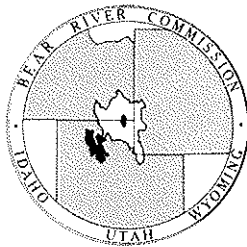


FOURTH ANNUAL REPORT

BEAR RIVER  
COMMISSION

1961

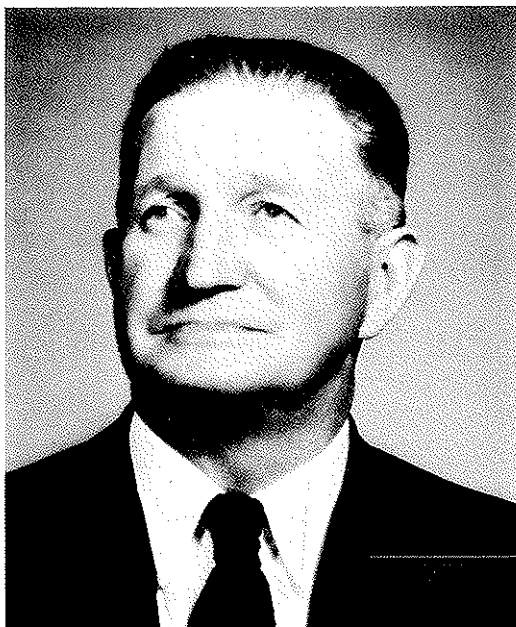


For the Report-Year October 1, 1960 to  
September 30, 1961

LOGAN, UTAH

April 1, 1962

IN MEMORIAM



FRED M. COOPER  
Commissioner from Idaho

Bear River Commission, 1958-61

BEAR RIVER COMMISSION

P. O. BOX 413

LOGAN, UTAH


April 1, 1962

Mr. President:

Submitted herewith is the Fourth Annual Report of the Bear River Commission, as required by Article III D 2 of the Bear River Compact.

A copy of the report is being transmitted to the Governor of each signatory State to the Bear River Compact.

Very truly yours,



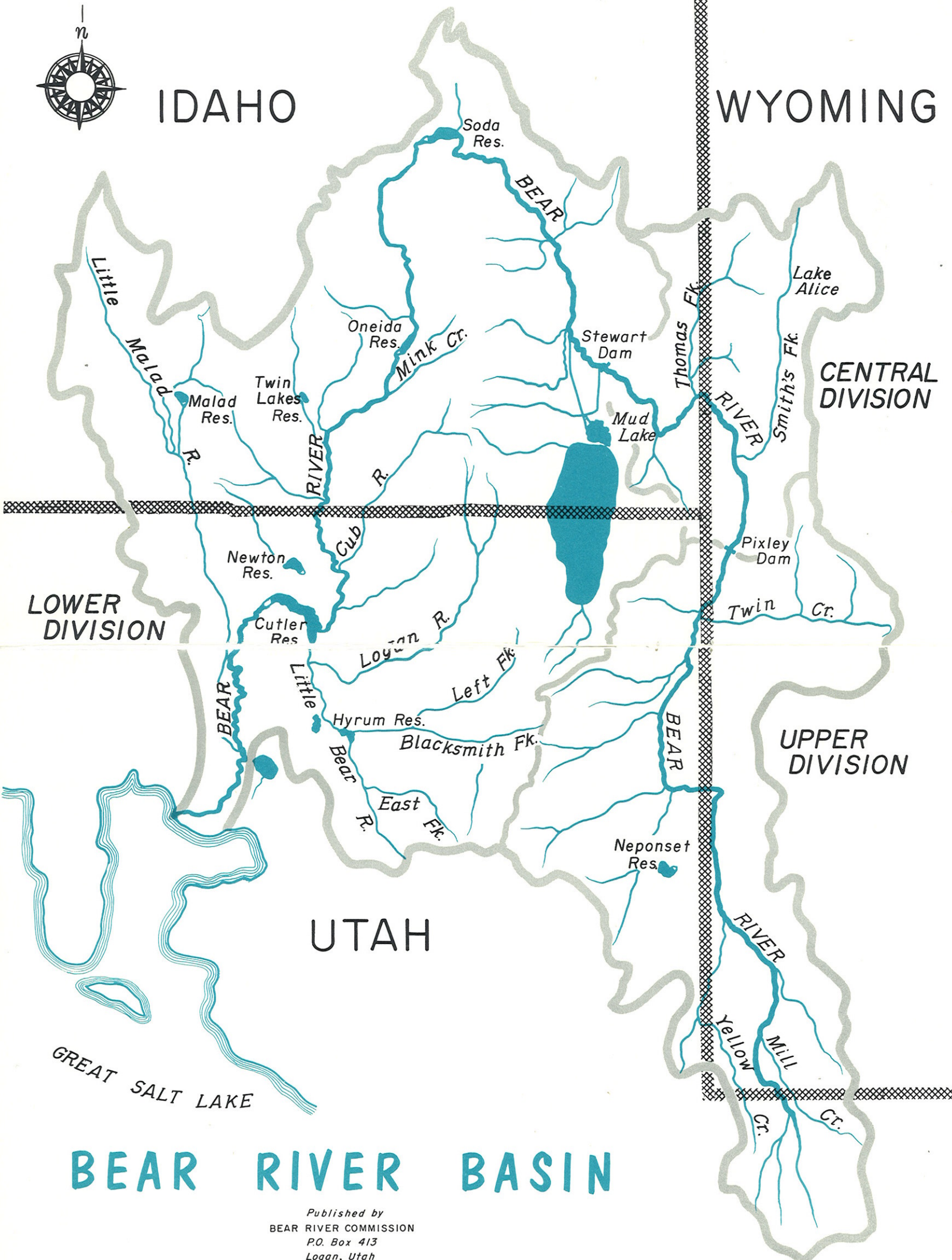
Wallace N. Jibson  
Assistant Secretary

THE PRESIDENT  
*The White House*  
*Washington, D. C.*



IDAHO

WYOMING



LOWER DIVISION

CENTRAL DIVISION

UPPER DIVISION

UTAH

GREAT SALT LAKE

# BEAR RIVER BASIN

Published by  
BEAR RIVER COMMISSION  
P.O. Box 413  
Logan, Utah

## TABLE OF CONTENTS

	Page
Letter of Transmittal.....	3
Frontispiece, Map of Bear River Basin.....	4-5
Introduction.....	9
Organization.....	9
Meetings.....	11
Budget and Fiscal Disbursements.....	11
Stream-Gaging Program.....	11
Hydrology.....	12
Water Supply.....	12
Comparative Flow at Gaging Stations (figure 1).....	13
Weather Modification Program.....	14
Bear Lake Bar Graph (figure 2).....	15
Administration and Compact Operation.....	14
General.....	14
Distribution of Streamflow.....	16
Upper Division.....	16
Central Division.....	17
Lower Division.....	17
Interstate Tributaries.....	18
Storage.....	18
New Storage.....	18
Bear Lake.....	18
Applications for Appropriation.....	18
Water Supply Hydrographs (figures 3, 4).....	19-20
Bear Lake Hydrograph (figure 5).....	21
Upper Division Hydrographs (figures 6, 7).....	22-23
Central Division Hydrographs (figures 8, 9).....	24-25
Central Division Tabulation of Diversions (tables 1-5).....	26-30
Appendix A—Auditor’s Report.....	32-36
Appendix B—Gaging-Station Records.....	38-63

# FOURTH ANNUAL REPORT OF THE BEAR RIVER COMMISSION

April 1, 1962

## ***I. Introduction***

The Bear River Compact is an interstate pact which determines the rights and obligations of the signatory States of Wyoming, Idaho, and Utah with respect to the waters of Bear River. Federal consent was given by the Congress, and legislation was approved March 17, 1958 by the President. The Bear River Commission was established as the interstate administrative agency to carry out provisions of the Compact.

Article III D 2 of the Compact provides that the Bear River Commission shall compile annually a report covering the work of the Commission for the water year ending the previous September 30 and transmit it to the President of the United States and to the Governors of the signatory States on or before April 1 of each year.

Activities of the Bear River Commission during the water year ending September 30, 1961 are summarized in this report. Financial report of the auditors and daily stream-gaging records are included in the appendixes.

## ***II. Organization***

Ten commissioners, three representing each State and one the United States, constitute the Bear River Commission. The Federal representative serves as Chairman without vote.

Those associated with the Bear River Compact were grieved to hear of the death in August 1961 of Fred M. Cooper who had served both with the negotiating commission and the present Bear River Commission. This vacancy in the Idaho representation remained until December 1961 when Cleo L. Swenson was appointed to the Commission.

## OFFICERS

Chairman .....E. O. Larson, Salt Lake City, Utah  
Vice-Chairman .....J. W. Myers, Evanston, Wyoming  
Secretary-Treasurer .....Jay R. Bingham, Bountiful, Utah  
Assistant Secretary .....Wallace N. Jibson, Logan, Utah

## MEMBERS

### Idaho

Fred M. Cooper .....Grace, Idaho  
Melvin Lauridsen .....Montpelier, Idaho  
George N. Carter .....Boise, Idaho

### Utah

Jay R. Bingham .....Bountiful, Utah  
Lawrence B. Johnson .....Randolph, Utah  
A. V. Smoot .....Corinne, Utah

### Wyoming

Earl Lloyd .....Cheyenne, Wyoming  
S. Reed Dayton .....Cokeville, Wyoming  
J. W. Myers .....Evanston, Wyoming

### United States

E. O. Larson .....Salt Lake City, Utah

## COMMITTEES

### Budget

A. V. Smoot .....Corinne, Utah  
J. W. Myers .....Evanston, Wyoming  
Melvin Lauridsen .....Montpelier, Idaho

### Operations

Fred M. Cooper .....Grace, Idaho  
Lawrence B. Johnson .....Randolph, Utah  
S. Reed Dayton .....Cokeville, Wyoming

### III. Meetings

Meetings of the Commission were held in accordance with the bylaws as follows:

Annual Meeting — April 17, 1961 — Salt Lake City, Utah

Regular Meeting — October 23, 1961 — Salt Lake City, Utah

### IV. Budget and Fiscal Disbursements

#### ADOPTED BUDGET

(As Revised)

	<i>Fiscal Year Ending 6-30-1962</i>	<i>Fiscal Year Ending 6-30-1963</i>	<i>Total Biennium Ending 6-30-1963</i>
<b>Compact Administration</b>			
Personal Services .....	\$ 7,300	\$ 7,160	\$14,460
Travel and Subsistence .....	1,000	1,000	2,000
General Office Expense .....	370	360	730
Fiscal & Administrative .....	340	440	780
Washington Office Tech. Charge ....	740	890	1,630
Printing and Reproduction .....	700	700	1,400
Treasurer (Bond and Audit) .....	400	400	800
Transcribing Minutes .....	150	150	300
Legal Retainer Fee .....	300	300	600
Miscellaneous .....	100	100	200
Sub-Total .....	\$11,400	\$11,500	\$22,900
<b>Stream-Gaging Program</b>			
Geological Survey .....	\$30,600	\$31,000	\$61,000
Total .....	\$42,000	\$42,500	\$84,500

#### ALLOCATION OF PROPOSED BUDGET

U. S. Geological Survey .....	\$15,300	\$15,500	\$30,800
State of Idaho .....	8,900	9,000	17,900
State of Utah .....	8,900	9,000	17,900
State of Wyoming .....	8,900	9,000	17,900
Total .....	\$42,000	\$42,500	\$84,500

All disbursements of Commission funds are made by check on vouchers signed by the Secretary-Treasurer, and approved and countersigned by the Chairman or Vice-Chairman.

The audit of accounts and records, including balance sheet of June 30, 1961, statement of budget revenue and appropriation accounts for the fiscal year ended June 30, 1961, are included in this report as appendix A.

### V. Stream-gaging Program

A cooperative, basin-wide program is administrated from the Geological Survey project office at Logan, Utah. This program is financed equally by the Geological Survey and the Bear River Commission. Re-



cords were secured at 32 gaging stations, most of which are operated for determination of water resources in the basin, and an additional 11 stations operated by Utah Power & Light Company under FPC license.

Additional gaging stations were installed during the water year on Rock Creek (Wyoming), St. Charles Creek (Idaho), and Summit Creek (Utah). Bear River station near Woodruff, Utah was moved to a site above Woodruff Narrows Reservoir, and an outflow station was installed a short distance below Woodruff Narrows Dam.

Water commissioners, employed by irrigation district or State, collected seasonal daily or partial records on about 130 irrigation canals above Bear Lake. These records were made available once or twice each week to the Commission office and were used to determine section allocations as required by the Compact. Geological Survey personnel spot checked discharge measurements and gaging procedures for adherence to standards of the Commission. Daily discharge records for canals in the Central Division are shown in tables 1-5; those in the Upper Division are maintained in the Commission file but are not published herein.

## VI. Hydrology

### A. Water Supply

Runoff in Bear River basin this year was in the range of 40 to 60 percent of the 19-year (1943-61) average. Supply was only slightly better than during the drouth of 1934 on such tributaries as Smiths Fork and Logan River.

Monthly and annual discharge at three representative gaging stations in the basin compared with long-time averages is shown in figure 1. Hydrographs of Bear River and Smiths Fork runoff are shown in figures 3 and 4 and the data are summarized in the following tables:

#### *Runoff in Acre-feet May-September*

	<i>Average 1943-61</i>	<i>1960</i>	<i>1961</i>
Upper Bear River .....	112,700	82,800	66,300
Smiths Fork .....	100,500	72,300	43,400
Total .....	213,100	155,100	109,700

#### *Runoff in Acre-feet Water Year*

	<i>Average 1943-61</i>	<i>1960</i>	<i>1961</i>
Upper Bear River .....	134,700	108,300	82,500
Smiths Fork .....	136,700	109,600	73,100
Total .....	271,400	217,900	155,600

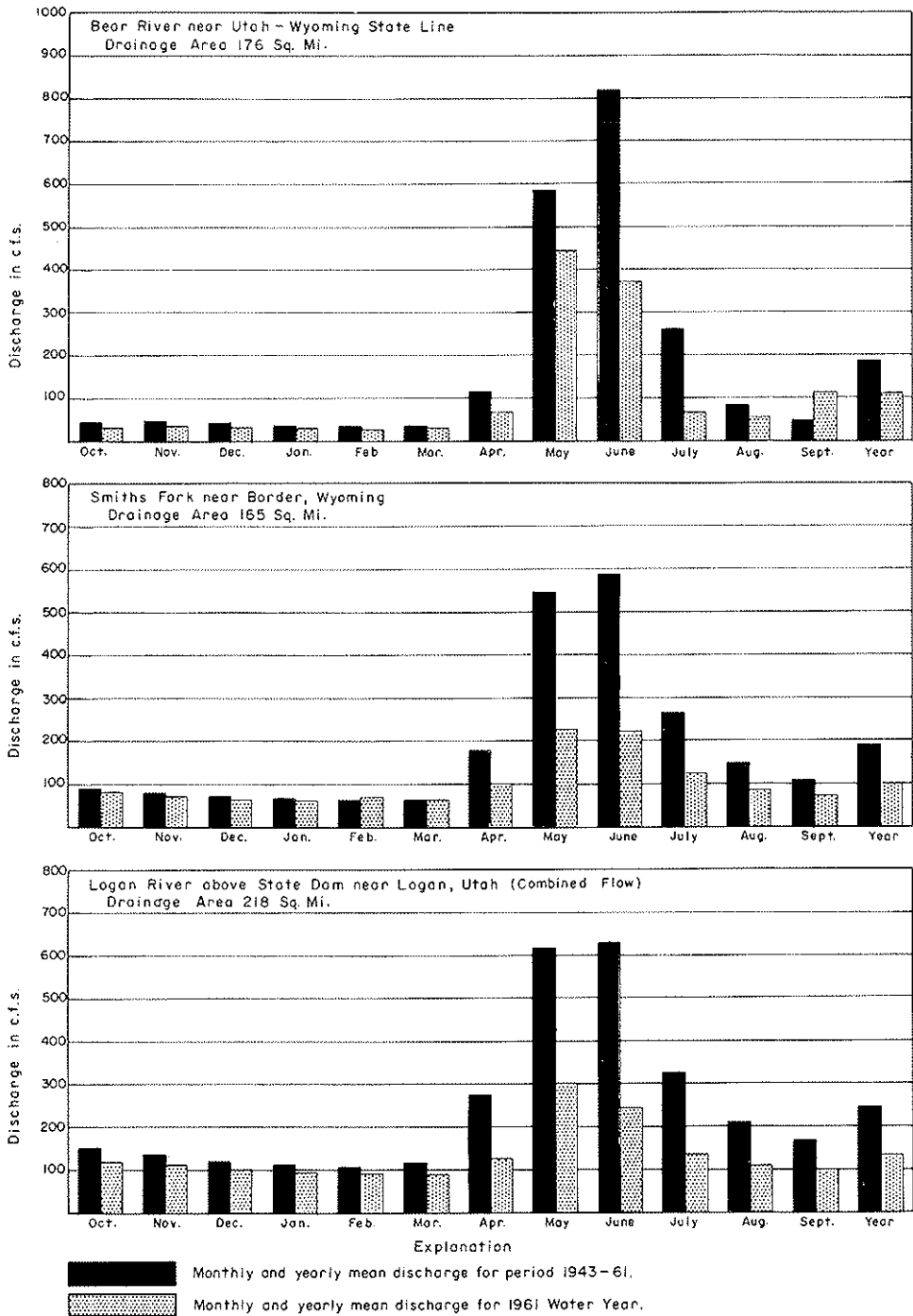


Fig 1. Comparison of discharge at three representative gaging stations during 1961 with average discharge for period 1943-61.

Bear Lake gained only 44,000 acre-feet during the winter and spring storage period while irrigation demand resulted in subsequent depletion of 338,000 acre-feet resulting in a net annual loss of 294,000 acre-feet. Irrigation season depletion was exceeded only in 1934 and then by less than ten percent. The bar graph in figure 2 compares 1961 lake operation with long-time averages. Bear Lake hydrographs for 1960 and 1961 are shown in figure 5, daily contents for 1961 in appendix B, and comparative elevations in the following table:

*Bear Lake elevation*

*Utah Power & Light Co. datum*

<i>Water Year</i>	<i>Beginning of Water Year</i>	<i>End of Storage Period</i>	<i>End of Water Year</i>
1959 .....	5,917.35	5,918.78	5,916.27
1960 .....	5,916.27	5,918.51	5,914.30
1961 .....	5,914.25	5,914.90	5,909.75

**B. Weather Modification Program**

A cloud-seeding program sponsored by Utah Power & Light Company has been in operation for the past several years and was continued during 1961. Silver iodide is released from smoke generators situated at strategic points over the upper basin.

**VII. Administration of Bear River Compact**

**A. General**

Provisions of the Compact are administered and enforced by direction of the Bear River Commission. However, water rights within each State are adjudicated and administered in accordance with State law subject to limitations provided in the Compact.

Cooperative stream-gaging agreements with the Geological Survey include a program of administrative and technical assistance to the Commission financed without matching Federal funds. This program is directed by the Geological Survey project engineer at Logan with the project office also serving as principal office for the Commission.

