

# BEAR RIVER COMMISSION



# TWENTIETH BIENNIAL REPORT



# 2017-2018

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**COVER: PHOTOS FROM 2017 AND 2018 BEAR RIVER TOURS**

Photo #1 – BQ Dam in the Lower Wyoming Section of the Upper Division where the BQ McFarland, BQ West and BQ East Canals and several pumps divert from the Bear River.

Photo #2 – Springs which discharge to Pine Creek, a tributary of the Smiths Fork.

Photo #3 – Looking upstream on the Outlet Canal at Paris Dike where PacifiCorp controls the discharge of water from the Bear Lake/Mud Lake complex.

Photo #4 – Confluence of Outlet Canal with the old channel of the Bear River below Stewart Dam.

**TWENTIETH BIENNIAL REPORT**

**BEAR RIVER  
COMMISSION**

**2017-2018**

**For the Biennium October 1, 2016**

**to**

**September 30, 2018**

**BOUNTIFUL, UTAH**

**November 2020**



**BEAR RIVER  
COMMISSION**

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**CHAIR**  
Jody Williams

**IDAHO  
COMMISSIONERS**  
Gary Spackman  
Kerry Romrell  
Curtis Stoddard

**UTAH  
COMMISSIONERS**  
Eric Millis  
Blair Francis  
Charles W. Holmgren

**WYOMING  
COMMISSIONERS**  
Adrian Hunolt  
Tim Teichert

**ENGINEER-MANAGER**  
Don A. Barnett

November 19, 2020

Donald Trump  
President of the United States  
Executive Office of the President  
The White House  
1600 Pennsylvania Avenue NW  
Washington, D.C. 20500

Dear President Trump:

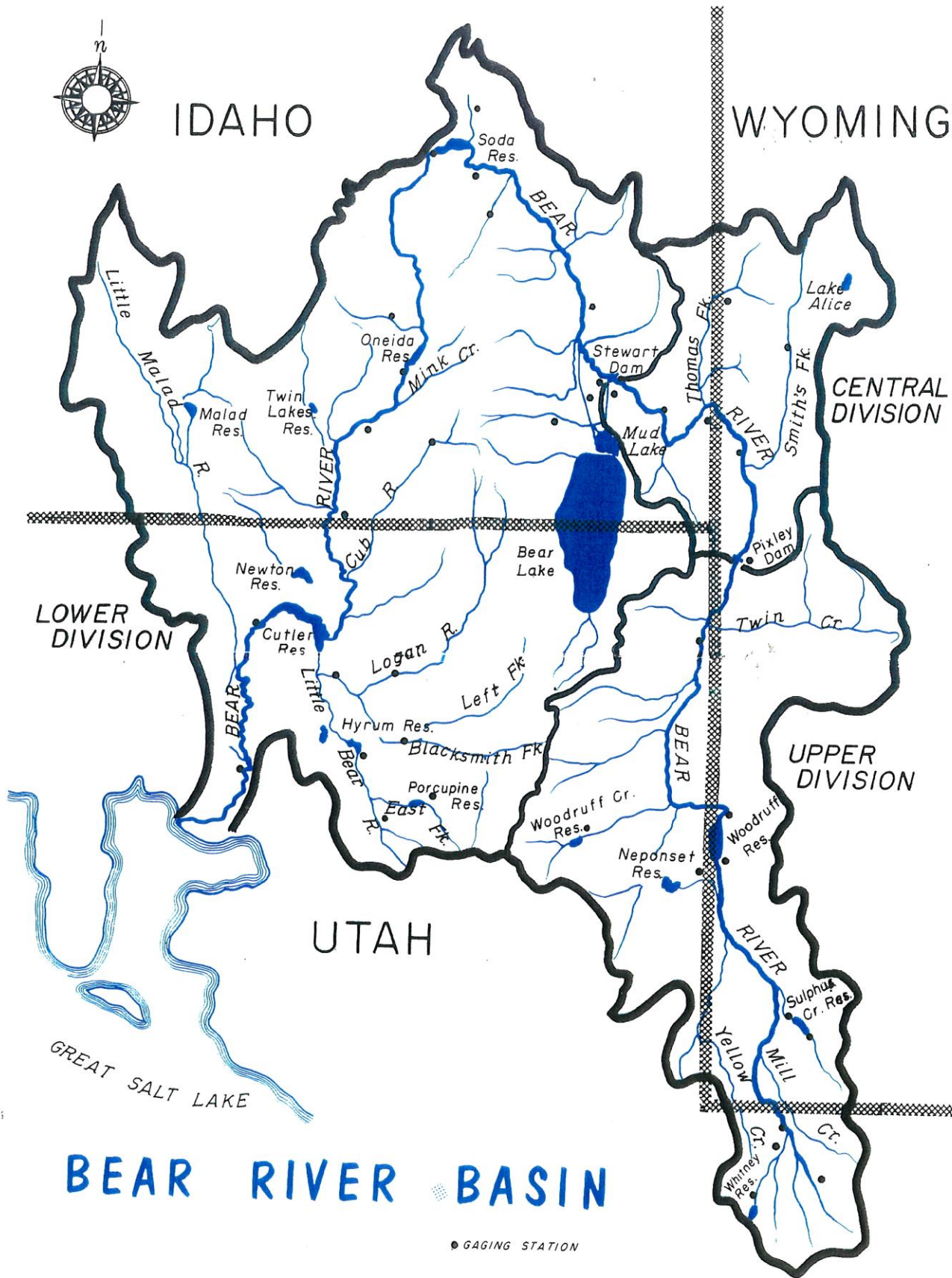
Submitted herewith is the Twentieth Biennial Report of the Bear River Commission, as required by Article III.D.2 of the Amended Bear River Compact.

A copy of the report is being transmitted to the governor of each signatory state to the Bear River Compact.

Sincerely,

Don A. Barnett  
Engineer-Manager

Enclosure



# BEAR RIVER BASIN

● GAGING STATION

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# **TWENTIETH BIENNIAL REPORT BEAR RIVER COMMISSION**

## **Overview**

### **SYNOPSIS**

The two years reported on in this biennial period were marked by drastically different water supplies. The water supply in 2017 was nothing short of phenomenal, whereas the 2018 water supply was, at best, mediocre. Though monitored in 2017, there was never a need or a request for interstate distribution in the Central Division. In 2018 a water emergence was declared in the Central Division pursuant to the Compact. No water emergencies were declared in 2017 or 2018 in the Upper and Lower Divisions. Distribution in all three divisions was done with great cooperation between administrators and users of waters within the Bear River system.

This biennial report is divided into three chapters. This first chapter, the Overview Chapter, provides a background of the Compact and the Commission and its general activities. The second and third chapters provide specific water supply and streamflow distribution information for the 2017 and 2018 water years, respectively.

### **BACKGROUND**

The Bear River Compact determines the rights and obligations of the signatory states of Idaho, Utah and Wyoming with respect to the waters of the Bear River. Federal consent to the Compact was given by the Congress and signed by President Eisenhower on March 17, 1958. The Bear River Commission was created by the Compact and has been organized as an interstate agency to administer the Compact.

The Bear River Compact was amended in accordance with Article XIII of the Original Compact (Article XIV, Amended Compact) following several years of study and review of Compact provisions. Principal amendments and other changes are discussed elsewhere in this report. Amendments to the Compact were agreed to by representatives of the compacting states on December 22, 1978, and State Amending Legislation was approved in each state in the spring of 1979. Congressional consent was given by the 96th Congress by Public Law 96-189 and signed into law by President Carter on February 8, 1980.

Article III.D.2 of the Compact was amended to provide that the Bear River Commission compile a biennial report rather than an annual report as required in the original Compact. Annual reports were compiled in each of the 21 years (1958-78) and were transmitted to the President of the United States and to the Governors of the signatory states. This is the

Twentieth Biennial Report covering the 2017 and 2018 water years (October 1, 2016, to September 30, 2018).

River operation under the Bear River Compact and activities of the Bear River Commission during the 2017 and 2018 water years are summarized in this report, by year, in the two chapters which follow. This biennial report is organized so that the specific information for each water year is reported in separate chapters. Selected streamflow records are given in the chapters discussing each water year.

## **COMMISSION ORGANIZATION & MEMBERS**

Ten commissioners, three representing each state and one representing the United States, constitute the Bear River Commission. The Federal representative serves as chairperson without a vote, while each of the other nine Commissioners has one vote. Figure O.1 lists the Bear River Commission membership as of October 1, 2016 (the beginning of the biennial period).

The Commission amended its bylaws on April 16, 1990. The amendments allowed for the creation of three standing committees of the Commission: the Management Committee, the Operations Committee, and the Records Committee. On November 18, 1997, the Commission again amended its bylaws and changed the name of the Records Committee to the Records & Public Involvement Committee. A Water Quality Committee was also created on November 18, 1997. These standing committees have duties as assigned to them by the Commission. Each state is allowed to designate its representatives to the committees, and in all committees votes are taken by state, with each state having one vote. These four committees met from time to time on an as-needed basis throughout this biennium. For the most part, they are advisory to the Commission.

The bylaws also provide for the creation of special committees which may be assigned tasks as deemed necessary. The Technical Advisory Committee (TAC) has been created by the Commission and serves the Commission as a whole (and each of the standing committees) on technical matters. The TAC is composed of state water agency personnel and is chaired by the Engineer-Manager of the Commission.

**Bear River Commission Members**  
(as of October 1, 2016)

**Officers**

Chair ..... Jody L. Williams, Salt Lake City, UT  
 Vice Chair<sup>1</sup> .....  
 Secretary ..... Eric Millis, Salt Lake City, UT  
 Treasurer ..... Randy Staker, Salt Lake City, UT  
 Engineer-Manager ..... Don A. Barnett, Bountiful, UT

**Members**

**Idaho**

Gary Spackman ..... Boise, ID  
 Kerry Romrell ..... Montpelier, ID  
 Curtis Stoddard ..... Grace, ID

**Utah**

Eric Millis ..... Salt Lake City, UT  
 Blair Francis ..... Woodruff, UT  
 Charles W. Holmgren ..... Bear River City, UT

**Wyoming**

Pat Tyrrell ..... Cheyenne, WY  
 Sam Lowham<sup>2</sup> ..... Evanston, WY  
 Tim Teichert ..... Cokeville, WY

**United States**

Jody L. Williams ..... Salt Lake City, UT

**Management Committee**

Gary Spackman ..... Boise, ID  
 Eric Millis ..... Salt Lake City, UT  
 Pat Tyrrell ..... Cheyenne, WY

**Operations Committee**

Sam Lowham ..... Evanston, WY  
 Blair Francis ..... Woodruff, UT  
 Kerry Romrell ..... Montpelier, ID

**Records Committee**

Charles Holmgren ..... Bear River City, UT  
 Curtis Stoddard ..... Grace, ID  
 Tim Teichert ..... Cokeville, WY

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<sup>1</sup> On November 22, 2016, Blair Francis was elected Vice Chairman  
<sup>2</sup> Sam Lowham was replaced by Adrian Hunolt on February 3, 2017

**Figure O.1**

## MEETINGS

Four Regular or Annual Commission meetings were held during the biennium. The dates of the meetings are as follows:

November 22, 2016	Regular Meeting	Salt Lake City, Utah
April 18, 2017	Annual Meeting	Salt Lake City, Utah
November 21, 2017	Regular Meeting	Salt Lake City, Utah
April 17, 2018	Annual Meeting	Salt Lake City, Utah

All four meetings during this biennium were held at the Utah Department of Natural Resources building in Salt Lake City, Utah. At the annual meetings held in April, elections were held, and fiscal matters were addressed. A fiscal report for the biennial period, prepared by the Treasurer, has been made a part of this chapter. Formal minutes for all four of the Commission meetings have been approved and are available on the Commission's website ([bearrivercommission.org](http://bearrivercommission.org)).

## COMMISSION ACTION AND ACTIVITIES

This section is to provide a brief accounting of significant actions or activities of the Commission during the biennial period separate and apart from specific streamflow measurement and distribution which are discussed elsewhere in this report. Greater details relative to specific actions or activities of the Commission are contained within the Commission's approved meeting minutes.

The first meeting of the biennial period was the Commission's regular fall meeting held on November 22, 2016, in Salt Lake City, Utah. The Commission meeting commenced with an introduction of Tim Teichert as a new Commissioner from Wyoming to replace Gordon Thornock. As Thornock was also serving as the Commission's Vice Chair, the Commission acted to replace him with Blair Francis as the new Vice Chair. The Commission then turned its attention to financial matters and received a FY2016 year-end financial report. The Commission then received a report on the proposed Paris Hills phosphate mine which had recently been reactivated. There was notable discussion regarding the significant groundwater dewatering effort which would be required if the mine were constructed. PacifiCorp then provided a report on their proposed Bear River Capacity Project which would seek to establish a spinning reserve at their Grace facility and increase channel capacity through the Gentile Valley. There was also a report on denial by FERC on the Twin Lakes Project and a report on the Last Chance Canal Company's diversion dam improvements. The Operations Committee reported that a water emergency had been declared in the Central Division. There was a discussion on the continuing assignment to the TAC to develop a common method for estimating depletions associated with supplemental water rights. There was also a discussion about the need to initiate the 20-year review of the Compact effort, as well as discussions on Utah's Comprehensive Development Plan on the Bear River. A more detailed report on this meeting can be found in the Commission's meeting minutes.

The second meeting of the Commission during this biennial period was the Commission's annual meeting which was held on April 18, 2017, in Salt Lake City, Utah. As the meeting began, Adrian Hunolt was introduced as a new Commissioner from Wyoming to take the place of Sam Lowham. A financial report was provided and the FY 2018 budget was approved. Upon motion the Commission's officers were voted to continue in their positions. The Commission then received a very encouraging report on the water supply outlook for 2017 with the snowpack then at about 154% of normal and streamflows projected at 158% to 277% of normal. The Commission then heard a detailed proposal from the Engineer-Manager on how the required 20-year Compact review effort could be carried out and, after lengthy discussion, the Commission formally voted to commence the process. The Commission then heard reports from the Records & Public Involvement Committee, the Operations Committee and the Water Quality Committee, as well as state reports. Included in the dialogue was some concern over PacifiCorp's proposed potential changes in operations at Bear Lake. A more detailed report of this meeting can be found in the Commission's meeting minutes.

The third meeting of the biennial period was the Commission's regular fall meeting held on November 21, 2017, in Salt Lake City, Utah. A report was provided by the Commission's Treasurer on the closeout of the FY2017 income and expenses. This was followed by a report by the Engineer-Manager on the 20-year Compact Review efforts, the public meetings and the efforts to seek public comments. The period for submitting comments was yet open at the time of the meeting. The Commission also heard a report on Utah's Bear River Comprehensive Plan for management of the sovereign lands. There were discussions regarding the phenomenal water year. There were also reports from the Commission's standing committees. More detail on specific discussions of the Commission and reports can be found in the Commission's meeting minutes.

The fourth and final meeting of the Commission during the biennial period was held on April 17, 2018, in Salt Lake City, Utah. At the start of the meeting the Commission remembered Jack A. Barnett, the second Engineer-Manager of the Commission, who had recently passed away, and offered a resolution of appreciation in his behalf. The Commission then heard the financial report, amended its 2018 budget to accommodate additional costs for the 20-Year Compact Review effort and approved the proposed budget for FY2019. The Commission received a report on the 2018 water supply outlook which appeared to be below normal. It then heard a detailed report on the comments which were received as part of the 20-Year Compact Review effort. After considerable discussion, the Commission determined to not open up the Compact for amendment and instructed the TAC to prepare a report and response document detailing the efforts and findings of the Commission. The Commission also heard a report on recent filings by Idaho and Utah on high flow storage in Bear Lake. The Commission then heard reports from each of its standing committees, as well as state reports. Greater detail relative to the Commission meeting and activities can be found in the Commission's meeting minutes.

In recognition of the Commission's commitment to broaden its public outreach, the Commission sponsored two tours during the biennial period. The first, in the summer of 2017, was of the lowest portions of the Upper Division and Wyoming portion of the Central Division in the Cokeville area. It included stops below Pixley Dam, at the Border Gage and up Smiths Fork and the Thomas Fork. The second tour was during the summer of 2018 and covered the area north of Bear Lake in the Central Division and upper portion of the Lower Division in Idaho. The tour included a drive along the Outlet Canal past Paris Dike to the confluence with the old channel of the Bear River. There was a stop at the Pescadero Gage, Stewart and Rainbow Dams and the

Causeway between Mud Lake and Bear Lake before ending at the Lifton Pumping plant. It also included a tour of portions of the Bear Lake National Wildlife Refuge. There was a review and discussions about irrigation in Idaho's Central Division. Both tours were deemed to have been very successful with more than forty participants on each from a number of interests within the Bear River Basin. The cover of this biennial report includes pictures from the two tours.

A very significant event during this biennial period was the initiation of the 20-year Compact review effort. This included a number of press releases, several news articles, five public meetings and other efforts to reach out to the public and solicit input. The Commission created a tab on its webpage filled with information on the Bear River Basin, the Compact and other information of interest. The public meetings included a PowerPoint presentation and discussions all aimed at informing the public so that they could provide informed input to the Commission. Written public comment was solicited through December 4, 2017. A total of 67 comments were submitted. At its spring 2018 meeting the Commission determined to not amend the Compact. It then instructed the TAC to prepare a summary and response document on the many comments received (the report was finalized after this biennial period and is now found on the Commission's website).

## FINANCIAL REPORT

The fiscal year of the Commission begins on July 1 of a given year and ends on June 30 of the following year. The expenditures for the period are shown in Figure O.2 and were presented to the Commission by the Treasurer.

The Commission records were audited by an auditor. The audit of accounts and records, including a statement of budget revenue and disbursements for the biennium ending June 30, 2018, is a part of the formally accepted Commission minutes.

Expenses 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 they represent.

### Financial Report June 30, 2018

	ACTUAL FY 17	ACTUAL FY 18	PROPOSED FY 19	PROPOSED FY 20
<b><u>ACTUAL/ANTICIPATED INCOME</u></b>				
Idaho Assessment	40,000.00	40,000.00	45,000.00	45,000.00
Utah Assessment	40,000.00	40,000.00	45,000.00	45,000.00
Wyoming Assessment	40,000.00	40,000.00	45,000.00	45,000.00
State Water Quality Agencies	5,468.00	8,343.00	8,254.00	8,254.00
Interest on Savings	1,540.49	2,454.00	800.00	800.00
TOTAL	\$127,008.49	\$130,797.00	\$129,054.00	\$129,054.00
<b><u>ACTUAL/ANTICIPATED EXPENSES</u></b>				
Stream Gaging	\$40,755.00	\$41,270.00	41,490.00	42,970.00
Personal Services, Engineer-Manager	64,350.00	65,640.00	67,281.00	68,963.00
Travel Expenses	1,491.18	1,197.77	1,200.00	1,200.00
Office Expenses	574.61	1,717.47	1,600.00	1,600.00
20-Year Compact Review		7,000.00		
Printing Biennial Report	0.00	0.00	1,000.00	1,000.00
Treasurer Bond & Audit	100.00	100.00	1,400.00	1,400.00
Printing	514.50	1,604.90	1,600.00	1,600.00
Real-time Web Hosting	7,215.99	5,415.99	8,400.00	8,400.00
Clerical	10,662.49	15,678.31	8,723.00	8,941.00
Tour	0.00	2,495.49	2,500.00	2,500.00
Contingency	0.00	0.00	2,000.00	2,000.00
TOTAL	\$125,663.77	\$142,119.93	137,194.00	140,574.00

**Figure O.2**

## **THE BEAR RIVER**

The Bear River drains an area of 6,900 square miles in southwestern Wyoming, northern Utah and southeastern Idaho. Its headwaters are but 90 miles from its mouth, yet it meanders 500 miles in a circuitous course in reaching the Great Salt Lake. In its travels, it makes five state line crossings in the three states. The map found on page ii shows the major features of the Bear River system.

The Bear River is not only the largest tributary to the Great Salt Lake, but is the largest stream in the North American Continent that does not flow to an ocean. Prior to settlement and irrigation development, the annual discharge of the river into the Great Salt Lake averaged an estimated 1,750,000 acre-feet. Settlement of lands adjacent to the Bear River began in about 1860, and power development began in 1907. In 1911, Bear Lake was converted into a storage reservoir by constructing inlet and outlet canals connecting the lake and the river.

Approximately 500 irrigation organizations own and operate separate irrigation systems in the Basin, supplying irrigation water for half a million acres of land. Six hydroelectric plants are in operation on the main stem of the Bear River.

In addition, a municipality, numerous communities, individual families, a variety of industrial and miscellaneous users, and waterfowl refuges withdraw water from the Bear River, its tributaries and its tributary ground water. Today, on an average, nearly a million acre-feet of water still flows annually into the Great Salt Lake from the Bear River.

## **BEAR RIVER COMPACT**

The Bear River Compact is a document voluntarily adopted by the states which establishes the rights and obligations of Idaho, Utah and Wyoming with respect to the waters of the Bear River. The Compact became effective on March 17, 1958.

The main purposes of the Compact are outlined in paragraph A of Article I of the Compact, which states:

*The major purposes of this Compact are to remove the causes of present and future controversy over the distribution and use of the waters of the Bear River, to provide for efficient use of water for multiple purposes, to permit additional development of the water resources of Bear River, and to promote interstate comity.*

The Original (1958) Compact provided the following:

- Divided the Bear River into three main divisions: the Upper Division, the Central Division, and the Lower Division, with subdivisions or sections created in the Upper and Central Divisions. The Compact specifically identified which river flows and canal diversions are to be assigned to each of the divisions.



- Apportioned the direct flows of the Bear River and its tributaries between Utah and Wyoming in the Upper Division (upstream of Pixley Dam) and between Idaho and Wyoming in the Central Division (Pixley Dam to Stewart Dam).
- Did not specifically allocate the water in the Lower Division between the states of Idaho and Utah. The Compact did, however, provide a mechanism wherein a Utah water user may allege that because of diversions within Idaho, he is being deprived of water to which he is justly entitled and request distribution across the state line. If the Commission finds this to be the case, the Commission may declare a water emergency and establish a water delivery schedule in the Lower Division based upon priority of rights without regard to the state line.
- Defined the pre-compact storage rights for each of the three states in reservoirs above Bear Lake and established additional rights to store above Stewart Dam 36,500 acre-feet of Bear River water in any water year. This 36,500 acre-feet of storage is referred to as "Original Compact Storage" and was allocated to each of the states as follows:
 

Utah	17,750 acre-feet
Wyoming	17,750 acre-feet
Idaho	1,000 acre-feet
- Reserved a portion of the storage capacity in Bear Lake for primary use by, and protection of, irrigation uses and rights downstream from Bear Lake. This compact-provided-for "irrigation reserve" establishes minimum Bear Lake levels which correspond to upstream storage development, below which Bear Lake cannot be drawn down only for power purposes.

## **AMENDED BEAR RIVER COMPACT**

Proposed amendments to the Bear River Compact were approved by the Commission in December 1978 and the Amended Compact became law on February 8, 1980. The Amended Compact replaces the original Compact. Amendments provide for the following principal changes to the 1958 Compact:

### **Amendment Highlights**

- The allocation and distribution of direct flow rights between the various sections in the Upper and Central Divisions are unchanged from the 1958 Compact.
- Additional storage is granted above Bear Lake for 74,500 acre-feet, of which 4,500 acre-feet is granted to Idaho and 35,000 acre-feet is granted each to Utah and Wyoming. This storage, plus water appropriated (including ground water) and applied to beneficial use after January 1, 1976, is limited to an annual depletion of 28,000 acre-feet, of which Idaho is allocated 2,000 acre-feet and Utah and Wyoming

are allocated 13,000 acre-feet each. This additional storage in the Upper and Central Division will not be allowed when the elevation of Bear Lake is below 5911 feet (Utah Power and Light datum).

- Additional rights are granted to store water in the Upper and Central Divisions which would otherwise be spilled or bypassed from Bear Lake when all other direct flow and storage rights are satisfied. These storage rights are allocated with equal priority as follows: 6 percent to Idaho, 47 percent to Utah and 47 percent to Wyoming.
- The method for the declaration of a water emergency in the Lower Division and the distribution of direct flow diversions by priority without regard to state line is unchanged from the 1958 Compact.
- The water not applied to beneficial use prior to January 1, 1976, including ground water tributary to the Bear River, is allocated on a depletion basis.
- In the Lower Division, Idaho is granted the first right to develop and deplete 125,000 acre-feet. Utah is granted the second right to develop and deplete 275,000 acre-feet. The next 150,000 acre-feet of water depletion will be divided equally between Utah and Idaho. All water in excess of the above allocations will be divided between Utah and Idaho, with Idaho receiving 30 percent and Utah 70 percent.

### **Compact Required Depletion Estimates**

The Amended Bear River Compact, as referenced above, states that the new provisions allowing for additional storage and use of waters subsequent to January 1, 1976, are to be administered based on allowed new depletions. The Compact provides that Commission-approved procedures shall be adopted to make such depletion estimates. Working under the direction of the Commission, the Technical Advisory Committee (TAC) first prepared a depletion estimate in 1990. An update to the depletion estimates has now been prepared through 2009. Such estimates are memorialized in a Technical Memorandum titled *2009 Depletions Update*. At the April 2014 Commission meeting the Commission formally adopted these updated depletion estimates. The Commission's approved procedures which provide for depletion estimate calculations were also revised. The Commission-approved procedures direct that the latest depletion estimates should be included in the Biennial Report. Figure O.3 represents the most recent depletion estimates.

**Bear River Commission**  
**Estimated Annual Depletions<sup>1</sup>**  
**Changes from January 1, 1976, to December 31, 2009**

ABOVE STEWART DAM

State	Allocation	Agricultural Depletions	M&I Depletions	Reservoir Evaporation	Total Depletions	Remaining Allocation
Utah	13,000	5,935	-5	841	6,771	6,229
Wyoming	13,000	2,407	401	197	3,005	9,995
Idaho	2,000	1,310	3	0	1,313	687

LOWER DIVISION

State	Allocation	Agricultural Depletions	M&I Depletions	Reservoir Evaporation	Total Depletions	Remaining Allocation
Idaho	125,000 <sup>2</sup>	8,667	300	11	8,978	116,022
Utah	275,000 <sup>3</sup>	-5,771	5,978	0	207	274,793

<sup>1</sup>Any reductions in pre-1976 depletions are reflected in the above numbers.

<sup>2</sup>First right under Compact. Compact grants additional rights.

<sup>3</sup>Second right under Compact. Compact grants additional rights.

**Figure O.3**

## ADMINISTRATION OF BEAR RIVER COMPACT

### General

Provisions of the Compact are generally administered and enforced under the 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.

Seasonal daily records are collected on about 130 diversions above Bear Lake by state river commissioners under the direction of their respective State Engineers and under the general supervision of the Commission's Engineer-Manager. These records include all of the diversions from Bear River main stem and Smith's Fork, as they are required to administer the Bear River Compact. Daily discharge records for canals in the Upper and Central Divisions are published in this biennial report and have been published in previous biennial reports.

The Engineer-Manager determines when, under provisions of the Compact, a water emergency exists in the Upper or Central Divisions. Once a determination has been made of a water emergency, the Engineer-Manager is in weekly contact with state river

commissioners as to flows and diversions and, at least once a week, allocates the water within the Upper and Central Divisions as provided for under the Compact. The Engineer-Manager also inspects diversions in the field as needed to ensure the equitable apportionment of the water of the Bear River as provided for under the Compact.

## Storage

### New Storage

The original 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.

The reservoirs listed in Figure O.4 have been constructed under the additional storage provisions of the original Compact.

### **Constructed Additional Storage Provided for Under the Original Compact**

<i>Reservoir</i>	<i>Allocation</i>
Sulphur Creek Reservoir (Wyoming) .....	4,614 ac-ft
Sulphur Creek Reservoir Enlargement (Wyoming).....	1,100 ac-ft
J. L. Martin Reservoir, Sulphur Creek (Wyoming) .....	88 ac-ft
A. J. Barker Reservoir, Yellow Creek (Utah) .....	162 ac-ft
Hatch Brothers Reservoir (Utah) .....	350 ac-ft
Woodruff Narrows Reservoir (Wyoming).....	3,250 ac-ft
Woodruff Narrows Reservoir (Utah) .....	15,240 ac-ft
Whitney Reservoir (Wyoming).....	4,200 ac-ft
Wyman Reservoir (Wyoming).....	22 ac-ft
Massae Reservoir (Wyoming) .....	107 ac-ft
Massae Reservoir Enlargement (Wyoming).....	51 ac-ft
Woodruff Creek Reservoir (Utah) .....	2,000 ac-ft
Coy Reservoir (Wyoming).....	50 ac-ft
Bear River Regional Joint Powers Board (Wyoming).....	168 ac-ft
<b>TOTAL ALLOCATION.....</b>	<b>31,402 ac-ft</b>

**Figure O.4**

Additional storage allowance is also granted under the Amended Compact. Woodruff Narrows was enlarged in 1980 under this provision from a capacity of 28,100 acre-feet to 57,300 acre-feet. Allocated to this enlargement is: Utah, 18,000 acre-feet, including 6,686 acre-feet depletion; and Wyoming, 2,960 acre-feet, including 871 acre-feet depletion.

Sulphur Creek Reservoir was enlarged in 1988 to a total capacity of 19,775 acre-feet. Allocated to this enlargement is 10,315 acre-feet (9,370 for municipal use), including 701 acre-feet for depletion.

## Bear Lake

Article VI of the Compact provides an irrigation reserve level in Bear Lake below which water shall not be released solely for generation of power, except in emergency; but after release for irrigation, it may be used in generating power as it is conveyed to irrigation diversion works. The reserve is to be increased by designated amounts as additional storage, allocated by the original Compact, is developed above Bear Lake. No additional storage was built pursuant to this provision in the Compact during the biennial period, and so the irrigation reserve elevation remained at 5,914.61 feet, with an active storage content in Bear Lake of 794,000 acre-feet. This irrigation reserve elevation corresponds to 30,000 acre-feet of developed additional original Compact storage allocation.

## **Water Supply**

The Commission uses three stream gages, one in each of the three river divisions, as general indicators of the water supply during a given year in the respective divisions. Each of these three gages has a period of record beginning in 1943 and continues to the present. There are not significant streamflow diversions above these three gages and, hence, they are used to approximate natural flow conditions.

In the Upper Division, most of the Bear River streamflow originates on the north slopes of the Uinta Mountains and flows northward across the state line into Wyoming. The USGS Utah-Wyoming State Line Gage has been used as a good indicator gage of the water supply generally available above Bear Lake and, in particular, to the Upper Division.

Inflow from the Smith's Fork to the Bear River in the Central Division often represents half, or more, of the combined flow of the Bear River at this location. Therefore, the USGS gage on Smith's Fork has been used by the Commission as an indicator of the available water supply in the Central Division.

A large amount of the available water supply in the Lower Division originates and is diverted in the Cache Valley. The major streams which are tributary to the Bear River in the Cache Valley originate in the mountains on the east side of the valley. One of these tributaries, the Logan River, has been used by the Commission as a good indicator gage of the water supply available for diversion in the Cache Valley and, in general, in the Lower Division. A canal diverts from the Logan River above the USGS gaging station. Hence, in order to gain a good record of approximate natural flow conditions, the canal diversion data are added to the USGS stream gage data to generate a combined Logan River flow value. It is this combined Logan River data which is used as an indicator of the general water supply in the Lower Division.

## **Streamflow Distribution**

The administration of the distribution of the waters of the Bear River between the three Compact states and the various subdivisions of the river, as defined by the Compact (the river crosses state lines five times), is defined by the original Compact. When the flow of the river in the Upper and Central Divisions decreases to certain levels, the Engineer-

Manager is to declare a "water emergency" and supervise the allocation of water between the sections within the divisions of the river as directed by the Compact.

The Compact provides that in the Upper Division, which comprises all of the Basin from its headwaters down to and including Pixley Dam, there shall be two sections administered in Wyoming and two sections administered in Utah. The Compact provides that when the total natural flow diversion 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 the sections as follows:

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

The Amended Compact further provides in Article IV.A.1.e. that:

*If for any reason the aggregate of all diversions in a river section of the Upper Division does not equal the allocation of water thereto, the unused portion of such allocation shall be available for use in the other river sections in the Upper Division in the following order: (1) In the other river section of the same State in which the unused allocation occurs; and (2) in the river sections of the other State. No permanent right of use shall be established by the distribution of water pursuant to this paragraph e.*

The Compact defines the Central Division as comprising that part of the Basin from Pixley Dam down to and including Stewart Dam (the point of diversion to Bear Lake). It includes one section in Wyoming and one in Idaho.

Divertible flow in the Central Division is the sum of diversions from Smith's Fork and designated tributaries, diversions from Bear River in the division, diversion to Bear Lake via the Rainbow Inlet Canal, and flow passing Stewart Dam. A water emergency shall exist when this divertible flow is less than 870 cfs, or when the flow of the Bear River entering Idaho (gaging station at Border) is less than 350 cfs. Wyoming diversions are limited to 43 percent of divertible flow during a water emergency.

Procedures for the Lower Division Water Delivery were adopted several years ago. No formal requests for the declaration of a water emergency in the Lower Division have ever been received by the Commission, though water is distributed by the States of Idaho and Utah with similar water right accounting models which essentially distribute water between users similar to what would occur if a water emergency were declared in the Lower Division.

### **Stream Gaging Program**

The Commission has concluded a record of the stream flows in the Bear River drainage is most important as this record is needed: 1) for the measurement and subsequent distribution of waters during the irrigation season in compliance with the Compact; 2) to verify the

compliance of diversions with the Compact; 3) for the review of the Compact, as is required from time to time; and 4) for the three states to plan for water resource use and development. As an indication of the Commission's commitment to the stream-gaging program, the Commission allocated in the biennium about half of its budget to the stream-gaging program. PacifiCorp, the individual states, and water user organizations maintain additional records of stream flows and canal diversions. A composite of all of the records is needed to accurately reflect the waters available for use in the Bear River drainage.

All of the stream gages supported by the Commission are operated and maintained by the U.S. Geological Survey (USGS). The USGS is well recognized as a leader in stream-gaging technologies, and their records are used as a standard for planning, water distribution and legal purposes. The cooperative agreement between the Bear River Commission and the USGS provides that both contribute to the funding of the program. The adequacy of the stream-gaging program is constantly reviewed by the Commission's TAC, by Commission members and by the USGS.

Lists of the individual gages supported during the biennium and the records of key gages during the biennium are made a part of this report, and respective detail is provided in the 2017 and 2018 chapters of this report. The locations of the gages that were in operation during the biennial period are shown on Figure O.5.

## **BIENNIUM STATE ADMINISTRATION**

Article XI of the Amended Compact provides that applications for appropriation or change in water use within each state shall be in accordance with individual state law, except no such application shall be approved if the effect will deprive water users within another state or increase the depletion beyond that which is provided for under the Compact. This article further requires that state officials report, in a format and at intervals established by the Commission, the status of their respective allocations and uses. The Commission has determined the best format for reporting such changes in use is the Biennial Report. Details of state water-related activities are shown in the respective years' write-ups.

