12-4-2009

Ex. 280-US-429

R. Nawa
Oregon Department of Fish and Wildlife

C. Huntington
Oregon Department of Fish and Wildlife

Stream: Sprague River
Tributary to: Williamson River
Reach: 6 (Harris)
Survey Type: ODFW Stream Habitat
Access: Canoe
Start: T34S-R09E-S30NE
Quad: S'Ocholis Canyon
Survey Date: 24 September 04
Surveyors: R. Nawa K. Hartzell
Report: R. Nawa, C. Huntington
Distance Surveyed: 9.9 km

Land Use

Land use is light grazing and rural residential. Mr. Harris told us that diking and destruction of willows in the upper basin during the 1950s by Army Core of Engineers led to increased flooding in the lower Sprague and channel widening. He does not think the river has downcut or become incised.

Valley and Stream Channel Geometry

The 0.02 percent gradient river was in a valley about 5 km wide. Anastomosing stream channels and a major horseshoe bend (Map) created very high sinuosity (4.7). Low terraces sloped abruptly to constrain narrow floodplains adjacent to the 34 m wide river. The channel showed evidence of downcutting, widening, and narrowing at various locations. The channel appeared to be downcutting in a hardened clay substrate at pool unit 33. Discrete blocks of clay (15-60 cm) were being eroded as the resulting pool scoured (Photo 412). A side channel, paralleling pool unit 33, was narrowing due to lateral accretion (deposition) and new growth of vegetation (units 34,35,36; Photo 415). Apparently, as meander cutoffs deepen (unit 33), abandoned side channels fill with sediment and narrow. Extensive vertical eroding streambanks at unit 27 and other locations suggests channel widening. Lateral migration of the channel may appear to mimic both channel widening and downcutting. The presence of flow in secondary channels during low flow periods, lack of exposed hard claypan (bedrock) in riffles, and numerous mid channel bars suggests the channel is not presently downcutting.

Substrate

The streambed was 95 percent sand and organics and two percent bedrock. About 3 percent of the streambed was scoured to expose a hardened clay that functioned similar to bedrock. Exposed clay hardpan was found in pools as expected but not in riffles.

Spawning Gravel

About 85 m^2 of potentially suitable gravel was found at riffles associated with mid-channel bars at units 24 and 26 (7 m^2/km). These mid-channel bars are not always shown on USGS maps, but would be visible on aerial photos. Fine gravel was found in riffles associated with mid-channel bars and islands (units 3,5,7, 11,19,21, Map). Gravel at these locations was often less than 10 mm and was judged not suitable for spawning salmon and steelhead (Photo 402). At unit 11 the median gravel size (D50) was 4-8 mm (Wolman Pebble Count; Photos 406,407). About 600 m^2 of fine gravel that was judged not suitable for salmon and steelhead had been disturbed in places indicating attempted fish reproduction, possibly by centrarchids or lamprey species.

Riparian Vegetation
Shade was only 4 percent because sagebrush and grass dominate the riparian zone. Riparian vegetation was inadequate to stabilize streambanks. About 25 percent of the streambanks were eroding. Instability of streambanks is also demonstrated by the low percent of undercut streambank (1% undercut).

Wood
The reach had only 10 pieces of wood (0.1 pieces/100m) because streambanks lack tree cover.

Rearing and Adult holding Habitat
Due to very low stream gradient, the reach was dominated by long scour pools (53%) and glides (38%). Pools were segregated from glides based on maximum depths that usually exceeded 2 m. Residual pool depths averaged 1.7 m. Glides averaged about 0.9 m deep. Emergent aquatic vegetation provides cover for fish.

Stream Temperature
Maximum spot stream temperature was 15 degrees C at 1435 pdt.

Photo 402 Unit 5
Gravel too fine for salmon. Disturbance indicates use by lampreys or centrarchids for spawning.

