STATE OF CALIFORNIA
Department of Public Works

Reports of the
Division of Water Resources
Edward Hyatt, State Engineer

Report on Water Master Service On North Cow Creek, Oak Run Creek, Clover Creek and Their Tributaries Within Cow Creek Water Master District, Shasta County, California

During the 1938 Season

By
W. A. Alexander
Watermaster Assistant
Sacramento, California
January, 1940

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Department of Public Works
SACRAMENTO

DIVISION OF WATER RESOURCES
401 PUBLIC WORKS BUILDING

January 4, 1940

Mr. Harold Conkling
Deputy State Engineer
Sacramento, California

Attention: Mr. Gordon Zander, Supervising Hydraulic Engineer

Dear Sir:

There is submitted herewith a report covering the water master service in the Cow Creek Water Master District, Shasta County, California, during the 1938 season.

This report considers the climatological and hydrographic features of the 1938 season together with a description of results of the water distribution.

Respectfully submitted,

W. A. Alexander
Water Master Assistant

JWM:RH

Come to GOLDEN GATE INTERNATIONAL EXPOSITION
February 18th to December 2nd 1939

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INTRODUCTION

The Cow Creek Water Master District was created by order of the Division of Water Resources on October 17, 1932 to include the water rights on North Cow Creek and its tributaries and the water rights on Oak Run Creek and its tributaries, in Shasta County, California, which water rights were established by decrees entered by the Superior Court, Shasta County, California, on April 29, 1932, in the case of Charles L. Lemm, et al., vs. John Rutherford, et al., No. 5804, and on July 22, 1932, in the case of F. A. Colby et al., vs. L. O. Strayer, et al., No. 5701, respectively. On January 21, 1938, said district was enlarged by "Order Changing Cow Creek Water Master District, Shasta County, California, and Containing a Description of All of the Lands Within Said District as so Changed," to embrace the water rights on Clover Creek and its Tributaries in Shasta County, California, as established by the decree entered by the Superior Court, Shasta County, California , on October 4, 1937, in the case of Millville Ditch Company v. Jesse Hufford, et al., No. 6904. The foregoing procedure is in accordance with the provisions of Section 37 of the Water Commission Act.

Water Master service in the Cow Creek Water Master District was carried on throughout the 1938 season in accordance with the "Distribution of Water" procedure contained in Sections 37 to 37f, inclusive, of the Water Commission Act. W. A. Alexander, Deputy Water Master, for Cow Creek Water Master District, served in that capacity throughout the season. T. R. Simpson was Supervising Water Master.

Water Master service in 1938 was commenced about June 1, and terminated on September 30. The various ditches, diverting from the several streams, except those damaged by the floods of December 1937, were regulated in accordance with the schedules of allotments contained in the above mentioned decrees.

DISCUSSION OF RESULTS

Precipitation

Data on precipitation, as compiled from records kept at Redding and McCloud, are presented in Table I at the end of this report. From these data, the total precipitation for the seasonal year 1937-38 was 66.04 inches, or 149 per cent of the seasonal mean of the 26 years of record.

Water Supply

Estimates of the net available flow of North Cow Creek, Oak Run Creek, Clover Creek and Cedar Creek from June 1 to September 30, 1938 are presented in Tables 2, 3, 4 and 5, respectively, at the end of this report. The net available flow on each stream was computed by the summation of the amounts of water diverted by the various ditches from that stream plus the flow in the stream below the lowermost ditch.

Hydrographs of the net available water supply as compared to the decreed allotments for each of the above named streams for the 1936, 1937 and 1938 seasons are shown on Plates 1, 2, 3 and 4, submitted at the end of this report.

Distribution

On North Cow Creek the available water supply was in excess of the amount required for 100 per cent allotments up to about August 20, but gradually decreased until about September 25, when the flow was sufficient to supply only 85 per cent of allotments. Rotation on the stream, however, was not necessary at any time during the season because several of the water users were unable to divert any of the water allotted to them and others only a portion of their allotments, due to flood damage to diversion structures and ditches in December 1937. The available supply was sufficient at all times to satisfy the

requirements of all users in both the A and B classes, who were in a position to take water.

