

APPENDIX I-D

SUITABILITY AND MICROHABITAT  
PREFERENCE CURVES

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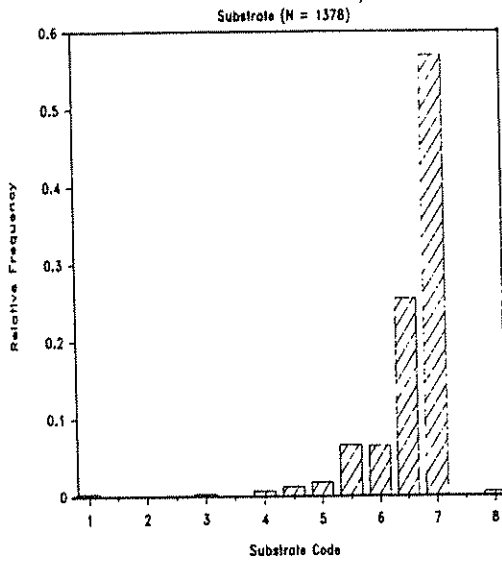
## CONTENTS

Appendix I-D contains suitability and microhabitat and availability curves for hardhead, Sacramento sucker, Sacramento squawfish, and rainbow trout for the Pit 3, 4, and 5 reaches. These data were combined with hydraulic data collected in the various river reaches by WESCO to model the effects of water releases on fish habitat.

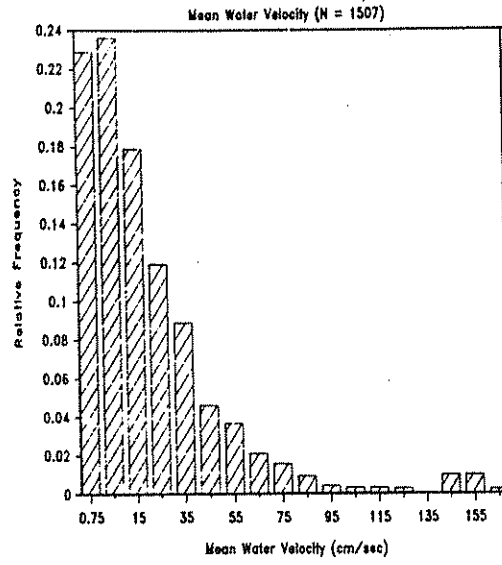
The bars correspond with the Y-axis labeled "Relative Frequency". The lines correspond with the Y-axis labeled "Suitability".

The tables indicate cover code values used in the IFIM to generate suitability curves.

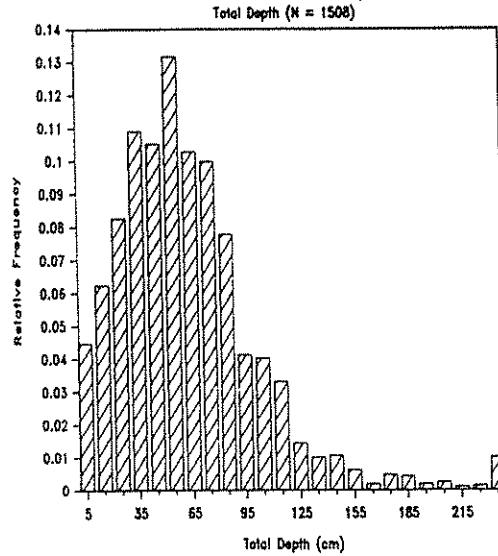
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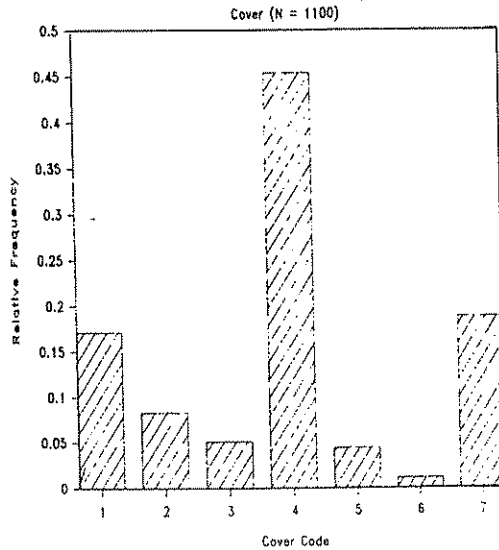
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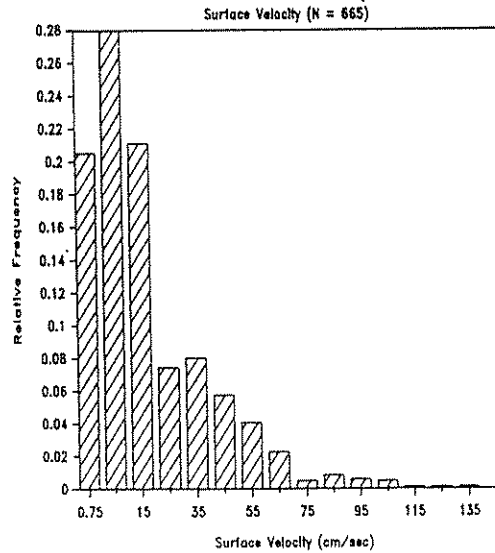
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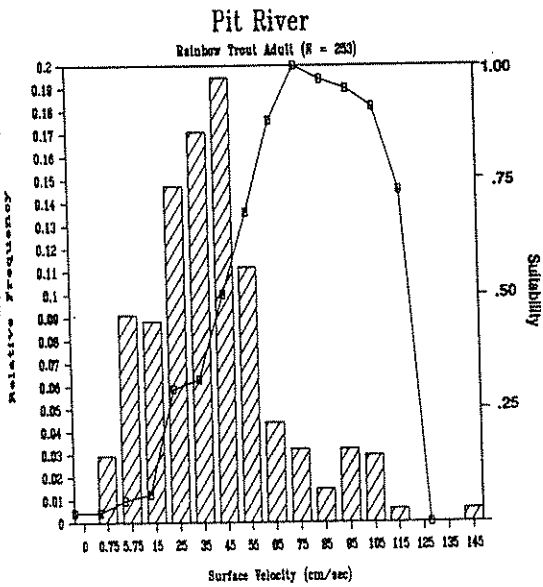
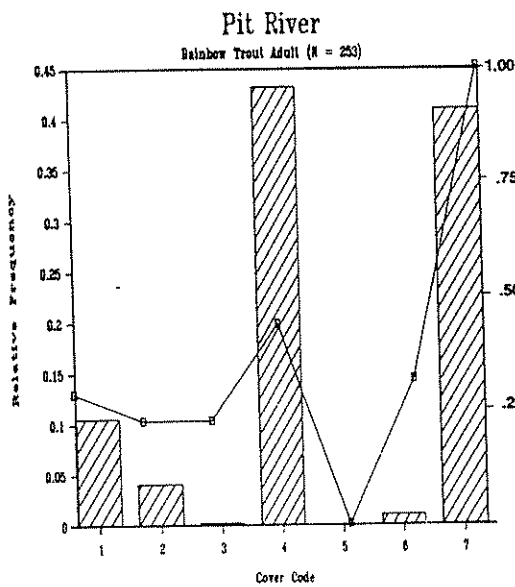
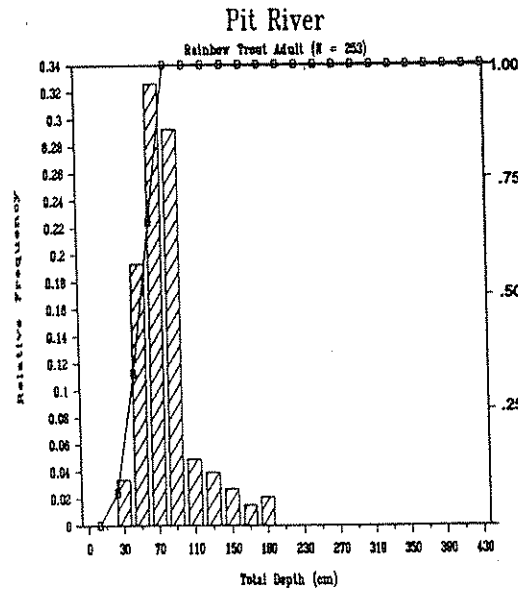
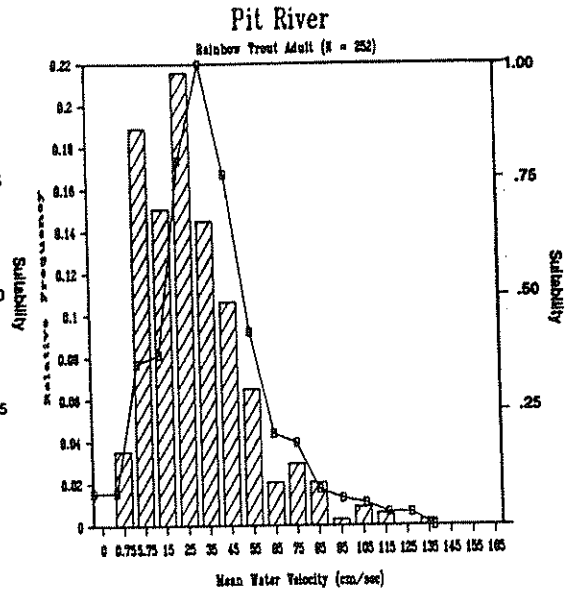
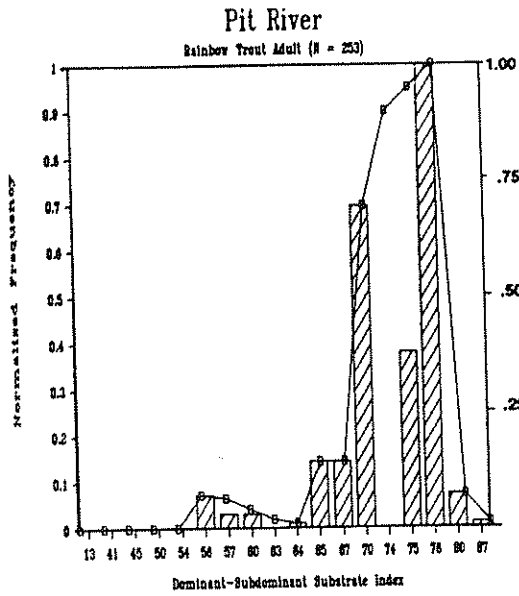


