

9-27-2004

## Ex. 280-US-461

R. Nawa  
*Oregon Department of Fish and Wildlife*

C. Huntington  
*Oregon Department of Fish and Wildlife*

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Stream: North Fork Sprague  
Tributary to: Sprague River>Williamson River  
Survey Type: Spawning Gravel  
Access: Foot  
Reach: 5 (partial)  
Start: T36S-R14E-S3NE  
Quad: Bly  
Date Surveyed: 27 September 04  
Surveyor: R. Nawa  
Report: R. Nawa, C. Huntington  
Distance Surveyed: estimated 1.1 km

Only the upper half of the reach was surveyed (Map 1). An estimated 940 m<sup>2</sup> of gravel were suitable for spawning steelhead at existing low flows (330 m<sup>2</sup> /km). An additional 320 m<sup>2</sup> of gravel would become available at bankfull flows (170 m<sup>2</sup> /km). The relatively coarse gravel/cobble substrate would also be suitable for Chinook salmon (Photo 457). Cobble embeddedness ranged from 30-50 percent. Gravel was concentrated below meander bends where the channel was sinuous.. The unsurveyed lower portion of the reach had a straight channel. No spawning gravel was apparent for at least 100 m in the straight channel below where the survey began. Beaver had dammed one side channel near the Ganong residence.

Photo 457. Coarse  
gravel/cobble substrate  
would be suitable for  
Chinook salmon spawning.

Stream: North Fork Sprague  
Tributary to: Sprague River>Williamson River  
Survey Type: Spawning Gravel  
Access: Foot  
Reach: 6  
Start: T35S-R14E-S35NE  
Quad: Bly  
Date Surveyed: 27 September 04  
Surveyor: R. Nawa  
Report: R. Nawa, C. Huntington  
Distance Surveyed: 1.42 km

The upper half of the reach was Forest Service; the lower portion was private (Map 1). Carry and Ralph Ganong provided access to private lands. Cobble and poorly sorted gravel dominated the channel (Photo 454). An estimated 4 m<sup>2</sup> of gravel were suitable for spawning steelhead at existing low flows (3 m<sup>2</sup>/km). Lack of suitable spawning gravel may be related to low sinuosity. Wetted width was about 15 m. An unscreened diversion ditch immediately below Forest Road 3411 diverts about 70 percent of the North Fork flow (Map). Greatly reduced flow in the North Fork would make adult salmon migration difficult. Stream temperature at the upper end of reach was 9.4°C at 1400.

Photo 454. Coarse  
cobble/ boulder  
substrate is unsuitable  
for spawning salmon  
and steelhead.

Stream: North Fork Sprague  
Tributary to: Sprague River > Williamson River  
Survey Type: Spawning Gravel  
Access: Foot  
Reach: 7 (partial)  
Start: T35S-R14E-S36NW  
Quad: Bly, Campbell Reservoir  
Date: 27 September 04  
Surveyor: R. Nawa  
Distance Surveyed: estimated 1.3 km

Only the lower half of the reach was surveyed (Map 1). The stream was in a very steep walled canyon with cobble/boulder substrate (Photo 449). Small patches of gravel were occasionally found behind large boulders. An estimated 16 m<sup>2</sup> of gravel were suitable for spawning steelhead at existing flows (12 m<sup>2</sup>/km). This reach has little potential for spawning, but would provide excellent holding water for adults because of high flows, cold water (9.4°C) and inaccessibility. Bankfull flow made wading treacherous.

Photo 449. Coarse cobble/boulder substrate was unsuitable for salmon and steelhead spawning.

Stream: North Fork Sprague  
Tributary to: Sprague River>Williamson River  
Survey Type: Spawning Gravel  
Access: Foot  
Reach: 14  
Start: T34S-R16E-S30NW  
Quads: Sandhill Crossing, Lee Thomas Crossing  
Survey Date: 26 September 04  
Surveyor: R. Nawa  
Report: R. Nawa, C. Huntington  
Distance Surveyed: 5.3 km

The entire reach was Freemont National Forest lands (Map 2). Low stream gradient and high sinuosity resulted in large amounts of mostly well sorted spawning gravel. An estimated 3,850 m<sup>2</sup> of gravel were suitable for steelhead spawning at existing low flows (732 m<sup>2</sup>/km). An additional 424 m<sup>2</sup> of gravel would become available at bankfull flows (81 m<sup>2</sup>/km). The median gravel size (D50) was 16-32 mm (Wolman Pebble Count). Fresh deposition on point bars indicates significant amounts of sediment moving through the system (Photos 442,443). An estimated 10-30 percent of the spawning gravel was sand. At 2 locations boulders were 40-80 percent embedded in fine gravel. Eroding streambanks were heavily grazed in meadow areas resulting in a lack of shade (few willows). The active channel was 4-8 m wide. Stream temperature was 13.3° C at 1630 pdt.

