1939

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EDWARD HYATT, STATE ENGINEER
CHIEF OF DIVISION

CULBERT L. OLSON
GOVERNOR OF CALIFORNIA

FRANK W. CLARK
DIRECTOR

STATE OF CALIFORNIA
Department of Public Works
SACRAMENTO

DIVISION OF WATER RESOURCES
401 PUBLIC WORKS BUILDING

January 30, 1940

Mr. Harold Conkling
Deputy State Engineer
Sacramento, California

Attention: Mr. Gordon Zander
Supervising Hydraulic Engineer

Dear Sir:

Herewith is submitted a report covering water master service on the Cow Creek Water Master District, Shasta County, California, during the 1939 season.

This report considers the climatological and hydrographic features and a description of results of water distribution during the 1939 season.

Respectfully submitted,

W. J. Alexandy
Water Master Assistant

ORGANIZATION

FRANK W. CLARK	Director of Public Works
EDWARD HYATT	State Engineer
HAROLD CONKLING	Deputy State Engineer

GORDON ZANDER
Supervising Hydraulic Engineer

Harrison Smitherum	Senior Hydraulic Engineer
W. A. Alexander	Water Master Assistant

Sacramento, California

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 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. v. John Rutherford, et al., No. 5804, and on July 22, 1932, in the case of F. A. Colby et al., v. 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 decree entered by the Superior Court, Shasta County, 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 1939 season in accordance with the "Distribution of Water" procedure contained in Sections 37 to 37f, inclusive, of the Water Commission Act. W. A. Alexander, the duly appointed water master for Cow Creek Water Master District, served in that capacity throughout the season.

Water master service was commenced on About June 1 and terminated on September 30. The various ditches diverting from the several streams were regulated in accordance with the schedules of allotments contained in the above mentioned decrees. All ditches, except three that were destroyed in the flood of December, 1937, were in operation throughout the season.

Discussion of Results

Precipitation

Data on precipitation, as compiled from records kept at Redding and McCloud, are presented in Table 1 at the end of this report. Based upon these data the total precipitation for the 1938-39 season was 28.31 inches, or 69 per cent of the mean for the 27 seasonal years - 1912 to 1939. Of this total, 22.06 inches, or 78 per cent fell during the period from October 1 to April 1, as compared to the 27 year mean of 81 per cent for the same months.

Water Supply

Estimates of the net available flow of North Cow Creek, Cedar Creek, Oak Run Creek and Clover Creek 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 delivered to the various ditches diverting from said 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 are shown on Plates 1, 2, 3 and 4.

Distribution

North Cow Creek. From June 1 to 29, 1939, the available water supply was distributed on a continuous flow basis. On June 29th, the rotation schedule was put into effect with the Class"A" users receiving the water. Distribution was carried on under the rotation schedule up to August 5, on which date and for the remainder of the season, all water users were put on minimum flow allotments.

The Wilsey Ditch was in such poor repair that its capacity was limited to about 25 per cent of its full rotation allotment, therefore, this ditch was operated on a continuous flow basis.

The Fasset Ditch, Hobson Upper Ditch and Ward Upper Ditch have not been repaired since being damaged by the flood of December, 1937. These ditches were

not operated during the 1939 season.

Cedar Creek

The water in Cedar Creek from June 1 to July 1 was distributed in accordance with the decree to all users with the exception of the Rowe Ranch, which made no use of Cedar Creek water during the 1939 season.

Subsequent to July 1 no water was delivered to the Hadley Ranch or the Bishop Ranch due to the impossibility of diverting water from the creek into their ditches at such a low flow.

Oak Run Creek

No regulation was required during the month of June as a surplus existed in the creek. From July 1st there was a rapid decrease in the water supply until the latter part of the month where the flow leveled off to about 2.50 cubic feet per second for the remainder of the season. This flow was only sufficient to supply stock and garden water on a continuous flow basis to all water users, so in order to permit partial irrigation a rotation schedule was used by the Strawn, Cook and Murphy ranches.

Clover Creek

Regulation commenced on June 1, 1939, and was continued throughout the season in accordance with the court decree previously mentioned in this report. The total allotment of 23.59 cubic feet per second was available on June 1, but steadily decreased to approximately 50 per cent on July 25th, where it remained nearly constant for the remainder of the season.

No water was used during the 1939 season on the Clover Creek Falls Ranch of C. Reineke, due to the poor repair of the ditches.

