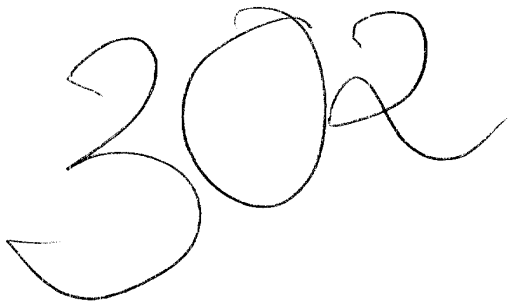
12-4-2009

Ex. 277-US-445

Belinda M. Badorek
Fisheries Biologist, USDA Forest Service Region 6


302

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

Reach	Mile From - To	Length in feet	LWD /Mile	Large /Mile	Small /Mile	Brush /Mile	Area in Sq Feet	% P	% R	% G	% S	% F	Cover*	Dom*	Sbd*
1	0 .6	3605.9	54.2	11.7	16.1	26.4	28106.8	8.2%	14.5%	77.2%	0.0%	0.0%	3 4	H	U
		3605.9					28106.8								

*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	Sinuosity	Corrected Length in ft	%Area	%Volume	Bankfull WD 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%			
								3605.9				10.0	7.5%

USDA Forest Service
Region 6

Stream Survey Management
Hydrology Summary

08-OCT-92

Stream Name : LARKIN CREEK 92
Year : '92

Reach	Miles	Snsty	Avg Grd	Ch En	Vy WC	Cn Cv	Flow in CFS	Correctd Length in ft	Correctd Area in SqFt	Corrected Volume in CuFt	Avg Width in ft	Bankfll W/D Rto	Resid Depth	Substrate* Bed D	Bed S	Bank D	Bank S	Gd Cv	* Mx* Em bd	Tp 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	.0	.0											
								3605.9	28106.8	47434.1											

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

USDA Forest Service — Stream Survey Management — Page 1 of 1
Region 6 — Reach Characterization — 08-OCT-92

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	Substrate* Subdom	Grade	Valley Length	Wdth Clss
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 : '92

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

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

USDA Forest Service
Region 6

Stream Survey Management
Riparian Vegetation Summary, Zone 2

08-OCT-92

Stream Name : LARKIN CREEK 92
Year : '92

Reach	Mile From - To	Zone Floodplain Vegetation, Zone 2 Width	GF	SS	SP	ST	LT	MT	GF* D	GF* S	SS* D	SS* S	SP* D	SP* S	ST* D	ST* S	LT* D	LT* S	MT* D	MT* S
1	0 - .6	80		100%							SS2	GF								

*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	Riffles	Glides	Pools	Riffles	Glides
1	.8296	1.0353	.9123	.9677	1.1111	1.1739
2	.8296	1.0353	.9123	.9677	1.1111	1.1739

USDA Forest Service
Region 6

Stream Survey Management
Special Features Summary

15-OCT-92

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	Pools (sq ft)	+ or - Confidence Interval	Glides (sq ft)	+ or - Confidence Interval	Riffles (sq ft)	+ or - Confidence Interval
1	2355	324.05	22130	1136.37	4165	
2						

USDA Forest Service
Region 6

Stream Survey Management
Form A Comments Summary

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.

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 : '92

**Reach No : 1

1 2	3	4	5	6 7 8	9	10	11 12	13 14	15	16	17	18	19 20	21 22 23	24	25	26	27	28	29	30	31	32	33 34 35
1 R1	425.0	8.0	1.2	BR CO	0	1	1 2	U H																
2 G1	400.0	6.0	1.3	BR CO	2	0	2 4	H U	60	1000			N	SA SA 4	GF	GF	CL	SS	SS2	GF	69 1005	341.0	6.0	1.3 R06F20A
3 P1	50.0	7.0	1.6	.9 BR CO	0	0	0 2	H U			40.0	2.4	N	GR SA 3	GF	GF	GF	SS	SS2	GF	60 1005	30.0	9.0	1.6 .9 R06F20A
4 G2	210.0	7.0	1.6	BR CO	0	1	1 4	H U																
5 P2	25.0	9.0	1.4	.7 BR CO	0	0	1 4	H U																
6 G3	100.0	5.0	1.5	BR CO	0	0	0 4	H U					N	SA SA 4	GF	GF	HA	SS	SS2	GF		95.0	6.0	1.5 R06F20A
7 P3	20.0	14.0	1.7	.7 BR CO	0	0	0 4	H U	60	1020	27.0	2.5	N	SA SA 4	GF	GF	HA	SS	SS2	GF	60 1020	22.0	10.0	1.7 .7 R06F20A
8 G4	280.0	10.0	1.3	BR CO	3	1	0 4	H U																
9 P4	50.0	8.0	1.4	.4 CO BR	0	0	0 3	H U																
10 R2	85.0	9.0	.9	CO BR	0	0	0 3	H U					N	SA SA 4	GF	GF	HA	SS	SS2	GF		88.0	10.0	.9 R06F20A
11 G5	785.0	7.0	1.9	CO BR	5	2	0 3	H U																
12 P5	65.0	10.0	2.0	.2 CO SA	0	1	0 3	H U			60.0	1.8	N	SA SA 4	GF	GF	GF	SS	SS2	CL		60.0	11.0	2.0 .2 R06F20A
13 G6	185.0	5.0	1.8	CO SA	4	2	1 3	H U					N	SA SA 4	GF	GF	GF	SS	SS2	CL		190.0	5.0	1.8 R06F20A
14 G7	910.0	5.0	2.1	CO SA	4	2	2 3	H U																
15 G8	45.0	7.0	1.8	SA GR	0	0	0 2	U H					N	SA SA 4	GF	GF	SS2	SS	SS2	CL		40.0	10.0	1.8 R06F20A
16 P6	25.0	18.0	2.3	1.3 SA GR	0	0	0 2	U H																
17 G9	245.0	15.0	2.1	SA GR	0	1	0 2	U H																

