F-09-10

Fish Trapping Results

Red Rock Creek

April 28 - June 14

1996

Prepared by

Jim T. Mogen

July 28, 1996

The Red Rock Creek fish trap was installed 28 April, eight days prior to complete ice-off of the Upper Lake. Unlike previous years, the trap was only maintained throughout the upstream migration period of Arctic grayling. The first grayling was captured 1 May, however, the bulk of grayling movement did not begin until late May (Figure 1). Upstream movement peaked with the capture of 27 grayling on 4 June. The trap was removed 14 June after upstream migration appeared to have ended. During the six-week trapping period, a total of 140, upstream-migrating, adult grayling were captured compared to 54 in 1995 and 116 in 1994 (Table 1). Only five downstream migrants were captured before the trap was removed. Only 19 (14%) of the 1996 grayling possessed tags or marks from the two previous years. No grayling were observed in any of the other historic spawning tributaries of the upper Centennial Valley in 1996.

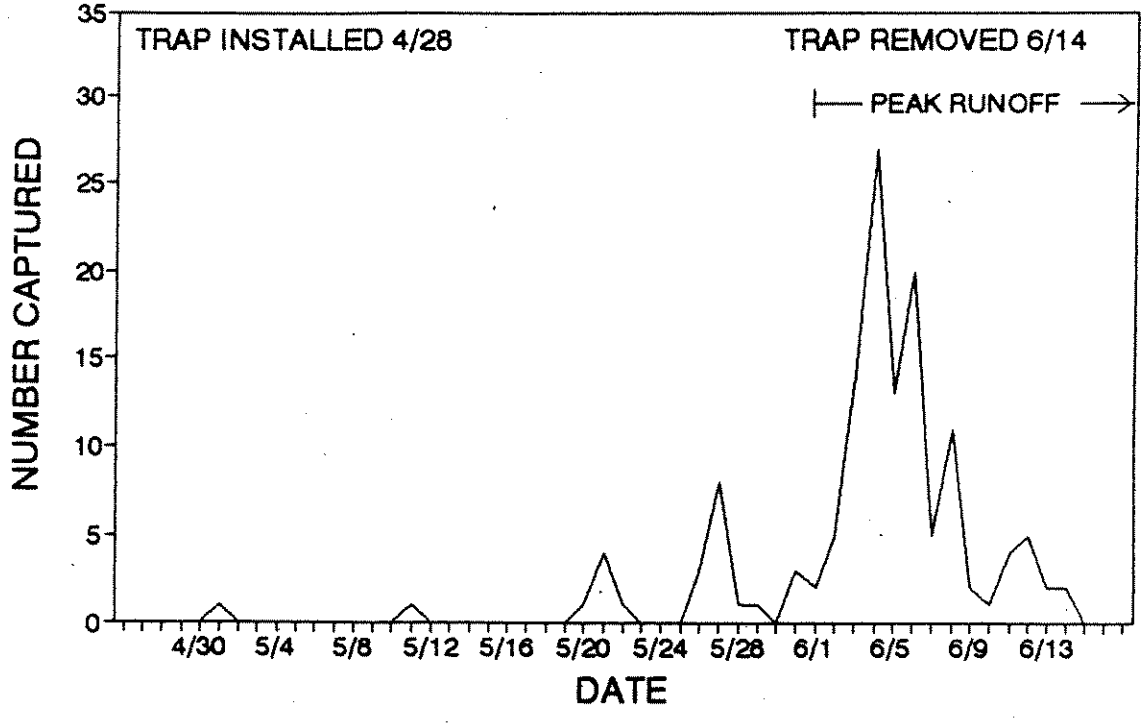

Figure 1. Chronology of Arctic grayling upstream movement in Red Rock Creek, 4/28-6/14, 1996.

Table 1. Numbers, sex ratios, and means and ranges of total length (mm) and pre-spawning weight (g) of all adult Arctic grayling captured during spawning runs in Red Rock Creek, 1994-1996.