There was no water available at the diversions from Dry Clover below the C. L. Harper Ditch from July 25th throughout the remainder of the season.

The Joe Rice Ranch, dependent upon drainage from the Whitmore and Klinger Ranches, was deficient in water supply throughout the season with practi-

cally no water available after July 25th. This was due to the fact that 50 per cent allotment is not adequate to permit a sufficient drainage from the above lands to reach the Joe Rice Ranch.

Structures

Parshall measuring devices were installed during the 1939 season to facilitate the distribution of water in the ditches listed under their respective creeks below as follows:

Cow Creek - Baker, Lemm, and Sam Rice Ditches.

Clover Creek - Bonde, Mill, Worley, Welch and Nailor and Millville Ditches.

Oak Run Creek - Kirkendahl, Alpaugh and Melton Upper Ditches.

Recommendations

Several measuring devices should be replaced during the 1940 season in order to facilitate distribution. The streams and their respective ditches in need of measuring devices are as follows:

Cow Creek - Ward, Cook and Butcher and Eldridge Lower Ditches.

Clover Creek - Guttman, Reineke, Yordy and Weigart Ditches.

Cedar Creek - King and Bidwell ditches.

TABLES

TABLE 1

Average of Precipitation at Redding and McCloud - 1912 to 1939 (1)

Monthly, seasonal and average amounts in inches.

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
1938-39	4.53	3.11	3.01	4.22	1.86	5.33	.14	3.93	.20	.52	T	1.46	28.31
Totals	61.73	121.93	167.07	221.58	173.72	146.77	88.28	58.53	28.80	5.98	3.38	25.90	1103.67
Mean 27 Years	2.27	4.52	6.19	8.21	6.43	5.44	3.27	2.17	1.07	0.22	0.13	.96	40.88

(1) See 1929 Water Master Report for records 1912 to 1922

TABLE 2

Estimated Net Available Flow in Cubic Feet per Second of North Cow Creek for the Period June 1 to Sept. 30, 1939.

Day	June	July	August	September	
1	48.6	22.0	6.10	6.20	
2	47.4	21.5	7.00	6.50	
3	44.8	21.0	6.80	6.40	
4	43.4	21.0	6.50	6.30	
5	42.0	20.2	6.40	6.30	
6	40.8	20.2	6.40	6.30	
7	39.6	20.2	6.40	6.30	
8	38.4	20.4	6.30	6.30	
9	37.2	20.4	6.30	6.30	
10	36.0	20.3	6.30	6.30	
11	35.3	20.3	6.30	6.30	
12	34.7	19.2	6.30	6.30	
13	34.2	18.0	6.30	6.30	
14	33.6	17.2	6.30	6.30	
15	33.0	16.3	6.30	6.30	
16	33.0	16.1	6.30	6.30	
17	33.0	15.0	6.30	6.30	
18	33.0	14.2	6.30	6.30	
19	33.0	13.1	6.30	8.00	
20	33.0	12.5	6.30	7.20	
21	31.8	11.4	6.30	7.20	
22	30.6	10.6	6.30	7.10	
23	29.4	9.8	6.20	6.80	
24	28.2	9.0	6.20	6.80	
25	27.0	8.1	6.20	6.70	
26	26.0	7.8	6.20	6.70	
27	25.0	7.2	6.10	6.70	
28	24.0	6.8	6.10	6.50	
29	23.0	6.5	6.10	6.50	
30	22.0	6.1	6.10	6.30	
31		6.1	6.10		
Total Sec. Ft. Days	1021.0	458.5	195.4	196.1	122 Day Period
Mean Sec. Ft.	34.0	14.8	6.30	6.54	15.3
Max. Sec. Ft.	48.6	22.0	7.00	8.00	48.6
Min. Sec. Ft.	22.0	6.10	6.10	6.30	6.10
Total Ac. Ft.	2025	909	384	389	3710

TABLE 5

Estimated Net Available Flow in Cubic Feet per Second of Cedar Creek for the Period June 1 to Sept.30 1939.

