8-23-2004

Ex. 281-US-423

R. Nawa
Oregon Department of Fish and Wildlife

K. Hartzell
Oregon Department of Fish and Wildlife

Stream: **Crooked Creek** >Wood River
Survey Type: **ODFW Stream Habitat**
Access: Canoe
Reach: 1
Start: T34S-R71/2E-S25
Quad: Agency Lake
Date Surveyed: 23 August 04
Surveyors: R. Nawa, K. Hartzell
Distance Surveyed: 4,813 m

ADD GRAVEL COUNT, PHOTOS, NOTES

Land Use

The stream flows through a cattle ranch with irrigated pastures.

Valley and stream channel geometry

Low lying marshes, narrow floodplains, dikes, and low terraces bordered the 14 m wide stream. A 500 m long dike on the south bank constrained lateral movement of the stream in the lower portions of the reach (Map). Sporadic smaller dikes further upstream constrained marsh development. Above the lower marsh area, the creek meanders in a pasture over 1 km wide. Extremely low map measured stream gradient (0.01%) was accompanied by high sinuosity (2.1). Due to extreme sinuosity, unit 29 has a high potential for a meander cutoff because only 17 m separates the channel flowing in opposite directions (Map). Meander cutoffs would significantly increase channel and streambank erosion that would be very difficult to correct.

Substrate

The streambed was 99 percent sand and organics. Patches of pumice gravel covered less than 1 percent. A hard claypan was exposed on about 30 percent of the stream bottom in the upper portion of the reach. This claypan functions similar to bedrock but was not classified as bedrock.

Spawning Gravel

Scattered surficial deposits of pumice gravel did not appear to be suitable for spawning. The reach had no riffles that would concentrate gravel deposition.

Riparian Vegetation

For the first 500 m of stream, forested wetlands and dense willows bordered the stream. Sedge dominated marshes bordered the lower portions of the stream (U1-U7). Grass dominated pastures in the upper portions of the reach (Photo 160). Sparse patches of willows were occasionally found in pasture areas. Shade averaged 4 percent and streambed erosion was only 2 percent. Apparently grass cover and existing sparse willow growth is adequate to protect most streambanks except at sharp meander bends. Artificially sloped dikes, erosion control plantings, and rock had been placed at sharp meander bends to reduce erosion.

Wood

Wood (0.8 piece/100m) was concentrated at meander bends where logs have been artificially placed into streambanks. Except for the first 500 m, almost no conifers or hardwoods are located close enough to the stream to contribute future wood debris. Overall, wood is neither a pool forming factor or significant source of cover.

Rearing and Adult Holding Habitat

The stream has a canal-like appearance due to the lack of riffles and exposed gravel bars (Photo 160). About 27 percent of the stream was pool habitat and 73 percent glides. Pools were distinguished from glides by maximum depths greater than 1.5 m, otherwise the two habitat types were similar. Average maximum pool depths were 1.9 m; glides maintained average depths of about 0.9 m. Pools often formed at sharp meander bends demonstrating that high sinuosity was the major pool forming factor (e.g., U13,U16,U19,U27,U29). An estimated 30 percent of the streambanks were undercut. Undercut streambanks provide ample cover for juvenile and adult fish, irrespective of wood densities and pool depths. Algae and emergent vegetation dominated the stream bottom in lower portions of the reach, providing excellent cover for fish. Three adult rainbow trout (40-60cm) were observed near a bridge about 750 m above the mouth (U4).

Stream Temperature

Maximum spot stream temperature was 11°C at 1530 pdt.

Photo 160 Unit 10. The stream was a continuous glide with scour holes >1.5 m deep at meander bends. Lush grasses dominated riparian zones.

Stream: **Crooked Creek** >Wood River
Survey Type: **ODFW Stream Habitat**
Access: Canoe
Reach: 2
Start: T34S-R71/2E-S13SE
Quad: Agency Lake, Fort Klamath
Date: 23 August 04
Surveyors: R. Nawa, K. Hartzell
Distance Surveyed: 8,298 m

ADD GRAVEL COUNT, PHOTOS, NOTES

Valley and stream channel geometry

Low terraces gently slope to form narrow floodplains that border the 13 m wide creek. In some areas the stream is bordered by marshes (wetlands) which confounds measurements of wetted width and active channel. Lateral accretions at the base of vertical cut banks was narrowing the channel in some locations. Extremely low stream gradient (0.01%) was accompanied by high sinuosity (2.3). Due to extreme sinuosity, some oxbows were particularly vulnerable to meander cutoffs. A meander cutoff with 10 percent of the flow diverted was developing at unit 44 (UTM 10 N:0587006;E:4720043 and Map). A meander cutoff with 2 percent of the flow diverted was developing at unit 44. At one location (UTM 10 N:586918;E:4720382), three sharp oxbows has a high meander cutoff potential (Map). Meander cutoffs would significantly increase channel and streambank erosion that would be very difficult to correct. Developing meander cutoffs channels could be blocked with wood, soil and large rocks. A washed out beaver dam above Highway 62 bridge (U71) suggests that beaver formerly caused channels to be more diverse and dynamic.

Substrate

The streambed was 96 percent sand and organics. About 4 percent was scattered surficial patches of 12-32 mm pumice gravel.

Spawning Gravel

An estimated 58 m^2 of pumice gravel were counted as suitable for spawning steelhead, although the quality of this gravel is likely poor. About 40 m^2 of high quality gravel suitable for both Chinook and steelhead has been placed at the end of reach 2 where a major spring from the Klamath Fish Hatchery enters the stream (Photo 223; Map). This gravel placement creates the only riffle in the entire reach. Tecumseh Spring (map) had 2 m^2 of suitable spawning gravel below the road crossing and an estimated 5 m^2 of gravel above the road crossing. Spawning gravel at Tecumseh Spring could be increased significantly with the placement of artificial gravel. Overall, the reach had an estimated 12 m^2 suitable steelhead spawning gravel per km surveyed.

Riparian Vegetation

The stream is primarily bordered by pasture grasses, marsh sedges, and patches of willows. At one location the stream abuts a forested high terrace that was recently logged. Willows, aspen, cottonwood, and occasional ponderosa pines provided canopy cover (Photo 167). Shade averaged 13 percent. About 5 percent of the streambanks were actively eroding. Apparently grass cover and existing sparse willow growth is adequate to protect most streambanks except at sharp meander bends. At unit 35 in the lower portion of the reach, formerly eroding streambanks were grassed over. At unit 39 lateral accretions of fine textured soil was accumulating at the base of formerly vertical cut banks. Rushes were colonizing the newly deposited soil. Erosion increased in the middle portion of the reach where grazing and trampling removed protective streambank vegetation (U40-U50).

Wood

Wood averaged 1.3 pieces/100m but was not evenly distributed. Wood was concentrated in local areas where the stream abutted forested terraces (estimated 5-10% of reach; Photo 176). Conversely, most of the stream (90-95%) had no wood because few conifers and hardwoods are located close enough to the stream to contribute wood debris.

Rearing and Adult Holding Habitat

The stream has a canal-like channel best described as a continuous glide with scour holes at meander bends. About 15 percent of the stream was scour pools and 85 percent glides. Pools were distinguished from glides by maximum depths usually greater than 1.5 m, otherwise the two habitat types were similar. Average maximum pool depths were 1.7 m; glides maintained average depths of about 0.8 m. Pools often formed at sharp meander bends (U41 and U53). High sinuosity was the major pool forming factor. An estimated 40 percent of the streambanks were undercut. Undercut streambanks provide ample cover for juvenile and adult fish (Photo 169). Three dead rainbow trout (25-40 cm) were observed below the hatchery (U79,U80). A worker at the hatchery was informed of these mortalities.

Stream Temperature/Streamflow

Maximum spot stream temperature was 11°C at U70 at 1410 PDT. A screened diversion ditch upstream from Tecumseh Spring was not diverting flow (Photo 210 U64).

Photo 167 Unit 36 Gallery riparian forests of willows, cottonwoods and pine bordered the stream in some areas.

Photo 169 Unit 38. An estimated 40% of the streambanks are undercut which provide abundant hiding cover for fish.

Photo 176 Unit 176. The few trees that fall into the stream provide stable wood and excellent cover.

Photo 210 Unit 64. Screened diversion ditch on west bank. No flow was being diverted.

Photo 223 Unit 84. Approximately 40 m^2 of placed spawning gravel was in a riffle fed by spring water passed through the fish hatchery.

REACH

PAGE: 2 OF: 2

STREAM: Crooked Cr.

CREW: RN, KH

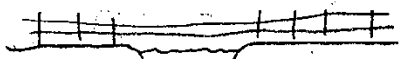
BASIN: Wood

USGS 7.5' MAP NAMES:

DATE	REACH #	UNIT NUMBER	CHANL FORM	VALLEY FORM	VWI	VEG CLASS DOM.	VEG CLASS SUB-DOM.	LAND USE DOM.	LAND USE SUB-DOM.	WATER TEMP	STRM FLOW	LOCATION TWN-RNG-SEC-1/4	PHOTO # /TIME	REACH NOTE
9/1/04	3	85	VS	WF	42	P	S	AG	LG	66°F	LF	34S, 75E, 1, SW	24 1720	

3 UTM: 0586254 4722463

FP FP



AcW = 4m
AcH = 0.9m
FPW = 100m

UTM:

UTM:

UTM:

UTM:

UTM:

UTM:

REACH

PAGE:_____OF:_____

STREAM:_____

CREW:_____

BASIN:_____

USGS 7.5' MAP NAMES:_____

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

UTM:_____

UTM:_____

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UTM:_____

UTM:_____

REACH

PAGE: 1 OF: 2

STREAM: Crooked Cr. / Agency Cr.

