Pyramid Reach Benthic Macroinvertebrates Study
Water Chemistry and Physical Habitat Data

Table 1. BMI Site Locations.

Site Location	Upstream Coordinates	Downstream Coordinates	Site description
Site 1 (DS of Pyramid Dam)	34.63537, -118.75689	34.63489, -118.75497	Site begins at river mile 0.94 and extends 150m upstream
Site 2 (DS of Frenchman's Flat)	34.61117, -118.7492	34.61032, -118.75035	Site begins at river mile 3.3 and extends 150m upstream
Site 3 (US of Blue Point Campground)	34.54669, -118.77316	34.54669, -118.7716	Site begins at river mile 16.01 and extends 150m upstream

Key: DS = downstream US = upstream m= meters

Table 2. Water quality and habitat characteristics. Collected from SSWP's 2018 Study on Piru Creek.

Category	Metric	Site 1 (DS of Pyramid Dam)	Site 2 (DS of Frenchman's Flat)	Site 3 (US of Blue Point Campground)
Water Quality	Water Temperature (°C)	21.23	24.72	22.15
	Dissolved Oxygen (mg/L)	9.35	7.97	7.44
	Specific Conductivity (µs/cm)	555	867	1056
	pH	7.97	7.94	7.99
	Reach Length (m)	150	150	150
	Flow (cfs)	2.6	1.3	0.3
Site Characteristics	**Habitat Composition (% of Site)**			
	Cascade/Falls	6	2	0
	Rapid	0	0	0
	Riffle	14	35	0
	Run	22	24	10
	Glide	0	5	48
	Pool	58	36	43
	Dry	0	0	0
	Dominant Thalweg Composition (% of Site)			
	Bedrock, Smooth	1	0	0
	Bedrock, Rough	0	3	0
	Boulder, Large	16	7	0
	Boulder, Small	30	16	1
	Cobble	15	5	2
	Gravel, Course	6	10	22

	Gravel, Fine	3	6	48
	Sand	5	11	13
	Fines	24	39	14
	Wood	1	2	0
	Other	0	2	0
Transect Characteristics	**Averaged Channel Conditions**			
	Average Sample Plot Depth (cm)	20.3	14.6	9.9
	Average Wetted Width (m)	6.3	2.8	3.7
	Average Bankful Width (m)	10.3	7.4	9.3
	Average Bankful Height (m)	0.6	0.7	0.4
	Riparian Canopy Cover (%)	79	88	63

Key: µS = microsiemens cm = centimeters °C = Celsius cfs = cubic feet per second
% = percent m = meter mg/l = milligrams/liter µm -= micrometers

Table 3. Water Quality Data. Collected from SSWP's 2018 Study on Piru Creek.

Site	Location	Time	Water Temperature (°C)	pH	Specific Conductivity (µS/cm)	Salinity (ppt)	Turbidity (NTU)	LDO (sat)	LDO (mg/L)
Site 1	Upstream	13:01	21.23	7.97	555	--	0	--	9.35
Site 1	Downstream	19:37	23.18	7.83	725	0.37	2.1	96.5	6.83
Site 2	Upstream	14:52	24.72	7.43	845	0.44	0	86.1	5.91
Site 2	Downstream	9:26	19.00	7.95	867	0.45	0.6	103.7	7.97
Site 3	Upstream	10:17	22.15	8.02	1030	0.54	0	124.7	9
Site 3	Downstream	8:27	20.34	7.99	1056	0.55	2.8	99.5	7.43

Key: °C = Celsius µS/cm= microsiemens per centimeter ppt = part per thousand NTU = Nephelometric turbidity unit
LDO = Luminescent dissolved oxygen sat= saturation mg/L = milligrams per liter

Site 1 Habitat Data

Table 4.Site 1 Microalgae and habitat complexity

Transect	General	
	Microalgae thickness (average per transect)	**Instream habitat complexity (total)**
AA	2	7

AB	2.33	--
BB	0.5	11
BC	2	--
CC	2	11
CD	2.2	--
DD	1.8	11
DE	2	--
EE	2	9
EF	1.8	--
FF	2.25	11
FG	1.8	--
GG	1.8	9
GH	2.6	--
HH	3	13
HI	2.4	--
II	3.25	9
IJ	2.25	--
JJ	3.33	11
JK	2.2	--
KK	3	10
AVERAGE	**2.2**	**10.2**

Microalgae Key:
0: No microalgae present
1 = Present, but not visible
2 = Present and visible but <1mm
3 = 1-5mm
4 = 5-20mm

Table 5. Site 1 Bank Stability

Transect	Bank Stability	
	Bank Stability Left Bank	**Stank Stability Right Bank**
AA	Stable	Stable
BB	Stable	Stable
CC	Stable	Stable
DD	Stable	Stable
EE	Stable	Stable
FF	Stable	Stable
GG	Stable	Stable
HH	Stable	Stable
II	Stable	Stable
JJ	Stable	Stable
KK	Stable	Stable