Day	June	July	August	September	
1	4.00	3.10	0.40	0.40	
2	4.00	2.90	.40	.40	
3	4.00	2.90	.40	.40	
4	4.00	2.70	.40	.40	
5	4.00	2.60	.40	.40	
6	4.00	2.40	.40	.40	
7	3.80	2.30	.40	.40	
8	3.80	2.20	.40	.40	
9	3.70	2.10	.40	.40	
10	3.70	1.80	.40	.40	
11	3.70	1.70	.40	.40	
12	3.70	1.50	.40	.40	
13	3.70	1.20	.40	.40	
14	3.70	1.10	.40	.40	
15	3.70	0.93	.40	.40	
16	3.70	0.91	.40	.40	
17	3.70	.90	.40	.40	
18	3.70	.90	.40	1.50	
19	3.70	.85	.40	1.40	
20	3.70	.80	.40	1.20	
21	3.70	.80	.40	1.20	
22	3.70	.80	.40	1.20	
23	3.70	.75	.40	1.30	
24	3.70	.75	.40	1.30	
25	3.70	.70	.40	1.30	
26	3.70	.70	.40	1.30	
27	3.70	.70	.40	1.30	
28	3.60	.70	.40	1.30	
29	3.60	.65	.40	1.30	
30	3.50	.65	.40	1.30	
31		.65	.40		
Total Sec.Feet Days	112.60	43.64	12.40	23.70	122 Day Period
Mean Sec. Ft.	3.75	1.41	.40	.79	1.58
Max. Sec. Ft.	4.00	3.10	.40	1.50	4.00
Min. Sec. Ft.	3.50	.65	.40	.40	.40
Total Ac.Ft.	223	86.5	24.6	47.0	381

TABLE 4

Estimated Net Available Flow in Cubic Feet Per Second of Oak Run Creek for the Period July 1 to Sept.30,1939

Day	June	July	August	September	
1	Surplus	5.10	2.60	2.50	
2	"	4.80	2.60	2.50	
3	"	4.60	2.60	2.50	
4	"	4.40	2.55	2.50	
5	"	4.20	2.55	2.50	
6	"	4.20	2.55	2.50	
7	"	4.00	2.55	2.50	
8	"	3.80	2.85	2.50	
9	"	3.60	2.72	2.50	
10	"	3.60	2.67	2.50	
11	"	3.60	2.67	2.50	
12	"	3.60	2.67	2.60	
13	"	3.60	2.60	2.65	
14	"	3.60	2.54	2.65	
15	"	3.60	2.50	2.70	
16	"	3.40	2.50	2.70	
17	"	3.40	2.50	2.70	
18	"	3.20	2.50	3.20	
19	"	3.20	2.50	3.10	
20	"	3.20	2.55	3.10	
21	"	3.20	2.55	3.10	
22	"	2.80	2.60	3.10	
23	"	2.80	2.80	3.10	
24	"	2.75	2.71	3.10	
25	"	2.75	2.71	3.10	
26	"	2.75	2.71	3.10	
27	"	2.75	2.65	3.10	
28	"	2.75	2.64	3.50	
29	"	2.75	2.59	4.30	
30	"	2.75	2.51	4.20	
31	"	2.75	2.50		
Total Sec. Ft.Days		107.50	80.74	86.60	92 Day Period
Mean Sec. Ft.		3.47	2.60	2.89	2.99
Max. Sec. Ft.		5.10	2.85	4.30	5.10
Min. Sec. Ft.		2.75	2.50	2.50	2.50
Total Ac. Ft.		213	160	172	545

TABLE 5

Estimated Net Available Flow in Cubic Feet per Second of Clover Creek for the Period June 1 to Sept.30, 1939.

Day	June	July	August	September	
1	25.0	16.3	11.3	10.2	
2	24.0	16.3	11.3	10.2	
3	24.0	16.3	11.0	10.2	
4	23.0	16.3	10.8	10.2	
5	23.0	16.3	10.2	10.2	
6	23.0	16.3	10.2	10.2	
7	22.0	16.3	10.2	10.2	
8	21.0	16.3	10.2	10.2	
9	20.0	16.3	10.2	10.2	
10	20.0	16.3	10.2	10.2	
11	19.5	15.9	10.2	10.2	
12	18.0	15.2	10.2	10.2	
13	17.6	14.6	10.2	10.2	
14	17.2	14.2	10.2	10.2	
15	16.3	13.9	10.2	10.2	
16	16.3	13.9	10.2	10.2	
17	16.3	13.9	10.2	11.0	
18	16.3	13.9	10.2	12.2	
19	16.3	13.9	10.2	12.2	
20	16.3	13.9	10.2	12.2	
21	16.3	13.9	10.2	12.2	
22	16.3	13.0	10.2	12.2	
23	16.3	12.2	10.2	12.2	
24	16.3	12.2	10.2	12.2	
25	16.3	11.5	10.2	12.2	
26	16.3	11.5	10.2	12.2	
27	16.3	11.5	10.2	12.2	
28	16.3	11.5	10.2	12.2	
29	16.3	11.5	10.2	12.2	
30	16.3	11.5	10.2	12.2	
31		11.5	10.2		
Total Sec. Ft. Days	538.1	438.1	319.8	332.8	122 Day Period
Mean Sec. Ft.	18.6	14.1	10.3	11.1	13.5
Max Sec. Ft.	25.0	16.3	11.3	12.2	25.0
Min Sec. Ft.	16.3	11.5	10.2	10.2	10.2
Total Ac. Ft.	1107	869	634	660	3270

