9-2-2004

Ex. 281-US-428

R. Nawa
Oregon Department of Fish and Wildlife

K. Hartzell
Oregon Department of Fish and Wildlife

Stream: **Fort Creek** >Wood River
Survey Type: **ODFW Stream Habitat**
Access: Foot
Reach: 1
Start: T33S-R7E-S27SE
Quad: Fort Klamath
Date: 2 September 04
Surveyors: R. Nawa, K. Hartzell
Distance Surveyed: 1,126 m

Valley and stream channel geometry
The stream is in an agricultural valley about 8 km wide. Low terraces slope abruptly to form narrow floodplains that border the 16 m wide creek. Extremely low map measured stream gradient (0.08%) was accompanied by high sinuosity (2.3). Due to extreme sinuosity, oxbows were particularly vulnerable to meander cutoffs. A meander cutoff was found at unit 5 that created a large alcove (actually a backwater pond) (Map). Meander cutoffs increase channel and streambank erosion.

Substrate
The streambed was 84 percent sand and organics. About 16 percent was surficial deposits of pumice gravel over sand. Gravel was mostly less than 25 mm in diameter.

Spawning Gravel
Surveyors recorded 38 m^2 /km of pumice gravel suitable for steelhead spawning. Gravel suitable for spawning was found on point bars where the stream meandered sharply. Due to high amounts of sand, cobble embeddedness was estimated at 50%. Old redds, presumably made by redband trout, were found at 3 locations.

Riparian Vegetation
The stream is in a forested valley bordered by pasture grasses, willows, and pine. The riparian zone (0-30m) had an average of 183 hardwoods and 122 conifers for each 1000 ft of stream. Average shade was 47 percent. Streambank erosion was 6 percent suggesting that grass and willow growth is adequate to protect most streambanks.

Wood
Wood averaged 10.1 pieces/100m of stream but wod was not evenly distributed. Wood concentrations were much higher in areas where the stream abutted forested terraces (estimated 50% of reach). Trees appear to remain in the channel where they fall. The stream seems to lack stream power to move wood into debris jams that would affect channel morphology.

Rearing and Adult Holding Habitat
About 83 percent of the stream was classified as glide habitat that averaged 0.8 m deep. The reach had 3 pools with well developed hydraulic controls (i.e. tailouts). Two scour pools were found at meander bends and averaged 2 m deep. A meander cutoff created a 598 m^2 backwater pond or alcove that was 0.4 m deep (U5). Wood was not a pool forming factor. An estimated 39 percent of the streambanks were undercut. Undercut streambanks, high amounts of stable wood, and deep pools provide abundant cover for juvenile and adult fish.

Stream Temperature
The maximum spot stream temperature was 8.3°C. A spring at unit 4 was 11°C.

Migration Barriers

Culverts under Highway 62 were not a barrier to fish migration because they had no drop at downstream end.

Photo 241 Unit 6
Large amounts of stable wood are found where the stream erodes forested terraces. Wood density averaged ten pieces/100 m.

Photo 229 Unit 8.
An $80m^2$ patch of pumice gravel was in a rapid below Highway 62. Old rainbow trout redds were observed here.

Stream: Fort Creek
Survey Type: ODFW Stream Habitat
Access: Foot
Reach: 3 (Forest Service)
Start: T33S-R7E-S23SW
Quad: Fort Klamath
Date: 2 September 04
Surveyors: R. Nawa, K. Hartzell
Distance Surveyed: 816 m

About 180 m below the Winema Forest boundary a diversion dam was removed and replaced with a very large pump encased in a cement structure (Photo 230). No screen for the newly installed pump was evident. About half of the flow was being removed by the pump.

Valley and stream channel geometry
The stream is in a 70 m wide valley bordered by 20 m high forested terraces. Narrow floodplains border the 19 m wide creek. Low stream gradient (0.3%) was accompanied by moderate sinuosity (1.3).

Substrate
The streambed was 30 percent sand, 29 percent gravel and 40 percent cobble. Gravel and cobble was pumice rock.

Spawning Gravel
Surveyors recorded a total of 175 m^2 of pumice gravel suitable for spawning (map). Circular pits in the gravel appeared to be lamprey redds. The reach was 76 percent riffle but gravel in riffles was poorly sorted. Sand was interspersed with clasts less than 1 inch and cobble 4-6 inches making most gravel unsuitable for spawning. The former impoundment may have prevented sorting.

Riparian Vegetation
The stream is bordered by forested slopes. The riparian zone (0-30m) had an average of 122 hardwoods and 386 conifers for each 1000 ft of stream. Average shade was 56 percent. Streambank erosion was only two percent, indicating that vegetation is adequate to protect streambanks.

Wood
Wood averaged 11.8 pieces/100m of stream. Trees appears to remain in the channel where they fall. The stream appears to lack stream power to move wood into debris jams that would affect channel morphology.

Rearing and Adult Holding Habitat
About 24 percent of the stream was glide habitat that averaged 0.5 m deep. No pools were identified. Undercut streambanks (25%) and high amounts of stable wood provide cover for juvenile and adult fish.

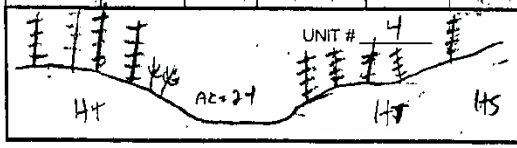
Stream Temperature
The maximum spot stream temperature was 9°C. Reservation springs was 8°C at 1645 PDT.

RIPARIAN

PAGE:_____ OF:_____

STREAM: Fort Creek (USFS Reach) DATE: 2 Sept 04 NAME:_____

UNIT NUMBER	SIDE	ZONE	SURFACE	SLOPE	CANOPY CLOSURE	SHRUB % COVER	GRASS/FORB % COVER	TREE	COUNT (DBH in CENTIMETERS) 3-15	15-30	30-50	50-90	90+	RIPARIAN NOTE
4	LEFT	1	HT	30	40	60	20	CONIFER						
								HARDWOOD						
		2	HT	20	60	0	20	CONIFER	1	1				
								HARDWOOD						
		3	HT	15	60	20	0	CONIFER					1	Ponderosa
								HARDWOOD						
4	RIGHT	1	HT	25	100	20	0	CONIFER	1	1				
								HARDWOOD						
		2	HS	15	80	0	0	CONIFER	3		2			
								HARDWOOD						
		3	HS	30	80	40	0	CONIFER			1	1		
								HARDWOOD						
	LEFT	1						CONIFER						
								HARDWOOD						
		2						CONIFER						
								HARDWOOD						
		3						CONIFER						
								HARDWOOD						
	RIGHT	1						CONIFER						
								HARDWOOD						
		2						CONIFER						
								HARDWOOD						
		3						CONIFER						
								HARDWOOD						



UNIT #_____

SPAWNING HABITAT FORM

Stream Font Creek Below 62 Reach 4 Below 62 Date 2 Sept 04

Surveyor(s) R. Nagy See Wolman Pebble Count

Surface area (m^2)	Class (G, GC, C)	Percent wetted	Percent usable	UNIT	Rock Type	Comments
2	G	100	100	9	NP	20% >1 ; 50% > 1/2
6	GC	100	100	9	P	>30% SAND + FG
2	GC	100	100	8	P	>30% SAND + FG
3	G	"	"	7	P	20% >1 - SURFICIAL DEPOSIT
4	G	"	"	7	P	20% >1 "
3	G	"	"	6	P	30% >1 "
4	G	"	"	6	P	" "
4	G	"	"	4	P	" "
3	G	"	"	4	P	" "
3	GC	"	"	3	P	" "
2	C	G	"	3	P	" "
4	G	"	"	3	P	" "
3	G	"	"	2	P	" "

Class: G= gravel; C= small cobble (≤150mm [6"])
Usable habitat is at least 150mm (6") deep and has water velocities between 1 and 4 feet/second.