Photo 442. Well sorted spawning gravel deposited at point bars associated with meander bends.

Photo 443. Gravel/cobble suitable for both steelhead and Chinook salmon

Stream: North Fork Sprague River  
Tributary to: Sprague River>Williamson River  
Survey Type: Spawning Gravel  
Access: Foot  
Reach: 15  
Start: T34S-R16E-S20NW  
Quads: Sandhill Crossing, Lee Thomas Crossing  
Date Surveyed: 26 September 04  
Report: R. Nawa, C. Huntington  
Surveyor: R. Nawa  
Distance Surveyed: 1.7 km

This reach is a private meadow within the Freemont National Forest (Map 2). Low stream gradient and high sinuosity resulted in large amounts of mostly well sorted spawning gravel in riffles (Photo 432). An estimated 1,154 m<sup>2</sup> of gravel were suitable for steelhead spawning at existing low flows (695 m<sup>2</sup>/km). An additional 352 m<sup>2</sup> of gravel would become available at bankfull flows (212 m<sup>2</sup>/km). The median gravel size (D50) was 16-32 mm ( Photo 434; Wolman Pebble Count). Estimated embeddedness was 10-20 percent. In some locations the gravels were heavily cemented or were surficial deposits < 15 cm deep over a claypan. These thin layers of gravel were judged unsuitable. Streambanks were only lightly grazed and seemed to be recovering. The active channel was 8 m. Stream temperature was 6.6° C at 1130.

Photo 432.  
Large amounts  
of well sorted  
gravel were in  
riffles.

Photo 434.  
Median gravel  
size was 16-32  
mm.

Stream: North Fork Sprague River  
Tributary to: Sprague River>Williamson River  
Survey Type: Spawning Gravel  
Access: Foot  
Reach: 16A  
Start: T34S-R16E-S20NE  
Quad: Lee Thomas Crossing  
Date: 26 September 04  
Surveyor: K. Hartzell  
Report: R. Nawa, C.Huntington  
Distance Surveyed: 0.4 km

This reach is on Freemont National Forest (Map 2). An estimated 382 m<sup>2</sup> of gravel/cobble was suitable for steelhead spawning at existing low flows (955 m<sup>2</sup>/km). Estimated sand content in gravel patches was 25 percent.

Photo 90.  
Meandering low  
gradient stream  
had a high density  
of spawning  
gravel .

Stream: North Fork Sprague River  
Tributary to: Sprague River>Williamson River  
Survey Type: Spawning Gravel  
Access: Foot  
Reach: 16B  
Start: T34S-R16E-S20SE  
Quad: Lee Thomas Crossing  
Date: 26 September 04  
Surveyor: K. Hartzell  
Report: R. Nawa, C.Huntington  
Distance Surveyed: 3.8 km

This reach is on Freemont National Forest land upstream of School Creek (Map 2). An estimated 217 m<sup>2</sup> of gravel/cobble was suitable for steelhead spawning at existing low flows (57 m<sup>2</sup>/km). Estimated sand content in gravel patches was 25 percent. Estimated embeddedness was 30 percent.

Photo 93. Source of spawning gravel appears to be from local streambank erosion.