The project engineer serves as Assistant Secretary to the Commission with responsibility to provide technical assistance and current streamflow data as required to operate under terms of the Compact. He establishes operational procedures, prepares hydrologic studies, and maintains the files and records of the Commission. Annual reports are compiled by the Assistant Secretary and Secretary-Treasurer.

Expense incurred by the Bear River Commission are paid equally by the signatory States. Compensation and expenses of the Federal representative, each commissioner, and each adviser are paid by the Government which he represents.

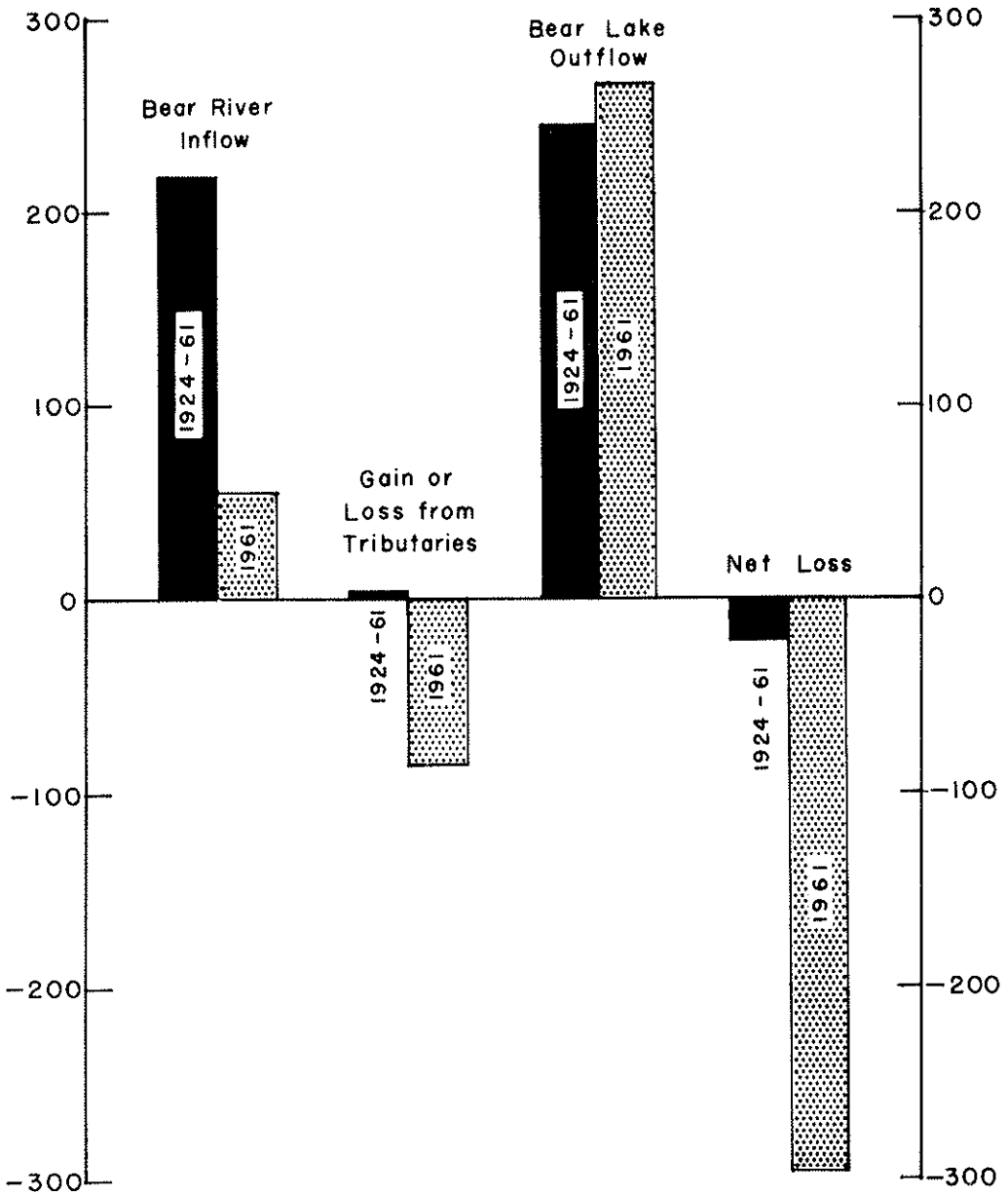


Fig. 2. BEAR LAKE  
Annual Quantities in Thousands of Acre-Feet

## B. Distribution of Streamflow

Streamflow records of individual diversions and of the river flow at designated points were collected by the Geological Survey, local water commissioners, and Utah Power and Light Company. Records were submitted currently to the Assistant Secretary for computation of diversion and allocation data which were then reported to the Commission and local water commissioners for such regulatory action required for compliance with the Compact.

As mentioned earlier, 1961 was one of the two or three drier years in the past several decades. Individual problems of water users of course became more acute this year with a condition of interstate regulation throughout the irrigation season in Upper and Central Divisions. In spite of a most difficult situation no instances of interstate controversy were brought before the Commission, though controversy did occur between users within a State.

### 1. Upper Division

The Upper Division comprises that portion of the basin above and including Pixley Dam and includes two sections in Wyoming and two in Utah. The Compact provides that when the total diversions in the division plus the flow passing Pixley Dam is less than 1,250 cfs (divertible flow), a water emergency exists and such divertible flow is allocated to sections as follows:

Upper Utah Section Diversions .....	0.6 percent
Upper Wyoming Section Diversions .....	49.3 percent
Lower Utah Section Diversions .....	40.5 percent
Lower Wyoming Section Diversions .....	9.6 percent

Hydrographs of diversion and allocation data in the Upper Division are shown in figures 6 and 7. Total divertible flow was less than 1,250 cfs, except one or two days, throughout the season. After mid-June it was evident that further interstate regulation would be of little benefit to Lower Utah and Lower Wyoming Sections. Thereafter, available natural flow in upper sections was diverted in accordance with State priorities until later in the season when stock water shortages required further interstate regulation.

Even more evident than in prior years, was the practical difficulty of maintaining percentage allocations to the State sections while total divertible flow was decreasing rapidly through the 400-600 cfs range. Most acreage in Lower Utah receives little if any water from the flat-gradient canals when discharging at less than half capacity, especially under a falling head. Thus, little is gained from interstate regulation during these periods.

Serious shortages in yield of meadow hay occurred in the lower Utah and Wyoming sections of the division. Availability of stored water and the opportunity of fully utilizing residual or base flow throughout the season alleviated drouth conditions in the upper sections, particularly on land with early priorities. An exception was in the Hilliard Flat area of Upper Wyoming in which, because of late priorities, supplies were very deficient.

## 2. Central Division

The Central Division comprises that part of the basin from Pixley Dam down to and including Stewart Dam (the point of diversion to Bear Lake). It includes a section in Wyoming and one in Idaho.

Article IV of the Compact provides that when the divertible flow in the division is less than 870 cfs, or the flow passing Bear River at Border gaging station is less than 350 cfs, a water emergency shall exist and total Wyoming diversions shall be limited to 43 percent of the divertible flow.

Hydrographs of diversion and allocation data are shown in figures 8 and 9. It is noted that a water emergency as defined above existed throughout the season. Total water diverted in Wyoming was within reasonable limits of allocation based on accuracy of current streamflow data. Total diverted water during the season was within five percent of the allocation.

Wyoming users feel that provisions of the Compact are very severe, especially in an extremely dry year. Percentage allocation of available water is proportional to acreage, and headgate requirement is claimed to be much greater in the gravelly soils which predominate in parts of the Wyoming section. However, it should be noted (see table below) that because total divertible flow includes water passing Stewart Dam and inflow to Bear Lake, Wyoming diversion rate per acre was 25 percent larger than Idaho in 1961 and 30 to 57 percent larger in previous years under interstate regulation.

Crop failures were experienced in both Idaho and Wyoming, especially from grain plantings and in yields of alfalfa. Practically all meadow hay was harvested, but yield was light.

### *Diversion in acre-feet per acre June-September*

	1954	1956	1958	1959	1960	1961*
Wyoming Section .....	4.86	5.40	4.00	3.83	2.99	2.16
Idaho Section** .....	2.01	2.61	2.54	2.52	2.30	1.72

\*May-September

\*\*Excludes flow passing Stewart Dam and Flow diverted to Bear Lake.

## 3. Lower Division

Authority is given the Commission upon its own motion to declare a water emergency in any division, and in the Lower Division such a declaration also may be made upon petition of an aggrieved Utah user against an Idaho user. Upon declaration of an emergency, the Commission is required to enforce water-delivery schedules based on priority of rights without regard to State lines.

There were no petitions filed with the Commission or water emergencies declared in the Lower Division in 1961.

#### 4. Interstate Tributaries

An aggrieved lower-State user on an interstate tributary may petition for declaration of a water emergency and distribution of flow under direction of the Commission. Interstate arbitration on tributaries was not requested in 1961.

#### C. Storage

##### 1. New Storage

The Compact defines storage rights in existing reservoirs above Bear Lake and provides for an additional storage allowance of 36,500 acre-feet annually. Idaho users on Thomas Fork are allotted 1,000 acre-feet of this amount and the remainder is divided equally between Wyoming and Utah.

Water was stored in 1961 in the following reservoirs constructed under additional storage provisions of the Compact:

<i>Reservoir</i>	<i>Capacity</i>
Sulphur Creek Reservoir (Wyoming) .....	4,615 ac-ft*
J. L. Martin, Bazoo Hollow, Sulphur Creek (Wyoming)....	88 ac-ft
A. J. Barker, Yellow Creek (Utah) .....	162 ac-ft

\*About 3,500 ac-ft stored in 1961.

##### 2. Bear Lake

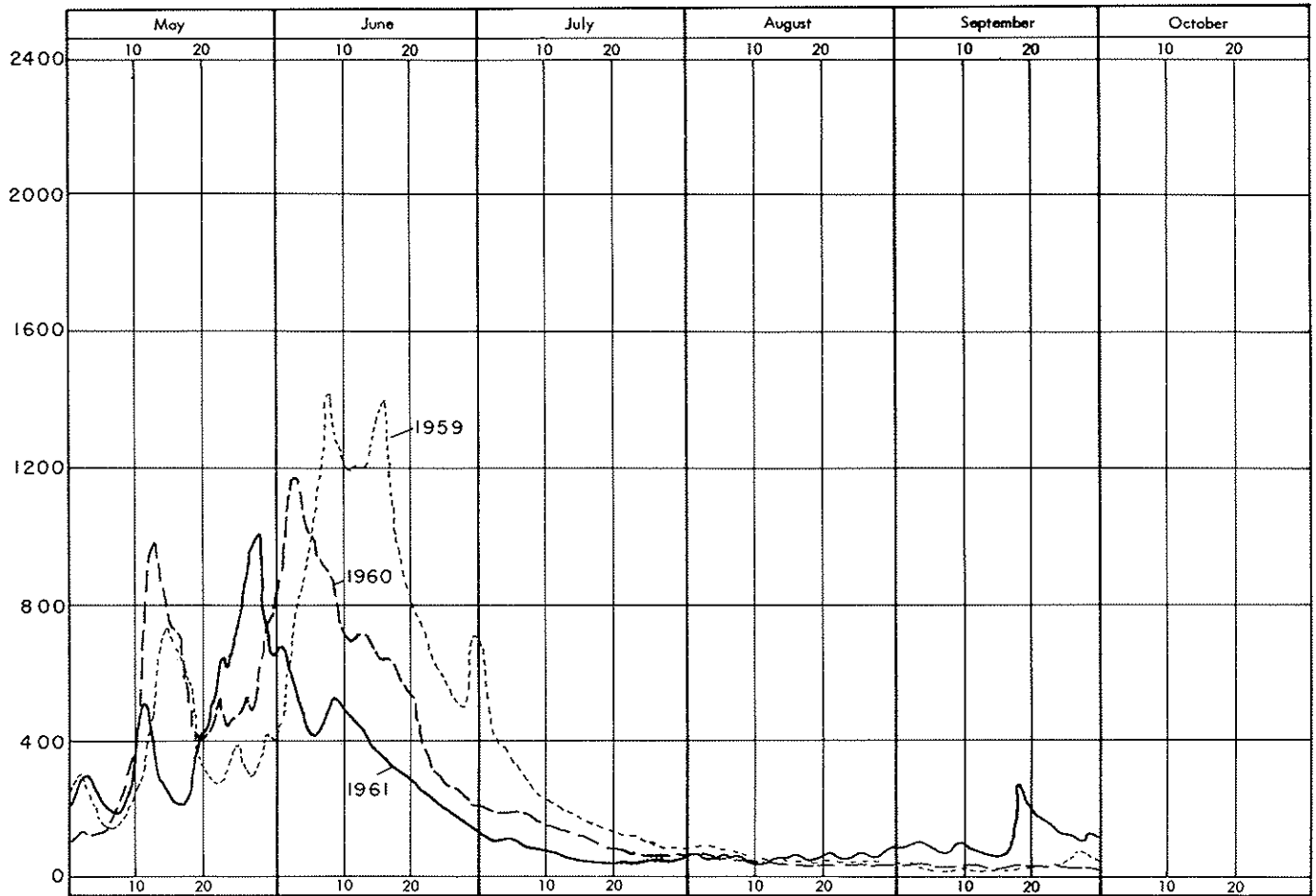
An irrigation reserve in Bear Lake is provided by article V of the Compact which is increased by steps as new storage is developed above the lake. The reserve remained at elevation 5,913.24 feet (703,300 acre-feet) throughout 1961. The lake level dropped below this reserve June 26, 1961 and remained below thereafter. Article V B provides that water of such reserve shall not be released solely for generation of power, except in emergency, but after release for irrigation it may be used for generation of power as it is conveyed to irrigation diversion works. This provision of the Compact has been complied with in 1961.

#### D. Applications for Appropriation

Article X of the Compact states, "Applications for appropriation, for change of point of diversion, place and nature of use, and for exchange of Bear River water shall be considered and acted upon in accordance with the law of the State in which the point of diversion is located, but no such application shall be approved if the effect thereof will be to deprive any water user in another State of water to which he is entitled. The official of each State in charge of water administration shall, upon the filing of an application affecting Bear River water, transmit a copy thereof to the Commission."

A large increase in applications for appropriation of water was noted during 1961 as would be expected in a drouth year. The majority of applications received pertain to ground water development for supplemental irrigation supply. The question of extent to which new rights for underground development might be granted without adverse effect on downstream States is not yet resolved by the committee of State Engineers.