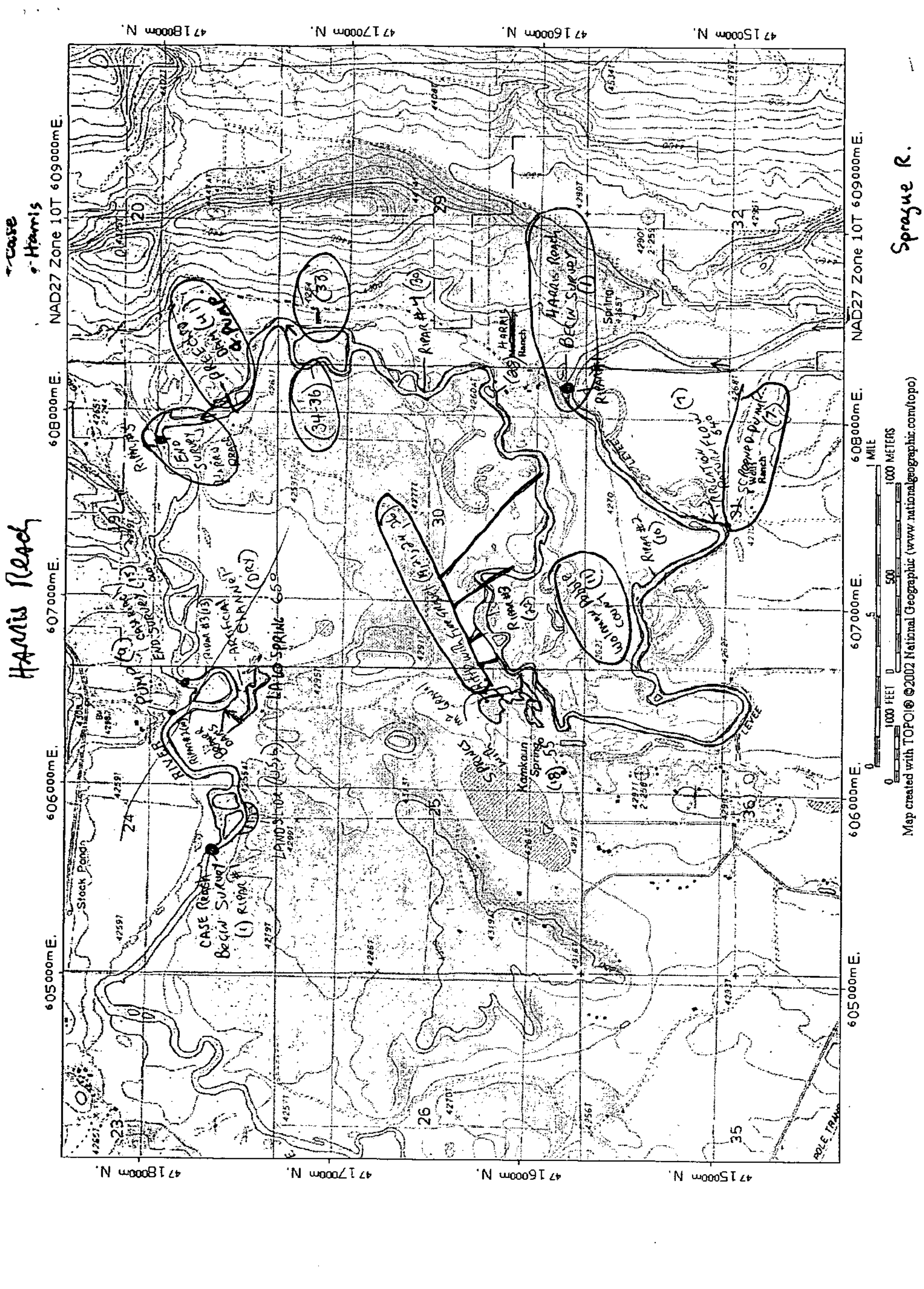
Photo 407 Unit11 Riffle location for Wolman Pebble Count.

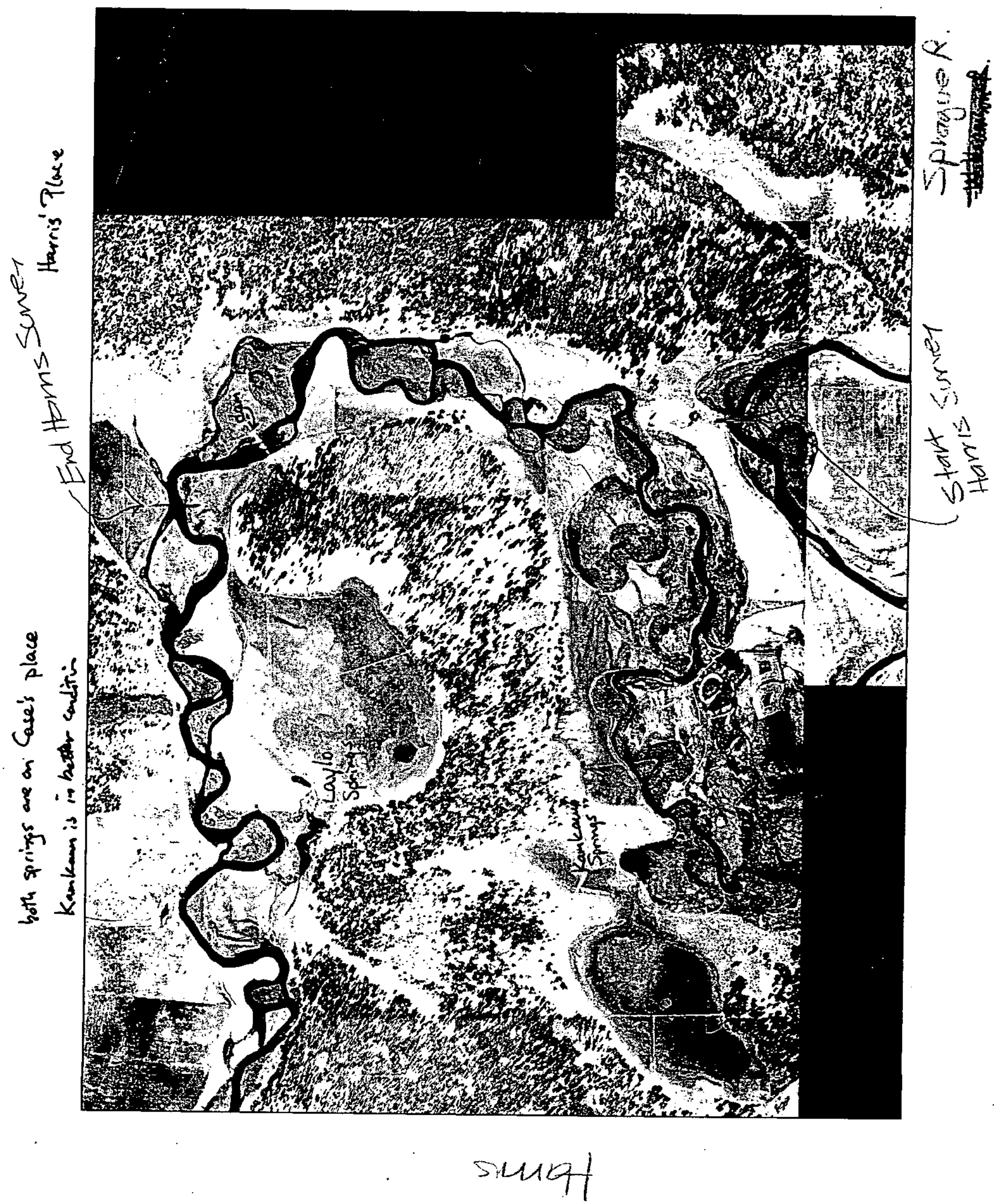
Photo 406 Unit 11. Median gravel size was 4-8mm, too small for spawning salmon and steelhead

