

APPENDIX A

Transect Selection Presentation June 12, 2008

Sultan River

Instream Flow Study – RSP3



Transect Selection and Field Reconnaissance
Revised – 6/12/2008

Discussion Overview

- Agenda-Itinerary
- Transect Selection Process
- Review Study Reaches
- Study Sites
- Preliminary Transect Selection by Reach
 - Reach 3
 - Reach 2
 - Reach 1B
 - Reach 1A

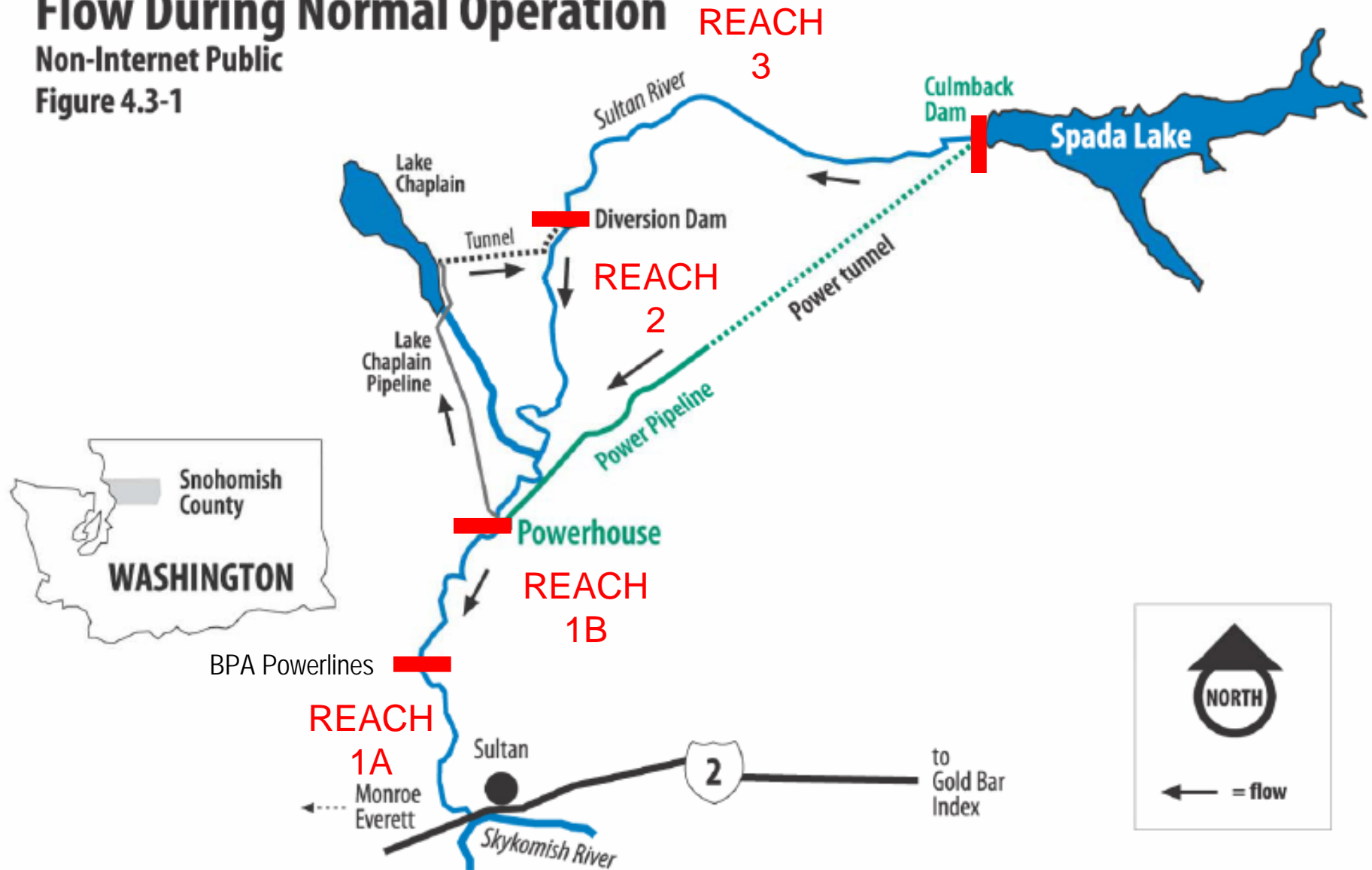
Transect Selection Process

- Review Reach Delineations – Topo Maps and Aerial Photographs
- Review Videotape – 2005 Helicopter Flyover
- Field Reconnaissance selected sites (April 11)
- Complete Helicopter Flyover (April 18)
- Evaluate Reach Habitat Composition
- Preliminary Transect Selections – Flagged (May 4 and May 9)
- Logistical Considerations (access; safety; flow releases)

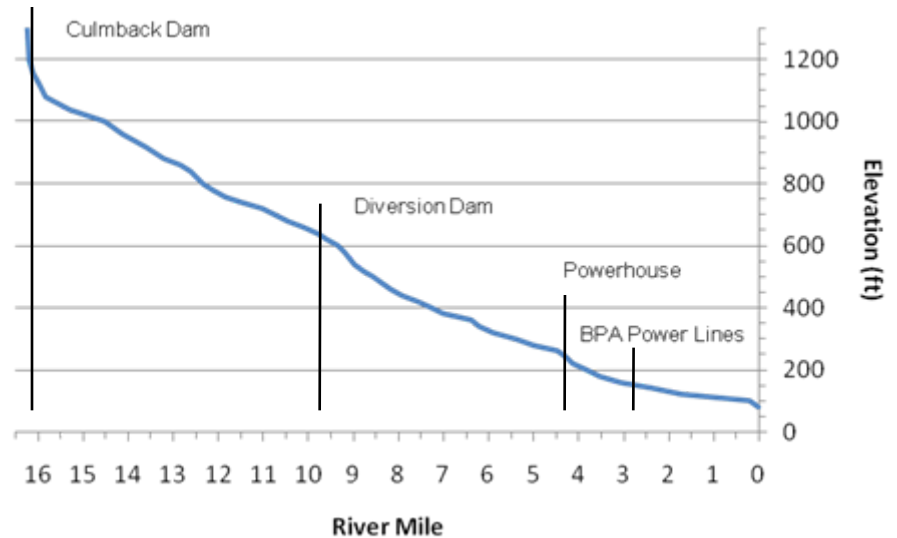
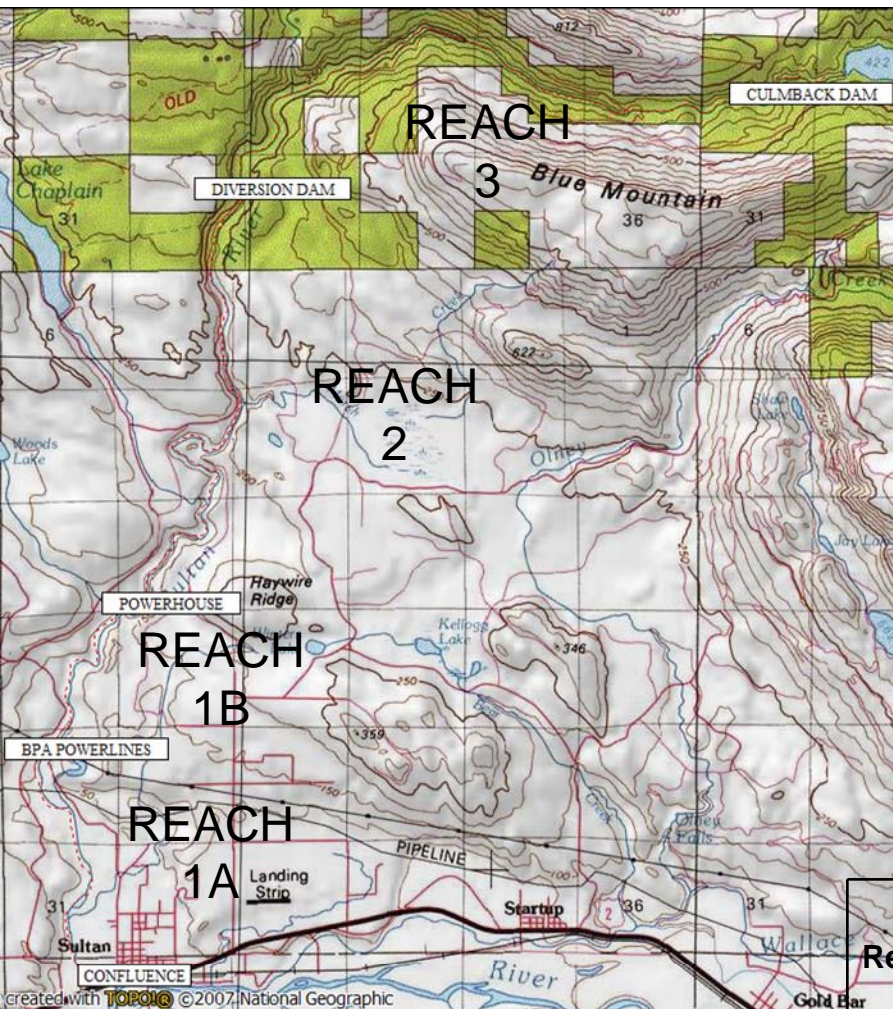
Jackson Hydroelectric Project Flow During Normal Operation

Non-Internet Public

Figure 4.3-1



Study Area: Confluence (RM 0.0) to Culmback Dam (RM 16.5)