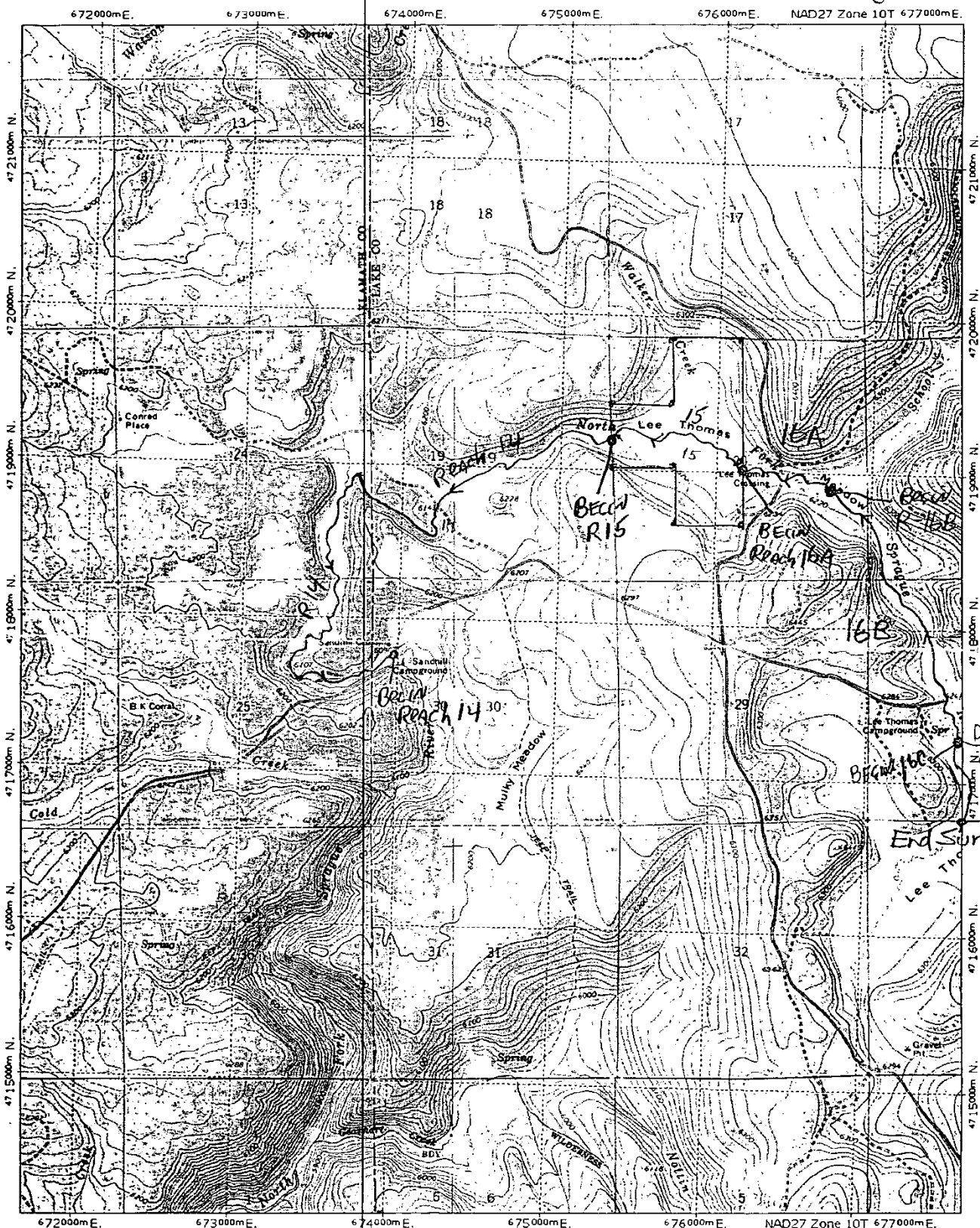


Stream: North Fork Sprague River  
Tributary to: Sprague River>Williamson River  
Survey Type: Spawning Gravel  
Access: Foot  
Reach: 16C  
Start: T34S-R16E-S28SW  
Quad: Lee Thomas Crossing  
Date: 26 September 04  
Surveyor: K. Hartzell  
Report: R. Nawa, C.Huntington  
Distance Surveyed: 3.8 km

This reach is on Fremont National Forest land upstream of Dead Cow Creek (Map 2;Photo 96). An estimated 165 m<sup>2</sup> of gravel was found suitable for steelhead spawning at existing low flows (57 m<sup>2</sup>/km). Estimated sand content in gravel patches ranged from 25-40 percent. .

Photo 96. Upstream view of Dead Cow Creek and North Fork.

