ATTACHMENT E1-E4

Forms

FORM E1 Segment Distribution: Calapooia River

UNCONFINED VW>4CW						
MODERATELY CONFINED 2CW<VW<4CW			110,111,119,120,121	112,122		
CONFINED VW<2CW	230,324,324.1, 324.2,324.3, 324.4,324.5, 324.6,325, 325.1,325.2, 325.3,326,326.1,326.2,327, 327.1,327.2		77,78,79, 156,194,328,329	1,2,5,6.1,30,32,46,65,66, 80,89,99,108.1,113,114, 115,123,124,125,126,128, 129,130,141,143.1,145, 146,148,150,151,154,155, 160,165,186,192.1,201, 225,226,227,228,242,243, 244,259,263,	3,6.2,8,10,12,19,21,24,26,28,31, 33,34,36,38,42,45,49,50,53,57, 60,62,67,69,72,75,81,82,84,86, 88,90,94,96,98,100,104,106,108.2,117,131,132,133,134,139,142,143.2,147,149,152,153,157,159,161,162,164,166,168,170,171, 173,174,175,176,178,180,182, 183,185,187,190,192.2,193,195, 199,202,204,206,209,210,212, 214,216,218,219,220,222,229, 231,232,234,238,240,245,247, 248,250,253,255,257,261,264, 265,267,272,273,276,279,282, 285,288,290,293,296,299,302, 307,310,312,317,319,320,330.2	4,7,9,11,13,14,15,16,17,18,20,22,23, 25,27,29,35,37,39,40,41,43,44,47,48, 51,52,54,55,56,58,59,61,63,63.1,64, 68,70,71,73,74,76,83,85,87,91,92,93, 95,97,101,102,103,105,107,109,116, 118,127,135,136,137,138,140,144, 158,163,167,169,172,177,179,181, 184,188,189,191,196,197,198,200, 203,205,207,208,211,213,215,217, 221,223,224,233,235,236,237,239, 241,246,249,251,252,254,256,258, 260,262,266,268,269,270,271,274, 275,277,281,283,286,289,291,292, 294,295,298,300,303,304,306,311, 313,315,316,318,321,322,323.2,331
	<1.0 % Pool–Riffle	1.0–2.0 % Pool–Riffle, Plane–Bed	2.0 – 4.0 % Plane–Bed, Forced Pool–Riffle	4.0 – 8.0 % Step–Pool, Forced Step–	8.0 – 20.0 % Cascade	>20.0 % Colluvial
	Gradient and Potential Reach Level Channel Morphology					

Form E2 Channel Disturbance Worksheet

Channel response reaches	Photo year	Observations
Mainstem of Calapooia River	1946	Photo year incomplete. Logging along the mainstem of the river.
	1967	High reflectance—coarse sediment deposition seen in gravel bars and channel braiding in loosely confined areas
	1978	Inputs occur and are visible in the loosely confined areas as gravel bars
Potts Creek	1946	Harvested along mainstem of trib.
	1949	Harvesting has occurred and a streamside road exists. Riparian vegetation is gone. High reflectance indicates sediment in channel
	1967	Harvesting continues in headwater areas. Debris torrent appears to have scoured out Potts Creek channel, widening riparian area
	1978	Riparian area along the mainstem of the trib has well vegetated riparian area
	1987	Well vegetated
North Fork	1946	Harvested along mainstem, stream has no riparian canopy, high reflectance—appears sediment laden
	1949	Logging has occurred up the mainstem. The channel has lost riparian canopy. It appears the channel has experienced recent sediment inputs. The channel appears braided/high reflectance indicates sediment inputs are high. Stream adjacent roading
	1967	Harvesting has occurred in headwaters—possible debris torrent has scoured and deposited coarse sediment along the channel
	1978	Riparian area vegetated—stream not evident
	1987	Well vegetated
King Creek	1949	King Camp is visible at the western side of the creek. Shacks are visible on photos, High reflectance along the mainstem appears to be coarse sediment load
	1967	Debris torrent has caused the mainstem channel to move about
	1978	Trib mainstem has lots of sediment deposits. The riparian canopy is returning
Hands Creek	1946	Old growth
	1949	Debris torrent appears in mainstem of trib
	1978	Riparian area well vegetated
	1987	Well vegetated

Form E3 Field Sites Visited

Seg.	Survey	Recon	Stream	Selection Rationale
30	x		Bigs	Check geologic signature in stream, assess fines routing, access
56		x	Unnamed below Washout	Recon smaller drainage discharge and resulting channel morphology
57		x	Washout	Observe 1996 storm event debris torrent stream in this system
79	X		Potts	Observe stream not debris torrented in 1996 storm event, bank cutting, check bedload
96	X		Unnamed near King	Check for geologic changes, GMU designation
98	X		King	Check for confinement in moderate sized transport drainages
112	X		North Fork	Check channel morphology in medium drainage response reach
138		x	Unnamed	Geologic or land use signature in Forest Service stream system
229	X		Blue	Check for confinement and in stream wood
243	X		McKenzie	Compare bedload to other tribs
259	x		McKinley	Observe how channel is processing sediment, access
308	X		U.S.	Check if Forest Service stream has more wood, less impacted from recent land use activities
324	X		Mainstem	Review GMU designation confinement calls and particle size
324.1	X		Mainstem	Land use and log drive signature
325	X		Mainstem	Check condition of riparian canopy along the mainstem
326	x		Mainstem	Review GMU designation, assess fines routing, check bedload
327	X		Mainstem	Check LWD function assess debris torrent inputs
328	x		Mainstem	Make observations about channel under Forest Service management

Sites delineated with surveys include one or more of the following types of data: bankfull width and depth; pool-riffle tally; and LWD tally. Other sites were reconned in the field and qualitative observations noted.

Segment #: 1230 Date: 4-4 FORM 27

Gradient: 8-10 Location: McKenzie

Confinement: TC Crew: EB, JH

Segment # 243

	Distance (m)	Unit Type	Pools: Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rlc Dpth (m)	Forming Agent	% Cover	Substrate: Dominant Substrate	Subdominant Substrate	Spawning Gravel	Dom/Second/Negl/Outside: LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %	Bankfull Width
1	28	P	4.0	4.1	4.8	0.50	0.15	LWD	10	Gr	B	R	1	1							6.8
2	61	R								B	–	–									
3	95	P	1.1	1.8	1.4	0.55	0.10	BLDr	20	Gr	B	R	1	4			1	4			
4	254	R								B	Gr	–									
5	297	P	3.5	3.6	3.7	0.50	0.20	BLDr	<5	Gr	B	R								40	
6	35	R								Gr	C	R									
7	37	P	3.2	3.7	3.7	0.50	0.15	BLDr	<5	Gr	B	R									
8	39	P	2.7	2.5	2.6	0.50	0.20	BLDr	<5	Gr	C	R					1	4			
9	45	R								Gr	B	–									
10	495	P	1.8	2.0	2.1	0.50	0.15	BLD	<5	Gr	B	R									
11	70.8	R	2							Gr	C	–					1	2			7.8
12	73	P	2.8	2.4	2.8	0.40	0.10	LWD	20	C	Gr	R					1	1		73	
13	85	R								Gr	C	RA									
14	912	P	4.0	3.1	1.5	0.60	0.20	BR	<5	BR	Gr	R									
15	983	R								C	BR	–									
16	110	P	2.5	3.2	2.6	1.10	0.15	BLDr/BR	20	BR	Gr	R			1	4	2	3/4			
17	1345	R								B	Gr	R			1	3	1	2			
18	1405	P	1.1	1.0	1.0	0.60	0.20	BLDr	20	Gr	B	RA									
19	1443	P	2.5	1.8	1.6	0.45	0.15	BLDr	<5	Gr	B	A									
20	156	R								GR	B	A					1	2		81	7.1

5 functional

Barriers NONE

Bank characteristics erosion/undercuts 80% of the survey reach had eroding banks, most likely occured during last event

Evidence of debris torrents/floods – Channel has had debris torrent occur w/in recent years (96') roughly 2 m of aggradation

Nature of LWD function/singles, jams – pool (lateral scour) formation, limited plunge pool form

Sensitivity to coarse sediment – LARGE QUANTITIES OF AGRADED UNSORTED COARSE SEDIMENT W/IN BFW – channel is cutting through deposition

Evidence and sensitivity of fine sediment deposition – LARGE AMOUNT OF FINES IN DEBRIS DEPOSITIONAL AREAS – stream seems to be processing FINES ADEQUATELY, SOME DEPOSITION IN POOL MARG

