 Feet Deep:	100		
BFW:		Dominant Bank Vegetation:	Brush	2 to 2.9 Feet Deep:	0		
Range (ft.):	to	Vegetative Cover (%):	80	3 to 3.9 Feet Deep:	0		
Mean (ft.):		Dominant Shelter:	Boulders	>= 4 Feet Deep:	0		
Std. Dev.:		Dominant Bank Substrate Type:	Boulder	Mean Max Residual Pool Depth (ft.):	0.7		
Base Flow (cfs.):	0.0	Occurrence of LWD (%):	0	Mean Pool Shelter Rating:	30		
Water (F):	60 - 62	Air (F):	63 - 68	LWD per 100 ft.:			
Dry Channel (ft.):	338	Riffles:	0	Pools:	0		
		Flat:	0				
Pool Tail Substrate (%):	Silt/Clay: 0	Sand:	0	Gravel:	0		
Embeddedness Values (%):	1. 0	2. 0	3. 0	Sm Cobble:	0		
				Lg Cobble:	0		
				Boulder:	0		
				Bedrock:	100		
				5. 100			

Table 9 - Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Salmon Creek Drainage: Van Duzen River

Survey Dates: 8/12/2003 to 8/12/2003

Confluence Location: Quad: MAD RIVER BUTTES Legal Description: T03NR03ES30

Latitude: 40:36:55.0N Longitude: 123:52:20.0W

Mean Percentage of Dominant Stream Bank Substrate

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Bedrock	0	0	0.00
Boulder	5	5	100.00
Cobble / Gravel	0	0	0.00
Sand / Silt / Clay	0	0	0.00

Mean Percentage of Dominant Stream Bank Vegetation

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Grass	0	0	0.00
Brush	2	3	50.00
Deciduous Trees	3	2	50.00
Coniferous Trees	0	0	0.00
No Vegetation	0	0	0.00

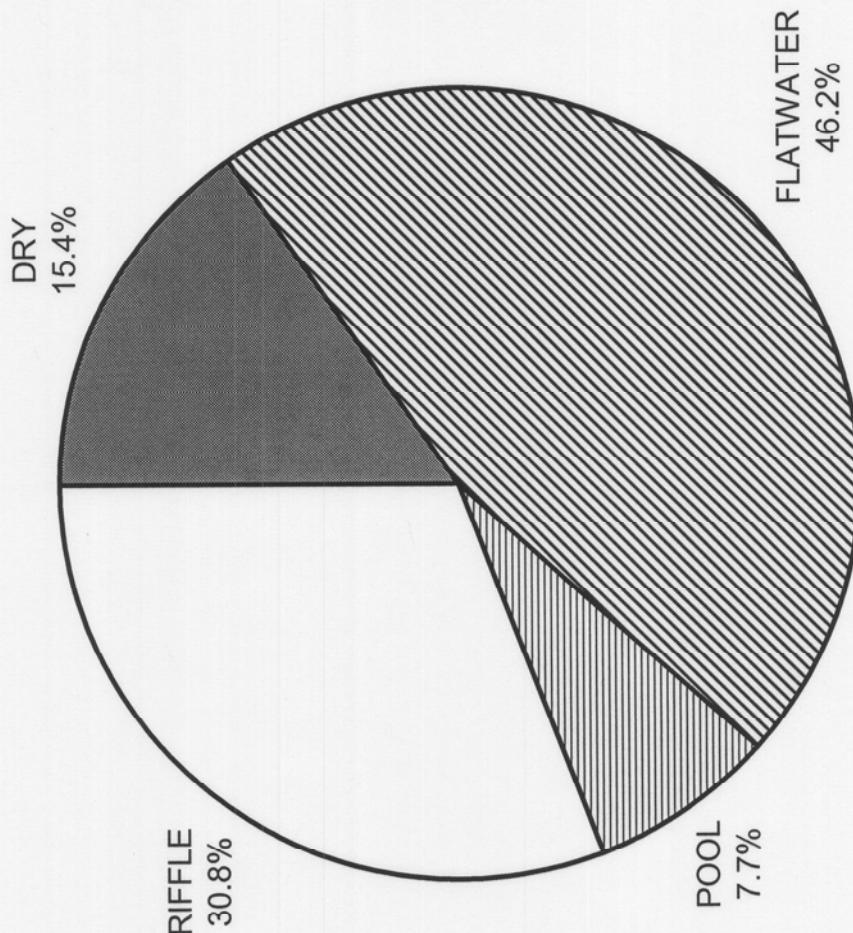
Total Stream Cobble Embeddedness Values:

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

StreamName: Salmon Creek Drainage: Van Duzen River
Survey Dates: 8/12/2003 to 8/12/2003
Confluence Location: Quad: MAD RIVER BUTTES Legal Description: T03NR03ES30 Latitude: 40:36:55.0N Longitude: 123:52:20.0W

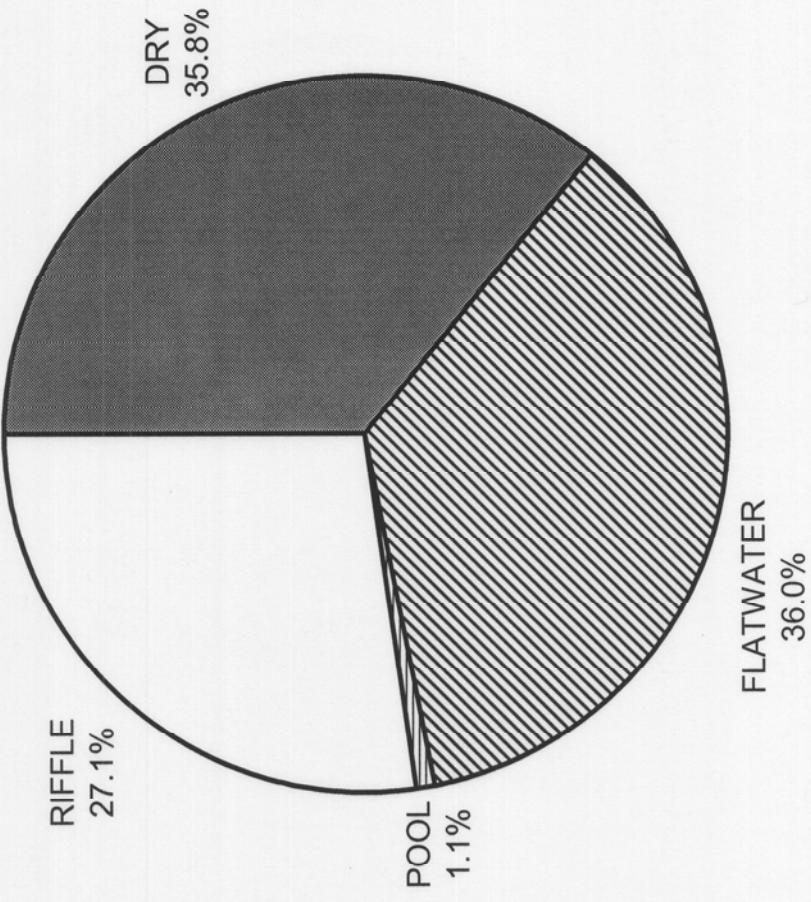
	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	0	0
SMALL WOODY DEBRIS (%)	0	0	0
LARGE WOODY DEBRIS (%)	0	0	0
ROOTS (%)	0	0	0
TERRESTRIAL VEGETATION (%)	0	0	0
AQUATIC VEGETATION (%)	0	0	0
WHITEWATER (%)	0	0	0
BOULDERS (%)	100	100	100
BEDROCK LEDGES (%)	0	0	0