P = PUMICE
NP = NOT PUMICE

Stream Name Fort Creek (USFS Reach) Rosgen Channel Type _____

~~Hydrologic~~ Unit 2 EPA Reach _____ EPA EXT _____

Stream Survey Reach Forest Service Sample # _____ Habitat Unit Type RI Fast/Slow Water _____

Observers RN, KH Date 9/2/04

Procedure X (Wolman, 1954) _____ (Bevenger and King, 1995) _____ Other

Measurement Device X Ruler _____ Gravelometer (FISP US SA-97)

Class Name	Particle Size (mm)	Dot Count	Total #	% Total	Cum. #	Cum %
Small Organic	< 25 mm					
Large Organic	> 25 mm					
Clay	<0.0039					
Silt	0.0039-0.0625					
Fine Sand	0.0625 - 0.25					
Med. Sand	0.25 - 0.5					
Coarse Sand	0.5 - 1.0	𝍸 ||||	9			
VC Sand	1 - 2		0			
VF Gravel	2 - 4	|	1			
Fine Gravel	4 - 8	||	2			
Fine Gravel	~~8 - 11~~	|||	3			
Med. Gravel	8 - 16	𝍸 ||||	9			
Coarse Gravel	16 - 32	𝍸 𝍸 𝍸 𝍸 ||	27			
VC Gravel	32 - 64	𝍸 𝍸 𝍸 𝍸 |||	29			
Sm. Cobble	64 - 128	𝍸 𝍸 𝍸 𝍸 |	26			
Lg. Cobble	128 - 256	𝍸 |||	8			
Sm. Boulder	256 - 512	|||	3			
Med. Boulder	512 - 1024					
Lg. Boulder	1024 - 2048					
VL Boulder	2048 - 4096					
Bedrock						

Total #: 117

Calculations: % Fines <2mm _____ % Fines <6mm _____ D50 _____ D84 _____

Notes: Pumice GRAVEL – REDO on TRANSECT LINE

UTM's: 584751, 4727671

SPAWNING HABITAT FORM

Stream Fort Creek Reach Forest Service Date 2 Sept 04

Surveyor(s) R. NAWA Wolman Count UNIT 2

Surface area (m^2)	Class (G, GC, C)	Percent wetted	Percent usable	Unit	Rock Type	Cobble Embed	Comments
4	GC	100	100	2	P	50%	20% Embed
80	GC	100	100	2	P	50%	0/0 Reads Visible
4	GC	"	"	2	P	"	
5	GC	"	"	2	P	"	
5	"	"	"	"	"	"	
8	"	"	"	"	"	"	
4	"	"	"	"	"	"	
6	"	"	"	3	"	"	
3	"	"	"	3	"	"	Old Redd
10	"	"	"	3	"	"	Old Redd
2	"	"	"	3	"	"	Poorly sorted
2	"	"	"	3	"	"	"
10	"	"	"	"	"	"	"
3	"	"	"	"	"	"	"
8	"	"	"	4	"	"	"
10	"	"	"	4	"	"	" Scattered Patches
4	"	"	"	4	"	"	Scattered Patches

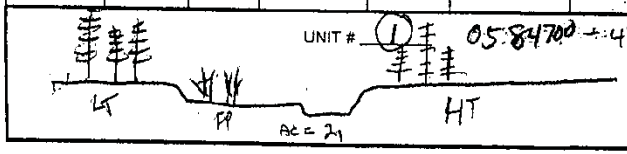
P= Pumice

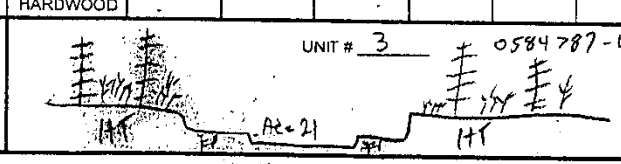
Class: G= gravel; C= small cobble (≤150mm [6"])
Usable habitat is at least 150mm (6") deep and has water velocities between 1 and 4 feet/second.

RIPARIAN

STREAM: Fort Creek (Forest Service) DATE: 2 Sept 03 PAGE:____ OF:____ NAME:____

UNIT NUMBER	SIDE	ZONE	SURFACE	SLOPE	CANOPY CLOSURE	SHRUB % COVER	GRASS/FORB % COVER	TREE	COUNT (DBH in CENTIMETERS) 3-15	15-30	30-50	50-90	90+	RIPARIAN NOTE
1	LEFT	1	FP	2	0	0	100	CONIFER						
								HARDWOOD						
		2	FP	0	0	20	100	CONIFER						
								HARDWOOD						
		3	FP	0	0	20	100	CONIFER						
								HARDWOOD						
1	RIGHT	1	HT	30	20	20	20	CONIFER						
								HARDWOOD						
		2	HT	5	40	60	20	CONIFER	1	1	1			
								HARDWOOD	1					
		3	HT	0	40	60	20	CONIFER			1			PONDEROSA
								HARDWOOD						
3	LEFT	1	FP	20	40	40	60	CONIFER						
								HARDWOOD	2					
		2	HT	8	80	80	0	CONIFER	2					
								HARDWOOD						
		3	HT	6	40	60	20	CONIFER						
								HARDWOOD						
3	RIGHT	1	FP	20	20	40	40	CONIFER						
								HARDWOOD		2				
		2	HT	20	60	20	60	CONIFER		1				
								HARDWOOD	1					
		3	HT	2	40	40	0	CONIFER	1					
								HARDWOOD						





WOOD

PAGE: 2 OF: _____

STREAM: Fort Cr (USFS) DATE: 9/[illegible]/04 NAME: Hartzell

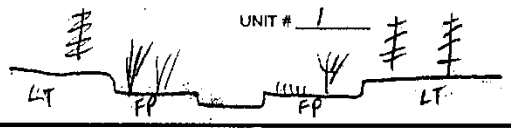
UNIT NUMBER	UNIT TYPE	DEBRIS CONFIG	DEBRIS TYPE	DEBRIS LOCAT	DBH CLASS	LENGTH CLASS (m) RW <3	3	6	9	12	15	18	21	24	28	32	36+	WOOD NOTE
1	GL	S	N	S	60								1					
1	GL	S	N	S	45			1	2	1								
1	GL	S	N	S	30				1	4	1							
1	GL	S	N	M	30			1	1									
2	RI	A	N	S	30		1	3										
2	RI	S	N	S	30			1	4	1								
2	RI	S	N	M	30				1	2	1							
2	RI	S	N	E	45							1	2	1				
2	RI	S	RN	E	120													
2	RI	S	RN	E	30					1	5	1						
2	RI	S	N	E	30			1	2	2								
3	RI	S	N	E	45							1	3					
3	RI	S	N	E	60							1	3					
3	RI	S	N	S	30						2	2						
3	RI	S	N	S	30						1	4						
3	RI	S	N	M	30				1	1	1							
3	RI	S	N	M	45				1	1	1	1						
3	RI	S	RN	E	120									1				
4	RI	S	N	S	45							1						
4	RI	S	N	S	30					2	1	1						
4	RI	S	N	E	45							1						
4	RI	S	N	M	30					2								
4	RI	S	N	E	60						1							
4	RI	S	N	M	45				1	1								
5	GL	S	N	S	30				1	2	1							
5	GL	S	RN	S	30						1	1						
5	GL	S	N	S	45				1	1	1							
5	GL	S	N	M	30				4	2								
5	GL	S	N	E	45					1								

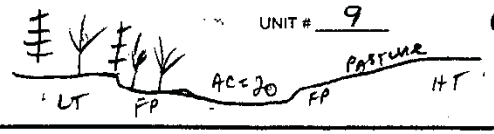
RIPARIAN

PAGE: 1 OF: 1

STREAM: Fort Cr Below 62 DATE: 2 Sept 04 NAME: Rick Nauta

UNIT NUMBER	SIDE	ZONE	SURFACE	SLOPE	CANOPY CLOSURE	SHRUB % COVER	GRASS/FORB % COVER	TREE	COUNT (DBH in CENTIMETERS) 3-15	15-30	30-50	50-90	90+	RIPARIAN NOTE
1	LEFT	1	FP	4	20	40	100	CONIFER		1				
								HARDWOOD	1					
		2	FP	0	40	40	100	CONIFER						
								HARDWOOD						
		3	FP	0	40	20	100	CONIFER			1			
								HARDWOOD						
1	RIGHT	1	FP	4	20	40	100	CONIFER						
								HARDWOOD	3					
		2	FP	0	60	80	100	CONIFER						
								HARDWOOD	2					
		3	LT	8	80	20	100	CONIFER		1	1			
								HARDWOOD						
9	LEFT	1	FP	10	0	0	100	CONIFER						
								HARDWOOD						
		2	HT	10	0	0	100	CONIFER						
								HARDWOOD						
		3	HT	10	0	0	100	CONIFER						
								HARDWOOD						
9	RIGHT	1	FP	4	20	40	100	CONIFER						
								HARDWOOD						
		2	FP	0	20	40	100	CONIFER						
								HARDWOOD						
		3	LT	10	20	60	100	CONIFER						
								HARDWOOD						





FOR EACH RIPARIAN TRANSECT, DRAW AND LABEL THE SURFACES (HT, LT, FP, HS, ETC) OF A CROSS SECTION IN THE BOX PROVIDED ABOVE. DRAWING AND LABELING VEGETATION IS NOT NECESSARY.