Are there terraces, height/matrix hillslope BOTH BANKS

Condition of Riparian vegetation/cut oldgrowth trees/downed logs MMD

Dominant channel and habitat forming processes – STEP POOL (MOST STEP-POOL TOO SMALL for 4 pools)

Beaver – NO –

Gravel Bars – MANY *UNSORTED DEBRIS FLOW DEPOSITION

Rearing limited to pool bottoms & non 4 pools w/in RIFFLE units – resistivity Resident only

Rearing slow water habitat abundant w/in steps

Fish Movement several 10-20 cm drops may provide moderate impediment

Segment #: 2OL Date: 1-5-97
Gradient: 5-7 Location: N Fork
Confinement: MC Crew: EB, JH
14.5°

Segment # 112

Unit	Distance (m)	Unit Type	Pools: Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rfc Dpth (m)	Forming Agent	% Cover	Substrate: Dominant Substrate	Subdominant Substrate	Spawning Gravel	Dom/Second/Negl/Outside: LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %	Bankfull Width
1	8^{5}	P	1^{2}	1^{3}	1^{8}	0^{45}	0^{10}	LWD	40	Gr	C	R/A	6	4	2	4	1	4			6^{5}
2	20^{4}	R								C	Gr	—	1	3			1	3			
3	25	P	3^{5}	3^{3}	3^{4}	0^{45}	0^{15}	LWD	30	Gr	B	R/A	4	4	1	1	2	3			
4	68^{5}	R								Gr	C	R/A	14	3/4			2/1	3/2			
5	71^{3}	P	2^{1}	2^{2}	2^{0}	0^{45}	0^{10}	LWD	30	Gr	C	R/A	8	4	2	1	1	3			
6	84^{7}	R								Gr	C	A	3	4							
7	88	P	3^{3}	3^{0}	3^{5}	0^{35}	0^{10}	Bldr	<5	Gr	B	R/A									
8	110^{4}	R								Gr	C	A					1	2			
9	118	P	3^{4}	2^{8}	2	0^{70}	0^{10}	LWD	20	Gr	B	R/A	2	3	2	1				87	7^{3}
10	120^{1}	R								C	—	—									
11	127^{1}	P	3^{3}	3^{0}	2^{2}	0^{40}	0^{15}	Bldr	<5	B	S	R					1	2			
12	128^{8}	P	2^{0}	1^{3}	1^{7}	0^{40}	0^{15}	Bldr	<5	B	Gr	R									
13	160^{2}	R								Gr	B	R/A	1	3			3	0			
14	163	P	1^{6}	2^{0}	2^{1}	0^{40}	0^{10}	Bld	<5	Gr	C	R/A								88	6^{3}
15																					

8 functional

Barriers: Large jams @ bottom of Reach

Bank characteristics erosion/undercuts: BANKS unstable, channel entrenched, Recent erosion, cutting, widening

Evidence of debris torrents/floods: STREAMSIDE ALDERS have been undercut & channel appears to have widened 2-3 m during the last storm event (96?), channel is cutting though deposits

Nature of LWD function/singles, jams: large pieces form scour/steps, infrequent. Recent recruitment of ALDERS have no impact on BED Deformation

Sensitivity to coarse sediment - moderate → high, Abundant coarse gravels in BARS.

Evidence and sensitivity of fine sediment deposition - channel seems to be processing, fine sediment ADEQUATELY

Are there terraces, height/matrix: LOW TERRACE (1-3 m) LB, RB, hillscape to RB @ gradient break @ top of sample reach

Condition of Riparian vegetation/cut oldgrowth trees/downed logs: M, M/S, D

Dominant channel and habitat forming processes: FORCED POOL RIFFLE (WOOD present) PLAIN BED (WOOD ABSENT) STEP POOL AT GRADIENT >6% (ENDED REACH @ GRADIENT BREAK)

Beaver: N/A

Gravel Bars: LATERAL BARS OF WELL SORTED, COARSE MATERIAL

Spawning: Abundant in pool tail out, Runs, glides

Rearing: limited to the few pools present

Fish Movement: unobstructed

Segment #: 10 Date: 7-2-11

Gradient: 10-12% Location: Little Kinyla

Confinement: Crew: EB, JH Segment # 96

0 - out of channel 2) Less than 25 11 3) Negligible 4) out of channel

	Distance (m)	Unit Type	Pools: Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rfc Dpth (m)	Forming Agent	% Cover	Substrate: Dominant Substrate	Subdominant Substrate	Spawning Gravel	Dom/Second/Negl/Outside: LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %	Bankfull Width
1	3.3	P	3.1	3.2	3.1	0.45	0.05	LWD	5	S	B	–			2	1/2				45	4.1
2	7.5	R											3	3	8	3		4			
3	9.9	P	1.3	1.2	1.1	0.41	0.15	LWD	20	Gr	C	R					3	2/4			
4	11.1	R										–			1	1	2	1			
5	13.3	P	0.6	1.1	0.1	0.4	0.1	LWD	10	G	–	–					2	0/4			
6	43.1	R								Gr	B	–									
7	44.4	P	1.80	1.80	1.80	0.50	0.05	Bldr	<5	Gr	C	R/A			1	0					
8	61.1	R								Gr	C	–	1	0			1	0			
9	63.9	P	1.1	1.20	0.70	0.35	0.10	Bldr	15	Gr	C	R/A			1	4					
10	65.6	R								Gr	Bl										
11	67	P	1.20	1.50	1.35	0.40	0.10	Bldr	5	Gr	C	R/A								4/6	
12	89.6	R								Gr	C	A					4	3/0			8.0
13	91.3	P	0.9	0.9	0.1	0.35	0.10	LWD	20	Gr	B	R/A					2	1/2			
14	118.9	R								Gr	B	A					5	0/			
15	123.0	P	1.30	0.8	1.70	0.30	0.05	Bld	40	Gr	R	R/A			1	4					
16	126.9	R								Gr	C	R/A									
17	129.8	P	1.6	1.5	2.1	0.30	0.05	Bld	0	Gr	B	R/A								34	5.6

11 functional

Culverts: CULVERT PASSABLE

Bank characteristics erosion/undercuts: ERODING BANKS = 80% OF SURVEYED REACH

Evidence of debris torrents/floods: Evidence of debris flow recently (past winter?)

Nature of LWD function/singles, jams: LARGE RESIDUAL PIECES FUNCTION AS BANK STABILITY

Sensitivity to coarse sediment: HIGH

Evidence and sensitivity of fine sediment deposition: SOME INTRASTITIAL ACCUMULATION OF FINES IN POOL BOTTOMS

Are there terraces, height/matrix: Entrenched as channel works through debris flow deposition

Condition of Riparian vegetation/cut oldgrowth trees/downed logs: - sparse, deciduous, small

Dominant channel and habitat forming processes: channel has just begun to work through abundant coarse sediments deposited by debris flow

Beaver: N/A

Gravel Bars: SCARCE, MOST material unsorted

Spawning: linked to pools (Residents)

Rearing: = POOL AREA

Fish Movement: unobstructed

VEGETATION - ABUNDANT AUTOCHTHONOUS PRODUCTION

18°C = STREAM TEMP

Segment #: [illegible] Date: [illegible]

Gradient: 8-10 Location: King Cr

Confinement: TC - MC Crew: EBJH

F: 1 (>75%), 2 (<75%) 3 (NEG) 4 (ZONE 4

Segment #98

Unit	Distance (m)	Unit Type	Pools: Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rfc Dpth (m)	Forming Agent	% Cover	Substrate: Dominant Substrate	Subdominant Substrate	Spawning Gravel	Dom/Second/Negl/Outside: LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %	Bankfull Width
1	4.3	P	1.5	1.4	1.3	0.4	0.10	Root	15	GR	C	R/A								90	8.4
2	6.9	R								Gr	C	R/A					•	0/			
3	11.5	P	2.1	2.4	2.0	0.45	0.10	Bldr	10	Gr	C	R/A									
4	18.3	P	1.5	2.0	1.1	0.42	0.15	Bldr	<5	Gr	C	R/A									
5	33.4	R								Gr	C	A			•	4					
6	36.9	P	2.12	1.90	1.50	0.50	0.20	Bldr	<5	Gr	C	A					•	3			5.5
7	41.4	R								C	B	–									
8	48.5	P	2.5	2.1	2.1	0.50	0.12	Bld	<5	Gr	C	R/A									
9	54.4	P	3.1	2.1	2.0	0.50	0.15	Bldr	<5	Gr	C	R/A									
10	72.5	R								B	G	R/A					••	4			
11	79.1	P	3.8	4	2.5	0.50	0.10	Bld	10	Gr	B	R/A				(1)	•2	2/3		87	
12	101.3	R								Gr	B	R/A							3		
13	103.3	P	1.5	0.70	0.40	0.45	0.10	Bld	15	B	C	–									
14	109	R								Gr	C	R/A									
15	113	P	1.60	2.10	1.0	0.40	0.15	Bld	20	Gr	B	R/A									
16	122	R								Gr	C	-					3.	0/2			
17	123.4	P	2.4	2.2	1.7	0.45	0.15	Bldr	60	C	Gr	RA									
18	127.9	R								Gr	C	R/A		1	3		1	2			
19	133.6	P	1.9	2.4	2.1	0.40	0.10	Root	20	Gr	S	R									
20	135.4	R								Gr	–	R	1	3	1	4	2	2/6			

7 functional

Barriers: CULVERT HAS 1' DROP @ BOTTOM,

Bank characteristics erosion/undercuts: Some eroding BANKS, LWD provides armoring. STABILIZED channel during HIGH FLOWS.

