Fish & Water

(FW)

The South Fork McKenzie watershed is 215 square miles (137,540 acres) in area. The main South Fork is approximately 30 miles long, with its headwater source at Mink Lake (S17, T19S, R7E) in the western Cascades. Significant tributaries ss I, II fish bearing streams, and some Class III's) in ascending order

Name	USGS origin	Length(mi)	5th Field	6th Field
Cougar Creek	Right bank		13 A	13 9
Rush Creek	Left bank		13 S	13 1
E Fk of S Fk	R bank		13 B	13 8
East Fork of the EFSK			13 B	13 8
Annie Cr	L bank		13 R	13 1
Walker Cr	R bank		13 C	13 8
Boone Cr	L bank		13 R	13 1
Rider Cr	L bank		13 R	13 1
Slide Cr	R bank		13 D	13 1
Smith Cr	R bank		13 D	13 1
Ridge Cr	L bank		13 Q	13 1
Tipsoo Cr	R bank		13 D	13 1
Penny Cr	L bank		13 Q	13 1
Horn Cr	L bank		13 Q	13 1
French Pete Cr	R bank		13 E	13 7
Pat Cr (trib to French Pete)			13 E	13 7
Aspen Cr (trib to Pat Creek)			13 E	13 7
Ollalie (trib to French Pete)			13 E	13 7
Balm Creek	L bank		13 P	13 2
Bouy Creek	L bank		13 P	13 2
Hardy Cr	L bank		13 P	13 2
Rebel Cr	R bank		13 F	13 2
Blue Cr	L bank		13 N	13 2
Starr Cr	L bank		13 N	13 2
Augusta Cr	L bank		13 M, 13 V	13 3
Loon Cr				
Grasshopper (trib to Augusta)			13 U	13 3
Cascade Cr	R bank		13 G	13 4
Fir Creek	R bank		13 G	13 4
Roaring River	L bank		13 J	13 5
Moss Creek (trib to Roaring River)			13 J	13 5
McBee Creek (trib to Roaring River)			13 J	13 5
Elk Creek	L bank		13 I	13 6
South Fork McKenzie (mouth to Dam)				13 9
South Fork McKenzie (Dam to French Pete Creek)				13 1
South Fork McKenzie (French Pete Creek to Augusta)				13 2
South Fork McKenzie (Augusta Cr to Roaring River)				13 4
South Fork McKenzie (Roaring River to headwaters)				13 6

ASSUMPTIONS

Four methodologies for stream inventory have been utilized in the South Fork McKenzie watershed (and the same holds true across the Willamette National Forest). Generally, the quality improved from the inception of the stream

inventory program in 1989 to the present, as supervisors and crew members gained experience. In addition, the Region and Forest improved protocol and methodologies as the use of the inventories was clarified and an increase in the knowledge of fluvial systems has occurred.
Notes on methodology: Pools identified as IP3, P4, and P5, in the G-P surveys are considered to be large, primary pools. Logs/trees greater than 24 inches diameter and 50 feet in length are counted as LWD for this summary.

SUMMARY OF EXISTING STREAM SURVEY DATA

Table 1. Name, method, year of survey, and length for S Fk streams.

				Location of data
Cougar Creek	USFS G-P	1990	3.8 mi	*BR
East Fk of S Fk	USFS Level II	1991	7.4 mi	S.O.
"EF" of East Fk	USFS Level II	1991	2.4 mi	S.O.
Walker	USFS Level II	1994	5.0 mi	BR
Rider Creek	USFS G-P	1990	1.7 mi	*BR
North Rider Cr	USFS G-P	1990	1.2	*BR
Ridge Creek	USFS Level II	1993	3.1 mi	BR
Penny Creek	USFS Level II	1991	2.1	S.O.?
Horn Creek	USFS Level II	1993	1.9	BR
French Pete	USFS Level II	1994	9.4	BR
Pat Creek	USFS Level II	1994	3.4	BR
Hardy Creek	USFS G-P	1990	4.9	*BR
Rebel Creek	USFS Level II	1994	4.9	BR
Balm Creek	USFS Level II	1993	2.0	BR
Starr Creek	USFS G-P	1990	3.2	*BR
Augusta Creek	USFS G-P	1991	7.1	*BR
Loon Creek	USFS Level II	1994	2.2	BR
Grasshopper Cr	USFS Level II	1991	3.0	S.O.?
Roaring River	USFS Level II	1990	2.7	S.O.
Roaring River	USFS Level II	1994	3.7	BR
Moss Creek	USFS G-P	1990	1.9	*BR
McBee Creek	USFS G-P	1991	2.1 mi	*BR
Elk Creek	USFS Level II	1994	4.0 mi	BR
South Fork	OSU	1988	13.2	3.5" disc
South Fork	ODFW	1991	3.4	3.5" disc
South Fork	USFS Level II	1994	7.1 mi	BR

Existing condition of streams based on G-P or Level II surveys of habitat.

Cougar Creek - Reach 1 | Gradient 3% | Survey date 7/11/90
Survey length = .1 mi | Large pools 9.7/mi | Temp = 12°C
Avg. width = 17' | LWD 101/mi | Substrate CO/SB/GR
Valley segment is lower alluvial valley

Reach 1 has .09-.16 pools/3-5 channel widths

Reach 2 | Gradient 8% | Survey date 7/11/90
Survey length = .31 mi | Large pools 13.1/mi | Temp = 12°C
Avg. width = 15' | LWD 161/mi | Substrate SB/CO/LB
Valley segment is incised till/colluvium

Reach 2 has .11-.19 pools/3-5 channel widths

Reach 3 | Gradient 7% | Survey date 7/11/90
Survey length = .14 mi | Large pools 13.8/mi | Temp = 13°C
Avg. width = 11' | LWD 128/mi | Substrate LB/SB
Valley segment is incised till/colluvium

Reach 3 has .09-.14 pools/3-5 channel widths

Reach 4 | Gradient 5% | Survey date 7/12/90
Survey length = .18 mi | Large pools 16.2/mi | Temp = 12C
Avg. width = 12' | LWD 167/mi | Substrate SB/LB/CO
Valley segment is incised till/colluvium

Reach 4 has .11-.18 pools/3-5 channel widths

Reach 5 | Gradient 5% | Survey date 7/12/90
Survey length = .37 mi | Large pools 10.8/mi | Temp 12C
Avg. width = 14' | LWD 205/mi | Substrate CO/GR/SB
Valley segment is alluviated mountain valley

Reach 5 has .09-.14 pools/3-5 channel widths

Reach 6 | Gradient 7% | Survey date 7/12/90
Survey length = .74 mi | Large pools 10.8/mi | Temp 10C
Avg. width = 11' | LWD 180/mi | Substrate GR/SB/CO
Valley segment is moderate-slope bound valley

Reach 6 has .07-.11 pools/3-5 channel widths

Reach 7 | Gradient 6% | Survey date 7/12/90
Survey length = .14 mi | Large pools 0/mi | Temp 10C
Avg. width = 17' | LWD 71/mi | Substrate GR/SB
Valley segment is incised till/colluvium

Reach 7 has no large pools

Reach 8 | Gradient 10% | Survey date 7/18/90
Survey length = .51 mi | Large pools 13.7/mi | Temp 11C

Avg. width = 9' LWD 465/mi Substrate SB/GR/wood?/CO
Valley segment is incised till/colluvium

Reach 8 has .07-.12 pools/3-5 channel widths

Reach 9 Gradient 17% Survey date 7/18/90
Survey length = .62 mi Large pools 8.1/mi Temp 12C
Avg. width = 11' LWD 265/mi Substrate SB/CO/GR
Valley segment is steeply incised/steep gradient

At gradients greater than 10% pool spacing is irregular and random, and therefore quantitative objectives for the steep systems have not been established.

Reach 10 Gradient 21% Survey date 7/19/90
Survey length = .31 mi Large pools 3.2.mi Temp 9C
Avg. width = 8' LWD 110/mi Substrate SB/BR/LB
Valley segment is valley wall/headwall tributary

Reach 11 Gradient 31% Survey date 7/19/90
Survey length = .50 mi Large pools 2.0/mi Temp 9C
Avg. width = 9' LWD 112/mi Substrate boulder/BR/wood
Valley segment is valley wall/headwall tributary

EFk of the South Fork - Reach 1 Gradient 7% Survey date 7/23/91 (start)
Survey length = .9 mi Large pools 25.6/mi Temp = ?
Avg. width = 23.2' LWD (>24" dia.) 9/mi Width:depth = 10.20

Reach 1 has .38-.56 pools/3-5 channel widths

Reach 2 Gradient 7% Survey date
Survey length = .7 mi Large pools 24.3/mi Temp = 58°F
Avg. width = 26.3' LWD (>24" dia.) 16/mi Width:depth = 8.36

Reach 2 has .36-.60 pools/3-5 channel widths

Reach 3 Gradient 7% Survey date
Survey length = 0.6 mi Large pools 20.0/mi Temp = ?
Avg. width = 26.3' LWD (>24" dia.) 18/mi Width:depth = 8.18
Embeddedness = No Streambed substrate = CO, GR

Reach 3 has .30-.50 pools/3-5 channel widths

Reach 4 Gradient 3% Survey date
Survey length = 2.3 mi Large pools 34.8/mi Temp = 60°F
Avg. width = 20.3' LWD (>24" dia.) 10/mi Width:depth = 6.36
Embeddedness = N Streambed substrate = CO, SB

Reach 4 has .40-.69 pools/3-5 channel widths

Reach 5	Gradient 5%	Survey date
Survey length = 2.9 mi	Large pools 45.4/mi	Temp = 52°F
Avg. width = 16.9'	LWD (>24" dia.) 37/mi	Width:depth = 6.97
Embeddedness = N	Streambed substrate = CO, SB	