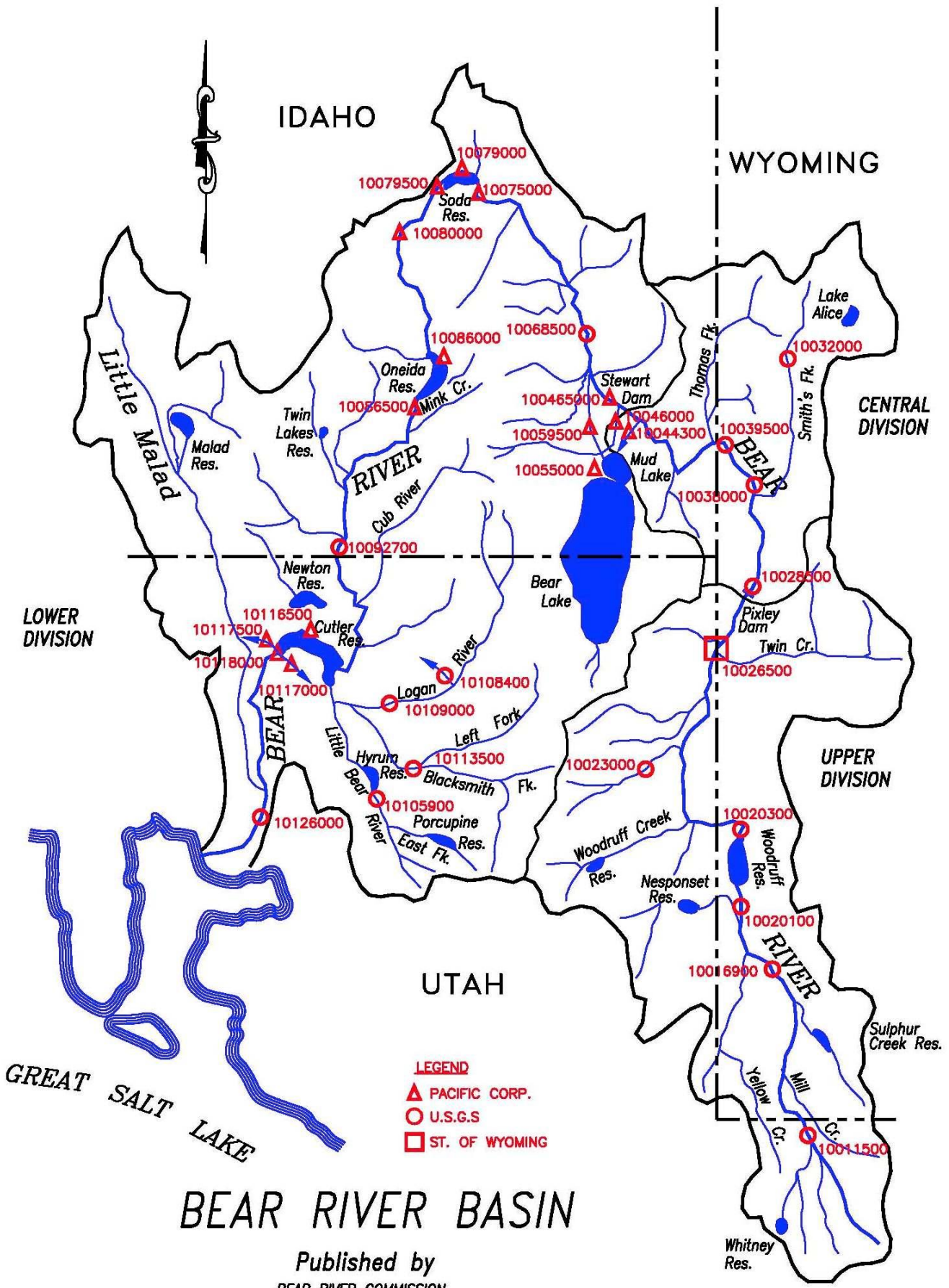


Figure O.5



## **WATER QUALITY EFFORTS**

The water quality agencies within each of the three Bear River States supported the Commission creating the Water Quality Committee. It was determined that the three state lead water quality administrators would serve as committee members. The committee generally reports twice each year at the Commission meetings regarding its activities. At the time of the creation of the Water Quality Committee, the Bear River Water Quality Task Force was already in existence. Technical representatives from the three states' water quality agencies co-chair this task force which meets three times a year in the basin and which serves as a support to the committee in identifying, reviewing, coordinating and reporting water quality activities within the Bear River Basin. Though water quality administration is not a specific charge in the Compact, water quality issues certainly become entwined in water administration within the Basin. Not only has the committee worked effectively on some cross-discipline issues, but the cooperation fostered within the water quality administration arena has been most notable and worthwhile.

In order for water quality streamflow data to be meaningful, there is a need for streamflow information. The Commission financially supports the stream gaging program in cooperation with the USGS which collects basic hydrologic information in the Bear River drainage. The water quality agencies, through the Water Quality Committee, have agreed to financially support a portion of the overall stream gaging costs as well.

In conjunction with the Commission's 20-year Compact review effort, the Water Quality Committee took a look back at its accomplishments, since it was created twenty years earlier, and began a strategic planning process to look at where it wants to direct efforts in the future. It also provided input and guidance to the Commission on comments which were submitted in the 20-year Compact review effort.

As reported in previous biennial reports, with the assistance of an EPA grant, a Bear River Water Information System (WIS) was created as a massive repository of hydrologic and water quality information. This valuable tool is housed at Utah State University (USU) ([bearriverinfo.org](http://bearriverinfo.org)). During the biennial period, the three states, through the Water Quality Committee, continued to financially and functionally support the maintenance of the WIS which underwent a platform change at USU.

During the biennial period, the three states reviewed their cooperative water quality monitoring efforts, created a ten-year summary report, and decided to scale back some of the previous monitoring in Wyoming. During the biennial period, the Water Quality Committee continued to coordinate and report on TMDL efforts within the states. Many of the discussions of the committee focused on sediment load in the Bear River, including a TMDL in the Upper Bear River Basin in Wyoming. They also looked at sediment issues associated with the Mud Lake complex, along with potential studies. Also, during this period, a joint effort by USGS, PacifiCorp and the three state water quality agencies led to the building and deployment of two water quality platforms on Bear Lake. This five-year effort will seek to better understand changes to water quality within the lake.

At each of the meetings the three states discussed their efforts with respect to water quality administration in the river. This is most valuable as the Bear River winds its way from the headwaters to its terminus in the Great Salt Lake by crossing state lines five times, creating six separate sections of the river in the three states. Continued discussions concerning each state's water quality standards and their TMDL efforts have been most productive, and discussions at the Water Quality Committee meetings and Bear River Water Quality Task Force meetings have helped inform administrators and coordinate efforts.

# 2017 Water Supply and Distribution Report

## OVERVIEW

The 2017 water year can be described as nothing short of phenomenal in all three Divisions. Early forecasts were for very high flows. Bear Lake made the largest storage increase on record. There was not a request for interstate regulation in any of the three Bear River divisions.

## WATER SUPPLY

Three stream gages, one in each division of the river, have been used by the Commission as indicator gages of the relative supply available for each of the divisions of the river (see Stream Gaging Program section in the Overview chapter). The Utah-Wyoming State Line and Smith's Fork gages measure a major portion of the stream flow in the Upper and Central Divisions, respectively. The Logan River is a major tributary to the Bear River in Cache Valley, which is in the Lower Division. Specific discharges, as measured by the USGS for the three gages during 2017, compared with the long-term averages, are summarized in Figure 2017.1 and are graphically illustrated in Figures 2017.2 through 2017.4 on the subsequent pages.

Figure 2017.1 shows a summary of the volumetric discharge for each of these gages for the water year. As the water supply available during the irrigation season is most critical for filling the natural flow rights, the discharge as measured at these gages during the irrigation season is also shown in Figure 2017.1.

Figures 2017.2 through 2017.4 show hydrographs for each of these three gaging stations. On each hydrograph, the mean daily flow during the irrigation season is plotted against the average of the mean daily flows for the period 1943 through 2017. The area between the 2017 hydrographs and the mean hydrographs represents the difference in volume of water discharged during 2017 versus the long-term average. This volumetric difference is illustrated by the bar charts shown on each of the figures.

As can be seen in Figure 2017.1, the annual discharge for the Upper Division (Utah-Wyoming State Line gage) was 143 percent of the long-term average, and streamflow on Smith's Fork and the Logan River were 171 and 164 percent, respectively. More important to the natural flow diversions than the streamflow during the water year is the streamflow during the irrigation season of May through September. During this period, the water supply was 140 percent (Upper Division), 164 percent (Central Division), and 160 percent

## 2017 Water Supply Summary by Division

### 2017 WATER YEAR

(Discharge in Acre-feet)

GAGE	AVERAGE (1943-17)	2017	PERCENT
Upper Division (UT-WY State Line)	139,600	199,500	143%
Central Division (Smith's Fork)	137,500	235,300	171%
Lower Division (Logan River)	181,700	298,100	164%

### 2017 IRRIGATION SEASON

#### MAY - SEPTEMBER

(Discharge in Acre-feet)

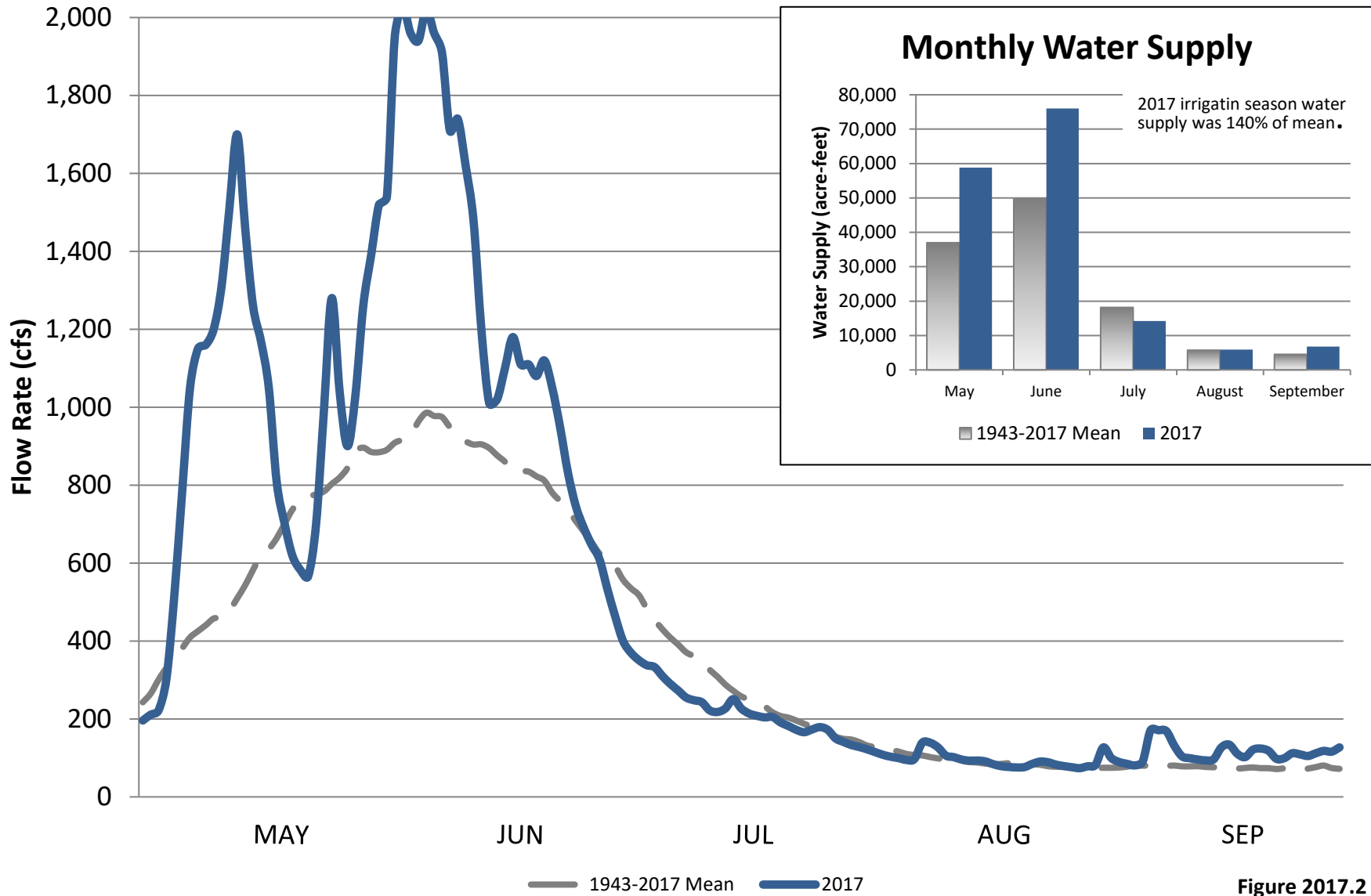
GAGE	AVERAGE (1943-17)	2017	PERCENT
Upper Division (UT-WY State Line)	115,100	161,700	140%
Central Division (Smith's Fork)	102,300	168,000	164%
Lower Division (Logan River)	121,600	194,800	160%

**Figure 2017.1**

(Lower Division). One item of interest to note is that though the actual stream flows realized during the irrigation season shown above were exceptionally high, they were about 18 percent below in the Upper Division, 24 percent below in the Central Division and approximately 70 percent below in the Lower Division the April 1 forecasted amounts.

A closer look at the three hydrographs (Figures 2017.2, 2017.3 and 2017.4) is also insightful when one is trying to understand the natural water supply in the spring and summer of 2017. All three gages show a very early high runoff peak in early May with a second, higher peak flow in early June. The Upper Division gage (Figure 2017.2) shows, with these two peaks, much higher than normal flows until late June after the flows actually dropped to below normal in early July and then rebounded to near normal for the remainder of the irrigation season. The Central Division gage (Figure 2017.3) shows a similar pattern in May and early June with flows staying above normal throughout the irrigation season. The Lower Division indicator gage (Figure 2017.4) likewise shows a runoff pattern with two May and June peaks which are dramatically above normal and then streamflow remaining notably above normal through the remainder of the irrigation season. In summary, during the 2017 irrigation season the streamflow was well above normal in all three Divisions.

## 2017 - Upper Division Water Supply Flow at Utah-Wyoming State Line Gage



17-3

**Figure 2017.2**

## 2017 - Central Division Water Supply

### Flow at Smiths Fork near Border, Wyoming Gage

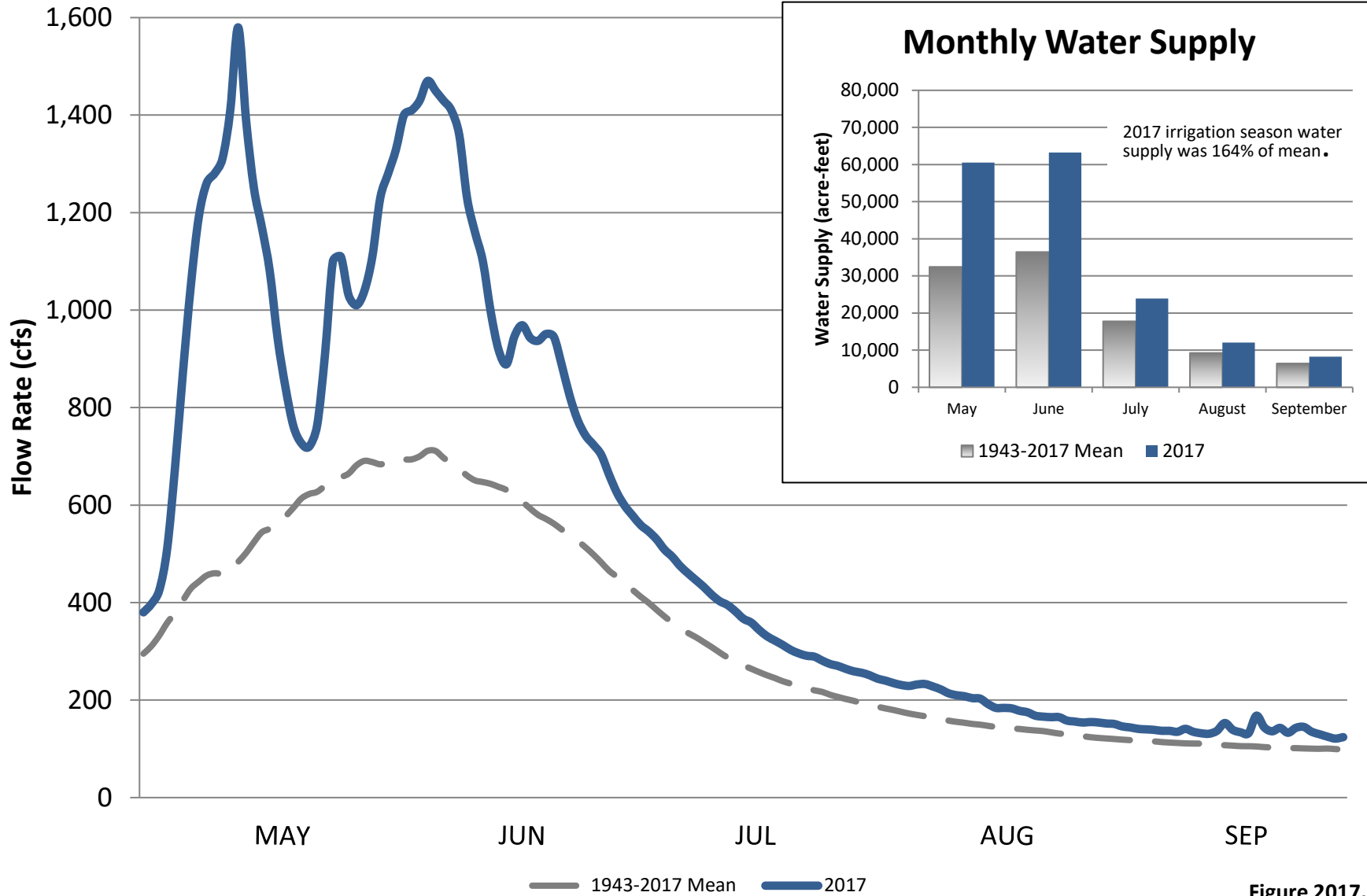


Figure 2017.3

## 2017 - Lower Division Water Supply Flow at Logan River Combined Gage

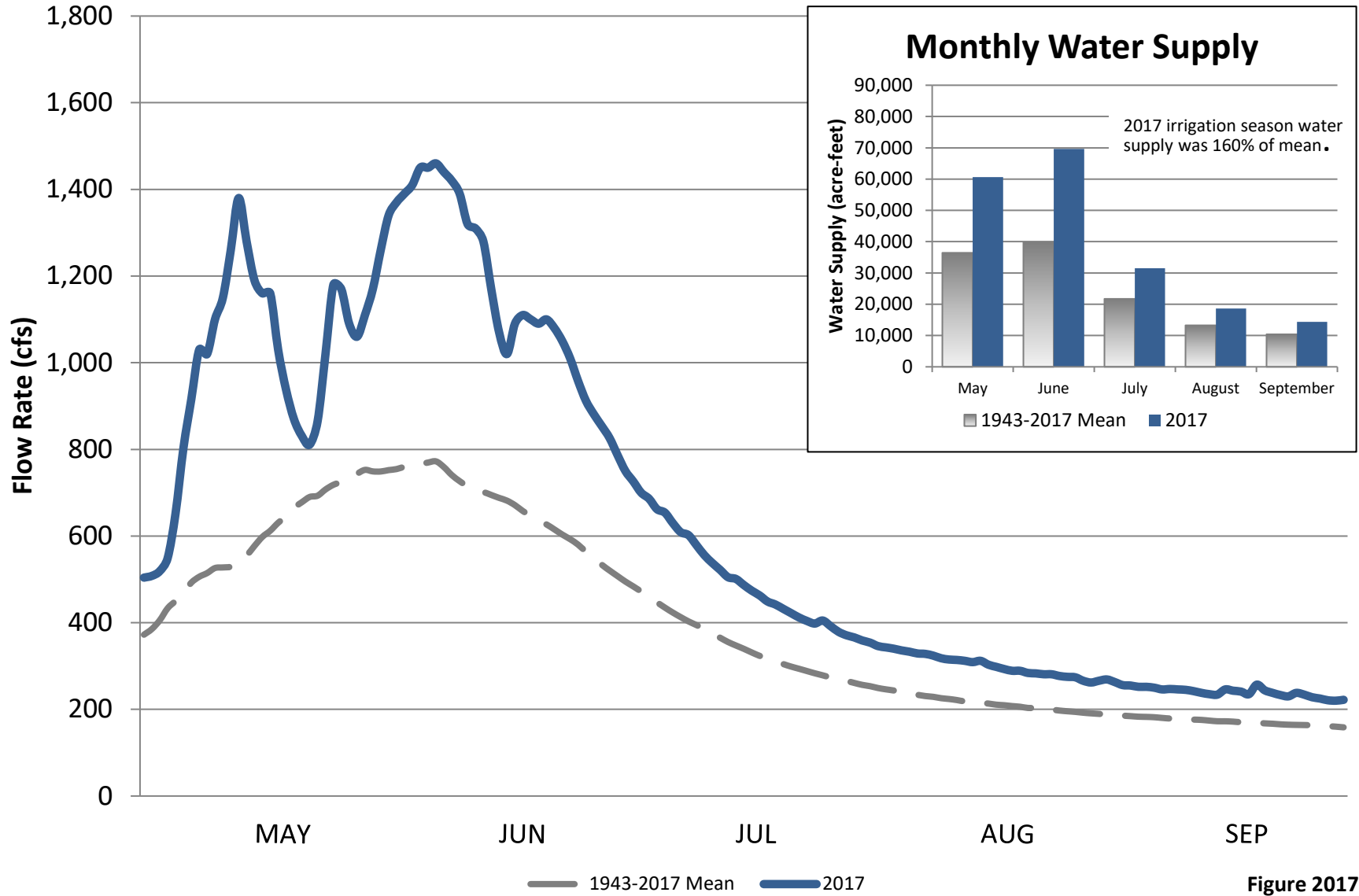


Figure 2017.4

## STORAGE

Storage supplies along the Bear River have a notable impact on the water resources available for irrigation each year. Because of improved water supply in 2016, with the exception of Bear Lake, the 2017 storage season began with decent carryover storage. Woodruff Narrows Reservoir is the largest reservoir in the Upper Division. However, Whitney, Sulphur Creek, and Woodruff Creek Reservoirs also provide for notable amounts of winter storage.

Paragraph B of Article VI of the Amended Compact, which allows for additional storage rights above Stewart Dam, also has a provision which restricts storage to occur if the water surface elevation at Bear Lake is below an elevation of 5911.0 (UP&L Datum). About half of the storage which is assigned to Woodruff Narrows Reservoir, from both the States of Utah and Wyoming, falls under this provision of the Amended Compact. Bear Lake began the storage season just slightly below 5911 (5910.69) but by late October had increased to above 5911 and so this storage restriction did not apply during the 2017 storage season.

Prior to 1997 a gage was maintained, with Commission funding, by the USGS on Woodruff Narrows Reservoir. The gage included a recorder which allowed for preservation of daily values. Since this time, periodic measurements have been kept by the Woodruff Narrows Reservoir Company in coordination with the Wyoming State Engineer's Office. In 2013 a real-time water level gage was installed at Woodruff Narrows Reservoir. Figure 2017.5 shows the maximum and minimum contents for the Woodruff Narrows Reservoir since its enlargement in 1980.

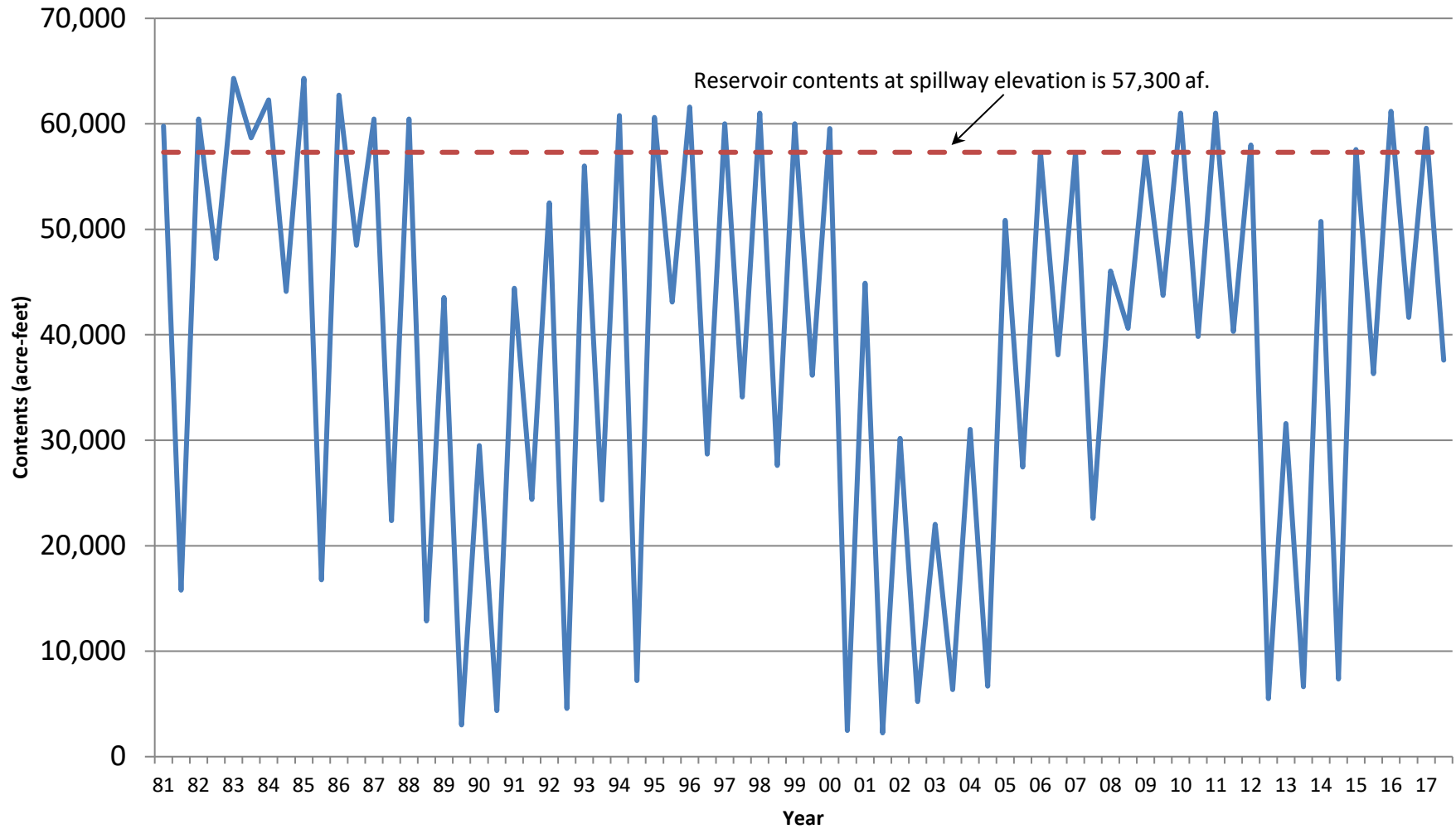
The spillway crest of Woodruff Narrows Dam is at an elevation of 6454.5 feet and when the water level is at this elevation, the content is 57,300 acre-feet. Hence, when the reservoir is spilling, the contents above this amount represent uncontrolled storage as this storage is only temporary and cannot be controlled by the reservoir company. Generally, during spill periods, the reservoir company is often releasing significant flows through its outlet works as well. Though the total contents are uncontrolled, the proportion of water discharging from the reservoir through the outlet works versus over the spillway is somewhat under the control of the reservoir company. Both discharge to the Bear River below the dam but above the stream gage, and it makes no difference to the total discharge measured into the Bear River. Because of the average water year in 2016, Woodruff Narrows was able to fill and then, with reduced releases during the irrigation season, it carried over 41,600 acre-feet into the 2017 storage season. Woodruff Narrows drafted the reservoir early in the season to address some spillway repairs. The spillway repairs were completed a few weeks later. With exceptional streamflow in May and June of 2017, the reservoir easily filled and spilled reaching a high content of 59,600 acre-feet on June 8. It should be noted that it spilled for much of the months of May and June before being drafted for summer irrigation uses. It ended the season with a meaningful carryover storage amount of 39,200 acre-feet.

There is no significant storage in the Central Division.



The largest and most significant storage reservoir in the Lower Division, and in the entire watershed, is Bear Lake, which is at the very top of the Lower Division. Bear Lake is operated as a storage reservoir by PacifiCorp. The Compact regulates various aspects of how PacifiCorp can manage the storage of water within Bear Lake. Figure 2017.6 summarizes the 2017 Bear Lake hydrologic information and significant operational events.

## Woodruff Narrows Reservoir Annual Maximum and Minimum Contents



Note: Through the 1996 water year a gage with a recorder was maintained by the USGS on Woodruff Narrows Reservoir. From then until 2013 measurements are based on spot observations and estimates by the Woodruff Narrows Reservoir Company and the Wyoming State Engineer's Office. Since 2013, a gage and recorder has been maintained by the Wyoming State Engineer's Office. Contents above 57,300 af represent uncontrolled storage.

**Figure 2017.5**

**Summary of Significant  
2017 Bear Lake  
Hydrologic Information and Operational Events**

<u>Date</u>	<u>Hydrologic Information/Event</u>	<u>Contents (% of Full) Discharge (% of Normal)</u>
10-01-16	Bear Lake Beginning Elevation — 5910.69 ft	536,739 af (38%)
09-25-16	Bear Lake Low Elevation <sup>1</sup> — 5910.61 ft	531,576 af (37%)
	Rainbow Inlet Canal Discharge	663,440 af (253%)
	Bear River Discharge Below Stewart Dam	1,839 af
	Bear Lake Net Runoff (Computed Total Inflow less lake Evaporation)	856,000 af (265%)
07-14-17	Bear Lake High Elevation — 5922.32 ft	1,327,566 af (93%)
	Outlet Canal Releases: 6/21 – 9/23 (95 days)	153,000 af
08-12-17	Outlet Canal Maximum Release – 1,343 cfs	
	Bear Lake Storage Release <sup>2</sup>	Not applicable – flood control operations
09-30-17	Bear Lake Ending Elevation — 5920.98 ft	1,233,523 af (87%)
	Bear Lake Settlement Agreement “System Loss” Volume	Not applicable – flood control operations

<sup>1</sup> Low contents prior to start of storage (occurred in previous water year).

<sup>2</sup> Net irrigation storage release from Bear Lake, subtracting Rainbow inflow and the decreed adjustment for the natural yield of Bear Lake and Mud Lake area. Includes system loss volume.

**Figure 2017.6**

Figure 2017.6 provides much information as to the water stored in Bear Lake in 2017. Some of this information will be discussed in the Lower Division section of this report. Because of the generally drier than normal period since 2011 when Bear Lake was last near full, the lake began the 2017 storage season at an elevation of 5910.69 feet, just below the upstream storage restriction trigger and at 38% of full contents. What occurred over the next several months can only be described as phenomenal with Bear Lake making the largest storage gain since it began operation as a reservoir more than 100 years ago. In total Bear Lake came up by nearly 12 feet and reached a high content at 93% of full capacity, leading to flood release operations beginning in August.

Figure 2017.7 is a graph which shows the annual maximum and minimum elevations of Bear Lake since 1915. As described above, the beginning storage elevation (or prior year minimum) occurred on just before the new water year. One can see from Figure 2017.7 that during the year the storage in the lake increased from an elevation of 5910.69 to 5922.32 and by September 30 had only been drawn down to 5920.98. The net elevation gain was more than 10 feet. As Bear Lake was in flood release mode, there was no prescribed release of storage water. Figure 2017.8 is an area plot showing the daily contents in Bear Lake over the past ten years. This hydrograph and Figure 2017.7 show the impact of two very significant water years amid average to well below average water years over the last ten-year period.

# BEAR LAKE ELEVATION

## Annual Maximum & Minimum Elevations

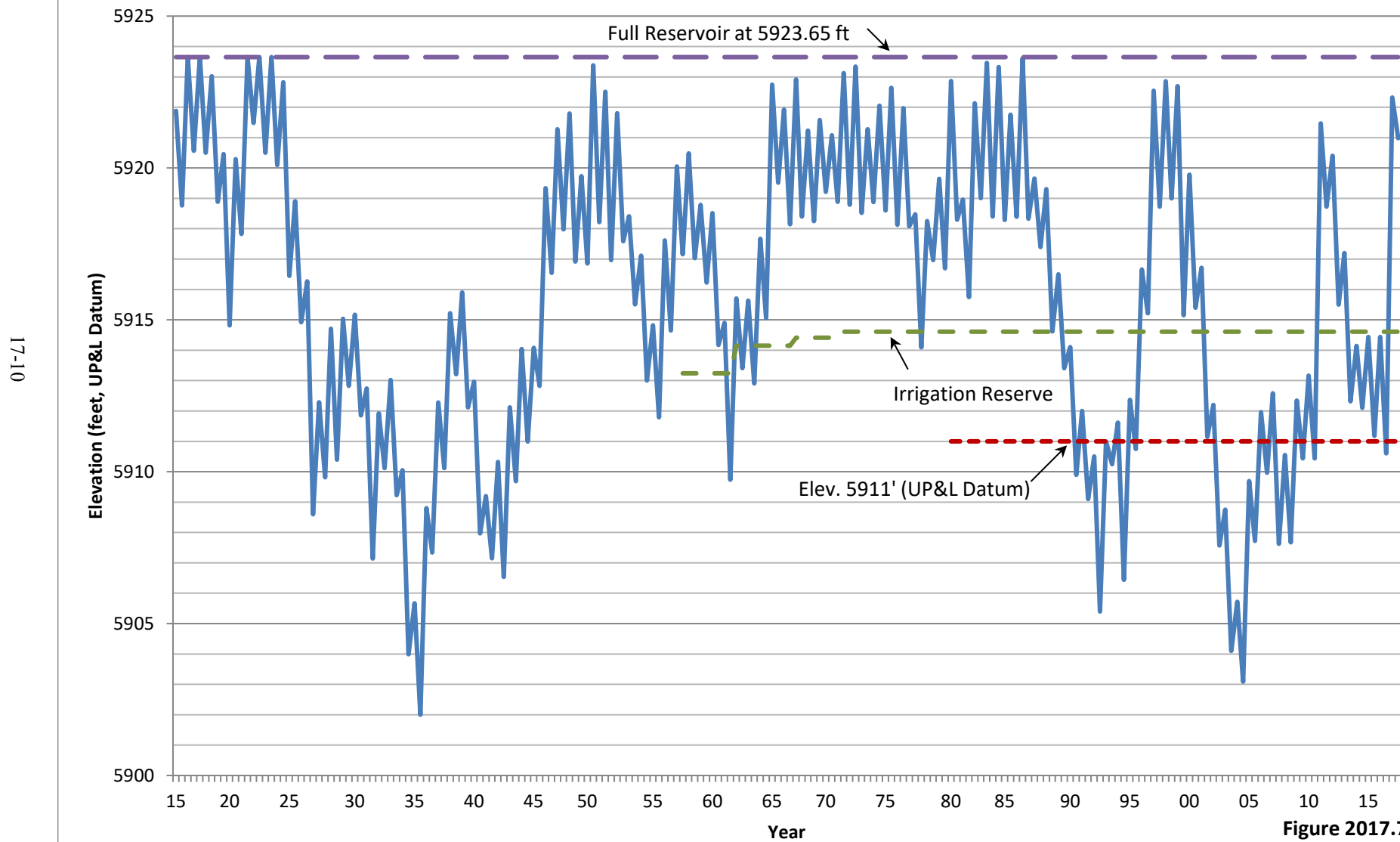


Figure 2017.7

# BEAR LAKE CONTENTS

## Water Years 2008 - 2017

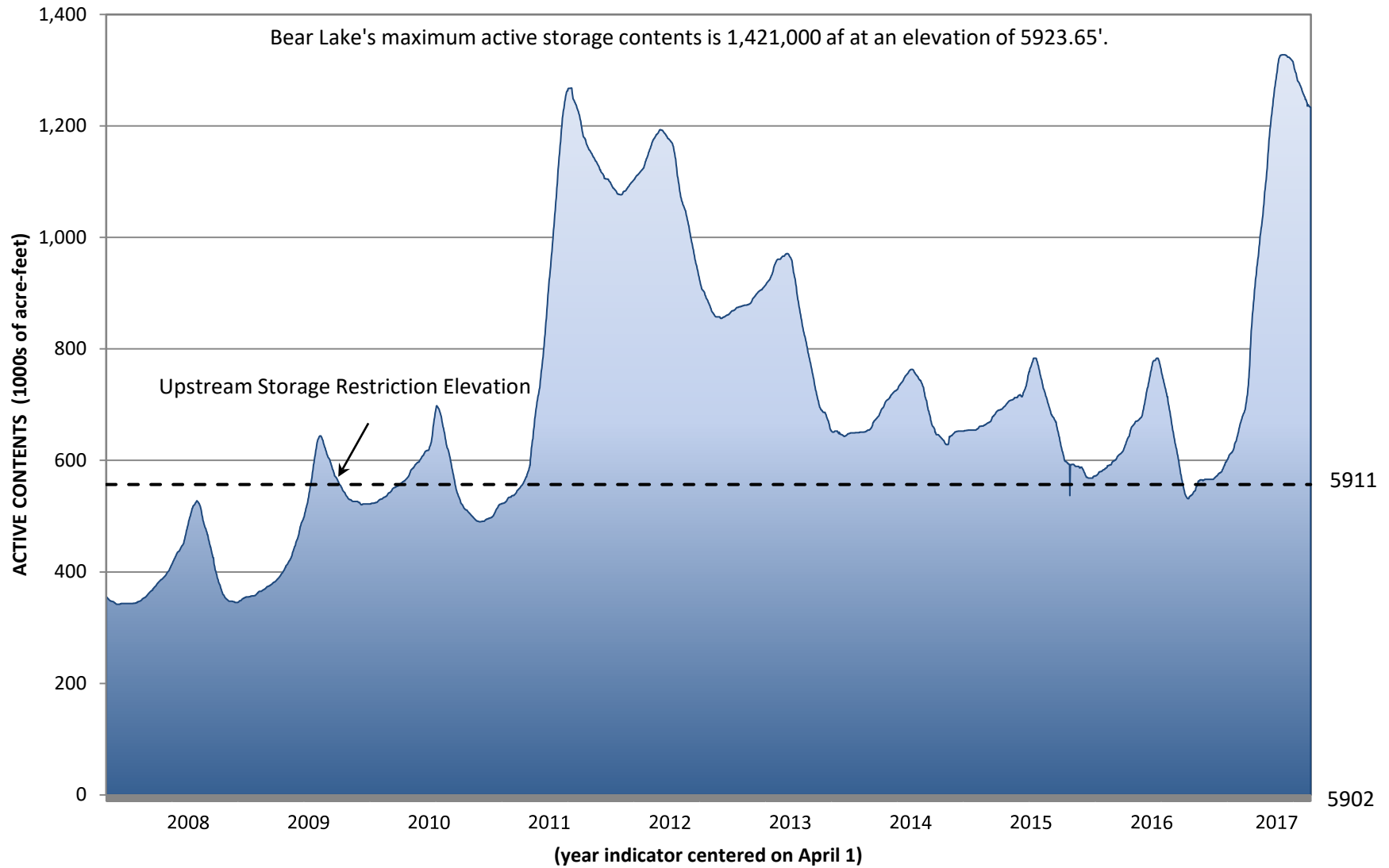


Figure 2017.8

## **STREAMFLOW DISTRIBUTION**

### **General**

The water administration in 2017 in the three divisions remained similar to prior years. In 2017 Ethan Overton became the hydrographer in the Lower Wyoming Section of the Upper Division and the Wyoming Section of the Central Division. There were no other changes to the River Commissioners/Watermasters in the other sections from the previous year. Don Barnett continued to serve as Engineer-Manager of the Bear River Commission. Each River Commissioner/Watermaster works under the direction of his State Engineer's office but coordinates with the Commission's Engineer-Manager with regard to total diversions in each of the various sections as defined by the Compact.

