

**Spokane River Instream Flow Study  
Appendix A**

**Cover and Substrate Codes**

**And**

**Habitat Suitability Criteria**

**Table 1. Cover and Substrate Codes**

Cover Code	Type of cover Note: Cover Codes are not used for spawning
00.1	Undercut bank
00.2	Overhanging vegetation <sup>1</sup>
00.3	Rootwad (including partly undercut)
00.4	Log jam/submerged brush pile
00.5	Log(s) parallel to bank
00.6	Aquatic vegetation
00.7	Short (<1') terrestrial grass
00.8	Tall (>3') dense grass <sup>2</sup>
00.9	Vegetation beyond the bank-full waters edge
Substrate Code	Type of substrate    Size (inches)
1	Silt, clay, or organic
2	Sand
3	Small gravel    (.1-.5")
4	Medium gravel   (.5-1.5")
5	Large gravel    (1.5-3")
6	Small cobble    (3-6")
7	Large cobble    (6-12")
8	Boulder          (>12")
9	Bedrock

<sup>1</sup> This includes low tree branches (<3 vertical ft) and bushes overhanging the bank-full water's edge.

<sup>2</sup> This category refers to stout, almost bushy type grasses such as reed canary grass up to the bank-full water's edge.

# Spokane Habitat Suitability Criteria

Curve Set ID: 11000000

Species Name: Mountain Whitefish

Life Stage: Fry

Misc Info: from Golder 2001

VEL(fps)	VELHSI	DEP(Ft)	DEPHSI	Sub code	SubHSI
0	1	0	0	0	0
2.3	1	1	1	11.5	0.25
3.3	0.15	3.8	1	13.9	0.25
4.1	0	4.6	0.4	14.5	0.5
99.9	0	5.9	0	14.9	0.3
		99.9	0	15.5	0.5
				15.9	0.3
				16.5	0.63
				16.9	0.33
				17.5	0.63
				17.9	0.33
				18.5	0.63
				18.9	0.33
				19.5	0.38
				19.9	0.28
				21.5	0.25
				23.9	0.25
				24.5	0.5
				24.9	0.3
				25.5	0.5
				25.9	0.3
				26.5	0.63
				26.9	0.33
				27.5	0.63
				27.9	0.33
				28.5	0.63
				28.9	0.33
				29.5	0.38
				29.9	0.28
				31.5	0.25
				33.9	0.25
				34.5	0.5
				34.9	0.3
				35.5	0.5
				35.9	0.3
				36.5	0.63
				36.9	0.33
				37.5	0.63
				37.9	0.33
				38.5	0.63
				38.9	0.33
				39.5	0.38
				39.9	0.28
				41.5	0.5
				41.9	0.7
				42.5	0.5
				42.9	0.7
				43.5	0.5
				43.9	0.7
				44.5	0.75
				45.9	0.75
				46.5	0.88
				46.9	0.78
				47.5	0.88
				47.9	0.78
				48.5	0.88
				48.9	0.78
				49.5	0.63
				49.9	0.73
				51.5	0.5
				51.9	0.7
				52.5	0.5
				52.9	0.7
				53.5	0.5
				53.9	0.7
				54.5	0.75
				54.9	0.75
				55.5	0.75

Curve Set ID: 11000000

Species Name: Mountain Whitefish

Life Stage: Fry

Misc Info: from Golder 2001

Sub code	SubHSI
0	55.9
	56.5
	56.9
	57.5
	57.9
	58.5
	58.9
	59.5
	59.9
	61.5
	61.9
	62.5
	62.9
	63.5
	63.9
	64.5
	64.9
	65.5
	65.9
	66.5
	68.9
	69.5
	69.9
	71.5
	71.9
	72.5
	72.9
	73.5
	73.9
	74.5
	74.9
	75.5
	75.9
	76.5
	78.9
	79.5
	79.9
	81.5
	81.9
	82.5
	82.9
	83.5
	83.9
	84.5
	84.9
	85.5
	85.9
	86.5
	88.9
	89.5
	89.9
	91.5
	91.9
	92.5
	92.9
	93.5
	93.9
	94.5
	94.9
	95.5
	95.9
	96.5
	96.9
	97.5
	97.9
	98.5
	98.9
	99.5
	99.9