On Cedar Creek the available water supply was in excess of 100 per cent allotments up to about August 15. Subsequent to that date the flow gradually decreased to about 35 per cent of allotments during the latter part of September.

On Oak Run Creek and Clover Creek, the available water supply was in excess of 100 per cent allotments for the respective streams during the entire season.

T A B L E S

TABLE I
PRECIPITATION DATA
AVERAGE AT REDDING AND McCLOUD

Season	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total Seasonal
1922-23	4.50	3.42	9.62	4.54	1.41	0.49	6.45	0.75	2.53	0.00	0.24	2.89	36.84
1923-24	1.89	0.87	2.05	2.01	4.61	1.06	0.13	0.10	0.12	0.00	0.28	0.15	13.27
1924-25	7.06	6.55	6.24	4.53	18.35	4.24	5.58	3.11	0.93	0.00	0.81	3.28	60.68
1925-26	0.55	3.74	2.60	6.25	9.80	0.38	5.34	1.02	0.00	0.00	0.29	0.00	29.97
1926-27	3.34	18.18	4.65	10.23	14.01	5.26	4.16	2.18	1.02	0.16	0.07	0.09	63.35
1927-28	2.01	10.87	5.70	3.70	4.69	9.20	2.93	0.35	0.30	0.00	0.20	0.22	40.17
1928-29	0.64	7.41	5.75	1.59	5.32	2.91	3.54	0.11	2.32	0.00	0.00	0.00	29.59
1929-30	1.26	0.00	11.23	5.55	4.68	4.60	3.12	0.88	0.12	0.04	0.00	2.84	34.32
1930-31	0.58	2.65	1.87	7.79	3.52	2.58	0.75	0.60	3.25	0.00	0.00	0.40	23.99
1931-32	3.16	2.41	12.74	2.65	1.47	2.12	2.75	3.80	0.22	0.17	0.00	0.00	31.49
1932-33	0.13	3.13	3.75	6.38	1.19	8.46	0.41	5.38	0.22	0.01	0.00	0.26	29.32
1933-34	2.50	0.01	9.03	4.96	6.60	2.29	3.92	1.16	0.86	0.08	0.03	0.09	31.53
1934-35	3.50	8.83	3.38	8.14	5.01	2.92	8.13	0.75	0.05	0.28	0.01	0.32	41.32
1935-36	2.33	0.85	6.40	12.21	10.05	1.21	4.23	1.33	3.19	0.48	0.00	0.16	42.44
1936-37	0.13	0.00	4.51	4.64	8.79	9.48	7.32	0.31	4.32	0.04	0.00	0.06	39.60
1937-38	4.37	13.37	8.67	7.68	15.11	12.08	2.95	0.58	T	0.00	0.00	1.23	66.04
26 Year Monthly Mean	2.20	4.57	6.31	8.36	6.61	5.44	3.39	2.10	1.10	0.21	0.13	0.94	41.36

TABLE 2

Estimated Daily Net Available Flow in Cubic Feet per Second of North Cow Creek for the Period June 1 to Sept. 30, 1938.

