



TRINITY RESTORATION ASSOCIATES INC.

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Administrative Office: P.O. Box 820, Arcata, CA 95521, (707) 826-2854 / FAX: 826-1742

Regional Office: P.O. Box 3972, Sonoma, CA 95370, (209) 586-1148 / FAX: 586-1159

FISH HABITAT TYPING OF LOWER LOST MAN CREEK APRIL 27, 1991

Investigative Report
for
Redwood National Park

by
Keith Barnard
August 6, 1991

Introduction

In the summer, 1989, Redwood National Park (RNP) removed an old concrete dam in lower Lost Man Creek. As part of an evaluation of that removal, Trinity Fisheries Consulting (TFC) was contracted to inventory the fish habitat types of lower Lost Man Creek. This report summarizes the fourth overall and the second post-project habitat inventory of the creek inventory, conducted on April 27, 1991.

Methods

The fish habitat of Lost Man Creek from the mouth at Prairie Creek (station 00+00 meters) to the Lost Man Creek picnic area bridge at station 20+50 meters was inventoried using the habitat typing method of Bisson et al (1981). Habitat typing was performed at a discharge of approximately 20 cfs, representing winter conditions. The parameters measured followed the methods used during the summer and winter, 1988 (TFC 1988) and the summer, 1990 (TFC 1990) surveys. The description of each habitat unit included the number, habitat type, length, average width, surface area, average depth, maximum depth, volume, pool tail crest depth and a two-part shelter rating. The present survey also includes a substrate coding for each habitat unit which identifies the dominant and subdominant particle size classes using the following system:

<u>Code</u>	<u>Size</u>	<u>Code</u>	<u>Size</u>
1	Silt	6	Large cobble (5"-10")
2	Sand	7	Small boulder (10"-20")
3	Small gravel (.08"-1")	8	Large boulder (>20")
4	Large gravel (1"-2")	9	Bedrock
5	Small cobble (2"-5")		

Summary and analysis of the 1991 data followed the same criteria as the pre-project surveys (TFC 1988). The stream reach was separated into two strata: the lower 1433 meters considered under the influence of the dam;

and a stratum above the dam, from station 14+33 to 20+50 at the picnic area bridge. Data are presented in summary tables, pie charts and histograms of key parameters for the two strata (Appendix A). Field data in metric units are included (Appendix B).

Results

A comparison of the distribution of habitat types by surface area between the winter 1988 survey (TFC 1988) and the present winter 1991 survey demonstrates a more distinct change in the lower section than in the upper section. The area distribution pie charts for both surveys (Figure 1) indicate that there was only a slight change in the riffle:run:pool ratio over time in the upper section. In the lower section, however, pool area decreased over time from 45.3% of the total to 27.0%, runs increased from 17.3 % to 20.3%, and riffle area increased from 37.4% to 52.7%.

Comparison between the summary tables of 1988 and 1991 for the lower section reveals a decrease of pools over time in: the number of units (50% to 41%); the percentage of surface area; and the percentage of volume of the section (67.4% to 56.3%). Along with these decreases comes a corresponding increase in riffle (and run) parameters over time throughout the lower section.

The upper section (14+33 to 20+50 m) exhibited less of a change over time. The total surface area of pools increased slightly from 42.6% to 50.3% while the surface area of riffles decreased from 44.6% to 38.5% and runs from 12.7% to 11.22%.

Conclusions

The changes in fish habitat in the lower section of Lost Man Creek between winter, 1988 and winter, 1991 are likely due to the removal of the concrete dam during the summer, 1988. Sediment stored behind the dam moved downstream through the system. The slug of sediment aggraded several pre-project pools, thus increasing riffle and run habitat. These changes are consistent with those found in the summer, 1990 and are probably temporary. An adjustment towards the pre-project conditions should occur over the next several years as the sediment load from the dam is flushed from Lost Man Creek and into Prairie Creek.

The impact of the habitat type shift on the fisheries was not directly studied during the post-project habitat typing. The direct observation and electrofishing conducted during the summer, 1988 was not duplicated for this post-project monitoring. Nonetheless, some speculations can be made.

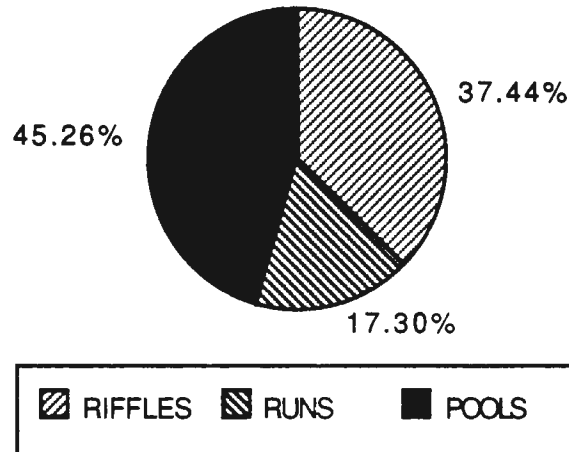
The removal of the dam has clearly improved access to the upper sections of Lost Man Creek for spawning adult salmonids. Assuming that chinook salmon fry tend to move out of the spawning tributaries as young-of-the-year in this region, the decrease in pool habitat will likely have little affect on chinook fry survival. On the other hand, coho salmon, which rear at

least one year in Lost Man Creek, and steelhead, which rear for one to two years, use pools with good shelter for much of their winter (and summer) rearing. The apparent loss of pool habitat in the lower 1430 meters will likely impact coho salmon and possibly steelhead by causing a temporary decrease in the carrying capacity of lower Lost Man Creek for the winter rearing stages.

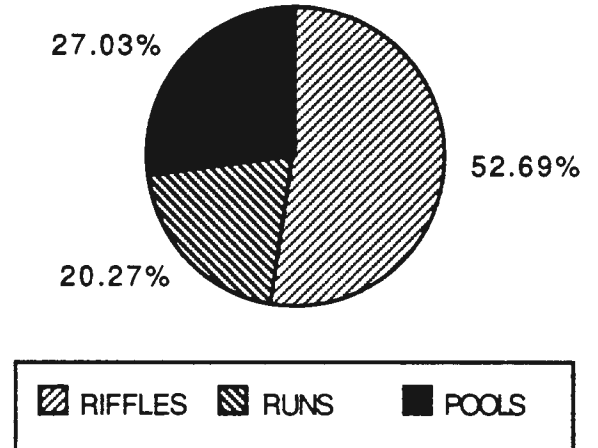
References

- Bisson, P.A., J.L. Nielsen, R.A. Palmason and L.E. Grove. 1981. A system of naming habitat types in small streams, with examples of habitat utilization by salmonids during low streamflow. Symposium Proceedings: Acquisition and Utilization of Aquatic Habitat Inventory Information. Western Division American Fisheries Society.
- Trinity Fisheries Consulting. 1988. Baseline documentation of the physical and biological aquatic ecosystem of Lost Man Creek. Investigation Report to Redwood National Park.

