STATE OF CALIFORNIA

DEPARTMENT OF PUBLIC WORKS

REPORTS OF THE
DIVISION OF WATER RESOURCES
EDWARD HYATT, STATE ENGINEER

REPORT ON WATER MASTER SERVICE IN COW CREEK WATER MASTER DISTRICT SHASTA COUNTY, CALIFORNIA 1940 SEASON

BY
G. M. Vickroy
Water Master

Sacramento, California

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EDWARD HYATT, STATE ENGINEER
CHIEF OF DIVISION

EARL WARREN
GOVERNOR OF CALIFORNIA

C. H. PURCELL
DIRECTOR

STATE OF CALIFORNIA

Department of Public Works

SACRAMENTO

DIVISION OF WATER RESOURCES
401 PUBLIC WORKS BUILDING

December, 1940

Mr. Harold Conkling
Deputy State Engineer
Sacramento, California

Attention: Gordon Zander
Supervising Hydraulic Engineer

Dear Sir:

Herewith is submitted the annual report on water master service in the Cow Creek Water Master District, Shasta County, California, during the 1940 season.

The report covers the distribution of water on North Cow, Cedar, Oak Run and Clover Creeks and presents a general description of the work. Records of precipitation, runoff and other pertinent data are included.

Respectfully submitted,

GMV:CS

FOR VICTORY
BUY
UNITED
STATES
SAVINGS
BONDS
AND STAMPS

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 Count, 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 decree of the Superior Court, Shasta County, entered October 4, 1937 in the case of Millville Ditch Company vs. Jesse Hufford, et al., No. 6904. The procedure of creating and enlarging said district 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 1940 season in accordance with the "Distribution of Water" procedure contained in Sections 37 to 37f, inclusive, of the Water Commission Act. G. M. Vickroy administered the diversions from the streams within the district throughout the season under appointment as Deputy Water Master. Harrison Smitherum was Supervising Water Master.

Water Master service in 1940 was commenced about June 1 and terminated on September 30. The various ditches diverting from the sevdral streams within the district were regulated in accordance with the schedules of allotments contained in the above mentioned decrees.

WATER SUPPLY

Precipitation

Data on precipitation, as compiled from the records of the United States Weather Bureau kept at Redding and McCloud, are presented in Table 1 at the end of this report. The total precipitation for the seasonal year 1939-40 was 62.94 inches, or 151 per cent of the seasonal mean for the 28 years of record. Of this total, 87 per cent fell during the period from October 1 to April 1 as compared to the 28 year mean of 81 per cent for the same period.

Stream Flow

The net available flow of North Cow Creek, Oak Run Creek, Clover Creek and Cedar Creek from July 1 to September 30, 1940 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 prepared from the data contained in the above numbered tables and presented herein as Plates 1, 2, 3 and 4, show a comparison between the water supply and the demands thereon for 1940. Also shown on these plates are hydrographs of the water supply for two other seasons.

DISTRIBUTION OF WATER

North Cow Creek

The available water supply in North Cow Creek was in excess of the amount required for 100 per cent allotments up to July 15, but gradually decreased until about August 15, when the flow was such as to give 60 per cent of allotments to both classes. Early rains increased the flow to about 100 per cent of allotments for the month of September.

Cedar Creek

The available water supply in Cedar Creek was in excess of the amount required for 100 per cent of allotments up to July 15. Subsequent to said date the flow gradually decreased to about 15 per cent of allotments on September 1. Early rains increased the flow to about 100 per cent of allotments after September 1.

Oak Run Creek

The available water supply in Oak Run Creek was in excess of 100 per cent of allotments for the entire season.

Clover Creek

The available water supply in Clover Creek was in excess of the amount required for 100 per cent of allotments up to July 20, then decreased to about 85 per cent on about September 1. Early rains in September increased the flow to 100 per cent of allotments.

Summary

The water supply was adequate for all demands, except on Cedar Creek. On that stream the supply was deficient during the month of August.