Evidence of debris torrents/floods: ABUNDANT ACCUMULATION OF COARSE SEDIMENT - COVERS BASE OF ALDER IN LM

Nature of LWD function/singles, jams: BANK stability enhanced by large, RESIDUAL PIECES. MAY HAVE MINIMIZED/DIMINISH COARSE SEDIMENT movement DURING 96 flood

Sensitivity to coarse sediment - C. Sediments ARE ABUNDANT IMMEDIATELY U.S. OF ROAD X-ING & throughout sample reach

Evidence and sensitivity of fine sediment deposition: NOT significant

Are there terraces, height/matrix: terrace (LOW) RB, LB = hillslope

Condition of Riparian vegetation/cut oldgrowth trees/downed logs: LARGE RESIDUAL CUT PIECES ALONG BANKS, ALSO ZONE 4 RIP. VEG = MEDIUM (12-16 dbh) SIZE DECIDUOUS, DENSE within BUFFER

Dominant channel and habitat forming processes: CASCADE, STEP POOL

Beaver: NO DAMS, some chewed branches evident

Gravel Bars: MEDIAL BARS, well sorted, small-medium GRAVEL

Spawning: in pools & riffles

Rearing: pool ABUNDANT, some SIDE channel pooling

Fish Movement: PASSAGE immediately U.S. of culvert RESTRICTED by large SEDIMENT DEPOSITION

NOTE: FRAME #1, ROLL J1, Frame 2

16%

Segment #: 200 Date: 1 2 11 Page 2

Gradient: 8-10% Location: KING

Confinement: MC Crew: EB, JH

#98

Unit	Distance (m) 135 →	Unit Type	Pools: Wkdth 1 (m)	Wkdth 2 (m)	Wkdth 3 (m)	Max Dpth (m)	Rfc Dpth (m)	Forming Agent	% Cover	Substrate: Dominant Substrate	Subdominant Substrate	Spawning Gravel	Dom/Second/Negl/Outside: LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %	Bankfull Wkdth
21	141.6	P	1'	1.2	1.0	0.49	0.13	LWD	80	Gr	C	R/A			1	1	1	1			
22	150	R								C	B	–			3	4	1	0			
23	158	R*								Gr	B	R/A									
24	162	P	3'	3.2	2.9	0.50	0.10	LWD	35	Gr	B	R/A								89	8.5

* STEPS

Barriers

Bank characteristics erosion/undercuts

Evidence of debris torrents/floods

Nature of LWD function/singles, jams

Sensitivity to coarse sediment

Evidence and sensitivity of fine sediment deposition

Are there terraces, height/matrix

Condition of Riparian vegetation/cut oldgrowth trees/downed logs

Dominant channel and habitat forming processes

Beaver

Gravel Bars

Spawning

Rearing

Fish Movement

Pepple count

2-4	
4-8	IIII
8-16	~~IIII~~ IVI
16-32	~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ III
32-64	~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ II
64-128	~~IIII~~ ~~IIII~~ ~~IIII~~ III
128-256	~~IIII~~ ~~IIII~~ ~~IIII~~
> 256	~~IIII~~ IIII

#

52, 22, 90, 64, 30, 18, 10, 4, 20, 48, 40, 130, 150, 35, 30, 88, 28, 35, 155, 66, 306, 128, 79, 60, 24, 14, 28, 26, 18, 55, 270, 81, 170, 55, 48, 49, 12, 28, 47, 30, 88, 50, 12, 258, 51, 54, 155, 7, 115, 10, 256+, 45, 145, 8, 60, 44, 156, 18, 10, 256+, 38, 35, 58, 31, 71, 15, 42, 30, 44, 31, 40, 45, 20, 19, 10, 256+, 51, 32, 40, 81, 115, 20, 45, 40, 120, 50, 44, 200, 74, 45, 145, 265+, 20, 13, 35, 38, 22, 91, 46, 256+, 22, 12, 256+, 61,

Segment #: 1000 Date: 7-7

Gradient: 0.2% Location: M Stem L. Chilliwack

Confinement: UC Crew: EB, JH

21°

Segment # 324

	Distance (m)	Unit Type	Pools: Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rlc Dpth (m)	Forming Agent	% Cover	Substrate: Dominant Substrate	Subdominant Substrate	Spawning Gravel	Dom/Second/Negl/Outside: LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %	Bankfull Width
1	227	R								Gr	C	—									28
2	1014	P	9	20	12	1.6	0.40	BLDR/MEAND	<5	Gr	C	R-A								21	
3	163	R								B	Gr	—									
4	263	P	17	22	23	2.3	0.65	BLDR/MEAND	<5	Gr	B	R-A								34	29
5	348	R								Gr	B	R-A							35		
6	387	P	12.1	11.4	9.2	1.10	0.60	MEAND/DEB	<5	Gr	B	R-A									
7	406	R								C	B	—									
8	474	P	13	14	13.5	1.05	0.40	BLDR	10	C	Gr	A	4	4							
9	587	R								C	Gr	A	3	4			1	4			26
10	650	P	14	15.5	17.5	1.5	0.42	BR/MEAN	<5	GR	BR	R/A								6	

[illegible]EYED D/S OF BRIDGE

Barriers NONE

Bank characteristics erosion/undercuts - MOSTLY BEDROCK OR WELL ARMORED BY BLDR / ROOTS

Evidence of debris torrents/floods - DEBRIS PILE @ BRIDGE

Nature of LWD function/singles, jams - N/A

Sensitivity to coarse sediment - LOW

Evidence and sensitivity of fine sediment deposition - IN POOL MARGINS / BOTTOMS ABUNDANT FINES W/IN INSTITIAL SPACES

Are there terraces, height/matrix High (3m+) terrace BOTH BANKS

Condition of Riparian vegetation/cut oldgrowth trees/downed logs NO SIGNIFICANT ACCUMULATION

Dominant channel and habitat forming processes - POOL/RIFFLE

Beaver - NO -

Gravel Bars INFREQUENT; MEDIAL BARS UNSORTED, LATERAL BARS WELL SORTED

[illegible]ng ABUNDANT

Rearing Some SIDE channel, slow water in Boulder Runs

Fish Movement UNOBSTRUCTED

[illegible] Date: [illegible]

2-4 Location: MStem

ment: TC Crew: JH, EB

Segment # 325

	Distance (m)	Unit Type	Pools: Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rfc Dpth (m)	Forming Agent	% Cover	Substrate: Dominant Substrate	Subdominant Substrate	Spawning Gravel	Dom/Second/Negl/Outside: LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %	Bankfull Width
1	28.1	P	6.1	12.2	11.5	1.1	0.25	Br	10	BR	Gr	A								13	25
2	33.8	R								Br	C	–									
3	37.3	P	5.2	6.0	5.0	0.8	0.5	BR	15	Br	B	–									
4	43.7	R								C	B	–									
5	52	P	9	10.2	10.6	0.15	0.45	Mean	<5	Gr	B	R/A									
6	57.8	R								C	Gr	A									
7	63.4	P	8.0	6.8	8.2	0.20	0.40	Bldr	10	Gr	B	R·A									
8	122	P	11	11.8	9	2.0	0.40	BR	10	B	GR	R									17
9	130	R								C	Gr	–								39	
10	140.9	P	6.4	6.2	5.8	1.20	0.50	BR	<5	BR	B	–									
11	158.5	R*								Br	–	–									
12	175.5	P	6.1	4.8	7.2	0.70	0.40	Bldr	<5	C	Gr	R									
13	199.5	R								C	Gr	A									
14	250.4	P	14	9	11	2.10	0.40	Br	10	Gr	BR	R-A									
15	265	R								B	Gr	R									
16	315	P	16	10	11	3+	0.40	BR	15	Gr	BR	R·A									
17	323	R								B	Gr	–					1	3			
18	344	P	8	6	3.5	1.75	0.40	BR	15	C	BR	–									
19	363	P	4	4.5	3.7	1.8	0.55	Br	<5	C	BR	R									
20	371	R								B	BR										