WOOD

PAGE: 1 OF: _____

STREAM: Fort Cr. (Below Rt. 62) DATE: 2 Sept 04 NAME: R. Nawa, Hartzell

UNIT NUMBER	UNIT TYPE	DEBRIS CONFIG	DEBRIS TYPE	DEBRIS LOCAT	DBH CLASS	LENGTH CLASS (m) RW <3	3	6	9	12	15	18	21	24	28	32	36+	WOOD NOTE
9	LP	A	N	S	15		2											
9	LP	A	N	S	30		1											
8	RP	A	N	S	15		2											
8		J	N	M	16		3	1										
8		S	N	F	15		1	2										
8	↓	S	N	S	30			2	1									
7	GL	S	N	M	30			1	4									
7	|	S	N	S	30			2	1									
7	|	S	N	S	15		1	2										
7	|	S	N	M	15		1	2										
7	↓	S	N	F	15		2	1										
6	GL	S	N	F	30			2	3									
6	|	S	RN	F	30			2	3	2								
6	|	S	RN	S	45			3	1									
6	|	S	C	S	45		1											
6	|	S	N	S	15		2	3										
6	↓	S	N	S	30			2										
4	GL	J	N	S	30			1	3	2								
4	|	S	N	F	30			2	3	3								
4	|	S	N	F	45				1									
4	↓	S	RN	S	45			1	2									
3	GL	S	N	S	30				5	6								
3	|	S	N	S	15			2										
3	↓	S	RN	F	30				1	2								
2	GL	S	RN	F	45					2								
2	|	S	N	S	30			3	8	2								
2	↓	S	N	M	30				3									
1	LP	S	N	S	30			1										

UNIT-2

PAGE: 1 OF: 1

STREAM: Font Creek (Forest Service) DATE: 2 Sept 04 NUMERATOR: R. Nauss

UNIT #	UNIT TYPE	DEPTH*	DEPTH** PTC	VERIFIED LENGTH	VERIFIED WIDTH	PERCENT SUBSTRATE S/O	SND	GRVL	CBLE	BLDR	BDRCK	BLDR COUNT	% ACTIVE EROSION	% UNDER CUT	COMMENT CODES	NOTE
1	GL	0.40				95		5						20	GS	AUTOMATED FLOW RECORDER; PUMICE GRAVEL
2	RF	0.30				0	20	40	40					30		PUMICE GRAVEL; LAMINAR FLOW?
3	RI	0.30					25	25	50					30		PUMICE GRAVEL
4	RI	0.30					15	35	50					20		
5	GL	0.60					30	30	40			6	20			RESERVATION SPRINGS = 46°@ 1643
V																
V																
V																

AX DEPTH POOLS - MODAL DEPTH IN FAST WATER UNITS

** ONLY MEASURED @ POOLS (EXCEPT OFF-CHANNEL POOLS)

UNIT - 1

PAGE: 2 OF: _____

STREAM: Fort Cr. (USFS) DATE: 9/2/04 ESTIMATOR: Hartzell

REACH #	UNIT #	UNIT TYPE	CHANL TYPE	% FLOW	UNIT LENGTH	UNIT WIDTH	SLOPE %	SHADE (0-90) LEFT	SHADE (0-90) RIGHT	ACTIVE CHANNEL HT.*	ACTIVE CHANNEL WIDTH	FLOOD PRONE HT.	FLOOD PRONE WIDTH	TERRACE HT.	TERRACE WIDTH	NOTE VWI	NOTE
USFS	1	GL	00	100	155	17	0.5	29	55	1.4	21	2.0	60	4.0	70	10	Start @ S. USFS Bound.
	2	RI	00	100	250	19	1.0	52	35								
	3	RI	00	100	250	20	1.0	40	55	0.8	21	1.6	32	2.6	42	4	
	4	RI	00	100	96	21	1.0	80	50								
↓	5	GL	00	100	65	17	0.5	70	62	0.8	17	1.6	18	4.5	23	2	End @ Spring HW

* MEASURE FROM THE STREAMBED TO THE TOP OF THE ACTIVE CHANNEL. TAKE THE MEASUREMENT AT POOL TAIL CREST ON POOL UNITS.

UNIT-2

PAGE: 1 OF: _____

STREAM: FORT CREEK (Below HWY 62) DATE: 23SEPT04 NUMERATOR: R. NAWA

	UNIT #	UNIT TYPE	DEPTH*	DEPTH** PTC	VERIFIED LENGTH	VERIFIED WIDTH	PERCENT SUBSTRATE S/O	SND	GRVL	CBLE	BLDR	BDRCK	BLDR COUNT	% ACTIVE EROSION	% UNDER CUT	COMMENT CODES	NOTE
1	10	CC						50	50								NO DROP ON CHANNEL 45° @ 0930
2	9	SP	2.2	.7				90	10						5		
3	8	RP	0.8	.6				85	15					5	10		PUMICE GRAVEL
4	7	GL	0.7					80	20					20	20		PUMICE GRAVEL
5	6	GL	0.8				20	60	20					10	30		PUMICE GRAVEL
6	5	AL	0.4				100								60		ALCOVE FROM MRBNDA CUTOFF
7	4	GL	0.8				50	40	10					10	50	55	SPRING AT RB 52° @ 1030
8	3	GL	0.8				50	30	20						50		PUMICE GRAVEL
9	2	GL	0.8				60	20	20						50		PUMICE GRAVEL
10	V 1	LP	1.7	.6			100		5						40		MRBNDA BOND 47° @ 1145
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20	V																
21																	
22																	
23																	
24																	
25																	
26																	
27																	
28																	
29																	
30	V																

AX DEPTH POOLS - MODAL DEPTH IN FAST WATER UNITS

** ONLY MEASURED @ POOLS (EXCEPT OFF-CHANNEL POOLS)

UNIT NUMBERS GO DOWN BECAUSE WE SURVEYED DOWNSTREAM

UNIT - 1

PAGE: 1 OF: _____

STREAM: Fort Cr. (Below Rt. 62) DATE: 9/2/04 ESTIMATOR: Hentze/11

REACH #	UNIT #	UNIT TYPE	CHANL TYPE	% FLOW	UNIT LENGTH	UNIT WIDTH	SLOPE %	SHADE (0-90) LEFT	SHADE (0-90) RIGHT	ACTIVE CHANNEL HT.*	ACTIVE CHANNEL WIDTH	FLOOD PRONE HT.	FLOOD PRONE WIDTH	TERRACE HT.	TERRACE WIDTH	NOTE VWI	NOTE
BR62	10	GL	00	100	21	2	0.5	90	90								Rte 62 Double Culv.
	9	RIS	00	100	24	17	0	40	50	1.0	20	2.0	41	35	50	24	
	8	RP	00	100	75	14	1.0	35	20								
	7	GL	00	100	145	12	0.5	31	60								
	6	GL	00	100	155	12	0.5	55	52								
	5	AL	10	00	46	13	0	11	12								
	4	GL	00	100	250	13	0.5	58	60								
	3	GL	00	100	250	14	0.5	50	10								
	2	GL	00	100	166	13	0.5	38	22								
↓	1	LP	00	100	40	13	0	50	34	1.2	16	2.4	100	25	7150	24	

* MEASURE FROM THE STREAMBED TO THE TOP OF THE ACTIVE CHANNEL. TAKE THE MEASUREMENT AT POOL TAIL CREST ON POOL UNITS.

PHOTO RECORD

PAGE: 1 OF: ____

STREAM: Fort Cr. SURVEY TYPE: OR. PLAN ☐ BASIN ☒ MIXED ☐

BASIN OR GCG: Wood FILM: DIGITAL ☒ SLIDE ☐ PRINTS ☐

SURVEY CREW: RN, KH ROLL #: ____ MAILER #: ____

U:\KLAM_PHOTOS\10\CANON_A Hwy 62 USGS Reach / Below Rt. 62

224 PHOTO # OR DIGITAL ID	UNIT #	DATE	TIME	STREAM / PHOTO DESCRIPTION
1 LB 28	6	9/2/04	1020	Wood Debris Looking DS
2 225/29	|	|	1145	US View of Barn / Ranchhouse
3 226/30	|	|	|	DS View
4 227/31	|	|	|	LB View
5 228/32	|	|	↓	RB View
6 229/33	8	|	1205	US View of Pumice Gravel
7 230/34	—	|	1338	DS View of New Diversion and Continuing Channel
8 231/35	|	|	1348	US View
9 232/36	|	|	|	DS View (Diversion Structure in Distance)
10 233/37	|	|	|	LB View
11 234/38	|	|	↓	RB View
12 235/39	2	|	1515	RB View of Wolman Gravel Count
13 236/40	3	|	1540	US View
14 237/41	3	|	1540	DS View
15 238/42	3	↓	1415	View of Stream Pole on Spawning Gravel
16 239/43	9	9/2/04	1738	RB View of Rip
17 240/44	9	|	1739	LB View of Rip
18 B 45	—	↓	1740	US View above Hwy 62 Bridge
19 241				
20 :				
21 :				
22 :				
23 :				
24 :				
25 :				
26 :				
27 :				
28 :				
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33 :				
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35 :				
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37 :				
38 :				
39 :				
40 :				

REACH

PAGE: 1 OF:

STREAM: Fort Cr.

