STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

O

EARL WARREN, Governor

C. H. PURCELL, Director of Public Works

A. D. EDMONSTON, State Engineer

REPORT ON WATERMASTER SERVICE IN SHASTA RIVER WATERMASTER SERVICE AREA

Siskiyou County, California

1950 SEASON

Sacramento, California

March, 1951

SUBMISSION TO, AND ADOPTION BY
DEPARTMENT OF PUBLIC WORKS

I, L. C. Jopson, Supervising Hydraulic Engineer, Division of Water Resources, Department of Public Works of the State of California, hereby submit the within contained report entitled "Report on Watermaster Service in Shasta River Watermaster Service Area, Siskiyou County, California, 1950 Season".

/s/ L. C. JOPSON
Supervising Hydraulic Engineer

I, Gordon Zander, Principal Hydraulic Engineer, Division of Water Resources, Department of Public Works of the State of California, hereby approve the within contained report entitled "Report on Watermaster Service in Shasta River Watermaster Service Area, Siskiyou County, California, 1950 Season".

/s/ GORDON ZANDER
Principal Hydraulic Engineer

I, A. D. Edmonston, State Engineer and Chief of the Division of Water Resources, Department of Public Works of the State of California, hereby approve and adopt the within contained report entitled "Report on Watermaster Service in Shasta River Watermaster Service Area, Siskiyou County, California, 1950 Season", as a report of the Department of Public Works,

WITNESS my hand and the seal of the Department of Public Works of the State of California, this day of , 195 .

DEPARTMENT OF PUBLIC WORKS

By /s/ A. D. EDMONSTON
A. D. Edmonston
State Engineer

(SEAL)

ORGANIZATION

C. H. Purcell . . . . . Director of Public Works

A. D. Edmonston . . . . . State Engineer

P. H. Van Etten . . . . . Assistant State Engineer

Gordon Zander . . . . . Principal Hydraulic Engineer

This report was prepared under the direction of

L. C. JOPSON
Supervising Hydraulic Engineer

By

WILLIAM B. SHAW
Assistant Hydraulic Engineer

T. R. Merryweather
Administrative Assistant

TABLE OF CONTENTS

	Page
INTRODUCTION	1
WATER SUPPLY	1
Precipitation	1
Snow Surveys	2
Stream Flow	2
DISTRIBUTION OF WATER	3
Shasta River above Junction with Boles Creek	3
Shasta River below Junction with Boles Creek and Boles Creek	4
Shasta River below Lake Dwinnell Reservoir	5
Beaughan Creek	7
Carrick Creek	8
Parks Creek	8
Big Springs	9
Lower Shasta River	9
Little Shasta River	11
CHANGES IN OWNERSHIP OF LANDS AND WATER RIGHTS	12

TABLES

1. Precipitation at Yreka, Siskiyou County, California, 1938-1950

2. Snow Survey Data, 1937-1950

3. Daily Discharge in Cubic Feet Per Second - SHASTA RIVER ABOVE EDSON-FOULKE YREKA DITCH - April 1 to September 27, 1950

4. Daily Discharge in Cubic Feet Per Second - PARKS CREEK ABOVE DUKE NORTH DITCH - April 4 to September 27, 1950

5. Daily Discharge in Cubic Feet Per Second - ROBERTSON WEIR-PARKS CREEK - April 4 to September 27, 1950

6. Daily Discharge in Cubic Feet Per Second - SHASTA RIVER AT EDGEWOOD BRIDGE - April 6 to September 30, 1950

7. Daily Discharge in Cubic Feet Per Second - SHASTA RIVER AT MONTAGUE BRIDGE - April 3 to September 30, 1950

8. Daily Discharge in Cubic Feet Per Second - LITTLE SHASTA RIVER ABOVE HARP DITCH - April 3 to September 30, 1950

9. Daily Discharge in Cubic Feet Per Second - CARRICK SPRING - April 1 to September 30, 1950.

TABLE OF CONTENTS (Cont'd)

TABLES (Cont'd)

10. Daily Discharge in Cubic Feet Per Second - CLELAND SPRING - April 1 to September 30, 1950

11. Daily Discharge in Cubic Feet Per Second - M.W.C.D. PARKS CANAL AT HEAD - April 1 to June 24, 1950

12. Daily Storage on Hand in Acre-Feet - LAKE DWINNELL RESERVOIR - April 8 to September 28, 1950

13. Daily Releases in Cubic Feet Per Second - LAKE DWINNELL RESERVOIR - April 1 to September 30, 1950

14. Summary of Deliveries to Prior Right Owners from LAKE DWINNELL RESERVOIR - 1930 - 1950

15. RECORD OF OPERATION OF LAKE DWINNELL RESERVOIR - 1929 to 1950

16. Daily Discharge in Cubic Feet Per Second - BIG SPRINGS IRRIGATION DISTRICT PUMPING PLANT - March 15 to September 30, 1950

17. Daily Discharge in Cubic Feet Per Second - GRENADA IRRIGATION DISTRICT PUMPING PLANT - April 13 to September 16, 1950

18. SUMMARY OF RUNOFF OF STREAMS IN SHASTA VALLEY - During Irrigation Season April 1 to September 30, Acre-Feet

INTRODUCTION

The Shasta River Watermaster Service Area was created by order of the Division of Water Resources under date of March 1, 1933, to include, with the exception of certain tributaries and springs named in said order, all the water rights on Shasta River and its tributaries in Siskiyou County, as established by the decree entered in the Shasta River adjudication proceeding on December 30, 1932, Superior Court, Siskiyou County, No. 7035. On December 30, 1935, the service area was changed to exclude the water rights on Willow Creek and its tributaries.

Watermaster service as provided in Part 4 of Division 2 of the Water Code, covered the regulation of diversions from April 1 to September 30 in 1950. Distribution was in accordance with the rights and priorities set forth in the decree entered in the above named proceeding. John T. Blair and William B. Shaw, Deputy Watermasters, administered the distribution of water from the streams within the service area under the supervision of P. E. Stephenson, Senior Hydraulic Engineer.

WATER SUPPLY

Precipitation

Data on precipitation as compiled from observations made at the U. S. Weather Bureau Station at Yreka, are presented in Table No. 1.