# UPPER DIVISION — BEAR RIVER SUPPLY CUBIC FEET PER SECOND



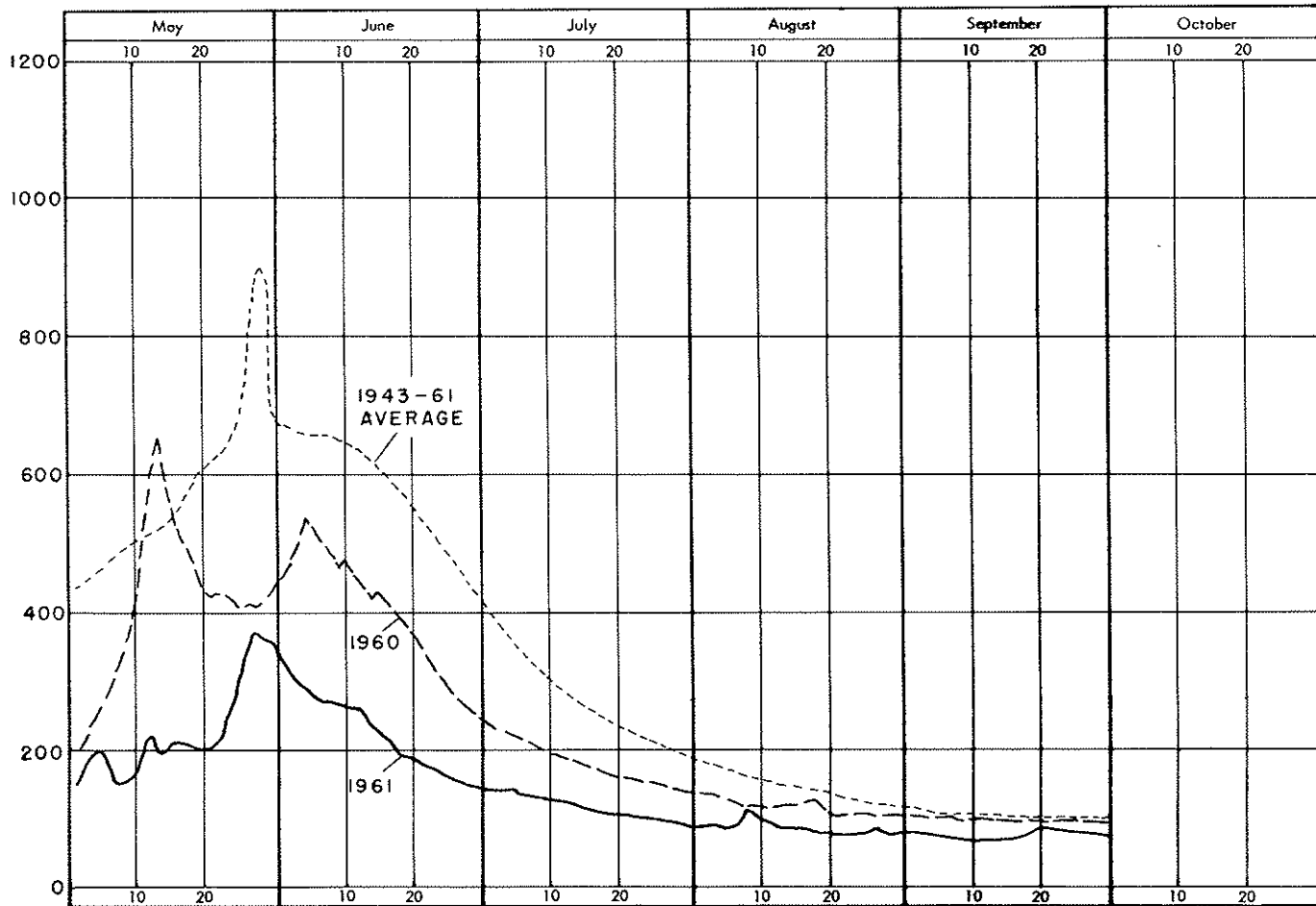
19

Figure 3



# CENTRAL DIVISION - SMITHS FORK SUPPLY

## CUBIC FEET PER SECOND



20

Figure 4

BEAR LAKE

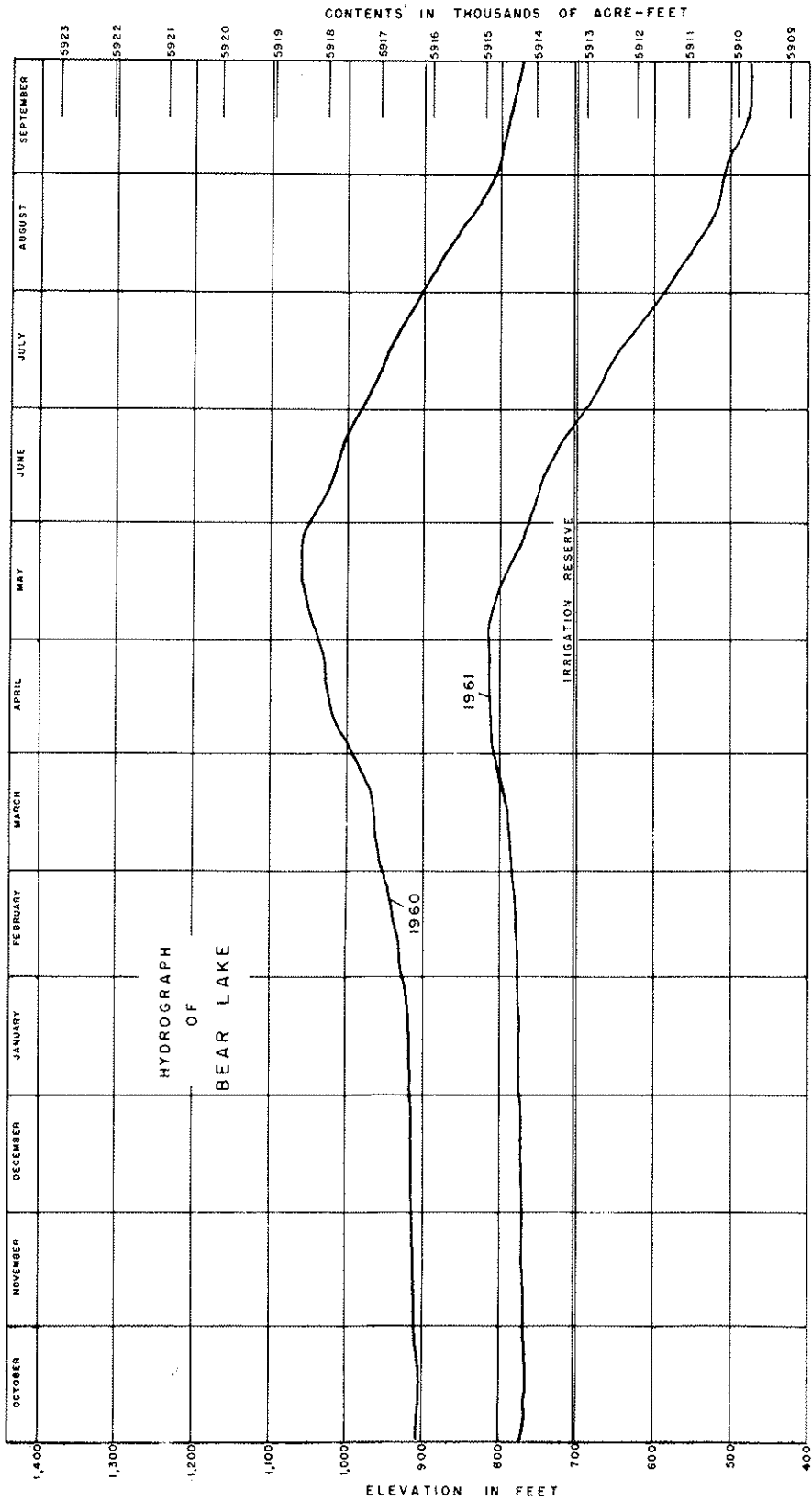


Figure 5

UPPER DIVISION - UPPER WYOMING SECTION  
CUBIC FEET PER SECOND

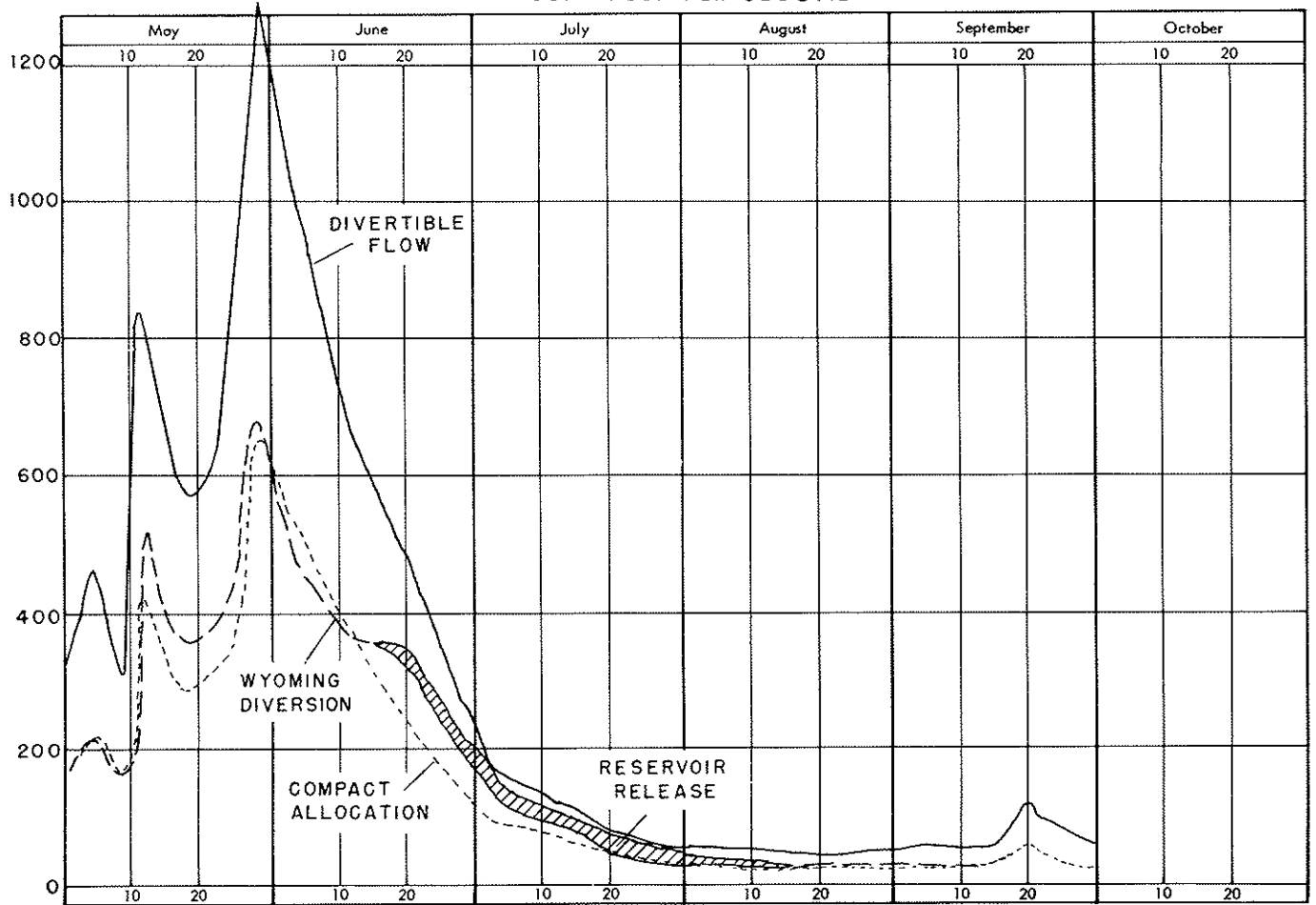


Figure 6

# UPPER DIVISION - LOWER SECTIONS

## CUBIC FEET PER SECOND

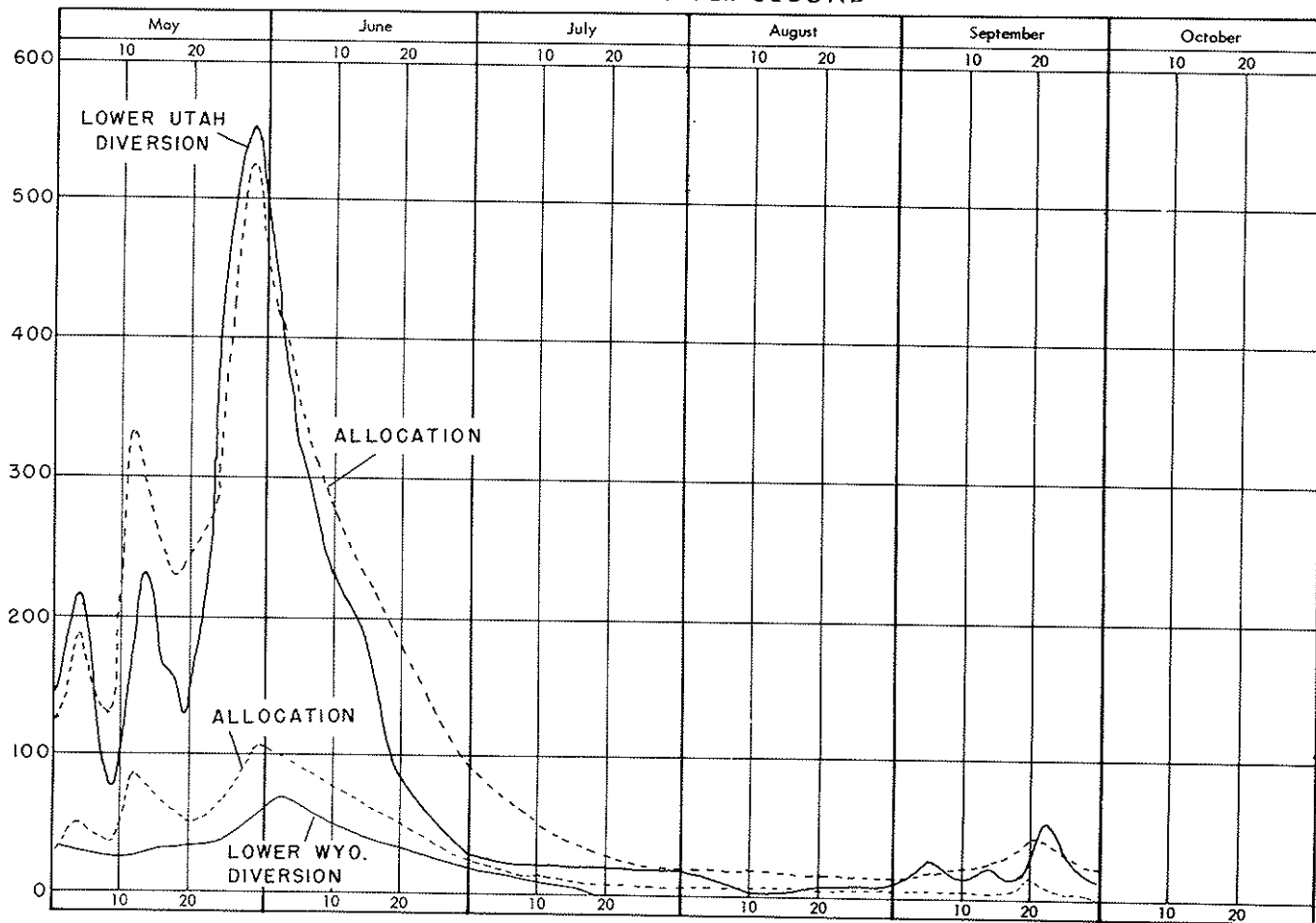


Figure 7

# CENTRAL DIVISION — WYOMING SECTION CUBIC FEET PER SECOND

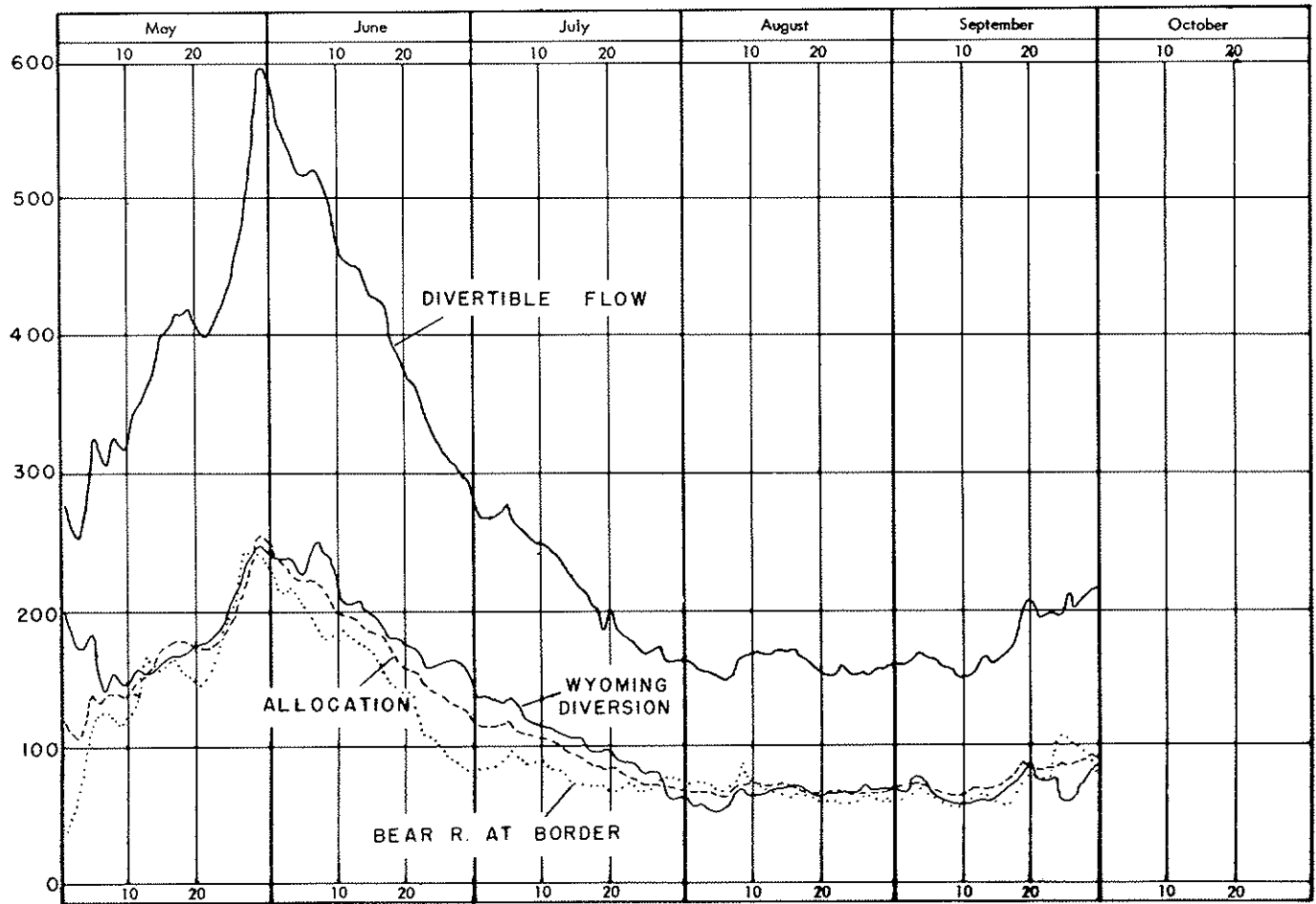
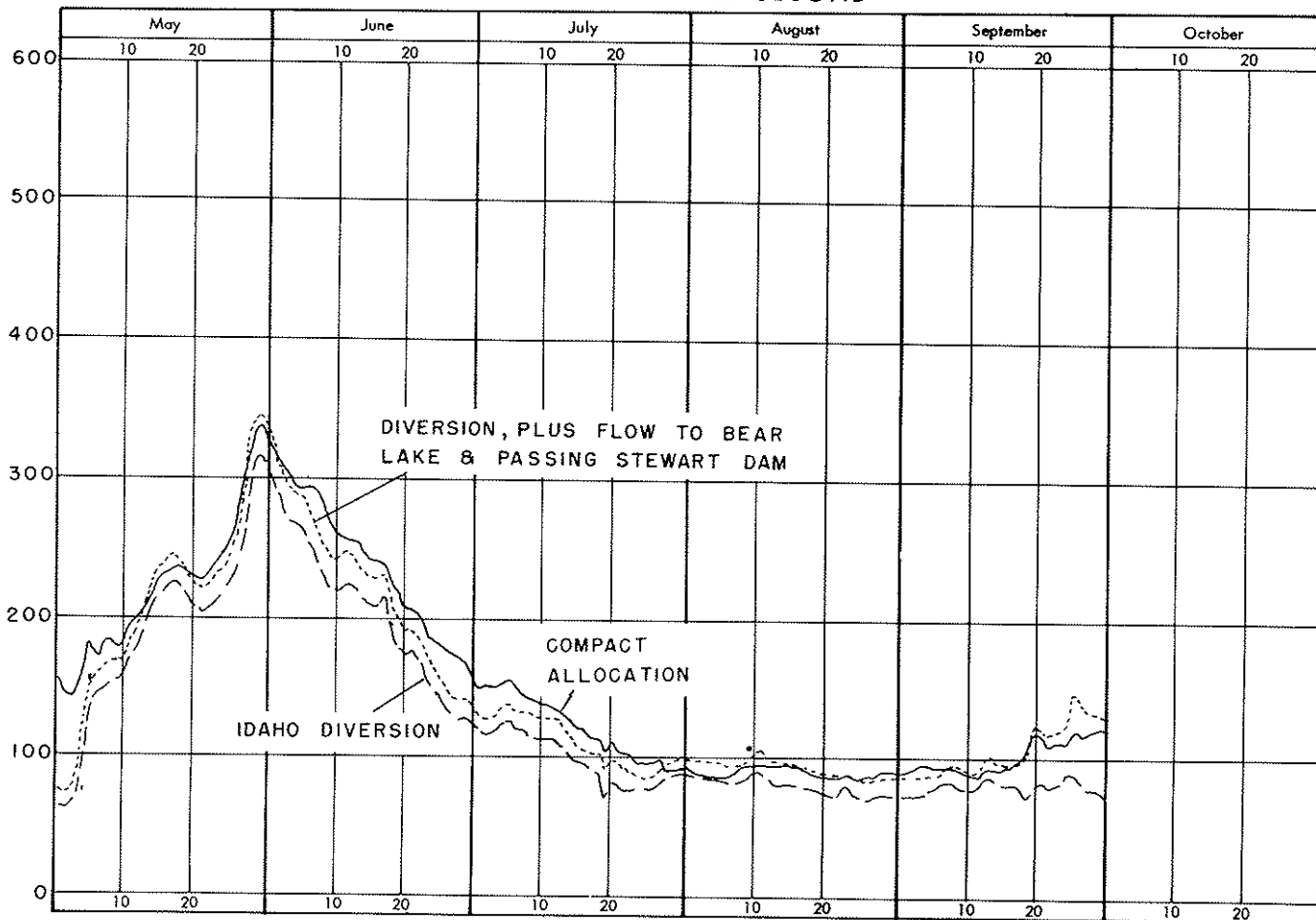


Figure 8

# CENTRAL DIVISION - IDAHO SECTION

CUBIC FEET PER SECOND



25

Figure 9













## APPENDIX A

### Lincoln G. Kelly and Company

Certified Public Accountants

SUITE 608 WALKER BANK BUILDING

TELEPHONE DAVIS 8-0141

Salt Lake City 11, Utah

REPRESENTED IN THE PRINCIPAL  
CITIES OF THE UNITED STATES, CANADA,  
GUAM AND BY CORRESPONDENTS ABROAD

October 12, 1961

Bear River Commission  
Utah State Capitol Building  
Salt Lake City, Utah

Gentlemen:

We have examined the financial records of the Bear River Commission for the fiscal year ended June 30, 1961, and the statement of budget revenue and appropriation accounts for the fiscal period then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

As a result of our examination, we present this report which includes comments and explanatory detail and the following described statements:

Exhibit A--Statement of budget revenue and appropriation accounts for the fiscal year ended June 30, 1961

Exhibit B--Statement of expenditures--stream gauging program--allocated to the United States Geological Survey and to the Bear River Commission, for the fiscal year ended June 30, 1961

Schedule A-1--Statement of revenue and expenditures

#### GENERAL COMMENTS

The Bear River Commission, composed of ten Commissioners, three each representing the States of Wyoming, Utah, and Idaho, and one, the United States, was organized on April 5, 1958, and by-laws adopted

April 26, 1958, as an interstate administrative agency to carry out provisions of the Bear River Compact. The Bear River Compact is an interstate pact which determines the rights and obligations of the signatory States of Wyoming, Idaho, and Utah with respect to waters of the Bear River. All expenses are to be charged to and paid by the three States on an equal basis.

