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Ex. 277-US-445

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**Stream Name : LARKIN CREEK 92
Year : '92

Reach	Length in feet	LWD /Mile	Large /Mile	Small /Mile	Brush /Mile	Area in Sq Feet	% P	% R	% G	% S	% F	Cover*	Dom*	Sbd*
1	3605.9	54.2	11.7	16.1	26.4	28106.8	8.2%	14.5%	77.2%	0.0%	0.0%	3	H	U
	3605.9					28106.8						4	H	U

*If more than one entry is listed per reach, there were an equal number of each entry.

**Stream Name : LARKIN CREEK 92
Year : '92

Reach Number	Mile From	Mile To	NSO From	NSO To	Sinu-osity	Corrected Length in ft	%Area	%Volume	Bankfull MD Ratio	Pools/Mile	% Pools
1	0	.6	1	17	1.7	3605.9	100.0%	100.0%	20.27	10.0	7.5%
2	.6	2.2	17	17	0.0	0.0	0.0%	0.0%			
						3605.9				10.0	7.5%

Stream Name : LARKIN CREEK 92
Year : 1992

Reach	Miles	Snsty	Grd	En	WC	Cv	Avg	Ch	Vy	Cn	Flow	Correctd	Correctd	Correctd	Avg	Bankfill	Resid	Bed	Substrate*	* Mx*									
1	2	1	2	1	2	1	in	ft	in	ft	in	in	sqft	in	cuft	in	ft	W/D	Rto	Depth	D	S	D	S	CV	bd	of	Time	
1	.6	1.7	0	S	2	2	2.93	3605.9	28106.8	47434.1	9.5	20.27	1.0	BR	CO	SA	SA	4	N	69	1005								
2	1.6						.0	3605.9	28106.8	47434.1																			

*If more than one entry per reach, there were an equal number of each entry.

Stream Name : LARKIN CREEK 92
 HUC : 18,1,2,1,5,B,,,,
 Year : '92

Reach No	River Mile From	River Mile To	Vlly Form	Sinusty	Ent	Substrate* Dom	Subdom	Grade	Valley Length	Width Class
1	0.0	0.6	7	1.7	S	BR	CO	0%	0.30	2
2	0.6	2.2								

Stream Name : LARKIN CREEK 92
Year : 1992

Reach	Mile From - To	Width	Zone	Floodplain Vegetation, Zone 1						Riparian Vegetation										
				GF	SS	SP	ST	LT	MT	GF	GF	HA								
1	0	.6	20	100%																

*If more than one entry is listed per reach, there were an equal number of each.

Stream Name : LARKIN CREEK 92
Year : '92

Reach	Mile From	To	Zone Floodplain Vegetation, Zone 2														
			Width	GF	SS	GF	SS	SP	ST	LT	MT	GF	SS	SP	ST	LT	MT
1	0	.6	80	100%													

*If more than one entry listed per reach, there were an equal number of each.
If report is blank, no data was found for this stream in Floodplain 2.

**Stream Name : LARKIN CREEK 92
 Year : '92

Reach N	Length Corrections			Width Corrections		
	Pools	Rifles	Glides	Pools	Rifles	Glides
1	.8296	1.0353	.9123	.9677	1.1111	1.1739
2	.8296	1.0353	.9123	.9677	1.1111	1.1739

Totals -----
Falls Chutes Dams Culverts

LARKIN CREEK

• NO SPECIAL FEATURES

Habitat Areas in Sqft, plus or minus Confidence

Stream Name : LARKIN CREEK '92
 Year : '92

Reach	Pool's Confidence (sq ft)	+ or - Interval	Glides Confidence (sq ft)	+ or - Interval	Riffles Confidence (sq ft)	+ or - Interval
1	2355	324.05	22130	1136.37		4165
2						

USDA Forest Service
Region 6

Stream Survey Management
Form A Comments Summary

Page 1 of 1
06-OCT-92

Stream Name : LARKIN CREEK 92
Year : '92

Comments

LARKIN CREEK DRAINS INTO THE LOWER WILLIAMSON RIVER.