Table 6. Site 1 Coarse Particulate Organic Matter Presence and Absence

Transect	Coarse Particulate Organic Matter (CPOM)				
	Left Bank	**Left Center**	**Center**	**Right Center**	**Right Bank**
AA	P	P	A	P	P
AB	P	P	P	A	P

BB	P	A	A	A	A
BC	P	A	A	P	P
CC	P	P	A	P	P
CD	P	P	P	P	P
DD	P	P	A	P	P
DE	P	P	A	A	P
EE	P	A	A	P	P
EF	P	A	A	A	A
FF	A	A	A	A	P
FG	P	P	A	A	P
GG	P	P	A	A	P
GH	P	P	A	A	P
HH	P	A	A	P	P
HI	P	P	A	P	P
II	P	A	P	A	A
IJ	P	P	A	A	P
JJ	A	P	A	A	P
JK	P	A	A	A	P
KK	P	A	P	P	P

Key: P= Present A= Absent D=Dry

Table 7. Site 1 Attached Microalgae Presence and Absence

Transect	Microalgae Attached				
	Left Bank	Left Center	Center	Right Center	Right Bank
AA	P	P	P	P	A
AB	A	P	P	A	P
BB	A	A	A	D	A
BC	A	A	A	P	D
CC	A	A	A	A	A
CD	D	A	A	A	P
DD	A	A	P	A	P
DE	P	A	A	A	P
EE	P	A	A	A	A
EF	P	A	A	A	A
FF	A	A	A	A	A
FG	A	A	A	A	A
GG	A	A	A	A	P
GH	A	A	A	A	P
HH	A	A	P	A	A
HI	P	A	A	P	A
II	A	A	P	A	A
IJ	A	A	A	A	P
JJ	A	P	A	A	P
JK	A	A	A	A	A
KK	A	A	A	A	A

Key: P= Present A= Absent D=Dry

Table 8. Site 1 Unattached Microalgae Presence and Absence

Transect	Microalgae Unattached

	Left Bank	Left Center	Center	Right Center	Right Bank
AA	A	A	A	A	A
AB	A	A	A	A	P
BB	A	A	A	D	A
BC	A	A	A	A	D
CC	A	A	A	A	A
CD	D	A	A	A	A
DD	A	A	A	A	A
DE	A	A	A	A	A
EE	A	A	A	A	A
EF	P	A	A	A	A
FF	A	A	A	A	A
FG	A	A	A	A	A
GG	A	A	A	A	A
GH	A	A	A	A	A
HH	A	A	A	A	A
HI	A	A	A	A	A
II	A	A	A	A	A
IJ	A	A	A	A	A
JJ	A	P	A	A	A
JK	A	A	A	A	A
KK	A	A	A	A	A

Key: P= Present A= Absent D=Dry

Table 9. Site 1 Macrophyte Presence and Absence

Transect	Macrophytes				
	Left Bank	Left Center	Center	Right Center	Right Bank
AA	A	A	A	A	A
AB	A	A	P	A	A
BB	P	A	A	D	A
BC	P	P	A	P	D
CC	P	A	A	A	A
CD	D	A	A	A	P
DD	A	P	A	A	P
DE	P	A	A	A	P
EE	P	A	A	A	P
EF	A	A	A	A	A
FF	P	A	A	A	A
FG	P	A	A	A	A
GG	P	A	A	A	P
GH	A	A	A	A	A
HH	P	A	A	A	A
HI	A	A	A	A	P
II	A	A	A	A	P
IJ	P	P	A	A	A
JJ	A	A	A	A	A
JK	A	A	A	A	A

KK	A	A	A	A	A

Key: P= Present A= Absent D=Dry

Table 10. Site 1 Canopy Cover Left Bank

Left Bank					
Transect	Upper Canopy	Lower Canopy	Ground Cover (<.05m high)		
	Trees and saplings >5m high	All vegetation 0.5m to 5m	Wood Shrubs & Saplings	Herbs/Grasses	Ground Cover
AA	3	2	3	1	2
BB	3	3	3	2	1
CC	2	2	3	1	2
DD	2	2	2	3	1
EE	2	3	3	1	1
FF	3	3	4	1	1
GG	2	2	3	2	0
HH	3	3	3	2	0
II	3	2	3	2	0
JJ	2	3	2	3	0
KK	2	2	2	1	3
AVERAGE	**2.5**	**2.5**	**2.8**	**1.7**	**1.0**

Key: 0 = Not Present
1 = Sparse (<10%)
2 = Moderate (10-40%)
3 = Heavy (40-75%)
4 = Very Heavy (>75%)