On July 1, 1960, the Commission entered into a cooperative agreement with the Geological Survey, United States Department of the Interior, for operation and maintenance of a gauging-station network. Expenses pertaining to this work are shared equally by the Commission and the Geological Survey, while other expenses incurred by the United States Geological Survey which directly relate to the compact administration are wholly financed by the Commission. This is the same agreement that was in effect for the preceding fiscal year. Details of the financial transactions relating to this agreement for the fiscal year ended June 30, 1961, are presented in exhibit B.

---

In our opinion, the accompanying statements present fairly the cash position of the Bear River Commission at June 30, 1961, and the results of the cash transactions for the period then ended, in conformity with generally accepted accounting principles applicable in the circumstances.

Yours very truly,

*Lincoln Shelby* 4/2

BEAR RIVER COMMISSION

Statement of Revenue and Expenditures  
for the Fiscal Year Ended June 30, 1961

REVENUE:

State of Wyoming . . . . .	\$ 8,700.00
State of Utah . . . . .	8,700.00
State of Idaho . . . . .	<u>8,700.00</u>

\$26,100.00

EXPENDITURES:

Commission's portion of direct expenses of the stream-gauging program--exhibit B:	
Personal services . . . . .	\$17,977.50
Travel and subsistence . . . . .	2,443.00
General office . . . . .	1,152.00
Fiscal and administrative . . . . .	973.00
Washington office charges . . . . .	1,840.00
Miscellaneous . . . . .	<u>130.50</u>
	24,516.00
Administrative expenses:	
Stationery and postage . . . . .	86.75
Printing annual report . . . . .	387.00
Treasurer's bond and audit . . . . .	250.00
Transcript of minutes . . . . .	70.00
Legal consultation . . . . .	<u>300.00</u>
	<u>1,093.75</u>

25,609.75

EXCESS OF REVENUE OVER EXPENDITURES  
FOR THE YEAR ENDED JUNE 30, 1961 . . . . .

490.25

CASH ON HAND AT JULY 1, 1960 . . . . .

2,006.00

CASH ON HAND AT JUNE 30, 1961,  
exhibit A . . . . .

\$ 2,496.25

## APPENDIX B

### GAGING-STATION RECORDS

Records of streamflow for State line and other key stations are included herein. The record consists of description of the station and a table showing the daily discharge in cubic feet per second and monthly and yearly runoff in acre-feet for the 1961 water year.

The description of the station gives the location, drainage area, records available, type and history of gage, average discharge, extremes of discharge, general remarks, and a statement of cooperation where applicable. This is essentially the same data as published in annual water-supply papers of the Geological Survey.

In the table of daily discharge, the figures for the maximum day and the minimum day for each month are underlined. If the figure is repeated, it is underlined only on the first day of its occurrence.

In the monthly summary below the daily table, the line headed "Total" gives the sum of the daily figures; it is the total second-foot-days for the month. The line headed "Mean" gives the average flow in cubic feet per second (second-feet) during the month. Runoff for the month is expressed in acre-feet (line-headed "Ac-ft").

Records included herein have been collected by the U. S. Geological Survey through cooperative agreement with the Bear River Commission and by the Utah Power & Light Company.

# BEAR RIVER BASIN

## 10-0115. Bear River near Utah-Wyoming State Line

Location.--Lat 40°58', long 110°51', in SE $\frac{1}{4}$  sec.30, T.3 N., R.10 E., on left bank just downstream from West Fork, 2.8 miles upstream from Utah-Wyoming State line.

Drainage Area.--176 sq mi.

Records available.--July 1942 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,968 ft (from river-profile map).

Average discharge.--19 years, 181 cfs (131,000 acre-ft per year).

Extremes.--Maximum discharge during year, 1,130 cfs May 28 (gage height, 2.78 ft); maximum gage height, 2.90 ft Dec. 9 (ice jam); minimum discharge, 23 cfs Oct. 30, Nov. 5, but may have been less during periods of ice effect.

1942-61: Maximum discharge, 2,800 cfs June 6, 1957 (gage height, 4.27 ft); minimum determined, 16 cfs Apr. 11, 1951, Nov. 5, 1954, Nov. 1, 1955, Oct. 30, 1956.

Remarks.--Records good except those for periods of ice effect which are fair. Two diversions above station for irrigation of about 200 acres above and 2,600 acres below station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 27 to June 28)

0.6	22	1.6	312
.8	36	2.2	550
1.0	59	2.7	945
1.2	96	3.0	1,240
1.5	193		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	36	b34		27	b31	35	218	674	132	61	80
2	26	32	40		b25	*30	36	286	607	115	54	103
3	26	*34	40		26	b29	40	307	550	108	59	106
4	26	33	38	b35	b28	b28	90	286	490	118	59	98
5	26	30	b33		b27	b29	*44	239	464	120	68	86
6					30	30	46	210	427	106	58	69
7	*26	34	*b30		30	b30	46	199	471	98	61	61
8	25	33	b31	35	29	b30	46	191	503	94	54	59
9	30	36	b33	34	29	b30	40	231	543	90	52	110
10	52	35	b34	34	30	b30	40	359	530	82	46	106
	55	40	b35	33	30	31	38					
11	51	40	b36	*b32	30	30	40	*490	490	71	47	82
12	36	42	b38	31	30	32	42	616	464	66	52	71
13	34	40	b38	30	b28	30	44	396	433	82	55	*66
14	31	40	b36	30	*b30	30	40	312	404	58	52	61
15	28	40	35	31	b30	31	38	274	381	56	*46	58
16	30	44	b32	b29	30	32	42	252	364	52	62	56
17	32	42	32	b29	30	32	47	222	333	48	55	90
18	32	42	32	b29	30	30	68	235	317	*44	47	270
19	32	38	35	b29	b30	30	86	307	307	42	44	202
20	32	42	*b36	b27	30	30	88	427	*293	42	52	176
21	32	44	36	b26	30	b30	82	427	279	42	82	180
22	32	44	36	b27	30	30	90	525	251	40	55	159
23	32	40	36	b27	b30	*32	76	*651	239	38	52	143
24	32	40	b36	b27	b30	34	68	614	231	35	51	134
25	31	40	36	27	30	32	69	696	214	42	55	123
26	32	38	36	*28	b29	32	*73	743	191	44	73	120
27	32	40	35	b28	b28	32	74	884	180	44	59	113
28	30	b38	b35	b25	b30	32	103	974	166	44	54	108
29	31	b30	b35	b27		36	140	919	149	46	61	132
30	28	b32	b35	26	-----	40	176	751	143	46	92	110
31	28	-----	b35	29	-----	35	-----	651	61	61	60	-----
Total	1,006	1,142	1,085	939	822	971	1,901	13,769	11,038	2,089	1,814	3,332
Mean	32.5	38.1	35.0	30.3	29.4	31.3	63.4	448	370	67.4	58.5	111
Ac-ft	2,000	2,270	2,150	1,860	1,650	1,930	2,770	27,360	21,990	4,140	3,600	6,610

Calendar year 1960: Max 1,180 Min 18 Mean 138 Ac-ft 100,200  
 Water year 1960-61: Max 974 Min 25 Mean 110 Ac-ft 79,310

Peak discharge (base, 1,100 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
May 28	12:30 a.m.	2.78 ft	1,130				

\* Discharge measurement made on this day.  
 b Stage-discharge relation affected by ice.



# BEAR RIVER BASIN

## 10-0157. Sulphur Creek above reservoir, near Evanston, Wyo.

Location.--Lat 41°09', long 110°46' in SW<sup>1</sup>/<sub>4</sub> sec.35, T.14 N., R.119 W., on right bank 1<sup>1</sup>/<sub>2</sub> miles downstream from Willow Creek, 2 miles upstream from Sulphur Creek Dam, and 11<sup>1</sup>/<sub>2</sub> miles southeast of Evanston.

Drainage area.--64 sq mi, approximately.

Records available.--December 1957 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,170 ft (from river-profile map).

Extremes.--Maximum discharge during year, 274 cfs Apr. 3 (gage height, 4.07 ft); no flow July 18 to Sept. 18. 1957-61: Maximum discharge, 560 cfs Apr. 18, 1958 (gage height, 5.07 ft), from rating curve extended above 100 cfs by logarithmic plotting; no flow at times in each year.

Remarks.--Records good except those for period of ice effect, which are poor. Several diversions for irrigation above station.

Rating table, except periods of ice effect (gage height, in feet  
and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 9 to Nov. 25, July 6-18)

1.3	0	2.0	9.9
1.4	.1	2.3	22
1.5	.3	2.6	42
1.6	.6	3.0	83
1.7	2.0	3.4	150
1.8	4.1		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.2					29	2.4	1.9	0.4		0
2	.2	.2					36	.7	1.9	.3		0
3	.2	*.3			2		*101	1.7	4.4	.3		0
4	.2	.3					*92	1.2	19	.3		0
5	.2	.3					33	1.0	21	.3		0
6	** .2	.3					19	1.0	18	.3		0
7	.3	.3	(*)				12	.6	14	.3		0
8	.3	.3		0.8			12	.6	13	.2		0
9	.3	.3					9.6	.5	9.0	.2		0
10	.3	.3					8.7	.5	9.9	.2		0
11	.3	.3		(*)			8.0	.6	7.1	.2		0
12	.3	.4					13	6.0	4.1	.2		0
13	.4	.4				3	12	20	3.5	.2		* 0
14	.4	.4			(*)		9.0	25	2.2	.2		0
15	.4	.4	0.2				8.4	19	1.6	.2	(*)	0
16	.4	.4					8.7	23	1.3	.1		0
17	.4	.4			3		12	9.6	.6	.1		0
18	.5	.4					12	6.3	.8	0		0
19	.4	.4					11	5.2	.5	0		.1
20	.4	.4					11	4.4	*.5	0		.4
21	.4	.4										
22	.4	.4				(*)	9.3	6.0	.5	0		.6
23	.4	.4					5.7	5.2	.5	0		.6
24	.4	.4		.5			5.7	*4.6	.5	0		.5
25	.4	.4					8.4	4.4	.5	0		.6
26	.4	.4					6.6	2.2	.4	0		.6
27							*5.7	2.0	.4	0		.5
28		.3				5	4.9	1.7	.4	0		.6
29							5.2	1.4	.4	0		.6
30							4.6	2.4	.4	0		.6
31							3.7	2.4	.4	0		.6
							3.7	1.9	.4	0		.9
Total	5.3	10.3	6.2	20.0	79	105	517.4	162.5	138.4	4.0	0	6.6
Mean	0.20	0.34	0.2	0.65	2.8	3.4	17.2	5.24	4.61	0.13	0	0.22
Ac-ft	12	20	12	60	187	208	1,030	322	275	7.9	0	13

Calendar year 1960: Max 208 Min 0 Mean 7.71 Ac-ft 5,600

Water year 1960-61: Max 101 Min 0 Mean 2.89 Ac-ft 2,100

\* Discharge measurement or observation of no flow made on this day.

\*\* Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Nov. 26 to Mar. 31.

# BEAR RIVER BASIN

## 10-0159. Sulphur Creek below reservoir, near Evanston, Wyo.

Location.--Lat 41°09', long 110°49', in SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.28, T.14 N., R.118 W., on left bank 400 ft downstream from Sulphur Creek Dam, 6.3 miles upstream from mouth, and 10 $\frac{1}{2}$  miles southeast of Evanston.

Drainage area.--68 sq mi, approximately.

Records available.--March 1958 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,110 ft (from river-profile map).

Extremes.--Maximum discharge during year, 3 $\frac{1}{2}$  cfs July 19 (gage height, 2.48 ft); no flow most of the year.  
1958-61: Maximum discharge, 164 cfs June 29, 1959 (gage height, 3.67 ft); no flow at times in year.

Remarks.--Records good. Flow regulated by Sulphur Creek Reservoir (capacity, 4,600 acre-ft) completed December 1957.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.0					0		0	6.0	21	19	
2	2.8					0		0	6.0	22	18	
3	2.7	(*)				0		0	6.0	27	18	
4	2.7					0		0	6.0	29	17	
5	2.2					0	(*)	0	6.2	29	14	
6	*2.0					0		0	6.0	28	7.5	
7	2.0		(*)			0		0	6.0	28	8.1	
8	1.9					0		0	6.0	32	8.4	
9	1.9					0		0	6.2	32	8.4	
10	.9					0		0	6.2	24	8.1	
11	.1			(*)		0		0	6.2	17	8.1	
12	0					0		0	6.5	17	8.1	
13	0					0	(*)	0	6.5	21	7.6	
14	0					0		0	6.8	22	*6.2	
15	0					0		0	7.2	22	5.2	
16	0					0		0	8.1	22	5.2	
17	0					0		0	9.8	22	5.2	
18	0					0		2.3	10	*22	5.2	
19	0					0		4.0	16	31	5.2	
20	0					0		4.2	*24	33	5.2	
21	0					.1		4.2	27	33	5.2	
22	0					**1.2		*4.0	26	33	7.5	
23	0					.4		4.0	26	33	11	
24	0					.2		4.0	26	26	12	
25	0					.1		4.0	26	20	12	
26	0					0		4.0	28	20	12	
27	0					0		4.2	28	21	12	
28	0					0		5.2	27	*21	6.9	
29	0					0		6.8	24	20	.1	
30	0					0		6.8	21	20	0	
31	0					0		6.2		19	0	
Total	24.2	0	0	0	0	1.0	0	63.9	418.7	779	266.6	0
Mean	0.78	0	0	0	0	0.03	0	2.06	14.0	25.1	8.60	0
Ac-ft	48	0	0	0	0	2.0	0	127	830	1,550	529	0

Calendar year 1960 : Max 77      Min 0      Mean 11.3      Ac-ft 8,230  
 Water year 1960-61: Max 33      Min 0      Mean 4.26      Ac-ft 3,090

\* Discharge measurement or observation of no flow made on this day.

\*\* Field estimate made on this day.

Note.--No gage-height record Mar. 21-24, July 14-17; discharge estimated on basis of gate changes, visits by watermaster, and notes of engineer.

# BEAR RIVER BASIN

## 10-0195. Chapman Canal at State Line, near Evanston, Wyo.

Location.--Lat 41°24', long 111°02', in SE¼ sec.36, T.17 N., R.121 W., on left bank at highway bridge, 6½ miles downstream from headgates and 10 miles northwest of Evanston.

Records available.--April 1942 to September 1961 (prior to October 1944 irrigation seasons only). Monthly discharge only for some periods, published in WSP 1314.

Gage.--Water-stage recorder. Altitude of gage is 6,570 ft (from river-profile map). Prior to Oct. 11, 1946, staff gage and Oct. 11, 1946, to Aug. 2, 1961, water-stage recorder at site 20 ft downstream at same datum.

Average discharge.--17 years (1944-61), 17.9 cfs (12,960 acre-ft per year).

Extremes.--1942-61: Maximum daily observed, 129 cfs Apr. 14, 1946; no flow at times each year.

Remarks.--Records fair. Canal diverts water from Bear River in NW¼ sec.36, T.16 N., R.121 W. Many diversions above station for irrigation in Wyoming. Flow at station is for storage in Neponset Reservoir, Utah, and irrigation in Saleratus basin, Utah.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	16	36		0		63	36	a17			a1
2	0	*22	36		0	(*)	74	32	*16			a3
3	0	20	37		0		60	32	17			a10
4	0	23	35		0		104	32	15			a10
5	0	22	a35		0	35	*91	32	15			a12
6	0	20	a16		0		91	29	15			a12
7	*0	24	*16		0		76	29	15			*10
8	0	30	0		0		65	38	15			8.2
9	0	27	0		0		68	33	16			8.2
10	0	27	0		0		65	32	15			5.6
11	3.2	28	0		0		58	39	14			7.1
12	23	30	0	(*)	0		60	43	15			*32
13	23	29	0		0		66	53	14			31
14	2.8	26	0		*0	30	65	57	*14			23
15	19	27	0		10		56	38	19		(*)	15
16	12	30	0				55	27	18			11
17	9.7	40	0				58	23	21	(*)		10
18	10	36	0			27	64	17	20			15
19	12	36	0			.25	76	20	19			43
20	12	36	0			52	79	14	20			62
21	13	36	0			56	76	23	*19			57
22	13	36	0		30	*51	71	*23	17			57
23	8.5	38	0			64	70	32	16			51
24	8.8	36	0			79	64	*36	15			47
25	10	34	0			92	58	36	16			45
26	7.7	35	0			86	*57	30	13			43
27	8.8	36	0			75	56	30	12			41
28	9.7	36	0			63	56	38	11			36
29	13	30	0			50	64	35	5.2			34
30	15	36	0			46	69	19	.1			41
31	14		0			50		a18				
Total	248.2	904	198.6	0	400	1,376	2,044	976	454.3	0	0	781.3
Mean	8.01	30.1	6.41	0	14.3	44.4	68.1	31.5	15.1	0	0	26.0
Ac-ft	492	1,790	394	0	783	2,730	4,050	1,940	901	0	0	1,550

Calendar year 1960: Max 114 Min 0 Mean 19.2 Ac-ft 13,910

Water year 1960-61: Max 104 Min 0 Mean 20.2 Ac-ft 14,640

\* Discharge measurement or observation of no flow made on this day.

a No gage-height record

Note.--Stage-discharge relation affected by ice Nov. 19-22, Feb. 15 to Mar. 17.

# BEAR RIVER BASIN

## 10-0205. Bear River near Woodruff, Utah

Location.--Lat 41°31'25", long 111°01'00", in SW¼ sec.20, T.16 N., R.120 W., in Wyoming, on left bank 2.8 miles upstream from Wyoming-Utah State line and 7.6 miles east of Woodruff.