CREW: RN, KH

BASIN: Wood

USGS 7.5' MAP NAMES:

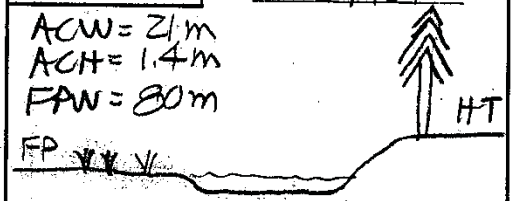
DATE	REACH #	UNIT NUMBER	CHANL FORM	VALLEY FORM	VWI	VEG CLASS DOM.	VEG CLASS SUB-DOM.	LAND USE DOM.	LAND USE SUB-DOM.	WATER TEMP	STRM FLOW	LOCATION TWN-RNG-SEC-1/4	PHOTO # /TIME	REACH NOTE
9/2/04	BR62	1	US	WF	24	C30	S	LT	LG	47°	LF	33S, 7.5E, 21, SE	39/1145	
9/2/04	USFS	1	CT	CT	18	C30	S	LT	NU	48°	LF	33S, 7.5E, 23, NE	34/1330	FS Boundary

Below Rt 62 UTM: 0583929 4725349

ACW = 16 ACH = 1.2 FPW = 100

USFS UTM: 0584700 4727484

ACW = 21 m
ACH = 1.4 m
FAN = 80 m



UTM:

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SPAWNING HABITAT FORM

Stream Fort Creek Reach Forest Service Date 2 Sept 04

Surveyor(s) R. NAWA Wolman Count UNIT 2

Surface area (m^2)	Class (G, GC, C)	Percent wetted	Percent usable	Unit	Rock Type	Cobble Emb	Comments
4	GC	100	100	2	8	P	50%
80	CC	100	100	2	8	P	50% o/o Reds Visible
4	GC	"	"	2	8	P	"
5	GC	"	"	2	8	P	"
5	"	"	"	"	8	"	"
8	"	"	"	"	8	"	"
4	"	"	"	"	8	"	"
6	"	"	"	3	7	"	"
3	"	"	"	3	7	"	"	o/o Redd
10	"	"	"	3	7	"	"	o/o Redd
2	"	"	"	3	7	"	"	Poorly Sorted
2	"	"	"	3	7	"	"	"
10	"	"	"	"	7	"	"	"
3	"	"	"	"	7	"	"	"
8	"	"	"	4	6	"	"	"
10	"	"	"	4	6	"	"	" Scattered Patches
11	"	"	"	4	6	"	"	Scattered Patches

Class: G= gravel; C= small cobble (≤150mm [6"])

P= Pumice

Usable habitat is at least 150mm (6") deep and has water velocities between 1 and 4 feet/second.

SPAWNING HABITAT FORM

Stream: Font Creek [illegible] Reach: Below 62 Date: 2 Sept 04

Surveyor(s): R. Naua [illegible]

Surface area (m^2)	Class (G, GC, C)	Percent wetted	Percent usable	Unit	Rock Type	Comments
2	G	100	100	9	NP	20% >1 ; 50% >½
6	GC	100	100	9	P	>30% sand + FG
2	GC	100	100	8	P	>30% sand + FG
3	G	"	"	7	P	20% >1 - surficial deposit
4	G	"	"	7	P	20% >1 "
3	G	"	"	6	P	30% >1 "
4	G	"	"	6	P	" "
4	G	"	"	4	P	" "
3	G	"	"	4	P	" "
3	G	"	"	3	P	" "
2	G	"	"	3	P	" "
4	C	"	"	3	P	" "
3	G	"	"	2	P	" "

Class: G= gravel; C= small cobble (≤150mm [6"])
Usable habitat is at least 150mm (6") deep and has water velocities between 1 and 4 feet/second.

P = Pumice
NP = Not Pumice

UNIT-2

PAGE: 1 OF: _____

STREAM: FORT CREEK (Below HWY 62) DATE: 2SEPT04 NUMERATOR: R. NAWA

	UNIT #	UNIT TYPE	DEPTH*	DEPTH** PTC	VERIFIED LENGTH	VERIFIED WIDTH	PERCENT SUBSTRATE S/O	SND	GRVL	CBLE	BLDR	BDRCK	BLDR COUNT	% ACTIVE EROSION	% UNDER CUT	COMMENT CODES	NOTE
1	10	CC						50	50								NO DROP ON CULVERTS 45°@ 0930
2	9	SP	2.2	.7				90	10						5		
3	8	RP	0.8					85	15					5	10		PUMICE GRAVEL
4	7	GL	0.7					80	20					20	20		PUMICE GRAVEL
5	6	GL	0.8				20	60	20					10	30		PUMICE GRAVEL
6	5	AL	0.4				100								60		ALCOVE FROM MEANDER CUTOFF
7	4	GL	0.8				50	40	10					10	50	SS	SPRING AT RB 52°@ 1030
8	3	GL	0.8				50	30	20						50		PUMICE GRAVEL
9	2	GL	0.8				60	20	20						50		PUMICE GRAVEL
10	V 1	LP	1.7	.6			100		5						40		MEANDER BEND 47° @ 1145
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20	V																
21																	
22																	
23																	
24																	
25																	
26																	
27																	
28																	
29																	
30	V																

AX DEPTH POOLS - MODAL DEPTH IN FAST WATER UNITS

** ONLY MEASURED @ POOLS (EXCEPT OFF-CHANNEL POOLS)

UNIT NUMBERS GO DOWN BECAUSE WE SURVEYED DOWNSTREAM

UNIT-2

PAGE: 1 OF: 1

STREAM: Font Creek (Forest Service) DATE: 2 Sept 04 NUMERATOR: R. Nawa

UNIT #	UNIT TYPE	DEPTH*	DEPTH** PTC	VERIFIED LENGTH	VERIFIED WIDTH	PERCENT SUBSTRATE S/O	SND	GRVL	CBLE	BLDR	BDRCK	BLDR COUNT	% ACTIVE EROSION	% UNDER CUT	COMMENT CODES	NOTE
1	GL	0.40				95		5						20	GS	AUTOMATED FLOW RECORDER; PUMICE GRAVEL
2	RF	0.30					20	40	40					30		PUMICE GRAVEL; LAMINOY POOLS ?
3	RI	0.30					25	25	50					30		PUMICE GRAVEL
4	RI	0.30					15	35	50					20		
5	GL	0.60					30	30	40			6	20			RESERVATION SPRINGS = 46°@ 1643
V																
V																
V																

AX DEPTH POOLS - MODAL DEPTH IN FAST WATER UNITS

** ONLY MEASURED @ POOLS (EXCEPT OFF-CHANNEL POOLS)

WOOD

PAGE: 1 OF: _____

STREAM: Fort Cr. (Below Rt. 62) DATE: 2 Sept 04 NAME: R. Nawa, Hartzell

UNIT NUMBER	UNIT TYPE	DEBRIS CONFIG	DEBRIS TYPE	DEBRIS LOCAT	DBH CLASS	LENGTH CLASS (m) RW <3	3	6	9	12	15	18	21	24	28	32	36+	WOOD NOTE
9	LP	A	N	S	15		2											
9	LP	A	N	S	30		1											
8	RP	A	N	S	15		2											
8		J	N	M	15		3	1										
8		S	N	E	15		1	2										
8	↓	S	N	S	30			2	1									
7	GL	S	N	M	30			1	4									
7	|	S	N	S	30			2	1									
7	|	S	N	S	15		1	2										
7	|	S	N	M	15		1	2										
7	↓	S	N	E	15		2	1										
6	GL	S	N	E	30			2	3									
6	|	S	RN	E	30			2	3	2								
6	|	S	N	S	45			3	1									
6	|	S	C	S	45		1											
6	|	S	N	S	15		2	3										
6	↓	S	N	S	30			2										
4	GL	S	N	S	30			1	3	2								
4	|	S	N	E	30			2	0	3								
4	|	S	N	E	45				1									
4	↓	S	RN	S	45			1	2									
3	GL	S	N	S	30				5	6								
3	|	S	N	S	15			2										
3	↓	S	RN	E	30				1	2								
2	GL	S	RN	E	45					2								
2	|	S	N	S	30			3	0	2								
2	↓	S	N	M	30				3									
1	LP	S	N	S	30			1										

WOOD

PAGE: 2 OF: _____

STREAM: Fort Cr (USPS) DATE: 9/2/04 NAME: Hartzell

UNIT NUMBER	UNIT TYPE	DEBRIS CONFIG	DEBRIS TYPE	DEBRIS LOCAT	DBH CLASS	LENGTH CLASS (m) RW <3	3	6	9	12	15	18	21	24	28	32	36+	WOOD NOTE
1	GL	S	N	S	60								1					
1	GL	S	N	S	45			1	2	1								
1	GL	S	N	S	30				1	4	1							
1	GL	S	N	M	30			1	1									
2	RI	A	N	S	30		1	3										
2	RI	S	N	S	30			1	4	1								
2	RI	S	N	M	30				1	2	1							
2	RI	S	N	E	45							1	2	1				
2	RI	S	RN	E	120													
2	RI	S	RN	E	30					1	5	1						
2	RI	S	N	S	30			1	2	2								
3	RI	S	N	E	45							1	3					
3	RI	S	N	E	60							1	3					
3	RI	S	N	S	30						2	2						
3	RI	S	N	E	30						1	4						
3	RI	S	N	M	30				1	1	1							
3	RI	S	N	M	45				1	1	1	1						
3	RI	S	RN	E	120									1				
4	RI	S	N	S	45							1						
4	RI	S	N	S	30					2	1	1						
4	RI	S	N	E	45							1						
4	RI	S	N	M	30					2								
4	RI	S	N	E	60						1							
4	RI	S	N	M	45				1	2								
5	GL	S	N	S	30				1	2	1							
5	GL	S	RN	E	30						1	1						
5	GL	S	N	S	45				1	1	1							
5	GL	S	N	M	30				4	2								
5	GL	S	N	E	45					1								