Stream Name : LARKIN CREEK 92
Year : '92

Reach No : 1

Comments

NUMEROUS SMALL SCOUR POOLS WHICH WERE UNCLASSIFIABLE. LOTS
OF LOG WEIRS. SILT ACCUMULATION. SMALL GRAVELS ABUNDANT.
SEE ATTACHED REPORT. SURVEY IS FROM MOUTH TO FOREST SERVICE
BOUNDARY.

Reach No : 2

Comments

PRIVATE LAND. NOT SURVEYED.

USDA Forest Service
Region 6

Stream Survey Management
Form C Comments Summary

Page 1 of 1
06-OCT-92

Stream Name : LARKIN CREEK 92
Year : '92

Reach No : 1

NSO HabType Comments

1 R1

PHOTOS 18-19 OF STREAM MOUTH.

8 G4

LARGE POOL OF BACK-WATER. 175 FT. OLD ROAD CROSSING/ROAD FOR
D.

Stream Name : LARKIN CREEK 92
Year : 1992

Reach No : 1

NSO HabType Comments

10 MR2

----- RIFFLE IS LOCATED AT SMALL FOOT BRIDGE CROSSING STREAM. SEV
ERAL LOG WEIRS HAVE BEEN PLACED IN THE STREAM BELOW AND ABOVE
E THIS AREA.



LARKIN CREEK FISH NOTES

Notes from 4/27/92 conversation with John Fortune, ODFW:

Rainbow and brown trout are present. Sculpins, dace, and lampreys are probably present.

Notes from KBA electroshocking on 6/9/92:

0.05 mile from mouth; 100-ft section sampled:

4 brown trout at 4 to 12 cm
2 redband at 5 to 7 cm
2 speckled dace at 7 to 8 cm

0.25 mile from mouth; 100-ft section sampled:

3 brown trout at 4 to 29 cm
9 redband at 4 to 9 cm
1 slender sculpin at 7 to 8 cm

0.50 mile from mouth; 150-ft section sampled:

2 brown trout at 11 to 15 cm
11 redband at 4 to 7 cm
5 speckled dace at 5 to 8 cm
4 lampreys observed at about 16 cm

Notes from 6/16/92 conversation with Rod French (ODFW) regarding redband:

Resident population may occur high in the system. Larkin once had a migratory population (based on "old-timers'" information) but ODFW has been unable to find this population. If they exist, migration might occur in the fall.

Notes from KBA electroshocking, 8/19/92:

0.25 mile from mouth; 100-foot length sampled:

7 brown trout 7-42 cm
8 redband 5-9 cm

FISH SURVEY

Using electroshocking techniques, a general fish inventory was conducted on June 8, 1992. Samples were taken near the beginning (mouth), middle, and end of the reach (see attached map). The presence of Brown Trout (length 4.0-29.0 cm), Rainbow/Redband Trout (length 4.0-9.0 cm), Speckled Dace (length 5.0-8.0 cm), and a Sculpin (length 7.0-8.0 cm) were confirmed. The Sculpin first identified as a Marbled Sculpin was later suspected to be a Slender Sculpin. Aproximately 4-5 lamprey were sighted in the uppermost glides of the reach, however, none were caught and fully identified. Freshwater mussels were seen throughout the reach.

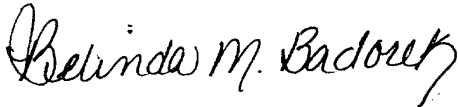
ADDITIONAL ELECTROSHOCKING:

Additional electroshocking in lieu of that found above was conducted August 19, 1992 by Terry Smith, Dara Heath, and Belinda Badorek. At this time a 100ft. area (above the foot-bridge) was sampled and the following fish were observed:

- *7 Brown Trout (7.0-42.0 cm)
- *8 Rainbow/Redband Trout (5.0-9.0 cm)

During this fish inventory no sculpin were caught or observed in Larkin Creek. While electroshocking in the Williamson River, above the confluence of Larkin Creek and below Knapp's Dam, numerous Marbled Sculpin were caught and identified. Some of these fish were preserved in formaldehyde and correct identification was re-confirmed in the office. I suggest that further sampling be conducted in Larkin Creek to accurately conclude which specie(s) of sculpin is present.

