

Lake Creek IFIM

Appendix D

Study Site and Transect Weighting For Packwood Hydroelectric Project

**PROPOSED STUDY SITE AND TRANSECT WEIGHTING
FOR**

PACKWOOD LAKE HYDROELECTRIC PROJECT

FERC NO. 2244

Presented to:

Dr. Hal Beecher
Washington Department of Fish and Wildlife
Olympia, WA

Prepared by:

EES Consulting, Inc.
Bellingham, WA

Prepared for:

Energy Northwest
Richland, WA

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Table 1. Study Site 1 Transects	
Reach: RM 0.0 - 0.7	
Transect	Transect Description
1	Glide
2	Run
3	Low Gradient Cascade/Run
4	Plungel Pool Tailout
5	Plunge Pool
6	Run
7	Plunge Pool Tailout
8	Low Gradient Cascade/Plunge Pool
9	Plunge Pool

Table 2. Study Site 1 Habitat Frequencies			
Code	Habitat Type	Frequency	%
1	Pool	0	0.0%
2	Lateral Pool	0	12.0%
3	Plunge Pool	3	16.0%
4	Glide	4	0.0%
5	Riffle	0	40.0%
6	Run	10	0.0%
7	Boulder Cascade	0	4.0%
8	Chute	1	0.0%
9	Rapid	0	24.0%
10	Cascade	6	0.0%
11	Braided Channel	0	0.0%
12	Split Channel	0	0.0%
13	Side Channel (1)	0	4.0%
14	Plunge Pool Tailout	1	0.0%
15	Falls	0	0.0%
	Total	25	1

Table 3. Those habitat types represented by transects at Study Site 1.

Code	Habitat Type	Frequency	%
3	Plunge Pool	3	12.50%
4	Glide	4	16.67%
6	Run	10	41.67%
10	Cascade	6	25.00%
14	Plunge Pool Tailout	1	4.17%
Total		24	1

Table 4. Final Transect Weighting for Study Site 1.

Transect	Transect Description	Frequency	Percentage
1	Glide	4	16.67%
2	Run	4	16.67%
3	Low Gradient Cascade/Run	5	20.83%
4	Plungel Pool Tailout	0.5	2.08%
5	Plunge Pool	1.2	5.00%
6	Run	4	16.67%
7	Plunge Pool Tailout	0.5	2.08%
8	Low Gradient Cascade/Plunge Pool	3.6	15.00%
9	Plunge Pool	1.2	5.00%
	Total	24	

Transect	Transect Description
1	Wide Run
2	Pool Tailout/Glide
3	Plunge Pool
4	Plunge Pool Tailout
5	Plunge Pool/Cascade
6	Run
7	Plunge Pool
8	Chute

Code	Habitat Type	Frequency	%
1	Pool	2	9.5%
2	Lateral Pool	0	19.0%
3	Plunge Pool	4	9.5%
4	Glide	2	0.0%
5	Riffle	0	28.6%
6	Run	6	0.0%
7	Boulder Cascade	0	9.5%
8	Chute	2	0.0%
9	Rapid	0	23.8%
10	Cascade	5	0.0%
11	Braided Channel	0	0.0%
12	Split Channel	0	0.0%
13	Side Channel (1)	0	0.0%
14	Plunge Pool Tailout	0	0.0%
15	Falls	0	0.0%
	Total	21	1

Table 7. Study Site Habitat Frequencies Reach 3 (RM 1.3 - 3.5)			
Code	Habitat Type	Frequency	%
1	Pool	3	3.9%
2	Lateral Pool	1	1.3%
3	Plunge Pool	12	15.8%
4	Glide	10	13.2%
5	Riffle	0	0.0%
6	Run	8	10.5%
7	Boulder Cascade	0	0.0%
8	Chute	8	10.5%
9	Rapid	0	0.0%
10	Cascade	26	34.2%
11	Braided Channel	0	0.0%
12	Split Channel	0	0.0%
13	Side Channel (1)	0	0.0%
14	Plunge Pool Tailout	5	6.6%
15	Falls	3	3.9%
	Total	76	1

