State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
Northern District

SUMMARY OF OPERATIONS

FOR

WATERMASTER SERVICE IN NORTHERN CALIFORNIA

1990 Season

OCTOBER 1991

Douglas P. Wheeler
Secretary for Resources
The Resources
Agency

Pete Wilson
Governor
State of
California

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FOREWORD

This report describes the watermaster service provided by the Department of Water Resources to areas in Northern California during the 1990 irrigation season. Authority for its preparation and publication is stated in the California Water Code, Division 2, Part 4, Chapter 7.

Information about 1990 watermaster service is presented in two sections in the attached Summary of Operations. The first gives general introductory information about water rights, water supply, service areas, and watermaster duties; the second describes the fourteen active service areas, twelve in the Department's Northern District and two in the Division of Operations and Maintenance, Oroville Field Division. Each of these service area descriptions gives detailed information on the area, the basis of watermaster service, sources of water supply, methods of distribution, 1990 water distribution, and personnel used.

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INTRODUCTION

Purpose and Benefits

The main purpose of watermaster service is to distribute water according to established water rights. This is done by apportioning to the rightful users the available supplies in streams that have had water right determinations.

Distribution of water in watermaster service areas is the lawful duty of the Department of Water Resources as directed in Part 4 of Division 2 of the California Water Code. Under watermaster service, water right owners are assured that their rights are protected, without their having to take legal action against other users.

A major benefit of watermaster service to water users and the State is that court litigation and violent conflict, which in the past happened often, are now rare. Also, available supplies of water are better used, as waste is reduced through careful management.

Because both the water right owners and the State receive benefits from watermaster service, the costs of performing the service are shared. The State general tax fund pays one-half of the cost of operating each service area and the water right owners in the service area pay the other half. Individual users' shares are determined in accordance with Article 3 of Chapter 7 of the above-mentioned Part 4 of Division 2 of the Water Code. Although this work is done as efficiently as possible, considerable public funds are needed to (1) maintain skilled representatives in the field during the dry months of the growing season, and (2) maintain administrative support at Department headquarters. Nevertheless, most clients find the benefits of fair, reliable, and comparatively worry-free distribution of water to be far superior than doing without the State watermaster service.

Determination of Water Rights

Many of the streams under State watermaster service have had their water rights defined by the courts under one of three adjudication procedures. These judgments establish each owner's rights in terms of rate of diversion, season of use, point of diversion, and place of use. They also establish priorities whereby each owner's rights are ranked according to the rights of all other decreed owners. Under this system, all rights of any one priority must be fully satisfied before water can be diverted to holders of lower priority rights. The determinations of the courts are commonly called decrees.

Water rights decisions necessary for establishing watermaster service areas are accomplished by the following methods: a statutory adjudication defines all water rights on the stream; court adjudication results when two or more parties have their water rights defined; and by court reference where by the State Water Resources Control Board makes an investigation and reports to the court regarding water rights of the parties involved. Water rights on Pine Creek near Alturas were determined by an agreement of the water users.

Non-Judicial Decisions

A permit or "license to appropriate" can be issued by the State Water Resources Control Board (SWRCB), or agreement can be reached by mutual consent of the water users involved.

Court Adjudication

A less extensive method of defining water rights is the "court adjudication" procedure. This type of adjudication results when two or more parties involved in a water rights dispute seek a solution to their problem under civil law. A decision handed down in such a civil action determines only the water rights of the parties involved in the action and therefore does not necessarily define all water rights on the stream. As a result, serious conflicts sometimes arise between decreed water right owners and persons claiming longer-standing riparian or appropriative rights that were not specified in the decree.

Court Reference

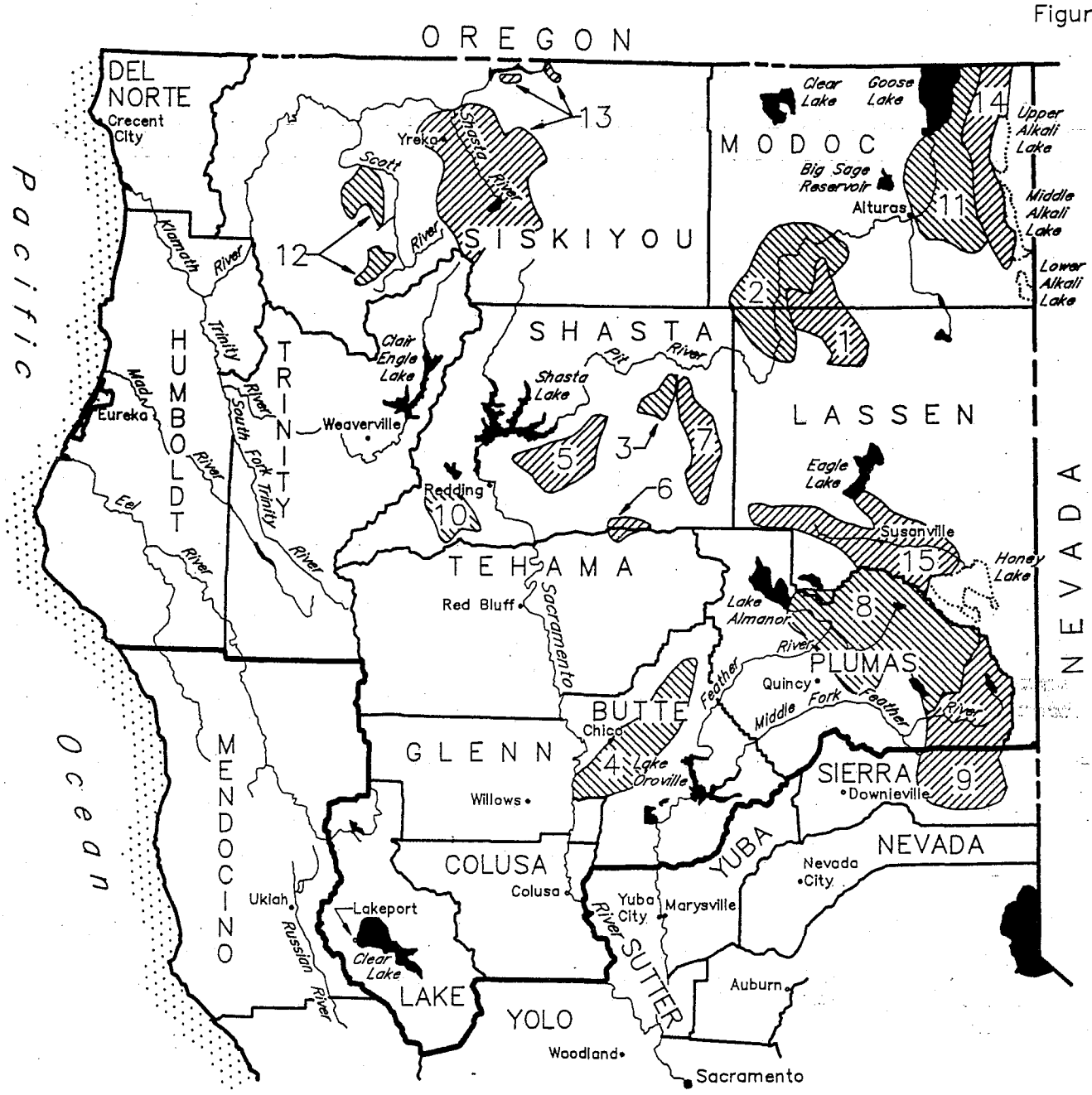
The "court reference" type of adjudication arises when a civil action, as discussed, is referred to SWRCB for a determination under authority contained in Sections 2000-2076 of the Water Code. The Board's report becomes the basis for the court's decision. As in court adjudications, a court referee determines only the water rights of the parties involved in the action.

Statutory Adjudications

The California Water Code (Sections 2500-2900) gives a procedure whereby water users of any stream may petition the SWRCB, Division of Water Rights, to make a legal determination of all water rights on that stream. If the Board finds that such a determination is in the best public interest, it proceeds with a legally binding decision. This results in a court decree that defines all water rights on the stream.

Figure 1 contains a location map of the service areas, the number of decreed owners, and the amounts of water rights for each area. Table 1 lists the Superior Court decrees and their type.

Figure 1



1990 Decreed Water Rights

Service Area	Number of Decreed Water Users	Total Decreed Water Rights ft3/s
1. Ash Creek	47	123.650
2. Big Valley	50	206.780
3. Burney Creek	11	33.090
4. Butte Creek	46	431.840
5. Cow Creek	99	56.562
6. Digger Creek	111	23.401
7. Hat Creek	87	135.716
8. Indian Creek	49	96.715
9. M.F. Feather River	119	376.739
10. N.F. Cottonwood Creek	12	29.050
11. N.F. Pit River	105	216.475
12. Scott River	102	129.560
13. Shasta River	208	623.857 1/
14. Surprise Valley	199	400.970 2/
15. Susan River	228	354.099

1/ Includes Willow Creek near Ager which is based on a percentage of flow.
2/ Includes Pine Creek near Alturas.

TABLE 1

WATERMASTER SERVICE AREAS, STREAM SYSTEMS

AND

SUPERIOR COURT DECREES REGULATING WATER DISTRIBUTION

Watermaster Service Area	Name of Stream System[a/]	County	Decree Number	Decree Date	Decree Type*	Date Watermaster Service Area Created	Remarks
Ash Creek	Ash Creek and Lassen	Modoc **	3670	10-27-47	CR	4-03-59	Included as part of Big Valley service area 1949 through 1958.
Big Valley	Pit River	Modoc ** and Lassen	6395	2-17-59	S	11-13-34	Service provided in accordance with recorded agreement in 1934. Service area operated under recorded agreement 1935 through 1958, and under decree since 1959. Service discontinued on December 31, 1981, and reactivated May 1, 1990.
Burney Creek	Burney Creek	Shasta	5111	1-30-26	CR	9-11-29	Service provided in accordance with decree since 1926.
Butte Creek	Butte Creek	Butte	18917	11-06-42	S	1-07-43	
Cow Creek[b/]	North Cow Creek	Shasta	5804	4-29-32	CR	10-17-32	
	Oak Run Creek	Shasta	5701	7-22-32	CR	10-17-32	
	Clover Creek	Shasta	6904	10-04-37	CR	1-21-38	
Digger Creek	Digger Creek	Shasta and Tehama **	2213	8-12-99	C	6-11-64	
			3214	5-27-13	C		
			3327	10-16-17	C		
			4570	2-24-27	C		
Hat Creek	Hat Creek	Shasta	5724	5-14-24	CR	9-11-29	Service provided in accordance with decree since 1924.
			7858	10-07-35	CR		
Indian Creek	Indian Creek	Plumas	4185	5-19-50	S	2-19-51	
Middle Fork Feather River	Middle Fork Feather River	Plumas ** and Sierra	3095	1-22-40	S	3-29-40	
North Fork Cottonwood Cr.	North Fork Cottonwood Cr.	Shasta	5479	6-09-20	CR	9-11-29	Service provided intermittently in the accordance with the decree since 1924.
North Fork Pit River	North Fork Pit River and all tributaries except Franklin Creek	Modoc	4074	12-14-39	S	12-18-39	All stream systems consolidated into North Fork Pit River service area 12-13-40.
	New Pine Creek	Modoc	2821	6-14-32	CR	6-22-32	
	Davis Creek	Modoc	2782	6-30-32	CR	7-13-32	
	Franklin Creek	Modoc	3118	9-08-33	CR	9-14-33	
	Cottonwood Creek	Modoc	2344	5-03-40	CR	12-13-40	
Scott River	French Creek	Siskiyou	14478	7-01-58	CR	11-19-68	French, Shackleford, and Wildcat Creek were combined in 1980 to form the Scott River service area. Sniktaw Creek was added on April 1, 1981.
	Shackleford Creek	Siskiyou	13775	4-10-50	S	11-06-50	
	Wildcat Creek	Siskiyou	30662	1-16-80	S	5-01-80	
	Sniktaw Creek	Siskiyou	30662	1-16-80	S	4-01-81	
Seiad Creek	Seiad Creek	Siskiyou	13774	4-10-50	S	11-06-50	No service provided since 1983.
Shasta River	Shasta River	Siskiyou	7035	12-29-32	S	3-01-33	
	Willow Creek	Siskiyou	24482	8-22-72	C	7-01-72	
	Cold Creek	Siskiyou	29348	7-05-78	S	4-01-81	
Surprise Valley	Cedar Creek	Modoc	1206	5-22-01	C	9-11-29	All adjudicated stream systems in Surprise Valley were consolidated into the Surprise Valley service area on 1-10-39. Bidwell Creek was added on March 16, 1960. Service started on Cedar Creek in 1926 in accordance with the decree. Service was provided on Soldier and Owl Creeks in 1929 in accordance with the decrees by order of the court.
			2343	2-15-23	C		
	Soldier Creek	Modoc	2405	11-28-28	CR	9-11-29	
	Owl Creek	Modoc	2410	4-29-29	CR	9-11-29	
	Emerson Creek	Modoc	2840	3-25-30	CR	4-02-03	
	Mill Creek	Modoc	3024	12-19-31	CR	12-30-31	
	Deer Creek	Modoc	3101	1-25-34	CR	12-29-34	
	Pine Creek near Cedarville	Modoc	3391	12-07-36	CR	1-13-37	
	Rader Creek	Modoc	3626	6-04-37	CR	6-12-37	
	Eagle Creek	Modoc	2304	4-05-26	C	1-10-39	
			3284	11-05-37	CR		
	Pine Creek near Alturas	Modoc	Agreement	11-22-23		1-12-35	Pine Creek was transferred from North Fork Pit River to Surprise Valley Watermaster serice Area in 1988.
	Cottonwood Creek	Modoc	6903	12-01-64	C	7-01-77	
	Bidwell Creek	Modoc	6420	1-13-60	S	3-16-60	
Susan River	Susan River	Lassen	4573	4-18-40	CR	11-10-41	
	Baxter Creek	Lassen	8174	12-15-55	S	2-16-56	
	Parker Creek	Lassen	8175	12-15-55	S	2-16-56	

* Explanation of type of decree:

C - Court adjudication (court makes determination from evidence submitted--no report of referee)
CR - Court reference (referred to State Water Resources Control Board for investigation and report)
S - Statutory adjudication (State Water Resources Control Board is petitioned by water users to make a determination of all water rights on a stream system)

** Decree entered by the Superior Court of this county.

[a/] Major tributaries only; a complete listing is given in "Index to Water Sources", page vi.

[b/] Mainstem Cow Creek not in service area.

Watermaster Service Areas

Watermaster service is provided in areas where the rights have been defined by the superior court of the county, or by agreement, and where an unbiased qualified person is needed to properly apportion the available water according to the established rights. The Director of the Department of Water Resources creates watermaster service areas where these conditions exist, following either a request by the users or an order by the superior court.

The first watermaster service areas were created in September 1929. Before then, some watermaster service was provided in accordance with the Water Commission Act of 1913. There are now about 50 streams in Northern California that are under State watermaster service. The newest service areas were created in 1979.

The counties and principal water sources of the various service areas in Northern California are listed in Table 2.

Of these fourteen areas, twelve are in the Department's Northern District and two are in the Division of Operation and Maintenance, Oroville Field Division.

Description of Region

The service areas are mainly in the mountainous northeastern part of the State where the growing season varies between about 100 and 140 days. Meadow hay and alfalfa are the principal crops under irrigation, although much land is used exclusively for pasturing livestock. Most irrigation is done by gravity systems, with water users diverting directly from the streams at one or more diversion points. However, pumped diversions and sprinkler irrigation systems are becoming popular in some areas.

Watermaster Responsibilities

To assure the proper distribution of water within the service area, each watermaster must ascertain the amount of water available and distribute it both by amount and priority according to established water rights.

Authority

To accomplish this, the watermaster gets his authority both from Water Code and from provisions of pertinent court decrees or voluntary agreements to physically regulate the streams in the service area. He is further authorized to supervise the design, construction, operation, and maintenance of diversion dams, headgates, and measuring devices.

Each watermaster supervises water distribution at around 100 to 200 diversions in one or more service areas. The need for frequently checking and regulating these diversion points increases substantially in years of short water supply.

TABLE 2

WATERMASTER SERVICE AREAS AND STREAM SYSTEMS

Service Area	County	Principal Water Sources: MAJOR STREAM and Tributaries[a]	Principal Water Sources: Reservoirs and Nontributary Streams
Ash Creek	Lassen, Modoc	ASH CREEK Butte, Rush, and Willow Creeks	
Big Valley	Modoc, Lassen	PIT RIVER Ash Creek	Lower Roberts Reservoir
Burney Creek	Shasta	BURNEY CREEK	
Butte Creek	Butte	BUTTE CREEK	West Branch Feather River
Cow Creek	Shasta	COW CREEK[b] North Cow, Clover, Oak Run, and Cedar Creeks	
Digger Creek	Shasta, Tehama	DIGGER CREEK	
Hat Creek	Shasta	HAT CREEK	
Indian Creek	Plumas	INDIAN CREEK Lights Creek, Wolf Creek	
Middle Fork Feather River	Plumas, Sierra	MIDDLE FORK FEATHER RIVER Little Last Chance, Smithneck, Webber and Fletcher Creeks; Spring Channels; Westside Canal	Little Truckee River
North Fork Cottonwood Creek	Shasta	NORTH FORK COTTONWOOD CREEK	Rainbow Lake
North Fork Pit River	Modoc	NORTH FORK PIT RIVER Parker Creek	Cottonwood, Davis, and New Pine Creek
Scott River	Siskiyou	FRENCH CREEK Shackleford, Mill, Miners, Wildcat, Oro Fino, Sniktaw Creeks	Cliff and Campbell Lakes
Shasta River	Siskiyou	SHASTA RIVER Little Shasta River	Dwinnell Reservoir (Lake Shastina), Cold Creek, Willow Creek
Surprise Valley	Modoc	NONE (All creeks listed at right are unconnected)	Bidwell, Mill, Soldier, Pine near Cedarville, Cedar, Deep, Cottonwood, Owl, Rader, Eagle, Emerson, and Pine Creek near Alturas
Susan River	Lassen	SUSAN RIVER Willow Creek	Lake Leavitt, Hog Flat, McCoy Flat Reservoirs; Baxter and Parker Creeks

[a] Major tributaries only.
[b] Mainstem Cow Creek not in service area.

Control Devices

Permanent measurement and control devices, which the State requires (Water Code Sections 4100-4104) at each owner's main point of diversion, are constructed by the water users under supervision of the watermaster. Installation of accurate, easily set, and lockable structures is a continuing objective of watermaster service, since once they are built, conflicts among water users usually stop. Also, the watermaster's ability to check and set each diversion regularly is greatly helped by engineered and properly built structures.

Interpretation of Decrees

The watermaster is often called upon to make on-the-spot interpretations of various court decrees, agreements, etc. Since most of these documents were written more than 30 years ago, many situations have developed that were not initially considered. Therefore, watermasters must use sound, careful, and practical judgment in attempting to reach workable solutions to water disputes. To accomplish this, they must possess a good understanding of California water rights law.

Water Supply

Water supply in the watermaster service areas comes mainly from unregulated runoff of small streams. Peak runoff--snowmelt in most cases--occurs in the spring, with relatively small streamflow occurring in the summer and early fall. Additional supplies from storage reservoirs and ground water pumping are used in some areas to supplement natural streamflow, but State watermasters do not supervise the use of ground water in this part of the State.

In some service areas, the water supply must be predicted in advance to determine the date watermastering will begin and, to some extent, the manpower needed. The Department's Bulletin 120 series, "Water Conditions in California," is used to assist in these predictions.

Precipitation

The streamflow available for distribution is affected by total precipitation, amount of snowpack, air temperature, and the amount of rainfall received during the irrigation season. The latter is particularly important in the upper Pit River-Surprise Valley areas, where about 25 to 30 percent of the annual precipitation occurs normally in April, May, and June. Spring storms, which are normally accompanied by relatively cool temperatures, materially affect both the water supply and the demand. Temperatures in the spring affect the demand for water and the manner in which snowmelt runoff occurs. A hot, dry spring depletes the water supply very early, even in years of normal snowpack. A cold, wet spring can extend the supply well into the irrigation season, but cold temperatures retard the growth of crops and are not necessarily desirable.

Table 3 reports the quantity of precipitation at selected stations in the service areas during the 1989-90 water year. The seasonal precipitation gives an indication of the related water supply available for distribution, and provides a basis for comparing the current year's supply with a long-term average.

Table 4 shows the snowpack on April 1, 1990 on all snow courses, and the snowpack on May 1, 1990 on selected courses. This information comes from the Department's basic data files.

Streamflow

The general water supply available for diversion within each watermaster area is determined from stream gaging stations placed at key locations in the main stream channels. Several major stations are installed and maintained by the Department and the U. S. Geological Survey as part of a Federal-State program for collection of year-round streamflow records. In addition, several stream gaging stations are installed and operated by the watermasters during the irrigation season to provide supplemental information. Also, water stage recorders are often installed by watermasters in selected diversion ditches to further assist them in proper distribution of the various water right allotments.

Table 5 presents runoff data at selected stream gaging stations in or near the service areas.

TABLE 3

PRECIPITATION AT SELECTED STATIONS - 1989-90 SEASON

Current Season = in inches
Long-term Average

Station	County	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Total	Percent of Mean
Fort Jones	Sisk.	1.77	.72	.21	3.91	1.45	1.17	1.09	2.64	.20	.42	.58	.35	14.51	64
R.S.		1.39	2.94	4.49	4.77	2.79	2.00	1.08	.76	.78	.34	.49	.65	22.48	
Happy Camp	Sisk.	6.63	1.87	1.14	10.08	4.66	2.80	.70	7.19	1.38	.17	1.57	.33	38.52	69
R.S.		3.67	7.91	10.90	12.18	7.78	6.51	2.78	1.45	.61	.25	.54	1.09	55.67	
Yreka	Sisk.	1.63	.81	.34	4.52	1.51	1.04	.80	2.38	.21	1.35	.56	.68	15.83	82
		1.25	2.34	3.83	3.68	2.17	1.80	.89	.77	.85	.40	.63	.59	19.20	
Redding, WSO	Shasta	3.69	1.20	.00	8.14	1.37	2.40	.65	6.60	.82	.49	1.06	1.17	27.59	72
Municipal AP		2.17	4.47	6.61	7.60	6.05	4.99	2.93	1.68	.84	.13	.18	.80	38.45	
Hat Creek	Shasta	2.47	1.07	.07	2.16	1.72	1.82	.81	3.06	.53	.00	.50	.10	14.31	76
P.H. #1		1.23	2.09	3.22	3.24	2.53	2.09	1.22	1.22	.89	.21	.37	.56	18.87	
Lookout 3WSW	Lassen	1.23	2.08	.60	1.60	.76	3.22	1.20	4.04	.15	.02	.50	.51	15.91	71
		1.32	3.34	3.51	3.65	2.51	2.61	1.44	1.29	1.02	.36	.53	.88	22.46	
Alturas	Modoc	.54	1.00	.12	.91	1.08	1.13	.59	1.61	.24	.22	.79	.03	8.26	66
R.S.		.94	1.31	1.53	1.67	1.23	1.25	1.00	1.21	1.09	.31	.43	.48	12.45	
Jess Valley	Modoc	1.06	1.38	.32	2.06	2.73	1.93	1.25	2.60	.50	T	.18	T	14.01	78
		1.38	1.89	1.96	1.99	1.67	1.82	1.80	2.04	1.57	.48	.64	.73	17.97	
Cedarville	Modoc	.56	1.43	.10	1.11	.79	1.51	1.01	1.32	.27	.80	.31	.04	9.25	64
		1.18	1.61	2.70	2.02	1.36	1.33	1.02	1.11	.83	.37	.38	.48	14.39	
Susanville	Lassen	1.58	1.26	.00	1.17	1.36	.09	.22	1.10	.12	2.00	.23	.34	9.47	66
Airport		1.14	1.43	2.59	2.88	1.93	1.38	.64	.75	.67	.30	.22	.36	14.29	
Greenville	Plumas	5.86	3.12	.00	6.69	3.49	1.90	.57	4.82	.32	.00	.43	.38	27.58	69
R.S.		2.31	4.64	7.00	8.47	6.25	4.95	2.72	1.59	.85	.30	.46	.67	40.21	
Sierraville	Sierra	4.27	2.79	.00	2.81	3.27	1.64	1.58	1.97	.21	.10	.30	.76	19.70	87
R.S.		1.97	2.99	4.73	2.81	3.75	1.64	1.56	1.35	.60	.32	.42	.52	22.66	
Vinton	Plumas	1.71	1.96	.00	.96	1.05	.65	.92	1.33	.21	1.50	.30	.68	11.27	86
		.91	1.33	2.15	2.39	1.54	1.26	.78	.99	.64	.32	.38	.37	13.06	

NOTE: Current season above line; long-term averages below line.