Photo 412 Unit 27
Chunks of clay hardpan calving off from streambed to deepen pool.

Photo 415 Unit 35
Lateral accretion (deposition) in side channel being colonized by willows.

Photo 416 Unit 39
Breeched diversion dam now replaced with pumps.


Harris Reach
Sprague R.
Case
Harris
47 18000m N.
47 17000m N.
47 16000m N.
47 15000m N.
605000mE.
606000mE.
607000mE.
608000mE.
NAD27 Zone 10T 609000mE.
Stock Pond
Kamkaun Springs
Harris Ranch
LEVEE
CASE Reach Begin Survey
Harris Reach Begin Survey
Map created with TOPO!® ©2002 National Geographic (www.nationalgeographic.com/topo)


both springs are on Case's place
Kamkum is in better condition
End Harris Survey
Harris' Place
Sprague R.
Start Harris Survey
Laylo Spring
Kamkum Springs
Harris

UNIT - 1

PAGE: 1 OF: 2

STREAM: Sprague R. (Harris) DATE: 9/24/04

Downstream Survey

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
Harris	1	GL	00	100	250	41	0.5	3	1	1.3	43	2.6	46	3.2	57	12	
	2	LP	00	100	120	42	0.0	2	1								
	3	RI	00	100	60	53	0.5	3	2								
	4	GL	00	100	210	43	0.5	2	2								
	5	RI	00	100	80	51	0.5	1	3								
	6	GL	00	100	250	32	0.5	2	2								
	7	GL	00	100	250	33	0.5	4	2								
	8	GL	00	100	250	31	0.5	2	2								
	9	GL	00	100	250	30	0.5	3	2								
	10	LP	00	100	550	31	0.0	1	2	1.4	32	2.8	39	3.2	43	8	
	11	RI	00	100	60	39	0.5	1	1								
	12	LP	00	100	700	36	0.0	2	1								
	13	RI	00	100	115	40	0.5	2	1								
	14	GL	00	100	250	28	0.5	1	1								
	15	SP	00	100	310	30	0.0	2	1								
	16	GL	00	100	250	40	0.5	2	3								
	17	LP	01	70	938	37	0.0	2	2								
	18	GL	11	30	42	22	0.5	15	10								
	19	RI	01	60	250	40	0.5	6	2								Kamkaun Spring
	20	GL	02	40	210	13	0.5	16	16								
	21	RI	00	100	120	42	0.5	3	2	0.8	40	1.6	41	2.0	43	24	Rt Terr. Only
	22	GL	00	100	250	34	0.5	15	10								
	23	GL	01	100	60	33	0.5	15	14								
	24	RI	00	100	80	36	0.5	9	3								
	25	LP	00	100	610	37	0.0	3	2								
	26	RI	00	100	110	45	0.5	2	3								
	27	LP	01	90	1160	38	0.0	2	2								
	28	GL	02	10	170	10	0.5	2	2								
	29	GL	00	100	250	36	0.5	1	2								
	30	GL	01	70	250	38	0.5	1	2	1.4	33	2.8	37	2.8	37	24	

* 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: 2

STREAM: Sprague (Hams) DATE: 9/24/04 ESTIMATOR: Hartzell

Downstream Survey

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
Hams	31	GL	02	30	195	10	0.5	2	1								
	32	GL	00	100	250	37	0.5	2	2								
	33	LP	01	70	460	30	0.0	1	1								
	34	GL	02	30	250	20	0.5	10	25								
	35	GL	02	30	250	16	0.5	4	3								
	36	GL	02	30	147	17	0.5	2	2								
	37	LP	00	100	210	40	0.0	1	1								
	38	GL	00	100	70	32	0.5	2	1								
	39	LP	01	80	360	33	0.0	1	2								
	40	GL	02	20	172	11	0.5	1	18								
	41	GL	00	100	250	45	0.5	2	4								Us of Brackett Dam
	42	GL	00	100	70	52	0.5	1	2	1.0	54	2.0	56	2.5	61	8	End of Survey
	43	LP	00	100	198	44	0.0	2	1								