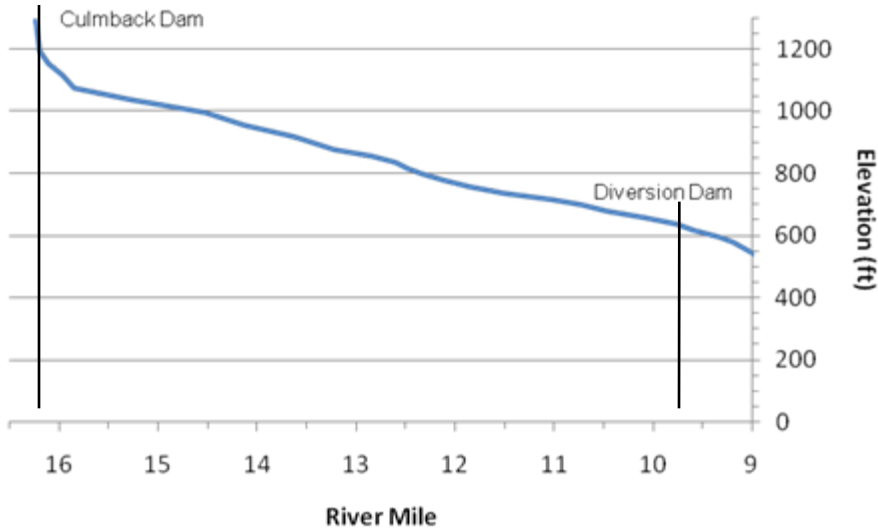
Reach	River Mile	Percent Composition			
		Run	Pool	Riffle	Cascade
1A	0.0 - 2.7	51.8	7.1	41.1	0.0
1B	2.7 - 4.3	40.5	23.8	16.7	19.0
2	4.3 - 9.7	26.0	30.0	26.0	18.0
3	9.7 - 16.5	35.3	16.2	22.1	26.5

Reach	Percent Composition				
	Coarse Gravel (1-3" dia.)	Cobble (3-6" dia.)	Large Cobble (6-12" dia.)	Boulder (>12" dia.)	Bedrock
1A	28.6	50.0	14.3	7.1	0.0
1B	0.0	3.1	15.0	62.7	19.0
2	2.3	3.7	15.0	43.3	33.7
3	1.0	1.5	13.2	53.7	30.6

Study Sites

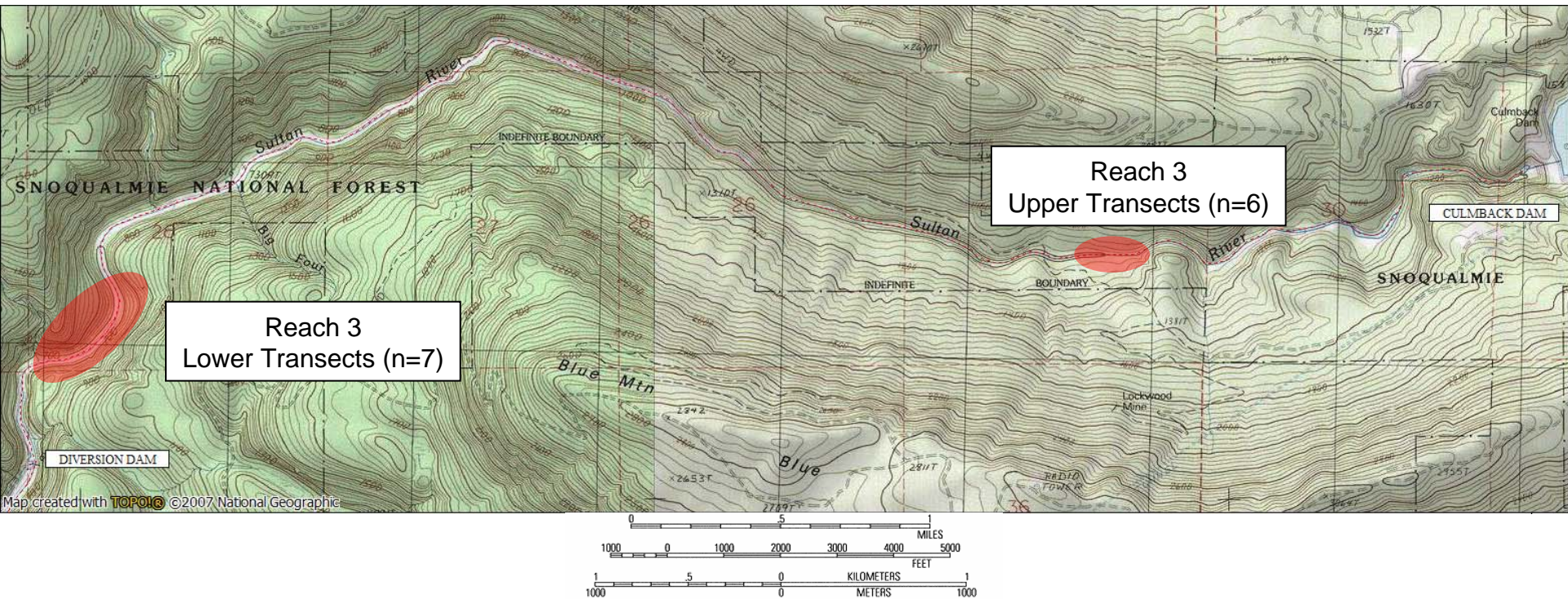
- ▶ Reach 3 (length = 6.8 mi) – Two Sites – Upper and Lower
- ▶ Reach 2 (length = 5.4 mi) – Two Sites – Upper and Lower
- ▶ Reach 1B (length = 1.6 mi) – Two Mainstem Transects
- ▶ Reach 1A (length = 2.7 mi) – Continuous Site – linked to Three Major Side Channels

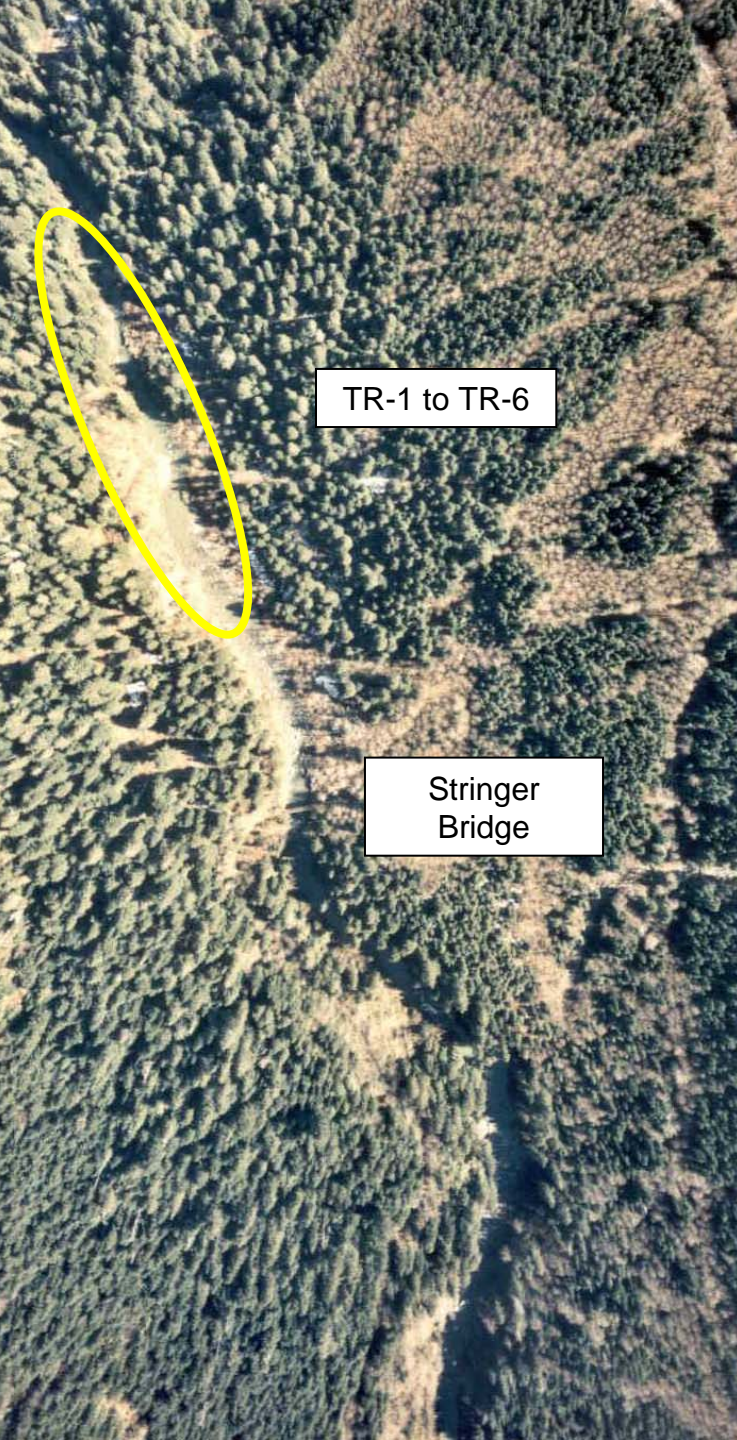
Reach 3: Diversion Dam (RM 9.7) to Culmback Dam (RM 16.5)



Habitat Type	Percent Composition	Preliminary Transects
Cascade	27	2
Riffle	22	8
Pool	16	3
Run	35	2
Total	100	15

Substrate Size	Percent Composition
Gravel (1-3" dia.)	1.0
Cobble (3-6" dia.)	1.5
Large Cobble (6-12" dia.)	13.2
Boulder (>12" dia.)	53.7
Bedrock	30.6





Reach 3 (Upper): Revised Transects

Revised Transect Number	Habitat Type	Revised Habitat Type	Location (U/S to D/S)
TR-6	Pool/Riffle	Low Gradient Riffle	Transition u/s of TR-5
TR-5	Pool	Pool	Body of pool
TR-4	Riffle/Pool Tailout	Glide	Large pool u/s of LWD jam
TR-3	Riffle	Low Gradient Riffle	~20m u/s of LWD jam
TR-2	Riffle	Low Gradient Riffle	d/s of LWD jam
TR-1	Cascade	Rapid	~50m u/s of bridge