TABLE 4

SNOWPACK AS OF APRIL 1 AND MAY 1, 1990, AT REPRESENTATIVE SNOW COURSES

Watermaster Service Areas	Snow Course* Group Related to Each Service Area	Calif. I. D. No.	Elevation (in feet)	WATER CONTENT OF SNOW				
				April 1 Average (in inches)	April 1,1990**		May 1, 1990	
					In inches	In Percent of April 1 Average	In inches	In Percent of April 1 Average
Ash Creek	Blue Lake Ranch	28	6,800	12.6	5.2	41		
Burney Creek	Thousand Lakes	33	6,500	38.1	14.8	39	1.1	3
Butte Creek	Humbug Summit	60	4,850	12.1	3.5	29	0.0	0
	Silver Lake Meadows	45	6,450	30.5	11.2	37	1.0	3
Cow Creek	New Manzanita Lake	343	5,900	7.9	1.0	13	0.0	0
Digger Creek	Burney Springs	41	4,700	2.8	0.0	0		
Hat Creek	New Manzanita Lake	343	5,900	7.9	1.0	13		
Indian Creek	Independence Lake	86	8,450	41.3	27.8	67		
Middle Fork Feather River	Mount Dyer No. 1	48	7,100	25.5	9.7	38	0.4	1
	Rowland Creek	280	6,700	18.5	11.1	60	0.2	1
	Yuba Pass	74	6,700	31.9	14.7	46	0.0	0
North Fork Pit River	Cedar Pass	30	7,100	17.2	13.6	79		
Scott River	Middle Boulder No. 1	5	6,600	31.5	8.5	27	0.0	0
Shasta River	Little Shasta	2	6,200	20.6	17.4	84		
	Parks Creek	1	6,700	36.6	19.2	52		
South Fork Pit River	Adin Mountain	35	6,350	13.6	6.9	51	0.0	0
Surprise Valley	Mount Bidwell	78	7,200	24.4	14.3	59		

* Snow courses are listed in order of elevation with each geographical group of watermaster areas.
** Data collected only at stations listed.

TABLE 5

RUNOFF, SELECTED STATIONS - 1989-90 (ACRE-FEET)

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual Total	Long Term Average	Percent of Average
Bidwell Creek near Fort Bidwell	282	218	426	576	408	829	1,543	1,515	1,467	379	209	146	7,998	18,000	44
Burney Creek at Burney	1,295	960	NR	NR	NR	3,697	2,227	2,471	2,727	625	NR	NR	NR	57,000	NR
Butte Creek near Chico	10,270	9,720	7,920	19,060	13,980	24,760	16,570	15,370	14,550	8,830	6,310	4,080	151,400	297,800	51
Hat Creek near Hat Creek	7,700	7,160	7,090	7,360	6,410	7,250	7,550	8,070	7,290	6,610	6,310	6,130	84,930	103,600	82
Pit River near Canby	4,270	4,910	5,510	6,270	5,490	16,140	2,950	1,880	4,420	550	926	1,150	54,470	181,800	30
Scott River near Fort Jones	8,610	8,140	9,750	37,690	15,460	34,830	31,900	27,020	22,920	3,120	851	727	201,000	478,200	42
Shasta River near Yreka	9,520	9,850	9,970	12,840	10,200	14,570	4,950	5,770	4,440	1,720	1,380	2,460	87,680	136,200	64
Susan River at Susanville	678	678	737	1,400	750	440	2,760	2,270	1,240	153	39	44	15,010	67,090	22

SERVICE AREA DESCRIPTIONS AND 1990 WATER SUPPLY STATISTICS

This portion of the report consists of fourteen sections, one for each service area active in 1990, presented in alphabetical order.

Each of these sections presents a description of the particular service area, including location, geography, and general characteristics. Following this is a section entitled "Basis of Service," which includes such data as the case number, date, and type of decrees, a brief summary of the decree or agreement that defines the water rights, the date the service area was created, and other related information.

These service area descriptions also give data on the water supply, methods of distribution, significant events of the watermaster season, and daily streamflow records. The water right ownerships are updated as of March 1 each year from County Assessors' records.

As in previous years, watermaster service is activated on different dates in the various areas depending upon the streamflow conditions, the ranchers' needs for the water, or, as on some streams, the terms of the decree. Service was continued in all areas through the growing season as long as needed.

The date service was started in each service area and the name of the watermaster in charge are listed on Table 6.

TABLE 6

START-UP DATES AND WATERMASTERS

Service Area	Date Service Began in 1990	Watermaster
Ash Creek	April 1	John P. Clements
Big Valley	May 1	Earl W. Hanson
Burney Creek	May 1	Earl W. Hanson
Butte Creek	April 1	John A. Nolan
Cow Creek	May 1	John A. Nolan
Digger Creek	June 1	John A. Nolan
Hat Creek	May 1	Earl W. Hanson
Indian Creek	April 1	Charles D. Hand
M. F. Feather River	March 15 May 2	Conrad L. Lahr Jon A. Haman
N. F. Cottonwood Creek	June 1	John A. Nolan
N. F. Pit River	April 1	John P. Clements
Scott River	April 1 April 2	Keithal B. Dick Lester L. Lighthall
Shasta River	April 1 April 1	Keithal B. Dick Lester L. Lighthall
Surprise Valley	March 19	Kevin L. Dossey
Susan River	March 1	Virgil D. Buechler

ASH CREEK WATERMASTER SERVICE AREA

The Ash Creek service area is in Modoc and Lassen Counties near the town of Adin, about 100 miles northeast of Redding via Highway 299E. The major sources of water for the service area are Ash Creek and three tributaries, Willow, Rush and Butte Creeks. Ash Creek rises in Ash Valley in the southeastern part of the service area, and flows northwesterly about 18 miles to its confluence with Rush Creek, then southwesterly to the town of Adin, and then westerly to Ash Creek Swamp and Pit River. Butte and Willow Creeks head in the mountains to the east and flow northwesterly into Big Valley. Butte Creek meets Ash Creek near the head of the Valley at Adin. It meets Willow Creek about 3 miles farther west, near the head of Ash Creek Swamp. The valley floor elevation in this vicinity is about 4,200 feet.

Basis of Service

The rights on this creek system were determined by a court reference and set forth in Decree No. 3670, Modoc County Superior Court, dated October 27, 1947. From 1949 through 1958, Ash Creek was included as a part of Big Valley watermaster service area. The Ash Creek service area has been served separately since April 3, 1959.

About 85 percent of the water rights in the service area are in Big Valley, west of the town of Adin. The rest are along the upstream tributaries and in Ash Valley, east of Adin. The part of Big Valley served is about 10 miles long by 6 miles wide, extending from Adin to the confluence of Ash Creek and the Pit River.

The Ash Creek Decree establishes the number of priority classes on the individual streams within the service area as follows: Ash Creek - five, Willow Creek - four, Rush Creek - one, and Butte Creek - two. Each of these streams is independently regulated.

Water Supply

The water supply for Ash and Rush Creeks comes mainly from snowmelt, since most of the watershed is between 5,000 and 6,000 feet in elevation. Willow Creek and Butte Creek get much of their water from springs. These creeks normally have enough water to satisfy demands until about June 1, after which the supply decreases rapidly. By the end of June, Ash Creek normally has receded to about 20 cubic feet per second (cfs), and Butte Creek to less than 1 cfs. The flow of these creeks then remains nearly constant for the rest of the season. Records of the daily mean discharge of stream gaging station, Ash Creek at Adin, is presented in Table 7. The flow in Willow Creek above Diversion No. 92 and 93 is presented in Table 8.

ASH CREEK WATERMASTER SERVICE AREA

TABLE 7

1990 Daily Mean Discharge
(In cubic feet per second)

ASH CREEK AT ADIN

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	125	55	31	637	18	20	17
2	321	56	29	326	21	17	19
3	243	55	29	171	19	16	19
4	261	55	31	103	19	20	20
5	267	52	29	78	19	20	18
6	169	55	26	66	19	20	18
7	133	52	27	59	21	22	19
8	109	47	23	51	21	23	18
9	85	46	17	39	19	25	19
10	90	43	13	45	18	22	18
11	109	41	16	35	18	25	18
12	113	40	18	34	19	23	19
13	92	39	22	38	19	23	18
14	114	37	24	47	20	24	19
15	279	36	20	38	22	27	20
16	262	36	17	34	20	21	22
17	195	38	19	34	21	21	21
18	147	38	19	28	21	24	21
19	114	36	17	23	22	27	19
20	95	34	20	25	20	25	15
21	85	32	20	21	18	23	18
22	78	34	21	14	18	22	19
23	75	49	28	20	18	21	22
24	69	62	38	19	18	21	25
25	63	45	32	15	18	22	27
26	72	38	28	14	34	21	23
27	69	36	31	14	27	23	19
28	63	34	32	16	23	23	26
29	58	33	41	14	17	21	23
30	56	32	54	16	16	18	23
31	56		385		18	16	
MEAN	131	42.9	37.3	69.1	20.0	21.8	20.1
AC-FT	8067	2551	2295	4114	1232	1341	1194

ASH CREEK WATERMASTER SERVICE AREA

TABLE 8

1990 Daily Mean Discharge
(In cubic feet per second)

WILLOW CREEK ABOVE DIVERSIONS 92 AND 93

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		5.4[1/]	6.7	42	5.4	4.7	5.2
2		5.4	6.7	15	5.4	4.4	5.2
3		5.7	6.5	6.2	5.4	4.4	5.2
4		5.7	6.5	6.2	5.4	4.4	5.2
5		5.7	6.5	6.2	5.4	4.4	4.9
6		5.7	6.2	7.5	5.4	4.4	4.7
7		5.9	6.2	6.7	5.4	4.4	4.7
8		6.2	6.2	6.7	5.4	4.9	4.7
9		6.5	5.9	7.0	5.4	4.7	4.7
10		6.5	5.9	6.7	5.4	4.7	4.7
11		6.5	5.9	6.5	5.4	4.7	4.7
12		6.5	5.9	6.5	4.9	4.4	4.7
13		6.5	5.9	6.5	4.9	4.4	4.7
14		6.5	5.9	6.5	4.9	4.4	4.7
15		6.2	5.9	6.5	4.9	4.4	4.7
16		6.7	5.9	6.5	4.7	4.4	4.7
17		7.0	5.9	6.7	4.7	4.7	4.7
18		7.0	5.9	6.5	4.7	5.2	4.7
19		6.7	5.9	6.2	4.7	5.7	4.7
20		6.5	5.9	5.9	4.7	5.4	4.7
21		7.0	5.9	5.9	4.7	5.4	4.7
22		7.0	5.9	5.7	4.7	5.2	4.7
23		8.4	6.5	5.7	4.7	5.2	4.7
24		9.3	7.0	5.7	4.7	5.2	4.9
25		7.5	6.2	5.7	4.7	5.2	4.9
26		7.0	6.5	5.7	4.7	5.2	4.9
27		6.7	6.5	5.7	4.7	5.2	4.9
28		6.7	6.7	5.7	4.7	5.2	4.9
29		6.7	7.2	5.4	4.7	5.2	4.9
30		6.7	11	5.4	4.7	5.2	4.9
31			23		4.7	5.2	
MEAN		6.6	6.9	7.7	5.0	4.9	4.8
AC-FT		392	426	458	306	299	287

[1/] No record before April 1.

Method of Distribution

Irrigation from Ash Creek and its tributaries uses numerous small dams to divert flow into systems of ditches. The ditches deliver the water to the various fields for spreading. Wild flooding is the method most used, but some ranchers have checks and ditches and some use pumps to operate sprinklers or to lift water to higher spreading ditches. In some cases, runoff water is captured and reused before it returns to the stream.

1990 Distribution

Watermaster service began in the Ash Creek watermaster service area on April 1 and continued until September 30 with John P. Clements, Associate Engineer, Water Resources, as watermaster.

Ash Creek

Due to the lack of snowpack, only a small portion of third priority water was available during April and May. Around June 1, a large rainstorm occurred which resulted in extreme flows in the Ash Creek drainage (peak flow at Adin was around 800 cfs). The flow steadily decreased thereafter, but full second priority water was available for the remainder of the season.

The public utility water described in paragraph 18 of the Ash Creek Decree (No. 3670) was delivered to the Akers Ranch south of Highway 299. About 2 cfs was delivered for a period of 17 days.

Butte Creek

Full priority was available for only a few days in April and June. The flow decreased to about 50 percent of first priority and then remained constant for the remainder of the season.

Rush Creek

Full priority water was available for only a few days in April and June. The flow decreased to about 40 percent of first priority and remained constant for the remainder of the season.

Willow Creek

Third priority water was available for only a few days in June. The upstream users were initially closed about the middle of April. The flow decreased to about 50 percent of second priority by June 15 and remained constant the rest of the season.

BIG VALLEY WATERMASTER SERVICE AREA

The Big Valley service area is in Modoc and Lassen counties in the vicinity of the towns of Lookout and Bieber, about 90 miles northeast of Redding via State Route 299.

The Pit River is the major source of water regulated by the watermaster. The river enters the valley north of the town of Lookout and flows southerly through the western part of the valley and out at the southern end. The major area of use is along approximately 13 miles of valley floor, up to 6 miles wide, along the Pit River at an approximate elevation of 4,200 feet.

Basis of Service

The Big Valley watermaster service area was created on November 13, 1934, and service began with the 1935 season, operating under an agreement to determine water rights recorded in 1934. The water rights in this service area were set forth in Decree No. 6395, Modoc County Superior Court, a statutory decree, dated February 17, 1959.

Distributing the water on a continuous flow basis, as provided by the decree, has proven impracticable to the users who employ wild flooding or border irrigation practices because of the wide variation of flows. By mutual agreement, an alternative procedure allowing each user a definite amount of water in acre-feet for each cubic foot per second of right allocated by the decree has been adopted. The watermaster estimates the amount of water probably available for the next 15 to 30 days and chooses the appropriate ac-ft/cfs ratio with a view to completing the rotation through the valley in not more than 30 days.

The irrigators using pumps and sprinklers have elected to receive their water on a more or less continuous flow basis. Over the years, different ways have been employed to insure that applications of small amounts over extended periods result in no advantage over the flooders who use large amounts for very short periods.

Water Supply

The flow in the Pit River at the head of Big Valley is mostly from direct runoff, mainly snowmelt, and return flow from irrigation water released from West Valley and Big Sage Reservoirs above South Fork Pit River and Hot Springs Irrigation District, respectively.

The available water supply in the Pit River as it flows through Big Valley used to be adequate to satisfy all demands until about June 1. The irrigation practices in Hot Springs Irrigation District, about 20 miles upstream from Big Valley, have a significant effect on the available water supply in Big Valley. Water users in Hot Springs Irrigation District divert most of the flow of the

Pit River for two- or three-week periods. In recent years, Hot Springs Irrigation District has improved the use and coordinated the distribution of their water, so releases from their system are less than they were 10 years ago. Big Valley Irrigation District water users are hard put to keep stock water in August and September.

Several users, who irrigate crops by sprinkling, have drilled wells to supplement their water supply. Some of these are several miles upstream from the place of use, and the Pit River is used to convey it downstream to where it is pumped out. The users who irrigate by flooding have not changed nor improved their practices.

Roberts Reservoir, which stores runoff of a minor tributary to the Pit River near the upper end of Big Valley above Lookout, serves as a supplemental source of water to those users in the area who are members of the Big Valley Mutual Water Company. Water from this reservoir is released into the Pit River and distributed to members of the water company along with the natural flow to which they are entitled.

The daily mean discharge of the Pit River near Canby stream gaging station is presented in Table 9, page 22.

Method of Distribution

Most water users in the Big Valley service area irrigate on a rotation schedule either by wild flooding or by checks and borders. Large flashboard dams placed in the channel make it possible to use the large heads of water characteristic of the supply in the area. In addition, some pumps are used for diversion, both in ditches and directly into sprinkler systems. The ranches which irrigate by wild flooding must use large heads of water in order to cover unleveled or high ground. Some of the runoff is recaptured for use by downstream lands.

1990 Distribution

Watermaster service began May 1 and ended September 30 with Earl Hanson, Assistant Engineer, Water Resources, as watermaster.

Last winter's snowpack was the lowest in the current four-year drought period. The river flow averaged 53 cfs during the last week in April and first week in May. Flooders and pumpers were irrigating the best that they could. On May 7, the flow dropped to less than 15 cfs and no irrigating was allowed. On May 30, a heavy rain and wet snow arrived and the river flow at the USGS gage at Canby recorded 320 cfs. Ash Creek at Adin passed about 400 cfs, much of which made its way into the lower Pit River. The countryside was soaked and received a heavy natural irrigation which revived pastures and the first crop of alfalfa.

On June 20, the river flow again dropped below 15 cfs except for two short periods. During these times of low flows, the water was reserved for stock

water and channel storage. After July 10, no Pit River water was allowed to be used for irrigating in an effort to provide at least a minimum amount of stock water to users.

The shareholders in Roberts Reservoir ran one small irrigation in late August after haying, and another of the same magnitude was done during the first part of September.

BIG VALLEY WATERMASTER SERVICE AREA

TABLE 9

1990 Daily Mean Discharge
(In cubic feet per second)

PIT RIVER NEAR CANBY

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	408	104	50	294	5.4	26	27
2	464	103	52	263	5.6	25	29
3	799	101	79	230	5.9	19	37
4	696	88	72	220	9.1	16	43
5	510	84	37	197	12	14	34
6	413	90	27	149	24	12	39
7	326	91	18	96	28	7.7	38
8	238	77	3.2	79	21	4.5	35
9	193	89	4.4	83	14	6.6	35
10	170	85	5.3	79	12	6.7	28
11	174	62	6.9	67	14	9.5	19
12	188	48	5.2	66	16	16	17
13	199	41	4.1	58	11	13	13
14	197	29	4.4	56	7.7	11	12
15	227	12	3.6	46	4.7	9.5	9.5
16	313	4.9	2.9	33	1.8	9.2	9.6
17	366	5.2	1.9	22	0.8	8.0	12
18	267	3.1	2.1	20	0.7	7.7	11
19	214	3.7	2.6	18	0.5	5.5	11
20	188	3.4	4.1	15	2.9	4.2	11
21	171	5.9	8.2	15	19	4.8	11
22	151	11	10	22	9.9	16	11
23	145	26	20	20	5.1	24	15
24	144	53	25	18	4.8	29	9.6
25	136	62	26	17	4.2	26	11
26	136	67	27	12	4.7	26	11
27	149	42	25	11	4.2	24	11
28	167	33	36	12	4.6	20	14
29	143	31	66	5.9	4.5	20	11
30	132	34	98	6.6	7.4	20	7.1
31	112		222		12	26	
MEAN	262	49.6	30.6	74.3	8.9	15.1	19.4
AC-FT	16140	2950	1880	4420	550	926	1150

BURNEY CREEK WATERMASTER SERVICE AREA

The Burney Creek service area is in eastern Shasta County above and below the town of Burney. The source of water for this service area is Burney Creek, which enters the southern part of the service area and flows through Burney in a northerly direction to the Pit River. The part of the valley served by this stream is about 11 miles long and 2 miles wide and extends both north and south of Burney.

Basis of Service

The rights on this creek system were determined by a court reference and set forth in Decree No. 5111, Shasta County Superior Court, dated January 30, 1926. Watermaster service was provided on the creek from 1926 to 1929 under the Water Commission Act of 1913. The present service area was created on September 11, 1929.

The Burney Creek decree sets forth a rotation schedule of distribution. The water users, however, have found it more beneficial to irrigate on a continuous-flow basis (one priority class plus surplus allotments), which is now normal practice. The water allotted to the Greer-Cornaz Ditch is distributed according to supplemental court decrees.

Water Supply

The water supply for Burney Creek comes from springs and snowmelt. Most of the watershed lies between the elevations of 4,000 and 7,500 on the northwest slopes of Burney Mountain. The creek normally has enough water for all demands until about the middle of June. The supply then gradually decreases until the end of July. For the rest of the irrigation season, runoff from perennial springs keeps the flow nearly constant at about 40 percent of allotments.

The daily mean discharge of Burney Creek near Burney is presented in Table 10. The stream gaging station on Burney Creek is downstream from four points of diversion, so the records do not show all of the available water supply of the creek.

Method of Distribution

Water is diverted from Burney Creek, in most cases, by means of low diversion dams into ditches that convey it to the individual users. Some users are still using flood irrigation, while some of the lower users are pressurizing the water with low lift pumps and sprinkler irrigation.

BURNEY CREEK WATERMASTER SERVICE AREA

TABLE 10

1990 Daily Mean Discharge
(In cubic feet per second)

BURNEY CREEK NEAR BURNEY

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	28	44	22	208	12	8.4	
2	41	44	21	162	12	8.4	
3	89	42	20	137	12	8.7	
4	107	42	19	116	12	8.7	
5	87	46	18	91	11	8.5	
6	68	51	16	75	11	8.7	
7	62	46	16	65	11	9.1[1/]	
8	64	44	18	51	11		
9	51	43	15	42	10		
10	86	37	16	38	11		
11	66	34	15	33	11		
12	53	33	15	29	10		
13	44	31	15	28	11		
14	42	31	15	25	11		
15	39	30	15	23	9.9		
16	40	29	14	25	9.7		
17	43	27	14	25	9.9		
18	50	26	14	22	10		
19	61	26	15	19	10		
20	68	24	27	18	10		
21	64	24	21	16	9.7		
22	67	24	22	15	9.4		
23	69	60	59	15	9.1		
24	69	86	54	14	9.2		
25	65	50	36	14	9.2		
26	70	38	34	14	9.1		
27	65	32	107	14	8.9		
28	59	29	102	14	8.8		
29	53	26	96	14	8.8		
30	48	24	150	13	8.6		
31	46		225		8.6		
MEAN	60.1	37.4	40.2	45.8	10.2		
AC-FT	3697	2227	2471	2727	625		

[1/] No record after August 7.

1990 Distribution

Watermaster service on Burney Creek began on May 1 and continued until September 30 with Earl Hanson, Assistant Engineer, Water Resources, as watermaster.

The flow in Burney Creek was not quite able to fill all the first priority allotments during May. A very heavy rain at the end of May soaked the ground and provided a natural irrigation. In addition, snow was deposited in the higher elevations and the snowmelt provided ample water until the last of June when the flow dropped to 80 percent of all allotments. It continued to drop until August when it leveled off at 50 percent of first priority allotments for the rest of the watermaster season.

A problem developed between two adjacent landowners, each users of the Greer-Cornez ditch. This took considerable time negotiating, advising and trying to assist them in finding a mutually agreeable and workable solution.

BUTTE CREEK WATERMASTER SERVICE AREA

The Butte Creek service area is in Butte County a few miles southeast of the City of Chico. The watermaster service area runs about 11 miles along Butte Creek, starting about 4 miles east of Chico and running downstream to the crossing of the Western Canal. It contains about 20,000 acres of valley floor lands at an average elevation of 150 feet.

Basis of Service

The rights on this stream system were determined by a statutory adjudication and set forth in Decree No. 18917, Butte County Superior Court, dated November 6, 1942. The Butte Creek watermaster service area was created on January 7, 1943.

The Butte Creek decree established three priority classes for summer use under Schedule 7, a surplus class inferior to the above rights, and a special class for Hamlin Slough. Schedule 3 of the decree defines the rights for rediversion (Diversion 50) of foreign water delivered into Butte Creek from the West Branch of the Feather River.

On September 18, 1969, the Water Resources Control Board granted permits for the following applications to take water from Butte Creek: application 22321, Gorrill Land Company; 22534, Garrison Patrick; and 22564, Louis C. Camenzind, Jr. These appropriative rights are also under control of the watermaster.

Water Supply

Butte Creek, the major source of water, drains about 150 square miles of the western slope of the Sierra Nevada in the northeasterly part of Butte County above the watermaster service area. The highest elevation in the watershed is about 7,000 feet.

Normally, snowmelt produces sustained high flows in the creek until about the end of June, after which perennial springs above Diversion 50 continue to produce flows of more than 40 cfs. Additional water is imported for distribution from the West Branch Feather River by means of the Hendricks (Toadtown) Canal through De Sabla Reservoir and Powerhouse into Butte Creek.

Records of the daily mean discharge at stream gaging stations in the Butte Creek service area are presented in Tables 11, 12, and 13.