Annual precipitation for the period from October 1, 1949 to September 30, 1950 was 131 per cent of the 35-year mean. About 83 per cent of the seasonal precipitation occurred during the period from October 1 to March 31, as compared with a 35-year mean of 77 per cent.

Snow Surveys

Data on water content of snow at four representative snow courses as measured on or about April 1 of each year are presented in Table 2.

Average water content of the snow pack on April 1, 1950 was about 87 per cent of mean for the 14-year period of record. The water supply for the snowmelt-runoff period was forecast from snowpack-runoff relationship curve based on the previous years of record. About 8,000 acre-feet was predicted to flow past the stream-flow gaging station above the Edson-Foulke Yreka Ditch during April and May. Measured runoff incidental to melting snow totaled about 9,500 acre-feet and occurred during the period April 1 to June 30.

Stream Flow

Stream flow measuring stations equipped with water-stage recorders were maintained during the period of watermaster service on Shasta River above the Edson-Foulke Yreka Ditch, at Edgewood Bridge and near Montague; on Parks Creek above the Duke North Ditch and at the 8-foot weir above the Robertson Ranch; and on Little Shasta River above the Harp Ditch. Records of discharge at these stations are presented in Tables 3 to 8, inclusive.

Intermittent measurements were made of the flows of Carrick and Cleland Springs and are recorded in Tables 9 and 10, respectively.

A summary comparing the seasonal runoff of various streams and springs in Shasta Valley for the 1950 season with that of previous seasons is presented in Table 18 of this report.

DISTRIBUTION OF WATER

Distribution for the 1950 season followed the practices initiated during the past seasons. As a necessary adjunct to distribution 14 water-stage recorders were installed and operated during the season at critical points on streams and diversion conduits. These recorders were in addition to those mentioned heretofore and were located as follows:

Beaughan Creek below Long-Bell Mill Pond	(2' - Parshall Flume)
Beaughan Creek above Jackson Ditch	(8' - Rectangular Weir)
Boles Creek below Lower Enos Ditch	(4' - Rectangular Weir)
Carrick Creek at Highway 97	(3' - Rectangular Weir)
Carrick Creek above Upper Jackson Ditch	(4' - Rectangular Weir)
Lake Dwinnell Reservoir in Outlet Tower	
Soule Ditch at Head	(4' - Rectangular Weir)
Dennis Ditch at Head	(4' - Rectangular Weir)
Jones No. 1 and No. 3 Take-outs	(4' - Rectangular Weirs)
McKee Take-out	(4' - Rectangular Weir)
M.W.C.D. Bypass Canal From Parks Creek	
M.W.C.D. Shasta River Canal-McKee Check	(9' - Rectangular Weir)
Big Springs Lake at B.S.I.D. Pumping Station	

The resulting distribution in each of the several sections into which the stream system naturally divides from the standpoint of water supply follows:

Shasta River above Junction with Boles Creek

The available water supply is the summation of the flow of Shasta River above the Edson-Foulke Yreka Ditch, as set forth in Table 3, plus the combined discharge of the Dow Eddy Creek Ditch and the Hammond-Scott Ditch divert-

ing from Eddy Creek. During the 1950 season, this supply was sufficient to satisfy all irrigation demands until about June 26. Subsequent to that date there was insufficient water to meet the demands of the Edson-Foulke Yreka Ditch and those ditches diverting from Eddy Creek. A summary of the distribution for the 1950 season is set forth in the following tabulation:

Allocations

Month	Average Available Water Supply Second-Feet	Distribution in Per Cent of Priority Allotments		
		Hammond-Scott	Foulke, et al.	Dow
April	58	No Diversion*	100	100
May	67	73*	100	100
June	48	31	100	100
July	16	48	40	21
August	6.0	22	13	0
September	5.5	17	13	0

* 100% available but not diverted.

Shasta River Below Junction with Boles Creek and Boles Creek

The available flow was sufficient to satisfy all priorities having direct flow rights including the Montague Water Conservation District until about June 27. Subsequently the water was distributed on an equal and correlative basis among water right owners down to and including the Mills Ranch. Under this arrangement an average of 100 per cent of allotments was delivered until August 1 and an average of about 50 per cent of allotments from August 1 to September 16, except for the Alexander Ditch which received 0.40 cubic foot per second for stockwatering purposes only. Subsequent to September 16 an average of 100 per cent of allotments was again delivered to all rights except

those of the Montague Water Conservation District.

Shasta River Below Lake Dwinnell Reservoir

Watermaster service on this section of the stream system involves the operation of the Montague Water Conservation District's Lake Dwinnell Reservoir during the irrigation season. The watermaster, in cooperation with the District, exercises control over deliveries from the reservoir to the District and to certain natural flow water right owners below the reservoir.

Deliveries to the water right owners below the reservoir are made in accordance with agreements between the District and the several water right owners which agreements specify the amount of water to be released to the respective owners "in lieu" of their natural flow rights. In general, each agreement sets forth the total acre-feet to which the water right owner is entitled and provides that delivery from the reservoir shall be made upon demand of the water user. All releases from the reservoir are under the control of the watermaster who regulates the discharge from the reservoir in accordance with the requirements of the District and the requests received from the "in lieu" rights. Rediversion of the "in lieu" water by the natural flow owners below the reservoir is also regulated. Operation of the reservoir by the watermaster resulted in an orderly release of the water to the advantage of both the District and the "in lieu" owners.

Delivery to the District commenced on April 14 and continued to about August 29. All demands of "in lieu" rights were satisfied during the season and about 250 acre-feet of storage remained on October 1.

Summaries of the operation of the reservoir during the 1950 season are set forth in the following tabulation.

Date	Storage on Hand Ac.Ft.	Change in Storage Ac.Ft.	Inflow to Reservoir Ac. Ft.	Total Draft Ac.Ft.	Measured Release Ac.Ft.	Seepage and Evaporation Loss Ac.Ft.
April 8	13,900					
		360	3,073	3,433	1,660	1,773
May 1	13,540					
		1,640	3,398	5,038	3,400	1,638
June 1	11,900					
		3,175	1,467	4,642	2,937	1,705
July 1	8,725					
		4,975	0	4,975	3,797	1,178
Aug. 1	3,750					
		3,095	0	3,095	2,928	167
Sept. 1	655					
		405	0	405	354	51
Sept. 30	250					
Total		13,650	7,938	21,588	15,076	6,512

DELIVERIES TO PRIOR RIGHT OWNERS

Below Reservoir

Name of Owner To Water Right	Allotment as per Agreement Acre-Feet	Amount Delivered from Lake Dwinnell Reservoir Acre-Feet	% of Allotment
Leland Root	198	198	100 %
John Soule	692	692	100 %
J. R. Kirsch, K. K. Waters and Emily S. Waters	696	696	100 %
McKee Company	1,200	1,185	99 %
Clarence Reed, and Margaret R. Reed	596	0 *	0 %
Totals	3,382	2,771	82 %

* Supplied from seepage below reservoir.