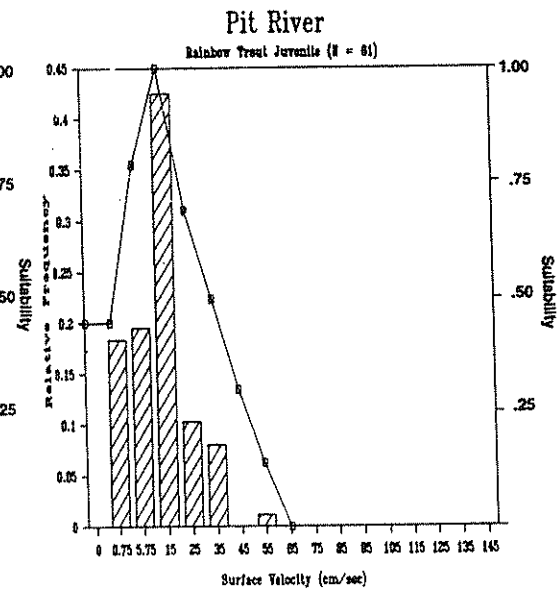
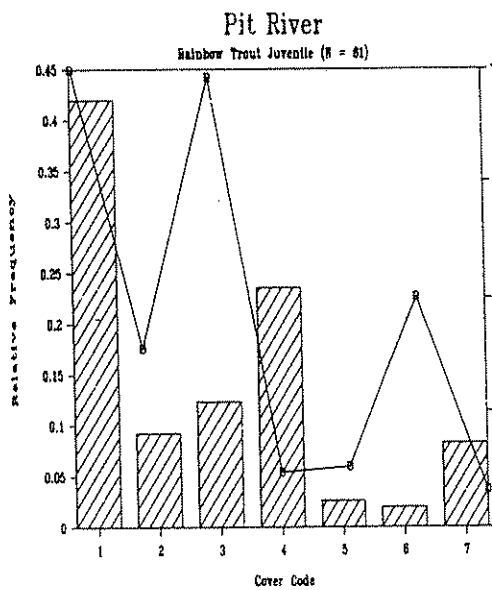
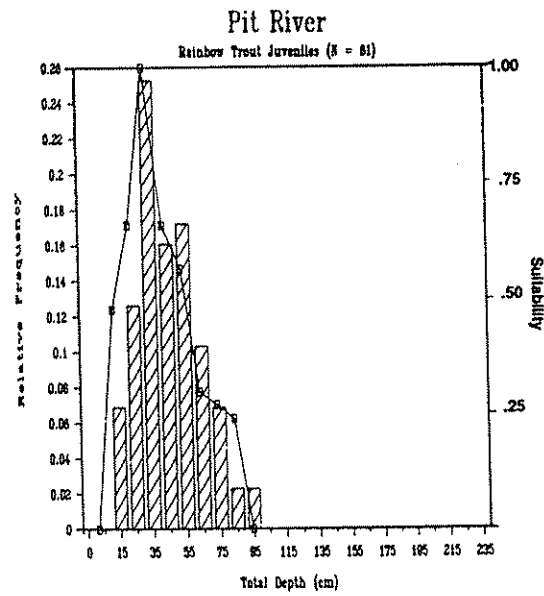
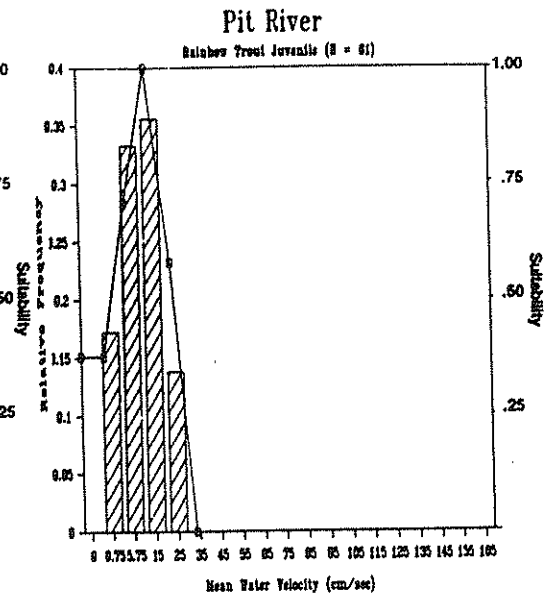
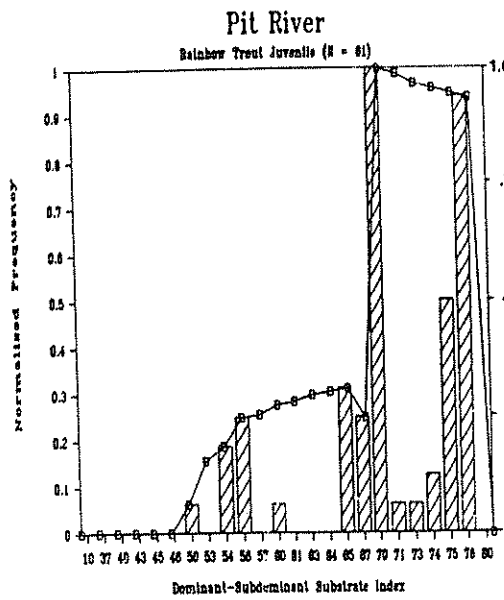
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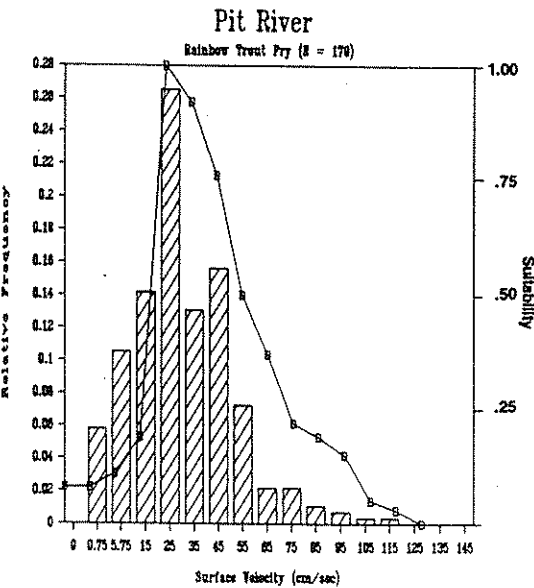
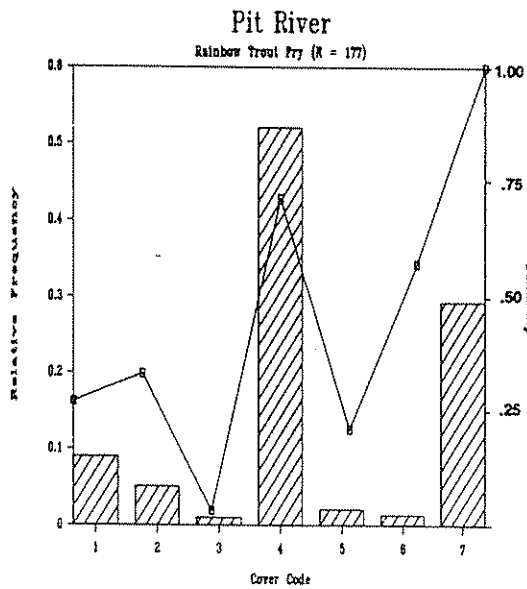
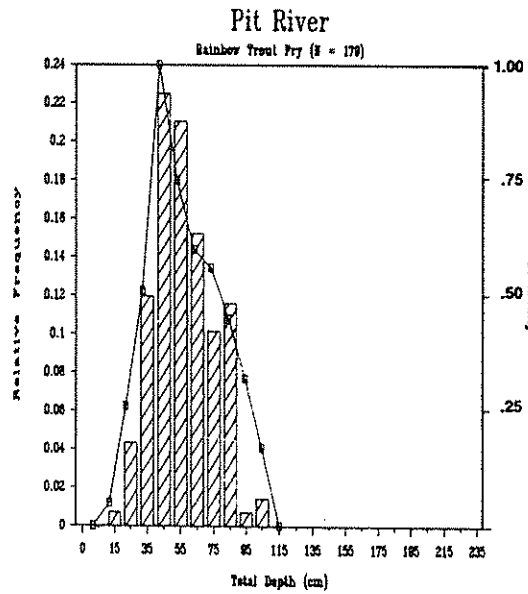
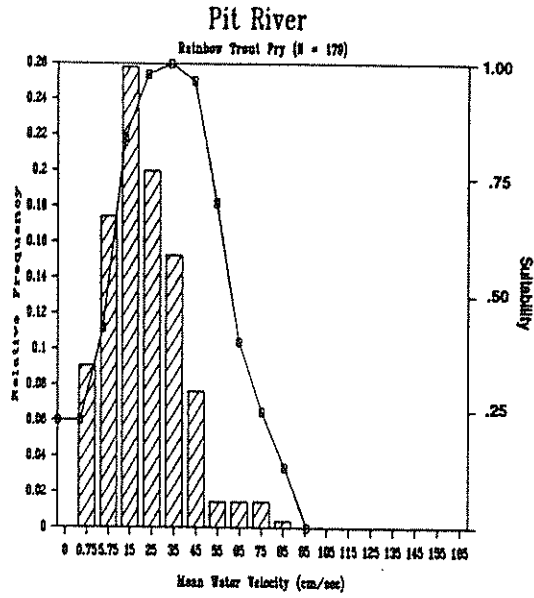
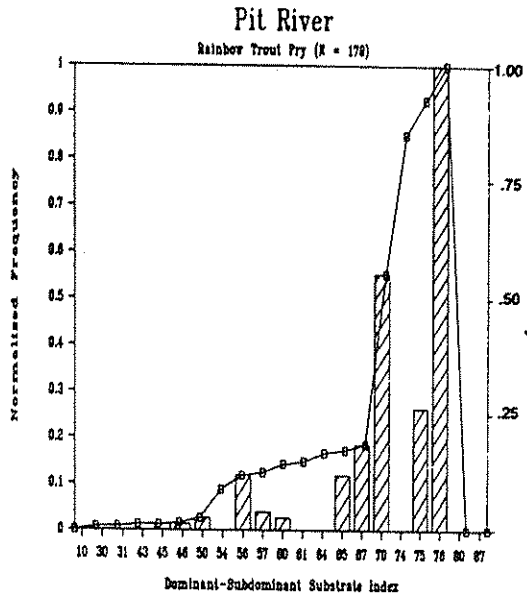


