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COASTAL RIVERS INVESTIGATIONS
INFORMATION REPORT 73-6

Summary of Hydrographic Observations and
Water Use Information on Salmon River
near Otis Junction, Oregon

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Management and Research Division

August 1973

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Introduction

The interest in collecting hydrographical data on Salmon River began as part of a generalized search for suitable hatchery sites on coastal streams in 1967. Because of the realization that the Salmon River did have significant potential for a hatchery, additional data have been collected in the intervening years. A thermograph has been operated from September 6, 1967 through October 4, 1968; from July 2, 1970 through October 13, 1971; and from June 11, 1973 to the present by Coastal River Investigations personnel (Figure 1) to gather diel temperature data. Minimum flows were measured during the hatchery site search and every year since with the exception of 1969.

Temperatures

A maximum water temperature of 68°F. was recorded on only 2 days (August 3, 1968 and August 10, 1971) (Table 1). The period of maximum temperature has varied from early July through early September on the different years. Generally the maximum temperatures in excess of 65° have been limited to a week's duration. The weekly average of the daily high temperatures has only reached 66°F. on 2 of the years of record, although it is likely that maximum temperatures were reached before the study was instigated in 1967 (Table 2). The diel temperature range was 3-7°F so temperatures always fell below 64° in the early morning hours.

The minimum temperature recorded was 39°F. and occurred on January 12 and 13, 1971. The weekly average of the minimum temperatures never fell lower than 42°F.

Flows

Various state and federal agencies have measured flows in Salmon River near the sites being considered for the hatchery. During the original study, a staff gauge was installed and the stream flow was measured at intervals to develop a stage-discharge curve. The lowest flow observed was 20.9 cfs on September 27, 1967 (Table 3).