Reach 5 has .43-.73 pools/3-5 channel widths

Fish species observed: cutthroat trout

East Fork of the EFSF McKenzie - Reach 1 Gradient 5% Survey date? 91

Survey length = .52	Large pools 132.0/mi	Temp 49F
Avg. width = 9.1'	LWD 90/mi	W:D = 6.08
Embeddedness = N	Streambed substrate = CO, SB	

Reach 2	Gradient = 8%	Survey date? 91
Survey length = 1.05 mi	Large pools 93.6/mi	Temp
Avg. width = 10.8'	LWD 108/mi	W:D = 9.96
Embeddedness = N/Y	Streambed substrate = CO, GR	

Reach 3	Gradient = 8%	Survey date? 91
Survey length = .74 mi	Large pools 58.8/mi	Temp 51F
Avg. width = 5.6'	LWD 36/mi	W:D = 6.3
Embeddedness = Y		

Walker Creek - Reach 1	Gradient = 9%	Survey date 7/94
Survey length = 1.3 mi	Large pools 15.4/mi	Temp 7C
Avg. width = 22.3'	LWD 58.2/mi	W:D 13.3

Reach 2	Gradient = 11%	
Survey length = 1.6 mi	Large pools 12.5/mi	Temp10C
Avg. width = 19.4'	LWD 69.4	W:D 11.9

Reach 3	Gradient = 8%	
Survey length = 2.1 mi	Large pools 4.8/mi	Temp 9C
Avg. width = 12.6'	LWD 35.2/mi	

Rider Creek - Reach 1	Gradient 15%	Survey date 12/17/90
Survey length = .18 mi	Large pools 21.8/mi	Temp = 4C
Avg. width = 28'	LWD 444/mi	W:D = 26.7 (n=1)
		Substrate is boulder/rubble

Valley segment is steeply incised/steep gradient

Reach 2	Gradient 13%	Survey date 1/28/91
Survey length = .28 mi	Large pools 7.2/mi	Temp = 2C
Avg. width = 13'	LWD 168/mi	Substrate = boulder/CO/BR

Valley segment is steeply incised/steep gradient

Reach 3	Gradient 12%	Survey date 1/29/91
Survey length = .44 mi	Large pools 4.6/mi	Temp = 2C
Avg. width = 12'	LWD 305/mi	Substrate = boulder/wood/BR/CO

Valley segment is valley wall/headwall tributary

Reach 4 Gradient 7% Survey date 1/30/91
Survey length = .12 mi Large pools 8.2/mi Temp 4C
Avg. width = 8' LWD 217/mi Substrate = CO/BR/boulder
Valley segment is valley wall/headwall tributary

Reach 5 Gradient 6% Survey date 1/30/91
Survey length = .68 mi Large pools 1.5/mi Temp 4C
Avg. width = 7' LWD 91/mi Substrate = CO/GR/rubble
Valley segment is U-shaped glacial trough

Ridge Creek - Reach 1 Gradient 13% Survey date 7/13/93 (start)
Survey length = 1.3 mi Large pools 20.8/mi Temp 11C
Avg. width = 10.7' LWD 334.4/mi Substrate = CO/CO
Valley segment is steeply incised/steep gradient Embeddedness noted

Other comments: subwatershed is heavily roaded (4.4mi/sq. mi). Culvert beneath 471 road may be migration barrier. Dispersed site at 471 road has impacted riparian area heavily.

Reach 2 Gradient 16%
Survey length = 1.1 mi Large pools 20.0/mi Temp 10C
Avg. width = 10.2 LWD 214/mi Substrate = CO/CO
Valley segment is moderate slope bound
No fish notes during snorkel survey

Reach 3 Gradient 18% Survey date 7/19/93
Survey length = .7 mi Large pools 10.0/mi Temp 10C
Avg. width = 6.5 LWD 42.1/mi Substrate SB/CO
Valley segment is moderate slope bound valley with steep gradient
No fish observed during snorkel survey Embeddedness noted

Penny Creek - Reach 1 Gradient 16% Survey date 7/2/91 (start)
Survey length = 0.9 mi Large pools 54.4/mi Temp = 50°F
Avg. width = 10.3' LWD (>24" dia.) 318/mi Width:depth = 10.3
Embeddedness = Yes Streambed substrate = CO, GR

Reach 1 has .32-53 pools/3-5 channel widths

Reach 2 Gradient 16% Survey date 7/10/91 (finish)
Survey length = 1.2 mi Large pools 32.5/mi Temp = 48°F
Avg. width = 10.2' LWD (>24" dia.) 160/mi Width:depth = 5.93
Embeddedness (yes & no) Streambed substrate = CO, GR

Reach 2 has .19-.31 pools/3-5 channel widths

Fish species: cutthroat trout

Horn Creek - Reach 1
Survey length = 0.6 mi
width = 8.6'
Embeddedness = N

Gradient 20%
Large pools 13.3/mi
LWD (>24" dia.) 50/mi
Streambed substrate = CO, SA

Survey date 7/27/93
Temp = 13°C @ 1316
Width:depth = 11.7

Other comments: Eight falls in R1. All barriers except lowest may have some passage. One cutthroat in the first pool (7" length). No other fish observed between mouth and 100' falls in the upper half of R1. Fines a concern.

Reach 2
Survey length = 1.2 mi
Avg. width = 6.1'
Embeddedness = Y

Gradient 21%
Large pools 4.2/mi
LWD (>24" dia.) 112/mi
Streambed substrate = GR, GR

Survey date 7/21 & 8/11/93
Temp = 10°C 1445
Width:depth = 11.6

Other comments: Temp = 12°C on 8/11/93 @ 1430. At 2,760 ft into R2 a steep left-bank trib had sluiced into Horn Creek. A slump of 100'L x 50'H resulted. Recent clearcut above the failure. Fines filled pools and pocket pools downstream of the sluice. R2 passes through or adjacent to 4 clearcut units. Thin buffer in mid-reach. No buffer for 5-yr old clearcut at end of reach. Spring-fed trib = 7°C from right bank 2,600' from end of the reach. Four falls 6-20' high create migration barriers. No road access to sluice.

French Pete Creek - Reach 1
Survey length = 2.0 mi
Avg. width = 24.7
Embeddedness = N

Gradient 4%
Pools 11.0/mi
LWD = 8/mi
Streambed substrate = CO/SB

Survey date 7-8/94
Temp 14C
W:D = 24.3

Reach 2
Survey length = 4.0 mi
Avg. width = 26.7
Embeddedness = N

Gradient 3%
Pools 13.3/mi
LWD = 19.6
Streambed substrate = CO/SB

Temp 15C
W:D = 17.5

Reach 3
Survey length = 1.8 mi
Avg. width = 22.9
Embeddedness = N

Gradient 5%
Pools 20.0/mi
LWD = 5/mi
Streambed substrate = CO/SB

Temp 13C
W:D = 17.9

Reach 4
Survey length = 1.6 mi
Avg. width = 21.3'
Embeddedness = N

Gradient 4%
Pools 9.4/mi
LWD = 36.1/mi
Streambed substrate = GR/CO

Temp 11C
W:D = 13.4

Pat Creek - Reach 1
Survey length = 1.4 mi
Avg. width = 14.9'
Embeddedness = N

Gradient 9%
Pools 20/mi
LWD 68.2/mi
Streambed substrate = CO/SB

Survey Date August 1994
Temp 11C
W:D 15.1

Reach 2	Gradient 7%	
Survey length = 1.4 mi	Pools 15.7/mi	Temp 10C
Avg. width = 13.0'	LWD 59.6	W:D 18.9
Embeddedness = N	Streambed substrate = CO/GR	

Reach 3	Gradient 11%	
Survey length = .6 mi	Pools 3.3/mi	Temp 9C
Avg. width = 7.9'	LWD 28.2/mi	W:D 14.0
Embeddedness = N/Y	Streambed substrate = GR/CO	

Olallie Creek - Reach 1	Gradient 8%	Survey Date August 1994
Survey length = 1.2 mi	Pools 21.7/mi	Temp 10C
Avg. width = 14.2'	LWD 7.3/mi	W:D 7.9
Embeddedness = N	Streambed substrate = CO/GR	

Reach 2	Gradient 9%	
Survey length = 1.1 mi	Pools 10.9/mi	Temp 10C
Avg. width = 13.0'	LWD 2.9/mi	W:D 10.3
Embeddedness = N	Streambed substrate = CO/SB	

Hardy Creek - Reach 1	Gradient 7%	Survey date 9/24/90
Survey length = .11 mi	Pools 0/mi	Temp = 12°C
Avg. width = 10'	LWD (>24" dia.) = 118/mi	

Valley segment is alluvial fan. Habitat = 100% riffle.
Streambed substrate is boulder/cobble.

Reach 1 is an alluvial fan, pool objectives not applicable.

Reach 2	Gradient 9%	Survey date 9/24/90
Survey length = .83 mi	Pools 17/mi	Temp = 12°C
Avg. width = 10'	LWD (>24" dia.) = 190/mi	

Valley segment is steeply incised/moderate gradient.
Streambed substrate is dominantly boulder/big boulder/rubble.

Reach 2 has .06-.16 pools/2-5 channel width
Other comments: Cutthroat trout, 4 log jams.