Belinda M. Badorek



Fisheries Biologist

Larkin Creek electrofishing effort July 10, 1998

Kevin Meyer and Terry Smith electrofished approximately 0.5 mile of Larkin Creek from the confluence of the lower Williamson River to the Winema National Forest boundary. We captured 20 sculpin of which we keyed out a randomly selected sample of 4 fish. Of the 4, 3 were slender sculpin (*Cottus tenuis*) and 1 was marbled sculpin (*C. klamathensis*).

Species	# caught Electrofishing	# seen Snorkeling
sculpin	20	1
redband trout >4 inch	1	2
brown trout >8 inch	8	0
rbt and brnt FRY	>100	>50
dace	100's	100's
lamprey > 8 inch	1	0

10 to 25% of the bed of Larkin Creek is comprised of freshwater mussels

STREAM IDENTIFICATION FORM A

R6-2500/2600-10

Page: 1 of

Date: / /
YY/Mmm/DD

A. State 41 B. County 035 C. Forest 20 D. District 02

E. Stream Name: Larkin Creek

F. Watershed Code 18.01.02.01 NFS 05.B: , , ,

G. USGS Quad: Solomon Butte

H. Survey Date: 1992/06/01
Year/ Month /Day

I. Name: BELINDA BADOZEK

1. Watershed Area 4827 Acres (Hectares)

2. Stream Order 1

3. Stream Class II

4. Fish Species , , , , ,

Data Source: LAMPREY, SPECKLED DACE, REDBAND/RAINBOW
TROUT, BROWN TROUT, SCLENDER SCULPIN. 1992
WNF ELECTROSHOCKING & STREAM SURVEY.

5. Flow Data:

Data Source: 2.931 CFS 1992 STREAM SURVEY.

6. Water Quality Data:

Data Source:

7. Macroinvertebrate Data:

Data Source:

8. Previous Surveys:

Data Source:

9. Historical Land Use Data:

Data Source:

10. Coordination:

11. Comments:

A. State 41 B. County 035 C. Forest 20 D. District 02
 E. Stream Name: LARKIN CR. ~~WILKINSON~~
 F. Watershed Code 18, 01, 02, 01 NFS 85-18
 G. USGS Quad: SALAMAN Butte 04 (Williamson above Lark)
 H. Survey Date: 92/06/01
 Year/ Month /Day
 I. Name: _____

0.6 MI

1. Reach # 1 2. NSO 1 to 17
 3. Flow 2.93 CFS
 4. Channel Entrenchment D M S ✓
 * 5. River Mile 0.0 to 0.6
 * 6. Sinuosity value 1.7
 * 7. Average Channel Gradient 0.1
 * 8. Valley Length 0.3
 9. Valley Form 7
 10. Valley Width Class 1 2 3 4
 11. Stream Canopy Closure 1 2 3 4
 12. Dominant/Subdominant a.) BR b.) CO
 Substrate
 13. Inner Riparian Zone Width 20
 14. Comments quite a few small
scour pools (too small
to measure). Numerous
Log Weirs. Small Gravel.
 15. Observer: H. Jennings
 Recorder: J. R. Ivis
 16. Date: 92/6/1
 YY/MM/DD ~ SURVEY IS FROM
MOUTH TO F.S.
BOUNDARY.

silt accum -
 Lots of plants
 (living & dead)

1. Reach # _____ 2. NSO _____ to _____
 3. Flow _____
 4. Channel Entrenchment D M S
 * 5. River Mile _____ to _____
 * 6. Sinuosity value _____
 7. Average Channel Gradient _____
 * 8. Valley Length _____
 9. Valley Form _____
 10. Valley Width Class 1 2 3 4
 11. Stream Canopy Closure 1 2 3 4
 12. Dominant/Subdominant a.) _____ b.) _____
 Substrate
 13. Inner Riparian Zone Width _____
 14. Comments _____
 15. Observer: _____
 Recorder: _____
 16. Date: ___/___/___
 YY/MM/DD