SUMMARY OF DELIVERIES
FROM LAKE DWINNELL RESERVOIR

Month	Measured Release Acre-Ft.	Deliveries to Prior Rights Acre-Feet	Deliveries to M.W.C.D. Canal Acre-Feet
April	1,660	286	1,374
May	3,400	647	2,793
June	2,937	405	2,532
July	3,797	533	3,264
August	2,928	546	2,382
Sept.	354	354	0

Additional data pertaining to Lake Dwinnell Reservoir are contained in Tables 11 to 15, inclusive.

Beaughan Creek

One measurement was made during the 1950 season at the 8-foot rectangular weir (Longbell Upper Weir) located at the head of Beaughan Creek. The results are given below:

Date	Gage Height Ft.	Discharge Cu.Ft. Per Second
5-26-50	0.37	5.92

This amount of water was sufficient to supply approximately 71% of the total second priority allotments of 8.28 cubic feet per second. Distribution was made in accordance therewith during the 1950 season.

The Long-Bell Lumber Company diverts practically the entire flow of Beaughan Creek, including the downstream users' share of the available water, for use at its sawmill. After such use, the downstream users' share of the water, which is 65 per cent of the measured flow at the Long-Bell Upper Weir, must be returned to Beaughan Creek below the Long-Bell

Mill Pond. The amount of water to be returned under this requirement was 3.85 cubic feet per second which is measured by means of a 2-foot parshall flume. During the 1950 season the flow was in excess of this amount at all times.

Carrick Creek

There was sufficient water available in Carrick Creek during the 1950 season to satisfy all irrigation requirements. The results of intermittent measurements of Carrick Spring are set forth in Table 9.

Parks Creek

Distribution on Parks Creek for the 1950 season was in accordance with practices followed during the past seasons. A summary of the distribution is set forth in the following tabulation:

Month	Measured Water Supply Cu. Ft. Per Second	Distribution in Per Cent of Priority Allotments			
		Duke	Caldonia	Foulke, et al	Robertson
April	39.7	100	100	100	90
May	46.9	100	100	100	96
June	22.9	100	100	80	78
July	5.5	75	17	0	15
August	2.0	40	0	0	4
September	2.1	30	0	0	4

Records of the flow available for the above distribution are set forth in Tables 4 and 5.

The records of diversion of the Montague Water Conservation District Bypass Canal to Shasta River are set forth in Table 11.

The available supply was sufficient to satisfy the 21st and 24th priority rights of Frank H. Solus at the extreme lower end of Parks Creek throughout the 1950 season.

Big Springs

The water supply of Big Springs during the 1950 season increased from an April average of 36 cubic feet per second to an average of 43 cubic feet per second during August and September.

This supply was sufficient to provide 100% of the Clink and Louie Brothers allotments throughout the season, and to provide The Big Springs Irrigation District with 60 per cent allotment in April which increased to 80 per cent by August. Records of the diversion by the Big Springs Irrigation District Pumping Plant during the 1950 season are set forth in Table 16.

Lower Shasta River

During the 1950 season 100 per cent allotments were available for all priorities until about July 13. Subsequent to that date and until August 19 it was necessary to reduce the Grenada Irrigation District diversion to about 55 per cent of their entitlement. During the period from August 19 to September 1 the water supply was sufficient to provide 100 per cent allotments. Subsequent to September 1 and until September 7 the Grenada Irrigation District Pumping Plant was regulated to about 55 per cent. Subsequent to September 7 and for the remainder of the season no regulation was necessary on this section of the stream.

The resulting flow of Shasta River at Montague Bridge was sufficient at all times to deliver an average of 100 per cent of allotments below this point.

A record of discharge of the Shasta River at Montague Bridge during the 1950 season is presented in Table 7. Records of diversion by the Grenada Irrigation District are presented in Table 17. A summary of diversions for this section of the stream is set forth in the following tabulation:

Month	Average Diversion Grenada Irrigation District Cu.Ft. per Second	Average Diversion Shasta River Water Association Cu.Ft. per Second *	Average Available Water Supply Flock et al. Cu.Ft. per Second
April	34	22	76
May	32	32	34
June	19	25	62
July	22	32	25
August	24	34	29
Sept.	25	34	98

* Estimated diversions

Little Shasta River

The water supply on this stream was sufficient to satisfy all demands until about June 15. Subsequent to that date and until the end of the season regulation was required. A summary of the distribution during the 1950 season is shown in the following tabulation:

Month	Available Water Supply Cubic Feet Per Second	Distribution of Priority Allotment - per cent						
		1	2	3	4	5	6	7
April	43	100	100	100	100	80	40	10
May	37	100	100	100	100	80	20	10
June	25	100	100	100	100	80	5	5
July	11	100	100	100	100	18	0	0
August	7	100	100	100	100	12	0	0
September	6	100	100	100	100	10	0	0

Records of the discharge of the Little Shasta River during the 1950 season are set forth in Table 8.

Records of intermittent measurements of the discharge of Cleland Spring during the 1950 season are presented in Table 10. The estimated average flow for the season was 8.6 cubic feet per second as compared with the 16-year average of 8.7 cubic feet per second.