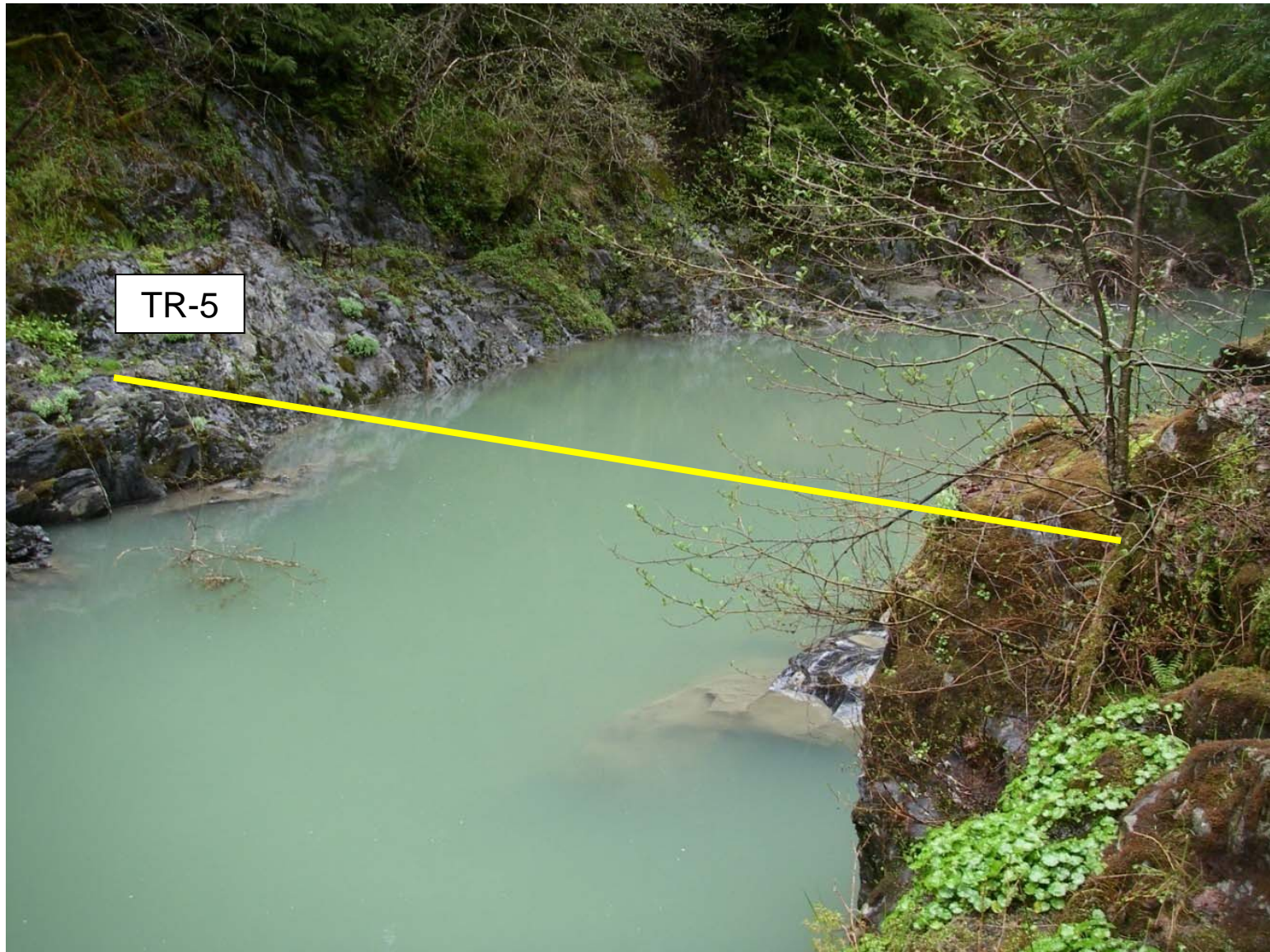
Reach 3 (UPPER): TR-6 (Transect # Revised)



Habitat Type: POOL/RIFFLE

Revised Habitat Type: LOW GRADIENT RIFFLE

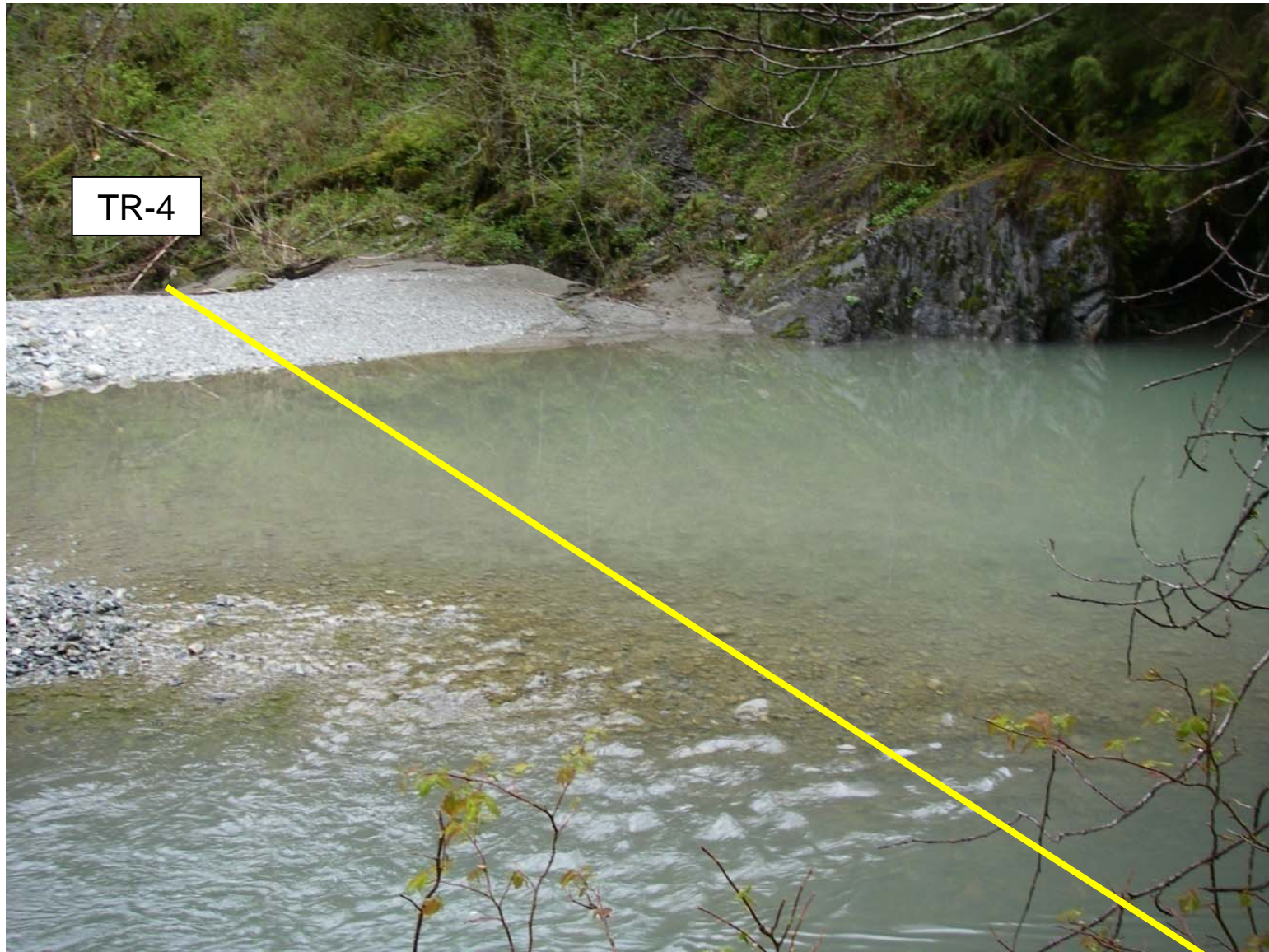
Reach 3 (UPPER): TR-5 (Transect # Revised)



Habitat Type: POOL

Revised Habitat Type: POOL

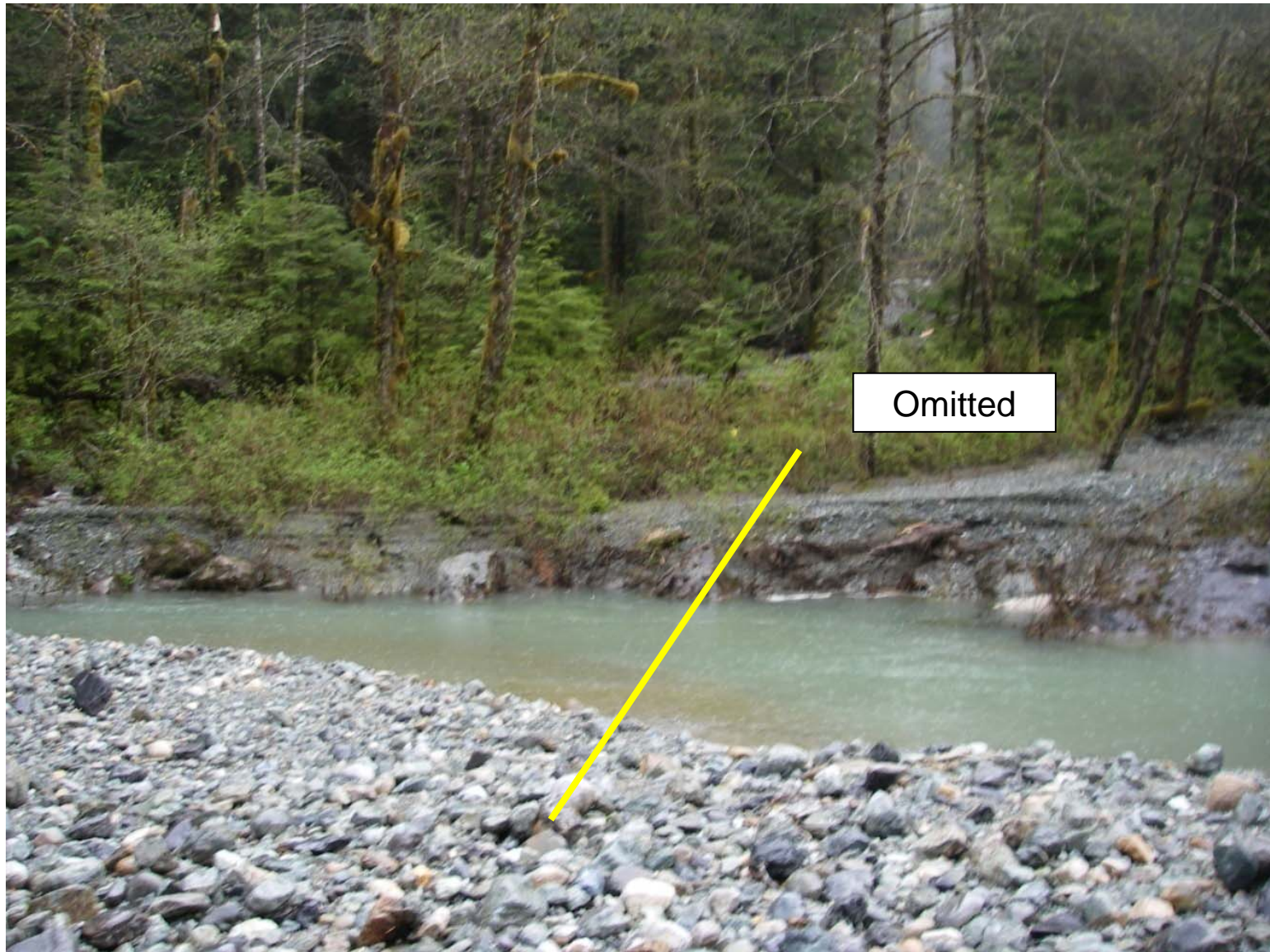
Reach 3 (UPPER): TR-4 (Transect # Revised)