**Reach No : 2

1 2	3	4	5	6 7 8	9	10	11 12	13 14	15	16	17	18	19 20	21 22 23	24	25	26	27	28	29	30	31	32	33 34 35

Stream Name : LARKIN CREEK 92
Year : '92

Reach No : 1

NSO	HabType	Comments
10	MR2	RIFFLE IS LOCATED AT SMALL FOOT BRIDGE CROSSING STREAM. SEVERAL LOG WEIRS HAVE BEEN PLACED IN THE STREAM BELOW AND ABOVE 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

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

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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, SCENDER 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: _____

FINAL REACH IDENTIFICATION FORM B2 (FIELD) Page ___ of ___
R6-2500/2600-21

A. State 41 B. County 035 C. Forest 20 D. District 02
E. Stream Name: LARKIN CR ~~Larkin~~
F. Watershed Code 18 . 01 . 02 . 01 NFS ~~05 13~~ ___ . ___ . ___ . ___ . ___
G. USGS Quad: Solomon Butte 04 (Williamson above Lake)
H. Survey Date: 92 / 06 / 01
Year/ Month /Day
I. Name: ___

.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%
*8. Valley Length 0.3
9. Valley Form 9
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 Gravels. Lots of (living & dead) Class 1 silt accum-
15. Observer: H. Jennings
Recorder: J. Riis
16. Date: 92/6/1 YY/MM/DD ~SURVEY IS from Mouth to F.S Boundary.

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
R6 2500-22/2600-22

Date: 92/6/1 (YY MM DD)

A. State BTR B. County 035 C. Forest Wenatchee D. District 02 E. Stream Name: Larken Ck.
F. Watershed Code 17.01.02.01 NPS 05 B ____.____.____.____ G. USGS Quad: Salomon Butte
H. Survey Date: 92/06/01 (Year/Month/Day)
I. Reach Number: 1 J. (Sampling frequency: Pool 50%; Riffle 50%; Glide 50%)
(* Indicates information to be gathered at the Nth unit only)