Table 11. Site 1 Canopy Cover Right Bank

Right Bank					
Transect	Upper Canopy	Lower Canopy	Ground Cover (<.05m high)		
	Trees and saplings >5m high	All vegetation 0.5m to 5m	Wood Shrubs & Saplings	Herbs/Grasses	Ground Cover
AA	2	1	1	1	4
BB	2	2	2	2	2
CC	2	2	2	2	2
DD	1	2	2	2	2
EE	3	2	2	1	4
FF	2	2	2	2	2
GG	2	2	2	2	3
HH	3	2	2	2	3
II	2	1	2	1	3
JJ	2	2	1	3	2
KK	2	2	3	1	2
AVERAGE	**2.1**	**1.8**	**1.9**	**1.7**	**2.6**

Key: 0 = Not Present
1 = Sparse (<10%)
2 = Moderate (10-40%)
3 = Heavy (40-75%)

4 = Very Heavy (>75%)

Table 12. Site 1 Stream Characteristics

Transect	General			Channel Depths				
	Wetted Width (m)	Bankful Width (m)	Bankful Height (m)	Left Bank Depth (cm)	Left Center Depth (cm)	Center Depth (cm)	Right Center Depth (cm)	Right Bank Depth (cm)
AA	3.35	6.4	0.83	0	7	26	55	0
AB	1.95	--	--	0	27.5	0	27	0
BB	6.4	14.5	0.21	0	0	0	0	0
BC	7.62	--	--	0	33.5	48	0	12
CC	7.32	11.4	0.43	0	42	65	34	22
CD	7.92	--	--	0	47	54	38	0
DD	7.32	12	0.61	0	48	0	0	0
DE	4.18	--	--	7.5	26	21	32.5	0
EE	4.27	8.1	0.52	0	16.5	17	37	0
EF	3.51	--	--	0	15	24	19	0
FF	5.79	13	0.67	0	11	53	35	0
FG	8.84	--	--	0	45	42	30	0
GG	8.53	11.4	0.73	0	77	47	64	0
GH	7.32	--	--	0	51	55	52	0
HH	4.72	8.6	0.7	0	35	55	55	35
HI	4.27	--	--	0	17	19	18.5	0
II	8.53	11.8	0.64	0	4	19	0	0
IJ	10.97	--	--	0	57	64	56	10
JJ	8.53	9.4	0.55	0	12	53	44	0
JK	6.71	--	--	30	72	55	47	0
KK	4.63	7.1	0.58	0	0	9	2	0
AVERAGE	**6.3**	**10.3**	**0.6**	**20.3**				

Key: m = meter cm = centimeter

Table 13. Site 1 Transect Substrate

Transect	Substrate				
	Left Bank Substrate	Left Center Substrate	Center Substrate	Right Center Substrate	Right Bank Substrate
AA	XB	XB	XB	GC	XB
AB	XB	GF	XB	GF	XB
BB	FN	XB	XB	CB	XB
BC	FN	SB	CB	XB	FN
CC	FN	CB	GC	SA	XB
CD	FN	CB	SB	SB	FN
DD	FN	FN	SB	SB	FN
DE	FN	CB	SB	CB	SB
EE	FN	SB	SB	GC	SB
EF	GC	SB	SA	CB	FN
FF	SB	SB	GF	XB	FN
FG	FN	SA	SB	SB	SB
GG	SB	FN	SB	SB	FN
GH	SB	SA	CB	SB	FN
HH	FN	SB	CB	GC	SA
HI	SB	XB	CB	GC	FN
II	FN	CB	XB	SB	SB

IJ	FN	FN	SB	CB	SB
JJ	XB	SB	CB	CB	FN
JK	RS	SB	CB	SB	CB
KK	FN	XB	SB	FN	WD

Substrate Key:
RS = Bedrock, Smooth
RR = Bedrock, Rough
XB = Boulder, Large
SB = Boulder, Small
CB = Cobble
GC = Gravel, Course
GF = Gravel Fine
SA = Sand
FN = Fines
WD = Wood

Table 14. Site 1 Substrate composition

Substrate Composition	
Substrate Type	**% Total**
Bedrock , Smooth (RS)	1%
Bedrock, Rough (RR)	0%
Boulder, Large (XB)	16%
Boulder, Small (SB)	30%
Cobble (CB)	15%
Gravel, Course (GC)	6%
Gravel, Fine (GF)	3%
Sand (SA)	5%
Fines (FN)	24%
Wood (WD)	1%