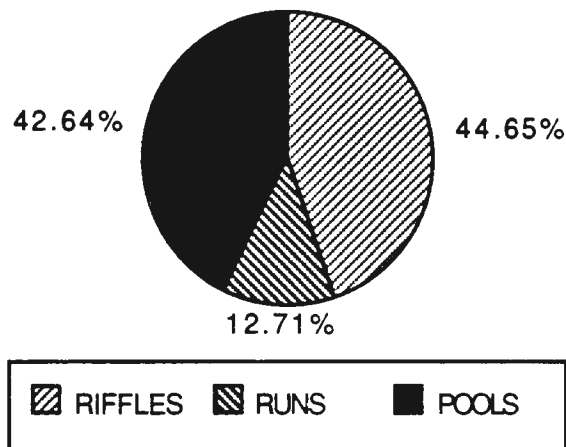
**LOWER LOST MAN CREEK
AREA DISTRIBUTION
WINTER BASEFLOW, 1988**



**LOWER LOST MAN CREEK
AREA DISTRIBUTION
WINTER, 1991**



**UPPER LOST MAN CREEK
AREA DISTRIBUTION
WINTER BASEFLOW, 1988**



**UPPER LOST MAN CREEK
AREA DISTRIBUTION
WINTER, 1991**

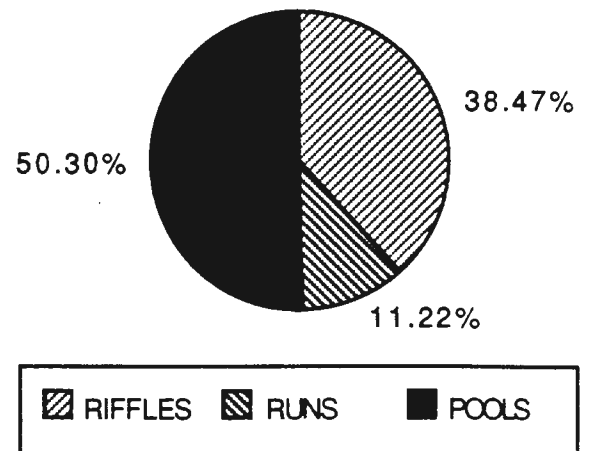
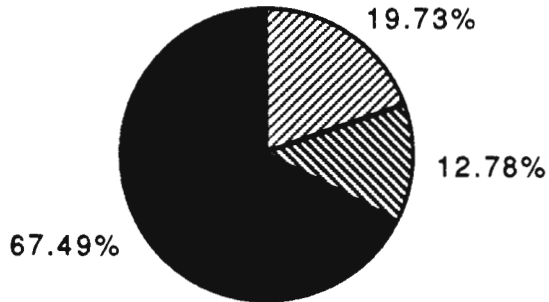


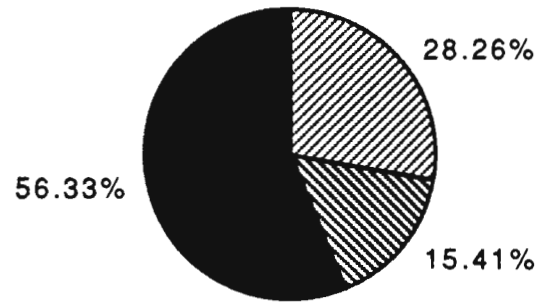
Figure 1. Comparison of surface area distribution of winter fish habitat for lower Lost Man Creek between 1988 and 1991.

**LOWER LOST MAN CREEK
VOLUME DISTRIBUTION
WINTER BASEFLOW, 1988**



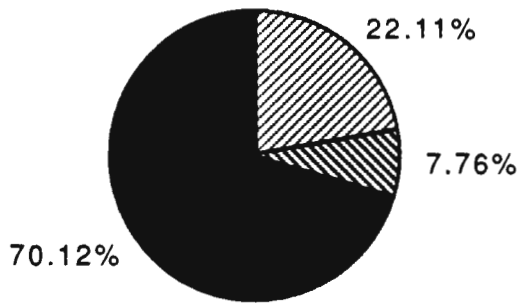
RIFFLES RUNS POOLS

**LOWER LOST MAN CREEK
VOLUME DISTRIBUTION
WINTER, 1991**



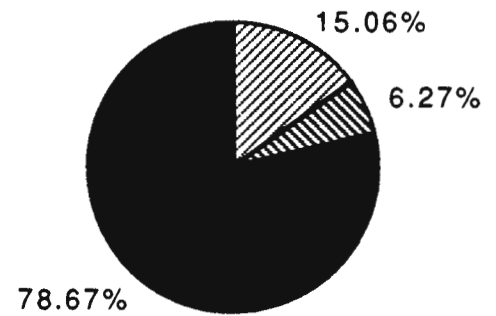
RIFFLES RUNS POOLS

**UPPER LOST MAN CREEK
VOLUME DISTRIBUTION
WINTER BASEFLOW, 1988**



RIFFLES RUNS POOLS

**UPPER LOST MAN CREEK
VOLUME DISTRIBUTION
WINTER, 1991**



RIFFLES RUNS POOLS

Figure 2. Comparison of volume distribution of winter fish habitat for lower Lost Man Creek between 1988 and 1991.

Appendix A Summary sheets and charts for winter 1991 habitat typing on
Lost Man Creek.

UNITS: METRIC

LOWER LOST MAN CREEK (0 - 1433 m): PHYSICAL SUMMARY

WINTER, 1991

		UNITS		LENGTH			WIDTH	AREA			DEPTH			VOLUME			SHELTER RATING		
HABITAT DESCRIPTIONS	HABITAT TYPES	TOTAL	% OF TOTAL	TOTAL	% OF TOTAL	AVG./ UNIT	AVG./ UNIT	TOTAL	TOTAL	AVG./ UNIT	AVG./ UNIT	MAXI- MUM	AVG. MAX.	TOTAL	% OF TOTAL	AVG./ UNIT	% COVER	VALUE	WEIGHTED
																	AVG./ UNIT	AVG./ UNIT	VALUE
		UNIT	UNIT	AVG./UNIT															
RIFLES																			
LO GRAD. RIFLES	1	27	37.0%	807.0	48.8%	29.9	8.1	7,017.0	52.4%	259.9	0.2	0.6	0.3	1,132.0	28.2%	41.9	6.9%	1.5	0.1
"CHUTE"	23	1	1.4%	6.1	0.4%	6.1	6.1	37.2	0.3%	37.2	0.1	0.2	0.2	3.4	0.1%	3.4	0.0%	0.0	0.0
TOTAL/AVG.	2	28	38.4%	813.1	49.2%	29.0	8.0	7,054.2	52.7%	251.9	0.2	0.6	0.3	1,135.4	28.3%	40.6	6.7	1.4	0.1

RUNS																			
GLIDE	14	5	6.8%	89.3	5.4%	17.9	8.7	768.0	5.7%	153.2	0.2	0.3	0.3	149.0	3.7%	29.8	2.0%	0.6	0.0
FLN	15	10	13.7%	244.0	14.8%	24.4	7.6	1,946.0	14.6%	194.8	0.3	0.4	0.4	470.0	11.7%	47.0	10.0%	1.5	0.2
TOTAL/AVG.	2	15	20.5%	333.3	20.1%	22.2	8.0	2,714.0	20.3%	180.9	0.3	0.4	0.4	619.0	15.4%	41.3	7.3	1.2	0.1