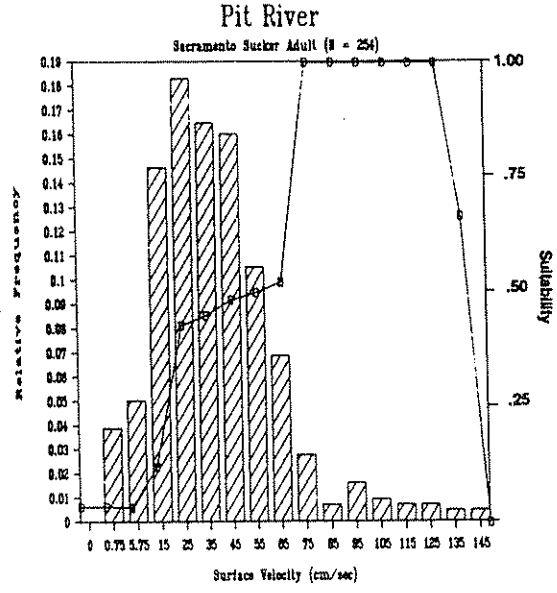
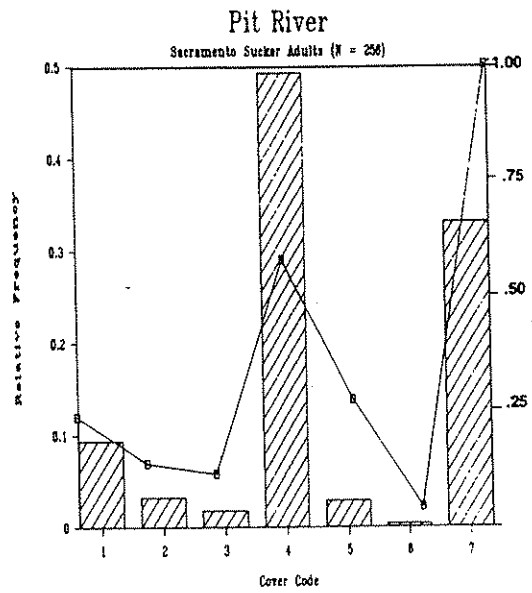
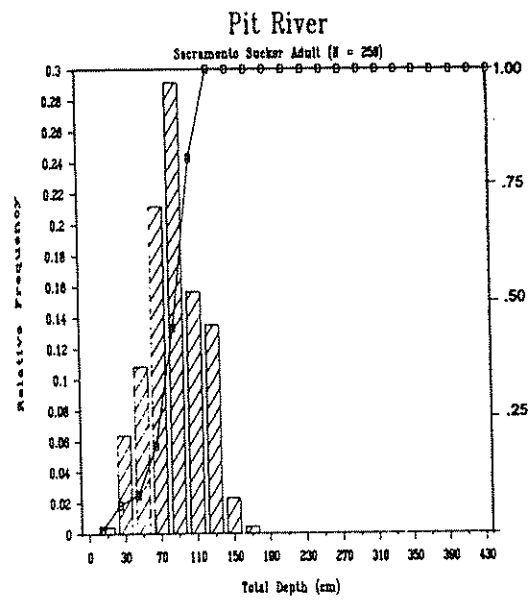
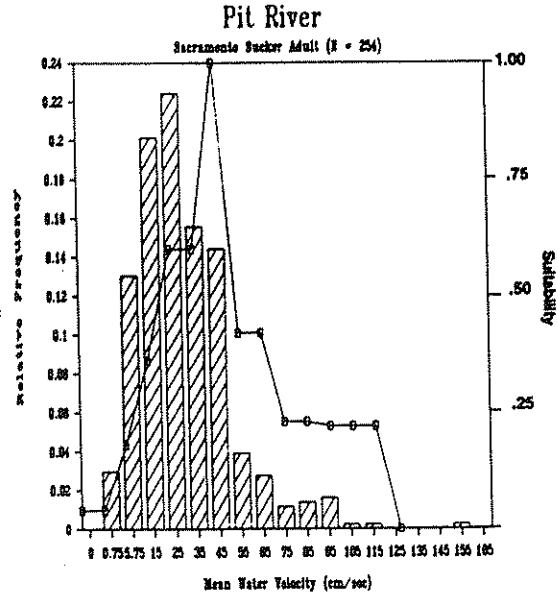
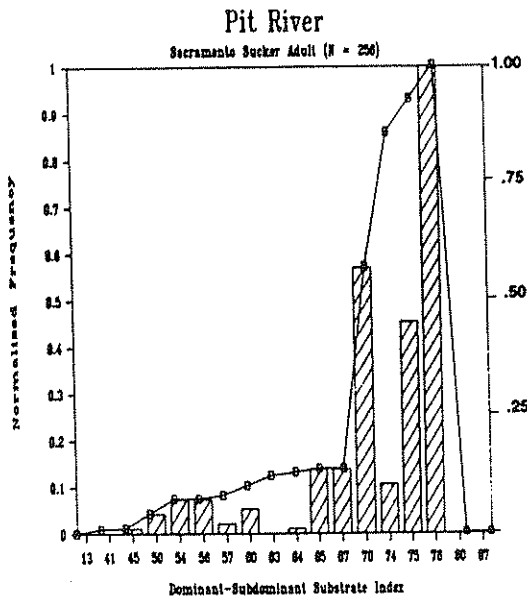
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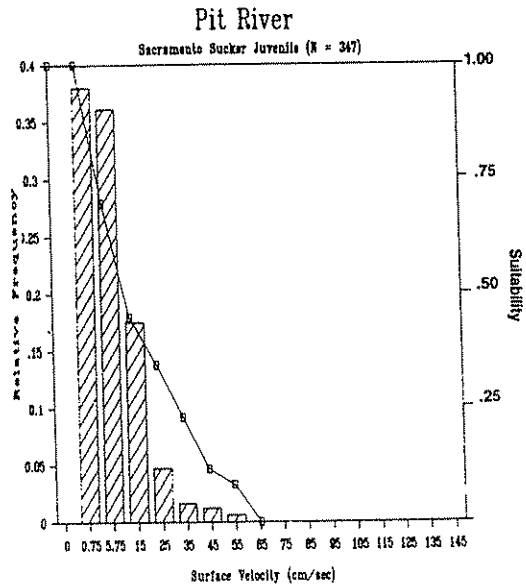
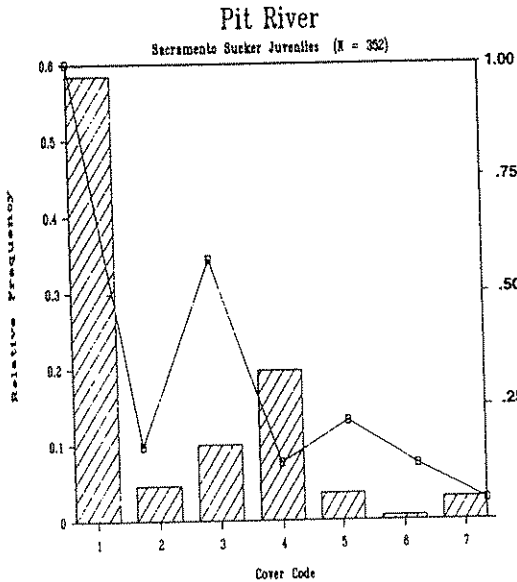
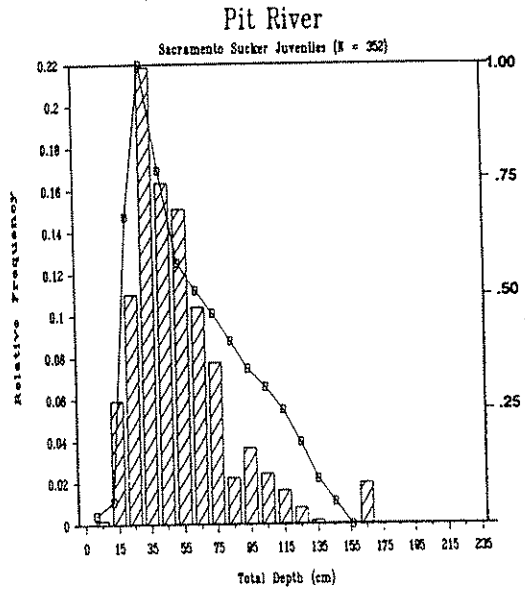
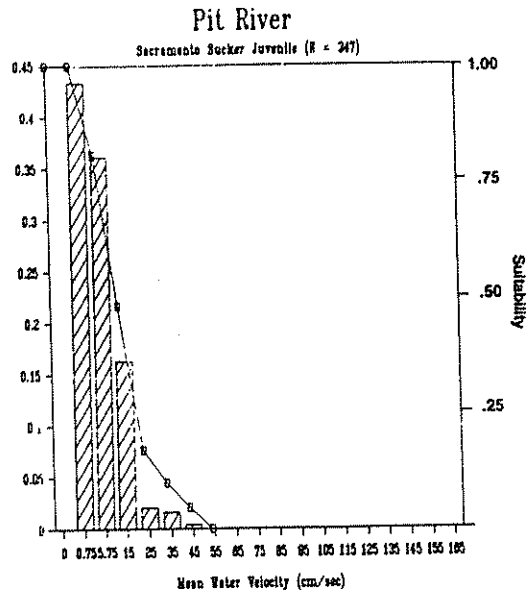
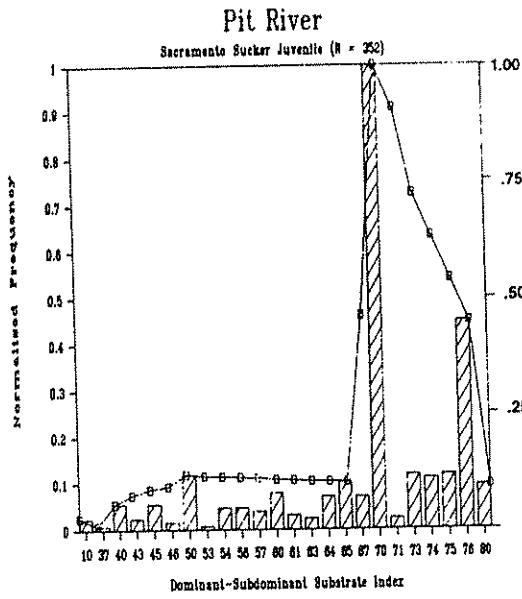