* BEDROCK CHUTE

Barriers —

Bank characteristics erosion/undercuts BEDROCK BANKS throughout sample reach

Evidence of debris torrents/floods —

Nature of LWD function/singles, jams — NO significant LWD accumulation

Sensitivity to coarse sediment – SEDIMENT limited, abundant exposed bedrock; ENDED reach @ U.S. gradient BREAK - SURVEYED REACH WAS "TRANSPORT" REACH

Evidence and sensitivity of fine sediment deposition SAND, FINE gravel in margins of pools

Are there terraces, height/matrix Hillslope LB. high terrace → hillslope RB

Condition of Riparian vegetation/cut oldgrowth trees/downed logs MMD.

Dominant channel and habitat forming processes BEDROCK control, BOULDER STEPS

Beaver —

Gravel Bars LARGE LATERAL BARS w/ well sorted gravel / COBBLE / BOULDER

[illegible]ng – ABUNDANT IN POOL BOTTOMS BOTH RESIDENT & ANDROMOUS

Rearing – DEEP POOLS w/ BEDROCK overhangs

Fish Movement unobstructed

Gradient: Location: MAINSTEM

Confinement: TC Crew: JH EB

page 2 of 2

Segment # 325

Unit	Distance (m) 37→	Unit Type	Pools: Width 1 (m)	Pools: Width 2 (m)	Pools: Width 3 (m)	Pools: Max Dpth (m)	Pools: Rlc Dpth (m)	Pools: Forming Agent	Pools: % Cover	Substrate: Dominant Substrata	Substrate: Subdominant Substrata	Substrate: Spawning Gravel	Dom/Second/Negl/Outside: LWD 10-20	Dom/Second/Negl/Outside: Functional	Dom/Second/Negl/Outside: LWD 20-50	Dom/Second/Negl/Outside: Functional	Dom/Second/Negl/Outside: LWD >50	Dom/Second/Negl/Outside: Functional	Side Channel Length (m)	Shade %	Bank Width
21	380.9	P	4.1	5	5	1.00	0.35	Br	<5	B	Gr	—					1	4			
22	388	P	4.6	4.5	2.5	0.8	0.5	Br	<5	C	Br	—	1	4							22
23	412	R								B	Gr										
24	441	P	6.4	6.6	6.1	0.1	0.50	Br	<5	Gr	C	A								21	

Barriers

Bank characteristics erosion/undercuts

Evidence of debris torrents/floods

Nature of LWD function/singles, jams

Sensitivity to coarse sediment

Evidence and sensitivity of fine sediment deposition

Are there terraces, height/matrix

Condition of Riparian vegetation/cut oldgrowth trees/downed logs

Dominant channel and habitat forming processes

Beaver

Gravel Bars

Spawning

Rearing

Fish Movement

Gradient: 2% Location: MAIN Stem

Confinement: MC Crew: EB JH

18°

[redacted] [redacted]

[redacted]nt

[redacted]27

Unit	Distance (m)	Unit Type	Pools: Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rfc Dpth (m)	Forming Agent	% Cover	Substrate: Dominant Substrate	Subdominant Substrate	Spawning Gravel	[redacted]nd/Negl/Outside: LWD 10-20	[redacted]	LWD 20-50	Functional	LWD >50	Functional	[redacted]	Shade %	Bankfull Width
1	73	R								C	Gr	A	2	3	1	3				21	22
2	136^{9}	P	10	6	12	0^{85}	0^{25}	Mean.	<5	G	B	A					1	0			
3	148^{1}	R								Gr	C	A					1	3			
4	156^{2}	P	5^{5}	5^{7}	6	0^{65}	0^{33}	Mem	10	Gr	C	A									
5	189	R								Gr	C	R-A					1	4			
6	212	P	5^{4}	5^{3}	9^{2}	1^{8}	0^{20}	BR	10	Gr	BR	R-A							6		21^{5}
7	337	R								C	Gr	A-R	3	4	1	4	20*	4			
8	363	P	14	15	8	1^{60}	0^{35}	LWD	20	Gr	C	R-A	1	1	1	3	2	2	2	15	
9	422	R								C	Gr	A		4	4	3					
10	441	P	7	7^{9}	6^{2}	0^{90}	0^{35} 3	Mean	10	Gr	B						3	3		28	25

4 [illegible]

Barriers – NONE

Bank characteristics erosion/undercuts – SLIGHTLY eroding, 5-10% undercut / RAW BANKS

Evidence of debris torrents/floods – large lateral BARS OF coarse unsorted material, channelization on LOW terrace 2 m above BED

Nature of LWD function/singles, jams Primarily BANK Armor, limited pool formation, [illegible] throughout [illegible]

*LARGE ACCUMULATION OF LWD ON LATERAL BAR – NON FUNCTIONAL

~~Sensitivity to~~ coarse sediment – ABUNDANT COARSE SEDIMENT

Evidence and sensitivity of fine sediment deposition – some [illegible] in pool BOTTOMS

Are there terraces, height/matrix – LOW terrace (1-3 m) LB, LOW terrace / ROAD grade RB

Condition of Riparian vegetation/cut oldgrowth trees/downed logs M, L, S

Dominant channel and habitat forming processes – PLAIN BED

Beaver NO

Gravel Bars LATERAL BARS OF UNSORTED LARGE GRAVEL → BOULDER ABUNDANT THROUGHOUT SEG.

Spawning – pool tails & riffle margins

Rearing – some limited OFF channel or undercut BANKS –

Fish Movement UNOBSTRUCTED

Segment #: 4000 Date: 4-4

Gradient: 1-3 Location: MAINSTEM

Confinement: UC Crew: ER, JH

Segment # # 324.1

Unit	Distance (m)	Unit Type	Pools: Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rlc Dpth (m)	Forming Agent	% Cover	Substrate: Dominant Substrate	Subdominant Substrate	Spawning Gravel	Dom/Second/Negl/Outside: LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %	[redacted]
1	89[2]	P	13	13[3]	12[3]	2	0[45]	BR	<5	GR	BR	A			2	4				15	22
2	146	R*		--						BR	B	—									
3	263	R								C	Gr	A	2	4			1	4	70		31
4	287	P	8[2]	8[2]	8[5]	0[70]	0[35]	Mean	<5	C	Gr	A-R	3	4							
5	326	R								C	Gr	A									
6	399	P	10	6[5]	13[5]	1[1]	0[35]	MEAN/BR	<5	Gr	BR	R-A									
7	441	R								Gr	Br	R-A								22	
*	490	P	11	14	21	2	0[25]	BR/MEAN	<5	Gr	Br	R-A	1	3							
9	610	R								Gr	C	A								11	28

* BEDROCK CHUTE

Barriers NONE

Bank characteristics erosion/undercuts BEDROCK OR WELL ARMORED BY VEG or BOULDERS

Evidence of debris torrents/floods - DEBRIS IN VEG 2m above BFH

Nature of LWD function/singles, jams little LWD - NO functional pieces w/in surveyed reach

Sensitivity to coarse sediment Sediment (when present) well sorted, transported through reach @ gradient breaks

Evidence and sensitivity of fine sediment deposition Little evidence except in bottoms of deep bedrock pools

Are there terraces, height/matrix high (3-5 m) terrace BOTH BANKS

Condition of Riparian vegetation/cut oldgrowth trees/downed logs MLS

Dominant channel and habitat forming processes PLAIN BED (Except where BEDROCK control)

Beaver - NO -

Gravel Bars LATERAL BARS WELL SORTED

Spawning Abundant, well sorted spawning gravels in pool bottoms and low gradient <2 RIFFLE units.

Rearing Deep, bedrock pools w/ overhanging Banks

Fish Movement unobstructed

Segment #: [illegible] Date: [illegible]

Gradient: 4- Location: MS CAL.