Several diversion structures and ditches, destroyed or damaged by high water in December, 1937 and in February and March, 1940, were not used or were not capable of diverting their entire allotments. Partly due to this condition the available water in North Cow Creek was at no time below 60 per cent of the total demands of both the "A" and "B" Classes, therefore rotation was not practiced at any time during the season.

The Fassett Ditch, Hobson Upper Ditch, Ward Upper Ditch and Eldridge Middle Ditch were not used in 1940 due to flood damage as stated above.

TABLES

TABLE 1

Average of Precipitation at Redding and McCloud - 1912 to 1940

Monthly, Seasonal and Average Amounts in Inches

Season	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	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
1939-40	1.29	0.61	11.61	14.66	17.32	9.44	3.44	1.97	0.35	0.48	0.00	1.77	62.94
Totals	63.02	122.54	178.68	236.24	191.04	156.21	91.72	60.50	29.15	6.46	3.38	27.67	1166.61
Mean 28 Years	2.25	4.38	6.38	8.44	6.82	5.57	3.28	2.16	1.04	.23	.12	.99	41.66

TABLE 2

Net Available Flow in Cubic Feet per Second
NORTH COW CREEK
July 1 to September 30, 1940

Day	July	August	September
1	50.0	19.0	18.5
2	49.0	19.0	18.5
3	48.0	19.0	18.5
4	46.0	19.0	26.0
5	45.0	19.0	32.0
6	45.0	19.0	32.0
7	44.0	19.0	34.0
8	43.0	19.0	36.0
9	43.0	19.0	38.0
10	42.0	18.5	40.0
11	41.0	18.5	40.0
12	41.0	18.5	36.0
13	40.0	18.5	36.0
14	39.0	18.5	35.0
15	38.0	18.5	35.0
16	37.0	18.5	40.0
17	36.0	18.5	40.0
18	33.0	18.5	40.0
19	30.0	18.5	40.0
20	28.0	18.5	40.0
21	27.0	18.5	40.0
22	27.0	18.5	40.0
23	26.0	18.5	40.0
24	26.0	18.5	40.0
25	25.0	18.5	40.0
26	23.0	18.5	40.0
27	20.0	18.5	40.0
28	20.0	18.5	40.0
29	20.0	18.5	40.0
30	20.0	18.5	40.0
31	20.0	18.5	
Total	1072.0	578.0	1075.5
Mean	34.5	19.2	34.7
Runoff in Ac. Ft.	2130	1150	2130

Total for 92 day period 5,410 acre feet.

TABLE 3

Net Available Flow in Cubic Feet per Second
OAK RUN CREEK
July 1 to September 30, 1940

Day	June	July	August	September	Remarks
1	SURPLUS	10.5	7.9	7.5	
2		10.5	7.8	7.5	
3		10.5	7.6	7.5	
4		10.5	7.5	8.0	
5		10.5	7.5	8.5	
6		10.4	7.5	8.6	
7		10.3	7.5	8.7	
8		10.2	7.5	8.8	
9		10.1	7.5	8.9	
10		10.0	7.5	9.0	
11		9.8	7.6	9.0	
12		9.6	7.8	9.0	
13		9.4	7.9	9.0	
14		9.2	7.9	9.0	
15		9.0	8.0	9.0	
16		9.0	8.0	9.0	
17		9.0	7.9	9.0	
18		9.0	7.8	9.0	
19		9.0	7.7	9.0	
20		9.0	7.5	9.0	
21		8.9	7.5	8.9	
22		8.7	7.5	8.8	
23		8.6	7.5	8.7	
24		8.5	7.5	8.6	
25		8.5	7.5	8.5	
26		8.4	7.5	8.5	
27		8.3	7.5	8.5	
28		8.2	7.5	8.5	
29		8.1	7.5	8.5	
30		8.0	7.5	8.5	
31		8.0	7.5		
Total		287.7	236.4	259.0	92 Day Period
Mean		9.2	7.6	8.3	8.3
Runoff in Ac.Ft.		571	469	514	1550