Reach 3	Gradient 11%	Survey date 9/25/90
Survey length = 1.04 mi	Pools 6.3/mi	Temp = 11°C
Avg. width = 11'	LWD (>24" dia.) = 308/mi	

Valley segment is incised till/colluvium.
Streambed substrate is boulder/big boulder/rubble

Reach 3 has .03-.07 pools/2-5 channel widths
Other comments: Cutthroat trout 1.5-3".

Reach 4	Gradient 17%	Survey date 10/01/90
Survey length = .44 mi	Large pools 4.3/mi	Temp 10C
Avg. width = 8'	LWD (>24"dia) 100/mi	

Valley segment is incised till/colluvium
Streambed substrate is rubble/cobble/big boulder

Reach 5 | Gradient 7% | Survey date 10/01/90
Survey length = .80 mi | Large pools 1.2 mi | Temp 9C
Avg. width = 5' | LWD (>24"dia) 166/mi | Width:depth = 15.7
Valley segment is incised till/colluvium
Streambed substrate is boulder/rubble

Reach 6 | Gradient 6% | Survey date 10/02/90
Survey length = .76 mi | Large pools 5.0/mi | Temp 9C
Avg. width = 5' | LWD (>24"dia) 140/mi
Valley segment is U-shaped glacial trough
Streambed substrate is boulder/big boulder

Reach 7 | Gradient 21% | Survey date 10/02/90
Survey length = .88 mi | Large pools 10.3/mi | Temp 7C
Avg. width = 5' | LWD (>24"dia) 55/mi
Valley segment is valley wall/headwall trib
Streambed substrate is bedrock/boulder

Rebel Creek - Reach 1 | Gradient 6% | Survey date July 1994
Survey length = 1.3 mi | Large pools 16.9/mi | Temp 10C
Avg. width = 14.6' | LWD 9.3/mi | W:D 19.1
Embeddedness = N | Streambed substrate CO/SB

Reach 2 | Gradient 11%
Survey length = 2.4 mi | Large pools 25.8/mi | Temp 10C
Avg. width = 15.0' | LWD 20.8/mi | W:D 6.4
Embeddedness = N | Streambed substrate CO/GR

Reach 3 | Gradient 13%
Survey length = 1.2 mi | Large pools 6.7/mi | Temp 10C
Avg. width = 8.1' | LWD 64.8/mi | W:D 7.3
Embeddedness = N | Streambed substrate GR/CO

Balm Creek - Reach 1 | Gradient 9% | Survey date 7/14/93
Survey length = 0.8 mi | Large pools 26.3/mi | Temp = 10°C @ 1245, 1440
Avg. width = 11.2' | LWD (>24"dia) 32/mi | Width:depth = 10.5
Embeddedness = N | Streambed substrate = CO, GR

Reach 1 has .17-.28 pools/3-5 channel widths
Other comments: Fish barrier in Reach 1. Cutthroat observed in lower reach of sizes 1-7". Habitat not good for fish > 7". Blowdown present in Reach 1.

Reach 2 | Gradient 12% | Survey date 7/15 and 7/19/93
Survey length = 0.4 mi | Large pools 20.0/mi | Temp = 9°C
Avg. width = 8.3' | LWD (>24" dia.) 52/mi | Width:depth = 13.0
Embeddedness = Y | Streambed substrate = CO, GR

Reach 2 has .09-.16 pools/3-5 channel widths
Other comments: No fish observed during daytime snorkel survey.

Reach 3 | Gradient 21% | Survey date 7/20/93

Survey length = 0.4 mi
Avg. width = 9.8'
Embeddedness = Y & N

Large pools 12.5/mi Temp = 9°C
LWD (>24" dia.) 50/mi Width:depth = 10.0
Streambed substrate = CO, CO

Other comments: Impassable culvert in Reach 3. No fish observed during snorkel.

Reach 4

Survey length = 0.4 mi
Avg. width = 5.5'
Embeddedness = Y

Gradient 25% Survey date 7/21/93
Large pools 20.0/mi Temp = 8°C
LWD (>24" dia.) 45/mi Width:depth = 11.1
Streambed substrate = SA, SA

Other comments: Very silty.

Starr Creek - Reach 1 Gradient 6% Survey date 7/24/90
Survey length = .6 mi Large pools 6.6/mi Temp = 14°C = 57.2F
Avg. width = 10' LWD 58.3/mi
Valley segment is incised till/colluvium Substrate = SB/LB/CO

Reach 1 has .04-.06 pools/3-5 channel widths
Other cooments: cutthroat, tailed frog tadpoles

Reach 2 Gradient 6% Survey date 7/24/90
Survey length = .27 mi Large pools 7.3/mi Temp = 14C
Avg. width = 12' LWD 63/mi Substrate = SB/LB/CO
Valley segment is steeply incised/steep gradient

Reach 2 has .05-.08 pools/3-5 channel widths

Reach 3 Gradient 11% Survey date 8/1/90
Survey length = .23 mi Large pools 56/mi Temp = 15C = 59F
Avg. width = 10' LWD 56.5/mi W:D = 7.6 (n = 2)
Substrate is SB/BR/LB/GR
Valley segment is steeply incised/steep gradient

Reach 3 has .32-.53 pools/3-5 channel widths

Reach 4 Gradient 7% Survey date 8/4/90
Survey length = .74 mi Large pools 15/mi Temp = 15C
Avg. width = 9' LWD 58/mi W:D = 8.4 (n = 2)
Substrate is SB/BR/LB/CO
Valley segment is steeply incised/steep gradient

Reach 4 has .08-.13 pools/3-5 channel widths

Reach 5 Gradient 11% Survey date 8/4/90
Survey length = .62 mi Large pools 8.1/mi Temp = 14C
Avg. width = 13' LWD 27.4/mi
Valley segment is steeply incised/steep gradient

Reach 5 has .06-.10 pools/3-5 channel widths

Augusta Creek - Reach 1 Gradient 3% Survey date 07/16/91
Survey length .84 mi Large pools 23.7/mi Temp 12C
Avg. width = 25' LWD 11/mi Substrate = rubble/boulder/CO
Valley segment is moderate-slope bound valley

Reach 2 Gradient 3% Survey date 07/18/91
Survey length .52 mi Large pools 13.5/mi Temp 13C
Avg. width = 25' LWD 19/mi Substrate = boulder/rubble/CO
Valley segment is moderate-slope bound valley

Reach 3 Gradient 3% Survey date 07/22/91
Survey length .43 mi Large pools 25.8/mi Temp 14C
Avg. width = 24' LWD 56/mi Substrate = CO/rubble/boulder
Valley segment is alluviated mountain valley

Reach 4	Gradient 4%	Survey date 07/23/91
Survey length 1.25 mi	Large pools 34.5/mi	Temp 14C
Avg. width = 25'	LWD 163/mi	Substrate = rubble/CO/boulder

Valley segment is steeply incised/moderate gradient

Reach 5	Gradient 7%	Survey date 07/31/91
Survey length = 1.4 mi	Large pools 21.8/mi	Temp 13C
Avg. width = 19'	LWD 161/mi	Substrate = boulder/rubble

Valley segment is steeply incised/steep gradient

Reach 6	Gradient 13%	Survey date 08/07/91
Survey length = 1.25 mi	Large pools 23.3/mi	Temp 11C
Avg. width = 9'	LWD 124/mi	Substrate = boulder/rubble

Valley segment is steeply incised/steep gradient

Reach 7	Gradient 16%	Survey date 08/19/91
Survey length = .68 mi	Large pools 0/mi	Temp 6C
Avg. width = 3'	LWD 88/mi	Substrate = CO/wood/rubble

Valley segment is valley wall/headwall tributary

Other comments: Fish (cutthroat, rainbow, sculpins, suckers, dace). See Augusta stream report for size distributions and densities.

Loon Creek - Reach 1	Gradient 14%	Survey date July 1994
Survey length = 1.0 mi	Large pools 26.0/mi	Temp 10C
Avg. width = 12.4'	LWD 60/mi	W:D 5.1
Embeddedness = N	Streambed substrate CO/SB	
Reach 2	Gradient 18%	
Survey length = 0.6	Large pools 21.7/mi	Temp 11C
Avg. width 9.4'	LWD 13/mi	W:D 6.5
Embeddedness = N	Streambed substrate BR/GR	
Reach 3	Gradient 24%	
Survey length = 0.6	Large pools 11.7/mi	Temp 8C
Avg. width 12.1'	LWD 251/mi	W:D 5.6
Embeddedness = N	Streambed substarte CO/CO	

Grasshopper Creek - Reach 1	Gradient 7%	Survey date 7/22-8/6/91
Survey length = .90 mi	Large pools 69/mi	Temp 56F
Avg. width = 12.6'	LWD 162/mi	Substrate = CO/GR
Embeddedness = Y		W:D = 5.47
Reach 2	Gradient 13%	Temp ?
Survey length = 1.8 mi	Large pools 57/mi	Substrate = CO, GR
Avg. width = 10.1	LWD = 31/mi	W:D = 5.2
Embeddedness = Y		
Reach 3	Gradient 13%	
Survey length = .34	Large pools 27/mi	Substrate GR, CO
Avg. width = 6.1'	LWD = 23/mi	Embeddedness = Y

Roaring River - Reach 1 Gradient 3% Survey date 10/3/90
Survey length = 0.7 mi Large pools 12.7/mi Temp = 43°F
Avg. width = 21.1' LWD (>24" dia.) 38/mi Width:depth = 25.0

observations: Cutthroat and bull trout 3-4 inches in length. Bull trout only observed in the side channel located next to the campground in R1.