	1994			1995			1996		
	Male	Female	Combined	Male	Female	Combined	Male	Female	Combined
Total Number*	86	155	241	27	58	85	55	85	140
Sex Ratio			1:1.8			1:2.1			1:1.6
Mean Length	378	392	387	357	357	357	356	353	354
(s.d.)	(38.2)	(37.9)	(32.6)	(34.5)	(42.0)	(38.0)	(29.8)	(28.17)	(28.8)
range	300-430	311-436	300-436	297-426	263-425	263-426	317-432	300-440	300-440
Pre-spawn Condition									
Number measured	43	73	116	15	39	54	55	85	140
Mean Weight	638	767	719	510	521	518	499	524	514
(s.d.)	(156.8)	(118.8)	(147.9)	(98.0)	(170.1)	(153.6)	(151.7)	(142.9)	(146.4)
range	255-865	290-990	255-990	305-710	225-860	225-860	294-1030	318-1021	295-1030

* Total number includes upstream and downstream migrants for 1994 and 1995 but only upstream migrants for 1996.

The 1996 sex ratio was similar to 1994 but substantially less than 1995 with females only outnumbering males in the run by a ratio 1.6 to 1.0. Average sizes, however, were more similar to those of 1995 (Table 1). Male total lengths averaged 356 mm and ranged from 317 to 432 while females averaged 353 mm and varied from 300 to 440. The 1996 spawning run appeared to be dominated by younger fish. Over 70 percent of the grayling measured less than 370 mm in total length, corresponding to ages II-III (based on 1994-95 age/growth data). Length frequency distributions (Figures 2 and 3) suggest relatively strong classes of younger aged fish and depict a shift in age structure from older fish to younger fish. All ages from II-VII, however, appeared to be represented in the 1996 spawning run.

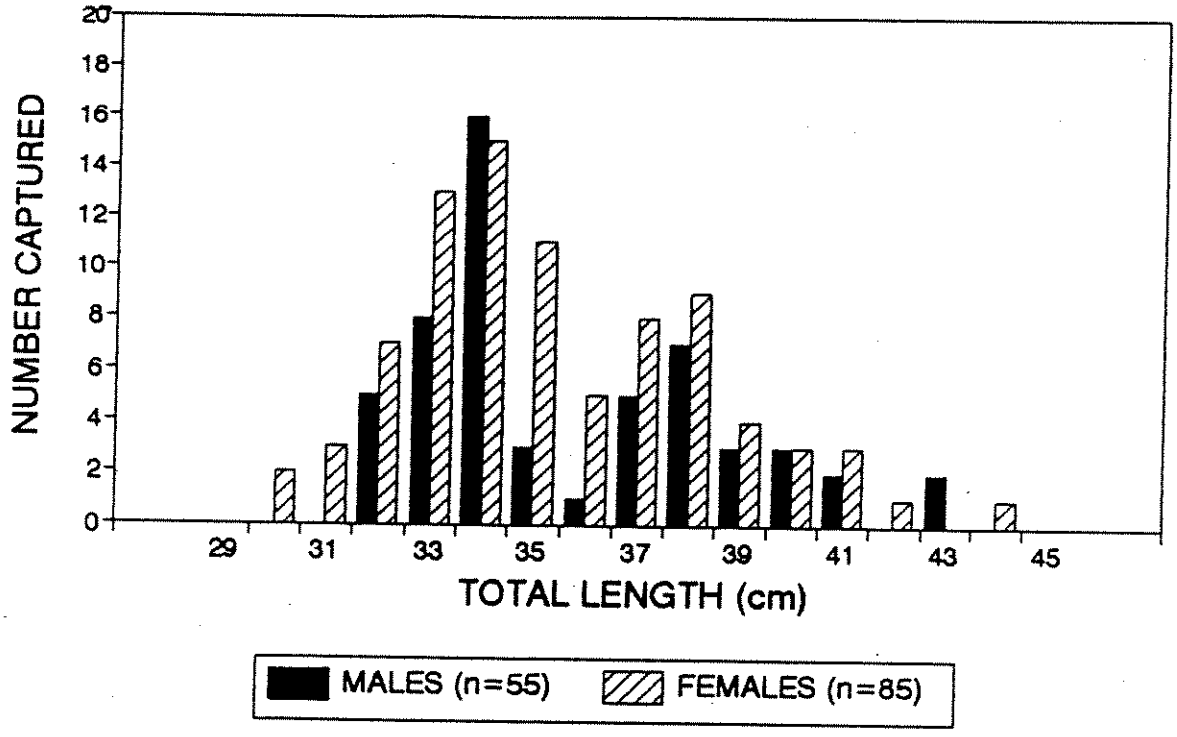

Figure 2. Length frequency distribution by sex of all adult Arctic grayling captured during upstream spawning migrations in Red Rock Creek, 1996.