POOLS																			
BCKWTR/BOUL.	5	1	1.4%	6.1	0.4%	6.1	3.7	22.3	0.2%	22.3	0.5	0.8	0.8	10.2	0.3%	10.2	5.0%	1.0	0.1
PLUNGE POOL	9	2	2.7%	26.2	1.6%	13.1	10.7	292.0	2.2%	146.0	0.7	1.5	1.2	234.0	5.8%	117.0	12.5%	3.0	0.4
LAT. SCOUR/LOD	10	13	17.8%	226.0	13.7%	17.4	7.6	1,759.0	13.1%	135.3	0.8	1.5	1.0	1,191.0	29.6%	91.6	33.1%	2.8	0.9
LAT. SCOUR/BOUL.	20	12	16.4%	222.0	13.4%	18.5	5.9	1,420.0	10.6%	116.3	0.5	1.5	0.8	747.0	18.6%	62.3	19.2%	2.8	0.5
CORNER POOL	22	2	2.7%	27.4	1.7%	13.7	4.3	126.0	0.9%	63.0	0.6	0.9	0.7	80.8	2.0%	40.3	22.5%	2.0	0.5
TOTAL/AVG.	5	30	41.1%	507.7	30.7%	16.9	6.8	3,619.3	27.0%	120.6	0.6	1.5	0.9	2,262.8	56.3%	75.4	24.5	2.7	0.7

HABITAT DESCRIPTIONS	HABITAT TYPES	UNITS		LENGTH			WIDTH	AREA			DEPTH			VOLUME			SHELTER RATING		
		TOTAL	% OF TOTAL	TOTAL	% OF TOTAL	AVG./ UNIT	AVG./ UNIT	TOTAL	% OF TOTAL	AVG./ UNIT	AVG./ UNIT	MAXI- MUM	AVG. MAX.	TOTAL	% OF TOTAL	AVG./ UNIT	% COVER	VALUE	WEIGHTED
																	AVG./ UNIT	AVG./ UNIT	VALUE AVG./UNIT
RIFLES	2	28	38.4%	813.1	49.2%	29.0	8.0	7,054.2	52.7%	251.9	0.2	0.6	0.3	1,135.4	28.3%	40.6	6.7%	1.4	0.1
RUNS	2	15	20.5%	333.3	20.1%	22.2	8.0	2,714.0	20.3%	180.9	0.3	0.4	0.4	619.0	15.4%	41.3	7.3%	1.2	0.1
POOLS	5	30	41.1%	507.7	30.7%	16.9	6.8	3,619.3	27.0%	120.6	0.6	1.5	0.9	2,262.8	56.3%	75.4	24.5%	2.7	0.7
TOTAL/AVG.	9	73	100.0%	1654.1	100.0%	22.7	7.5	13,387.5	100.0%	183.4	0.4	1.5	0.6	4,017.2	100.0%	55.0	14.1%	1.9	0.3

UNITS: METRIC

UPPER LOST MAN CREEK (1433-2050 m.): PHYSICAL SUMMARY

WINTER, 1991

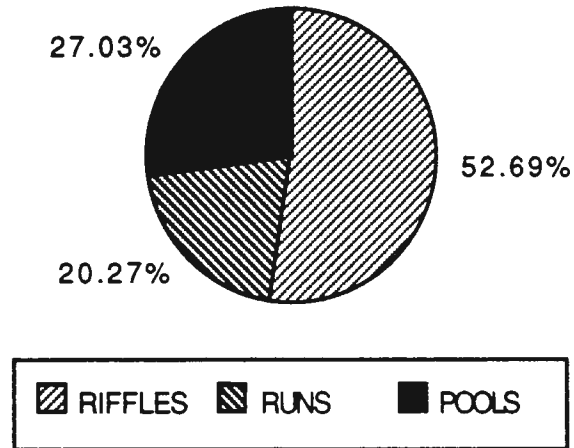
		UNITS		LENGTH			WIDTH	AREA			DEPTH			VOLUME			SHELTER RATING				
HABITAT DESCRIPTIONS	HABITAT TYPES	TOTAL	% OF TOTAL	TOTAL	% OF TOTAL	AVG./ UNIT	AVG./ UNIT	TOTAL	% OF TOTAL	AVG./ UNIT	AVG./ UNIT	MAXI-MUM	AVG. MAX.	TOTAL	% OF TOTAL	AVG./ UNIT	% COVER	VALUE	WEIGHTED		
																	AVG./ UNIT	AVG./ UNIT	VALUE	VALUE	AVG./UNIT
RIFLES																					
LO GRAD. RIFLES	1	15	32.6%	269.0	35.1%	17.9	6.6	1,900.0	37.0%	126.7	0.2	0.3	0.2	307.6	14.4%	20.5	5.3%	1.0	0.1		
HIGRAD. RIFLES	2	2	4.3%	22.9	3.0%	11.5	3.4	78.0	1.5%	39.0	0.2	0.4	0.3	14.3	0.7%	7.2	17.5%	2.0	0.4		
TOTAL/AVG.	2	17	37.0%	291.9	38.1%	17.2	6.2	1,978.0	38.5%	116.4	0.2	0.4	0.2	321.9	15.1%	18.9	6.7	1.1	0.1		

RUNS																			
GLIDE	14	3	6.5%	27.4	3.6%	9.1	10.2	269.0	5.2%	89.7	0.2	0.4	0.3	54.4	2.5%	18.1	5.0%	0.7	0.0
RUN	15	5	10.9%	85.3	11.1%	17.1	3.7	308.0	6.0%	61.6	0.2	0.6	0.4	79.5	3.7%	15.9	22.0%	1.8	0.4
TOTAL/AVG.	2	8	17.4%	112.7	14.7%	14.1	6.1	577.0	11.2%	72.1	0.2	0.6	0.3	133.9	6.3%	16.7	15.6	1.4	0.3

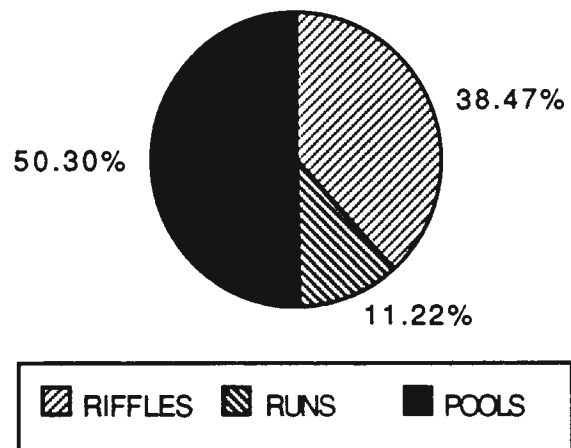
POOLS																			
BCKWTR/LOD	7	1	2.2%	6.7	0.9%	6.7	6.7	45.0	0.9%	45.0	0.3	0.4	0.4	13.7	0.6%	13.7	10.0%	3.0	0.3
LAT. SCOUR/LOD	10	10	21.7%	153.0	19.9%	15.3	6.9	1,060.0	20.6%	106.0	0.6	1.5	0.9	672.4	31.5%	67.2	30.0%	2.7	0.8
LAT. SCOUR/RTWD.	11	5	10.9%	77.7	10.1%	15.5	6.8	542.0	10.5%	108.4	0.4	0.9	0.7	245.1	11.5%	49.0	9.0%	2.8	0.3
LAT. SCOUR/BDRK	12	4	8.7%	66.9	11.3%	21.7	7.5	649.0	12.6%	162.3	0.7	1.8	1.2	502.1	23.5%	125.5	32.5%	2.0	0.7
LAT. SCOUR/BOUL.	20	1	2.2%	38.1	5.0%	38.1	7.6	290.3	5.6%	290.3	0.9	1.3	1.3	247.8	11.6%	247.8	15.0%	3.0	0.5
TOTAL/AVG.	5	21	45.7%	362.4	47.2%	17.3	7.0	2,586.3	50.3%	123.2	0.6	1.8	0.9	1,681.1	78.7%	80.1	23.8	2.6	0.6