Habitat Type: RIFFLE/POOL TAILOUT

Revised Habitat Type: GLIDE

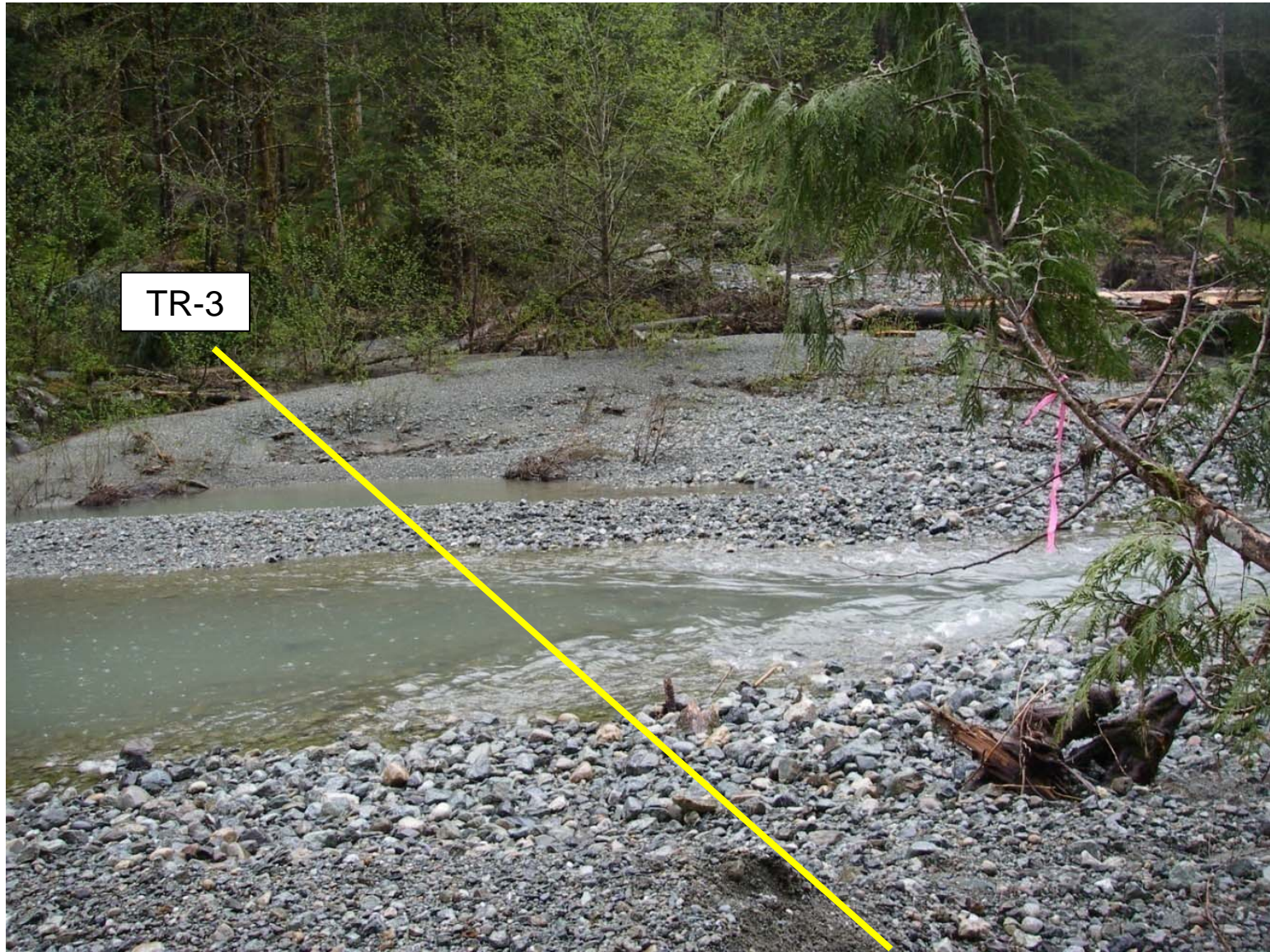
Reach 3 (UPPER): Transect Omitted (Initially TR-5)



Habitat Type: RUN

Revised Habitat Type: TRANSECT OMITTED

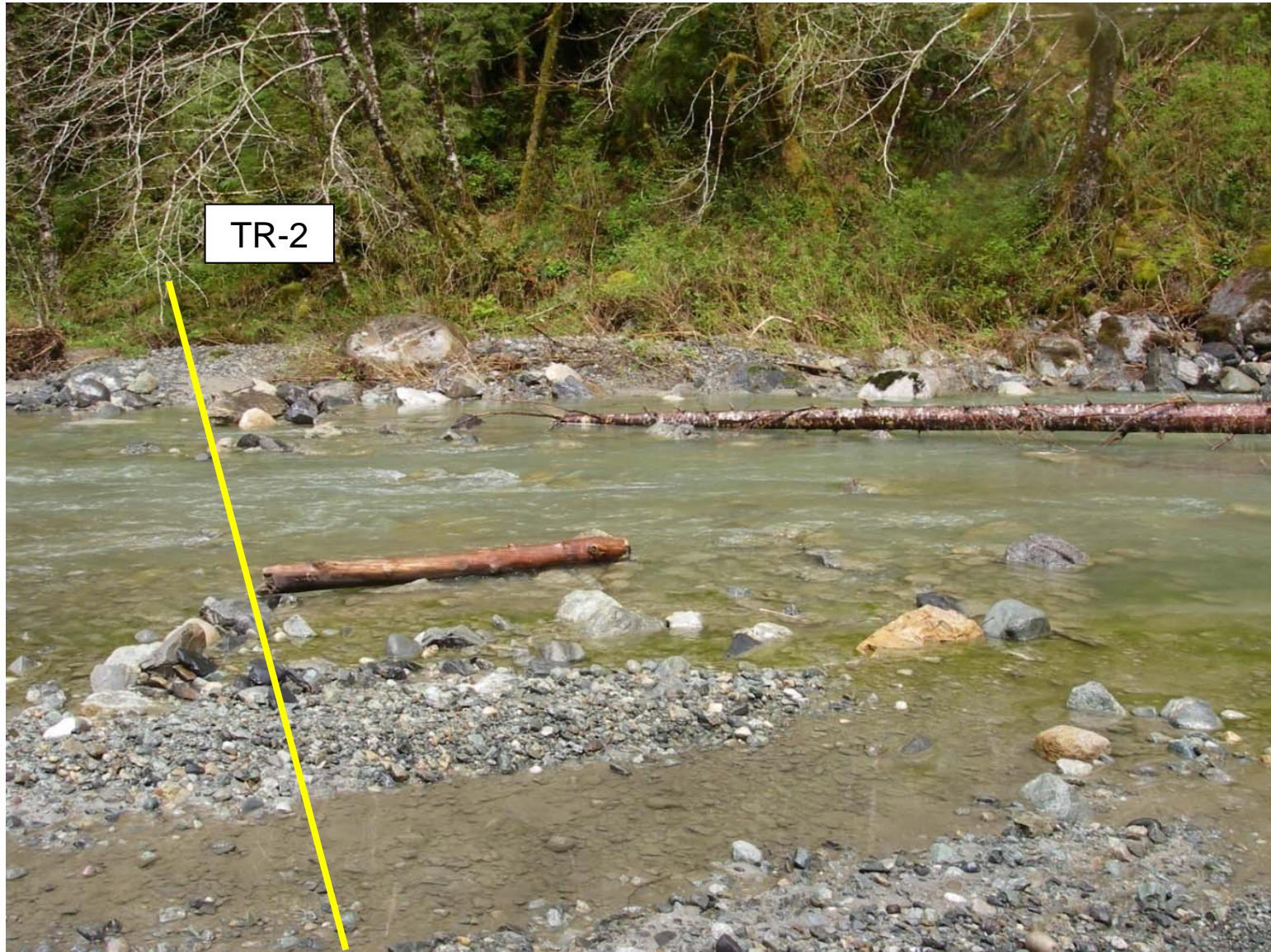
Reach 3 (UPPER): TR-3 (Transect # Revised)