* 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: 2

STREAM: SPROCUE (HARRIS REACH) DATE: 24 SEPT 04 NUMERATOR: R. NAWA

UNIT #	UNIT TYPE	DEPTH*	DEPTH** PTC	VERIFIED LENGTH	VERIFIED WIDTH	PERCENT SUBSTRATE S/O	SND	GRVL	CBLE	BLDR	BDRCK	BLDR COUNT	% ACTIVE EROSION	% UNDER CUT	COMMENT CODES	NOTE
1	GL	1.0				100							20		ES	57°@ 1050 MAX DEPTH = 1.7 Dike LB
2	LP	1.8	.5										30			
3	RI	.5				95		5								GRAVEL < .75"
4	GL	1.0											10			MAX D = 1.6
5	RI	.5				100							10			GRAVEL < .75" w/ ROOTS
6	GL	.6											5			MAX D = 0.9
7	GL	.9				95		5					5		SD	RB IRRIGATION RETURN 0607475-4715146
8	GL	.9											5		CS	RB DIKE 540@112
9	GL	1.1				100							10	5		RB DIKE ?
V 10	LP	2.6	.4			50					50		10			CLAY HARDPAN BOTTOM
11	RI	.4				70		30					40			RBA GRAVEL < .75" - WOLMAN COUNT
12	LP	2.6	.6			95					5		10			
13	RI	.6				95		5					5			
14	GL	.9				100							20			58°@ 1330
15	SP	1.7	.7			100							30			MOSTLY @ 7.0 DEEP GLIDE
16	GL	.7				95		5					40			GRAVEL < .5"
17	LP	3.0	.4			100							40			MEADOW BONDS 57°@ 1400
18	GL	1.9				40	60						30			KARMKAWSP 55°@ 1415 129 ADULT RB
19	RI	.3				80		20					20			K 59°@ 1435 GRAVEL < .5"
V 20	GL	1.0				100							50			SIDE CHANNEL AROUND ISLAND
21	RI	.4				80		20					50			GRAVEL < .5"
22	GL	.75				100							40			
23	GL	.95				100							40			
24	RI	.6				90		10					40			GRAVEL MOSTLY < .5"
25	LP	2.7	.5			100							50			
26	RI	.5				80		20					40			
27	LP	2.2	.6			100							50		MOST > 1.2M;	VERTICAL BANKS, CLAY LOAM CAPPING OFF
28	GL	.8				100							5			SIDE CHANNEL AT HARRIS RANCH HOUSE
29	GL	0.8				100							40			MAX D = 1.4
V 30	GL	1.1				100							30			

AX DEPTH POOLS - MODAL DEPTH IN FAST WATER UNITS

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

UNIT-2

PAGE: 2 OF: 2

STREAM: SPRAGUE DATE: 24 SEPT 04 NUMERATOR: R. NAGRA

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	.8				100							30			Side channel
32	GL	.9				100							20			
33	LP	2.3	.7			100							30			Clay Pan calving deepening & widening Pool
34	GL	.8				100							10			Depositional Side channel
35	GL	.8				100							10			Side channel / Narrowing Due to Lateral Acretion
36	GL	.6				100							20			Lateral Acretion
37	LP	2.0	.7			100							20			
38	GL	1.0				100							20			
39	LP	1.9				100							5			Lateral Deposition LB
V 40	GL	.5				100									SO	Side Channel w/ Pump
41	GL	.5				95		5					5			(Breached) 2.0m High Dam spans River
42	GL	.5				100										
43	LP	2.4	.8			100							5			0607784-4718009 End survey
V																
V																

AX DEPTH POOLS - MODAL DEPTH IN FAST WATER UNITS

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

REACH

PAGE: 1 OF:

STREAM: Sprague (Harms)

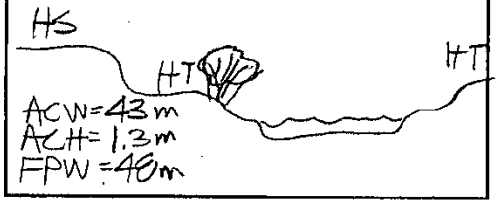
CREW: KH, RN

BASIN: Sprague

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
9/24/04	Harms	1	CT	CT	12	P	S	LG	RR	57°F	LF	34S, 9E, 30, 3I	R01/1030	

Harms UTM: 0609113 4715876



UTM:

UTM:

UTM:

UTM:

UTM:

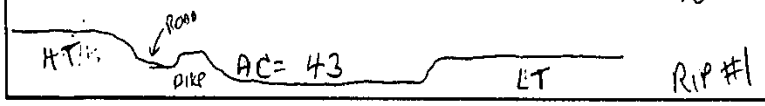
RIPARIAN

PAGE: 1 OF: 3

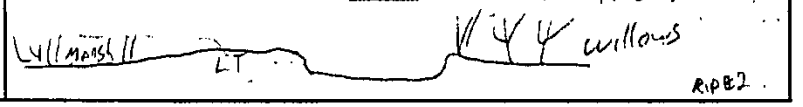
STREAM: SPRAGUE RIVER (HARRIS REACH) DATE: 24 SEPT. 04 NAME: RICH NAWA

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
1	LEFT	1	HS	20	0	0	100	CONIFER						
								HARDWOOD						
		2	HS	20	0	0	40	CONIFER						
								HARDWOOD						
		3	HS	20	0	20	20	CONIFER						
								HARDWOOD						
1	RIGHT	1	FP	1.5	0	0	80	CONIFER						
								HARDWOOD						
		2	LT	0	0	20	100	CONIFER						
								HARDWOOD						
		3	LT	0	0	0	80	CONIFER						
								HARDWOOD						
10	LEFT	1	LT	5	0	0	100	CONIFER						
								HARDWOOD						
		2	LT	0	0	0	100	CONIFER						
								HARDWOOD	2					willow
		3	LT	0	0	0	100	CONIFER						
								HARDWOOD						
10	RIGHT	1	LT	10	0	20	80	CONIFER						
								HARDWOOD						
		2	LT	0	80	20	60	CONIFER						
								HARDWOOD						
		3	LT	0	0	40	100	CONIFER						
								HARDWOOD						