HABITAT DESCRIPTIONS	HABITAT TYPES	UNITS		LENGTH			WIDTH	AREA			DEPTH			VOLUME			SHELTER RATING		
		TOTAL	% OF TOTAL	TOTAL	% OF TOTAL	AVG./ UNIT	AVG./ UNIT	TOTAL	% OF TOTAL	AVG./ UNIT	AVG./ UNIT	MAXI-MUM	AVG. MAX.	TOTAL	% OF TOTAL	AVG./ UNIT	% COVER	VALUE	WEIGHTED
																	AVG./ UNIT	AVG./ UNIT	VALUE AVG./UNIT
RIFLES	2	17	37.0%	291.9	38.1%	17.2	6.2	1,978.0	38.5%	116.4	0.2	0.4	0.2	321.9	15.1%	18.9	6.7%	1.1	0.1
RUNS	2	8	17.4%	112.7	14.7%	14.1	6.1	577.0	11.2%	72.1	0.2	0.6	0.3	133.9	6.3%	16.7	15.6%	1.4	0.3
POOLS	5	21	45.7%	362.4	47.2%	17.3	7.0	2,586.3	50.3%	123.2	0.6	1.8	0.9	1,681.1	78.7%	80.1	23.8%	2.6	0.6
TOTAL/AVG.	9	46	100.0%	767.0	100.0%	16.7	6.6	5,141.3	100.0%	111.8	0.4	1.8	0.6	2,136.9	100.0%	46.5	16.1%	1.9	0.4

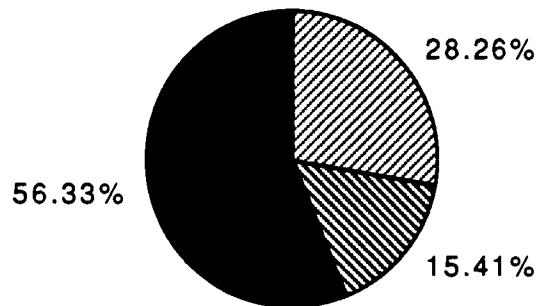
**LOWER LOST MAN CREEK
AREA DISTRIBUTION
WINTER, 1991**



**UPPER LOST MAN CREEK
AREA DISTRIBUTION
WINTER, 1991**

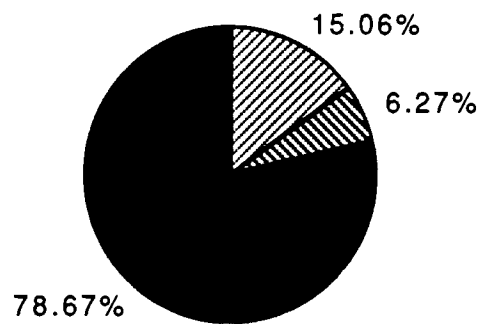


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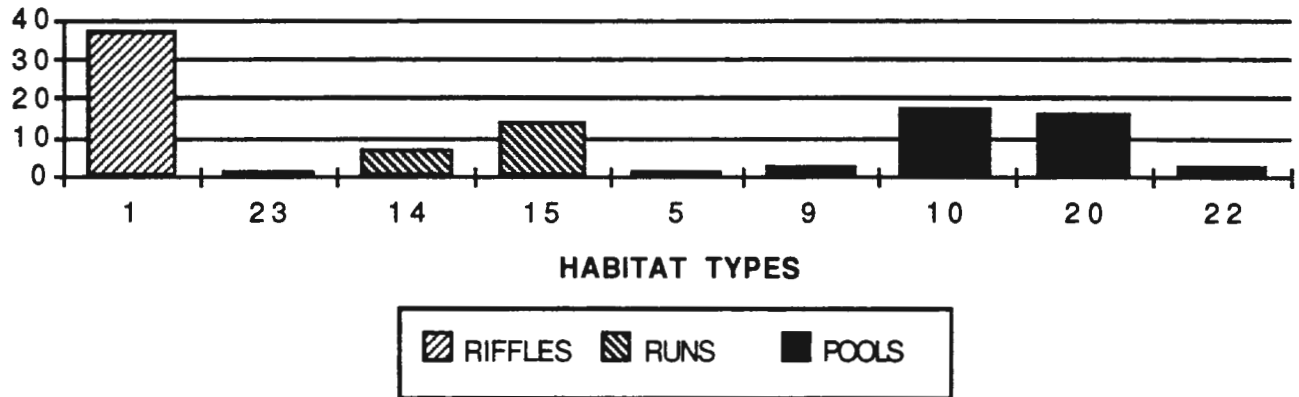
RIFFLES RUNS POOLS