Salmon Creek 2003
HABITAT TYPES BY PERCENT OCCURRENCE



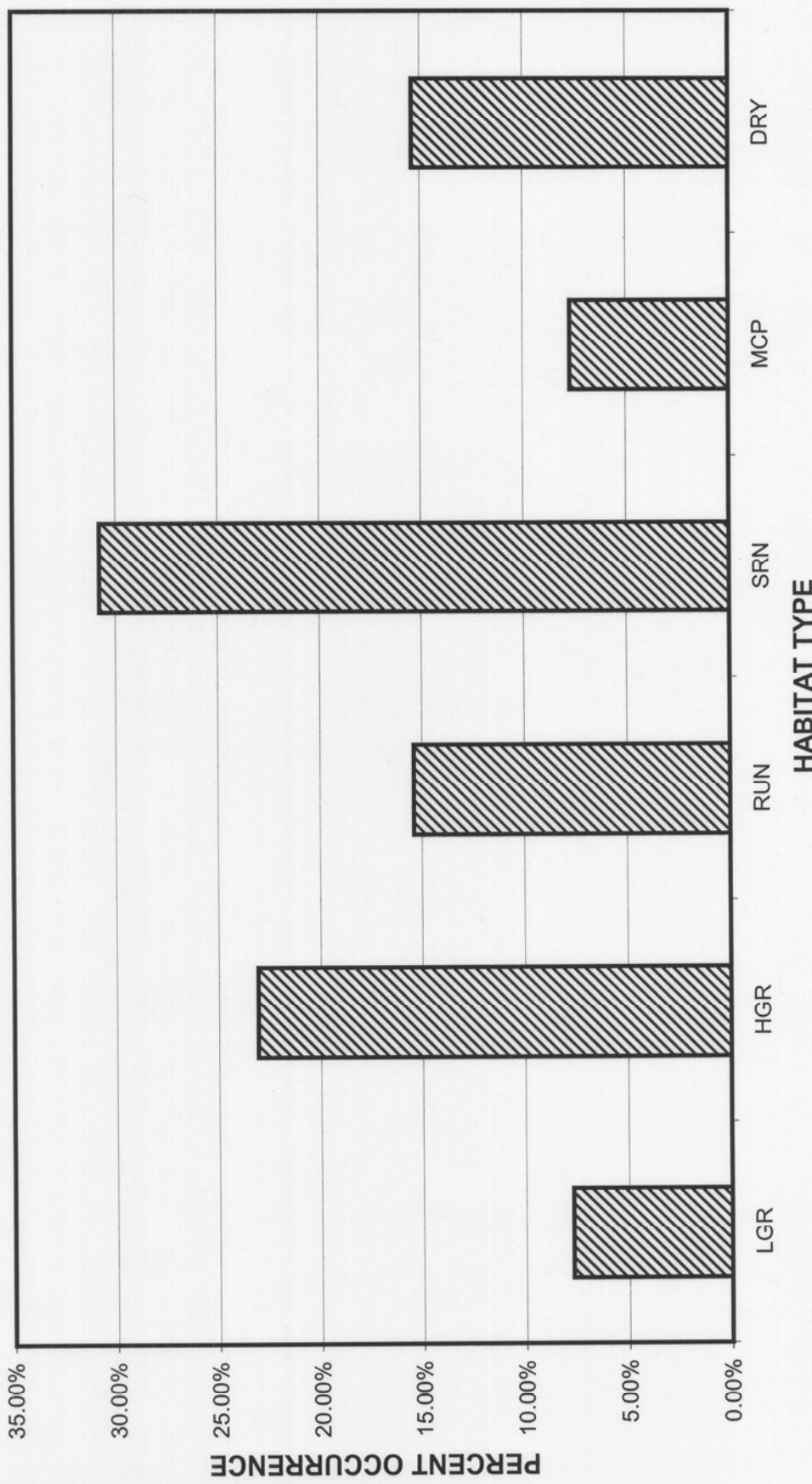
GRAPH 1

Salmon Creek 2003
HABITAT TYPES BY PERCENT TOTAL LENGTH



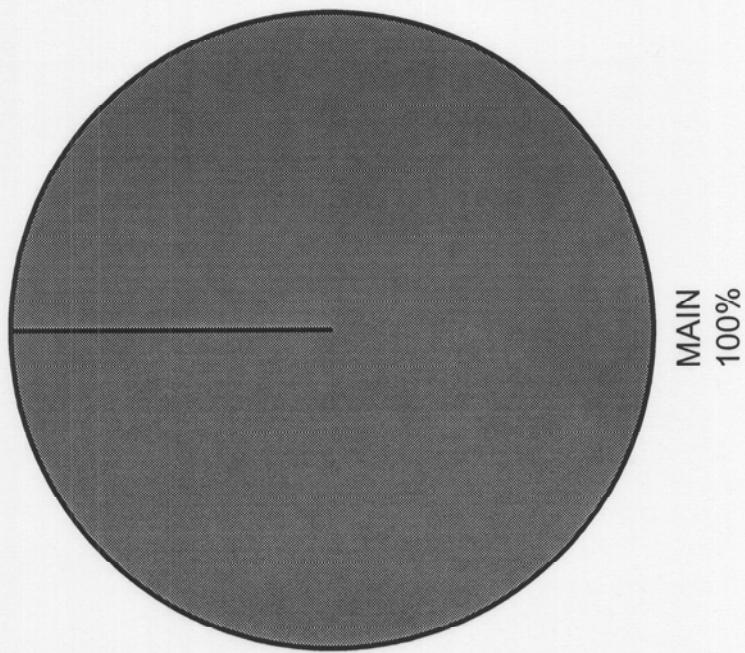
GRAPH 2