BUTTE CREEK WATERMASTER SERVICE AREA

TABLE 11

1990 Daily Mean Discharge
(In cubic feet per second)

BUTTE CREEK NEAR CHICO

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	390	317	201	522	151	119	96
2	404	314	197	454	150	117	96
3	628	310	192	400	147	115	81
4	596	313	187	362	142	111	72
5	556	308	178	337	163	110	63
6	494	308	173	320	162	109	63
7	448	304	168	305	162	106	62
8	429	304	166	280	158	104	61
9	411	301	161	274	156	105	61
10	466	293	157	272	153	104	61
11	496	291	155	265	149	97	60
12	436	291	153	257	153	96	60
13	386	287	149	250	155	95	62
14	359	287	145	249	154	95	58
15	345	283	147	241	160	95	61
16	340	281	137	232	152	94	61
17	344	277	139	219	148	95	61
18	359	267	134	193	146	96	61
19	362	262	134	120	144	103	61
20	368	259	243	132	145	108	58
21	369	247	256	179	139	103	56
22	362	255	211	175	138	99	68
23	363	285	309	166	134	102	69
24	364	301	300	165	129	101	80
25	365	272	246	159	129	100	78
26	358	248	231	160	122	102	79
27	350	236	507	164	125	102	83
28	348	230	786	164	123	100	78
29	338	217	471	161	122	99	74
30	329	206	425	156	122	99	72
31	320		692		119	98	
MEAN	403	278	250	244	144	103	68.5
AC-FT	24760	16570	15370	14550	8830	6310	4080

BUTTE CREEK WATERMASTER SERVICE AREA

TABLE 12

1990 Daily Mean Discharge
(In cubic feet per second)

BUTTE CREEK NEAR DURHAM

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	338	242	54	429	35	8.8	8.8
2	344	227	50	351	33	8.8	8.8
3	587	215	47	298	33	8.8	8.8
4	583	214	41	245	33	8.8	8.8
5	546	213	38	199	36	8.8	8.8
6	467	208	40	164	40	8.8	8.3
7	420	208	38	150	40	8.8	8.3
8	400	208	36	109	40	8.8	8.3
9	384	206	37	96	38	8.8	8.3
10	434	200	36	92	30	8.8	9.0
11	481	197	35	86	23	8.8	9.4
12	420	195	36	80	25	8.8	9.0
13	370	187	35	76	20	8.8	8.8
14	340	188	31	76	24	8.8	8.8
15	325	182	24	69	27	8.8	8.8
16	319	179	21	61	20	8.8	8.8
17	318	177	25	54	16	8.8	8.8
18	330	173	19	39	15	8.8	8.8
19	333	170	16	14	12	8.8	8.8
20	336	161	66	34	9.6	10	8.8
21	333	150	92	92	9.6	9.7	8.8
22	330	158	61	60	8.9	8.8	8.8
23	325	186	156	55	13	9.0	12
24	322	192	208	52	12	11	24
25	320	154	158	46	11	9.5	43
26	318	118	164	44	10	9.7	47
27	311	94	431	46	8.8	8.8	57
28	309	74	796	43	8.8	8.8	44
29	303	61	398	41	8.5	8.8	33
30	278	59	333	38	8.3	8.8	34
31	251		594		8.3	8.8	
MEAN	370	173	133	108	21.2	9.0	16.2
AC-FT	22760	10310	8164	6424	1303	553	965

BUTTE CREEK WATERMASTER SERVICE AREA

TABLE 13

1990 Daily Mean Discharge
(In cubic feet per second)

TOADTOWN CANAL ABOVE BUTTE CANAL

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		110[1/]	76	119	65	60	42
2		110	79	118	66	62	41
3		110	75	116	61	59	18
4		113	75	116	60	54	0
5		114	72	118	84	57	0
6		111	67	117	83	52	0
7		114	66	119	80	51	0
8		114	66	112	81	52	0
9		113	62	114	78	50	0
10		112	61	114	77	50	0
11		112	59	114	74	43	0
12		113	57	113	81	43	0
13		111	58	103	83	43	0
14		113	56	103	80	42	0
15		112	54	101	83	40	0
16		114	53	101	80	40	0
17		112	49	89	77	42	0
18		109	48	0	79	43	0
19		113	50	0	73	44	0
20		103	110	61	78	45	0
21		106	107	73	77	46	10
22		102	83	71	74	46	13
23		110	112	67	71	46	13
24		108	111	66	65	44	19
25		107	108	61	66	45	15
26		98	108	70	66	44	16
27		95	110	69	65	44	11
28		92	108	71	65	46	12
29		84	117	68	64	44	11
30		77	117	67	63	44	10
31			117		63	43	
MEAN		106	80.3	87.7	73.0	47.2	7.7
AC-FT		6311	4941	5218	4487	2904	458

[1/] No record before April 1.

Method of Distribution

Water is diverted from Butte Creek by pumping and by gravity diversions. Arrott Investment Company, M & T, Inc., Dayton Mutual Water Company, and Durham Mutual Water Company divert relatively large amounts of water by gravity into ditches leading to their individual distribution systems. Various methods of irrigation are in general practice, including contour checks, strip or border checks, basin checks, furrows, wild flooding, and sprinklers. The use of sprinklers has increased in the past few years, especially for orchards.

1990 Distribution

Watermaster service began April 1 in the Butte Creek service area and continued until September 30 with John A. Nolan, Water Resources Engineering Associate, as watermaster.

The water supply for the 1990 irrigation season was about normal. It would have been much below normal except for a major storm in late May which improved the water supply for the irrigation season. The appropriative rights that are in addition to the Butte Creek decree were partially filled until mid-June, at which time the rice fields were flooded. During the third week in July the Adams Esquon Ranch closed its diversion gates for the remainder of the season and irrigated with well water for the balance of the season.

COW CREEK WATERMASTER SERVICE AREA

The Cow Creek service area is in central Shasta County in the foothills east of Redding. Water for this service area comes from three major creek systems. They are North Cow Creek (sometimes referred to as Little Cow Creek), Oak Run Creek, and Clover Creek. These creeks flow westerly to their confluence in the Millville-Palo Cedro area, then south to the Sacramento River east of the City of Anderson. The service area is generally a narrow strip of land on both sides of each of these creeks. In some cases, water is exported from one creek to the other.

Basis of Service

The water rights on each of these creek systems were determined by court references and set forth in separate decrees. Water rights for these creeks were set forth by Shasta County Superior Court decrees as follows:

Creek	Decree No.	Date
North Cow	5804	April 29, 1932
Oak Run	5701	July 22, 1932
Clover	6904	October 4, 1937

The North Cow Creek decree which includes Cedar Creek, sets forth a rotation schedule of distribution. The water users, however, have found it more beneficial to irrigate on a continuous-flow basis, which is now normal practice. Only one priority allotment was provided in each of the Cow Creek service area decrees, except for the Oak Run Creek decree, which contains a surplus allotment.

The Cow Creek watermaster service area was originally created on October 17, 1932, including North Cow Creek and Oak Run Creek water rights. On January 21, 1938, the service area was expanded to include the Clover Creek rights.

Water Supply

Water for this service area comes mostly from springs and seepage, with some early snowmelt runoff. The watershed varies in elevation from 500 to 5,000 feet and consists mainly of low, brushy hills that do not accumulate a heavy snowpack. Relatively large amounts of precipitation during the winter normally produce substantial seepage and springs that flow through the irrigation season. The creeks normally have sufficient water to supply all demands until late July. The supply then gradually decreases to an average of about 60 to 70 percent of allotments by around mid-September.

The daily mean discharge of North Cow Creek near Ingot is presented in Table 14. The stream gaging station on North Cow Creek is downstream of

COW CREEK WATERMASTER SERVICE AREA

TABLE 14

1990 Daily Mean Discharge
(In cubic feet per second)

NORTH COW CREEK NEAR INGOT

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1				152	41	9.0	12
2				135	40	8.2	11
3				121	40	8.0	11
4				109	38	7.3	11
5				100	37	6.9	11
6				91	37	6.9	10
7				86	36	6.0	9.1
8				81	33	6.0	9.0
9				76	31	6.0	9.0
10				73	29	6.0	8.2
11				69	27	6.9	8.2
12				66	25	8.0	8.2
13				63	22	8.0	9.0
14				62	20	7.3	9.0
15				60	19	9.0	10
16				60	18	10	11
17				59	19	11	9.1
18			40[1/]	58	21	15	9.0
19			44	55	19	17	8.2
20			53	54	16	14	6.0
21			55	53	16	14	6.0
22			61	52	14	13	9.0
23			104	51	12	11	11
24			91	50	12	10	14
25			81	48	12	12	17
26			88	48	12	18	21
27			142	47	12	19	19
28			154	46	11	17	17
29			161	45	11	16	16
30			176	44	11	15	14
31			190		9.1	12	
MEAN			103	70	23	11	11
AC-FT			2860	4190	1390	660	660

[1/] No record before May 18.

many of the diversions and is used by the watermaster, mainly to indicate changes in flow conditions rather than amounts of water available. Consequently, the records do not show all the available water supply of the creek.

Method of Distribution

Water is diverted from the creeks, in most cases by means of low diversion dams, into ditches that convey it to the place of use. Lateral ditches are then used to spread it over the land. Irrigation has been on a continuous-flow basis instead of by rotation since 1934.

1990 Distribution

Watermaster service for North Cow Creek began on May 1 and continued through October 30 with John A. Nolan, Water Resources Engineering Associate, as watermaster.

Cedar Creek

The flow in Cedar Creek was adequate to supply all demands throughout the season.

Clover Creek

The flow was adequate to supply 100 percent of the one priority through the middle of August. It slowly dropped to 75 percent where it stayed for the remainder of the irrigation season.

North Cow Creek

The flow was adequate to supply 100 percent of the one priority through the first week in August. It dropped rapidly to a low of 50 percent by August 10. After some major cuts to upstream diversions the water available for the lower users was brought back up and ranged from 90 to 100 percent of their allotments for the remainder of the irrigation season.

Oak Run Creek

The flow was adequate to supply 100 percent of first priority for the entire irrigation season.

DIGGER CREEK WATERMASTER SERVICE AREA

The Digger Creek service area is situated in southeastern Shasta County and northeastern Tehama County.

Digger Creek forms part of the boundary between Shasta and Tehama counties. It drains about 45 miles on the western slopes of the Sierra, just west of Lassen National Park. The creek flows west through the town of Manton to its confluence with North Fork Battle Creek. Manton, the only community in the area, lies about 40 miles northeast of Red Bluff.

Basis of Service

The rights to use of the waters of Digger Creek were determined by four court adjudications. The Crooker Ditch, now combined with the Harrison Ditch, may divert all the water in the creek at its point of diversion. Diversions below this point, though defined by decree, are not in the service area.

Four Tehama County Superior Court decrees define the rights included in the service area. These decrees are listed in Table 15.

TABLE 15

DECREES DEFINING DIGGER CREEK WATER RIGHTS

Case	Decree No.	Date Entered
Gransbury v Edwards	2213	August 12, 1899
Wells v Pritchard	2114	May 27, 1913
Harrison et al v Kaler et al	3327	October 16, 1917
Herrick v Forward	4570	February 24, 1927

The four decrees have, in effect, divided the water rights on the creek into two groups, the upper users and the lower users. The three upper users irrigate land alongside the stream so that all run-off water returns to Digger Creek. The lower users are located within a 5-square-mile area. Very little runoff from the lower users returns to the creek.

The water rights of the three upper users are absolute and not related to those of lower users; therefore, allotments are not cut proportionally as Digger Creek flows decrease. Since the lower users have to stand all deficiencies, the upper users, in effect, have first priority allotments and the lower users have second and third priority allotments.

Water Supply

Snowmelt contributes to the early runoff, but the summer streamflow is primarily from springs. In average runoff years, there is sufficient flow in Digger Creek, with careful regulation, to satisfy all decreed allotments throughout the irrigation season, but serious deficiencies occur in dry years.

Method of Distribution

Irrigation is done mainly by wild flooding, although border checks and sprinklers are used on a few fields. Small diversion dams are placed in the stream channel to divert water into ditches for conveyance to the fields.

1990 Distribution

Watermaster service on Digger Creek began on June 1 and continued until September 30 with John A. Nolan, Water Resources Engineering Associate, as watermaster.

Above normal precipitation occurred during late May, and improved the available water supply. The flow in Digger Creek provided 100 percent of the allotments being filled until the end of July. The Crooker lateral declined to about 50 percent of third priority during August and September.

HAT CREEK WATERMASTER SERVICE AREA

The Hat Creek service area is in the eastern part of Shasta County, north of Lassen Volcanic Park. Hat Creek, which flows north through the area, is the only source of water in the service area. The place of use is Hat Creek Valley, which is about 20 miles long and 2 miles wide, running north from about 3 miles south of the town of Old Station to the confluence with Rising River. The irrigatable lands, which consist primarily of volcanic ash, are interlaced with large volcanic rock outcropping.

Basis of Service

Hat Creek water is distributed under provisions of court reference adjudications which resulted in Decree No. 5724, dated May 14, 1924, and Decree No. 7858, dated May 7, 1935, Shasta Superior Court. Decree No. 5724 established irrigation and nonirrigation allotments for 18 periods of rotation between "upper" and "lower" user groups from May 1 to October 28 annually. Decree No. 7858 established three additional water right allotments for continuous irrigation, May 1 through October 28, and allotments for October 28 to May 1 annually for all users. These latter rights are not normally supervised by the watermaster.

Watermaster service in the Hat Creek area has been provided in accordance with the decree since 1924. The existing service area was created on September 11, 1929.

Decree No. 5724 defines the allotments in the separate schedules: upper and lower users, requiring 10-day rotations beginning at 6 a.m., May 1, and ending at 6 a.m., October 28. All water rights have the same priority, with the surplus flows distributed according to the users that are on rotation. The upper users' water rights require 154.7 cfs and lower users require 166.5 cfs. The lower users require more because of additional channel loss. When the upper users are being served, the lower users receive a minimum flow for stock water.

Water Supply

The water supply for Hat Creek comes from snowmelt runoff from Lassen Peak and from large springs. Snowmelt creates a high flow during May and June, but most of the summer supply comes from large springs that decrease only slightly in output. Only after a series of dry years does the flow of these springs decrease below 75 percent of total allotments. Records of mean daily discharge of Hat Creek near Hat Creek are in Table 16.

HAT CREEK WATERMASTER SERVICE AREA

TABLE 16

1990 Daily Mean Discharge
(In cubic feet per second)

HAT CREEK NEAR HAT CREEK

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	116	121	125	137	115	99	106
2	118	122	130	140	115	99	106
3	119	123	130	139	114	99	106
4	118	124	131	136	114	99	106
5	117	126	132	130	114	99	106
6	116	127	134	129	114	99	107
7	116	130	133	127	113	99	106
8	116	129	129	125	112	99	101
9	115	129	127	125	112	105	98
10	117	130	127	129	106	107	98
11	115	132	123	131	103	107	97
12	115	133	118	129	102	107	97
13	113	128	119	128	102	107	97
14	116	124	118	128	102	107	98
15	116	127	115	127	102	106	99
16	115	127	114	127	101	107	99
17	116	129	113	125	101	107	98
18	118	129	113	123	101	108	103
19	118	129	114	123	102	105	106
20	118	126	120	116	107	101	106
21	118	126	126	112	110	103	106
22	120	126	129	112	109	101	106
23	121	138	148	111	109	101	106
24	121	131	139	110	109	100	107
25	122	125	133	110	109	100	107
26	122	124	134	109	109	100	110
27	121	126	176	109	108	99	108
28	121	125	172	108	108	99	102
29	121	122	151	107	108	103	99
30	120	119	150	112	102	105	99
31	120		144		100	106	
MEAN	118	127	131	122	108	103	103
AC-FT	7250	7550	8070	7290	6610	6310	6130

Method of Distribution

Most irrigation in the area is done by wild flooding. Large heads of water are used to cover the land rapidly, thereby preventing excessive loss from percolation in the porous soil. Diversion dams built across the creek divert water into large ditches. The fields, many of which have checks and borders, are then flooded from the main diversion ditches or from laterals. Several domestic rights are met by pumping directly from Hat Creek. Some ranchers have leveled their fields in recent years, thus improving their irrigation efficiency.

1990 Distribution

Watermaster service on Hat Creek began on May 1 and continued through September 30, with Earl Hanson, Assistant Engineer, as watermaster.

Last winter's snowpack was the lowest in the current four-year drought. The flow at the beginning of the watermaster season on May 1 was only 80 percent for the upper users and May 11, 75 percent for the lower users. By way of comparison, this is where the 1989 season ended. It continued to decline until July 30 when there was only 60 percent of the water available for the lower users and starting August 9 the upper users had to get by with 65 percent of their decreed rights. It remained at these levels for the rest of the season.

A few of the users have several ditches and diversions and attempt to switch their use around like a "shell game." Some surprise visits and serious talks made them more cautious. A problem that has been developing over the years and is getting worse is the condition of some of the measuring devices. A program of repairing, replacing and upgrading should be instituted.

INDIAN CREEK WATERMASTER SERVICE AREA

The Indian Creek service area is in north central Plumas County, near Greenville. The major sources of supply in the service area are Indian Creek and two tributaries, Wolf Creek and Lights Creek. Indian Creek, along with minor tributaries, rises in the mountains east of the service area. It flows through Genesee and Indian Valleys and past Taylorsville and Crescent Mills to where it joins the North Fork Feather River. Indian Creek is joined on the north by Lights Creek in southeast Indian Valley and by Wolf Creek in the northwest part of the valley. The major place of use is in Indian Valley, an irregular-shaped area of about 20 square miles. The average elevation is about 3,500 feet.

Basis of Service

The Indian Creek watermaster service area was created on February 19, 1951. It includes, with certain exceptions, the water rights set forth in Decree No. 4185, entered December 19, 1950, by the Superior Court of Plumas County, and the rights under Permit 7665 issued in approval of Application 12642 after entry of the decree. The statutory proceeding leading to the decree was entitled, "In the Matter of the Determination of the Rights of the Various Claimants to the Water of Indian Creek Stream System in Plumas County, California."

The service area has been amended twice. Watermaster service has been provided during each irrigation season since the service area was created, and annual reports show the work accomplished. There are 49 water right owners in the service area, with allotments totaling 96.715 cfs. Indian Creek decree establishes three priority classes for each major stream within the service area.

Water Supply

The water supply in the Indian Creek service area comes mainly from snowmelt, with springs and seepage maintaining some late summer flows. The flow of Wolf Creek is normally sufficient to supply all allotments until June 1. Indian and Lights Creeks have sufficient flow to supply all allotments until July 1. After these dates, flows decrease throughout the season and by the end of August, only a small part of allotments is available. The 1990 mean daily discharge for Indian Creek near Crescent Mills is in Table 17.

Method of Distribution

The basic method of irrigation in Indian Valley is wild flooding. Small diversion dams are constructed in the stream channels to divert water into distribution ditches for conveyance to the fields. Small check dams, located throughout the fields in swales, help to spread the water over the ground. There is a limited amount of check and border irrigation in the valley, and a few sprinkler systems are in use.

INDIAN CREEK WATERMASTER SERVICE AREA

TABLE 17

1990 Daily Mean Discharge
(In cubic feet per second)

INDIAN CREEK NEAR CRESCENT MILLS[1/]

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	430	525	174	597	26	18	10
2	464	521	156	477	27	17	8.8
3	786	501	140	378	28	17	7.4
4	978	480	135	303	25	14	12
5	850	491	127	256	22	15	15
6	702	534	118	223	26	13	12
7	643	522	113	194	24	18	15
8	688	502	102	142	21	19	18
9	726	464	95	132	20	11	18
10	747	410	88	103	20	12	15
11	664	390	85	99	18	9.9	12
12	565	363	73	91	17	8.5	13
13	474	344	68	87	12	12	13
14	450	350	59	88	13	16	12
15	413	344	56	81	13	13	11
16	437	331	56	77	12	13	12
17	515	326	50	74	19	15	12
18	747	312	43	72	22	15	18
19	980	299	47	66	19	13	15
20	1160	280	77	59	28	16	12
21	1130	262	94	57	28	19	9.3
22	1120	265	89	50	26	17	11
23	1070	319	122	45	22	14	12
24	1050	389	166	41	21	14	11
25	971	324	149	47	20	15	24
26	900	269	131	45	16	17	27
27	785	235	140	40	15	19	32
28	714	219	174	37	13	21	30
29	633	203	170	34	11	15	29
30	572	188	180	30	18	12	27
31	540		545		17	9.1	
MEAN	739	365	123	134	20.0	14.8	15.8
AC-FT	45430	21740	7580	7980	1230	907	939

[1/] USGS Station

1990 Distribution

Watermaster service began in the Indian Creek service area on April 1, 1990 and continued through October 1, 1990, with Charles D. Hand, Water Resources Engineering Associate, as watermaster. The 1990 water season was below average for the Indian Valley watermaster service.

Wolf Creek

The available water supply of Wolf Creek was adequate to supply 100 percent of the first priority through May; by the end of July the flow was down to 25 percent of the first priority where it remained for the rest of the season.

Lights Creek and Tributaries

The available water supply on Lights and Cooks Creeks was adequate to supply 100 percent of the first and second priorities through May; by mid-July there was only enough to supply 20 percent of the first priority and by early August there was no water.

Indian Creek

The available water supply of Indian Creek was adequate to supply all demands through May. By the end of July the supply was adequate to supply 75 percent of the first priority and remained at this level for the duration of the season.

MIDDLE FORK FEATHER RIVER WATERMASTER SERVICE AREA

The Middle Fork Feather River service area is in Sierra Valley on the west slope of the Sierra Nevada in eastern Sierra and Plumas counties.

Major sources of supply for this service area are the Middle Fork Feather River and its tributaries in the Sierra Valley. The area comprises five major stream groups. Starting in the northeast corner of the valley and proceeding in a clockwise direction, these are Little Last Chance Creek, Smithneck Creek, Weber Creek and tributaries, West Side Canal, and Fletcher Creek and Spring Channels. The Middle Fork Feather River flows generally north for about 15 miles through Sierra Valley. It then flows westerly out of the valley near Beckwourth. The major place of use is in Sierra Valley, which is about 15 miles long and 10 miles wide. The average elevation of the valley floor is 4,900 feet.

Basis of Service

The Middle Fork Feather River watermaster service area was created on March 29, 1940, to include, with the exception of certain tributaries and springs, all water rights set forth in Decree No. 3095, entered in the Middle Fork Feather River statutory adjudication proceeding on January 19, 1940, Superior Court, Plumas County. The decree establishes the number of priority classes for each of the major stream systems within the Middle Fork Feather River service area as follows: (1) Little Last Chance Creek - eight; (2) Smithneck Creek - five; (3) West Side Canal Group - five; (4) Fletcher Creek and Spring Channels - three; (5) Webber Creek and tributaries - six; and (6) Sierra Valley Water Company - one.

The service area has been amended three times. Watermaster service has been provided during each irrigation season since the service area was created, and annual reports have been prepared to show the work accomplished.

There are currently 118 water right owners in the service area, with total allotments amounting to 376.739 cfs.

Water Supply

The major water supply in the Middle Fork Feather River service area comes from runoff, with minor flow from springs and supplemental and foreign water.

Natural flows of Little Last Chance Creek are supplemented by reservoir storage provided by Frenchman Dam, which the Department of Water Resources built in 1961. Stored water is released as needed under the provisions of a water supply contract.

Smithneck Creek flow is normally sufficient to supply all allotments until about the middle of May. It then decreases until about June 1 when only first and second priority allotments are available for the remainder of the season.

The natural flow of Weber Creek is normally sufficient to supply all allotments until the middle of May. At that time, up to 60 cfs is diverted from the

Little Truckee River to supplement the natural flow. This imported water is diverted through the Little Truckee Ditch into Onion Creek and then into Weber Creek, via Cold Stream, for use of shareholders in the Sierra Valley Water Company. This supplemental supply decreases rapidly in July, producing only a small quantity during the latter part of the season.

The West Side Canal streams normally supply all allotments until early June. The flow then gradually declines throughout the remainder of the season. The flow of Fletcher Creek and Spring Channels normally supplies all allotments until July 1. Then it gradually declines for the rest of the season.

Records of the daily mean discharges of Little Truckee Ditch and the Middle Fork Feather River near Portola are presented in Tables 18 and 19.

Method of Distribution

Wild flooding is used by most ranches to irrigate their fields. Small diversion dams are placed in the stream channels to divert the water into individual distribution systems. Check dams are constructed in the swales to implement flooding once the water reaches the fields.

1990 Distribution

Watermaster service began March 15 in the Middle Fork Feather River service area and continued until September 30, with Conrad Lahr, Water Services Supervisor, as watermaster. The available water supply in the service area was below average during the season.

Little Last Chance Creek

Frenchman Dam and Reservoir began its twenty-eighth season of operation. A five-year contract concerning storage, distribution, and sale of water was negotiated during 1989 with the Last Chance Creek Water District. Delivery and distribution of water was made in accordance with the provisions of the contract and the instructions of the District's Board of Directors. Deliveries for Little Last Chance Water District started May 2, 1990. A total of 7,088 acre-feet of water was delivered. Jon Haman, Water Resources Engineering Associate, preformed the duties of watermaster in the District.

Smithneck Creek

The normal two-week rotation schedule for water users below Loyalton was started April 24, 1990 with sufficient water to supply first and 30 percent of second priorities. By mid-August, the flow at this point dropped to less than 10 percent of second priority being available. The Pat's Meadow area located on the upper end of Smithneck Creek was included into the watermaster service area by request of some of the users.