Drainage area.--870 sq mi, approximately.

Records available.--October 1941 to September 1961 (discontinued). Monthly discharge only for some periods, published in WSP 1314.

Gage.--Water-stage recorder. Altitude of gage is 6,360 ft (from river-profile map).

Average discharge.--20 years, 197 cfs (142,600 acre-ft per year).

Extremes.--Maximum discharge during year, 712 cfs May 29, 30 (gage height 2.97 ft); maximum gage height, 3.63 ft Mar. 17 (ice jam); no flow July 22-26, July 30 to Aug. 6.

1941-61: Maximum discharge, 3,010 cfs Apr. 28, 1952 (gage height, 5.32 ft); maximum gage height, 5.98 ft Mar. 21, 1951 (ice jam); no flow at times in each year 1942-48, 1954-61.

Remarks.--Records good except those for periods of ice effect, which are fair. Diversions for irrigation of about 45,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet and discharge, in cubic feet per second)

0.5	0	1.5	60
.6	.2	1.8	158
.7	1.6	2.2	299
.8	3.4	2.5	434
1.0	13	3.0	731
1.2	30		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.0	2.7					30	98	377	3.8	0	17
2	2.5	2.7					49	170	354	3.2	0	18
3	3.0	2.7			35	(*)	74	220	324	3.8	0	16
4	3.0	*4.7	16				149	223	320	5.1	0	22
5	2.3	7.6	(*)	38			180	152	307	3.4	0	37
6		1.6	9.2				113	105	287	3.2	0	35
7	**1.5	8.7					80	92	238	3.0	4.2	30
8	1.6	8.7			45	22	63	54	218	2.7	12	22
9	5.1	9.0					44	36	206	2.3	8.8	17
10	5.1	11					44	22	206	*2.0	3.4	12
11	10						40	30	206	1.3	2.5	*19
12	16			(*)			28	119	183	1.0	2.0	46
13	14	15		35			30	227	161	.8	1.6	22
14	10				55	(*)	44	199	177	.5	1.3	10
15	14				(*)		39	149	167	.2	*1.0	7.6
16	10						28	149	141	.1	.6	6.3
17	6.8						22	164	116	.1	.2	4.7
18	5.5				30		28	106	105	.1	.1	8.8
19	4.7				25		37	70	*92	.1	.1	18
20	3.8	20	40		22	25	58	82	72	.1	1.6	74
21							76	155	52	.1	11	59
22	3.4					(*)	65	206	39	0	1.6	43
23	3.0				32		51	249	28	0	1.6	36
24	2.9						39	368	22	0	5.5	28
25	3.0			(*)	22		*35	*346	14	0	6.3	24
26	3.0						28	28	400	12	0	15
27	2.7						26	24	455	.1	.1	18
28	2.9	16					28	22	536	.8	.1	12
29	2.7						28	22	*634	6.3	.1	18
30	2.5						28	47	621	4.7	0	14
31	2.5						28		480	0	8.1	12
Total	155.5	422.0	1,072	1,067	1,058	748	1,587	6,895	4,450.7	37.2	141.7	709.4
Mean	5.02	14.1	34.6	34.4	37.1	24.1	52.9	222	148	1.20	4.57	23.6
Ac-ft	308	857	2,130	2,120	2,060	1,480	3,150	13,680	8,830	74	281	1,410

Calendar year 1960: Max 1,010 Min 0 Mean 120 Ac-ft 87,180

Water year 1960-61: Max 634 Min 0 Mean 50.2 Ac-ft 36,360

Peak discharge (base, 1,500 cfs).--No peak above base.

\* Discharge measurement made on this day.

\*\* Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Nov. 9 to Mar. 29.

# BEAR RIVER BASIN

## 10-0265. Bear River near Randolph, Utah

Location.--Lat 41°48', long 111°06', in SE¼ sec.7, T.12 N., R.8 E., on left bank 3.5 miles upstream from Twin Creek, 4.8 miles upstream from Utah-Wyoming State line, and 11 miles northeast of Randolph.

Drainage area.--1,640 sq mi, approximately.

Records available.--October 1943 to September 1961. Monthly discharge only for some periods, published in WSP 1314.

Gage.--Water-stage recorder. Altitude of gage is 6,205 ft (from river-profile map).

Average discharge.--18 years, 179 cfs (129,600 acre-ft per year).

Extremes.--Maximum discharge during year not determined, occurred during ice break up Mar. 21 or 22; maximum gage height 3.85 ft Mar. 16 (ice effect); minimum discharge, 2.2 cfs Aug. 21, 22, 23.

1943-1961: Maximum discharge, 2,660 cfs May 8, 1952 (gage height, 8.60 ft); minimum, that of Aug. 21, 22, 23, 1961.

Remarks.--Records good except those for periods of ice effect which are fair. Diversions for irrigation of about 96,000 acres above station.

Rating table, except periods of ice effect (gage height in feet,  
and discharge, in cubic feet per second)

1.1	1	1.8	40
1.2	3	2.2	89
1.3	8	2.8	188
1.5	16		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.8	21					58	9.6	62	10	3.6	4.5
2	4.6	*20					56	8.8	77	11	3.3	4.5
3	5.1	20			38		59	8.8	51	12	3.6	4.8
4	5.1	22	22				54	8.4	52	13	2.6	4.2
5	*5.1	22		41			36	8.4	52	12	2.4	4.5
6	5.4	22					29	8.4	46	11	3.9	4.2
7	5.4	22	(*)		48		20	8.0	38	11	3.9	4.5
8	7.2	24				25	16	8.0	30	11	3.0	6.0
9	7.6	22	35				15	7.6	27	11	2.6	5.4
10	12	24		(*)			15	7.6	23	8.4	2.8	5.4
11	7.6	25					15	6.8	22	6.4	2.8	4.8
12	6.4	24					14	7.2	27	6.0	2.8	4.2
13	6.0	25		38	(*)		14	8.0	25	5.7	3.0	4.5
14	6.0	24			88		14	8.0	22	5.4	2.8	*4.8
15	6.0	24					13	8.4	22	5.1	*3.3	5.1
16	6.0	25				30	12	9.6	17	4.8	4.5	6.0
17	6.0	26				35	12	8.8	19	*4.5	3.9	7.2
18	6.0	25			35	50	10	8.4	28	4.5	3.3	9.6
19	8.0	25			28	80	8.4	7.8	*22	4.5	2.6	17
20	15	23	43			120	8.8	8.4	20	4.2	2.6	11
21	16					160	8.8	7.2	22	3.9	2.4	12
22	17					*120	8.8	6.4	20	3.9	2.4	9.2
23	17	23		35		75	8.4	6.4	18	3.3	2.2	8.4
24	17				25	84	8.8	6.0	16	4.2	3.0	9.2
25	18					71	8.8	*6.0	15	3.9	3.0	9.2
26	20					64	8.8	6.4	15	3.0	9.6	9.2
27	20					61	*8.8	7.2	14	3.6	5.4	8.8
28	20	22				60	12	13	13	3.9	3.6	8.8
29	20					58	20	41	11	3.9	3.9	8.4
30	20					58	10	45	10	3.3	4.2	9.2
31	20					58		81		3.6	5.7	
Total	340.5	690	1,157	1,160	1,124	1,557	582.4	390.4	806	202.0	108.5	214.6
Mean	11.0	23.0	37.3	37.4	40.1	50.2	19.4	12.6	26.9	6.52	3.50	7.15
Ac-ft	675	1,370	2,290	2,300	2,230	3,090	1,160	774	1,600	401	215	426

Calendar year 1960: Max 673 Min 4.8 Mean 73.6 Ac-ft 53,460  
 Water year 1960-61: Max 160 Min 2.2 Mean 22.8 Ac-ft 16,530

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16, 17; Nov. 21 to Mar. 22.

# BEAR RIVER BASIN

## 10-0285. Bear River below Pixley Dam, near Cokeville, Wyo.

Location.--Lat 41°56'20", long 110°59'05", in SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.25, T.23 N., R.120 W., 800 ft downstream from Pixley Dam, 11 miles south of Cokeville, and 17.5 miles downstream from Twin Creek.

Drainage area.--2,040 sq mi, approximately.

Records available.--October 1941 to November 1943 (published as Bear River near Cokeville), October 1952 to September 1955, May 1958 to September 1961 (irrigation seasons only). Monthly discharge only for some periods published in WSP 1314.

Gage.--Water-stage recorder. Altitude of gage is 8,185 ft (from river-profile map). Oct. 31, 1941, to Nov. 30, 1943, at site 200 ft downstream at different datum.

Average discharge.--6 years (1941-43, 1952-56), 137 cfs (99,180 acre-ft per year).

Extremes.--Maximum discharge during season, 130 cfs, Sept. 22 (gage height 3.25 ft); minimum daily recorded, 0.3 cfs Aug. 21.  
1941-43, 1952-56, 1958-61: Maximum daily discharge, 2,300 cfs Mar. 25, 1956; minimum daily recorded, that of Aug. 21, 1961.

Remarks.--Records good except those for period of no gage-height record, which are poor. Natural flow of stream affected by diversions for irrigation and return flow from irrigated areas. No diversion between station and Collett Creek Branch of Smiths Fork.

Discharge, in cubic feet per second, May to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								2.0	0.9	0.9	0.7	0.5
2								*1.4	.9	.9	.7	.6
3								1.2	.8	.9	.7	.6
4	†16							.9	.8	.9	.6	.6
5								.8	1.0	.9	.6	.7
6								.8	1.3	.9	.6	.7
7								.8	1.4	.8	.5	.7
8								.8	1.4	.8	.5	.7
9								.8	1.4	.8	.5	.7
10								.8	1.3	.7	.5	.7
11								.8	1.2	.7	.5	.8
12								.8	1.0	.7	.5	.8
13								.8	.9	.7	.5	.9
14								.8	*.9	.6	.5	.9
15								.6	.9	.7	.4	1.0
16								.8	.9	.7	.4	1.0
17								.8	.9	.7	.4	1.0
18								.8	.8	.7	.4	1.0
19								.8	.8	.8	.4	1.0
20								.8	.8	*.8	.4	1.0
21								.8	.8	.8	.3	1.0
22								.8	.8	.7	.4	.50
23								.8	.8	.6	*.4	.30
24								.8	.8	.6	.4	.20
25							*2.0	.8	.8	.7	.5	.10
26								2.0	.8	.7	.5	} 10
27								2.0	.8	.7	.5	
28								2.0	.8	.7	.5	
29								2.0	.7	.7	.5	
30								2.0	.7	.7	.5	
31								---	---	---	---	---
Total								26.8	28.3	23.2	15.3	176.9
Mean								0.86	0.94	0.75	0.49	5.90
Ac-ft								53	56	46	30	351

Calendar year : Max - Min Mean Ac-ft  
The season : Max - Min - Mean - Ac-ft 536

\* Discharge measurement made on this day.  
† Result of discharge measurement.  
Note.--No gage-height record Sept. 16-30.

# BEAR RIVER BASIN

## 10-0320. Smiths Fork near Border, Wyo.

Location.--Lat 42°17', long 110°52', in NW¼ sec. 33, T.27 N., R.118 W., on left bank 4½ miles upstream from Howland Creek, 6 miles downstream from Hobble Creek, and 12 miles northeast of Border.

Drainage area.--165 sq. mi.

Records available.--May 1942 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,650 ft (from topographic map). Prior to Oct. 16, 1945, at site 0.8 mile downstream at different datum.

Average discharge.--19 years, 189 cfs (136,800 acre-ft per year).

Extremes.--Maximum discharge during year, 370 cfs May 28 (gage height, 2.84 ft); maximum gage height, 3.48 ft Dec. 16 (ice jam); minimum discharge, 50 cfs Mar. 8.  
1942-61: Maximum discharge, 1,800 cfs June 7, 1957 (gage height, 4.56 ft); minimum recorded, 35 cfs Mar. 21, 1955, result of freezeup.

Remarks.--Records good except those for periods of ice effect, which are fair. One diversion for irrigation of about 200 acres above station.

Rating table, except periods of ice effect (gage height, in feet,  
and discharge, in cubic feet per second)

1.5	49	2.7	345
1.8	83	3.0	472
2.2	169		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	82	* 74	b 70		b 64	b 61	70	147	322	140	81	74
2	80	71	b 70		b 64	62	78	172	310	137	89	80
3	80	75	b 68		b 64	63	93	187	302	135	88	75
4	80	75	b 66		b 60	b 60	103	190	291	142	83	75
5	* 82	70	b 62		b 60	b 60	94	178	287	145	83	70
6	80	70	b 59		b 62	63	91	145	276	133	88	68
7	82	74	b 55		b 64	80	83	147	a 275	130	117	66
8	91	74	* b 58		68	b 60	82	142	a 274	126	96	66
9	91	b 70	b 62		66	b 60	85	150	a 273	124	93	68
10	91	b 72	b 65		65	60	79	172	272	121	93	66
11	91	74			68	59	76	212	268	117	86	66
12	89	73		(*)	66	59	78	219	250	115	86	70
13	86	73			73	59	85	199	243	115	68	66
14	82	71			66	60	80	193	229	113	88	* 65
15	79	71		b 60	* 65	62	75	202	219	111	83	64
16	79	70			62	64	78	209	216	109	* 86	65
17	78	71			62	62	85	193	202	105	82	75
18	78	68			63	62	94	193	196	103	79	86
19	78	b 67			b 62	60	115	190	190	103	78	86
20	76	b 68	b 65		62	62	117	187	184	* 103	79	85
21	76	b 70			62	62	111	199	* 175	105	80	86
22	76	b 66			62	59	115	216	172	101	76	79
23	76	73				* 66	111	246	166	97	74	78
24	76	71				71	101	268	164	96	75	76
25	76	69			b 60	73	* 99	* 302	156	96	78	75
26	75	69				70	97	341	156	99	85	74
27	74	70				69	96	361	150	96	74	71
28	74	b 71				64	96	361	150	93	70	70
29	75	b 67				65	113	357	145	91	70	68
30	75	b 69				66	130	353	342	86	71	86
31	73					69		333		88	70	66
Total	2,479	2,117	1,999	1,860	1,768	1,951	2,817	6,967	6,657	3,476	2,579	2,177
Mean	80.0	70.6	64.5	60	63.1	62.9	93.9	225	222	112	83.2	72.6
Ac-ft	4,920	4,200	3,960	3,690	3,510	3,870	5,590	13,820	13,200	6,890	5,120	4,320
Calendar year 1960:	Max 622	Min 52	Mean 148	Ac-ft 107,300								
Water year 1960-61:	Max 361	Min -	Mean 101	Ac-ft 75,090								

\* Discharge measurement made on this day.  
a No gage-height record.  
b Stage-discharge relation affected by ice.

# BEAR RIVER BASIN

## 10-0395. Bear River at Border, Wyo.

Location.--Lat 42°11', long 111°03', in NE1/4 sec.15, T.14 S., R.46 E., in Idaho, on left bank a quarter of a mile west of Wyoming-Idaho State line, half a mile west of Border, and 2.1 miles upstream from Thomas Fork.

Drainage area.--2,490 sq mi, approximately.

Records available.--October 1937 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 6,061.63 ft above mean sea level, unadjusted.

Average discharge.--24 years, 384 cfs (278,000 acre-ft per year).

Extremes.--Maximum gage height during year, 3.06 ft Mar. 18 (discharge not determined, occurred during period of ice effect); minimum discharge, 31 cfs Apr. 27, 28, 29.  
1937-61: Maximum discharge, 3,680 cfs May 11, 1952 (gage height, 8.69 ft); minimum daily, 30 cfs Aug. 18-22, 1940.

Remarks.--Records good except those for periods of ice effect, which are fair. Diversions for irrigation of about 124,000 acres above station.

Rating table, except periods of ice effect (gage height in feet,  
and discharge, in cubic feet per second

0.5	21	1.4	158
.7	44	2.0	289
.9	73		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	93	*125	175	135	115	160	150	57	218	83	70	80
2	88	124	170	130	120	160	146	56	212	85	73	63
3	87	123	180	128	120	155	162	75	218	86	70	87
4	*82	144	165	125	122	158	174	101	210	90	67	66
5	82	156	155	120	125	155	170	122	201	98	64	63
6	81	152	140	120	130	160	150	127	197	93	66	60
7	79	154	120	115	135	170	140	127	186	86	70	56
8	86	170	*130	123	138	170	122	*122	178	88	86	53
9	99	156	140	130	142	165	122	117	180	88	72	54
10	107	156	140	130	148	160	122	124	186	88	72	56
11	117	168	140	125	152	155	106	131	184	82	69	60
12	118	174	130	125	155	145	99	154	180	81	64	61
13	125	173	125	*130	160	155	72	108	176	79	64	61
14	122	172	115	135	165	170	64	153	172	73	66	56
15	125	162	115	140	170	200	58	156	170	72	61	*54
16	124	158	105	140	*175	280	48	164	158	70	*64	53
17	122	158	120	140	175	300	45	170	150	69	66	63
18	120	154	135	140	175	284	48	154	142	70	63	73
19	117	156	145	140	168	265	44	152	138	67	57	78
20	115	148	140	140	165	242	40	148	124	66	57	73
21	114	152	135	135	170	201	38	146	124	*66	56	72
22	115	150	145	130	160	184	38	154	*109	72	58	73
23	115	170	155	125	185	*199	36	166	107	70	54	102
24	117	172	150	120	180	244	37	186	104	66	56	106
25	115	170	150	125	172	210	*37	199	98	66	57	89
26	117	166	145	125	160	235	37	*210	93	69	64	95
27	117	166	145	120	160	247	33	242	88	76	64	92
28	121	154	145	120	160	214	31	222	84	75	58	90
29	121	145	140	115		184	31	242	81	75	56	76
30	127	160	140	115	-----	188	33	238	82	72	57	72
31	124	-----	135	115	-----	146	-----	233	-----	70	57	-----
Total	3,412	4,689	4,370	3,955	4,322	6,040	2,451	4,921	4,546	2,391	1,980	2,107
Mean	110	156	141	128	154	195	81.0	156	152	77.1	63.9	70.2
Ac-ft	6,770	9,300	8,670	7,840	8,570	11,980	4,620	9,560	9,020	4,740	3,930	4,180
Calendar year 1960:	Max	1,280	Min	75	Mean	236	Ac-ft	171,200				
Water year 1960-61:	Max	300	Min	51	Mean	123	Ac-ft	69,380				

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 22-23, Nov. 28 to Mar. 17.



# BEAR RIVER BASIN

## 10-0460. Rainbow inlet canal near Dingle, Idaho

Location.--Lat 42°13'00", long 111°17'30", in SE¼ sec.3, T.14 S., R.44 E., on left bank 1½ miles west of Dingle and 1 3/4 miles downstream from headworks at Stewart Dam.

Records available.--October 1945 to September 1961 in reports of Geological Survey, January 1922 to September 1945 in files of Salt Lake City district office, Geological Survey.

Gage.--Water-stage recorder. Altitude of gage is 5,950 ft (from topographic map).