CREW: KH, RN

BASIN: Wood

USGS 7.5' MAP NAMES:

DATE	REACH #	UNIT NUMBER	CHANL FORM	VALLEY FORM	VWI	VEG CLASS DOM.	VEG CLASS SUB-DOM.	LAND USE DOM.	LAND USE SUB-DOM.	WATER TEMP	STRM FLOW	LOCATION TWN-RNG-SEC-1/4	PHOTO # /TIME	REACH NOTE
8/23/04	1	1	US	WF	50	P	S	AG	LG	52°F	LF	34S, 7.5E, 25 NE	1041320	Wood River
8/24/04	2	2	US	WF	38	P	S	AG	LG	51°F	LF	34S 7.5E, 13 SE	161025	Agency Cr
8/25/04	1	1	US	WF	40	P	S	AG	LG	51°F	LF	34S, 7.5E, 13 SE	170 N/020	Crooked Cr

1

UTM: 0586622 4716578

ACW = 27m
ACH = 1.2m
FPW > 100m

FP Dike

Confluence with Wood River

2

UTM: 0586924 4718843

ACW = 22m
ACH = 1.3m
FPW > 100m

FP FP

Confluence with Agency Cr

UTM:

UTM:

UTM:

Agency Cr

UTM: 0586927 4718874

ACW = 5m
ACH = 0.8m
FPW > 100m

FP FP

Confluence with Crooked Cr

REACH

PAGE:_____ OF:_____

STREAM:_____

CREW:_____

BASIN:_____

USGS 7.5' MAP NAMES:_____

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

UTM:_____

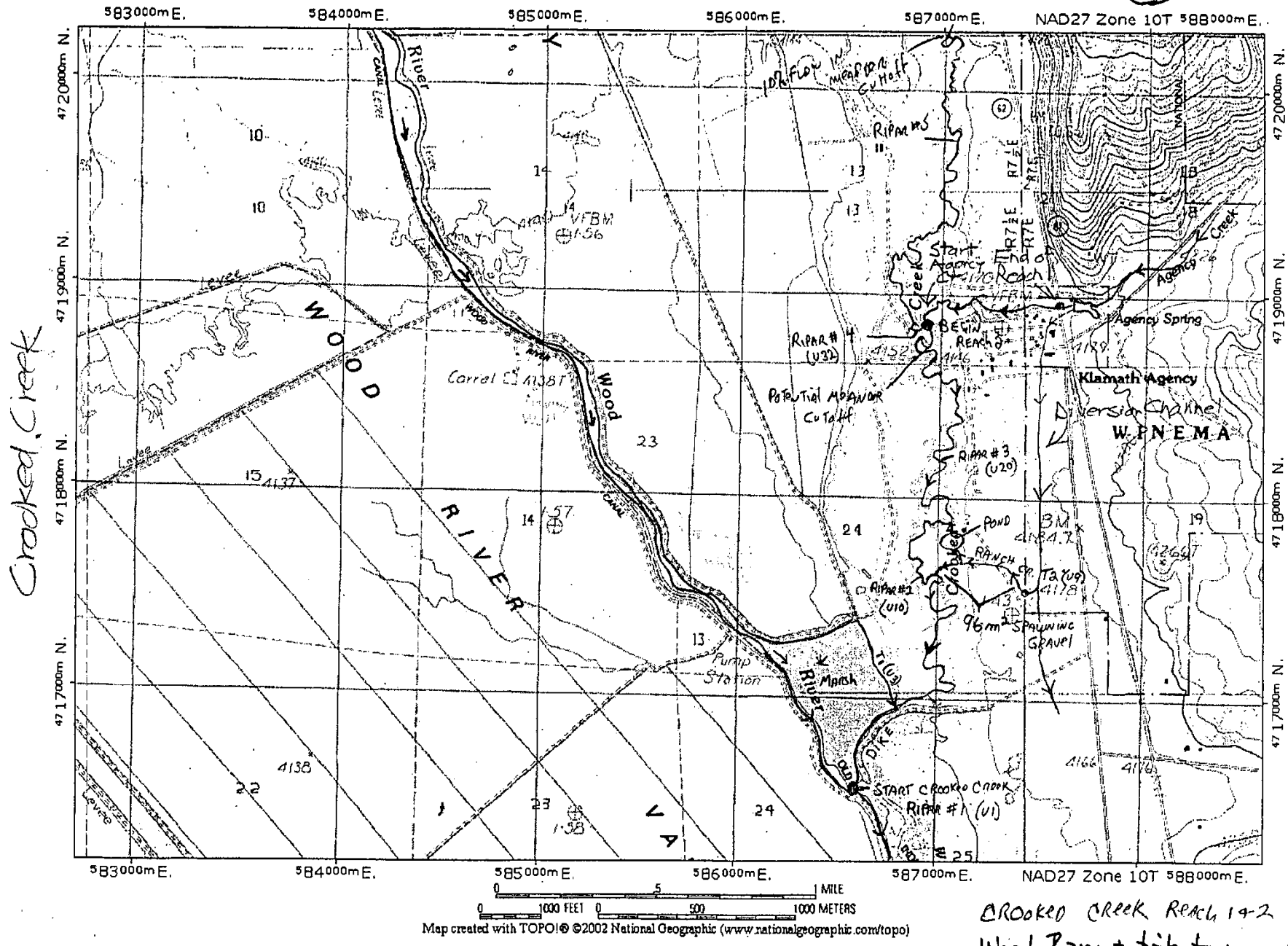
UTM:_____

UTM:_____

UTM:_____

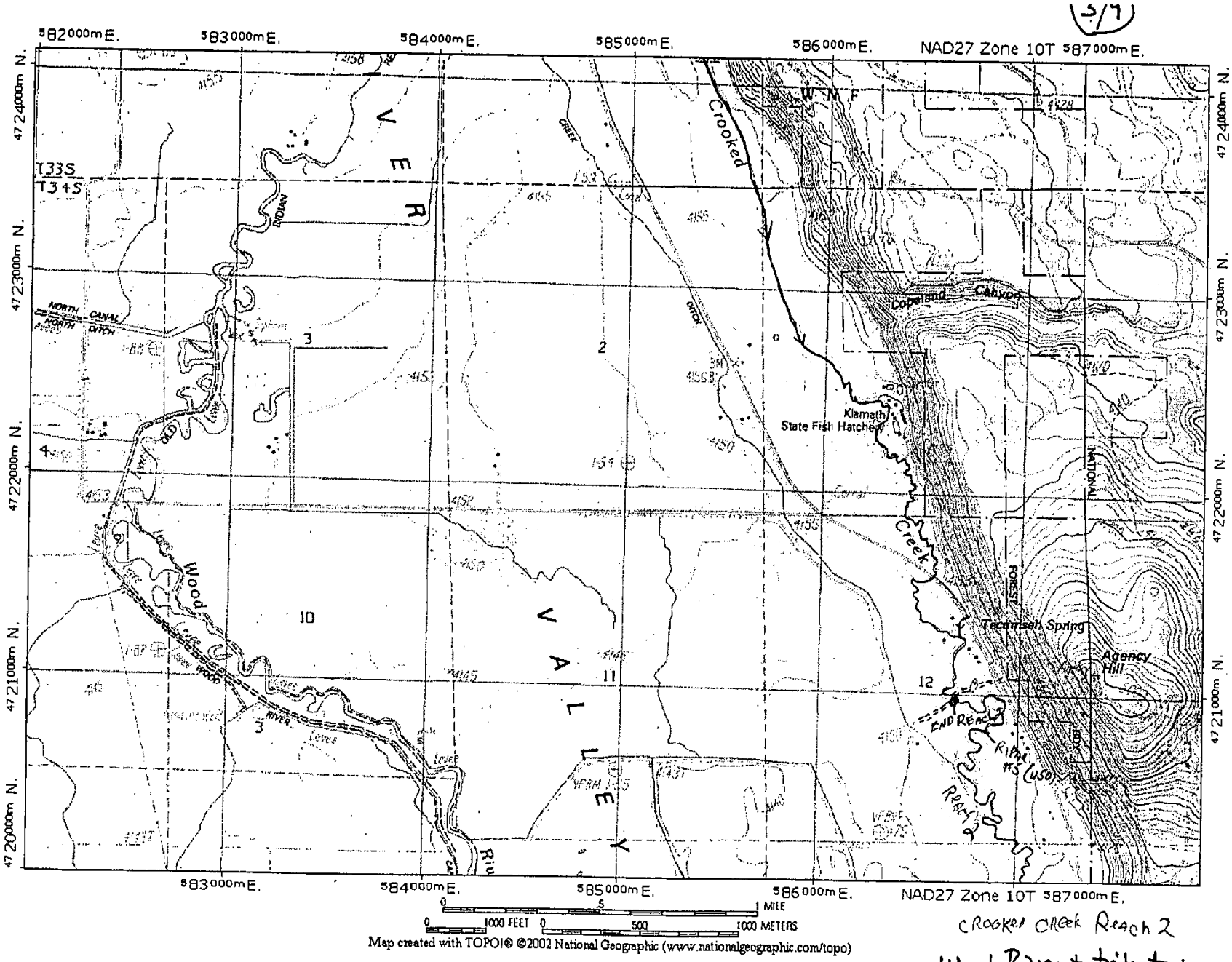
UTM:_____

UTM:_____



(2/4)

Crooked Creek Reach 1-2
Wood River + tributaries
Agency Creek Reach 1



Crooked Creek Reach 2
Wood River + tributaries

UNIT - 1

PAGE: 1 OF: 3

STREAM: Crooked Cr. DATE: 8/23/04 ESTIMATOR: Hartzell

REACH #	UNIT #	UNIT TYPE	CHANL TYPE	% FLOW	UNIT LENGTH	UNIT WIDTH	SLOPE %	SHADE (0-90) LEFT	SHADE (0-90) RIGHT	ACTIVE CHANNEL HT.*	ACTIVE CHANNEL WIDTH	FLOOD PRONE HT.	FLOOD PRONE WIDTH	TERRACE HT.	TERRACE WIDTH	VWI	NOTE
1	1	GL	00	100	250	15	0.5	8	12	1.2	27	2.4	7100	3.3	7200	50	Conf. w/ Wood R.
1	2	GL	01	90	250	14	0.5	3	20								
1	3	GL	11	10	75	12	0.5	1	1								LB Outflow from Marsh
1	4	GL	00	100	250	10	0.5	1	1								
1	5	GL	00	100	250	21	0.5	1	1								
1	6	GL	00	100	250	17	0.5	1	1								
1	7	GL	00	100	250	19	0.5	1	1								
1	8	LP	01	85	800	16	0.5	1	3								
1	9	RI	11	15	21	2.6	3	1	1								
1	10	GL	00	100	30	15	0.5	1	1	1.4	18	2.8	7200	None		36	RB Trib (Ranch Cr.)
1	11	LP	00	100	28	15	0.5	1	1								
1	12	GL	00	100	280	12	0.5	1	1								
1	13	LP	01	95	165	12	0.5	1	1								
1	14	RI	11	5	12	2.1	3	5	5								
1	15	GL	00	100	30	13	0.5	1	7								RB Trib (Pond Outflow)
1	16	LP	00	100	62	12	0.5	1	1								
1	17	GL	00	100	250	14	0.5	1	1								
1	18	GL	00	100	120	13	0.5	1	1								
1	19	LP	00	100	78	19	0.5	1	1								
1	20	GL	00	100	180	19	0.5	1	1	1.4	20	2.8	7200	None		50	
1	21	LP	00	100	55	16	0.5	1	1								
1	22	GL	00	100	146	17	0.5	1	1								
1	23	LP	00	100	52	16	0.5	1	16								
1	24	GL	00	100	250	18	0.5	1	10								
1	25	GL	00	100	250	17	0.5	1	13								
1	26	GL	00	100	156	18	0.5	2	1								
1	27	LP	00	100	58	16	0.5	1	1								
1	28	GL	00	100	154	16	0.5	2	9								
1	29	LP	00	100	60	18	0.5	9	7								
1	30	GL	00	100	90	16	0.5	9	8								