Weber Creek

Flow in this system decreased to only enough to supply first priority by mid-July. Importation of water from the Little Truckee River began April 3, 1990 to supplement the natural flow of Weber Creek to satisfy all allotments

of the Sierra Valley Water Company shareholders (one priority). A total of 7,000 acre-foot of water was delivered through the Little Truckee Ditch during the irrigation season.

West Side Canal Group

Sufficient water was available to supply first and second priorities at the start of the season. The flow decreased by early July to satisfy less than 50 percent of second priority.

Fletcher Creek and Spring Creek

This system started the irrigation season with enough water to supply all of first and 50 percent of second priorities. By mid-July, the flow had dropped to an amount capable of meeting only 20 percent of first priorities.

MIDDLE FORK FEATHER RIVER WATERMASTER SERVICE AREA

TABLE 18

1990 Daily Mean Discharge
(In cubic feet per second)

LITTLE TRUCKEE DITCH AT HEAD

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1			29	59	17	2.2	0.8
2			28	57	16	1.7	0.8
3		5.7[1/]	29	53	28	1.2	0.8
4		18	32	52	18	1.5	0.7
5		18	32	52	14	1.1	0.8
6		18	32	50	14	1.1	0.9
7		18	31	47	14	1.5	1.0
8		18	31	49	11	3.9	1.0
9		18	32	47	11	3.2	1.0
10		18	41	45	11	1.5	1.0
11		19	52	46	10	1.4	0.8
12		19	51	45	10	1.5	0.4
13		22	51	48	8.6	1.4	0
14		24	54	54	6.2	0.8	0
15		24	58	50	7.6	0.8	0
16		25	58	37	9.5	0.8	0
17		24	56	37	7.3	0.9	0
18		24	52	39	6.7	1.1	0
19		24	50	36	5.9	1.8	0
20		24	53	35	2.8	2.4	0
21		20	58	30	2.8	2.2	0
22		16	58	34	2.6	2.0	0
23		16	58	39	2.4	1.8	0
24		16	58	29	3.5	1.7	0
25		16	58	37	3.2	1.5	0
26		7.3	59	32	3.2	1.7	0
27		7.3	59	24	3.0	1.4	0
28		7.3	59	23	2.8	1.4	0
29		5.4	59	17	2.4	1.5	0
30		19	59	21	2.0	1.4	0
31			59		2.0	1.2	
MEAN		17.5	48.3	40.8	8.3	1.6	0.3
AC-FT		974	2967	2428	513	98	20

[1/] No record before April 3.

MIDDLE FORK FEATHER RIVER WATERMASTER SERVICE AREA

TABLE 19

1990 Daily Mean Discharge
(In cubic feet per second)

MIDDLE FORK FEATHER RIVER NEAR PORTOLA

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	53	164	88	91	10	13	14
2	58	150	76	94	12	13	14
3	72	142	69	97	10	13	14
4	103	126	58	106	12	13	14
5	135	121	49	111	14	13	11
6	176	145	22	106	14	12	8.5
7	229	178	25	91	14	5.8	7.9
8	316	169	26	71	14	5.4	9.2
9	384	164	28	62	13	5.8	8.5
10	556	135	31	53	13	6.8	10
11	520	128	32	38	13	6.8	7.9
12	456	122	31	25	13	7.3	9.2
13	396	83	29	32	13	8.5	7.3
14	302	29	26	34	14	7.3	6.3
15	269	25	24	34	14	5.8	9.2
16	226	38	19	39	12	6.3	12
17	269	55	17	41	7.9	7.3	13
18	400	67	16	34	7.3	9.2	14
19	602	72	15	28	7.9	13	11
20	791	77	16	26	7.9	14	10
21	863	82	18	23	7.3	14	10 E
22	886	88	21	19	7.3	14	11 E
23	813	113	26	16	7.3	13	12 E
24	686	150	30	16	5.8	8.5	14 E
25	560	169	30	15	6.3	9.2	14 E
26	431	190	30	16	6.3	13	14 E
27	329	182	32	14	6.8	14	14 E
28	247	147	37	13	7.3	14	14 E
29	196	117	53	11	9.2	14	14 E
30	173	92	60	10	12	14	14 E
31	155		85		12	14	
MEAN	375.9	117.3	36.1	45.5	10.4	10.6	11.4
AC-FT	23110	6980	2220	2710	642	651	678

NORTH FORK COTTONWOOD CREEK WATERMASTER SERVICE AREA

The North Fork Cottonwood Creek service area is in Shasta County near the town of Ono, west of Redding. The source of water for this service area is the North Fork of Cottonwood Creek and its two major tributaries, Moon Creek and Jerusalem Creek. The North Fork of Cottonwood Creek flows through the service area in a southeasterly direction to where it joins the other two major forks of Cottonwood Creek and then to the Sacramento River east of the town of Cottonwood. The service area consists of sparsely scattered parcels, some in hilly terrain and some in the valleys.

Basis of Service

The water rights of this creek system were determined by court reference and set forth in Decree No. 5479, Shasta County Superior Court, dated June 9, 1920. The North Fork Cottonwood Creek watermaster service area was created September 11, 1929, although service had been provided intermittently in accordance with the decree since 1924. All water rights have equal priority.

Water Supply

Snowmelt contributes to the flow in the North Fork Cottonwood Creek system during the early part of the irrigation season, and perennial springs provide the major source of supply during the summer and fall months. The flow is normally sufficient to supply all demands except in dry years, when the available supply may be as low as 20 to 40 percent of the decreed allotments. A record of the daily mean discharge of North Fork Cottonwood Creek near Igo is presented in Table 20. This gaging station is at the lower end of the creek, but gives a general indication of the water supply.

Method of Distribution

The general practice throughout the area is to irrigate by wild flooding. One water user pumps directly from the creek, using a sprinkler system to irrigate his crops. Pumping was necessary at this diversion point because the irrigated land was considerably higher than the creek channel.

1990 Distribution

Watermaster service for North Fork Cottonwood Creek began June 1 and continued through September 30 with John A. Nolan, Water Resources Engineering Associate, as watermaster.

A major storm broke the winter drought with 6.60 inches of precipitation recorded in Redding during May. The available water supply was enough to provide 100 percent of the one priority throughout the irrigation season.

The Bee Ditch diversion dam continues to leak so much that water was not available in the ditch most of the season.

NORTH FORK COTTONWOOD CREEK WATERMASTER SERVICE AREA

TABLE 20

1990 Daily Mean Discharge
(In cubic feet per second)

COTTONWOOD CREEK NORTH FORK NEAR IGO

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	71	31	22	381	42	15	11
2	126	30	22	342	41	15	10
3	159	28	21	300	40	12	10
4	139	25	20	271	39	8.9	10
5	118	24	14	241	39	9.4	10
6	99	23	13	197	39	8.8	11
7	92	24	12	135	39	7.9	9.7
8	87	27	12	125	36	8.2	9.6
9	81	27	12	117	32	9.4	9.4
10	93	25	12	111	32	10	9.0
11	81	24	12	105	30	10	9.1
12	75	28	12	99	29	10	8.7
13	73	29	12	97	27	9.9	8.6
14	79	28	11	94	27	10	9.0
15	73	28	10	90	26	11	9.6
16	69	28	10	63	24	11	9.4
17	68	30	9.9	60	30	12	9.0
18	67	30	9.9	56	30	12	8.5
19	66	28	13	52	26	12	8.4
20	63	28	51	49	22	12	7.8
21	61	27	34	47	20	12	7.5
22	59	29	174	46	19	12	7.7
23	51	44	168	44	19	11	7.7
24	50	29	99	43	18	11	9.5
25	50	27	98	42	18	11	12
26	47	25	139	47	18	14	12
27	45	24	1030	46	18	15	11
28	37	23	1010	45	17	14	9.3
29	33	23	523	44	17	13	8.4
30	31	23	507	43	16	12	8.0
31	31		430		16	12	
MEAN	73.4	27.3	146	114	27.3	11.3	9.4
AC-FT	4510	1624	8971	6807	1678	697	557

NORTH FORK PIT RIVER WATERMASTER SERVICE AREA

The North Fork Pit River service area lies along the west slopes of the Warner Mountains in northeastern Modoc County and extends southward from the Oregon border about 45 miles to just south of Alturas.

The North Fork Pit River flows in a southerly direction from the south rim of Goose Lake Basin to its confluence with the South Fork Pit River west of Alturas. The basins of Goose Lake and the North Fork Pit River may be considered completely separate, since the lake has not spilled into the river for nearly 100 years.

Nine small independent streams flowing in a westerly direction from the west slope of the Warner Mountains constitute the major source of water. Three of these (New Pine, Cottonwood, and Davis Creeks) are tributary to Goose Lake. Five are tributary to the North Fork Pit River. From north to south, they are: Linville, Franklin, Joseph, Thoms, and Parker Creeks.

The place of use in the northern half of the area is a relatively long, narrow, sloping strip of land between the east shore of Goose Lake and the foothills of the Warner Mountains. The places of use in the southern half of the area, which are supplied from the North Fork Pit River and its tributaries, are primarily in the narrow valleys bordering the streams. The elevation of the places of use range from about 4,350 feet just below Alturas to about 5,200 feet at the upper portions on some of the creeks.

Basis of Service

Table 21 briefly outlines the five decrees covering the area and presents data on the establishment of watermaster service and water rights.

Water Supply

The water supply comes mainly from snowmelt for all streams in the North Fork Pit River service area except Linville Creek, which, having a relatively small drainage area, is almost entirely spring-fed. After mid-June, the rest of the streams also depend on springs, but diminish rapidly until mid-July, after which the flow remains fairly constant. There are several small reservoirs in the area, but they are used essentially for regulatory storage. The mean daily discharge of various tributaries is presented in Tables 22 through 27.

Method of Distribution

Distribution is accomplished by diversion structures in the main channels diverting into ditches that convey the water to its place of use. Wild flooding from small feeder ditches is the common method of application. There is, however, increasing use of sprinkler systems, some directly from ditches, with

TABLE 21

DECREES AND RELATED DATA - NORTH FORK PIT RIVER WATERMASTER SERVICE AREA

Stream	Modoc County Superior Court Decree No.	Date	Type[a]	Service Area Created	No. of Decree Water Right Owners	Total cfs	Remarks
New Pine	2821	6-14-32	CR	6-22-32	21	22.15	Four priorities.
Cottonwood	2344	5-03-40	CR	12-13-40	5	15.35	When water for Diversion Creek No. 3 is insufficient to reach the area of use, it is diverted at Diversion No. 4.
Davis	2782	6-30-32	CR	7-13-32	19	68.75	Four priorities, 4-1 to 9-30. Some rights vary according to flow available. Most first & second priorities are year-round. One second priority right is for 0.40 cfs export for Roberts Creek.
					2[b]		Appropriative Permit 9825 allows diversion from North Fork Davis Creek and License 10549 to divert from Davis Creek, both for the period from 10-1 to 5-1.
Franklin	3118	9-08-33	CR	9-14-33	3	11.66	Four priorities. The first priority and all second priority rights are year-round, except one which is equal to the sum of all the others (1.46 cfs) and is for the period 9-15 to 3-31 annually. Third and fourth priorities are for 4-1 to 9-30 each year.
North Fork Pit River	4074	12-14-34	S	12-18-39	10	52.08	Five priorities, 4-1 to 9-30. Pit River Dorris Reservoir water diverted through Parker Creek ditch on Parker Creek. Fourth and fifth priorities are special class.
Linville	4074	12-14-39	S	12-18-39	3	8.30	Two priorities.
Joseph	4074	12-14-39	S	12-18-39	6	11.98	Four priorities, 4-1 to 9-30. Diversions on south side of stream, with the exception of No. 26, are on net consumptive use basis.
Parker	4074	12-14-39	S	12-18-39	9	17.87	Four priorities, 4-1 to 9-30. Diversion on Dorris Reservoir shown on North Fork Pit River schedule is made at No. 122, Parker Creek Ditch.
Shields	4074	12-14-39	S	12-18-39	7	7.70	Four priorities, 4-1 to 9-30.
Thoms	4074	12-14-39	S	12-18-39	9	6.44	Three priorities, 4-1 to 9-30.
						9.40	5.0 cfs export to Cedar Creek; and 4.40 cfs export to Stony Canyon.
Gleason	4074	12-14-39	S	12-18-39	4	4.55	Five priorities.

[a] S-Statutory, CR-Court Reference.
[b] Appropriative rights, junior to the decreed rights.

supplemental ground water being added as the surface flow diminishes. Sub-irrigation by the use of large flashboard dams to raise the water level in the channel is practiced along the North Fork Pit River between Parker Creek and Alturas.

1990 Distribution

Watermaster service began in the North Fork Pit River watermaster service area on April 1 and continued through September 30 with John P. Clements, Associate Engineer, Water Resources, as watermaster.

New Pine Creek

Full priority occurred for only a few days in April during the peak snowmelt period and a few days in June as a result of a large rainstorm. By the middle of June, only third priority was available; mid-July, second priority; and September 1, only first priority. On September 30, the flow was about 1.5 cfs.

Cottonwood Creek

Full priority occurred for only a few days during the rainstorm around June 1. During most of April and May, only a portion of third priority water was available. By mid-July, only stockwater was available for the two first priority users. Flow on September 30 was about 0.2 cfs.

Davis Creek

Third priority water did not occur. Only a portion of second priority water was available during the water master season. By August 1, the flow had decreased to about 5.0 cfs, and 4.0 cfs by September 1.

Linville Creek

This stream fluctuated very little during the irrigation season. On May 1, the flow was 3.1 cfs; on September 30, the flow was 2.6 cfs.

Franklin Creek

Fourth priority water did not occur. For most of the season only a portion of third priority water was available. By mid-July, the flow had decreased to about 2.1 cfs and remained fairly constant until the end of the season.

Joseph Creek

Full second priority water was available for only a few days during the peak snowmelt of April and May and the heavy rainstorm around June 1. The XL Indian Reservation diversion was closed July 1.

Thoms Creek

Full priority water was available through mid-June. The flow steadily decreased thereafter to about 2.0 cfs by August 1, and 1.0 cfs on September 30.

Parker Creek

Full priority water was available through mid-June. The diversion to Dorris Reservoir was closed June 20. After haying operations, the water users rotated the creek flow. The flow on August 1 was about 4.0 cfs and 2.0 cfs on September 1.

Gleason Creek

No regulation was required on Gleason Creek during 1990.

Shields Creek

Third priority water did not occur except for a few days after the June 1 rainstorm. Only a portion of second priority water was available during the entire irrigation season. After haying operations, the water users rotated the creek flow. The flow on August 1 was 2.7 cfs and 2.0 cfs on September 30.

North Fork Pit River

Due to the heavy rainstorm around June 1, full priority water was available through mid-June. By August 1 however, very little natural flow was available and any significant flow in the river was due to storage release by the XL Indian Reservation.

NORTH FORK PIT RIVER WATERMASTER SERVICE AREA

TABLE 22

1990 Daily Mean Discharge
(In cubic feet per second)

NEW PINE CREEK ABOVE ALL DIVERSIONS

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		6.5[1/]	18	22	9.8	3.7	2.9
2		6.7	17	28	9.2	3.7	2.9
3		7.1	18	35	9.2	3.7	2.9
4		7.5	17	33	8.6	3.7	2.8
5		8.6	18	32	8.0	3.7	2.8
6		11	20	30	7.5	3.5	2.8
7		11	21	29	7.5	3.5	2.8
8		11	19	27	7.4	3.5	2.8
9		12	18	26	7.4	3.5	2.8
10		13	16	23	7.3	3.5	2.6
11		14	15	22	7.3	3.5	2.6
12		16	14	20	7.1	3.5	2.6
13		17	14	18	7.1	3.5	2.6
14		18	13	17	7.1	3.5	2.6
15		20	13	16	6.9	3.5	2.6
16		20	13	16	6.7	3.5	2.6
17		21	12	14	6.5	3.4	2.6
18		22	12	13	6.5	3.7	2.6
19		21	12	12	6.5	3.5	2.6
20		21	13	13	6.7	3.5	2.3
21		20	13	13	6.5	3.5	2.3
22		22	12	12	6.2	3.4	2.3
23		27	11	12	6.2	3.4	2.1
24		26	12	11	5.8	3.2	2.1
25		23	11	11	5.5	3.2	2.1
26		22	11	11	5.2	3.2	1.8
27		21	14	11	4.9	3.1	1.8
28		24	14	11	4.6	3.1	1.8
29		22	18	11	4.3	3.1	1.6
30		21	19	11	4.0	3.1	1.6
31			21		3.7	3.1	
MEAN		17.1	15.1	18.7	6.7	3.4	2.4
AC-FT		1016	930	1111	411	211	145

[1/] No record before April 1.

NORTH FORK PIT RIVER WATERMASTER SERVICE AREA

TABLE 23

1990 Daily Mean Discharge
(In cubic feet per second)

COTTONWOOD CREEK ABOVE ALL DIVERSIONS

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		4.0[1/]	7.0	20	1.4	0.3	0.2
2		4.4	6.5	28	1.3	0.3	0.2
3		4.7	5.5	26	1.3	0.3	0.2
4		5.3	5.0	20	1.2	0.3	0.2
5		5.7	5.2	16	1.2	0.3	0.2
6		6.1	5.5	14	1.1	0.3	0.2
7		6.5	5.6	12	1.0	0.3	0.2
8		6.3	5.4	10	1.0	0.3	0.2
9		6.2	5.3	9.1	0.9	0.3	0.2
10		6.1	5.0	8.2	0.9	0.3	0.2
11		6.1	4.8	7.3	0.8	0.2	0.2
12		6.2	4.3	6.0	0.8	0.2	0.2
13		6.3	4.0	5.0	0.7	0.2	0.2
14		6.5	3.8	4.7	0.7	0.2	0.2
15		6.7	3.5	4.3	0.6	0.2	0.2
16		6.8	3.2	4.0	0.6	0.3	0.2
17		6.8	3.0	3.8	0.6	0.5	0.2
18		7.0	3.3	3.4	0.6	0.6	0.2
19		7.0	2.9	3.0	0.6	0.4	0.2
20		7.0	2.5	2.8	0.7	0.4	0.2
21		7.3	3.0	2.6	0.7	0.4	0.2
22		7.3	2.7	2.4	0.6	0.3	0.2
23		11	2.5	2.2	0.6	0.3	0.2
24		11	2.8	2.0	0.5	0.3	0.2
25		10	3.0	1.9	0.5	0.3	0.2
26		9.5	3.5	1.7	0.5	0.3	0.2
27		9.0	4.5	1.6	0.4	0.3	0.2
28		8.3	7.5	1.5	0.4	0.3	0.2
29		8.0	10	1.5	0.4	0.3	0.2
30		7.4	13	1.4	0.3	0.3	0.2
31			14		0.3	0.3	
MEAN		7.0	5.1	7.5	0.7	0.3	0.2
AC-FT		418	313	449	46	19	12

[1/] No record before April 1.

NORTH FORK PIT RIVER WATERMASTER SERVICE AREA

TABLE 24

1990 Daily Mean Discharge
(In cubic feet per second)

DAVIS CREEK BELOW DIVERSIONS NO. 1, 3, AND 21

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		10[1/]	19	31	7.4	4.1	3.3
2		11	18	24	7.4	4.1	3.3
3		12	18	24	7.4	4.1	3.1
4		12	17	20	7.0	4.1	3.1
5		13	17	19	6.7	4.1	3.1
6		13	18	18	6.7	4.1	3.1
7		14	18	17	6.4	4.1	3.1
8		14	17	16	6.4	4.1	3.1
9		14	16	16	6.1	3.8	3.1
10		15	15	15	5.8	3.8	3.1
11		15	15	15	5.8	3.5	3.1
12		16	15	14	5.5	3.5	3.1
13		17	14	14	5.2	3.5	3.1
14		17	14	13	5.5	3.5	3.1
15		18	13	12	5.2	3.8	3.1
16		19	13	12	5.2	3.8	3.1
17		22	13	12	4.9	3.8	3.1
18		29	12	11	4.9	5.5	3.1
19		28	12	10	5.5	4.6	3.1
20		26	11	9.3	5.5	4.1	3.1
21		24	11	8.6	5.5	4.1	3.1
22		26	10	9.0	5.2	3.8	3.3
23		26	9.7	9.0	5.2	3.8	3.3
24		27	10	8.6	4.9	3.5	3.3
25		24	10	8.3	4.6	3.5	3.3
26		22	11	8.3	4.6	3.3	3.3
27		23	10	8.0	4.3	3.3	3.3
28		22	12	8.0	4.3	3.3	3.3
29		21	17	7.7	4.3	3.3	3.3
30		19	17	7.7	4.3	3.3	3.3
31			26		4.1	3.3	
MEAN		19.0	14.5	13.5	5.5	3.8	3.2
AC-FT		1129	890	804	341	235	189

[1/] No record before April 1.

NORTH FORK PIT RIVER WATERMASTER SERVICE AREA

TABLE 25

1990 Daily Mean Discharge
(In cubic feet per second)

LINVILLE CREEK ABOVE ALL DIVERSIONS

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		2.7[1/]	3.1	3.1	2.7	2.6	2.6
2		2.8	3.1	2.9	2.7	2.6	2.6
3		2.8	3.1	2.8	2.7	2.6	2.6
4		2.9	3.1	2.8	2.7	2.6	2.6
5		2.9	3.1	2.8	2.7	2.6	2.6
6		3.1	2.9	2.7	2.7	2.6	2.6
7		3.1	2.9	2.7	2.7	2.6	2.6
8		3.2	2.8	2.7	2.7	2.6	2.6
9		3.2	2.8	2.7	2.7	2.6	2.6
10		3.1	2.8	2.7	2.7	2.6	2.6
11		2.9	2.8	2.7	2.7	2.6	2.6
12		2.8	2.8	2.7	2.7	2.6	2.6
13		2.8	2.7	2.8	2.7	2.6	2.6
14		2.9	2.7	2.8	2.7	2.6	2.6
15		2.9	2.7	2.8	2.7	2.6	2.6
16		2.9	2.7	2.8	2.7	2.6	2.6
17		3.1	2.7	2.8	2.7	2.6	2.6
18		2.9	2.7	2.8	2.8	2.8	2.6
19		3.1	2.7	2.7	2.9	2.7	2.6
20		3.1	2.7	2.7	2.7	2.6	2.6
21		3.1	2.7	2.7	2.7	2.6	2.6
22		3.1	2.7	2.7	2.7	2.6	2.6
23		3.1	2.8	2.7	2.7	2.6	2.6
24		3.2	2.7	2.7	2.7	2.6	2.6
25		3.2	2.7	2.7	2.7	2.6	2.6
26		3.2	2.7	2.7	2.6	2.6	2.6
27		3.2	2.8	2.7	2.6	2.6	2.6
28		3.2	2.9	2.7	2.6	2.6	2.6
29		3.1	2.8	2.7	2.6	2.6	2.6
30		3.1	2.8	2.7	2.6	2.6	2.6
31			3.1		2.6	2.6	
MEAN		3.0	2.8	2.8	2.7	2.6	2.6
AC-FT		180	174	164	165	160	155

[1/] No record before April 1.

NORTH FORK PIT RIVER WATERMASTER SERVICE AREA

TABLE 26

1990 Daily Mean Discharge
(In cubic feet per second)

FRANKLIN CREEK ABOVE ALL DIVERSIONS

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		4.1[1/]	5.3	6.3	2.7	2.1	2.1
2		4.6	5.1	7.5	2.7	2.1	2.1
3		4.8	4.8	7.5	2.7	2.1	2.1
4		4.8	4.6	7.3	2.7	2.1	2.1
5		4.0	4.1	7.0	2.7	2.1	2.1
6		4.8	4.1	6.8	2.7	2.1	2.1
7		5.1	4.1	6.3	2.5	2.1	2.1
8		5.3	3.9	5.8	2.5	2.1	2.1
9		5.3	3.9	5.6	2.5	2.1	2.1
10		5.6	3.7	5.3	2.5	2.1	2.1
11		5.6	3.7	4.8	2.5	2.1	2.1
12		6.0	3.5	4.6	2.5	2.1	2.1
13		6.3	3.5	4.4	2.5	2.1	2.1
14		6.3	3.5	4.1	2.5	2.1	2.1
15		6.3	3.5	3.9	2.5	2.1	2.1
16		6.8	3.5	3.9	2.3	2.1	2.1
17		8.1	3.5	3.9	2.1	2.1	2.1
18		7.8	3.5	3.7	2.3	2.5	2.1
19		9.0	3.9	3.7	2.5	2.3	2.1
20		8.7	3.7	3.5	2.9	2.3	2.1
21		8.7	3.5	3.3	2.5	2.1	2.1
22		9.2	3.5	3.3	2.3	2.1	2.1
23		9.8	3.9	3.1	2.3	2.1	2.1
24		9.0	3.9	3.1	2.1	2.1	2.1
25		8.1	3.7	3.1	2.1	2.1	2.1
26		7.5	3.7	3.1	2.1	2.1	2.1
27		7.0	3.7	3.1	2.1	2.1	2.1
28		6.5	4.6	3.1	2.1	2.1	2.1
29		6.3	5.1	2.9	2.1	2.1	2.1
30		5.8	5.3	2.9	2.1	2.1	2.1
31			5.8		2.1	2.1	
MEAN		6.6	4.1	4.6	2.4	2.1	2.1
AC-FT		392	250	272	148	131	125

1/ No record before April 1.