CHANGES IN OWNERSHIP OF LANDS AND WATER RIGHTS

The changes of ownership which occurred subsequent to filing "Statement for Shasta River Watermaster Service Area, County of Siskiyou, State of California, for 1950", and which have been included in the statement for said watermaster service area for 1951, are listed in the following tabulation:

Tract No.	Name of Water Right Owner Appearing in 1950 Statement	Name of Water Right Owner as Changed in 1951 Statement	Water c.f.s.
5-59	Dennis, Fred	Kirsch, J. B.	0.64
5-86	Lively, H. T.	Fleharty, William S. and Fleharty, Bernice W.	2.50
5-82	Stone, K. T.	Belcastro, Mike A.	1.085
5-54	Clink, W. A. et al	Brah Bros.	7.50
5-81	Hessig, Estate of J. H.	Hock, John R. and Hock, Ann	0.953
5-51	DeSoza, George F. et al	Critchfield, Mrs. Barry	1.99
5-100 5-110 5-111	Hammond, C.; Hammond, D.; Hammond, Q.; and Hammond, S.	Hammond, Stewart	6.40
5-100 5-109 5-110	Hammond, C.; Hammond, D.; Hammond, Q.; and Hammond, S.	Hammond, Dwight L.	9.58
5-89	King, Frank A.	Mazzini, John	6.35
5-89	King, Frank A.	Barnum, Floyd	0.40

TABLE 1

PRECIPITATION AT YREKA, SISKIYOU COUNTY, CALIFORNIA

Elevation 2, 526 Feet

Monthly, Seasonal and Average Amount in Inches

1938 - 1950

Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Seasonal
1938-39	.82	.80	1.38	2.15	1.23	1.51	.42	.45	.04	.35	.00	2.35	11.50
1939-40	.89	.00	6.12	2.36	5.13	3.52	.69	.32	.56	.09	.00	1.71	21.39
1940-41	1.34	.98	4.13	2.85	2.99	1.51	2.07	1.66	.95	.70	.54	.81	20.53
1941-42	1.01	1.84	8.01	1.88	2.65	.33	1.60	3.96	.30	.00	.13	.47	22.18
1942-43	.34	6.26	5.01	4.22	1.41	1.21	1.07	.66	1.07	.09	.01	.00	21.35
1943-44	2.24	1.17	.85	1.25	1.43	1.44	1.00	.73	.68	.60	.25	.22	11.86
1944-45	.45	2.86	1.15	.96	2.87	1.53	.69	4.06	.07	.13	.05	T	14.82
1945-46	2.06	2.86	4.55	2.25	1.99	1.13	.57	.89	.89	.41	T	.08	17.68
1946-47	1.07	3.15	.76	1.16	.93	1.84	.35	.73	1.13	.26	.85	.00	12.23
1947-48	2.46	.99	.74	5.35	1.36	1.56	2.50	.90	1.33	.29	2.54	.98	21.00
1948-49	.52	2.26	3.99	.39	1.76	.39	.32	1.29	.57	.00	.00	.30	11.79
1949-50	.55	1.46	.99	6.11	6.21	2.37	.50	.30	1.02	.01	.88	1.01	21.41
35-Year Mean	1.14	2.39	2.82	2.38	2.40	1.40	1.01	.90	.70	.34	.26	.55	16.33

out entirely

skip in text only

TABLE 2

SNOW SURVEY DATA

1937 - 1950

use above normal

Year	Water Content of Snow as of April 1 - Inches				
	Parks Creek Elevation - 6,500	Sweetwater Elevation-5,500	Mt. Shasta Elevation-8,000	N. Fk. Sacramento Elevation-6,800	Average
1937	31.8	18.4	43.4	35.5	32.3
1938	33.3	27.0	120.4	39.1	55.0
1939	24.8	10.5	23.3	9.9	17.1
1940	36.3	6.3	67.4	22.2	33.1
1941	54.6	18.8	108.6	45.3	56.8
1942	33.1	12.7	52.7	22.5	30.2
1943	34.2	11.8	41.5	15.4	25.7
1944	18.2	7.7	28.6	12.6	16.8
1945	29.3	10.9	46.7	19.9	26.7
1946	42.8	14.2	53.4	25.4	33.9
1947	29.7	6.1	37.2	13.4	21.6
1948	17.5	5.9	36.2	10.2	17.5
1949	33.4	17.7	34.6	28.1	28.4
1950	33.0	14.8	40.0	17.6	26.3
14 Year Mean	32.3	13.1	52.4	22.7	30.1
61 Year Mean (Normal)	33.4	24.4	56.1	~~14.1~~ 23.5	
1951 Values	32.1	10.0	52.5	14.1	

TABLE 3

Daily Discharge in Cubic Feet Per Second
SHASTA RIVER ABOVE EDSON-FOULKE YREKA DITCH
APRIL 1 TO SEPTEMBER 27, 1950

Day	April	May	June	July	August	September
1	50	43	81	23	6	2
2	46	43	76	22	6.5	2
3	44	39	64	22	6.5	2
4	46	33	35	21	6	2
5	59	30	56	19	6	2
6	63	27	54	18	6	2
7	58	26	46	15	6	2
8	54	24	35	14	6	2.5
9	50	23	32	13	5.5	2.5
10	51	24	61	13	5	2.5
11	52	31	46	12	5	2.5
12	61	42	49	10	5	2.5
13	60	51	41	9.5	5	3
14	52	60	41	9	4.5	3.5
15	46	65	41	9	4	4
16	49	69	42	9	3.5	7
17	52	78	43	8	3.5	7.5
18	57	76	40	8	3.5	6
19	65	64	37	9	3.5	7
20	82	63	41	8	3	8
21	86	71	43	8	3	7
22	81	84	40	7	2	6
23	65	88	44	7	2	5.5
24	59	88	43	7	2	5.5
25	54	84	37	8	2	5
26	53	87	31	10	2	5
27	55	84	35	9	2	5
28	51	78	26	9	2	
29	47	76	24	9	2	
30	45	78	23	8	2	
31		84		7	2	
Total Sec. Ft. Days	1,693	1,813	1,307	360	121	*111.5
Mean Sec. Ft.	56	58	43	12	4	*4
Total Ac. Ft.	3,358	3,596	2,592	714	240	*220

* 27-day period
Total for 180 day period - 10,720 acre-feet

TABLE 4

Daily Discharge in Cubic Feet Per Second
PARKS CREEK ABOVE DUKE NORTH DITCH
APRIL 4 TO SEPTEMBER 27, 1950