1.6 MI

1. Reach # 2 2. NSO 17 to 17
 3. Flow _____
 4. Channel Entrenchment D M S
 * 5. River Mile 0.6 to 2.2
 * 6. Sinuosity value _____
 7. Average Channel Gradient _____
 * 8. Valley Length _____
 9. Valley Form _____
 10. Valley Width Class 1 2 3 4
 11. Stream Canopy Closure 1 2 3 4
 12. Dominant/Subdominant a.) _____ b.) _____
 Substrate
 13. Inner Riparian Zone Width 20
 14. Comments PRIVATE. NOT
SURVEYED.
 15. Observer: _____
 Recorder: _____
 16. Date: ___/___/___
 YY/MM/DD

1. Reach # _____ 2. NSO _____ to _____
 3. Flow _____
 4. Channel Entrenchment D M S
 * 5. River Mile _____ to _____
 * 6. Sinuosity value _____
 7. Average Channel Gradient _____
 * 8. Valley Length _____
 9. Valley Form _____
 10. Valley Width Class 1 2 3 4
 11. Stream Canopy Closure 1 2 3 4
 12. Dominant/Subdominant a.) _____ b.) _____
 Substrate
 13. Inner Riparian Zone Width _____
 14. Comments _____
 15. Observer: _____
 Recorder: _____
 16. Date: ___/___/___
 YY/MM/DD

*These values determined back in office

RIPARIAN IDENTIFICATION FORM C
NO 2500-24/2000-22

A. State PA B. County 030 C. Forest 10
 F. Watershed Code 18, 01, 04, 04FS 03, 03
 H. Survey Date: 9/16/11
 D. District 02 E. Stream Name: Lawken Ck.
 G. USGS Quad: S160404

Observer Jewling?
 Recorder RHS

I. Reach Number: 1 J. (Sampling frequency: Pool 50%; Riffle 50%, Glide 50%)

(* Indicates information to be gathered at the 1m unit only)

1. Nat. Type	2. Seq. & Num.	3. Heb. Length	4. Hab. Width	5. Max. Depth	6. Depth	7. Substrate	8. Substrate	9. Piece Lwd	10. B	11. L	12. S	13. D	14. Total Cover	15. Bank		16. Bank Full Depth	17. Embedd	18. Bank Substrate	19. Bank	20. Floodplain 1	21. Floodplain 2	22. Vegetation	23. Vegetation	24. Floodplain 2	25. Floodplain 2	26. Floodplain 2	27. Water Temp.	28. Comments		
														ft.	ft.														ft.	ft.
		15	68	45	7	1-8	SA GR	0	0	0	0	0	0	2	W	H	—	N	SA	SA	4	GF	GF	SS	SS	2	LL			
		16	68	40	10	1-8	SA GR																							
		16	P6	25	18	2-3	SA GR	0	0	0	0	0	0	2	W	H														
		17	G9	24	5	1	SA GR	0	1	0	0	0	0	2	W	H														

FloodP veg codes = GF, SS, SP, ST, LT, MT
 Shrubland ht. = (1(0-2'), 2(2-5') 3(5-10') 4(>10')

Conifer Codes = CA, CC, CD, CE, CF, CH, CJ, CL, CM, CP, CQ, CR, CS, CT, CW, CY, CZ
 Hardwood Codes = HA, HB, HC, HD, HE, HL, HM, HO, HQ, HT, HV, HW, HX

Pool start #	Riffle start #	Glide start #
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