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

UNIT - 1

PAGE: 2 OF: 3

STREAM: Crooked Cr. DATE: 8/24/04 ESTIMATOR: Hartzell

REACH #	UNIT #	UNIT TYPE	CHANL TYPE	% FLOW	UNIT LENGTH	UNIT WIDTH	SLOPE %	SHADE (0-90) LEFT	SHADE (0-90) RIGHT	ACTIVE CHANNEL HT.*	ACTIVE CHANNEL WIDTH	FLOOD PRONE HT.	FLOOD PRONE WIDTH	TERRACE HT.	TERRACE WIDTH	VWI	NOTE
1	31	GL	11	20	60	3.0	0.5	1	8								Agency Cr.
2	32	GL	01	80	250	14	0.5	1	7	1.3	22	2.6	7100	None	—	38	
2	33	GL	00	100	250	14	0.5	1	10								
2	34	GL	00	100	155	14	0.5	5	6								
2	35	LP	00	100	172	16	0.5		13								
2	36	GL	00	100	250	14	0.5	1	3								
2	37	GL	00	100	250	15	0.5	1	1								
2	38	GL	00	100	250	16	0.5	1	60								
2	39	GL	00	100	250	15	0.5	1	20								
2	40	GL	00	100	220	15	0.5	1	1	1.3	31	2.6	7200	None	—	27	
2	41	LP	00	100	77	14	0.5	1	36								
2	42	GL	00	100	250	15	0.5	1	3								
2	43	GL	00	100	190	14	0.5	1	1								
2	44	LP	00	100	390	16	0.5	1	4								
2	45	GL	00	100	250	14	0.5	1	1								
2	46	GL	00	100	250	15	0.5	1	8								
2	47	GL	00	100	250	15	0.5	1	1								
2	48	GL	00	100	250	14	0.5	3	2								
2	49	GL	00	100	250	14	0.5	60	3	1.4	20	2.8	7160	None	—	40	
2	50	GL	00	100	250	16	0.5	1	1								
2	51	GL	00	100	250	15	0.5	1	1								
2	52	GL	00	100	110	16	0.5	55	10								
2	53	LP	00	100	39	14	0.5	50	9								
2	54	GL	00	100	250	16	0.5	60	12								
2	55	GL	00	100	250	14	0.5	1	6								
2	56	GL	00	100	76	15	0.5	1	1								End of Single Lane Brdg Just South of Tecumseh Sonny's Rt. 62 Bridge

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

UNIT - 1

PAGE: 3 OF: 3

STREAM: Crooked Cr. DATE: 9/1/04 ESTIMATOR: Hartzell

REACH #	UNIT #	UNIT TYPE	CHANL TYPE	% FLOW	UNIT LENGTH	UNIT WIDTH	SLOPE %	SHADE (0-90) LEFT	SHADE (0-90) RIGHT	ACTIVE CHANNEL HT.*	ACTIVE CHANNEL WIDTH	FLOOD PRONE HT.	FLOOD PRONE WIDTH	TERRACE HT.	TERRACE WIDTH	NOTE VWI	NOTE
2	57	GL	00	100	780	16	0.5	40	1								Slanted Single Lane Bridge
2	58	GL	01	80	250	15	0.5	50	36								
2	59	GL	11	20	102	12	0.5	60	40								Tecumseh Spring Outflow
2	60	GL	00	100	97	15	0.6	2	44	1.1	16	2.2	150	3.5	7300	44	Left Bank Ter. Ht.
2	61	LP	00	100	67	15	0	1	28								
2	62	GL	00	100	49	14	0.5	1	31								
2	63	LP	00	100	140	4	0	1	34								
2	64	GL	00	100	28	15	0.5	1	36								
2	65	LP	00	100	43	4	0	1	3								SD
2	66	GL	00	100	59	15	0.5	1	12								
2	67	LP	00	100	56	6	0	1	2								
2	68	GL	00	100	90	14	0.5	1	30								
2	69	LP	00	100	33	11	0	2	35	1.25	11	2.5	7100	3.0	7300	50	Hwy 62 RC Rt Bank Terrace Ht.
2	70	GL	00	100	161	11	0.5	1	43								
2	71	LP	00	100	35	19	0	1	2								
2	72	GL	01	100	250	15	0.5	1	10								
2	73	AI	02	0	30	3	0	15	15								
2	74	GL	00	100	250	14	0.5	1	10								
2	75	GL	00	100	72	12	0.5	2	10								
2	76	LP	00	100	77	10	0	3	26								
2	77	GL	00	100	250	6	0.5	2	15								
2	78	LP	00	100	45	7	0	1	14								
2	79	GL	00	100	212	8	0.5	1	7								
2	80	GL	01	90	250	7	0.5	1	1	1.2	14	2.4	>100	None		42	Floodplain to Rt HS
2	81	GL	02	20	61	6	0.5	1	1								
2	82	PP	00	100	27	16	0	10	27								
2	83	GL	00	100	141	9	0.5	90	90								Hatchery Outflow
2	84	RI	11	80	80	8	1.0	1	66								
3	85	GL	00	20	60	2	0.5	1	1								Major Spring Outflow. Start of Small a Chan.

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

UNIT - 1

PAGE:________OF:________

STREAM:______________________ DATE:______________ ESTIMATOR:______________________

REACH	UNIT	UNIT	CHANL	%	UNIT	UNIT	SLOPE	SHADE (0-90)		ACTIVE CHANNEL		FLOOD PRONE		TERRACE			NOTE
#	#	TYPE	TYPE	FLOW	LENGTH	WIDTH	%	LEFT	RIGHT	HT.*	WIDTH	HT.	WIDTH	HT.	WIDTH	VWI	

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

UNIT-2

PAGE: 1 OF: 3

STREAM: CROOKED CREEK DATE: 23 AUG 04 NUMERATOR: R. NAWA

UNIT #	UNIT TYPE	DEPTH* M/MAX	DEPTH** PTC	VERIFIED LENGTH	VERIFIED WIDTH	PERCENT SUBSTRATE S/O	SND	GRVL	CBLE	BLDR	BDRCK	BLDR COUNT	% ACTIVE EROSION	% UNDER CUT	COMMENT CODES	NOTE
1	GL	1.0/1.8				95		5						50		MARSH LB, DIKE RB - 52° @ 1310
2	GL	1.0/1.8				95		5						50		MARSH
3	GL	.9				100								40	BD	BROWN DAM AT LB/DIKE 64°E 586794 4716978
4	GL	1.0/1.8				95		5						60	BC	
5	GL	1.1				95		5					5	30	CS	DIKE RB; MARSH LB -
6	GL	1.0				100								30	CS	MARSH RB; DIKE LB
7	GL	1.1				100								30	CS	DIKE RB 50m
8	LP	1.9	1.1			100								30	CS	DIKE LB 50 m 53° @ 1507
9	RI	0.25						50	50			5				55° @ 153° 0587004 - 4717622
V 10	GL	.8				100								30		
11	LP	2.1	.8			100										
12	GL	.9				100								30	CS	LB DIKE 100m
13	LP	2.0	.9			100								30		MEANDER → POOL
14	RI	0.15						30	70			4				OUTLET FROM POOL T26 587059 4717877
15	GL	.9				100							5	30		
16	LP	2.0	.9			100								20	GS	MEANDER → POOL
17	GL	.9				100							5	30		
18	GL	.9				100								30		
19	LP	2.4	.9			100								5		MEANDER → POOL
V 20	GL	1.0				100							5	20		RUN # 3
21	LP	1.9	1.0			100								20		
22	GL	1.0				100							5	20		
23	LP	1.6	1.0			100								5		
24	GL	1.0				100								20	SD	PUMP RB
25	GL	0.8				95		5					5	20		50° @ 0930
26	GL	0.8				95		5					5	20	BC	willows RB
27	LP	1.6	0.8			100							5	20		MEANDER → POOL
28	GL	0.7				95		5					5	20		LB willow / RB ERODING
29	LP	1.8	.7			100								20		MEANDER POOL - POTENTIAL MEANDER CUTOFF
V 30	GL	0.7				95		5					5	20	CS	DIKE RB

23 AUG

AM 8/24/04

* DEPTH POOLS - MODAL DEPTH IN FAST WATER UNITS

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

UNIT-2

PAGE: 2 OF: 3

STREAM: CROOKED Creek DATE: 24 AUG 04 NUMERATOR: R. NAWA

UNIT #	UNIT TYPE	DEPTH*	DEPTH** PTC	VERIFIED LENGTH	VERIFIED WIDTH	PERCENT SUBSTRATE S/O	SND	GRVL	CBLE	BLDR	BDRCK	BLDR COUNT	% ACTIVE EROSION	% UNDER CUT	COMMENT CODES	NOTE
31	GL	0.30				95		5						40		ACRACY CREEK (T3) 51° @ 1100
32	GL	0.9				95		5					5	30		Riffle # 4 / LOGS AT MEANDER TO REDUCE EROSION
33	GL	1.0				95		5					5	30		
34	GL	1.0				95		5						30	UD	GRAVEL < 1/2" / PUMP LB - NO SCREEN?
35	LP	1.8	1.0			95		5						30		GRAVEL < 1/2"
36	GL	1.0				95		5						40		STREAMBANK Healing LB
37	GL	0.9				95		5						40		50° @ 1140
38	GL	0.9				100								60		MARSH RUSHES LB/RB
39	GL	0.9				100								60		
V 40	GL	1.0				100								60	BC	GRAVEL Riffle # 5 - Collapse Bridge - Hawkins Post
41	LP	1.9	.9			100								30		MEANDER POND → POOL
42	GL	1.0				95		5					5	40		
43	GL	0.8				95		5					5	40		
44	LP	2.0	.8			95		5					5	60	→	MEANDER CUTOFF FLOWING 5% OF MAINSTEM
45	GL	1.0				95		5					5	60	UD	DESIGNATED PUMP 2 RB
46	GL	0.9				95		5					5	50		
47	GL	0.9				95		5					5	40		MEANDER CUTOFF
48	GL	0.8				95		5						50		
49	GL	0.7				100								30	DS	
V 50	GL	1.0/1.8				100							5	40		Riffle #6
51	GL	0.9				95		5					5	30		
52	GL	1.0				95		5						40		HIGH SINUOSITY
53	LP	2.2	1.0			100								50		MEANDER → POOL
54	GL	1.0				95		5						50		
55	GL	1.0				95		5						50		
56	GL	0.9				95		5						50	BC	End Bridge
V																