TABLE 4

Net Available Flow in Cubic Feet Per Second
CLOVER CREEK
July 1 to September 30, 1940

Day	June	July	August	September
1		40.0	20.0	20.0
2		39.0	20.0	20.0
3		38.0	20.0	23.0
4		37.0	20.0	24.0
5		35.0	20.0	25.0
6		34.0	20.0	26.0
7		33.0	20.0	27.0
8		32.0	20.0	28.0
9		31.0	20.0	28.0
10		30.0	20.0	28.0
11		29.0	20.0	28.0
12		28.0	20.0	27.0
13		27.0	20.0	27.0
14		26.0	20.0	26.0
15	SURPLUS	26.0	20.0	25.0
16		25.5	20.0	25.0
17		25.0	20.0	25.0
18		24.5	20.0	25.0
19		24.0	20.0	25.0
20		24.0	20.0	25.0
21		23.0	20.0	25.0
22		22.0	20.0	25.0
23		21.5	20.0	25.0
24		21.0	20.0	25.0
25		20.0	20.0	25.0
26		20.0	20.0	25.0
27		20.0	20.0	25.0
28		20.0	20.0	25.0
29		20.0	20.0	25.0
30		20.0	20.0	25.0
31		20.0	20.0	
Total		835.5	620.0	757.0
Mean		26.1	20.0	25.2
Runoff in Ac.Ft.		1660	1230	1500

Total 92 day period 4,390 acre-feet

TABLE 5

Net Available Flow in Cubic Feet per Second
CEDAR CREEK
July 1 to September 30, 1940

Day	June	July	August	September
1		8.0	2.9	1.5
2		7.8	2.8	1.5
3		7.6	2.7	3.0
4		7.4	2.6	3.5
5		7.0	2.5	4.0
6		6.7	2.4	6.0
7		6.5	2.3	6.0
8		6.4	2.2	6.0
9		6.2	2.1	6.0
10		6.0	2.0	6.0
11		5.9	1.9	6.2
12		5.8	1.8	6.3
13		5.7	1.7	6.5
14	SURPLUS	5.6	1.6	6.8
15		5.5	1.5	7.0
16		5.2	1.5	6.8
17		5.0	1.5	6.6
18		4.8	1.5	6.4
19		4.6	1.5	6.2
20		4.5	1.5	6.0
21		4.4	1.5	6.0
22		4.3	1.5	6.0
23		4.2	1.5	6.0
24		4.1	1.5	6.0
25		4.0	1.5	6.0
26		3.8	1.5	6.0
27		3.6	1.5	6.0
28		3.2	1.5	6.0
29		3.1	1.5	6.0
30		3.0	1.5	6.0
31		3.0	1.5	
Total		159.5	57.0	168.3
Mean		5.1	1.8	5.6
Runoff in Ac.Ft.		316.	113.	334.

Total 92 day period 763 acre-feet.