Table 14. Site 1 Flow Habitats

Transect	**Flow Habitats (% of segment)**						
	Cascade/Falls	**Rapid**	**Riffle**	**Run**	**Glide**	**Pool**	**Dry**
AB	60	0	10	10	0	20	0
BC	0	0	30	0	0	70	0
CD	0	0	0	0	0	100	0
DE	0	0	0	100	0	0	0
EF	0	0	50	50	0	0	0
FG	0	0	0	0	0	100	0
GH	0	0	0	0	0	100	0
HI	0	0	20	60	0	20	0
IJ	0	0	10	0	0	90	0
JK	0	0	20	0	0	80	0
Reach Average	**6%**	**0%**	**14%**	**22%**	**0%**	**58%**	**0%**

Table 15. Site 1 Cobble Embeddedness

Cobble % Embeddedness	
65	0
70	60
70	60
50	50
70	50
0	30
70	40
0	40
10	80

0	20
0	10
0	0
40	--
Average = 35	

Site 2 Habitat Data

Table 16. Site 2 Microalgae and habitat complexity

Transect	General	
	Microalgae thickness (average per transect)	**Instream habitat complexity (total)**
AA	1.2	9
AB	1	--
BB	0.6	8
BC	1	--
CC	1	15
CD	2	--
DD	1	9
DE	1	--
EE	1.67	12
EF	1.67	--
FF	1	11
FG	1	--
GG	2	7
GH	0.67	--
HH	0.6	5
HI	0	--
II	0.6	13
IJ	1.8	--
JJ	1.6	9
JK	1.8	--
KK	1.2	12
AVERAGE	**1.2**	**10.0**

Microalgae Key:
0: No microalgae present
1 = Present, but not visible
2 = Present and visible but <1mm
3 = 1-5mm
4 = 5-20mm

Table 17. Site 2 Bank stability

Transect	Bank Stability	
	Bank Stability Left Bank	**Stank Stability Right Bank**
AA	Stable	Stable

BB	Stable	Stable
CC	Vulnerable	Vulnerable
DD	Stable	Stable
EE	Stable	Stable
FF	Stable	Stable
GG	Stable	Stable
HH	Stable	Stable
II	Stable	Stable
JJ	Stable	Stable
KK	Stable	Stable

Table 18. Site 2 Coarse Particulate Organic Matter Presence or Absence

Transect	Coarse Particulate Organic Matter (CPOM)				
	Left Bank	Left Center	Center	Right Center	Right Bank
AA	P	A	P	P	P
AB	P	P	P	A	P
BB	P	P	P	A	P
BC	P	P	P	A	P
CC	P	A	P	P	P
CD	P	P	P	P	P
DD	P	P	A	P	P
DE	A	A	P	P	P
EE	P	P	P	P	P
EF	P	P	P	A	P
FF	P	P	A	A	P
FG	P	A	P	A	P
GG	P	P	P	P	P
GH	P	P	D	D	P
HH	P	P	P	P	P
HI	P	A	A	A	P
II	A	P	A	P	A
IJ	P	A	A	P	A
JJ	P	A	A	A	A
JK	P	P	P	A	A
KK	P	A	A	A	P

Key: P= Present A= Absent D=Dry

Table 19. Site 2 Microalgae Attached Presence or Absence

Transect	Microalgae Attached				
	Left Bank	Left Center	Center	Right Center	Right Bank
AA	P	A	A	A	A
AB	P	A	A	A	P
BB	P	A	A	A	P
BC	P	P	P	P	P
CC	P	A	P	A	A

CD	P	P	P	P	P
DD	A	P	A	A	P
DE	P	A	P	A	A
EE	A	P	P	P	P
EF	A	P	P	P	A
FF	P	A	A	A	D
FG	A	A	A	A	A
GG	P	A	P	A	P
GH	P	P	D	D	P
HH	P	P	P	P	P
HI	A	A	A	A	P
II	A	A	A	A	A
IJ	A	A	A	A	A
JJ	A	A	P	A	A
JK	A	A	A	A	A
KK	A	A	A	A	A

Key: P= Present A= Absent D=Dry

Table 20. Site 2 Microalgae Unattached Presence or Absence

Transect	Microalgae Unattached				
	Left Bank	Left Center	Center	Right Center	Right Bank
AA	A	A	A	A	A
AB	A	A	A	A	A
BB	A	A	A	A	A
BC	A	A	A	A	A
CC	A	A	A	A	A
CD	A	A	A	A	A
DD	A	A	A	A	A
DE	A	A	A	A	A
EE	A	A	A	A	A
EF	A	A	A	A	A
FF	A	A	A	A	D
FG	A	A	A	A	A
GG	A	A	A	A	A
GH	A	A	D	D	P
HH	A	A	A	A	A
HI	A	A	A	A	A
II	A	A	A	A	A
IJ	A	A	A	A	A
JJ	A	A	A	A	A
JK	A	A	A	A	A
KK	A	A	A	A	A