DAY	JUNE	JULY	AUGUST	SEPTEMBER	REMARKS
1	100.0	54.0	32.8	20.5	
2	96.0	53.0	32.5	20.0	
3	94.0	52.0	32.3	19.5	
4	92.0	51.0	32.3	19.0	
5	90.0	50.0	32.1	18.8	
6	88.0	48.5	31.8	18.6	
7	86.0	47.0	31.6	18.2	
8	84.0	45.5	31.4	17.8	
9	82.0	44.0	31.2	17.4	
10	80.0	43.0	31.0	17.0	
11	78.0	42.0	30.0	17.0	
12	76.0	41.0	28.0	17.0	
13	74.0	40.0	27.0	17.0	
14	72.0	39.0	26.0	17.0	
15	70.0	38.0	25.4	17.0	
16	68.0	37.8	25.4	17.0	
17	66.0	37.6	25.3	17.0	
18	64.0	37.4	25.2	17.0	
19	62.0	37.2	25.1	17.0	
20	60.0	37.0	25.0	17.0	
21	59.0	36.5	24.5	17.0	
22	58.5	36.0	24.5	17.0	
23	58.0	35.0	24.0	17.0	
24	57.5	34.0	23.5	17.0	
25	57.0	33.7	23.0	17.0	
26	57.0	33.6	22.0	18.0	
27	56.5	33.4	22.0	19.0	
28	56.0	33.2	22.0	20.0	
29	55.5	33.1	21.0	23.0	
30	55.0	33.0	21.0	25.0	
31	-	33.0	21.0	-	
TOTAL: SEC.FT: DAYS	2152.0	1249.5	829.9	546.3	122 day period
MEAN SEC.FT:	71.8	40.3	26.8	18.2	39.1
MAX. SEC.FT:	100	54.0	32.8	25.0	100.
MIN. SEC.FT.	55.0	33.0	21.0	17.0	17.0
TOTAL: AC.FT:	4270	2480	1650.	1080.	9480

TABLE 3

Estimated Daily Net Available Flow in Cubic Feet per Second of Oak Run Creek for the period from June 1 to Sept.30, 1938

DAY	JUNE	JULY	AUGUST	SEPTEMBER	REMARKS
1	18.0	15.9	12.0	5.50	
2	17.9	15.7	11.8	5.50	
3	17.8	15.5	11.5	5.50	
4	17.7	15.3	11.3	5.50	
5	17.6	15.2	11.0	5.50	
6	17.5	15.0	11.0	5.50	
7	17.4	15.0	10.5	5.50	
8	17.3	15.5	10.0	5.50	
9	17.2	15.8	9.50	5.50	
10	17.1	16.0	9.00	5.50	
11	17.0	15.0	9.00	5.50	
12	16.9	14.0	8.50	5.50	
13	16.8	13.5	8.00	5.80	
14	16.8	13.5	7.50	5.80	
15	16.7	13.0	7.00	6.00	
16	16.7	13.0	7.00	6.00	
17	16.6	13.0	7.00	6.10	
18	16.6	13.0	7.00	6.20	
19	16.5	13.0	7.00	6.40	
20	16.5	13.0	7.00	6.50	
21	16.4	13.0	6.90	6.60	
22	16.4	12.5	6.80	6.70	
23	16.3	12.5	6.70	6.80	
24	16.3	12.0	6.60	6.90	
25	16.2	12.0	6.50	7.00	
26	16.2	12.0	6.30	7.20	
27	16.2	12.0	6.10	7.40	
28	16.1	12.0	5.90	7.60	
29	16.1	12.0	5.70	7.80	
30	16.0	12.0	5.50	8.00	
31	-	12.0	5.50	-	
TOTAL SEC. FT. DAYS	504.8	422.9	251.10	186.80	122 day period
MEAN SEC. FT.	16.8	13.6	8.10	6.22	11.2
MAX. SEC.FT.	18.0	15.9	12.0	8.00	18.0
MIN. SEC.FT.	16.0	12.0	5.50	5.50	5.50
TOTAL AC.FT.	1000.	838.	498	370.	2710.

TABLE 4

Estimated Net Available Flow in Cubic Feet per Second of Clover Creek for the Period June 1 to September 30,1938