Middle N. Fork Sprague



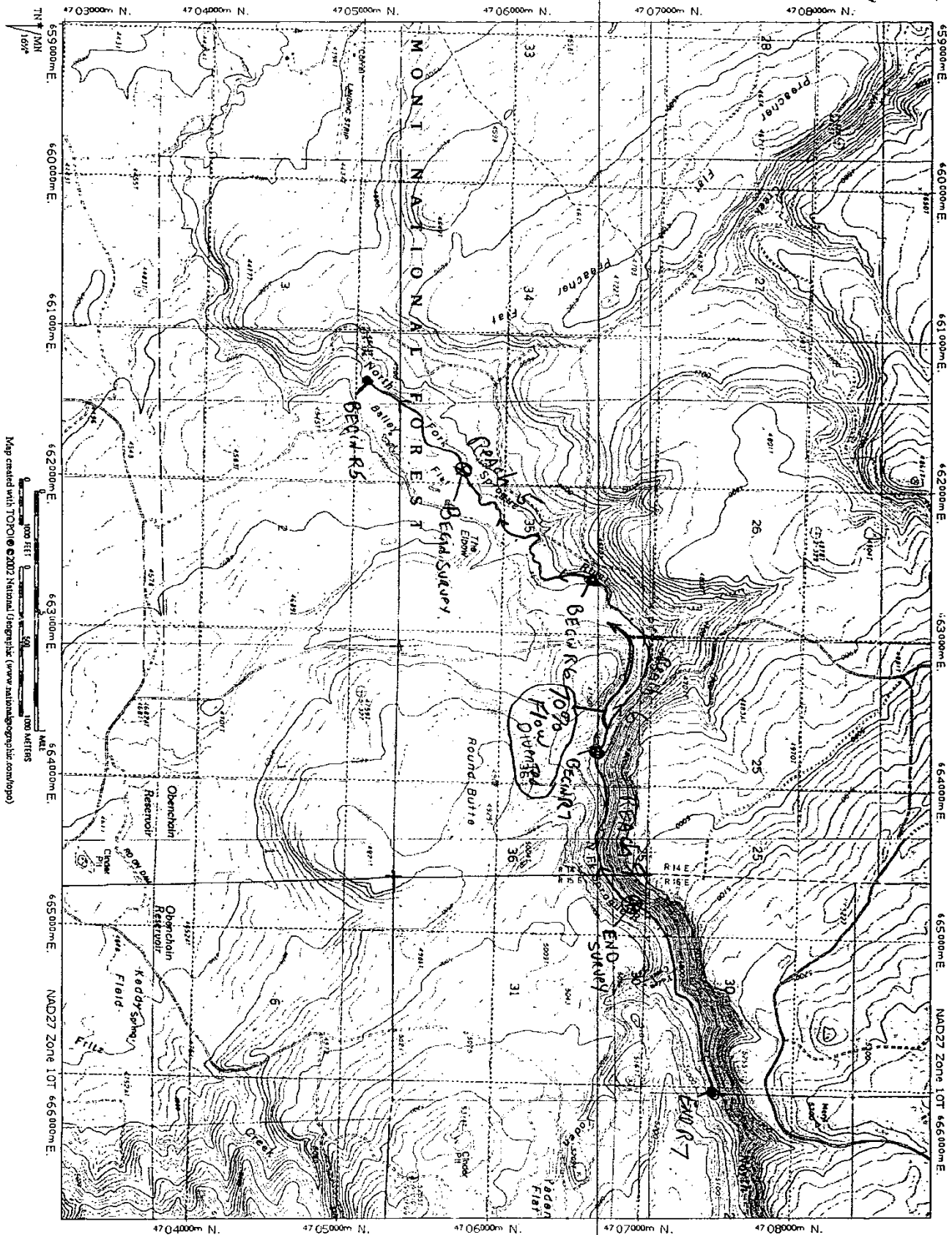
672000m E. 673000m E. 674000m E. 675000m E. 676000m E. 677000m E. NAD27 Zone 10T 4715000m N. 4716000m N. 4717000m N. 4718000m N. 4719000m N. 4720000m N. 4721000m N. TN 16N 162°

0 1000 FEET 500 1000 METERS

Map created with TOPO!® ©2002 National Geographic (www.nationalgeographic.com/topo)

Reach 5, 6, 7

Lower N. Fork Sprague



### SPAWNING HABITAT FORM

Stream North Fork Sprawl Reach 14 Date 26 Sept 04  
 Surveyor(s) R. NAWA

Surface area (m <sup>2</sup> )	Class (G, GC, C)	Percent wetted	Percent usable	% SAND	Cob Emb	Comments
32	G	100	80	20	N.D.	Bank sand hill crossing RO
70	G	70	50			
60	G	100	90			
20	G	100	80			
30	G	100	80			
40	G	80	50			
30	G	60	40			
200	G	100	70			
40	G	90	60			
60	G	100	80			
70	G	60	40			
35	G	80	60			
80	GC	90	60			
35	G	80	60			
88	G	90	60			
300	G	70	50			
90	GC	90	60			
16	G	100	80			
80	G	60	40			
12	G	60	40			
30	GC	80	60			
48	G	100	100			
50	G	100	80			
40	GC	100	100			
120	G	100	80			
64	G	100	80			
100	G	100	60			BIRDs EMBEDDED 40-80%
64	G	100	80			
40	G	100	80			WW DECREASES TO 4m
30	GC	100	100			
80	GC	100	80			
12	GC	100	60			56° @ 1630
10	GC	100	100	✓	✓	

2,455

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 North Fork SPRAGUE Reach 14 (USFS) Date 26 SEPT 04  
 Surveyor(s) R. NAWA 4,663 m<sup>2</sup> / 3.07 miles = 1426 m<sup>2</sup>/mile