Table 8. Study Site 2 Reaches 2 - 3 (RM 0.7 - 3.5) Combined.			
Code	Habitat Type	Frequency	%
1	Pool	5	5.2%
2	Lateral Pool	1	1.0%
3	Plunge Pool	16	16.5%
4	Glide	12	12.4%
5	Riffle	0	0.0%
6	Run	14	14.4%
7	Boulder Cascade	0	0.0%
8	Chute	10	10.3%
9	Rapid	0	0.0%
10	Cascade	31	32.0%
11	Braided Channel	0	0.0%
12	Split Channel	0	0.0%
13	Side Channel (1)	0	0.0%
	Plunge Pool		
14	Tailout	5	5.2%
15	Falls	3	3.1%
	Total	97	1

Table 9. Habitat Types Represented by Transects in Study Site 2.			
Code	Habitat Type	Frequency	%
1	Pool	5	5.3%
2	Lateral Pool	1	1.1%
3	Plunge Pool	16	17.0%
4	Glide	12	12.8%
6	Run	14	14.9%
8	Chute	10	10.6%
10	Cascade	31	33.0%
14	Plunge Pool Tailout	5	5.3%
		94	1

Table 10. Final Transect Weighting, Study Site 2.			
Transect	Transect Description	Frequency	%
1	Wide Run	10.00	10.64%
2	Pool Tailout/Glide	13.67	14.54%
3	Plunge Pool	8.80	9.36%
4	Plunge Pool Tailout	3.33	3.55%
5	Plunge Pool/Cascade	20.40	21.70%
6	Run	19.00	20.21%
7	Plunge Pool	8.80	9.36%
8	Chute	10.00	10.64%
		94	

Table 11. Study Site 3 Transects (RM 3.5 – 4.9)

Transect	Transect Description
1	Head of Pool
2	Pool
3	Pool Tailout
4	Narrow Run (Boulder w/perched gravel)
5	Narrow Cascade/Plunge Pool (boulder w/perched gravel)
6	Glide narrow/chute (cobble/boulder)

Table 12. Study Site3 Habitat Frequencies

Code	Habitat Type	Frequency	%
1	Pool	3	6.8%
2	Lateral Pool	0	0.0%
3	Plunge Pool	6	13.6%
4	Glide	6	13.6%
5	Riffle	0	0.0%
6	Run	16	36.4%
7	Boulder Cascade	1	2.3%
8	Chute	0	0.0%
9	Rapid	0	0.0%
10	Cascade	11	25.0%
11	Braided Channel	0	0.0%
12	Split Channel	0	0.0%
13	Side Channel (1)	0	0.0%
14	Plunge Pool Tailout	1	2.3%
15	Falls	0	0.0%
	Total	44	1

Table 13. Habitat represented by transects in, Study Site 3.

Code	Habitat Type	Frequency	%
1	Pool	3	6.8%
3	Plunge Pool	6	13.6%
4	Glide	6	13.6%
6	Run	16	36.4%
7	Boulder Cascade	1	2.3%
10	Cascade	11	25.0%
14	Plunge Pool Tailout	1	2.3%
	Total	44	1

Table 14. Final Transect Weighting, Study Site 3.

Transect	Transect Description	Freq	%
1	Head of Pool	3.6	8.2%
2	Pool	3.6	8.2%
3	Pool Tailout	1	2.3%
4	Narrow Run (Boulder w/perched gravel)	16	36.4%
5	Narrow Cascade/Plunge Pool (boulder w/perched gravel)	13.8	31.4%
6	Glide narrow/chute (cobble/boulder)	6	13.6%
		44	1

Table 15. Study Site 4 Transects RM 4.9 - 5.4

Transect	Transect Description
1	Wide Run
2	Plunge Pool
3	Narrow Run (boulder and cobble)
4	Pool (bedrock on sides; cobble/boulder on margins)
5	Split Channel Glide ((boulder/cobble)
6	Run (below plunge pool)
7	Split Channel w/lateral pool
8	Wide Glide
9	Pool Tailout
10	Wide Pool
11	Riffle (gravel and cobble)

Table 16. Study Site 4 Habitat Frequencies

Code	Habitat Type	Frequency	%
1	Pool	1	6.3%
2	Lateral Pool	0	0.0%
3	Plunge Pool	3	18.8%
4	Glide	6	37.5%
5	Riffle	0	0.0%
6	Run	2	12.5%
7	Boulder Cascade	0	0.0%
8	Chute	0	0.0%
9	Rapid	0	0.0%
10	Cascade	2	12.5%
11	Braided Channel	0	0.0%
12	Split Channel	0	0.0%
13	Side Channel (1)	0	0.0%
14	Plunge Pool Tailout	2	12.5%
15	Falls	0	0.0%
	Total	16	1

Table 17. Habitat Types Represented by Transects, Study Site 4 (Reach 5).