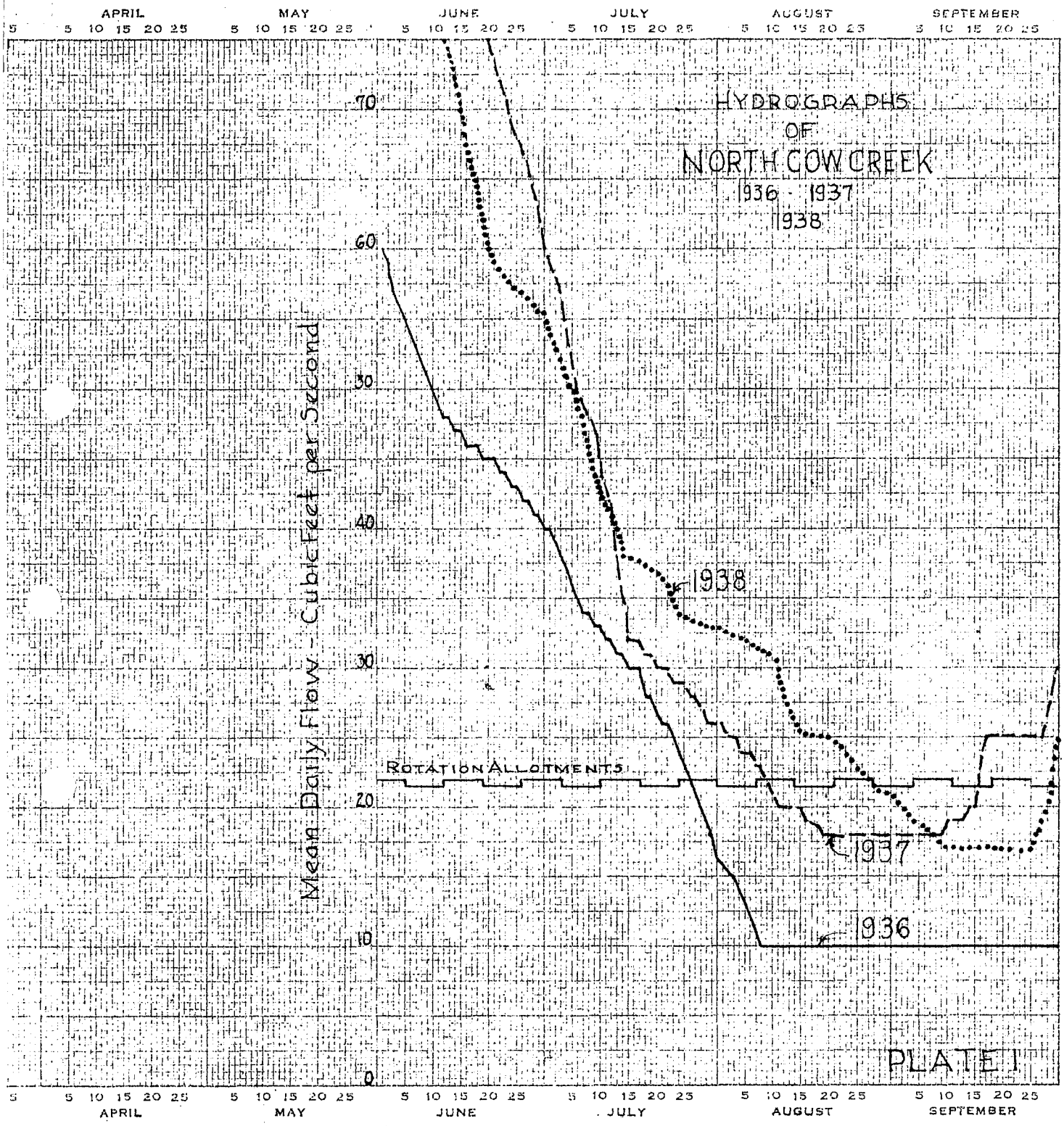
DAY	JUNE	JULY	AUGUST	SEPTEMBER	REMARKS
1	50.0	40.0	30.0	25.0	
2	49.0	39.5	29.5	25.0	
3	48.5	39.0	29.0	25.0	
4	48.0	38.5	28.5	25.0	
5	47.5	38.0	28.0	25.0	
6	47.0	38.0	28.0	25.0	
7	46.5	37.0	28.0	25.0	
8	46.0	37.0	28.0	25.0	
9	45.5	36.0	28.0	25.0	
10	45.0	36.0	28.0	25.0	
11	45.0	36.0	28.0	25.0	
12	44.5	36.0	28.0	25.0	
13	44.5	36.0	28.0	24.5	
14	44.5	36.0	28.0	24.5	
15	44.5	36.0	28.0	24.0	
16	44.0	35.0	27.5	24.0	
17	43.5	34.5	27.5	24.0	
18	43.0	34.0	27.0	24.0	
19	42.5	33.5	26.5	24.0	
20	42.0	33.0	26.5	24.0	
21	42.0	23.0	26.5	24.0	
22	42.0	32.5	26.5	24.5	
23	41.5	32.0	26.5	24.5	
24	41.5	31.5	26.5	25.0	
25	41.5	31.0	26.5	25.0	
26	41.0	31.0	26.0	26.0	
27	41.0	31.0	26.0	27.0	
28	40.5	31.0	25.5	28.0	
29	40.5	31.0	25.0	30.0	
30	40.0	31.0	25.0	31.0	
31	-	30.5	25.0	-	
TOTAL SEC. FT. DAYS	1322.5	1074.5	845.0	758.0	122 day period
MEAN SEC.FT.	44.1	34.7	27.3	25.3	32.8
MAX. SEC.FT.	50.0	40.0	30.0	31.0	50.0
MIN. SEC.FT.	40.0	30.5	25.0	25.0	25.0
TOTAL AC.FT.	2630	2130.	1680.	1500.	7940