Reach 1 has .15-.25 pools/3-5 channel widths

Reach 2 Gradient 6% Survey date 10/ /90
Survey length = 1.3 mi Large pools 18.8/mi Temp = 44°F
Avg. width = 19.9' LWD (>24" dia.) 28/mi Width:depth = 5.3
Embeddedness = Yes Streambed substrate = CO, SB

Reach 2 has .21-.35 pools/3-5 channel widths

Reach 3 Gradient 19% Survey date 10/10/90 (finish)
Survey length = 0.9 mi Large pools 11.6/mi Temp = 42°F
Avg. width = 19.3' LWD (>24" dia.) 75/mi Width:depth = 12.3
Embeddedness = Yes Streambed substrate = CO, SB

Reach 3 has .13-.21 pools/3-5 channel widths

Roaring River water temperature = 42°F on 8/29/75 (no air temp)
Tributary to Roaring River
Moss Creek 8/29/75 52°F

Moss Creek - Reach 1 Gradient 9% Survey date 09/04/90
Survey length .91 mi Large pools 7.7/mi Temp 12C
Avg. width = ? LWD 82/mi Substrate = boulder/big boulder
Valley segment is incised till/colluvium
Other comments: cutthroat (largely juvenile habitat) up to R2. Fish migration barrier between R1 and R2.

Reach 2 Gradient 23% Survey date 09/05/90
Survey length .39 mi Large pools 5.1/mi Temp 10C
Avg. width = 7' LWD 118/mi Substrate = boulder/big boulder
Valley segment is steeply incised/steep gradient

Reach 3 Gradient 15% Survey date No habitat info
Reach length .3 mi Temp 10C

Valley segment is valley wall/headwall tributary

Reach 4 Gradient 2% Survey date No habitat info
Reach length .2 mi Temp 10C

Valley segment is valley wall/headwall tributary

McBee Creek - Reach 1 Gradient 6% Survey date 9/10/91
Survey length = 1.5 mi Large pools 5.3/mi Temp = 10°C = 50F (54F @

Avg. width = 9' (wetted) LWD 53/mi W:D = 16.9 1334)
"High flow" width = 15'
Valley segment = incised glacial till/alluvium Substrate = Boulder/CO/GR
Other comments: cutthroat

Forest Plan S&G = 1 pool/3-5 channel widths for streams of 2-8% gradient.
Reach 1 has .02-.05 pools/3-5 channel widths

Reach 2 Gradient 1%
Survey length = .6 mi Large pools NO INFO Temp = 10C
Avg. width (approx 5') LWD NO INFO
"High flow" width = 8'
Valley segment = alluviated mountain valley Substrate = SA, organics
Valley width is 200x channel width

SOUTH FORK MCKENZIE INVENTORY INFORMATION

South Fork McKenzie - Stations A-B Survey date 8/16/37
Cougar to Walker Cr = 2.9 miles Resting pools 77.3/mi Temp = 53F = 11.6C
Avg. width = 96'

This reach has 4.2-9.8 pools/3-7 channel widths

Stations B-C Survey date 8/16/37
Walker Cr to French Pete = 5.6 miles Resting pools 48/mi Temp = 53.5F
Avg. width = 75'

This reach has 2.0-4.8 pools/3-7 channel widths

Stations C-D Survey date 8/17/37
French Pete Creek to Dutch Oven Camp = 5.6 miles (?)
Avg. width = 66' Resting pools 38.4/mi

This reach has 1.4-3.4 resting pools/3-7 channel widths

Upper Tributary to the South Fork (temperatures)
Elk Creek 5/27/64 40° 1645, air 58 (0.6 mi above mouth)
Elk Creek 6/24/64 49°F 1610, air 79
Elk Creek 8/29/75 55°F 0930, air 60°F

OSU South Fork - Reach 1 Confluence to Cougar Reservoir Survey date?
Cumulative length = 4.86 mi Pools 5.6/mi Temp?
Cumulative thalweg = 3.0 mi 17 pools/3.0 miles
Side channel = 6.3% (by surface area) and 22% (of total length)
Avg. width of all units = 70.2'
Riffle wetted width = 69.7'
Riffle active channel width = 79.9'
LWD = approx. 40 pieces > 15.2m (50') and .61m (24") = 8.2/mi of channel
Streambed substrate CO - GR - SB - BR - SA
73 14 8 3 1
Gradient RM 0 to RM 2.3 (upstream of bridge) approx. .66%
Gradient RM 2.3 to RM 4.5 (tailrace of dam) approx .73% (from 4"/mi map)

Reach 1 has .42-.59 pools/5-7 active riffle channel width (80')

Reach 2 Reservoir to Augusta Creek Survey date?
Survey length of 0,1, and 2 channel types = 6.7 mi Pools = 4.1/mi
Cumulative thalweg = 6.5 mi Pools = 4.3/mi
Side channel = 3% (by surface area) and 12.2% (of total channel length)
Avg. width of all units = 62.1' (wetted width) and 69.9' (active width)
Riffle wetted width = 73.1' Average depth = 1.1'
Riffle active channel width = 80.5'
LWD = approx 67-80 pieces meet the 24"dia & 50' length criteria = 10-12/mi
Streambed substrate CO - SB - GR
77 15 7
Gradient RM 9.75 to RM 12 approx. 1.35%
(Ridge Cr to approx. 1/4 mi above Hardy Creek)
Gradient RM 12 to RM 12.8 approx. .95%
(...to Hardy Ridge intersection)
Gradient RM 12.8 to RM 14 approx. 2.8%
(...to downstream edge of Rebel Cr alluvial fan)
Gradient RM 14 to RM 16.5 approx. 1.06%
(...to Augusta Creek)

Reach 2 has .20-.46 pools/3-7 channel widths

Reach 3 Augusta to Elk Creek Survey date?
Survey length = 9.6 miles
Cumulative thalweg = 8.8 mi Pools range from 4.8-5.2/mi
Side channel = 10.3% (by surface area) and 30% (of total channel length)
Avg. width of all units = 38.2' (wetted width) and 43.0' (active width)
Riffle wetted width = 47.1' Average depth =
Riffle active channel width = 52.1'
LWD = approx 131 pieces/9.6 mile to 214 pieces/8.8 mi ==> 13.6-24/mi
Streambed substrate CO - GR(coarse) - SB - GR(fine) - SA
65 28 3 2 1
Gradient RM 16.5 to RM 25 approx. 1.5%
(...to Elk Creek)

Reach 3 at 5.2 pools/mi has .25-.36 pools/5-7 channel widths
(@ 52' channel width R3 has .52 pools/10 channel widths)

ODFW South Fk Reach 1 | Gradient 2.4% | Survey date 8/26/91
Survey length = .76 mi | Pools 18/mi | Temp = 9°C
Avg. width = 28.5' | LWD | Width:depth = 17.6

Streambed substrate	GR	SA	CO	SB/LB	S/O	BR
(%)	30	20	20	17	13	0

Reach 1 has .29-.68 pools/3-7 channel widths.

Other comments: From Elk Creek up is an unconstrained channel with an open V-shaped valley.

Reach 2 | Gradient 2.6% | Survey date 8/26/91
Survey length = 1.7 mi | Pools 27/mi | Temp = 9°C
Avg. width = 38.7 (wetted) | LWD | Width:depth = 20.25

Streambed substrate	SA	GR	CO	SB/LB	S/O	BR
(%)	32	28	18	12	10	0

Reach 2 has .59-1.38 pools/3-7 channel widths.

Other comments: Reach 2 began where high terraces first occurred and the valley narrowed to a moderate V-shape. The channel was constrained by the terraces.

Reach 3 | Gradient 3.2% | Survey date 8/28/91
Survey length = .63 mi | Pools 27/mi | Temp = 9°C
Avg. width = 38.1' (wetted) | LWD | Width:depth = 18.4

Streambed substrate	SA	GR	CO	S/O	SB/LB	BR
(%)	29	22	20	17	11	0

Reach 3 has .58-1.4 pools/3-7 channel widths.

Other comments: Reach 3 began where terraces ended and hillslope appeared on the left stream bank. The channel had alternating hillslope and terrace constraints.

Reach 4 | Gradient 4.1% | Survey date 8/28/91
Survey length = .31 mi | Pools 25.8/mi | Temp = 8°C
Avg. width = 34.1 (wetted) | LWD | Width:depth = 23.6

Streambed substrate	SA	GR	CO	SB/LB	S/O	BR
(%)	28	27	19	14	12	0

Reach 4 has .50-1.17 pools/3-7 channel widths.