During the 2017 irrigation season, the following River Commissioners/Watermasters measured water in their sections of the river:

<u>DIVISION</u>	<u>SECTION</u>	<u>RIVER COMMISSIONER/ WATERMASTER</u>
Upper	Upper Utah	Travis McInnis
	Upper Wyoming	Travis McInnis
	Lower Utah	Ron Hoffman
	Lower Wyoming	Ethan Overton
Central	Wyoming	Ethan Overton
	Idaho	Josh Hanks
Lower	Idaho	Josh Hanks
	Utah	Jim Watterson

### **Upper Division**

The Upper Division divertible flow, as defined by the Compact, consists of a summation of the diversions of all of the canals in the four sections, plus waters bypassing Pixley Dam, less that portion of water diverted by the canals which is attributable to storage releases from Whitney, Sulphur Creek, Woodruff Narrows and Grassy Lake Reservoirs. The Compact provides that when the total divertible flow is less than 1250 cfs, a water emergency exists. Different than normal, almost from the commencement of the irrigation season until July 7, the total divertible flow was well above this threshold. There was no request for interstate regulation. However, there was an early call for intrastate regulation from a Wyoming canal below Woodruff Narrows Reservoir. Once the flows dropped below the 1250 cfs water emergency trigger, the Upper Wyoming Section took very close to what would have been its allocation during the remainder of the irrigation season. The Lower Utah Section diverted well below what would have been its allocation had there been a water emergency. In recent years, users in the Upper Division have at times opted for the flexibility available through

unofficial general cooperation and sharing of water rather than direct Compact administration.

During years when a water emergency has been declared, the regulation of the river is based on the weekly diversions as called in by the respective River Commissioners. At the end of each year, these River Commissioners submit to their respective State Engineers a complete written report of water deliveries. It is this information which is presented in the graphs and tables on the following pages and not the weekly totals called in during times of regulation. The weekly call-in totals, which are received during the irrigation season, differ slightly from the year-end data because of timing of call-ins and call-outs, shifts on canal ratings and other factors.

Figures 2017.9 and 2017.10 show the divertible flow and natural flow diversions in the Upper Wyoming and Lower Utah Sections, respectively. Also shown on the graphs (magenta line) is what would have been the Compact allocation had a water emergency been imposed. As can be seen in Figure 2017.10, during much of the irrigation season, diversion in the Lower Utah Section was below the allocation. However, this is due to the fact that the water was getting past the Lower Utah Section to the Lower Wyoming Section and not due to over diversion in the Upper Wyoming Section as is confirmed by Figure 2017.9. Figure 2017.11 is a tabulation by month of canal diversions and shows the calculation of divertible flow (less storage release) and allocations to the respective sections, pursuant to the Compact, had a water emergency been declared. The values shown for each canal and pump in this figure represent total diversion (including both natural flow and storage), and then the storage water is subtracted out of the section totals before computing the total divertible flow.

# 2017 - Upper Division

## Upper Wyoming Section Diversions vs Allocation

17-14

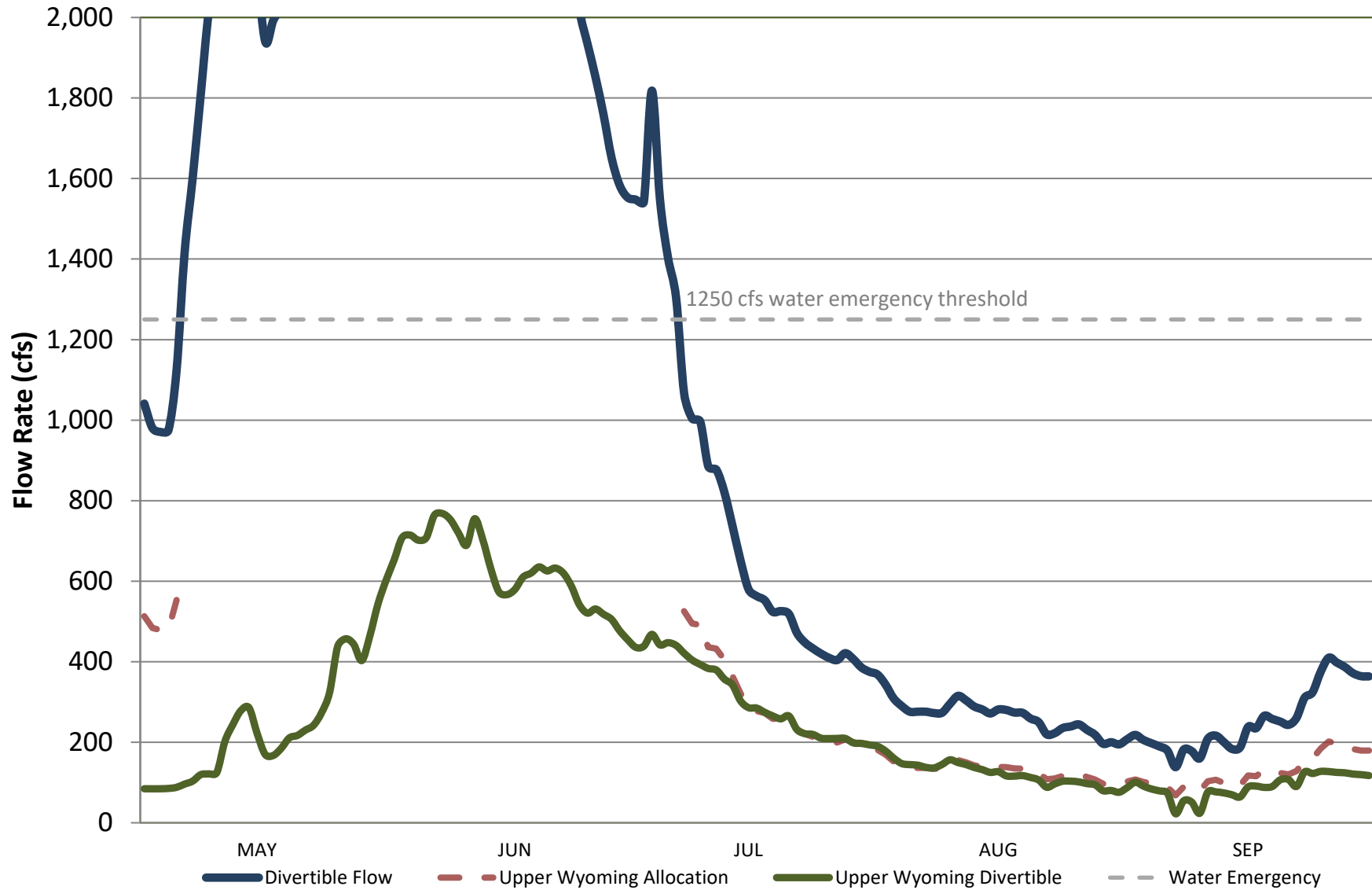


Figure 2017.9



# 2017 - Upper Division

## Lower Utah Section Diversions vs Allocation

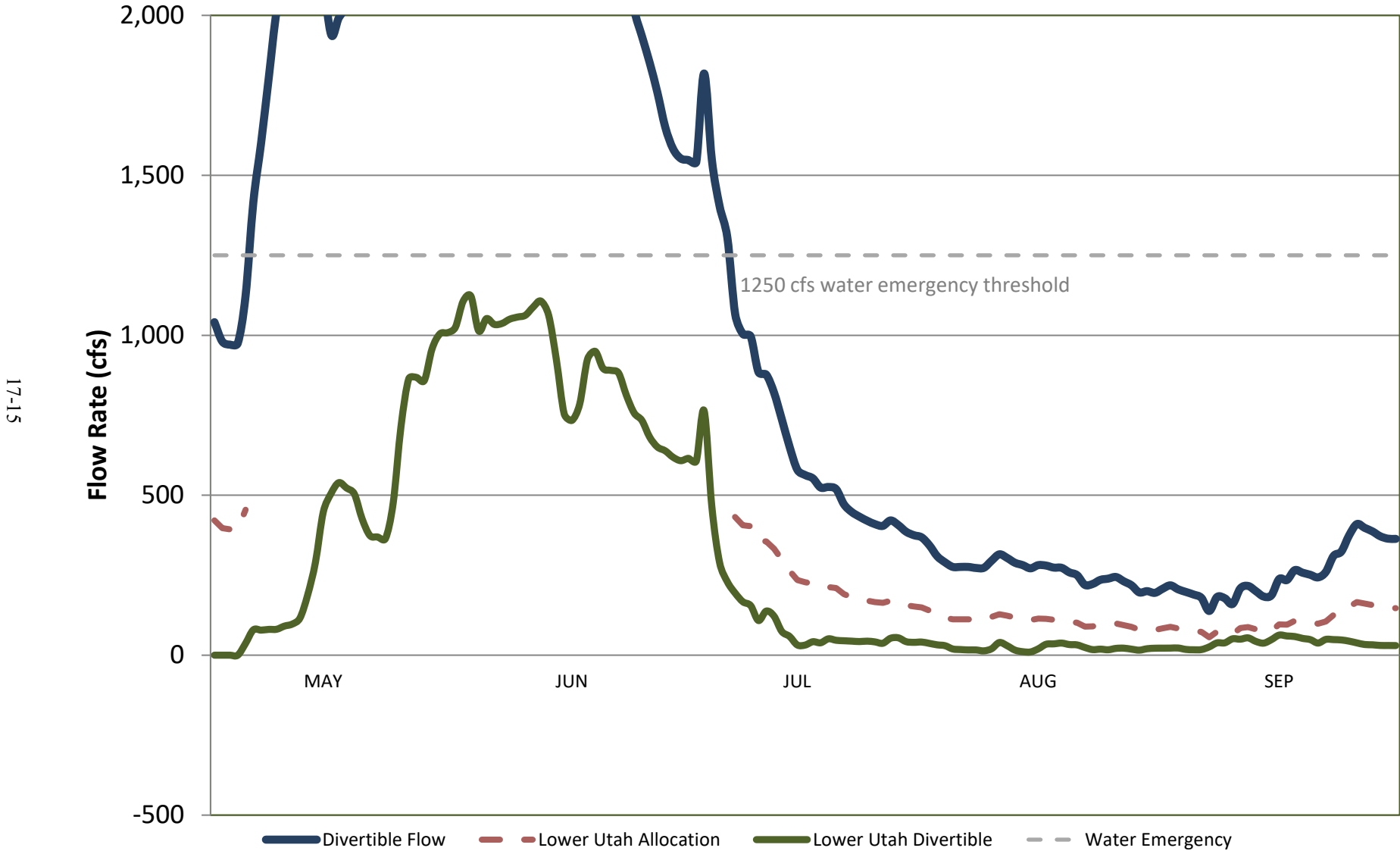


Figure 2017.10

2017

DAILY DISCHARGE IN CFS OF BEAR RIVER CANALS WITH COMPACT ALLOCATIONS IN THE UPPER DIVISION

May

Table with columns 1-31 representing days of May and rows listing various canal and storage sections including UPPER UTAH SECTION, UPPER WYOMING SECTION, and LOWER UTAH/ WYOMING. Values represent daily discharge in cfs, with some rows showing negative values for storage release.

NOTE:

"Chapman (Stataline)" is a second measurement of flows in the Chapman Canal. As such, the values are not re-added into the Upper Wyoming total. Whitney and Sulphur Creek Reservoirs supply storage to irrigators in the Upper Wyoming Section. Woodruff Narrows storage is credited 83% to the Lower Utah Section, Bear River and Francis Lee Canal irrigators, and 17% to Wyoming irrigators.

Figure 2017.11

DAILY DISCHARGE IN CFS OF BEAR RIVER CANALS WITH COMPACT ALLOCATIONS IN THE UPPER DIVISION

June

Table with columns for months (1-30) and rows for various canal sections including Upper Utah, Upper Wyoming, Lower Utah, and Lower Wyoming. Data represents daily discharge in CFS.

NOTE:

"Chapman (Stateline)" is a second measurement of flows in the Chapman Canal. As such, the values are not re-added into the Upper Wyoming total. Whitney and Sulphur Creek Reservoirs supply storage to irrigators in the Upper Wyoming Section. Woodruff Narrows storage is credited 83% to the Lower Utah Section, Bear River and Francis Lee Canal irrigators, and 17% to Wyoming irrigators.







## Central Division

The Compact provides that a water emergency shall be deemed to exist when the divertible flow in the Central Division drops below 870 cfs. A water emergency shall also be deemed to exist in the Central Division if the flow rate at the Border Gage drops below 350 cfs. The Compact provides that once a water emergency is deemed to exist, the State of Wyoming is to be restricted to 43 percent of the total divertible flow. The remaining 57 percent is available for use within Idaho.

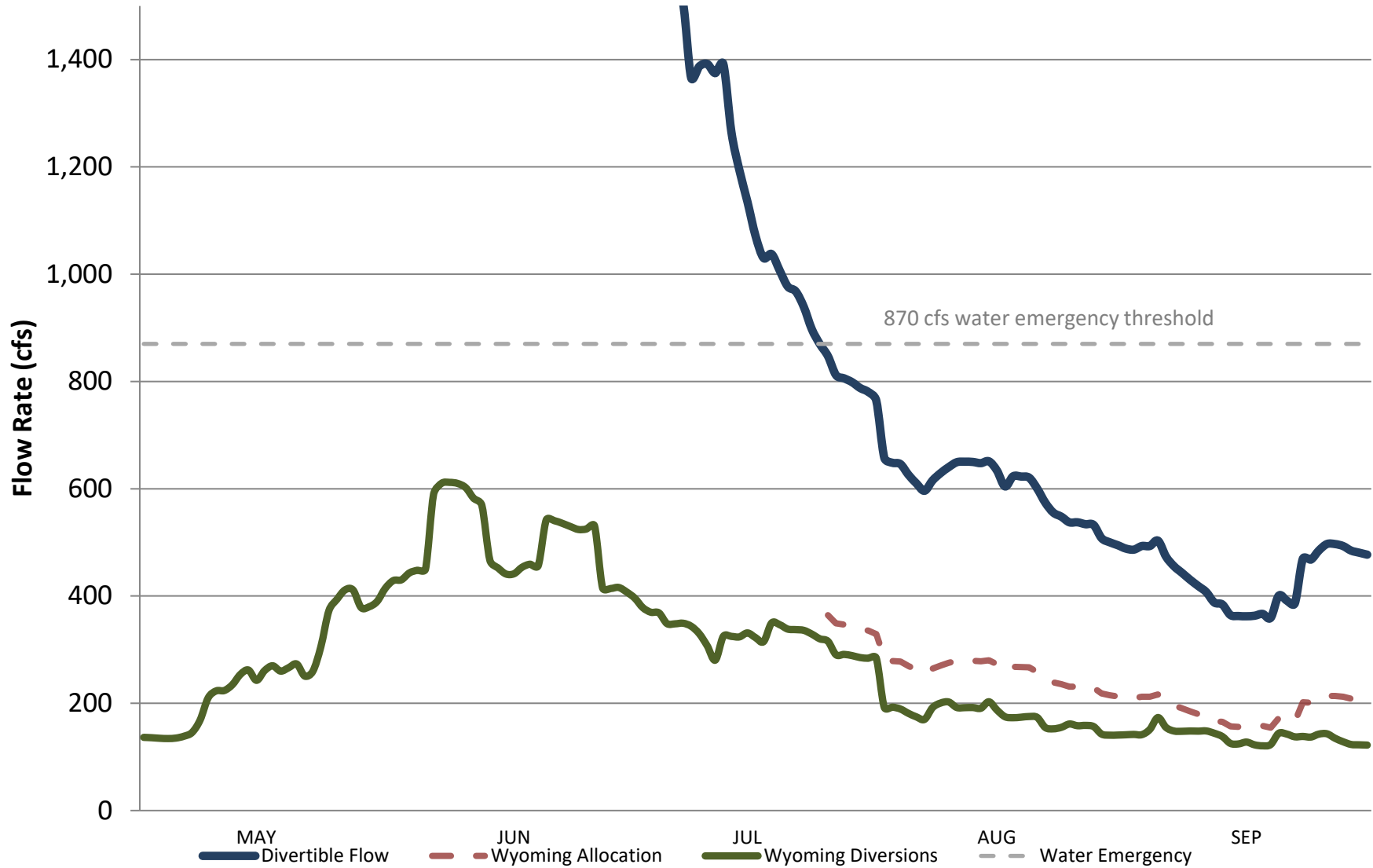
Figures 2017.12 and 2017.13 graphically illustrate the Central Division's divertible flow and the respective allocations and diversions by the Wyoming and Idaho Sections under a water emergency. The flow passing the Border Gage is not illustrated on these figures as it confuses the diversion and allocation data. It is important to note that on Figure 2017.13 the line labeled as "Available to Idaho" represents the summation of diversions within the State of Idaho, as well as flow passing Stewart Dam and diversion to the Rainbow Inlet Canal. As the Compact provides that 57 percent of the Central Division's divertible flow shall be available for use within Idaho, this line is used to show whether such provision of the Compact was met. However, the Compact also provides that if Idaho elects to not divert into its canals its full entitlement, a portion of its allocation can pass into the Lower Division via the Rainbow Inlet Canal or Stewart Dam. Data for these hydrographs are based on the River Commissioners'/Watermasters' annual reports to their respective state water agencies.

Figure 2017.14 shows a compilation of daily canal diversions as provided by the respective River Commissioners/Watermasters. The Wyoming and Idaho Sections' diversions and allocations are tabulated and summarized at the bottom of each page. The pages are divided such that there is one month's data per page. As the flow of the Bear River at the Border Gage could also be critical to the declaration of a water emergency, as defined by the Compact, this gage's data are also shown in these tables.

As described above, the 2017 water year was extremely wet, especially in the Central Division, with streamflow well above the water emergency triggers until late July. There was also significant flow passing from the Upper Division to the Central Division for much of the irrigation season. In early August, the flow at the Border Gage dropped below the 350 cfs water emergency trigger and during the second week there was a request that diversion data be tallied and reported back. Upon review it was found that Wyoming users were diverting well below what would have been their allocation under a water emergency. Though the calling in and tabulation of diversions continued until the third week of September, Wyoming continued to divert well below what would have been its allocation and there was never a request for interstate regulation. By the third week of September the Idaho users had mostly turned off and call-ins ceased. Figures 2017.12 and 2017.13, show the divertible flow in the two sections and what would have been the allocations had a water emergency been declared. There was very good cooperation between the Wyoming and Idaho Watermasters throughout this irrigation season.

# 2017 - Central Division Distribution

## Wyoming Section Diversions vs Allocation



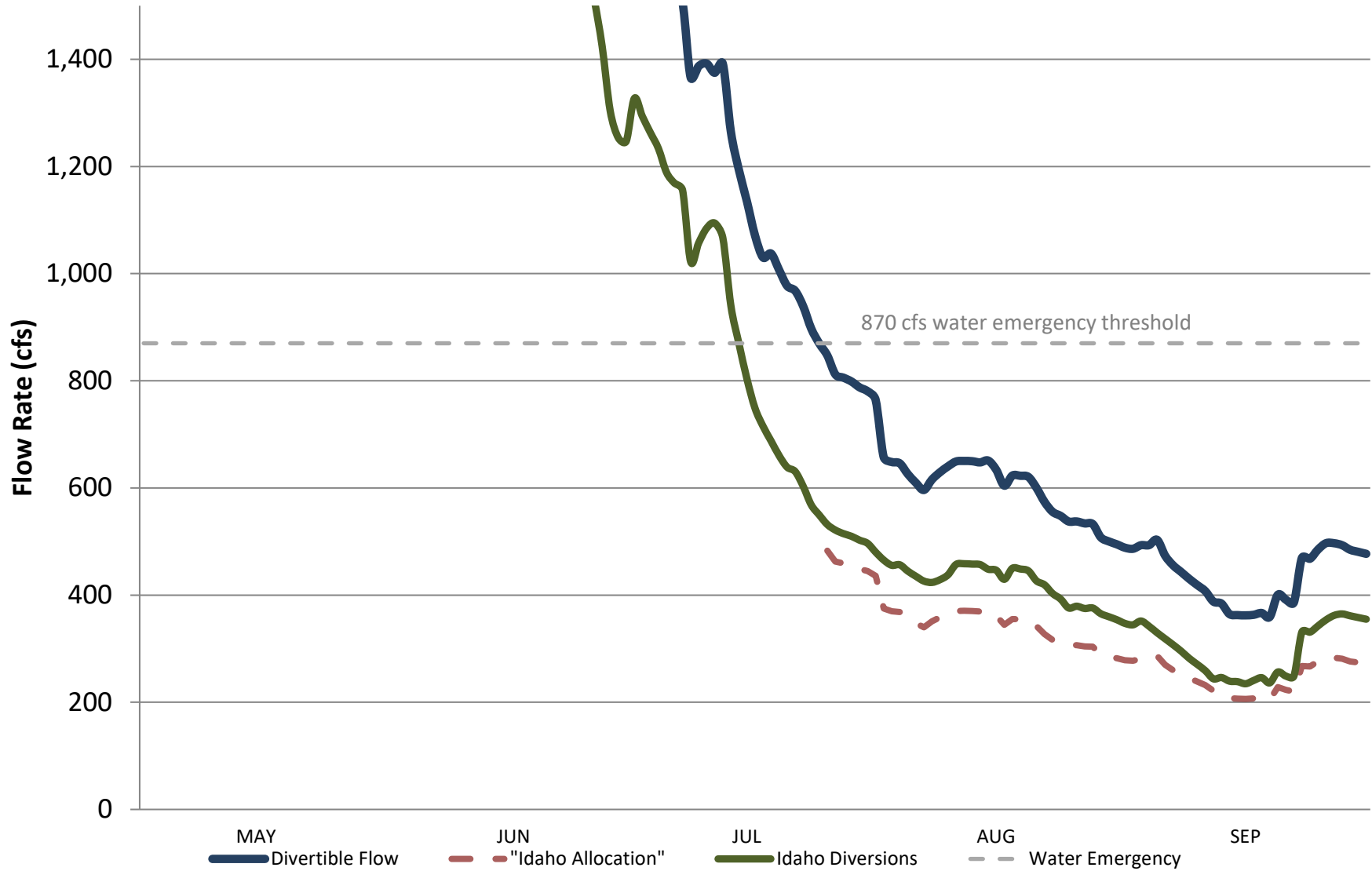
17-22

Figure 2017.12



# 2017 - Central Division Distribution

## Idaho Section Diversions vs Allocation



17-23

Figure 2017.13











## Lower Division

The Compact provides that a Utah Lower Division water user can petition the Commission for interstate regulation if he believes that he is being deprived of water to which he is justly entitled due to diversions in Idaho. If, upon review, the Commission finds such to be the case, then the Compact provides for the declaration of a water emergency and that it shall put into effect water delivery schedules based on priority of rights without regard to the state line. The Commission has never received such a petition. However, with growing concern for such a possibility, the Commission, over a several-year period, determined how it would receive and review such a petition and implement water delivery should a water emergency be declared. At its November meeting in 1997, the Commission adopted *Interim Procedures for Lower Division Water Delivery*. Appendix B to the procedures, which was revised with the procedures in April 2004, provides for the accounting and distribution method to be used in a water emergency.

Also appended to the procedures is *Water Delivery Schedule No. 1* which was revised by the Commission in 2015 and which includes the mainstem Lower Division water rights in both Idaho and Utah. After adoption of the water delivery schedule, both states began using this common schedule of water rights in their water right accounting programs. Hence, though not regulated by the Commission, the distribution in the Lower Division is cooperatively managed by the states of Idaho and Utah through their respective Watermasters and River Commissioners. Such distribution was facilitated in 2017 with [occasional] conference calls with the state agencies, large water users and PacifiCorp. Figure 2017.15 shows the delivery of water in the Lower Division as reported by the two state agencies.

### 2017 Lower Division Irrigation Water Deliveries

Canal/Group	Natural Flow (af)	Storage Use (af)	Total Diversion (af)
<b>Idaho</b>			
Gentile Valley	22,457	369	22,826
West Cache	34,741	814	35,555
Cub River Pumps	14,359	158	14,517
Last Chance and Bench B	92,770	163	92,933
Idaho Small Irrigators	5,503	702	6,204
<b>Utah</b>			
Bear River Canal Company	257,233	10,236	267,469
Utah Small Irrigators	8,143	507	8,650

Figure 2017.15

Allocation and deliveries of Bear Lake storage water are significant in most years to the total water diverted in the Lower Division. In 1995, PacifiCorp, the irrigators and Bear Lake interests entered into a settlement agreement as to the allocation of storage water from Bear

Lake. In 2004 the parties entered into an *Amended and Restated Bear Lake Settlement Agreement*. PacifiCorp tracks deliveries pursuant to the settlement agreement. Figure 2017.16 shows such deliveries in 2017. Note as has been discussed elsewhere, 2017 was a phenomenal water year. Therefore, PacifiCorp was in flood control operations with releases from Bear Lake most of the year and did not purposefully release water for irrigation purposes. Thus, the below table shows “Not Applicable” for most values.

**2017 Bear Lake Storage Deliveries**

Irrigation Storage Allocation	245,000 af
Bear Lake Storage Release	Not Applicable
Lake Recovery Volume	Not Applicable
Decreed Transit Losses <sup>1</sup>	Not Applicable
System Losses <sup>2</sup>	Not Applicable
Delivered Bear Lake Storage	Not Applicable

<sup>1</sup>Approximate, based on average rate for all irrigators

<sup>2</sup>Water that passes below Cutler Dam that is accounted for as storage water release

**Figure 2017.16**



## STATE WATER ACTIVITIES

Article XI of the Amended Compact provides that applications for appropriation or change in water use within each state shall be in accordance with individual state law, except no such application shall be approved if the effect will deprive water users within another state or increase the depletion beyond that which is provided for under the Compact. This article further requires that state officials report, in a format and at intervals established by the Commission, the status of their respective allocations and uses. The Commission has determined the best format for reporting such changes in use is the Biennial Report. Figure O.3 in the Overview section of this report provides the most recent depletion information. This portion of the Biennial Report provides a summary of major water and water right related activities in each of the states during the 2017 water year.

### Idaho

#### Water Activities

A public meeting was held on July 18, 2017 in Malad City to discuss a proposed management plan for the Malad Valley Ground Water Management Area. The proposed management plan recommended creation of a Water Measurement District and ground water level monitoring network, construction of a stream gage to monitor flows in the Malad River, development of measurement sites at springs throughout the Malad Valley, and completion of an inventory of flowing artesian wells in the Malad Valley. The proposed management plan also expressed support for a general adjudication of all water rights within the Malad Valley and a five-year extension of the temporary moratorium on new ground water right permits in the Malad Valley.

#### Water Rights

Water right permits were issued in Basins 11 and 13 as shown in the table below:

<u>Right No.</u>	<u>Priority Date</u>	<u>Rate (cfs)</u>	<u>Source</u>	<u>Water Use</u>	<u>Total Acres</u>
11-7823	7/29/2016	0.02	SPRING	STOCKWATER	
11-7829	4/24/2017	0.43	GROUND WATER	DOMESTIC	
13-7925	11/19/2014	0.32	WASTE WATER	IRRIGATION	16.0
13-7968	7/28/2016	0.04	SPRING	DOMESTIC	
13-7984	11/28/2016	0.04	SPRING	DOMESTIC	
13-7985	10/17/2016	0.04	SPRING	DOMESTIC	
13-7988	2/23/2017	0.04	GROUND WATER	DOMESTIC	
13-7996	5/19/2017	1.00	UNNAMED SPRING	FISH PROPAGATION	

Several water right transfer applications were approved with point of diversion, place of use, and/or nature/season of use changes; three approvals in Basin 11, seven approvals in Basin 13, and three approvals in Basin 15.

## **Utah**

### Water Activities

Cache County voters in the November 2016 election approved the formation of the Cache Water District (CWD), and the Cache County Council appointed the initial Board of Trustees in January 2017.

In February 2017, the Division of Water Resources (DWRe) announced that the Bear River Development Project (BRDP) could likely be delayed further as a result of regional water conservation efforts and the implementation of innovative programs such as secondary metering. In the 1990s, it was projected that the BRDP would be needed by 2015. Over the years, with continual planning efforts, the project need has been pushed further out a few times due to conservation efforts and regional water development by the four participating entities. This most recent announcement projects the first need to be around 2050 or beyond. In the meantime, the Division will continue to study the needs and impacts of the project.

A cloud seeding project to increase snowpack has been ongoing since 1989 in the Lower Division in Eastern Box Elder County and Cache County. The winter storm systems in these areas were seeded with 23 ground-based generators using silver iodide at a total cost of \$76,500. Bear River Water Conservancy District and Cache County cost shared (50/50) with the Utah Board of Water Resources in the cloud seeding project during the 2017 water year.

### Water Rights

There were 53 applications to appropriate that were approved in Utah during 2017 for ground water for “ordinary domestic and stockwatering” purposes and associated irrigation use for 51 homes. In the Upper Division, in Summit County, there was an application to appropriate from a spring approved to store 4.0 acre-feet of water in a pond during the non-irrigation season. Change applications were also approved to change the points of diversion, nature and/or place of use of historic water rights.

## **Wyoming**

### Water Activities

Wyoming again saw changes as their new commissioner Adrian Hunolt was appointed to replace Sam Lowham as the Upper Wyoming Commissioner. Hydrographer-Commissioner Levi Walker was also replaced by Ethan Overton in the Central Division of Wyoming.

Wyoming continued to look for ways to produce a common method of accounting supplemental supply depletions. Several methods have been identified with each having its own set of difficulties.

On October 1, 2016, the State Engineer released 4,100 acre-feet of un-built Original Compact Storage for reallocation. A policy memorandum was issued on July 10, 2017, to outline the process to request 1,100 acre-feet of the unallocated 4,100 acre-feet for small water users (up to 100 acre-feet per project) in the Bear River Basin. Two inquiries were received and placed under review in time for the end of the water year deadline on September 30th.

Water Rights

New water right permits subject to Compact depletions issued from Wyoming's allocation are as follows:

<u>Permit No.</u>	<u>Appropriator</u>	<u>Priority Date</u>
P208002W	Teichert Brothers LLC	August 9, 2017
P206782W	Kirk and Janet Widmer	February 13, 2017
P206482W	Circle B Land Company Hufford LLC	May 16, 2016
P204171W	Kenneth Hansen	April 6, 2015

## **STREAM GAGING**

As was indicated in the Overview chapter of this report, under the subsection concerning the Stream Gaging Program, the Bear River Commission participates in a cooperative contract with the USGS for the maintenance of stream gages on the Bear River and significant tributaries. Also, the states, PacifiCorp and, at times, others participate in stream gaging on the Bear River and its tributaries. The Commission believes the collection of data concerning stream flows in the Bear River system is very important and allocates a significant portion of its annual budget in support of the cooperative stream gaging program with the U.S. Geological Survey. However, costs continue to increase and so the Commission is constantly reviewing the stream gaging program to determine if all of the stations supported are necessary for the Commission to fulfill the responsibilities assigned to it by the Compact. There were no changes to the Commission's stream gaging program in 2017.

During 2017, a total of 32 gages were maintained on the Bear River system. Of these 32 gages, 5 were part of a cooperative effort between the Bear River Commission and the USGS, and the USGS funded 7 gages under its Ground and Surface Water Information Program (GSWIP). PacifiCorp maintained 15 gages on the Bear River system during 2017. Three additional gages were maintained under the USGS Cooperative Program with the State of Utah (2 gages) and the State of Idaho (1 gage). Additionally, the State of Wyoming maintained 1 gage on the Bear River and the USFWS funded 1 USGS gage. Figure 2017.17 shows a tabulation of these gages and the entities which participated in the operation and funding of each gage. The approximate locations of the stream gages are shown on Figure O.5 in the Overview section of this report.

Publication of the streamflow records for 12 of the gages in this report were considered to be of significant value to the Commission and are included on pages 17-36 through 17-48.