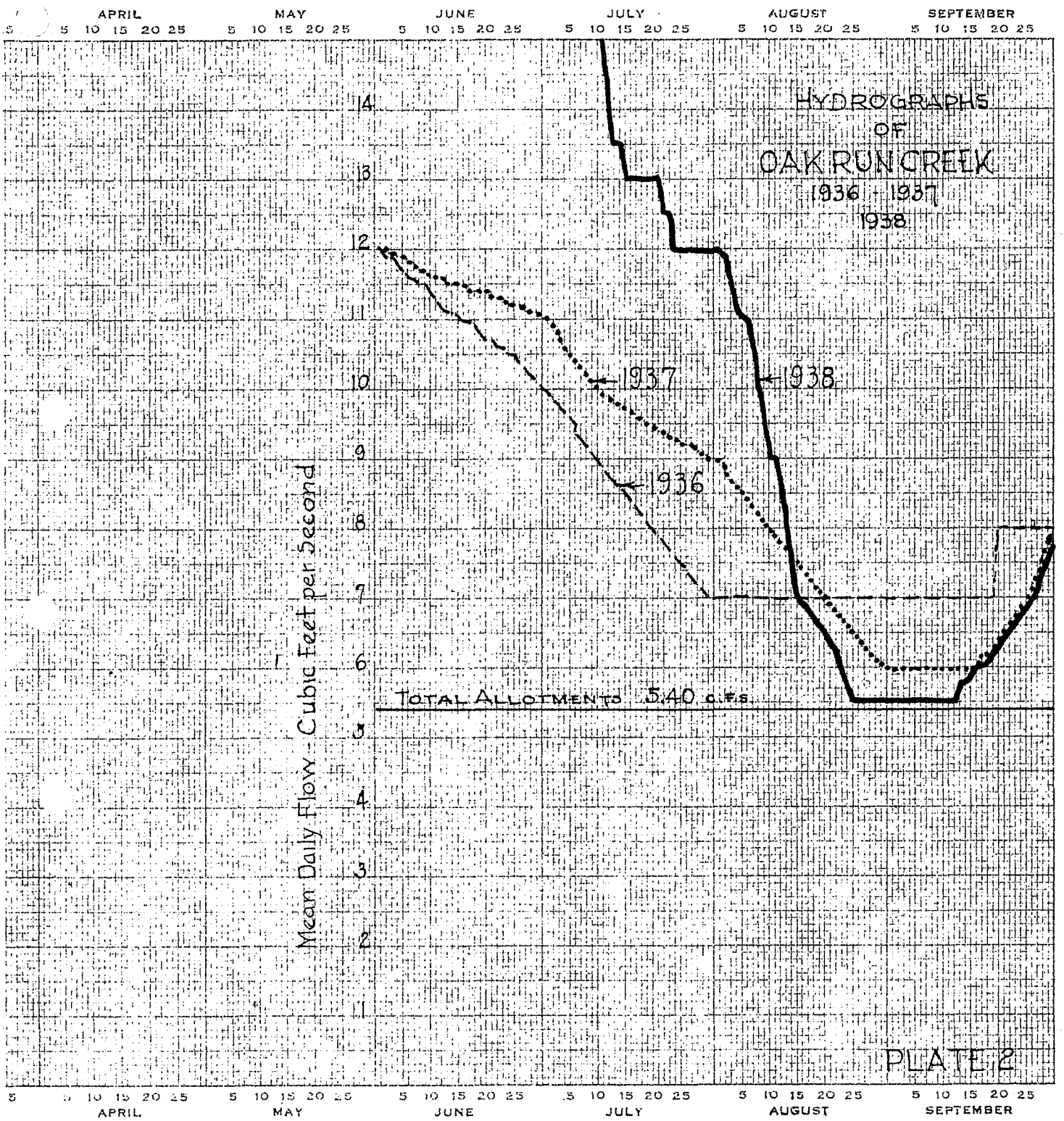
TABLE 5

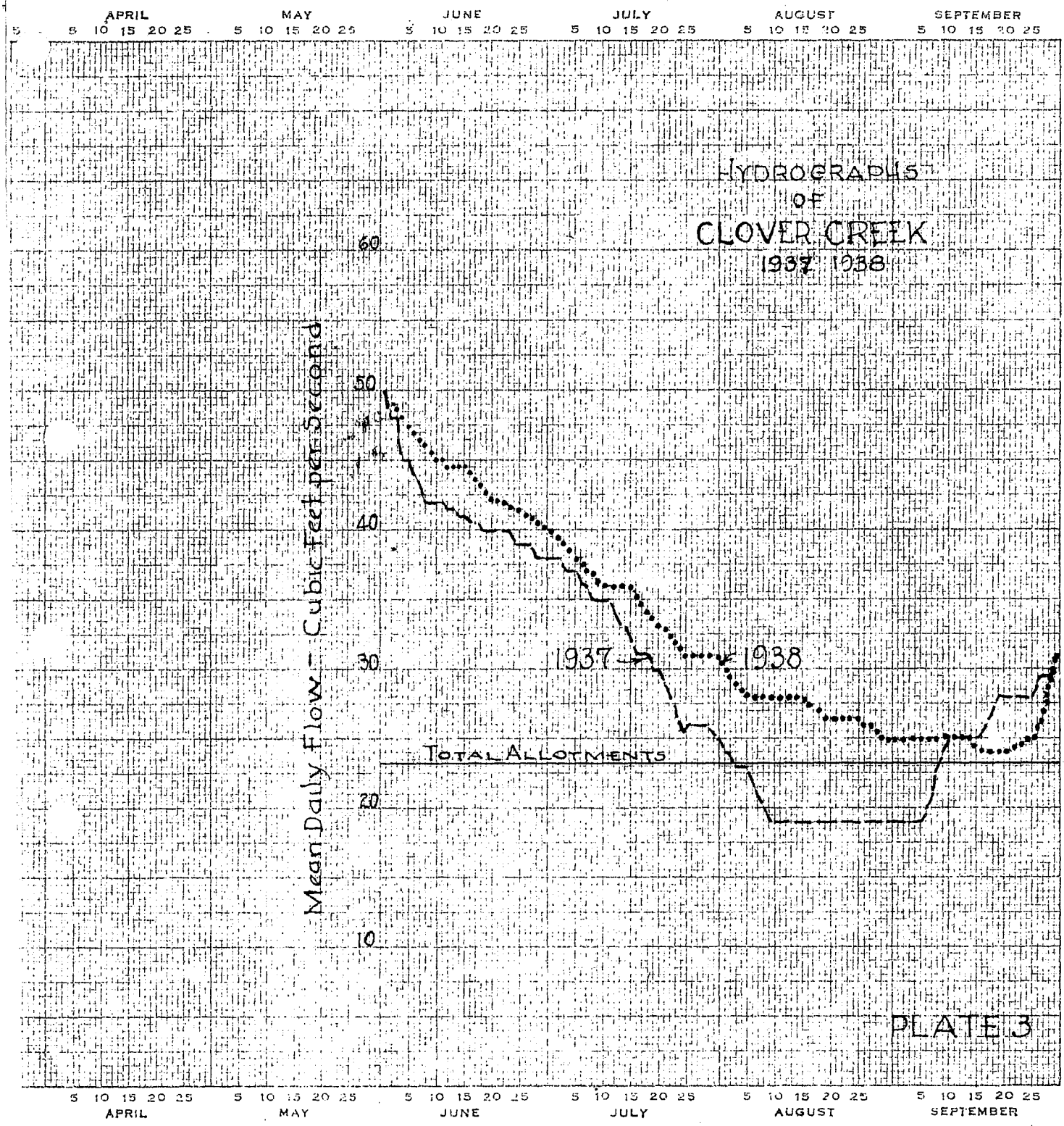
Estimated Net Available Flow in Cubic Feet per Second of Cedar Creek for the period June 1 to Sept.30,1938