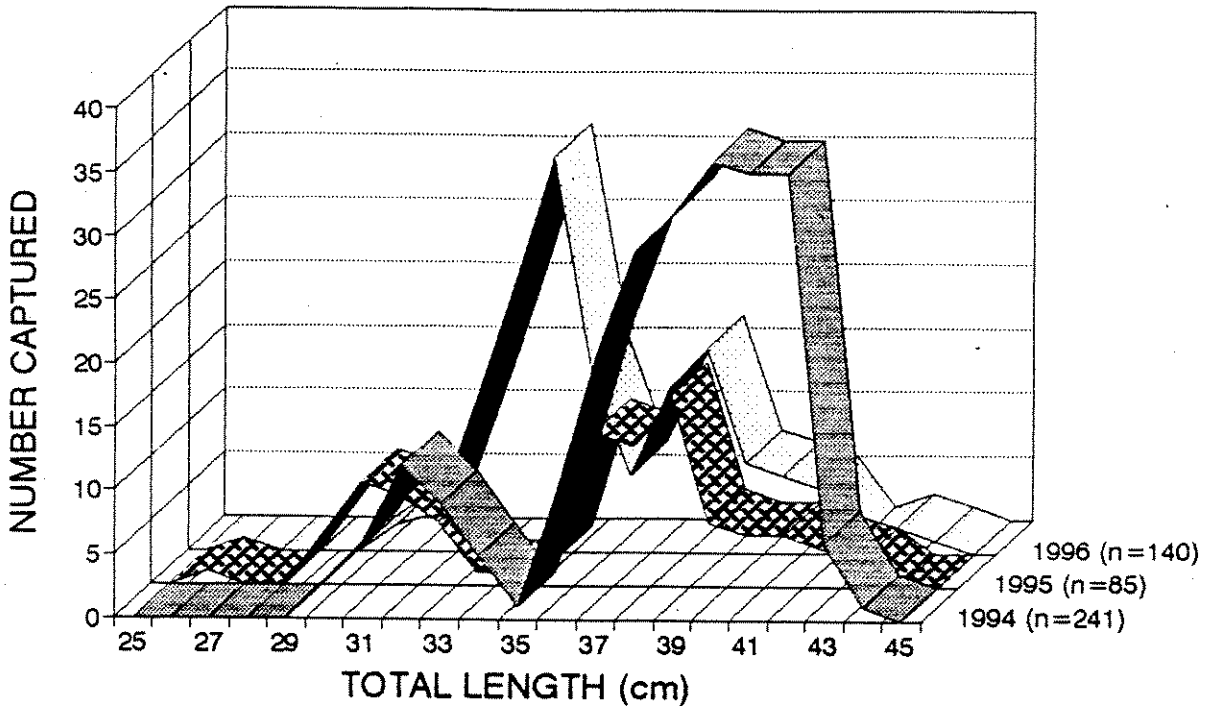

Figure 3. Length frequency distributions of all adult Arctic grayling captured during spawning migrations in Red Rock Creek, 1994-1996.

A total of 438 adult cutthroat trout were also captured during the six-week trapping period. However, unlike grayling, this total includes both upstream and downstream migrants. The first upstream moving cutthroat were captured 1 May with upstream migration continuing throughout May (Figure 4). Post-spawn downstream migrants were also captured soon after the trap was in place indicating, as in the past two years, that cutthroat began spawning movements well before grayling. This was also evidenced by observation of numerous cutthroat spawning redds throughout Red Rock Creek, above and below the trap, in late April and early May. Downstream migration continued throughout the trapping period, however trapping efficiency of downstream migrants was greatly reduced during the last two weeks of the trapping period due to increased stream discharge.