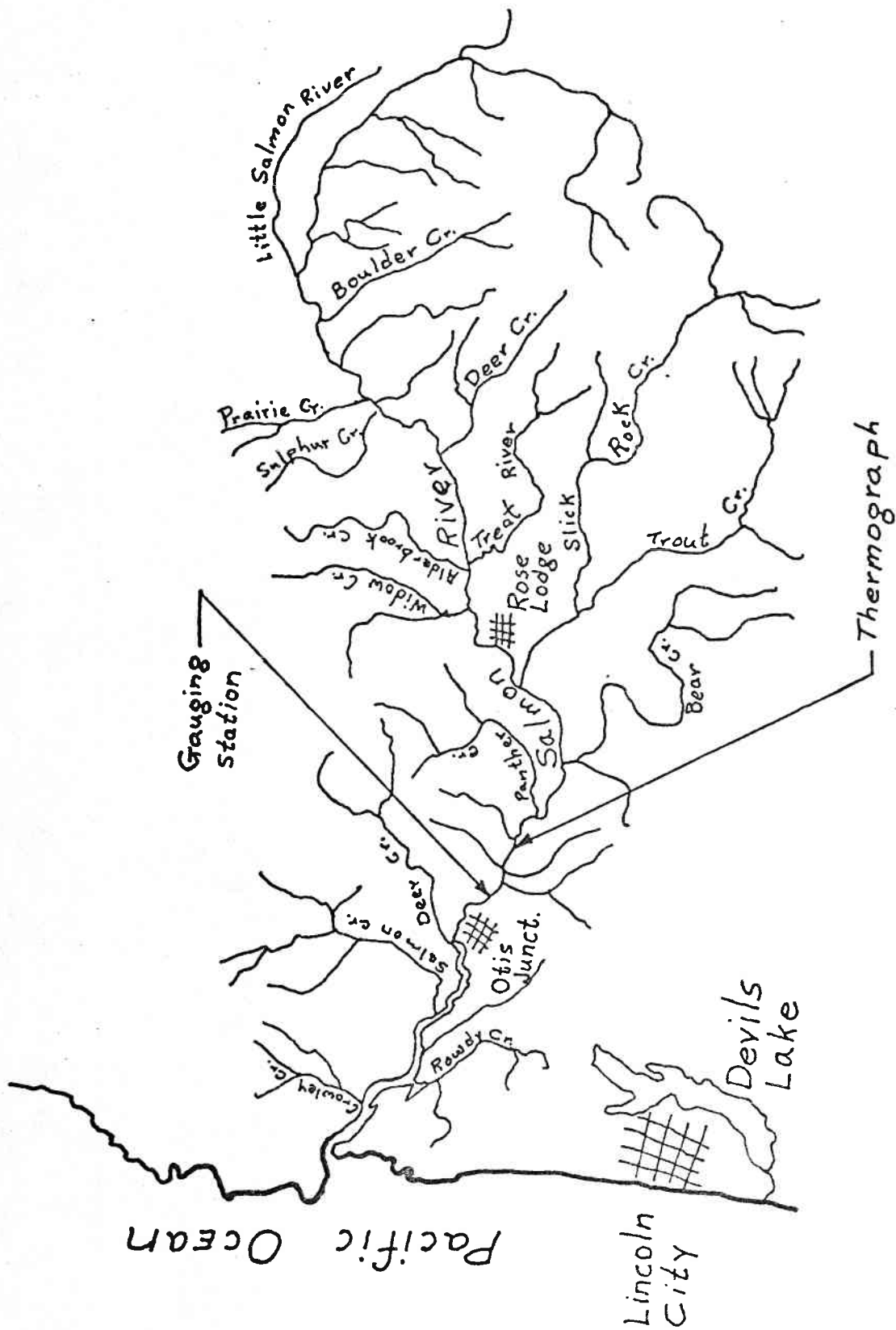


Figure 1. Salmon River Watershed Showing Location of Gauging Station and Thermograph.

Since 1967 was known as an extremely dry year^{1/}, we can assume the 20.9 cfs to be the minimum that will be encountered. Flow data from other agencies as well as subsequent observations by our own agency indicate a normal summer low flow of approximately 30 cfs (Table 4). High flows in excess of 7 feet over low summer level were observed. No high-flow volume measurements were taken because of lack of equipment, but a permanent high water reference point has been established.

Turbidities

Turbidities observed during weekly visits never exceeded 28 ppm., however, greater turbidities are known to occur. Visibilities as a measure of turbidity indicate that during the high flow season, the stream was clear on about one-half the visits and slightly to moderately turbid on the other half of the visits. Generally speaking, Salmon River rises and becomes turbid quickly at the start of a storm and falls and clears rapidly as the storm abates.

Water Rights

Review of water rights records of the State Water Master for Lincoln County indicates there are 22.126 cfs of appropriated water for all the Salmon River and its tributaries. Of the total, 13.886 cfs is for diversion ~~below~~^{above} the hatchery sites. There is storage rights of 35.74 acre feet, of which only 9.74 acre ft. is above the hatchery sites. There is a 4.0 cfs municipal reservation by the City of Oceanlake that probably will never be exercised. Others of these rights may be abandoned but no effort has been made to cancel them.

Water Policy

The State Water Resources Board policy for Salmon River states that no appropriation of water except for domestic or livestock uses will be allowed when the flow at Otis Junction bridge drops below:

^{1/} ("For the state as a whole, the summer of 1967 was the longest and undoubtedly one of the hottest dry spells ever recorded").

June 1 - July 15 - 35 cfs
July 16 - September 15 - 18 cfs
September 16 - May 31 -150 cfs

Summary

The available data cover fairly extreme water years so the variations in hydro-graphic characteristics are fairly well depicted. Data will continue to be collected regularly until the facility is in operation to provide background information for hatchery operation.

Table 1. Salmon River Daily Minimum and Maximum Water Temperatures, 1967-68, 1970-71, and 1973 ^{1/}.