UNIT # 1 0608113 - 4715876



UNIT # 10 0607102 - 4715420



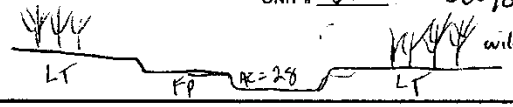
RIPARIAN

PAGE: 2 OF: 3

STREAM: SPRAGUE (HARRIS REACH) DATE: 24 SEPT 04 NAME: R NALES

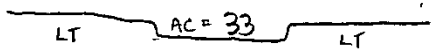
UNIT NUMBER	SIDE	ZONE	SURFACE	SLOPE	CANOPY CLOSURE	SHRUB % COVER	GRASS/FORB % COVER	TREE	COUNT (DBH in CENTIMETERS) 3-15	15-30	30-50	50-90	90+	RIPARIAN NOTE
22	LEFT	1	LT	17	0	0	100	CONIFER						
								HARDWOOD						
		2	LT	0	0	0	100	CONIFER						
								HARDWOOD						
		3	LT	0	0	0	100	CONIFER						
								HARDWOOD						
22	RIGHT	1	LT	20	0	0	20	CONIFER						
								HARDWOOD						
		2	LT	0	80	0	60	CONIFER						
								HARDWOOD	15					willows
		3	LT	0	80	0	60	CONIFER						
								HARDWOOD	12					willows
	LEFT	1	LT	12	0	0	100	CONIFER						
								HARDWOOD						
		2	LT	0	0	0	100	CONIFER						
								HARDWOOD						
		3	LT	0	0	0	100	CONIFER						
								HARDWOOD						
	RIGHT	1	LT	8	0	0	100	CONIFER						
								HARDWOOD						
		2	LT	0	0	0	100	CONIFER						
								HARDWOOD						
		3	LT	0	0	0	100	CONIFER						
								HARDWOOD						

UNIT # 22 0607092-4716235



RIP #3

UNIT # 30 0608126-4716566



RIP #4

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: SPRAGUE (HANAS ROACH) DATE: 24 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
143	LEFT	1	LT	8	0	0	100	CONIFER						
								HARDWOOD						
		2	LT	0	0	0	100	CONIFER						
								HARDWOOD						
		3	LT	0	0	0	100	CONIFER						
								HARDWOOD						
143	RIGHT	1	LT	12	0	0	100	CONIFER						
								HARDWOOD						
		2	LT	0	0	0	100	CONIFER						
								HARDWOOD						
		3	LT	0	0	0	100	CONIFER						
								HARDWOOD						
	LEFT	1						CONIFER						
								HARDWOOD						
		2						CONIFER						
								HARDWOOD						
		3						CONIFER						
								HARDWOOD						
	RIGHT	1						CONIFER						
								HARDWOOD						
		2						CONIFER						
								HARDWOOD						
		3						CONIFER						
								HARDWOOD						

UNIT # 43 0607784-4718009

LT DC=35 LT RIPAR #5

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:_____ OF:_____

STREAM:_____ DATE:_____ NAME:_____

UNIT NUMBER	SIDE	ZONE	SURFACE	SLOPE	CANOPY CLOSURE	SHRUB %COVER	GRASS/FORB %COVER	COUNT (DBH in CENTIMETERS) TREE	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 # _____

Stream Name SPRAGUE Rosgen Channel Type _____

Hydrologic Unit 11 EPA Reach _____ EPA EXT _____

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

Observers _____ Date 24 SEPT

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

Measurement Device _____Ruler _____Gravelometer (FISP US SA-97)

Class Name	Particle Size (mm)	Dot Count	Total #	% Total	Cum. #	Cum %
Small Organic	< 25 mm					
Large Organic	> 25 mm					
Clay	<0.0039					
Silt	0.0039-0.0625					
Fine Sand	0.0625 - 0.25					
Med. Sand	0.25 - 0.5					
Coarse Sand	0.5 - 1.0					
VC Sand	0 - 2	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸	40			
VF Gravel	2 - 4	𝍸 𝍸 𝍸	12			
Fine Gravel	4 - 8	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸	29			
~~Fine Gravel~~	~~6 - 8~~					
Med. Gravel	8 - 16	𝍸 𝍸 𝍸 𝍸 𝍸	22			
Coarse Gravel	16 - 32	𝍸 𝍸	11			
VC Gravel	32 - 64	𝍸	3			
Sm. Cobble	64 - 128		1			
Lg. Cobble	128 - 256					
Sm. Boulder	256 - 512		119			
Med. Boulder	512 - 1024					
Lg. Boulder	1024 - 2048					
VL Boulder	2048 - 4096					
Bedrock						

Total #: _____

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

Notes:

UTM = 0606648 - 4715438 ~ 20 6-8" Depressions

WW = 39 m D = .30 BASS NESTS?

Stream Name _____ Rosgen Channel Type _____

Hydrologic Unit _____ EPA Reach _____ EPA EXT _____

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

Observers_____ Date_____

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

Measurement Device_____Ruler_____Gravelometer (FISP US SA-97)

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

Total #: _____

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

Notes: _____

WOOD

PAGE: 1 OF: 1

STREAM: Sprague (Harris) DATE: 9/24/04 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
12	LP	S	N	C	45			1	1									
15	SP	S	N	S	45			1										
15	SP	S	N	M	45				1	1								
17	LP	S	N	S	60				1									
19	RI	S	N	S	60		1											
19	RI	S	N	M	60			1	1									
41	GL	S	N	S	60				1									

WOOD

PAGE:_____ OF:_____

STREAM:_____ DATE:_____ NAME:_____

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

SPAWNING HABITAT FORM

Stream SPRAGUE (HARRIS REACH) Reach HARRIS Date 24 SEPT 04

Surveyor(s) R. NAWA

Surface area (m²)	Class (G, GC, C)	Percent wetted	Percent usable	UNIT	Comments
35	G	100	100	24	20271' - 30% SAND
50	G	100	100	26	20271 30% SAND

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_____ Reach_____ Date_____

Surveyor(s)_____

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

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.