Salmon Creek 2003
HABITAT TYPES BY PERCENT OCCURRENCE



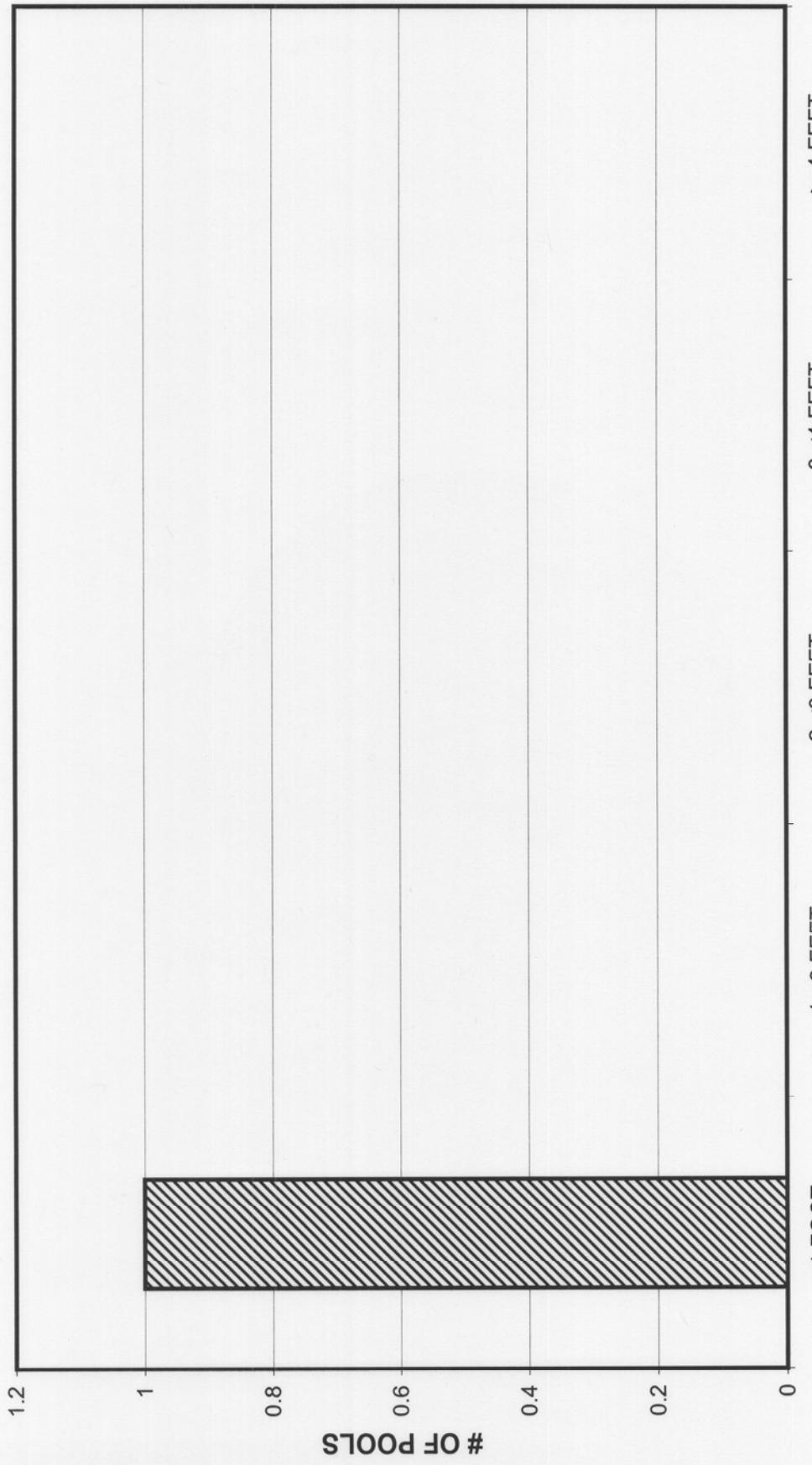
GRAPH 3

Salmon Creek 2003
POOL TYPES BY PERCENT OCCURRENCE



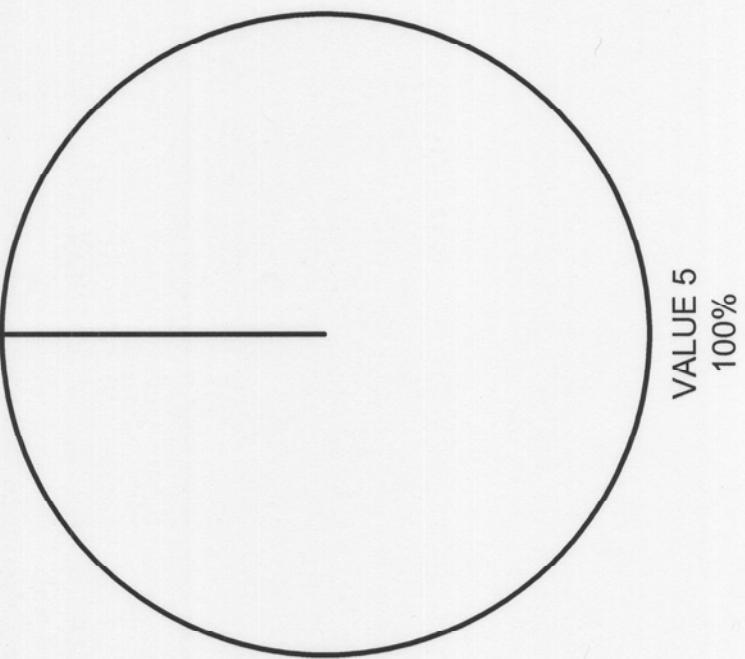
GRAPH 4

Salmon Creek 2003
