

# **Lake Creek Instream Flow Study**

## **Appendix E**

### **Spawning and Rearing Habitat Suitability Indices**

### Chinook Spawning Depth and Velocity Preferences

Plotted Velocity	Velocity Preference	Plotted Depth	Depth Preference
0.00	0.00	0.00	0.00
0.50	0.00	0.50	0.00
1.00	0.10	1.20	1.00
1.30	0.70	3.40	1.00
1.75	1.00	5.00	0.00
3.00	1.00	99.99	0.00
4.00	0.00		
99.99	0.00		

Note: For Chinook spawning substrate preferences use Table Y.

### Coho Spawning Depth and Velocity Preferences

Plotted Velocity	Velocity Preference	Plotted Depth	Depth Preference
0.00	0.40	0.00	0.00
0.25	0.40	0.45	0.00
1.05	1.00	1.15	0.75
1.80	0.81	2.05	1.00
2.65	0.29	3.25	0.09
3.90	0.00	4.00	0.01
99.99	0.00	99.99	0.01

Note: For coho spawning substrate preferences use Table Y.

### Steelhead Spawning Depth and Velocity Preferences

Plotted Velocity	Velocity Preference	Plotted Depth	Depth Preference
0.00	0.00	0.00	0.00
0.55	0.00	0.65	0.00
2.50	1.00	1.25	1.00
3.25	1.00	1.55	1.00
3.45	0.62	2.40	0.50
5.00	0.00	99.99	0.50
99.99	0.00		

Note: For steelhead spawning substrate preferences use Table Z.

### Rainbow Trout Spawning Depth and Velocity Preferences

Plotted Velocity	Velocity Preference	Plotted Depth	Depth Preference
0.00	0.06	0.00	0.00
0.60	0.10	0.25	0.00
1.65	0.91	0.45	0.58
2.10	1.00	0.85	1.00
2.45	1.00	1.15	1.00
3.30	0.00	1.30	0.45
99.99	0.00	1.95	0.40
		2.50	0.40
		99.99	0.40

### Cutthroat Trout Spawning Depth and Velocity Preferences

<b>Plotted Velocity</b>	<b>Velocity Preference</b>	<b>Plotted Depth</b>	<b>Depth Preference</b>
0.00	0.00	0.00	0.00
0.15	0.00	0.15	0.04
0.40	0.30	0.35	0.90
0.55	0.90	0.45	1.00
0.95	1.00	0.75	1.00
1.15	1.00	0.95	0.10
1.50	0.80	1.30	0.07
2.00	0.26	5.00	0.00
3.00	0.00	99.99	0.00
99.99	0.00		

Note: For cutthroat trout spawning substrate preferences use Table AA.

**Table Y. Chinook and Coho Salmon Spawning Substrate Preferences**

<b>Substrate Code</b>	<b>Substrate Preference</b>	<b>Substrate Code</b>	<b>Substrate Preference</b>	<b>Substrate Code</b>	<b>Substrate Preference</b>
11.90	0.00	52.80	0.80	75.90	0.55
31.70	0.00	52.90	0.90	76.50	0.75
31.80	0.24	53.50	0.65	76.90	0.55
31.90	0.27	53.90	0.93	77.90	0.50
32.50	0.00	54.50	1.00	78.50	0.25
32.70	0.00	56.90	1.00	78.90	0.00
32.80	0.24	57.50	0.75	79.50	0.00
32.90	0.27	57.90	0.95	79.90	0.00
33.90	0.30	58.50	0.50	80.50	0.00
34.50	0.65	58.90	0.90	80.90	0.00
34.90	0.37	59.50	0.00	81.50	0.00
35.50	0.65	59.90	0.00	81.90	0.00
35.90	0.37	60.50	0.00	82.50	0.00
36.50	0.65	60.90	0.00	82.90	0.00
36.90	0.37	61.50	0.00	83.50	0.00
37.50	0.40	61.70	0.00	83.90	0.00
37.90	0.32	61.80	0.80	84.50	0.00
38.50	0.15	61.90	0.90	84.90	0.00
38.90	0.27	62.50	0.00	85.50	0.00
39.50	0.00	62.70	0.00	85.90	0.00
39.90	0.00	62.80	0.80	86.50	0.00
40.50	0.00	62.90	0.90	86.90	0.00
40.90	0.00	63.50	0.65	87.50	0.00
41.50	0.00	63.90	0.93	87.90	0.00
41.70	0.00	64.50	1.00	88.50	0.00
41.80	0.80	66.90	1.00	88.90	0.00
41.90	0.90	67.50	0.75	89.50	0.00
42.50	0.00	67.90	0.95	89.90	0.00
42.70	0.00	68.50	0.50	90.50	0.00
42.80	0.80	68.90	0.90	90.90	0.00
42.90	0.90	69.50	0.00	91.50	0.00
43.50	0.65	69.90	0.00	91.90	0.00
43.90	0.93	70.50	0.00	92.50	0.00
44.90	1.00	70.90	0.00	92.90	0.00
46.90	1.00	71.50	0.00	93.50	0.00
47.50	0.75	71.70	0.00	93.90	0.00
47.90	0.95	71.80	0.40	94.50	0.00
48.50	0.50	71.90	0.45	94.90	0.00
48.90	0.90	72.50	0.00	95.50	0.00
49.50	0.00	72.70	0.00	95.90	0.00
49.90	0.00	72.80	0.40	96.50	0.00
51.50	0.00	72.90	0.45	96.90	0.00
51.70	0.00	73.50	0.40	97.50	0.00
51.80	0.80	73.90	0.48	97.90	0.00
51.90	0.90	74.50	0.75	98.50	0.00
52.50	0.00	74.90	0.55	98.90	0.00
52.70	0.00	75.50	0.75	99.50	0.00