UNIT - 1

PAGE: 1 OF: _____

STREAM: Fort Cr. (Below Rt. 62) DATE: 9/2/04 ESTIMATOR: Hentzell

REACH #	UNIT #	UNIT TYPE	CHANL TYPE	% FLOW	UNIT LENGTH	UNIT WIDTH	SLOPE %	SHADE (0-90) LEFT	SHADE (0-90) RIGHT	ACTIVE CHANNEL HT.*	ACTIVE CHANNEL WIDTH	FLOOD PRONE HT.	FLOOD PRONE WIDTH	TERRACE HT.	TERRACE WIDTH	NOTE VWI	NOTE
BR62	10	GL	00	100	21	2	0.5	90	90								Hwy 62 Double Culv.
	9	LP	00	100	24	17	0	40	50	1.0	20	2.0	41	3-5	50	30	
	8	RP	00	100	75	14	1.0	35	20								
	7	GL	00	100	145	12	0.6	31	60								
	6	GL	00	100	155	12	0.5	55	52								
	5	AL	10	00	46	13	0	11	12								
	4	GL	00	100	250	13	0.5	58	60								
	3	GL	00	100	250	14	0.5	50	10								
	2	GL	00	100	166	13	0.5	38	22								
↓	1	LP	00	100	40	13	0	50	34	1.2	16	2.4	100	25	7.50	21	

* MEASURE FROM THE STREAMBED TO THE TOP OF THE ACTIVE CHANNEL. TAKE THE MEASUREMENT AT POOL TAIL CREST ON POOL UNITS.

UNIT - 1

PAGE: 2 OF: _____

STREAM: Fort Cr. (USFS) DATE: 9/2/04 ESTIMATOR: Hartzell

REACH #	UNIT #	UNIT TYPE	CHANL TYPE	% FLOW	UNIT LENGTH	UNIT WIDTH	SLOPE %	SHADE (0-90) LEFT	SHADE (0-90) RIGHT	ACTIVE CHANNEL HT.*	ACTIVE CHANNEL WIDTH	FLOOD PRONE HT.	FLOOD PRONE WIDTH	TERRACE HT.	TERRACE WIDTH	NOTE VWI	NOTE
USFS	1	GL	00	100	155	17	0.5	29	55	1.4	21	2.8	60	4.0	70	18	Start @ S. USFS Bound.
	2	RI	00	100	250	19	1.0	52	35								
	3	RI	00	100	250	20	1.0	48	55	0.8	21	1.6	32	2.6	42	4	
	4	RI	00	100	96	21	1.0	80	58								
↓	5	GL	00	100	65	17	0.5	70	62	0.8	17	1.6	18	4.5	23	2	End @ Spring HW

* MEASURE FROM THE STREAMBED TO THE TOP OF THE ACTIVE CHANNEL. TAKE THE MEASUREMENT AT POOL TAIL CREST ON POOL UNITS.

REACH

PAGE: 1 OF:

STREAM: Fort Cr.

CREW: RN, KH

BASIN: Wood

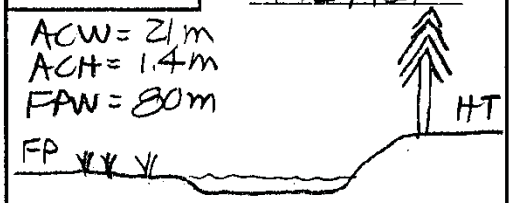
USGS 7.5' MAP NAMES:

DATE	REACH #	UNIT NUMBER	CHANL FORM	VALLEY FORM	VWI	VEG CLASS DOM.	VEG CLASS SUB-DOM.	LAND USE DOM.	LAND USE SUB-DOM.	WATER TEMP	STRM FLOW	LOCATION TWN-RNG-SEC-1/4	PHOTO # /TIME	REACH NOTE
9/2/04	BR62	1	US	WF	21	C30	S	LT	LG	47°	LF	33S, 75E, 21, SE	39/1145	
9/2/04	USFS	1	CT	CT	19	C30	S	LT	NU	48°	LF	33S, 75E, 23, NE	34/1330	FS Boundary

Below Rt. 62 UTM: 0583929 4725349

ACW = 16 ACH = 1.2 FPW = 100

USFS UTM: 0584700 4727484



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REACH

PAGE:_____OF:_____

STREAM:_____

CREW:_____

BASIN:_____

USGS 7.5' MAP NAMES:_____

DATE	REACH #	UNIT NUMBER	CHANL FORM	VALLEY FORM	VWI	VEG CLASS DOM.	VEG CLASS SUB-DOM.	LAND USE DOM.	LAND USE SUB-DOM.	WATER TEMP	STRM FLOW	LOCATION TWN-RNG-SEC-1/4	PHOTO # /TIME	REACH NOTE
													/	

UTM:_____

UTM:_____

UTM:_____

UTM:_____

UTM:_____

UTM:_____

STREAM SUMMARY **FORT CREEK**

Number Units	Total Length (m)	Avg Width (m)	Avg Depth (m)	Total Area (m^2)	Substrate Percent Wetted Area S/O	Snd	Grvl	Cbl	Bldr	Bdrk	Large Boulders (#>0.5m)
15	1,988	14.5	0.77	30,632	31	36	20	12	0	0	6

Habitat Group	Wetted Area (m^2)	Percent
Dammed & BW Pools	598	1.95%
Scour Pools	928	3.03%
Glides	16,248	53.04%
Riffles	12,816	41.84%
Rapids	0	0.00%
Cascades	0	0.00%
Step/Falls	0	0.00%
Dry	0	0.00%
Culverts	42	0.14%

Pool attributes

% bldr
% undercut
Pieces LWD
% shelter pools

OREGON DEPARTMENT OF FISH AND WILDLIF **FORT CREEK**

HABITAT INVENTORY Report Date: 9/27/2004 Survey Date: 9/2/2004

REACH 1 **T33S-R07E-S27SE** **REACH 1**

HABITAT DETAIL

Habitat Type	Number Units	Total Length (m)	Avg Width (m)	Avg Depth (m)	Total Area (m^2)	Large Boulders (#>0.5m)		Substrate Percent Wetted Area S/O	Snd	Grvl	Cbl	Bldr	Bdrk
CULVERT CROSSING	1	21	2.0	0.70	42	0		0	50	50	0	0	0
GLIDE	5	966	12.8	0.78	12,508	0		36	46	18	0	0	0
POOL-ALCOVE	1	46	13.0	0.40	598	0		100	0	0	0	0	0
POOL-LATERAL SCOUR	2	64	15.0	1.95	928	0		48	45	7	0	0	0
RIFFLE W/ POCKETS	1	75	14.0	0.80	1,050	0		0	85	15	0	0	0
Total:	10	1,172	12.3	0.97	15,126	0	**Avg**	38	46	17	0	0	0

HABITAT SUMMARY

Habitat Group	Number Units	Total Length (m)	Avg Width (m)	Avg Depth (m)	Wetted Area (m^2)	Percent	Large Boulders Number	(# / $100m^2$)
Dammed & BW Pools	1	46	13.0	0.40	598	3.95%	0	0.0
Scour Pools	2	64	15.0	1.95	928	6.14%	0	0.0
Glides	5	966	12.8	0.78	12,508	82.69%	0	0.0
Riffles	1	75	14.0	0.80	1,050	6.94%	0	0.0
Rapids	0	0			0	0.00%	0	0.0
Cascades	0	0			0	0.00%	0	0.0
Step/Falls	0	0			0	0.00%	0	0.0
Dry	0	0			0	0.00%	0	0.0
Culverts	1	21	2.0	0.70	42	0.28%	0	0.0

POOL SUMMARY

	Total	Total of all Channel Lengths # / Km	Primary Channel Length # / Km
All Pools:	3	2.6	2.7
Pools >=1m deep:	2	1.7	1.8
Complex pools (LWD pieces>=3):	1	0.9	0.9
Pool frequency (channel widths/pool):	21.7		
Residual pool depth (avg):	1.30		

OREGON DEPARTMENT OF FISH AND WILDLIF **FORT CREEK**

HABITAT INVENTORY Report Date: 9/27/2004 Survey Date 9/2/2004

REACH 1 **T33S-R07E-S27SE** **REACH 1**

Valley and Channel Summary

Valley Characteristics (Percent Reach Length)

Narrow Valley Floor		Broad Valley Floor	
Steep V-shape	0%	Constraining Terraces	0%
Moderate V-shape	0%	Multiple Terraces	0%
Open V-shape	0%	Wide Floodplain	100%

Valley Width Index 26 VWI Range: ~~24-4~~ 21-30

Channel Morphology (Percent Reach Length)