MAXIMUM DEPTH IN POOLS



GRAPH 5

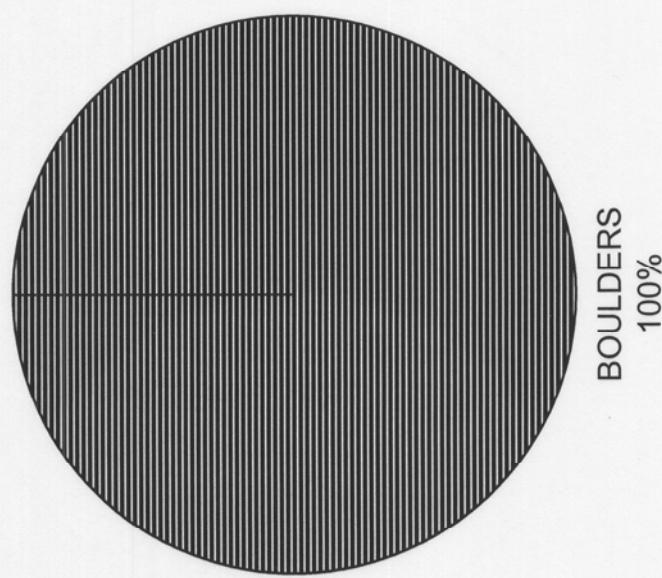
Salmon Creek 2003
PERCENT EMBEDDEDNESS



VALUE 5
100%

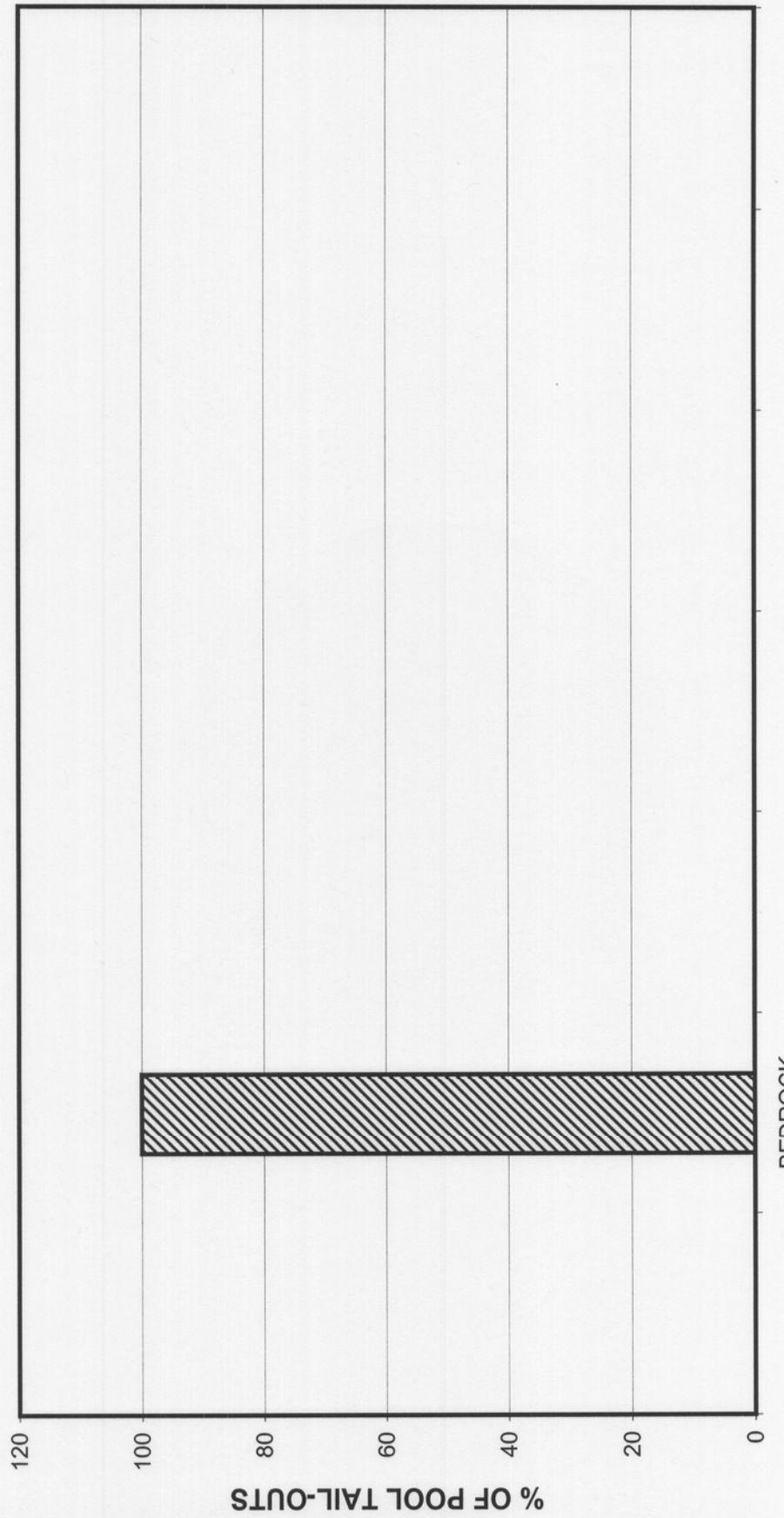
GRAPH 6

Salmon Creek 2003