Day	April	May	June	July	August	September
1		42	45	11	2	2
2		40	41	11	2	2
3		36	35	10	2	2
4	34	33	32	10	2	2
5	34	30	30	8	2	2
6	35	26	31	8	2	2
7	34	25	28	7	2	2
8	31	23	24	7	2	2
9	29	25	21	7	2	2
10	26	28	25	7	2	2
11	26	38	24	7	2	2
12	29	49	26	7	2	2
13	31	58	22	6	2	2
14	29	64	21	6	2	2
15	28	61	23	5	2	4
16	32	63	19	5	2	6
17	36	61	21	5	2	4
18	44	55	19	5	2	3
19	53	52	19	4	2	2
20	60	53	18	4	2	2
21	63	57	19	2	2	2
22	59	56	16	4	2	2
23	56	60	15	3	2	2
24	46	59	22	2	2	2
25	45	58	20	2	2	2
26	45	56	17	5	2	2
27	43	54	15	2	2	2
28	42	51	14	2	2	
29	41	48	13	2	2	
30	41	47	12	2	2	
31		47		2	2	
Total Sec. Ft. Days	*1,082	1,455	687	170	62	*63
Mean Sec. Ft.	*39.7	46.9	22.9	5.5	2.0	*2.3
Total Ac. Ft.	*2,146	2,886	1,363	337	123	*125

* 27-day period
Total for 177 day period - 6,980 acre-feet.

TABLE 5

Daily Discharge in Cubic Feet per Second
ROBERTSON WEIR - PARKS CREEK
APRIL 4 TO SEPTEMBER 27, 1950

Day	April	May	June	July	August	September
1		18.8	13.8	4.1	1.1	0.2
2		18.3	13.2	3.7	1.4	.2
3		19.3	14.4	3.7	1.7	.2
4	9.7	18.3	12.6	3.7	1.1	.2
5	10.3	16.3	12.0	4.1	1.3	.2
6	12.0	15.0	12.3	3.5	1.1	.2
7	20.0	14.7	15.6	3.3	1.1	.3
8	21.9	12.6	14.1	2.7	0.7	.3
9	15.7	12.0	10.8	2.7	.7	.3
10	10.3	12.6	18.0	2.6	.6	.2
11	8.1	15.0	16.3	2.7	.5	.2
12	7.6	17.0	20.0	2.7	.6	.2
13	10.2	15.0	14.7	2.7	.6	.2
14	11.7	13.5	12.6	2.6	.6	.2
15	11.1	12.9	13.2	2.4	.5	.4
16	10.8	13.2	15.0	2.4	.5	.9
17	11.4	12.6	17.3	2.4	.4	1.0
18	15.7	12.0	14.7	2.4	.4	1.3
19	15.0	15.0	10.8	2.5	.3	1.1
20	14.4	16.3	8.6	2.7	.2	1.1
21	12.9	16.0	8.6	2.2	.2	.9
22	12.0	16.0	7.9	1.6	.3	.7
23	12.0	16.0	8.4	1.3	.2	1.0
24	15.8	16.3	17.3	1.3	.3	1.3
25	20.0	16.3	14.4	1.3	.3	1.2
26	19.7	16.3	12.9	1.0	.3	1.4
27	19.7	16.0	10.5	1.0	.3	1.4
28	19.7	16.3	8.9	0.9	.4	
29	19.7	16.7	7.1	1.0	.4	
30	19.7	15.7	5.4	1.0	.3	
31		14.1		1.1	.3	
Total Sec. Ft. Days	* 387.0	477.1	379.9	73.5	19.3	*17.0
Mean Sec. Ft.	* 14.3	15.4	12.5	2.4	0.6	* 0.6
Total Ac. Ft.	* 770	945.	757	146	38	*34

* 27-day period
Total for 177 day period - 2,690 acre-feet.

TABLE 6

Daily Discharge in Cubic Feet Per Second
SHASTA RIVER AT EDGEWOOD BRIDGE
April 6 to September 30, 1950

Day	April	May	June	July	August	September
1	No	38	66	10	3.9	3.2
2		41	59	11	3.9	3.2
3	Record	41	51	10	4.7	3.2
4		32	41	8.0	5.5	3.2
5		25	33	8.0	6.5	3.6
6	59	20	37	7.5	6.0	3.9
7	59	17	39	6.5	9.0	3.9
8	60	16	27	6.0	6.0	3.9
9	61	13	17	7.0	6.5	4.3
10	60	11	59	9.0	6.5	4.7
11	59	16	44	8.0	6.5	5.0
12	71	35	43	9.0	6.5	5.0
13	76	57	33	9.0	6.5	5.0
14	62	83	29	8.0	6.0	5.0
15	55	96	30	7.5	5.5	5.0
16	54	107	32	7.0	5.0	11
17	58	96	29	7.0	4.0	13
18	60	77	28	7.0	3.6	14
19	76	73	27	7.5	3.6	13
20	110	85	22	9.0	2.8	13
21	119	91	24	7.5	2.8	12
22	103	104	20	7.5	2.8	11
23	82	99	28	7.0	2.8	10
24	73	101	37	6.5	2.8	9.0
25	70	99	25	6.5	2.8	8.5
26	63	96	20	6.0	2.8	8.0
27	54	91	15	5.5	3.2	7.5
28	47	73	14	4.7	3.2	7.5
29	45	47	13	4.7	3.2	7.5
30	43	66	12	4.3	3.2	7.5
31		68		4.1	3.2	
Total Sec. Ft. Days	* 1,679	1,854	954	226	140	207
Mean Sec. Ft.	* 56.0	59.8	31.8	7.3	4.5	7.1
Total Ac. Ft.	* 3,324	3,671	1,907	449	227	410

* 25-day period. Total for 177-day period - 9,990 acre-feet.

TABLE 7

Daily Discharge in Cubic Feet Per Second
SHASTA RIVER AT MONTAGUE BRIDGE
April 3 to September 30, 1950

Day	April	May	June	July	August	September
1	No Record	44	24	29	22	14
2	.....	52	26	30	17	20
3	122	56	25	30	20	22
4	126	59	28	25	24	18
5	75	44	38	29	26	16
6	93	38	37	34	22	18
7	103	44	55	24	33	24
8	150	76	62	22	39	26
9	160	53	44	22	43	45
10	134	47	62	20	26	59
11	111	38	65	20	75	59
12	85	25	75	20	59	53
13	85	23	111	50	31	59
14	75	30	86	50	39	110
15	67	30	111	39	45	133
16	72	23	93	20	33	150
17	93	23	93	13	15	155
18	72	28	52	18	14	165
19	59	23	75	18	20	162
20	59	27	79	20	19	153
21	72	28	77	14	20	155
22	60	28	77	14	22	153
23	59	25	82	20	16	153
24	59	23	85	20	20	157
25	54	30	89	20	20	170
26	39	27	96	19	22	160
27	52	23	52	22	21	145
28	35	21	28	20	25	138
29	39	27	25	20	19	128
30	39	25	21	50	21	120
31		24		22	16	
Total Sec Ft. Days	* 2,139	1,064	1,873	774	894	2,940
Mean Sec. Ft.	* 76	34	62	25	29	98
Total Ac. Ft.	* 4,242	2,110	3,714	1,535	1,773	5,830

* 28-day period. Total for 181-day period - 19,204 acre-feet.