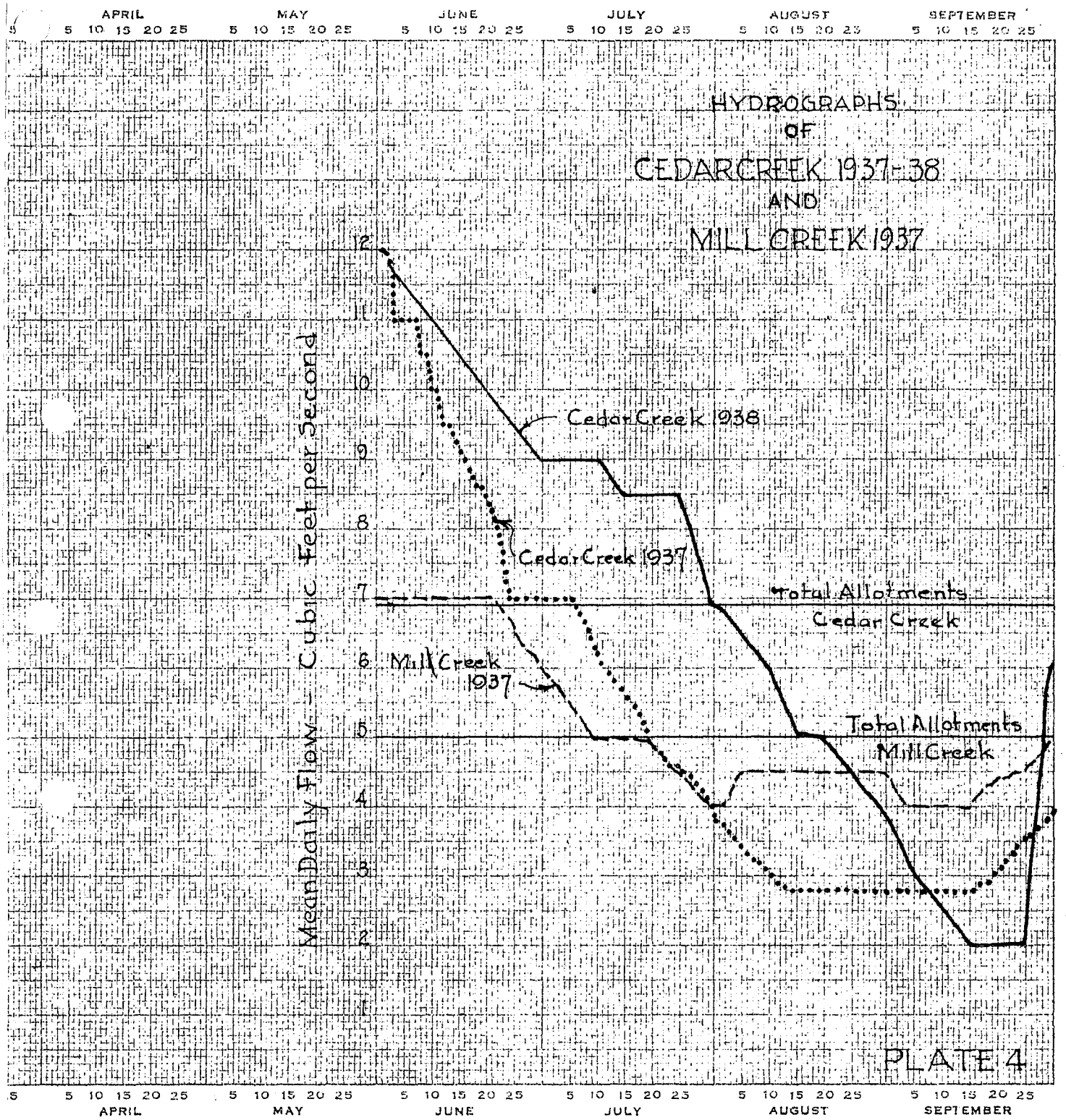
DAY	JUNE	JULY	AUGUST	SEPTEMBER	REMARKS
1	12.0	9.00	6.90	3.80	
2	11.9	9.00	6.80	3.60	
3	11.7	9.00	6.70	3.40	
4	11.6	9.00	6.60	3.20	
5	11.5	9.00	6.50	3.00	
6	11.4	9.00	6.40	2.90	
7	11.3	9.00	6.30	2.80	
8	11.2	9.00	6.20	2.70	
9	11.1	9.00	6.10	2.60	
10	11.0	9.00	6.00	2.50	
11	10.9	8.90	5.80	2.40	
12	10.8	8.80	5.60	2.30	
13	10.7	8.70	5.40	2.20	
14	10.6	8.60	5.20	2.10	
15	10.5	8.50	5.00	2.00	
16	10.4	8.50	5.00	2.00	
17	10.3	8.50	5.00	2.00	
18	10.2	8.50	5.00	2.00	
19	10.1	8.50	5.00	2.00	
20	10.0	8.50	5.00	2.00	
21	9.90	8.50	4.90	2.00	
22	9.80	8.50	4.80	2.00	
23	9.70	8.50	4.70	2.00	
24	9.60	8.50	4.60	2.00	
25	9.50	8.50	4.50	2.00	
26	9.40	8.20	4.40	2.00	
27	9.30	7.90	4.30	3.00	
28	9.20	7.60	4.20	4.00	
29	9.10	7.30	4.10	5.00	
30	9.00	7.00	4.00	6.00	
31	-	6.90	3.90	-	
TOTAL SEC. FT. DAYS	313.70	265.40	164.90	81.50	122 day period
MEAN SEC.FT.	10.5	8.50	5.32	2.72	6.73
MAX. SEC.FT.	12.0	9.00	6.90	6.00	12.0
MIN. SEC.FT.	9.00	6.90	3.90	2.00	2.00
TOTAL AC.FT.	622.	523	327.	162.	1630.