PLATES

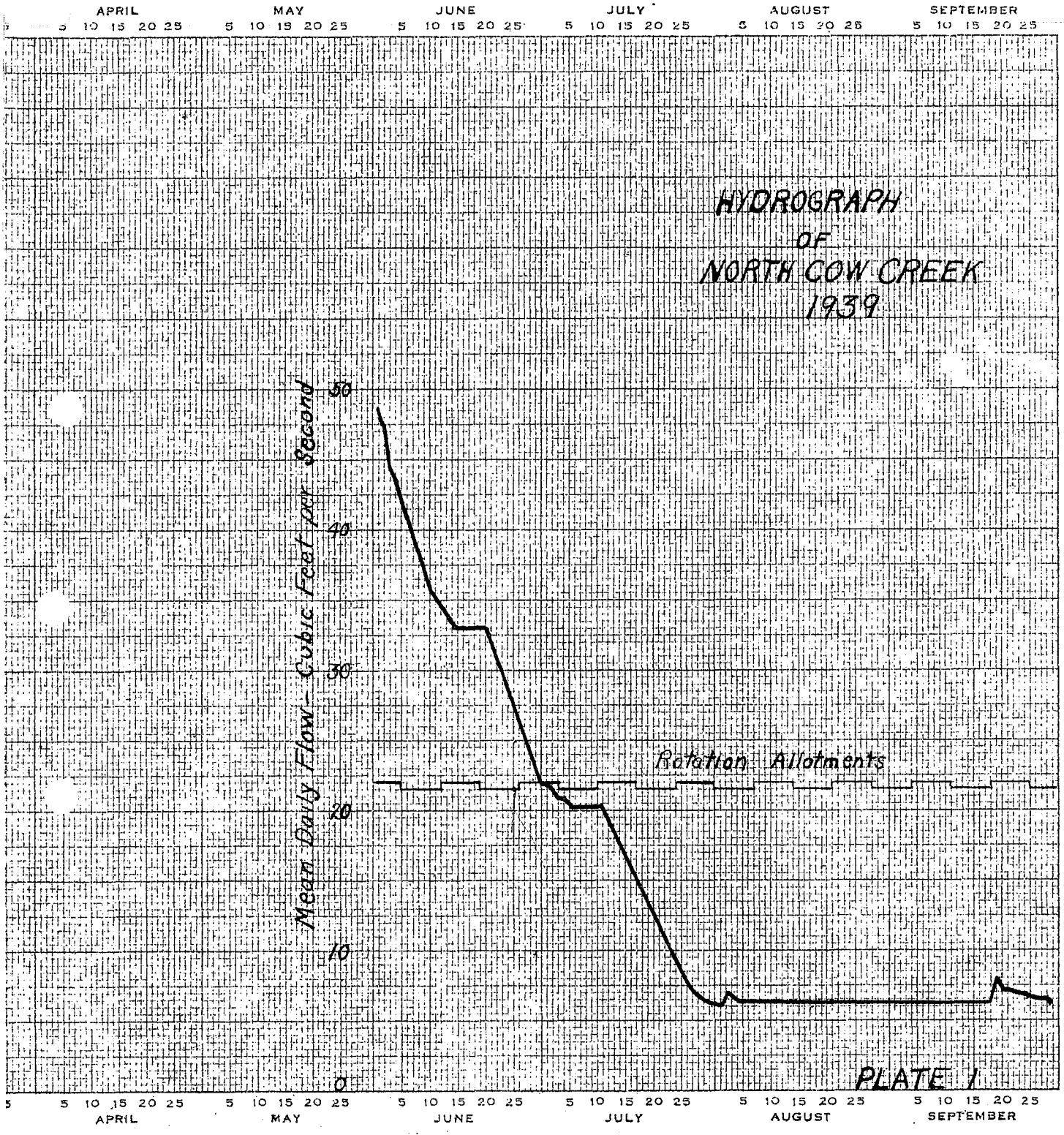

HYDROGRAPH
OF
NORTH COW CREEK
1939
Mean Daily Flow - Cubic Feet per Second
50
40
30
20
10
0
Rotation Allotments
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
5 10 15 20 25