Key: P= Present A= Absent D=Dry

Table 21. Site 2 Macrophytes Presence or Absence

Transect	Macrophytes

	Left Bank	Left Center	Center	Right Center	Right Bank
AA	A	A	A	A	A
AB	P	P	A	A	P
BB	A	A	A	A	P
BC	A	A	A	A	A
CC	A	A	A	A	A
CD	P	A	A	A	P
DD	P	P	A	A	P
DE	A	A	P	P	P
EE	P	P	A	A	P
EF	P	A	A	A	P
FF	A	A	A	A	D
FG	A	A	P	A	P
GG	P	P	A	A	P
GH	P	A	D	D	P
HH	P	A	A	A	P
HI	A	A	A	A	P
II	A	A	A	A	A
IJ	A	A	A	A	A
JJ	A	A	A	A	A
JK	A	A	A	A	A
KK	A	A	A	A	A

Key: P= Present A= Absent D=Dry

Table 22. Site 2 Left Bank Canopy and Ground Cover

Left Bank					
Transect	Upper Canopy	Lower Canopy	Ground Cover (<.05m high)		
	Trees and saplings >5m high	All vegetation 0.5m to 5m	Wood Shrubs & Saplings	Herbs or Grasses	Ground Cover
AA	1	1	1	1	4
BB	2	2	2	1	3
CC	2	2	2	1	3
DD	2	2	2	1	3
EE	1	2	2	2	2
FF	1	4	4	1	1
GG	3	2	2	2	2
HH	2	3	2	2	1
II	2	2	2	1	3
JJ	3	3	3	1	2
KK	2	2	2	1	2
AVERAGE	**1.9**	**2.3**	**2.2**	**1.3**	**2.4**

Key: 0 = Not Present
1 = Sparse (<10%)
2 = Moderate (10-40%)
3 = Heavy (40-75%)
4 = Very Heavy (>75%)

Table 23. Site 2 Right Bank Canopy and Ground Cover

Right Bank					
Transect	Upper Canopy	Lower Canopy	Ground Cover (<.05m high)		
	Trees and saplings >5m high	All vegetation 0.5m to 5m	Wood Shrubs & Saplings	Herbs/Grasses	Ground Cover
AA	2	2	2	3	1
BB	2	2	2	3	1
CC	2	2	1	2	4
DD	2	2	3	2	2
EE	1	3	4	1	2
FF	2	1	2	3	2
GG	1	2	2	2	2
HH	1	2	2	1	2
II	2	2	2	3	3
JJ	1	1	1	1	4
KK	2	2	2	2	2
AVERAGE	**1.6**	**1.9**	**2.1**	**2.1**	**2.3**

Key: 0 = Not Present
1 = Sparse (<10%)
2 = Moderate (10-40%)
3 = Heavy (40-75%)
4 = Very Heavy (>75%)

Table 24. Site 2 Channel Characteristics

Transect	General			Channel Depths				
	Wetted Width (m)	Bankful Width (m)	Bankful Height (m)	Left Bank Depth (cm)	Left Center Depth (cm)	Center Depth (cm)	Right Center Depth (cm)	Right Bank Depth (cm)
AA	0.98	8	0.82	0	21.34	22.86	15.24	0
AB	3.96	--	--	0	18.29	38.1	36.58	0
BB	3.51	7.1	0.82	0	30.48	26.21	28.96	0
BC	3.2	--	--	0	15.24	17.68	3.02	1.52
CC	4.45	6.5	0.76	0	36.58	59.44	57.91	60.96
CD	1.58	--	--	0	30.48	38.1	28.96	0
DD	1.95	8.3	0.732	0	30.48	35.05	33.53	0
DE	3.35	--	--	0	0	0	9.14	0
EE	3.05	4.3	0.732	0	7.62	13.72	18.29	0
EF	3.35	--	--	0	16.76	22.56	22.86	0
FF	2.29	6.9	0.91	0	11.28	19.51	28.35	0
FG	3.05	--	--	0	11.58	7.32	4.57	0
GG	4.27	11.8	0.76	0	0	32	14.02	0
GH	4.27	--	--	0	41.15	0	0	0
HH	2.44	10	0.55	0	7.62	6.1	9.14	0
HI	3.05	--	--	0	19.81	33.53	35.05	0
II	1.58	8	0.55	0	5.18	25.91	0	0
IJ	1.4	--	--	13.71	60.96	25.91	18.29	0
JJ	3.96	5.6	0.3	0	18.28	16.75	22.56	0
JK	2.32	--	--	0	47.24	56.39	62.48	13.72
KK	1.37	4.5	0.98	9.14	18.29	21.95	18.29	0