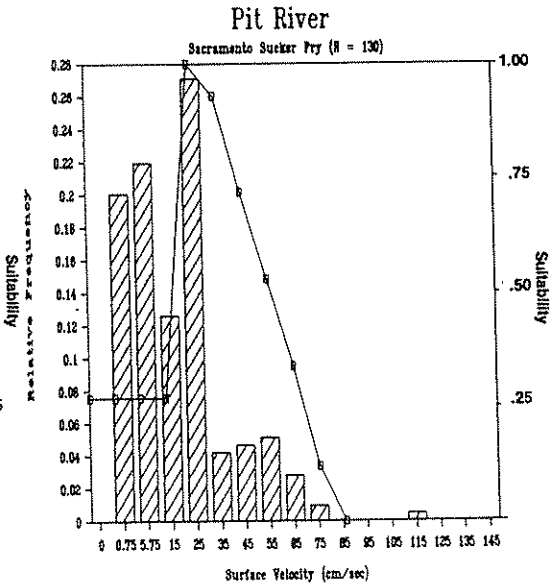
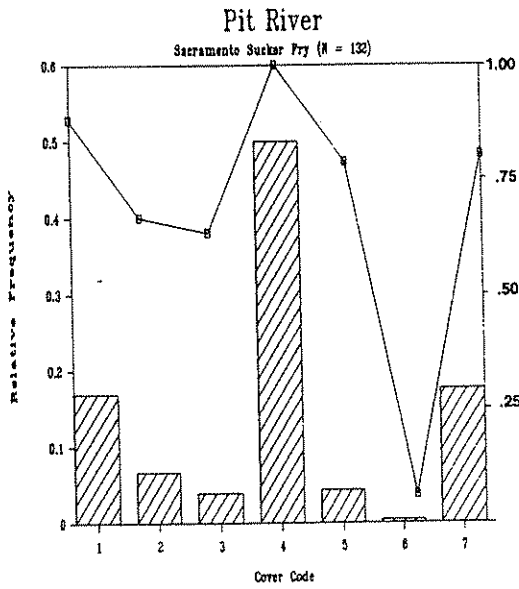
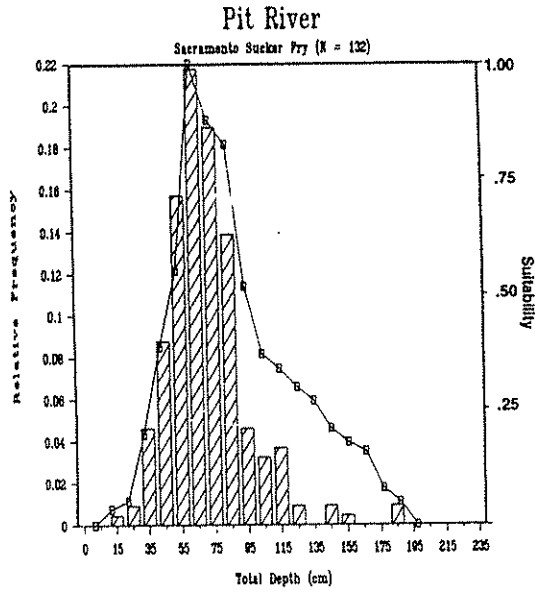
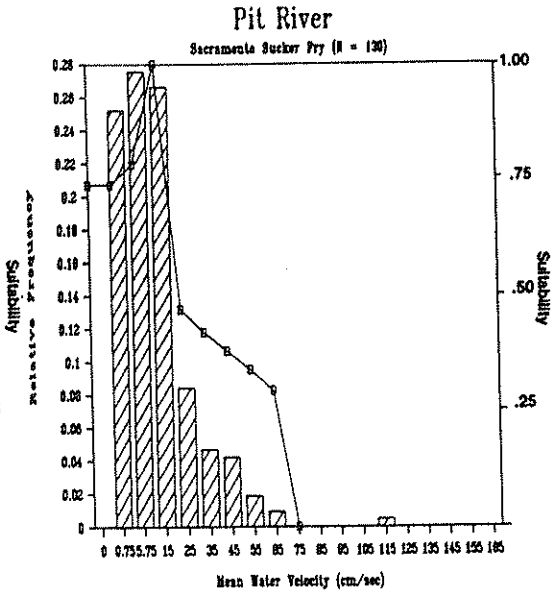
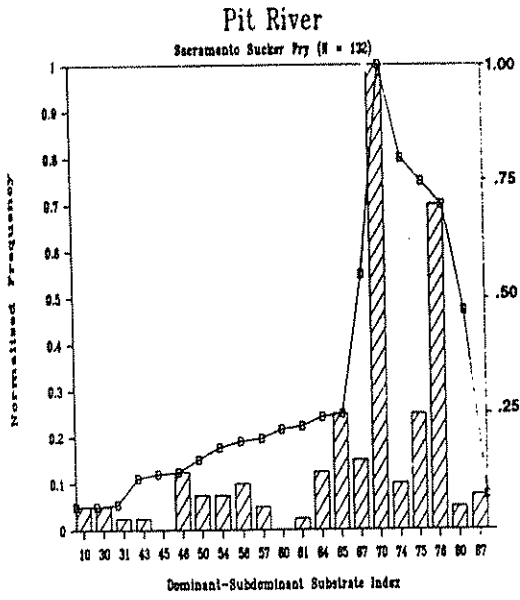


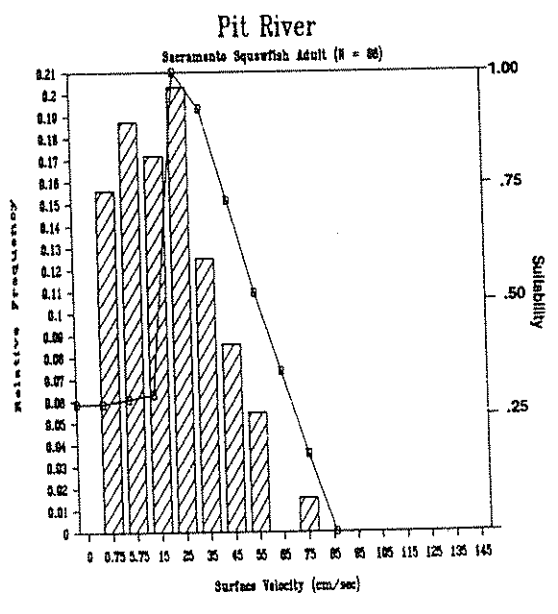
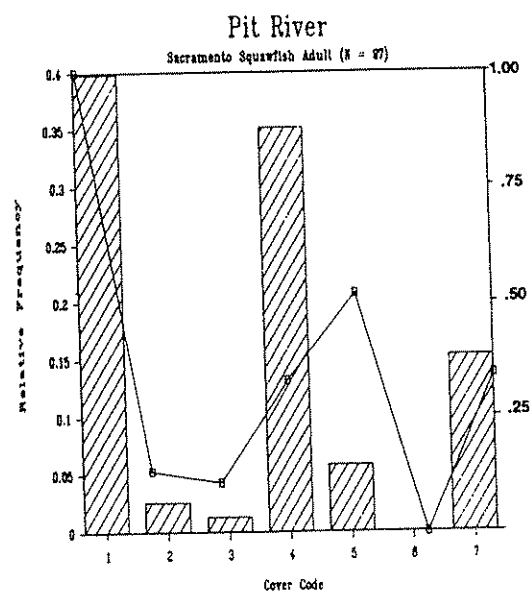
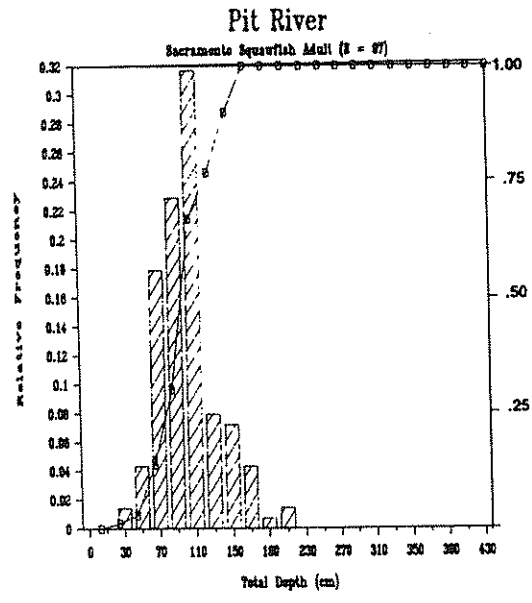
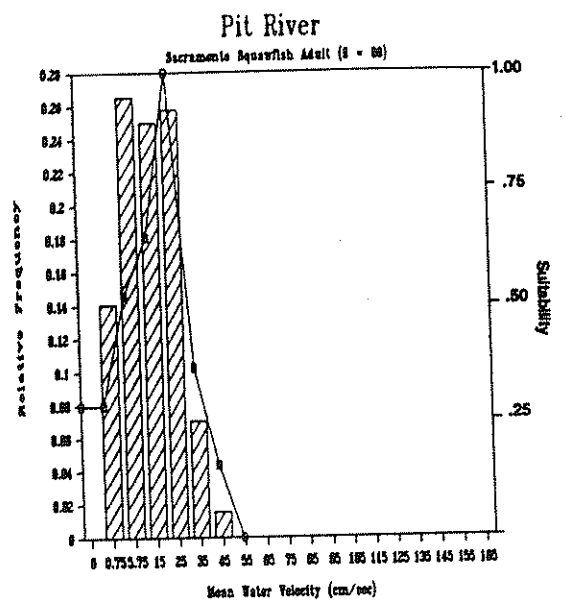
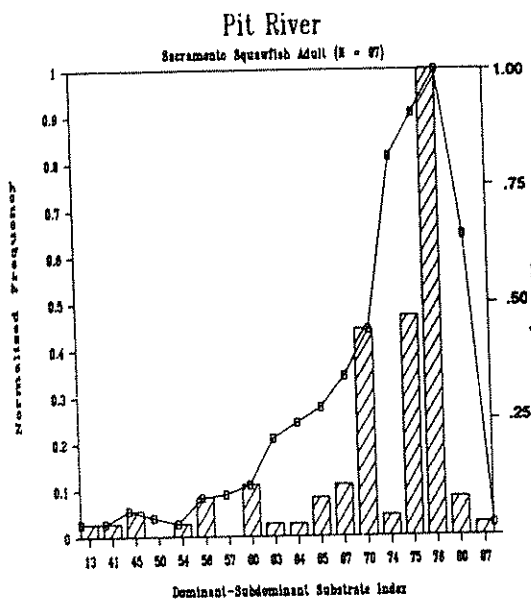