Confinement: TC Crew: JH, ER

segment #328 1554E 5/14/20

	Distance (m)	Unit Type	Pools: Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rfc Dpth (m)	Forming Agent	% Cover	Substrate: Dominant Substrate	Subdominant Substrate	Spawning Gravel	Dom/Second/Negl/Outside: LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %	Bankfull Width
1	124	P	4.1	3.8	5.3	0.40	0.20	BR	10	BR	Gr	R						3		52	11.1
2	145	R								BR	–	–									
3	198	P	1.3	1.7	0.8	0.60	0.10	BR	15	BR	–	–									
4	346	R								BR	–	–									
5	40	P	1.7	2.2	2.9	1.20	0.20	Br	<5	BR	C	–									
6	457	R								BR	–	–									
7	509	P	2.4	2.0	2.1	0.90	0.30	BR	<5	BR	Gr	A					3	4			
8	717	R								C	BR	A					1	0			
9	74	P	4.1	4.0	4.2	0.60	0.20	BR	<5	BR	–	–									
10	85	R								Gr	C	A					8*	2/1			
11	92	P	4.0	3.2	2.1	0.50	0.10	Bldr	<5	Gr	BR	R/			2	4	1	4	28		
12	113	R								Gr	B	R/A									
13	122	P	4.7	4.9	4.3	0.70	0.20	LWD	40	C	Gr	R/A			∞	3	∞*	1			
14	132	R								C	GR	A	2	4	2	4	1	4			
15	1545	P	5.1	5.9	6.4	0.90	0.10	LWD	20	Gr	C	R/A			2	2	3	2/4			
16	1699	R								C	Gr	R/A							4	74	14
17	1716	P	3.8	2.2	1.8	0.60	0.20	Bldr	<5	C	B	–									
18	220	R								C	Gr	R/A									
19	232	P	3.0	5.6	2.4	0.60	0.20	BR	10	Gr	Bldr	R			1	4	1	4			
20	243	R								BR	–	–	1	2			1	3			
21	252	P	5.4	3.1	4.1	0.90	0.20	LWD	30						3	2	8**	3			

Others – 4m BEDROCK FALLS @ BOTTOM OF SURVEY REACH, 4 functional

Bank characteristics erosion/undercuts Bedrock channel, tightly confined → 100m, then mod confinement, some BANK erosion, roots provide stabilizing → 230m, then BR controlled

Evidence of debris torrents/floods – NO –

Nature of LWD function/singles, jams * large jam(s) channel spanning key pieces (100cm² dia), Nick point ≈ 1.5 m of COARSE SED. AGREGATION Behind log. ** Jam is relic stringer BRIDGE

Sensitivity to coarse sediment – LOW sensitivity to COARSE SEDIMENT – processed through system, Accumulations Behind LARGE PIECES

Evidence and sensitivity of fine sediment deposition — NONE —

Are there terraces, height/matrix VALLEY WALL RB, high terrace (>3m) L. BANK TO 100 m, then low terrace Both banks (ht 1 m) → 200m then high terrace (>3m) BOTH BANKS

Condition of Riparian vegetation/cut oldgrowth trees/downed logs O.G. Right BANK, resid OG w/ MIXED SMALL DENSE on Left. bank.

Dominant channel and habitat forming processes – LWD – large channel spanning pieces trap sediment, where no wood present – Bedrock control

Beaver – NO –

Gravel Bars large, well sorted lateral bars ABOVE / in below large jams, MEDIAL bars OF well sorted small gravels w/in riffle units

Spawning – ABUNDANT spawning gravels ABOVE 1ST jam vs. to top OF REACH

Rearing – ABUNDANT OFF channel / pools w/ ch. cover,

Fish Movement obstructed by falls

* from 3:4

Gradient: 2-4 Location: POTTS CR

Confinement: MC Crew: EB, JH

Segment #79

Unit	Distance (m)	Unit Type	Pools: Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rlc Dpth (m)	Forming Agent	% Cover	Substrate: Dominant Substrate	Subdominant Substrate	Spawning Gravel	Dom/Second/Negl/Outside: LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %	Bankfull Width
1	8.6	P	2.1	2.5	3.4	0.70	0.20	BR		Gr	BR	R	2	4						90	5.7
2	10.7	R								BR	—	-									
3	17.0	P	1.7	1.9	2.1	0.90	0.10	BR/LWD	<5	BR	—	—					1	1			
4	67	R								GR	C	R-A									
5	75.1	P	2.4	3.1	3.1	0.50	0.25	BR	<5	C	Gr	R									
6	91.5	R								Gr	B	R									
7	95.2	P	3.3	2.0	3.6	0.40	0.15	BR	<5	Gr	BR	R									
8	97.3	R								B	Br	—									
9	107.5	P	2.2	2	2.1	0.60	0.15	Br	10	Gr	B	R								90	6.0
10	112.1	P	2.5	2.1	2.0	0.60	0.25	BR		Gr	B	R									
11	119.7	P	2.6	2.2	0.7	0.55	0.25	Br	<5	Gr	B	R									
12	127.4	R								Gr	B	R									
13	131.1	P	4.1	3.1	4.4	0.80	0.25	Bldr	10	Gr	B	R									
14	146.6	R								Gr	B	R					1	4			
15	150.2	P	3.1	1.8	1.8	0.50	0.20	Bldr	10	Gr	B	R								92	
16	160.3	R								Gr	C	R					2	3/4			
17	171.6	P	2.4	3.4	3.7	0.80	0.10	Bldr	<5	Gr	D	R									7
18	176.0	R								G	C	R									
19	185.5	P	4.4	4.8	3.6	0.95	0.20	Br		Gr	BR	R									

Barriers 1.5 m DROP BR pool,

Bank characteristics erosion/undercuts moderate undercutting, roots, BR provide armor, 10m eroding BANK (3m high) U.S. OF REACH

Evidence of debris torrents/floods - NO - (tribs have evidence of failure U.S. of reach)

Nature of LWD function/singles, jams NO significant amount of LWD. when present - Form pools

~~Sensitivity to~~ coarse sediment coarse sediments move through reach, many areas scoured to BEDROCK

Evidence and sensitivity of fine sediment deposition - NONE -

Are there terraces, height/matrix high terrace 3m+ RB, low terrace 1-3m LB

Condition of Riparian vegetation/cut oldgrowth trees/downed logs M, S, D

Dominant channel and habitat forming processes plain BED (WOOD ABSENT) when gradient < 4%, otherwise BEDROCK CONTROL → step pool when adequate sediment present

Beaver NO

Gravel Bars well sorted alluvial BARS present throughout reach

Spawning limited to pool tails / bottoms

Rearing limited off channel / slow water in OH pools

Fish Movement Several 1+m Bedrock drops restrict movement

Segment #: 1204 Date: 9-4-97

Gradient: 8-12 Location: BLUE CR.

Confinement: TC Crew: JH EB

Segment #229

	Distance (m)	Unit Type	Pools: Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rfc Dpth (m)	Forming Agent	% Cover	Substrate: Dominant Substrate	Subdominant Substrate	Spawning Gravel	Dom/Second/Negl/Outside: LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %	Bankfull Width
1	43	P	1.2	1.40	1.80	0.90	0.40	LWD	25	Gr	C	A					2	1			4.8
2	92	R								C	Gr	—									
3	123	P	1.8	1.6	1.1	0.35	0.10	LWD	10	Gr	C	R					2	1	4		
4	136	R								Gr	C	A			3	2	1	2			
5	387	P	1.8	1.1	1.5	0.50	0.10	LWD	30	Gr	C	R					2	1			
6	42	P	1.8	2.0	2.1	0.40	0.15	LWD	<5	Gr	C	R			1	1					
7	56	R								C	Gr	—			1	2					
8	579	P	1.1	0.9	0.8	0.35	0.20	Bldr	<5	Gr	C	R								61	
9	90	R								Gr	B	—			2	4	3/1	0/0			4.2
10	938	P	1.1	1.6	1.5	0.30	0.5	LWD	80	Gr	C	R	1	3			1	1			
11	96	R								B	C	—									
12	984	P	0.5	0.7	1.5	0.30	0.10	Bldr	25	Gr	B	R			1	3	1	4			
13	102	R								Gr	C	A									
14	105	P	2	1.1	0.9	0.35	0.10	Bldr	<5	Gr	B	R							3m	97	
15	117.2	R								BR	B	—					4	0			
16	118.7	P	2	0.5	2	0.40	0.10	BR	<5	BR	S	-									
17	123.5	R*								BR	—	-					2	3/4			
18	129.4	P	1.3	1.8	1.9	0.40	0.05	BR	30	BR	GR	—					2	3/4			
19	137.8	R*								BR	B	—			1	2	1	3			5.4
	140.7	P	0.5	2.8	1.5	0.40	0.10	BR	20	BR	B	-			1	3	1	0		90	
	175	R*	* BEDROCK CHUTE							BR	—	—						15 functional			

Barriers 2 m BEDROCK STEP @ 110m, CULVERT PASSABLE

Bank characteristics erosion/undercuts ARMORED (BR) @ 105m US., DS BANKS have BEEN ERODED During last event.