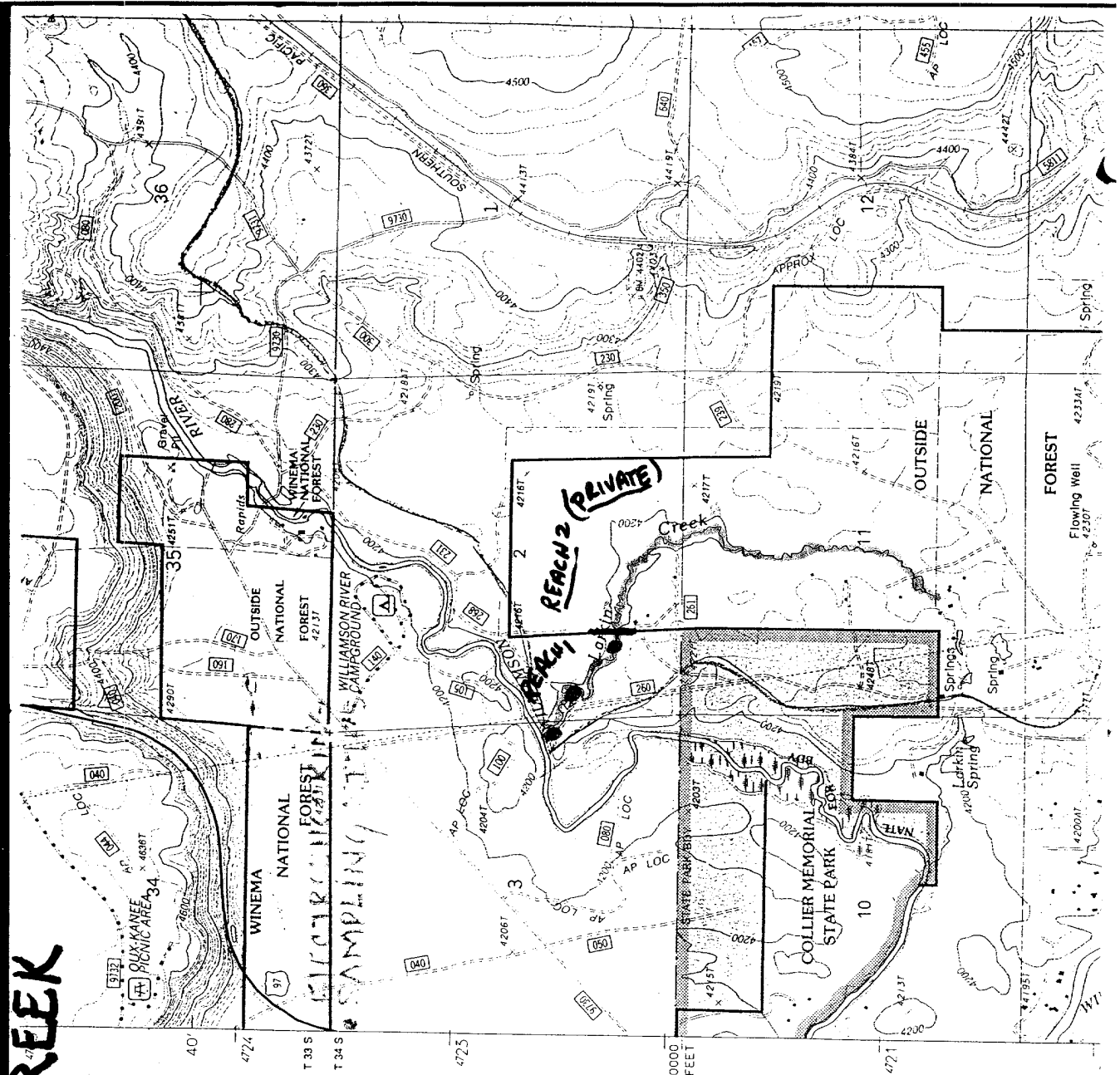
DISCHARGE FORM Q

Stream Name <u>Larkin Cr.</u>		Date <u>6/1/92</u>		Page <u>1</u> of <u> </u>	
Meter (type & number) <u>Pygmy No. 7</u>		Swoffer (number) <u>3956</u>			
Spin Test (seconds): Before <u>60+</u> After <u>60+</u>		All measurements at <u>45</u> seconds			
Instrument Person <u>J. Rihs</u>		Recorder <u>H. Jennings</u>			