AVERAGE	**2.8**	**7.4**	**0.7**	**14.6**

Key: m= meter cm = centimeter

Table 25. Site 2 Substrate

Transect	Substrate				
	Left Bank Substrate	**Left Center Substrate**	**Center Substrate**	**Right Center Substrate**	**Right Bank Substrate**
AA	RR	GF	GC	GC	SA
AB	FN	FN	FN	FN	FN
BB	FN	SB	FN	SA	FN
BC	SB	SB	GC	SB	SB
CC	FN	FN	FN	SA	FN
CD	SA	SB	SB	SB	FN
DD	FN	FN	SB	SB	FN
DE	WD	XB	FN	SB	FN
EE	CB	SB	CB	SB	FN
EF	FN	GC	CB	SB	FN
FF	GC	FN	GC	FN	FN
FG	XB	FN	FN	GC	SB
GG	WD	XB	GC	SB	FN
GH	FN	SB	XB	XB	XB
HH	OT	GC	GC	SA	OT
HI	FN	FN	FN	FN	XB
II	FN	CB	CB	FN	FN
IJ	FN	SA	SA	SA	FN
JJ	FN	SA	GF	SA	RR
JK	FN	FN	FN	GF	RR
KK	GF	SA	SA	GF	GF

Substrate Key: RS = Bedrock, Smooth
RR = Bedrock, Rough XB = Boulder, Large
SB = Boulder, Small CB = Cobble
GC = Gravel, Course GF = Gravel Fine
SA = Sand FN = Fines
WD = Wood

Table 26. Site 2 Flow Habitats

Transect	Flow Habitats (% of segment)						
	Cascade/Falls	**Rapid**	**Riffle**	**Run**	**Glide**	**Pool**	**Dry**
AB	0	0	20	20	0	60	0
BC	0	0	90	0	0	10	0
CD	10	0	10	70	0	10	0
DE	0	0	90	0	0	10	0
EF	0	0	20	30	10	40	0
FG	5	0	45	0	5	45	0
GH	0	0	30	70	0	0	0
HI	0	0	30	10	20	40	0
IJ	0	0	15	15	10	60	0
JK	0	0	0	20	0	80	0
Reach Average	**2%**	**0%**	**35%**	**24%**	**5%**	**36%**	**0%**

Table 27. Site 2 Substrate Composition

Substrate Composition	
Substrate Type	**% Total**
Bedrock , Smooth (RS)	0%
Bedrock, Rough (RR)	3%
Boulder, Large (XB)	7%
Boulder, Small (SB)	16%
Cobble (CB)	5%
Gravel, Course (GC)	10%
Gravel, Fine (GF)	6%
Sand (SA)	11%
Fines (FN)	39%
Wood (WD)	2%
Other (OT)	2%

Table 28. Site 2 Cobble Embeddedness

Cobble % Embeddedness	
0	50
5	50
80	60
0	15
0	40
20	70
30	60
40	70
50	30
65	35
50	10
50	40
20	--
Average = 38	

Site 3 Habitat Data

Table 29. Site 3 Microalgae and Habitat Complexity

Transect	General	
	Microalgae thickness (average per transect)	**Instream habitat complexity (total)**
AA	1	6
AB	1	--
BB	1	4
BC	1.25	--
CC	1	2
CD	1.6	--
DD	1.25	2

DE	2	--
EE	1.6	3
EF	1.5	--
FF	1	6
FG	1.75	--
GG	1.75	10
GH	2.25	--
HH	2.33	4
HI	1.67	--
II	2	9
IJ	1.75	--
JJ	1.2	10
JK	1.2	--
KK	2	9
AVERAGE	**1.5**	**5.9**

Microalgae Key:
0: No microalgae present
1 = Present, but not visible
2 = Present and visible but <1mm
3 = 1-5mm
4 = 5-20mm

Table 30. Site 3 Bank Stability

Transect	Bank Stability	
	Bank Stability Left Bank	Stank Stability Right Bank
AA	Stable	Stable
BB	Stable	Stable
CC	Stable	Stable
DD	Stable	Stable
EE	Stable	Stable
FF	Stable	Stable
GG	Stable	Stable
HH	Stable	Stable
II	Stable	Vulnerable
JJ	Stable	Stable
KK	Stable	Stable

Table 31. Site 3 Coarse Particulate Organic Matter Presence or Absence

Transect	Coarse Particulate Organic Matter (CPOM)				
	Left Bank	Left Center	Center	Right Center	Right Bank
AA	P	P	P	P	P
AB	P	P	P	P	P
BB	P	A	P	A	P
BC	P	P	P	A	A
CC	P	A	A	A	P
CD	P	A	A	A	P
DD	P	A	P	A	A
DE	P	P	P	P	P
EE	P	P	A	P	A