NORTH FORK PIT RIVER WATERMASTER SERVICE AREA

TABLE 27

1990 Daily Mean Discharge
(In cubic feet per second)

JOSEPH CREEK BELOW COUCH CREEK

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		9.0[1/]	12	16	3.4	2.0	1.5
2		9.2	11	16	5.6	2.0	1.3
3		9.5	9.9	18	6.0	2.0	1.3
4		9.5	9.0	16	5.6	2.0	1.3
5		9.0	8.0	15	4.7	1.7	1.3
6		8.7	8.0	14	4.3	1.2	1.3
7		9.0	7.9	13	4.2	1.2	1.3
8		9.2	7.5	11	4.0	1.2	1.2
9		8.7	7.1	9.9	3.7	1.2	1.1
10		9.0	7.0	9.2	3.7	1.2	1.1
11		8.7	6.8	8.7	3.5	1.2	1.3
12		8.6	6.6	8.0	3.4	1.8	1.9
13		8.3	6.3	7.5	3.3	1.9	2.0
14		8.2	6.2	7.1	3.4	1.9	1.9
15		8.3	6.0	6.8	2.9	1.9	1.9
16		9.6	5.7	6.8	2.8	1.9	1.9
17		13	5.7	6.6	2.9	1.9	1.9
18		15	5.6	6.3	2.9	2.3	1.9
19		14	5.6	5.9	3.7	2.1	1.8
20		12	6.0	5.6	4.0	2.0	1.8
21		12	5.9	5.4	3.0	1.8	1.7
22		15	5.3	5.1	2.7	1.8	1.7
23		28	5.6	4.9	2.5	1.7	1.7
24		24	6.2	4.6	2.3	1.7	1.7
25		16	5.9	4.4	2.3	1.7	1.7
26		16	5.9	4.3	2.3	1.7	1.7
27		15	6.2	4.2	2.2	1.6	1.6
28		15	6.6	4.0	2.2	1.5	1.6
29		15	8.3	3.7	2.1	1.5	1.6
30		13	8.6	3.5	2.1	1.5	1.6
31			14		2.0	1.3	
MEAN		12.2	7.3	8.4	3.3	1.7	1.6
AC-FT		725	449	499	206	104	95

[1/] No record before April 1.

SCOTT RIVER WATERMASTER SERVICE AREA

The Scott River service area is in western Siskiyou County and consists of five tributaries of the Scott River: French Creek, Shackleford Creek, Sniktaw Creek, Oro Fino Creek, and Wildcat Creek. Before 1980, French Creek and Shackleford Creek were separate service areas. Wildcat Creek came into service in 1981, and the four tributaries to the Scott River were combined to form the Scott River watermaster service area.

Scott River Service Area 1990 Distribution

Watermaster service began in the Scott River watermaster service area on April 1 and ended on September 30 with Keithal B. Dick, Water Resources Technician II, as watermaster. Lester Lighthall was called into service on April 2 and finished on September 27. Mr. Lighthall's services were needed to assist Mr. Dick because of the increased need for regulation.

French Creek

The French Creek service area is in Scott Valley, western Siskiyou County, near the town of Etna. The major sources of water supply are French, Miners, and North Fork French Creeks. French Creek flows northeast through the center of the service area. Miners Creek begins east of the headwaters of French Creek and flows in a northerly direction, joining French Creek about three miles above its confluence with Scott River. North Fork French Creek begins north of the headwaters of French Creek and flows easterly, joining French Creek one mile upstream from the confluence with Miners Creek.

The service area encompasses the entire agricultural area within the French Creek Basin and some additional lands along the west side of the Scott River near the town of Etna. It is about 0.5 mile wide and 5 miles long, with the main axis and drainage running from south to north. Elevations of the agricultural area range from about 3,200 feet at the south to about 2,800 feet at the confluence of French Creek and Scott River.

Basis of Service. The rights of this creek system were determined by court reference and set forth in Decree No. 14478, Siskiyou County Superior Court, dated July 1, 1958.

The French Creek watermaster service area was created on November 19, 1968, and service was started on July 1, 1969.

Water is distributed according to three schedules: North Fork French Creek, with three priorities; Miners Creek with three; and the French Creek, Horse Range Creek, Paynes Lake Creek, and Duck Lake system, with seven.

These schedules are independent of each other with two exceptions: (1) Miners Creek users have the option of diverting from French Creek when water is not available from Miners Creek, and (2) maximum allowable flows are specified at given points, regardless of the source of the water.

One peculiarity of this decree is that it included two water rights that have a specified amount, which are subject to the exclusive control of the other owners of the ditch.

Water Supply. The water supply comes from snowmelt runoff, springs and seepage, and occasional summer thundershowers.

The watershed of French Creek contains about 32 square miles of heavily forested, steep mountainous terrain of the easterly slopes of the Salmon Mountains. It varies in elevation from about 7,200 feet along its west rim to about 3,200 feet at the foot of the slopes bordering French Creek Valley. Snowmelt runoff is normally sufficient to supply all demands until about the middle of July. The daily mean discharge of French Creek above North Fork French Creek is presented in Table 28.

French Creek 1990 Distribution

The season started on French Creek with all users receiving full rights. These flows continued above 100 percent of all priorities until July 15. By August 10, distribution was down to second priority users only and continued at that rate until September 30, the end of the irrigation season.

Releases were started from Smith Lake to the North Fork Ditch users on July 12.

Shackleford Creek

The Shackleford Creek service area is in western Siskiyou County near the town of Fort Jones in Scott Valley. The major sources of water for this service area are Shackleford Creek, which flows through the central part of Quartz Valley, and its tributary, Mill Creek, which rises east of the headwaters of Shackleford Creek. Evans Creek, a small tributary to Mill Creek, enters from the south.

The service area encompasses the Quartz Valley region of Scott Valley and includes the entire agricultural area within the Shackleford Creek Basin. It is about 2 miles wide by 6 miles long, with the main axis and drainage running from south to north. Elevations on the agricultural area range from about 3,100 feet at the south to about 2,650 feet at the confluence of Shackleford Creek and Scott River.

Basis of Service. The Shackleford Creek watermaster service area was created on November 6, 1950. Water is distributed under the provisions of a statutory adjudication which resulted in Decree No. 13775, Siskiyou County Superior Court, dated April 3, 1950.

The allotments are defined in four separate schedules. The upper and lower Shackleford Creek groups each have seven priority classes. The upper Mill Creek group and lower Mill Creek group each have three priority classes.

The decree also includes two storage rights upstream of all diversions. This stored water is released late in the irrigation season to Shackleford Creek for use by owners.

SCOTT RIVER WATERMASTER SERVICE AREA

TABLE 28

1990 Daily Mean Discharge
(In cubic feet per second)

FRENCH CREEK ABOVE NORTH FORK FRENCH CREEK

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1			27	49	8.8	2.8	2.2
2			25	43	8.5	2.8	2.1
3			24	47	8.5	3.0	2.0
4			25	58	8.2	3.0	2.0
5			27	51	7.5	2.9	2.0
6			30	42	8.8	3.0	2.0
7			30	39	7.2	3.4	2.0
8			26	36	6.9	2.9	2.0
9			23	34	6.6	2.7	2.0
10		36[1/]	22	31	6.0	2.6	2.0
11		37	19	29	6.0	2.6	1.9
12		37	19	26	5.0	3.6	1.9
13		38	18	25	4.5	2.8	1.9
14		42	17	21	4.4	2.2	1.9
15		43	16	21	3.9	2.0	1.9
16		48	15	21	3.6	2.0	2.0
17		49	14	20	3.5	2.0	2.0
18		43	13	20	3.4	2.0	2.0[1/]
19		43	13	18	3.3	2.0	
20		40	13	17	5.0	2.1	
21		37	17	18	5.2	2.6	
22		38	16	16	4.1	2.5	
23		58	54	15	2.8	2.4	
24		49	46	13	2.6	2.3	
25		49	33	13	2.6	2.1	
26		47	25	12	3.3	2.0	
27		46	26	11	3.3	2.0	
28		49	54	11	3.3	2.1	
29		38	67	10	3.2	2.2	
30		37	46	10	2.8	2.3	
31			51		2.8	2.3	
MEAN		43.0	27.4	25.9	5.0	2.5	2.0
AC-FT		1793	1688	1541	309	153	71

[1/] No record before April 10 and after September 18.

Water Supply. The water supply for Shackleford Creek comes from snowmelt run-off, springs and seepage, and supplemental stored water released from Cliff and Campbell Lakes, near the headwaters of Shackleford Creek.

The watershed of the Shackleford Creek stream system contains about 31 square miles, located in the heavily forested, steep mountainous terrain of the north-easterly slopes of the Salmon Mountains. It varies in elevation from about 7,000 feet along its west rim to about 3,000 feet at the foot of the slopes bordering Quartz Valley. Snowmelt runoff is normally sufficient to supply all demands until the middle of July. The supply then usually decreases until the first part of August when water is released from Cliff and Campbell Lakes to maintain sufficient flow in the Shackleford Ditch.

Method of Distribution. Irrigation is accomplished primarily by wild flooding of permanent pasture and alfalfa fields. Water is distributed by ditches and laterals to the places of use. Shackleford Ditch, the largest of these ditches, has a length of about 6 miles and a capacity of about 12 cfs.

Shackleford Creek 1990 Distribution

The season started on Shackleford Creek with all users receiving full rights.

Releases were started from Campbell Lake to the Shackleford Ditch on July 4. Second priority lasted until August 14 and dropped to 50 percent of second priority by September 1 where it remained until September 30.

Sniktaw Creek

The Sniktaw Creek service area is in western Siskiyou County, seven miles west of the town of Fort Jones in Scott Valley. It encompasses an agricultural area about three miles long and one mile wide, running from south to north. Elevations in the Sniktaw watershed range from 6,700 feet in the southwest to about 2,650 feet at the confluence of Sniktaw Creek and Scott River.

Basis of Service. The Sniktaw Creek service area was added to the Scott River watermaster service area on April 1, 1981. Water is distributed under the provisions of a statutory adjudication which resulted in Decree No. 30662, Siskiyou County Superior Court, dated January 16, 1980.

The allotments are defined in the Scott River Decree, Schedule B 38, which has three priority allotments.

Water Supply. The water supply for Sniktaw Creek comes from snowmelt, springs, and seepage. Water from Shackleford Creek (Diversions 3, 17, 19, 20, and 21) supplements available water in Sniktaw Creek.

Return water from Heide's Shackleford Creek Ditch, Diversion 3, commingles with natural flow of Sniktaw Creek. After leaving the Heide property and entering Sniktaw Creek, it is allotted as set forth in Schedule B38 (Sniktaw Creek) from Diversions 665 to 679.

Heide may use tailwater from Shackleford Creek Ditch, Diversion 3, for irrigation of 27 acres under License 10875 issued on Application 22882 for use on former Indian lands. The right may be exercised only at times that Heide is receiving water from Shackleford Creek Ditch, Diversion 3, or at times that all Sniktaw Creek allotments are being filled.

Sniktaw Creek 1990 Distribution

All priorities were filled until June 16; by July 1, the water supply had receded to 50 percent of second priority. The Heide Ditch from Shackleford Creek was closed July 10.

Wildcat Creek

The Wildcat Creek service area is in western Siskiyou County near the town of Callahan. The major sources of water are Wildcat Creek, which flows through the service area, foreign water imported from Jackson Creek, Grizzly Creek and Camp Gulch.

Basis of Service. The Wildcat Creek watermaster area was started May 1, 1980. Water is distributed under a statutory adjudication that resulted in Decree No. 30662, Siskiyou County Superior Court, dated January 16, 1980. The allotments are defined in the Scott River Decree, Schedule B 10.

Method of Distribution. Irrigation is done mainly by wild flooding of permanent pasture. Water is distributed by ditches and laterals to the place of use.

Wildcat Creek 1990 Distribution

The water supply was normal. Import water from Sugar Creek and Jackson Creek helped supply water to the Kerrigan Ranch, and runoff from the Kerrigan Ranch helped supply the Struckman Ranch. Recorders were installed on the Parshall flumes at points A and B, described in the decree. By August 15, the natural flow of Wildcat Creek was down to 1.0 cfs. Recorders were installed on the Jackson Creek Ditch and at Kerrigan's diversion from Wildcat Creek to determine the natural flow of Wildcat Creek.

Oro Fino Creek

The Oro Fino Creek watermaster service area is in southwestern Siskiyou County near the town of Greenview. It encompasses an agricultural area about 5 miles long and 0.5 mile wide, running from south to north. Elevations along Oro Fino Creek range from 2,900 feet near the headwaters to 2,700 feet at the confluence of Oro Fino Creek and the Scott River.

Basis of Service. The Oro Fino Creek service area was added to the Scott River watermaster service area on July 1, 1984. Water is distributed under the provision of the statutory adjudication which resulted in Decree 30662, Siskiyou County Superior Court, dated January 6, 1980.

Water Supply. The water supply for Oro Fino Creek above Diversion 606 is derived from Kidder Creek. Springs feed Oro Fino Creek below Diversion 607. Allotments are diverted from underflow by means of offset wells or sumps at Diversions 606, 606a, 611, and 612. The allotments at Diversions 607, 608, 609, 610, 613, 613a, 614, 615, and 616, may be diverted, at the option of the claimant, from surface flow or from underflow by means of offset wells or sumps or a combination of both with the provision that when surface flow in the creek (at the county road at the O. Lewis property) recedes to 3 cfs, the percentage or amount of the surface flow reaching the point of diversion of each of the following claimants shall be bypassed at the claimant's lower property line: Friden 51 percent, O. Lewis 96 percent, and Luckensmeyer all flow in excess of 1.31 cfs.

The ground water table along Oro Fino Creek is recharged mainly by Kidder Creek Diversions 446 and 448 which supply surface water to the Foster and Friden lands. Kidder Creek streamflow for these diversions is mainly snowmelt runoff.

Oro Fino Creek 1990 Distribution

The water supply of Oro Fino Creek was normal. No regulation was required this season.

SHASTA RIVER WATERMASTER SERVICE AREA

The Shasta River service area is in the central part of Siskiyou County. Willow Creek and Cold Creek, formerly in the Klamath River watermaster service area, were incorporated into the Shasta River watermaster service area in 1983.

The water supply comes from Shasta River and its several tributaries. The upper reaches of the service area are served by two groups of tributaries. One group, comprising Boles, Beaughan, Carrick, and Jackson Creeks, rises on the northwestern slopes of Mount Shasta. The other group, consisting of Dale and Eddy Creeks, and Shasta River west of Interstate 5, rises on the eastern slopes of the Trinity Mountains. All these streams join the mainstem Shasta River above Lake Shastina (Dwinnell Reservoir) near the town of Weed. As the Shasta River flows northward from Lake Shastina to its confluence with the Klamath River, north of Yreka, it is joined by three major tributaries. Parks Creek, rising on the eastern slopes of the Trinity Mountains, enters from the west near the town of Gazelle. Big Springs Creek, from Big Springs Lake, enters from the east about a mile below Parks Creek. Little Shasta River, rising on the slopes of the mountainous area between Butte Valley and Shasta Valley, enters from the east near the town of Montague.

Shasta Valley is about 30 miles long and 30 miles wide. In the center of the valley are many small, cone-shaped, volcanic hillocks that divide the area into separate parts. Because of these volcanic formations, only about 141,000 acres of about 507,000 acres in the valley are irrigable. The valley floor elevation averages about 3,000 feet.

Willow Creek is in Siskiyou County, about 10 miles northeast of Montague. It is the major source of water to the service area and rises on the west slope of the 7,800-foot Willow Creek Mountain. It flows northwest through about 11 miles of rolling hills to its confluence with the Klamath River. The Willow Creek area is about 8 miles long by 1 mile wide and varies in elevation between about 2,600 and 4,000 feet.

Cold Creek is just south of Copco Lake, a hydroelectric power reservoir on the Klamath River in the extreme northern part of Siskiyou County. Yreka is 30 miles southwest of the Cold Creek stream system. Elevations within the Cold Creek watershed range from 2,900 feet to about 6,500 feet.

Basis of Service

The Shasta River watermaster service area was created on March 1, 1933. The appropriative water rights on this stream system were determined by a statutory adjudication that resulted in Decree No. 7035, Siskiyou County Superior Court, dated December 29, 1932.

The decree lists the water rights of the entire stream system by the names of the users. The rights supervised by the watermaster are broken down into eight separate schedules. These are: Shasta River above its confluence with

Big Springs Creek - 43 priorities; Boles Creek - 20 priorities; Beaughan Creek - 5 priorities; Jackson Creek - 7 priorities; Carrick Creek - 13 priorities; Parks Creek - 25 priorities; Shasta River below its confluence with Big Springs Creek and Big Springs Creek and tributaries - 29 priorities; and Little Shasta River - 7 priorities. Additional schedules include Willow Creek, Yreka Creek, and miscellaneous independent springs, gulches, and sloughs, but these are not included in the service area.

Montague Water Conservation District has appropriative rights for storage of Shasta River and Parks Creek water in Lake Shastina. By agreement with the District, five nearby downstream users receive water from storage in lieu of their decreed continuous flow allotments. The watermaster handles the reservoir releases for these users. A peculiarity of the Shasta River decree is that it defines only appropriative rights and excludes a number of riparian users on the Lower Shasta River. Owners of these riparian rights are subject to beneficial use and are regulated during periods of short water supply by the watermaster.

Water Supply

The water supply for Shasta Valley comes from snowmelt runoff, springs and underground flow, and occasional summer thundershowers. In several parts of the stream system, the springs from underground flow are enough to supply most allotments throughout the season. Much of the underground flow comes from the northern slopes of Mount Shasta, which rises to 14,162 feet at the south end of Shasta Valley. Although the snowpack on Mount Shasta is usually heavy, there is little surface runoff.

Parks Creek, Upper Shasta River, and Little Shasta River get much of their water from snowmelt runoff, usually enough to supply allotments until the middle of May.

Beaughan Creek, Carrick Creek, Shasta River from Boles Creek to Lake Shastina, Big Springs, and Lower Shasta River have enough runoff from springs to supply many of the allotments throughout the season.

Records of the daily mean discharge at several stream gaging stations in the Shasta River service area are in Tables 29 through 32, pages 77 through 80. The daily mean storage in Lake Shastina is in Table 33, page 81.

Method of Distribution

Irrigation of permanent pasture and alfalfa lands is mainly by wild flooding. Much of the return water is recaptured and used on lower pasture lands. Sprinkling systems are used for irrigating some alfalfa and grain lands. Water is routed by diversion dams and then carried by ditch or canal to the place of use. The largest and longest canal in the area is the Edson-Foulke Yreka Ditch, which has a capacity of about 60 cfs and a length of about 14 miles. Water is also supplied to ditch systems by pumped diversions, the three largest belonging to two irrigation districts and a private water users' association. Some riparian lands are also served by pump diversions.

There are many privately-owned storage reservoirs in the area. Water from these reservoirs supplements continuous-flow allotments.

Because of their large rights, the watermaster's close surveillance of Grenada and Big Springs Irrigation Districts and Shasta River Water Users Association is very important, particularly in dry years. Control of releases from Montague Water Conservation District's Dwinnell Reservoir (Lake Shastina) is another responsibility of the watermaster. This includes measurement of deliveries of stored water to users just below the dam. Control of releases from Hammond Lake is also a duty of the watermaster as of 1989.

1990 Distribution

Watermaster service began April 1 in the Shasta River wastermaster service area and ended September 30 with Keithal B. Dick, Water Resources Technician II, as watermaster. Lester L. Lighthall was called into service on April 1 and finished on September 28. Mr. Lighthall's services were needed to assist Mr. Dick because of the record low water supply, which was less than 90 percent of normal, and the unusually dry conditions during the first part of the year.

Parks Creek

Flows were enough to fill the irrigation demand and provide excess to Dwinnell Reservoir until June 10. Flows decreased and third priorities were out by August 1. Flows continued to decrease, with 2.2 cfs by the end of August.

Upper Shasta River

Regulation was required from April 1. Rains occurred in late May and early June, and the flow in upper Shasta River was enough to fill all priorities until June 29. Flow decreased to 44 percent of third and fourth priorities in August and remained near that level until the last part of September. Lower priorities below the Yreka Ditch received return flow and inflow from springs after June 29.

The Hammond Lake Water Users Association, owners of the Hammond Reservoir, was added to the Shasta River watermaster service area in 1988. The 348 acre-foot reservoir has storage licenses 5261 and 6531 for water diverted from the North Fork Sacramento River. The stored water is released to the Shasta River and then diverted into diversions 3, 4, 5, and 6. The releases are measured at a recently installed weir located downstream from the reservoir. The Hammond Ranch has been subdivided over the past 20 years and, as a result, the present place-of-use maps are no longer accurate. The Association is in the process of updating these maps. The reservoir filled and remained full until July 5; releases started July 1. The reservoir was drained by September 8. Diversions from North Fork Sacramento River were started on May 19, and ended July 20.

Boles Creek and Shasta River to Lake Shastina (Dwinnell Reservoir)

Boles Creek and this portion of Shasta River are operated as one stream under a long-standing oral agreement among the water right owners. The water is distributed on a correlative, equal-priority basis. Water was set to 100 percent of all rights on July 1. Flows decreased to 75 percent of rights by mid-August and remained between 75 and 80 percent for the rest of the season.

Beaughan Creek

With close regulation of the upper users, all priorities were satisfied for the entire season.

Carrick Creek

Carrick Springs supplied enough water to satisfy all 13 priorities for the entire season with close regulation.

Little Shasta River

There was less than average snowmelt runoff again this season on the Little Shasta River. The flows were sufficient to fill sixth priority until May 1, then declined to 60 percent of sixth priority on May 14. On July 1, the available flow provided 30 percent of fifth priority, declined to 5 percent of fifth priority by late August 1, and remained at that level until September 30.

Dwinnell Reservoir

Storage in Dwinnell Reservoir on April 1 was 21,360 acre-feet and increased to 21,960 acre-feet by June 6. On September 30, storage was down to 2,850 acre-feet. By agreement with the Montague Water Conservation District, owner of Dwinnell Reservoir, water users on Shasta River below the reservoir received stored water on demand.

Deliveries to Natural Flow Water Right Owners Below Dwinnell Reservoir - 1990

Name of Water Right Owner	Allotment (in acre-feet)	Amount Delivered from Dwinnell Reservoir (in acre-feet)
J. N. Taylor	1,200	1,200
Flying L Ranch	198	198
Hole-in-the-Ground Ranch	596	596
Seldom Seen Ranch	924	924
Hidden Valley Ranch	464	464
	3,382	3,382

Big Springs Lake

Big Springs Irrigation District used their own wells, and no water was received from Big Springs Lake. An agreement between E. J. Louie, A. H. Newton, Jr., and

Montague Water Conservation District was made during the winter of 1986. They agreed that when the flows of Big Springs recede from 17.5 cfs to 10.0 cfs, Montague Water Conservation District would do the following:

- Turn off the Basey pumps until the flow of Big Springs was 17.5 cfs or pay A. H. Newton, Jr. the additional power cost to use his own pumps.

- If flows of Big Springs fall below 10.0 cfs, Montague Water Conservation District will shut off the Basey pumps until flows return to above 10.0 cfs.

From April 1 until the first of September, daily observations were made. On May 5, Montague Water Conservation District was required to shut off one Basey pump; eventually, all three Basey pumps had to be turned off for a short period.

Lower Shasta River

The flows in Lower Shasta River were enough to supply all priorities until May 8. On this date, Grenada Irrigation District had to shut off one pump. Water supply fluctuated at times, and Grenada Irrigation District pumps had to operate intermittently.

Willow Creek (North of Montague)

Basis of Service. Willow Creek has had a long history of litigation. The present basis of service was initiated in 1949 when the Department of Public Works, Division of Water Resources was asked to referee a civil suit. The matter was not finalized by a decree until 1972. The issues involved were reopened in 1971, and by Decree No. 24482, dated April 28, 1972, the Siskiyou County Superior Court appointed the Department of Water Resources to supervise distribution of water in accordance with an earlier agreement between the users which defined their respective rights. Accordingly, Klamath River Watermaster Service Area (formerly Willow Creek Watermaster Service Area) was created on June 22, 1972, and service began on July 1, 1972.

There are three water users in the service area. Distribution is on a fractional basis until the flow drops to a specified amount below the upper two users. At that time, the total flow is rotated between the upper two users.

Water Supply. The main source of water for the Willow Creek stream system is from snowmelt. Runoff from the snowmelt begins late in March or early April and is almost entirely gone by June. Thereafter, the streamflow decreases rapidly until about July 25. From then until the rainy season begins, the flow remains at a low-flow stage sufficient to provide domestic and stock-watering purposes to the two upper users.