Habitat Type: RIFFLE

Revised Habitat Type: LOW GRADIENT RIFFLE

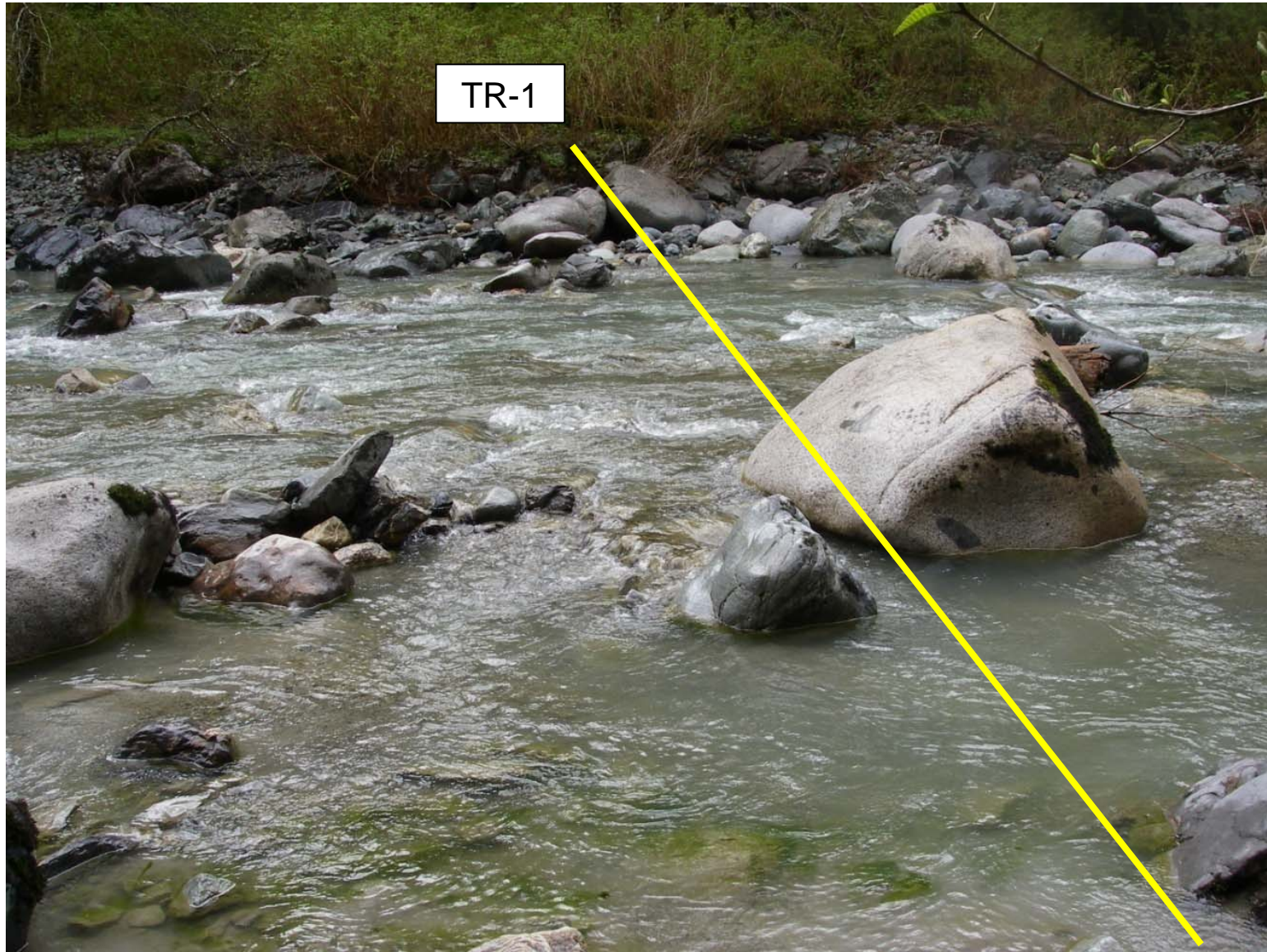
Reach 3 (UPPER): TR-2 (Transect # Revised)



Habitat Type: RIFFLE

Revised Habitat Type: LOW GRADIENT RIFFLE

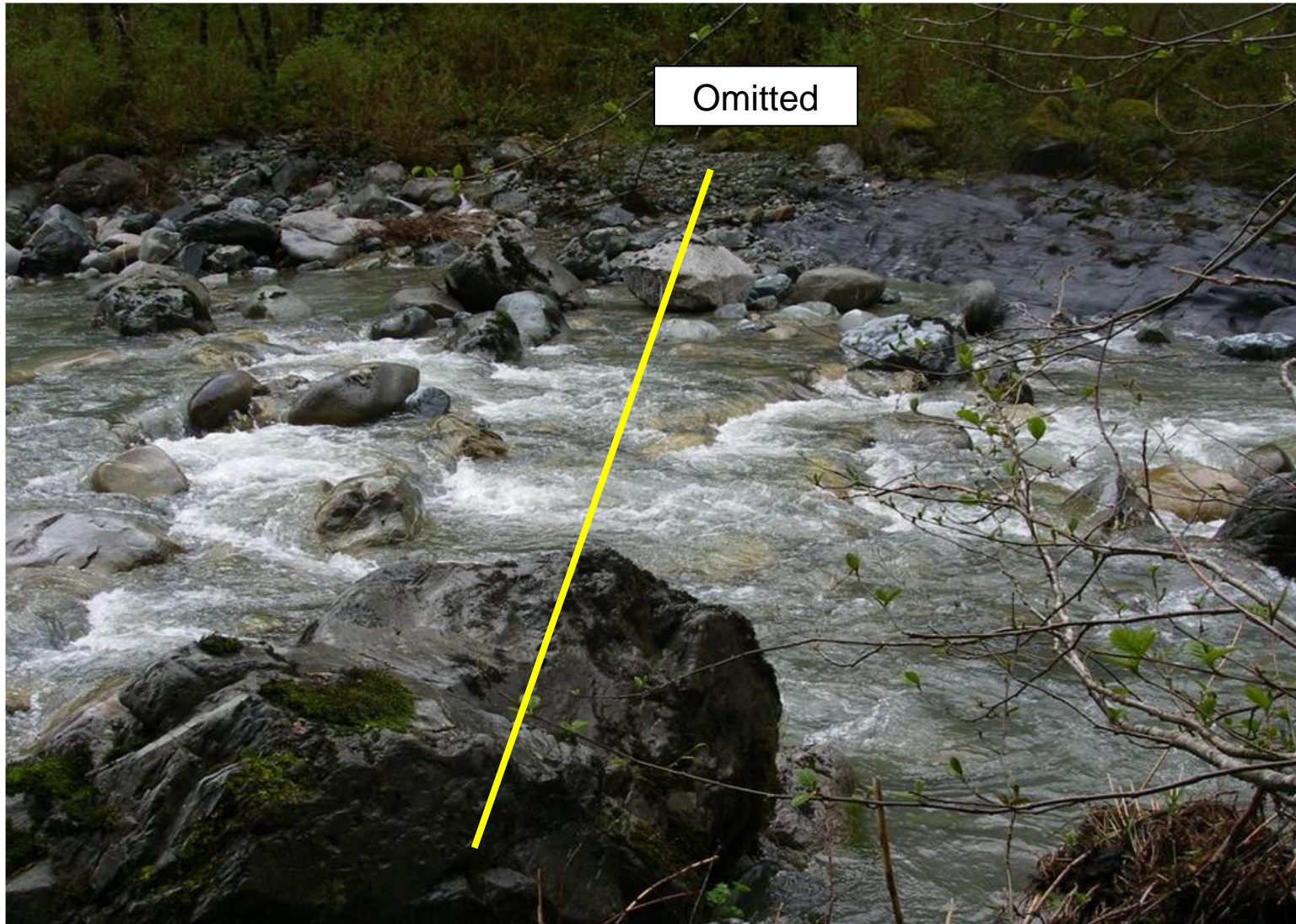
Reach 3 (UPPER): TR-1 (Transect # Revised)



Habitat Type: CASCADE

Revised Habitat Type: RAPID

Reach 3 (UPPER): Transect Omitted (Initially TR-1)



Habitat Type: CASCADE

Revised Habitat Type: TRANSECT OMITTED

Reach 3 (UPPER): Slide Location



Slide from 2006 flood. Transects positioned immediately upstream and downstream of this location.



Reach 3 (Lower): Revised Transects

Transect Number	Habitat Type	Revised Habitat Type	Location (U/S to D/S)
TR-7	Pool/Riffle	Glide	u/s of Diversion Dam
TR-6	Riffle	Low Gradient Riffle	"
TR-5	Pool	Pool	"
TR-4	Glide	Glide	"
TR-3	Riffle	Rapid	"
TR-2	Riffle	Low Gradient Riffle	"
TR-1	Riffle	Glide	"

Reach 3 (LOWER): TR-7 & TR-6



Habitat Type: POOL/RIFFLE (TR-7) & RIFFLE (TR-6)

Revised Habitat Type: GLIDE (TR-7) & LOW GRADIENT RIFFLE (TR-6)