EF	P	P	P	P	P
FF	P	P	P	P	P
FG	A	A	P	P	P
GG	P	P	P	P	P
GH	P	A	A	P	P
HH	P	P	A	P	P
HI	P	A	A	P	P
II	P	A	A	P	P
IJ	P	A	A	A	P
JJ	P	A	A	A	A
JK	P	P	A	A	P
KK	P	A	P	P	P

Key: P= Present A= Absent D=Dry

Table 32. Site 3 Attached Microalgae Presence or Absence

Transect	Microalgae Attached				
	Left Bank	Left Center	Center	Right Center	Right Bank
AA	A	A	A	A	A
AB	A	P	P	P	D
BB	A	A	A	A	A
BC	D	A	A	A	A
CC	A	A	A	A	A
CD	A	A	A	P	A
DD	A	A	A	A	A
DE	P	P	P	A	A
EE	P	A	A	A	P
EF	P	A	P	A	A
FF	A	A	A	A	D
FG	A	A	P	P	A
GG	A	P	A	A	A
GH	A	A	A	A	A
HH	A	P	A	P	A
HI	P	A	A	P	A
II	P	A	A	A	A
IJ	A	A	A	A	A
JJ	P	A	A	A	A
JK	P	P	A	A	A
KK	P	A	A	A	A

Key: P= Present A= Absent D=Dry

Table 33. Site 3 Unattached Microalgae Presence or Absence

Transect	Microalgae Unattached				
	Left Bank	Left Center	Center	Right Center	Right Bank
AA	A	A	A	A	A

AB	A	A	A	A	D
BB	A	A	A	A	A
BC	A	A	A	A	A
CC	A	A	A	A	A
CD	A	A	P	A	A
DD	A	A	A	A	A
DE	A	A	A	A	P
EE	A	A	A	A	A
EF	A	A	A	A	A
FF	A	A	A	A	A
FG	A	A	P	A	A
GG	A	A	P	A	A
GH	A	A	P	A	A
HH	A	P	A	A	A
HI	A	A	A	A	A
II	P	A	A	P	A
IJ	A	A	A	A	A
JJ	A	A	A	P	A
JK	P	P	A	A	A
KK	A	A	A	A	A

Key: P= Present A= Absent D=Dry

Table 34. Site 3 Macrophyte Presence or Absence

Transect	Macrophytes				
	Left Bank	Left Center	Center	Right Center	Right Bank
AA	A	A	A	A	P
AB	A	A	A	A	D
BB	A	A	A	A	P
BC	P	A	A	A	A
CC	P	A	A	A	P
CD	P	A	A	A	P
DD	P	A	A	A	A
DE	P	A	A	A	A
EE	A	A	A	A	A
EF	A	A	A	A	A
FF	A	A	A	A	A
FG	A	A	A	A	P
GG	A	A	A	A	P
GH	A	A	A	A	P
HH	A	A	A	A	P
HI	A	A	A	A	P
II	P	A	A	A	A
IJ	P	A	A	A	P
JJ	A	A	A	A	A
JK	P	P	A	A	P
KK	P	A	A	P	P

Key: P= Present A= Absent D=Dry

Table 35. Site 3 Left Bank Canopy and Ground Cover

Left Bank					
Transect	Upper Canopy	Lower Canopy	Ground Cover (<.05m high)		
	Trees and saplings >5m high	All vegetation 0.5m to 5m	Wood Shrubs & Saplings	Herbs or Grasses	Ground Cover
AA	3	2	2	3	2
BB	3	3	3	3	1
CC	2	3	2	3	2
DD	2	2	2	2	2
EE	2	2	2	1	3
FF	1	2	2	1	3
GG	2	2	2	1	3
HH	2	3	2	3	1
II	1	4	4	1	1
JJ	1	4	4	2	1
KK	3	4	3	2	1
AVERAGE	**2.0**	**2.8**	**2.5**	**2.0**	**1.8**

Key: 0 = Not Present
1 = Sparse (<10%)
2 = Moderate (10-40%)
3 = Heavy (40-75%)
4 = Very Heavy (>75%)

Table 36. Site 3 Right Bank Canopy and Ground Cover

Right Bank					
Transect	Upper Canopy	Lower Canopy	Ground Cover (<.05m high)		
	Trees and saplings >5m high	All vegetation 0.5m to 5m	Wood Shrubs & Saplings	Herbs/Grasses	Ground Cover
AA	0	3	3	2	2
BB	0	2	3	1	2
CC	0	2	2	2	2
DD	1	1	1	1	4
EE	1	1	1	1	3
FF	3	4	4	1	1
GG	3	3	3	2	1
HH	2	3	3	2	1
II	2	4	4	1	1
JJ	1	3	3	3	1
KK	1	3	3	2	1
AVERAGE	**1.3**	**2.6**	**2.7**	**1.6**	**1.7**