PLATE 1

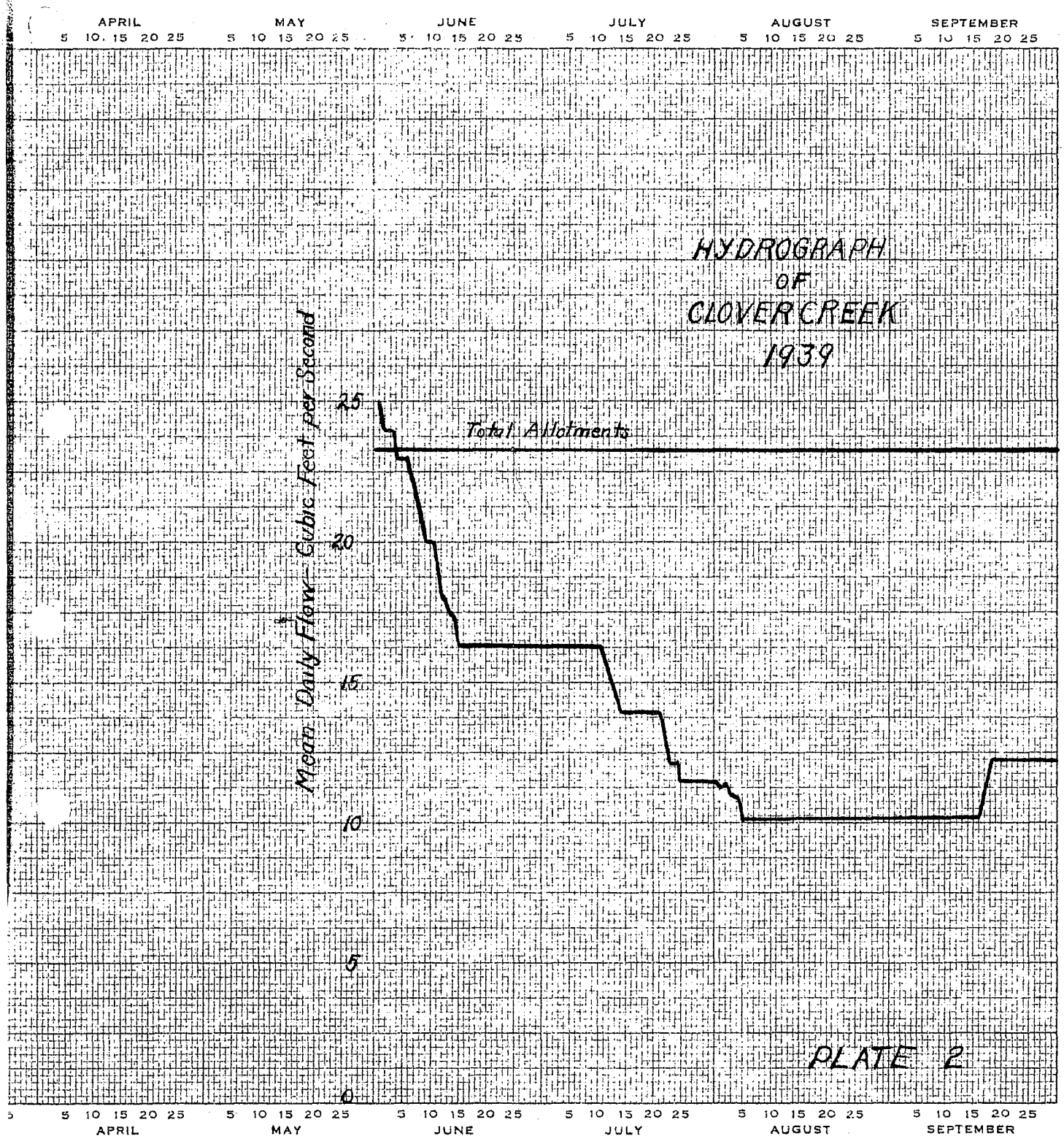
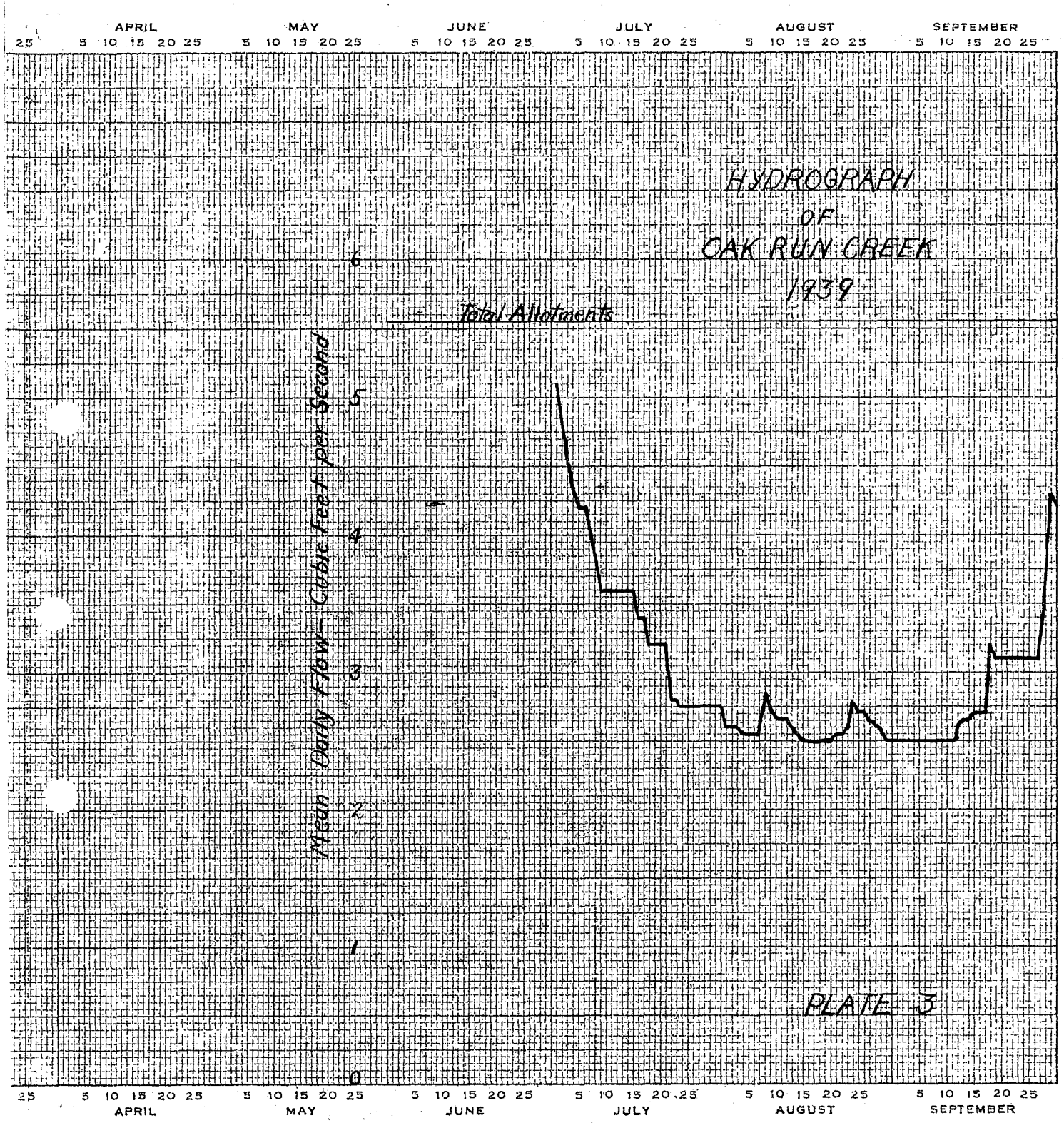
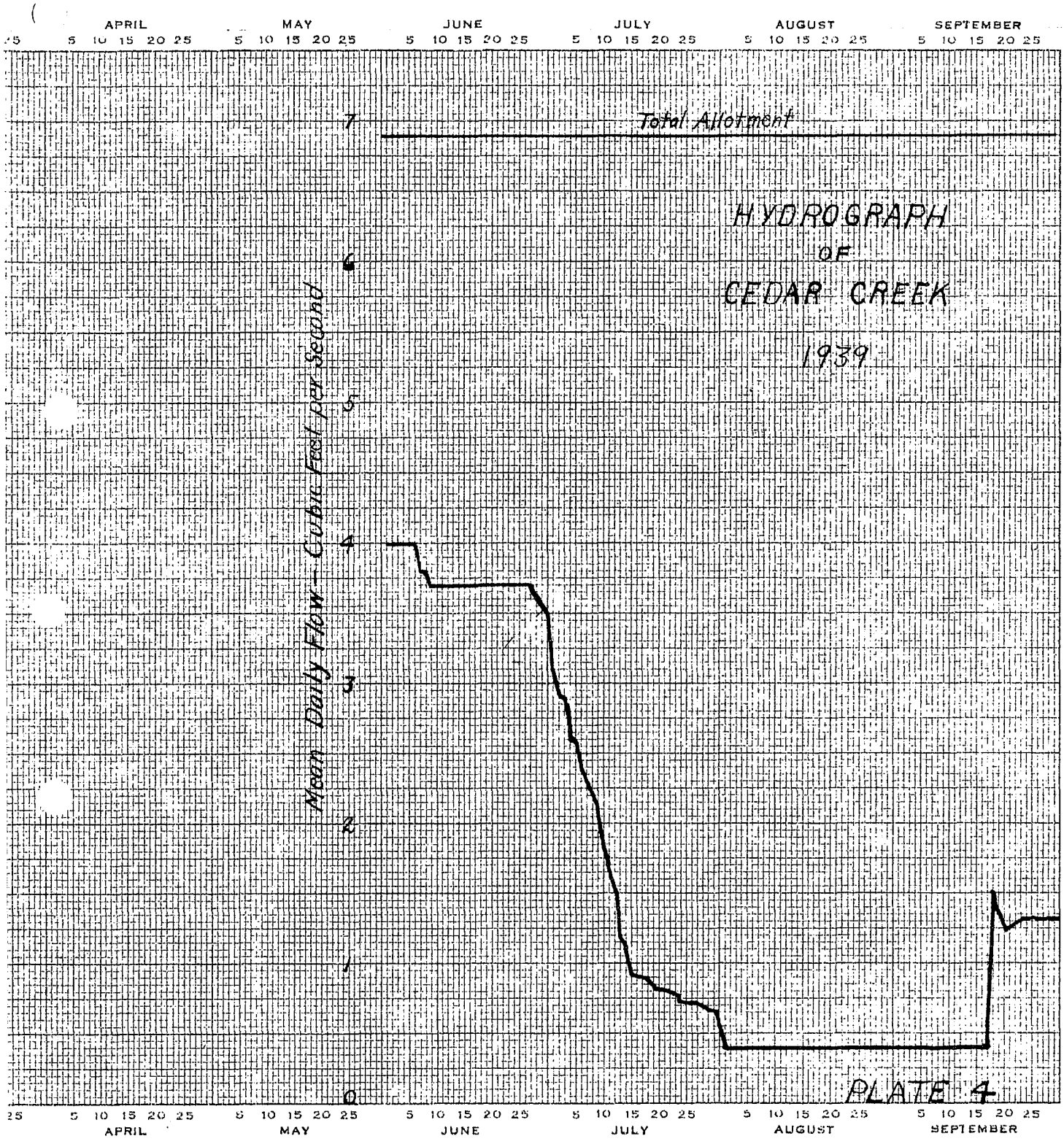

HYDROGRAPH
OF
CLOVER CREEK
1939
Total Allotments
Mean Daily Flow - Cubic Feet per Second
25
20
15
10
5
0
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
5 10 15 20 25

PLATE 2


HYDROGRAPH
OF
OAK RUN CREEK
1939
Total Allotments
Mean Daily Flow—Cubic Feet per Second
0
1
2
3
4
5
6
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
25 5 10 15 20 25
PLATE 3


HYDROGRAPH
OF
CEDAR CREEK
1939
Total Allotment
Mean Daily Flow - Cubic Feet per Second
7
6
5
4
3
2
1
0
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
5 10 15 20 25
PLATE 4