	1967							
	September		October		November		December	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1	--	--	56	57	50	52	46	46
2	--	--	54	56	49	50	46	48
3	--	--	53	54	48	49	48	48
4	--	--	52	53	49	50	47	48
5	--	--	53	54	48	50	46	47
6	61	66	53	54	48	50	46	47
7	59	64	53	56	49	51	47	47
8	58	62	52	54	50	51	46	47
9	58	61	53	56	50	51	47	49
10	59	62	54	56	50	51	49	49
11	59	62	56	57	50	51	--	--
12	--	--	54	56	51	52	44	46
13	--	--	53	55	51	52	43	44
14	--	--	53	54	51	52	43	43
15	--	--	51	53	50	52	42	43
16	--	--	50	52	48	50	42	45
17	--	--	51	53	48	50	--	--
18	--	--	51	53	49	51	--	--
19	--	--	50	52	47	49	--	--
20	58	63	48	50	46	48	--	--
21	60	62	49	52	45	47	--	--
22	57	60	50	53	47	49	42	44
23	54	60	50	52	46	48	43	45
24	54	59	49	51	48	49	44	47
25	55	59	50	52	47	49	46	47
26	54	61	48	50	45	47	46	47
27	56	60	50	53	--	--	47	47
28	56	59	50	52	45	47	47	50
29	57	58	49	51	47	47	47	49
30	56	58	50	52	46	47	47	47
31			50	52			47	49
Min.	54	58	48	50	45	47	42	43
Max.	61	66	56	57	51	52	49	50

^{1/} 1967-1968, thermograph located 0.7 miles east of Otis Junction.

Table 1. (Continued)

	1968									
	January		February		March		April		May	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1	47	49	43	46	--	--	48	50	48	54
2	45	47	43	46	--	--	47	49	48	55
3	46	48	43	46	--	--	48	52	49	56
4	46	47	43	46	--	--	48	50	50	53
5	44	46	43	46	--	--	47	49	48	50
6	42	44	43	46	--	--	--	--	48	52
7	43	45	46	47	--	--	--	--	46	53
8	44	45	44	49	--	--	--	--	48	56
9	45	46	-- ^{1/}	--	43	47	--	--	52	56
10	45	45	--	--	45	49	48	53	52	54
11	44	45	--	--	47	48	--	--	51	54
12	44	46	--	--	46	47	--	--	51	53
13	46	48	--	--	46	48	--	--	48	53
14	48	50	--	--	47	48	--	--	49	52
15	48	50	--	--	--	--	--	--	50	56
16	46	48	--	--	--	--	45	48	50	59
17	46	48	--	--	--	--	44	51	53	56
18	46	47	--	--	--	--	46	48	52	59
19	47	47	--	--	--	--	45	48	55	57
20	47	49	--	--	--	--	45	49	54	56
21	48	50	--	--	--	--	--	--	52	56
22	46	48	--	--	--	--	--	--	53	56
23	46	47	--	--	--	--	--	--	53	56
24	46	47	--	--	--	--	--	--	51	54
25	43	46	--	--	--	--	50	50	52	53
26	42	43	--	--	46	48	48	52	52	53
27	40	42	--	--	48	50	47	55	52	56
28	40	40	--	--	50	50	50	58	--	--
29	39	40	--	--	46	50	52	58	--	--
30	40	41	--	--	45	49	50	54	--	57
31	41	43	--	--	48	52	--	--	50	55

Min.	39	40	43	46	43	47	44	48	46	50
Max.	48	50	46	49	50	52	52	58	55	59

^{1/} 1970-71 & 1973, thermograph located 1.0 miles east of Otis Junction.

Table 1. (Continued)

	1968									
	June		July		August		September		October	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1	51	53	54	64	60	64	56	57	50	52
2	53	53	58	63	60	67	54	56	48	51
3	51	53	58	62	63	68	53	56	48	51
4	50	53	59	64	63	66	54	58	--	53
5	49	53	58	64	62	66	--	--		
6	51	54	58	65	60	62	--	--		
7	53	54	58	64	56	62	56	60		
8	52	53	59	65	56	63	54	58		
9	52	54	60	65	57	63	56	57		
10	50	56	59	63	57	64	56	58		
11	53	54	59	62	58	63	54	56		
12	52	54	55	60	56	62	54	56		
13	--	--	58	61	57	60	54	55		
14	--	--	57	61	57	59	54	55		
15	54	61	55	62	56	58	54	54		
16	55	62	56	62	56	60	54	56		
17	55	62	56	64	56	59	54	55		
18	55	61	58	61	--	--	53	55		
19	56	59	56	62	--	--	51	52		
20	53	61	56	62	53	58	50	52		
21	54	58	55	62	52	57	50	52		
22	55	57	56	63	53	55	50	52		
23	55	60	58	60	54	55	51	54		
24	55	63	58	66	54	55	52	56		
25	58	64	59	66	54	55	52	56		
26	57	60	58	66	54	55	52	55		
27	56	60	59	66	54	55	52	54		
28	54	57	58	65	54	55	50	54		
29	53	55	58	65	--	--	52	56		
30	53	61	58	66	55	58	53	55		
31			59	65	55	58				