Surface area (m <sup>2</sup> )	Class (G, GC, C)	Percent wetted	Percent usable	% SAND	Cob Emb	Comments
20	GC	100	100	20	N.D	"CONRAD PLANE" TRIB SEC
60	G	100	60	30		
16	G	90	40	—		
30	G	80	60	20		
300	G	95	80	30		GLIDE
12	G	100	80	—		SCATTERED AMONG BOULDER
64	G	100	70	20		
54	G	100	80	20		BOULDER EMBRG = 60%
40	G	40	30	10		
150	G	70	50	20		
32	G	80	50	20		
64	GC	100	90	20		
72	G	80	40	20		
100	G	100	40	20		ROAD CROSSES CREEK - NO BRIDGE
70	GC	90	40	20		
20	GC	100	30	20		
30	G	100	60	20		
200	GC	90	70	20		
36	G	80	50	20		
45	G	100	40	20		
40	GC	100	60	20		
30	GC	100	70	20		
40	G	100	70	30		
50	GC	90	60	30		
20	G	80	70	20		
50	G	100	60	20		
80	GC	100	60	20		
40	GC	100	80	20		
20	G	100	100	30	10-20	
14	G	100	40	30	N/D	
50	G	100	20	30		
8	G	100	100	30		
65	G	90	70	30		

14 82.

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 N.F. SPRAGUE Reach 14 Date 26 Sept 04  
 Surveyor(s) R. NAWA

Surface area (m <sup>2</sup> )	Class (G, GC, C)	Percent wetted	Percent usable	% SAND	CDB EMB	Comments
80	GC	100	80	ND	ND	WOLMAN Pebble count
4	GC	100	70			
16	GC	100	100			
16	G	80	50			Boulders 70% Embedded in Fine Gravel
50	GC	90	50			
12	G	100	100			
100	G	100	80			
8	GC	100	70			

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 North Fork Sprague Reach 15 (Private) Date 26 Sept 04  
 Surveyor(s) R. Nawa Lee Thomas Measner  $1506 \text{ m}^2 / 10.3 \text{ mi} = 146.2 \text{ m}^2 / \text{mile}$

Surface area (m <sup>2</sup> )	Class (G, GC, C)	Percent wetted	Percent usable	% S <sub>90-0</sub>	% Emb	Comments
45	GC	90	80	ND	ND	
80		90	70			
120		100	90			
55		100	70			
30		100	80			
50		80	60			
50		80	60			
100		50	40			
100		40	30			
70		90	70			
60		40	30		10%	
40		50	30		10	
30		50	30		10	
100		80	60		10	
25		100	80		10	
40		50	40		10	
130		100	80		10	
80		50	30		20	
36		100	100		10	
30		60	40		10	old lamprey redds?
50		80	60		10	Point Bar
40		100	80		10	Point Bar
100		70	50		10	Wolman count
5		100	100		10	
40	V	100	100		20	

Class: G= gravel, C= small cobble ( $\leq 150\text{mm}$  [6"])  
 Usable habitat is at least 150mm (6") deep and has water velocities between 1 and 4 feet/second.

SPAWNING HABITAT FORM

Stream N. Fork Sprague Reach 16-A, 16-B Date 9/26/04  
 Surveyor(s) Hartzell

Surface area (m <sup>2</sup> )	Class (G, GC, C)	Percent wetted	Percent usable	90 Sand	Start @ USFS P.L. Reach 16-A, Comments	
4	G	100	100	25	3676153, 4719034	
6	GC		20	20		
45	GC		30	20		
48	GC		80	25		
18	GC		60	25		
15	GC		50	25		
8	GC		90	20		
20	GC		60	25		
12	GC		50	25		
16	GC	✓	50	25		
Rd. 3372 Bridge						
12	GC	100	80	25		
48	GC		20	25		
60	GC		20	25		
30	GC		50	25		
16	GC		50	25		
24	G	✓	100	20	Primo Gravel From School Cr., Start R-16A	
2	GC	100	80	25		
12	GC		20	30		
3	GC		80	25		
10	GC		90	25		
8	C		90	—	30% Embed	
10	G		20	25		
8	GC		90	25		
18	GC		100	25		
30	GC		50	25		
9	GC		80	25		
12	GC		30	25		
6	GC		100	25		
3	C		100	—	30% Embed	
9	GC		100	40		
6	GC	✓	100	25		

Gravel predominates in all areas called a GC combination

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 N. Fork Sprague Reach 16B, 16C Date 9/26/04  
 Surveyor(s) Hartzell

Surface area (m <sup>2</sup> )	Class (G, GC, C)	Percent wetted	Percent usable	90% Sort	Comments
4	G	100	70	30	0677492, 4717550
					Rd. 3411 Bridge > 20 m
					S is now Primary Chan.
10	GC	100	70	25	for Dead Cow Cr.
12	GC		50	25	
36	GC		70	25	
21	GC	✓	70	25	
					Dead Cow Cr. Original
					Channel as shown on map
					Begin Reach 16C
2	G	100	60	30	0677602, 4717347
6	GC		20	30	
5	GC		100	25	
5	GC		100	30	
6	GC		100	30	
30	G		60	40	
6	G		100	40	
3	G		40	40	
12	GC		90	20	
8	G		100	25	
12	G		60	30	
16	G		100	25	
4	GC		100	25	
21	G		70	35	
9	G		30	30	
20	GC	✓	100	40	
					USFS Fenceline: End R.
					0677662, 4716777
					50°F @ 1645

Gravel predominates in all areas called a G-C combination

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.