## BEAR RIVER SYSTEM STREAM GAGING STATIONS

### STREAM GAGES MAINTAINED DURING THE 2017 WATER YEAR

STATION #	STATION NAME	OPERATED BY	MEASUREMENT FUNDED BY	PUBLICATION FUNDED BY
<u>10011500</u> ☼	Bear River near UT-WY state line	USGS	USGS	USGS
10016900☼	Bear River at Evanston WY	USGS-WY	USGS	USGS
<u>10020100</u> ☼	Bear River above reservoir near Woodruff UT	USGS	USGS	USGS
<u>10020300</u>	Bear River below reservoir near Woodruff UT	USGS	BRC/USGS	BRC/USGS
10023000	Big Creek near Randolph UT	USGS	UTDNR/USGS	UTDNR/USGS
10026500	Bear River near Randolph UT	WSE	State of WY	State of WY
<u>10028500</u> <sup>1</sup>	Bear River below Pixley Dam near Cokeville WY	USGS	BRC/USGS	BRC/USGS
<u>10032000</u>	Smiths Fork near Border WY	USGS	BRC/USGS	BRC/USGS
10038000☼	Bear River below Smiths Fork near Cokeville WY	USGS	USGS	USGS
<u>10039500</u>	Bear River at Border WY	USGS	BRC/USGS	BRC/USGS
10044300	Dingle Inlet Canal near Dingle ID	PacifiCorp	PacifiCorp	not published
<u>10046000</u>	Rainbow Inlet Canal near Dingle ID	PacifiCorp	PacifiCorp	PacifiCorp
10046500 <sup>2</sup>	Bear River below Stewart Dam near Montpelier ID	PacifiCorp	PacifiCorp	not published
<u>10055500</u>	Bear Lake at Lifton near St. Charles ID	PacifiCorp	PacifiCorp	PacifiCorp
<u>10059500</u>	Bear Lake Outlet Canal near Paris ID	PacifiCorp	PacifiCorp	PacifiCorp
10068500	Bear River at Pescadero ID	USGS	IDDNR/USGS	IDDNR/USGS
10075000	Bear River at Soda Springs ID	PacifiCorp	PacifiCorp	PacifiCorp
10079000	Soda Point Reservoir at Alexander ID	PacifiCorp	PacifiCorp	PacifiCorp
10079500	Bear River at Alexander ID	PacifiCorp	PacifiCorp	PacifiCorp
10080000	Bear River below Grace Dam near Grace ID	PacifiCorp	PacifiCorp	PacifiCorp
10086000	Oneida Narrows Reservoir at Oneida ID	PacifiCorp	PacifiCorp	PacifiCorp
10086500	Bear River below PacifiCorp Tailrace at Oneida ID	PacifiCorp	PacifiCorp	PacifiCorp
<u>10092700</u>	Bear River at ID-UT state line	USGS	BRC/USGS	BRC/USGS
10105900	Little Bear River at Paradise UT	USGS	UTDNR/USGS	UTDNR/USGS
10108400☼	Logan, Hyde Park, Smithfield Canal near Logan UT	USGS	USGS	USGS
<u>10109000</u> <sup>3</sup> ☼	Logan River above State Dam near Logan UT	USGS	USGS	USGS
10113500☼	Blacksmith Fork abv Upper & Lower Dam Near Hyrum UT	USGS	USGS	USGS
10116500	Cutler Reservoir near Collinston UT	PacifiCorp	PacifiCorp	PacifiCorp
10117000	Hammond (East Side) Canal near Collinston UT	PacifiCorp	PacifiCorp	PacifiCorp
10117500	West Side Canal near Collinston UT	PacifiCorp	PacifiCorp	PacifiCorp
10118000	Bear River near Collinston UT	PacifiCorp	PacifiCorp	PacifiCorp
<u>10126000</u>	Bear River near Corinne UT	USGS	USFWS	USFWS/USGS

Notes:

☼ GSWIP site

Underlined station numbers indicate those gages for which stream flow data are published in this report.

<sup>1</sup> This gage is operated seasonally from April 1 until September 30 each year.

<sup>2</sup> Discharge measurements below Stewart Dam are required for interstate regulation pursuant to the Compact. However, flow is general only a few cfs. PacifiCorp maintains this gage and reports discharge to the Idaho watermaster. The data are included with the Central Division's canal diversion data herein.

<sup>3</sup> Gage 10109001 represents a summation of the Logan River discharge (10109000) and canal diversions (10108400) upstream of the gage. This is not a physical river gage. Gages 10109000 and 10108400 are part of the Ground and Surface Water Information Program (GSWIP).

**Figure 2017.17**

## 10011500 BEAR RIVER NEAR UTAH-WYOMING STATE LINE

LOCATION.--Lat 40°57'55", long 110°51'10" referenced to North American Datum of 1927, in SE ¼ NW ¼ SE ¼ sec.30, T.3 N., R.10 E., Summit County, UT, Hydrologic Unit 16010101, on left bank 400 ft downstream from West Fork and 2.8 mi upstream from Utah-Wyoming State line.

DRAINAGE AREA.--172 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1942 to current year.

REVISED RECORDS.--WDR UT-74-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 7,965 ft above NGVD of 1929, from river-profile map. Prior to October 1, 1986 at datum 3.0 ft higher.

REMARKS.-- Records good except for estimated daily discharges which are poor and other periods as noted. Records fair May 20, 2014 through Jun. 17, 2014 due to variable control conditions from snow-melt runoff. Flow regulated slightly by Whitney Reservoir, total capacity, 4,700 acre-ft since 1966. Three diversions above station for irrigation of about 265 acres above and 2,600 acres below station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,390 ft<sup>3</sup>/s, Jun 30, 2011, gage height, 7.82 ft; minimum, 6.8 ft<sup>3</sup>/s, Apr 12, 1984, result of upstream ice jam.

### DISCHARGE, CUBIC FEET PER SECOND

YEAR 2016-10-01 to 2017-09-30

#### DAILY MEAN VALUES

[e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	120	120	e55.5	e47.6	e42.4	e41.3	123	196	1,540	400	122	100
2	111	104	e55.0	e46.9	e42.5	e43.1	129	211	1,950	370	115	89.6
3	123	92.6	e55.7	e47.2	e42.8	e45.6	119	222	2,030	351	108	84.8
4	115	91.0	e57.8	e47.1	e42.9	e51.2	112	303	1,960	338	103	80.9
5	110	89.3	e52.1	e45.6	e43.0	e52.0	106	516	1,940	333	99.4	90.7
6	104	85.7	e48.4	e44.4	e43.7	e43.1	113	784	2,020	310	94.7	171
7	98.1	81.9	e46.4	e43.9	e45.1	e47.1	134	1,050	1,960	290	97.1	171
8	95.0	78.0	e46.2	e44.5	e48.8	e52.1	172	1,150	1,910	273	139	169
9	89.5	76.7	e50.6	e45.4	e51.9	e54.7	153	1,160	1,710	255	139	132
10	85.5	74.8	e53.4	e46.0	e50.6	e55.6	132	1,200	1,740	248	127	104
11	84.5	72.9	e52.6	e45.4	e46.0	e53.0	136	1,310	1,620	243	106	99.3
12	80.1	71.5	e52.0	e44.8	e44.9	e55.8	146	1,510	1,480	222	102	96.0
13	76.5	70.8	e53.7	e45.0	e47.9	56.9	207	1,700	1,200	218	95.8	93.7
14	73.3	67.2	e61.2	e44.7	e48.3	65.9	266	1,460	1,010	227	92.9	96.2
15	70.6	66.6	e66.8	e44.6	e53.5	75.1	258	1,260	1,020	251	93.3	127
16	70.1	65.8	e62.9	e44.7	e56.3	86.1	274	1,170	1,100	227	91.1	134
17	82.5	60.4	e51.1	e44.7	e57.3	96.3	317	1,050	1,180	214	84.0	111
18	79.9	57.3	e44.1	e45.2	e58.9	115	370	809	1,110	208	78.9	102
19	75.9	74.3	e56.3	e45.7	e56.9	141	405	702	1,110	204	76.8	121
20	66.8	69.7	e65.5	e46.1	e57.0	156	330	619	1,080	205	75.5	124
21	75.2	69.5	e56.3	e45.7	e60.6	178	281	583	1,120	191	76.5	118
22	74.3	69.2	e53.1	e45.2	e57.1	202	259	566	1,050	182	84.9	97.5
23	72.3	59.4	e53.3	e45.6	e52.3	193	296	698	949	172	90.6	99.5
24	79.3	59.4	e51.8	e46.5	e47.5	167	326	990	832	166	88.8	112
25	111	62.3	e48.5	e45.8	e46.2	159	279	1,280	746	173	82.7	109
26	90.2	62.2	e46.9	e44.5	e45.9	144	250	1,040	691	179	79.0	105
27	81.6	62.2	e47.7	e43.5	e44.1	141	243	900	647	172	76.2	112
28	78.9	61.8	e48.1	e42.8	e40.5	129	223	1,030	610	150	73.7	118
29	104	60.0	e47.5	e42.4		124	209	1,260	534	141	78.5	116
30	93.3	e57.2	e48.1	e42.4		133	200	1,390	463	133	82.0	127
31	129		e48.3	e42.4		129		1,520		128	127	
<b>Total</b>	<b>2,800</b>	<b>2,194</b>	<b>1,637</b>	<b>1,396</b>	<b>1,375</b>	<b>3,086</b>	<b>6,568</b>	<b>29,640</b>	<b>38,310</b>	<b>7,174</b>	<b>2,980</b>	<b>3,411</b>
<b>Mean</b>	<b>90.3</b>	<b>73.1</b>	<b>52.8</b>	<b>45.0</b>	<b>49.1</b>	<b>99.5</b>	<b>219</b>	<b>956</b>	<b>1,277</b>	<b>231</b>	<b>96.1</b>	<b>114</b>
<b>Max</b>	<b>129</b>	<b>120</b>	<b>66.8</b>	<b>47.6</b>	<b>60.6</b>	<b>202</b>	<b>405</b>	<b>1700</b>	<b>2030</b>	<b>400</b>	<b>139</b>	<b>171</b>
<b>Min</b>	<b>66.8</b>	<b>57.2</b>	<b>44.1</b>	<b>42.4</b>	<b>40.5</b>	<b>41.3</b>	<b>106</b>	<b>196</b>	<b>463</b>	<b>128</b>	<b>73.7</b>	<b>80.9</b>
<b>Ac-ft</b>	<b>5,555</b>	<b>4,351</b>	<b>3,247</b>	<b>2,770</b>	<b>2,727</b>	<b>6,121</b>	<b>13,030</b>	<b>58,790</b>	<b>75,990</b>	<b>14,230</b>	<b>5,911</b>	<b>6,766</b>

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943-2017, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	66.3	55.1	45.7	41.6	39.8	44.7	115	601	835	295	93.3	76.0
<b>Max</b>	208	106	94.9	72.4	64.3	99.5	316	1,044	1,990	1,371	244	229
<b>(WY)</b>	(1983)	(1984)	(1984)	(1984)	(1984)	(2017)	(1946)	(1984)	(1986)	(2011)	(1965)	(1983)
<b>Min</b>	30.8	32.5	27.7	28.9	21.1	26.0	37.2	162	204	67.4	31.0	23.9
<b>(WY)</b>	(1959)	(1955)	(1960)	(2007)	(2003)	(1964)	(1944)	(1977)	(1992)	(1961)	(2002)	(1956)

Figure 2017.17 (cont.)

# 10020100 BEAR RIVER ABOVE RESERVOIR, NEAR WOODRUFF, UT

LOCATION.--Lat 41°26'04", long 111°01'01" referenced to North American Datum of 1927, in NE ¼ NW ¼ sec.29, T.17 N., R.120 W., Uinta County, WY, Hydrologic Unit 16010101, on right bank 4.8 mi upstream from Woodruff Narrows Dam and 9.6 mi southeast of Woodruff.

DRAINAGE AREA.--755 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1961 to current year.

REVISED RECORDS.--WDR UT-74-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 6,455 ft above NGVD of 1929, from river-profile map.

REMARKS.-- Diversion for irrigation of about 43,500 acres above station. Records are good except estimated daily discharges which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,150 ft<sup>3</sup>/s, Jun 2, 1983, gage height, 6.17 ft; minimum, no flow several days during Aug, Sep 1988, and Sep 2002.

## DISCHARGE, CUBIC FEET PER SECOND WATER YEAR 2016-10-01 to 2017-09-30 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	43.4	42.3	e10.1	e60.4	e64.0	e55.7	873	508	1,480	145	12.7	26.5
2	37.8	52.6	e11.5	e60.3	e63.3	e57.8	735	458	1,510	112	9.20	27.0
3	41.9	39.8	e14.1	e59.6	e62.3	e60.1	618	455	1,650	99.1	6.15	23.0
4	37.2	30.2	e16.9	e58.1	e61.9	e62.5	512	472	1,710	76.0	7.52	18.7
5	44.0	25.1	e21.0	e55.1	e62.1	e65.3	406	622	1,700	61.8	6.33	18.2
6	38.6	23.1	e22.9	e51.9	e63.3	e72.4	370	924	1,710	45.5	5.47	28.4
7	41.7	21.2	e23.3	e53.5	e64.2	e80.3	369	1,230	1,760	42.6	5.00	37.4
8	73.6	18.1	e25.2	e57.6	e65.2	e92.1	442	1,480	1,680	31.9	6.09	31.6
9	70.3	15.9	e28.2	e62.9	e66.0	e109	609	1,640	1,620	26.1	16.5	35.6
10	63.0	13.9	e31.3	e65.7	e65.5	e150	571	1,660	1,450	24.3	34.4	37.4
11	57.8	12.7	e36.7	e66.0	e64.5	e207	572	1,640	1,460	17.9	26.4	39.7
12	53.2	11.4	e41.8	e65.2	e62.8	e273	505	1,700	1,380	14.6	20.3	30.0
13	52.8	10.3	e47.8	e62.4	e61.1	e402	469	1,830	1,180	11.4	14.8	26.0
14	50.7	9.43	e52.8	e59.3	e59.7	e555	542	2,120	865	7.95	13.3	34.5
15	49.7	8.85	e57.7	e56.3	e58.8	e740	574	2,000	645	4.85	10.7	49.1
16	50.9	7.30	e57.9	e53.3	e59.6	974	539	1,660	624	8.07	10.3	43.6
17	70.4	6.48	e53.3	e52.2	e61.9	1,130	570	1,520	686	21.9	12.4	71.3
18	87.4	7.17	e50.0	e53.8	e64.7	1,060	617	1,330	698	19.4	11.3	60.2
19	83.9	6.32	e54.2	e55.5	e65.8	1,030	795	1,070	661	27.9	7.36	42.5
20	72.7	5.07	e65.0	e57.1	e66.3	872	867	898	625	24.0	e4.68	35.1
21	62.6	16.4	e70.6	e58.7	e67.0	769	725	784	601	24.1	e3.52	51.1
22	59.6	16.5	e70.1	e60.4	e66.0	768	609	752	592	24.1	e3.55	49.4
23	59.3	15.6	e69.1	e60.7	e64.7	866	568	705	515	24.4	e3.67	67.9
24	54.4	13.4	e68.3	e60.7	e62.2	826	632	847	440	26.2	e6.14	108
25	14.8	8.67	e67.3	e59.5	e59.3	650	711	1,180	396	25.4	15.8	146
26	18.8	7.19	e65.1	e58.5	e57.3	598	649	1,380	318	29.5	17.8	135
27	22.8	e6.54	e62.7	e57.6	e55.8	530	576	1,100	259	48.9	14.7	125
28	15.9	e8.19	e61.4	e56.9	e55.0	540	541	976	225	43.9	12.6	118
29	12.6	e9.06	e60.9	e57.8		555	524	1,030	201	29.9	19.3	112
30	10.5	e8.82	e60.5	e59.6		521	564	1,200	166	21.4	20.8	107
31	26.7		e60.6	e62.6		707		1,330		16.6	24.1	
<b>Total</b>	1,479	478	1,438	1,819	1,750	15,380	17,650	36,500	28,810	1,137	383	1,734
<b>Mean</b>	47.7	15.9	46.4	58.7	62.5	496	588	1,177	960	36.7	12.4	57.8
<b>Max</b>	87.4	52.6	70.6	66.0	67.0	1130	873	2120	1760	145	34.4	146
<b>Min</b>	10.5	5.07	10.1	51.9	55.0	55.7	369	455	166	4.85	3.52	18.2
<b>Ac-ft</b>	2,934	947	2,853	3,608	3,472	30,500	35,020	72,400	57,140	2,255	759	3,442

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 -2017, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	65.4	64.0	63.3	61.8	73.6	157	311	773	801	185	46.3	46.1
<b>Max</b>	437	198	181	147	312	627	671	1,957	2,564	1,355	340	288
<b>(WY)</b>	(1983)	(1974)	(1984)	(1984)	(1986)	(1986)	(1969)	(1984)	(1986)	(2011)	(1983)	(1983)
<b>Min</b>	3.03	6.06	7.21	6.76	10.4	26.8	77.7	104	47.3	4.41	.68	.49
<b>(WY)</b>	(1965)	(1989)	(1989)	(1989)	(2003)	(1977)	(1977)	(1977)	(2012)	(2000)	(2000)	(1988)

Figure 2017.17 (cont.)

# 1002030 BEAR RIVER BELOW RESERVOIR, NEAR WOODRUFF, UT

LOCATION.--Lat 41°30'20", long 111°00'50" referenced to North American Datum of 1927, in NE ¼ NE ¼ NW ¼ sec.32, T.18 N., R.120 W., Uinta County, WY, Hydrologic Unit 16010101, on right bank 1,100 ft downstream from Woodruff Narrows Dam, 1.6 mi upstream from Salt Creek, 5.4 mi upstream from Wyoming-Utah State line, and 7.7 mi east of Woodruff.

DRAINAGE AREA.--784 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1961 to current year.

REVISED RECORDS.--WDR UT-74-1: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 6,398.96 ft above NGVD of 1929. Prior to September 26, 1962, at site 175 ft upstream at same datum.

REMARKS.-- Flow regulated by Woodruff Narrows Reservoir (station 10020200) beginning January 1962. Diversions for irrigation of about 43,500 acres above station. Records are good, except estimated daily discharges which are poor, and other exceptions as noted. Aug 4 to Sep 30, 2014 records are fair (due to variable control conditions from rain storm event).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,820 ft<sup>3</sup>/s, Jun 2, 1983, gage height, 8.26 ft; no flow Jul 4, 5, 1962, Aug 30, 31, Sep 1, 2, 6, 7, 1979, Oct 30, 1980.

## DISCHARGE, CUBIC FEET PER SECOND WATER YEAR 2016-10-01 to 2017-09-30 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	17.8	17.1	16.4	17.2	16.6	165	760	634	1,090	752	53.9	52.0
2	17.7	17.1	16.7	17.1	16.7	165	761	634	1,100	747	53.9	52.0
3	17.8	17.0	16.7	17.3	16.7	166	760	632	1,210	306	53.9	51.8
4	17.8	17.0	16.7	17.2	17.1	166	758	631	1,410	83.8	53.9	51.0
5	17.7	16.9	16.7	17.3	17.2	167	757	631	1,540	83.9	53.9	51.0
6	17.4	16.9	16.7	17.3	17.3	168	714	680	1,600	83.1	53.9	50.5
7	17.7	16.9	16.6	17.3	17.3	168	551	810	1,660	83.0	54.8	50.1
8	17.7	16.9	16.7	17.4	17.0	166	467	881	1,670	82.5	54.3	50.1
9	17.7	16.9	16.7	17.5	17.5	167	469	885	1,640	68.6	54.8	50.1
10	17.6	16.8	16.7	16.9	17.5	167	470	891	1,520	61.0	55.0	49.8
11	17.6	16.8	16.7	15.7	16.3	224	469	900	1,460	61.0	55.2	49.2
12	17.6	16.8	16.7	15.7	16.2	315	469	906	1,430	61.0	55.9	49.2
13	17.6	16.8	16.7	15.7	16.2	346	470	992	1,340	61.0	54.4	49.2
14	17.5	16.7	16.7	15.7	16.4	347	470	1,490	1,190	57.3	54.1	49.2
15	17.5	16.7	16.7	16.1	16.7	350	471	1,820	1,090	55.2	54.2	49.2
16	17.6	16.7	16.6	16.2	16.7	406	472	1,800	1,070	55.0	53.9	49.2
17	17.6	16.7	16.7	16.2	38.3	740	473	1,650	1,060	55.0	53.8	49.2
18	17.5	16.7	16.7	16.2	74.1	1,100	474	1,510	917	55.1	53.3	49.0
19	17.4	16.7	16.7	16.5	74.1	1,280	475	1,330	794	54.9	52.9	49.2
20	17.4	16.7	16.5	16.3	119	1,360	477	1,180	792	54.4	52.9	49.0
21	17.4	16.7	16.7	16.2	158	1,490	479	1,090	791	53.9	52.4	32.9
22	17.3	16.7	16.7	16.2	162	1,530	481	1,070	788	53.9	52.0	16.2
23	17.3	16.6	16.7	16.2	162	1,440	482	1,060	787	53.9	52.0	16.2
24	17.3	16.7	16.7	16.2	162	1,300	483	1,060	784	53.9	52.0	15.9
25	17.3	16.7	16.7	16.2	163	1,150	483	1,070	783	55.5	52.0	15.7
26	17.2	16.7	16.7	16.5	164	1,100	484	1,070	780	56.6	52.0	15.5
27	17.2	16.7	16.7	16.7	164	887	553	1,070	774	56.5	52.0	14.7
28	17.2	16.7	16.9	16.7	164	762	647	1,080	768	56.6	52.0	14.7
29	17.2	16.7	17.3	16.7		763	635	1,080	765	55.9	52.0	14.7
30	17.1	16.7	17.2	16.7		761	634	1,080	761	54.4	52.0	14.7
31	17.1		17.3	16.7		760		1,080		53.9	52.0	
<b>Total</b>	542	504	519	514	1,874	20,080	16,550	32,700	33,360	3,526	1,655	1,171
<b>Mean</b>	17.5	16.8	16.7	16.6	66.9	648	552	1,055	1,112	114	53.4	39.0
<b>Max</b>	17.8	17.1	17.3	17.5	164	1530	761	1820	1670	752	55.9	52.0
<b>Min</b>	17.1	16.6	16.4	15.7	16.2	165	467	631	761	53.9	52.0	14.7
<b>Ac-ft</b>	1,075	999	1,029	1,019	3,716	39,820	32,820	64,850	66,180	6,993	3,283	2,323

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 2017, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	51.4	46.6	40.2	38.3	40.3	91.9	249	744	955	261	70.3	55.7
<b>Max</b>	425	421	184	153	171	648	891	1,828	2,437	1,339	331	278
<b>(WY)</b>	(1983)	(1983)	(1983)	(1985)	(1971)	(2017)	(1985)	(1984)	(1983)	(2011)	(1983)	(1983)
<b>Min</b>	3.89	.12	4.28	4.37	4.71	4.70	.34	27.8	357	10.4	3.91	3.65
<b>(WY)</b>	(1990)	(1981)	(1978)	(1978)	(1978)	(1978)	(1977)	(1977)	(2002)	(2002)	(1979)	(1979)



# 10028500 BEAR RIVER BELOW PIXLEY DAM, NEAR COKEVILLE, WY

LOCATION.--Lat 41°56'20", long 110°59'05" referenced to North American Datum of 1927, in SW ¼ SE ¼ SE ¼ sec.25, T.23 N., R.120 W., Lincoln County, WY, Hydrologic Unit 16010102, 800 ft downstream from Pixley Dam, 11 mi south of Cokeville, and 17.5 mi downstream from Twin Creek.

DRAINAGE AREA.--2,032 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1941 to November 1943 (published as Bear River near Cokeville), October 1952 to September 1956, May 1958 to current year (seasonal only). Monthly discharge only for some periods, published in WSP 1314.

REVISED RECORDS.--WDR UT-74-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 6,185 ft above NGVD of 1929, from river-profile map. October 31, 1941 to November 30, 1943, at site 200 ft downstream at different datum. September 24, 1952 to August 31, 1994 at site 50 ft downstream at same datum. May 7, 2015 to August 14, 2015 at site 850 ft upstream at same datum.

REMARKS.-- Natural flow of stream affected by diversions for irrigation, return flow from irrigated areas, and regulation by upstream reservoirs. Records are fair except for estimated daily discharges which are poor and other periods as noted. 6/20/14 - 7/12/14; records are poor due to variable control conditions from backwater. 5/6/15 - 9/30/16, 3/18/16 - 5/16/16, 6/8/16 - 10/4/16; records are good.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 2,300 ft<sup>3</sup>/s, Mar 25, 1956; minimum daily discharge, 0.09 ft<sup>3</sup>/s, Sep 8, 2002.

## DISCHARGE, CUBIC FEET PER SECOND WATER YEAR 2016-10-01 to 2017-09-30 DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	23.6	---	---	---	---	---	1,440	1,010	903	372	117	85.3
2	24.6	---	---	---	---	---	1,450	1,000	909	370	113	82.0
3	25.8	---	---	---	---	---	1,430	992	925	376	110	84.2
4	26.2	---	---	---	---	---	1,390	977	922	391	109	82.9
5	---	---	---	---	---	---	1,350	966	933	420	113	79.9
6	---	---	---	---	---	---	1,290	963	940	463	123	78.5
7	---	---	---	---	---	---	1,250	966	951	390	116	75.9
8	---	---	---	---	---	---	1,230	976	977	377	112	75.7
9	---	---	---	---	---	---	1,230	1,020	991	397	116	74.6
10	---	---	---	---	---	---	1,180	1,070	988	359	120	74.5
11	---	---	---	---	---	---	1,080	1,120	1,020	330	123	76.8
12	---	---	---	---	---	---	1,010	1,170	1,050	313	131	73.2
13	---	---	---	---	---	---	957	1,190	1,070	287	136	68.3
14	---	---	---	---	---	---	945	1,210	1,080	259	134	68.3
15	---	---	---	---	---	---	941	1,230	1,060	239	133	78.8
16	---	---	---	---	---	---	907	1,230	1,020	227	131	77.5
17	---	---	---	---	---	---	888	1,250	1,000	215	121	90.0
18	---	---	---	---	---	---	891	1,290	992	208	114	96.6
19	---	---	---	---	---	---	950	1,340	980	198	110	94.0
20	---	---	---	---	---	---	1,040	1,370	906	190	109	97.1
21	---	---	---	---	---	---	1,040	1,400	740	180	105	99.6
22	---	---	---	---	---	1,470	1,010	1,400	567	169	105	99.1
23	---	---	---	---	---	1,530	978	1,400	557	158	108	99.3
24	---	---	---	---	---	1,550	970	1,370	537	148	113	108
25	---	---	---	---	---	1,550	978	1,300	516	141	114	111
26	---	---	---	---	---	1,540	979	1,160	496	138	104	117
27	---	---	---	---	---	1,520	962	977	462	136	99.3	117
28	---	---	---	---	---	1,490	959	910	389	131	95.4	114
29	---	---	---	---	---	1,470	963	928	372	127	92.1	114
30	---	---	---	---	---	1,450	989	938	374	127	88.6	121
31	---	---	---	---	---	1,450		920		122	87.9	
<b>Total</b>							32,679	35,040	24,630	7,957	3,503	2,713
<b>Mean</b>							1,089	1,130	821	257	113	90.5
<b>Max</b>							1450	1400	1080	463	136	121
<b>Min</b>							888	910	372	122	87.9	68.3
<b>Ac-ft</b>							64,810	69,510	48,850	15,780	6,949	5,383

Figure 2017.17 (cont.)

## 10032000 SMITHS FORK NEAR BORDER, WY

LOCATION.--Lat 42°17'36", long 110°52'18" referenced to North American Datum of 1927, in NE ¼ SW ¼ sec.28, T.27 N., R.118 W., Lincoln County, WY, Hydrologic Unit 16010102, on left bank 4.9 mi upstream from Howland Creek, 5.6 mi downstream from Hobbles Creek, and 12.4 mi northeast of Border.

DRAINAGE AREA.--165 mi<sup>2</sup>.

PERIOD OF RECORD.--May 1942 to current year.

REVISED RECORDS.--WSP 1734: 1952(M).

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 6,720 ft above NGVD of 1929, from topographic map. Prior to October 16, 1945, at site 1.2 mi downstream at different datum. October 16, 1945 to November 1986 at site 0.4 mi downstream at different datum.

REMARKS.-- Records good except for estimated daily discharges which are poor. One diversion for irrigation of about 200 acres above station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,100 ft<sup>3</sup>/s, Jun 4, 1986, gage height, 5.66 ft; minimum, 19 ft<sup>3</sup>/s, Feb 28, 2007.

### DISCHARGE, CUBIC FEET PER SECOND WATER YEAR 2016-10-01 to 2017-09-30 DAILY MEAN VALUES

[e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	93.2	136	e91.9	e62.9	e85.1	82.0	325	380	1,280	598	251	151
2	97.5	127	e88.7	e62.1	e87.3	e80.8	350	397	1,330	578	244	146
3	118	122	e88.3	e61.5	e87.0	e79.7	324	425	1,400	559	240	144
4	108	118	e95.1	e65.5	84.8	e82.6	307	510	1,410	546	235	141
5	100	115	91.0	e57.1	82.2	e82.9	296	677	1,430	530	231	140
6	97.9	113	e57.4	e45.6	81.0	81.0	304	872	1,470	509	229	139
7	96.3	110	e60.1	e48.0	79.6	77.6	331	1,050	1,450	494	232	137
8	95.0	108	e61.3	e60.5	69.7	77.2	372	1,190	1,430	475	233	137
9	93.4	107	e78.1	e76.7	77.7	79.5	356	1,260	1,410	460	228	135
10	91.7	106	e87.9	e82.1	106	84.5	332	1,280	1,360	446	222	141
11	90.5	104	e84.1	e83.6	102	87.9	325	1,310	1,230	432	214	135
12	90.3	103	e76.7	e82.7	e87.1	88.3	345	1,410	1,160	416	210	132
13	89.2	102	e77.6	e76.0	e86.5	86.5	450	1,580	1,100	403	208	131
14	88.8	102	e80.6	e67.4	e89.6	89.0	572	1,390	996	395	204	137
15	98.7	100	e87.9	e60.3	e94.4	94.6	519	1,250	918	382	203	153
16	114	99.8	e87.7	e58.8	e95.4	109	509	1,170	889	367	192	139
17	127	99.8	e69.3	e59.7	94.9	123	529	1,080	946	359	184	134
18	108	e90.3	e52.1	e61.7	91.7	139	547	942	969	344	184	132
19	105	97.9	e60.8	e65.3	91.7	163	609	841	943	331	183	168
20	100	98.3	e74.2	e69.2	88.5	201	620	762	937	322	178	144
21	100	108	e75.2	e73.0	91.2	215	590	727	951	313	175	136
22	101	101	e71.9	e76.7	90.0	257	556	720	945	303	168	143
23	101	94.7	e72.2	e79.1	89.4	297	574	763	887	296	166	133
24	107	95.6	e75.0	e75.8	86.1	279	578	909	824	291	165	143
25	121	e87.0	e70.9	e72.6	79.5	277	529	1,100	775	289	165	145
26	118	e92.7	e66.1	e70.9	80.8	259	499	1,110	743	281	158	135
27	111	97.9	e64.7	e69.9	88.0	248	477	1,030	724	274	156	130
28	111	94.0	e68.7	e69.9	81.5	244	443	1,010	703	270	154	125
29	146	e90.2	e63.6	e71.3		256	412	1,040	662	264	155	121
30	134	e87.3	e61.9	e73.8		286	389	1,110	625	259	154	124
31	143		e62.6	e77.8		311		1,230		256	152	
<b>Total</b>	3,296	3,106	2,304	2,118	2,449	4,918	13,370	30,530	31,900	12,040	6,072	4,151
<b>Mean</b>	106	104	74.3	68.3	87.5	159	446	985	1,063	388	196	138
<b>Max</b>	146	136	95.1	83.6	106	311	620	1580	1470	598	251	168
<b>Min</b>	88.8	87.0	52.1	45.6	69.7	77.2	296	380	625	256	152	121
<b>Ac-ft</b>	6,536	6,163	4,569	4,200	4,857	9,755	26,520	60,550	63,270	23,890	12,050	8,233

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 2017, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	90.5	78.2	68.1	62.8	60.5	63.8	162	528	612	289	151	108
<b>Max</b>	156	114	88.4	85.0	87.5	159	446	1,072	1,377	779	280	169
<b>(WY)</b>	(1987)	(1986)	(1983)	(1983)	(2017)	(2017)	(2017)	(1997)	(1986)	(2011)	(2011)	(2011)
<b>Min</b>	51.0	50.7	41.5	39.7	34.7	39.5	58.6	99.1	96.2	61.4	55.1	52.1
<b>(WY)</b>	(1978)	(1978)	(2002)	(2008)	(2003)	(1988)	(1975)	(1977)	(1977)	(1977)	(1977)	(1977)

Figure 2017.17 (cont.)

## 10039500 BEAR RIVER AT BORDER, WY

LOCATION.--Lat 42°12'40", long 111°03'11" referenced to North American Datum of 1927, in NE ¼ NE ¼ NE ¼ sec.15, T.14 S., R.46 E., Bear Lake County, ID, Hydrologic Unit 16010102, on left bank 0.2 mi west of Wyoming-Idaho State line, 0.5 mi west of Border, and 2.1 mi upstream from Thomas Fork.

DRAINAGE AREA.--2,480 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1937 to September 1996, October 1996 to September 2000 (seasonal), October 2000 to current year.

REVISED RECORDS.--WDR UT-74-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 6,051.63 ft above NGVD of 1929, unadjusted.

REMARKS.-- Natural flow of stream affected by regulation of upstream reservoirs, diversions for irrigation, and return flow from irrigated areas.

Records are good except estimated discharges which are poor and the following exceptions: March 13 to August 15, 2017 which is rated fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,880 ft<sup>3</sup>/s, Jun 7, 1983, gage height, 9.69 ft; minimum discharge, 24 ft<sup>3</sup>/s, Apr 29, 30, 1977.

### DISCHARGE, CUBIC FEET PER SECOND WATER YEAR 2016-10-01 to 2017-09-30 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	95.3	231	e189	e148	e158	e376	3,050	1,670	2,000	871	367	276
2	98.8	229	e190	e153	e163	e384	2,990	1,650	2,040	838	351	263
3	110	222	e183	e152	e167	e390	2,940	1,620	2,070	828	339	245
4	135	219	e186	e145	e170	e394	2,880	1,610	2,120	830	337	218
5	119	216	e189	e132	e173	e399	2,760	1,670	2,160	836	331	213
6	112	215	e174	e115	e175	e407	2,610	1,810	2,180	871	334	206
7	111	212	e168	e106	e176	e418	2,470	2,010	2,220	910	340	201
8	110	210	e163	e114	e179	e430	2,450	2,220	2,240	820	340	195
9	110	212	e162	e136	e188	e441	2,520	2,400	2,260	826	345	195
10	113	235	e173	e157	e217	e471	2,400	2,520	2,270	827	345	196
11	113	231	e171	e158	e260	e493	2,200	2,600	2,250	791	340	197
12	113	221	e167	e137	e283	e574	2,020	2,650	2,200	748	331	194
13	114	219	e166	e130	e271	e693	1,920	2,710	2,170	699	333	194
14	114	218	e167	e129	e276	e822	1,950	2,770	2,160	650	335	198
15	119	217	e173	e128	e284	973	2,030	2,790	2,040	612	e338	224
16	130	215	e184	e126	e306	1,200	1,950	2,750	1,910	579	348	231
17	178	205	e175	e126	e331	1,290	1,890	2,730	1,840	559	338	219
18	211	188	e153	e128	e346	1,800	1,880	2,680	1,840	545	320	226
19	194	196	e149	e136	e353	2,360	1,990	2,640	1,840	521	311	249
20	186	207	e148	e149	e359	2,520	2,090	2,570	1,790	500	303	266
21	181	211	e154	e159	e363	2,640	2,170	2,470	1,700	483	300	252
22	181	230	e154	e169	e364	2,850	2,120	2,410	1,480	456	292	256
23	183	221	e156	e171	e363	3,150	2,030	2,360	1,360	437	291	252
24	181	217	e159	e164	e360	3,240	2,010	2,330	1,300	428	296	267
25	191	e198	e159	e156	e356	3,250	2,050	2,380	1,230	413	294	292
26	197	e185	e152	e152	e360	3,240	1,960	2,480	1,150	410	296	280
27	199	211	e150	e151	e364	3,220	1,910	2,510	1,090	408	283	271
28	196	203	e154	e150	e371	3,170	1,860	2,310	1,020	398	272	264
29	212	e167	e152	e151		3,100	1,790	2,090	944	383	264	256
30	229	e179	e149	e151		3,060	1,710	2,020	901	378	264	256
31	225		e147	e154		3,080		1,990		377	268	
<b>Total</b>	4,761	6,340	5,116	4,433	7,735	50,830	66,600	71,420	53,769	19,230	9,846	7,052
<b>Mean</b>	154	211	165	143	276	1,640	2,220	2,304	1,792	620	318	235
<b>Max</b>	229	235	190	171	371	3250	3050	2790	2270	910	367	292
<b>Min</b>	95.3	167	147	106	158	376	1710	1610	901	377	264	194
<b>Ac-ft</b>	9,444	12,580	10,150	8,793	15,340	100,800	132,100	141,700	106,700	38,150	19,530	13,990

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 2017, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	196	214	186	171	195	370	705	974	1,134	529	218	170
<b>Max</b>	752	693	563	381	479	1,640	2,220	3,158	3,829	2,837	752	671
<b>(WY)</b>	(1983)	(1983)	(1983)	(1985)	(1986)	(2017)	(2017)	(1952)	(1983)	(2011)	(1983)	(1983)
<b>Min</b>	43.5	74.7	97.2	77.6	75.2	105	71.2	74.4	62.2	54.2	42.3	38.5
<b>(WY)</b>	(2002)	(2002)	(2002)	(1993)	(1993)	(1988)	(1977)	(1977)	(1977)	(1977)	(1940)	(1940)

Figure 2017.17 (cont.)