Observer A. Jennings
Recorder J. Rins

1. Nat. Seq. Ord. #	2. Hab. Type & Num. P,R,G, S,P,D,T	3. Hab. Length ft.	4. Hab. Width ft.	5. Max. Depth 0.1ft	6. Depth @Pool Tail 0.1ft	6. Depth @Pool Crest 0.1ft	7. Substrate Dom. SA,GR, CO,SB, LB,BR	8. Substrate S-dom. SA,GR, CO,SB, LB,BR	9. # Piece LWD Brush	10. # Piece LWD Small	11. # Piece LWD Larg	12. Total Cover I=0,5 20,40 code 1-4	13. Total Cover Dom. U,S,D H,W,T A	14. Total Cover S-dom U,S,D H,W,T A	**15** Bank full Width ft.	**16** Bank full Depth ft.	**17** Embeddedness >35% Y/orN	**18** BankSubstrat SA,GR, CO,SB LB,BR Dom.	**19** SA,GR CO,SB LB,BR S-dom	**20** Bank Grnd Cover 1-4	**21** Floodplain 1 Vegetation class a.	**22** Floodplain 1 Vegetation Dom. b.	**23** Floodplain 1 Vegetation Sdom c.	**24** Floodplain 2 Vegetation class a.	**25** Floodplain 2 Vegetation Dom. b.	**26** Floodplain 2 Vegetation Sdom c.	+27+ Water Temp. (3X/day) °F or (circle one) Degree	+27+ Water Temp. (3X/day) °F or (circle one) Time	34 Comments
1	R1	425	8	1.2			BR	CO	0	1	1	2	M	H															18/19 photos of mouth
2	G1	700	6	1.8			BR	CO	2	0	2	4	H	U			N	SA	SA	4	GF	GF	CL	SS	SS2	GF	60	1000	
	MG1	341	6	1.9															SA										
3	P1	50	7	1.6	0.9		BR	CO	0	0	0	2	H	U	40	2.4	N	GR	SA	3	GF	GF	GF	SS	SS2	GF	69	1005	
	MP1	30	9	1.6	0.9										40	2.4													
4	G2	210	7	1.6			BR	CO	0	1	1	4	H	U															
5	P2	25	9	1.4	0.7		BR	CO	0	0	1	4	H	U															
6	G3	100	5	1.5	—		BR	CO	0	0	0	4	H	U			N	BA	SA	4	GF	GF	HA	SS	SS2	GF	—		
	MG3	95	6	1.5	—																								
7	P3	20	14	1.7	0.7		BR	CO	0	0	0	4	H	U	27	2.5	N	SA	SA	4	GF	GF	HA	SS	SS2	GF	60	1620	
	MP3	22	10	1.7	0.7																								
8	G4	280	10	1.3	—		BR	CO	3	1	0	4	H	U															Backwater @ 175' (old Rd. X'ing)
9	P4	50	8	1.4	0.4		CO	BR	0	0	0	3	H	U															
10	R2	85	9	0.9	—		CO	BR	0	0	0	3	H	U			N	SA	SA	4	GF	GF	HA	SS	SS2	GF			@ Bridge
	MR2	88	10	0.9	—																								Logs placed for Rehab
11	G5	785	7	1.9	—		CO	BR	5	2	0	3	H	U															
12	P5	65	10	2.0	0.2		CO	SA	0	1	0	3	H	U			N	SA	SA	4	GF	GF	GF	SS	SS2	CL			
	MP5	60	11	2.0	0.2										60	1.8													
13	G6	183	5	1.8	—																								
	MG6	190	5	1.8	—		CO	SA	4	2	1	3	H	U			N	SA	SA	4	GF	GF	GF	SS	SS2	CL			
14	G8	910	5	2.1	—		CO	SA	4	2	2	3	H	U															

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,CX
Hardwood Codes: HA,HB,HC,HD,HE,HL,HM,HO,HQ,HT,HV,HW,HX

Pool start # 1, 3, 5, 7, 9, 11

Riffle start # 2, 4, 6, 8, 10, 12

Glide start # 1, 3, 5, 7, 9, 11

RIPARIAN IDENTIFICATION FORM C
R6 2500-22/2600-22

Page: 2 of 2
Date: 92/6/1 (YY MM DD)

A. State OR B. County 035 C. Forest 20 D. District 02 E. Stream Name: Larken Ck.
F. Watershed Code 18.01.02.0 NFS 05.B G. USGS Quad: Sloman Butte
H. Survey Date: 92/6/1 (Year/ Month /Day)
I. Reach Number: 1 J. (Sampling frequency: Pool 50%; Riffle 50%; Glide 50%)
(* Indicates information to be gathered at the Nth unit only)

Observer Jennings
Recorder Riha

1. Nat. Seq. Ord. #	2. Hab. Type & Num. P,R,G, S,P,D,T	3. Hab. Lngth ft.	4. Hab. Width ft.	5. Max. Depth 0.1ft	6. Depth @Pool Tail Crest 0.1ft	7. Substrate Dom. SA,GR, CO,SB, LB,BR	8. Substrate S-dom. SA,GR, CO,SB, LB,BR	9. # Piece LWD B Brush	10. # Piece LWD S Small	11. # Piece LWD L Larg	12. Total Cover %=0,5,20,40 code 1-4	13. Total Cover Dom. U,S,D H,W,T A	14. Total Cover S-dom U,S,D H,W,T A	**15** Bank full Width ft.	**16** Bank full Depth ft.	**17** Embeddedness >35% Y/orN	**18** Bank Substrat SA,GR, CO,SB LB,BR Dom.	**19** Bank Substrat SA,GR CO,SB LB,BR S-dom	**20** Bank Grnd Cover 1-4	**21** Floodplain 1 Vegetation class a.	Dom. b.	Sdom c.	**24** Floodplain 2 Vegetation class a.	Dom. b.	Sdom c.	Water Temp. (3X/day) °F or °C (circle one) Degree	Time	34 Comments
15	GB	45	7	1.8	—	SA	GR	0	0	0	2	U	H	—	—	N	SA	SA	4	GF	GB	SS	SS	SS2	CL			
	MGB	40	10	1.8	—	SA	GR																						
16	PG	25	18	2.3	1.3	SA	GR	0	0	0	2	U	H	—	—	—													
17	GB	245	15	2.1	—	SA	GR	0	1	0	2	U	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,CX
Hardwood Codes= HA,HB,HC,HD,HE,HL,HM,HO,HQ,HT,HV,HW,HX