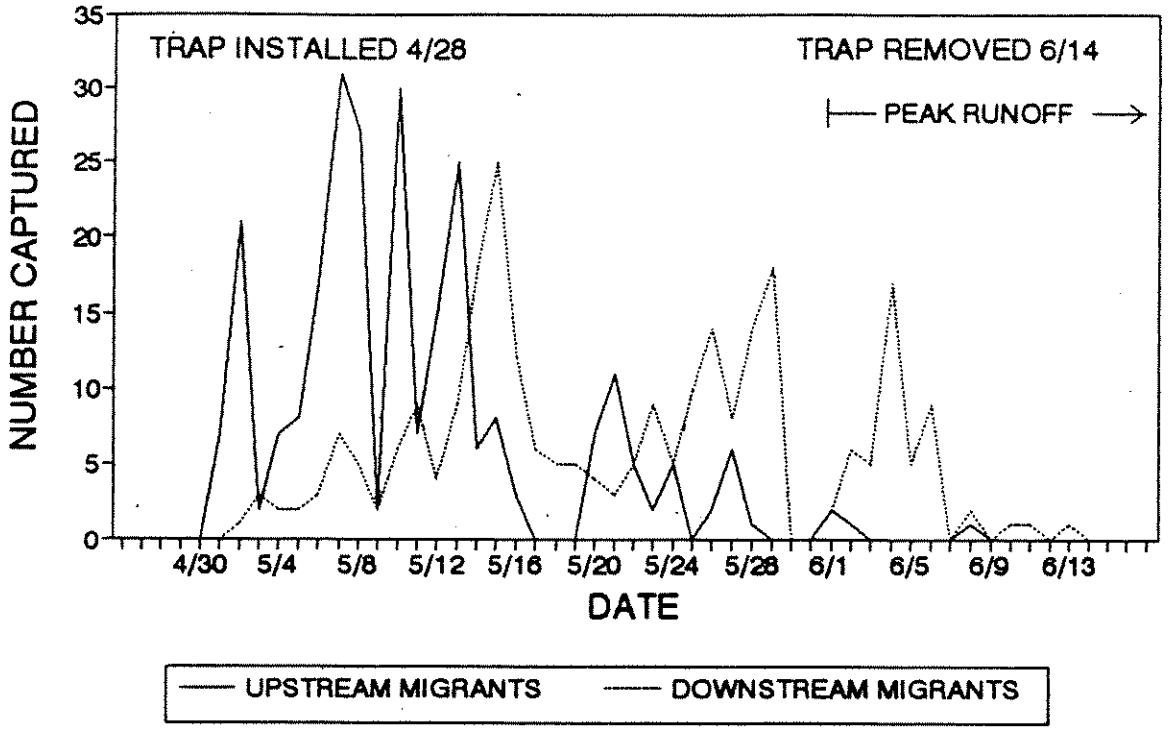

Figure 4. Chronology of Cutthroat trout movement in Red Rock Creek, 4/28-6/14, 1996.

Cutthroat trout population characteristics appear very stable between 1994, 1995 and 1996 (Table 2). Females outnumbered males by a ratio of 1.8 to 1.0, compared to 1.9 to 1.0 in 1994 and 1995. Mean sizes remained similar as well. Males averaged 507 mm in total length and ranged from 304 to 610 while females averaged 519 mm and varied from 333 to 795. Length frequency distributions are presented in figures 5 and 6. Although the total number captured varied between the years, size distribution appears fairly stable with the majority of the fish being between 40 and 60 cm. Of the total 438 captured in 1996, 148 (33.8%) had been captured in previous years.

Table 2. Numbers, sex ratios and means and ranges of total length (mm), pre-spawning weight (kg), and post-spawning weight (kg) of all cutthroat trout captured during spawning migrations in Red Rock Creek, 1994-1996.