AX DEPTH POOLS - MODAL DEPTH IN FAST WATER UNITS

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

UNIT-2

STREAM: Crooked Cr. DATE: 1 Sept 04 NUMERATOR: R. NAWA

UNIT #	UNIT TYPE	DEPTH*	DEPTH** PTC	VERIFIED LENGTH	VERIFIED WIDTH	PERCENT SUBSTRATE S/O	SND	GRVL	CBLE	BLDR	BDRCK	BLDR COUNT	% ACTIVE EROSION	% UNDER CUT	COMMENT CODES	NOTE
57	GL	0.8				100							30	30	BC	0580346 - 4734990
58	GL	0.8				100							30	30	BC	51° @ 1150
59	GL	0.6				95		5		30				40	BC	2 m² SPAWNING GRAVEL 480
60	GL	0.6				95		5					20	40		51° @ 1215
61	LP	1.6	.6			95		5						30		
62	GL	0.8				95		5						30		
63	LP	1.9	0.8			95		5						30		
64	GL	0.8				95		5					5	20	SD	IRRIGATION CANAL LB - NO FLOW
65	LP	1.4	0.6			95		5					30	20		
V 66	GL	0.8				95		5					20	30		SCATTERED PATCHES OF GRAVEL
67	LP	1.8	0.8			100							40	30		
68	GL	0.7				95		5				3	10	20		62 HWY BRIDGE
69	LP	1.7	0.6			90		5	5					20	GS	STAFF GAGE = 1.7
70	GL	0.7				90		5					5	30		520 @ 1410
71	LP	1.8	0.4			100								30		WASHED OUT BEAVER DAM
72	GL	0.6				95		5					5	30	SS	
73	AL	0.3				100										COMPLEX ALCOVE
74	GL	0.6				95		5						60	SS	MARSH RB
75	GL	0.6				95		5						60		MARSH RB
V 76	LP	1.4	.4			95		5				3		30	SS	MARSH LB
77	GL	.7				95		5						60	SS	MARSH LB - SPRING DIVERTED INTO IRRIGATION PIPE
78	LP	1.4	.4			95		5					5	40		51° @ 1510
79	GL	.6				95		5					5	30		2 DEAD RAINBOW 10-14"
80	GL	.7				95		5						20		BEAVER CUTTINGS 1 DEAD RB 15"
81	GL	.7				100							20	10		SIDE CHANNEL
82	PP	1.4	.3			95		5						20	SS	51° @ 1530 - SPRING FROM CLIFF 70% flow
83	GL	.9				95		5						30		51° @ 1600
84	RF	.3				60		40				2		10	SS, GS	BIG SPRING AT HATCHERY - GS = 0.88/49°/730
85	GL	.4				100										66° @ 1730
V																

AX DEPTH POOLS - MODAL DEPTH IN FAST WATER UNITS

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

UNIT-2

PAGE:_____ OF:_____

STREAM:_____ DATE:_____ NUMERATOR:_____

UNIT #	UNIT TYPE	DEPTH*	DEPTH** PTC	VERIFIED LENGTH	VERIFIED WIDTH	PERCENT SUBSTRATE S/O	SND	GRVL	CBLE	BLDR	BDRCK	BLDR COUNT	% ACTIVE EROSION	% UNDER CUT	COMMENT CODES	NOTE
V																
V																
V																

AX DEPTH POOLS - MODAL DEPTH IN FAST WATER UNITS

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

PHOTO RECORD PAGE: 2 OF: 2

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

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

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

102 CANON-1

	PHOTO # / GR DIGITAL ID	UNIT #	DATE	TIME	STREAM / PHOTO DESCRIPTION	
1:	B 14	64	9/1/04	1240	DS/LB View of Diversion	A 0210
2:	15	69,70		1405	US View	211
3:	16				DS View Including Hwy 62 Bridge	212
4:	17				LB View	213
5:	18	↓		↓	RB View	214
6:	19	80		1555	US View Including Powerline to Hatchery	215
7:	20	81		1555	DS View	216
8:	21	82		1615	RB View of Hatchery Outflow	217
9:	22	83		1635	US View	218
10:	23	83		1635	DS View	219
11:	24	85		1727	US View of Much Smaller Crooked Cr.	220
12:	25	83		1727	DS View of Combined Flow	221
13:	26	84		1727	US View of Spring Riffle	222
14:	B 27	84	↓	1735	View of ODFW Placed Spawning Gravel	223
15:						
16:						
17:						
18:						
19:						
20:						
21:						
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PHOTO RECORD

PAGE:_____OF:_____

STREAM:_____ SURVEY TYPE: OR. PLAN ☐ BASIN ☐ MIXED ☐

BASIN OR GCG:_____ FILM: DIGITAL ☐ SLIDE ☐ PRINTS ☐

SURVEY CREW:_____ ROLL #:_____ MAILER #:_____

PHOTO # OR DIGITAL ID	UNIT #	DATE	TIME	STREAM / PHOTO DESCRIPTION
1 :				
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PHOTO RECORD PAGE: 1 OF: 2

STREAM: CRooked SURVEY TYPE: OR. PLAN ☐ BASIN ☐ MIXED ☐

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

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

PHOTO # OR DIGITAL ID	UNIT #	DATE	TIME	STREAM / PHOTO DESCRIPTION
1: A 154	1	23AUG04	1310	UPSTREAM (NAME CARD)
2: 155	1	"	"	DOWN
3: 156	1	"	"	RIGHT BANK
4: 157	9	"	1530	SPAWNING GRAVEL IN RANCH CREEK *
5: 158	—			RANCH CREEK GW² GRAVEL IN TAILOUT } RAND
6: 159	10	"	1630	UPSTREAM - DIKE LB
7: 160	10	"	1630	DOWNSTREAM
8: 161	20	"		UPSTREAM
9: 162	20	"		DOWNSTREAM
10: 163	32	24AUG	1030	UPSTREAM
11: 164	30	"	"	DOWNSTREAM - DIKE RB
12: 165	31	"	"	MOUTH ACCESS CREEK RB
13: 166	35	"	1130	FORMER ENCROACHING LB NOW HAYED OVER WITH GRASS
14: 167	36	"	1145	GALLERY RIPARIAN FOREST RB : GRASS/willow/ASPEN/PINE
15: 168	36	"	"	FORMER ENCROACHING LB NOW HAYLINE OVER W/ GRASS COVER
16: 169	38	"	1150	UNDERCUT RB
17: 170	40	"	1220	UPSTREAM RIPARIAN #5
18: 171	40	"	1230	DOWNSTREAM "
19: 172	40	"	1230	R.B. - willows "
20: 173	42	"	1320	L.B. - EROSION IN GRAZED PASTURE
21: 174	49	"	1450	~~WOOD~~ DEBRIS JAM ACROSS STREAM
22: 175	50	"	1630	UPSTREAM MEADOW
23: 176	50	"	1630	DOWNSTREAM WOOD
24: A 177	50	"	1630	RIGHT BANK willows
25:				
26:				
27:				
28:				
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31:				
32:				
33:				
34:				
35:				
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UC1

UC2

PHOTO RECORD

PAGE:_____OF:_____

STREAM:_____ SURVEY TYPE: OR. PLAN ☐ BASIN ☐ MIXED ☐

BASIN OR GCG:_____ FILM: DIGITAL ☐ SLIDE ☐ PRINTS ☐

SURVEY CREW:_____ ROLL #:_____ MAILER #:_____

PHOTO # OR DIGITAL ID	UNIT #	DATE	TIME	STREAM / PHOTO DESCRIPTION
1 :				
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SPAWNING HABITAT FORM

Stream Crooked Reach 2 Date 1 Sept 04

Surveyor(s) R. NAWA

Surface area (m^2)	Class (G, GC, C)	Percent wetted	Percent usable	UNIT	Comments
4	G	100	100	61	30% >1 - >50% SAND/GRC
2	G	100	100	63	20% >1 >50% SAND/GRC
4	G	100	100	66	20% >1 >50% SAND/GRC
2	G	100	100	66	" "
2	G	"	"	68	" "
2	G	"	"	70	" "
2	G	"	"	73	30% >1 "
3	G	"	"	71	" - PUMICE ROCK?
2	G	"	"	75	20% >1 - >50% SAND/
2	G	"	"	77	30% >1 - >50% SAND
1	G	"	"	77	20% >1 "
1	"	"	"	"	" "
4	"	"	"	78	40% >1 - PUMICE ROCK
2	"	"	"	78	30% >1 "
3	"	"	"	79	" PUMICE ROCK
3	"	"	"	79	" "
4	"	"	"	79	20% >1 "
4	"	"	"	79	" "
3	"	"	"	80	" "
3	"	"	"	80	" "
3	"	"	"	80	" "
2	"	"	"	82	10% >1 PUMICE ROCK
4	GC	"	"	84	NOT PUMICE MOSTLY 1"
10	GC	90	60	84	46" DEEP NOT PUMICE - PLACED? OLD REDD
10	GC	"	60	84	26" DEEP NICE PLACED GRAVEL NOT PUMICE
6	GC	"	50	84	26" DEEP "
2	G	"	"	84	4 30% SAND
4	G	"	"	84	"
4	G	"	"	84	"

PUMICE POOR QUALITY

EXCELLENT QUALITY

PUMICE

PLACED

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

SPAWNING HABITAT FORM

Stream Tecumseh SP Reach _____ Date 1 Sept 04

Surveyor(s) R. NAGY

Surface area (m^2)	Class (G, GC, C)	Percent wetted	Percent usable	Comments
2	G	100	100	Below culvert

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

WOOD

PAGE: 1 OF: 3

STREAM: CROOKED CR. DATE: 23 AUG 04 NAME: R. NAWA

UNIT NUMBER	UNIT TYPE	DEBRIS CONFIG	DEBRIS TYPE	DEBRIS LOCAT	DBH CLASS	LENGTH CLASS (m) RW <3	3	6	9	12	15	18	21	24	28	32	36+	WOOD NOTE
1	GL	S	RN	S	30				1									
2	GL	S	N	F	30					1								
2	"	S	N	S	30				1									
2	"	S	C	M	30			1										
2	"	S	C	S	30			1										
2	"	S	C	M	30			1	1									
2	"	S	C	S	30													
4	GL	A	C	M	30				1									
4	GL	A	N	F	30							1						
6	GL	S	C	S	30			1										
7	GL	S	N	S	15		1											
8	LP	S	C	F	15				1									
8	LP	S	N	S	30				1									
11	LP	A	N	S	30		2	2										Placed Artificially
13	LP	A	C	S	30			2										Placed Artificially
14	RI	S	C	F	30		2											"
16	LP	S	N	S	45			1										"
16	LP	S	N	S	30		1											"
19	LP	S	C	S	30					1								"
21	LP	S	C	S	30				1									"
23	LP	A	C	S	36		1	2	1									"
24	GL	S	C	M	30			2										
26	GL	S	C	M	30			1										
28	GL	S	C	S	30			1										
28	GL	S	C	M	45		1											
30	GL	S	C	M	60		1											
32	GL	S	C	M	30		1											
32	GL	S	C	S	30		1											Placed artificially
32	GL	A	C	S	30		1	1										"
32	GL	S	C	S	30		1	1										"