	Dist. from left stake	Width of subset	Depth of water	Area of subset	Meter revolutions	Velocity	Discharge (cfs)
L&W	5'	0.5					
	6'	1	0.10		0		0
	7	1	0.25	0.25	44	0.983	0.246
	8	0.75	0.25	0.188	70	1.548	0.291
	8.5	0.5	0.30	0.15	86	1.895	0.284
	9	0.5	0.30	0.15	85	1.873	0.281
	9.5	0.5	0.30	0.15	91	2.004	0.301
	10	0.5	0.35	0.175	85	1.873	0.328
	10.5	0.5	0.35	0.175	92	2.025	0.354
	11	0.5	0.20	0.10	82	1.808	0.181
	11.5	0.5	0.20	0.10	82	1.808	0.181
	12	0.5	0.25	0.125	81	1.787	0.223
	12.5	0.5	0.25	0.125	61	1.352	0.169
	13	0.5	0.25	0.125	25	0.571	0.071
	13.5	0.75	0.20	0.15	5	0.137	0.021
R&W	14.5	0.5	0		0		0
✓	9.5	9.5				TOTAL	2.931

LARKIN CREEK

1992 ~ STREAM SURVEY



LARKIN CREEK

Larkin Creek, a 2.2 mile long stream of which 0.6 miles are on Forest Service land, was surveyed June 1, 1992 according to the methods prescribed by the Region 6 Hankin and Reeves Stream Survey protocol. Larkin Creek was divided into 2 Reaches. Reach 1 contained river miles 0.0 to 0.6, resided on the Chiloquin Ranger District, and extended from Larkin Creek's confluence with the Williamson River to the Forest Service/private land boundary (T33 R7 S3). Reach 2 contained river miles 0.6 to 2.2, was located on private land, and appeared to extend from the Forest Service/private land boundary to spring-fed headwaters. Reach 2 was not surveyed.

June 1, 1992 the discharge at the mouth of Larkin Creek was 2.931 cfs. On June 11, 1992 the discharge of the Williamson River directly above Larkin Creek was 19.119 cfs; hence, at this time Larkin Creek contributed approximately 13% / 5³ of the flow to the Williamson River.

June 8, 1992 fish sampling via electroshocking was conducted.

HABITAT SURVEY

Within the area surveyed, Reach 1, Larkin Creek was determined a highly sinuous and low gradient system. It had 20-30% stream canopy closure, a broad trough-like valley form, and a 100-300 foot valley floor. Also within the reach were several distinct features. The lower portion of the reach was characterized by cobble, bedrock and gravel substrates, greater habitat type diversity, and a larger percentage of effective fish cover. There were several pools in this area which were not classifiable according to protocol definition (habitat width > habitat length), but were significant fisheries habitat. Throughout this section there were also several log weirs (10-15). Communications with Holly Jennings, Winema Forest Fisheries Biologist, disclosed they had been placed in the stream by the Chiloquin Ranger District as part of a stream enhancement project. The weirs appeared to be effective in gravel accumulation and pool formation, and many had fish passages cut in them; hence, they did not seem to pose passage problems.

In the upper section of the reach, above the old road #268 crossing, the substrates consisted of silt and gravels, less habitat variety, and a smaller percentage of effective fish cover. Most of the habitat within this area consisted of glides. In this upper section, harvesting activities have occurred along both sides of the stream.

Throughout the reach grass/forb, shrub/seedlings, and lodgepole comprised the inner and outer riparian zone, while undercut banks and hanging vegetation provided the greatest amount of fish cover.

The habitat area (square feet) and ratios based on estimations are:

POOLS 15,180 SQ. FT. RIFFLES 8,670 SQ. FT. GLIDES 211,720 SQ. FT.

P:R:G=6:4:90

FISH SURVEY

Using electroshocking techniques, a general fish inventory was conducted. Samples were taken near the beginning (mouth), middle, and end of the reach (see attached map). The presence of **Brown Trout** (length 4.0-29.0 cm), **Rainbow/Redband Trout** (length 4.0-9.0 cm), **Speckled Dace** (length 5.0-8.0 cm), and **Sculpin** (length 7.0-8.0 cm) were confirmed. Approximately 4-5 lamprey were sighted in the uppermost glides of the reach, however, none were

unconfirmed

(over)