**UPPER LOST MAN CREEK
VOLUME DISTRIBUTION
WINTER, 1991**

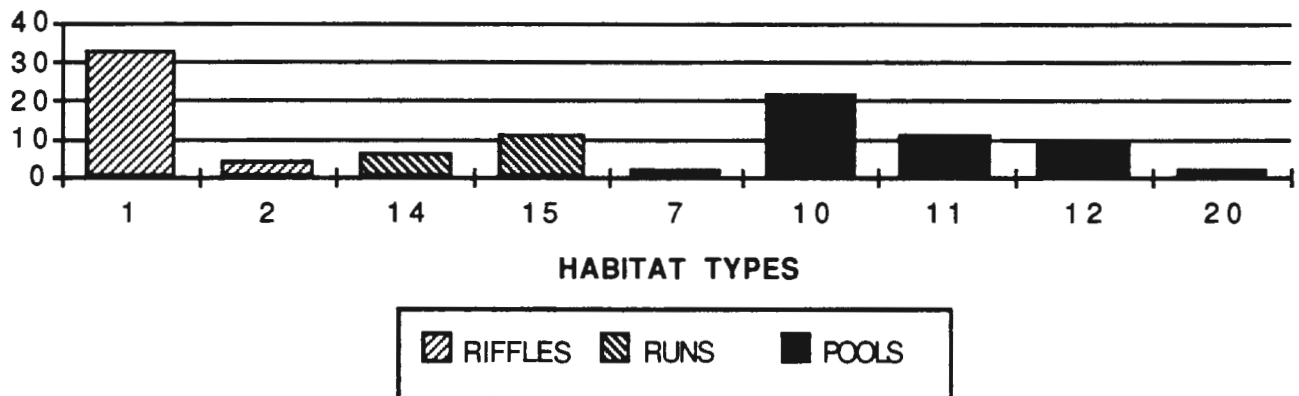


RIFFLES RUNS POOLS

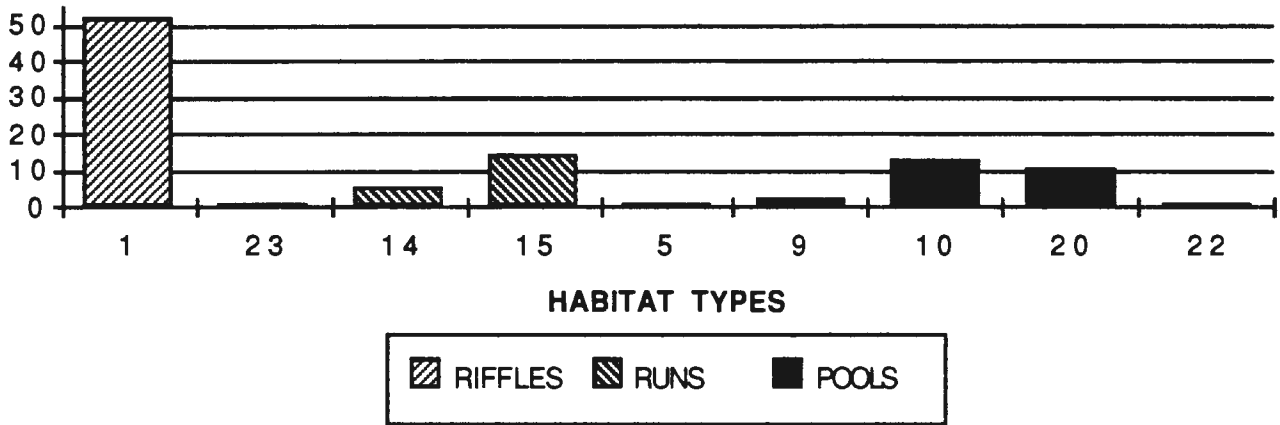
**LOWER LOST MAN CREEK (0-1433 m.)
PERCENTAGE OF TOTAL NUMBER OF UNITS
BY HABITAT TYPE
WINTER, 1991**



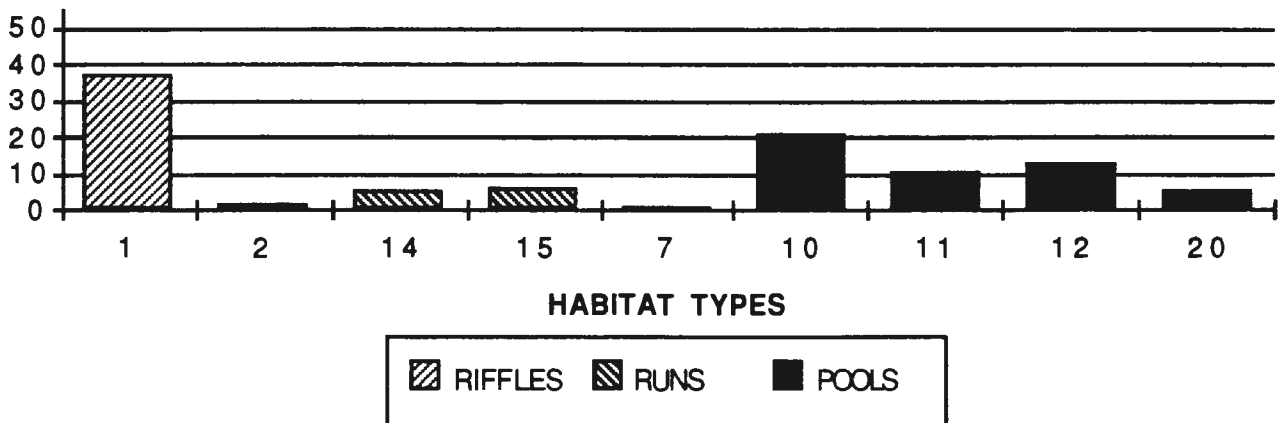
**UPPER LOST MAN CREEK (1433-2050 m.)
PERCENTAGE OF TOTAL NUMBER OF UNITS
BY HABITAT TYPE
WINTER, 1991**



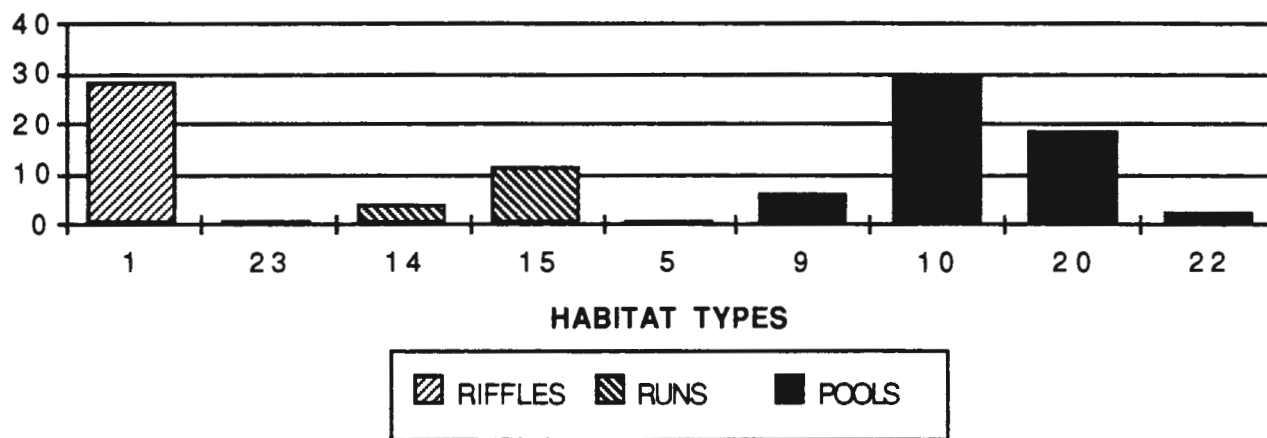
LOWER LOST MAN CREEK (0-1433 m.)
 PERCENTAGE OF TOTAL SURFACE AREA
 BY HABITAT TYPE
 WINTER, 1991