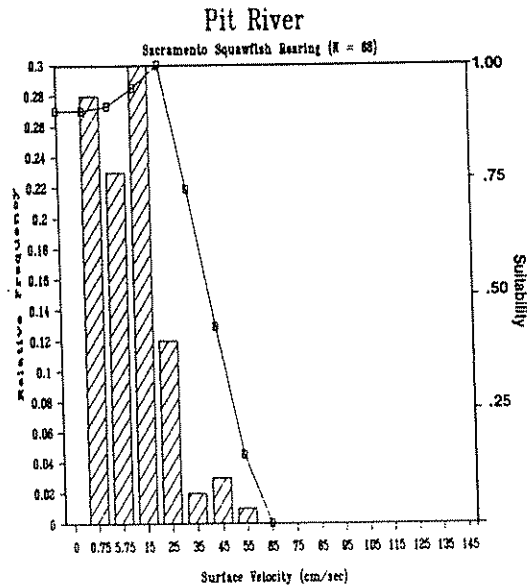
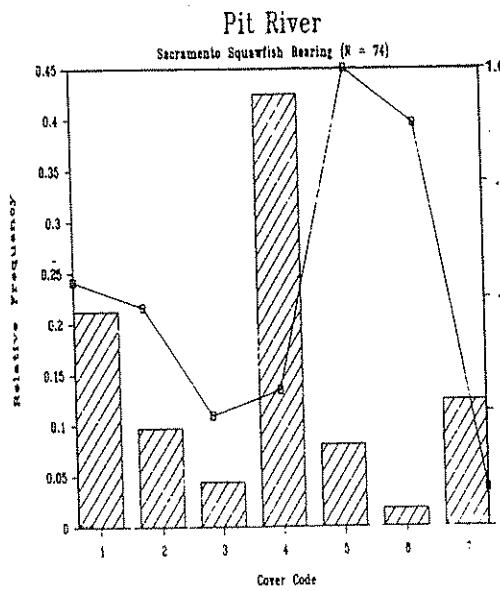
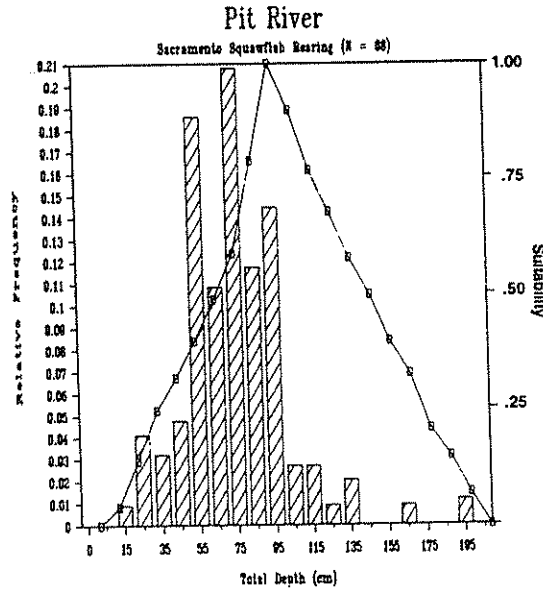
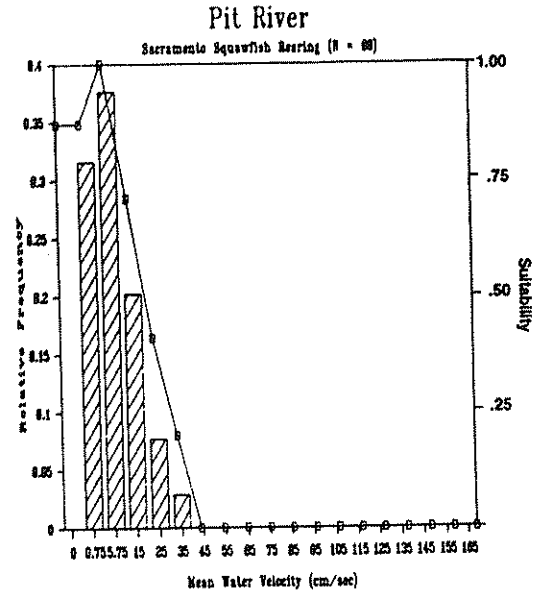
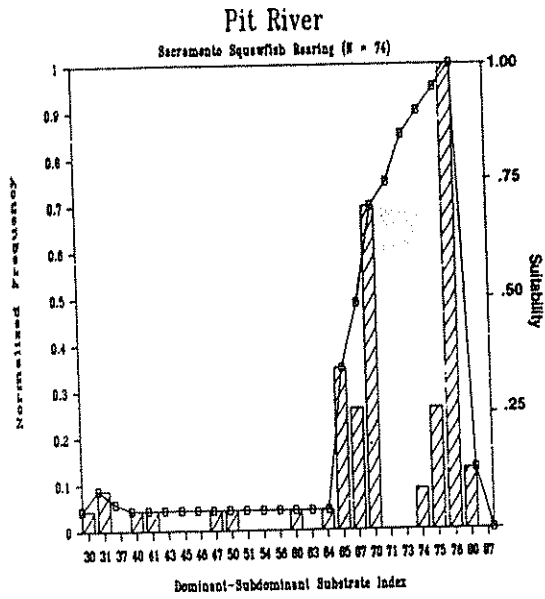


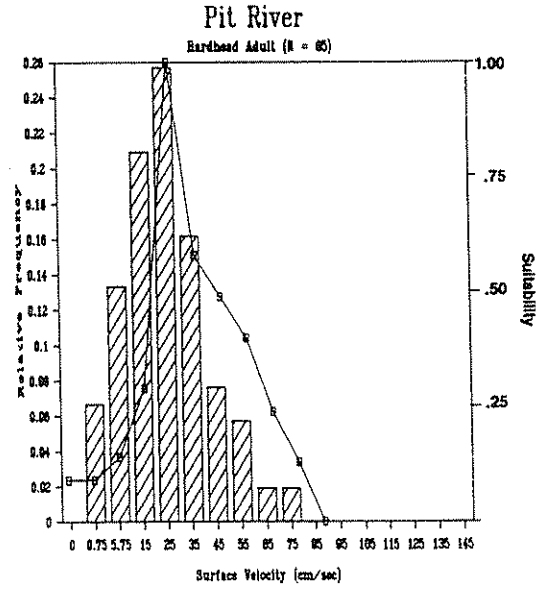
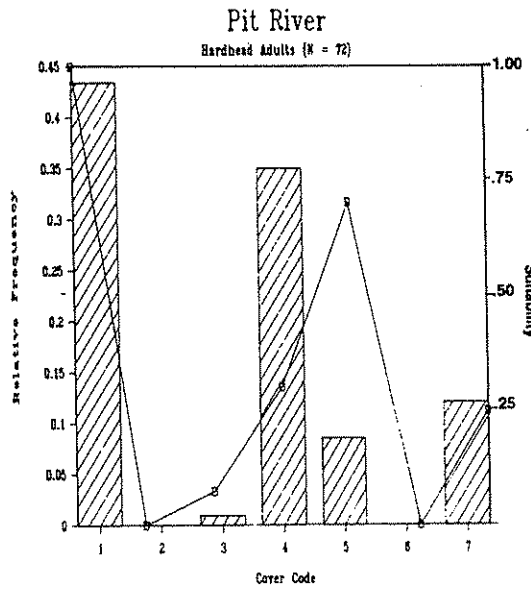
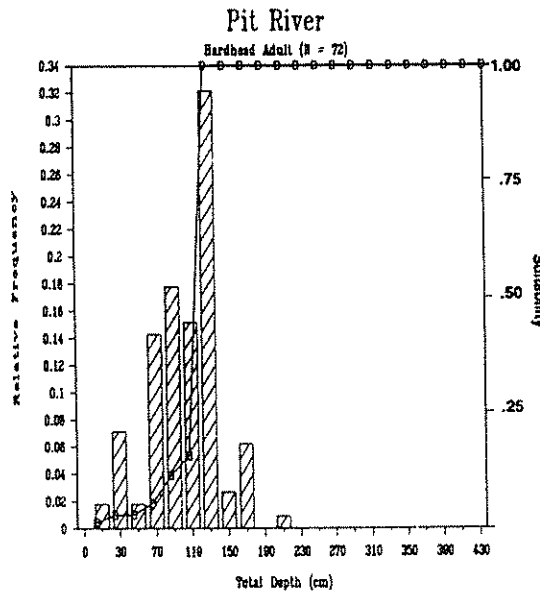
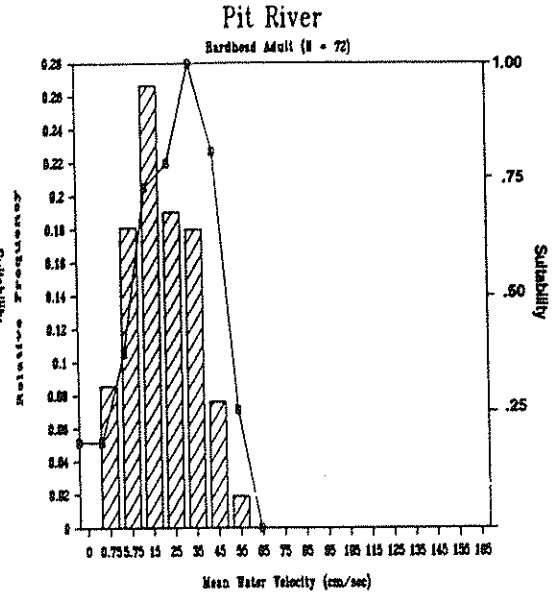
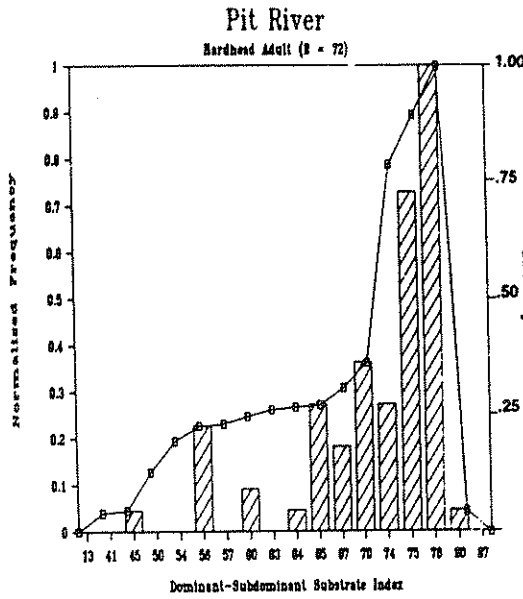