Appendix Table FW1: Fish Species of the McKenzie River Basin

Common Name	Scientific Name
Catfish	Family Ictaluridae
Brown bullhead	Ictalurus nebulosus
Lampreys	Family Petromyzontidae
Pacific brook lamprey	Lampetra pacifica
Western brook lamprey	Lampetra richardsoni
Pacific lamprey	Lampetra tridentata
Minnows	Family Cyprinidae
Chiselmouth	Acrocheilus alutaceus
Peamouth	Mylocheilus caurinus
Northern squawfish	Ptychoceilus oregonensis
Longnose dace	Rhinichthys cataracta
Speckled dace	Rhinichthys osculus
Redside shiner	Richardsonius balteatus
Sculpins	Family Cottidae
Paiute sculpin	Cottus beldingi
Shorthead sculpin	Cottus confusus
Reticulate sculpin	Cottus perplexus
Stickleback	Family Gasterosteidae
Threespine stickleback	Gasterosteus aculeatus
Sturgeons	Family Acipenseridae
White sturgeon	Acipenser transmontanus
Suckers	Family Catostomidae
Largescale sucker	Catostomus macrocheilus
Sunfishes	Family Centrarchidae
Bluegill*	Lepomis macrochirus
Largemouth bass*	Micropterus salmoides
White crappie*	Pomoxis annularis
Trout	Family Salmonidae
Coho Salmon	Oncorhynchus kisutch
Chinook salmon	Oncorhynchus tshawytscha
Mountain whitefish	Prosopium williamsoni
Cutthroat trout	Oncorhynchus clarki
Rainbow trout (resident & steelhead)*	Oncarhynchus mykiss
Bull trout	Salvelinus confluentus
Brook trout*	Salvelinus fontinalis
Troutperch	Family Percopsidae
Sand roller	Percopsis transmontana

*Introduced

Appendix Table FW2:
Instream Large Woody Debris (LWD)

Group1 COUGAR

Stream/Reach	Small[1] LWD	Medium[2] LWD	Large[3] LWD	Total Pieces >24 in./50 ft.	Valley Bottom Road Adjacent
Cougar Creek					
R1	13.0	4.0	6.0	10.0	Y
R2	18.0	14.0	36.0	50.0	Y
R3	12.0	8.0	10.0	18.0	Y
R4	22.0	16.0	14.0	30.0	Y
R5	62.0	34.0	42.0	76.0	Y
R6	122.0	66.0	67.0	133.0	Y/N
R7	13.0	4.0	6.0	10.0	Nt
R8	234.0	172.0	65.0	237.0	N
R9	247.0	111.0	53.0	164.0	N
R10	123.0	26.0	8.0	34.0	Y
R11	89.0	38.0	18.0	56.0	N

1 - Small is wood with 12" dbh and 25' length.
2 - Medium is wood with 24" dbh and 50' length
3 - Large is wood with 36" dbh and 50' length.

Instream Large Woody Debris (LWD)

Group3 BOONE/HARDY

Stream/Reach	Small[1] LWD	Medium[2] LWD	Large[3] LWD	Total Pieces >24 in./50 ft.	Valley Bottom Road Adjacent
Balm Creek					
R1	48.0	21.0	11.0	32.0	Y
R2	125.0	49.5	2.6	52.1	N
R3	50.3	40.7	9.6	50.3	Nt
R4	44.9	42.4	2.5	44.9	Nt
Hardy Creek					
R1	13.0	8.0	5.0	13.0	Y
R2	119.0	113.0	45.0	158.0	Y/N
R3	188.0	203.0	117.0	320.0	N
R4	32.0	44.0	56.0	100.0	Y
R5	57.0	96.0	70.0	166.0	Nt
R6	46.0	68.0	72.0	140.0	N
R7	31.0	25.0	30.0	55.0	Nt
Horn Creek					
R1	31.9	40.3	10.1	50.4	Nt
R2	73.9	60.5	51.1	111.6	N
North Rider Creek					
R1	15.0	3.0	13.0	16.0	N
R2	6.0	7.0	14.0	21.0	Nt
R3	6.0	8.0	19.0	27.0	N
R4	44.0	51.0	57.0	108.0	N
Penny Creek					
R1	191.0	229.0	89.0	318.0	Nt
R2	266.0	95.0	65.0	160.0	Nt
Rider Creek					
R1	14.0	51.0	29.0	80.0	N
R2	13.0	21.0	26.0	47.0	Ncc
R3	41.0	83.0	51.0	134.0	N
R4	9.0	13.0	13.0	26.0	N
R5	40.0	40.0	22.0	62.0	Y
Ridge Creek					
R1	107.5	265.7	68.7	334.4	N
R2	155.2	194.7	19.3	214.0	Nt
R3	52.3	30.5	11.6	42.1	N

1 - Small is wood with 12" dbh and 25' length.
2 - Medium is wood with 24" dbh and 50' length
3 - Large is wood with 36" dbh and 50' length.

Instream Large Woody Debris (LWD)

Group4 STARR/LOON

Stream/Reach	Small[1] LWD	Medium[2] LWD	Large[3] LWD	Total Pieces >24 in./50 ft.	Valley Bottom Road Adjacent
Loon Creek					
R1	177.3	50.5	9.2	59.7	Nt
R2	56.4	13.1	0.0	13.1	N
R3	104.2	114.8	136.0	250.8	N
Starr Creek					
R1	51.0	25.0	10.0	35.0	Nt
R2	19.0	12.0	5.0	17.0	N
R3	3.0	10.0	28.0	38.0	N
R4	69.0	23.0	20.0	43.0	N
R5	13.0	14.0	23.0	37.0	N
R6	5.0	0.0	1.0	1.0	Yt

1 - Small is wood with 12" dbh and 25' length.
2 - Medium is wood with 24" dbh and 50' length
3 - Large is wood with 36" dbh and 50' length.

Instream Large Woody Debris (LWD)

Group5 AUGUSTA

Stream/Reach	Small[1] LWD	Medium[2] LWD	Large[3] LWD	Total Pieces >24 in./50 ft.	Valley Bottom Road Adjacent
Augusta Creek					
R1	9.0	8.0	1.0	9.0	Y
R2	10.0	7.0	3.0	10.0	Y
R3	19.0	14.0	10.0	24.0	Y
R4	139.0	134.0	70.0	204.0	N
R5	272.0	147.0	79.0	226.0	Y/N
R6	325.0	110.0	45.0	155.0	N
R7	79.0	41.0	19.0	60.0	N
Grasshopper Creek					
R1	57.8	78.9	83.3	162.2	Nt
R2	24.5	16.0	15.5	31.5	Nt
R3	10.0	10.0	13.3	23.3	N

1 - Small is wood with 12" dbh and 25' length.
2 - Medium is wood with 24" dbh and 50' length
3 - Large is wood with 36" dbh and 50' length.

Instream Large Woody Debris (LWD)

Group7 ROARING RIVER/ELK

Stream/Reach	Small[1] LWD	Medium[2] LWD	Large[3] LWD	Total Pieces >24 in./50 ft.	Valley Bottom Road Adjacent
Elk Creek					
R1	81.1	29.8	3.7	33.5	Y
R2	25.7	19.4	14.3	33.7	Y
R3	110.2	44.1	15.3	59.4	N
R4	42.7	29.9	18.5	48.4	N
McBee Creek					
R1	169.0	53.0	27.0	80.0	Y/N
Moss Creek					
R1	89.0	53.0	22.0	75.0	N
R2	36.0	40.0	6.0	46.0	N
Roaring River (90)					
R1	100.0	32.0	6.0	38.0	Y/N
R2	58.0	26.0	2.0	28.0	Y
R3	127.0	69.0	6.0	75.0	N
Roaring River (94)					
R1	38.0	3.0	0.0	3.0	Y/N
R2	16.0	3.7	0.0	3.7	Y
R3	39.8	2.7	0.0	2.7	Y/N
R4	175.7	64.2	1.9	66.1	N

1 - Small is wood with 12" dbh and 25' length.
2 - Medium is wood with 24" dbh and 50' length
3 - Large is wood with 36" dbh and 50' length.

Instream Large Woody Debris (LWD)

Group8 FRENCH PETE

Stream/Reach	Small[1] LWD	Medium[2] LWD	Large[3] LWD	Total Pieces >24 in./50 ft.	Valley Bottom Road Adjacent
French Pete					
R1	20.1	4.8	3.2	8.0	Nt
R2	49.0	13.9	5.7	19.6	N
R3	44.6	5.0	0.0	5.0	N
R4	45.6	26.0	10.1	36.1	N
Olallie Creek					
R1	56.9	6.5	.8	7.3	N
R2	28.0	1.9	1.0	2.9	N
Pat Creek					
R1	110.9	40.5	27.7	68.2	N
R2	78.8	37.0	22.6	59.6	N
R3	49.4	14.1	14.1	28.2	N
Rebel Creek					
R1	29.7	8.5	.8	9.3	Y/N
R2	40.0	20.4	.4	20.8	N
R3	63.9	49.9	14.9	64.8	N
Walker Creek					
R1	37.8	41.7	16.5	58.2	
R2	57.9	50.5	18.9	69.4	
R3	40.9	26.5	8.7	35.2	

1 - Small is wood with 12" dbh and 25' length.
2 - Medium is wood with 24" dbh and 50' length
3 - Large is wood with 36" dbh and 50' length.

Instream Large Woody Debris (LWD)

Group9 EAST FORK OF SOUTH FORK MCKENZIE

Stream/Reach	Small[1] LWD	Medium[2] LWD	Large[3] LWD	Total Pieces >24 in./50 ft.	Valley Bottom Road Adjacent
EF of EFSFk					
R1	48.0	42.0	48.0	90.0	Nt
R2	68.0	50.0	58.2	108.2	Y?
R3	29.0	22.5	13.8	36.3	Y?
EastFork of South Fk					
R1	28.0	6.6	36.7	43.3	Y
R2	53.0	15.7	68.6	84.3	Y
R3	108.0	15.0	126.7	141.7	N
R4	25.0	7.8	35.7	43.5	Y
R5	32.0	26.2	68.9	95.1	N

1 - Small is wood with 12" dbh and 25' length.
2 - Medium is wood with 24" dbh and 50' length
3 - Large is wood with 36" dbh and 50' length.

Instream Large Woody Debris (LWD)

Group 10 SOUTH FORK MCKENZIE

Stream/Reach	Small[1] LWD	Medium[2] LWD	Large[3] LWD	Total Pieces >24 in./50 ft.	Valley Bottom Road Adjacent
Upper S Fk(94)					
R1	36.8	21.6	9.4	31.0	
R2	57.7	35.7	27.4	63.1	
R3	26.7	15.2	10.7	25.9	
R4	45.9	38.6	9.7	48.3	

1 - Small is wood with 12" dbh and 25' length.
2 - Medium is wood with 24" dbh and 50' length
3 - Large is wood with 36" dbh and 50' length.