Method of Distribution. Both sprinkler and flood irrigation are used in the Klamath River service area. The upper water user has the option of using gravity diversions for either flood or sprinkler irrigation. The middle user relies entirely on runoff from the upper user's flood irrigation. The lower user in the area uses both flood and sprinkler irrigation during the early season when the supply is abundant. As the supply dwindles, the remaining water is pumped from a sump to the sprinkler system.

1990 Distribution. Water was so low by June 25, all remaining flows were rotated by upper users.

Cold Creek

Basis of Service. A statutory adjudication of Cold Creek in 1978 ordered the Department of Water Resources to provide watermaster service at Diversions 2, 3, and 4, and at the division weir on the Silva-Lennox Ditch. Watermaster service began April 1, 1981.

Water Supply. The water supply of the Cold Creek stream system satisfied requirements until July.

Method of Distribution. Both sprinkler and flood irrigation are used in Cold Creek service area.

1990 Distribution. Flow is from springs and remained very constant all season. A recorder was operated at the automatic split.

SHASTA RIVER WATERMASTER SERVICE AREA

TABLE 29

1990 Daily Mean Discharge
(In cubic feet per second)

SHASTA RIVER NEAR YREKA[1/]

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	210	158	68	262	29	26	27
2	222	148	64	242	30	20	33
3	266	126	65	197	26	16	35
4	260	104	52	150	25	13	34
5	300	107	52	128	24	17	29
6	302	107	46	125	26	18	27
7	275	95	34	120	35	19	21
8	266	76	30	79	32	28	18
9	262	73	24	67	31	25	14
10	270	66	27	57	32	18	23
11	275	53	30	57	19	17	20
12	262	47	31	55	16	16	34
13	248	44	37	48	14	14	36
14	247	54	24	47	15	12	35
15	258	58	36	48	12	12	29
16	251	46	44	45	25	25	27
17	244	59	28	55	21	27	32
18	243	77	20	56	46	24	35
19	231	71	20	46	67	24	36
20	218	75	47	38	50	29	43
21	217	94	64	37	46	33	48
22	210	84	100	35	42	35	44
23	218	76	300	24	41	33	28
24	219	105	281	16	37	24	23
25	215	103	199	20	24	23	54
26	215	84	162	40	19	23	96
27	214	73	155	35	18	25	87
28	199	76	199	43	13	25	89
29	183	74	216	37	11	22	90
30	174	84	207	30	18	24	91
31	171		249		25	29	
MEAN	237	83.2	93.9	74.6	28.0	22.5	41.3
AC-FT	14570	4950	5770	4440	1720	1380	2460

[1/] USGS Station

SHASTA RIVER WATERMASTER SERVICE AREA

TABLE 30

1990 Daily Mean Discharge
(In cubic feet per second)

SHASTA RIVER NEAR EDGEWOOD

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	42	34	22	191	12	7.6	10
2	58	31	20	155	13	6.9	9.7
3	76	27	19	137	13	6.0	9.1
4	67	22	17	124	11	6.3	8.2
5	71	23	16	112	11	6.1	7.1
6	62	22	18	100	10	5.4	7.2
7	59	24	18	86	9.7	5.4	6.5
8	69	27	17	74	9.5	6.3	6.4
9	53	21	16	69	7.8	8.4	6.6
10	60	20	15	63	7.4	7.0	7.5
11	53	18	14	50	6.4	6.1	7.2
12	47	17	14	42	5.7	6.6	7.4
13	42	17	13	33	5.0	7.3	8.0
14	46	18	13	23	5.3	7.2	7.5
15	42	23	13	20	5.7	7.8	7.8
16	40	62	11	21	6.3	7.1	8.4
17	39	125	11	26	9.3	8.1	8.6
18	44	86	12	28	12	12	8.5
19	48	73	14	20	18	13	10
20	54	65	18	18	14	12	9.4
21	55	52	17	17	10	11	8.1
22	61	51	405E	16	10	11	8.2
23	65	83	520E	18	9.4	12	10
24	63	64	180	18	8.9	12	11
25	62	44	131	15	8.3	12	12
26	61	35	111	13	6.7	10	15
27	58	29	760E	13	6.7	9.2	15
28	53	30	741E	13	6.7	9.8	15
29	47	29	325	13	7.5	10	16
30	42	24	319	12	6.9	9.6	15
31	36		242		7.1	10	
MEAN	54.0	39.9	131E	51.3	9.0	8.7	9.5
AC-FT	3322	2372	8057E	3055	556	534	568

E - Estimated

SHASTA RIVER WATERMASTER SERVICE AREA

TABLE 31

1990 Daily Mean Discharge
(In cubic feet per second)

PARKS CREEK ABOVE EDSON-FOULKE YREKA DITCH

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		26[1/]	24	56	7.0	2.8	2.7
2		28	23	52	10	2.6	2.5
3		29	19	50	9.3	2.4	2.5
4		30	17	46	8.5	2.2	2.3
5		34	15	45	8.1	2.1	2.1
6		36	14	35	7.7	2.1	1.9
7		38	13	31	7.3	1.9	1.7
8		37	13	27	6.9	1.9	1.7
9		35	12	24	6.5	1.9	1.7
10		33	11	23	6.5	1.9	1.7
11		33	10	22	6.3	1.7	1.7
12		32	10	19	6.3	1.7	1.7
13		31	10	18	6.2	1.9	1.9
14		33	8.5	17	6.1	1.9	2.1
15		33	6.4	16	5.9	1.9	2.1
16		46	6.4	15	5.0	1.9	2.3
17		58	6.4	14	4.4	2.1	2.3
18		50	6.4	14	4.5	2.3	2.3
19		41	6.0	11	5.7	2.9	2.5
20		39	7.0	9.0	5.0	3.1	3.5
21		35	7.0	8.5	4.8	3.1	4.4
22		34	55	7.0	4.7	2.9	4.4
23		38	60	6.6	5.1	2.7	4.4
24		33	46	6.5	5.3	2.7	4.4
25		28	33	6.2	5.2	2.7	4.6
26		28	30	5.7	4.8	2.9	4.8
27		27	61	5.7	4.5	2.9	4.6
28		26	75	6.0	4.1	2.9	4.4
29		25	68	7.0	3.8	2.9	4.4
30		24	65	7.0	3.4	2.9	4.4
31			61		3.0	2.8	
MEAN		34.0	25.8	20.3	5.9	2.4	2.9
AC-FT		2020	1590	1210	363	148	172

[1/] No record before April 1.

SHASTA RIVER WATERMASTER SERVICE AREA

TABLE 32

1990 Daily Mean Discharge
(In cubic feet per second)

SHASTA RIVER AT MONTAGUE-GRENADA HIGHWAY BRIDGE

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		160[1/]	74	286	22	23	33
2		158	67	275	22	20	34
3		124	64	215	22	16	29
4		117	55	172	17	22	29
5		120	51	158	20	23	33
6		120	42	120	31	27	20
7		93	27	113	27	31	20
8		71	12	103	27	27	17
9		67	20	110	27	20	27
10		51	20	87	26	19	22
11		41	23	71	17	17	34
12		27	31	90	11	16	33
13		45	12	61	19	14	31
14		55	24	45	20	14	33
15		45	29	23	31	31	29
16		34	26	22	31	31	26
17		51	16	20	45	27	33
18		61	12	27	33	23	34
19		67	34	27	38	29	34
20		87	55	34	34	31	36
21		90	58	33	40	34	34
22		77	64	23	45	33	34
23		94	271	16	42	24	32
24		130	270	17	33	24	28
25		110	222	31	24	22	28
26		97	193	24	20	27	26
27		90	162	29	13	20	26
28		84	252	23	17	23	24
29		77	260	20	17	23	25
30		100	252	20	22	23	24
31			279		31	34	
MEAN		84.7	96.0	76.5	26.6	24.4	28.9
AC-FT		5044	5905	4552	1634	1500	1722

[1/] No record before April 1.

SHASTA RIVER WATERMASTER SERVICE AREA
Water Year 1990-91

TABLE 33

LAKE SHASTINA (DWINNELL RESERVOIR)
DAILY MEAN STORAGE IN ACRE-FEET

DAY	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	5,920	8,740	10,400	11,700	17,480	19,260	21,360	18,980	21,080	17,610	10,700	5,180
2	5,920	8,740	10,500	11,700	17,610	19,260	21,360	18,840	21,360	17,220	11,000	5,040
3	5,920	8,830	10,500	11,700	17,740	19,400	21,360	18,700	21,500	16,960	10,800	4,840
4	5,920	8,920	10,600	11,800	17,740	19,400	21,360	18,420	21,640	16,700	10,000	4,720
5	5,920	9,010	10,600	11,800	17,870	19,680	21,360	18,280	21,780	15,740	9,800	4,600
6	5,920	9,100	10,700	11,900	17,890	19,680	21,220	18,280	21,920	15,980	9,500	4,480
7	5,920	9,100	10,700	12,100	18,000	19,820	21,080	18,140	21,920	16,100	9,300	4,360
8	6,000	9,200	10,800	13,090	18,000	19,960	21,080	18,000	21,920	16,340	9,100	4,240
9	6,000	9,300	10,800	14,080	18,140	20,100	20,940	17,870	21,920	16,580	8,830	4,120
10	6,000	9,300	10,800	14,300	18,140	20,240	20,800	17,740	21,920	14,300	8,740	4,000
11	6,080	9,400	10,900	14,540	18,280	20,240	20,660	17,430	21,920	14,660	8,470	3,940
12	6,080	9,500	11,000	14,780	18,420	20,380	20,520	17,220	21,640	15,020	8,200	3,820
13	6,080	9,500	11,000	15,260	18,420	20,380	20,240	17,090	21,500	14,780	8,020	3,580
14	6,080	9,500	11,000	15,740	18,420	20,520	19,960	16,960	21,220	14,660	7,840	3,520
15	6,080	9,600	11,100	15,980	18,560	20,520	19,820	16,830	21,080	14,540	7,660	3,460
16	6,160	9,600	11,100	16,100	18,560	20,520	19,680	16,700	20,800	14,080	7,390	3,400
17	6,160	9,700	11,100	16,340	18,560	20,660	19,680	15,740	20,660	13,860	7,210	3,340
18	6,160	9,700	11,100	16,460	18,560	20,660	19,680	15,500	20,520	13,640	6,940	3,220
19	6,160	9,700	11,200	16,580	18,560	20,660	19,680	15,380	20,380	13,310	6,760	3,150
20	6,240	9,800	11,200	16,700	18,700	20,660	19,680	15,140	20,240	13,200	6,580	3,000
21	6,240	9,800	11,300	16,700	18,700	20,800	19,540	14,900	20,100	12,980	6,400	2,950
22	6,240	9,900	11,300	16,830	18,840	20,800	19,400	14,900	20,100	12,760	6,240	2,900
23	6,850	10,000	11,400	16,960	18,840	20,940	19,400	15,980	19,680	12,540	6,000	2,850
24	7,840	10,000	11,400	17,090	18,840	21,080	19,540	16,100	19,540	12,320	5,920	2,850
25	8,290	10,100	11,400	17,090	18,980	21,080	19,540	16,830	19,260	12,100	5,920	2,800
26	8,380	10,100	11,500	17,220	19,120	21,220	19,540	17,090	18,980	12,000	5,760	2,800
27	8,470	10,200	11,500	17,220	19,120	21,220	19,540	17,480	18,840	11,800	5,680	2,800
28	8,560	10,200	11,500	17,350	19,260	21,220	19,400	18,700	18,420	11,500	5,530	2,800
29	8,650	10,200	11,500	17,350	19,260	21,360	19,260	19,400	18,140	11,400	5,460	2,850
30	8,650	10,200	11,600	17,480		21,360	19,260	19,640	17,870	11,200	5,390	2,850
31	8,740		11,600	17,480		21,360		20,520		10,900	5,320	

SURPRISE VALLEY WATERMASTER SERVICE AREA

The Surprise Valley service area is in Modoc County, east of the Warner Mountains. Eleven individual stream systems rising on the eastern slope of the Warner Mountains supply water to the area. These are fed by snowmelt runoff and run in fast, steep courses down the eastern slope of the Warner Mountains to the valley floor where numerous scattered diversion ditches convey water to the irrigated lands.

Pine Creek, southeast of Alturas, was included in the Surprise Valley watermaster service area in 1988.

Basis of Service

The Surprise Valley watermaster service area was created January 10, 1939, and includes Mill, Soldier, Pine, Cedar, Deep, Owl, Rader, and Emerson Creeks, all of which once had individual watermaster service. Also, service was started on Eagle Creek at that time. Bidwell Creek was added to the service area March 16, 1960, and Cottonwood Creek was added in 1977. Each of the eleven stream systems in Surprise Valley is under separate decrees.

The Pine Creek agreement established water rights for Pine Creek, which is located on the west slope of the Warner Range, on November 22, 1933. This stream was added to the South Fork Pit River area on January 22, 1935. Pine Creek Reservoir, a small reservoir above all diversions, was originally used for power generation. Now a recreation site, it has a small water right but is not in the service area. Pine Creek was added to the North Fork Pit River area on July 1, 1982 and changed to the Surprise Valley watermaster service area in 1988. The Pine Creek agreement established two priorities.

See Table 34, page 87, for specific data regarding the decrees and water rights on the individual creeks.

Water Supply

The water supply comes almost entirely from snowmelt, with only minor spring-fed flows occurring late in the season. Due to the steep eastern slope of the Warner Mountains, there are no likely storage sites on the service-area streams. Because of the lack of such regulatory storage, the available water supply at any specific diversion point may vary considerably within a few hours. Wide daily temperature changes cause great changes in the rate of snowmelt runoff. This situation is worsened by the relatively short, steep drainage area. Also, occasional summer thundershowers may cause a creek to discharge a flow of mammoth proportions for several hours. These flashes can cause considerable damage from washouts and debris deposition but are of such short duration that little or no beneficial use can be made of the water.

The water supply for Pine Creek is derived mostly from snowmelt runoff. Therefore, runoff is usually small in the early spring, increases to a peak in May as temperatures rise, and then gradually decreases throughout the remainder of the season. Water users supplement their irrigation supplies from other sources whenever possible.

Records of the daily mean discharge at several stream gaging stations within the service area are presented in Tables 35 through 47, pages 88 through 100.

Method of Distribution

Continuous-flow distribution is used on most creeks, but water is rotated among some users in accordance with either decree schedule or by mutual agreement.

Alfalfa and meadow hay, the major crops in the valley, are irrigated by sprinklers and wild flooding, although some lands depend upon subsurface irrigation. A few of these systems work by gravity, but most use pumps with the surface water supplemented by deep wells. Many additional acres have been put into production during the past few years through the use of deep wells. Only surface water supplies are under State watermaster service.

To facilitate distribution of irrigation water, construction of permanent diversion dams, headgates, and measuring devices has been encouraged in recent years. Although these structures do not solve the problems of discharge variation and debris deposition, they do help a lot to solve water measurement and distribution problems.

1990 Distribution

Watermaster service began in the Surprise Valley watermaster service area on March 19 and continued until September 30. Kevin Dossey, Assistant Engineer, Water Resources, was watermaster.

The 1990 season was a relatively dry one. The Warner Mountains snowpack water equivalent was about 50 percent of average on April 1, 1990. Most streamflows had peaked by early May and were steadily declining when a late May snowstorm dumped up to a foot of snow on the Warners. The resulting runoff boosted streamflows to such an extent that flows remained above pre-storm levels for a full month. However, the drought situation continued and some creek flows dwindled to the lowest levels in recent history.

Bidwell Creek

Total stream runoff from April 1 through September 30 was 5,259 acre-feet. Full priority water was never available this season. Flow on September 30 was about 3 cfs.

Mill Creek

Total stream runoff from April 1 through September 30 was 3,016 acre-feet. Full priority water was available for only a few days in April. Flows dropped to second priorities only in early July and to first priorities only by August 1. Flow on September 30 was 1.0 cfs.

Soldier Creek

Total stream runoff from March 19 through September 30 was 2,004 acre-feet. Flows were high enough to fill all priorities for only a few days in April, and by mid-May, only first priorities and portions of second priorities were being filled. By the end of the rotation period on June 19, flow was less than 4 cfs. By July 1, only first priority water was available and on September 30, flow was down to 0.5 cfs.

Pine Creek

Total stream runoff during the rotation period was 858 acre-feet. Less than two rotations were completed. On April 29, streamflow reduced to 4 cfs and was distributed to Tracts 68 and 70. On May 2, flow had dropped to 1.6 cfs and was turned down the Cressler Ditch. When the late May snowstorm increased flows to 17 cfs on June 1, the rotation was resumed and continued for 4 days. Flow was turned down the Cressler Ditch again on June 8. Flow in the creek ceased by June 18.

Cedar Creek

Total stream runoff from April 1 through September 30 was 1,235 acre-feet. Water was diverted from Thoms Creek to Cedar Creek in early April. Water was rotated among second priority water users until May 8 when flow dropped below 5 cfs and all flow was turned to Tract 91. Flow on September 30 was 0.2 cfs.

Deep Creek

Total stream runoff from April 1 through September 30 was 1,455 acre-feet. Full priority water was never available this year. By the end of April, only first priority water was available in South Deep Creek. On September 30, flow was 0.3 cfs in South Deep Creek and 0.2 cfs in North Deep Creek.

Cottonwood Creek

Total stream runoff from April 1 through September 30 was 2,606 acre-feet. Water rotation between Tracts 243, 245, 246, and 109 began April 11 and ended July 10. A concrete diversion structure was constructed to facilitate the distribution of water to Tracts 244-1 and 244-2. Flow on July 10 was 3.3 cfs and by September 30, flow was 0.6 cfs.

Owl Creek

Total runoff from April 1 through September 30 was 3,120 acre-feet. Flow on September 30 was 0.8 cfs.

Rader Creek

Total stream runoff from April 1 through September 30 was 1,897 acre-feet. Water was diverted to the Cockrell Ditch from May 30 until June 19. Flows dropped quickly in June and by late July, only first priority water was available. Flow on September 30 was 0.3 cfs.

Eagle Creek

Total stream runoff from June 1 through September 30 was 2,410 acre-feet. By mid-July, only first priority water was available. Flow on September 30 was 0.8 cfs.

Emerson Creek

Total stream runoff from April 1 through September 30 was 1,288 acre-feet. Only first priority and portions of second priority water was available this year. Streamflow had reduced to first priority only by July 10. Flow on September 30 was 1.3 cfs.

Pine Creek Near Alturas

Total stream runoff from April 1 through September 30 was 5,599 acre-feet. A recorder was installed in the diversion structure pool at the head of ditch No. 5. Flow on September 30 was about 7 cfs.

TABLE 34

DECREES AND RELATED DATA - SURPRISE VALLEY STREAMS

Stream	Modoc County Superior Court Decree No.	Date	Type[a]	Service Area Created	No. of Water Right Owners	Total Cfs	Remarks
Bidwell	6420	1-13-60	S	3-16-60[b]	46	63.74	(Schedule 3) 3 priorities March 15-July 19. (Schedule 4) 5 priorities July 10-September 30. If no water passing version No. 23 September 30-March 14, 1st priority provisions of Schedule 4 apply
Mill	3024	12-19-31	CR	12-30-31	38	37.13	One priority on Brown Creek, tributary to Rutherford Creek, 7 priorities on Rutherford Creek, tributary to Mill Creek, 1st and 2nd for year-round use, 3rd and 4th April through September.
Soldier	2045	11-28-28	CR	9-11-29	13 4[c]	33.50 4.37	Starting March 19 each year, lower users receive water for 4 13-day periods alternating with upper users who receive water for 4 10-day periods, ending June 19. 7 priorities during lower users periods, 8 during upper users periods and 12 for rest of the year. Appropriative License 1566, 1613, 1648, and 1850.
Pine near Cedarville	3391	12-07-36	CR	1-13-37	5 1[c]	[d] 0.08	One full rotation totalling 693 AF. Rotation continues until flow decreases to 4 cfs, then all water goes to Cal-Vada Ranch until flow decreases to 1.60 cfs, then all water goes to the R. Bordwell Ranch.
Cedar	1206 2343 [d]	5-22-01 2-15-23	CA CA	9-11-29	12	28.90[d]	Water rights established by these two decrees and an agreement signed by all users. No. 1206 set 1st and 2nd priorities; No. 2443 3rd priority and agreement the 4th. 28.90 cfs includes 5.00 cfs imported from Thoms Creek on west slope of Warner Mountains.
Deep	3101	1-25-34	CR	12-29-34	11	29.37	Schedule 2 establishes 5 priorities, year-round.
Cottonwood	6903	12-01-64	CA	7-01-77[b]	8	[d]	Water rights based on a percentage of flow in an equal priority.
Owl	2410	5-29-29	CA	9-11-29	8	41.70	21 priorities; all year round but 8th priority, under which each of 3 owners receives his allotment for an 8-day period. Appropriative License No.2842, 3.54 cfs.
Rader	3626	6-04-37	CR	6-12-37	6	21.00	7 priorities. 7th is for surplus water. Diversions No. 1, 3, 6, and 7 have seasonal limitations.
Eagle	2304 3284	4-05-26 11-05-37	CA CR	1-10-39	36	30.57	Decree No. 3284 added rights in all priority classes, and established 4 classes. 4.50 cfs right of Betford Corp. is for use March 1 to July 1. Eagleville 'town users', Schedule 2 may divert through Gee & Grider ditches March 16 to October 14 each year. Set 1st priority rights of Gee & Grider ditches, Par. XVII & XVIII, for use April 15 to October 1.
Emerson	2840	3-25-30	CR	4-11-30	10	24.65	4 priorities, 1st is for year-round use, others April 1 to September 30.
Pine near Alturas[e]	----	11-22-33	A	1-22-35	16	60.00	Surplus flow into Doris Reservoir. Tributary to South Fork Pit River.

[a] S-Statutory, CR-Court Reference, CA-Court Adjudication, A-Agreement
[b] Added to existing Surprise Valley service area.
[c] Appropriative rights junior to the decreed rights.
[d] See remarks.
[e] Pine Creek is on the west slope of Warner Range near Alturas.

SURPRISE VALLEY WATERMASTER SERVICE AREA

TABLE 35

1990 Daily Mean Discharge
(In cubic feet per second)

BIDWELL CREEK NEAR FORT BIDWELL

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	9.7	20	28	37	9.1	4.1	3.4
2	10	21	27	41	8.8	4.0	3.2
3	10	22	26	44	8.4	3.9	3.1
4	10	23	26	45	8.1	3.8	3.0
5	9.8	24	26	43	7.8	3.9	2.9
6	9.5	24	28	40	7.6	3.7	2.9
7	9.5	25	29	39	7.4	3.6	2.8
8	9.5	25	28	36	7.2	3.5	2.6
9	9.2	23	26	34	6.9	3.4	2.6
10	9.2	22	25	32	6.7	3.3	2.6
11	8.8	22	25	30	6.7	2.9	2.4
12	8.6	22	24	28	6.7	2.9	2.4
13	7.9	22	22	26	6.4	2.9	2.4
14	8.2	23	22	24	6.3	2.8	2.3
15	8.0	24	21	23	6.0	2.6	2.1
16	7.9	25	21	22	5.8	2.6	2.1
17	8.3	27	20	20	5.6	2.6	2.1
18	9.1	28	20	19	5.5	2.9	2.1
19	12	27	21	18	5.4	3.4	2.1
20	17	27	22	17	5.4	3.5	2.1
21	19	25	21	16	5.2	3.6	2.1
22	21	29	21	15	5.1	3.6	2.1
23	24	35	21	13	4.9	3.6	2.1
24	23	32	21	13	5.0	3.6	2.1
25	22	30	21	12	4.9	3.6	2.2
26	23	29	21	12	4.9	3.6	2.4
27	21	29	26	11	4.9	3.6	2.4
28	19	32	26	10	4.9	3.6	2.4
29	18	32	30	10	4.6	3.6	2.4
30	18	29	33	9.6	4.5	3.5	2.4
31	18		36		4.4	3.4	
MEAN	13.5	25.9	24.6	24.7	6.2	3.4	2.5
AC-FT	829	1543	1515	1467	379	209	146

SURPRISE VALLEY WATERMASTER SERVICE AREA

TABLE 36

1990 Daily Mean Discharge
(In cubic feet per second)

MILL CREEK ABOVE ALL DIVERSIONS

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		7.5[1/]	17	20	4.4	2.0	1.1
2		8.1	15	28	4.4	1.8	1.1
3		9.8	15	22	4.4	1.8	1.1
4		12	14	20	4.0	1.8	1.1
5		13	14	18	4.0	1.8	1.0
6		14	14	18	3.6	1.8	1.0
7		18	14	16	3.6	1.7	1.0
8		21	13	15	3.4	1.6	1.0
9		19	13	14	3.2	1.6	1.0
10		18	12	13	3.2	1.5	1.0
11		19	12	12	3.2	1.5	1.0
12		18	12	12	3.2	1.5	1.0
13		20	11	11	3.2	1.5	1.0
14		20	9.8	11	3.0	1.5	1.0
15		20	9.1	10	3.0	1.5	1.0
16		24	8.1	9.7	3.0	1.4	1.0
17		32	8.1	8.4	2.8	1.4	1.0
18		36	7.5	8.2	2.8	3.0	1.0
19		25	8.1	8.1	2.7	2.4	1.0
20		24	8.7	7.7	2.7	2.4	1.0
21		23	8.1	7.7	2.6	2.4	1.0
22		32	7.5	7.7	2.5	2.4	1.0
23		42	8.1	7.1	2.4	2.0	1.0
24		37	8.4	6.7	2.4	1.6	1.0
25		28	8.7	6.3	2.3	1.6	1.0
26		24	9.1	5.7	2.3	1.6	1.0
27		24	9.5	5.7	2.2	1.6	1.0
28		24	9.8	5.3	2.2	1.5	1.0
29		20	13	5.0	2.2	1.4	1.0
30		18	15	4.7	2.0	1.2	1.0
31			17		2.0	1.1	
MEAN		21.7	11.3	11.5	3.0	1.7	1.0
AC-FT		1290	693	682	184	107	60

[1/] No record before April 1.