Pool start # ____ ____

Riffle start # ____ ____

Glide start # ____ ____

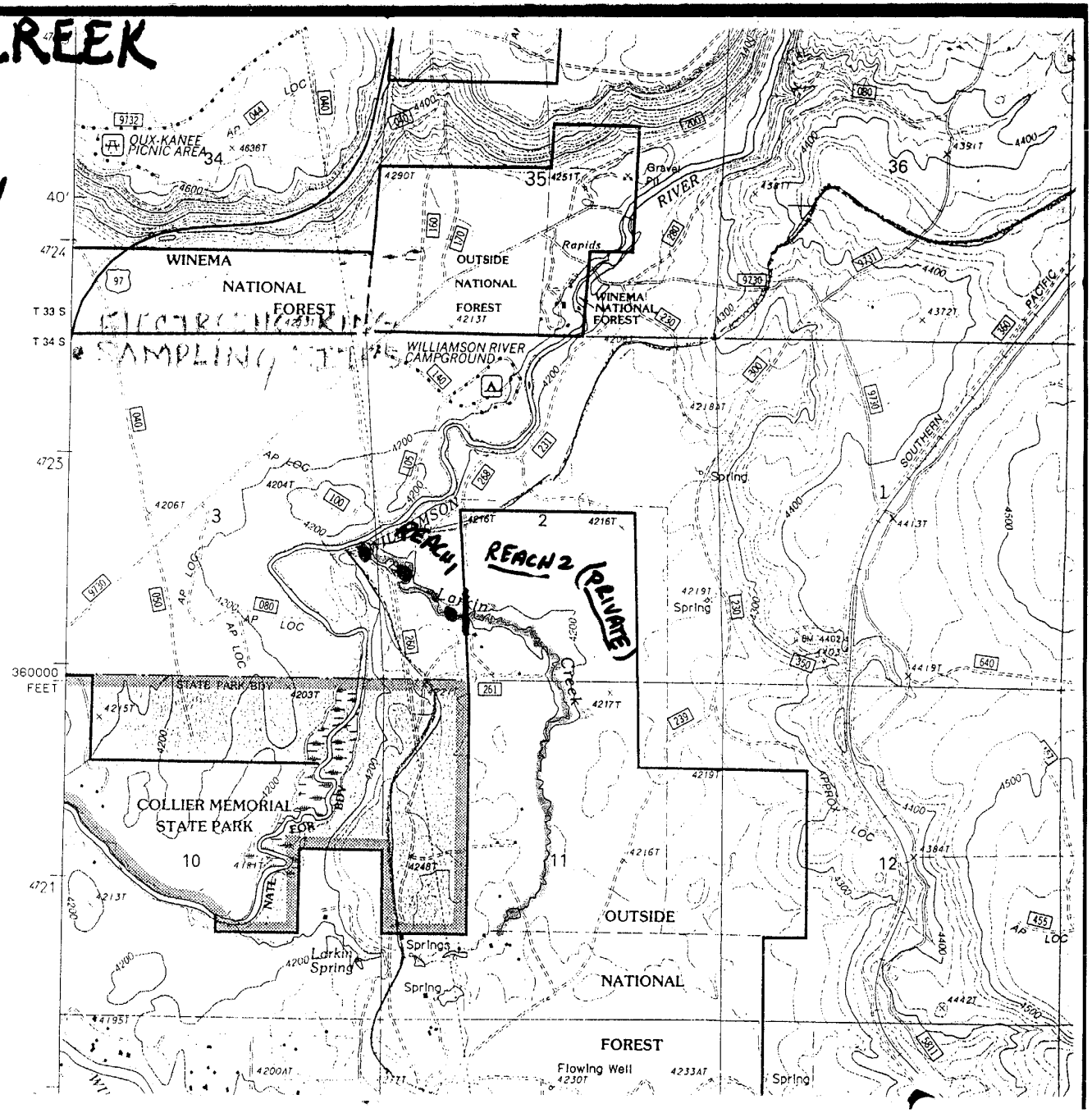
DISCHARGE FORM Q

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

Dist. from left stake	Width of subset	Depth of water	Area of subset	Meter revolutions	Velocity	Discharge (cfs)
LEW 5'	0.5					
6'	1	0.10		Ø		Ø
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
REW 14.5	0.5	Ø		Ø		Ø
✓ 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~~ 15% 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)