Appendix Table FW3:

Observed Pool Values and Objectives

Group 1 COUGAR

Stream/Reach	Length (mi)	Width (ft)	Gradient (%)	Observed Large Pools/Mile	Objective Large Pools/Mile	% Area in Large Pools	Residual Pool Depth (ft)
Cougar Creek							
R1	0.10	17.00	3.00	9.70	62 - 155	4.00	1.70
R2	0.31	15.00	8.00	13.10	70 - 176	4.00	0.40
R3	0.14	11.00	7.00	13.80	96 - 240	7.00	1.10
R4	0.18	12.00	5.00	16.20	88 - 220	7.00	0.50
R5	0.37	14.00	5.00	10.80	75 - 189	3.00	1.20
R6	0.74	11.00	7.00	10.80	96 - 240	3.00	1.20
R7	0.14	17.00	6.00	0.00	62 - 155	0.00	0.00
R8	0.51	9.00	10.00	13.70	117 - 293	4.00	1.00
R9	0.62	11.00	17.00	8.10	*	1.00	0.80
R10	0.31	8.00	21.00	3.20	*	1.00	0.60
R11	0.51	9.00	31.00	2.00	*	1.00	0.90

Observed Pool Values and Objectives

Group 3 BOONE/HARDY

Stream/Reach	Length (mi)	Width (ft)	Gradient (%)	Observed Large Pools/Mile	Objective Large Pools/Mile	% Area in Large Pools	Residual Pool Depth (ft)
Balm Creek							
R1	0.80	11.20	9.00	26.30	94 - 236	11.30	1.60
R2	0.40	8.30	12.00	20.00	*	5.90	1.50
R3	0.40	9.80	21.00	12.50	*	3.00	1.50
R4	0.40	5.50	25.00	20.00	*	8.90	1.20
Hardy Creek							
R1	0.11	10.00	7.00	0.00	Alluvial fan	0.00	0.00
R2	0.83	10.00	9.00	17.00	106 - 264	17.00	1.90
R3	1.04	11.00	11.00	6.30	96 - 240	4.00	1.30
R4	0.44	8.00	17.00	4.30	*	4.00	1.40
R5	0.80	5.00	7.00	1.20	211 - 528	3.00	1.10
R6	0.76	5.00	6.00	5.00	211 - 528	2.00	1.30
R7	0.88	5.00	21.00	10.30	*	9.00	2.40
Horn Creek							
R1	0.60	8.60	20.00	13.30	*	4.20	2.10
R2	1.20	6.10	21.00	4.20	*	1.10	1.70
North Rider							
R1	0.06	10.00	32.00	0.00	*	0.00	0.00
R2	0.22	8.00	24.00	0.00	*	0.00	0.00
R3	0.14	11.00	14.00	6.70	*	4.00	1.60
R4	0.80	11.00	19.00	2.40	*	1.00	1.70
Penny Creek							
R1	0.09	10.30	16.00	54.40	*	8.10	2.10
R2	1.20	10.20	16.00	32.50	*	6.70	2.10

Observed Pool Values and Objectives

Group3 BOONE/HARDY

Stream/Reach	Length (mi)	Width (ft)	Gradient (%)	Observed Large Pools/Mile	Objective Large Pools/Mile	% Area in Large Pools	Residual Pool Depth (ft)
Rider Creek							
R1	0.18	28.00	15.00	21.80	*	12.00	2.00
R2	0.28	13.00	13.00	7.20	*	3.00	1.80
R3	0.44	12.00	12.00	4.60	*	3.00	1.20
R4	0.12	8.00	7.00	8.20	132 - 330	9.00	2.10
R5	0.68	7.00	6.00	1.50	151 - 377	2.00	1.60
Ridge Creek							
R1	1.30	10.70	13.00	20.80	*	5.10	2.10
R2	1.10	10.20	16.00	20.00	*	5.50	1.70
R3	0.70	6.50	18.00	10.00	*	5.20	1.30

Group4 STARR/LOON

Observed Pool Values and Objectives

Stream/Reach	Length (mi)	Width (ft)	Gradient (%)	Observed Large Pools/Mile	Objective Large Pools/Mile	% Area in Large Pools	Residual Pool Depth (ft)
Loon Creek							
R1	1.10	12.40	14.00	26.00	85 - 213	10.40	1.80
R2	0.53	9.40	18.00	21.70	112 - 281	8.20	2.20
R3	0.57	12.10	24.00	11.70	87 - 218	4.10	1.80
Starr Creek							
R1	0.60	10.00	6.00	6.60	106 - 264	3.00	1.00
R2	0.27	12.00	6.00	7.30	88 - 220	4.00	1.10
R3	0.23	10.00	11.00	56.00	106 - 264	37.00	2.60
R4	0.74	9.00	7.00	15.00	117 - 293	10.00	1.90
R5	0.62	13.00	11.00	8.10	81 - 203	3.00	1.80
R6	0.21	8.00	17.00	9.50	*	2.00	1.70

Observed Pool Values and Objectives

Group5 AUGUSTA

Stream/Reach	Length (mi)	Width (ft)	Gradient (%)	Observed Large Pools/Mile	Objective Large Pools/Mile	% Area in Large Pools	Residual Pool Depth (ft)
Augusta Creek							
R1	0.84	25.00	3.00	23.70	42 - 106	19.00	1.10
R2	0.52	25.00	3.00	13.50	42 - 106	13.00	1.70
R3	0.43	24.00	3.00	25.80	44 - 110	19.00	1.20
R4	1.25	25.00	4.00	34.50	42 - 106	22.00	1.60
R5	1.40	19.00	7.00	21.80	56 - 139	15.00	2.10
R6	1.25	9.00	13.00	23.30	117 - 293 (*)	13.00	2.20
R7	0.68	3.00	16.00	0.00	*	0.00	
Grasshopper							
R1	0.90	12.60	7.00	69.00	84 - 210	29.00	1.80
R2	1.80	10.10	13.00	57.00	*	22.00	1.70
R3	0.34	6.10	13.00	27.00	*	4.20	1.40

Observed Pool Values and Objectives

Group7 ROARING RIVER/ELK

Stream/Reach	Length (mi)	Width (ft)	Gradient (%)	Observed Large Pools/Mile	Objective Large Pools/Mile	% Area in Large Pools	Residual Pool Depth (ft)
Elk Creek							
R1	1.10	21.20	3.00	8.20	50 - 125	3.20	1.80
R2	1.70	18.20	4.00	21.20	58 - 145	13.30	1.80
R3	1.50	18.10	9.00	29.30	58 - 146	9.80	2.80
R4	0.60	14.90	16.00	33.30	*	12.10	2.60
McBee Creek							
R1	1.50	9.00	6.00	5.30	117 - 293	2.00	1.30
Moss Creek							
R1	0.91	11.00	9.00	7.70	96 - 240	3.00	1.30
R2	0.39	7.00	23.00	5.10	*	2.00	1.60
Roaring River (90)							
R1	0.70	21.10	3.00	12.70	50 - 125	7.40	2.30
R2	1.30	19.90	6.00	18.80	53 - 140	10.60	3.20
R3	0.90	19.30	19.00	11.60	*	5.10	1.30
Roaring River (94)							
R1	0.70	28.90	3.00	5.70	37 - 91	5.40	1.70
R2	0.80	28.20	9.00	1.30	37 - 94	0.80	1.90
R3	1.10	26.00	6.00	3.60	41 - 102	2.80	3.50
R4	1.10	16.80	10.00	4.50	63 - 157	3.20	2.10

Observed Pool Values and Objectives

Group8 FRENCH PETE

Stream/Reach	Length (mi)	Width (ft)	Gradient (%)	Observed Large Pools/Mile	Objective Large Pools/Mile	% Area in Large Pools	Residual Pool Depth (ft)
French Pete							
R1	2.00	24.70	4.00	11.00	43 - 107	12.80	2.30
R2	4.00	17.48	3.00	13.30	40 - 99	17.80	2.20
R3	1.80	22.90	5.00	20.00	46 - 115	20.30	2.70
R4	1.60	21.30	4.00	9.40	50 - 124	9.60	2.50
Olallie Creek							
R1	1.20	14.20	8.00	21.70	74 - 186	10.00	1.90
R2	1.10	13.00	9.00	10.90	81 - 203	4.20	1.70
Pat Creek							
R1	1.40	14.90	9.00	20.00	71 - 177	11.40	1.80
R2	1.40	13.00	7.00	15.70	81 - 203	6.40	2.10
R3	0.60	7.90	11.00	3.30	134 - 334	0.90	1.80
Rebel Creek							
R1	1.30	14.60	6.00	16.90	72 - 180	9.30	1.90
R2	2.40	15.00	11.00	25.80	70 - 176	11.40	1.50
R3	1.20	8.10	13.00	6.70	*	3.60	1.30
Walker Creek							
R1	1.30	22.30	9.00	15.40	47 - 118	9.90	2.10
R2	1.60	19.40	9.00	12.50	54 - 136	6.60	2.20
R3	2.10	12.22	5.00	4.80	84 - 209	2.40	1.80