**RAINBOW INLET CANAL NEAR DINGLE, ID  
(10046000)**

**STREAMFLOW RECORDS FOR WATER YEAR 2017**

LOCATION.--Lat 42°13'48", long 111°17'43" referenced to North American Datum of 1927, in NW ¼ SW ¼ SE ¼ sec.3, T.14 S., R.44 E., BEAR LAKE County, Hydrologic Unit 16010201, on right bank 1.5 mi west of Dingle and 1.8 mi downstream from headworks at Stewart Dam.

PERIOD OF RECORD.--October 2006 to current year published by PacifiCorp. January 1922 to September 2006 published in United States Geological Survey Water-Data Reports. Monthly discharge only prior to October 1945, published in United States Geological Survey WSP 1314.

GAGE.--Water-stage recorder. Elevation of gage datum is 5,922.0 ft above NGVD of 1929, (by topographic survey). Prior to October 1, 1923, at site 300 ft downstream at different datum; October 1, 1923 to October 27, 1944, at site 0.5 mi downstream at different datum.

REMARKS.--Records fair except for estimated daily discharges, which are poor. Canal diverts from Bear River at Stewart Dam in NE¼ sec. 34, T.013 S., R.0 44 E., for storage in Bear Lake. At times flow in canal is augmented by surplus water from Black Otter Slough entering at the station and by seepage and surplus water from irrigation. Flow contributions from Black Otter Slough is included in the values below.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 4,950 ft³/s, May 27, 1984; no flow Apr 28, 1977 and Oct 1, 1979.

DISCHARGE MEASUREMENT DATES.-- 8-11-16, 10-21-16, 11-6-16, 11-20-16, 12-13-16, 2-16-17, 2-21-17, 2-24-17, 3-1-17, 3-8-17, 3-29-17, 6-10-17, 6-13-17, 6-21-17, 6-23-17, 8-10-17, 8-24-17, 9-22-17, 10-1-17, 10-5-17.

**Rainbow Inlet Canal near Dingle, ID (10046000)  
Water Year 2017 (October 2016 to September 2017)**

**Daily Mean Values**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1	100	315	200	180	160	581	3690	2180	2210	1050	288	238	
2	100	315	200	180	160	573	3570	2100	2170	1020	286	228	
3	115	315	190	180	160	550	3400	2040	2200	993	277	219	
4	125	300	205	180	160	524	3280	2000	2240	949	270	209	
5	185	300	205	180	160	526	3110	2060	2270	932	265	200	
6	185	256	180	160	160	528	2900	2200	2270	919	260	190	
7	145	252	180	160	160	529	2780	2370	2220	919	265	181	
8	140	252	180	160	160	531	2670	2420	2200	892	275	171	
9	140	252	170	160	182	541	2690	2580	2200	920	300	162	
10	140	250	180	160	195	556	2680	2790	2230	929	300	152	
11	140	256	180	160	205	588	2470	2950	2210	901	300	158	
12	140	254	210	160	220	642	2370	2940	2180	774	300	155	
13	150	250	183	160	220	730	2220	3000	2160	703	295	160	
14	150	240	183	160	220	860	2150	3130	2130	636	295	160	
15	150	240	183	160	235	964	2240	3280	2100	582	280	170	
16	150	235	183	160	400	1040	2300	3270	1970	548	300	180	
17	170	250	183	160	399	1140	2250	3190	1860	521	300	175	
18	260	210	183	160	407	1500	2260	3120	1810	493	300	200	
19	325	210	183	160	418	1920	2310	3020	1790	469	300	210	
20	320	218	183	160	418	2130	2380	2940	1750	459	295	210	
21	245	218	183	160	416	2340	2410	2820	1620	431	280	293	
22	240	218	183	160	433	2480	2460	2680	1460	398	270	293	
23	240	240	183	160	458	2690	2410	2580	1340	379	254	305	
24	240	240	183	160	474	3090	2400	2490	1280	362	260	317	
25	240	230	183	160	492	3530	2430	2440	1220	349	255	325	
26	240	210	183	160	509	3760	2410	2430	1130	343	255	329	
27	250	210	180	160	527	3810	2390	2500	1060	339	245	326	
28	250	218	180	160	545	3780	2390	2530	1010	332	240	323	
29	250	210	180	160		3670	2370	2470	1000	328	235	321	
30	270	200	180	160		3680	2280	2410	1080	312	230	318	
31	300		180	160		3690		2260		298	230		
Monthly Statistics												Yearly Stats	
<b>Total</b>	6,095	7,364	5,742	5,060	8,653	53,473	77,670	81,190	54,370	19,480	8,505	6,878	<b>334,480</b>
<b>Mean</b>	197	245	185	163	309	1,720	2,590	2,620	1,810	628	274	229	<b>915</b>
<b>Min</b>	100	200	170	160	160	524	2,150	2,000	1,000	298	230	152	<b>100</b>
<b>Max</b>	325	315	210	180	545	3,810	3,690	3,280	2,270	1,050	300	329	<b>3,810</b>
<b>Ins. Min</b>	100	200	170	160	160	497	2,140	1,980	950	276	222	152	<b>100</b>
<b>Ins. Max</b>	325	315	306	293	1,020	3,840	3,730	3,330	2,410	1,100	309	329	<b>3,840</b>
<b>Ac-ft</b>	12,090	14,610	11,390	10,040	17,160	106,060	154,060	161,040	107,840	38,640	16,870	13,640	<b>663,440</b>

**PacifiCorp  
Reservoir Records  
Bear Lake 2016-2017  
Daily Contents (Acre Feet)**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	536738	565200	565848	578823	613328	666432	809603	1007890	1205518	1326860	1319830	1269273	1
2	536738	565200	565848	578823	613981	668407	821709	1012035	1211116	1326860	1319127	1267168	2
3	537384	565200	565848	579472	613981	670383	832482	1016181	1216015	1326860	1318424	1265765	3
4	538029	565200	565848	580771	614634	672361	841245	1020328	1220916	1326860	1317721	1263661	4
5	538029	564551	565848	582720	615941	674339	847994	1024477	1226516	1327563	1317018	1262258	5
6	538675	564551	565848	584019	617247	676317	856099	1029322	1231419	1327563	1316316	1260154	6
7	539321	563903	565848	584669	618554	678296	862862	1033475	1236322	1327563	1315613	1258752	7
8	540613	563903	565848	585970	619207	680277	869632	1039710	1242628	1327563	1314208	1257349	8
9	541906	564551	565848	587920	620514	681597	876410	1045947	1248235	1327563	1311398	1255947	9
10	543198	564551	566496	589221	623783	682917	883196	1052881	1253143	1327563	1308588	1254545	10
11	543844	565200	567793	590521	627054	684238	889992	1059822	1258050	1327563	1305076	1253143	11
12	544490	565200	568441	591822	629671	685560	897476	1067459	1262960	1327563	1302266	1251741	12
13	545136	565848	568441	591822	631635	686882	905650	1073711	1267168	1327563	1300159	1251040	13
14	545136	565848	569089	595727	632945	688865	911788	1081357	1271378	1327563	1298052	1247534	14
15	545783	565848	569738	597030	633600	690848	918612	1086920	1275588	1326860	1296648	1247534	15
16	547507	565848	570386	597030	634910	693494	924761	1092484	1279798	1326860	1295244	1246833	16
17	550772	565848	571035	597681	636876	696803	927494	1097353	1284010	1326860	1293839	1245431	17
18	551974	565848	571683	598332	638841	700777	932967	1103617	1288223	1326157	1291031	1243328	18
19	553175	565848	571683	599635	641464	704752	939811	1109186	1292435	1326157	1288223	1241226	19
20	553776	565848	572332	600937	644087	709394	946662	1116151	1296648	1325453	1284712	1235621	20
21	554978	565848	572981	601589	646056	713374	951461	1124514	1300862	1324750	1281904	1238424	21
22	556179	565848	573630	602240	648681	717358	956264	1132880	1305778	1323344	1280500	1238424	22
23	559369	565848	574279	604196	651307	722008	961068	1141250	1309993	1323344	1279798	1237723	23
24	562608	565848	575578	605500	654593	728657	965876	1149624	1314208	1323344	1279096	1236322	24
25	562608	565848	576227	607457	657221	735311	970687	1158001	1317721	1323344	1278395	1235621	25
26	563903	565848	576876	609413	659851	745306	976877	1166378	1320532	1323344	1276991	1234921	26
27	563903	565848	576876	610065	662482	748642	983070	1174759	1322641	1322641	1276289	1234220	27
28	563903	565848	577525	610718	664457	758654	988579	1181746	1323344	1322641	1274886	1234220	28
29	563903	565848	577525	611370		770691	996160	1188736	1325453	1321938	1273482	1233520	29
30	565200	565848	578174	612023		782747	1002368	1194328	1326157	1321235	1272079	1233520	30
31	565200		578174	612676		796165		1199922		1320532	1270676		31

**Monthly Totals**

**Yearly Totals**

Mean	550,128	565,416	570,890	596,135	634,532	706,834	914,962	1,096,208	1,274,493	1,325,544	1,295,406	1,247,841	<b>898,199</b>
Min	536,738	563,903	565,848	578,823	613,328	666,432	809,603	1,007,890	1,205,518	1,320,532	1,270,676	1,233,520	<b>536,738</b>
Max	565,200	565,848	578,174	612,676	664,457	796,165	1,002,368	1,199,922	1,326,157	1,327,563	1,319,830	1,269,273	<b>1,327,563</b>

Notes:

**PacifiCorp  
Reservoir Level Records  
Bear Lake 2016-2017**

**Daily Stage (Ft) Add 5900 for Elevation**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	10.69	11.13	11.14	11.34	11.87	12.68	14.83	17.74	20.58	22.31	22.21	21.49	1
2	10.69	11.13	11.14	11.34	11.88	12.71	15.01	17.80	20.66	22.31	22.20	21.46	2
3	10.70	11.13	11.14	11.35	11.88	12.74	15.17	17.86	20.73	22.31	22.19	21.44	3
4	10.71	11.13	11.14	11.37	11.89	12.77	15.30	17.92	20.80	22.31	22.18	21.41	4
5	10.71	11.12	11.14	11.40	11.91	12.80	15.40	17.98	20.88	22.32	22.17	21.39	5
6	10.72	11.12	11.14	11.42	11.93	12.83	15.52	18.05	20.95	22.32	22.16	21.36	6
7	10.73	11.11	11.14	11.43	11.95	12.86	15.62	18.11	21.02	22.32	22.15	21.34	7
8	10.75	11.11	11.14	11.45	11.96	12.89	15.72	18.20	21.11	22.32	22.13	21.32	8
9	10.77	11.12	11.14	11.48	11.98	12.91	15.82	18.29	21.19	22.32	22.09	21.30	9
10	10.79	11.12	11.15	11.50	12.03	12.93	15.92	18.39	21.26	22.32	22.05	21.28	10
11	10.80	11.13	11.17	11.52	12.08	12.95	16.02	18.49	21.33	22.32	22.00	21.26	11
12	10.81	11.13	11.18	11.54	12.12	12.97	16.13	18.60	21.40	22.32	21.96	21.24	12
13	10.82	11.14	11.18	11.54	12.15	12.99	16.25	18.69	21.46	22.32	21.93	21.23	13
14	10.82	11.14	11.19	11.60	12.17	13.02	16.34	18.80	21.52	22.32	21.90	21.18	14
15	10.83	11.14	11.20	11.62	12.18	13.05	16.44	18.88	21.58	22.31	21.88	21.18	15
16	10.85	11.14	11.21	11.62	12.20	13.09	16.53	18.96	21.64	22.31	21.86	21.17	16
17	10.90	11.14	11.22	11.63	12.23	13.14	16.57	19.03	21.70	22.31	21.84	21.15	17
18	10.92	11.14	11.23	11.64	12.26	13.20	16.65	19.12	21.76	22.30	21.80	21.12	18
19	10.94	11.14	11.23	11.66	12.30	13.26	16.75	19.20	21.82	22.30	21.76	21.09	19
20	10.95	11.14	11.24	11.68	12.34	13.33	16.85	19.30	21.88	22.29	21.71	21.01	20
21	10.97	11.14	11.25	11.69	12.37	13.39	16.92	19.42	21.94	22.28	21.67	21.05	21
22	10.99	11.14	11.26	11.70	12.41	13.45	16.99	19.54	22.01	22.26	21.65	21.05	22
23	11.04	11.14	11.27	11.73	12.45	13.52	17.06	19.66	22.07	22.26	21.64	21.04	23
24	11.09	11.14	11.29	11.75	12.50	13.62	17.13	19.78	22.13	22.26	21.63	21.02	24
25	11.09	11.14	11.30	11.78	12.54	13.72	17.20	19.90	22.18	22.26	21.62	21.01	25
26	11.11	11.14	11.31	11.81	12.58	13.87	17.29	20.02	22.22	22.26	21.60	21.00	26
27	11.11	11.14	11.31	11.82	12.62	13.92	17.38	20.14	22.25	22.25	21.59	20.99	27
28	11.11	11.14	11.32	11.83	12.65	14.07	17.46	20.24	22.26	22.25	21.57	20.99	28
29	11.11	11.14	11.32	11.84		14.25	17.57	20.34	22.29	22.24	21.55	20.98	29
30	11.13	11.14	11.33	11.85		14.43	17.66	20.42	22.30	22.23	21.53	20.98	30
31	11.13		11.33	11.86		14.63		20.50		22.22	21.51		31

**BEAR LAKE STATISTICS**

**Monthly**

**Yearly**

Daily Mean	10.90	11.13	11.22	11.61	12.19	13.29	16.38	19.01	21.56	22.29	21.86	21.18	16.05
Daily Min	10.69	11.11	11.14	11.34	11.87	12.68	14.83	17.74	20.58	22.22	21.51	20.98	10.69
Daily Max	11.13	11.14	11.33	11.86	12.65	14.63	17.66	20.50	22.30	22.32	22.21	21.49	22.32

Notes: Based on lake elevations taken at Utah State Park Marina.



**BEAR LAKE OUTLET CANAL  
NEAR PARIS, ID  
(10059500)**

**STREAMFLOW RECORDS FOR WATER YEAR 2017**

LOCATION.--Lat 42°13'00", long 111°20'35" referenced to North American Datum of 1927, in SW ¼ NW ¼ SW ¼ sec.8, T.14 S., R.44 E., Bear Lake County, ID, Hydrologic Unit 16010201, on right bank 2,000 ft downstream from headgates (at dike) and 3 mi southeast of Paris.

PERIOD OF RECORD.--October 2006 to current year published by PacifiCorp. September 1945 to September 2006 published in USGS Water Data Reports. Monthly discharge only January 1922 to September 1945, published in WSP 1314.

GAGE.--Water-stage recorder. Datum of gage is 5,912.6 ft above NGVD of 1929, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 3,080 ft<sup>3</sup>/s, Jun 19-21, 1986; minimum daily discharge, no releases during most winters.

DISCHARGE MEASUREMENT DATES.-- 6-23-17, 6-29-17, 7-8-17, 7-13-17, 7-20-17, 7-28-17, 8-4-17, 8-10-17, 8-13-17, 8-24-17, 9-2-17, 9-10-17, 10-5-17.

**Bear Lake Outlet Canal near Paris, ID (10059500)  
Water Year 2017 (October 2016 to September 2017)**

**Daily Mean Values**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1	0	0	0	0	0	0	0	0	0	697	817	825	
2	0	0	0	0	0	0	0	0	0	698	808	962	
3	0	0	0	0	0	0	0	0	0	705	920	969	
4	0	0	0	0	0	0	0	0	0	708	1040	973	
5	0	0	0	0	0	0	0	0	0	702	1070	964	
6	0	0	0	0	0	0	0	0	0	799	1090	951	
7	0	0	0	0	0	0	0	0	0	921	1100	942	
8	0	0	0	0	0	0	0	0	0	925	1120	931	
9	0	0	0	0	0	0	0	0	0	923	1180	666	
10	0	0	0	0	0	0	0	0	0	923	1270	477	
11	0	0	0	0	0	0	0	0	0	923	1320	565	
12	0	0	0	0	0	0	0	0	0	913	1200	564	
13	0	0	0	0	0	0	0	0	0	905	1060	561	
14	0	0	0	0	0	0	0	0	0	903	1030	560	
15	0	0	0	0	0	0	0	0	0	905	1010	565	
16	0	0	0	0	0	0	0	0	0	906	1010	564	
17	0	0	0	0	0	0	0	0	0	955	997	565	
18	0	0	0	0	0	0	0	0	0	1040	991	564	
19	0	0	0	0	0	0	0	0	0	1060	983	569	
20	0	0	0	0	0	0	0	0	0	1060	972	571	
21	0	0	0	0	0	0	0	0	155	1040	962	581	
22	0	0	0	0	0	0	0	0	375	1030	958	571	
23	0	0	0	0	0	0	0	0	362	1010	859	241	
24	0	0	0	0	0	0	0	0	362	998	704	0	
25	0	0	0	0	0	0	0	0	365	950	705	0	
26	0	0	0	0	0	0	0	0	364	893	707	0	
27	0	0	0	0	0	0	0	0	581	822	707	0	
28	0	0	0	0	0	0	0	0	912	727	705	0	
29	0	0	0	0	0	0	0	0	711	717	702	0	
30	0	0	0	0	0	0	0	0	697	709	702	0	
31	0	0	0	0	0	0	0	0	0	755	702	0	
	<b>Monthly Statistics</b>												<b>Yearly Stats</b>
<b>Total</b>	0	0	0	0	0	0	0	0	4,884	27,222	29,401	15,701	<b>77,208</b>
<b>Mean</b>	0	0	0	0	0	0	0	0	163	878	948	523	<b>209</b>
<b>Min</b>	0	0	0	0	0	0	0	0	0	697	702	0	<b>0</b>
<b>Max</b>	0	0	0	0	0	0	0	0	912	1,060	1,320	973	<b>1,320</b>
<b>Ins. Min</b>	0	0	0	0	0	0	0	0	0	678	698	0	<b>0</b>
<b>Ins. Max</b>	0	0	0	0	0	0	0	0	1,050	1,070	1,340	977	<b>1,340</b>
<b>Ac-ft</b>	0	0	0	0	0	0	0	0	9,690	53,990	58,320	31,140	<b>153,140</b>

## 10092700 BEAR RIVER AT IDAHO-UTAH STATE LINE

LOCATION.--Lat 42°00'47", long 111°55'14" referenced to North American Datum of 1927, in NE ¼ NW ¼ NE ¼ sec.29, T.16 S., R.39 E., Franklin County, ID, Hydrologic Unit 16010202, on left bank 1,050 ft downstream from inlet canal to Cub River pumps, 1.1 mi downstream from Weston Creek, 1.8 mi upstream from Idaho-Utah State line, and 3.5 mi southeast of Weston.

PERIOD OF RECORD.--October 1970 to current year.

REVISED RECORDS.--WDR UT-74-1: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 4,420 ft above NGVD of 1929, from topographic map. Prior to September 10, 1982 at datum 12.00 ft higher. September 10, 1982 to September 30, 1985 at datum 10.0 ft higher.

REMARKS.-- Records good except for estimated daily discharges, which are poor. Natural flow of stream affected by storage reservoirs, power developments, diversions for irrigation, and return flow from irrigated areas.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,870 ft<sup>3</sup>/s, Jun 14, 1984, gage height, 19.20 ft, present datum; maximum gage height, 20.25 ft, Jun 21, 1971, present datum; minimum daily discharge, 24 ft<sup>3</sup>/s, May 16, 2004.

### DISCHARGE, CUBIC FEET PER SECOND WATER YEAR 2016-10-01 to 2017-09-30 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	327	534	464	e641	e683	e1,770	2,760	2,050	1,490	802	760	758
2	334	557	404	e647	e692	1,630	2,540	2,160	1,440	815	690	762
3	332	571	408	e580	633	1,430	2,570	1,880	1,330	750	693	755
4	324	564	417	e540	635	1,380	2,420	1,880	1,110	583	950	751
5	328	538	424	e513	636	1,390	2,240	1,800	1,140	600	911	958
6	383	543	460	e429	665	1,480	2,140	1,910	1,120	611	905	1,020
7	460	548	459	e406	826	1,380	2,000	2,070	1,050	693	927	1,010
8	446	552	436	e419	1,390	1,380	2,410	2,180	1,060	682	1,040	1,030
9	411	532	399	e610	2,430	1,860	2,880	2,190	1,030	744	1,080	1,080
10	404	495	518	e909	e3,130	2,380	2,810	2,050	969	725	1,120	1,090
11	399	481	620	e1,140	3,640	2,610	2,590	2,120	901	776	1,190	1,170
12	394	477	474	e1,140	2,830	2,540	2,510	2,090	994	790	1,460	1,330
13	559	474	526	e942	2,130	1,950	2,230	2,130	946	750	1,250	1,350
14	690	460	538	e764	1,770	1,880	2,360	2,220	1,120	680	1,190	1,380
15	770	344	537	e683	1,740	1,970	2,420	2,180	1,090	740	1,100	1,530
16	821	348	845	e634	1,820	2,210	2,220	2,170	985	720	1,220	1,720
17	851	347	1,170	e567	1,690	2,520	2,250	2,180	953	694	1,190	1,680
18	679	350	636	e474	1,680	2,520	2,140	2,280	820	659	1,050	1,310
19	658	364	671	e490	2,040	2,760	2,200	2,130	742	684	1,170	1,180
20	604	355	620	e585	2,380	2,790	2,250	2,100	707	707	1,200	1,150
21	602	371	607	e678	2,790	2,760	2,250	2,090	664	746	1,070	1,350
22	574	359	626	e633	3,540	2,770	2,240	1,970	489	893	1,050	1,430
23	508	352	532	e563	2,520	2,830	2,270	1,940	527	767	972	1,290
24	510	357	598	e589	2,160	2,830	2,280	1,860	491	862	1,040	860
25	528	e425	632	e622	1,960	3,020	2,160	1,860	461	863	941	713
26	551	e438	588	e614	e1,840	3,090	2,020	1,840	452	884	802	673
27	543	468	557	e598	e1,740	3,100	2,030	1,790	523	955	843	682
28	532	482	463	e585	e1,720	3,390	2,230	1,770	677	876	771	679
29	548	492	581	e581		3,260	2,130	1,680	706	909	696	844
30	542	465	e575	e632		3,080	2,100	1,520	764	793	750	486
31	533		e566	e598		2,930		1,490		778	734	
<b>Total</b>	16,150	13,640	17,350	19,810	51,710	72,890	69,650	61,580	26,750	23,530	30,760	32,020
<b>Mean</b>	521	455	560	639	1,847	2,351	2,322	1,986	892	759	992	1,067
<b>Max</b>	851	571	1170	1140	3640	3390	2880	2280	1490	955	1460	1720
<b>Min</b>	324	344	399	406	633	1380	2000	1490	452	583	690	486
<b>Ac-ft</b>	32,020	27,060	34,420	39,280	102,600	144,600	138,100	122,100	53,059	46,670	61,020	63,510

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1971 - 2017, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	790	840	852	833	866	1,070	1,285	1,328	1,202	949	882	819
<b>Max</b>	2,849	2,983	2,552	1,904	2,556	3,264	3,594	3,968	4,263	3,442	2,416	2,545
<b>(WY)</b>	(1984)	(1984)	(1985)	(1984)	(1986)	(1986)	(1986)	(1986)	(1986)	(1983)	(1984)	(1986)
<b>Min</b>	224	298	310	269	296	351	351	158	301	368	461	192
<b>(WY)</b>	(2004)	(1993)	(1982)	(2004)	(2002)	(1991)	(2003)	(2003)	(2004)	(2006)	(1993)	(1992)

Figure 2017.17 (cont.)



**10109001 COMBINED DISCHARGE, IN CUBIC FEET PER SECOND, OF LOGAN RIVER ABOVE STATE DAM AND  
CACHE HIGHLINE CANAL LOGAN, HYDE PARK AND SMITHFIELD CANAL NEAR LOGAN, UTAH**

Water-Data Report 2017 REVISED RECORDS.--WDR UT-04-1: Discharge.

**DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR 2017-10-01 to 2018-09-30  
DAILY MEAN VALUES**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	128	160	121	110	114	208	564	504	1,340	750	354	263
2	129	156	118	114	113	199	575	508	1,370	726	346	256
3	128	149	115	111	113	198	533	519	1,390	700	343	255
4	128	147	118	118	119	194	494	549	1,410	686	340	252
5	126	144	118	112	119	199	468	652	1,450	662	336	252
6	126	143	103	91.2	123	199	467	803	1,450	654	333	250
7	124	138	110	105	146	192	499	916	1,460	630	329	246
8	124	136	100	116	160	191	657	1,030	1,440	609	328	247
9	121	134	120	142	219	197	599	1,020	1,420	602	324	246
10	119	134	132	137	412	206	533	1,100	1,390	579	318	245
11	120	131	129	146	444	222	515	1,150	1,320	556	315	242
12	119	132	121	133	344	239	515	1,260	1,310	538	314	238
13	120	130	115	127	315	243	568	1,380	1,280	522	312	235
14	119	129	117	126	279	268	635	1,280	1,170	505	309	234
15	133	128	121	122	253	308	590	1,190	1,070	501	312	246
16	146	127	148	118	241	365	572	1,160	1,020	487	303	243
17	167	126	140	115	230	434	596	1,160	1,090	474	298	241
18	149	124	120	118	225	478	663	1,030	1,110	463	293	235
19	141	123	113	123	237	541	716	938	1,100	449	289	257
20	135	123	131	120	230	589	697	870	1,090	442	289	244
21	132	128	128	121	259	615	657	831	1,100	432	284	238
22	133	126	120	118	301	812	615	811	1,080	422	283	233
23	132	122	116	122	279	914	619	865	1,050	412	281	230
24	130	124	123	120	251	716	653	1,020	1,010	404	281	238
25	135	123	124	117	236	654	651	1,180	958	398	277	234
26	137	123	118	116	229	576	600	1,170	912	405	275	228
27	137	125	108	103	226	540	605	1,090	881	392	274	225
28	137	129	120	112	213	500	567	1,060	854	379	266	221
29	145	118	110	111		478	539	1,110	826	371	262	220
30	145	120	112	112		527	515	1,170	787	366	266	222
31	157		112	114		563		1,260		359	269	
<b>Total</b>	4,122	3,952	3,701	3,670	6,430	12,570	17,480	30,590	35,140	15,880	9,403	7,216
<b>Mean</b>	133	132	119	118	230	405	583	987	1,171	512	303	241
<b>Max</b>	167	160	148	146	444	914	716	1380	1460	750	354	263
<b>Min</b>	119	118	100	91.2	113	191	467	504	787	359	262	220
<b>Ac-ft</b>	8,176	7,839	7,341	7,280	12,750	24,920	34,670	60,670	69,690	31,490	18,650	14,310

**STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1922 - 2017, BY WATER YEAR (WY)**

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	146	130	116	109	107	125	253	592	643	338	210	168
<b>Max</b>	262	221	187	165	230	405	629	1,186	1,465	1,118	477	312
<b>(WY)</b>	(2012)	(2012)	(1984)	(2012)	(2017)	(2017)	(1986)	(1936)	(1986)	(2011)	(2011)	(2011)
<b>Min</b>	74.2	71.9	69.0	63.1	61.6	80.3	111	163	141	103	86.4	79.9
<b>(WY)</b>	(1935)	(1993)	(1993)	(1993)	(1993)	(1942)	(1991)	(1977)	(1934)	(1934)	(1992)	(1934)

Figure 2017.17 (cont.)

## 10126000 BEAR RIVER NEAR CORINNE, UT

LOCATION.--Lat 41°34'35", long 112°06'00" referenced to North American Datum of 1927, in NE ¼ SE ¼ NE ¼ sec.30, T.10 N., R.2 W., Box Elder County, UT, Hydrologic Unit 16010204, on right bank 1.2 mi downstream from Salt Creek, 2.0 mi northeast of Corinne, and 2.8 mi downstream from Malad River.

DRAINAGE AREA.--7,029 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1949 to September 1957, October 1963 to current year.

REVISED RECORDS.--WRD UT-74-1: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 4,204.6 ft above NGVD of 1929, unadjusted. Auxiliary nonrecording gage 7,800 ft downstream July 27, 1950 to November 21, 1955.

REMARKS.-- Records good except for estimated daily discharges, which are poor. Natural flow of stream affected by Cutler Dam many miles upstream of gage, power development, diversions for irrigation, and return flow from irrigated areas and backwater from Bear River Bird Refuge about 5 miles downstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,770 ft<sup>3</sup>/s, May 19, 1984, gage height, 17.50 ft; minimum daily discharge, 23 ft<sup>3</sup>/s, Jul 30, 2004.

**DISCHARGE, CUBIC FEET PER SECOND**  
**WATER YEAR 2016-10-01 to 2017-09-30**  
**DAILY MEAN VALUES**  
[e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	198	1,110	1,020	e1,210	e1,260	4,960	6,630	5,060	3,690	1,050	716	435
2	651	1,230	956	e1,250	e1,280	4,310	6,600	5,020	3,670	1,140	628	448
3	771	1,240	944	e1,300	e1,350	4,080	6,530	4,900	3,690	1,120	554	464
4	432	1,180	922	e1,240	e1,370	4,020	6,250	4,800	3,660	1,100	420	512
5	327	1,120	809	---	e1,380	3,940	5,960	4,610	3,630	965	357	569
6	500	1,070	618	---	e1,480	3,890	5,640	4,520	3,580	696	235	643
7	551	1,060	e793	---	e2,050	3,890	5,380	4,440	3,510	522	243	653
8	569	1,050	e898	e1,050	e2,480	3,880	5,400	4,450	3,470	264	461	663
9	569	1,050	e932	e1,110	e3,250	3,860	5,430	4,550	3,460	435	559	713
10	621	1,010	e972	e1,400	e4,420	3,760	5,750	4,750	3,550	645	601	785
11	723	991	1,150	e2,100	e5,880	4,050	6,110	4,930	3,300	710	657	785
12	700	988	1,350	e2,550	e7,320	4,300	6,250	5,150	3,070	707	719	874
13	664	853	1,560	e2,810	8,520	4,360	6,210	5,330	2,730	696	818	912
14	647	754	1,460	e2,820	9,390	4,640	6,060	5,470	2,580	681	943	1,030
15	770	879	1,190	e2,810	8,890	4,820	5,830	5,480	2,540	681	988	1,160
16	997	944	1,070	e2,760	7,690	4,830	5,640	5,490	2,500	677	912	1,370
17	1,400	796	e1,390	e2,770	6,650	4,810	5,490	5,540	2,490	642	860	1,700
18	1,540	679	e1,600	e2,710	5,650	4,660	5,460	5,500	2,510	591	828	1,680
19	1,580	735	e1,650	e2,360	5,230	4,510	5,450	5,340	2,320	582	798	1,650
20	1,300	761	e1,650	e1,810	5,180	4,650	5,460	5,190	2,010	538	773	1,600
21	910	733	e1,620	e1,540	5,610	4,970	5,520	5,040	1,760	437	842	1,600
22	990	762	e1,510	e1,510	6,420	5,470	5,650	4,720	1,560	381	887	1,680
23	992	1,040	e1,450	e1,500	7,280	5,810	5,700	4,500	1,590	380	774	1,860
24	955	985	e1,470	e1,450	8,120	6,090	5,710	4,290	1,400	412	549	1,750
25	789	711	e1,560	e1,420	8,310	6,500	5,700	4,250	1,170	465	380	1,570
26	637	714	e1,510	e1,400	7,600	6,870	5,550	3,890	1,110	477	500	1,430
27	764	887	e1,350	e1,340	6,330	7,260	5,280	3,740	1,090	494	611	1,190
28	848	977	e1,250	e1,290	5,620	7,310	5,270	3,670	911	635	562	1,060
29	738	990	e1,250	e1,260		7,200	5,280	3,770	793	776	435	820
30	727	1,070	e1,230	e1,260		7,060	5,180	3,770	836	846	422	539
31	895		e1,210	e1,270		6,800		3,760		835	431	
<b>Total</b>	<b>24,750</b>	<b>28,370</b>	<b>38,340</b>		<b>146,000</b>	<b>157,600</b>	<b>172,400</b>	<b>145,900</b>	<b>74,180</b>	<b>20,580</b>	<b>19,460</b>	<b>32,150</b>
<b>Mean</b>	<b>799</b>	<b>946</b>	<b>1,237</b>		<b>5,215</b>	<b>5,083</b>	<b>5,746</b>	<b>4,707</b>	<b>2,473</b>	<b>664</b>	<b>628</b>	<b>1,072</b>
<b>Max</b>	<b>1580</b>	<b>1240</b>	<b>1650</b>		<b>9390</b>	<b>7310</b>	<b>6630</b>	<b>5540</b>	<b>3690</b>	<b>1140</b>	<b>988</b>	<b>1860</b>
<b>Min</b>	<b>198</b>	<b>679</b>	<b>618</b>		<b>1260</b>	<b>3760</b>	<b>5180</b>	<b>3670</b>	<b>793</b>	<b>264</b>	<b>235</b>	<b>435</b>
<b>Ac-ft</b>	<b>49,100</b>	<b>56,270</b>	<b>76,050</b>		<b>289,600</b>	<b>312,500</b>	<b>341,900</b>	<b>289,400</b>	<b>147,100</b>	<b>40,820</b>	<b>38,600</b>	<b>63,759</b>

Figure 2017.17 (cont.)

# 2018 Water Supply and Distribution Report

## OVERVIEW

The water supply in 2018 was fairly mediocre with irrigation season stream flow varying from 70% to 86% (below the forecasted amounts). Additionally, summer rains were well below normal. Thankfully, due to the extremely wet conditions in 2017, reservoirs began the 2018 water year in fairly good shape. A water emergency was declared towards the end of the irrigation season in the Central Division. Despite the mediocre water year, water was fairly distributed between the States pursuant to the Compact.