Key: 0 = Not Present
1 = Sparse (<10%)
2 = Moderate (10-40%)
3 = Heavy (40-75%)
4 = Very Heavy (>75%)

Table 37. Site 3 Channel Characteristics

Transect	General			Channel Depths				
	Wetted Width (m)	Bankful Width (m)	Bankful Height (m)	Left Bank Depth (cm)	Left Center Depth (cm)	Center Depth (cm)	Right Center Depth (cm)	Right Bank Depth (cm)
AA	1.52	15.5	0.366	0	4	5.5	4.5	0
AB	1.52	---	--	0	5	5.5	3.5	0
BB	2.56	11.6	0.183	0	2.5	11.5	8	0
BC	8.78	--	--	0	2.5	9.5	24.5	33
CC	2.16	12.1	0.366	0	7	5	2.5	0
CD	2.38	--	--	0	8	8.5	6	0
DD	2.99	8	0.366	0	12.5	26.5	44.5	45.5
DE	2.35	--	--	0	3.5	9	13	30.5
EE	2.8	13.3	0.335	0	4	8.5	13.5	13
EF	3.32	--	--	0	9.5	9.5	5	4.5
FF	1.52	10.2	0.518	0	7	9	10	0
FG	4.42	--	--	0	6	6	7	0
GG	2.74	8.7	0.457	0	5	14	22	19
GH	2.74	--	--	0	2	8	11	0
HH	7.01	6.3	0.29	0	9	9	8.5	0
HI	6.28	--	--	6.5	12	15.5	26	0
II	5.7	5.6	0.336	5.5	17	17.5	30.5	0
IJ	3.57	--	--	0	21	12.5	7	0
JJ	5.79	6.5	0.427	0	14	16.5	28.5	0
JK	3.96	--	--	17	28	55	61	0
KK	2.56	4.1	0.396	0	18	31	38	0
AVERAGE	**3.7**	**9.3**	**0.4**	**9.9**				

Key: m= meters cm= centimeters

Table 38. Site 3 Substrate

Transect	Substrate				
	Left Bank Substrate	Left Center Substrate	Center Substrate	Right Center Substrate	Right Bank Substrate
AA	GC	GF	GC	SA	GC
AB	GC	GC	GC	GC	GC
BB	GC	GF	GF	GF	GF
BC	SA	GC	GF	GF	GC
CC	GC	GF	GC	GC	GC
CD	GF	GF	GF	GF	GF
DD	GF	GF	GF	GC	GF
DE	GC	GC	GF	GF	GF
EE	GF	GF	GC	GC	GF
EF	GC	GF	GF	FN	FN
FF	GC	GF	GC	GF	SA
FG	GF	GF	GF	GF	FN
GG	GF	GF	GF	GF	FN
GH	GF	GF	GF	GF	FN
HH	SA	GF	GF	GF	FN
HI	FN	GF	GF	GF	FN
II	FN	FN	SA	SA	FN
IJ	FN	GF	GF	GF	SA
JJ	FN	GF	SA	SA	SA

JK	FN	SA	SB	SA	FN
KK	SA	GF	CB	CB	SA

Substrate Key:
RS = Bedrock, Smooth
RR = Bedrock, Rough
XB = Boulder, Large
SB = Boulder, Small
CB = Cobble
GC = Gravel, Course
GF = Gravel Fine
SA = Sand
FN = Fines
WD = Wood

Table 39. Site 3 Flow Habitats

Transect	Flow Habitats (% of segment)						
	Cascade/Falls	Rapid	Riffle	Run	Glide	Pool	Dry
AB	0	0	0	100	0	0	0
BC	0	0	0	0	50	50	0
CD	0	0	0	0	50	50	0
DE	0	0	0	0	75	25	0
EF	0	0	0	0	100	0	0
FG	0	0	0	0	100	0	0
GH	0	0	0	0	50	50	0
HI	0	0	0	0	0	100	0
IJ	0	0	0	0	40	60	0
JK	0	0	0	0	10	90	0
Reach Average	**0%**	**0%**	**0%**	**10%**	**48%**	**43%**	**0%**

Table 40. Site 3 Substrate Composition

Substrate Composition	
Substrate Type	**% Total**
Bedrock , Smooth (RS)	0%
Bedrock, Rough (RR)	0%
Boulder, Large (XB)	0%
Boulder, Small (SB)	1%
Cobble (CB)	2%
Gravel, Course (GC)	22%
Gravel, Fine (GF)	48%
Sand (SA)	13%
Fines (FN)	14%
Wood (WD)	0%

Table 41. Site 3 Cobble Embeddedness

Cobble % Embeddedness	
50	60
90	30
50	80
90	80
60	60
70	10
30	50
50	30
70	35

50	0
20	10
60	20
40	--
Average = 48	