Min.	49	53	54	60	52	55	50	52	48	51
Max.	58	64	60	66	63	68	56	60	50	53

Table 1. (Continued)

	1970									
	July		August		September		October		November	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1			59	60	58	59	52	55	47	49
2		67	58	62	55	60	51	56	47	49
3	60	67	57	58	58	59	53	55	47	49
4	61	67	57	58	57	59	54	54	49	50
5	59	65	57	64	56	56	54	55	49	50
6	58	65	60	63	56	58	--	--	49	50
7	58	65	58	62	57	58	--	--	50	50
8	58	65	56	62	--	--	57	53	50	50
9	57	63	56	64	--	--	52	53	48	49
10	56	63	57	66	--	58	53	54	47	48
11	56	63	59	67	53	58	52	53	48	49
12	56	63	60	65	52	56	50	51	47	49
13	57	64	61	65	49	54	47	49	45	47
14	56	66	57	64	48	52	48	52	46	47
15	59	66	57	63	48	53	50	51	47	49
16	58	64	57	62	51	56	50	51	48	49
17	59	66	54	61	54	57	51	51	47	48
18	59	66	54	61	56	57	51	52	47	48
19	60	67	57	61	54	55	51	52	48	48
20	61	65	58	63	54	55	51	51	46	48
21	59	62	59	64	53	55	50	51	44	46
22	56	62	59	60	53	53	48	49	41	43
23	55	63	58	59	51	52	49	49	41	41
24	59	65	57	59	50	52	49	49	47	48
25	59	60	58	60	49	53	49	49	45	46
26	59	61	55	61	52	56	44	48	45	45
27	59	62	58	61	52	56	44	45	45	45
28	57	61	57	61	52	55	44	44	45	45
29	55	62	56	63	--	--	44	46	44	45
30	56	63	58	61	--	--	45	47	43	45
31	56	64	58	59			46	49		

Min.	55	61	54	58	48	52	44	44	41	41
Max.	61	67	61	67	58	60	54	56	50	50

Table 1. (Continued)

	1970		1971							
	December		January		February		March		April	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1	44	44	--	--	46	47	43	43	42	46
2	44	44	--	--	45	46	43	43	45	48
3	44	44	--	--	45	45	43	43	43	48
4	44	44	43	43	45	45	43	43	43	50
5	44	45	41	41	44	45	41	43	46	50
6	44	46	40	41	44	44	42	43	47	48
7	46	46	41	43	44	45	42	43	45	48
8	45	46	43	44	45	45	42	43	45	46
9	45	45	44	44	45	45	42	43	43	44
10	45	46	43	44	45	46	41	43	43	44
11	43	46	41	43	45	46	42	43	43	46
12	43	43	39	41	46	47	42	43	43	47
13	43	44	39	40	47	47	42	44	45	48
14	44	44	40	42	47	47	43	44	46	48
15	44	45	41	42	46	47	42	44	45	48
16	44	44	42	44	45	46	42	45	44	46
17	44	44	44	45	45	46	42	44	44	46
18	43	44	45	46	46	46	42	43	44	49
19	42	43	45	46	45	46	43	46	43	48
20	42	43	44	45	44	45	43	45	45	47
21	42	43	44		44	45	44	46	43	46
22	43	43	--	--	45	45	45	46	44	48
23	43	44	--	--	45	45	44	45	45	47
24	43	44	--	--	44	45	43	44	44	46
25	43	44	--	--	43	44	42	45	44	51
26	43	43	--	--	43	43	43	--	46	53
27	43	44	--	--	43	43	--	--	48	51
28	44	44	44	45	43	43	--	--	46	47
29	44	44	44	45			45	47	46	50
30	44	44	45	47			43	45	47	50
31	44	45	47	47			43	45		

Min.	42	43	39	40	43	43	41	43	42	44
Max.	46	46	47	47	47	47	45	47	48	53

Table 1. (Continued)