Stream Name Noath Fork Sprague Rosgen Channel Type C  
 Hydrologic Unit BB\* Reach 15 EPA EXT \_\_\_\_\_  
 Stream Survey Reach \_\_\_\_\_ Sample # 1 Habitat Unit Type \_\_\_\_\_ Fast/Slow Water \_\_\_\_\_  
 Observers R. NAWA Date \_\_\_\_\_  
 Procedure  (Wolman, 1954) \_\_\_\_\_ (Beverger 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					
<del>Clay</del>	<del>&lt;0.0039</del>					
<del>Silt</del>	<del>0.0039-0.0625</del>					
<del>Fine Sand</del>	<del>0.0625 - 0.25</del>					
<del>Med. Sand</del>	<del>0.25 - 0.5</del>					
<del>Coarse Sand</del>	<del>0.5 - 1.0</del>					
VC Sand	<u>P-2</u>		<u>7</u>			
<del>VF Gravel</del>	<del>2 - 4</del>		<u>0</u>			
Fine Gravel	<u>4-8</u>		<u>1</u>			
<del>Fine Gravel</del>	<del>6 - 8</del>					
Med. Gravel	<u>8 - 16</u>		<u>7</u>			
Coarse Gravel	<u>16 - 32</u>		<u>37</u>			
VC Gravel	<u>32 - 64</u>		<u>45</u>			
Sm. Cobble	<u>64 - 128</u>		<u>5</u>			
Lg. Cobble	128 - 256					
Sm. Boulder	256 - 512					
Med. Boulder	512 - 1024					
Lg. Boulder	1024 - 2048					
VL Boulder	2048 - 4096					
Bedrock						

Total #: 102

Calculations: % Fines <2mm \_\_\_\_\_ % Fines <6mm \_\_\_\_\_ D50 \_\_\_\_\_ D84 \_\_\_\_\_  
 Notes: UTM = 676687 - 4719083 Active channel = 6.9 m

Stream Name NORTH Fork SPRING Rosgen Channel Type C  
 Hydrologic Unit \_\_\_\_\_ ~~EPA~~ Reach 14 EPA EXT \_\_\_\_\_  
 Stream Survey Reach \_\_\_\_\_ Sample # 1 Habitat Unit Type \_\_\_\_\_ Fast/Slow Water \_\_\_\_\_  
 Observers R. Ngura Date 26 SEPT 04  
 Procedure X (Wolman, 1954) \_\_\_\_\_ (Beverger 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		5	5		
VF Gravel	2 - 4		0			
Fine Gravel	4 - 8		5	5		
Med. Gravel	8 - 16		11	11		
Coarse Gravel	16 - 32		36	36		
VC Gravel	32 - 64		39	39		
Sm. Cobble	64 - 128		4	4		
Lg. Cobble	128 - 256					
Sm. Boulder	256 - 512					
Med. Boulder	512 - 1024					
Lg. Boulder	1024 - 2048					
VL Boulder	2048 - 4096					
Bedrock						

Total #: 100

Calculations: % Fines <2mm \_\_\_\_\_ % Fines <6mm \_\_\_\_\_ D50 \_\_\_\_\_ D84 \_\_\_\_\_  
 Notes: AC = 8.1m CLIC UTM = 625056 - 4719260