Evidence of debris torrents/floods COARSE SED / WOOD DEBRIS AGRADED ≈ 1-1.5 m

Nature of LWD function/singles, jams steps, lateral scour, most pieces ABOVE BFH

Sensitivity to coarse sediment - upper part of reach scoured to BR.

Evidence and sensitivity of fine sediment deposition - pool margins have ACCUMULATION OF FINES

Are there terraces, height/matrix VALLEY WALL both banks

Condition of Riparian vegetation/cut oldgrowth trees/downed logs MSD

Dominant channel and habitat forming processes STEP POOL (ABUNDANT SMALL non q pools w/in riffle units) Bedrock control 105m → US

Beaver — NO —

Gravel Bars — lateral bars w/ small gravels otherwise coarse sed is UNSORTED

ng VERY limited, small QUANTITIES OF well sorted material in pool margins

aring Limited by pool size, LACK OF COVER

Movement .5 m steps & a 2 m falls inhibit movement.

Segment #: 100 Date: 8-20-99
Gradient: 4% Location: Bigs Creek
Confinement: Moderate Crew: Heffner / Brutis

Segment #30

			Pools							Substrate			Dom/Second/Negl/Outside								
#	Distance (m)	Unit Type	Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rlc Dpth (m)	Forming Agent	% Cover	Dominant Substrate	Subdominant Substrate	Spawning Gravel	LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %	Bankfull Width m
1	4	P	1.8	1.7	2	35	10	B	10	C	B	+	2	0	1	0	1	0	–	82	5.6
2	8.4	R	–	–	–	–	–	–	–	C	B	+	–	–	–	–	–	–	–		
3	12.6	P	[illegible]	1.6	.95	35	15	B	5	G/C	B	A	–	–	–	–	–	–			
4	27.5	R	–	–	–	–	–	–		G/C	B	–	–	–	–			–			
5	29	P	2.1	1.9	.55	40	20	3	5	G/C	B	RA	1	0	–	–	–	–	–		
6	39.5	R	–	–	–	–	–	–	–	C	C/B	–	–	–	–		1	N			
7	41.8	P	2.5	1.8	2.0	40	15	B	10	B	C	RA	–	–	3	N	–	–	–		
8	52	R	3	–	–	–	~~15~~	–	–	C	B		–		–						
9	55.5	P	3.2	3.1	2.0	60	15	B	10	G/C	B	RA	5	0	4	0	2	N	–	74	7.6
10	61.5	P	3.3	2.8	2.7	90	20	B	15	G/C	B	RA*	5	0	3	0	–	–	–		
11	69.5	R	~~5~~	~~3.8~~	–	~~60~~	~~10~~	–	–	G/C	B	r ~~*~~	residual				–	–			
12	72.6	P	5	3.8	3.4	60	10	B	5	G/C	B	R/A*	–	–	–	–	1	N			
13	108	R	–	–	–	–	–	–		G/C	B	~~*~~	–	–	5	0	1		debris		
14	110.5	P	2.1	1.7	1.1	50	20	B	5	C/G	B	~~*~~	–	–	–	–	1	0			
15	143	R	–	–	–	smaller pools				G/C	B		–	–	–		–				
16	145.5	P	2.5	3.6	2.4	55	20	B	5	C/G	B		–	–	1	0	2	0			5.2

Step-Pools –

Pools – Currently cascading rapids, close to being barrier at lower flows – 1 m high

Bank characteristics erosion/undercuts Banks well vegetated except for some undercutting – cutting thru cobble & boulders. Some 3 m high bankcutting – 75'

Evidence of debris torrents/floods length of stream experienced high flows – debris hung up over bank / flotsam

Nature of LWD function/singles, jams outside streams, wedged in trees

Sensitivity to coarse sediment – large boulders form pools – currently

Evidence and sensitivity of fine sediment deposition Sand along margins of some pools – good spawning for resident trout – streamponder flushes fines out (sand pockets along banks)

Are there terraces, height/matrix Terrace along margin, [illegible] well vegetated with sand/cobble/boulders

Condition of Riparian vegetation/cut oldgrowth trees/downed logs Riparian area consists of alder – large old growth/mess covered along terrace edge – [illegible] – Around 30 yr old ALDER

Dominant channel and habitat forming processes boulder

Beaver – NONE

Gravel Bars D-50 30%

Spawning – Some areas of small patches of resident size gravel – [illegible] areas of cobble/gravel for anadromous

Rearing – POOR – NOT much cover except for boulders, no side channels –

Fish Movement Great, step pools [illegible] make movement difficult

Segment #: [illegible] Date: 8/20/97

Gradient: 9% Location: Trib - McKinley Creek

Confinement: Confined Crew: HEFFNER/BAINS

Segment #259

Unit	Distance (m) 0.00	Unit Type	Pools: Width 1 (m)	Pools: Width 2 (m)	Pools: Width 3 (m)	Pools: Max Dpth (m)	Pools: Rfc Dpth (m)	Pools: Forming Agent	Pools: % Cover	Substrate: Dominant Substrate	Substrate: Subdominant Substrate	Substrate: Spawning Gravel	Dom/Second/Negl/Outside: LWD 10-20	Dom/Second/Negl/Outside: Functional	Dom/Second/Negl/Outside: LWD 20-50	Dom/Second/Negl/Outside: Functional	Dom/Second/Negl/Outside: LWD >50	Dom/Second/Negl/Outside: Functional	Side Channel Length (m)	Shade %	Bankfull Width
1	10.5	R	—	—	—	—	—	—	—	BR	B		—	—	—	—	—				
2	12.8	P	1.45	3.8	3.0	50	15	BR	0	BR	B		—	—	—	—	—				
3	26	R	—	—	—	—	—	—	—				—	—	—	—	12	0			
4	42.2	P	3.3	4.8	4.10	60	10	BR	5	BR	C		—	—	—	—	2/5	N/O		12	12.2
5	64.6	R	—	—	—	—	—	—	—				—	—	—	—	—	—			
6	72	P	5.3	4.2	4.1	90	20	BR	5	G/C	BR		—	—	—	—	1	0			
7	76	R	—	—	—	—	—	—	—	BR	BR		—	—	—	—	—	—			
8	78.5	P	1.2	1.7	1.4	55	10	BR	0	BR	BR		—	—	—	—	1	0			
9	112.2	R	—	—	—	—	—	—	—	C	B		—	—	—	—	5	0			Debris jam
10	117.7	P	3.6	3.1	2.1	65	15	B	5	C	B		—	—	—	—	30+	0			Debris jam
																				4	9.4

Barriers: Cascade - falls
Bedrock falls barrier - 1 m

Bank characteristics erosion/undercuts: Scoured channel with cobble/boulder terraces

Evidence of debris torrents/floods: Debris torrent to bedrock. Debris jams on terraces - Multi pieces.

Nature of LWD function/singles, jams: Thrown above bankfull.