PLATES


HYDROGRAPHS
OF
NORTH COW CREEK
1936 - 1937
1938
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
5 10 15 20 25
Mean Daily Flow - Cubic Feet per Second
70
60
50
40
30
20
10
0
1938
1937
1936
ROTATION ALLOTMENTS
PLATE I


HYDROGRAPHS
OF
OAK RUN CREEK
1936 - 1937
1938
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
5 10 15 20 25
14
13
12
11
10
9
8
7
6
5
4
3
2
1
1937
1938
1936
TOTAL ALLOTMENTS 5.40 c.f.s.
Mean Daily Flow - Cubic Feet per Second
PLATE 2


HYDROGRAPHS
OF
CLOVER CREEK
1937 1938
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
5 10 15 20 25
60
50
40
30
20
10
Mean Daily Flow - Cubic Feet per Second
1937
1938
TOTAL ALLOTMENTS
PLATE 3


HYDROGRAPHS
OF
CEDAR CREEK 1937-38
AND
MILL CREEK 1937
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
5 10 15 20 25
Mean Daily Flow - Cubic Feet per Second
12
11
10
9
8
7
6
5
4
3
2
1
Cedar Creek 1938
Cedar Creek 1937
Total Allotments
Cedar Creek
Mill Creek
1937
Total Allotments
Mill Creek
PLATE 4