# Spokane Habitat Suitability Criteria

Curve Set ID: 12000000

Species Name: Mountain Whitefish

Life Stage: Juvenile

Misc Info: from Golder 2001

VEL(fps)	VELHSI	DEP(Ft)	DEPHSI	Sub code	SubHSI
0	0.2	0	0	0	0.25
1.1	1	0.2	0	11.5	0.25
3.6	1	1.5	1	13.9	0.25
5.9	0	4.6	1	14.5	0.38
99.9	0	5.6	0.5	14.9	0.28
		13.1	0.5	15.5	0.38
		99.9	0.5	15.9	0.28
				16.5	0.63
				16.9	0.33
				17.5	0.63
				17.9	0.33
				18.5	0.63
				18.9	0.33
				19.5	0.38
				19.9	0.28
				21.5	0.25
				23.9	0.25
				24.5	0.38
				24.9	0.28
				25.5	0.38
				25.9	0.28
				26.5	0.63
				26.9	0.33
				27.5	0.63
				27.9	0.33
				28.5	0.63
				28.9	0.33
				29.5	0.38
				29.9	0.28
				31.5	0.25
				33.9	0.25
				34.5	0.38
				34.9	0.28
				35.5	0.38
				35.9	0.28
				36.5	0.63
				36.9	0.33
				37.5	0.63
				37.9	0.33
				38.5	0.63
				38.9	0.33
				39.5	0.38
				39.9	0.28
				41.5	0.38
				41.9	0.48
				42.5	0.38
				42.9	0.48
				43.5	0.38
				43.9	0.48
				44.5	0.5
				45.9	0.5
				46.5	0.75
				46.9	0.55
				47.5	0.75
				47.9	0.55
				48.5	0.75
				48.9	0.55
				49.5	0.5
				49.9	0.5
				51.5	0.38
				51.9	0.48
				52.5	0.38
				52.9	0.48
				53.5	0.38
				53.9	0.48
				54.5	0.5
				54.9	0.5
				55.5	0.5

Curve Set ID: 12000000

Species Name: Mountain Whitefish

Life Stage: Juvenile

Misc Info: from Golder 2001

Sub code	SubHSI
55.9	0.5
56.5	0.75
56.9	0.55
57.5	0.75
57.9	0.55
58.5	0.75
58.9	0.55
59.5	0.5
59.9	0.5
61.5	0.63
61.9	0.93
62.5	0.63
62.9	0.93
63.5	0.63
63.9	0.93
64.5	0.75
64.9	0.95
65.5	0.75
65.9	0.95
66.5	1
68.9	1
69.5	0.75
69.9	0.95
71.5	0.63
71.9	0.93
72.5	0.63
72.9	0.93
73.5	0.63
73.9	0.93
74.5	0.75
74.9	0.95
75.5	0.75
75.9	0.95
76.5	1
78.9	1
79.5	0.75
79.9	0.95
81.5	0.63
81.9	0.93
82.5	0.63
82.9	0.93
83.5	0.63
83.9	0.93
84.5	0.75
84.9	0.95
85.5	0.75
85.9	0.95
86.5	1
88.9	1
89.5	0.75
89.9	0.95
91.5	0.38
91.9	0.48
92.5	0.38
92.9	0.48
93.5	0.38
93.9	0.48
94.5	0.5
94.9	0.5
95.5	0.5
95.9	0.5
96.5	0.75
96.9	0.55
97.5	0.75
97.9	0.55
98.5	0.75
98.9	0.55
99.5	0.5
99.9	0.5

# Spokane Habitat Suitability Criteria

Curve Set ID: 13000000

Species Name: Mountain Whitefish

Life Stage: Adult

Misc Info: from Golder 2001

VEL(fps)	VELHSI	DEP(Ft)	DEPHSI	Sub code	SubHSI
0	0.2	0	0	0	0.25
1.3	1	0.5	0	11.5	0.25
3.3	1	1.8	1	13.9	0.25
3.9	0.4	13.1	1	14.5	0.38
5.9	0	99.9	1	14.9	0.28
99.9	0			15.5	0.38
				15.9	0.28
				16.5	0.63
				16.9	0.33
				17.5	0.63
				17.9	0.33
				18.5	0.63
				18.9	0.33
				19.5	0.38
				19.9	0.28
				21.5	0.25
				23.9	0.25
				24.5	0.38
				24.9	0.28
				25.5	0.38
				25.9	0.28
				26.5	0.63
				26.9	0.33
				27.5	0.63
				27.9	0.33
				28.5	0.63
				28.9	0.33
				29.5	0.38
				29.9	0.28
				31.5	0.25
				33.9	0.25
				34.5	0.38
				34.9	0.28
				35.5	0.38
				35.9	0.28
				36.5	0.63
				36.9	0.33
				37.5	0.63
				37.9	0.33
				38.5	0.63
				38.9	0.33
				39.5	0.38
				39.9	0.28
				41.5	0.38
				41.9	0.48
				42.5	0.38
				42.9	0.48
				43.5	0.38
				43.9	0.48
				44.5	0.5
				45.9	0.5
				46.5	0.75
				46.9	0.55
				47.5	0.75
				47.9	0.55
				48.5	0.75
				48.9	0.55
				49.5	0.5
				49.9	0.5
				51.5	0.38
				51.9	0.48
				52.5	0.38
				52.9	0.48
				53.5	0.38
				53.9	0.48
				54.5	0.5
				54.9	0.5
				55.5	0.5