**Table Z. Steelhead Spawning Substrate Preferences**

<b>Substrate Code</b>	<b>Substrate Preference</b>	<b>Substrate Code</b>	<b>Substrate Preference</b>	<b>Substrate Code</b>	<b>Substrate Preference</b>
11.90	0.00	49.90	0.00	71.80	0.24
31.70	0.00	51.50	0.00	71.90	0.27
31.80	0.40	51.70	0.00	72.50	0.00
31.90	0.45	51.80	0.80	72.70	0.00
32.50	0.00	51.90	0.90	72.80	0.24
32.70	0.00	52.50	0.00	72.90	0.27
32.80	0.40	52.70	0.00	73.50	0.40
32.90	0.45	52.80	0.80	73.90	0.32
33.90	0.50	52.90	0.90	74.50	0.65
34.50	0.75	53.50	0.75	74.90	0.37
34.90	0.55	53.90	0.95	75.50	0.65
35.50	0.75	54.50	1.00	75.90	0.37
35.90	0.55	56.90	1.00	76.50	0.65
36.50	0.75	57.50	0.65	76.90	0.37
36.90	0.55	57.90	0.93	77.50	0.30
37.50	0.40	58.50	0.50	77.90	0.30
37.90	0.48	58.90	0.90	78.50	0.00
38.50	0.25	59.50	0.00	78.90	0.00
38.90	0.45	59.90	0.00	79.50	0.00
39.50	0.00	61.50	0.00	79.90	0.00
39.90	0.00	61.70	0.00	81.50	0.00
41.50	0.00	61.80	0.80	82.90	0.00
41.70	0.00	61.90	0.90	83.50	0.00
41.80	0.80	62.50	0.00	83.90	0.00
41.90	0.90	62.70	0.00	84.50	0.00
42.50	0.00	62.80	0.80	86.90	0.00
42.70	0.00	62.90	0.90	87.50	0.00
42.80	0.80	63.50	0.75	87.90	0.00
42.90	0.90	63.90	0.95	88.50	0.00
43.50	0.75	64.50	1.00	92.90	0.00
43.90	0.95	66.90	1.00	93.50	0.00
44.50	1.00	67.50	0.65	93.90	0.00
44.90	1.00	67.90	0.93	94.50	0.00
46.90	1.00	68.50	0.50	96.90	0.00
47.50	0.65	68.90	0.90	97.50	0.00
47.90	0.93	69.50	0.00	97.90	0.00
48.50	0.50	69.90	0.00	98.50	0.00
48.90	0.90	71.50	0.00	99.90	0.00
49.50	0.00	71.70	0.00		