TABLE 8

Daily Discharge in Cubic Feet Per Second
LITTLE SHASTA RIVER ABOVE HARP DITCH
April 3 to September 30, 1950

Day	April	May	June	July	August	September
1	No	42	38	17	8	6
2	Record	37	37	17	8	6
3	38	29	37	17	8	6
4	40	25	35	15	8	6
5	42	25	33	14	8	6
6	52	24	31	13	8	6
7	38	24	31	13	8	6
8	38	24	30	13	8	6
9	48	25	28	13	8	6
10	46	29	28	12	8	6
11	40	33	25	12	8	6
12	40	39	30	12	8	6
13	42	47	25	11	8	7
14	35	52	25	11	8	7
15	33	52	22	11	7	7
16	37	42	25	10	7	7
17	42	40	22	10	7	7
18	44	40	21	10	7	8
19	44	38	21	10	7	7
20	49	38	24	10	7	7
21	50	38	23	10	7	7
22	48	38	22	10	7	6
23	44	39	19	9	6	6
24	42	39	18	9	6	6
25	42	40	18	9	6	6
26	42	40	17	9	6	6
27	47	40	17	9	6	6
28	44	41	17	9	6	6
29	44	42	17	9	6	6
30	44	40	17	9	6	6
31		40		9	6	
Total Sec Ft. Days	* 1,194	1,142	753	352	222	190
Mean Sec. Ft.	* 43	37	25	11	7	6
Total Ac. Ft.	* 2,368	2,264	1,493	698	440	377

* 28-day period. Total for 181-day period - 7,640 acre-feet.

TABLE 9

Daily Discharge in Cubic Feet Per Second
CARRICK SPRING
April 1 to September 30, 1950

Day	April	May	June	July	August	September
1		6.2	5.9			6.3
2					6.2	
3				6.0		
4	6.2					
5		6.0				
6			5.9	6.0	6.2	
7						
8						
9						
10	6.2			6.0		6.3
11		6.0			6.2	6.4
12						
13				6.1		
14			5.8	6.1		
15						
16		6.0		6.1		6.4
17	6.2	6.0			6.2	
18						
19				6.1		
20				6.1		
21			5.8			6.4
22					6.2	
23		6.0		6.1	6.3	
24						
25	6.2				6.3	
26				6.1	6.4	
27						
28			5.8			6.4
29	6.2			6.1		
30		5.9				
31					6.4	
Total Sec. Ft. Days	186	180	174	189	192	192
Mean Sec. Ft.	6.2	6.0	5.8	6.1	6.2	6.4
Total Ac. Ft.	368	356	345	374	380	380

Total for 183-day period - 2,203 acre-feet.

TABLE 10

Daily Discharge in Cubic Feet Per Second
CLELAND SPRING
April 1 to September 30, 1950

Day	April	May	June	July	August	September
1						
2						
3						
4		8.4				
5						
6					8.8	9.2
7			8.5			
8						
9				8.7		
10	8.4					
11						
12						
13						
14						
15		8.4				
16						
17						
18						
19				8.8	8.9	
20						
21						
22						
23						
24						
25		8.4	8.7			
26					9.0	
27						
28				8.8		9.3
29						
30						
31						
Mean Sec. Ft.	8.4	8.4	8.6	8.8	8.9	9.2
Total Ac. Ft.	500	516	512	541	547	547

Total for 183-day period - 3,163 acre-feet.

TABLE 11

Daily Discharge in Cubic Feet Per Second
M.W.C.D. PARKS CANAL AT HEAD
April 1 to June 24, 1950

Day	April	May	June	July
1		15	14	
2	No	13	9	
3	Flow	11	3	
4		6	1	
5		3	0	
6		1	0	
7		1	0	
8		1	0	
9	0	0	0	
10	2	23	1	
11	3	46	0	
12	3	50	1	
13	4	46	0	
14	5	52	0	
15	5	53	0	
16	8	51	0	
17	10	54	0	
18	17	38	0	No
19	25	33	0	Flow
20	40	29	0	
21	50	31	0	
22	43	35	0	
23	33	34	1	
24	21	41	0	
25	13	35		
26	14	32		
27	23	30		
28	20	24	No	
29	14	22	Flow	
30	12	21		
31		18		
Total Sec. Ft. Days	365	843	30	
Mean Sec. Ft.	12.2	27.2	1.0	
Total Ac. Ft.	724	1,672	59	

Total for 75-day period - 2,455 acre-feet.

TABLE 12

Daily Storage on Hand in Acre-Feet
LAKE DWINNELL RESERVOIR
April 8 to September 28, 1950

Day	April	May	June	July	August	September
1		13,540	11,900	8,725	3,750	655
2		13,420	11,800	8,535	3,620	640
3		13,300	11,700	8,440	3,490	620
4	No	13,190	11,600	8,250	3,365	600
5	Record	13,080	11,500	8,160	3,230	580
6		12,970	11,400	8,025	3,090	560
7		12,860	11,350	7,890	2,950	555
8	13,900	12,750	11,275	7,685	2,825	540
9	13,940	12,585	11,200	7,475	2,700	525
10	13,980	12,420	10,900	7,265	2,575	510
11	14,020	12,255	10,500	7,095	2,450	490
12	14,060	12,100	10,350	6,925	2,310	470
13	14,100	12,000	10,325	6,755	2,180	455
14	14,140	11,900	10,300	6,585	2,050	435
15	14,180	11,900	10,200	6,340	1,950	415
16	14,220	11,900	10,100	6,100	1,855	395
17	14,260	11,900	10,000	5,860	1,760	380
18	14,140	11,900	9,850	5,660	1,660	365
19	14,020	11,900	9,700	5,455	1,560	355
20	14,140	11,870	9,700	5,260	1,465	340
21	14,260	11,830	9,700	5,070	1,375	330
22	14,240	11,800	9,700	4,930	1,285	320
23	14,220	11,775	9,700	4,790	1,200	310
24	14,200	11,750	9,600	4,645	1,105	295
25	14,110	11,725	9,500	4,510	1,010	280
26	14,020	11,700	9,400	4,375	950	270
27	13,900	11,800	9,300	4,290	890	260
28	13,780	12,000	9,105	4,100	830	250
29	13,700	12,100	9,010	4,010	770	250
30	13,620	12,050	8,820	3,940	720	250
31		12,000		3,870	670	250