WOOD

PAGE: 2 OF: 3

STREAM: Crooked Cr. DATE: 8/24/04 NAME: Hartzell

UNIT NUMBER	UNIT TYPE	DEBRIS CONFIG	DEBRIS TYPE	DEBRIS LOCAT	DBH CLASS	LENGTH CLASS (m) RW <3	3	6	9	12	15	18	21	24	28	32	36+	WOOD NOTE
33	GL	S	C	M	45		1											
34	GL	S	RW	S	45				1									Fallen Pine?
39	GL	S	C	S	30		1											
38	GL	S	C	M	45		1											
40	GL	A	C	S	30				1									
40	GL	A	C	S	45				1									
40	GL	S	C	M	30				1									
40	GL	S	C	S	45				1									
41	LD	S	C	S	30					1								
47	GL	S	C	S	30				2									
44	LD	S	N	S	30			1	2									
45	GL	S	N	M	45		1											
46	GL	S	RN	S	30				3									
46	GL	S	RW	S	45				2									
48	GL	S	RN	S	30				2	3								
48	GL	S	N	S	30			1	2	2								
48	GL	S	RN	F	45					1								
49	GL	S	N	S	30				3	2								
49	GL	S	RN	S	45				1	2								
49	GL	A	N	S	45				2	3								
50	GL	S	N	T	30				2									
50	GL	S	N	S	45					2								
51	GL	S	N	F	60					1								
51	GL	S	N	F	45					1								
51	GL	S	N	S	30		1	1	2									
52	GL	S	N	S	30			1	2									
54	GL	S	N	S	30				2									
54	GL	S	N	S	15			1										
54	GL	S	N	F	30					1								
55	GL	S	RN	F	46					1								
56	GL	S	N	S	30				1									
55	GL	S	N	S	15		1											

WOOD

PAGE: 3 OF: 3

STREAM: CROOKED CR. DATE: 1 SEPT 04 NAME: R. NAWA

UNIT NUMBER	UNIT TYPE	DEBRIS CONFIG	DEBRIS TYPE	DEBRIS LOCAT	DBH CLASS	LENGTH CLASS (m) RW <3	3	6	9	12	15	18	21	24	28	32	36+	WOOD NOTE
58	GL	J	C	S	30				1		1							
58	GL	J	C	M	15	2												
57	GL	S	N	S	30		1											
57	CL	S	N	S	30		1											
57	CL	S	RN	S	30			1										
56	CL	S	C	S	30			1										
59	GL	J	N	F	30		2	2	1									
59	CL	S	N	M	30			1										
59	GL	S	N	M	30			1										
59	CL	S	N	S	45				1									
59	CL	S	N	M	30			1										
60	CL	S	RN	M	45				1									
60	GL	S	N	S	30			1										
63	LP	S	RN	S	30					1								FALLEN ASPEN
68	GL	S	N	S	15		2			1								
69	LP	A	N	S	15		1	1										
69	LP	A	N	S	30				1									
70	GL	S	N	F	30					1								
70	GL	A	N	F	30			1	1									
70	GL	S	N	S	45		1											
71	LP	S	N	S	45			1	1									
71	LP	S	N	M	30			1										
72	GL	S	N	M	30				1									
83	GL	S	N	F	30				1									
84	RI	S	N	F	45				1									

WOOD

PAGE:______ OF:______

STREAM:____________________ DATE:____________ NAME:____________________

UNIT	UNIT		DEBRIS		DBH	LENGTH CLASS (m)												WOOD NOTE
NUMBER	TYPE	CONFIG	TYPE	LOCAT	CLASS	RW <3	3	6	9	12	15	18	21	24	28	32	36+	

RIPARIAN

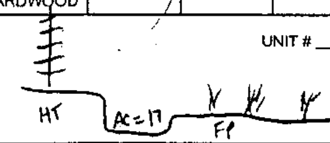
PAGE: 3 OF: 5

STREAM: CROOKED Creek (R2) DATE: 24 AUG 04 NAME: R. Nowa

UNIT NUMBER	SIDE	ZONE	SURFACE	SLOPE	CANOPY CLOSURE	SHRUB % COVER	GRASS/FORB % COVER	TREE	COUNT (DBH in CENTIMETERS) 3-15	15-30	30-50	50-90	90+	RIPARIAN NOTE
40	LEFT	1	FP	4	0	0	100	CONIFER						
								HARDWOOD						
		2	FP	0	0	0	100	CONIFER						
								HARDWOOD						
		3	FP	0	0	0	100	CONIFER						
								HARDWOOD						
40	RIGHT	1	FP	0	0	20	100	CONIFER						
								HARDWOOD						
		2	FP	0	0	40	100	CONIFER						
								HARDWOOD						
		3	FP	4	20	40	80	CONIFER						
								HARDWOOD	2					willow
50	LEFT	1	HT	40	0	0	80	CONIFER						
								HARDWOOD						
		2	HT	5	20	0	100	CONIFER			1			Ponderosa
								HARDWOOD						
		3	HT	5	0	0	100	CONIFER						
								HARDWOOD						
50	RIGHT	1	FP	4	0	0	100	CONIFER						
								HARDWOOD						
		2	FP	0	0	20	100	CONIFER						
								HARDWOOD						
		3	FP	0	0	0	100	CONIFER						
								HARDWOOD						

0586993 - 4719616 UNIT # 40 (0634968 - 4702058 Hess Spring R. Basin) NO

UNIT # 50 0586740 - 4720702



RIPARIAN

PAGE:_____ OF:_____

STREAM:_____ DATE:_____ NAME:_____

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

UNIT # _____

UNIT # _____

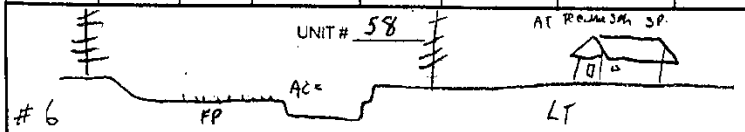
FOR EACH RIPARIAN TRANSECT, DRAW AND LABEL THE SURFACES (HT, LT, FP, HS, ETC) OF A CROSS SECTION IN THE BOX PROVIDED ABOVE. DRAWING AND LABELING VEGETATION IS NOT NECESSARY.

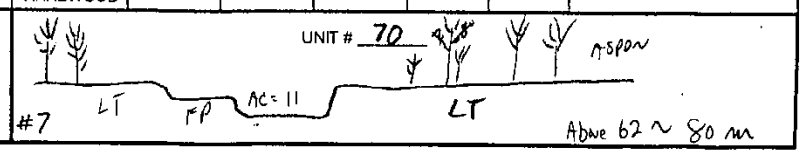
RIPARIAN

PAGE: 4 OF: 5

STREAM: Crooked DATE: 1 SEPT 04 NAME: R. NAWA

UNIT NUMBER	SIDE	ZONE	SURFACE	SLOPE	CANOPY CLOSURE	SHRUB % COVER	GRASS/FORB % COVER	TREE	COUNT (DBH in CENTIMETERS) 3-15	15-30	30-50	50-90	90+	RIPARIAN NOTE
58	LEFT	1	FP	15	0	0	100	CONIFER				1		PONDEROSSA Pine
								HARDWOOD						
		2	FP	0	0	0	100	CONIFER						
								HARDWOOD						
		3	FP	LT	20	0	100	CONIFER						
								HARDWOOD						
58	RIGHT	1	LT	15	40	0	100	CONIFER						
								HARDWOOD						
		2	LT	0	20	0	100	CONIFER						
								HARDWOOD						
		3	LT	0	0	0	100	CONIFER						
								HARDWOOD						
70	LEFT	1	LF	10	0	20	100	CONIFER						
								HARDWOOD						
		2	LT	0	0	0	100	CONIFER						
								HARDWOOD						
		3	LT	0	0	20	100	CONIFER						
								HARDWOOD						
70	RIGHT	1	LT	30	60	70	100	CONIFER						
								HARDWOOD	1	1	1			ASPEN
		2	LT	0	40	40	100	CONIFER						
								HARDWOOD	1	1	1			ASPEN
		3	LT	0	60	60	80	CONIFER						
								HARDWOOD						





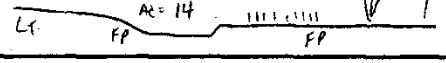
RIPARIAN

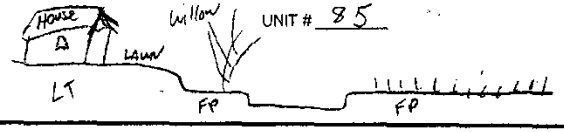
PAGE: 5 OF: 6

STREAM: Crooked Cr DATE: 1 Sept 04 NAME: R. Nauta

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

#8 UNIT # 80 586275 - 4722257





#9

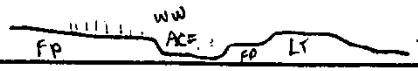
FOR EACH RIPARIAN TRANSECT, DRAW AND LABEL THE SURFACES (HT, LT, FP, HS, ETC) OF A CROSS SECTION IN THE BOX PROVIDED ABOVE. DRAWING AND LABELING VEGETATION IS NOT NECESSARY.