MEAN PERCENT COVER TYPES IN POOLS



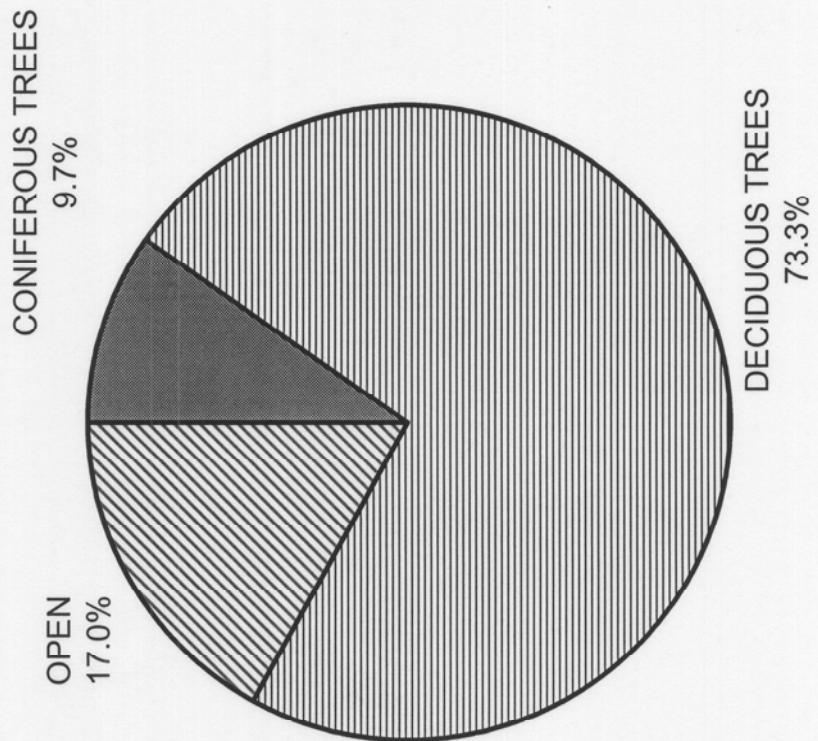
GRAPH 7

Salmon Creek 2003
SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



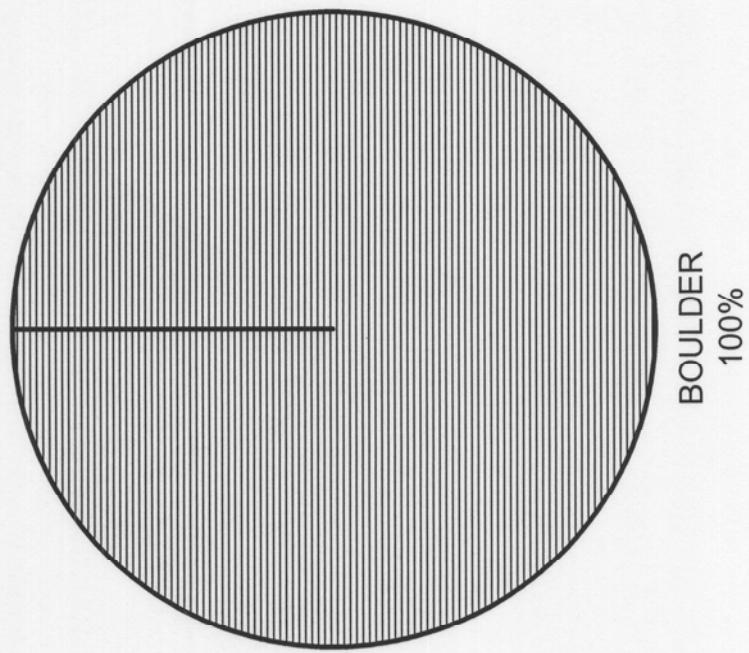
GRAPH 8