PHOTO RECORD PAGE: 1 OF:

STREAM: Sprague R. (Case) SURVEY TYPE: OR. PLAN ☐ BASIN ☒ MIXED ☐

BASIN OR GCG: Sprague R. FILM: DIGITAL ☒ SLIDE ☐ PRINTS ☐

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

UPKLAM - PHOTOS / 103 CANYN - A

	PHOTO # OR DIGITAL ID	UNIT #	DATE	TIME	STREAM / PHOTO DESCRIPTION
1:	B 145/342	1	9/9/04	1040	US View
2:	146/343				DS View
3:	147/344				LB Rip
4:	148/345			1050	RB Rip
5:	149/346	3		1110	US View of Cleared RB
6:	150/347	10		1230	US View
7:	151/348				DS View
8:	152/349				LB Rip
9:	153/350				RB Rip
10:	154/351	10		1305	RB View of BD impounded Spring Outflow
11:	155/352	13		1400	US View
12:	156/353				DS View
13:	157/354				LB Rip
14:	158/355				RB Rip
15:	159/356	10		1420	Closer look @ Lalo Spring DS Beaver Dam
16:	160/357	Lalo Sp		1435	View of Lalo Spring Pool
17:	161/358			1440	View of Spring Pool Spillway
18:	B 162/359			1450	View of Spring Sour
19:					
20:					
21:					
22:					
23:					
24:					
25:					
26:					
27:					
28:					
29:					
30:					
31:					
32:					
33:					
34:					
35:					
36:					
37:					
38:					
39:					
40:					

SPRAGUE RIVER

LALO SPRING

REACH

PAGE: 1 OF:

STREAM: Sprague (Harms)

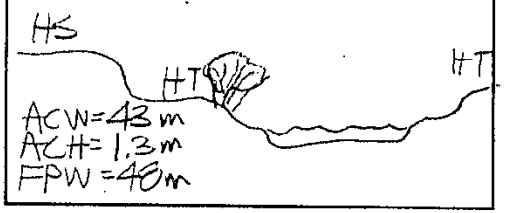
CREW: KH, RN

BASIN: Sprague

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
9/24/04	Harms	1	CT	CT	24	P	S	LG	RR	57°F	LF	34S, 9E, 30, 3	20/1030	

Harms UTM: 0608113 4715976



UTM:

UTM:

UTM:

UTM:

UTM:

UNIT - 1

PAGE: 1 OF: 2

STREAM: Sprague R. (Harris) DATE: 9/24/04

ESTIMATOR: Hartzell

Downstream Survey

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
Harris	1	GL	00	100	250	41	0.5	3	1	1.3	43	2.6	48	3.2	57	24	
	2	LP	00	100	120	42	0.0	2	1								
	3	RI	00	100	60	53	0.5	3	2								
	4	GL	00	100	210	43	0.5	2	2								
	5	RI	00	100	80	51	0.5	1	3								
	6	GL	00	100	250	32	0.5	2	2								
	7	GL	00	100	250	33	0.5	4	2								
	8	GL	00	100	250	31	0.5	2	2								
	9	GL	00	100	250	30	0.5	3	2								
	10	LP	00	100	550	31	0.0	1	2	1.4	32	2.8	39	3.2	43	24	
	11	RI	00	100	60	39	0.5	1	1								
	12	LP	00	100	700	36	0.0	2	1								
	13	RI	00	100	115	40	0.5	2	1								
	14	GL	00	100	250	28	0.5	1	1								
	15	SP	00	100	310	30	0.0	2	1								
	16	GL	00	100	250	40	0.5	2	3								
	17	LP	01	70	938	37	0.0	2	2								
	18	GL	11	30	42	22	0.5	15	10								Kamkaun Spring
	19	RI	01	60	250	40	0.5	16	2								
	20	GL	02	40	210	13	0.5	16	16								
	21	RI	00	100	120	42	0.5	3	2	0.8	40	1.6	41	2.0	43	24	RT Terr. Only
	22	GL	00	100	250	34	0.5	15	10								
	23	GL	00	100	60	33	0.5	15	14								
	24	RI	00	100	90	36	0.5	9	3								
	25	LP	00	100	610	37	0.0	3	2								
	26	RI	00	100	110	45	0.5	2	3								
	27	LP	01	90	1160	38	0.0	2	2								
	28	GL	02	10	120	10	0.5	2	2								
	29	GL	00	100	250	36	0.5	1	2								
	30	GL	01	90	250	38	0.5	1	2	1.4	33	2.8	37	2.8	37	24	