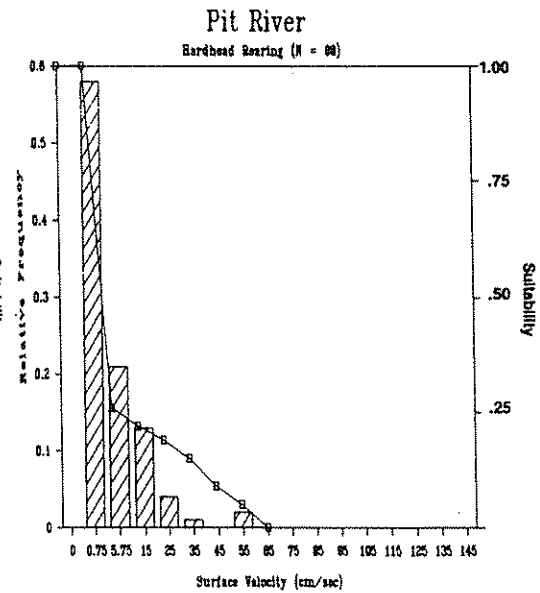
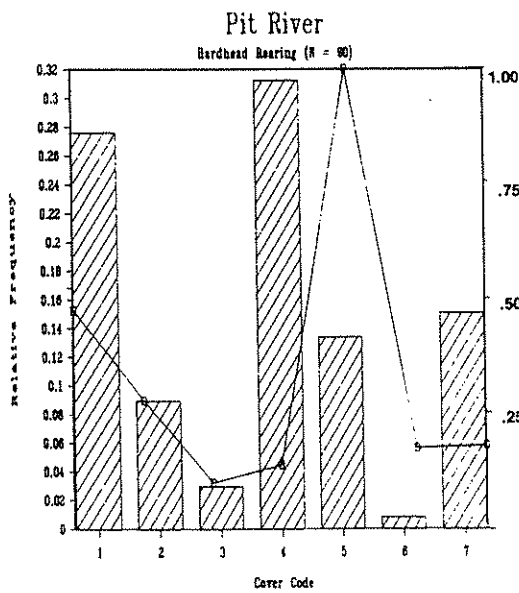
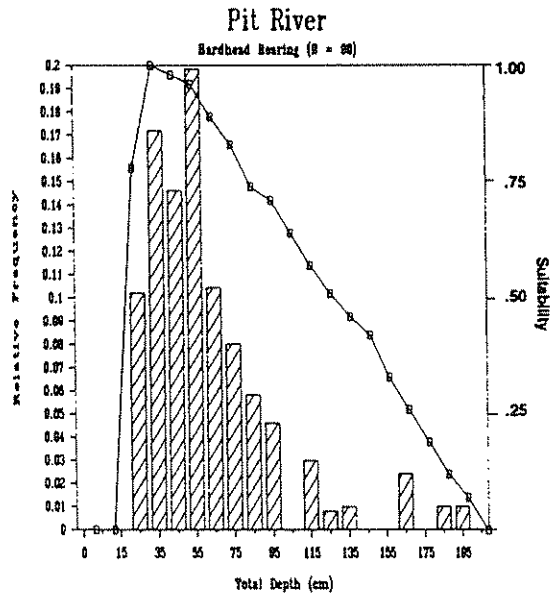
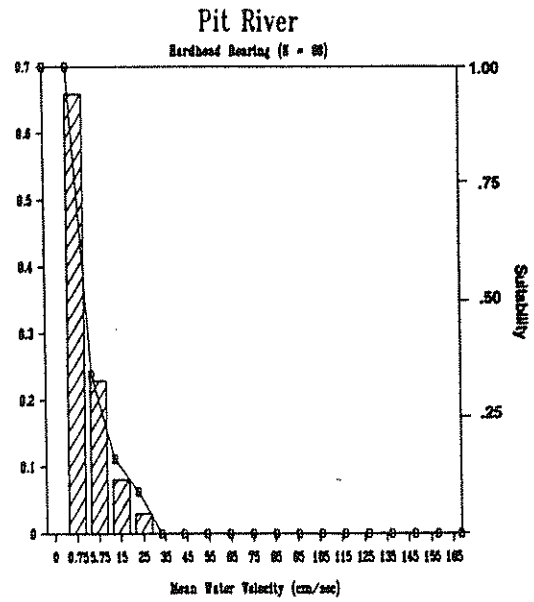
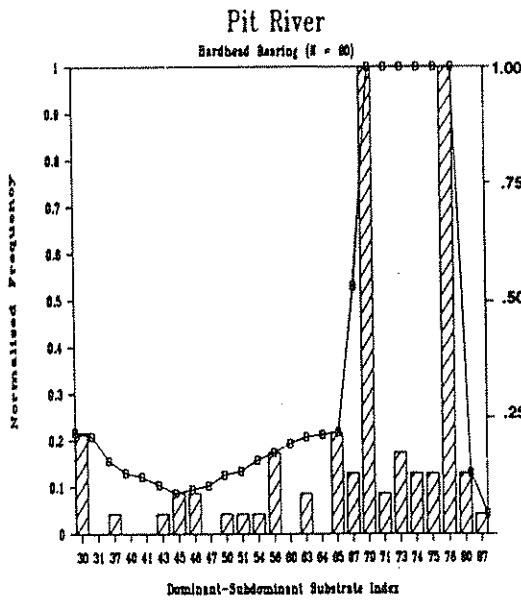




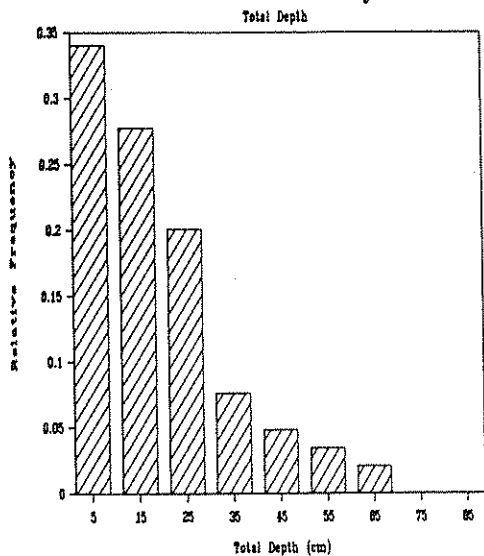




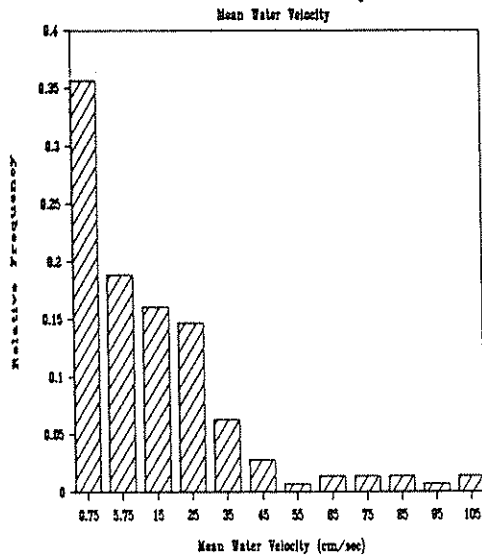




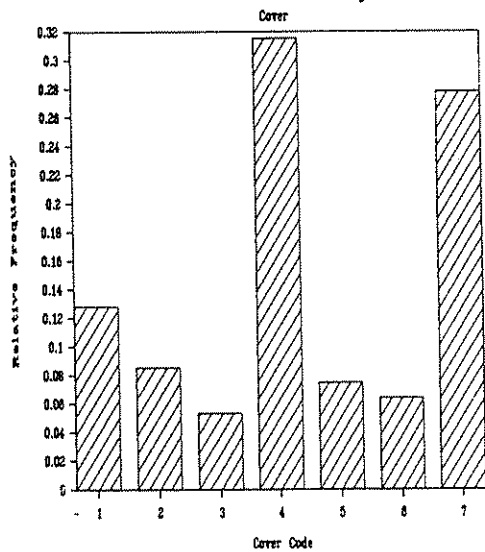
Rock Creek Availability Data



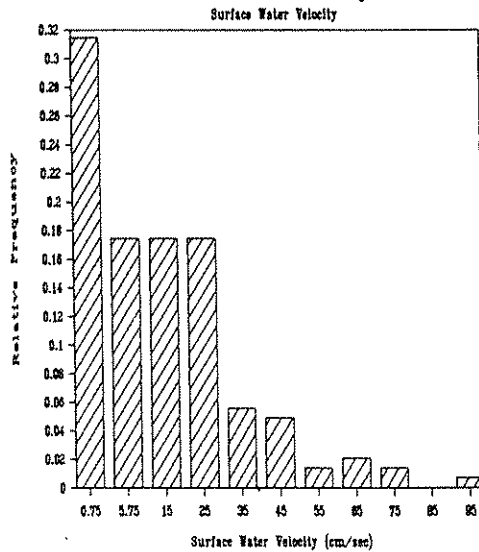
Rock Creek Availability Data



Rock Creek Availability Data



Rock Creek Availability Data





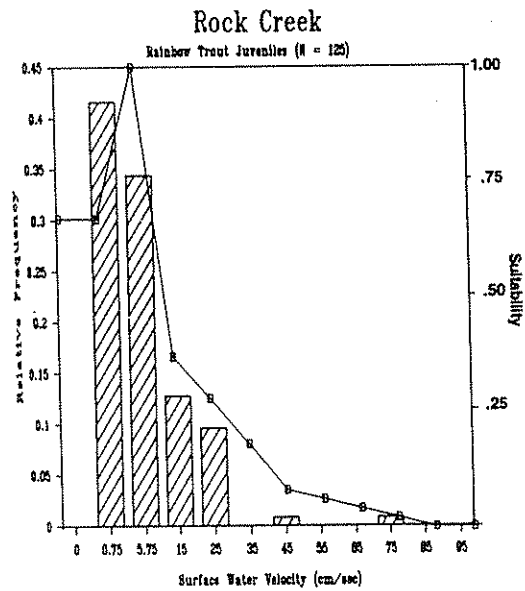
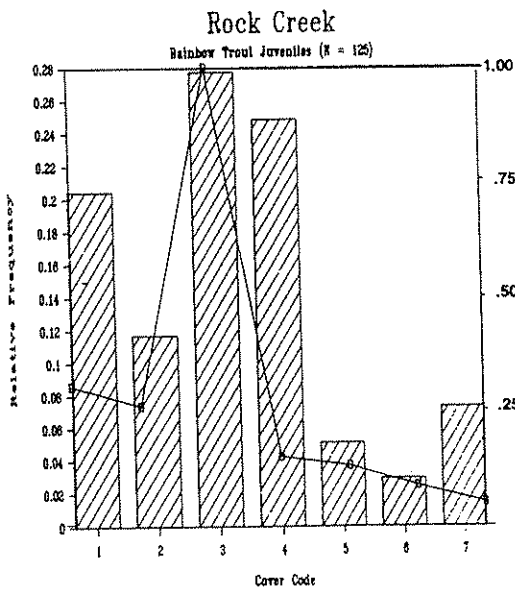
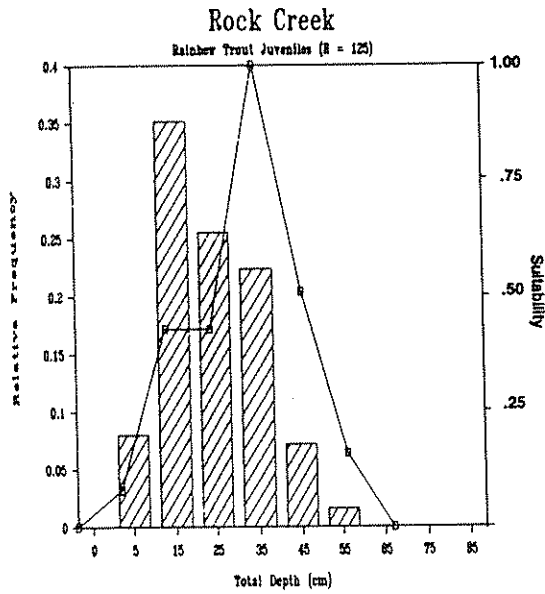
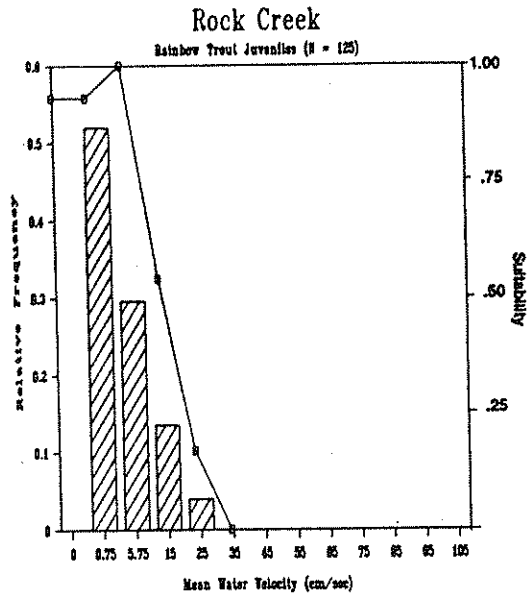
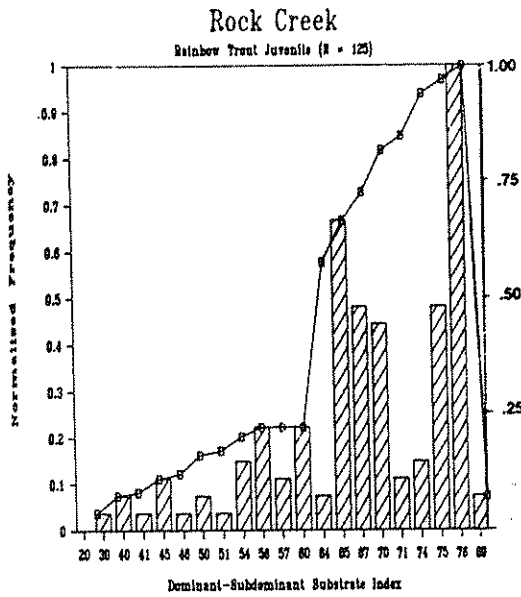