Constrained		Unconstrained	
Hillslope	0%	Single Channel	100%
Bedrock	0%	Multiple Channel	0%
Terrace	0%	Braided Channel	0%
Alt. Terrace/Hill	0%		
Landuse	0%		

Channel Characteristics

Type	Length (m)	Area (m2)	Dry Units
Primary	1,126	14,528	0
Secondary	46	598	0

Channel Dimensions (m)

Wetted	Active	Floodprone n = 2	First Terrace n = 2
Width: 12.3	Width: 18.0	70.5 (41 - 100)	125.0 (50 - 200)
Depth: 0.97	Height: 1.1	2.2 (2 - 2.4)	3.0 (2.5 - 3.5)

W:D ratio: 16.7
Entrenchment (ACW:FPW ratio): 4.2
Stream Flow Type: LF
Habitat Units/100m (total channel length): 0.9
Average Unit Gradient 0.5%
Habitat Units/100m (primary channel length) 0.9
Water temperature (°C) 9.0 - 9.0

Riparian, Bank, and Wood Summary

	Primary	Secondary
Land Use:	LT	LG
Riparian Vegetation:	C30	S

Bank Condition and Shade

Bank Status	Percent Reach Length	Shade (% of 180)
Actively Eroding:	6%	Reach avg: 47%
Undercut Banks:	39%	Range: 13 - 100

Large Wood Debris

	Total	Total / 100m primary channel
All pieces (>=3m x 0.15m):	114	10.1
Volume (m^3):	64	5.7
Key pieces (>=12m x 0.60m):	0	0.0

OREGON DEPARTMENT OF FISH AND WILDLIFE — FORT CREEK

HABITAT INVENTOR Report Date: 9/27/2004 Survey Date: 9/2/2004

RIPARIAN ZONE VEGETATION SUMMARY

REACH 1 — REACH 1

Summary of Riparian Zone (0-30m) 2 transects

Total hardwoods/1000	183
Total conifers/1000 ft	122
Total conifers >20" dbh/1000 f	0
Total conifers >35" dbh/1000 f	0

Average number of trees in a 5-meter wide band

Diameter class (cm)	Zone 1 0-10 meters		Zone 2 10 - 20 meters		Zone 3 20 - 30 meters		Zones 1-3 0-30 meters	
	Conifer	Hardwood	Conifer	Hardwood	Conifer	Hardwood	Conifer	Hardwood
3-15cm	0.0	2.0	0.0	1.0	0.0	0.0	0.0	3.0
15-30cm	0.5	0.0	0.0	0.0	0.5	0.0	1.0	0.0
30-50cm	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0
50-90cm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>90cm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total/100m2	0.5	2.0	0.0	1.0	1.5	0.0	0.7	1.0

Canopy closure and ground cover

	Zone 1 0-10 meters (%)	Zone 2 10 - 20 meters (%)	Zone 3 20 - 30 meters (%)
Canopy closure	15	30	35
Shrub cover	30	40	25
Grass/forb cover	100	100	100

Predominant landform in each zone

	Zone 1 0-10 meters (%)	Zone 2 10 - 20 meters (%)	Zone 3 20 - 30 meters (%)
Hillslope	0	0	0
High terrace	0	25	25
Low terrace	0	0	50
Floodplain	100	75	25
Wetland/meadow	0	0	0
Stream channel	0	0	0
Roadbed/Railroad	0	0	0
Riprap	0	0	0
Surface slope (%)	6	3	7

OREGON DEPARTMENT OF FISH AND WILDLIFE **FORT CREEK**

HABITAT INVENTORY Report Date: 9/27/2004 Survey Date: 9/2/2004

REACH 2 **T33S-R07E-S23NE** **REACH 2**

HABITAT DETAIL

Habitat Type	Number Units	Total Length (m)	Avg Width (m)	Avg Depth (m)	Total Area (m^2)	Large Boulders (#>0.5m)		Substrate Percent Wetted Area S/O	Snd	Grvl	Cbl	Bldr	Bdrk
GLIDE	2	220	17.0	0.50	3,740	6		48	15	18	20	0	0
RIFFLE	3	596	20.0	0.30	11,766	0		0	20	33	47	0	0
Total:	5	816	18.8	0.38	15,506	6	**Avg**	19	18	27	36	0	0

HABITAT SUMMARY

Habitat Group	Number Units	Total Length (m)	Avg Width (m)	Avg Depth (m)	Wetted Area (m^2)	Wetted Area Percent	Large Boulders Number	Large Boulders (# / $100m^2$)
Dammed & BW Pools	0	0			0	0.00%	0	0.0
Scour Pools	0	0			0	0.00%	0	0.0
Glides	2	220	17.0	0.50	3,740	24.12%	6	0.2
Riffles	3	596	20.0	0.30	11,766	75.88%	0	0.0
Rapids	0	0			0	0.00%	0	0.0
Cascades	0	0			0	0.00%	0	0.0
Step/Falls	0	0			0	0.00%	0	0.0
Dry	0	0			0	0.00%	0	0.0
Culverts	0	0			0	0.00%	0	0.0

POOL SUMMARY

	Total	Total of all Channel Lengths # / Km	Primary Channel Length # / Km
All Pools:	0	0.0	0.0
Pools >=1m deep:	0	0.0	0.0
Complex pools (LWD pieces>=3):	0	0.0	0.0
Pool frequency (channel widths/pool):	0.0		
Residual pool depth (avg):			

OREGON DEPARTMENT OF FISH AND WILDLIF **FORT CREEK**

HABITAT INVENTORY Report Date: 9/27/2004 Survey Date 9/2/2004

REACH 2 **T33S-R07E-S23NE** **REACH 2**

Valley and Channel Summary

Valley Characteristics (Percent Reach Length)

Narrow Valley Floor		Broad Valley Floor	
Steep V-shape	0%	Constraining Terraces	100%
Moderate V-shape	0%	Multiple Terraces	0%
Open V-shape	0%	Wide Floodplain	0%

Valley Width Index ~~[illegible]~~ 45 VWI Range: ~~2 [illegible]~~ 23-70

Channel Morphology (Percent Reach Length)

Constrained		Unconstrained	
Hillslope	0%	Single Channel	0%
Bedrock	0%	Multiple Channel	0%
Terrace	100%	Braided Channel	0%
Alt. Terrace/Hill	0%		
Landuse	0%		

Channel Characteristics

Type	Length (m)	Area (m2)	Dry Units
Primary	816	15,506	0
Secondary	0	0	0

Channel Dimensions (m)

Wetted	Active	Floodprone n = 3	First Terrace n = 3
Width: 18.8	Width: 19.7	36.7 (18 - 60)	45.0 (23 - 70)
Depth: 0.38	Height: 1.0	2.0 (1.6 - 2.8)	3.7 (2.6 - 4.5)

W:D ratio: 20.8
Stream Flow Type: LF
Average Unit Gradient 0.9%
Water temperature (°C) 9.0 - 9.0

Entrenchment (ACW:FPW ratio): 1.8
Habitat Units/100m (total channel length): 0.6
Habitat Units/100m (primary channel length) 0.6

Riparian, Bank, and Wood Summary

	Primary	Secondary
Land Use:	LT	NU
Riparian Vegetation:	C30	S

Bank Condition and Shade

Bank Status	Percent Reach Length	Shade (% of 180)
Actively Eroding:	2%	Reach avg: 56%
Undercut Banks:	25%	Range: 47 - 77

Large Wood Debris

	Total	Total / 100m primary channel
All pieces (>=3m x 0.15m):	96	11.8
Volume (m^3):	199	24.4
Key pieces (>=12m x 0.60m):	8	1.0

OREGON DEPARTMENT OF FISH AND WILDLIFE — FORT CREEK

HABITAT INVENTOR — Report Date: 9/27/2004 — Survey Date: 9/2/2004

RIPARIAN ZONE VEGETATION SUMMARY

REACH 2 — REACH 2

Summary of Riparian Zone (0-30m) 3 transects

Total hardwoods/1000	122
Total conifers/1000 ft	386
Total conifers >20" dbh/1000 f	41
Total conifers >35" dbh/1000 f	20

Average number of trees in a 5-meter wide band

Diameter class (cm)	Zone 1 0-10 meters		Zone 2 10 - 20 meters		Zone 3 20 - 30 meters		Zones 1-3 0-30 meters	
	Conifer	Hardwood	Conifer	Hardwood	Conifer	Hardwood	Conifer	Hardwood
3-15cm	0.3	0.7	2.0	0.7	0.3	0.0	2.7	1.3
15-30cm	0.3	0.7	1.0	0.0	0.0	0.0	1.3	0.7
30-50cm	0.0	0.0	1.0	0.0	0.7	0.0	1.7	0.0
50-90cm	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.0
>90cm	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.0
Total/100m2	0.7	1.3	4.0	0.7	1.7	0.0	2.1	0.7

Canopy closure and ground cover

	Zone 1 0-10 meters (%)	Zone 2 10 - 20 meters (%)	Zone 3 20 - 30 meters (%)
Canopy closure	37	53	43
Shrub cover	30	30	40
Grass/forb cover	40	33	23