Code	Habitat Type	Frequency	%
1	Pool	1	6.3%
3	Plunge Pool	3	18.8%
4	Glide	6	37.5%
6	Run	2	12.5%
10	Cascade	2	12.5%
14	Plunge Pool Tailout	2	12.5%
	Total	16	1

Table 18. Final Transect Weighting, Study Site 4.

Transect	Transect Description	Freq	%age
1	Wide Run	1.33	8.33%
2	Plunge Pool	1.33	8.33%
3	Narrow Run (boulder and cobble) Pool (bedrock on sides; cobble/boulder on margins)	1.33	8.33%
4	Split Channel Glide ((boulder/cobble)	1.33	8.33%
5	Run (below plunge pool)	1.33	8.33%
6	Split Channel w/lateral pool	2.00	12.50%
7	Wide Glide	1.33	8.33%
8	Pool Tailout	2.00	12.50%
9	Wide Pool	1.33	8.33%
10	Riffle (gravel and cobble)	1.33	8.33%
11		16.00	1.00

Study Site	Begin	End	Total	Percentage
1	0.0	0.7	0.7	13.0%
2	0.7	3.5	2.8	51.9%
3	3.5	4.9	1.4	25.9%
4	4.9	5.4	0.5	9.3%
Total			5.4	1

Study Site	Transect	Transect Description	Frequency	Study Site Percentage	Total Weighted Percentage
1	1	Glide	4.00	16.67%	2.16%
	2	Run	4.00	16.67%	2.16%
	3	Low Gradient Cascade/Run	5.00	20.83%	2.70%
	4	Plungel Pool Tailout	0.50	2.08%	0.27%
	5	Plunge Pool	1.20	5.00%	0.65%
	6	Run	4.00	16.67%	2.16%
	7	Plunge Pool Tailout	0.50	2.08%	0.27%
	8	Low Gradient Cascade/Plunge Pool	3.60	15.00%	1.94%
	9	Plunge Pool	1.20	5.00%	0.65%
2	1	Wide Run	10.00	10.64%	5.52%
	2	Pool Tailout/Glide	13.67	14.54%	7.54%
	3	Plunge Pool	8.80	9.36%	4.85%
	4	Plunge Pool Tailout	3.33	3.55%	1.84%
	5	Plunge Pool/Cascade	20.40	21.70%	11.25%
	6	Run	19.00	20.21%	10.48%
	7	Plunge Pool	8.80	9.36%	4.85%
	8	Chute	10.00	10.64%	5.52%
3	1	Head of Pool	3.60	8.18%	2.12%
	2	Pool	3.60	8.18%	2.12%
	3	Pool Tailout	1.00	2.27%	0.59%
	4	Narrow Run (Boulder w/perched gravel)	16.00	36.36%	9.43%
	5	Narrow Cascade/Plunge Pool (boulder w/perched gravel)	13.80	31.36%	8.13%
	6	Glide narrow/chute (cobble/boulder)	6.00	13.64%	3.54%
4	1	Wide Run	1.33	8.33%	0.77%
	2	Plunge Pool	1.33	8.33%	0.77%
	3	Narrow Run (boulder and cobble)	1.33	8.33%	0.77%
	4	Pool (bedrock on sides; cobble/boulder on margins)	1.33	8.33%	0.77%
	5	Split Channel Glide ((boulder/cobble)	1.33	8.33%	0.77%
	6	Run (below plunge pool)	1.33	8.33%	0.77%
	7	Split Channel w/lateral pool	2.00	12.50%	1.16%
	8	Wide Glide	1.33	8.33%	0.77%
	9	Pool Tailout	2.00	12.50%	1.16%
	10	Wide Pool	1.33	8.33%	0.77%
	11	Riffle (gravel and cobble)	1.33	8.33%	0.77%