* 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: 2

STREAM: Sprague (Hams) DATE: 9/24/04 ESTIMATOR: Hartzell

Downstream Survey

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
Hams	31	GL	02	30	195	10	0.5	2	1								
	32	GL	00	100	250	37	0.5	2	2								
	33	LP	01	70	460	30	0.0	1	1								
	34	GL	02	30	250	20	0.5	10	25								
	35	GL	02	30	260	16	0.5	4	3								
	36	GL	02	30	147	17	0.5	2	2								
	37	LP	00	100	210	40	0.0	1	1								
	38	GL	00	100	70	32	0.5	2	1								
	39	LP	01	80	360	33	0.0	1	2								
	40	GL	02	20	172	11	0.5	1	18								
	41	GL	00	100	250	45	0.5	2	4								
	42	GL	00	100	70	52	0.5	1	2	1.0	54	2.0	56	2.5	61	24	Us of Breached Dam
	43	LP	00	100	190	44	0.0	2	1								End of Survey

* 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: 2

STREAM: SPRAGUE (HARRIS REACH) DATE: 24 SEPT 04 NUMERATOR: R. NAWA

DOWNSTREAM

UNIT #	UNIT TYPE	DEPTH*	DEPTH** PTC	VERIFIED LENGTH	VERIFIED WIDTH	PERCENT SUBSTRATE S/O	SND	GRVL	CBLE	BLDR	BDRCK	BLDR COUNT	% ACTIVE EROSION	% UNDER CUT	COMMENT CODES	NOTE
1	GL	1.0				100							20		es	57 @ 1050 MAX DEPTH = 1.7 Dike LB
2	LP	1.8	.5										30			
3	RI	.5				95		5								GRAVEL < .75"
4	GL	1.0											10			MAX D = 1.6
5	RI	.5				100							10			GRAVEL < .75" w/ BOOS
6	GL	.6											5			MAX D = 0.9
7	GL	.9				95		5					5		SD	RB IRRIGATION RETURN 0607475-4725146
8	GL	.9											5		CS	RB DIKE 540 @ 1120
9	GL	1.1				100							10	5		RB DIKE ?
V 10	LP	2.6	.4			50					50		10			CLAY HARDPAN BOTTOM
11	RI	.4				70		30					40			RBA GRAVEL < .75" - WOLMAN COUNT
12	LP	2.6	.6			95					5		10			
13	RI	.6				95		5					5			
14	GL	.9				100							20			SP @ 1330
15	SP	1.7	.7			100							30			MOSTLY @ 1.0 DEEP CLIFF
16	GL	.7				95		5					40			GRAVEL < .5"
17	LP	3.0	.4			100							40			MEANDER BENDS SP @ 1400
18	GL	1.9				40	60						30			KM KM SP 55° @ 1415 129 ADULT RD
19	RI	.3				80		20					20			KM 55° @ 1435 GRAVEL < .5"
V 20	GL	1.0				100							50			SIDE CHANNEL AROUND ISLAND
21	RI	.4				80		20					50			GRAVEL < .5"
22	GL	.75				100							40			
23	GL	.95				100							40			
24	RI	.6				90		10					40			GRAVEL, MOSTLY < 1.5"
25	LP	2.7	.5			100							50			
26	RI	.5				80		20					40			
27	LP	2.2	.6			100							50			MAX = 1.2m; VERTICAL BANKS, CLAY LAYER CAVING OFF
28	GL	.8				100							5			SIDE CHANNEL AT HARRIS RANCH HOUSES
29	GL	0.8				100							40			MAX D = 1.4
V 30	GL	1.1				100							30			

* MAX DEPTH POOLS - MODAL DEPTH IN FAST WATER UNITS

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

UNIT-2

PAGE: 2 OF: 2

STREAM: SPRAGUE DATE: 24 SEPT 04 NUMERATOR: R. NAONA

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	.8				100							30			SIDE CHANNEL
32	GL	.9				100							20			
33	LP	2.3	.7			100							70			CLAY PAN CAVING DEEPENING & WIDENING
34	GL	.8				100							10			DEPOSITIONAL SIDE CHANNEL
35	GL	.8				100							10			SIDE CHANNEL NARROWING
36	GL	.6				100							20			LATERAL ACCRETION
37	LP	2.0	.7			100							20			
38	GL	1.0				100							20			
39	LP	1.9				100							5			LATERAL DEPOSITION LB
V 40	GL	.5				100									SO	SIDE CHANNEL W/ PUMP
41	GL	.5				95		5					5			(BREACHED) 2.0m HIGH DAM SPANS RIVER
42	GL	.5				100										
43	LP	2.4	.8			100							5			0607784-4718009 END SURVEY
V																
V																

AX DEPTH POOLS - MODAL DEPTH IN FAST WATER UNITS

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

DUE TO LATERAL ACCRETION

WOOD

PAGE: 1 OF: 1

STREAM: Sprague (Harris) DATE: 9/24/04 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
2	LP	S	N	C	45			1	1									
5	SP	S	N	S	45			1										
15	SP	S	N	M	45				1	1								
17	LP	S	N	S	60				1									
18	RI	S	N	S	60		1											
19	RI	S	N	S/M	60			1	1									
41	GL	S	N	S	60													

RIPARIAN

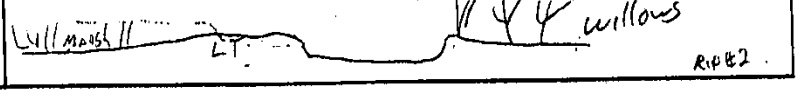
PAGE: 1 OF: 3

STREAM: SPRAGUE River (HARRIS Reach) DATE: 24 SEPT. 04 NAME: Rich 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
1	LEFT	1	HS	20	0	0	100	CONIFER						
								HARDWOOD						
		2	HS	20	0	0	40	CONIFER						
								HARDWOOD						
		3	HS	20	0	20	20	CONIFER						
								HARDWOOD						
1	RIGHT	1	FP	1.6	0	0	80	CONIFER						
								HARDWOOD						
		2	LT	0	0	20	100	CONIFER						
								HARDWOOD						
		3	LT	0	0	0	180	CONIFER						
								HARDWOOD						
10	LEFT	1	LT	8	0	0	100	CONIFER						
								HARDWOOD						
		2	LT	0	30	20	100	CONIFER						
								HARDWOOD	2					willow
		3	LT	0	0	10	100	CONIFER						
								HARDWOOD						
10	RIGHT	1	LT	10	0	20	80	CONIFER						
								HARDWOOD						
		2	LT	0	80	20	160	CONIFER						
								HARDWOOD						
		3	LT	0	0	40	100	CONIFER						
								HARDWOOD						