Observed Pool Values and Objectives

Group 9 EAST FORK OF SOUTH FORK MCKENZIE

Stream/Reach	Length (mi)	Width (ft)	Gradient (%)	Observed Large Pools/Mile	Objective Large Pools/Mile	% Area in Large Pools	Residual Pool Depth (ft)
E Fork of E Fk S Fk McKenzie							
R1	0.52	9.10	5.00	132.00	116 - 290	40.00	1.30
R2	1.05	10.80	8.00	93.60	98 - 244	35.70	1.20
R3	0.74	5.60	8.00	58.80	189 - 471	19.70	1.10
East Fork of S Fork McKenzie							
R1	0.90	23.00	7.00	25.60	46 - 115	8.80	2.10
R2	0.70	26.00	7.00	24.30	41 - 102	17.40	2.50
R3	0.60	26.00	7.00	20.00	41 - 102	15.10	2.50
R4	2.30	20.00	3.00	34.80	53 - 132	22.80	2.20
R5	2.90	17.00	5.00	45.40	62 - 155	30.90	1.80

Observed Pool Values and Objectives

Group 10 SOUTH FORK MCKENZIE

Stream/Reach	Length (mi)	Width (ft)	Gradient (%)	Observed Large Pools/Mile	Objective Large Pools/Mile	% Area in Large Pools	Residual Pool Depth (ft)
South Fork McKenzie (ODFW)							
R 1	0.76	28.50	2.40	18.00	37 - 93	25.00	
R 2	1.70	38.70	2.60	27.00	27 - 68	30.00	
R 3	0.63	38.10	3.20	27.00	28 - 69	30.00	
R 4	0.31	34.10	4.10	25.80	31 - 77	21.00	
South Fork McKenzie (OSU)							
R 1	4.86	70.00	0.70	5.60	6.6 - 16.5	11.30	
R 2	6.50	62.00	1.50	4.30	6.6 - 16.5	13.50	
R 3	9.60	38.20	1.50	5.00	10 - 25	7.50	
Upper South Fork McKenzie (94)							
R 1	3.30	28.00	3.00	4.80	38 - 94	4.80	2.70
R 2	2.10	29.10	5.00	5.70	36 - 91	4.10	3.40
R 3	1.30	17.70	9.00	4.60	60 - 149	4.70	3.50
R 4	0.50	12.60	3.00	5.00	84 - 210	5.00	3.00

Appendix Table FW4: Aggregate Recovery Percentages(ARP) by Subwatershed

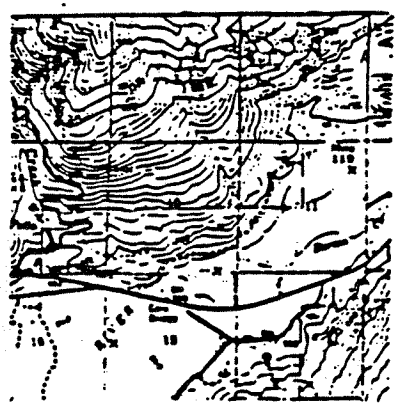
Subwatershed Name	Subwatershed Number	Current ARP Value	Recommended ARP Value(1)
Cougar	13A	77.03	75
East Fork	13B	88.17	70
Walker	13C	96.62	70
Smith	13D	97.37	75
French Pete	13E	99.08	75
Rebel	13F	97.82	70
Cascade	13G	95.43	70
South Fk-Mink	13H	97.9	70
Elk	13I	86.12	75
Roaring River	13J	84.46	70
Trail	13K	98.05	80
Twin Springs	13L	83.8	75
Loon/Lower Augusta	13M	73.24	80
Starr	13N	79.19	75
Hardy	13P	81.4	75
Green/Ridge	13Q	72.13	65
Boone/Rider	13R	83.36	65
Deathball	13S	83.29	70
Grasshopper	13U	82.92	75
Upper Augusta	13V	87.38	75

(1) Determined from Land & Resources management Plan 1990, Appendix E

Appendix Report FW5:

Code	Segment Type	Distinguishing Criteria
	Key	Stream Order: defined by Strahler 1957
		Valley Bottom Width: ACW (active channel width) refers to annual floodplain channel width
		Minimum Distance: 1000 feet
	Oblique drawing	Side Slopes: gradient of stream adjacent slope and valley wall slopes
		Channel Pattern: degree of sinuosity, meandering and braiding
		Land Form Feature: describes geomorphic characteristics responsible segment development
		Other Common Characteristics
		Substrate: qualitative description of dominant substrate types
	Topographic Map	Channel Gradient: average gradient of overall segment
		Channel Type: material that controls channel pattern: alluvial stream is able to move laterally on valley bottoms: bedrock controlled stream is constricted: boulder controlled stream is controlled by an unconsolidated soil and boulder mixture
		LWD: large woody debris-describes characteristics in a natural state

Code	Segment Type
1	Lower Alluvial Valley



Distinguishing Criteria

Stream Order: valley formed by major 5th and 6th order streams, but tributaries may be 1-4th order streams, flowing through the valley formed by large streams

Valley Width: greater than 5X ACW

Side Slopes: 0-10%

Channel Pattern: often highly meandered

Land Form Feature: streams located in lower large river floodplains and on ancient river or lacusterine terraces; stream may be adjacent to moderate to steep slopes on one side; stream may also be located in low elevation glacier carved valleys that have since been overlain with deep alluvial deposits

Other Common Characteristics

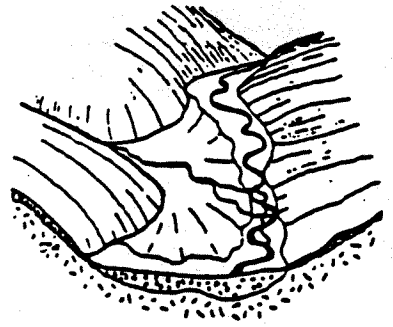
Substrates: fines, gravel, cobble in small 1st and 2nd order tributaries on valley floor; rubble and boulders dominate riffles and rapids of larger rivers

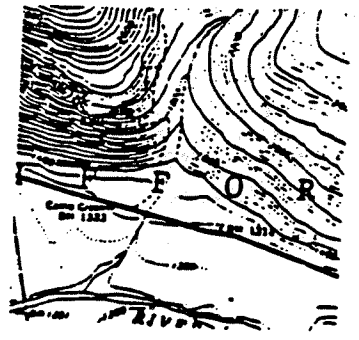
Channel Gradient: 0-5%

Channel Type: alluvial

LWD: abundant large jams on channel margins and braids in large rivers; variable in smaller 1st through 3rd order tributaries on valley floor; small jams and undercut root wads commonly create good pool and cover habitat in smaller tributaries

Code	Segment Type
2	Alluvial Fan





Distinguishing Criteria

Stream Order: alluvial fan from larg 2nd, 3rd, 4th order tributaries deposite on valley floor and alluvial terraces o 5th and 6th order stream

Valley Width: greater than 3X ACW, bu may be more confined in upper portions o the fan where the stream exits the canyo

Side Slope: flat to moderate, althougl the upper end of the alluvial depositio may be in lower incised valley

Channel Pattern: moderate sinuous meanders, occasional braids

Land Form Feature: stream travels through its own alluvial fan depositior on large 5th and 6th order valley floors; the upper end of these segments may be located in the lower stretches of incised valleys and canyons; stream actively downcuts through unconsolidated banks in moderate gradients

Other Common Characteristics

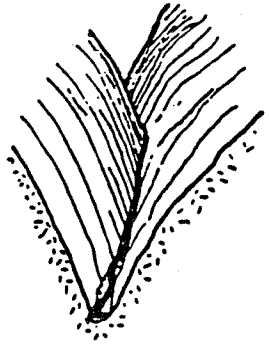
Substrate: boulder, big boulder deposited in upper fan, while smaller rubble and cobble substrate predominate in lower low gradient sections

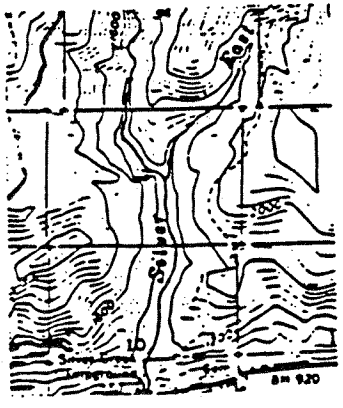
Channel Gradient: 1-6%

Channel Type: alluvial

LWD: frequent large jams and individual stems often deposited in high flow channel, but only occasional small jams and embedded individual stems create high quality pools and spawning sites

Code	Segment Type
3	Steeply Incised Valley/Moderate Channel Gradient





Distinguishing Criteria

Stream Order: large 2, 3, 4

Valley Width: 1-2X ACW

Side Slopes: steep, often bedrock walled

Channel Pattern: straight to slightly sinuous, confined by sideslopes

Land Form Feature: normally found down cutting steep competent hillsides composed of igneous intrusions or volcanic originated rock; sometimes found in early glacial till and colluvium deposits where stream deeply downcut to a more resistant layer; lava flows or other resistant rock layers may result in vertical canyon walls on one or both sides of the channel

Other Common Characteristics

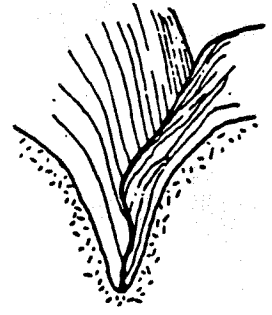
Substrate: boulder, big boulder, bedrock in steeper gradients; rubble, boulder, big boulder in moderate gradients; rubble and cobble in alluviated terraces dammed by debris jams or bedrock constrictions

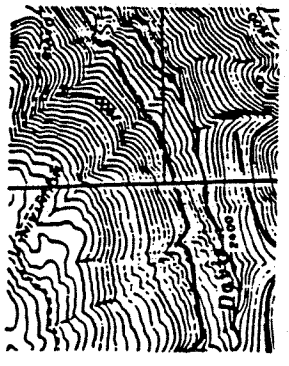
Channel Gradient: 3-6%

Channel Type: bedrock control, alluvial in short reaches

LWD: infrequent large jams; most individual pieces are moved out in flood events; where wood does remain it is normally well mixed and embedded short pieces

Code	Segment Type
4	Steeply Incised Valley/Steep Channel Gradient





Distinguishing Criteria

Stream Order: 2, 3; large 3rd and 4th order streams usually downcut to the extent that they create segment code 3 type channels

Valley Width: 1X ACW

Side Slopes: steep, commonly vertical cliffs

Channel Pattern: straight to slightly sinuous, confined by sideslopes

Landform Feature: normally found down cutting steep competent hillsides formed from igneous intrusions, fault blocks or volcanic extrusions; sometimes found in early glacial till deposits where the stream is deeply incised to a more resistant rock layer; lava flows or other resistant rock layers may result in vertical canyon walls on one or both sides of the channel. One side may be a steeply incised, less resistant layer.