Reach 3 (LOWER): TR-5



Habitat Type: POOL

Revised Habitat Type: POOL

Reach 3 (LOWER): TR-4



Habitat Type: GLIDE

Revised Habitat Type: GLIDE

Reach 3 (LOWER): TR-3



Habitat Type: RIFFLE

Revised Habitat Type: RAPID

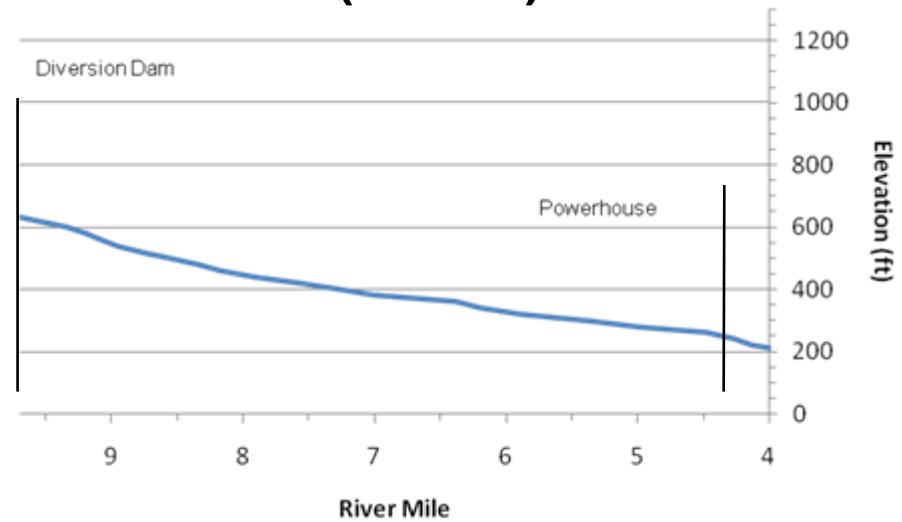
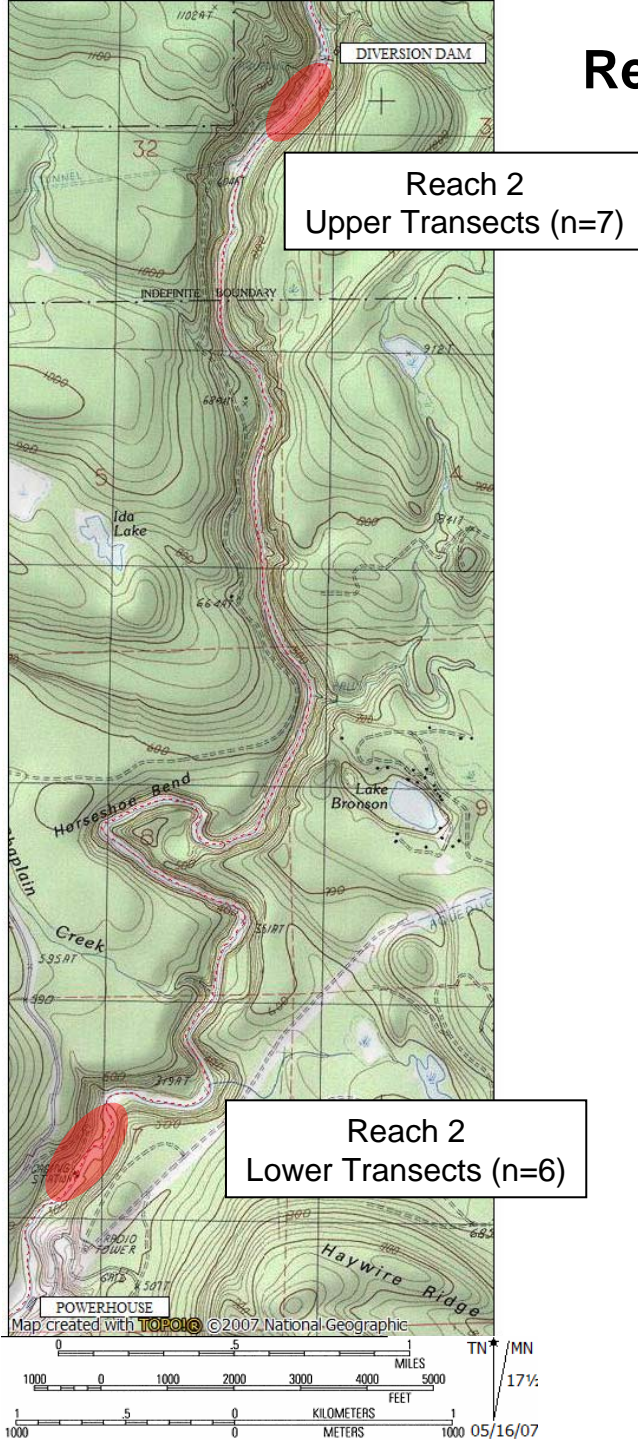
Reach 3 (LOWER): TR-2 & TR-1



Habitat Type: RIFFLE (TR-2) & RIFFLE (TR-1)

Revised Habitat Type: LOW GRADIENT RIFFLE (TR-2) & GLIDE (TR-1)

Reach 2: Powerhouse (RM 4.3) Diversion Dam (RM 9.7)



Habitat Type	Percent Composition	Preliminary Transects
Cascade	18	2
Riffle	26	6
Pool	30	5
Run	26	0
Total	100	13

Substrate Size	Percent Composition
Gravel (1-3" dia.)	2.3
Cobble (3-6" dia.)	3.7
Large Cobble (6-12" dia.)	15.0
Boulder (>12" dia.)	43.3
Bedrock	33.7

1"=500' 153.51 S.R. 4-9

Reach 2 (Upper): Revised Transects

Transect Number	Habitat Type	Revised Habitat Type	Location (U/S to D/S)
TR-7	Riffle	Low Gradient Riffle	u/s of USGS trolley line
TR-6	Riffle	Low Gradient Riffle	d/s of USGS trolley line
TR-5	Cascade	Rapid	
TR-4	Riffle	Low Gradient Riffle	
TR-3	Riffle	Low Gradient Riffle	Gauging station stairs
TR-2	Pool	Glide	
TR-1	Pool/Cascade	Pool	Transition



Reach 2 (UPPER): TR-7 & TR-6



Habitat Type: RIFFLE (TR-7) & RIFFLE (TR-6)

Revised Habitat Type: LOW GRADIENT RIFFLE (TR-7) & LOW GRADIENT RIFFLE (TR-6)

Reach 2 (UPPER): TR-5



Habitat Type: CASCADE

Revised Habitat Type: RAPID

Reach 2 (UPPER): TR-4 & TR-3



Habitat Type: RIFFLE (TR-4) AND RIFFLE (TR-3)

Revised Habitat Type: LOW GRADIENT RIFFLE (TR-4) & LOW GRADIENT RIFFLE (TR-3)

Reach 2 (UPPER): TR-2 & TR-1



Habitat Type: POOL (TR-2) & POOL/CASCADE (TR-1)

Revised Habitat Type: GLIDE (TR-2) & POOL (TR-1)



Reach 2 (Lower): Revised Transects

Transect Number	Habitat Type	Revised Habitat Type	Location (U/S to D/S)
TR-6	Pool Tailout	Pool	u/s of Powerhouse
TR-5	Cascade/Riffle	Low Gradient Riffle	"
TR-4	Pool	Pool	"
TR-3	Pool Tailout	Glide	"
TR-2	Riffle	Rapid	"
TR-1	Riffle	Glide	"

Reach 2 (LOWER): TR-6



Habitat Type: POOL TAILOUT

Revised Habitat Type: POOL

Reach 2 (LOWER): TR-5



Habitat Type: CASCADE/RIFFLE

Revised Habitat Type: LOW GRADIENT RIFFLE

Reach 2 (LOWER): TR-4 & TR-3



Habitat Type: POOL (TR-4) & POOL TAILOUT (TR-3)

Revised Habitat Type: POOL (TR-4) & GLIDE (TR-3)