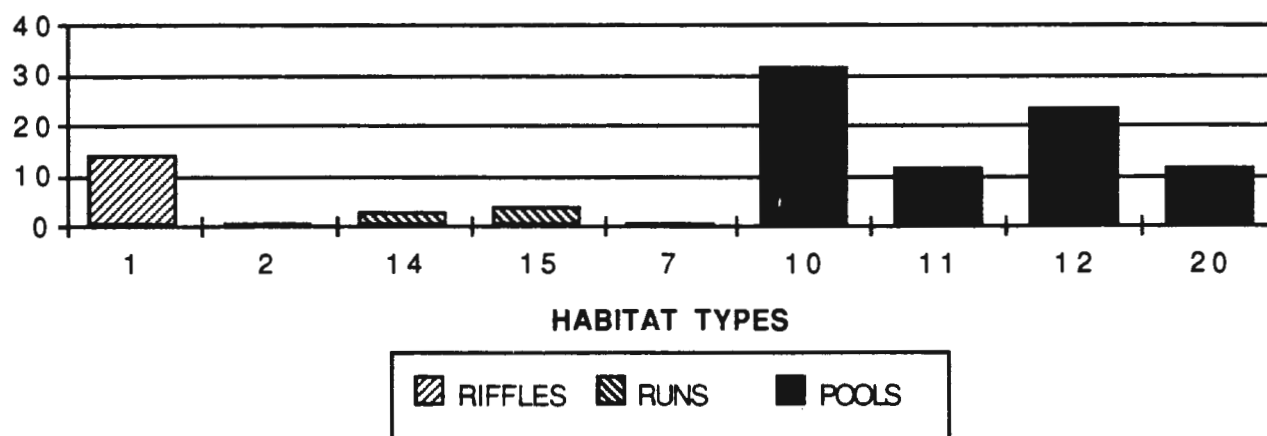
UPPER LOST MAN CREEK (1433-2050 m.)
 PERCENTAGE OF TOTAL SURFACE AREA
 BY HABITAT TYPE
 WINTER, 1991



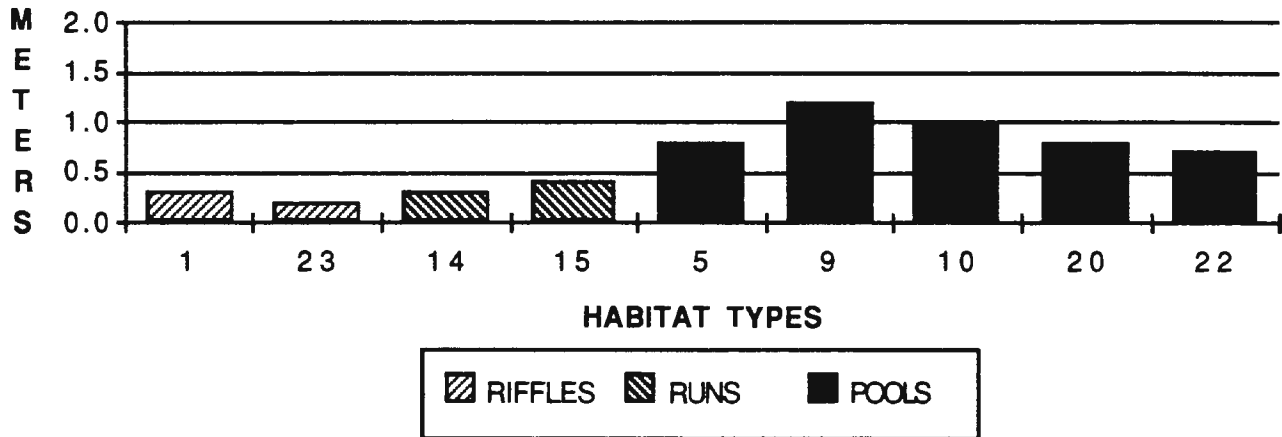
**LOWER LOST MAN CREEK (0-1433 m.)
PERCENTAGE OF TOTAL VOLUME
BY HABITAT TYPE
WINTER, 1991**



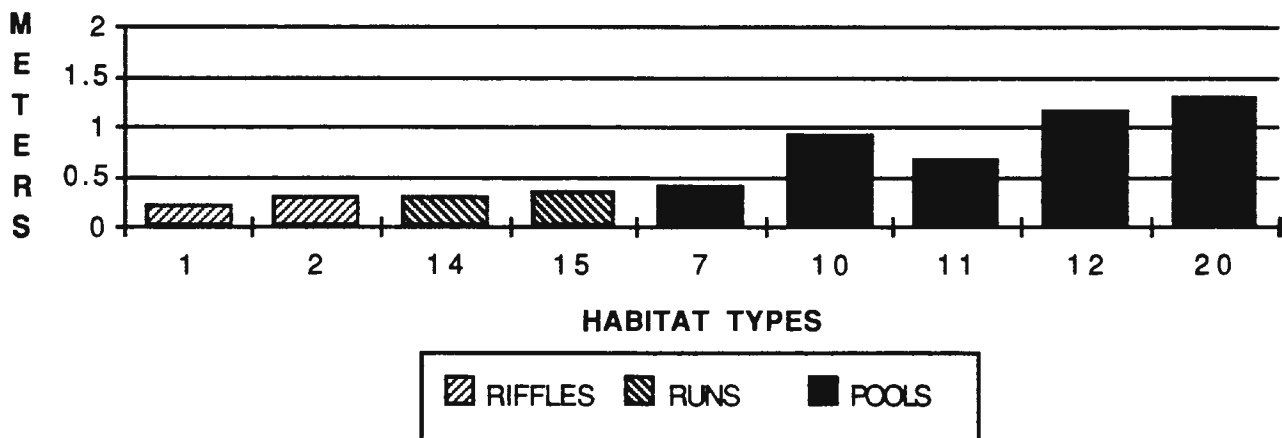
**UPPER LOST MAN CREEK (1433-2050 m.)
PERCENTAGE OF TOTAL VOLUME
BY HABITAT TYPE
WINTER, 1991**



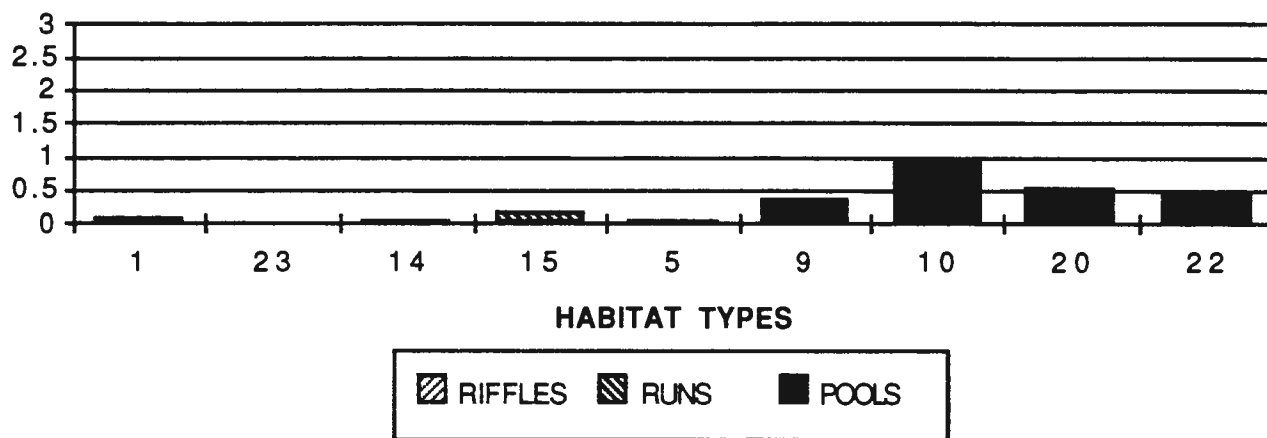
LOWER LOST MAN CREEK (0-1433 m.)
 AVERAGE MAXIMUM DEPTH PER UNIT
 BY HABITAT TYPE
 WINTER, 1991