Reach 14

PHOTO RECORD

PAGE: 1 OF 1

STREAM: North Fork Sprague SURVEY TYPE: OR. PLAN  BASIN  MIXED

BASIN OR GCG: Reach 14, 15, 16 A, B, C Sprague FILM: DIGITAL  SLIDE  PRINTS

SURVEY CREW: R. Nowak / K. H. ROLL #: \_\_\_\_\_ MAILER #: \_\_\_\_\_

PHOTO # OR DIGITAL ID	UNIT #	DATE	TIME	STREAM / PHOTO DESCRIPTION
1: B 444	14	26 Sept 04	1640	Close up of freshly deposited gravel on point bar
2: B 443	14		1650	Close up of gravel texture
3: B 442	14		1500	Gravel Deposition AT Point Bar
4: B 441	14		1510	Stream lacks shape in meadows
5: B 440	14		1500	Excellent gravel deposited above fallen tree
6: B 429	14		1450	Poor section BCR Embedment = 70% - NOT COUNTED
7: B 430	14		1430	Wolman pebble count site
8: B 437	14		1410	Downstream into USFS - No willows same bank erosion
9: B 436	15		1410	Upstream Private - willows recovering
10: B 435	15		1350	Cemented gravel below eroded from bank
11: B 434	15		1310	Close up of clean gravel
12: B 433	15		1310	Riffle with 100 m <sup>2</sup> gravel
13: B 432	15		1250	130 m <sup>2</sup> spawning gravel in low gradient riffle
14: B 431	15		1210	Spawning gravel close up - Lamprey redds?
15: B 430	15		1120	Wolman pebble count
16: B 429	15		1100	Downstream into private land - Lee Thomas meadow
17:				
18: C 90	16A		1113	US View of FS Land w/ Rich
19:	16A			US View of channel
20:	15			DS View of channel w/ Rich
21:	16B		1450	US View of eroded bank
22:	16B		1450	DS View of meanders 0677502, 4717713
23:	16B		1535	DS View
24:	16C			US View of Dead Cow Cr (Original channel)
25:	16C			US View from reach break
26:	16B		1557	Side channel riffle & spawning gravel
27:	17		1652	US View of willowless private land
28:	17			US View of private land & house
29:	16C			DS View at reach break
30:	16B		1715	US View of New Dead Cow Cr. channel (20m south of bdy)
31:	16B		1715	DS View of rd 3411 bridge
32:	16B		1725	US View of meanders Fork Lava Outcrop
33:	16B		1725	DS View of meanders " " "
34:	16B		1750	US View of School Creek & Gravel
35: C107	16B		1750	US View of School Cr. Inflow
36:				
37:				
38:				
39:				
40:				

**PHOTO RECORD**

PAGE: \_\_\_\_\_ OF: \_\_\_\_\_

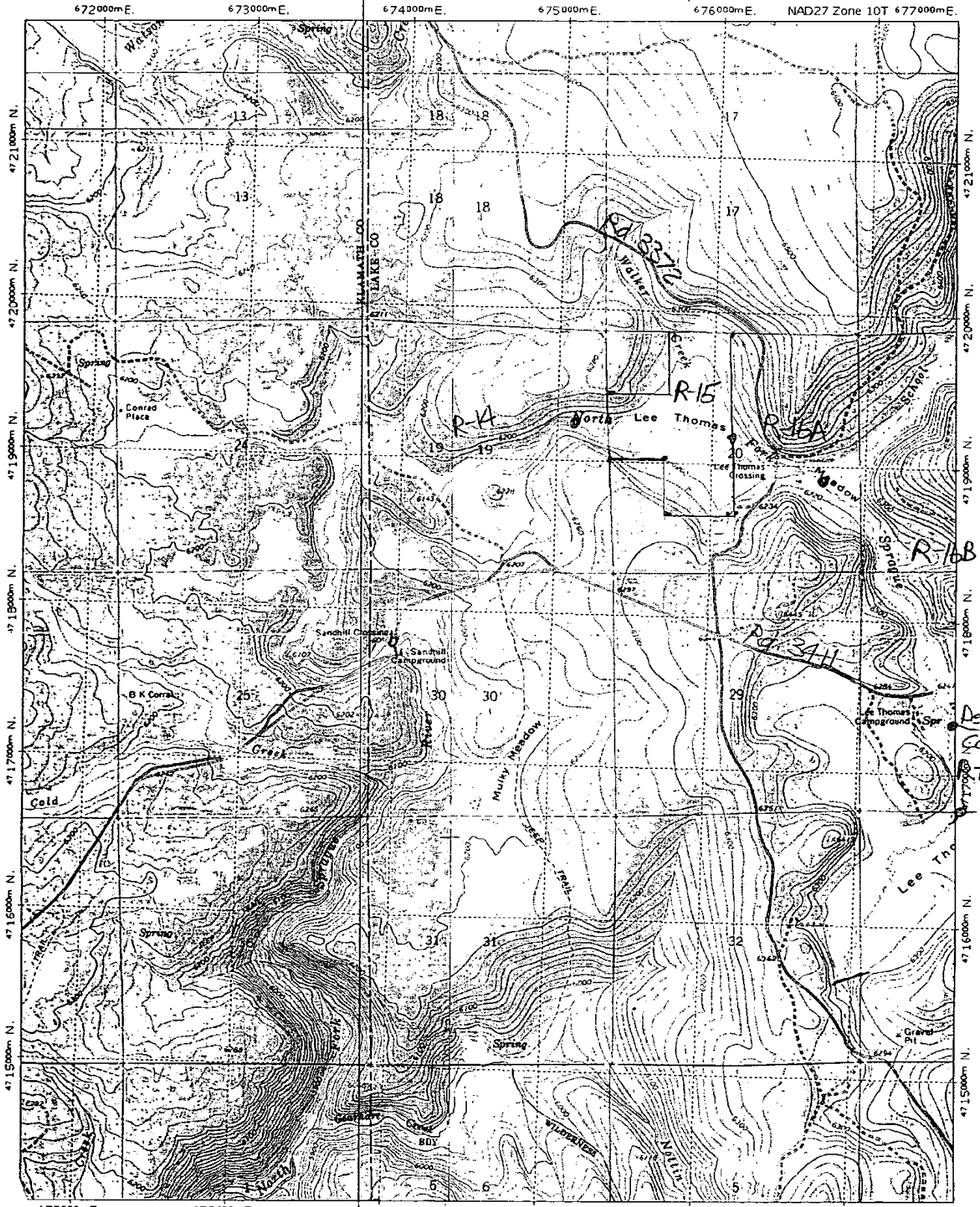
STREAM: \_\_\_\_\_ SURVEY TYPE: OR. PLAN  BASIN  MIXED