Sensitivity to coarse sediment:

Evidence and sensitivity of fine sediment deposition: Fines in velocity shadows

Are there terraces, height/matrix: Cobble, boulder terraces line stream

Condition of Riparian vegetation/cut oldgrowth trees/downed logs:

Dominant channel and habitat forming processes: BR and Boulder

Beaver: — WASHED DOWN STREAM

Gravel Bars: — WASHED DOWN STREAM

Spawning: Poor

Rearing: Poor

Fish Movement: Poor

Segment #: 4016 Date: 8-20-97
Gradient: 6% Location: ~~Calapooia River~~ Blue Creek
Confinement: Moderately Crew: Heffner / Baitis

#325

	Distance (m) 0.00	Unit Type	Pools: Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rfc Dpth (m)	Forming Agent	% Cover	Substrate: Dominant Substrate	Subdominant Substrate	Spawning Gravel	Dom/Second/Negl/Outside: LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %	Bankfull Width (m)
1	4.5	P	3.5	3.6	3.9	80	15	B	0	B	C	–	–	–	–	–	–	–	–	94	4.4
2	9.2	R	–	–	–	–	–	–	–			–	–	–	–	–	–	–			
3	10.5	P	2.1	1.8	1.1	45	20	B	10	C	B	gravel on margins	–	–	–	–	–	–			
4	27.1	R	–	–	–	–	–	–	–	G	C/B	–	–	–	–	–	–	–			
5	30.9	P	3.3	2.9	2.2	45	20	B	0	G	C/B	–	–	–	–	–	–	–			
6	41.5	R	–	–	–	–	–	–	–	G	C	–	–	–	–	–	–	–			
7	44.7	P	4.1	3.3	2.6	85	10	BR	10	G	C	–	1	0	–	–	–	–			
8	85.9	R				–	–			G/C	B	–	–	–	–	–	–	–			split channel
9	88.2	P	2.1	2.0	1.6	45	20	B	10	G/C	B	–	–	–	–	–	–	–		92	6.0
10	109.2	R				–	–			G	C	–	–	–	–	–	–	–			split channel terrace
11	113.6	P	2.6	2.9	2.2	45	10	B	0	G	C	A	–	–	–	–	–	–			
12	121.2	R	–	–	–	–	–	–	–	B	C	–	–	–	–	–	–	–			
13	122.7	P	1.8	1.6	1.4	55	25	B	10	G/G	B	–	1	0	–	–	–	–			plunge pool
14	126.3	R	–	–	–	–	–	–	–	G	C	–									
15	130.9	P	3.1	2.9	2.6	75	25	LWD	30	G	C	A	1/4	D/N	–	–	1	S			
16	140.9	R	–	–	–	–	–	–	–	G	C	A					1	N			
17	142.0	P	1.1	1.2	0.6	50	20	B	10	G	C	A	3	D	–	–	1	N	Same piece	73	5.8
~~18~~	~~86~~	~~R~~	~~–~~	~~–~~	~~–~~	~~–~~	~~–~~	~~–~~	~~–~~	~~C~~	~~B~~										
~~19~~	~~127~~	~~P~~	~~8.2~~	~~4.0~~	~~12.0~~	~~140~~	~~35~~	~~B~~	~~5~~	~~G~~	~~B~~										

Step-Pool, cascade –

...ers – NONE

Bank characteristics erosion/undercuts very limited erosion on high terraces

Evidence of debris torrents/floods little evidence of high flows

Nature of LWD function/singles, jams Some pieces are forcing pools

Sensitivity to coarse sediment Bedload causes channel form changes at lower gradient breaks w/ so channel can split

Evidence and sensitivity of fine sediment deposition Fines in velocity chadows

Are there terraces, height/matrix Limited terraces - narrow, but gradient reduces to ≈ 2-3%

Condition of Riparian vegetation/cut oldgrowth trees/downed logs – Some oldgrowth stumps along stream channel - Alder dominated 20-30 years old

Dominant channel and habitat forming processes Boulders, some bedrock

Beaver – NONE

Peak flows - lower stream power less evidence of flotsam or debris flow less sensitive than Bigo.

Gravel Bars – Gravel Pulse that was functioning different than a Gravel Bar - Several areas of Gravel & Margins

Spawning ~~Poor~~ – Not that many Good Gravel areas, some Anadramous fish

...ring – POOR, STEEP, with a couple of side channels

Fish Movement Good – Not to many steps, but a few

Segment #: 1200 Date: 6-20-97

Gradient: 4% Location: ~~Blue Creek~~ Calapooia River Mainstem

Confinement: Mod Crew: Heffner / Baitis

Segment #325 18° C mainstem 17.5° C on Bigs

RESPONSE

Unit	Distance (m)	Unit Type	Pools: Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rfc Dpth (m)	Forming Agent	% Cover	Substrate: Dominant Substrate	Subdominant Substrate	Spawning Gravel	Dom/Second/Negl/Outside: LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %	Bankfull Width
1	19.0	R	—	—	—	—	—	—	—	C	B	—	—	—	2	0	—	—	—	5	26.0 m
2	25.0	P	6	6	6	85	20	B	5	C	B	—	—	—	—	—	—	—	—	—	Scour pool
3	62	R	—	—	—	—	—	—	—	G	C	A	20	0	5	0	—	—	—	—	Flatsum
4	84	P	7.8	6.9	6.2	100	45	F	25	G	C	A	5	0	1	N	2	S	—	—	Rootwads
5	109	R	—	—	—	—	—	—	—	G	C	A					4/DJ	N/O			
6	154	P	12.1	14.5	10.8	200	40	BR	5	G	C	A					2	0			
7	192	R	—	—	—	—	—	—	—	BR	C		DJ/O				2	0			
8	200	P	7.1	5.2	4.1	145	15	B	10	G/C/BR		A	2	N	—	—	—	—			Side pool
9	312	P	15.5	16.6	7.1	200+	40	BR	5	G	C	A	—	—	—	—	—	—		5	27.0 m
10	+86	R	—	—	—	—	—	—	—	C	B	A	—	—	—	—	—	—			
11	127	P	8.2	7.0	12.0	140	35	B	5	C	B	A	—	—	—	—	—	—		26	25 m

Photo #3 Riffle - glide

Barriers NONE — Mainline road is stream adjacent, confining on channel
In some reaches where gradient drops, gravel become dominant, better sorting

Bank characteristics erosion/undercuts vegetated banks, gravels + cobbles + boulder bars, some bedrock outcroppings
Erosion of banks 2 m above cobble lined wetted banks - minimal

Evidence of debris torrents/floods Overbank LWD, debris jams on terraces

Nature of LWD function/singles, jams Most LWD is overbank. Some wedged jams line low flow channel - Few to no functional pieces

Sensitivity to coarse sediment Gravel bars ~~along~~ below bedrock velocity shadows with smaller particle size (< 2 cm). Boulders forcing pools

Evidence and sensitivity of fine sediment deposition Sand bars on margin - very limited. Fines layer along margin of channel / no fines in thalweg

Are there terraces, height/matrix terrace grades to low water mark - matrix alluvial fines w/ rounded river rock cobble sizes

Condition of Riparian vegetation/cut oldgrowth trees/downed logs Debris jams line (outside) channel

Dominant channel and habitat forming processes Bedrock, Boulder, Freeform
Peakflows have limited opportunity for overbank flow

Beaver - Some Beaver activity but no Dams
d50 ranges from large gravels (50 mm) in some reaches to cobbles 100 mm in others

Gravel Bars Along margins at velocity shadows - gravel sizes

Spawning Some Good anadromous ~~and~~ but Poor Resident gravels mostly larger Coble

Rearing Poor Rearing, lousy cover, not much for Side channel

Fish Movement Good, lower gradient

UNIT	Distance	Hab. Type	— Pools Only — MAXDP	RFCDP	RESDP	FORM	%WCOV	Substrate DOM	SDOM	SPGR	LWD 10-20 (cm)	20-50 (cm)	>50 (cm)	KP Tally	SHADE	Ba Fu
	0															
1	56.5	P	1.08	8.7, 8.5, 10.1	.30	BDROCK	0	Bol	Bed	A					27%	27
2	86	R						Bol		A	1					
3	104	P	2.0	10, 11.1, 10.8	.25	Bedrock	5	Bed	Bol	R,A						
4	154	R						Bol	Gravel	R,A		1				
5	178	P	1.6	5.8, 6.9, 7.0	.30	Bedrock	15	Bol	Cobbl	A						
6	215	R						"	Bed	A					21%	17
7	254	P	90	11, 10.5, 11.6	35	Bedrock	5	"	Grad	A,R			1			
8	342	R						"		A					37%	2
9	357	P	85	6.7, 7.1, 7.0	30	Bedrock	20	"	Cob	A,R	11	1	111			

temp 18°C

radiant 1.5%

UNIT	Distance	Hab. Type	— Pools Only — MAXDP	RFCDP	RESDP	FORM	%WCOV	Substrate DOM	SDOM	SPGR	LWD 10-20 (cm)	20-50 (cm)	>50 (cm)	KP Tally	SHADE

Mason MSR 366

Seg _____ Stream _____ Location _____
Grad _____ Conf _____ Mor pH _____ Species _____
Riparian: _____
Date _____ Crew _____ WW _____ BF _____

Barriers:	Movement:
LWD:	**Spawning:**
Coarse sed:	**Rearing:**
Fine sed:	**OTHER:**

Seg 9033? Stream Cal River Location #326
Grad 1.5 Conf _____ Mor pH _____ Species _____
Riparian: MIXED ~~MEDIUM~~
Date 8/15 Crew _____ WW _____ BF _____