## WATER SUPPLY

Three stream gages, one in each division of the river, have been used by the Commission as indicator gages of the relative supply available for each of the divisions of the river (see Stream Gaging Program section in the Overview chapter). The Utah-Wyoming State Line and Smith's Fork gages measure a major portion of the stream flow in the Upper and Central Divisions, respectively. The Logan River is a major tributary to the Bear River in Cache Valley, which is in the Lower Division. Specific discharges, as measured by the USGS for the three gages during 2018, compared with the long-term averages, are summarized in Figure 2018.1 and are graphically illustrated in Figures 2018.2 through 2018.4 on the subsequent pages.

Figure 2018.1 shows a summary of the volumetric discharge for each of these gages for the water year. As the water supply available during the irrigation season is most critical for filling the natural flow rights, the discharge as measured at these gages during the irrigation season is also shown in Figure 2018.1.

Figures 2018.2 through 2018.4 show hydrographs for each of these three gaging stations. On each hydrograph, the mean daily flow during the irrigation season is plotted against the average of the mean daily flows for the period 1943 through 2018. The area between the 2018 hydrographs and the mean hydrographs represents the difference in volume of water discharged during 2018 versus the long-term average. This volumetric difference is illustrated by the bar charts shown on each of the figures.

As can be seen in Figure 2018.1, the annual discharge for the Upper Division (Utah-Wyoming State Line gage) was 80 percent of the long-term average, and streamflow on Smith's Fork and the Logan River were 94 and 89 percent, respectively. More important to the natural flow diversions than the streamflow during the water year is the streamflow during the irrigation season of May through September. During this period, the water supply was 70 percent (Upper Division), 86 percent (Central Division), and 74 percent (Lower Division).

## 2018 Water Supply Summary by Division

### 2018 WATER YEAR

(Discharge in Acre-feet)

GAGE	AVERAGE (1943-18)	2018	PERCENT
Upper Division (UT-WY State Line)	139,200	110,800	80%
Central Division (Smith's Fork)	137,400	129,400	94%
Lower Division (Logan River)	181,500	161,600	89%

### 2018 IRRIGATION SEASON

#### MAY - SEPTEMBER

(Discharge in Acre-feet)

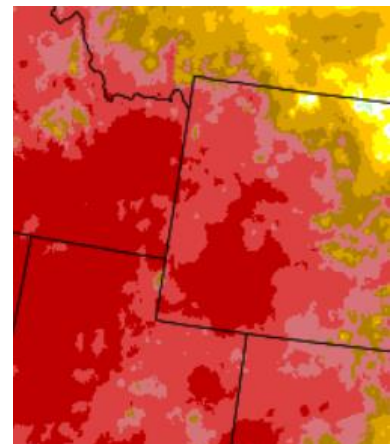
GAGE	AVERAGE (1943-18)	2018	PERCENT
Upper Division (UT-WY State Line)	114,600	80,500	70%
Central Division (Smith's Fork)	102,100	87,400	86%
Lower Division (Logan River)	121,100	89,500	74%

**Figure 2018.1**

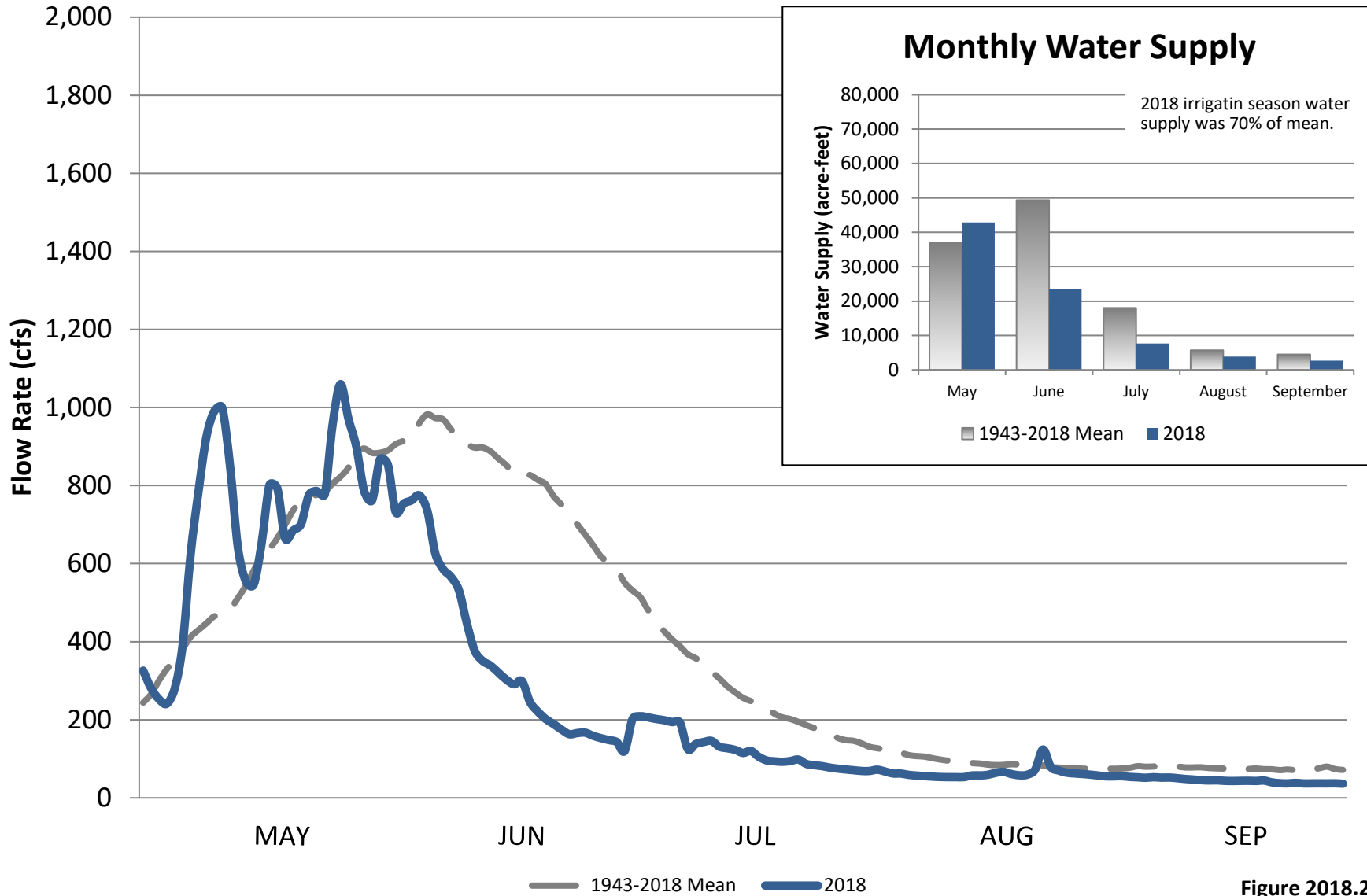
One item of interest to note is that the April 1 streamflow forecasts for the April – September period were fairly close to the actual streamflows realized during the irrigation season. The forecasted amounts on April 1 were 65%, 89% and 70%, respectively.

A closer look at the three hydrographs (Figures 2018.2, 2018.3 and 2018.4) is also insightful when one is trying to understand the natural flow water supply in the spring and summer of 2018. The three gages show an early and high to slightly high runoff peak in early to mid-May with a second peak flow in late May, after which flow was notably below normal in June and July and stayed below normal in all three Divisions through the remainder of the season.

Historically the Commission has focused on the snowpack with its attendant streamflow forecasts as the main indicator of water supply. However, in recent years, the impact of summer precipitation has become more apparent as an important portion of the irrigation water supply. The summer of 2018 proved to be very dry as is shown by this map of September's percent of average precipitation. The medium red represents areas of 1%-10% of average precipitation with the dark red areas representing 0% of the 30-year normal.



## 2018 - Upper Division Water Supply Flow at Utah-Wyoming State Line Gage



**Figure 2018.2**

# 2018 - Central Division Water Supply

## Flow at Smiths Fork near Border, Wyoming Gage

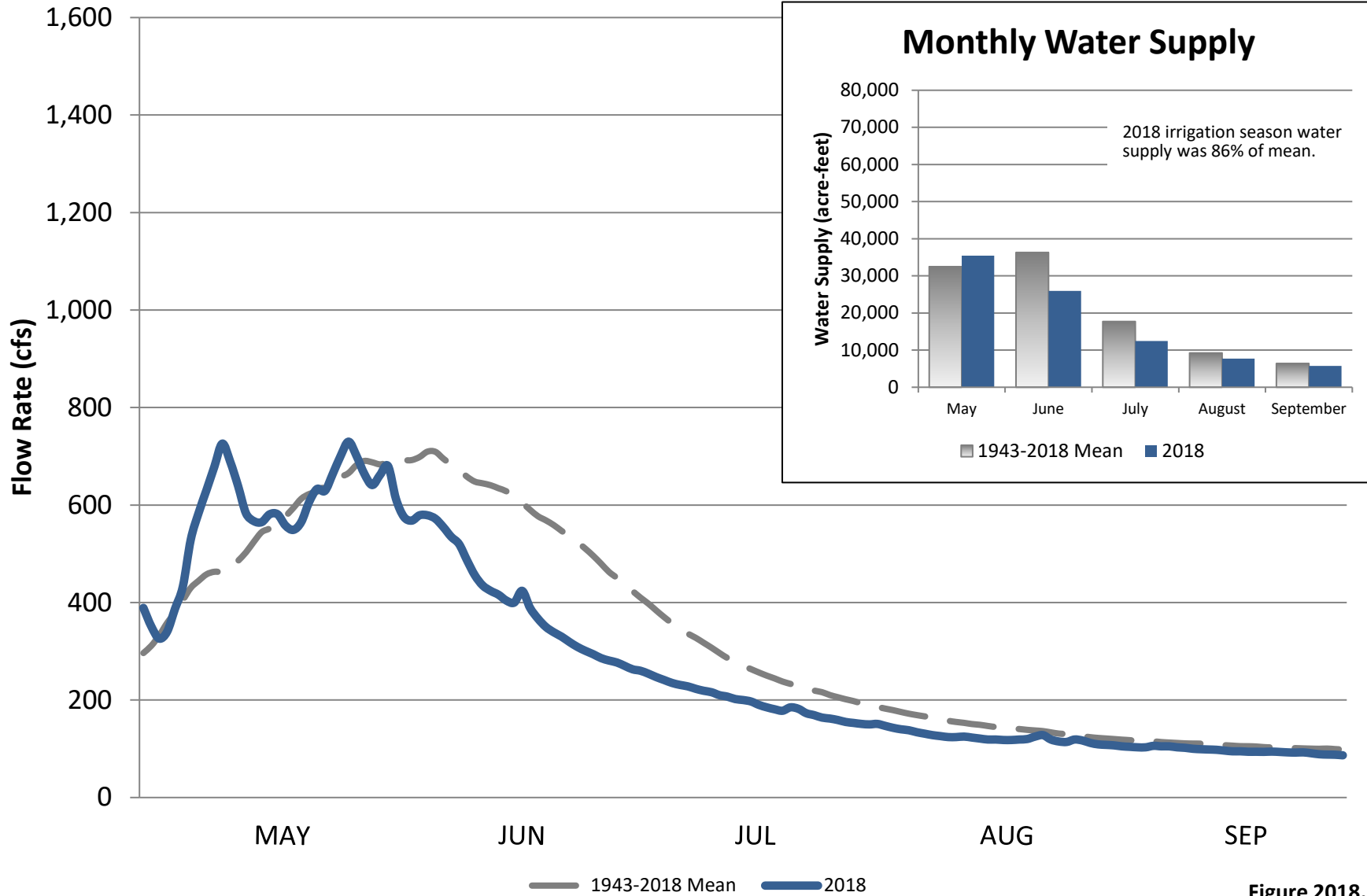
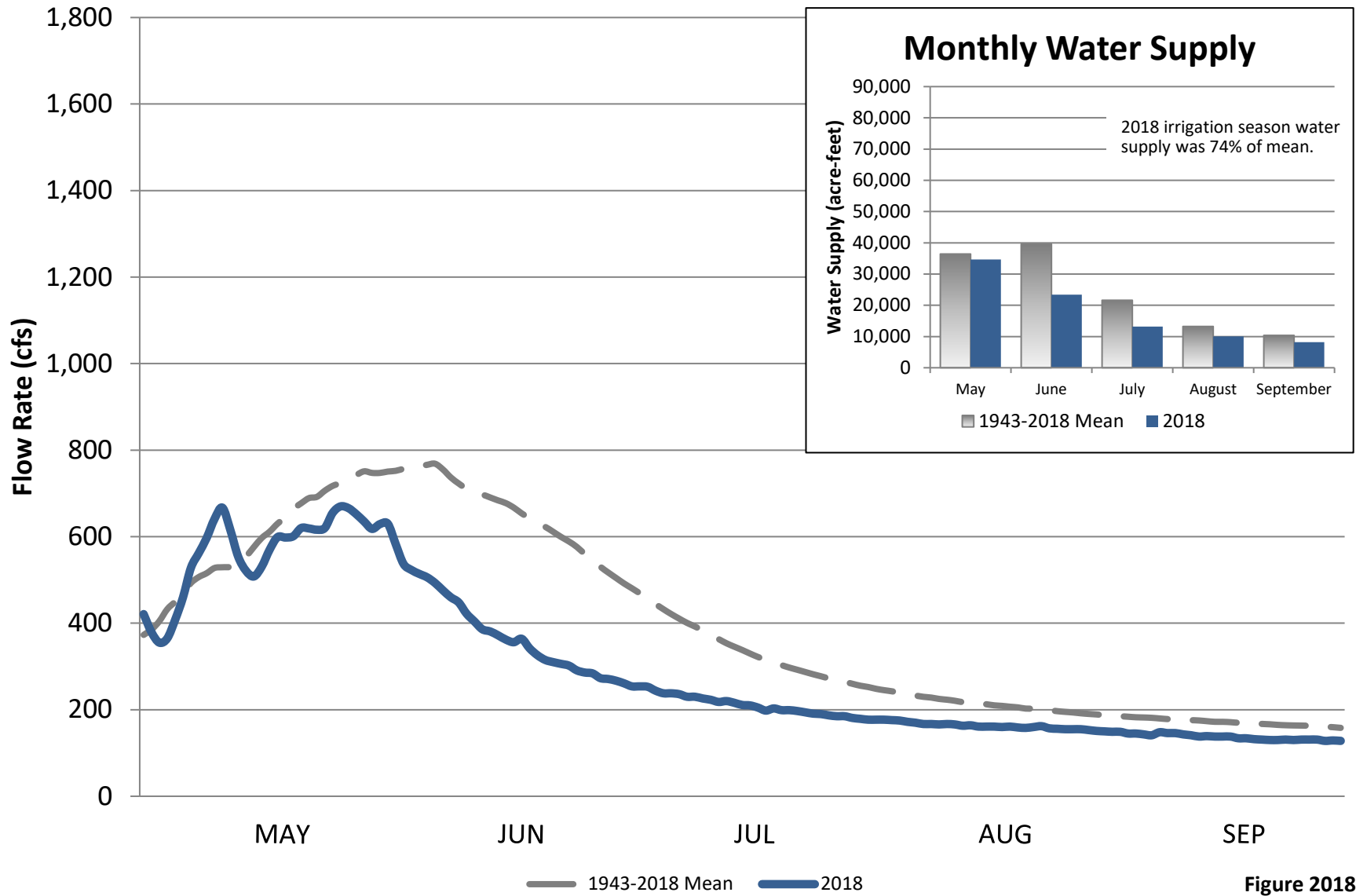


Figure 2018.3

## 2018 - Lower Division Water Supply Flow at Logan River Combined Gage



**Figure 2018.4**

## STORAGE

Storage supplies along the Bear River have a notable impact on the water resources available for irrigation each year. Because of the exceptional water supply in 2017, the 2018 storage season began with significant carryover storage. Woodruff Narrows Reservoir is the largest reservoir in the Upper Division. However, Whitney, Sulphur Creek, and Woodruff Creek Reservoirs also provide for notable amounts of winter storage.

Paragraph B of Article VI of the Amended Compact, which allows for additional storage rights above Stewart Dam, also has a provision which restricts storage to occur if the water surface elevation at Bear Lake is below an elevation of 5911.0 (UP&L Datum). About half of the storage which is assigned to Woodruff Narrows Reservoir, from both the States of Utah and Wyoming, falls under this provision of the Amended Compact. Bear Lake began the storage season above 5920, and therefore, well above the 5911 foot elevation storage restriction and so this limit did not apply during the 2018 storage season.

Prior to 1997 a gage was maintained, with Commission funding, by the USGS on Woodruff Narrows Reservoir. The gage included a recorder which allowed for preservation of daily values. Since this time, periodic measurements have been kept by the Woodruff Narrows Reservoir Company in coordination with the Wyoming State Engineer's Office. In 2013 a real-time water level gage was installed at Woodruff Narrows Reservoir. Figure 2018.5 shows the maximum and minimum contents for the Woodruff Narrows Reservoir since its enlargement in 1980.

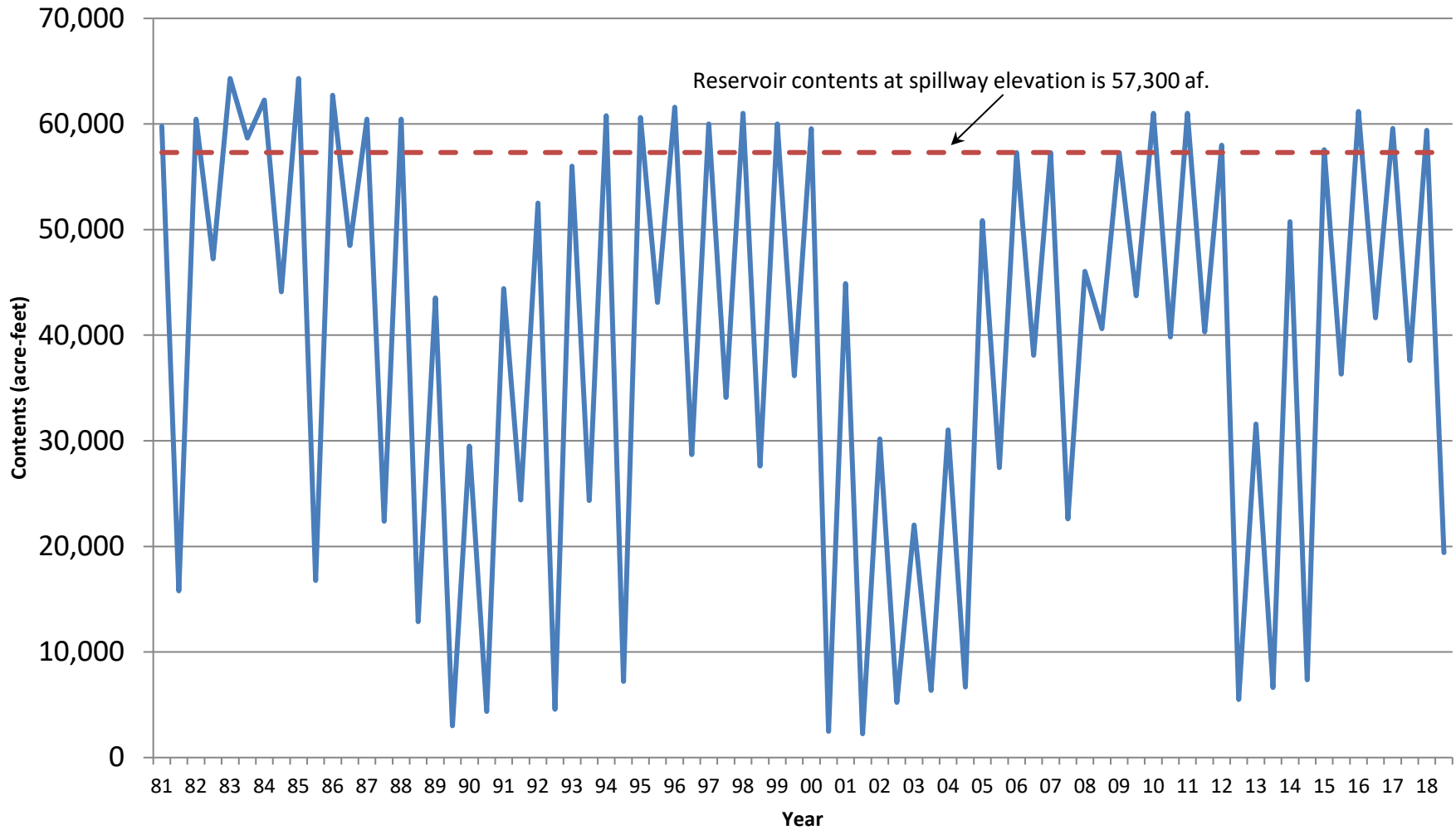
The spillway crest of Woodruff Narrows Dam is at an elevation of 6454.5 feet and when the water level is at this elevation, the content is 57,300 acre-feet. Hence, when the reservoir is spilling, the contents above this amount represent uncontrolled storage as this storage is only temporary and cannot be controlled by the reservoir company. Generally, during spill periods, the reservoir company is often releasing significant flows through its outlet works as well. Though the total contents are uncontrolled, the proportion of water discharging from the reservoir through the outlet works versus over the spillway is somewhat under the control of the reservoir company. Both discharge to the Bear River below the dam but above the stream gage, and it makes no difference to the total discharge measured into the Bear River. Because of the well above average water year in 2017 which led to significant carryover storage, Woodruff Narrows was able to easily fill with a maximum contents of 59,400 acre-feet and then, with nearly 40,000 acre-feet of releases during the irrigation season, it carried into the 2018 storage season just under 20,000 acre-feet.

There is no significant storage in the Central Division.

The largest and most significant storage reservoir in the Lower Division, and in the entire watershed, is Bear Lake, which is at the very top of the Lower Division. Bear Lake is operated as a storage reservoir by PacifiCorp. The Compact regulates various aspects of how PacifiCorp can manage the storage of water within Bear Lake. Figure 2018.6 summarizes the 2018 Bear Lake hydrologic information and significant operational events.



## Woodruff Narrows Reservoir Annual Maximum and Minimum Contents



Note: Through the 1996 water year a gage with a recorder was maintained by the USGS on Woodruff Narrows Reservoir. From then until 2013 measurements are based on spot observations and estimates by the Woodruff Narrows Reservoir Company and the Wyoming State Engineer's Office. Since 2013, a gage and recorder has been maintained by the Wyoming State Engineer's Office. Contents above 57,300 af represent uncontrolled storage.

**Figure 2018.5**

**Summary of Significant  
2018 Bear Lake  
Hydrologic Information and Operational Events**

<u>Date</u>	<u>Hydrologic Information/Event</u>	<u>Contents (% of Full) Discharge (% of Normal)</u>
10-01-17	Bear Lake Beginning Elevation — 5920.98 ft	1,233,523 af (87%)
03-16-18	Bear Lake Low Elevation <sup>1</sup> — 5919.12 ft <sup>1</sup>	1,103,620 af (78%)
	Rainbow Inlet Canal Discharge	201,000 af (77%)
	Bear River Discharge Below Stewart Dam	1,760 af
	Bear Lake Net Runoff (Computed Total Inflow less lake Evaporation)	177,000 af (55%)
06-11-18	Bear Lake High Elevation — 5920.44 ft	1,195,730 af (84%)
	Outlet Canal Releases: 10/4/17-3/20/18; 3/23-3/31; 5/26-9/26 (124 days irrigation releases)	487.650 af
06-19-18	Outlet Canal Maximum Release – 1,519 cfs	
	Bear Lake Storage Release <sup>2</sup>	192,000 af
09-30-18	Bear Lake Ending Elevation — 5916.48 ft	921,348 af (65%)
	Bear Lake Settlement Agreement “System Loss” Volume	18,800 af

<sup>1</sup> Low contents prior to start of storage (occurred in previous water year)

<sup>2</sup> Net irrigation storage release from Bear Lake, subtracting Rainbow inflow and the decreed adjustment for the natural yield of Bear Lake and Mud Lake area. Includes system loss volume.

<sup>3</sup> Due to uncontrolled flow from (welcome) rain events. Whenever water flows below Cutler during the irrigation season, any storage water in the system at Cutler is the first water out. Natural flow goes to irrigators.

**Figure 2018.6**

Bear Lake began the 2018 water year in flood control operations with significant (more than 700 cfs) releases occurring through most of the storage season. By March 13<sup>th</sup>, with forecasted below normal runoff and Bear Lake near an elevation of 5919, flood releases ceased and PacifiCorp reinitiated storage. With a dramatically reduced runoff (55% of normal) Bear Lake reached a high elevation of 5920.44 feet on June 11. Total storage release was 192,000 acre-feet and Bear Lake ended the water year at 5916.48 feet, or 65% full.

Figure 2018.7 is a graph which shows the annual maximum and minimum elevations of Bear Lake since 1915. As described above, the beginning storage elevation (or minimum) occurred, due to flood control releases, well into the storage period in March. One can see from Figure 2018.7 that after flood releases the storage in the lake increased from an elevation of 5919.12 to 5920.44 and by September 30 had been drawn down nearly four feet to 5916.48. The net elevation loss over the year was three and half feet. Figure 2018.8 is an area plot showing the daily contents in Bear Lake over the past ten years. This hydrograph and Figure 2018.7 show the impact of two very significant water years amid average to well below average water years over the last ten-year period.

# BEAR LAKE ELEVATION

## Annual Maximum & Minimum Elevations

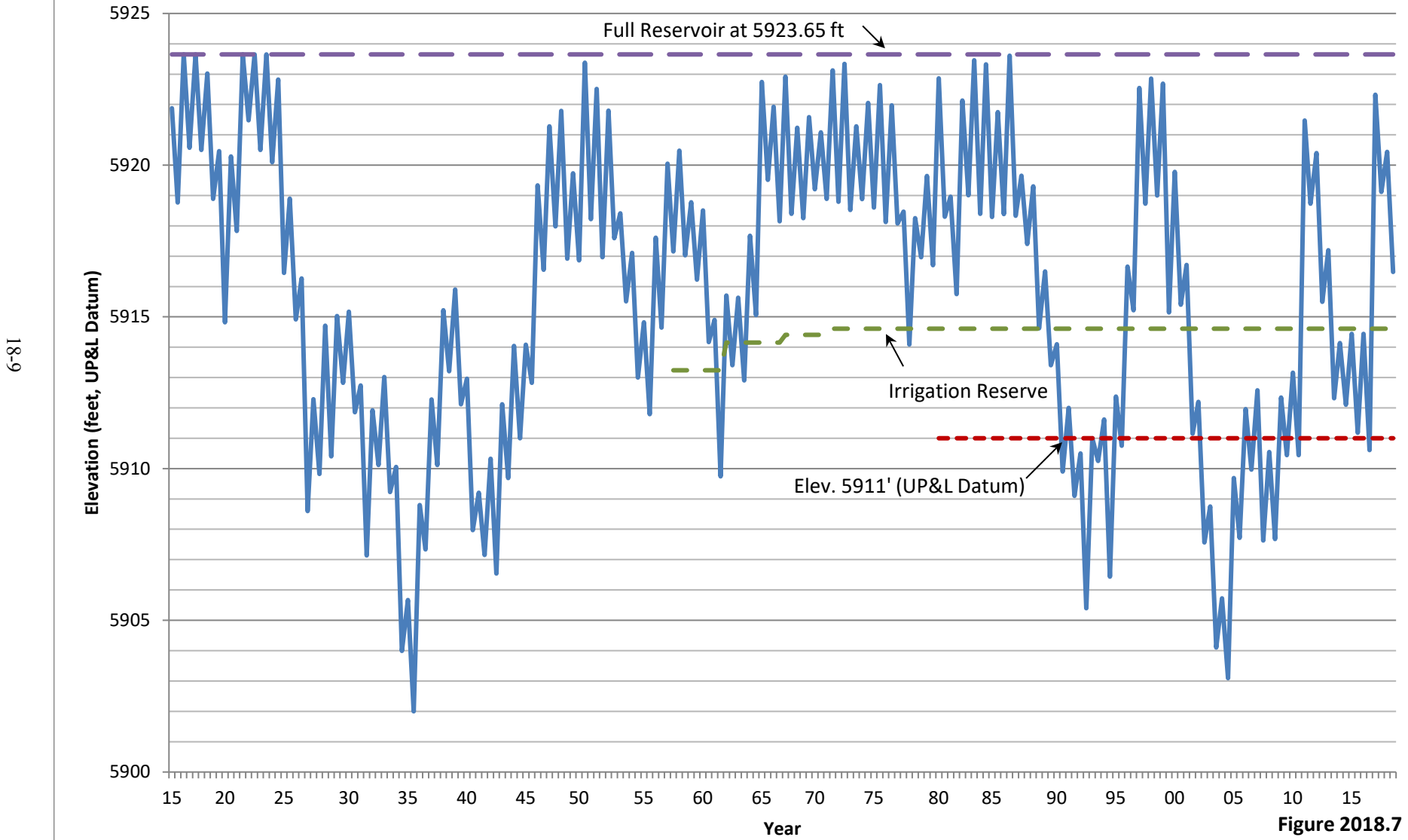


Figure 2018.7

# BEAR LAKE CONTENTS

## Water Years 2009 - 2018

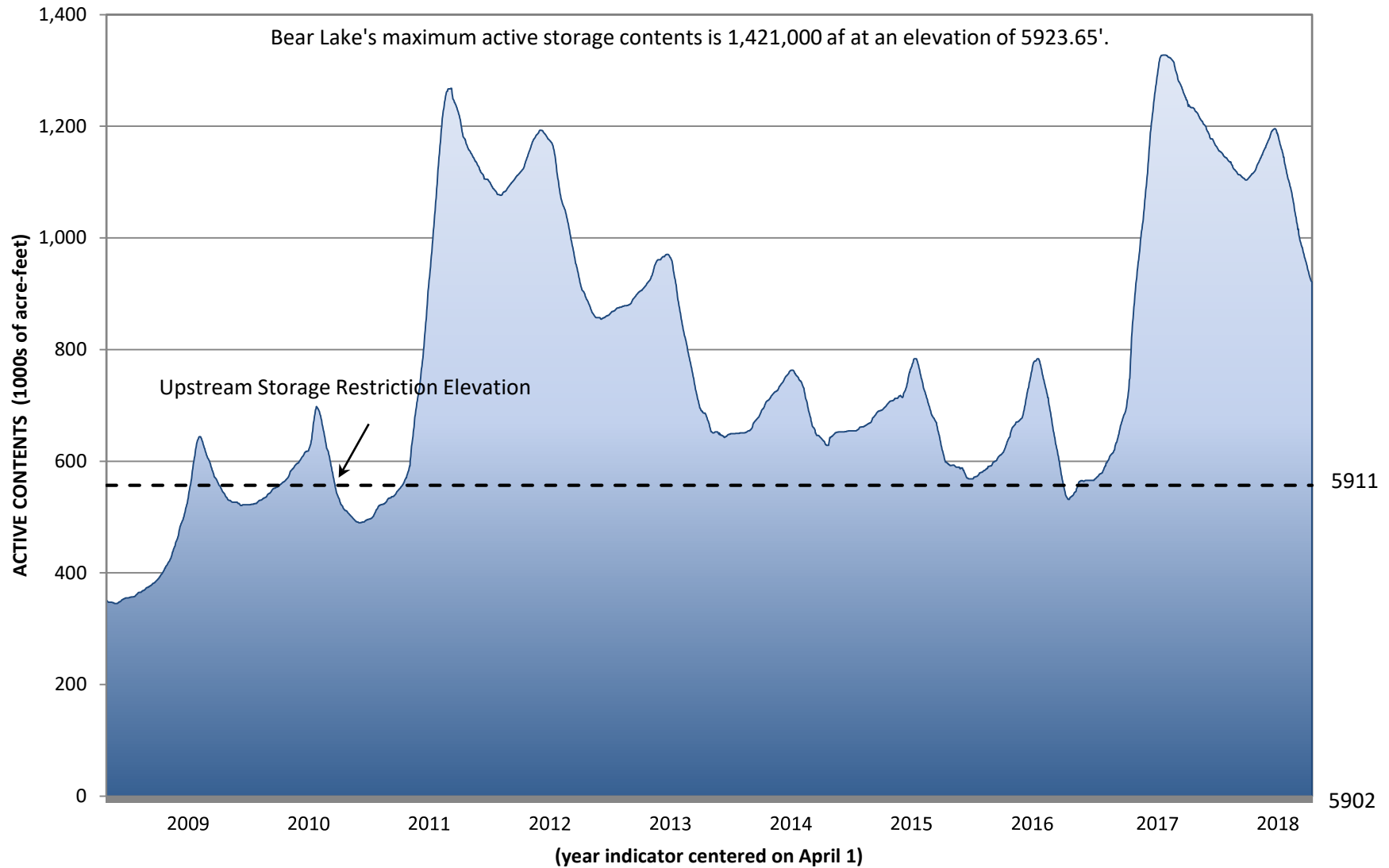


Figure 2018.8

18-10

## STREAMFLOW DISTRIBUTION

### General

The water administration in 2018 in the three divisions remained similar to prior years. There were no changes to the River Commissioners/Watermasters in the other sections from the previous year. Don Barnett continued to serve as Engineer-Manager of the Bear River Commission. Each River Commissioner/Watermaster works under the direction of his State Engineer's office, but coordinates with the Commission's Engineer-Manager with regard to total diversions in each of the various sections as defined by the Compact.

During the 2018 irrigation season, the following River Commissioners/Watermasters measured and distributed water in their sections of the river:

<u>DIVISION</u>	<u>SECTION</u>	<u>RIVER COMMISSIONER/ WATERMASTER</u>
Upper	Upper Utah	Travis McInnis
	Upper Wyoming	Travis McInnis
	Lower Utah	Ron Hoffman
	Lower Wyoming	Ethan Overton
Central	Wyoming	Ethan Overton
	Idaho	Josh Hanks
Lower	Idaho	Josh Hanks
	Utah	Jim Watterson

### Upper Division

The Upper Division divertible flow, as defined by the Compact, consists of a summation of the diversions of all of the canals in the four sections, plus waters bypassing Pixley Dam, less that portion of water diverted by the canals which is attributable to storage releases from Whitney, Sulphur Creek, Woodruff Narrows and Grassy Lake Reservoirs. The Compact provides that when the total divertible flow is less than 1250 cfs, a water emergency exists. The total divertible flow dropped below this amount on June 13 and remained below for the rest of the irrigation season. Nevertheless, there was no request for interstate regulation. Through June and early July, the Upper Wyoming Section took less than what would have been its allocation if a water emergency had been declared and then very close to the amount for the remainder of the irrigation season. The Lower Utah Section took a little under its allocation during most of the year. In recent years, users in the Upper Division have at times opted for the flexibility available through unofficial general cooperation and sharing of water rather than direct Compact administration.

During years when a water emergency has been declared, the regulation of the river is based on the weekly diversions as called in by the respective River Commissioners. At the end of

each year, these River Commissioners submit to their respective State Engineers a complete written report of water deliveries. It is this information which is presented in the graphs and tables on the following pages and not the weekly totals called in during times of regulation. The weekly call-in totals, which are received during the irrigation season, differ slightly from the year-end data because of timing of call-ins and call-outs, shifts on canal ratings and other factors.

Figures 2018.9 and 2018.10 show the divertible flow and natural flow diversions in the Upper Wyoming and Lower Utah Sections, respectively. Also shown on the graphs (magenta line) is what would have been the Compact allocation had a water emergency been imposed. As can be seen in Figure 2018.10, during much of the irrigation season, diversion in the Lower Utah Section was below the allocation. However, this is due to the fact that the water was getting past the Lower Utah Section to the Lower Wyoming Section and not due to over diversion in the Upper Wyoming Section as is confirmed by Figure 2018.9. Figure 2018.11 is a tabulation by month of canal diversions and shows the calculation of divertible flow (less storage release) and allocations to the respective sections, pursuant to the Compact, had a water emergency been declared. The values shown for each canal and pump in this figure represent total diversion (including both natural flow and storage), and then the storage water is subtracted out of the section totals before computing the total divertible flow.