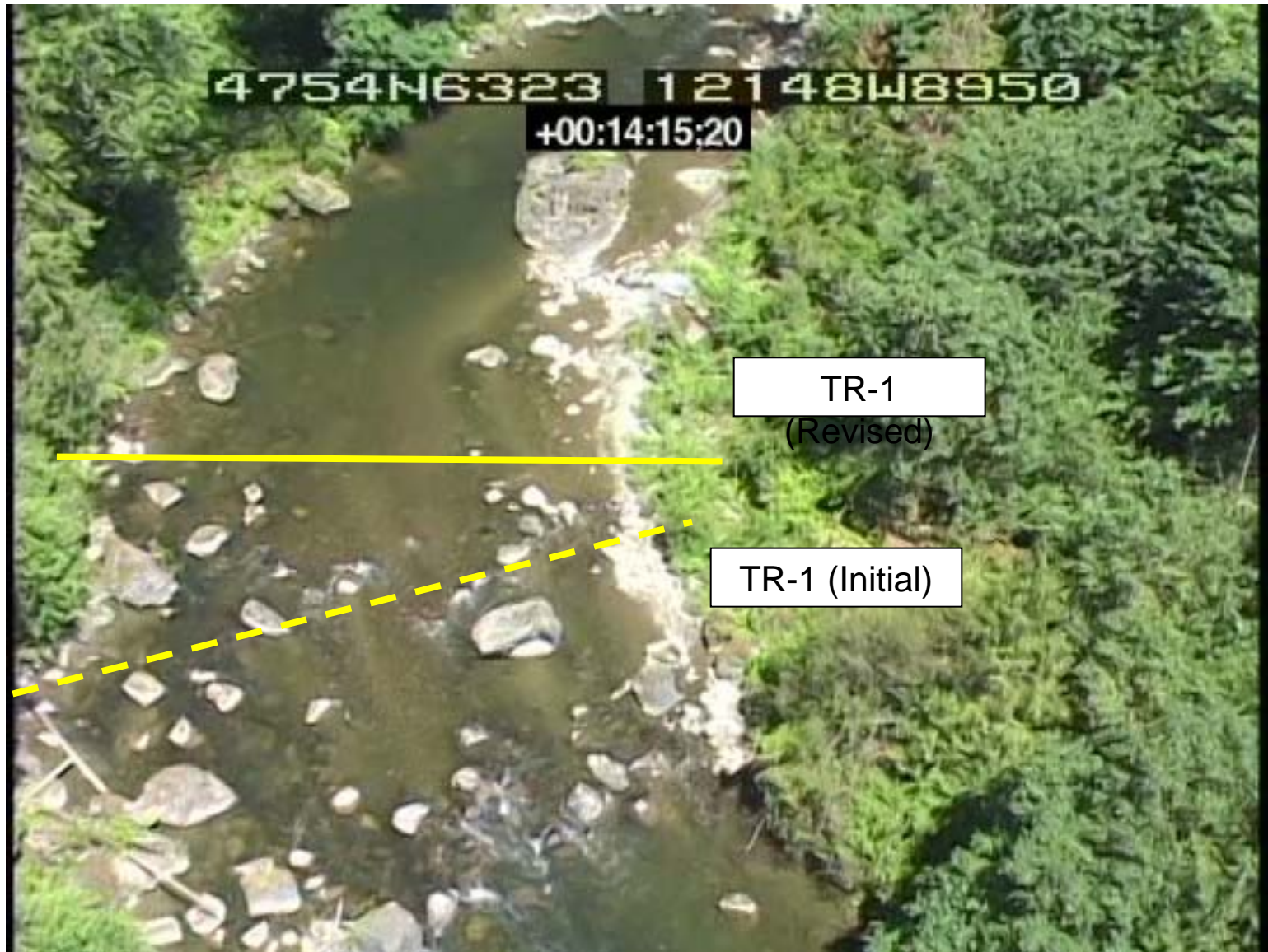
Reach 2 (LOWER): TR-2



Habitat Type: RIFFLE

Revised Habitat Type: RAPID

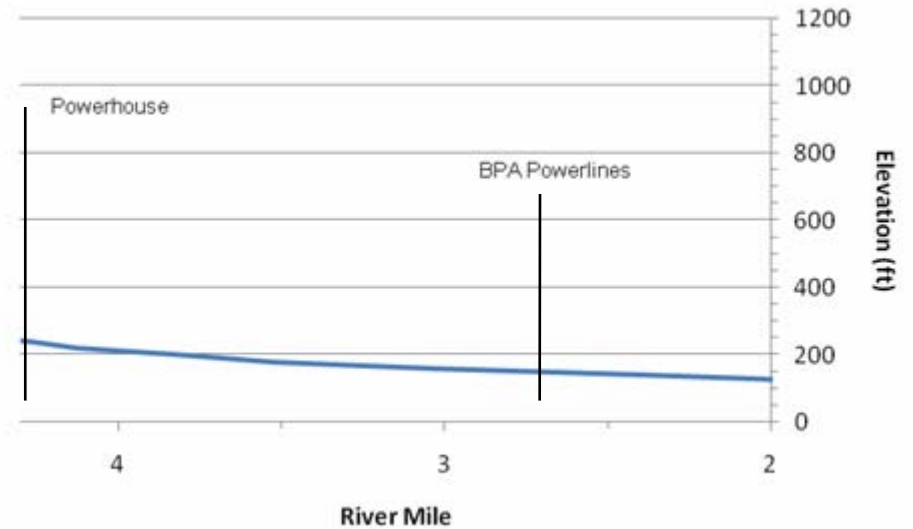
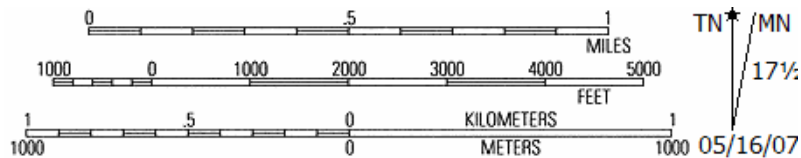
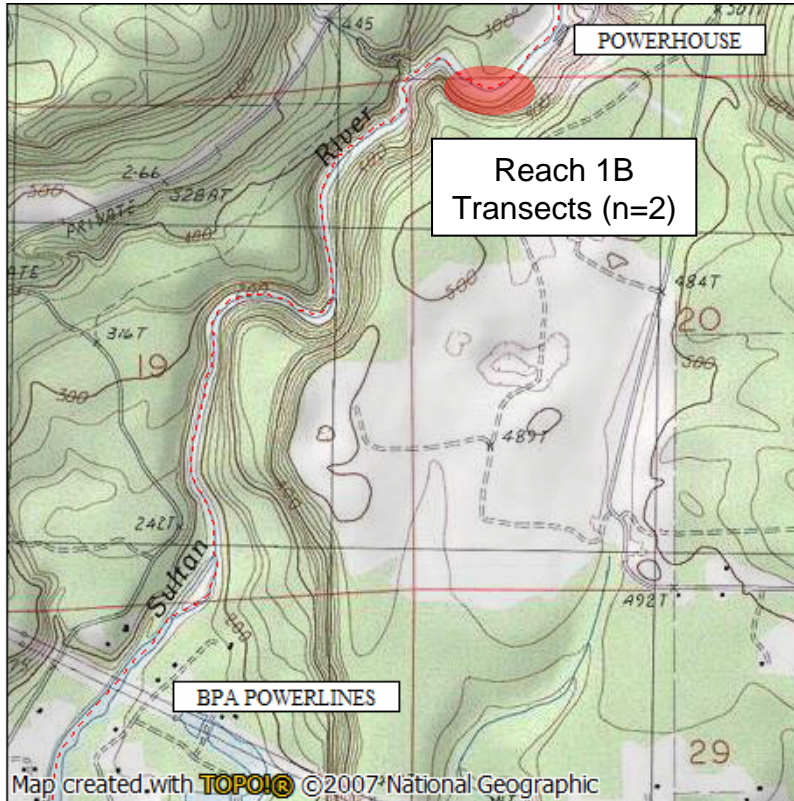
Reach 2 (LOWER): TR-1



Habitat Type: RIFFLE

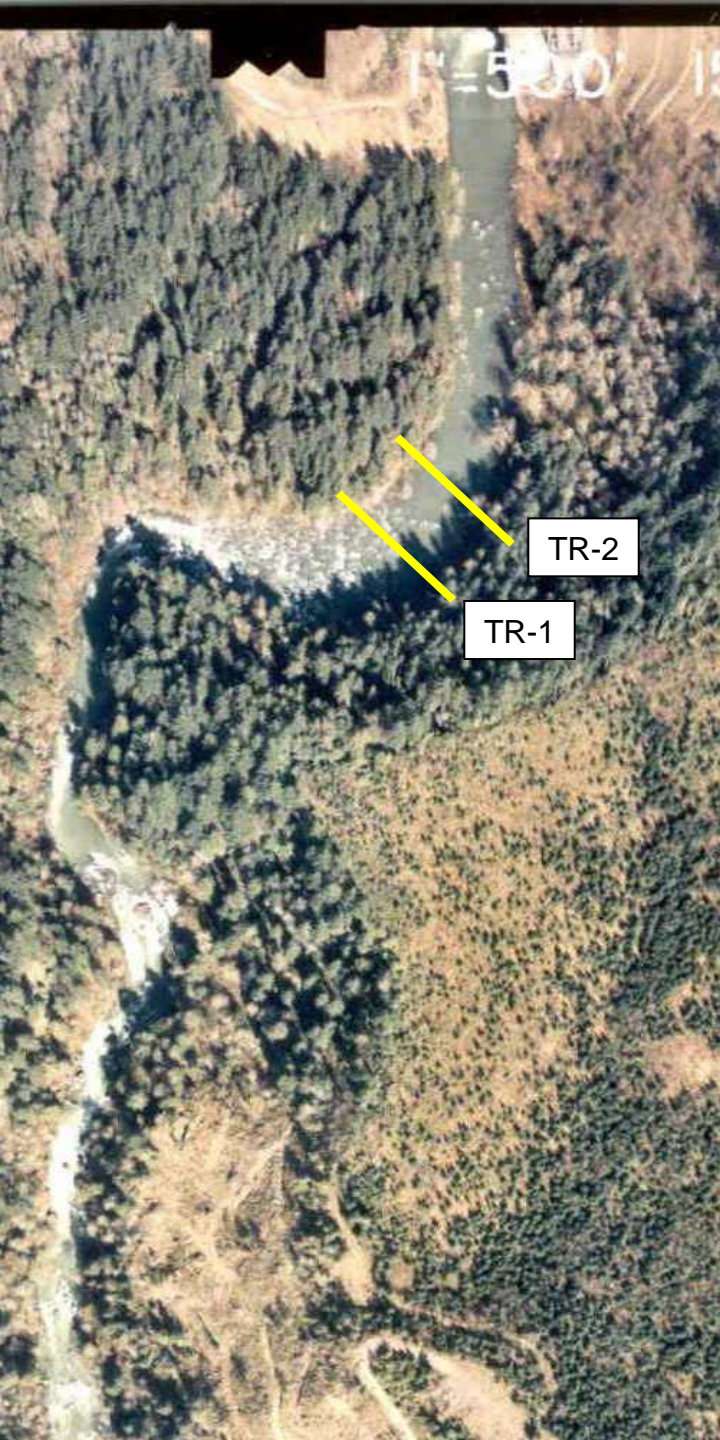
Revised Habitat Type: GLIDE

Reach 1B: BPA Powerlines (RM 2.7) to Powerhouse (RM 4.3)



Habitat Type	Percent Composition	Preliminary Transects
Cascade	19	0
Riffle	17	1
Pool	24	0
Run	40	1
Total	100	0

Substrate	Percent Composition
Gravel (1-3" dia.)	0.0
Cobble (3-6" dia.)	3.1
Large Cobble (6-12" dia.)	15.0
Boulder (>12" dia.)	62.7
Bedrock	19.0



Reach 1B: Revised Transects

(Relocated from Reach 1A at the request of resource agencies)

Transect Number	Habitat Type	Revised Habitat Type	Location (U/S to D/S)
TR-2	Run	Glide	d/s of Powerhouse
TR-1	Riffle	Low Gradient Riffle	"