	1971											
	May		June		July		August		September		October	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1	48	52	49	50	53	57	58	64	57	58	48	50
2	50	55	49	50	51	57	59	64	55	57	48	50
3	51	52	50	51	50	57	60	64	54	55	49	51
4	50	51	49	55	53	55	61	62	52	56	50	53
5	48	50	51	53	53	55	58	62	55	57	52	55
6	47	53	52	53	53	56	59	64	54	56	54	56
7	50	55	52	53	51	58	58	64	51	55	52	54
8	51	54	51	56	54	55	59	66	52	56	53	56
9	49	52	52	55	54	55	62	67	55	58	54	55
10	48	54	53	54	53	54	63	68	54	56	53	55
11	50	56	52	54	53	55	63	67	55	57	54	55
12	52	55	51	54	51	53	61	66	53	57	52	53
13	50	52	52	53	53	59	61	62	54	57	53	
14	49	52	50	55	54	60	59	64	51	55		
15	49	52	49	55	55	60	58	64	51	55		
16	46	49	50	54	54	60	57	63	53	57		
17	46	47	51	53	54	61	57	63	53	57		
18	46	49	52	53	56	62	57	63	53	57		
19	48	49	52	54	58	60	59	62	52	56		
20	47	48	53	54	58	64	60	62	54	58		
21	47	50	52	59	58	64	60	61	54	57		
22	48	52	56	57	60	64	58	62	52	56		
23	50	54	54	57	59	62	56	61	54	55		
24	50	52	51	53	57	63	56	62	54	56		
25	51	52	50	53	58	63	60	63	54	55		
26	51	51	49	53	59	62	57	62	52	53		
27	50	53	50	52	59	60	57	58	50	52		
28	51	53	49	51	58	60	57	58	51	52		
29	50	52	48	54	58	59	57	61	50	50		
30	49	50	50	56	58	58	59	60	47	50		
31	49	50			57	59	58	59				
Min.	46	47	48	50	50	54	56	58	47	50	48	50
Max.	52	56	56	59	60	64	63	68	57	58	54	56

Table 1. (Continued)

	1973									
	June		July							
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1			--	--	60	66				
2			59	61	59	64				
3			56	61	61	65				
4			59	60	61	65				
5			57	60	61	65				
6			56	59	62	67				
7			56	59	62	63				
8			57	59	61	66				
9			56	63	62	63				
10			59	60	61	64				
11	59	61	55	61	59	64				
12	58	59	56	62	60	62				
13	56	58	57	64	61	62				
14	55	57	59	65	60	65				
15	55	56	60	65	58	61				
16	54	54	59	65	59	60				
17	52	54	61	65	56	61				
18	50	54	61	63	54	60				
19	53	60	61	61	54	60				
20	56	63	60	61	55	60				
21	59	63	60	61	56	60				
22	58	62	59	60	55	60				
23	57	58	57	60	55	58				
24	58	58	56	62	57	58				
25	58	--	58	64	57	61				
26	--	--	60	66	57	60				
27	--	--	61	67	58					
28	--	--	62	67						
29			62	66						
30			61	66						
31			60	65						

Min.	50	54	55	59						
Max.	59	65	62	67						

Table 2. Weekly Average of Daily High and Low Temperatures of Salmon River, Approximately 1 Mile East of Otis Junction.

		Minimum for Week	Maximum for Week	Average Minimum	Average Maximum
1967					
Sept.	4-10	58	66	59	63
	11-17	59	62	59	62
	18-24	54	63	57	61
	25-Oct. 1	54	61	56	58
Oct.	2- 8	52	56	53	54
	9-15	51	57	53	55
	16-22	48	53	50	52
	23-29	48	53	49	52
	30-Nov. 5	48	52	49	51
Nov.	6-12	48	52	50	51
	13-19	47	52	49	51
	20-26	45	49	46	48
	27-Dec. 3	45	48	46	47
Dec.	4-10	46	49	47	48
	11-17	42	46	43	44
	18-24	42	47	43	45
	25-31	46	50	47	48
1968					
Jan.	1- 7	42	49	45	47
	8-14	44	50	45	46
	15-21	46	50	47	48
	22-28	40	48	43	45
	29-Feb. 4	39	46	42	44
Feb.	5-11	43	49	44	47
	12-18	--	--	--	--
	19-25	--	--	--	--
	26-Mar. 3				
Mar.	4-10	43	49	44	48
	11-17	46	48	46	48
	18-24	--	--	--	--
	25-31	45	52	46	50
April	1- 7	47	52	48	50
	8-14	48	53	48	53
	15-21	44	51	45	49
	22-28	47	53	49	54
	29-May 5	48	53	49	54
May	6-12	46	52	50	54
	13-19	48	59	51	56
	20-26	51	56	52	55
	27-June 2	50	57	52	56
June	3- 9	49	54	51	53
	10-16	50	62	53	57
	17-23	53	62	55	60
	24-30	53	64	55	60