**Table AA.** Rainbow Trout and Cutthroat Trout Spawning Substrate Preferences

<b>Substrate Code</b>	<b>Substrate Preference</b>	<b>Substrate Code</b>	<b>Substrate Preference</b>	<b>Substrate Code</b>	<b>Substrate Preference</b>
11.90	0.00	42.70	0.00	63.50	0.65
13.90	0.00	42.80	0.80	63.90	0.53
14.50	0.00	42.90	0.90	64.50	0.75
14.90	0.00	43.50	0.90	64.90	0.55
15.50	0.00	43.90	0.98	65.50	0.65
15.90	0.00	44.90	1.00	65.90	0.53
16.50	0.00	45.50	0.90	66.90	0.50
16.90	0.00	45.90	0.98	67.50	0.25
17.50	0.00	46.50	0.75	67.90	0.45
21.50	0.00	46.90	0.95	68.50	0.25
23.90	0.00	47.50	0.50	68.90	0.45
24.50	0.00	47.90	0.90	69.50	0.00
24.90	0.00	48.50	0.50	69.90	0.00
25.50	0.00	48.90	0.90	71.50	0.00
25.90	0.00	49.50	0.00	72.90	0.00
26.50	0.00	49.90	0.00	73.50	0.00
26.90	0.00	51.50	0.00	73.90	0.00
27.50	0.00	51.70	0.00	74.50	0.00
29.90	0.00	51.80	0.64	74.90	0.00
31.50	0.00	51.90	0.72	75.50	0.00
31.70	0.00	52.50	0.00	75.90	0.00
31.80	0.64	52.70	0.00	76.50	0.00
31.90	0.72	52.80	0.64	76.90	0.00
32.50	0.00	52.90	0.72	77.90	0.00
32.70	0.00	53.50	0.80	82.90	0.00
32.80	0.64	53.90	0.80	83.50	0.00
32.90	0.72	54.50	0.90	83.90	0.00
33.90	0.80	54.90	0.82	84.50	0.00
34.50	0.90	55.90	0.80	84.90	0.00
34.90	0.82	56.50	0.65	85.50	0.00
35.50	0.80	56.90	0.77	85.90	0.00
35.90	0.80	57.50	0.40	86.50	0.00
36.50	0.65	57.90	0.72	86.90	0.00
36.90	0.77	58.50	0.40	87.50	0.00
37.50	0.40	58.90	0.72	92.90	0.00
37.90	0.72	59.50	0.00	93.50	0.00
38.50	0.40	59.90	0.00	93.90	0.00
38.90	0.72	61.50	0.00	94.50	0.00
39.50	0.00	61.70	0.00	94.90	0.00
39.90	0.00	61.80	0.40	95.50	0.00
41.50	0.00	61.90	0.45	95.90	0.00
41.70	0.00	62.50	0.00	96.50	0.00
41.80	0.80	62.70	0.00	96.90	0.00
41.90	0.90	62.80	0.40	97.50	0.00
42.50	0.00	62.90	0.45	99.99	0.00

**Table BB. Chinook Rearing Depth and Velocity Preferences**

Plotted Velocity	Velocity Preference	Plotted Depth	Depth Preference
0.00	0.09	0.00	0.00
0.35	0.26	0.45	0.00
0.45	0.93	1.35	0.50
0.70	1.00	1.55	0.80
1.15	0.90	2.20	1.00
1.25	0.75	99.99	1.00
2.30	0.08		
3.60	0.00		
99.99	0.00		

Note: For Chinook rearing substrate preferences use Table CC.

**Table BB. Coho Rearing Depth and Velocity Preferences**

Plotted Velocity	Velocity Preference	Plotted Depth	Depth Preference
0.00	0.78	0.00	0.00
0.15	1.00	0.10	0.00
0.30	0.96	0.25	0.25
0.45	0.31	1.55	0.90
0.60	0.20	2.50	1.00
1.20	0.16	3.25	1.00
2.00	0.00	3.90	0.90
99.99	0.00	4.00	0.27
		99.99	0.27

Note: For coho rearing substrate preferences use Table CC.

**Table BB. Steelhead Rearing Depth and Velocity Preferences**

Plotted Velocity	Velocity Preference	Plotted Depth	Depth Preference
0.00	0.23	0.00	0.00
0.25	0.30	0.25	0.00
0.90	0.80	1.80	0.39
1.35	1.00	2.65	1.00
1.55	1.00	2.95	1.00
2.60	0.80	4.50	0.64
2.95	0.39	99.99	0.64
3.65	0.22		
5.50	0.16		
6.00	0.00		
99.99	0.00		

Note: For steelhead rearing substrate preferences use Table CC.

**Table BB.** Rainbow Trout Rearing Depth and Velocity Preferences

Plotted Velocity	Velocity Preference	Plotted Depth	Depth Preference
0.00	0.25	0.00	0.00
0.85	1.00	0.55	0.00
1.75	0.45	1.55	0.45
2.65	0.40	2.25	0.50
3.70	0.10	2.60	0.65
5.25	0.00	2.75	1.00
99.99	0.00	3.40	1.00
		4.75	0.66
		99.99	0.66

Note: For rainbow trout rearing substrate preferences use Table CC.