Reach 1B: TR-2



Habitat Type: RUN

Revised Habitat Type: GLIDE

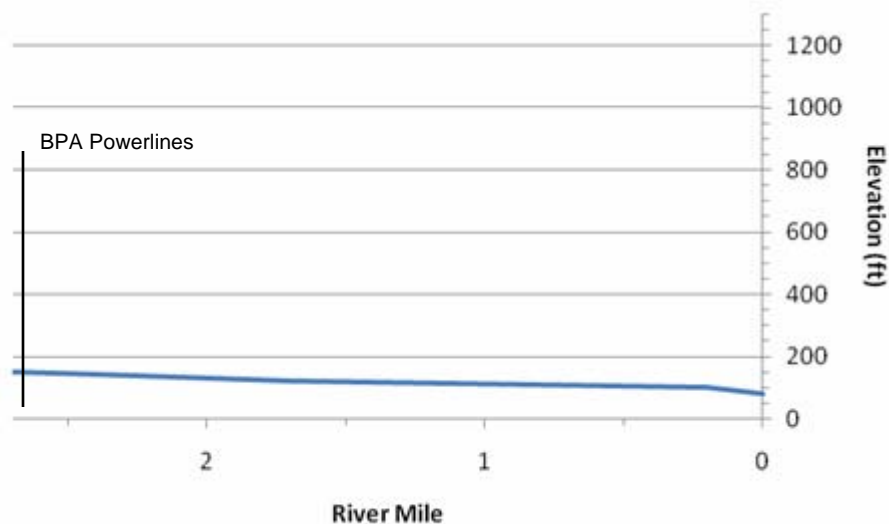
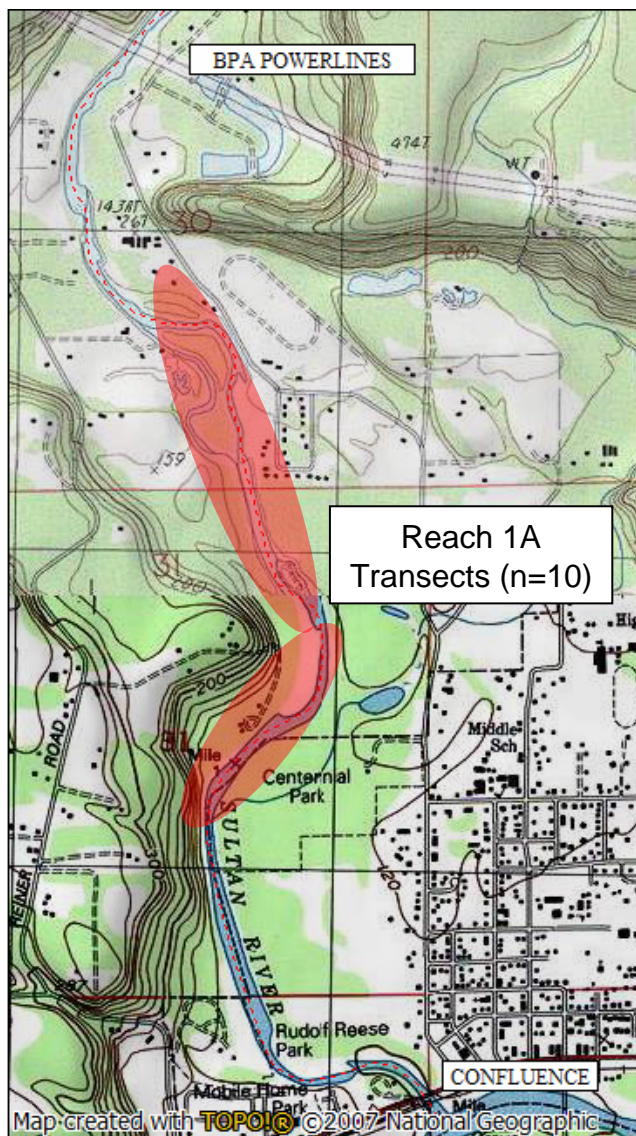
Reach 1B: TR-1



Habitat Type: RIFFLE

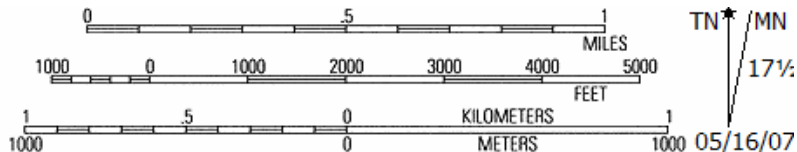
Revised Habitat Type: LOW GRADIENT RIFFLE

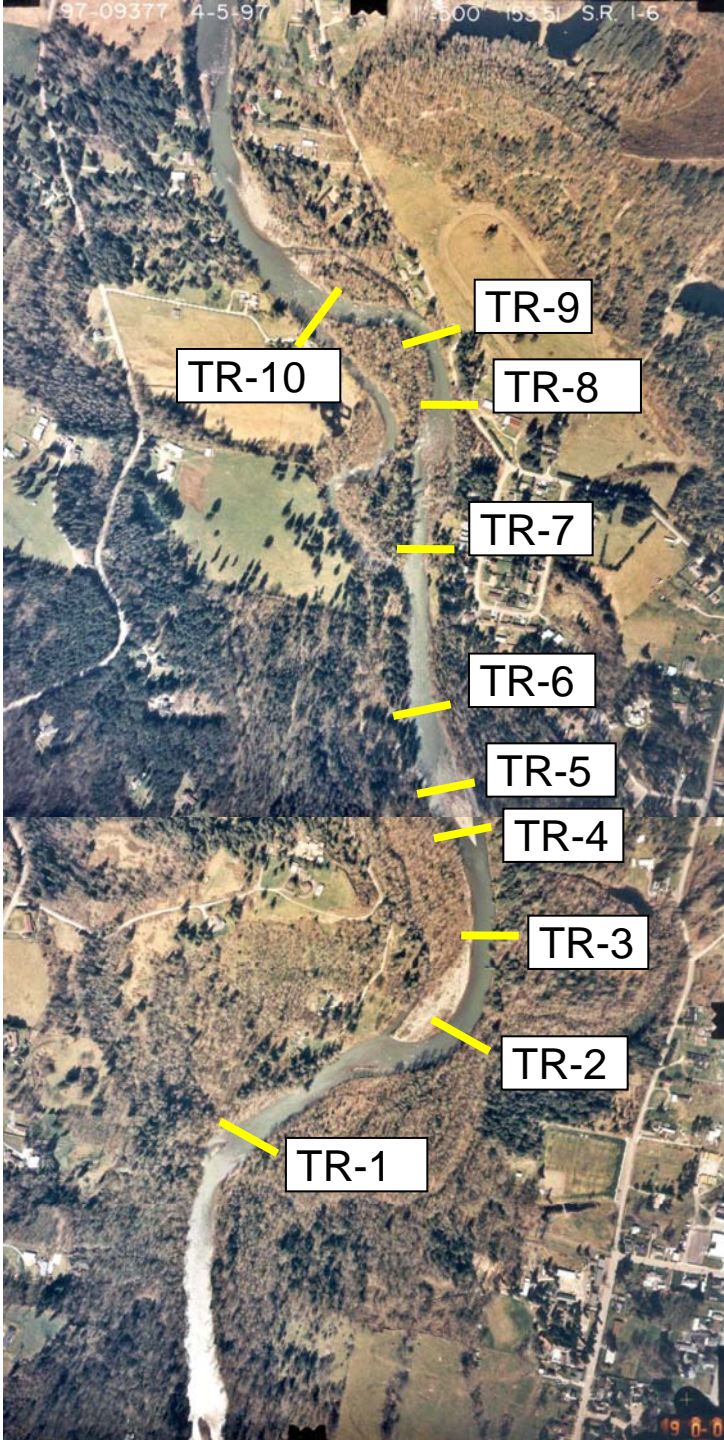
Reach 1A: Confluence (RM 0.0) to BPA Powerlines (RM 2.7)



Habitat Type	Percent Composition	Preliminary Transects
Cascade	0	0
Riffle	41	7
Pool	7	2
Run	52	3
Total	100	12

Substrate	Percent Composition
Gravel (1-3" dia.)	28.6
Cobble (3-6" dia.)	50.0
Large Cobble (6-12" dia.)	14.3
Boulder (>12" dia.)	7.1
Bedrock	0.0





Reach 1A: Revised Transects

Revised Transect Number	Habitat Type	Revised Habitat Type	Location (U/S to D/S)
TR-10	Riffle	Rapid	Head of Mike's Island
TR-9	Pool	Pool	
TR-8	Pool Tailout/Riffle	Glide	
TR-7	Riffle	Low Gradient Riffle	
TR-6	Run/Pool	Glide	u/s of Keenes Island
TR-5	Riffle	Low Gradient Riffle	Top of Rose Bar
TR-4	Riffle	Low Gradient Riffle	Bisects Rose Bar
TR-3	Run/Pool	Glide	
TR-2	Riffle	Low Gradient Riffle	Right side of Osprey Island
TR-1	Glide/Run	Glide	

Reach 1A: TR-10 (Transect # Revised) & Head of SC-3



Habitat Type: RIFFLE

Revised Habitat Type: RAPID

Reach 1A: Transect Omitted (Initially TR-11)



Habitat Type: RIFFLE

Revised Habitat Type: TRANSECT OMITTED – RELOCATED TO REACH 1B AT RESOURCE AGENCY REQUEST

Reach 1A: TR-9 (Transect # Revised)



Habitat Type: POOL

Revised Habitat Type: POOL

Reach 1A: TR-8 (Transect # Revised)



Habitat Type: POOL TAILOUT/RIFFLE

Revised Habitat Type: GLIDE

Reach 1A: TR-7 (Transect # Revised)



Habitat Type: RIFFLE

Revised Habitat Type: LOW GRADIENT RIFFLE

Reach 1A: TR-6 (Transect # Revised)



Habitat Type: RUN/POOL

Revised Habitat Type: GLIDE

Reach 1A: TR-5 (Transect # Revised) & Head of SC-2



Habitat Type: RIFFLE (TR-6) & HEAD OF SIDE CHANNEL (SC-2)

Revised Habitat Type: LOW GRADIENT RIFFLE

Reach 1A: TR-4 (Transect # Revised)



Habitat Type: RIFFLE

Revised Habitat Type: LOW GRADIENT RIFFLE

Reach 1A: TR-3 (Transect # Revised)



Habitat Type: RUN/POOL

Revised Habitat Type: GLIDE

Reach 1A: TR-2 (Transect # Revised) & Head of SC-1



Habitat Type: RIFFLE (TR-3) & HEAD OF SIDE CHANNEL (SC-1)

Revised Habitat Type: LOW GRADIENT RIFFLE

Reach 1A: TR-1 (Transect # Revised)



Habitat Type: GLIDE/RUN

Revised Habitat Type: GLIDE

Reach 1A: Transect Omitted (Initially TR-1)



Habitat Type: RIFFLE

Revised Habitat Type: TRANSECT OMITTED – RELOCATED TO REACH 1B AT RESOURCE AGENCY REQUEST