Average discharge.--59 years, 293 cfs (212,100 acre-ft per year).

Extremes.--Maximum discharge during year, 301 cfs Mar. 20 (gage height, 1.96 ft); minimum daily, 7.9 cfs Aug. 2, 1945-61; Maximum discharge, 4,180 cfs May 7, 1952 (gage height, 8.62 ft); minimum daily, 6.5 cfs Sept. 24, 1956.

Cooperation.--Records collected by Utah Power & Light Co., under general supervision of Geological Survey, in connection with a Federal Power Commission project.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	118	128	92	74	111	161	9.3	21	9.8	8.0	13
2	37	120	130	90	82	102	166	9.1	20	10	7.9	12
3	54	120	147	95	82	106	166	9.0	18	11	8.3	12
4	72	128	173	85	81	113	163	9.6	18	11	8.8	11
5	80	128	100	82	81	97	183	10	18	11	9.0	10
6	90	137	92	77	80	80	190	11	18	9.8	9.3	10
7	94	137	74	79	82	97	183	12	18	11	9.5	11
8	97	139	82	82	83	116	151	12	19	12	10	10
9	106	185	97	82	87	120	141	11	18	14	10	9.4
10	116	149	100	77	92	116	131	9.7	18	15	10	9.8
11	128	130	100	80	94	122	130	10	17	14	10	10
12	131	147	100	77	97	118	124	11	17	13	10	10
13	139	157	88	77	106	115	109	12	16	12	11	11
14	157	155	79	74	109	115	95	13	16	11	11	11
15	177	161	74	74	118	130	68	13	16	10	11	11
16	131	163	71	80	120	159	25	14	16	10	10	11
17	130	159	74	83	130	205	16	14	16	10	9.5	17
18	130	157	87	82	131	226	13	13	15	11	9.7	30
19	126	155	85	83	128	228	11	13	15	11	9.8	41
20	122	155	90	88	122	252	9.1	14	14	12	11	37
21	118	155	92	92	120	248	9.8	14	14	10	11	35
22	116	133	100	79	120	224	9.7	15	13	9.3	11	36
23	118	159	104	69	122	201	9.8	16	12	9.0	11	37
24	116	166	100	75	124	205	9.4	17	12	8.8	11	41
25	118	157	99	80	115	252	9.0	17	11	8.6	11	58
26	116	155	99	82	115	238	8.7	18	9.8	8.6	12	58
27	118	153	95	99	110	245	8.3	18	11	8.7	13	56
28	115	94	100	87	107	252	8.6	20	11	8.5	13	56
29	113	120	95	92	-----	210	8.8	23	12	8.3	12	54
30	120	99	95	79	-----	188	9.1	23	11	8.3	12	56
31	120	-----	95	74	-----	179	-----	23	-----	8.2	12	-----
Total	3,401	4,291	3,015	2,557	2,910	5,170	2,306.1	433.7	460.8	324.9	322.8	784.2
Mean	110	143	97.3	82.5	104	167	76.9	14.0	15.4	10.5	10.4	26.1
Ac-ft	6,750	8,510	5,980	5,070	5,770	10,250	4,570	860	914	644	640	1,560

Calendar year 1960: Max 1,340 Min 11 Mean 171 Ac-ft 124,300  
 Water year 1960-61: Max 252 Min 7.9 Mean 71.2 Ac-ft 51,520

## BEAR RIVER BASIN

### 10-0465. Bear River below Stewart Dam, near Montpelier, Idaho

Location.--Lat 42°15'30", long 111°17'30", in NE¼ sec.34, T.13 S., R.44 E., on right bank 300 ft downstream from Stewart Dam and ½ miles south of Montpelier.

Records available.--October 1945 to September 1961 in reports of Geological Survey. January 1922 to September 1945 in files of Salt Lake City district office, Geological Survey.

Gage.--Water-stage recorder. Altitude of gage is 5,950 ft (from topographic map).

Average discharge.--39 years, 62.4 cfs (45,180 acre-ft per year).

Extremes.--Maximum daily discharge during year, 19 cfs Mar. 20, 25-27; minimum daily, 0.4 cfs Aug. 24. 1922-61: Maximum daily discharge, 3,050 cfs June 3, 1923; no flow July 15, 1958.

Cooperation.--Records collected by Utah Power & Light Co., under general supervision of Geological Survey, in connection with a Federal Power Commission project.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.0	3.6	3.6	5.4	6.2	8.1	14	2.3	4.3	1.2	2.6	1.2
2	7.3	3.3	3.6	5.4	6.6	5.5	14	2.3	3.6	1.6	2.9	1.6
3	7.3	3.3	3.6	5.4	6.6	6.5	13	2.3	3.3	1.2	3.8	1.3
4	5.1	3.3	4.0	5.4	7.0	6.5	13	2.9	2.9	1.6	4.0	1.6
5	7.7	2.6	3.6	5.4	7.0	8.1	13	2.6	2.8	1.6	3.6	1.6
6	7.0	2.9	3.6	5.4	7.0	8.5	13	2.9	2.9	1.6	3.3	1.6
7	6.6	2.9	3.3	5.4	7.0	8.5	13	2.9	2.6	1.9	3.3	2.3
8	6.6	3.3	3.6	5.4	7.0	8.9	14	3.6	2.6	2.6	3.3	2.6
9	6.6	4.3	3.6	5.1	7.3	8.1	13	4.0	2.6	1.9	2.6	1.6
10	6.6	3.6	4.0	5.1	7.0	8.5	13	3.6	2.6	1.6	3.3	1.2
11	6.2	3.6	4.0	5.1	7.0	8.5	6.2	4.3	2.6	1.2	4.7	1.9
12	5.8	3.3	4.3	5.4	7.7	8.9	2.6	4.3	2.6	1.2	5.1	2.9
13	5.8	3.6	4.3	5.4	7.3	8.9	3.3	5.1	2.6	1.2	6.2	3.8
14	5.4	3.3	4.7	5.8	7.3	11	2.9	5.8	2.9	1.2	5.1	3.8
15	5.4	3.6	4.7	5.8	7.7	15	2.6	6.6	3.3	1.2	4.3	5.4
16	5.4	3.6	4.7	5.8	7.7	15	2.3	7.0	3.6	1.9	4.7	4.7
17	5.1	3.6	4.7	5.8	8.1	17	2.3	6.2	3.8	1.9	4.3	4.3
18	5.1	3.6	4.7	6.2	8.1	16	1.9	6.2	1.2	1.2	4.7	5.1
19	4.7	3.6	5.1	6.6	8.5	17	1.9	6.2	1.6	3.3	4.3	2.6
20	4.3	4.0	5.1	5.8	8.1	19	1.9	5.8	1.6	6.6	3.6	2.6
21	4.7	3.6	5.4	6.6	8.1	18	1.9	6.2	1.9	4.3	3.6	2.3
22	4.7	3.3	5.4	7.0	8.1	18	1.9	4.0	1.2	2.9	3.6	2.6
23	4.7	4.0	5.4	6.6	8.5	18	1.9	1.9	1.9	2.6	1.9	2.9
24	4.7	4.0	5.4	6.2	8.5	18	1.6	2.3	1.6	1.6	1.4	3.3
25	4.7	3.6	5.4	6.2	8.5	19	1.6	2.6	1.6	1.6	1.6	2.9
26	5.1	3.6	5.4	6.6	8.5	19	1.2	2.9	1.6	1.6	1.6	1.8
27	4.7	4.0	5.4	6.6	8.5	19	1.6	2.6	1.6	1.6	1.9	1.8
28	4.3	3.3	5.8	6.6	8.5	18	1.6	3.6	1.6	1.2	1.6	1.8
29	4.3	3.3	5.8	6.2	8.5	18	1.9	5.4	1.6	1.9	1.6	1.9
30	4.0	3.3	5.4	6.2	8.5	15	1.9	5.8	1.9	2.3	1.2	1.9
31	3.8	---	5.1	6.2	8.5	14	---	4.7	---	2.3	1.6	---
Total	173.5	104.9	142.7	181.8	213.4	413.5	178.0	128.9	64.6	59.6	97.0	76.5
Mean	5.60	3.50	4.60	5.86	7.62	13.3	5.93	4.16	2.16	1.92	3.13	2.55
Ac-ft	344	208	283	361	423	820	353	258	128	118	192	152
Calendar year 1960:	Max	21	Min	2.6	Mean	9.40	Ac-ft	6,820				
Water year 1960-61:	Max	19	Min	0.4	Mean	5.03	Ac-ft	3,840				

# BEAR RIVER BASIN

## 10-0555. Bear Lake at Lifton, near St. Charles, Idaho

Location.--Lat 42°07'20", long 111°19'20", in NE¼ sec.16, T.15 S., R.44 E., in Lifton pumping plant of Utah Power & Light Co., 3½ miles east of St. Charles.

Records available.--October 1903 to June 1908 (gage heights only), October 1945 to September 1961. January 1921 to September 1945 (elevations only) in files of Salt Lake City district office, Geological Survey. Published as Bear Lake at Fish Haven 1903-6.

Gage.--Water-stage recorder. Datum of gage is 5,900 ft above mean sea level, unadjusted (levels by Utah Power & Light Co.). October 1903 to June 1906 staff gage at different site and datum.

Extremes.--Maximum contents during year, 814,300 acre-ft Apr. 15 to May 4 (gage height, 14.90 ft); minimum, 476,300 acre-ft Sept. 18-30 (gage height, 9.75 ft).  
 1921-61: Maximum contents, 1,423,600 acre-ft June 10, 1923 (gage height, 23.68 ft); no usable contents Nov. 9-19, 1935 (gage height, 2.00 ft, lower limit of pumps).

Cooperation.--Gage heights furnished by Utah Power & Light Co., under general supervision of Geological Survey, in connection with a Federal Power Commission project. Contents computed by Geological Survey from capacity table based on data furnished by Utah Power & Light Co.

Contents in thousands of acre-foot, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	770.8	768.1	771.4	774.1	776.8	789.5	810.3	814.3	758.7	684.2	582.0	510.2
2	776.1	768.1	771.4	774.1	776.8	785.5	811.6	814.3	758.0	680.9	579.4	507.7
3	769.4	768.1	772.1	774.1	776.8	786.2	812.3	814.3	756.7	677.6	576.8	505.1
4	768.1	768.7	772.1	774.1	776.8	786.2	812.3	814.3	755.3	675.0	575.6	502.5
5	766.7	768.7	772.1	774.8	777.4	786.8	812.3	815.6	754.0	672.3	571.0	500.0
6	765.4	768.7	772.1	774.8	777.4	786.8	812.3	813.0	752.0	670.3	567.8	497.4
7	765.4	768.7	772.8	774.8	777.4	787.5	813.0	812.3	750.6	668.4	564.5	494.9
8	765.4	768.7	772.8	774.8	778.1	788.2	813.0	811.6	749.3	666.4	561.2	492.3
9	765.4	768.7	772.8	774.8	778.1	788.2	813.0	810.3	748.0	664.4	558.0	489.7
10	765.4	768.7	772.8	774.8	778.8	788.8	813.0	808.9	746.6	662.4	554.8	486.5
11	766.1	768.7	772.8	774.8	778.8	789.5	813.6	806.9	745.3	659.8	550.8	484.0
12	766.1	768.7	772.8	774.8	779.5	790.2	813.6	804.9	744.0	656.5	547.6	482.7
13	766.1	769.4	772.8	774.8	779.5	790.8	813.6	802.9	741.9	653.2	543.7	481.4
14	765.4	769.4	772.8	774.8	779.5	790.8	813.6	800.2	739.9	650.0	539.8	479.5
15	765.4	769.4	772.8	774.8	780.1	791.5	814.3	797.6	737.2	646.7	536.6	478.2
16	765.4	769.4	772.8	775.4	780.1	792.9	814.3	795.5	734.6	643.4	534.0	477.6
17	765.4	770.1	772.8	775.4	780.8	794.2	814.3	792.9	731.9	639.4	530.7	476.9
18	766.1	770.1	773.4	775.4	780.8	795.5	814.3	790.2	728.6	636.2	528.1	476.3
19	766.1	770.1	773.4	775.4	781.5	796.2	814.3	787.5	726.0	632.3	524.9	476.3
20	766.1	770.8	773.4	775.4	782.1	796.9	814.3	785.5	722.6	628.3	523.0	476.3
21	766.7	770.8	773.4	775.4	782.1	797.6	814.3	782.8	719.9	624.4	520.5	476.3
22	766.7	770.8	773.4	775.4	782.8	798.2	814.3	780.1	716.6	620.5	518.5	476.3
23	766.7	771.4	773.4	776.1	782.8	798.9	814.3	778.1	713.3	615.9	516.6	476.3
24	766.7	771.4	773.4	776.1	783.5	799.6	814.3	775.4	710.0	612.6	513.3	476.3
25	767.4	771.4	773.4	776.1	783.5	800.9	814.3	772.8	706.0	608.7	514.7	476.3
26	767.4	771.4	773.4	776.1	784.2	802.2	814.3	770.8	702.0	604.8	514.7	476.3
27	768.1	771.4	773.4	776.8	784.8	803.6	814.3	769.4	698.7	600.9	514.7	476.3
28	768.1	771.4	774.1	776.8	785.5	804.9	814.3	767.4	695.4	597.0	514.1	476.3
29	768.1	771.4	774.1	776.8	786.2	806.3	814.3	764.7	692.1	593.1	513.4	476.3
30	768.1	771.4	774.1	776.8	786.8	807.6	814.3	762.7	688.2	589.2	512.8	476.3
31	768.1	-----	774.1	776.8	-----	808.9	-----	760.7	-----	585.3	511.6	-----
Total												
Mean												
Ac-ft												

Calendar year : Max Min Mean Ac-ft  
 Water year : Max Min Mean Ac-ft

# BEAR RIVER BASIN

## 10-0586. Bloomington Creek at Bloomington, Idaho

Location.--Lat 42°11'05", long 111°25'30", in SE1/4 sec.20, T.14 S., R.43 E., on left bank 1 mile west of Bloomington.

Drainage area.--24.4 sq mi.

Records available.--October 1960 to September 1961.

Gage.--Water-stage recorder 4 feet above 8-foot concrete flume. Altitude of gage is 6,070 ft (from topographic map).

Extremes.--Maximum discharge during year, 41 cfs May 10 (gage height, 2.12 ft); minimum, 9.4 cfs Jan. 27.

Remarks.--Records good. No diversion above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	16	16	14	13	13	16	22	26	16	14	15
2	17	16	16	14	13	13	18	25	26	16	15	15
3	*18	17	16	14	13	13	19	27	29	16	15	15
4	18	17	16	14	13	13	19	29	28	17	15	14
5	17	16	16	14	13	13	16	26	25	16	15	14
6	17	16	16	14	13	13	16	24	23	16	16	14
7	18	17	16	14	13	13	15	23	22	16	16	14
8	19	16	15	14	13	12	15	22	21	16	15	14
9	19	15	*15	13	13	12	15	27	21	16	18	14
10	19	16	14	13	14	13	14	35	20	16	15	14
11	18	16	14	13	14	13	14	36	19	16	15	14
12	18	17	14	13	14	13	14	33	19	16	15	14
13	18	18	14	13	13	13	16	30	18	16	15	14
14	18	17	14	*13	13	13	18	31	18	15	15	14
15	17	16	14	13	13	13	14	30	19	14	14	*14
16	17	16	14	13	13	14	14	28	16	14	15	14
17	16	16	14	13	*13	14	15	27	18	14	*15	14
18	18	17	14	13	13	13	16	29	17	14	14	16
19	18	16	14	13	13	13	*18	28	16	14	14	16
20	18	16	14	13	13	13	16	33	17	14	16	16
21	17	16	14	13	13	13	16	33	17	*14	14	14
22	17	16	14	13	13	13	16	34	16	14	14	14
23	17	16	14	13	13	*14	15	36	*16	14	14	14
24	17	16	14	13	13	14	18	35	16	13	15	14
25	17	16	14	13	13	14	15	33	16	14	15	14
26	17	16	14	13	13	14	15	*34	16	14	15	14
27	17	16	14	13	13	13	14	32	16	14	14	14
28	17	16	14	13	13	13	15	30	16	14	14	14
29	17	16	14	13	13	14	17	28	16	14	14	14
30	16	16	14	13	13	14	19	29	16	14	14	13
31	*17	-----	14	13	-----	15	-----	27	-----	14	14	-----
Total	543	487	450	411	367	413	471	916	579	460	455	428
Mean	17.5	16.2	14.5	13.3	13.1	13.3	15.7	29.5	19.3	14.8	14.7	14.3
Ac-ft	1,080	968	893	815	728	815	934	1,820	1,150	912	902	849

Calendar year 1960: Max - Min - Mean - Ac-ft -  
 Water year 1960-61: Max 36 Min 12 Mean 16.4 Ac-ft 11,860

\* Discharge measurement made on this day.  
Note.--No gage-height record Dec. 6-8, Jan. 5-13.

# BEAR RIVER BASIN

## 10-0595. Bear Lake outlet canal near Paris, Idaho

Location.--Lat 42°13'00", long 111°20'30", in SW 1/4 sec. 8, T.14 S., R.44 E., on right bank 2,000 ft downstream from headgates (at dike) and 3 miles southeast of Paris.

Records available.--October 1945 to September 1961 in reports of Geological Survey. January 1922 to September 1945 in files of Salt Lake City district office, Geological Survey.

Gage.--Water-stage recorder. Altitude of gage is 5,920 ft (from topographic map).

Average discharge.--39 years, 341 cfs (246,900 acre-ft per year).

Extremes.--Maximum discharge during year, 1,540 cfs July 21 (gage height, 18.65 ft); minimum daily 1 cfs many days.  
1922-61: Maximum daily discharge, 1,670 cfs Aug. 8, 1924; minimum daily, 1 cfs for many days in 1937, 1954, 1959, 1961.