Predominant landform in each zone

	Zone 1 0-10 meters (%)	Zone 2 10 - 20 meters (%)	Zone 3 20 - 30 meters (%)
Hillslope	0	17	17
High terrace	50	67	67
Low terrace	0	0	0
Floodplain	50	17	17
Wetland/meadow	0	0	0
Stream channel	0	0	0
Roadbed/Railroad	0	0	0
Riprap	0	0	0
Surface slope (%)	21	11	9

OREGON DEPARTMENT OF FISH AND WILDLIFE **FORT CREEK**

HABITAT INVENTORY - RIPARIAN SURVEY 9/2/2004

Summary of Riparian Zone (0-30m) for all reaches **5 transects**

Summary of riparian zone (0-100 feet) extrapolated to 1,000 feet along stream

Total hardwoods/1000	146
Total conifers/1000 ft	280
Total conifers >20" dbh/1000 f	24
Total conifers >35" dbh/1000 f	12

Average number of trees in a 5-m wide band

Diameter class (cm)	Zones 1-3 0-30 meters Conifer	Hardwood
3-15cm	1.6	2.0
15-30cm	1.2	0.4
30-50cm	1.4	0.0
50-90cm	0.2	0.0
>90cm	0.2	0.0

OREGON DEPARTMENT OF FISH AND WILDLIFE FORT CREEK

HABITAT INVENTORY Report Date: 9/27/2004 Survey Date: 9/2/2004

RIPARIAN ZONE VEGETATION

Reach 1 Reach 1

					Cover (percent)				Diameter class (cm)					
Unit	Side	Zone	Surface	Slope	Canopy	Shrub	Grass		3-15	15-30	30-50	50-90	>90	Notes
2	LF	1	FP	10	0	0	100	Conifer						
								Hardwood						
2	LF	2	HT	10	0	0	100	Conifer						
								Hardwood						
2	LF	3	HT	10	0	0	100	Conifer						
								Hardwood						
2	RT	1	FP	4	20	40	100	Conifer						
								Hardwood						
2	RT	2	FP	0	20	40	100	Conifer						
								Hardwood						
2	RT	3	LT	10	20	60	100	Conifer						
								Hardwood						
10	LF	1	FP	4	20	40	100	Conifer		1				
								Hardwood	1					
10	LF	2	FP	0	40	40	100	Conifer						
								Hardwood						
10	LF	3	FP	0	40	20	100	Conifer			1			
								Hardwood						
10	RT	1	FP	4	20	40	100	Conifer						
								Hardwood	3					
10	RT	2	FP	0	60	80	100	Conifer						
								Hardwood	2					
10	RT	3	LT	8	80	20	100	Conifer		1	1			
								Hardwood						

OREGON DEPARTMENT OF FISH AND WILDLIFE FORT CREEK

HABITAT INVENTORY Report Date: 9/27/2004 Survey Date: 9/2/2004

RIPARIAN ZONE VEGETATION

Reach 2 Reach 2

					Cover (percent)				Diameter class (cm)					
Unit	Side	Zone	Surface	Slope	Canopy	Shrub	Grass		3-15	15-30	30-50	50-90	>90	Notes
11	LF	1	FP	2	0	0	100	Conifer						
								Hardwood						
11	LF	2	FP	0	0	20	100	Conifer						
								Hardwood						
11	LF	3	FP	0	0	20	100	Conifer						
								Hardwood						
11	RT	1	HT	30	20	20	20	Conifer						
								Hardwood						
11	RT	2	HT	5	40	60	20	Conifer		1	1			
								Hardwood	1					
11	RT	3	HT	0	40	60	20	Conifer			1			PONDEROSA PINE
								Hardwood						
13	LF	1	FP	20	40	40	60	Conifer						
								Hardwood	2					
13	LF	2	HT	8	80	80	0	Conifer	2					
								Hardwood						
13	LF	3	HT	6	40	60	20	Conifer						
								Hardwood						
13	RT	1	FP	20	20	40	40	Conifer						
								Hardwood		2				
13	RT	2	HT	20	60	20	60	Conifer		1				
								Hardwood	1					
13	RT	3	HT	2	40	40	0	Conifer	1					
								Hardwood						
14	LF	1	HT	30	40	60	20	Conifer						
								Hardwood						
14	LF	2	HT	20	60	0	20	Conifer	1	1				
								Hardwood						
14	LF	3	HT	15	60	20	0	Conifer					1	PONDEROSA PINE
								Hardwood						
14	RT	1	HT	25	100	20	0	Conifer	1	1				
								Hardwood						
14	RT	2	HS	15	80	0	0	Conifer	3		2			
								Hardwood						
14	RT	3	HS	30	80	40	0	Conifer			1	1		
								Hardwood						

FORT CREEK

REACH	UNIT#	TYPE	CHAN	DIST.(m)	COMMENTS	NOTE_ESTIMATOR	NOTE_NUMERATOR
1	1	LP	00	40			MEANDER BEND
1	2	GL	00	206			PUMICE GRAVEL
1	3	GL	00	456			PUMICE GRAVEL
1	4	GL	00	706	SS		RB SPRING; 11C AT 1030
1	5	AL	10				MEANDER CUTOFF ALCOVE
1	6	GL	00	861			PUMICE GRAVEL
1	7	GL	00	1006			PUMICE GRAVEL
1	8	RP	00	1081			PUMICE GRAVEL
1	10	CC	00	1126	CC	END AT HWY 62 DOUBLE CULVERT	NO DROP ON CULVERTS; 7.5C-0930
2	11	GL	00	1281	GS	START AT FS BOUNDARY	AUTOMATED FLOW RECORDER
2	12	RI	00	1531			PUMICE GRAVEL; LAMPREY REDDS
2	13	RI	00	1781			PUMICE GRAVEL
2	15	GL	00	1942		END AT SPRING HEADWATERS	RESERVATIONS SPRINGS; 8C-1645

PHOTO RECORD PAGE: 1 OF: _____

STREAM: Fort Cr. SURVEY TYPE: OR. PLAN ☐ BASIN ☒ MIXED ☐

BASIN OR GCG: Wood FILM: DIGITAL ☒ SLIDE ☐ PRINTS ☐

SURVEY CREW: RN, KH ROLL #: _____ MAILER #: _____

Below Rt. 62 USFS Reach / Hwy 62

	PHOTO # OR DIGITAL ID	UNIT #	DATE	TIME	STREAM / PHOTO DESCRIPTION
1	B 029	5	9/2/04	1020	Wood Debris Looking DS
2	030	1		1145	US View of Barn / Ranchhouse
3	031	1			DS View
4	032	1			LB View
5	033	1		↓	RB View
6	034	8		1205	US View of Pumice Gravel
7	035	—		1339	DS View of New Diversion and Continuing Channel
8	036	1		1348	US View
9	037	1			DS View (Diversion Structure in Distance)
10	038	1			LB View
11	039	1		↓	RB View
12	040	7		1515	RB View of Walman Gravel Count
13	041	3		1540	US View
14	042	3		1540	DS View
15	043	3	↓	1415	View of Stream Pole on Spawning Gravel
16	044	9	9/2/04	1738	RB View of Rip
17	045	9		1739	LB View of Rip
18	B 046	—	↓	1740	US View above Hwy 62 Bridge
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					

Stream Name Fort Creek (USFS Road) Rosgen Channel Type _____

~~Hydrologic~~ Unit 2 EPA Reach _____ EPA EXT _____

Stream Survey Reach Forest Service Sample # _____ Habitat Unit Type RI Fast/Slow Water _____

Observers R.N., K.H Date 9/2/04

Procedure X (Wolman, 1954) ____ (Bevenger and King, 1995) _____ Other

Measurement Device X Ruler ____ Gravelometer (FISP US SA-97)

Class Name	Particle Size (mm)	Dot Count	Total #	% Total	Cum. #	Cum %
Small Organic	< 25 mm					
Large Organic	> 25 mm					
Clay	<0.0039					
Silt	0.0039-0.0625					
Fine Sand	0.0625 - 0.25					
Med. Sand	0.25 - 0.5					
Coarse Sand	0.5 - 1.0	𝍸 ||||	9			
VC Sand	1 - 2		0			
VF Gravel	2 - 4	|	1			
Fine Gravel	4 - 6	||	2			
Fine Gravel	6 - 8	|||	3			
Med. Gravel	8 - 16	𝍸 |||	9			
Coarse Gravel	16 - 32	𝍸 𝍸 𝍸 𝍸 𝍸 ||	27			
VC Gravel	32 - 64	𝍸 𝍸 𝍸 𝍸 |||	29			
Sm. Cobble	64 - 128	𝍸 𝍸 𝍸 𝍸 𝍸 |	26			
Lg. Cobble	128 - 256	𝍸 |||	8			
Sm. Boulder	256 - 512	|||	3			
Med. Boulder	512 - 1024					
Lg. Boulder	1024 - 2048					
VL Boulder	2048 - 4096					
Bedrock						