**Table BB.** Rainbow Trout Winter Rearing Depth and Velocity Preferences

Plotted Velocity	Velocity Preference	Plotted Depth	Depth Preference
0.00	1.00	0.00	0.00
0.50	1.00	0.20	0.00
1.00	0.20	0.30	0.20
2.00	0.00	0.50	1.00
99.99	0.00	1.50	1.00
		3.00	0.25
		3.50	0.10
		6.00	0.10
		99.99	0.10

Note: For rainbow trout winter rearing substrate preferences use Table CC.

**Table BB.** Cutthroat Trout Rearing Depth and Velocity Preferences

Plotted Velocity	Velocity Preference	Plotted Depth	Depth Preference
0.00	0.13	0.00	0.00
0.15	0.20	0.65	0.00
0.35	0.80	1.80	0.50
0.65	1.00	1.95	0.90
0.75	1.00	2.05	1.00
1.05	0.82	2.25	1.00
1.35	0.50	2.65	0.80
1.85	0.50	2.80	0.60
2.70	0.15	99.99	0.60
3.25	0.15		
4.00	0.00		
99.99	0.00		

Note: For cutthroat trout rearing substrate preferences use Table CC.

**Table CC.** Chinook, coho, steelhead, rainbow, and cutthroat trout rearing substrate preferences.

<b>Substrate Code</b>	<b>Substrate Preference</b>	<b>Substrate Code</b>	<b>Substrate Preference</b>	<b>Substrate Code</b>	<b>Substrate Preference</b>
0.10	1.00	38.90	1.00	68.50	1.00
0.20	1.00	39.50	0.20	68.90	1.00
0.30	1.00	39.90	0.12	69.50	0.40
0.40	1.00	41.50	0.20	69.90	0.48
0.50	0.80	41.90	0.28	71.50	0.40
0.60	0.80	42.50	0.20	71.90	0.64
0.70	0.10	42.90	0.28	72.50	0.40
0.80	0.70	43.50	0.20	72.90	0.64
0.90	0.20	43.90	0.28	73.50	0.40
11.90	0.10	44.90	0.30	73.90	0.64
13.90	0.10	45.90	0.30	74.50	0.50
14.50	0.20	46.50	0.40	74.90	0.66
14.90	0.12	46.90	0.32	75.50	0.50
15.50	0.20	47.50	0.50	75.90	0.66
15.90	0.12	47.90	0.34	76.50	0.60
16.50	0.30	48.50	1.00	76.90	0.68
16.90	0.14	48.90	1.00	77.90	0.70
17.50	0.40	49.50	0.30	78.50	1.00
17.90	0.16	49.90	0.30	78.90	1.00
18.50	1.00	51.50	0.20	79.50	0.50
18.90	1.00	51.90	0.28	79.90	0.66
19.50	0.20	52.50	0.20	81.50	1.00
19.90	0.12	52.90	0.28	83.90	1.00
21.50	0.10	53.50	0.20	84.50	1.00
23.90	0.10	53.90	0.28	85.90	1.00
24.50	0.20	54.50	0.30	86.50	1.00
24.90	0.12	55.90	0.30	86.90	1.00
25.50	0.20	56.50	0.40	87.50	1.00
25.90	0.12	56.90	0.32	87.90	1.00
26.50	0.30	57.50	0.50	88.90	1.00
26.90	0.14	57.90	0.34	89.50	1.00
27.50	0.40	58.50	1.00	89.90	1.00
27.90	0.16	58.90	1.00	91.50	0.20
28.50	1.00	59.50	0.30	91.90	0.28
28.90	1.00	59.90	0.30	92.50	0.20
29.50	0.20	61.50	0.30	92.90	0.28
29.90	0.12	61.90	0.46	93.50	0.20
31.50	0.10	62.50	0.30	93.90	0.28
33.90	0.10	62.90	0.46	94.50	0.30
34.50	0.20	63.50	0.30	95.90	0.30
34.90	0.12	63.90	0.46	96.50	0.40
35.50	0.20	64.50	0.40	96.90	0.32
35.90	0.12	64.90	0.48	97.50	0.50
36.50	0.30	65.50	0.40	97.90	0.34
36.90	0.14	65.90	0.48	98.50	1.00
37.50	0.40	66.90	0.50	98.90	1.00
37.90	0.16	67.50	0.60	99.99	0.30
38.50	1.00	67.90	0.52		