Table 5.4. Cover code suitabilities for rainbow trout adults.

Percent Occurrence of Cover (Decimal):			.0 = NO COVER			
.1 = 1 to 25%		.2 = 25 to 50%	.3 = 50 to 75%			
.4 = 75 to 100%		.5 = 30 to 69%	.6 = 70 to 100%			
Code	Description	Suitability	Code	Description	Suitability	
2.1	Small object	.27	25.61	Small object and OHV	.23	
2.2		.26	25.62		.23	
2.3		.25	25.63		.23	
2.4		.23	25.64		.23	
3.1	Medium object	.27	26.5	Small object & RWUCB	.28	
3.2		.26	26.6		.27	
3.3		.25	27.51	Small object and ST	.44	
3.4		.23			27.52	.61
4.1	OHV	.33	27.53	Medium and Large object	.81	
4.2		.37	27.54		1.00	
4.3		.41	27.61		.42	
4.4		.44			.61	
5.1		.22	27.63		.81	
5.2		.15	27.64		1.00	
5.3		.07	34.5		.31	
5.4		.00			34.6	.33
6.1	RWUCB	.30	35.51	Medium Object and OHV	.19	
6.2		.30			35.52	.11
6.3		.31			35.53	.11
6.4		.31			35.54	.11
7.0	NO COVER	.29	35.61	Medium object and RWUCB	.23	
7.1	Surface Turbulence	.46			35.62	.23
7.2		.64			35.63	.23
7.3		.82			35.64	.23
7.4		1.00				.23
23.5	Small and Medium object	.25	36.5	Medium object and RWUCB	.28	
23.6		.23	36.6		.27	
24.5	Small and Large object	.25	37.51	Medium object and ST	.44	
24.6		.33	37.52		.61	
			37.53		.81	
25.51	Small object and OHV	.19	37.54		1.00	
25.52		.11	37.61	.42		
25.53		.11		37.62	.61	
25.54		.11		37.63	.81	
				37.64	1.00	

Table 5.4. Cover code suitabilities for rainbow trout adults (continued).

Percent Occurrence of Cover (Decimal):			.0 = NO COVER		
.1 = 1 to 25%		.2 = 25 to 50%	.3 = 50 to 75%		
.4 = 75 to 100%		.5 = 30 to 69%	.6 = 70 to 100%		
Code	Description	Suitability	Code	Description	Suitability
45.51	Large object and OHV	.18	87.51	Small and Medium object and OHV	.19
45.52		.22	87.52		.11
45.53		.22	87.53		.11
45.54		.22	87.54		.11
45.61		.44	87.61		.23
45.62		.44	87.62		.23
45.63		.44	87.63		.23
45.64		.44	87.64		.23
46.5	Large object and RWUCB	.33	88.51	Small and Medium object and ST	.44
46.6		.37	88.52		.61
47.51	Large object and ST	.54	88.53		.81
47.52		.72	88.54		1.00
47.53		.86	88.61	.42	
47.54		1.00	88.62	.61	
47.61		.58	88.63		.81
47.62		.72	88.64		1.00
47.63		.86	89.51	Small and Large object and OHV	.23
47.64	1.00	89.52	.16		
57.11	OHV and ST	.39	89.53		.16
57.12		.57	89.54		.16
57.13		.82	89.61	.32	
57.14		1.00	89.62	.32	
57.51		.32	89.63		.32
57.52		.50	89.64		.32
57.53		.75	90.51	Small and Large object and ST	.48
57.54	1.00	90.52	.66		
57.61		.25	90.53		.83
57.62		.50	90.54		1.00
57.63		.75	90.61		.49
57.64		1.00	90.62		.66
65.51	RWUCB and OHV	.23	90.63		.83
65.52		.15	90.64		1.00
65.53		.15	91.51	Small object	.21
65.54		.15	91.52	RWUCB and OHV	.13
65.61		.31	91.53		.13
65.62		.31	91.54		.13
65.63		.31			
65.64		.31			

Table 5.4. Cover code suitabilities for rainbow trout adults (concluded).

Percent Occurrence of Cover (Decimal):			.0 = NO COVER		
.1 = 1 to 25%		.2 = 25 to 50%	.3 = 50 to 75%		.6 = 70 to 100%
.4 = 75 to 100%		.5 = 30 to 69%			
Code	Description	Suitability	Code	Description	Suitability
91.61	Small object	.27	95.61	Medium object	.27
91.62	RWUCB and OHV	.27	95.62	RWUCB and OHV	.27
91.63		.27	95.63		.27
91.64		.27	95.64		.27
92.51	Small object	.39	96.51	Medium object	.39
92.52	RWUCB and ST	.63	96.52	RWUCB and ST	.63
92.53		.82	96.53		.82
92.54		1.00	96.54		1.00
92.61		.45	96.61		.45
92.62		.63	96.62		.63
92.63		.82	96.63		.82
92.64		1.00	96.64		1.00
93.51	Medium and Large	.40	97.55 <sup>1</sup>	Large object	.72
93.52	object and OHV	.16	97.56	OHV and ST	1.00
93.53		.16	97.65 <sup>2</sup>		.72
93.54		.16	97.66		1.00
93.61		.32	98.51	Large object	.26
93.62		.32	98.52	RWUCB and OHV	.19
93.63		.32	98.53		.19
93.64		.32	98.54		.19
94.51	Medium and Large	.48	98.61		.37
94.52	object and ST	.66	98.62		.37
94.53		.83	98.63		.37
94.54		1.00	98.64		.37
94.61		.49	99.51	Large object	.51
94.62		.66	99.52	RWUCB and ST	.69
94.63		.83	99.53		.84
94.64		1.00	99.54		1.00
95.51	Medium object	.21	99.61		.53
95.52	RWUCB and OHV	.13	99.62		.69
95.53		.13	99.63		.89
95.54		.13	99.64		1.00

1 Code 97.5 assumes 50% coverage by large object	Both assume dominance by best cover type (i.e., OHV or ST)
2 Code 97.6 assumes 100% coverage by large object	

Table 5.4. Cover code suitabilities for rainbow trout juveniles.

Percent Occurrence of Cover (Decimal):			.0 = NO COVER			
.1 = 1 to 25%		.2 = 25 to 50%	.3 = 50 to 75%		.6 = 70 to 100%	
.4 = 75 to 100%		.5 = 30 to 69%				
Code	Description	Suitability	Code	Description	Suitability	
2.1	Small object	.86	25.61	Small object and OHV	.45	
2.2		.77	25.62		.45	
2.3		.58	25.63		.45	
2.4		.45	25.64		.45	
3.1	Medium object	1.00	26.5	Small object & RWUCB	.75	
3.2		1.00	26.6		.50	
3.3		.99	27.51	Small object and ST	.52	
3.4		.99			27.52	.31
4.1	OHV	.81	27.53	Medium and Large object	.31	
4.2		.61	27.54		.31	
4.3		.41	27.61		.45	
4.4		.21			27.61	.45
5.1		.81	27.63		.45	
5.2		.61	27.64		.45	
5.3		.61	34.5		Medium and Large object	.80
5.4		.22				34.6
6.1	RWUCB	.88	35.51	Medium Object and OHV	.80	
6.2		.77			35.52	.61
6.3		.66			35.53	.61
6.4		.55			35.54	.61
7.0	NO COVER	1.00	35.61	Surface Turbulence	.99	
7.1	Surface Turbulence	.79				
7.2	.59	35.62				
7.3	.38	35.63				
7.4	.18	35.64				
23.5	Small and Medium object	.86	36.5	Medium object and RWUCB	.89	
23.6		.72	36.6		.77	
24.5	Small and Large object	.63	37.51	Medium object and ST	.79	
24.6		.33	37.52		.59	
25.51		Small object and OHV	.53		37.53	.59
25.52			.33		37.54	.59
25.53	.33		37.61	.99		
25.54	.33		37.62	.99		
			37.63	.99		
			37.64	.99		

Table 5.4. Cover code suitabilities for rainbow trout juveniles (continued).