Table 2. (Continued)

		Minimum for Week	Maximum for Week	Average Minimum	Average Maximum
1968					
July	1- 7	54	65	58	64
	8-14	55	65	58	62
	15-21	55	64	56	62
	22-28	56	60	58	65
	29-Aug. 4	58	68	60	66
Aug.	5-11	56	66	58	63
	12-18	56	62	56	60
	19-25	52	58	53	56
	26-Sept. 1	54	58	55	56
Sept.	2- 8	53	60	54	58
	9-15	54	58	55	56
	16-22	50	56	52	53
	23-29	50	56	52	55
	30-Oct. 4	48	55	50	52
1970					
July	1- 7	61	67	59	66
	8-14	56	66	57	64
	15-21	58	67	59	65
	22-28	55	65	58	62
	29-Aug. 4	55	64	57	61
Aug.	5-11	56	67	58	64
	12-18	54	65	57	63
	19-25	57	64	58	61
	26-Sept. 1	55	63	57	61
Sept.	2- 8	55	60	57	58
	9-15	48	58	50	55
	16-22	51	57	54	55
	23-29	49	56	51	54
	30-Oct. 6	51	56	53	55
Oct.	7-13	47	54	51	52
	14-20	48	52	50	51
	21-27	44	51	48	49
	28-Nov. 3	44	49	46	48
Nov.	4-10	47	50	49	50
	11-17	45	49	47	48
	18-24	41	48	45	46
	25-Dec. 1	43	46	44	45
Dec.	2- 8	44	46	44	45
	9-15	43	46	44	45
	16-22	42	44	43	43
	23-29	43	44	43	44

Table 2. (Continued)

		Minimum for Week	Maximum for Week	Average Minimum	Average Maximum
1971					
Dec.	30-Jan. 5	41	45	43	43
Jan.	6-12	39	44	42	43
	13-19	39	46	42	44
	20-26	--	--	--	--
	27-Feb. 2	44	47	45	46
Feb.	3- 9	44	45	45	45
	10-16	45	47	46	47
	17-23	44	46	45	45
	24-Mar. 2	43	45	43	43
	3- 9	41	43	42	43
	10-16	41	45	42	44
	17-23	42	46	43	45
	24-30	42	47	43	45
	31-Apr. 6	42	50	44	48
April	7-13	43	48	44	46
	14-20	43	49	44	47
	21-27	43	53	45	49
	28-May 4	46	55	48	51
May	5-11	47	56	49	53
	12-18	46	55	48	51
	19-25	47	54	49	51
	26-June 1	49	53	50	51
June	2- 8	49	56	51	53
	9-15	49	55	51	54
	16-22	50	59	52	55
	23-29	48	57	50	53
	30-July 6	50	57	52	56
July	7-13	51	59	53	56
	14-20	54	64	56	61
	21-27	57	64	57	65
	28-Aug. 3	57	64	58	61
Aug.	4-10	58	68	60	65
	11-17	57	67	59	64
	18-24	56	63	58	62
	25-31	57	63	58	60
Sept.	1- 7	51	58	54	56
	8-14	51	58	53	57
	15-21	51	58	53	57
	22-28	50	56	52	54
	29-Oct. 5	47	55	49	51
Oct.	6-12	52	56	53	55

Table 2. (Continued)

		Minimum for Week	Maximum for Week	Average Minimum	Average Maximum
1973					
June	11-17	52	61	56	57
	18-24	50	63	56	60
	25-July 1	--	--	--	--
July	2- 8	56	61	57	60
	9-15	55	65	57	63
	16-22	59	65	60	62
	23-29	56	67	59	65
	30-Aug. 5	59	66	60	65
Aug.	6-12	59	67	61	64
	13-19	54	65	57	61
	20-26	55	61	56	60

Table 3. Summary of Hydrographic Observations 0.7 Mile above Otis Junction, 1967-68.