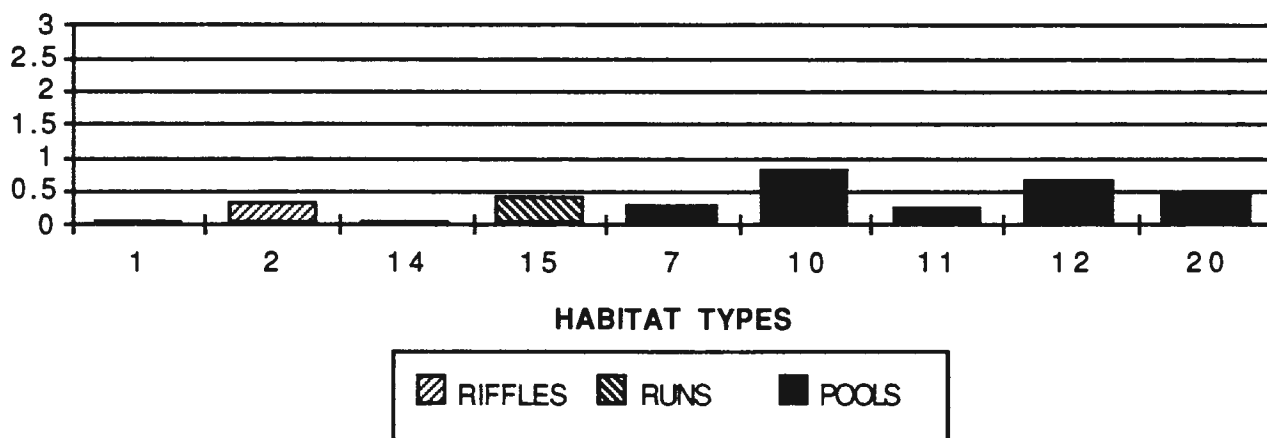
UPPER LOST MAN CREEK (1433-2050 m.)
 AVERAGE MAXIMUM DEPTH PER UNIT
 BY HABITAT TYPE
 WINTER, 1991



LOWER LOST MAN CREEK (0-1433 m.)
AVERAGE WEIGHTED SHELTER RATING
BY HABITAT TYPE
WINTER, 1991



UPPER LOST MAN CREEK (1433-2050 m.)
AVERAGE WEIGHTED SHELTER RATING
BY HABITAT TYPE
WINTER, 1991



Appendix B Field data for winter 1991 habitat typing on Lost Man Creek

STREAM: LOST MAN
STRATUM: LOWER
FEET

DATE: 4/27/91
CFS: ±20
SURVEYOR: BARNARD

HABITAT TYPE FIELD DATA

UNIT	HABITAT	AVERAGE		DEPTH		POOL	SHELTER RATING		DOM.	SUBDOM.	STATION	NOTES:
#	TYPE	L	W	AVG	MAX	TAIL CREST	% COVER	VALUE	SUBSTR.	SUBSTR.	NUMBER	
1	20	13.7	4.9	0.5	0.58	0.18	15	2	4	3		
2	1	8.2	5.5	0.2	0.30		10	1	4	3		
3	10	8.5	5.5	0.4	0.58	0.18	15	2	3	4		Cabled Log RB
4	15	12.2	6.1	0.3	0.40	0.00	25	2	4	3		
5	1	44.2	6.7	0.2	0.27	0.00	20	2	4	5		
6	20	39.0	6.1	0.5	0.58	0.15	15	3	3	4		101 Bridge abutment, Stage=0.02' above 4/22/91
7	22	6.1	3.7	0.5	0.61	0.21	25	2	3	2		Adjacent to 8
8	1	20.7	10.7	0.2	0.30		10	2	3	4		RB trib.
9	15	27.4	10.7	0.2	0.37	0.15	10	1	3	4		Lamprey redd
10	20	22.9	6.7	0.6	1.04	0.15	30	3	3	2		Not LSR as in 89
11	9	9.1	9.1	0.5	0.82	0.15	10	3	3	4		Hatchery wier at top
12	20	41.1	7.9	0.6	0.91	0.06	15	3	3	4	02+10	Top of unit, 2 lamprey adults
13	1	13.7	7.9	0.2	0.30		10	2	4	5		
14	20	15.2	6.7	0.5	0.61	0.18	15	3	3	4		
15	1	9.1	9.1	0.2	0.24		5	1	3	2	02+50	
16	9	17.1	12.2	0.9	1.52	0.15	15	3	2	3		
17	23	6.1	6.1	0.1	0.15		0	0	9			Concrete apron
18	20	8.5	6.1	0.9	1.46	0.15	30	3	3	2		Concrete wier LB
19	1	16.8	7.9	0.2	0.37		10	2	3	4	03+00	Redds flagged
20	20	23.8	6.7	0.6	0.85	0.21	15	3	3	4		
21	1	7.3	7.3	0.1	0.24		5	2	3	4		
22	14	12.2	7.9	0.2	0.34	0.12	5	2	3	4		RNP LM Fry Trap #1
23	20	12.2	4.3	0.5	0.64	0.12	20	3	4	3	03+50	
24	15	15.2	4.3	0.3	0.37	0.12	15	2	3	4		
25	10	16.8	9.1	0.9	1.22	0.18	70	3	2	3		
26	1	27.4	9.8	0.2	0.34		5	2	3	4	04+00	
27	5	6.1	3.7	0.5	0.76	0.24	5	1	1	2		Adj. to 26
28	20	7.6	2.4	0.5	0.70	0.24	10	2	4	3		Concrete wier bottom
29	10	30.5	6.1	0.7	0.98	0.24	15	3	3	4		
30	1	10.7	8.5	0.2	0.24		15	2	4	3		
31	15	18.3	7.3	0.2	0.37	0.18	10	2	3	4	04+50	
32	10	13.7	4.9	0.5	0.70	0.18	35	3	4	3		
33	1	7.6	3.7	0.2	0.27		10	2	4	3		
34	10	14.6	3.0	0.5	0.70	0.18	35	3	4	3		
35	14	30.5	6.7	0.2	0.24		0	0	4	3		Adj. to 34
36	14	18.3	10.7	0.2	0.27	0.15	5	1	3	2		
37	10	32.0	9.8	0.7	1.22	0.15	25	3	3	2		
38	22	21.3	4.9	0.7	0.85	0.15	20	2	2	3		RB Trib
39	1	16.8	7.6	0.2	0.37		0	0	4	3	05+50	
40	14	8.5	7.6	0.2	0.30		0	0	3	4		
41	10	8.5	9.1	0.4	0.64	0.18	15	3	4	3		
42	1	73.2	7.9	0.2	0.34		5	2	4	5	06+00	
43	15	27.4	7.3	0.3	0.43	0.18	5	2	4	3	06+50	
44	10	10.1	9.1	0.7	0.91	0.18	30	3	2	3		LM Pool E
45	1	9.8	9.1	0.2	0.27		5	2	3	4		
46	10	22.9	8.5	0.9	1.52	0.18	45	3	3	4	07+00	
47	1	25.9	7.6	0.2	0.27		5	2	3	4		
48	15	28.0	7.9	0.2	0.43	0.15	10	2	3	4		
49	1	91.4	9.1	0.2	0.58		10	2	4	3	08+00 and 08+50, LMFT #2	
50	15	45.7	9.1	0.2	0.43	0.15	5	1	3	4		
51	1	25.9	11.0	0.1	0.30		0	0	3	4		
52	14	19.8	10.4	0.2	0.30	0.12	0	0	3	4	09+50	
53	10	16.8	10.7	0.8	1.10	0.12	20	3	3	2		
54	1	135.6	10.7	0.1	0.30		5	2	3	4		
55	10	21.3	7.3	0.5	0.85	0.12	10	2	4	5		
56	1	22.9	10.7	0.1	0.18		5	1	4	5		
57	1	12.2	6.7	0.2	0.24		0	0	4	3	11+50	RB channel, mid-channel bar where dam was remov
58	20	6.1	6.1	0.4	0.55	0.15	15	3	4	5		RB channel, mid-channel bar where dam was remov
59	1	27.4	6.1	0.2	0.24		10	1	4	5		RB channel, mid-channel bar where dam was remov