Percent Occurrence of Cover (Decimal):				.0 = NO COVER	
.1 = 1 to 25%		.2 = 25 to 50%		.3 = 50 to 75%	
.4 = 75 to 100%		.5 = 30 to 69%		.6 = 70 to 100%	
Code	Description	Suitability	Code	Description	Suitability
45.51	Large object and OHV	.61	87.51	Small and Medium object and OHV	.67
45.52		.21	87.52		.47
45.53		.21	87.53		.47
45.54		.22	87.54		.47
45.61		.21	87.61		.72
45.62		.21	87.62		.72
45.63		.21	87.63		.72
45.64		.21	87.64		.72
46.5	Large object and RWUCB	.69	88.51	Small and Medium object and ST	.65
46.6		.38	88.52		.45
			88.53		.45
			88.54		.45
47.51	Large object and ST	.40			
47.52		.19			
47.53		.19	88.61		.72
47.54		.19	88.62		.72
			88.63		.72
47.61		.21	88.64		.72
47.62		.21			
47.63		.21	89.51	Small and Large object and OHV	.47
47.64		.21	89.52		.27
			89.53		.27
			89.54		.27
57.11	OHV and ST	.35			
57.12		.39			
57.13		.19	89.61		.33
57.14		.19	89.62		.33
			89.63		.33
57.51		.41	89.64		.33
57.52		.20			
57.53		.20	90.51	Small and Large object and ST	.46
57.54		.20	90.52		.25
			90.53		.25
			90.54		.25
57.61		.22			
57.62		.22			
57.63		.22	90.61		.33
57.64		.22	90.62		.33
			90.63		.33
			90.64		.33
65.51	RWUCB and OHV	.58			
65.52		.39			
65.53		.39	91.51	Small object RWUCB and OHV	.55
65.54		.39	91.52		.36
		91.53	.36		
		91.54	.36		
65.61		.55			
65.62		.55			
65.63		.55			
65.64		.55			

Table 5.4. Cover code suitabilities for rainbow trout juveniles (concluded).

Percent Occurrence of Cover (Decimal):			.0 = NO COVER		
.1 = 1 to 25%		.2 = 25 to 50%	.3 = 50 to 75%		
.4 = 75 to 100%		.5 = 30 to 69%	.6 = 70 to 100%		
Code	Description	Suitability	Code	Description	Suitability
91.61	Small object	.50	95.61	Medium object	.99
91.62	RWUCB and OHV	.50	95.62	RWUCB and OHV	.99
91.63		.50	95.63		.99
91.64		.50	95.64		.99
92.51	Small object	.55	96.51	Medium object	.68
92.52	RWUCB and ST	.34	96.52	RWUCB and ST	.47
92.53		.34	96.53		.47
92.54		.34	96.54		.47
92.61		.50	96.61		.77
92.62		.50	96.62		.77
92.63		.50	96.63		.77
92.64		.50	96.64		.77
93.51	Medium and Large	.61	97.55 <sup>1</sup>	Large object	.21
93.52	object and OHV	.41	97.56	OHV and ST	.21
93.53		.41	97.65		.21
93.54		.41	97.66		.21
93.61		.60	98.51	Large object	.49
93.62		.60	98.52	RWUCB and OHV	.30
93.63		.60	98.53		.30
93.64		.60	98.54		.30
94.51	Medium and Large	.59	98.61		.38
94.52	object and ST	.39	98.62		.38
94.53		.39	98.63		.38
94.54		.39	98.64		.38
94.61		.60	99.51	Large object	.49
94.62		.60	99.52	RWUCB and ST	.28
94.63		.60	99.53		.28
94.64		.60	99.54		.28
95.51	Medium object	.69	99.61		.38
95.52	RWUCB and OHV	.49	99.62		.38
95.53		.49	99.63		.38
95.54		.49	99.64		.38

<sup>1</sup> Assume mean of OHV and ST

Table 5.4. Cover code suitabilities for rainbow trout fry (Rock Creek).

Percent Occurrence of Cover (Decimal):					
.1 = 1 to 25%		.2 = 25 to 50%		.0 = NO COVER	
.4 = 75 to 100%		.5 = 30 to 69%		.3 = 50 to 75%	
				.6 = 70 to 100%	
Code	Description	Suitability	Code	Description	Suitability
2.1	Small object	.47	25.61	Small object and OHV	.80
2.2		.58	25.62		.80
2.3		.69	25.63		.80
2.4		.80	25.64		.80
3.1	Medium object	.52	26.5	Small object & RWUCB	.53
3.2		.68	26.6		.70
3.3		.84			
3.4		1.00	27.51		Small object and ST
		27.52	.87		
4.1	.48	27.53	.91		
4.2	.61	27.54	.94		
4.3		.73			
4.4		.85	27.61		.83
			27.61		.87
5.1	OHV	.42	27.63		.91
5.2		.49	27.64		.94
5.3		.55			
5.4		.61	34.5	Medium and Large object	.64
		34.6	.93		
6.1	RWUCB	.42		Medium Object and OHV	.74
6.2		.48	35.51		.81
6.3		.54	35.52		.81
6.4		.60	35.53		.81
			35.54		.81
7.0	NO COVER	.36			
7.1	Surface Turbulence	.51	35.61		1.00
7.2		.65	35.62		1.00
7.3		.79	35.63		1.00
7.4		.94	35.64		1.00
23.5	Small and Medium object	.63	36.5	Medium object and RWUCB	.58
23.6		.90	36.6		.77
24.5	Small and Large object	.63	37.51	Medium object and ST	.83
24.6		.83	37.52		.97
			37.53		.97
			37.54		.97
25.51	Small object and OHV	.64			
25.52		.71			
25.53		.71	37.61		1.00
25.54		.71	37.62		1.00
			37.63		1.00
		37.64		1.00	

Table 5.4. Cover code suitabilities for rainbow trout fry (Rock Creek) (continued).

Percent Occurrence of Cover (Decimal):			.0 = NO COVER		
.1 = 1 to 25%			.2 = 25 to 50%		
.4 = 75 to 100%			.3 = 50 to 75%		
			.6 = 70 to 100%		
Code	Description	Suitability	Code	Description	Suitability
45.51	Large object and OHV	.67	87.51	Small and Medium object and OHV	.69
45.52		.73	87.52		.75
45.53		.73	87.53		.75
45.54		.73	87.54		.75
45.61		.85	87.61		.90
45.62		.85	87.62		.90
45.63		.85	87.63		.90
45.64		.85	87.64		.90
46.5	Large object and RWUCB	.54	88.51	Small and Medium object and ST	.77
46.6		.73	88.52		.92
			88.53		.93
47.51	Large object and ST	.75	88.54		.94
47.52		.89			
47.53		.92	88.61		.91
47.54		.94	88.62		.92
			88.63		.93
47.61		.87	88.64		.94
47.62		.89			
47.63		.92	89.51	Small and Large object and OHV	.66
47.64	.94	89.52			.72
		89.53			.72
		89.54			.72
57.11	OHV and ST	.57			
57.12		.71			
57.13		.86	89.61		.83
57.14		.94	89.62		.83
			89.63		.83
57.51		.63	89.64		.83
57.52		.77			
57.53		.86	90.51	Small and Large object and ST	.74
57.54	.94	90.52			.89
		90.53			.91
		90.54			.94
57.61		.69			
57.62		.77			
57.63		.86	90.61		.86
57.64		.94	90.62		.89
			90.63		.91
65.51	RWUCB and OHV	.54	90.64		.94
65.52		.61			
65.53		.61	91.51	Small object	.59
65.54		.61	91.52	RWUCB and OHV	.65
			91.53		.65
65.61		.60	91.54		.65
65.62		.61			
65.63		.61			
65.64		.61			



Table 5.4. Cover code suitabilities for rainbow trout fry (Rock Creek) (concluded).

Percent Occurrence of Cover (Decimal):			.0 = NO COVER		
.1 = 1 to 25%		.2 = 25 to 50%	.3 = 50 to 75%		
.4 = 75 to 100%		.5 = 30 to 69%	.6 = 70 to 100%		
Code	Description	Suitability	Code	Description	Suitability
91.61	Small object	.70	95.61	Medium object	.80
91.62	RWUCB and OHV	.70	95.62	RWUCB and OHV	.80
91.63		.70	95.63		.80
91.64		.70	95.64		.80
92.51	Small object	.67	96.51	Medium object	.73
92.52	RWUCB and ST	.82	96.52	RWUCB and ST	.87
92.53		.88	96.53		.91
92.54		.94	96.54		.94
92.61		.76	96.61		.83
92.62		.82	96.62		.87
92.63		.88	96.63		.91
92.64		.94	96.64		.94
93.51	Medium and Large	.71	97.55 <sup>1</sup>	Large object	.89
93.52	object and OHV	.77	97.56	OHV and ST	.94
93.53		.77	97.65		.89
93.54		.77	97.66		.94
93.61		.93	98.51	Large object	.61
93.62		.93	98.52	RWUCB and OHV	.67
93.63		.93	98.53		.67
93.64		.93	98.54		.67
94.51	Medium and Large	.79	98.61		.73
94.52	object and ST	.93	98.62		.73
94.53		.94	98.63		.73
94.54		.94	98.64		.73
94.61		.93	99.51	Large object	.69
94.62		.93	99.52	RWUCB and ST	.83
94.63		.94	99.53		.89
94.64		.94	99.54		.94
95.51	Medium object	.84	99.61		.78
95.52	RWUCB and OHV	.71	99.62		.83
95.53		.71	99.63		.89
95.54		.71	99.64		.94

<sup>1</sup> Assume dominance by ST

Velocity (ft/sec)

Spawning Rainbow

Pit River 1985

0	0
0.5	0
1	0.58
1.4	1
1.9	1
2.2	0.96
2.3	0.68
2.8	0.4
3.2	0

Depth (ft)

Pit River 1985

0	0
0.3	0
0.4	0.2
0.6	1
0.8	1
1	0.88
1.6	0.3
2	0.14
3	0

Velocity (ft/sec)

Fry Rainbow

Pit River 1985

0	0.38
0.02	0.38
0.19	0.71
0.49	1
0.82	0.38
1.15	0

Depth (ft)

Pit River 1985

0	0
0.16	0
0.49	0.48
0.82	0.65
1.15	1
1.48	0.66
1.8	0.56
2.13	0.43
2.46	0.3
2.79	0.27
3.12	0.24
3.44	0

Velocity (ft/sec)

Juvenile Rainbow

Pit River 1985

0	0.23
0.02	0.23
0.19	0.45
0.49	0.84
0.82	0.98
1.15	1
1.48	0.96
1.8	0.7
2.13	0.4
2.46	0.25
2.79	0.13
3.12	0

Depth

Pit River 1985

0	0
0.16	0
0.49	0.05
0.82	0.26
1.15	0.51
1.48	1
1.8	0.75
2.13	0.69
2.46	0.56
2.79	0.45
3.12	0.32
3.44	0.17
3.77	0

Adult	Velocity (ft/sec)		Depth	
	Pit River 1985	Rainbow	Pit River 1985	
	0	0.07	0	0
	0.02	0.07	0.32	0
	0.19	0.35	0.98	0.07
	0.49	0.37	1.64	0.33
	0.82	0.79	2.3	0.66
	1.14	0.79	2.95	1
	1.48	1	3.61	1
	1.8	0.76	4.26	1
	2.13	0.42	4.92	1
	2.46	0.2	5.58	1
	2.79	0.18	6.23	1
	3.11	0.08	6.89	1
	3.44	0.06		
	3.77	0.05		
	4.1	0.03		
	4.43	0.03		
	4.76	0		