TABLE 13

Daily Releases in Cubic Feet Per Second
LAKE DWINNELL RESERVOIR
April 1 to September 30, 1950

Day	April	May	June	July	August	September
1		50	25	57	53	5.8
2	No	50	25	57	53	6.0
3	Releases	50	25	57	53	5.8
4		50	25	57	53	5.7
5		50	64	52	53	5.7
6		50	64	52	53	5.7
7		50	64	65	53	5.3
8	10	54	64	65	53	5.2
9	10	54	70	65	53	5.0
10	10	54	20	65	53	5.0
11	10	54	20	65	47	5.0
12	10	55	20	65	47	8.2
13	20	55	14	65	47	10.7
14	22	55	57	67	47	10.4
15	22	63	57	67	47	10.1
16	30	63	57	67	47	7.1
17	34	63	57	67	47	4.5
18	34	63	57	67	45	4.6
19	43	63	57	67	45	4.1
20	43	63	57	67	45	4.1
21	52	63	57	68	48	4.1
22	52	70	57	68	48	4.1
23	52	70	62	68	48	4.1
24	53	70	62	67	48	4.3
25	53	70	62	67	45	4.1
26	54	62	57	67	45	4.5
27	54	62	57	67	45	6.0
28	56	62	57	63	59	7.5
29	56	25	57	63	45	7.5
30	56	25	57	24	45	7.5
31		25		58	7.0	
Total Sec. Ft. Days	837	1,714	1,480	1,914	1,476	178.3
Total Ac.Ft.	1,660	3,400	2,940	3,800	2,928	354

Total for 183-day period - 15,090 acre-feet.

TABLE 14

Summary of Deliveries to Prior Right Owners
from
LAKE DWINNELL RESERVOIR
1930-1950

Year	Deliveries in Acre-Feet						Deliveries in Per Cent of Allotment
	Root	Soule	Waters-Kirsch	McKee	Reed, Et al.	Total	
1930	190	485	465	923	*1	2060	61
1931	198	473	473	909	*1	2050	61
1932	*1	*1	*1	*1	*1		
1933	198	692	687	1130	101	2210	83
1934	159	692	461	922	159	2390	71
1935	198	609	600	1075	234	2720	80
1936	198	637	527	1195	202	2759	82
1937	198	633	489	1200	120	2690	80
1938	198	*2	*2	1073	*2	1271	38
1939	198	692	687	1138	308	3023	90
1940	198	471	562	1105	0	2336	69
		*4	*4	*4	*3		*4
1941	198	561	631	1200	51	2641	76 *4
1942	198	344	618	1200	0	2360	70 *4
1943	198	509	443	1200	0	2350	70 *4
1944	198	692	460	1200	0	2250	76 *4
1945	198	591	387	1050	0	2220	65 *4
1946	198	484	486	1094	0	2262	67 *4
1947	198	692	565	1147	0	2602	77 *4
1948	198	511	386	1005	0	2100	62 *4
1949	198	692	411	1192	0	2493	75 *4
1950	198	692	696	1185	0	2771	82 *4

*1 Record of deliveries missing.

*2 Reservoir seepage provided sufficient water to satisfy irrigation demands.

*3 Accretions to the flow of Shasta River from Reservoir Seepage through Dennis Ranch provide more than sufficient water to supply full allotment.

*4 1940-1950 Reservoir Seepage provided additional water to Soule, Dennis, and Reed.
(Walters and Kirsch are present owners of Dennis right)