SURPRISE VALLEY WATERMASTER SERVICE AREA

TABLE 37

1990 Daily Mean Discharge
(In cubic feet per second)

SOLDIER CREEK ABOVE ALL DIVERSIONS

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		12	8.0	20	1.9	1.1	0.6
2		13	8.0	23	1.9	0.9	0.6
3		15	8.0	19	1.9	0.9	0.5
4		15	7.6	12	1.8	0.9	0.5
5		14	7.1	9.5	1.8	0.9	0.5
6		19	6.9	8.0	1.7	0.9	0.5
7		21	6.4	7.4	1.7	0.9	0.5
8		19	5.7	6.6	1.6	0.9	0.5
9		14	5.1	5.9	1.5	0.9	0.5
10		14	4.3	5.6	1.5	0.9	0.5
11		14	4.3	5.3	1.5	0.9	0.5
12		13	3.9	5.0	1.5	0.9	0.5
13		13	3.5	5.1	1.5	0.9	0.5
14		14	3.4	5.0	1.4	0.9	0.5
15		14	3.3	4.8	1.4	0.9	0.5
16		21	3.3	4.3	1.4	0.9	0.5
17		22	3.2	3.9	1.5	0.9	0.4
18		21	3.2	3.9	1.5	1.4	0.4
19	10[1/]	14	3.3	3.9	1.6	1.2	0.4
20	11	12	3.4	3.5	1.5	1.2	0.4
21	12	12	3.3	3.5	1.4	1.2	0.4
22	15	31	2.7	3.5	1.3	1.2	0.4
23	18	33	3.4	3.1	1.2	1.1	0.4
24	13	21	5.1	2.0	1.2	0.9	0.5
25	12	14	5.4	2.6	1.2	0.9	0.5
26	12	12	6.9	2.3	1.2	0.9	0.5
27	11	12	6.4	2.3	1.1	0.9	0.5
28	9.5	11	6.4	2.2	1.1	0.7	0.5
29	9.1	8.9	11	2.1	1.1	0.7	0.5
30	9.5	8.2	12	2.0	1.1	0.7	0.5
31	11		15		1.1	0.7	
MEAN	11.8	15.9	5.8	6.3	1.5	0.9	0.5
AC-FT	153	946	356	373	89	58	29

[1/] No record before March 19.

SURPRISE VALLEY WATERMASTER SERVICE AREA

TABLE 38

1990 Daily Mean Discharge
(In cubic feet per second)

PINE CREEK NEAR CEDARVILLE AT DIVERSION OF NORTH AND SOUTH CHANNELS

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		8.1	2.7	12			
2		8.5	2.0	8.3			
3		9.4	1.2	5.1			
4		8.9	1.1	3.9			
5		8.1	1.0	2.3			
6		9.1	0.9	2.1			
7		11	0.9	1.9			
8		13	0.9	1.6			
9		10	0.6	1.1			
10		9.1	0.6	0.9			
11		8.9	0.5	0.8			
12		7.5	0.5	0.7			
13		7.1	0.5	0.7			
14		4.9	0.4	0.4			
15		4.3	0.4	0.4			
16		7.1	0.3	0.3			
17		6.7	0.3	0.1			
18		7.1	0.3	0.0			
19		5.0	0.3	0.0			
20	14[1/]	4.4	0.5	0.0			
21	14	3.9	0.4	0.0			
22	15	12	0.3	0.0			
23	19	16	0.4	0.0			
24	14	9.9	0.8	0.0			
25	10	6.2	0.5	0.0			
26	10	5.4	0.5	0.0			
27	10	4.9	0.7	0.0			
28	8.3	4.3	0.5	0.0			
29	7.0	3.7	0.8	0.0			
30	6.8	3.4	2.4	0.0[1/]			
31	7.1		4.0				
MEAN	11.3	7.6	0.9	2.5			
AC-FT	268	452	54	84			

[1/] No record before March 20 or after June 30.

SURPRISE VALLEY WATERMASTER SERVICE AREA

TABLE 39

1990 Daily Mean Discharge
(In cubic feet per second)

CEDAR CREEK AT CEDARVILLE

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	4.2	9.2	7.9	13	1.3	0.6E	0.2
2	4.6	9.4	7.3	13	1.3	0.6E	0.2
3	5.0	9.4	6.9	10	1.3	0.6E	0.2
4	5.0	9.7	6.5	8.7	1.2	0.6E	0.2
5	4.9	9.7	6.1	7.9	1.2	0.6E	0.2
6	4.7	9.7	5.7	7.5	1.2	0.6E	0.1
7	4.6	9.7	5.4	6.9	1.1	0.6E	0.1
8	4.4	9.9	5.2	6.3	1.0	0.6E	0.1
9	4.3	10	4.8	5.6	1.0	0.6E	0.1
10	4.5	10	4.3	5.2	0.9	0.6E	0.1
11	4.3	11	4.0	4.9	0.9	0.6E	0.1
12	4.0	11	4.0	4.4	0.9	0.6E	0.1
13	3.5	11	3.7	4.5	0.8	0.6E	0.1
14	3.8	11	3.3	4.0	0.7	0.6E	0.1
15	3.9	11	3.0	3.8	0.6	0.6E	0.1
16	4.0	11	2.7	3.2	0.6	0.5E	0.1
17	4.7	11	2.5	3.0	0.6E	0.5E	0.1
18	6.6	11	2.4	2.9	0.6E	0.5E	0.1
19	7.5	9.8	2.8	2.6	0.6E	0.5E	0.1
20	8.5	9.8	3.4	2.3	0.6E	0.5E	0.1
21	8.5	9.3	2.7	2.2	0.6E	0.4E	0.1
22	8.7	11	2.4	2.0	0.6E	0.4E	0.1
23	8.8	11	3.0	1.9	0.6E	0.4E	0.1
24	8.8	11	3.9	1.8	0.6E	0.4E	0.1
25	8.8	10	3.3	1.7	0.6E	0.4E	0.1
26	8.9	9.5	4.2	1.7	0.6E	0.3E	0.1
27	9.1	9.0	4.2	1.6	0.6E	0.3E	0.1
28	9.1	8.7	4.6	1.6	0.6E	0.3E	0.1
29	9.1	8.5	6.2	1.5	0.6E	0.3E	0.1
30	9.1	8.5	7.5	1.4	0.6E	0.2	0.1
31	9.3		10		0.6E	0.2	
MEAN	6.3	10.0	4.6	4.6	0.8E	0.5E	0.1
AC-FT	387	596	285	272	44E	31E	7

E - Estimated

SURPRISE VALLEY WATERMASTER SERVICE AREA

TABLE 40

1990 Daily Mean Discharge
(In cubic feet per second)

NORTH DEEP CREEK ABOVE ALL DIVERSIONS

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		3.2[1/]	3.0	5.4	0.6	0.2	0.2
2		3.4	2.6	5.0	0.6	0.2	0.2
3		4.0	2.3	4.7	0.6	0.2	0.2
4		4.4	2.2	4.0	0.5	0.2	0.2
5		4.8	2.0	3.3	0.5	0.2	0.2
6		4.8	1.9	2.9	0.5	0.2	0.2
7		5.1	1.7	2.6	0.5	0.2	0.2
8		6.0	1.6	2.2	0.4	0.2	0.2
9		5.8	1.5	1.9	0.4	0.2	0.2
10		4.8	1.4	1.8	0.4	0.2	0.2
11		4.4	1.3	1.7	0.4	0.2	0.2
12		4.2	1.3	1.5	0.4	0.2	0.2
13		4.1	1.3	1.5	0.4	0.2	0.2
14		4.0	1.2	1.5	0.4	0.2	0.2
15		3.7	1.2	1.4	0.4	0.2	0.2
16		3.4	1.2	1.3	0.4	0.2	0.2
17		3.7	1.2	1.2	0.4	0.2	0.2
18		3.7	1.2	1.2	0.4	0.3	0.2
19		3.2	1.2	1.1	0.4	0.3	0.2
20		3.0	1.2	1.1	0.4	0.3	0.2
21		2.8	1.2	1.0	0.3	0.2	0.2
22		4.1	1.2	0.9	0.3	0.2	0.2
23		6.6	2.3	0.9	0.3	0.2	0.2
24		6.0	1.2	0.9	0.3	0.2	0.2
25		5.1	1.2	0.8	0.3	0.2	0.2
26		4.7	1.3	0.8	0.3	0.2	0.2
27		4.4	1.3	0.8	0.3	0.2	0.2
28		4.1	1.3	0.7	0.3	0.2	0.2
29		3.8	1.4	0.7	0.2	0.2	0.2
30		3.4	1.9	0.6	0.2	0.2	0.2
31			4.5		0.2	0.2	
MEAN		4.3	1.7	1.8	0.4	0.2	0.2
AC-FT		255	102	110	24	13	12

[1/] No record before April 1.

SURPRISE VALLEY WATERMASTER SERVICE AREA

TABLE 41

1990 Daily Mean Discharge
(In cubic feet per second)

SOUTH DEEP CREEK BELOW NO. 2 DIVERSION

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		5.4[1/]	5.1	10	0.9	0.3	0.3
2		6.2	4.7	9.6	0.9	0.3	0.3
3		7.5	4.2	8.9	0.9	0.3	0.3
4		8.2	4.0	7.7	0.8	0.3	0.3
5		9.0	3.8	6.4	0.8	0.3	0.3
6		9.0	3.6	5.5	0.8	0.3	0.3
7		9.5	3.4	4.9	0.7	0.3	0.3
8		11	3.2	4.2	0.6	0.3	0.3
9		11	3.0	3.7	0.6	0.3	0.3
10		9.0	2.9	3.5	0.6	0.3	0.3
11		8.2	2.7	3.3	0.6	0.3	0.3
12		8.0	2.7	2.9	0.6	0.3	0.3
13		7.7	2.5	2.9	0.6	0.3	0.3
14		7.5	2.4	2.7	0.6	0.3	0.3
15		7.0	2.4	2.5	0.6	0.3	0.3
16		6.2	2.4	2.4	0.6	0.3	0.3
17		7.0	2.4	2.2	0.6	0.3	0.3
18		7.0	2.2	2.1	0.6	0.5	0.3
19		5.4	2.2	2.0	0.6	0.4	0.3
20		5.1	2.2	1.9	0.5	0.4	0.3
21		4.9	2.2	1.7	0.5	0.3	0.3
22		7.7	2.2	1.6	0.4	0.3	0.3
23		12	2.3	1.6	0.4	0.3	0.3
24		11	2.5	1.5	0.4	0.3	0.3
25		9.5	2.4	1.4	0.4	0.3	0.3
26		8.7	2.7	1.3	0.4	0.3	0.3
27		8.2	2.5	1.2	0.4	0.3	0.3
28		7.7	2.5	1.1	0.4	0.3	0.3
29		7.2	2.9	1.1	0.3	0.3	0.3
30		6.2	3.6	1.0	0.3	0.3	0.3
31			8.6		0.3	0.3	
MEAN		7.9	3.1	3.4	0.6	0.3	0.3
AC-FT		472	191	204	35	19	18

[1/] No record before April 1.

SURPRISE VALLEY WATERMASTER AREA

TABLE 42

1990 Daily Mean Discharge
(In cubic feet per second)

COTTONWOOD CREEK FLUME BELOW PAGE DITCH

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		7.6[1/]	12	24	6.7	1.7	0.7
2		7.9	12	26	6.0	1.5	0.7
3		6.2	12	28	5.4	1.4	0.7
4		8.6	12	25	5.4	1.4	0.6
5		8.9	13	21	4.8	1.4	0.6
6		8.6	16	21	4.8	1.3	0.6
7		8.2	13	20	4.4	1.3	0.5
8		7.9	11	18	4.0	1.3	0.5
9		7.0	11	18	3.6	1.1	0.5
10		9.1	11	18	3.3	1.1	0.5
11		13	11	17	3.1	0.9	0.5
12		13	9.8	16	3.1	0.9	0.5
13		13	9.5	15	2.8	0.7	0.5
14		13	8.8	13	2.8	0.7	0.5
15		13	8.4	11	2.6	0.7	0.5
16		13	8.4	11	2.6	0.7	0.6
17		15	8.4	11	2.6	1.1	0.6
18		16	8.4	11	2.6	1.7	0.6
19		15	8.1	11	2.6	1.7	0.6
20		14	8.1	11	2.8	1.5	0.6
21		12	8.4	11	2.6	1.5	0.5
22		14	8.1	11	2.4	1.4	0.5
23		17	8.4	11	2.3	1.3	0.5
24		20	9.8	10	2.3	1.1	0.6
25		11	9.1	8.3	2.2	1.1	0.5
26		10	10	7.5	2.2	1.1	0.5
27		12	12	7.5	2.0	1.1	0.6
28		20	12	7.5	2.0	0.9	0.6
29		16	17	7.5	1.9	0.7	0.6
30		13	20	6.7	1.7	0.7	0.6
31			36		1.7	0.7	
MEAN		12.2	11.7	14.5	3.2	1.2	0.6
AC-FT		724	719	861	197	71	34

[1/] No record before April 1.

SURPRISE VALLEY WATERMASTER SERVICE AREA

TABLE 43

1990 Daily Mean Discharge
(In cubic feet per second)

OWL CREEK BELOW ALLEN-ARRECHE DITCH

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		8.0[1/]	16	30	6.2	1.9	1.1
2		8.4	14	32	6.2	1.8	1.0
3		8.9	15	33	6.2	1.5	1.0
4		9.4	16	31	5.8	1.5	0.9
5		9.9	22	28	5.8	1.5	0.9
6		11	24	27	5.5	1.4	0.8
7		11	23	25	5.5	1.4	0.7
8		11	22	23	5.1	1.4	0.7
9		8.9	18	22	4.3	1.4	0.7
10		9.9	16	18	4.3	1.4	0.7
11		11	14	16	4.0	1.3	0.7
12		11	13	14	4.0	1.3	0.8
13		12	13	13	3.7	1.2	0.8
14		13	13	13	3.1	1.2	0.8
15		13	13	12	3.0	1.2	0.9
16		15	13	12	2.9	1.1	0.9
17		17	12	11	2.9	1.3	1.0
18		15	12	10	3.0	1.8	1.1
19		15	12	10	3.0	1.8	1.1
20		15	13	10	2.8	1.7	1.1
21		15	13	10	2.4	1.7	1.0
22		16	12	10	2.2	1.5	0.9
23		19	13	9.9	2.2	1.4	0.9
24		20	13	9.0	2.2	1.3	0.9
25		16	13	8.5	2.2	1.3	0.8
26		16	13	8.1	2.2	1.2	0.8
27		24	14	7.7	2.2	1.2	0.8
28		22	15	7.7	2.1	1.1	0.8
29		18	15	7.7	2.0	1.1	0.8
30		18	22	6.9	1.9	1.1	0.8
31			40		1.9	1.1	
MEAN		14.0	16.0	15.9	3.6	1.4	0.9
AC-FT		832	986	945	220	85	52

[1/] No record before April 1.

SURPRISE VALLEY WATERMASTER SERVICE AREA

TABLE 44

1990 Daily Mean Discharge
(In cubic feet per second)

RADER CREEK BELOW COCKRELL DIVERSION

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		7.8[1/]	9.3	9.8	3.8	1.1	0.4
2		7.8	8.7	13	3.8	1.0	0.4
3		8.1	8.1	13	3.6	1.0	0.4
4		8.1	8.3	14	3.6	1.0	0.4
5		8.4	9.1	14	3.3	0.9	0.3
6		8.4	11	14	3.0	0.9	0.3
7		8.7	11	14	3.0	0.9	0.3
8		8.7	10	14	2.8	0.8	0.3
9		8.7	9.5	14	2.8	0.8	0.3
10		8.7	9.1	14	2.6	0.7	0.3
11		9.0	8.6	13	2.6	0.7	0.3
12		9.3	8.3	13	2.4	0.7	0.3
13		9.6	8.1	12	2.4	0.7	0.3
14		11	7.8	11	2.2	0.7	0.3
15		12	7.5	9.8	1.7	0.7	0.3
16		12	7.2	8.5	1.7	0.7	0.3
17		12	6.9	8.5	1.7	0.6	0.3
18		12	6.6	7.7	1.7	0.6	0.3
19		12	6.6	7.0	2.2	0.6	0.3
20		11	6.3	7.7	2.2	0.6	0.3
21		11	6.8	8.5	2.2	0.6	0.3
22		12	7.1	8.5	1.7	0.6	0.3
23		12	7.1	7.7	1.5	0.6	0.3
24		10	7.4	7.0	1.5	0.6	0.3
25		10	7.4	6.5	1.5	0.5	0.3
26		11	7.8	5.9	1.2	0.5	0.3
27		11	9.1	5.5	1.2	0.5	0.3
28		11	8.8	4.7	1.2	0.5	0.3
29		11	10	4.4	1.1	0.5	0.3
30		9.9	11	4.1	1.1	0.5	0.3
31			9.1		1.1	0.4	
MEAN		10.1	8.4	9.8	2.2	0.7	0.3
AC-FT		599	515	585	136	43	19

[1/] No record before April 1.

SURPRISE VALLEY WATERMASTER SERVICE AREA

TABLE 45

1990 Daily Mean Discharge
(In cubic feet per second)

EAGLE CREEK NEAR EAGLEVILLE

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		6.6[1/]	12	13	7.0	1.6	0.9
2		6.6	11	17	6.3	1.6	0.9
3		6.9	11	18	5.6	1.7	0.9
4		6.9	11	20	5.3	1.7	0.9
5		7.2	12	19	5.0	1.6	0.9
6		7.5	12	17	4.9	1.6	0.9
7		7.9	12	16	4.5	1.4	0.9
8		7.9	13	16	4.0	1.4	0.9
9		8.5	13	16	3.9	1.4	0.9
10		9.0	13	16	3.8	1.4	0.9
11		9.5	13	16	3.6	1.4	0.9
12		9.8	12	16	3.5	1.3	0.8
13		10	12	16	3.4	1.1	0.8
14		11	10	14	3.3	1.0	0.8
15		12	10	13	3.1	1.0	0.8
16		13	10	11	2.8	1.0	0.9
17		14	9.0	10	2.7	1.0	0.9
18		14	8.6	10	2.8	1.1	0.9
19		14	8.2	10	2.8	1.3	0.9
20		14	7.8	12	2.8	1.1	0.9
21		13	7.8	13	2.7	1.1	0.9
22		14	8.0	13	2.7	1.0	0.8
23		14	8.2	13	2.3	0.9	0.8
24		12	8.6	10	2.0	0.8	0.8
25		12	8.6	9.8	1.7	0.8	0.8
26		13	9.2	9.5	1.7	0.8	0.8
27		13	10	9.3	1.7	0.8	0.8
28		13	11	8.9	1.6	0.8	0.8
29		13	12	8.1	1.6	1.0	0.8
30		12	13	7.7	1.6	0.9	0.8
31			11		1.6	0.9	
MEAN		10.8	10.6	13.3	3.3	1.2	0.9
AC-FT		644	651	789	203	72	51

[1/] No record before April 1.

SURPRISE VALLEY WATERMASTER SERVICE AREA

TABLE 46

1990 Daily Mean Discharge
(In cubic feet per second)

EMERSON CREEK ABOVE ALL DIVERSIONS

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		7.7[1/]	5.8	7.6	2.4	1.5	1.4
2		7.7	6.0	7.7	2.4	1.5	1.3
3		7.6	6.0	7.4	2.4	1.5	1.3
4		7.6	5.8	7.1	2.2	1.5	1.2
5		7.4	5.8	6.7	2.2	1.4	1.2
6		7.4	5.8	6.4	2.2	1.4	1.2
7		7.4	5.8	6.0	2.2	1.4	1.2
8		7.4	5.6	5.6	2.2	1.4	1.2
9		7.4	5.5	5.5	2.1	1.5	1.2
10		7.4	5.2	5.2	2.1	1.4	1.3
11		7.1	5.2	5.2	2.1	1.4	1.3
12		7.1	4.9	4.9	2.1	1.4	1.3
13		7.1	4.9	4.9	2.1	1.4	1.3
14		7.1	4.6	4.5	1.9	1.3	1.3
15		7.1	4.5	4.5	1.7	1.3	1.3
16		7.1	4.4	4.0	1.7	1.4	1.3
17		7.1	4.4	4.0	1.7	1.5	1.3
18		6.7	4.0	3.9	1.7	1.5	1.3
19		6.7	4.4	3.9	1.7	1.6	1.3
20		6.7	4.6	3.7	1.7	1.6	1.3
21		6.7	4.4	3.6	1.7	1.5	1.3
22		7.1	4.0	3.4	1.5	1.5	1.3
23		7.1	4.5	3.3	1.5	1.5	1.3
24		7.1	4.5	3.1	1.5	1.5	1.3
25		7.4	4.5	3.0	1.5	1.5	1.3
26		7.4	4.6	2.9	1.5	1.5	1.3
27		7.4	4.9	2.9	1.5	1.5	1.3
28		6.4	4.6	2.8	1.5	1.5	1.3
29		5.6	5.5	2.8	1.5	1.5	1.3
30		5.6	5.8	2.6	1.5	1.5	1.3
31			5.8		1.5	1.4	
MEAN		7.1	5.0	4.6	1.9	1.5	1.3
AC-FT		422	310	276	114	90	76

[1/] No record before April 1.

SURPRISE VALLEY WATERMASTER SERVICE AREA

TABLE 47

1990 Daily Mean Discharge
(In cubic feet per second)

PINE CREEK NEAR ALTURAS

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	18	13	23	34	15	10	7.7
2	36	13	23	29	15	9.9	7.7
3	27	14	23	28	15	9.7	7.7
4	17	15	23	27	14	9.6	7.7
5	14	15	22	26	14	9.4	7.7
6	13	15	22	27	14	9.1	7.7
7	12	16	21	28	14	9.1	7.4
8	11	16	21	28	13	9.2	7.4
9	11	15	22	28	13	9.2	7.4
10	11	16	22	28	13	9.3	7.2
11	11	16	22	28	13	9.1	6.9
12	12	16	22	27	13	9.1	6.9
13	12	17	22	27	13	9.0	6.9
14	20	17	22	26	12	8.8	6.9
15	25	17	21	26	12	8.6	7.1
16	18	17	20	25	12	8.6	7.1
17	14	20	19	24	12	8.6	7.1
18	13	20	19	24	12	9.6	7.1
19	13	20	19	22	12	9.6	7.1
20	13	23	19	21	12	9.4	6.9
21	13	24	18	20	12	9.1	6.9
22	13	26	17	20	11	8.8	6.9
23	14	30	18	19	11	8.3	6.9
24	14	29	19	18	11	8.2	7.1
25	14	28	18	18	11	8.2	7.1
26	14	27	19	17	11	8.2	7.1
27	13	26	19	17	11	8.2	7.1
28	13	26	20	16	11	7.9	7.1
29	13	24	20	16	10	7.9	6.9
30	13	24	21	16	10	7.9	6.9
31	13		29		10	7.9	
MEAN	15.1	19.8	20.8	23.7	12.3	8.9	7.2
AC-FT	928	1180	1279	1408	758	546	428

SUSAN RIVER WATERMASTER SERVICE AREA

The Susan River service area is in southern Lassen County near Susanville. The main area of water use is in Honey Lake Valley between Susanville and the northwest shore of Honey Lake, a stretch of about 25 miles. The valley floor is at an elevation of about 4,000 feet. Water comes from three stream systems: Susan River, Baxter Creek, Parker Creek, and their respective tributaries.

The Susan River originates in the Cascade Range just east of Lassen National Park at an elevation of about 7,900 feet. It runs east from Silver Lake through McCoy Flat Reservoir, the town of Susanville, and then to Honey Lake.