	1994			1995			1996		
	Male	Female	Combined	Male	Female	Combined	Male	Female	Combined
Total Number	71	136	207	135	262	397	158	280	438
Sex Ratio (M:F)			1:1.9			1:1.9			1:1.8
Mean Length	505	513	510	479	501	493	507	519	515
range	320-680	322-750	320-750	326-683	334-780	236-780	304-610	333-795	304-795
(s.d.)	(80.0)	(79.1)	(80.0)	(69.1)	(60.9)	(64.0)	(59.3)	(55.6)	(56.9)
Pre-spawn Condition									
Number measured	12	17	29	31	85	116	103	158	261
Mean Weight	1.60	1.25	1.40	1.22	1.32	1.29	1.54	1.73	1.66
range	0.4-2.5	0.4-2.2	0.4-2.5	0.4-2.3	0.4-2.4	0.4-2.4	0.3-2.9	0.5-6.1	0.3-6.1
(s.d.)	(0.6)	(0.5)	(0.6)	(0.5)	(0.5)	(0.5)	(0.5)	(0.7)	(0.7)
Post-spawn Condition									
Number measured	59	116	175	104	177	281	55	122	177
Mean Weight	1.48	1.48	1.48	1.19	1.41	1.32	1.63	1.53	1.56
range	0.3-3.2	0.2-3.9	0.2-3.9	0.3-2.9	0.5-4.6	0.3-4.6	0.8-2.9	0.8-4.1	0.8-4.1
(s.d.)	(0.6)	(0.6)	(0.6)	(0.6)	(0.7)	(0.6)	(0.4)	(0.6)	(0.6)

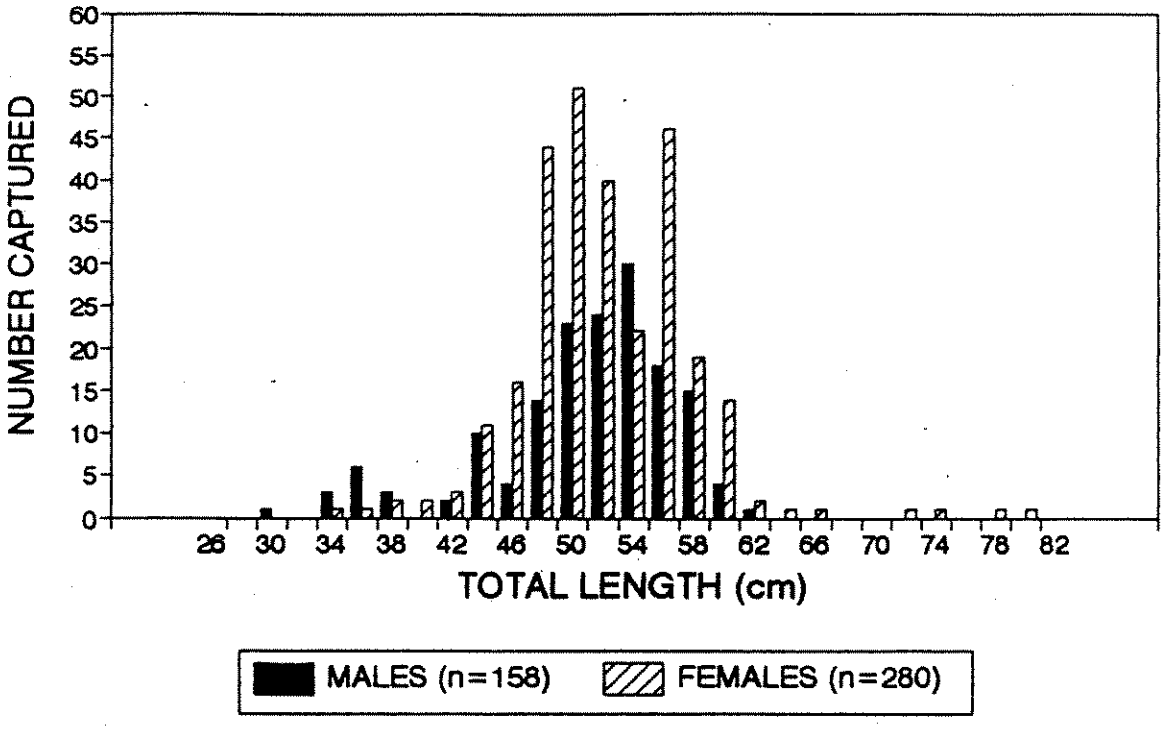

Figure 5. Length frequency distribution by sex of all adult cutthroat trout captured during spawning migrations in Red Rock Creek, 1996.