text current year

TABLE 15

RECORD OF OPERATION OF LAKE DWINNELL RESERVOIR - 1929 to 1950

Year	Reservoir Storage on April 1 Ac.Ft.	Inflow Apr. 1 to Sept. 30 Ac.Ft.	Total Available Water Supply Ac.Ft.	Maximum Storage in Reservoir Ac.Ft.	Maximum Storage in Reservoir Date	Delivery from Reservoir: M.W.C.D. Ac.Ft.	M.W.C.D. Period	Prior Rights Ac.Ft.	Prior Rights Period	Total Ac.Ft.	Storage in Res. When Delivery to MWCD Ceased Ac.Ft.	Seepage & Evaporation Loss Ac.Ft.
1929				4,500		No Rcrd.		No Rcrd				
1930				10,500	Mar. 14	5,000	5/5/30-7/4/30	2,060	4/23/30-9/5/30	7,060	2,800	
1931				4,250	Apr. 4	0		2,050	4/1/37-7/25/31	2,050	2,800	
1932	5,500			5,500	Mar. 20	2,000	5/15/32-6/15/32	No Rcrd		2,000	2,000	
1933	5,200			6,500	May 3	4,750	4/21/33-7/16/33	2,810	4/10/33-9/3/33	7,560	2,200	
1934	4,850			5,000	Apr. 5	1,500	4/10/34-4/23/34	2,390	4/5/34-7/22/34	3,890	2,800	
1935	5,000	4,620	9,620	5,700	May 10	2,700	5/10/34-6/2/35	2,720	4/9/35-8/11/35	5,420	3,000	4,200
1936	5,460	4,720	10,180	6,020	Mar. 3	1,560	4/14/36-5/20/36	2,760	4/14/36-8/11/36	4,320	3,250	5,860
1937	5,940	14,040	19,980	9,800	May 6	7,360	5/5/37-9/15/37	2,690	4/26/37-9/9/37	10,050	0	9,930
1938	31,600	28,440	60,040	32,100	May 3	23,910b	5/1/38-9/30/38	1,270	5/1/38-9/30/38	25,180	2,850	32,010
1939	7,350	1,210	8,560	7,350	Apr. 1	2,350	4/9/39-5/5/39	3,020	4/4/39-8/10/39	5,370	3,525	3,190
1940	27,350	18,000	45,350	28,000	Apr. 6	18,570c	4/22/40-9/18/40	2,340	4/17/40-9/30/40	20,900	2,540	22,040
1941	31,680	48,060	79,740	34,400	Apr. 4	36,490d	4/1/41-9/30/41	2,640	5/1/41-9/30/41	39,130	13,600	27,010
1942	25,700	20,600	46,300	29,100	June 6	12,940e	4/13/42-9/30/42	2,360	4/13/42-9/30/42	15,300	10,000	21,000
1943	33,100	12,880	45,980	33,400	Apr. 5	19,770f	4/13/43-9/30/43	2,350	4/15/43-9/30/43	22,120	4,900	18,960
1944	14,200	5,370	19,570	14,200	Apr. 1	9,030	4/17/44-9/30/44	2,550	4/17/44-9/30/44	11,580	90	7,900
1945	17,550	12,450	30,000	18,600	June 11	9,840	4/13/45-9/30/45	2,220	4/13/45-9/30/45	12,060	2,500	15,400
1946	24,400	11,600	36,000	25,100	May 20	11,640	4/2/46-9/30/46	2,260	4/19/46-9/30/46	13,900	5,400	16,600
1947	17,800	3,600	21,400	17,800	Apr. 1	10,600	4/16/47-9/40/47	2,600	4/10/47-9/30/47	13,260	0	8,150
1948	12,400	25,680	38,080	27,200	June 21	9,030	4/21/48-9/30/48	2,100	4/21/48-9/30/48	11,130	10,200	16,750
1949	22,200	14,800	37,000	22,900	Apr. 23	14,900	4/7/49-9/26/49	2,500	4/6/49-9/30/49	17,400	2,900	16,700
1950	13,900	7,983	21,883	14,260	Apr. 17 & 24	12,305	4/8/50-8/30/50	2,771	4/14/50-9/30/50	15,076	250	6,557

TABLE 15 (Cont'd)

RECORD OF OPERATION OF LAKE DWINNELL RESERVOIR - 1929 to 1947

(a) In 1929 the District used water only for puddling its canal.

(b) Includes 831 acre-feet wasted through outlet to prevent increase in reservoir level and 9980 acre-feet delivered by District to Stallcup and Big Springs Irrigation District.

(c) Includes 2710 acre-feet wasted in April to maintain reservoir level and deliveries through the entire season to Big Springs Irrigation District.

(d) Includes 21,600 acre-feet wasted in April and May through outlet to prevent increase in reservoir level and 5,970 acre-feet delivered to Big Springs Irrigation District.

(e) Includes 3,390 acre-feet delivered to Big Springs Irrigation District.

(f) Includes 10,000 acre-feet wasted in April through outlet to maintain safe water-surface elevation in reservoir.

TABLE 16

Daily Discharge in Cubic Feet Per Second
BIG SPRINGS IRRIGATION DISTRICT PUMPING PLANT
March 15, to September 30, 1950

Day	March	April	May	June	July	August	September
1		26	26	26	26	26	26
2		26	26	26	26	26	26
3		23	26	26	26	26	26
4			26	26	26	26	26
5			26	26	26	26	26
6			26	26	26	26	26
7		No Diversion	26	26	26	26	26
8	No Diversion		26	26	26	26	26
9			26	26	26	26	26
10			26	26	26	26	26
11			26	26	26	26	9
12			26	26	26	26	
13			26	26	22	26	
14		20	26	26	0	26	
15	14	26	26	26	20	26	
16	19	26	26	26	26	26	No Diversion
17	19	26	26	26	26	26	
18	20	26	26	26	26	26	
19	20	26	26	26	26	26	
20	21	26	26	26	26	26	
21	21	26	26	26	26	26	
22	21	26	26	26	26	26	
23	22	26	23	26	26	26	
24	22	26	0	26	26	26	
25	23	26	0	26	26	26	16
26	23	26	16	26	26	26	26
27	24	26	26	26	26	26	26
28	24	26	26	26	26	26	26
29	25	26	26	26	26	26	26
30	25	26	26	26	26	26	13
31	26		26		26	26	
Total Sec. Ft. Days	* 369	511	741	780	770 ~~806~~	806	428
Mean Sec. Ft.	* 21.7	17.0	25.6	26.0	26.0	26.0	14.3
Total Ac.Ft.	* 732	1,014	1,470	1,547	1527 ~~1,599~~	1,599	849

* 17-day period. Total for 200-day period - 8783 ~~8,810~~ acre-feet.

TABLE 18

SUMMARY OF RUNOFF OF STREAMS IN SHASTA VALLEY
During Irrigation Season April 1 to September 30
Acre-Feet

show relationship to mean in text

Name of Stream \ Year	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950
Shasta River Above Yreka Ditch	8,510	7,440	13,600	19,100	4,090	14,800	33,300	13,800	10,900	6,600	11,000	13,500	6,690	16,320	14,400	10,721
Parks Creek Above Duke North Ditch	6,100	6,560	11,000	14,400	4,490	16,000	18,100	9,880	8,800	5,670	9,720	10,540	5,770	11,870	8,970	6,172
Little Shasta River Above Harp Ditch	5,630	6,520	5,680	6,060	3,270	4,160	4,480	5,570	10,500	2,840	6,100	7,080	2,110	12,700	7,970	7,640
Beaughan Spring	1,960	1,860	1,820	1,950	1,810	1,810	2,200	2,140	2,100	2,150	2,450	2,450	2,150	2,214	2,180	2,150
Big Spring	12,200	12,100	12,100	-	12,100	-	-	15,600	14,800	14,500	14,400	14,600	7,690	14,816	14,800	14,800
Carrick Spring	2,090	2,050	2,020	2,110	2,000	2,070	2,700	2,700	2,530	2,450	2,540	2,530	2,510	2,450	2,380	2,203
Cleland Spring	2,420	2,400	2,410	2,790	3,060	3,070	3,170	3,160	3,820	3,840	3,290	3,330	3,270	3,200	3,070	3,163