# 2018 - Upper Division

## Upper Wyoming Section Diversions vs Allocation

18-13

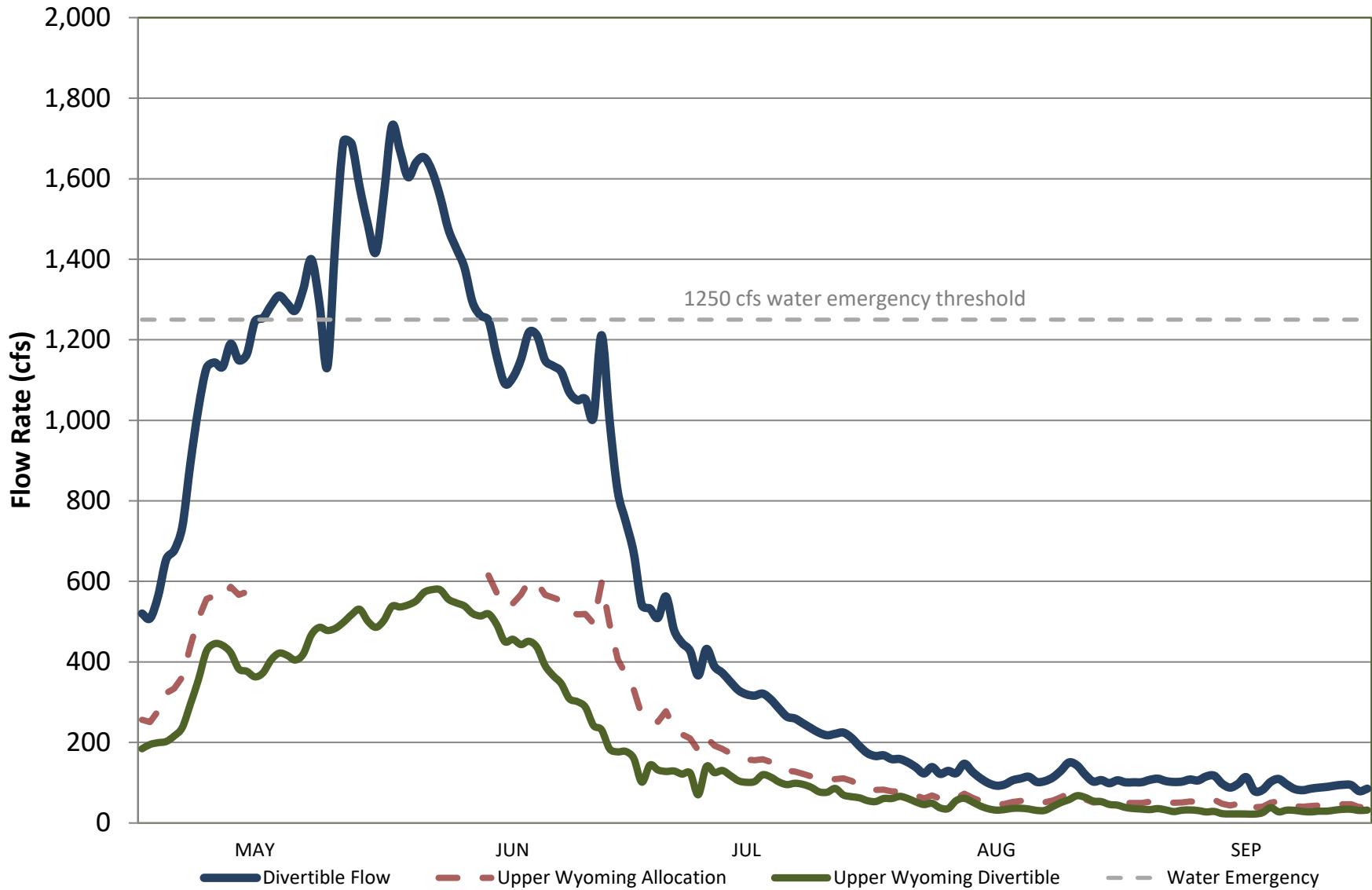


Figure 2018.9

# 2018 - Upper Division

## Lower Utah Section Diversions vs Allocation

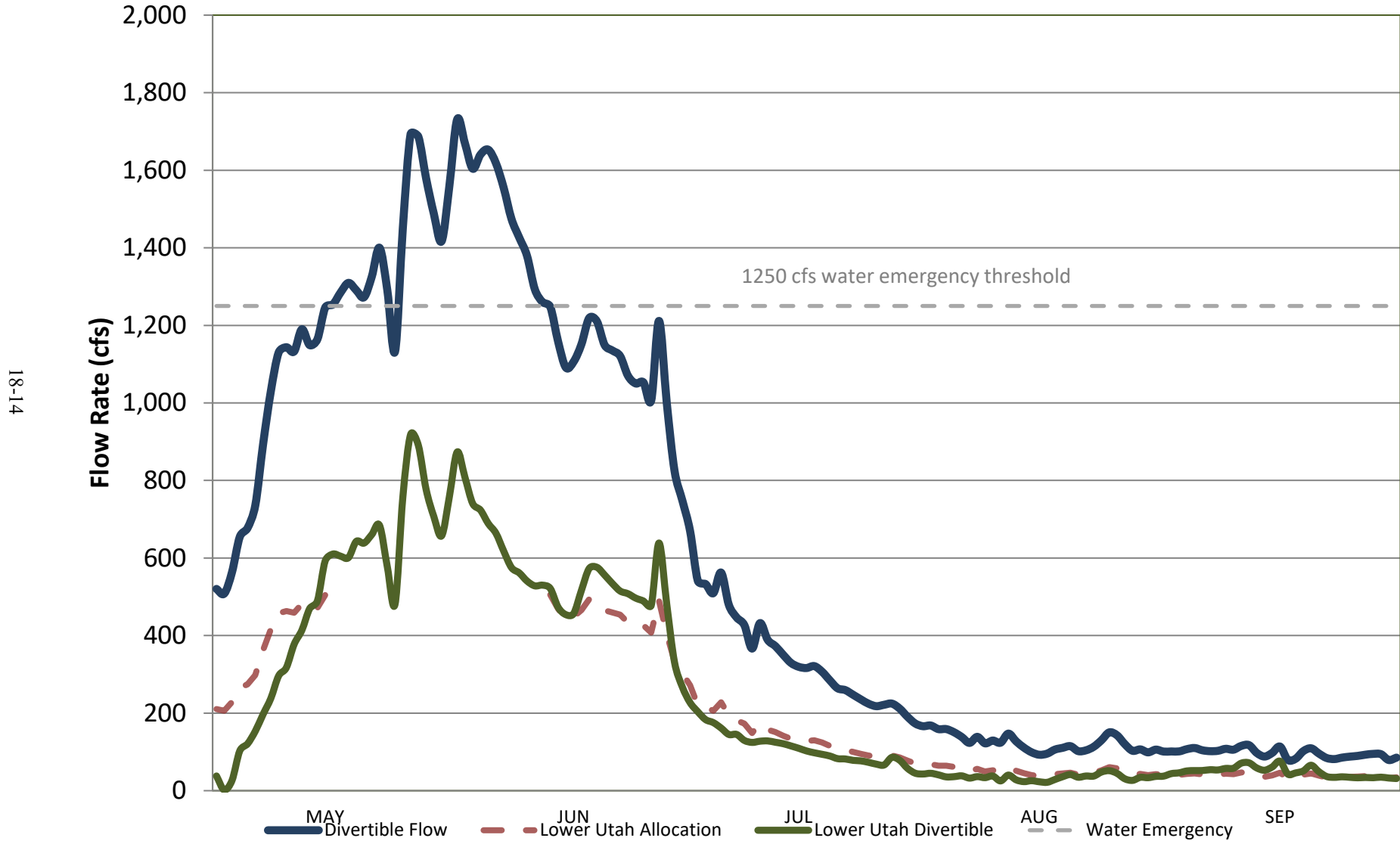


Figure 2018.10



DAILY DISCHARGE IN CFS OF BEAR RIVER CANALS WITH COMPACT ALLOCATIONS IN THE UPPER DIVISION

	May																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
<b>UPPER UTAH SECTION</b>																																
Hovarka (E Fk)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	15	15	16	15	15	15	16	16	16	16	17	17	17	17	16	17	
Hatch (W Fk)	0	0	0	0	0	0	0	0	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
<b>UPPER WYOMING SECTION</b>																																
Hilliard East Fork (E Fk)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6		
Lannon & Lone Mtn	11	11	11	10	10	11	13	13	14	15	15	14	13	13	13	13	14	14	14	13	13	14	14	15	17	17	17	17	17	18		
Hilliard West Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	5	23	36	38	41	45	33	27	27	28	28	28	27	27		
Bear (Bear R)	12	11	11	11	12	15	22	46	63	66	64	60	60	65	50	52	58	56	54	53	53	53	52	51	49	48	50	66	65	63	64	
Tropic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Kreider Domestic Pump	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Danielson	3	2	2	2	4	10	10	9	8	7	7	5	4	4	4	4	5	4	4	4	4	4	4	5	5	10	10	10	9	8	7	8
Crown & Pine Grove	4	4	4	3	2	2	5	9	7	6	6	6	5	5	4	4	4	4	4	4	4	4	5	6	6	6	9	9	8	8	8	
McGraw	4	5	7	8	11	14	17	20	27	27	27	25	22	20	20	21	23	24	22	22	22	23	23	18	8	8	8	8	8	8		
Lewis (D4)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Homer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
Lewis and Blanchard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
Myers No. 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	2	2	4	4	4	4	4	4	
Hare	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	
Coffman	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Knoder	0	0	0	0	0	0	0	1	3	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
Myers No. 1	0	0	0	0	0	0	0	0	3	6	7	6	5	4	4	5	6	6	5	5	5	5	5	6	6	6	6	6	5	5	5	
Myers Irr	8	8	7	6	7	8	10	12	12	13	12	11	10	8	8	9	11	11	9	9	9	10	10	10	11	12	11	9	9	9		
Evanston Pipeline	3	3	3	3	3	4	5	4	5	4	4	3	3	3	3	4	4	4	4	4	4	4	3	4	5	5	5	5	5	1		
Booth	0	0	0	0	0	0	2	6	8	9	7	7	4	1	1	2	8	10	8	7	7	11	21	19	19	15	15	13	13	10	13	
Anel Irr	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	5	15	16	14	14	13	13	13	13	14		
Cornelison	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Ev Water Supply (and Anderson)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Knight No. 2 (and No. 1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	6	6	6	6	6	5	5	4	4	
"State Hospital Ditch"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Evanston Water	4	4	4	4	8	10	8	10	14	15	12	6	7	11	13	19	17	15	14	14	18	21	21	22	22	23	22	20	19	18	19	
Wilson Irr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Faulkner	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Rocky Mtn & Blyth (and Crompton)	5	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
B.E.A.R. Project PL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
File Irr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Johnston & Narramore	0	0	0	0	0	0	0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
Sim's Creek Slough Diversion	1	1	1	1	1	2	2	3	4	4	4	4	4	3	3	3	3	3	3	5	6	6	6	8	14	14	12	11	10	10	10	
John Sims	10	16	15	13	12	12	22	29	30	28	23	21	16	15	14	14	15	15	16	16	16	16	16	16	16	16	16	16	16	16	25	
Michael Sims	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
S. P.	0	1	1	1	1	1	1	2	2	8	15	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Almy	2	2	2	2	2	2	2	2	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Sims, Blight & Turner	2	2	2	2	2	2	2	4	4	4	4	4	4	7	7	7	7	7	7	7	7	7	7	15	15	15	15	15	15	15	15	
Bowns	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Nixon West Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Turner	0	0	0	0	0	0	0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
Chapman (Headgate)	72	76	82	88	97	105	123	139	148	152	151	150	141	135	135	134	137	134	129	126	125	125	127	126	129	135	134	128	124	121	120	
Chapman (Stataline, incl'd above)	61	65	72	72	80	84	100	117	126	134	134	142	128	119	120	118	116	109	98	98	100	103	98	101	109	109	109	107	92	85	80	
Morris Bros Irr (Lower)	1	1	1	1	1	3	4	4	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1		
Bowns & Bruce	0	0	0	0	0	0	0	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	14	14	14	14	14	14	14	6	6	6
Olson No. 1 Pump	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Turnel	12	10	9	9	8	10	12	13	15	16	18	16	14	13	13	14	15	15	14	14	14	16	17	18	21	32	40	37	35	35		
Francis-Lee	5	5	5	4	4	4	4	5	5	6	12	11	11	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	
Bear River Canal	23	35	47	45	43	40	30	26	28	29	31	32	33	32	30	29	29	30	31	30	30	30	30	37	53	52	50	48	46	47	46	
TOTAL UPPER WY DIV.	187	205	221	222	234	252	299	361	431	450	444	426	398	391	375	385	408	426	426	400	0	0	0	0	0	0	0	0	0	0	0	
Whitney Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sulphur Creek Storage	2	2	2	2	2	2	3	4	4	4	3	3	3	3	3	3	4	4	3	3	3	3	3	4	5	5	5	5	5	5	1	
<b>LOWER UTAH</b>																																
Neville	0	0	0	0	0	0	1	1	2	3	3	4	3	3	2	2	2	3	3	2	2	4	6	6	6	7	7	7	7	6		
Booth	0	0	0	0	3	7	7	10	13	15	15	15	14	13	13	13	14	14	14	13	13	14	14	13	13	14	14	12	11	11		
Rees Land & Livestock	0	23	23	23	22	21	0	0	0	0	0	0	0	0	15</																	

DAILY DISCHARGE IN CFS OF BEAR RIVER CANALS WITH COMPACT ALLOCATIONS IN THE UPPER DIVISION

	June																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
UPPER UTAH SECTION																																
Hovarka (E Fk)	17	16	17	17	17	17	16	16	16	16	16	16	16	13	6	6	6	6	6	5	5	5	5	5	5	5	5	5	5	5		
Hatch (W Fk)	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4			
UPPER WYOMING SECTION																																
Hilliard East Fork (E Fk)	28	26	26	25	26	27	26	26	26	26	26	28	28	28	28	28	28	28	28	27	27	27	27	11	0	0	0	0	0	0		
Lannon & Lone Mtn	19	19	20	20	20	20	18	18	17	17	18	21	20	18	18	18	18	18	17	16	16	14	13	14	5	0	0	4	12	11		
Hilliard West Side	28	28	27	27	27	26	26	29	31	25	34	38	36	33	33	33	33	33	32	31	30	32	34	29	15	4	4	4	4			
Bear (Bear R)	65	72	86	85	86	86	84	82	81	80	80	80	79	67	66	66	66	63	61	60	56	28	15	13	10	10	10	10	10			
Tropic	0	0	0	3	9	9	8	8	8	8	7	7	7	4	4	4	4	4	4	4	4	3	2	2	2	2	3	3	3			
Kreider Domestic Pump	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Danielson	10	9	9	10	10	10	9	8	8	8	7	6	5	5	4	4	4	4	3	2	2	2	2	2	1	0	0	0	0			
Crown & Pine Grove	9	12	18	18	18	19	20	19	19	18	17	21	23	21	24	27	26	28	24	24	23	26	25	24	24	25	23	18	8	8		
McGraw	8	8	8	12	20	21	22	21	21	20	19	16	17	15	14	13	14	12	10	8	8	9	8	6	4	4	3	4	4			
Lewis (D4)	3	4	4	4	4	4	4	3	2	2	1	1	0	1	0	1	3	4	5	4	3	4	4	5	5	6	7	6	5			
Homer	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Lewis and Blanchard	2	2	2	2	2	6	6	6	6	6	6	6	6	6	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4			
Myers No. 2	5	4	5	8	11	12	10	9	9	9	7	4	2	1	1	1	1	1	1	2	1	0	0	0	1	2	2	2	2			
Hare	1	1	1	1	8	8	8	8	8	8	8	8	8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2			
Coffman	1	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0			
Knoder	0	1	0	1	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	3	3	3	3	3			
Myers No. 1	6	10	5	4	4	4	3	3	3	3	3	6	8	4	4	4	4	3	2	2	4	3	4	2	1	0	0	0	0			
Myers Irr	9	8	8	8	8	7	6	5	5	4	3	3	2	2	3	4	4	3	2	2	2	2	2	2	2	3	4	3	3			
Evanston Pipeline	0	7	8	8	12	12	12	12	12	12	12	15	15	10	10	10	10	10	10	10	10	10	10	10	10	6	11	12	12	11		
Booth	16	10	8	8	7	9	25	21	20	19	18	15	10	8	10	23	15	5	6	7	7	6	8	9	8	9	9	7	6	12		
Anel Irr	14	14	14	14	14	14	14	14	14	14	14	14	14	14	10	7	8	7	6	6	6	6	6	6	6	6	6	6	6	6		
Cornellson	7	7	7	6	6	6	6	6	6	6	6	6	6	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3			
Ev Water Supply (and Anderson)	7	7	7	5	5	5	5	5	5	5	5	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3			
Knight No. 2 (and No. 1)	4	4	4	4	4	4	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	3	3	3	4	5	6	5	5		
*State Hospital Ditch	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Evanston Water	24	21	20	22	21	22	20	21	20	23	26	22	22	22	21	18	19	22	21	20	19	18	17	16	16	17	16	17	16	16		
Wilson Irr	0	0	0	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2			
Faulkner	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Rocky Mtn & Blyth (and Crompton)	7	9	9	9	9	9	9	10	10	10	9	9	8	8	8	8	8	9	9	10	10	10	10	8	4	5	5	5	5			
B.E.A.R. Project PL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
File Irr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Johnson & Narramore	4	4	4	4	4	5	5	5	5	5	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Sim's Creek Slough Diversion	12	12	12	12	12	11	11	11	11	10	9	9	8	8	9	10	9	11	9	8	8	8	7	7	6	5	6	6	6	6		
John Sims	25	22	18	17	13	13	12	11	12	11	11	11	10	9	7	6	6	6	5	5	5	5	6	5	4	4	4	4	4			
Michael Sims	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
S. P.	8	7	7	7	7	6	8	8	8	8	6	5	2	1	0	0	1	1	2	2	3	3	2	2	2	4	5	3	5	4		
Almy	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2			
Sims, Blight & Turner	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	4	4	4	4	4	4	4	1	1	1	0	0	0		
Bowns	5	5	5	5	5	5	5	5	5	5	5	5	5	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0		
Nixon West Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Turner	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		
Chapman (Headgate)	122	118	114	115	113	111	105	101	98	95	91	87	92	97	93	99	100	107	104	92	88	85	77	78	76	69	76	75	74	74		
Chapman (Stalentine, incl'd above)	82	79	70	64	62	61	55	53	52	53	50	42	52	47	53	57	69	77	65	56	51	46	46	46	39	45	44	41	43			
Morris Bros Irr (Lower)	1	1	1	1	3	2	0	0	0	0	1	1	0	1	1	2	1	0	0	0	0	0	0	0	0	0	1	3	2	0		
Bowns & Bruce	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
Olson No. 1 Pump	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Tunnel	37	33	30	29	26	25	23	19	17	15	14	11	12	11	11	12	10	11	11	11	10	9	7	8	10	12	6	0	0	0		
Francis-Lee	28	25	25	25	25	24	23	24	24	24	25	24	25	24	25	24	25	24	25	24	25	24	25	25	25	24	23	13	6	6		
Bear River Canal	46	45	45	45	46	47	47	47	48	48	48	49	49	49	50	51	51	52	51	51	51	51	51	51	52	53	53	55	26	1	1	0
TOTAL UPPER WY DIV.	578	575	580	590	612	619	619	595	586	579	561	555	561	538	498	514	501	510	494	468	452	442	405	398	353	310	264	224	221	221		
Whitney Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sulphur Creek Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5	15	15	15	15	15	33	43	51	51	51	20	21	25	39	44	44
LOWER UTAH																																
Neville	7	6	6	6	6	8	8	6	6	6	6	6	6	6	6	6	6	7	8	8	6	6	6	6	5	3	0	0	0	0		
Booth	10	10	11	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	14	14	13	13	13	13	13	13	8	0	0	0		
Rees Land & Livestock	19	17	17	18	18	18	18	18	18	18	18	18	18	17	17	17	16	16	14	14	15	13	11	8	0	0	0	0	0	0		
Crawford-Thompson	148	149	145	143	143	142	140	140	140	139	138	140	142	141	139	134	149	151	147	145	143	142	141	140	138	136						





DAILY DISCHARGE IN CFS OF BEAR RIVER CANALS WITH COMPACT ALLOCATIONS IN THE UPPER DIVISION

	September																														Total	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
UPPER UTAH SECTION																																
Hovarka (E Fk)	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	748
Hatch (W Fk)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	598
UPPER WYOMING SECTION																																
Hilliard East Fork (E Fk)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	859	
Lannon & Lone Mtn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,301	
Hilliard West Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,541	
Bear (Bear R)	8	8	8	7	7	7	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	4,350	
Tropic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	208	
Kreider Domestic Pump	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Danielson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	353	
Crown & Pine Grove	3	3	3	3	3	3	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	5	6	6	6	5	4	1,452	
McGraw	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1,094	
Lewis (D4)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	281	
Homer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90	
Lewis and Blanchard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	192	
Myers No. 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	184	
Hare	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	159	
Coffman	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	
Knoder	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	2	2	2	2	2	2	2	2	2	1	1	1	2	328
Myers No. 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	247	
Myers Irr	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	598	
Evanston Pipeline	8	8	8	8	8	8	8	8	8	8	8	8	8	9	9	9	9	9	8	8	8	8	8	7	7	6	5	5	5	5	1,321	
Booth	4	4	4	4	4	4	4	4	3	3	2	2	2	2	2	2	2	3	3	3	3	3	1	1	1	2	3	4	2	1	1,076	
Anel Irr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	659	
Cornellison	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	302	
Ev Water Supply (and Anderson)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	228	
Knight No. 2 (and No. 1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	328	
*State Hospital Ditch*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Evanston Water	4	4	4	4	4	4	4	4	3	3	3	3	2	2	2	2	3	3	3	2	2	2	2	2	2	2	2	2	2	2	1,633	
Wilson Irr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	103	
Faulkner	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	136	
Rocky Mtn & Blyth (and Crompton)	2	2	2	2	2	2	1	1	2	2	1	2	2	2	2	2	2	2	2	1	1	1	0	2	0	0	1	3	2	2	676	
B.E.A.R. Project PL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	
Fife Irr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Johnston & Narramore	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	206	
Sim's Creek Slough Diversion	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	0	0	0	611	
John Sims	6	6	5	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1,261	
Michael Sims	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
S. P.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	430	
Almy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	152	
Sims, Blight & Turner	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	397	
Bowns	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	222	
Nixon West Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Turner	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	189	
Chapman (Headgate)	8	7	7	6	5	3	3	4	3	2	2	1	1	1	1	2	2	4	6	6	6	6	6	6	6	6	6	6	6	8	8,657	
Chapman (Stateline, incl'd above)	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,053		
Morris Bros Irr (Lower)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	97	
Bowns & Bruce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	349	
Olson No. 1 Pump	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	
Turnel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	1	1	1	1	1	0	0	0	0	0	1,133	
Francis-Lee	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	3	3	3	1,131	
Bear River Canal	23	23	23	23	23	22	22	22	22	22	22	22	22	22	22	22	22	22	18	2	1	1	1	1	1	1	1	1	1	1	3,362	
TOTAL UPPER WY DIV.	75	74	72	70	67	63	63	64	63	61	60	58	58	58	58	57	58	57	43	45	43	40	38	40	42	44	46	46	43	44	38,013	
Whitney Storage	17	17	17	17	17	17	13	13	13	13	13	13	13	13	13	13	13	6	6	0	0	0	0	0	0	0	0	0	0	0	2,244	
Sulphur Creek Storage	22	22	22	17	17	18	19	19	19	21	18	21	22	22	22	22	19	12	9	13	11	11	11	10	12	12	12	12	12	12	3,613	
LOWER UTAH																																
Neville	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	263	
Booth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	683	
Rees Land & Livestock	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	828	
Crawford-Thompson	10	10	14	13	12	14	17	17	17																							

## Central Division

The Compact provides that a water emergency shall be deemed to exist when the divertible flow in the Central Division drops below 870 cfs. A water emergency shall also be deemed to exist in the Central Division if the flow rate at the Border Gage drops below 350 cfs. The Compact provides that once a water emergency is deemed to exist, diversions in the State of Wyoming are to be limited to 43 percent of the total divertible flow. The remaining 57 percent is available for use within Idaho.

During the irrigation, the Engineer-Manager, in coordination with the state river commissioners/Watermasters, watches the flows in the Central Division to determine when a water emergency is being approached. On about July 9 the flow at the Border Gage dropped below the 350 cfs water emergency threshold and weekly call-in/call-out of diversion data commenced. Figure 2018.12 shows the weekly call-in/call-out information for the Central Division. Shown with the black triangles is the total divertible flow as defined by the Compact. The green dots show Wyoming diversion data with the solid dots showing actual diversions and the hollow dots showing Wyoming's allocation (43%). Similarly, the brown squares show the Idaho data with the hollow squares showing Idaho's allocation (57%) and the solid squares showing total water available to Idaho. These values include not only diversions to Idaho canals and pumps but also water bypassing Stewart Dam as well as water flowing into the Rainbow Inlet Canal. The grey diamonds show the calculated gains/losses in the Idaho Section of the River which is determined by subtracting the flows at the Border Gage from the sum of the Idaho diversions plus discharge into the Rainbow Inlet Canal and flows bypassing Stewart Dam. The red triangles represent the forecasted divertible flow each week. The solid line is the flow at the Border Gage. It is important to note that, though efforts are made to ensure the quality of data, these values represent the preliminary, real-time flow and diversion data that are available each week as the irrigation season progresses. In order to adjust for lag-time in flows from Wyoming to Idaho, the typical weekly process is for Wyoming to measure/regulate its diversions on Monday and Tuesday, Idaho to do its diversions on Thursday and then for the call-out/regulation for the next week to occur on Friday. In 2018 the weekly call-in/call-out practice commence on July 16. On August 18 a water emergency was declared, and interstate regulation commenced. This continued until September 20 when the water emergency was lifted.

After the close of the irrigation season final diversion and flow data are tabulation. Figures 2018.13 and 2018.14 graphically illustrate the Central Division's divertible flow and the respective allocations and diversions by the Wyoming and Idaho Sections under a water emergency. The flow passing the Border Gage is not illustrated on these figures as it confuses the diversion and allocation data. It is important to note that on Figure 2018.14 the line labeled as "Available to Idaho" represents the summation of diversions within the State of Idaho, as well as flow passing Stewart Dam and diversion to the Rainbow Inlet Canal. As the Compact provides that 57 percent of the Central Division's divertible flow shall be available for use within Idaho, this line is used to show whether such provision of the Compact was met. However, the Compact also provides that if Idaho elects to not divert into its canals its full entitlement, a portion of its allocation can pass into the Lower Division via the Rainbow Inlet

Canal or Stewart Dam. Data for these hydrographs are based on the River Commissioners'/Watermasters' annual reports to their respective state water agencies.

Figure 2018.15 shows a compilation of daily canal diversions as provided by the respective River Commissioners/Watermasters. The Wyoming and Idaho Sections' diversions and allocations are tabulated and summarized at the bottom of each page. The pages are divided such that there is one month's data per page. As the flow of the Bear River at the Border Gage could also be critical to the declaration of a water emergency, as defined by the Compact, this gage's data are also shown in these tables. Despite the dryness of the year, there was very good cooperation between the Wyoming and Idaho River Commissioners/watermasters in administering water distribution throughout this irrigation season.

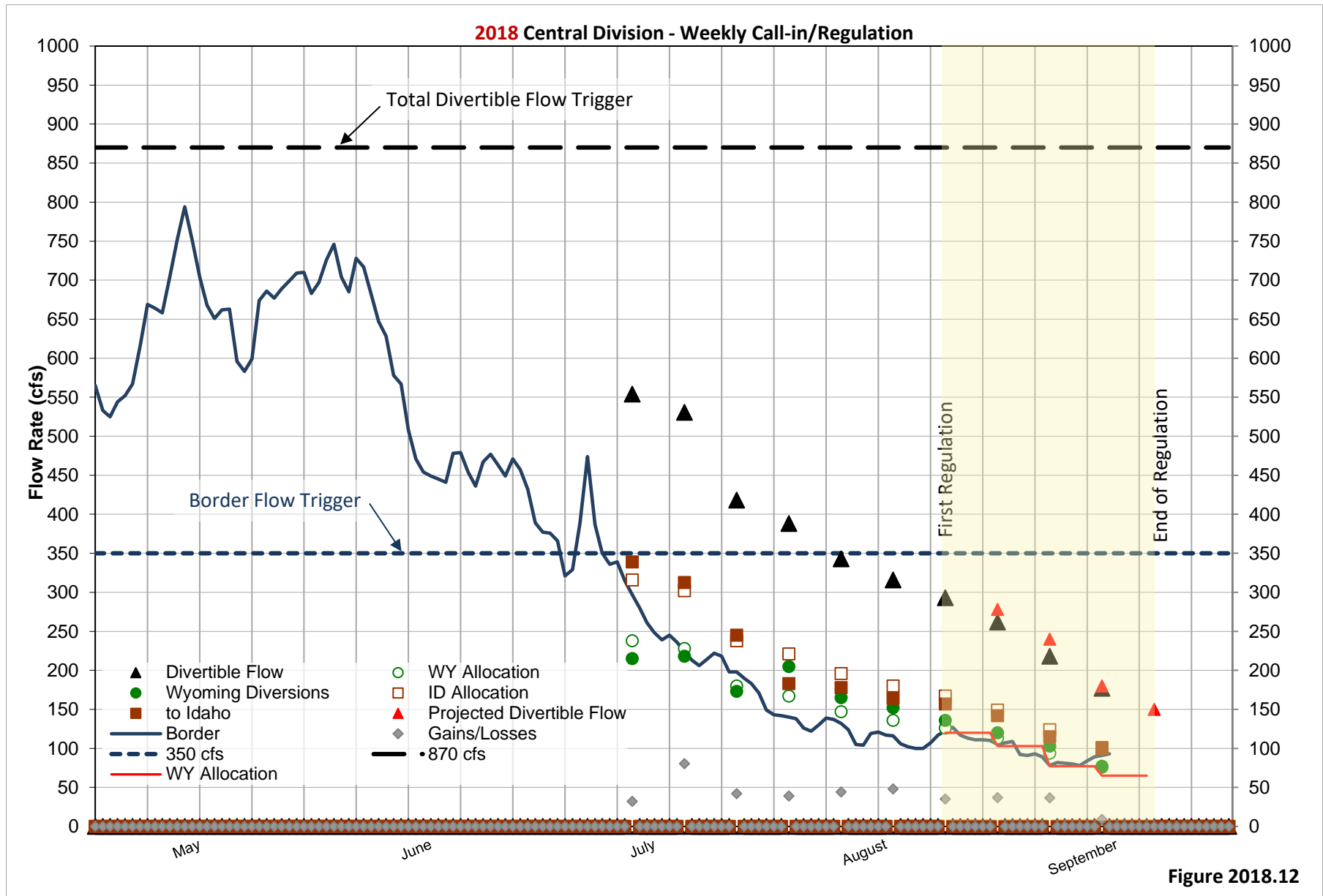


Figure 2018.12



# 2018 - Central Division Distribution

## Wyoming Section Diversions vs Allocation

18-23

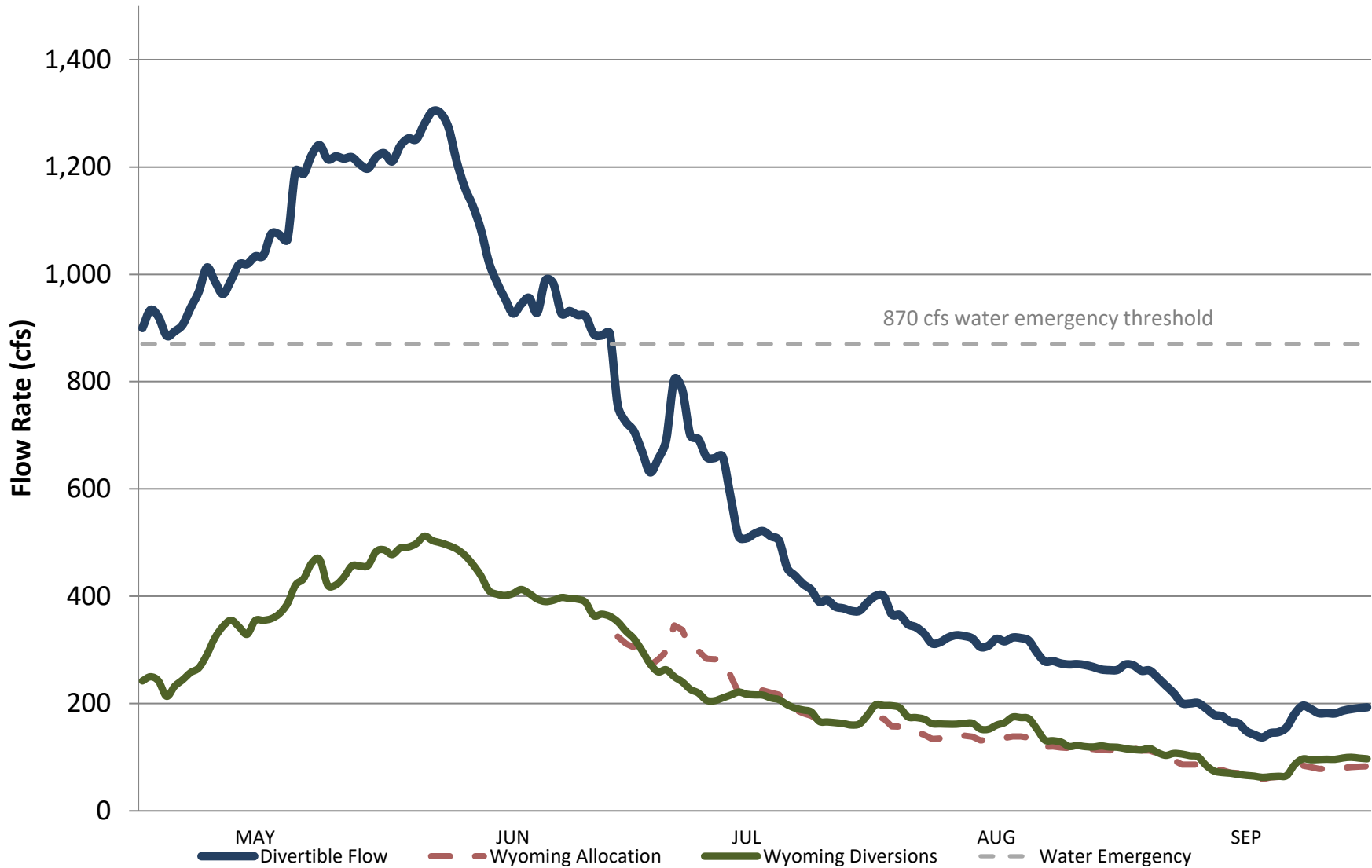
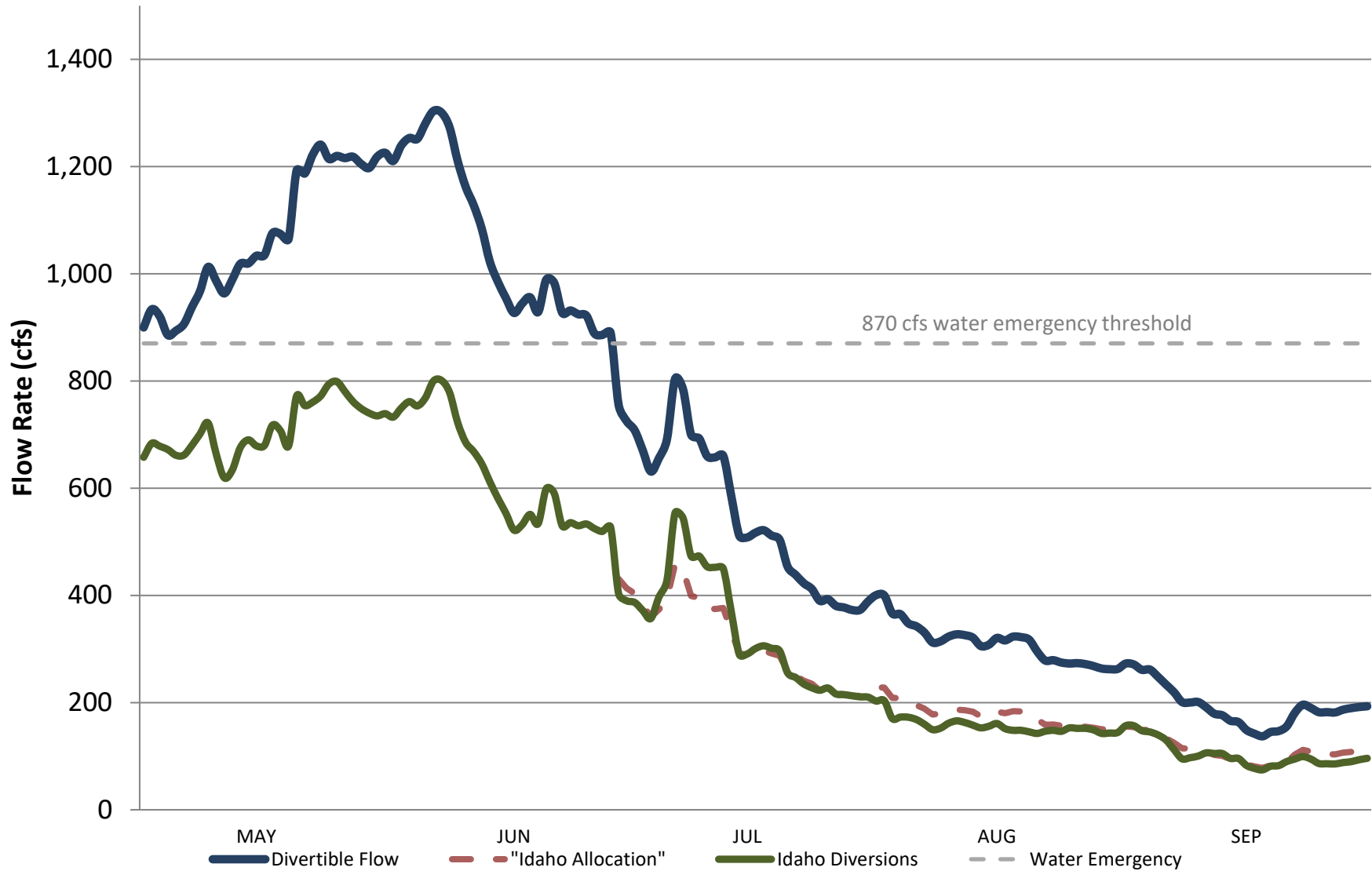