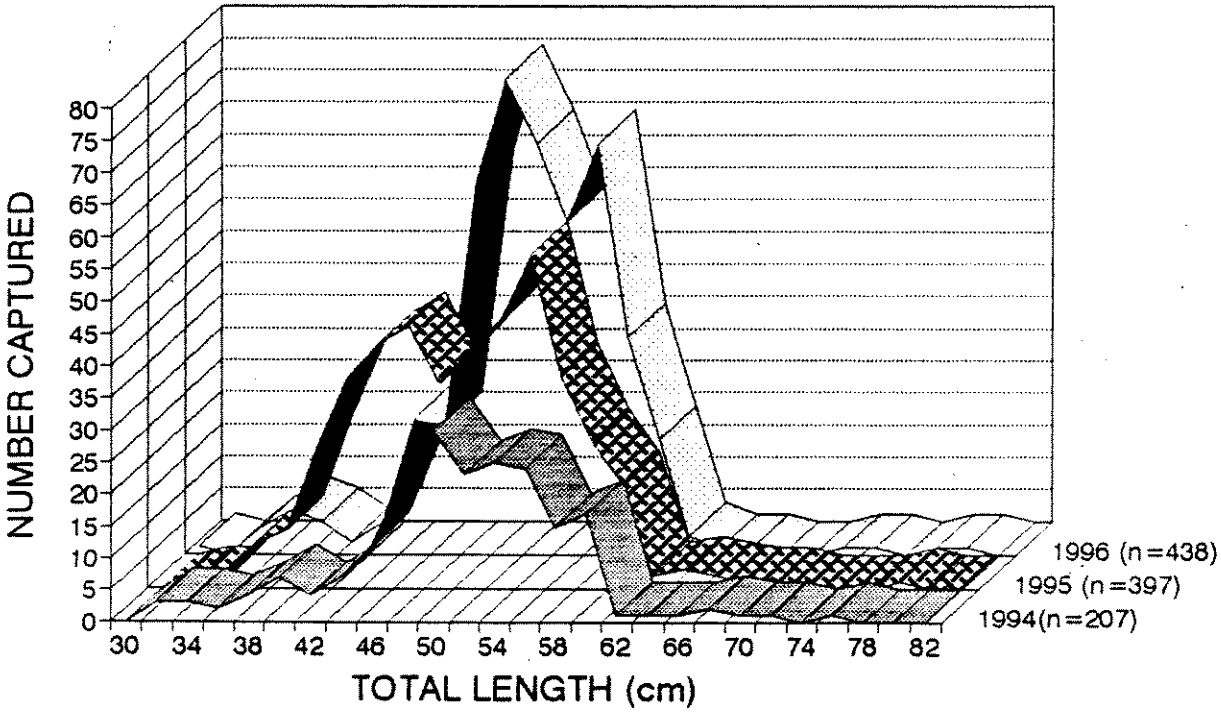

Figure 6. Length frequency distribution of all cutthroat trout captured during spawning migrations in Red Rock Creek, 1994-1996.

In addition to Arctic grayling and cutthroat trout, 22 brook trout, 4 whitefish (Table 3), and several hundred suckers were captured in the Red Rock Creek fish trap.

Table 3. Numbers and means and ranges of total length (mm) and weight (g) of all brook trout and whitefish captured during trapping periods in Red Rock Creek, 1994-1996.

	1994	1995	1996
BROOK TROUT			
Total Number	9	11	22
Mean Length (range)	299 (201 - 420)	300 (157 - 430)	314 (170 - 406)
Mean Weight (range)	306 (78 - 630)	325 (31 - 760)	404 (80 - 860)
WHITEFISH			
Total Number	2	2	4
Mean Length (range)	428 (400 - 456)	354 (296 - 412)	309 (219 - 405)
Mean Weight (range)	869 (830 - 907)	568 (300 - 825)	413 (136 - 726)