RIPARIAN

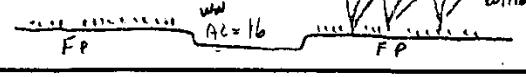
STREAM: Crooked Cr. DATE: 8/23/04 NAME: Nanuq PAGE: 2 OF: 5

UNIT NUMBER	SIDE	ZONE	SURFACE	SLOPE	CANOPY CLOSURE	SHRUB % COVER	GRASS/FORB % COVER	TREE	COUNT (DBH in CENTIMETERS) 3-15	15-30	30-50	50-90	90+	RIPARIAN NOTE
20	LEFT	1	FP	5	0	0	100	CONIFER						
								HARDWOOD						
		2	LT	0	0	0	100	CONIFER						
								HARDWOOD						
		3	FP	5	0	0	100	CONIFER						
								HARDWOOD						
20	RIGHT	1	FP	4	0	0	100	CONIFER						
								HARDWOOD						
		2	FP	0	0	0	100	CONIFER						
								HARDWOOD						
		3	FP	0	0	0	100	CONIFER						
								HARDWOOD						
32	LEFT	1	FP	5	0	0	100	CONIFER						
								HARDWOOD						
		2	FP	0	0	0	100	CONIFER						
								HARDWOOD						
		3	FP	0	0	0	100	CONIFER						
								HARDWOOD						
32	RIGHT	1	FP	5	20	20	100	CONIFER						
								HARDWOOD						willows
		2	FP	0	60	40	40	CONIFER						
								HARDWOOD	3					willows
		3	FP	0	20	20	100	CONIFER						
								HARDWOOD						willows

UNIT # 20 0587014 - 4718197



UNIT # 32 0586924 - 4718843



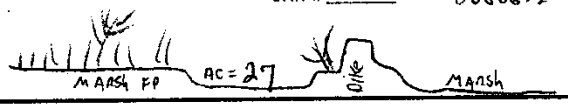
RIPARIAN

PAGE: 1 OF: 5

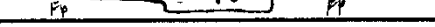
STREAM: Crooked Creek DATE: 23 Aug 04 NAME: R. Nowo / K H

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

UNIT # 1 0586672 - 4716578



UNIT # 10 100 m upstream of ~~Spring~~ Ranch Creek



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

STREAM SUMMARY **CROOKED CREEK**

Number Units	Total Length (m)	Avg Width (m)	Avg Depth (m)	Total Area (m^2)	Substrate Percent Wetted Area S/O	Snd	Grvl	Cbl	Bldr	Bdrk	Large Boulders (#>0.5m)
84	13,552	13.7	1.07	196,460	94	0	4	1	0	0	17

Habitat Group	Wetted Area (m^2)	Percent
Dammed & BW Pools	90	0.05%
Scour Pools	38,282	19.49%
Glides	157,368	80.10%
Riffles	720	0.37%
Rapids	0	0.00%
Cascades	0	0.00%
Step/Falls	0	0.00%
Dry	0	0.00%
Culverts	0	0.00%

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

HABITAT INVENTORY Report Date: 9/26/2004 Survey Date 8/23/2004

REACH 1 **T34S-R07E-S25NE** **REACH 1**

Valley and Channel Summary

Valley Characteristics (Percent Reach Length)

Narrow Valley Floor		Broad Valley Floor	
Steep V-shape	0%	Constraining Terraces	0%
Moderate V-shape	0%	Multiple Terraces	0%
Open V-shape	0% 45	Wide Floodplain	100%

Valley Width Index ~~21.7~~ VWI Range: ~~20 - 25~~ 36-50

Channel Morphology (Percent Reach Length)

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

Channel Characteristics

Type	Length (m)	Area (m2)	Dry Units
Primary	4,813	77,863	0
Secondary	168	710	0

Channel Dimensions (m)

Wetted	Active	Floodprone n = 3	First Terrace n = 1
Width: 14.3	Width: 21.7	216.7 (150 - 250)	250.0 (250 - 250)
Depth: 1.15	Height: 1.3	2.7 (2.4 - 2.8)	3.3 (3.3 - 3.3)

W:D ratio: 16.5
Stream Flow Type: LF
Average Unit Gradient 0.4%
Water temperature (°C) 11.0 - 11.0

Entrenchment (ACW:FPW ratio): 10.6
Habitat Units/100m (total channel length): 0.6
Habitat Units/100m (primary channel length) 0.6

Riparian, Bank, and Wood Summary

	Primary	Secondary
Land Use:	AG	LG
Riparian Vegetation:	P	S

Bank Condition and Shade

Bank Status	Percent Reach Length	Shade (% of 180)
Actively Eroding:	2%	Reach avg: 4%
Undercut Banks:	30%	Range: 1 - 17

Large Wood Debris

	Total	Total / 100m primary channel
All pieces (>=3m x 0.15m):	37	0.8
Volume (m^3):	18	0.4
Key pieces (>=12m x 0.60m):	0	0.0

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

HABITAT INVENTORY Report Date: 9/26/2004 Survey Date: 8/23/2004

REACH 1 **T34S-R07E-S25NE** **REACH 1**

HABITAT DETAIL

Habitat Type	Number Units	Total Length (m)	Avg Width (m)	Avg Depth (m)	Total Area (m^2)	Large Boulders (#>0.5m)		Substrate Percent Wetted Area S/O	Snd	Grvl	Cbl	Bldr	Bdrk
GLIDE	20	3,590	15.0	0.89	57,347	0		98	0	2	0	0	0
POOL-LATERAL SCOUR	9	1,358	15.6	1.92	21,146	0		100	0	0	0	0	0
RIFFLE	2	33	2.4	0.20	80	9		0	0	40	60	0	0
Total:	31	4,981	14.3	1.15	78,573	9	**Avg**	92	0	4	4	0	0

HABITAT SUMMARY

Habitat Group	Number Units	Total Length (m)	Avg Width (m)	Avg Depth (m)	Wetted Area (m^2)	Wetted Area Percent	Large Boulders Number	Large Boulders (# / $100m^2$)
Dammed & BW Pools	0	0			0	0.00%	0	0.0
Scour Pools	9	1,358	15.6	1.92	21,146	26.91%	0	0.0
Glides	20	3,590	15.0	0.89	57,347	72.99%	0	0.0
Riffles	2	33	2.4	0.20	80	0.10%	9	11.3
Rapids	0	0			0	0.00%	0	0.0
Cascades	0	0			0	0.00%	0	0.0
Step/Falls	0	0			0	0.00%	0	0.0
Dry	0	0			0	0.00%	0	0.0
Culverts	0	0			0	0.00%	0	0.0

POOL SUMMARY

	Total	Total of all Channel Lengths # / Km	Primary Channel Length # / Km
All Pools:	9	1.8	1.9
Pools >=1m deep:	9	1.8	1.9
Complex pools (LWD pieces>=3):	3	0.6	0.6
Pool frequency (channel widths/pool):	25.5		
Residual pool depth (avg):	1.02		

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

HABITAT INVENTORY Report Date: 9/26/2004 Survey Date 8/23/2004

REACH 2 **T34S-R07E-S13SE** **REACH 2**

Valley and Channel Summary

Valley Characteristics (Percent Reach Length)

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

Valley Width Index ~~29.3~~ 40 VWI Range: ~~14 - 21~~ 27-30

Channel Morphology (Percent Reach Length)

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

Channel Characteristics

Type	Length (m)	Area (m2)	Dry Units
Primary	8,298	115,567	0
Secondary	273	2,320	0

Channel Dimensions (m)

Wetted	Active	Floodprone *n* = 6	First Terrace *n* = 2
Width: 13.3	Width: 19.0	175.0 (150 - 250)	350.0 (350 - 350)
Depth: 1.03	Height: 1.3	2.5 (2.2 - 2.8)	3.3 (3 - 3.5)

W:D ratio: 15.0
Stream Flow Type: LF
Average Unit Gradient 0.4%
Water temperature (°C) 10.5 - 10.5

Entrenchment (ACW:FPW ratio): 9.8
Habitat Units/100m (total channel length): 0.6
Habitat Units/100m (primary channel length) 0.6

Riparian, Bank, and Wood Summary

	Primary	Secondary
Land Use:	AG	LG
Riparian Vegetation:	P	S

Bank Condition and Shade

Bank Status	Percent Reach Length	Shade (% of 180)
Actively Eroding:	5%	Reach avg: 13%
Undercut Banks:	40%	Range: 1 - 100

Large Wood Debris

	Total	Total / 100m primary channel
All pieces (>=3m x 0.15m):	106	1.3
Volume (m^3):	83	1.0
Key pieces (>=12m x 0.60m):	1	0.0

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

HABITAT INVENTORY Report Date: 9/26/2004 Survey Date: 8/23/2004

REACH 2 **T34S-R07E-S13SE** **REACH 2**

HABITAT DETAIL

Habitat Type	Number Units	Total Length (m)	Avg Width (m)	Avg Depth (m)	Total Area (m^2)	Large Boulders (#>0.5m)		Substrate Percent Wetted Area S/O	Snd	Grvl	Cbl	Bldr	Bdrk
GLIDE	38	7,312	13.5	0.83	100,021	3		96	0	4	0	0	0
POOL-ALCOVE	1	30	3.0	0.30	90	0		100	0	0	0	0	0
POOL-LATERAL SCOUR	12	1,122	13.8	1.74	16,704	3		96	0	3	0	0	0
POOL-PLUNGE	1	27	16.0	1.40	432	0		95	0	5	0	0	0
RIFFLE	1	80	8.0	0.30	640	2		60	0	40	0	0	0
Total:	53	8,571	13.3	1.03	117,887	8	**Avg**	95	0	4	0	0	0

HABITAT SUMMARY

Habitat Group	Number Units	Total Length (m)	Avg Width (m)	Avg Depth (m)	Wetted Area (m^2)	Percent	Large Boulders Number	(# / $100m^2$)
Dammed & BW Pools	1	30	3.0	0.30	90	0.08%	0	0.0
Scour Pools	13	1,149	14.0	1.72	17,136	14.54%	3	0.0
Glides	38	7,312	13.5	0.83	100,021	84.84%	3	0.0
Riffles	1	80	8.0	0.30	640	0.54%	2	0.3
Rapids	0	0			0	0.00%	0	0.0
Cascades	0	0			0	0.00%	0	0.0
Step/Falls	0	0			0	0.00%	0	0.0
Dry	0	0			0	0.00%	0	0.0
Culverts	0	0			0	0.00%	0	0.0

POOL SUMMARY

	Total	Total of all Channel Lengths # / Km	Primary Channel Length # / Km
All Pools:	14	1.6	1.7
Pools >=1m deep:	13	1.5	1.6
Complex pools (LWD pieces>=3):	3	0.4	0.4
Pool frequency (channel widths/pool):	32.2		
Residual pool depth (avg):	1.05		

OREGON DEPARTMENT OF FISH AND WILDLIFE CROOKED CREEK

HABITAT INVENTORY Report Date: 9/26/2004 Survey Date: 8/23/2004

RIPARIAN ZONE VEGETATION

Reach 1 Reach 1

Unit	Side	Zone	Surface	Slope	Cover (percent) Canopy	Shrub	Grass		Diameter class (cm) 3-15	15-30	30-60	60-90	>90	Notes
1	LF	1	FP	0	20	0	100	Conifer						
								Hardwood						
1	LF	2	FP	0	20	0	100	Conifer						
								Hardwood						
1	LF	3	FP	0	80	0	100	Conifer						
								Hardwood						
1	RT	1	FP	30	0	0	60	Conifer						
								Hardwood						
1	RT	2	HT	30	0	0	40	Conifer						
								Hardwood						
1	RT	3	FP	10	0	0	20	Conifer						
								Hardwood						
10	LF	1	FP	2	0	0	100	Conifer						
								Hardwood						
10	LF	2	FP	0	0	0	100	Conifer						
								Hardwood						
10	LF	3	FP	0	0	0	100	Conifer						
								Hardwood						
10	RT	1	FP	2	0	0	100	Conifer						
								Hardwood						
10	RT	2	FP	0	0	0	100	Conifer						
								Hardwood						
10	RT	3	FP	0	0	0	100	Conifer						
								Hardwood						
20	LF	1	FP	5	0	0	100	Conifer						
								Hardwood						
20	LF	2	LT	0	0	0	100	Conifer						
								Hardwood						
20	LF	3	FP	5	0	0	100	Conifer						
								Hardwood						
20	RT	1	FP	4	0	0	100	Conifer						
								Hardwood						
20	RT	2	FP	0	0	0	100	Conifer						
								Hardwood						
20	RT	3	FP	0	0	0	100	Conifer						
								Hardwood						