Cooperation.--Records collected by Utah Power & Light Co., under general supervision of Geological Survey, in connection with a Federal Power Commission project.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	212	2	1	1.4	1.4	5.5	3.2	1.6	1,070	1,450	1,240	520
2	213	2	1	1.4	1.8	5.2	3.1	1.7	1,010	1,460	1,030	524
3	213	2	1	1.4	1.8	5.4	3.0	1.8	1,060	1,470	1,120	532
4	217	2	1	1.4	3.0	5.3	2.9	151	1,030	1,470	1,210	530
5	220	2	1	1.4	2.2	5.2	2.8	312	1,020	1,200	1,190	522
6	218	2	1	1.4	2.4	5.1	2.7	308	912	774	1,190	524
7	215	2	1	1.4	2.7	5.0	2.6	320	753	766	1,190	524
8	111	2	1	1.4	2.9	5.0	2.5	407	753	741	1,190	472
9	26	2	1	1.4	3.1	4.9	2.4	560	762	736	1,180	411
10	26	1	1	1.4	3.3	4.8	2.3	590	753	555	1,170	406
11	26	1	1	1.4	3.8	4.7	2.2	827	750	1,330	1,180	404
12	26	1	1	1.4	3.7	4.7	2.2	997	741	1,400	1,190	420
13	26	1	1	1.4	3.3	4.6	2.1	1,020	788	1,390	1,190	427
14	14	1	1	1.4	4.1	4.8	2.0	1,020	915	1,390	1,150	441
15	12	1	1	1.4	4.3	4.5	1.9	1,050	1,020	1,360	1,010	422
16	2	1	1	1.4	4.5	4.4	1.8	1,030	1,010	1,360	893	441
17	2	1	1	1.4	4.7	4.4	1.7	1,050	1,040	1,410	793	451
18	2	1	1	1.4	5.0	4.3	1.6	1,070	1,110	1,470	683	242
19	2	1	1	1.4	5.2	4.2	1.6	1,070	1,160	1,480	672	39
20	2	1	1	1.4	5.4	4.2	1.6	1,060	1,190	1,520	668	36
21	2	1	1	1.4	5.6	4.1	1.6	1,050	1,240	1,520	629	40
22	2	1	1	1.4	5.8	4.0	1.6	1,050	1,300	1,480	543	58
23	2	1	1	1.4	6.0	4.0	1.6	1,050	1,360	1,470	368	37
24	2	1	1	1.4	5.9	3.9	1.6	1,040	1,330	1,450	194	35
25	2	1	1	1.4	5.8	3.8	1.6	1,040	1,360	1,440	205	34
26	2	1	1	1.4	6.0	3.7	1.6	1,050	1,380	1,470	206	36
27	2	1	1	1.4	6.7	3.6	1.6	1,080	1,430	1,460	210	36
28	2	1	1	1.4	5.6	3.5	1.6	1,160	1,480	1,470	212	36
29	2	1	1	1.4	-----	3.4	1.6	1,180	1,490	1,450	213	49
30	2	1	1	1.4	-----	3.3	1.6	1,180	1,450	1,430	279	72
31	2	-----	1	1.4	-----	3.3	-----	1,150	-----	1,370	454	-----
Total	1,797	39	31	43.4	113.9	156.7	62.2	24,796.8	32,678	41,155	24,660	8,701
Mean	56.6	1.3	1.0	1.40	4.07	4.41	2.07	300	1,038	1,327	795	290
Ac-ft	3,560	77	61	66	226	273	123	49,160	64,810	61,590	48,910	17,260
Calendar year 1960:	Max 1,360	Min 1	Mean 331	Ac-ft 240,400								
Water year 1960-61:	Max 1,820	Min 1	Mean 368	Ac-ft 266,200								

# BEAR RIVER BASIN

## 10-0875. Mink Creek below Dry Fork, near Mink Creek, Idaho

Location.--Lat 42°15'30", long 111°40'30", in NE 1/4 sec. 33, T.13 S., R.41 E., on right bank 500 ft downstream from Dry Fork and 3 miles northeast of town of Mink Creek.

Drainage area.--19.3 sq mi.

Records available.--April 1947 to September 1952, October 1955 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 5,300 ft (from topographic map).

Average discharge.--11 years 72.3 cfs (52,340 acre-ft per year).

Extremes.--Maximum discharge during year, 185 cfs May 27 (gage height, 2.81 ft); minimum 2.5 cfs Oct. 4. 1947-52, 1955-61: Maximum discharge, 600 cfs May 29, 1946; maximum gage height, 3.97 ft June 7, 1957; minimum discharge, that of Oct. 4, 1960.

Remarks.--Records excellent except those for period of no gage-height record, which are fair. Mink Creek Canal began diverting above station in June 1950. Diversion is routed through Glendale Reservoir in Worm Creek basin for irrigation near Preston. Two other diversions above station for irrigation of about 1,000 acres above and below station.

Rating table, (gage height, in feet, and discharge in cubic feet per second)

0.8	2.5	1.4	12
.9	2.9	1.5	16
1.0	3.7	1.7	27
1.1	5.0	2.0	52
1.2	6.5	2.4	101
1.3	9.0	2.9	200

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.9	35	26	26	23	25	38	69	139	28	16	11
2	3.4	35	29	26	23	25	40	64	131	25	15	12
3	2.7	35	29	26	23	25	46	70	121	25	16	11
4	8.5	35	24	26	23	25	54	92	112	28	16	11
5	15	35	29	26	23	25	52	92	103	27	16	11
6	*19	33	28	26	23	24	48	82	95	25	17	11
7	26	33	*26	25	23	22	46	74	95	25	16	11
8	36	33	28	25	23	24	44	68	90	24	16	11
9	38	33	28	25	*23	24	43	57	86	24	17	11
10	36	*32	28	25	25	24	41	77	80	24	16	11
11	35	32	28	25	25	24	*40	98	77	23	15	11
12	35	32	26	*25	26	24	37	100	72	23	16	11
13	34	33	26	25	25	24	39	89	65	22	15	11
14	34	32	27	24	25	*25	37	85	59	22	15	9.6
15	34	31	28	24	25	25	36	83	56	22	14	12
16	34	31	28	24	25	28	35	77	*52	22	14	15
17	34	31	28	23	25	28	33	70	47	22	13	15
18	34	31	27	23	25	29	33	72	44	22	13	18
19	34	30	27	23	25	30	43	73	41	22	13	18
20	34	30	26	23	25	31	45	103	39	22	13	16
21	34	30	28	23	25	30	45	119	36	22	12	13
22	34	30	28	23	26	30	50	139	32	22	12	12
23	34	30	28	23	25	32	52	160	30	21	12	10
24	33	30	27	23	25	35	49	164	28	20	13	12
25	33	30	28	23	25	37	46	167	28	20	12	13
26	33	30	28	23	25	37	44	178	27	*16	12	9.3
27	33	30	27	23	25	36	42	180	27	18	11	*7.2
28	33	30	27	23	25	33	40	173	27	18	11	9.0
29	33	29	26	23	25	35	43	160	26	16	*11	11
30	33	29	27	23	25	35	40	154	26	16	10	11
31	33	---	27	23	---	36	---	144	---	15	11	---
Total	895.5	940	863	748	684	692	1,294	3,323	1,891	681	429	355.1
Mean	28.9	31.3	27.8	24.1	24.4	23.8	43.1	107	63.0	22.0	13.8	11.8
Ac-ft	1,780	1,860	1,710	1,480	1,360	1,770	2,570	6,590	3,750	1,350	651	704
Calendar year 1960:	Mx 292	Min 2.7	Mean 47.3	Ac-ft 34,360								
Water year 1960-61:	Mx 180	Min 2.7	Mean 35.6	Ac-ft 25,780								

\* Discharge measurement made on this day.  
 Note.--No gage-height record June 26 to July 24.

# BEAR RIVER BASIN

## 10-0905. Bear River near Preston, Idaho

Location.--Lat 42°10', long 111°51', in NW¼ sec.36, T.14 S., R.39 E., on left bank 600 ft downstream from headgates of West Cache Canal, 5 miles downstream from Mink Creek, 5 miles north of Preston, and 5½ miles upstream from Battle Creek.

Drainage area.--4,500 sq mi, approximately.

Records available.--October 1889 to December 1916, January to September 1917 (gage heights only), January 1944 to September 1961. Prior to 1903, published as "at Battlecreek." Monthly discharge only for some periods, published in WSP 1314.

Gage.--Water-stage recorder. Altitude of gage is 4,540 ft (from topographic map). October 1889 to September 1917 Staff or wire-weight gages at several sites within 5 miles downstream at different datums.

Average discharge.--18 years (1943-61), 806 cfs (853,500 acre-ft per year).

Extremes.--Maximum discharge during year, 2,920 cfs Nov. 2 (gage height, 4.57 ft); minimum, 2.3 cfs Feb. 23, 24 (gage height, 0.22 ft); minimum daily, 27 cfs Oct. 30.  
 1889-1917: Maximum discharge, about 8,500 cfs June 9, 10, 1907, estimated on basis of records for station near Collinston, Utah; maximum gage height observed, 9.04 ft Jan. 17, 18, 1917 (backwater from ice), site and datum then in use; minimum not determined.  
 1943-61: Maximum discharge, 4,420 cfs Apr. 17, 1950 (gage height, 5.61 ft); minimum, 0.6 cfs June 14, 1949; minimum daily 9.5 cfs July 6, 1957.

Remarks.--Records excellent. Station is below all irrigation diversions from Bear River in Idaho except Cub River pumps in SE¼ sec.20, T.16 S., R.39 E. Natural flow of stream affected by storage reservoirs, power developments, diversions for irrigation, and return flow from irrigated areas.

Revisions(water years).--WSP 250: 1905-7

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	565	387	405	82	352	392	623	260	703	1,040	916	236
2	503	476	540	178	426	552	470	119	804	980	990	481
3	479	588	401	395	246	443	577	136	639	914	1,080	280
4	424	488	102	256	271	296	388	266	775	742	957	329
5	123	359	441	409	154	163	464	252	822	620	1,080	556
6	*310	38	430	327	380	702	582	186	810	757	819	460
7	356	357	457	105	456	432	503	158	675	685	1,010	500
8	87	437	350	77	284	402	628	228	222	855	899	353
9	66	492	413	414	*390	402	318	581	410	491	781	548
10	172	462	247	426	445	416	391	918	422	578	963	501
11	324	419	86	512	591	274	*394	*1,070	388	902	995	398
12	385	290	356	500	448	280	632	985	479	762	1,040	381
13	249	122	472	529	315	215	587	891	379	828	930	269
14	239	315	467	323	494	*373	659	700	508	1,060	745	271
15	241	342	532	87	489	511	224	777	635	658	1,150	734
16	259	498	516	289	506	784	245	987	*477	920	821	822
17	274	457	531	501	498	908	354	902	869	1,030	775	552
18	280	518	78	506	409	797	854	858	841	1,200	754	336
19	253	458	408	485	182	454	519	854	774	897	696	186
20	282	49	388	552	189	727	277	1,010	887	1,080	643	181
21	286	212	562	265	347	596	328	819	860	1,000	494	231
22	302	325	533	81	551	603	253	895	897	1,060	505	318
23	203	344	502	448	186	719	129	876	899	816	516	314
24	253	434	326	427	224	589	643	840	873	736	312	367
25	252	477	50	432	416	709	597	913	902	935	782	275
26	313	418	43	455	392	619	410	938	820	760	522	345
27	418	292	419	446	573	597	453	783	918	854	120	715
28	517	280	499	364	374	1,150	468	391	999	1,020	239	230
29	289	404	481	114	-----	368	157	582	996	1,020	*350	124
30	27	387	372	-----	-----	685	557	39	706	1,000	716	413
31	111	-----	385	365	-----	551	-----	650	-----	1,090	485	-----
Total	8,902	11,125	11,977	10,722	10,588	16,707	13,166	20,531	21,683	27,104	22,782	11,517
Mean	287	371	386	346	373	539	439	662	723	874	735	384
Ac-ft	17,660	22,070	23,760	21,270	21,000	33,140	26,110	40,720	43,010	53,760	45,190	22,840

Calendar year 1960: Max 1,380 Min 27 Mean 569 Ac-ft 413,100  
 Water year 1960-61: Max 1,200 Min 27 Mean 512 Ac-ft 370,500

\* Discharge measurement made on this day.

# BEAR RIVER BASIN

## 10-0930. Cub River near Preston, Idaho

Location.--Lat 42°08', long 111°41', in SW $\frac{1}{4}$  sec.5, T.15 S., R.41 E., on right bank 0.2 mile upstream from headgates of Cub River-Worm Creek Canal, 0.7 mile upstream from forest boundary, and 10 miles east of Preston.

Drainage area.--19.4 sq mi.

Records available.--March 1940 to September 1952, October 1955 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 5,320 ft (from topographic map).

Average discharge.--18 years, 82.8 cfs (59,940 acre-ft per year).

Extremes.--Maximum discharge during year, 351 cfs May 26 (gage height, 2.33 ft); minimum, 12 cfs Feb. 10, result of freezeup.  
1940-52, 1955-61: Maximum discharge, 715 cfs June 7, 1957 (gage height, 3.39 ft; maximum gage height, 3.83 ft June 2, 1943; minimum discharge, 11 cfs Jan. 22, 1951.

Remarks.--Records excellent. No diversion above station.

Rating table, (gage height, in feet, and discharge, in cubic feet per second)

0.5	16
.8	28
1.0	41
1.3	71
1.9	178
2.5	368

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	22	20	18	16	17	30	70	229	58	33	26
2	24	22	20	18	16	17	33	117	221	57	33	26
3	24	22	20	b18	16	17	41	158	216	56	31	26
4	24	22	21	b18	16	17	49	*159	200	58	31	26
5	24	22	20	b17	16	17	73	163	185	54	31	25
6	*24	22	b20	b17	16	17	40	144	174	52	31	24
7	24	23	b20	17	16	17	37	117	172	50	31	24
8	25	22	20	17	16	17	33	101	168	49	30	24
9	25	22	20	17	*16	17	33	112	165	53	30	24
10	25	*22	20	17	17	17	32	172	155	47	30	24
11	24	22	19	17	16	17	*31	241	148	47	30	24
12	25	22	19	*17	17	17	32	232	138	46	30	24
13	24	23	19	17	16	17	35	190	125	45	30	23
14	24	22	19	17	16	*18	33	192	117	44	30	23
15	24	22	19	17	16	18	32	174	110	43	29	23
16	24	22	19	17	16	22	31	155	*105	43	30	22
17	23	22	19	17	17	22	31	138	99	42	28	23
18	23	22	19	17	17	22	33	155	96	40	28	24
19	23	22	18	17	17	23	40	178	91	40	28	24
20	23	21	18	b16	16	24	43	246	87	40	26	24
21	23	21	*18	b16	16	22	41	255	84	40	27	22
22	23	21	18	b16	17	23	44	277	81	38	27	22
23	23	21	18	b16	17	27	44	305	77	38	27	22
24	23	22	18	16	17	32	45	297	74	38	27	22
25	23	22	18	16	17	32	40	308	71	*37	27	22
26	23	21	18	16	b17	30	40	*327	69	35	27	21
27	23	22	18	b16	b17	28	38	323	66	35	26	*21
28	23	21	b18	b16	17	26	37	308	65	34	26	21
29	23	20	b18	b16		26	40	284	61	33	*26	21
30	22	20	b18	16	-----	27	49	271	59	33	26	21
31	22	-----	18	16	-----	20	-----	244	-----	33	-----	-----
Total	731	653	587	519	460	671	1,128	6,390	3,708	1,358	894	698
Mean	23.6	21.8	18.9	16.7	16.4	21.6	37.6	206	124	43.8	28.8	23.3
Ac-ft	1,450	1,300	1,160	1,030	912	1,330	2,240	12,670	7,350	2,690	1,770	1,380

Calendar year 1960: Max 496 Min 17 Mean 82.1 Ac-ft 45,100  
 Water year 1960-61: Max 327 Min 16 Mean 48.7 Ac-ft 35,280

\* Discharge measurement made on this day.  
 b Stage-discharge relation affected by ice.



# BEAR RIVER BASIN

## 10-1090. Logan River above State dam, near Logan, Utah

Location.--Lat 41°44'40", long 111°47'00", in NE½ sec.36, T.12 N., R.1 E., on right bank at Logan plant of Utah Power & Light Co., 125 ft upstream from tailrace, half a mile upstream from State dam, and 2½ miles east of Logan.

Drainage area.--218 sq mi.

Records available.--June 1896 to September 1961. Published as Logan River near Logan prior to 1913. Records since May 1913 equivalent to earlier records if records for Utah Power & Light Co.'s tailrace near Logan are added. Monthly discharge only for some periods, published in WSP 1314.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 4,680 ft (from topographic map). Prior to May 7, 1913, staff gage at various sites within half a mile downstream, below confluence of tailrace, at different datums. May 7 to Sept. 30, 1913, water-stage recorder at present site at different datums and Oct. 1, 1913, to Sept. 3, 1958, at datum about 2.3 ft lower than present datum.

Average discharge.--48 years (1913-61), 103 cfs (74,570 acre-ft per year). Average combined discharge of Logan River above State dam, Utah Power & Light Co.'s tailrace, and Logan, Hyde Park & Smithfield Canal, 65 years (1896-1961), 276 cfs (199,800 acre-ft per year).

Extremes.--Maximum discharge during year, 158 cfs Mar. 21 (gage height 1.68 ft); minimum daily, 11 cfs Apr. 28. Maximum combined discharge during year (Logan River above State dam, Utah Power & Light Co.'s tailrace, and Logan, Hyde Park & Smithfield Canal) 298 cfs May 28; minimum daily, 77 cfs Jan. 28, Feb. 27, Mar. 8. 1913-61: Maximum discharge, 2,000 cfs Mar. 21, 1916 (gage height, 5.6 ft, datum then in use), from rating curve extended above 1,000 cfs; minimum daily 6 cfs Nov. 7, 1940. 1896-1961: Maximum combined observed discharge (Logan River above State dam, Utah Power & Light Co.'s tailrace, and Logan, Hyde Park & Smithfield Canal), 2,480 cfs May 24, 1907; minimum daily, 50 cfs Jan 21, 1935.

Remarks.--Records excellent above 20 cfs and good below. Water diverted from river and springs above station for power, irrigation, and municipal supply. Flow regulated by powerplants above station. For records of combined flow of Logan River, Utah Power & Light Co.'s tailrace, and Logan, Hyde Park & Smithfield Canal, see following page. Combined flow record excludes that in Logan City culinary pipe lines and one small irrigation diversion from Power flume that siphons canyon 400 ft upstream from station.

Cooperation.--Records collected in Collaboration with Utah Power & Light Co. in connection with a Federal Power Commission project.

Revisions (water years).--WSP 1314: 1900

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	16	12	14	15	12	21	32	75	32	17	17
2	15	16	12	15	14	12	22	23	75	31	17	15
3	15	16	12	15	14	12	34	20	73	28	18	15
4	15	17	12	16	13	16	53	25	60	26	17	15
5	*15	16	12	15	13	19	46	20	58	26	17	15
6	16	17	12	*13	13	19	32	18	52	25	17	15
7	*16	16	14	13	13	20	25	17	50	21	18	14
8	17	17	13	14	13	18	22	16	48	17	*16	14
9	17	15	12	14	13	20	20	15	47	17	*16	14
10	17	14	12	15	15	19	19	19	36	17	16	14
11	17	15	12	14	16	19	18	50	32	17	16	16
12	17	14	12	14	14	19	20	*50	27	17	16	15
13	17	14	12	13	14	19	21	32	23	16	16	15
14	17	15	12	13	14	20	16	34	20	16	16	15
15	17	14	*12	14	13	21	12	28	*20	16	16	14
16	18	14	12	13	*13	25	12	22	21	16	17	14
17	18	*14	12	14	12	27	12	17	21	16	16	14
18	17	14	13	14	12	23	13	16	20	16	*16	16
19	16	15	14	*14	12	23	35	17	19	17	16	16
20	16	15	13	13	12	62	41	28	17	17	16	15
21	16	18	13	13	12	87	36	40	17	17	17	14
22	16	21	16	13	13	53	35	58	17	16	17	13
23	16	22	12	13	*12	26	38	100	*17	16	16	12
24	16	21	12	13	12	28	35	114	16	16	17	12
25	17	22	13	13	12	34	26	*109	16	16	17	12
26	16	21	13	14	12	35	17	119	17	16	16	12
27	16	21	13	15	12	30	12	123	18	16	16	12
28	16	20	13	13	13	*68	11	126	25	17	16	12
29	16	22	14	14	14	62	14	119	38	17	16	*13
30	16	19	14	16	-----	21	23	109	38	17	16	13
31	16	-----	13	16	-----	*21	-----	91	-----	17	-----	-----
Total	505	511	395	433	366	890	741	1,607	1,013	585	512	423
Mean	16.3	17.0	12.7	14.0	13.1	28.7	24.7	51.8	33.8	18.9	16.5	14.1
Ac-ft	1,000	1,010	780	859	726	1,760	1,470	3,190	2,010	1,160	1,020	839

Calendar year 1960: Max 503 Min 12 Mean 51.4 Ac-ft 37,300  
 Water year 1960-61: Max 126 Min 11 Mean 21.9 Ac-ft 15,820

\* Discharge measurement made on this day.