PLATES

PLATE 1

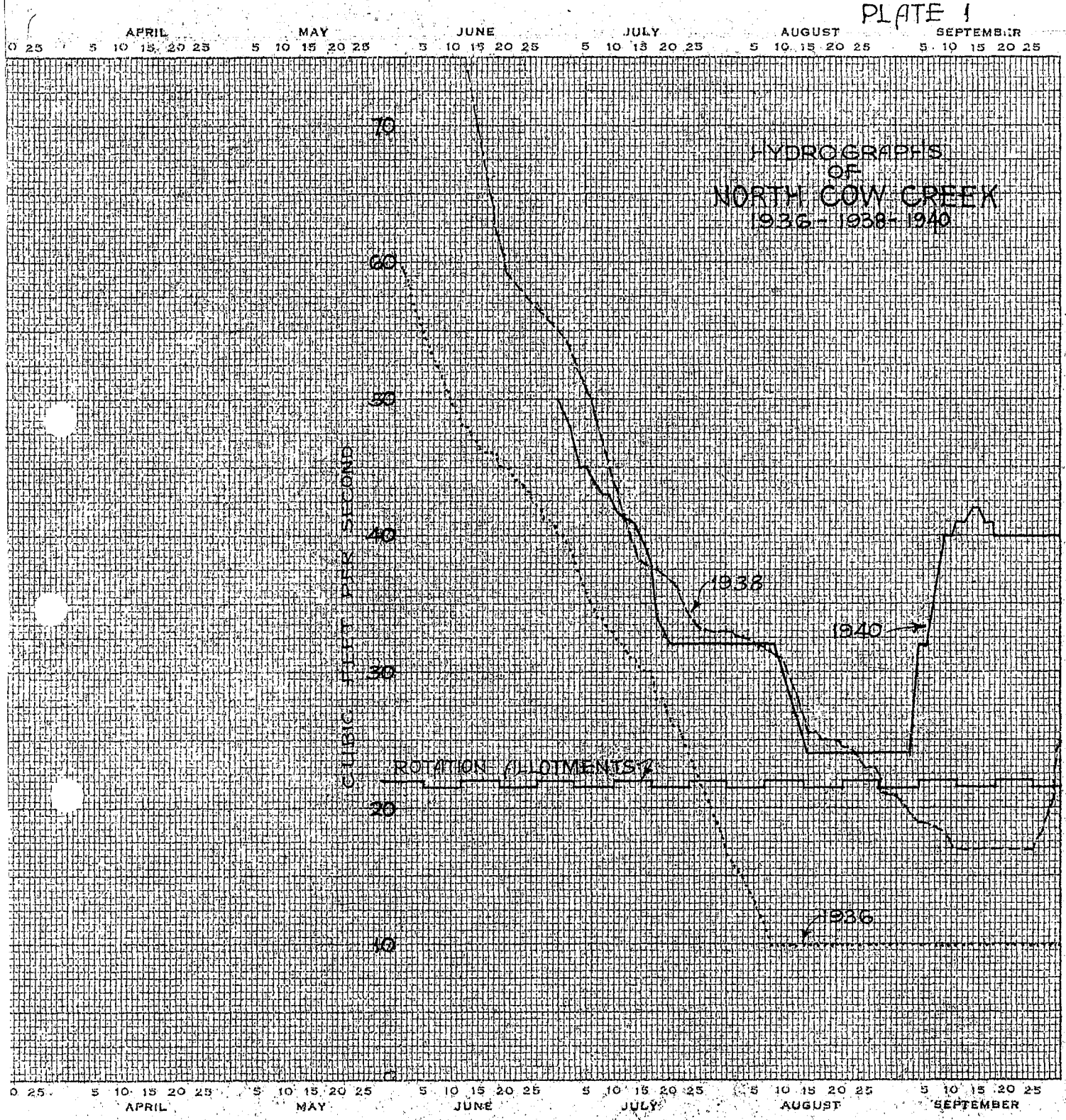

HYDROGRAPHS
OF
NORTH COW CREEK
1936 - 1938 - 1940
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
0 25
5 10 15 20 25
70
60
50
40
30
20
10
CUBIC FEET PER SECOND
ROTATION ALLOTMENTS
1938
1940
1936