**Salmon Creek 2003
MEAN PERCENT CANOPY**



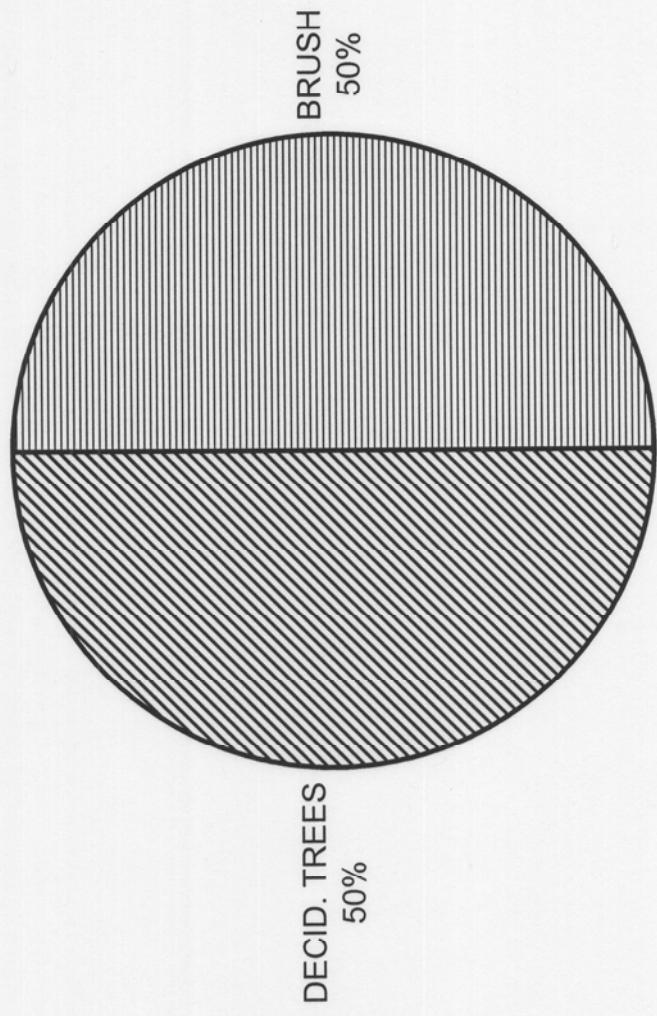
GRAPH 9

Salmon Creek 2003
DOMINANT BANK COMPOSITION IN SURVEY REACH



GRAPH 10

Salmon Creek 2003
DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11