## BEAR RIVER BASIN

### 10-1090. Logan River above State dam, near Logan, Utah — continued

Combined discharge, in cubic feet per second, of Logan River above State dam, Utah Power & Light Co.'s tailrace, and Logan, Hyde Park & Smithfield Canal near Logan, Utah, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	117	110	103	97	90	84	93	203	333	158	111	96
2	117	112	106	95	88	83	99	272	332	189	111	96
3	116	111	108	90	90	80	111	257	330	153	112	96
4	119	112	102	90	85	81	143	269	314	156	110	97
5	114	110	99	91	84	82	144	270	313	158	109	96
6	115	108	87	93	90	83	130	246	305	154	111	91
7	119	115	89	87	89	83	123	241	301	148	112	88
8	121	110	101	97	89	77	120	225	299	143	109	89
9	122	108	102	92	90	82	116	223	295	143	107	90
10	122	103	97	94	98	80	112	232	281	142	106	91
11	122	108	97	94	98	82	106	301	273	140	104	91
12	121	110	93	94	95	82	113	302	264	135	108	90
13	121	116	94	92	93	81	116	276	252	133	105	91
14	116	121	95	94	91	87	109	279	242	133	108	90
15	116	121	93	93	88	88	109	268	237	133	104	88
16	116	120	92	91	88	96	106	260	232	132	105	87
17	116	119	98	92	87	98	103	247	225	126	103	88
18	115	112	99	91	87	90	113	239	219	125	101	98
19	115	112	98	89	83	90	140	244	219	125	96	101
20	116	104	97	86	85	84	148	273	210	126	97	93
21	114	108	95	88	85	87	141	293	208	126	98	97
22	114	109	100	87	88	94	140	315	199	124	98	92
23	115	110	94	88	86	96	141	361	197	120	97	89
24	115	108	94	89	84	99	137	375	190	118	98	91
25	116	112	96	90	87	104	128	371	189	117	99	89
26	113	108	96	90	78	106	123	382	181	114	98	86
27	112	110	96	78	77	100	121	387	176	115	98	85
28	111	108	94	77	86	88	117	390	169	116	96	87
29	112	92	85	87	81	91	136	382	167	118	93	89
30	112	110	94	86	86	90	172	371	165	113	94	88
31	110	---	94	82	---	82	---	352	---	112	95	---
Total	3,599	3,319	2,988	2,814	2,460	2,740	3,710	8,096	7,317	4,113	3,189	2,742
Mean	116	111	96.4	90.8	87.9	88.4	124	293	244	133	103	91.4
Ac-ft	7,140	6,580	5,930	5,580	4,680	5,450	7,360	18,040	14,510	8,160	6,330	5,440
Calendar year 1960 :	Max 781	Min 77	Mean 189	Ac-ft 136,900								
Water year 1960-61 :	Max 390	Min 77	Mean 132	Ac-ft 95,360								

# BEAR RIVER BASIN

## 10-1135. Blacksmith Fork above Utah Power & Light Co.'s dam, near Hyrum, Utah

Location.--Lat 41°37'20", long 111°44'25", in NE¼ sec. 8, T.10 N., R.2 E., on right bank three-quarters of a mile upstream from diversion dam, 3½ miles upstream from powerplant of Utah Power & Light Co., and 6 miles east of Hyrum.

Drainage area.--260 sq mi.

Records available.--October 1913 to September 1961. Monthly discharge only for October 1913, published in WSP 1514.

Gage.--Water-stage recorder. Altitude of gage is 5,000 ft (from topographic map). Prior to Oct. 2, 1934, at site 1,000 ft upstream at different datum.

Average discharge.--48 years, 124 cfs (39,770 acre-ft per year).

Extremes.--Maximum discharge during year, 115 cfs Apr. 19 (gage height, 2.59 ft); maximum gage height, 3.62 ft Jan. 29 (ice jam); minimum daily discharge, 42 cfs Sept. 15, 16.

1913-61: Maximum discharge, 1,600 cfs May 15, 1917 (gage height, 6.5 ft, from floodmarks, site and datum then in use), from rating curve extended above 800 cfs; minimum daily, 29 cfs Jan. 3, 1935.

Remarks.--Records excellent. A few small diversions for irrigation of about 200 acres above station. Low flow may be slightly regulated by powerplant above station.

Revisions (water years).--WSP 1514: 1925

Rating table, (gage height, in feet, and discharge, in cubic feet per second)

2.0	40
2.1	58
2.3	100

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	*66	*65	62	58	58	71	77	64	54	49	*44
2	64	66	64	62	58	58	71	79	71	53	47	47
3	64	66	68	*b62	58	58	77	79	66	54	47	45
4	64	66	66	b62	58	58	67	81	66	56	45	45
5	62	66	66	b62	b56	56	83	75	71	56	47	45
6	64	66	b66	b64	58	51	79	79	66	53	49	44
7	64	66	b66	b67	58	58	75	77	62	53	47	44
8	66	66	b66	b64	58	59	71	75	62	53	47	44
9	66	66	66	64	58	58	71	73	60	53	47	45
10	68	66	68	62	66	58	71	75	60	53	47	45
11	68	66	68	62	66	60	68	79	60	53	47	45
12	66	66	68	62	68	60	68	79	60	53	49	45
13	66	66	68	62	62	60	71	75	58	53	49	44
14	66	66	68	62	62	62	73	79	58	53	49	44
15	64	60	68	62	62	75	68	79	58	51	47	42
16	64	66	66	62	62	79	68	79	58	49	47	42
17	64	66	66	62	62	66	68	81	58	49	47	42
18	66	66	66	62	60	62	66	71	58	49	45	51
19	66	66	66	62	60	58	96	73	56	49	45	54
20	66	66	66	62	60	54	67	73	56	49	45	51
21	66	64	66	60	62	54	75	73	54	49	45	53
22	66	64	66	60	64	53	75	73	54	47	45	53
23	66	62	66	60	62	54	73	73	54	49	45	53
24	66	64	64	60	62	58	75	75	54	49	47	51
25	68	64	64	56	60	62	73	73	54	45	47	49
26	68	64	66	60	60	60	73	71	54	47	49	49
27	62	66	66	b59	58	58	66	71	54	49	47	49
28	66	66	64	b62	*58	58	*66	66	54	53	45	49
29	66	62	b64	b62	58	54	66	68	53	49	45	*49
30	66	62	b62	b62	b62	54	68	68	*53	47	45	47
31	66	---	b62	*56	---	*62	---	68	---	48	---	---
Total	2,018	1,966	2,040	1,695	1,688	1,632	2,199	2,325	1,766	1,579	1,447	1,412
Mean	65.1	65.5	65.8	60.8	60.3	59.1	73.3	75.0	58.9	50.9	46.7	47.1
Ac-ft	4,000	3,900	4,050	3,740	3,350	3,630	4,360	4,610	3,500	3,130	2,870	2,800

Calendar year 1960: Max 271 Min 56 Mean 90.7 Ac-ft 65,870

Water year 1960-61: Max 96 Min 42 Mean 60.7 Ac-ft 43,940

Peak discharge (base, 140 cfs).--No peak above base.

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

# BEAR RIVER BASIN

## 10-1170. Hammond (East Side) Canal near Collinston, Utah

Location.--Lat 41°50', long 112°03', in SE $\frac{1}{4}$  sec.27, T.13 N., R.2 W., on right bank 3,600 ft downstream from Cutler Dam and 4 miles north of Collinston.

Records available.--June 1912 to September 1961. Prior to 1915, published as Hammond ditch near Collinston. Monthly discharge only for some periods, published in WSP 1314.

Gage.--Water-stage recorder. Prior to May 22, 1914, staff gage at same site and datum.

Average discharge.--49 years, 50.5 cfs (36,560 acre-ft per year).

Extremes.--1912-61: Maximum daily discharge, 182 cfs June 28, July 1, 1932, June 27, 28, 1933, May 17, 1960; no flow at times in each year.

Remarks.--Records good. Canal diverts from east side of Bear River in NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.26, T.13 N., R.2 W., at dam at which West Side Canal and intake of Cutler powerplant also divert. Water from this canal and West Side Canal used for irrigation of about 58,000 acres below station in eastern Box Elder County.

Cooperation.--Gage-height record and seven discharge measurements furnished by Utah Power & Light Co.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	89	19	(*)					82	*165	173	161	114
2	86	19						79	165	170	161	108
3	94	19						112	163	170	161	106
4	89	15						137	157	140	160	106
5	90	11						137	146	74	156	106
6	91	11						144	132	*50	156	104
7	89	11						150	124	75	156	104
8	68	11						146	123	90	153	100
9	47	11				(*)		141	125	116	*158	102
10	35	11						*141	130	119	158	101
11	*34	11						153	137	128	157	101
12	32	11						158	137	158	157	99
13	23	11						168	144	138	157	94
14	19	11						169	150	146	160	92
15	19	*11						162	150	151	169	92
16	19	6.9						152	152	152	*163	91
17	*19	0						150	162	152	162	88
18	19	0						150	169	165	163	55
19	19	0						150	170	187	166	22
20	19	0						154	161	165	161	22
21	19	0						156	*170	164	156	21
22	19	0						156	172	165	158	*19
23	19	0						156	174	164	156	16
24	19	0						156	173	164	159	16
25	19	0						159	174	159	154	13
26	19	0						165	174	147	148	11
27	19	0						165	166	146	146	*11
28	19	0						164	174	146	145	10
29	19	0						164	174	150	141	9.8
30	19	0						167	175	160	132	9.8
31	19							167		161	119	
Total	1,229	199.9	0	0	0	0	0	4,592	4,692	4,356	4,911	1,943.6
Mean	39.6	6.56	0	0	0	0	0	148	158	141	155	64.8
Ac-ft	2,440	396	0	0	0	0	0	9,110	9,310	8,640	9,540	3,860
Calendar year 1960:	Max 182	Min 0		Mean 64.0	Ac-ft 46,460							
Water year 1960-61:	Max 175	Min 0		Mean 59.8	Ac-ft 43,300							

\* Discharge measurement or observation of no flow made on this day.

# BEAR RIVER BASIN

## 10-1175. West Side Canal near Collinston, Utah

Location.--Lat 41°50', long 112°04', in SW<sup>1</sup>/<sub>4</sub> sec.27, T.13 N., R.2 W., on left bank 4,200 ft downstream from Cutler Dam and 4 miles north of Collinston.

Records available.--June 1912 to September 1961. Monthly discharge only for some periods, published in WSP 1314.

Gage.--Water-stage recorder. Prior to May 22, 1914 staff gage at same site and datum.

Average discharge.--49 years, 235 cfs (170,100 acre-ft per year).

Extremes.--1912-61: Maximum daily discharge, 751 cfs June 24, 25, 1959; no flow for periods in every year except 1914.

Remarks.--Records good except those for periods of ice effect, which are fair. Canal diverts from west side of Bear River in NW<sup>1</sup>/<sub>4</sub>SW<sup>1</sup>/<sub>4</sub> sec.26, T.13 N., R.2 W., at dam at which Hammond (East Side) Canal and intake of Cutler powerplant also divert. Water from this canal and Hammond (East Side) Canal used for irrigation of about 58,000 acres below stations in eastern Box Elder County.

Cooperation.--Gage-height record and 12 discharge measurements furnished by Utah Power & Light Co.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	504	113	67					252	*696	719	690	568
2	504	113	*68					296	700	715	702	566
3	495	113	66					394	696	709	705	549
4	480	106	67	(*)				451	669	576	696	551
5	451	99	65				8	453	632	323	677	549
6	438	99	66					482	582	*274	673	540
7	426	101	65		20			544	559	356	663	531
8	324	101	60		(*)			580	555	397	663	629
9	250	92	50					626	560	482	*656	522
10	182	79	45				4	*679	576	528	654	511
11	*177	77						*694	576	618	654	510
12	151	77						700	576	665	654	511
13	134	77						686	618	684	656	511
14	134	77		35			*1	669	660	700	648	513
15	133	*77			(*)			673	671	698	628	510
16	133	77					0	636	684	686	*622	511
17	*133	76			18		0	652	679	675	614	504
18	133	73					0	663	679	669	622	311
19	133	73					0	669	694	650	634	172
20	132	72	40				0	658	705	624	616	172
21	132	69					0	656	*698	596	608	172
22	132	67			13		0	663	713	574	616	*156
23	132	66					0	660	724	562	632	128
24	132	66					0	667	724	576	630	128
25	132	69			8		0	694	719	652	622	123
26	132	69					0	705	713	642	608	119
27	122	69					0	711	707	652	608	*119
28	114	69					0	711	719	652	596	117
29	113	69					0	707	717	652	582	116
30	112	68		20	-----		0	705	717	665	574	116
31	114	-----		20	-----		0	709	-----	679	564	-----
Total	6,814	2,453	1,459	1,055	457	81	0	19,045	19,918	18,650	19,767	10,929
Mean	220	81.8	47.1	34.0	16.3	2.6	0	614	663	602	638	364
Ac-ft	13,520	4,870	2,890	2,090	906	161	0	37,780	39,510	36,990	39,210	21,680

Calendar year 1960: Max 742 Min 0 Mean 239 Ac-ft 217,000  
 Water year 1960-61: Max 724 Min 0 Mean 276 Ac-ft 199,600

\* Discharge measurement made on this day.  
 Note.--Stage-discharge relation affected by ice Dec. 7 to Mar. 15.

# BEAR RIVER BASIN

## 10-1180. Bear River near Collinston, Utah

Location.--Lat 41°50', long 112°03', in NW<sup>1</sup>SE<sup>1</sup> sec.27, T.13 N., R.2 W., on right bank 800 ft downstream from Cutler plant of Utah Power & Light Co., 2,000 ft downstream from Cutler Dam, and 5<sup>1</sup>/<sub>2</sub> miles north of Collinston.

Drainage area.--6,000 sq mi, approximately.

Records available.--July 1889 to September 1961. Published as "at Collinston" prior to 1900. Monthly discharge only for some periods, published in WSP 1314.

Gage.--Water-stage recorder. Datum of gage is 4,276.13 ft above mean sea level (levels by Bureau of Reclamation). Prior to Nov. 8, 1913, staff gage and Nov. 8, 1913, to Sept. 10, 1938, water-stage recorder, at site three-quarters of a mile downstream at different datums.

Extremes.--Maximum discharge during year, 5,730 cfs Nov. 2 (gage height, 4.72 ft); minimum daily, 21 cfs June 23-27.

1889-1961: Maximum discharge observed, 11,600 cfs June 7-10, 1909 (gage height, 7.70 ft, site and datum then in use); minimum daily, 10 cfs Aug. 4-12, 18-23, 1905; practically no flow at 12 p.m. Aug. 5, 1920.

Remarks.--Records excellent. Natural flow of stream affected by storage reservoirs, power developments, diversions for irrigation, and return flow from irrigated areas.

Cooperation.--Nine discharge measurements furnished by Utah Power & Light Co.

Revisions (water years).--WSP 1564: 1902.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	851	953	24	861	1,090	1,310	592	23	23	25	54
2	23	773	1,020	24	1,040	1,400	1,160	23	23	23	24	39
3	23	766	569	712	1,240	1,520	1,210	27	23	44	24	22
4	23	1,090	278	*721	482	1,250	1,080	26	24	23	25	22
5	24	511	775	537	26	936	986	26	24	22	25	22
6	23	345	879	554	947	734	969	27	24	*23	25	22
7	23	894	825	392	820	776	990	29	24	*23	24	23
8	23	835	645	52	*891	1,030	672	29	25	24	24	22
9	23	830	628	822	846	965	66	33	23	24	*25	23
10	26	1,190	702	949	1,140	883	711	*26	23	25	25	22
11	*22	1,200	25	945	1,270	931	1,220	25	23	25	25	22
12	33	928	866	1,090	1,260	945	1,280	25	23	25	24	22
13	228	145	856	1,020	1,550	584	1,420	26	23	23	24	22
14	488	1,110	903	358	1,180	848	1,330	26	23	25	24	22
15	798	*1,090	899	27	*1,080	911	1,250	26	23	25	25	23
16	663	835	1,020	907	1,170	1,050	1,000	24	24	25	*24	22
17	*747	835	395	1,110	1,680	1,250	982	24	24	25	24	23
18	448	1,020	25	1,090	1,610	1,310	1,290	23	24	25	24	23
19	436	835	1,090	834	1,380	704	630	23	24	25	24	23
20	523	350	1,270	853	1,370	1,650	804	23	23	25	24	23
21	591	1,200	1,260	295	958	1,290	1,270	23	*49	25	25	24
22	600	1,070	1,210	282	715	1,200	1,060	23	22	25	24	23
23	439	1,260	1,230	1,000	985	1,160	665	22	21	26	25	23
24	702	898	459	1,020	1,100	1,210	963	22	21	26	25	24
25	580	963	24	866	849	1,490	772	23	21	26	25	25
26	805	922	228	887	750	1,270	806	23	21	25	24	1,610
27	1,170	752	1,090	852	1,090	1,420	1,250	25	21	25	23	*655
28	1,000	831	1,110	523	1,150	1,450	1,210	24	22	25	23	691
29	378	768	1,130	26		*1,380	332	24	23	25	29	627
30	23	762	952	770		1,160	485	23	23	26	25	646
31	666	-----	522	646		1,320	-----	23	-----	25	22	-----
Total	11,569	25,557	23,858	20,178	29,430	35,177	29,183	1,336	714	783	756	4,846
Mean	373	852	770	651	1,051	1,135	973	43.1	23.8	25.3	24.4	162
Ac-ft	22,950	50,690	47,320	40,020	58,370	68,770	57,680	2,650	1,420	1,550	1,500	9,610

Calendar year 1960: Max 2,860 Min 18 Mean 704 Ac-ft 511,400  
 Water year 1960-61: Max 1,660 Min 21 Mean 502 Ac-ft 363,700

\* Discharge measurement made on this day.