Total #: 117

Calculations: % Fines <2mm _____ % Fines <6mm _____ D50 _____ D84 _____

Notes: Pumice GRAVEL – REDO on TRANSECT LINE

UTM's: 584751, 4727671

Stream Name _____ Rosgen Channel Type _____

Hydrologic Unit _____ EPA Reach _____ EPA EXT _____

Stream Survey Reach _____ Sample # _____ Habitat Unit Type _____ Fast/Slow Water _____

Observers_____ Date_____

Procedure_____(Wolman, 1954)_____(Bevenger and King, 1995) _____ Other

Measurement Device_____Ruler_____Gravelometer (FISP US SA-97)

Class Name	Particle Size (mm)	Dot Count	Total #	% Total	Cum. #	Cum %
Small Organic	< 25 mm					
Large Organic	> 25 mm					
Clay	<0.0039					
Silt	0.0039-0.0625					
Fine Sand	0.0625 - 0.25					
Med. Sand	0.25 - 0.5					
Coarse Sand	0.5 - 1.0					
VC Sand	1 - 2					
VF Gravel	2 - 4					
Fine Gravel	4 - 6					
Fine Gravel	6 - 8					
Med. Gravel	8 - 16					
Coarse Gravel	16 - 32					
VC Gravel	32 - 64					
Sm. Cobble	64 - 128					
Lg. Cobble	128 - 256					
Sm. Boulder	256 - 512					
Med. Boulder	512 - 1024					
Lg. Boulder	1024 - 2048					
VL Boulder	2048 - 4096					
Bedrock						

Total #: _____

Calculations: % Fines <2mm _____ % Fines <6mm _____ D50 _____ D84 _____

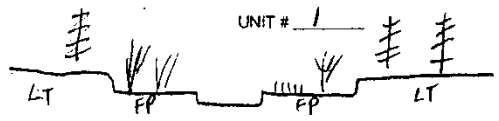
Notes: _____

RIPARIAN

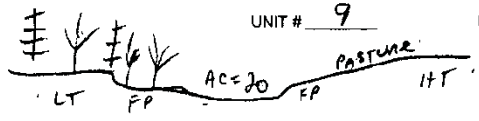
PAGE: 1 OF: _____

STREAM: Font Cr Below 62 DATE: 2 Sept 04 NAME: Rick Nolan

UNIT NUMBER	SIDE	ZONE	SURFACE	SLOPE	CANOPY CLOSURE	SHRUB % COVER	GRASS/FORB % COVER	TREE	COUNT (DBH in CENTIMETERS) 3-15	15-30	30-50	50-90	90+	RIPARIAN NOTE
1	LEFT	1	FP	4	20	40	100	CONIFER		1				
								HARDWOOD	1					
		2	FP	0	40	40	100	CONIFER						
								HARDWOOD						
		3	FP	0	40	20	100	CONIFER			1			
								HARDWOOD						
1	RIGHT	1	FP	4	20	40	100	CONIFER						
								HARDWOOD	3					
		2	FP	0	60	80	100	CONIFER						
								HARDWOOD	2					
		3	LT	8	80	20	100	CONIFER		1	1			
								HARDWOOD						
9	LEFT	1	FP	10	0	0	100	CONIFER						
								HARDWOOD						
		2	HT	10	0	0	100	CONIFER						
								HARDWOOD						
		3	HT	10	0	0	100	CONIFER						
								HARDWOOD						
9	RIGHT	1	FP	4	20	40	100	CONIFER						
								HARDWOOD						
		2	FP	0	20	40	100	CONIFER						
								HARDWOOD						
		3	LT	10	20	60	100	CONIFER						
								HARDWOOD						



0583929 - 4725349



60m below Hwy 62

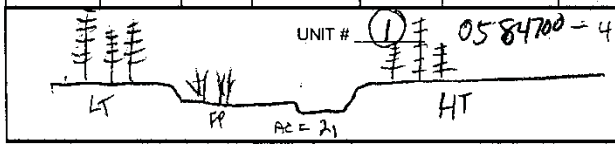
FOR EACH RIPARIAN TRANSECT, DRAW AND LABEL THE SURFACES (HT, LT, FP, HS, ETC) OF A CROSS SECTION IN THE BOX PROVIDED ABOVE. DRAWING AND LABELING VEGETATION IS NOT NECESSARY.

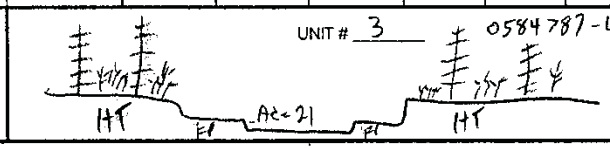
RIPARIAN

PAGE: 2 OF: _____

STREAM: FORT CREEK (FOREST SERVICE) DATE: 2 SEPT 03 NAME: NANCY

UNIT NUMBER	SIDE	ZONE	SURFACE	SLOPE	CANOPY CLOSURE	SHRUB % COVER	GRASS/FORB % COVER	TREE	COUNT (DBH in CENTIMETERS) 3-15	15-30	30-50	50-90	90+	RIPARIAN NOTE
1	LEFT	1	FP	2	0	0	100	CONIFER						
								HARDWOOD						
		2	FP	0	0	20	100	CONIFER						
								HARDWOOD						
		3	FP	0	0	20	100	CONIFER						
								HARDWOOD						
1	RIGHT	1	HT	30	20	20	20	CONIFER						
								HARDWOOD						
		2	HT	5	40	60	20	CONIFER		1	1			
								HARDWOOD	1					
		3	HT	0	40	60	20	CONIFER			1			PONDEROSA
								HARDWOOD						
3	LEFT	1	FP	20	40	40	60	CONIFER						
								HARDWOOD	2					
		2	HT	8	80	80	0	CONIFER	2					
								HARDWOOD						
		3	HT	6	40	60	20	CONIFER						
								HARDWOOD						
3	RIGHT	1	FP	20	20	40	40	CONIFER						
								HARDWOOD		2				
		2	HT	20	60	20	60	CONIFER		1				
								HARDWOOD	1					
		3	HT	2	40	40	0	CONIFER	1					
								HARDWOOD						



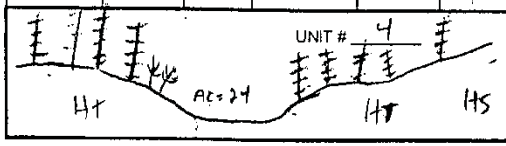


RIPARIAN

PAGE: 3 OF: _____

STREAM: Font Creek (USFS Reach) DATE: 2 Sept 04 NAME: Nava

UNIT NUMBER	SIDE	ZONE	SURFACE	SLOPE	CANOPY CLOSURE	SHRUB % COVER	GRASS/FORB % COVER	TREE	COUNT (DBH in CENTIMETERS) 3-15	15-30	30-50	50-90	90+	RIPARIAN NOTE
4	LEFT	1	HT	30	40	60	20	CONIFER						
								HARDWOOD						
		2	HT	20	60	0	20	CONIFER	1	1				
								HARDWOOD						
		3	HT	15	60	20	0	CONIFER					1	POW AMOSA
								HARDWOOD						
4	RIGHT	1	HT	25	100	20	0	CONIFER	1	1				
								HARDWOOD						
		2	HS	15	80	0	0	CONIFER	3		2			
								HARDWOOD						
		3	HS	30	80	40	0	CONIFER			1	1		
								HARDWOOD						
	LEFT	1						CONIFER						
								HARDWOOD						
		2						CONIFER						
								HARDWOOD						
		3						CONIFER						
								HARDWOOD						
	RIGHT	1						CONIFER						
								HARDWOOD						
		2						CONIFER						
								HARDWOOD						
		3						CONIFER						
								HARDWOOD						



UNIT # _____

RIPARIAN

PAGE:_____ OF:_____

STREAM:_____ DATE:_____ NAME:_____

UNIT NUMBER	SIDE	ZONE	SURFACE	SLOPE	CANOPY CLOSURE	SHRUB % COVER	GRASS/FORB % COVER	TREE	COUNT (DBH in CENTIMETERS) 3-15	15-30	30-50	50-90	90+	RIPARIAN NOTE
	LEFT	1						CONIFER						
								HARDWOOD						
		2						CONIFER						
								HARDWOOD						
		3						CONIFER						
								HARDWOOD						
	RIGHT	1						CONIFER						
								HARDWOOD						
		2						CONIFER						
								HARDWOOD						
		3						CONIFER						
								HARDWOOD						
	LEFT	1						CONIFER						
								HARDWOOD						
		2						CONIFER						
								HARDWOOD						
		3						CONIFER						
								HARDWOOD						
	RIGHT	1						CONIFER						
								HARDWOOD						
		2						CONIFER						
								HARDWOOD						
		3						CONIFER						
								HARDWOOD						

UNIT # _____

UNIT # _____

FOR EACH RIPARIAN TRANSECT, DRAW AND LABEL THE SURFACES (HT, LT, FP, HS, ETC) OF A CROSS SECTION IN THE BOX PROVIDED ABOVE. DRAWING AND LABELING VEGETATION IS NOT NECESSARY.