The river has four major tributaries: Piute Creek, entering from the north at Susanville; Gold Run and Lassen Creeks, entering from the south between Susanville and Johnstonville; and Willow Creek, entering from the north above Standish. Gold Run and Lassen Creeks rise on the north slope of Diamond Mountain at an elevation of about 7,600 feet. The watersheds of Piute and Willow Creeks are on the south slopes of Round Valley Mountain at lower elevations.

The Susan River divides into three channels, a short distance below its confluence with Willow Creek. The channels are Tanner Slough Channel on the north, Old Channel in the middle, and Dill Slough Channel on the south. Hartson Slough and Whitehead Slough divert from Dill Slough on its south bank, further downstream.

The Baxter Creek stream system is in Honey Lake Valley on the east side of the Sierra Nevada, about 10 miles southeast of Susanville. The main creeks in the system are Baxter Creek, which rises on the west side of the basin and flows east, and Elesian, Sloss, and Bankhead Creeks, tributaries of Baxter Creek from the south.

Parker Creek is also in Honey Lake Valley on the east slope of the Sierra Nevada, about 15 miles southeast of Susanville. It rises on the east side of Diamond Mountain and flows east for about 5 miles into Honey Lake.

Basis of Service

The water of Susan River and its tributaries is distributed according to the water rights defined in Decree No. 4573, Lassen County Superior Court, entered on April 18, 1940. Schedule 3 of the decree defines the rights to the use of water from Willow Creek in Willow Creek Valley, Lower Willow Creek, and the Susan River delta below the Colony Dam. Schedule 4 of the decree defines the rights to the use of water from Gold Run, Piute, Hills, Holtzclaw, and Lassen Creeks above their confluence with the Susan River. Schedules 5 and 6 of the decree define the rights to the use of water from the Susan River, exclusive of its tributaries. The decree establishes three priority classes each on Susan River and Gold Run Creek, two on Willow Creek, and one each on Piute and Hills Creeks.

The water of Baxter Creek and its tributaries is distributed according to the water rights defined in the statutory adjudication as set forth in Decree No. 8174, Lassen County Superior Court, dated December 15, 1955. Schedule 3 of the decree defines the rights to the use of water from Sloss and Bankhead Creeks, and Schedule 4 defines the rights to the use of water from Baxter and Elesian Creeks. The Baxter Creek rights are divided into five priority classes.

The water of Parker Creek and its tributaries is distributed according to the water rights defined by a statutory adjudication as set forth in Decree No. 8175, Lassen County Superior Court, dated December 15, 1955. Schedule 3 of the decree defines the rights to the use of water from Parker Creek, with four priority classes.

The Susan River watermaster service area was created by order of the Division of Water Resources on November 10, 1941. The Baxter and Parker Creek stream systems were added to the Susan River service area on February 16, 1956.

Water Supply

Water in the Susan River service area comes from two major sources: snowmelt runoff and springs. Snowpack in the Willow Creek Valley and Piute Creek watersheds, which contain more than half the Susan River stream system, melts early in the spring and is usually depleted by May 1. Irrigation requirements from this part of the stream system are then almost entirely dependent on the flow of springs that are relatively constant throughout the year.

Under average flow conditions, Lassen, Gold Run, Baxter, and Parker Creeks and the Susan River above Susanville are sustained by snowmelt runoff until early June. The flow from perennial springs in this portion of the system is comparatively small.

The Lassen Irrigation Company stores supplemental water in Hog Flat and McCoy Flat Reservoirs, on the headwaters of the Susan River. This stored water is released into the Susan River Channel and joins the natural flow, usually during June and July. It is then rediverted into Lake Leavitt for further distribution by the irrigation company.

Records of daily mean discharge of the several stream gaging stations in the service area are presented in Tables 48 through 56, pages 105 through 113.

Method of Distribution

A major portion of the irrigation in the Susan River service area is done by flooding. Water is supplied to the area from the Susan River, tributaries to the river, and other minor streams. The distribution of water is provided by a system of diversion dams, canals and ditches. Included in the operation of the service area are three reservoirs owned and operated by the Lassen Irrigation Company which are McCoy Flat Reservoir, Hog Flat Reservoir, and Lake Leavitt.

1990 Distribution

This is the 49th annual report on watermaster service in the Susan River watermaster service area and covers the period of distribution beginning March 1 and continuing until November 1. Virgil Buechler, Water Resources Engineering Associate, was the watermaster.

Streamflow conditions for the service area were at a most severe drought level for 1990, the fourth consecutive year. The 1990 runoff at the USGS gaging station, "Susan River at Susanville," was 22 percent of normal.

Parker Creek

First priority water rights were served through March and then dried up to a spring-fed trickle for the upper users.

Baxter Creek

A minimum flow was available at the start of the season and gradually decreased until it dried up at the Long ditch diversion on April 8, 1990

Hills Creek

The water supply in Hills Creek was insufficient to fill Emerson Lake.

Gold Run Creek

At the beginning of the season the streamflow only provided 29 percent of the water rights. On April 13 the available flow reached its maximum for the season of 13 cfs or 82 percent of the water rights. The streamflow then gradually decreased to 0.6 cfs on June 26 and remained below two cfs until September 30 which was the end of the record.

Piute Creek

The spring-fed water supply was sufficient to satisfy all allotments and provide most of the first priority to the Old Channel users.

Susan River

The flow in the Susan River decreased to 4 cfs or first priority June 21 after McCoy Flat storage water was depleted. The streamflow then decreased to a minimum of 0.14 cfs on September 5, the lowest flow of record.

Considerable channel cleaning was accomplished again this summer on the Old Channel system. The Old Channel headgate was shut off on October 20 for a major attempt to clean the entire reach by removing willows, channel bottom cleaning and channel realignment. While the Old Channel was shut off the flow continued on to the Johnstonville Diversion dam enabling the A&B Canal users to obtain minimum stock water.

Lassen Irrigation Company Reservoirs

McCoy Flat measured inflow was 577 acre-feet for the period April 1 to April 28. McCoy Flat released a total of 719 acre-feet from April 5 through May 6 when it dried up. Hog Flat Reservoir released a total of 347 acre-feet during the period April 30 through May 10 when it dried up.

Lower Susan River Below the Confluence of Willow Creek

The total flow in the Lower Susan River below Willow Creek exceeded 10 cfs until June 29 and then remained above 4 cfs for the remainder of the season.

Lassen Holtzslaw Creek

Lassen Creek had a flow of one cfs on April 8. The creek flow provided only stock water most of the summer.

Willow Creek

The Neuhaus-Jacob ditch had a continuous flow of 2.1 cfs during the period from April 1 to October 31.

The lower Schedule 3 users received their percentage of second priority water for the summer.

Flow of Mapes Big Springs. To determine the flow of Mapes Big Springs, a gaging station with a 5-foot parshall flume was operated in 1990 by DWR. This station, "Willow Creek (above Mapes Big Springs) near Susanville," is above Mapes Big Springs and is located 1.7 miles above the USGS gaging station "Willow Creek near Susanville." The difference in the mean daily cubic feet per second of these two station is the flow of Mapes Big Springs in this 1.7 mile reach and has been computed as follows:

Flow of Mapes Big Springs

Month	cfs
April	4.5
May	1.7
June	3.2
July	3.2
August	2.1
September	1.1

The flow at Willow Creek near the Susanville USGS gaging station and Willow Creek (above Mapes Big Springs) near Susanville is presented in Tables 52 and 53.

SUSAN RIVER WATERMASTER SERVICE AREA

TABLE 48

1990 Daily Mean Discharge
(In cubic feet per second)

SUSAN RIVER AT SUSANVILLE[1/]

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	54	55	87	75	4.7	0.8	0.5E
2	49	56	110	67	3.9	0.8	0.3E
3	119	55	106	58	4.3	0.7	0.2E
4	90	58	101	47	4.6	0.7	0.2E
5	64	63	95	41	5.1	0.6	0.2E
6	58	72	85	36	5.2	0.6	0.2E
7	59	80	66	28	3.7	0.6E	0.1E
8	61	73	36	22	1.8	0.6E	0.1E
9	56	67	29	20	1.7	0.7E	0.1E
10	56	60	22	17	1.7	0.7E	0.2E
11	46	55	19	17	2.0	0.7E	0.2E
12	40	51	17	17	2.0	0.6E	0.8E
13	35	46	16	16	1.9	0.6E	0.4E
14	35	44	15	18	1.9	0.5E	0.2
15	37	42	15	17	2.0	0.5E	0.2
16	42	40	14	17	2.0	0.4E	0.3
17	55	39	12	15	2.1	0.4E	0.3
18	75	37	10	12	3.1	0.5E	0.2
19	91	37	10	12	4.6	0.5E	3.5
20	100	34	13	12	3.7	0.6E	2.7
21	100	33	18	10	3.1	0.6E	0.7
22	104	32	14	7.8	2.5	0.7E	0.7
23	105	45	17	6.6	1.5	0.7E	0.9
24	100	44	21	6.0	1.1	0.7E	1.2
25	94	34	16	6.3	1.1	0.7E	1.6
26	94	30	13	6.1	1.0	0.7E	1.3
27	81	28	15	4.6	1.0	0.8E	1.8
28	73	27	19	4.7	1.0	0.7E	1.0
29	64	28	20	4.8	0.9	0.6E	1.1
30	58	26	25	5.2	0.9	0.6E	0.9
31	55		88		0.9	0.6E	
MEAN	69.4	46.4	36.9	20.9	2.5	0.6E	0.7E
AC-FT	4260	2760	2270	1240	153	39E	44E

[1/] USGS Station
E - Estimated

SUSAN RIVER WATERMASTER SERVICE AREA

TABLE 49

1990 Daily Mean Discharge
(In cubic feet per second)

SUSAN RIVER ABOVE NO. 44 DIVERSION

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		34	10	80	5.0	0.0	0.0
2		34	13	61	5.0	0.0	0.0
3		31	12	58	4.9	0.0	0.0
4		28	10	48	3.5	0.0	0.0
5		31	28	39	3.5	0.0	0.0
6		36	7.0	31	2.0	0.0	0.0
7		42	6.8	24	1.8	0.0	0.0
8		39	6.8	16	1.3	0.0	0.0
9		36	7.0	15	0.8	0.0	0.0
10		34	7.0	13	0.6	0.0	0.0
11		32	8.0	10	0.6	0.0	0.0
12		32	8.0	10	0.5	0.0	0.0
13		31	10	10	0.5	0.0	0.0
14		28	11	10	0.5	0.0	0.0
15		28	14	10	0.5	0.0	0.0
16		28	17	10	0.5	0.0	0.0
17		28	19	8.5	0.8	0.0	0.0
18		16	20	8.4	2.1	0.0	0.0
19		10	20	8.4	21	0.0	0.0
20	42[1/]	10	19	8.0	19	0.0	0.0
21	42	10	26	7.8	1.8	0.0	0.0
22	42	10	23	23	19	0.0	0.0
23	39	21	24	5.0	18	0.0	0.0
24	35	32	25	5.0	13	0.0	0.0
25	35	23	25	5.0	0.6	0.0	0.0
26	35	22	24	5.0	0.6	0.0	0.0
27	35	21	25	5.0	0.5	0.0	0.0
28	35	10	25	5.0	0.8	0.0	0.0
29	34	6.8	26	5.0	0.8	0.0	0.0
30	34	6.8	53	5.0	0.6	0.0	0.0
31	34		80		0.4	0.0	
MEAN	36.8	25.0	19.7	18.3	4.2	0.0	0.0
AC-FT	876	1490	1210	1090	258	0.0	0.0

[1/] No record before March 20.

SUSAN RIVER WATERMASTER SERVICE AREA

TABLE 50

1990 Daily Mean Discharge
(In cubic feet per second)

SUSAN RIVER ABOVE CONFLUENCE OF WILLOW CREEK

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	29	11	4.6	22	0.2	0.2	0.0
2	27	13	3.6	15	0.0	0.2	0.1
3	27	12	2.5	10	0.0	0.2	1.1
4	27	13	2.6	8.9	0.0	0.2	0.0
5	18	11	2.3	4.9	2.0	0.2	0.0
6	13	7.6	2.3	7.6	0.0	0.2	0.0
7	11	4.9	2.0	6.7	0.0	0.0	0.0
8	13	15	2.3	5.7	1.0	0.0	0.0
9	12	19	2.3	5.1	0.1	0.0	0.0
10	9.5	15	2.4	4.6	0.1	0.0	0.8
11	7.9	14	2.5	3.3	0.1	0.0	0.4
12	9.8	12	2.5	2.7	0.1	0.0	0.0
13	9.8	15	2.5	2.7	0.1	0.0	0.0
14	7.3	13	2.3	2.7	0.1	0.0	0.0
15	7.3	9.8	2.3	2.7	0.1	0.0	0.0
16	6.7	9.8	2.3	2.7	0.1	0.0	0.0
17	6.7	11	2.0	7.3	3.2	0.0	0.8
18	7.3	11	2.3	2.5	3.4	0.0	0.4
19	8.9	9.8	2.3	1.9	3.6	0.8	0.0
20	8.9	7.9	2.4	1.6	2.5	1.6	0.0
21	4.6	7.3	2.5	1.6	2.5	0.8	0.0
22	15	6.2	2.6	0.8	0.1	0.0	0.0
23	27	5.1	2.7	0.8	0.1	0.0	0.0
24	25	5.9	2.7	0.8	1.0	0.0	0.0
25	15	8.9	2.7	0.8	0.2	0.0	0.0
26	11	7.3	2.7	0.8	0.2	0.0	1.1
27	11	6.7	2.7	1.6	0.2	1.1	0.4
28	6.7	6.2	2.7	1.1	0.2	0.1	0.0
29	7.3	5.7	2.7	0.8	0.2	0.0	0.0
30	9.8	4.6	2.7	0.4	0.2	0.0	0.0
31	11		12		0.2	0.0	
MEAN	13.2	10.0	2.9	4.3	0.7	0.2	0.2
AC-FT	813	593	177	258	43	11	10

SUSAN RIVER WATERMASTER SERVICE AREA

TABLE 51

1990 Daily Mean Discharge
(In cubic feet per second)

GOLD RUN CREEK NEAR SUSANVILLE

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		8.2	7.6	11	0.6	0.6	0.9
2		8.2	6.0	12	0.6	0.6	0.8
3		8.5	6.0	12	0.6	0.6	0.7
4		11	6.2	9.0	0.6	0.6	0.8
5		11	6.2	7.4	0.9	0.6	0.9
6		11	5.6	5.2	0.9	0.6	0.9
7		12	5.2	5.2	0.9	0.6	0.8
8		12	5.2	8.0	1.0	0.6	0.8
9		13	5.2	4.0	0.9	0.6	0.7
10		12	4.8	4.0	0.9	0.6	0.9
11		13	5.2	4.0	0.6	0.6	0.9
12		13	5.2	4.0	0.6	0.6	0.9
13		13	5.6	4.2	0.6	0.6	0.9
14	4.0[1/]	13	6.0	4.1	0.6	0.6	0.9
15	4.0	13	6.0	4.0	0.6	0.6	1.0
16	4.0	13	7.6	4.0	0.6	0.6	1.1
17	4.1	13	7.6	3.6	0.6	0.6	0.9
18	5.2	13	7.6	3.0	0.6	0.9	0.9
19	5.3	12	7.7	3.0	0.6	1.4	0.9
20	7.6	12	9.6	2.4	0.6	1.6	0.9
21	8.2	12	11	2.4	0.6	1.6	0.9
22	10	11	10	2.1	0.6	1.5	0.9
23	11	11	11	1.6	0.6	0.9	0.8
24	11	12	5.2	1.2	0.6	0.9	0.9
25	11	12	8.2	0.8	0.6	0.9	0.9
26	10	11	8.2	0.6	0.6	0.9	0.9
27	10	10	8.3	0.6	0.6	0.9	1.2
28	7.6	10	6.1	0.6	0.6	0.9	1.2
29	7.6	8.2	5.8	0.6	0.6	0.9	1.2
30	7.6	7.6	5.2	0.6	0.6	0.9	1.1
31	7.6		12		0.6	0.9	
MEAN	7.5	11.3	7.0	4.2	0.6	0.9	0.9
AC-FT	267	674	430	247	40	50	55

[1/] No record before March 14.

SUSAN RIVER WATERMASTER SERVICE AREA

TABLE 52

1990 Daily Mean Discharge
(In cubic feet per second)

WILLOW CREEK NEAR SUSANVILLE[1/]

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	53	16	10	12	6.4	4.3	4.5
2	51	18	10	13	6.2	4.2	4.0
3	67	19	11	13	6.2	4.1	3.5
4	86	19	11	11	6.2	3.7	3.2
5	64	20	11	10	6.1	3.6	3.2
6	48	19	11	9.7	6.3	3.6	3.2
7	41	17	10	9.3	6.3	3.6	3.2
8	37	15	9.5	9.0	6.1	3.7	3.3
9	36	14	8.4	8.8	5.5	3.8	3.3
10	36	16	9.2	8.5	5.1	3.7	3.4
11	38	19	9.7	8.4	4.8	3.6	3.4
12	37	21	9.7	8.1	4.5	3.4	3.2
13	35	20	9.7	8.0	4.7	3.3	3.0
14	35	16	9.6	7.8	4.6	3.3	2.9
15	34	16	9.5	7.8	4.6	3.3	2.8
16	31	18	8.8	7.8	4.5	3.2	2.8
17	22	20	7.9	7.7	4.6	3.4	3.2
18	19	22	7.6	7.5	6.4	3.4	3.5
19	16	21	7.6	7.2	5.3	3.7	3.7
20	21	20	7.8	7.2	5.0	4.1	4.1
21	21	21	8.2	8.0	4.8	4.5	4.2
22	20	23	8.4	9.4	4.6	4.6	4.4
23	20	23	8.7	10	4.6	4.8	4.6
24	20	23	9.0	9.4	4.5	4.9	4.9
25	20	21	9.0	8.3	4.4	4.8	5.0
26	20	19	8.8	7.6	4.4	5.0	5.3
27	20	15	8.8	7.3	4.5	5.2	5.4
28	21	12	8.5	6.9	4.5	5.0	5.3
29	21	10	8.1	6.6	4.8	4.7	5.3
30	21	10	8.5	6.5	4.8	4.9	5.3
31	20		11		4.5	4.9	
MEAN	33.3	18.1	9.2	8.7	5.1	4.0	3.9
AC-FT	2040	1080	567	519	317	251	232

[1/] USGS Station.

SUSAN RIVER WATERMASTER SERVICE AREA

TABLE 53

1990 Daily Mean Discharge
(In cubic feet per second)

WILLOW CREEK (ABOVE MAPES BIG SPRINGS) NEAR SUSANVILLE[1/]

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		10[2/]	7.7	9.7	3.5	2.5	3.2
2		12	8.6	10	3.5	2.5	2.5
3		12	9.4	9.1	3.5	2.2	2.1
4		13	11	7.6	3.3	1.8	2.0
5		15	11	6.3	3.4	1.7	1.9
6		12	9.8	5.3	3.8	1.7	2.0
7		11	9.3	4.8	3.8	1.6	2.1
8		8.5	8.4	4.4	3.4	1.4	2.1
9		8.9	7.2	4.2	2.5	1.3	2.1
10		11	8.8	4.2	2.1	1.2	2.5
11		14	9.3	4.1	1.4	1.1	2.1
12		15	9.2	4.0	0.7	1.0	2.1
13		15	9.1	3.7	0.5	0.9	1.7
14		11	8.9	3.6	0.6	0.6	1.4
15		12	8.6	3.8	0.1	0.2	1.2
16		14	7.4	3.8	0.0	0.0	1.2
17		16	6.2	3.7	0.3	0.0	1.4
18		18	5.8	3.6	0.8	0.1	1.4
19		17	5.8	3.3	1.6	1.3	2.5
20		16	6.1	3.4	1.0	1.6	4.1
21		18	6.6	4.6	0.7	2.1	4.2
22		20	6.5	6.2	0.6	2.3	4.9
23		20	6.3	6.9	1.4	2.8	4.8
24		20	6.5	6.3	1.1	2.8	4.1
25		18	6.3	4.9	1.0	3.0	3.9
26		16	5.7	4.4	1.1	3.4	4.4
27		12	5.2	4.3	1.4	3.8	4.0
28		8.3	5.0	3.9	2.1	3.6	3.6
29		6.6	4.9	3.6	2.7	3.7	3.6
30		7.1	4.9	3.6	2.9	3.9	3.4
31			8.4		2.7	3.6	
MEAN		13.6	7.5	5.0	1.9	1.9	2.8
AC-FT		808	464	300	114	118	164

1/ This station is operated by DWR and is located 1.7 miles above the USGS "Willow Creek near Susanville" stream gage. The purpose of this station is to determine the flows of "Mapes Big Springs" by computing the difference in flows between the two stations.

2/ No record before April 1.

SUSAN RIVER WATERMASTER SERVICE AREA

TABLE 54

1990 Daily Mean Discharge
(In cubic feet per second)

WILLOW CREEK AT THE CONFLUENCE OF THE SUSAN RIVER

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		23	12	19	8.0	6.7	5.7
2		21	14	20	7.3	6.7	5.9
3		22	14	15	5.9	6.7	6.7
4		23	14	15	5.7	6.5	6.5
5		23	14	14	5.7	6.2	6.5
6		24	14	14	6.7	4.3	6.2
7		19	14	13	7.9	4.3	6.5
8		21	14	13	7.3	4.3	6.5
9		20	14	12	6.5	4.6	6.7
10		19	13	12	5.9	4.3	6.5
11		20	13	12	5.9	5.7	5.9
12		25	13	12	5.1	5.7	5.7
13		26	12	12	6.7	5.7	5.7
14		25	11	11	6.7	5.7	5.4
15	37[1/]	20	11	11	7.0	5.7	5.4
16	37	21	12	8.9	6.7	5.4	5.4
17	32	21	12	8.9	7.3	5.1	5.4
18	28	25	12	8.9	8.6	5.1	5.4
19	21	26	12	9.2	9.5	4.9	5.4
20	25	24	11	9.2	7.9	4.9	5.4
21	27	23	12	9.2	7.6	4.6	5.4
22	27	26	11	9.5	6.5	4.9	5.7
23	27	24	12	10	6.7	5.4	5.7
24	27	23	12	12	7.0	5.7	5.9
25	26	23	12	12	7.0	5.9	6.2
26	25	21	12	12	7.0	5.9	7.0
27	26	19	13	12	6.5	6.2	6.7
28	25	19	13	9.5	6.5	5.7	7.0
29	26	15	13	9.5	6.7	5.9	7.3
30	24	13	13	8.9	6.7	6.2	6.7
31	24		13		6.7	5.9	
MEAN		21.8	12.6	11.8	6.9	5.5	6.1
AC-FT	920	1297	778	704	423	339	361

[1/] No record before march 15.

SUSAN RIVER WATERMASTER SERVICE AREA

TABLE 55

1990 Daily Mean Discharge
(In cubic feet per second)

OPERATION OF MCCOY AND HOG FLAT RESERVOIRS

	McCoy Flat Reservoir Inflow from Susan River	McCoy Flat Reservoir Release to Susan River		Hog Flat Reservoir Releases to Susan River	
DAY	APRIL	APRIL	MAY	APRIL	MAY
1	16[1]		61		27
2	16		59		23
3	18		56		21
4	19		54		19
5	14	3.7[2]	48		15
6	13	9.2	152[2]		12
7	19	9.2			11
8	14	9.2			11
9	12	9.0			6.7
10	10	6.4			2.5[2]
11	9.5	4.8[2]			
12	11				
13	11				
14	12				
15	12				
16	11				
17	9.8				
18	8.9				
19	7.3				
20	5.9				
21	4.6				
22	3.6				
23	8.9				
24	13				
25	5.9				
26	3.6				
27	1.0				
28	1.0[1]				
29					
30		18[2]		27[2]	
31					
MEAN	10.4	8.8	48.8	27.0	14.8
AC-FT	577	138	581	54	293

[1] No record before April 1 and no flow after April 28.
[2] No other releases before or after this period.

SUSAN RIVER WATERMASTER SERVICE AREA

TABLE 56

1990 Daily Mean Discharge
(In cubic feet per second)

A AND B CANAL ABOVE LAKE LEAVITT

DAY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1	65	8.9					
2	55	4.6	55				
3	68	4.6	49				
4	114	4.6	46				
5	78	5.1	45				
6	69	13	55				
7	65	2.5	33				
8	69		22				
9	61		12				
10	63		7.3				
11	52		1.9				
12	44		1.0				
13	37		0[1/]				
14	35						
15	33						
16	37						
17	46						
18	58						
19	65						
20	86						
21	75						
22	65						
23	46						
24	38						
25	32						
26	40						
27	22						
28	21						
29	20						
30	18						
31	37						
MEAN	52.0	6.1	27.2				
AC-FT	3200	85	648				

[1/] No flow from April 8 to May 1 and after May 12.