Date	Staff Gauge (ft.)	Flow (cfs)	Turb. (ppm)	Vis.	Date	Staff Gauge (ft.)	Flow (cfs)	Turb. (ppm)	Vis.
8-2-67	--	31.2	< 25	1	3-25-68	3.80	--	< 25	2
8-18	--	25.6	"	"	4-2	2.80	--	"	"
9-5	0.25	29.0	"	"	4-9	2.30	--	"	1
9-8	0.22	25.5	"	"	4-15	2.40	--	"	"
9-19	0.25	29.0	"	"	4-24	1.80	--	"	"
9-26	0.20	23.5	"	"	5-1	1.80	--	"	"
9-27	0.18	20.9	"	"	5-8	1.60	--	"	"
10-3	3.20	--	--	3	5-15	1.30	149.0	"	"
10-11	1.60	189.0	< 25	2	5-21	1.52	--	"	"
10-19	1.00	116.3	"	1	5-29	1.85	--	"	2
10-26	1.90	225.0	"	2	6-5	3.20	--	"	"
11-1	1.90	225.0	"	1	6-14	1.68	--	"	1
11-10	6.40	--	"	2	6-21	1.20	133.0	"	"
11-18	1.70	201.0	"	1	6-28	1.10	117.0	"	"
11-28	1.26	148.0	"	"	7-5	1.00	101.0	"	"
12-4	6.60	--	"	2	7-12	1.00	101.0	"	"
12-12	3.50	--	"	1	7-19	0.80	69.0	"	"
12-22	3.10	--	"	2	7-26	0.70	53.0	"	"
12-28	2.45	--	"	1	7-29	0.66	48.0	"	"
1-5-68	1.80	--	"	"	8-2	0.60	38.0	"	"
1-11	3.90	--	"	2	8-6	0.60	38.0	"	"
1-18	3.90	--	"	"	8-6	0.67	49.5	"	"
1-26	2.30	--	"	1	8-12	0.58	--	"	"
2-6	4.30	--	"	2	8-19	1.34	--	--	4
2-15	1.80	--	"	1	8-29	1.65	--	< 25	2
2-22	8.00+	--	"	3	9-6	0.92	--	"	1
3-1	2.30	--	"	1	9-13	0.85	--	"	"
3-8	1.80	--	"	"	9-20	--	--	"	2
3-15	7.30	--	28	3	9-27	0.92	--	"	3
					10-4	1.01	--	"	"

Table 4. Salmon River Flow Data from Miscellaneous Sources, 1963-1973.

Date	Flow	Location	Source of Data
9-9-63	22.6	About 5 miles east (upstream) from Otis Junction. Below Slick Rock Creek.	OGC
9-10-64	49	" " "	OGC
9-27-67	20.9	0.7 miles east (upstream) from Otis Junction	OFC
8-6-68	38	" " " "	
8-14-70	30.8	" " " "	OFC
8-27-70	30.5	0.7 miles east (upstream) from Otis Junction	USGS
9-23-70	91.9	" " " "	OFC
6-1-71	163	About 5 miles east (upstream) from Otis Junction. Below Slick Rock Creek	OGC
7-21-71	89	" " "	OGC
8-5-71	80	" " "	OGC
8-19-71	54.4	0.7 miles east (upstream) from Otis Junction	OFC
7-11-72	74	Otis Bridge	USGS
8-31-72	30.9	0.7 miles east (upstream) from Otis Junction	State Eng.
9-6-72	33.5	Otis Bridge	USGS
10-16-72	37	Otis Bridge	USGS
11-13-72	222	Otis Bridge	USGS
12-19-72	1920	Otis Bridge	USGS
3-14-73	543	Otis Bridge	USGS
7-16-73	69.7	0.7 miles east (upstream) from Otis Junction	OFC
8-1-73	51.0	" " " "	OFC
8-13-73	43.1	" " " "	OFC