OREGON DEPARTMENT OF FISH AND WILDLIFE CROOKED CREEK

HABITAT INVENTORY Report Date: 9/26/2004 Survey Date: 8/23/2004

RIPARIAN ZONE VEGETATION

Reach 2 Reach 2

Unit	Side	Zone	Surface	Slope	Cover (percent) Canopy	Shrub	Grass		Diameter class (cm) 3-15	15-30	30-60	60-90	>90	Notes
32	LF	1	FP	5	0	0	100	Conifer						
								Hardwood						
32	LF	2	FP	0	0	0	100	Conifer						
								Hardwood						
32	LF	3	FP	0	0	0	100	Conifer						
								Hardwood						
32	RT	1	FP	5	20	20	100	Conifer						WILLOWS
								Hardwood						
32	RT	2	FP	0	60	40	40	Conifer						WILLOWS
								Hardwood	3					
32	RT	3	FP	0	20	20	100	Conifer						WILLOWS
								Hardwood						
40	LF	1	FP	4	0	0	100	Conifer						
								Hardwood						
40	LF	2	FP	0	0	0	100	Conifer						
								Hardwood						
40	LF	3	FP	0	0	0	100	Conifer						
								Hardwood						
40	RT	1	FP	0	0	20	100	Conifer						
								Hardwood						
40	RT	2	FP	0	0	40	100	Conifer						
								Hardwood						
40	RT	3	FP	4	20	40	80	Conifer						WILLOWS
								Hardwood	2					
50	LF	1	HT	40	0	0	80	Conifer						
								Hardwood						
50	LF	2	HT	5	20	0	100	Conifer						
								Hardwood						
50	LF	3	HT	5	0	0	100	Conifer						
								Hardwood						
50	RT	1	FP	4	0	0	100	Conifer						
								Hardwood						
50	RT	2	FP	0	0	20	100	Conifer						
								Hardwood						
50	RT	3	FP	0	0	0	100	Conifer						
								Hardwood						
58	LF	1	FP	15	0	0	100	Conifer					1	PONDEROSA PINE
								Hardwood						

58	LF	2	FP	0	0	0	100	Conifer					
								Hardwood					
58	LF	3	LT	15	20	0	100	Conifer					
								Hardwood					
58	RT	1	LT	15	40	0	100	Conifer					
								Hardwood					
58	RT	2	LT	0	20	0	100	Conifer					
								Hardwood					
58	RT	3	LT	0	0	0	100	Conifer					
								Hardwood					
70	LF	1	LT	10	0	20	100	Conifer					
								Hardwood					
70	LF	2	LT	0	0	0	100	Conifer					
								Hardwood					
70	LF	3	LT	0	0	20	100	Conifer					
								Hardwood					
70	RT	1	LT	30	60	20	100	Conifer					ASPEN
								Hardwood	1	1	1		
70	RT	2	LT	0	40	40	100	Conifer					ASPEN
								Hardwood	1	1	1		
70	RT	3	LT	0	60	60	80	Conifer					
								Hardwood					
80	LF	1	FP	4	0	0	100	Conifer					
								Hardwood					
80	LF	2	LT	2	0	0	100	Conifer					
								Hardwood					
80	LF	3	LT	0	0	0	100	Conifer					
								Hardwood					
80	RT	1	FP	2	0	20	100	Conifer					
								Hardwood					
80	RT	2	FP	0	0	60	100	Conifer					
								Hardwood					
80	RT	3	FP	0	20	60	100	Conifer					WILLOW
								Hardwood	1				

CROOKED CREEK

REACH	UNIT#	TYPE	CHAN	DIST.(m)	COMMENTS	NOTE_ESTIMATOR	NOTE_NUMERATOR
1	1	GL	00	250		RT TERRACE (DIKE) ONLY	LB MARSH; RB DIKE
1	2	GL	01	500			MARSH
1	3	GL	11		BD	LB OUTFLOW FROM MARSH	BEAVER DAM AT LB DIKE
1	4	GL	00	750	BC		
1	5	GL	00	1000	CS		RB DIKE; LB MARSH
1	6	GL	00	1250	CS		RB MARSH; LB DIKE
1	7	GL	00	1500	CS		RB DIKE FOR 50M
1	8	LP	01	2300	CS		LB DIKE FOR 50M
1	9	RI	11			RB TRIB (RANCH CREEK)	12.5C AT 1530
1	12	GL	00	2608	CS		LB DIKE FOR 100M
1	13	LP	01	2773			MEANDER POOL
1	14	RI	11			RB TRIB (POND OUTFLOW)	OUTLET FROM POND
1	16	LP	00	2915	GS		MEANDER POOL
1	19	LP	00	3363			MEANDER POOL
1	24	GL	00	4045	SD		PUMP RB
1	25	GL	00	4295			10C AT 0920
1	26	GL	00	4451	BC		WILLOWS RB
1	27	LP	00	4509			MEANDER POOL
1	28	GL	00	4663			LB WILLOWS; RB ERODING
1	29	LP	00	4723			MEANDER POOL
1	30	GL	00	4813	CS		RB DIKE
1	31	GL	11			AGENCY CREEK	AGENCY CREEK; 10.5C AT 1000
2	32	GL	01	5063			LOGS AT MEANDER FOR EROSION
2	34	GL	00	5468	UD		GRAVEL <1/2"; LB PUMP
2	35	LP	00	5640			GRAVEL <1/2"
2	36	GL	00	5890			STREAMBANKS HEALING LB
2	37	GL	00	6140			10C AT 1140
2	38	GL	00	6390			MARSH RUSHES LB/RB
2	40	GL	00	6860	BC		COLLAPSED BRIDGE
2	41	LP	00	6937			MEANDER BEND POOL
2	44	LP	00	7757			MEANDER CUTOFF FLOWING 5%
2	45	GL	00	8007	UD		2" RESIDENT'S PUMP RB
2	49	GL	00	9007	DJ		
2	52	GL	00	9617			HIGH SINUOSITY
2	53	LP	00	9656			MEANDER POOL
2	56	GL	00	10232	BC	END AT SINGLE LANE BRIDGE	END AT BRIDGE
2	57	GL	00	10482	BC		
2	58	GL	01	10732	BC		10.5C AT 1150
2	59	GL	11		BC	TECUMSEH SPRING OUTFLOW	2 SQ M SPAWNING GRAVEL
2	60	GL	00	10829		LB TERRACE HT	10.5C AT 1215
2	64	GL	00	11121	SD	SD	IRRIGATION CANAL LB, NO FLOW
2	66	GL	00	11222			SCATTERED PATCHES OF GRAVEL
2	68	GL	00	11368		HWY 62 BC	HWY 62 BRIDGE
2	69	LP	00	11401	GS	RB TERRACE HT	STAFF GAUGE = 1.7
2	70	GL	00	11562			11C AT 1410
2	71	LP	00	11597			WASHED OUT BEAVER DAM
2	72	GL	01	11847	SS		
2	73	AL	10				COMPLEX ALCOVE
2	74	GL	00	12097	SS		MARSH RB
2	75	GL	00	12169			MARSH RB

CROOKED CREEK

REACH	UNIT#	TYPE	CHAN	DIST.(m)	COMMENTS	NOTE_ESTIMATOR	NOTE_NUMERATOR
2	79	GL	00	12693			2 DEAD RAINBOW 10-14"
2	80	GL	01	12943		FLOODPLAIN TO RT HS	1 DEAD RAINBOW 15"
2	81	GL	02				SIDE CHANNEL
2	82	PP	00	12970	SS	HATCHERY OUTFLOW	SPRING FROM CULVERT
2	83	GL	00	13111			10.5C AT 1600
2	84	RI	11		SS,GS	MAJOR SPRING OUTFLOW	BIG SPRING AT HATCHERY

STREAM SUMMARY **SPRING CREEK**

Number Units	Total Length (m)	Avg Width (m)	Avg Depth (m)	Total Area (m^2)	Substrate Percent Wetted Area S/O	Snd	Grvl	Cbl	Bldr	Bdrk	Large Boulders (#>0.5m)
36	4,104	48.3	1.45	232,030	56	3	12	6	3	21	12

Habitat Group	Wetted Area (m^2)	Percent
Dammed & BW Pools	0	0.00%
Scour Pools	3,078	1.33%
Glides	219,700	94.69%
Riffles	7,302	3.15%
Rapids	1,914	0.82%
Cascades	0	0.00%
Step/Falls	36	0.02%
Dry	0	0.00%
Culverts	0	0.00%

REACH

PAGE: 1 OF:

STREAM: Crooked Cr.