UNIT # 1 0608113 - 4715876

UNIT # 10 0607102 - 4715420



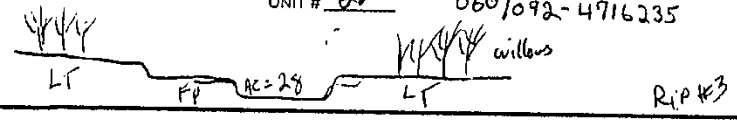
RIPARIAN

STREAM: SPRAGUE (HARRIS Reach) DATE: 24 SEPT 04 PAGE: 2 OF: 3

NAME: R. NAGEL

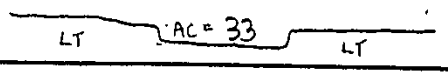
UNIT NUMBER	SIDE	ZONE	SURFACE	SLOPE	CANOPY CLOSURE	SHRUB % COVER	GRASS/FORB % COVER	TREE	COUNT (DBH in CENTIMETERS) 3-15	15-30	30-50	50-90	90+	RIPARIAN NOTE
22	LEFT	1	LT	12	0	0	100	CONIFER						
								HARDWOOD						
		2	LT	0	0	0	100	CONIFER						
								HARDWOOD						
		3	LT	0	0	0	100	CONIFER						
								HARDWOOD						
22	RIGHT	1	LT	20	0	0	20	CONIFER						
								HARDWOOD						
		2	LT	0	80	0	60	CONIFER						
								HARDWOOD	15					willows
		3	LT	0	80	0	60	CONIFER						
								HARDWOOD	12					willows
	LEFT	1	LT	12	0	0	100	CONIFER						
								HARDWOOD						
		2	LT	0	0	0	100	CONIFER						
								HARDWOOD						
		3	LT	0	0	0	100	CONIFER						
								HARDWOOD						
	RIGHT	1	LT	8	0	0	100	CONIFER						
								HARDWOOD						
		2	LT	0	0	0	100	CONIFER						
								HARDWOOD						
		3	LT	0	0	0	100	CONIFER						
								HARDWOOD						

UNIT # 22 0607092-4716235



RIP #3

UNIT # 30 0608126-4716566



RIP #4

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: 3 OF: 3

STREAM: SPRAGUE (Hanau Reach) DATE: 24 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
43	LEFT	1	LT	8	0	0	100	CONIFER						
								HARDWOOD						
		2	LT	0	0	0	100	CONIFER						
								HARDWOOD						
		3	LT	0	0	0	100	CONIFER						
								HARDWOOD						
43	RIGHT	1	LT	12	0	0	100	CONIFER						
								HARDWOOD						
		2	LT	0	0	0	100	CONIFER						
								HARDWOOD						
		3	LT	0	0	0	100	CONIFER						
								HARDWOOD						
	LEFT	1						CONIFER						
								HARDWOOD						
		2						CONIFER						
								HARDWOOD						
		3						CONIFER						
								HARDWOOD						
	RIGHT	1						CONIFER						
								HARDWOOD						
		2						CONIFER						
								HARDWOOD						
		3						CONIFER						
								HARDWOOD						

UNIT # 43 0607784-4718009

LT — nc=35 — LT

RIPAR #5

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.

PHOTO RECORD

PAGE: 1 OF: ____

STREAM: Sprague (Harris) SURVEY TYPE: OR. PLAN ☐ BASIN ☒ MIXED ☐

BASIN OR GCG: Sprague FILM: DIGITAL ✓ SLIDE ☐ PRINTS ☐

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

PHOTO # OR DIGITAL ID	UNIT #	DATE	TIME	STREAM / PHOTO DESCRIPTION
1: B 398	1	9/24/04	1030	US View
2: 399	↓		↓	DS View
3: 400				RB Rip
4: 401	↓		↓	DS View of Left Bank
5: 402	3		1110	View of Riffle Gravel (Possible Redd)
6: 403	7		1130	Screened Diversion + Pump Structure
7: 404	10		1205	US View
8: 405	10		1205	DS View
9: 406	11		1240	View of Riffle Gravel
10: 407	11		1240	RB to LB View of Wolman Site
11: 408	22		1505	ES View
12: 409	21		1515	US View of Riffle
13: 410	21		1518	View of Available Gravel in Riffle
14: 411	27		1545	LR Erosion
15: 412	27		1548	View of Submerged Cleaving Hardpan
16: 413	30		1625	US View
17: 414	30		1625	DS View
18: 415	35		1720	LB View of Side Channel Accretion & Willows
19: 416	39,40		1755	DS View of Breached Dam
20: B 417	39,40		1755	" " " " "
21:				
22:				
23:				
24:				
25:				
26:				
27:				
28:				
29:				
30:				
31:				
32:				
33:				
34:				
35:				
36:				
37:				
38:				
39:				
40:				