UNIT	HABITAT	AVERAGE		DEPTH		POOL	SHELTER RATING		DOM	SUBDOM	STATION	NOTES:
#	TYPE	L	W	AVG	MAX	TAIL CREST	% COVER	VALUE	SUBSTR.	SUBSTR.	NUMBER	
60	20	15.2	6.7	0.3	0.52	0.15	40	3	4	3		LB channel, mid-channel bar where dam was remov
61	1	35.1	5.5	0.1	0.21	0.00	15	2	4	5		LB channel, mid-channel bar where dam was remov
62	1	24.4	12.2	0.2	0.21		5	3	3	4		5-6 yr. alders from LB fallen in creek
63	15	25.9	10.7	0.2	0.24		0	0	4	3		
64	1	82.3	9.1	0.2	0.27		5	2	4	5		12+50 & 13+00, Fast water
65	20	16.8	6.7	0.4	0.58	0.18	10	3	5	4		
66	1	15.2	6.1	0.2	0.24		0	0	4	5		
67	15	30.5	5.5	0.3	0.43	0.18	10	1	4	5		13+50
68	1	14.6	5.5	0.2	0.30		5	1	5	6		
69	15	13.4	7.3	0.2	0.43	0.18	10	2	4	5		Fast water
70	10	12.2	7.6	0.8	1.22	0.18	75	3	4	5		14+00 LWD, Fast
71	1	6.1	8.5	0.2	0.27		5	1	5	4		Fast
72	10	18.3	8.5	0.5	0.88	0.18	40	3	3	4		
73	1	22.9	7.3	0.2	0.30		5	1	5	6		
74	11	12.2	6.7	0.3	0.49	0.18	10	2	4	3		Fast pool off RB alder roots
75	1	10.7	9.1	0.2	0.24		0	0	4	5		
76	14	9.1	9.1	0.3	0.37	0.18	5	1	4	3		
77	10	22.9	9.1	0.9	1.46	0.18	20	3	4	2		Also bedrock
78	1	10.7	8.5	0.2	0.24		5	1	4	5		15+00
79	10	24.4	5.5	0.5	0.79	0.15	40	2	3	2		
80	15	18.3	6.1	0.3	0.55	0.15	15	2	5	4		Fast run with LWD
81	1	15.8	7.3	0.2	0.27		5	3	5	6		15+50
82	12	24.4	9.1	0.9	1.83	0.18	20	2	2	3		
83	10	9.1	7.3	0.5	0.88	0.18	75	3	4	2		
84	1	19.2	6.1	0.2	0.27		10	1	4	3		16+00
85	20	38.1	7.6	0.9	1.28	0.18	15	3	3	2		Boulders LB & LWD
86	1	56.4	9.1	0.2	0.27		5	1	4	5		16+50
87	1	10.7	7.6	0.2	0.27		10	1	4	3		17+00 LB channel
88	10	12.2	7.3	0.3	0.55	0.18	15	2	4	3		LB channel, Fast
89	1	21.3	7.6	0.2	0.21		5	1	4	3		LB channel
90	12	18.3	7.3	0.5	0.73	0.15	20	2	4	3		17+50 LB channel
91	15	13.7	4.3	0.2	0.37	0.15	20	2	4	5		LB channel, Fast run
92	10	13.4	8.5	0.3	0.55	0.15	10	2	2	3		RB channel adj. to 87
93	15	21.3	2.4	0.2	0.30		10	1	3	2		RB channel
94	10	9.1	3.0	0.5	0.67		10	3	2	3		RB channel
95	15	18.3	2.4	0.2	0.37		15	2	3	2		RB channel
96	1	12.2	1.8	0.1	0.15		15	2	3	4		RB channel
97	15	13.7	3.0	0.2	0.27	0.09	50	2	2	3		RB channel adj. to 91
98	10	16.8	7.3	1.0	1.52	0.18	45	3	2	4		Main channel, RB trib
99	1	18.3	10.1	0.2	0.24		5	1	4	3		
100	11	24.4	7.3	0.5	0.85	0.15	5	3	3	4		
101	1	21.3	6.1	0.2	0.30		5	1	4	5		18+50
102	12	22.9	4.3	0.5	0.76	0.18	80	2	3	2		Clay bedrock RB
103	1	11.0	9.1	0.2	0.24		5	1	4	5		
104	10	12.2	6.1	0.4	0.55	0.15	10	3	4	5		19+00
105	1	11.6	6.7	0.2	0.21		5	1	4	5		
106	10	8.5	8.5	0.5	0.88	0.15	25	3	4	2		
107	7	6.7	6.7	0.3	0.43	0.15	10	3	1	2		
108	11	16.8	6.7	0.5	0.73	0.18	10	3	4	5		Alder rootwad LB
109	2	10.7	2.4	0.2	0.37		30	3	5	4		Fast run
110	10	24.4	6.1	0.7	1.37	0.18	50	3	4	5		19+50
111	14	10.7	7.6	10.7	11.58		5	1	3	4		
112	11	13.7	8.5	0.5	0.79	0.15	10	3	4	5		
113	2	12.2	4.3	0.2	0.24		5	1	5	4		RB channel
114	1	24.4	5.5	0.2	0.21		5	1	4	5		RB channel
115	1	5.5	1.8	0.1	0.12		0	0	4	3		LB channel adj. to 113
116	11	10.7	4.9	0.4	0.61	0.06	10	3	4	2		LB channel adj. to 114
117	1	19.8	3.0	0.1	0.18		0	0	4	3		LB channel adj. to 114
118	14	7.6	13.7	0.2	0.24	0.12	0	0	3	4		LMFT #3
119	12	21.3	9.1	0.9	1.37	0.18	10	2	2	3		Bridge abutment, staff gauge 2.80