CREW: RN, KH

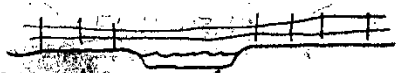
BASIN: Wood

USGS 7.5' MAP NAMES:

DATE	REACH #	UNIT NUMBER	CHANL FORM	VALLEY FORM	VWI	VEG CLASS DOM.	VEG CLASS SUB-DOM.	LAND USE DOM.	LAND USE SUB-DOM.	WATER TEMP	STRM FLOW	LOCATION TWN-RNG-SEC-1/4	PHOTO # /TIME	REACH NOTE
9/1/04	3	85	US	WF	24	P	S	AG	LG	68°F	LF	34S,7.5E,1,SW	24 / 1707	

3 UTM: 0586254 4722463

FP FP



ACW = 4m
ACH = 0.9m
FPW = 100m

UTM:

UTM:

UTM:

UTM:

UTM:

PHOTO RECORD PAGE: 1 OF: _____

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

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

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

	PHOTO # OR DIGITAL ID	UNIT #	DATE	TIME	STREAM / PHOTO DESCRIPTION
1:	B 14/210	64	9/1/04	1240	DS/LB View of Diversion
2:	15/211	69, 70		1405	US View
3:	16/212				DS View Including Hwy 62 Bridge
4:	17/213				LB View
5:	18/214	↓		↓	RB View
6:	19/215	80		1555	US View Including Powerline to Hatchery
7:	20/216	81		1555	DS View
8:	21/217	82		1615	RB View of Hatchery Outflow
9:	22/218	83		1635	US View
10:	23/219	83		1635	DS View
11:	24/220	85		1727	US View of Much Smaller Crooked Cr.
12:	25/221	83		1727	DS View of Combined Flow
13:	26/222	84		1727	US View of Spring Riffle
14:	B 27/223	84	↓	1735	View of ODFW Placed Spawning Gravel
15:					
16:					
17:					
18:					
19:					
20:					
21:					
22:					
23:					
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UNIT - 1

PAGE: 1 OF: _____

STREAM: Crooked Cr DATE: 9/1/04 ESTIMATOR: Hartzell

REACH #	UNIT #	UNIT TYPE	CHANL TYPE	% FLOW	UNIT LENGTH	UNIT WIDTH	SLOPE %	SHADE (0-90) LEFT	SHADE (0-90) RIGHT	ACTIVE CHANNEL HT.*	ACTIVE CHANNEL WIDTH	FLOOD PRONE HT.	FLOOD PRONE WIDTH	TERRACE HT.	TERRACE WIDTH	VWI	NOTE
2	57	GL	00	100	750	16	0.5	40	1								Start of Single Lane Bridge
2	58	GL	01	80	250	15	0.6	50	36								
2	59	GL	11	20	102	6	0.5	60	40								Tecumseh Spring Outflow
2	60	GL	00	100	97	15	0.6	2	44	1.1	16	2.2	150	3.5	7300	24	Left Bank Ter. Ht.
2	61	LP	00	100	67	15	0	1	20								
2	62	GL	00	100	49	14	0.5	1	31								
2	63	LP	00	100	148	4	0	1	34								
2	64	GL	00	100	28	15	0.6	1	36								SD
2	65	LP	00	100	43	4	0	1	3								
2	66	GL	00	100	58	15	0.5	1	12								
2	67	LP	00	100	56	6	0	1	2								
2	68	GL	00	100	90	14	0.5	1	30								Hwy 62 BC
2	69	LP	00	100	33	11	0	21	35	1.25	11	2.5	7100	3.0	7300	24	Rt Bank Terrace Ht.
2	70	GL	00	100	62	11	0.5	1	43								
2	71	LP	00	100	35	19	0	1	2								
2	72	GL	01	100	250	15	0.5	1	10								
2	73	RI	02	0	30	3	0	15	15								
2	74	GL	00	100	250	14	0.5	1	10								
2	75	GL	00	100	79	12	0.5	2	10								
2	76	LP	00	100	17	10	0	3	26								
2	77	GL	00	100	450	6	0.5	2	15								
2	78	LP	00	100	45	7	0	1	14								
2	79	GL	00	100	212	8	0.5	1	7								
2	80	GL	01	80	250	7	0.5	1	1	1.2	14	2.4	7100	None		24	Floodplain to Rt HS
2	81	GL	02	20	61	6	0.5	1	1								
2	82	PP	00	100	27	16	0	10	27								Hatchery Outflow
2	83	GL	00	100	41	9	0.5	90	90								
2	84	RI	11	80	80	8	1.0	1	60								Mouth of Spring Outflow
3	85	GL	00	20	60	2	0.5	1	1								Start of Small Chan.

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

UNIT-2

PAGE: 1 OF: 1

STREAM: Crooked Cr. DATE: 1 Sept 04 NUMERATOR: R. NAWA

UNIT #	UNIT TYPE	DEPTH*	DEPTH** PTC	VERIFIED LENGTH	VERIFIED WIDTH	PERCENT SUBSTRATE S/O	SND	GRVL	CBLE	BLDR	BDRCK	BLDR COUNT	% ACTIVE EROSION	% UNDER CUT	COMMENT CODES	NOTE
57	GL	0.9				100							30	30	BC	0580346T 4734990
58	GL	0.8				100							30	30	BC	51° @ 1150
59	GL	0.2				95		5		30				40	BC	2 m² SPAWNING GRAVEL 480
60	GL	0.6				95		5					20	40		51°@ 1215
61		1.6	.6			95		5						50		
62		0.8				95		5						30		
63	DP	1.9	0.8			95		5						30		
64		0.4				95		5					5	20	SD	IRRIGATION POND LB - NO FLOW
65		1.4	0.6			95		5					30	20		
V 66		0.8				95		5					20	30		SCATTERED PATCHES of GRAVEL
67		1.8	0.8			100							40	30		
68		0.7				95		5				3	10	20		62 HWY BRIDGE
69		1.7	0.6			90		5	5					20	GS	STAFF GAGE = 1.7
70	GL	0.7				90		5					5	30		520 @ 1410
71	LP	1.8	0.4			100								30		WASHED OUT BEAVER DAM
72	GL	0.6				95		5					5	30	SS	
73	GL	0.3				100										COMPLEX: ALCOVE
74	GL	0.6				95		5						60	SS	MARSH RB
75	GL	0.6				95		5						60		MARSH RB
V 76	LP	1.4	.4			95		5				3		30	SS	MARSH LB
77	GL	1.7				95		5						60	SS	MARSH LB - SPRING DIVERTED INTO IRRIGATION PIPE
78	LP	1.4	.4			95		5					5	40		51°@ 1510
79	GL	.6				95		5					5	30		2 0000 Rainbow 10-14"
80	GL	.7				95		5						20		Beaver Cuttings | Dead RB 15"
81	GL	.7				100							20	10		Side channel
82	PP	1.4	.3			95		5						20	SS	51°@ 1530 - spring from culvert 70% flow
83	GL	.9				95		5						30		51°@ 1600
84	RI	.3				60		40				2		10	SS, GS	Big Spring AT Hatchery - GS = 0.88/49%
85	GL	.4				100										66°@ 1730
V																

AX DEPTH POOLS - MODAL DEPTH IN FAST WATER UNITS

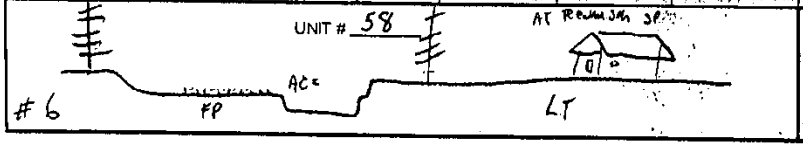
** ONLY MEASURED @ POOLS (EXCEPT OFF-CHANNEL POOLS)

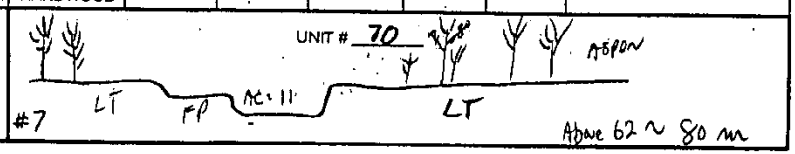
RIPARIAN

PAGE: 1 OF: 2

STREAM: Crooked DATE: 1 SEPT 04 NAME: R. NACWA

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





SPAWNING HABITAT FORM

Stream Crooked Reach 2 Date 1 Sept 04

Surveyor(s) R. Nava

Surface area (m^2)	Class (G, GC, C)	Percent wetted	Percent usable	Unit	Comments — Pumice Rock - 50% sand/fg
4	G	100	100	61	30% >1 - >50% sand/org
2	G	100	100	63	20% >1 75% sand/org
4	G	100	100	68	20% >1 >50% sand/fg s
2	G	100	100	66	" "
2	G	"	"	68	" "
2	G	"	"	70	" "
2	G	"	"	73	30% >1 "
3	G	"	"	71	" - Pumice Rock?
2	G	"	"	75	20% >1 - >50% Sand
2	G	"	"	77	30% >1 - >50% Sand
1	G	"	"	77	20% >1 "
1	"	"	"	"	" "
2	"	"	"	78	40% >1 - Pumice Rock
2	"	"	"	78	30% >1 "
3	"	"	"	79	" Pumice Rock
3	"	"	"	79	" "
4	"	"	"	79	20% >1 "
4	"	"	"	79	3 " "
3	"	"	"	80	" "
3	"	"	"	80	" "
3	"	"	"	80	" "
2	"	"	"	82	10% >1 Pumice Rock
4	GC	"	"	84	NOT Pumice mostly 1"
10	GC	90	60	84	4" or NOT pumice - Placed? old redd
10	GC	"	60	84	4" or Nice placed gravel NOT pumice
6	GC	"	50	84	<4" or "
2	G	"	"	84	30% Sand
4	G	"	"	84	"
4	G	"	"	84	"

Margin notes: Pumice poor quality; Natural pumice; Placed; Excellent quality

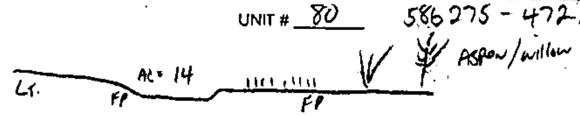
Class: G= gravel; C= small cobble (≤150mm [6"])
Usable habitat is at least 150mm (6") deep and has water velocities between 1 and 4 feet/second.

RIPARIAN

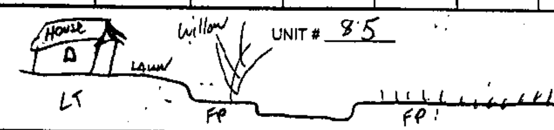
STREAM: Crooked Cr DATE: 1 Sept 04 PAGE: 2 OF: 2 NAME: N. Nava

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

#8 UNIT # 80 586275 - 4722257



UNIT # 85 #9



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

WOOD

PAGE: 1 OF: _____

STREAM: Crooked CR. DATE: 1 Sept 04 NAME: R. NAGWA

UNIT NUMBER	UNIT TYPE	DEBRIS CONFIG	DEBRIS TYPE	DEBRIS LOCAT	DBH CLASS	LENGTH CLASS (m) RW <3	3	6	9	12	15	18	21	24	28	32	36+	WOOD NOTE
58	GL	J	C	S	30		1		1		1							
	GL	J	C	M	15	2												
57	GL	S	N	S	30		1											
57	GL	S	N	S	30		1											
57	GL	S	RN	S	30			1										
58	GL	S	C	S	30			1										
59	GL	J	N	F	30		2	2	1									
59	GL	S	N	M	30			1										
59	GL	S	N	M	30			1										
59	GL	S	N	S	45				1									
59	GL	S	N	M	30			1										
60	GL	S	RN	M	45				1									
	GL	S	N	S	30			1										
63	LP	S	RN	S	30					1								Fallen ASPEN
68	GL	S	N	S	15		2											
69	LP	A	N	S	15		1	1										
69	LP	A	N	S	30				1									
70	GL	S	N	F	30					1								
70	GL	A	N	F	30			1	1									
70	GL	S	N	S	45		1											
71	LP	S	N	S	45			1	1									
71	LP	S	N	M	30			1										
72	GL	S	N	M	30				1									
83	GL	S	N	F	30				1									
84	RI	S	N	F	45				1									