BASIN OR GCG: \_\_\_\_\_ FILM: DIGITAL  SLIDE  PRINTS

SURVEY CREW: \_\_\_\_\_ ROLL #: \_\_\_\_\_ MAILER #: \_\_\_\_\_

PHOTO # OR DIGITAL ID	UNIT #	DATE	TIME	STREAM / PHOTO DESCRIPTION
1:				
2:				
3:				
4:				
5:				
6:				
7:				
8:				
9:				
10:				
11:				
12:				
13:				
14:				
15:				
16:				
17:				
18:				
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20:				
21:				
22:				
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25:				
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# Middle N. Fork Sprague



MN  
 X<sup>o</sup>

16A	0.25M
16B	2.35M
16C	0.60M
	7721N



# SPAWNING HABITAT FORM

Stream N. F. SPRUCE Reach 5, 6, 7 Date 27 SEPT 04  
Surveyor(s) R. NAWA

Surface area (m <sup>2</sup> )	Class (G, GC, C)	Percent wetted	Percent usable	REACH	Comments
110	GC	70	30	5	
40	GC	80	30	5	
40	GC	70	20	5	
150	GC	60	30	5	
50	GC	60	20	5	
80	GC	90	40	5	
200	GC	60	20	5	cobble Embay = 30-50%
150	GC	50	20	5	
60	GC	100	80	5	
60	GC	60	40	5	
<hr/>					
4	GC	80	0	6	
6	GC	20	0	6	70% Flow DIVERTED AT 150m below 3411
<hr/>					
2	GC	100	100	7	Patch above Rd 3711
2	GC	100	100	7	Below Boulder
20	G	60	40	7	Below debris Jam on RB
				NOTE:	Reach 6+7 dominated by Cobble/Boulder substrate UNSUITABLE FOR SPAWNING

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 <sup>2</sup> )	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 1

STREAM: North Fork Sprague SURVEY TYPE: OR. PLAN  BASIN  MIXED

BASIN OR GCG: Reach 5, 6, 7 Sprague FILM: DIGITAL  SLIDE  PRINTS

SURVEY CREW: R. NAWA ROLL #: \_\_\_\_\_ MAILER #: \_\_\_\_\_

PHOTO # OR DIGITAL ID	REACH #	DATE	TIME	STREAM / PHOTO DESCRIPTION
1: B 451	5	27 SEP 04	1525	Suitable gravel cobble substrate Found in R 5 suitable for Clunk
2: B 456	6		1515	Downstream - private
3: B 455	6		1515	upstream - forest service
4: B 454	6		1455	cobble boulder substrate unsuitable for spawning
5: B 453	6		1445	Downstream cobble boulder substrate
6: B 452	6		1435	diversion dam with natural bypass at LB
7: B 451	6		1430	unscreened diversion takes 70% flow
8: B 450	6		1400	"Basin Reach 6" working downstream
9: B 445	7		1030	mid channel bar - cobble boulder unsuitable for spawning
10: B 446	7		1030	370 gradient culvert R0341 - possible barrier at Arch sp. flow
11: B 447	7		1140	3-4% gradient cobble boulder riffles & cascades
12: B 448	7		1120	colluvial canyon dominated by boulders & cobble
13: B 449	7		1145	cobble boulder substrate unsuitable for spawning
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STREAM: \_\_\_\_\_ SURVEY TYPE: OR. PLAN  BASIN  MIXED

BASIN OR GCG: \_\_\_\_\_ FILM: DIGITAL  SLIDE  PRINTS

SURVEY CREW: \_\_\_\_\_ ROLL #: \_\_\_\_\_ MAILER #: \_\_\_\_\_

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