Curve Set ID: 13000000

Species Name: Mountain Whitefish

Life Stage: Adult

Misc Info: from Golder 2001

Sub code	SubHSI
55.9	0.5
56.5	0.75
56.9	0.55
57.5	0.75
57.9	0.55
58.5	0.75
58.9	0.55
59.5	0.5
59.9	0.5
61.5	0.63
61.9	0.93
62.5	0.63
62.9	0.93
63.5	0.63
63.9	0.93
64.5	0.75
64.9	0.95
65.5	0.75
65.9	0.95
66.5	1
68.9	1
69.5	0.75
69.9	0.95
71.5	0.63
71.9	0.93
72.5	0.63
72.9	0.93
73.5	0.63
73.9	0.93
74.5	0.75
74.9	0.95
75.5	0.75
75.9	0.95
76.5	1
78.9	1
79.5	0.75
79.9	0.95
81.5	0.63
81.9	0.93
82.5	0.63
82.9	0.93
83.5	0.63
83.9	0.93
84.5	0.75
84.9	0.95
85.5	0.75
85.9	0.95
86.5	1
88.9	1
89.5	0.75
89.9	0.95
91.5	0.38
91.9	0.48
92.5	0.38
92.9	0.48
93.5	0.38
93.9	0.48
94.5	0.5
94.9	0.5
95.5	0.5
95.9	0.5
96.5	0.75
96.9	0.55
97.5	0.75
97.9	0.55
98.5	0.75
98.9	0.55
99.5	0.5
99.9	0.5

## Spokane Habitat Suitability Criteria

Curve Set ID: 14000000

Species Name: Mountain Whitefish

Life Stage: Spawning

Misc Info: from Golder

VEL(fps)	VELHSI	DEP(Ft)	DEPHSI	Sub code	SubHSI
0	0	0	0	0	0
0.5	0	0.5	0	11.5	0
1.3	1	1.6	1	29.9	0
3.6	1	13.1	0	31.5	0.5
5.9	0	99.9	0	31.9	0.9
99.9	0			32.5	0.5
				32.9	0.9
				33.5	1
				37.9	1
				38.5	0.5
				38.9	0.9
				39.5	0.5
				39.9	0.9
				41.5	0.5
				41.9	0.9
				42.5	0.5
				42.9	0.9
				43.5	1
				47.9	1
				48.5	0.5
				48.9	0.9
				49.5	0.5
				49.9	0.9
				51.5	0.5
				51.9	0.9
				52.5	0.5
				52.9	0.9
				53.5	1
				57.9	1
				58.5	0.5
				58.9	0.9
				59.5	0.5
				59.9	0.9
				61.5	0.5
				61.9	0.9
				62.5	0.5
				62.9	0.9
				63.5	1
				67.9	1

Curve Set ID: 14000000

Species Name: Mountain Whitefish

Life Stage: Spawning

Misc Info: from Golder

Sub code	SubHSI
68.5	0.5
68.9	0.9
69.5	0.5
69.9	0.9
71.5	0.5
71.9	0.9
72.5	0.5
72.9	0.9
73.5	1
77.9	1
78.5	0.5
78.9	0.9
79.5	0.5
79.9	0.9
81.5	0
82.9	0
83.5	0.5
83.9	0.1
84.5	0.5
84.9	0.1
85.5	0.5
85.9	0.1
86.5	0.5
86.9	0.1
87.5	0.5
87.9	0.1
88.5	0
92.9	0
93.5	0.5
93.9	0.1
94.5	0.5
94.9	0.1
95.5	0.5
95.9	0.1
96.5	0.5
96.9	0.1
97.5	0.5
97.9	0.1
98.5	0
99.9	0

# Spokane Habitat Suitability Criteria

Curve Set ID: 00080100

Species Name: rainbow trout

Life Stage: spawning

Misc Info:

VEL(fps)	VELHSI	DEP(Ft)	DEPHSI	Sub code	SubHSI
0	0.06	0	0	11.9	0
0.6	0.1	0.25	0	31.7	0
1.65	0.91	0.45	0.58	31.8	0.64
2.1	1	0.85	1	31.9	0.72
2.45	1	1.15	1	32.5	0
3.3	0	1.3	0.45	32.7	0
99	0	1.95	0.4	32.8	0.64
		2.5	0.4	32.9	0.72
		3.3	0.4	33.9	0.8
		99	0.4	34.5	0.9
				34.9	0.82
				35.5	0.8
				35.9	0.8
				36.5	0.65
				36.9	0.77
				37.5	0.4
				37.9	0.72
				38.5	0.4
				38.9	0.72
				39.5	0
				39.9	0
				41.5	0
				41.7	0
				41.8	0.8
				41.9	0.9
				42.5	0
				42.7	0
				42.8	0.8
				42.9	0.9
				43.5	0.9
				43.9	0.98
				44.9	1
				45.5	0.9
				45.9	0.98
				46.5	0.75
				46.9	0.95
				47.5	0.5
				47.9	0.9
				48.5	0.5
				48.9	0.9
				49.5	0
				49.9	0
				51.5	0
				51.7	0
				51.8	0.64
				51.9	0.72
				52.5	0
				52.7	0
				52.8	0.64
				52.9	0.72
				53.5	0.8
				53.9	0.8
				54.5	0.9

Curve Set ID: 00080100

Species Name: rainbow trout

Life Stage: spawning

Misc Info:

Sub code	SubHSI
54.9	0.82
55.9	0.8
56.5	0.65
56.9	0.77
57.5	0.4
57.9	0.72
58.5	0.4
58.9	0.72
59.5	0
59.9	0
61.5	0
61.7	0
61.8	0.4
61.9	0.45
62.5	0
62.7	0
62.8	0.4
62.9	0.45
63.5	0.65
63.9	0.53
64.5	0.75
64.9	0.55
65.5	0.65
65.9	0.53
66.9	0.5
67.5	0.25
67.9	0.45
68.5	0.25
68.9	0.45
69.5	0
69.9	0
71.5	0
72.9	0
73.5	0
73.9	0
74.5	0
74.9	0
75.5	0
75.9	0
76.5	0
76.9	0
77.9	0
82.9	0
83.5	0
83.9	0
84.5	0
84.9	0
85.5	0
85.9	0
86.5	0
86.9	0
87.5	0
99.9	0

# Spokane Habitat Suitability Criteria

Curve Set ID: 00080200  
 Species Name: rainbow trout  
 Life Stage: Adult/Juvenile  
 Misc Info:

VEL(fps)	VELHSI	DEP(Ft)	DEPHSI	Sub code	SubHSI
0	0.25	0	0	0.1	1
0.85	1	0.55	0	0.2	1
1.75	0.45	1.55	0.45	0.3	1
2.65	0.4	2.25	0.5	0.4	1
3.7	0.1	2.6	0.65	0.5	0.8
5.25	0	2.75	1	0.6	0.8
99	0	3.4	1	0.7	0.1
		4.75	0.66	0.8	0.7
		5.25	0.66	0.9	0.2
		99	0.66	11.9	0.1
				13.9	0.1
				14.5	0.2
				14.9	0.12
				15.5	0.2
				15.9	0.12
				16.5	0.3
				16.9	0.14
				17.5	0.4
				17.9	0.16
				18.5	1
				18.9	1
				19.5	0.2
				19.9	0.12
				21.5	0.1
				23.9	0.1
				24.5	0.2
				24.9	0.12
				25.5	0.2
				25.9	0.12
				26.5	0.3
				26.9	0.14
				27.5	0.4
				27.9	0.16
				28.5	1
				28.9	1
				29.5	0.2
				29.9	0.12
				31.5	0.1
				33.9	0.1
				34.5	0.2
				34.9	0.12
				35.5	0.2
				35.9	0.12
				36.5	0.3
				36.9	0.14
				37.5	0.4
				37.9	0.16
				38.5	1
				38.9	1
				39.5	0.2
				39.9	0.12
				41.5	0.2
				41.9	0.28
				42.5	0.2
				42.9	0.28
				43.5	0.2
				43.9	0.28
				44.9	0.3
				45.9	0.3
				46.5	0.4
				46.9	0.32
				47.5	0.5
				47.9	0.34
				48.5	1
				48.9	1
				49.5	0.3
				49.9	0.3

Curve Set ID: 00080200  
 Species Name: rainbow trout  
 Life Stage: Adult/Juvenile  
 Misc Info:

Sub code	SubHSI
51.5	0.2
51.9	0.28
52.5	0.2
52.9	0.28
53.5	0.2
53.9	0.28
54.5	0.3
55.9	0.3
56.5	0.4
56.9	0.32
57.5	0.5
57.9	0.34
58.5	1
58.9	1
59.5	0.3
59.9	0.3
61.5	0.3
61.9	0.46
62.5	0.3
62.9	0.46
63.5	0.3
63.9	0.46
64.5	0.4
64.9	0.48
65.5	0.4
65.9	0.48
66.9	0.5
67.5	0.6
67.9	0.52
68.5	1
68.9	1
69.5	0.4
69.9	0.48
71.5	0.4
71.9	0.64
72.5	0.4
72.9	0.64
73.5	0.4
73.9	0.64
74.5	0.5
74.9	0.66
75.5	0.5
75.9	0.66
76.5	0.6
76.9	0.68
77.9	0.7
78.5	1
78.9	1
79.5	0.5
79.9	0.66
81.5	1
89.9	1
91.5	0.2
91.9	0.28
92.5	0.2
92.9	0.28
93.5	0.2
93.9	0.28
94.5	0.3
95.9	0.3
96.5	0.4
96.9	0.32
97.5	0.5
97.9	0.34
98.5	1
98.9	1
99.9	0.3

# Spokane Habitat Suitability Criteria

Curve Set ID: 00080204

Species Name: rainbow trout

Life Stage: juvenile

Misc Info: winter

VEL(fps)	VELHSI	DEP(Ft)	DEPHSI	Sub code	SubHSI
0	1	0	0	0.1	1
0.5	1	0.2	0	0.2	1
1	0.2	0.3	0.2	0.3	1
2	0	0.5	1	0.4	1
6	0	1.5	1	0.5	0.8
99	0	3	0.25	0.6	0.8
		3.5	0.1	0.7	0.1
		6	0.1	0.8	0.7
		99	0.1	0.9	0.2
				11.9	0.1
				13.9	0.1
				14.5	0.2
				14.9	0.12
				15.5	0.2
				15.9	0.12
				16.5	0.3
				16.9	0.14
				17.5	0.4
				17.9	0.16
				18.5	1
				18.9	1
				19.5	0.2
				19.9	0.12
				21.5	0.1
				23.9	0.1
				24.5	0.2
				24.9	0.12
				25.5	0.2
				25.9	0.12
				26.5	0.3
				26.9	0.14
				27.5	0.4
				27.9	0.16
				28.5	1
				28.9	1
				29.5	0.2
				29.9	0.12
				31.5	0.1
				33.9	0.1
				34.5	0.2
				34.9	0.12
				35.5	0.2
				35.9	0.12
				36.5	0.3
				36.9	0.14
				37.5	0.4
				37.9	0.16
				38.5	1
				38.9	1
				39.5	0.2
				39.9	0.12
				41.5	0.2
				41.9	0.28
				42.5	0.2
				42.9	0.28
				43.5	0.2
				43.9	0.28
				44.9	0.3
				45.9	0.3
				46.5	0.4
				46.9	0.32
				47.5	0.5
				47.9	0.34
				48.5	1
				48.9	1
				49.5	0.3
				49.9	0.3

Curve Set ID: 00080204

Species Name: rainbow trout

Life Stage: juvenile

Misc Info: winter

Sub code	SubHSI
51.5	0.2
51.9	0.28
52.5	0.2
52.9	0.28
53.5	0.2
53.9	0.28
54.5	0.3
55.9	0.3
56.5	0.4
56.9	0.32
57.5	0.5
57.9	0.34
58.5	1
58.9	1
59.5	0.3
59.9	0.3
61.5	0.3
61.9	0.46
62.5	0.3
62.9	0.46
63.5	0.3
63.9	0.46
64.5	0.4
64.9	0.48
65.5	0.4
65.9	0.48
66.9	0.5
67.5	0.6
67.9	0.52
68.5	1
68.9	1
69.5	0.4
69.9	0.48
71.5	0.4
71.9	0.64
72.5	0.4
72.9	0.64
73.5	0.4
73.9	0.64
74.5	0.5
74.9	0.66
75.5	0.5
75.9	0.66
76.5	0.6
76.9	0.68
77.9	0.7
78.5	1
78.9	1
79.5	0.5
79.9	0.66
81.5	1
89.9	1
91.5	0.2
91.9	0.28
92.5	0.2
92.9	0.28
93.5	0.2
93.9	0.28
94.5	0.3
95.9	0.3
96.5	0.4
96.9	0.32
97.5	0.5
97.9	0.34
98.5	1
98.9	1
99.9	0.3