Barriers: NONE	Movement: Good, easy movement
LWD: only in Margins	**Spawning:** - Good - Mostly larger cobble, but Gravels in some pool tailouts
Coarse sed: Largely Boulder with areas of Cobbles in pool tail outs. Gravel in 1 pool + Riffle	**Rearing:** - poor - very few side channel, not much cover
Fine sed: Very little, more evident Some Sand in one pool but it appears to be a new deposit	**OTHER:** there did appear to be lots of smaller salmonid fry - Some larger fish also spotted

Gradient: Location:

Confinement: TC Crew: EB, JH

#30

			Pools							Substrate			Dom/Second/Negl/Outside								
Unit	Distance (m)	Unit Type	Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rfc Dpth (m)	Forming Agent	% Cover	Dominant Substrate	Subdominant Substrate	Spawning Gravel	LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %	Bankfull Width

SLIDE #1-2 ROLL 2 SUBSURFACE FLOW @ TIME OF VISIT - DNS

Barriers CULVERT perched .5 m

Bank characteristics erosion/undercuts

Evidence of debris torrents/floods - remnant sediment deposition from debris flow

Nature of LWD function/singles, jams

Sensitivity to coarse sediment

Evidence and sensitivity of fine sediment deposition

Are there terraces, height/matrix

Condition of Riparian vegetation/cut oldgrowth trees/downed logs MSS

Dominant channel and habitat forming processes

Beaver - NO -

Gravel Bars

Spawning Segment #186=

Rearing

Fish Movement

Segment #: 170 Date: [illegible]

Gradient: Location:

Confinement: TC Crew:

Segment #56

			Pools							Substrate			Dom/Second/Negl/Outside								
Unit	Distance (m)	Unit Type	Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rfc Dpth (m)	Forming Agent	% Cover	Dominant Substrate	Subdominant Substrate	Spawning Gravel	LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %	Bankfull Width

EPHEMERAL - NO WATER (N) TIME OF SURVEY - REVISI

Barriers CULVERT perched 3m — 1 photo TAKEN - upstream

Bank characteristics erosion/undercuts

Evidence of debris torrents/floods

Nature of LWD function/singles, jams

Sensitivity to coarse sediment

Evidence and sensitivity of fine sediment deposition

Are there terraces, height/matrix

Condition of Riparian vegetation/cut oldgrowth trees/downed logs

Dominant channel and habitat forming processes

Beaver

Gravel Bars

Spawning

Rearing

Fish Movement

Segment #: [illegible] Date: 7-7-[illegible]

Gradient: >8% Location: WASHOUT

Confinement: TC Crew: EB, JH

Segment #57

	Distance (m)	Unit Type	Pools: Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rlc Dpth (m)	Forming Agent	% Cover	Substrate: Dominant Substrate	Subdominant Substrate	Spawning Gravel	Dom/Second/Negl/Outside: LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %	Bankfull Width

Barriers

Bank characteristics erosion/undercuts

Evidence of debris torrents/floods - STREAM CHANNEL SHOWS EVIDENCE A LARGE SCALE, DEBRIS TORRENT IN RECENT PAST (96?) SCOURED TO BEDROCK IN PLACES - almost EXACT Replica of McKinley Ck

Nature of LWD function/singles, jams N/A

Sensitivity to coarse sediment - high -

Evidence and sensitivity of fine sediment deposition - NO -

Are there terraces, height/matrix

Condition of Riparian vegetation/cut oldgrowth trees/downed logs MMD

Dominant channel and habitat forming processes

Beaver —

Gravel Bars —

[illegible]ing —

Rearing —

Fish Movement

Segment #: [illegible] Date: 9-3

Gradient: Location:

Confinement: Crew:

Segment #138

Reach						Pools				Substrate			Dom/Second/Negl/Outside							
Unit	Distance (m)	Unit Type	Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rfc Dpth (m)	Forming Agent	% Cover	Dominant Substrate	Subdominant Substrate	Spawning Gravel	LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %

Barriers LARGE JAM IN MAINSTEM (953 seg), CULVERT [illegible] (1m) (50 x 100 meters)

Bank characteristics erosion/undercuts

Evidence of debris torrents/floods STREAM HAS "SLUICED" DEPOSIT IN MAINSTEM RESULTED IN the LARGE JAM.

Nature of LWD function/singles, jams – All above WATER line

Sensitivity to coarse sediment HIGHLY SENSITIVE - LIMIT TRANSPORT

Evidence and sensitivity of fine sediment deposition

Are there terraces, height/matrix

Condition of Riparian vegetation/cut oldgrowth trees/downed logs CMD

Dominant channel and habitat forming processes

Beaver NONE

Gravel Bars –

Spawning POOR

Rearing POOR

Fish Movement Bad, STEEP Rocky Channel

FRAME 8 & 9 Roll 1

Segment #: 1460 Date: 4-3-97
Gradient: 6-8 Location: U.S. Creek
Confinement: TC Crew: JH, EB
13°C

Segment #308

	Distance (m)	Unit Type	Pools: Width 1 (m)	Width 2 (m)	Width 3 (m)	Max Dpth (m)	Rfc Dpth (m)	Forming Agent	% Cover	Substrate: Dominant Substrate	Subdominant Substrate	Spawning Gravel	Dom/Second/Negl/Outside: LWD 10-20	Functional	LWD 20-50	Functional	LWD >50	Functional	Side Channel Length (m)	Shade %	Bankfull Width
1	22.4	R								Gr	C	R/A		2	3		1	3			
2	26.8	P	7.3	7.1	7.0	0.70	0.20	LWD	25	Gr	C	R/A	2	4	1	1/2	2	1		94	6.9
3	38.0	R								Gr	C	A	2	3	3	2	3	2			
4	43.7	P	2.7	2.0	2.1	0.80	0.15	LWD	20	Gr	C	R/A	2	3	2	2	2	1			
5	51	P	1.9	2.0	2.1	0.40	0.10	LWD	35	Gr	C	R/A			2	1	2	1/2			
6	68	R								Gr	C	R/A					1	4			
7	76.2	P	2.5	3.3	3.5	0.60	0.15	BR	20	Br	Gr	R	1	4	1	3	1	3			
8	87.5	R								Gr	C	A	3	2	2	1	3	3			
9	95.2	P	2.8	3.9	3.3	0.80	0.20	LWD	40	Gr	C	R/A	10	3	8	2	3	2/1			
10	107	R								Gr	C	R/A			4	2/3	1	2			6.5
11	120.9	P	2.1	2.4	1.3	0.80	0.15	LWD	30	GR	S	R			3/4	1/3	2	2	3		
12	134	R								Gr	C	A					1	1/4	30		
13	136.2	P	4.2	4.0	2.0	1.-	0.10	LWD	40	Gr	S	R					4	1			
14	139	R								C	-	-					3	2			
15	146.4	P	1.5	2	1.2	0.40	0.-	LWD	25	C	S	-	7	3			2	2			7.0
16	152	R								C	S	-	2	3	2	3					
17	159.5	P	2.0	2.1	2.3	0.40	0.10	Bdr	<5	Gr	C	R/A									
18	169	R								[illegible]	[illegible]	[illegible]	-								
19	171.5	P	3.5	3.8	3.2	0.50	0.10	LWD	10	Gr	C	A			2	1				89	
20																					

41 functional

ers - culvert perched 1 ft, 1m LWD drop, impassable

Bank characteristics erosion/undercuts - large, eroding banks @ 110m, roots provide bank armor

Evidence of debris torrents/floods - LARGE ACCUMULATIONS OF COARSE SED AND LARGE WOOD SPORADIC throughout REACH

Nature of LWD function/singles, jams - LARGE key pieces form jams w/ smaller pieces & sediment trapped
LWD form step pools, provide cover

Sensitivity to coarse sediment - MODERATE

Evidence and sensitivity of fine sediment deposition - Accumulations in pool bottoms adjacent to eroding BANKS
LIMITED TO 2 - 10 m stretches

Are there terraces, height/matrix - Low terrace (to 2m) prevalent

Condition of Riparian vegetation/cut oldgrowth trees/downed logs M, M/S, D

Dominant channel and habitat forming processes FORCED POOL RIFFLE

Beaver NO

Gravel Bars LATERAL, WELL SORTED FINE GRAVEL

Spawning - IN POOLS

ing - ABUNDANT POOLS W/ COVER

Fish Movement LWD FORM STEPS UP TO 1 m hts, RESTRICTED