PLATE 2

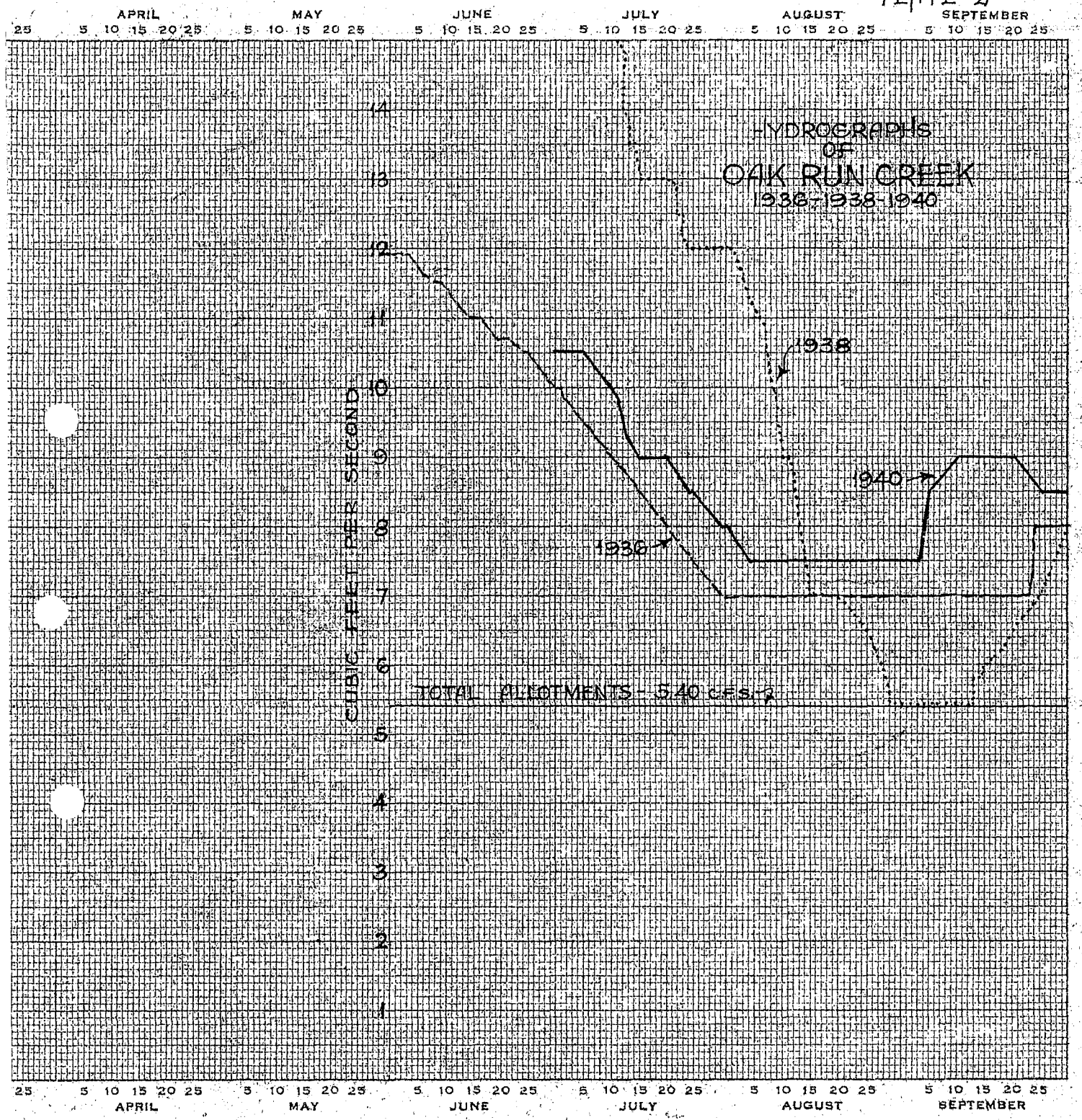

HYDROGRAPHS
OF
OAK RUN CREEK
1936-1938-1940
1938
1940
1936
TOTAL ALLOTMENTS - 5.40 c.f.s.
CUBIC FEET PER SECOND
14
13
12
11
10
9
8
7
6
5
4
3
2
1
25 5 10 15 20 25 5 10 15 20 25 5 10 15 20 25 5 10 15 20 25 5 10 15 20 25 5 10 15 20 25
APRIL MAY JUNE JULY AUGUST SEPTEMBER