Other Common Characteristics

Substrate: bedrock, big boulder dominated, many areas sluiced to bedrock with deposition of rubble and boulder in between

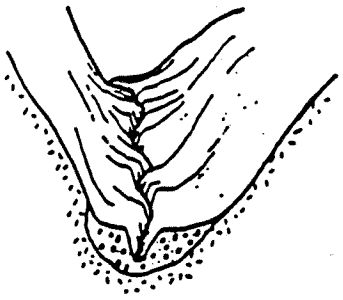
Channel Gradient: steep, generally >6%, although short sections of moderate gradient exists between steep bedrock areas

Channel Type: bedrock control

LWD: infrequent large jams; single pieces are moved out in flood events

Code	Segment Type	Distinguishing Criteria
5	Incised Glacial Till or Incised Colluvium Deposits	**Stream Order:** 2, 3, 4

Valley Width: 1-2X ACW



Side Slopes: immediate stream adjacent slopes moderate to steep due to downcutting through glacial till and colluvium surfaces, upper slopes tend to grade from flat to steep as elevation is gained

Channel Pattern: straight to slightly sinuous; occasional braids

Land Form Feature: streams downcutting through glacial deposits or colluvium originated substrate; advanced downcutting has led to steep to moderate stream adjacent slope with poorly consolidated upper bank material; this leads to moderate to high potential for bank failure

Other Common Characteristics

Substrate: generally rubble/boulder; banks are generally composed of unsorted glacial drift material or colluvium deposition

Channel Gradient: 2-5%; alluvial deposition can reduce gradient to 0-3% in localized areas

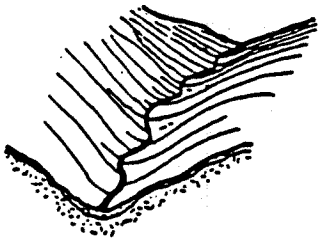
Channel Type: boulder confined

LWD: variable, often abundant single stems and occasional jams; jams and individual pieces are commonly deposited in high flow areas and where they contribute little to perennial habitat

Code	Segment Type	Distinguishing Criteria
6	Moderate-Slope Bound Valley	**Stream Order:** 1, 2, 3

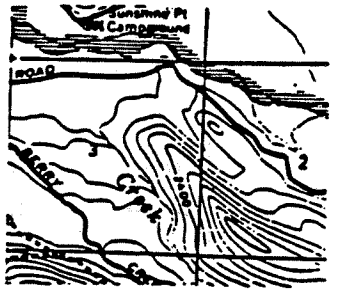
Valley Width: 1-2X ACW

Side Slopes: moderate; occasional shor sections of steep side walls



Channel Pattern: straight to slightl sinuous, with occasional channe splitting

Land Form Feature: generally located i lower foothills and minor fault bloc areas; also found in upper drainag network where stream power i insufficient to deeply downcut underlyin strata; immediate stream adjacent slope range from nearly flat to moderatel steep; the distinguishing characteristi separating this from other valley type is the low gradient upper side slopes



Other Common Characteristics

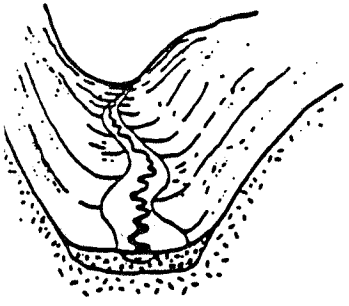
Substrate: cobble/rubble, local areas o rubble, boulder and bedrock

Channel Gradient: low to moderate; 1-5

Channel Type: alluvial, may be shor areas of bedrock or boulder control

LWD: small jams and single stems ar common; debris is an important poo former

Code	Segment Type
7	U-Shaped Glacial Trough Valley



Distinguishing Criteria

Stream Order: 1, 2, small 3

Valley Width: >5X ACW

Side Slopes: flat, although stream sometimes is adjacent to glacial terraces and moraines

Channel Pattern: moderate to high meanders

Land Form Feature: located in the bottoms and lower side slopes of the U-shaped glacial valleys; the present stream channel has not significantly downcut below the level of the valley floor and is free to meander; valley floor is generally composed of glacial deposits, but the active channel is filled with small substrate material from alluvial deposits

Other Common Characteristics

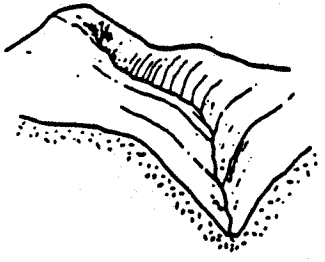
Substrate: ranges from fines to rubble, depending on local stream gradient

Channel Gradient: low; 0-3%; can be short steep sections where stream downcuts terminal moraines

Channel Type: alluvial

LWD: variable, depending upon vegetation type; segments in subalpine areas have little LWD, while segments in more developed timber have abundant small jams and single pieces creating habitat; LWD often critical in formation of high quality pool and cover

Code	Segment Type
8	Valley Wall/ vs. Headwall Tributary



Distinguishing Criteria

Stream Order: 1, small 2

Valley Width: >1X ACW

Side Slopes: moderate to steep

Channel Pattern: straight; stairstep longitudinal profile

Land Form Feature: small tributaries flowing over moderate to steep competent hillsides, glacial scoured slopes, or glacial depositions; once a valley wall tributary enters a valley floor of a 5th or 6th order river it is considered a lower alluvial valley segment type

Other Common Characteristics

Substrate: boulder/ bedrock in steep sections; boulder, rubble in moderate gradient reaches

Channel Gradient: 1-5% near junction with larger streams, becoming very steep upslope on the valley wall, stairsteps create short sections of low gradient deposition between cascades

Channel Type: bedrock or boulder control

LWD: variable; important in creating stairsteps; in steep bedrock sections LWD is normally sluiced out; moderate to low gradient sections commonly have single pieces of LWD with infrequent small jams creating rubble deposition upstream

Code	Segment Type	Distinguishing Criteria
9	Lava Flow/ Spring Fed Meadows	

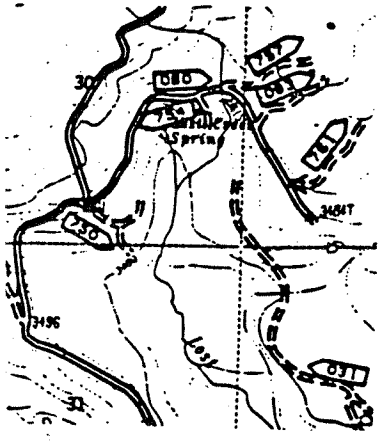
Stream Order: 1, small 2

Valley Width: greater than 5X ACW; watershed boundaries poorly defined

Side Slopes: 0-10%

Channel Pattern: slight meanders resistant substrate prevents accelerated meandering

Land Form Feature: lava flows have generally low gradient slopes and very resistant strata; these segment types have very slight downcutting and valley development. Much of these valley segment types are found in association with Mt. Adams in the southern portion of the Forest



Other Common Characteristics

Substrate: fines to cobble; occasional boulders scattered along the banks and in-channel

Channel Gradient: 0-3%

Channel Type: alluvial or boulder controlled

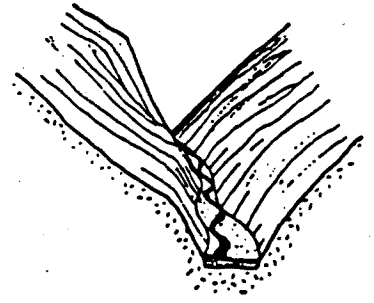
LWD: generally low, some infrequent large jams; beaver often are responsible for input of individual pieces; when LWD is present it normally creates good pool and cover habitat

Code	Segment Type	Distinguishing Criteria
10	Alluviated Mountain Valley	

Stream Order: 2, 3, 4

Valley Width: 2-5X ACW

Side Slopes: immediate stream adjace slope may be flat due to alluvi deposition, but upper valley slope increase from moderate to steep



Channel Pattern: moderate to hig meanders and braiding

Land Form Feature: these valley segmen types may be hard to distinguish from U shaped glacial troughs with th distinguishing characteristic being th classic U-shaped valley form for th later being missing. These valle segments are formed from continua alluvial deposition; the stream generall flows over a relatively wide annua floodplain; they can also be formed fro a reduction in stream energy leading t deposition of sediment and debris as result of changes in formative factor such as bedrock constrictions and lo gradient bed topography; valley bottom are generally well established with vegetation

Other Common Characteristics

Substrate: gravel/cobble/rubble dominate, although the upper end of this segment type may be dominated by small boulder

Channel Gradient: 0-3%

Channel Type: alluvial

LWD: common, frequent jams and single pieces create excellent pool habitat; undercut rootwad habitat common; large trees may be partially undercut in older sections of this valley type