PLATE 3

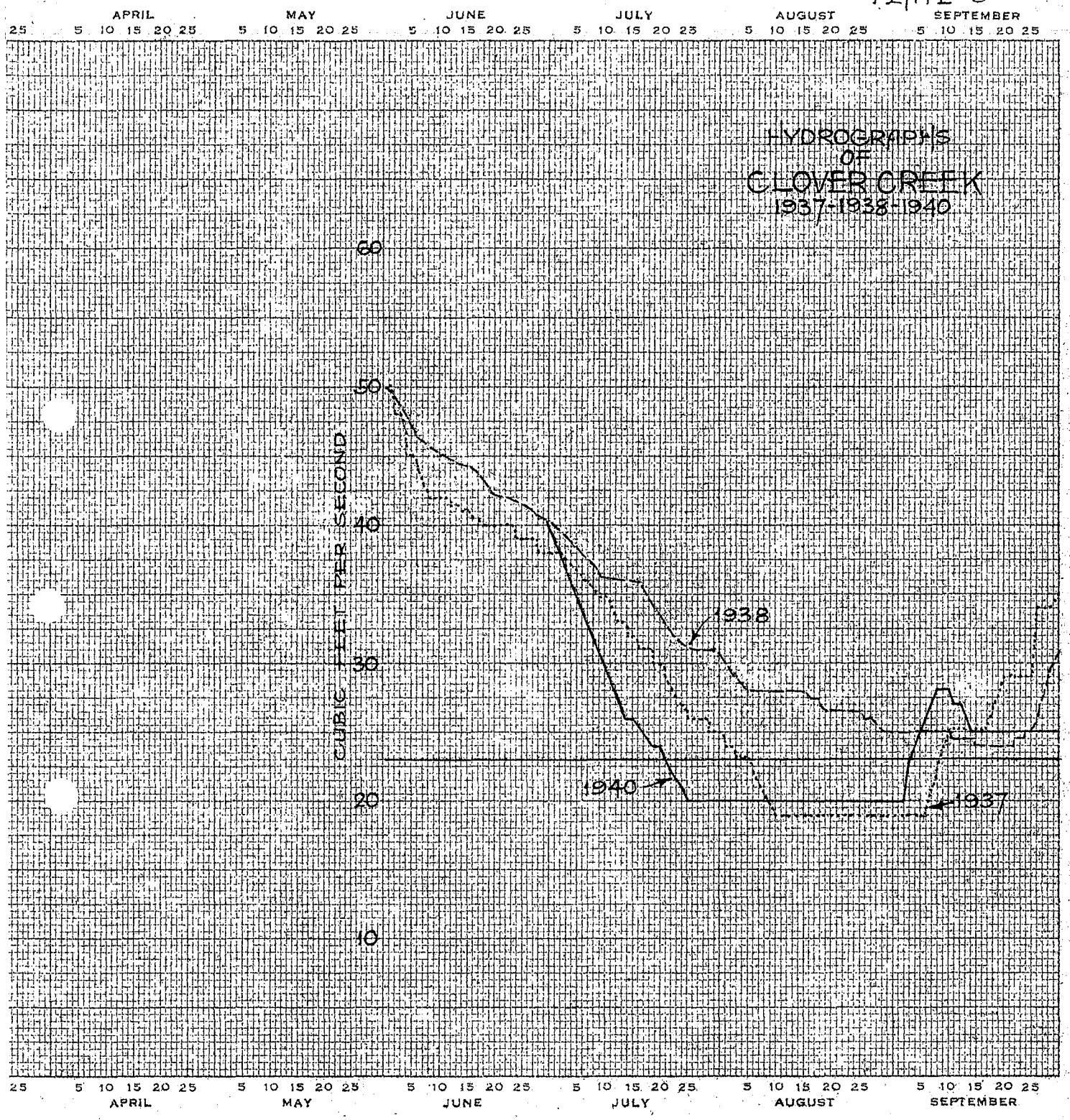
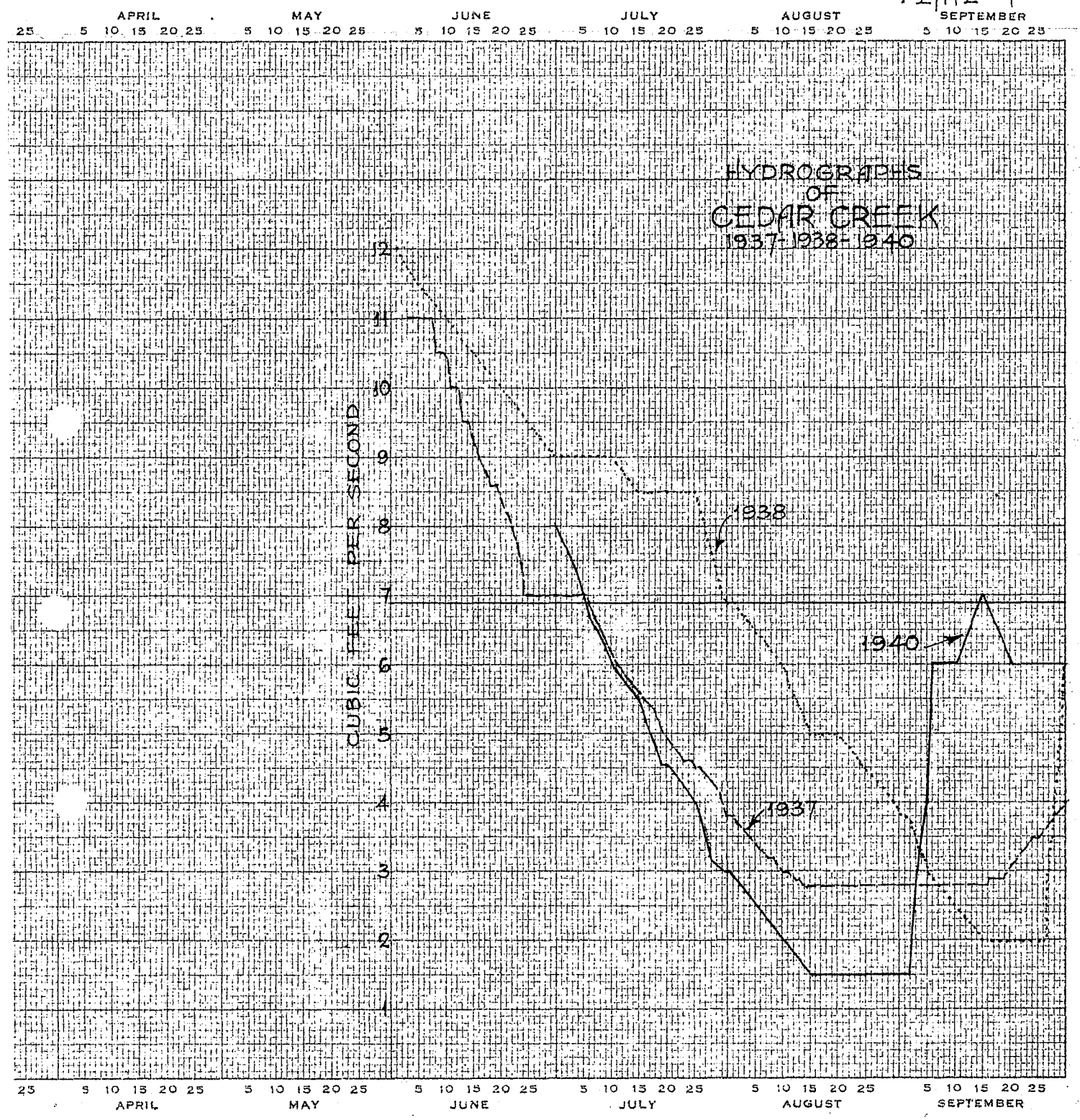

HYDROGRAPHS
OF
CLOVER CREEK
1937-1938-1940
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
25 5 10 15 20 25
CUBIC FEET PER SECOND
60
50
40
30
20
10
1938
1940
1937

PLATE 4


HYDROGRAPHS
OF
CEDAR CREEK
1937-1938-1940
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
25 5 10 15 20 25
CUBIC FEET PER SECOND
12
11
10
9
8
7
6
5
4
3
2
1
1938
1940
1937