Figure 2018.13

# 2018 - Central Division Distribution

## Idaho Section Diversions vs Allocation



18-24

Figure 2018.14



DAILY DISCHARGE IN CFS OF BEAR RIVER CANALS WITH COMPACT ALLOCATIONS IN THE CENTRAL DIVISION

	June																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
WYOMING DIVERSIONS																															
BEAR RIVER CANALS																															
Thornock Pump and Pivot	0	1	3	3	2	0	0	0	1	3	3	3	2	3	3	3	2	0	0	0	3	3	3	3	3	3	3	3	2	0	
Bridge Pump	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Alonzo F. Sights (Main Stem)	10	10	9	9	10	10	11	11	11	11	11	11	11	11	10	10	10	10	10	10	10	11	11	11	11	12	10	10	9	8	
Wyman No. 1 (East)	15	15	14	14	15	15	14	14	13	13	12	11	11	11	11	11	11	12	12	11	11	12	12	12	12	12	12	12	11	8	
Wyman No. 2 (West)	34	34	34	34	34	34	34	34	34	34	30	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	8	
Oscar E. Snyder	35	35	35	35	33	20	20	20	20	20	20	20	11	11	11	11	11	11	11	12	14	22	23	23	22	22	22	20	18	18	
Rocky Point (D2)	25	25	25	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	31	31	31	31	31	31	31	25	25	25	25	
Cook Bros	59	60	58	57	61	60	58	56	54	50	50	45	42	41	41	45	54	57	60	59	59	65	66	67	67	70	68	66	62	62	
John R. Richards Terr	24	23	21	20	21	20	20	20	19	19	17	16	15	14	14	14	13	14	14	13	12	12	11	11	11	10	9	7	6	6	
TRIBUTARY DIVERSIONS																															
Abraham Stoner (Sublette Cr)	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	
Teichert Bro's Ditch (Sublette Cr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Teichert Bro's Spreader Dk (Sublette Cr)	8	8	8	8	8	5	5	5	5	5	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
Grade (Grade Canyon Cr)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
D.C.P. (Bruner Cr)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Curtis Pump (Bruner Cr)	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	1	1	1	1	1	
Goodell (Pine Cr)	2	6	6	5	5	4	4	5	6	6	6	6	6	6	5	4	4	4	4	4	4	5	5	5	5	4	2	3	4	4	
V.H. (Pine Cr)	15	11	11	12	13	13	13	11	11	11	11	11	11	11	10	11	13	13	13	13	13	13	14	14	14	14	15	14	13	13	
Dimond No. 2 (Spring Cr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Kenyon (Spring Cr)	0	0	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
SMITH'S FORK DIVERSIONS																															
Quinn-Bourne	3	14	14	14	13	12	12	12	12	12	12	12	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	
Bar-O-Bar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TJC Pump (Brown Pump)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Francis-Larson	6	5	4	4	5	5	4	4	4	4	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	1	1	1	
C.B.D. No 7	0	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	3	3	3	2	2	2	2	2	0	0	0	0	0	
Button Flat	2	2	2	2	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	5	10	10	10	10	10	10	10	10	10	10	
Progress	12	12	12	12	12	12	12	12	12	12	9	9	9	9	9	9	9	9	9	9	9	7	7	7	7	2	2	2	2	2	
Larson Pump	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Emelle	21	20	18	20	25	24	23	23	22	22	21	20	20	18	18	17	17	18	17	15	14	9	8	6	7	8	12	12	11	11	
Seven C Ranch North Pivot Pump	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Seven C Ranch South Pump & Pipeline	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Cooper	21	16	15	21	24	23	24	25	25	24	22	19	16	14	11	10	8	3	0	0	0	0	0	0	0	0	0	0	0	0	
Wheellock	11	11	11	11	11	11	11	11	11	11	11	10	10	10	10	10	10	10	10	10	10	10	10	5	5	5	5	5	5	5	
Covey (Headgate)	68	67	66	74	73	74	72	71	70	70	73	74	74	74	74	74	74	74	72	72	72	72	73	72	72	73	73	73	74	73	
Covey (Bruner Cr)	9	9	9	9	8	9	8	8	8	7	7	8	8	7	7	7	7	8	8	8	8	8	8	6	5	6	6	5	6	6	
Covey (Spring Cr)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
Whites Water	20	18	18	18	28	30	28	27	25	21	15	14	14	15	19	19	21	21	21	18	17	17	17	17	17	17	17	13	13	12	11
South Branch Irr (N Branch)	6	17	27	25	24	23	23	22	21	20	19	18	17	16	16	16	17	16	14	13	13	12	11	11	11	11	10	10	10	10	
Reed Ditch (N Branch)	10	10	10	7	7	7	7	7	7	7	7	7	3	3	3	3	3	4	4	4	4	4	4	4	4	4	0	0	0	0	
Stoner & Nichols (M Branch)	6	6	6	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
Minnie Roberts (M Branch)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
Gastananga South (M Branch)	0	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	
Gastananga North (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N Cokeville / Morgan (M Branch)	17	17	17	14	14	14	14	14	14	14	13	13	13	13	13	13	13	13	13	13	3	3	3	3	3	3	7	7	7	7	
Tanner (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Star (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Star Two Pump (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Cokeville Water (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Igo No. 3 (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Igo No. 2 (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Smith's Fork Ditch (M Branch)	8	8	8	7	7	7	7	7	7	7	5	5	5	5	5	5	5	5	5	7	7	7	7	7	7	7	3	3	3	3	
Petersen Pump (S Branch)	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	2	2	2	2	2	
Petersen Yard P.L.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bourne (S Branch)	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	1	1	1	1	
Forgen Irr (S Branch)	10	10	10	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	7	7	7	7	0	0	0	0	
TOTAL WYOMING DIVERSIONS	478	490	492	498	512	504	500	495	488	477	460	439	411	404	401	405	413	405	395	390	392	398	396	394	389	364	367	363	352	335	
IDAHO DIVERSIONS																															
Miller Ditch	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	
Rigby	3	3	3	0	0	0	0	0	0	0	3	3	3	3	0	2	2	2	2	2	2	0	0	2	2	2	2				

DAILY DISCHARGE IN CFS OF BEAR RIVER CANALS WITH COMPACT ALLOCATIONS IN THE CENTRAL DIVISION

	July																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
<b>WYOMING DIVERSIONS</b>																															
<b>BEAR RIVER CANALS</b>																															
Thornock Pump and Pivot	1	3	1	0	0	0	0	0	0	0	1	3	2	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3
Bridge Pump	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Alonzo F. Sights (Main Stem)	8	8	5	5	5	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Wyman No. 1 (East)	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Wyman No. 2 (West)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Oscar E. Snyder	18	18	16	16	18	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Rocky Point (D2)	25	25	32	32	32	32	32	32	32	20	20	20	20	20	20	20	20	7	7	7	7	7	7	7	7	7	7	7	7	7	
Cook Bros	61	60	46	32	34	37	34	33	32	33	31	29	28	27	25	25	25	24	23	21	20	15	10	9	10	10	10	10	20	35	32
John R. Richards Terr	6	5	3	3	5	6	4	3	2	2	1	2	2	2	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	
<b>TRIBUTARY DIVERSIONS</b>																															
Abraham Stoner (Sublette Cr)	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	2	
Teichert Bro's Ditch (Sublette Cr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Teichert Bro's Spreader Dk (Sublette Cr)	3	3	3	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Grade (Grade Canyon Cr)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	
D.C.P. (Bruner Cr)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Curtis Pump (Bruner Cr)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	
Goodell (Pine Cr)	4	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	6	5	5	5	5	5	
V.H. (Pine Cr)	13	12	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	10	11	10	10	10	10	10	10	10	10	10	
Dimond No. 2 (Spring Cr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Kenyon (Spring Cr)	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>SMITHS FORK DIVERSIONS</b>																															
Quinn-Bourne	11	11	11	11	11	11	11	11	10	11	11	11	11	11	10	10	10	10	10	10	9	10	10	9	9	9	9	9	9	9	
Bar-O-Bar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
TJC Pump (Brown Pump)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Francis-Larson	1	1	1	1	1	1	1	2	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	1	0	0	0	0	
C.B.D. No 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Button Flat	10	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	9	9	9	9	9	9	7	
Progress	2	2	2	2	2	2	2	7	7	7	7	7	7	7	6	6	6	6	6	6	6	6	6	8	8	8	8	8	8	8	
Larson Pump	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Emelle	9	8	7	7	6	6	6	6	6	6	6	6	5	7	12	12	12	12	11	10	9	9	8	8	10	11	10	9	10	10	
Seven C Ranch North Pivot Pump	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Seven C Ranch South Pump & Pipeline	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Cooper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Wheelock	5	5	5	5	5	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Covey (Headgate)	73	73	73	73	73	72	73	62	57	57	57	57	61	68	67	67	68	67	67	61	57	57	53	47	47	46	47	46	37	36	34
Covey (Bruner Cr)	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	5	5	
Covey (Spring Cr)	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	6	6	6	6	6	6	6	
Whites Water	6	7	7	7	8	8	8	8	9	10	12	12	12	12	12	11	10	9	9	8	8	10	11	10	10	9	10	10	10	10	
South Branch Irr (N Branch)	10	10	9	9	8	7	7	7	7	6	6	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	3	2	2	3
Reed Ditch (N Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stoner & Nichols (M Branch)	5	5	5	6	6	6	5	5	5	6	6	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	5	5	5	5	
Minnie Roberts (M Branch)	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Gastananga South (M Branch)	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Gastananga North (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N Cokeville / Morgan (M Branch)	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	4	4	4	4	4	4	10	
Tanner (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Star (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Star Two Pump (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Cokeville Water (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Igo No. 3 (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Igo No. 2 (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Smith's Fork Ditch (M Branch)	3	3	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
Petersen Pump (S Branch)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	
Petersen Yard P.L.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bourne (S Branch)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	7	
Forgeon Irr (S Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	
<b>TOTAL WYOMING DIVERSIONS</b>	<b>321</b>	<b>299</b>	<b>274</b>	<b>259</b>	<b>263</b>	<b>250</b>	<b>240</b>	<b>226</b>	<b>220</b>	<b>206</b>	<b>205</b>	<b>210</b>	<b>216</b>	<b>221</b>	<b>217</b>	<b>216</b>	<b>210</b>	<b>207</b>	<b>198</b>	<b>191</b>	<b>188</b>	<b>184</b>	<b>167</b>	<b>166</b>	<b>164</b>	<b>163</b>	<b>160</b>	<b>162</b>	<b>179</b>	<b>198</b>	
<b>IDAHO DIVERSIONS</b>																															
Miller Ditch	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Rigby	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	
Nuffer Canal	12	12	11	11	10	10	10	9	9	8	8	7	7	6	6																



DAILY DISCHARGE IN CFS OF BEAR RIVER CANALS WITH COMPACT ALLOCATIONS IN THE CENTRAL DIVISION

	September																														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
<b>WYOMING DIVERSIONS</b>																															
<b>BEAR RIVER CANALS</b>																															
Thornock Pump and Pivot	0	0	1	3	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	190
Bridge Pump	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Alonzo F. Sights (Main Stem)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	596	
Wynman No. 1 (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	4	4	3	1	1	1	1	922	
Wynman No. 2 (West)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1707	
Oscar E. Snyder	2	2	2	3	5	7	7	4	3	2	3	5	4	3	2	2	3	3	3	3	3	3	3	3	3	2	2	2	2	2071	
Rocky Point (D2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2100	
Cook Bros	14	13	14	14	22	36	37	36	36	36	38	39	39	39	39	39	34	33	33	34	34	33	33	33	35	36	38	38	38	38	5401
John R. Richards Terr	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1212
<b>TRIBUTARY DIVERSIONS</b>																															
Abraham Stoner (Sublette Cr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	110	
Teichert Bro's Ditch (Sublette Cr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Teichert Bro's Spreader Dk (Sublette Cr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	469	
Grade (Grade Canyon Cr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	156	
D.C.P. (Bruner Cr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	147	
Curtis Pump (Bruner Cr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54	
Goodell (Pine Cr)	6	6	6	6	6	6	5	5	5	5	5	5	5	5	5	4	5	3	3	3	3	3	3	3	4	5	7	7	6	784	
V.H. (Pine Cr)	9	9	9	9	9	9	9	9	9	9	9	9	9	9	10	10	9	11	12	12	11	12	12	11	10	8	8	9	10	1648	
Dimond No. 2 (Spring Cr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Kenyon (Spring Cr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81	
<b>SMITHS FORK DIVERSIONS</b>																															
Quinn-Bourne	5	5	5	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	3	926
Bar-O-Bar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TJC Pump (Brown Pump)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Francis-Larson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	290	
C.B.D. No 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39	
Button Flat	4	4	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	487	
Progress	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	700	
Larson Pump	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Emelle	10	11	12	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	4	5	1534
Seven C Ranch North Pivot Pump	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	114	
Seven C Ranch South Pump & Pipeline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	
Cooper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1104	
Wheelock	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	555	
Covey (Headgate)	25	25	26	24	15	9	7	6	4	2	0	0	0	0	0	0	0	0	0	0	1	4	4	6	8	8	8	8	8	6443	
Covey (Bruner Cr)	6	5	5	5	5	6	6	6	6	6	2	0	0	0	0	0	0	0	0	0	5	8	8	7	6	6	6	6	6	979	
Covey (Spring Cr)	5	6	5	5	5	5	6	6	6	3	0	0	0	0	0	0	3	5	5	5	5	5	5	5	6	6	7	6	6	824	
Writes Water	10	10	10	10	10	12	14	15	14	13	11	10	9	8	7	7	7	7	8	12	15	14	12	12	10	10	8	5	4	1648	
South Branch Irr (N Branch)	2	2	2	2	3	3	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	908	
Reed Ditch (N Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	424	
Stoner & Nichols (M Branch)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	334	
Minnie Roberts (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	213	
Gastenganga South (M Branch)	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	
Gastenganga North (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	
N Cokeville / Morgan (M Branch)	4	4	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0	0	0	0	4	4	4	4	4	4	4	4	4	956	
Tanner (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
Star (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Star Two Pump (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	
Cokeville Water (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Igo No. 3 (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Igo No. 2 (M Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	
Smith's Fork Ditch (M Branch)	3	3	3	3	3	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	3	3	3	442	
Petersen Pump (S Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77	
Petersen Yard P.L.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Bourne (S Branch)	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	394	
Forgen Irr (S Branch)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	537	
<b>TOTAL WYOMING DIVERSIONS</b>	<b>114</b>	<b>114</b>	<b>116</b>	<b>109</b>	<b>103</b>	<b>107</b>	<b>106</b>	<b>103</b>	<b>101</b>	<b>85</b>	<b>74</b>	<b>71</b>	<b>70</b>	<b>68</b>	<b>66</b>	<b>65</b>	<b>63</b>	<b>64</b>	<b>64</b>	<b>66</b>	<b>86</b>	<b>97</b>	<b>95</b>	<b>96</b>	<b>96</b>	<b>99</b>	<b>100</b>	<b>98</b>	<b>97</b>	<b>37973</b>	
<b>IDAHO DIVERSIONS</b>																															
Miller Ditch	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	319	
Rigby	2	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	0	0	0	0	0	0	87	
Nuffer Canal	14	14	14	14	13	13	13	13	13	13	15	15	15	15																	

## Lower Division

The Compact provides that a Utah Lower Division water user can petition the Commission for interstate regulation if he believes that he is being deprived of water to which he is justly entitled due to diversions in Idaho. If, upon review, the Commission finds such to be the case, then the Compact provides for the declaration of a water emergency and that it shall put into effect water delivery schedules based on priority of rights without regard to the state line. The Commission has never received such a petition. However, with growing concern for such a possibility, the Commission, over a several-year period, determined how it would receive and review such a petition and implement water delivery should a water emergency be declared. At its November meeting in 1997, the Commission adopted *Interim Procedures for Lower Division Water Delivery*. Appendix B to the procedures, which was revised with the procedures in April 2004, provides for the accounting and distribution method to be used in a water emergency.

Also appended to the procedures is *Water Delivery Schedule No. 1* which was revised by the Commission in 2015 and which includes the mainstem Lower Division water rights in both Idaho and Utah. After adoption of the water delivery schedule, both states began using this common schedule of water rights in their water right accounting programs. Hence, though not regulated by the Commission, the distribution in the Lower Division is cooperatively managed by the states of Idaho and Utah through their respective Watermasters and River Commissioners. Such distribution was facilitated in 2018 with weekly conference calls with the state agencies, large water users and PacifiCorp. Figure 2018.16 shows the delivery of water in the Lower Division as reported by the two state agencies.

### 2018 Lower Division Irrigation Water Deliveries

Canal/Group	Natural Flow (af)	Storage Use (af)	Total Diversion (af)
<b>Idaho</b>			
Gentile Valley	9,850	789	10,639
West Cache	29,612	8,047	37,659
Cub River Pumps	2,098	19,696	21,794
Last Chance and Bench B	71,535	19,936	91,471
Idaho Small Irrigators	14,570	2,393	16,963
<b>Utah</b>			
Bear River Canal Company	188,366	103,272	291,638
Utah Small Irrigators	2,503	7,904	10,407

Figure 2018.16

Allocation and deliveries of Bear Lake storage water are significant in most years to the total water diverted in the Lower Division. In 1995, PacifiCorp, the irrigators and Bear Lake interests entered into a settlement agreement as to the allocation of storage water from Bear



Lake. In 2004 the parties entered into an *Amended and Restated Bear Lake Settlement Agreement*. PacifiCorp tracks deliveries pursuant to the settlement agreement. Figure 2018.17 shows such deliveries in 2018. Note that during the early portion of 2018 PacifiCorp was in flood release operations at Bear Lake. The below values represent the portion of the release that was purposeful to irrigation demands.

**2018 Bear Lake Storage Deliveries**

Irrigation Storage Allocation	245,000 af
Bear Lake Storage Release	192,000 af
Lake Recovery Volume	53,000 af
Decreed Transit Losses <sup>1</sup>	6700 af
System Losses <sup>2</sup>	18,800 af
Delivered Bear Lake Storage	166,500 af

<sup>1</sup>Approximate, 3.5% of total storage release per the Dietrich Decree

<sup>2</sup>Water that passes below Cutler Dam that is accounted for as storage water release

**Figure 2018.17**

## STATE WATER ACTIVITIES

Article XI of the Amended Compact provides that applications for appropriation or change in water use within each state shall be in accordance with individual state law, except no such application shall be approved if the effect will deprive water users within another state or increase the depletion beyond that which is provided for under the Compact. This article further requires that state officials report, in a format and at intervals established by the Commission, the status of their respective allocations and uses. The Commission has determined the best format for reporting such changes in use is the Biennial Report. Figure O.3 in the Overview section of this report provides the most recent depletion information. This portion of the Biennial Report provides a summary of major water and water right related activities in each of the states during the 2018 water year.

### Idaho

#### Water Activities

On November 3, 2017, the Department of Water Resources issued an order approving a Water Management Plan for the Malad Valley Ground Water Management Area. Among other things, the plan calls for the measurement of ground water diversions in Malad Valley and increased water level monitoring throughout the valley.

Also, on November 3, 2017, the Department issued an order extending the temporary moratorium in Malad Valley. The moratorium was extended for five years, until November 2022, to allow time for the collection and review of hydrologic data for Malad Valley.

Water right permits were issued in Basins 11, 13 and 15 as shown in the table below:

In April 2018, the Idaho Department of Water Resources approved Transfer 81750, which changed the place of use for a portion of ground water right 11-7014 (38.5 acres) from Idaho to Wyoming, and Transfer 81752, which changed the place of use for Thomas Fork rights 11-7678 and 11-7679 (154.5 acres) from Idaho to Wyoming. The points of diversion for water rights 11-7014, 11-7678 and 11-7679 continue to be located in Idaho.

#### Water Rights

Water right permits were issued in Basins 11, 13 and 15 as shown in the table below:

<u>Right No.</u>	<u>Priority Date</u>	<u>Rate (cfs)</u>	<u>Source</u>	<u>Water Use</u>
11-7829	4/24/2017	0.430	GROUND WATER	DOMESTIC
13-7925	11/19/2014	0.320	WASTE WATER	IRRIGATION
13-7984	11/28/2016	0.040	SPRING	DOMESTIC
13-7985	10/17/2016	0.040	SPRING	DOMESTIC
13-7996	5/19/2017	1.000	UNNAMED SPRING	FISH PROPAGATION
11-7831	10/25/2017	0.020	UNNAMED SPRING	STOCKWATER
11-7834	2/20/2018	0.020	BLOOMINGTON CREEK	STOCKWATER

11-7839	4/12/2018	0.020	SPRING	STOCKWATER
11-7840	4/12/2018	0.020	SPRING	STOCKWATER
13-8001	9/7/2017	0.040	GROUND WATER	DOMESTIC
13-8002	9/11/2017	0.040	GROUND WATER	DOMESTIC
13-8003	9/7/2017	0.040	SPRING	DOMESTIC
13-8005	11/1/2017	0.040	GROUND WATER	DOMESTIC
13-8006	11/29/2017	0.020	SPRING	DOMESTIC
13-8007	1/24/2018	0.080	SPRING	DOMESTIC, STOCK
13-8014	1/19/2018	0.040	GROUND WATER	DOMESTIC
13-8018	5/3/2018	0.040	SPRING	DOMESTIC
13-8021	5/7/2018	1.100	BEAR RIVER	IRRIGATION
13-8024	7/9/2018	0.010	SPRING	STOCKWATER
15-7435	10/23/2017	0.040	SPRINGS	DOMESTIC, STOCK
15-7436	11/14/2017	0.060	GROUND WATER	DOMESTIC

## Utah

### Water Activities

The Division of Water Resources continued to study the needs and impacts of the Bear River Development Project (BRDP). The scope of work for the Division's current feasibility study includes ongoing refinement of the pipeline alignment, project management, stakeholder engagement and inter-agency coordination assistance. The study includes a conceptual design of an entire BRD system. Any reservoir sites or pipeline alignments in the study are not finalized. Prior to finalizing the design of the BRD project (or any phases), a NEPA environmental analysis will need to be completed. The study will provide an updated preliminary cost estimate. The final report is expected to be released in spring of 2019.

In August 2018, the Division signed a Memo of Agreement (MOA) with the Utah Transit Authority (UTA) to start the early acquisition and preservation of a utility corridor for a shared right-of-way (ROW) through Box Elder County, particularly adjacent to the UP Railroad along the Willard Bay Reservoir. The shared corridor with UTA allows for a sharing of resources with another government agency. The acquired corridor can also be an enhancement to the surrounding communities. The Division and UTA have already had preliminary discussions with planning officials from Box Elder County and adjacent towns about potentially providing an easement for a trail along the corridor, even prior to actual construction of UTA or BRD projects.

A cloud seeding project to increase snowpack has been ongoing since 1989 in the Lower Division in Eastern Box Elder County and Cache County. The winter storm systems in these areas were seeded with 21 ground-based generators using silver iodide at a total cost of \$88,100. Bear River Water Conservancy District and Cache County cost shared (50/50) with the Utah Board of Water Resources in the cloud seeding project during the 2018 water year.

Water Rights

There were 49 applications to appropriate that were approved in Utah during 2018 for ground water for “ordinary domestic and stockwatering” purposes and associated irrigation use for 45 homes. In the Lower Division, an application to appropriate ground water for municipal use was approved to divert 1201 acre-feet of water that is mitigated by surface water rights held by the municipality. Also, in the Lower Division, applications to appropriate ground water for irrigation of 215 acres were approved and applications to appropriate 24.75 cfs of surface water from drains and return flows were approved for irrigation and waterfowl habitat. Change applications were also approved to change the points of diversion, nature and/or place of use of historic water rights.

**Wyoming**

Water Activities

Wyoming users attended public meetings that were held in Evanston, Wyoming and Montpelier, Idaho to gather public input as part of the Bear River Compact 20-year review. One formal compact change request was submitted by Lincoln County Conservation District which involved administration of waters in the Central Division. The Commission ultimately voted not to amend the Compact, but to further engage with the other states in discussions on the topic.

The Upper Division received an in-state call for regulation from a Wyoming canal below Woodruff Narrows Reservoir after Woodruff Narrows had filled to capacity. Regulation lasted the remainder of the 2018 irrigation season.

Wyoming continues to look for ways to produce a common method of accounting supplemental supply depletions. Several methods have been identified with each having its own pros and cons. Wyoming’s efforts take into consideration the differences between data availability within each of the states and the varying impact of regulation under each state’s rules.

In an effort to utilize a portion of the un-allocated 4,100 acre-feet of Original Compact Storage water assigned to Wyoming; a petition was received from YC Ranch LLC. This petition sought to change 26.9 acre-feet of adjudicated Amended Compact Allocation to Original Compact Allocation and was in accordance with the State Engineer’s policy memo relative to assignment of this water. This petition was granted by the Wyoming State Board of Control and now allows the reservoir to entirely fill under Original Compact Allocation.

Water Rights

New water right permits subject to Compact depletions issued from Wyoming’s allocation are as follows:

<u>Permit No.</u>	<u>Appropriator</u>	<u>Priority Date</u>
P208731W	4-E Farms LLC	March 12, 2018
P7884E	Willis Land Wyoming LLC	April 23, 2018
P36054D	Hoby Knowles	August 20, 2018

## STREAM GAGING

As was indicated in the Overview chapter of this report, under the subsection concerning the Stream Gaging Program, the Bear River Commission participates in a cooperative contract with the USGS for the maintenance of stream gages on the Bear River and significant tributaries. Also, the states, PacifiCorp and, at times, others participate in stream gaging on the Bear River and its tributaries. The Commission believes the collection of data concerning stream flows in the Bear River system is very important and allocates a significant portion of its annual budget in support of the cooperative stream gaging program with the U.S. Geological Survey. However, costs continue to increase and so the Commission is constantly reviewing the stream gaging program to determine if all of the stations supported are necessary for the Commission to fulfill the responsibilities assigned to it by the Compact.

In the spring of 2018 two water quality platforms were deployed on Bear Lake. The platforms were jointly funded by Bear Lake Watch, the Idaho Department of Environmental Quality, Utah Division of Water Quality and USGS. The platforms collect a number of water quality and weather data. The platforms are deployed each spring and retrieved each winter before Bear Lake ices over. One platform is to remain at the same location each year while the other will be moved around the lake.



During 2018, a total of 33 gages were maintained on the Bear River system. Of these 33 gages, 5 were part of a cooperative effort between the Bear River Commission and the USGS, and the USGS funded 7 gages under its Ground and Surface Water Information Program (GSWIP). PacifiCorp maintained 15 gages on the Bear River system during 2018. Three additional gages were maintained under the USGS Cooperative Program with the State of Utah (2 gages) and the State of Idaho (1 gage). Additionally, the State of Wyoming maintained 1 gage on the Bear River and the USFWS funded 1 USGS gage. The Bear Lake water quality platforms were funded as described above. Figure 2018.18 shows a tabulation of these gages and the entities which participated in the operation and funding of each gage. The approximate locations of the stream gages are shown on Figure O.5 in the Overview section of this report.

Publication of the streamflow records for 12 of the gages in this report were considered to be of significant value to the Commission and are included on pages 18-37 through 18-48.

## BEAR RIVER SYSTEM STREAM GAGING STATIONS STREAM GAGES MAINTAINED DURING THE 2018 WATER YEAR

STATION #	STATION NAME	OPERATED BY	FUNDED BY
<u>10011500</u> ☺	Bear River near UT-WY state line	USGS	USGS
10016900☺	Bear River at Evanston WY	USGS-WY	USGS
<u>10020100</u> ☺	Bear River above reservoir near Woodruff UT	USGS	USGS
<u>10020300</u>	Bear River below reservoir near Woodruff UT	USGS	BRC/USGS
10023000	Big Creek near Randolph UT	USGS	UTDNR/USGS
10026500	Bear River near Randolph UT	WSE	State of WY
<u>10028500</u> <sup>1</sup>	Bear River below Pixley Dam near Cokeville WY	USGS	BRC/USGS
<u>10032000</u>	Smiths Fork near Border WY	USGS	BRC/USGS
10038000☺	Bear River below Smiths Fork near Cokeville WY	USGS	USGS
<u>10039500</u>	Bear River at Border WY	USGS	BRC/USGS
10044300 <sup>2</sup>	Dingle Inlet Canal near Dingle ID	PacifiCorp	PacifiCorp
<u>10046000</u>	Rainbow Inlet Canal near Dingle ID	PacifiCorp	PacifiCorp
10046500 <sup>2,3</sup>	Bear River below Stewart Dam near Montpelier ID	PacifiCorp	PacifiCorp
	Bear Lake Water Quality Platforms	USGS	(see below) <sup>4</sup>
<u>10055500</u>	Bear Lake at Lifton near St. Charles ID	PacifiCorp	PacifiCorp
<u>10059500</u>	Bear Lake Outlet Canal near Paris ID	PacifiCorp	PacifiCorp
10068500	Bear River at Pescadero ID	USGS	IDDNR/USGS
10075000	Bear River at Soda Springs ID	PacifiCorp	PacifiCorp
10079000	Soda Point Reservoir at Alexander ID	PacifiCorp	PacifiCorp
10079500	Bear River at Alexander ID	PacifiCorp	PacifiCorp
10080000	Bear River below Grace Dam near Grace ID	PacifiCorp	PacifiCorp
10086000	Oneida Narrows Reservoir at Oneida ID	PacifiCorp	PacifiCorp
10086500	Bear River below PacifiCorp Tailrace at Oneida ID	PacifiCorp	PacifiCorp
<u>10092700</u>	Bear River at ID-UT state line	USGS	BRC/USGS
10105900	Little Bear River at Paradise UT	USGS	UTDNR/USGS
10108400☺	Logan, Hyde Park, Smithfield Canal near Logan UT	USGS	USGS
<u>10109000</u> ☺ <sup>5</sup>	Logan River above State Dam near Logan UT	USGS	USGS
10113500☺	Blacksmith Fork abv Upper & Lower Dam Near Hyrum UT	USGS	USGS
10116500	Cutler Reservoir near Collinston UT	PacifiCorp	PacifiCorp
10117000	Hammond (East Side) Canal near Collinston UT	PacifiCorp	PacifiCorp
10117500	West Side Canal near Collinston UT	PacifiCorp	PacifiCorp
10118000	Bear River near Collinston UT	PacifiCorp	PacifiCorp
<u>10126000</u>	Bear River near Corinne UT	USGS	USFWS

Notes:

μ GSWIP site – Ground and Surface Water Information Program

Underlined station numbers indicate those gages for which stream flow data are published in this report.

<sup>1</sup> This gage is operated seasonally from April 1 until September 30 each year.

<sup>2</sup> Data for these gages are generated by PacifiCorp but not formally published

<sup>3</sup> Discharge measurements below Stewart Dam are required for interstate regulation pursuant to the Compact. However, flow is general only a few cfs. PacifiCorp maintains this gage and reports discharge to the Idaho watermaster. The data are included with the Central Division's canal diversion data herein.

<sup>4</sup> These two water quality platforms are jointly funded by Bear Lake Watch, Idaho Department of Environmental Quality, Utah Division of Water Quality, PacifiCorp and USGS.

<sup>5</sup> Gage 10109001 represents a summation of the Logan River discharge (10109000) and canal diversions (10108400) upstream of the gage. This is not a physical river gage. Gages 10109000 and 10108400 are part of the GSWIP.

**Figure 2018.18**

## 10011500 BEAR RIVER NEAR UTAH-WYOMING STATE LINE

LOCATION.--Lat 40°57'55", long 110°51'10" referenced to North American Datum of 1927, in SE ¼ NW ¼ SE ¼ sec.30, T.3 N., R.10 E., Summit County, UT, Hydrologic Unit 16010101, on left bank 400 ft downstream from West Fork and 2.8 mi upstream from Utah-Wyoming State line.

DRAINAGE AREA.--172 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1942 to current year.

REVISED RECORDS.--WDR UT-74-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 7,965 ft above NGVD of 1929, from river-profile map. Prior to October 1, 1986 at datum 3.0 ft higher.

REMARKS.-- Records good except for estimated daily discharges which are poor and other periods as noted. Records fair May 20, 2014 through Jun. 17, 2014 due to variable control conditions from snow-melt runoff. Flow regulated slightly by Whitney Reservoir, total capacity, 4,700 acre-ft since 1966. Three diversions above station for irrigation of about 265 acres above and 2,600 acres below station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,390 ft<sup>3</sup>/s, Jun 30, 2011, gage height, 7.82 ft; minimum, 6.8 ft<sup>3</sup>/s, Apr 12, 1984, result of upstream ice jam.

### DISCHARGE, CUBIC FEET PER SECOND

YEAR 2017-10-01 to 2018-09-30

#### DAILY MEAN VALUES

[e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	137	65.5	65.0	e44.8	e43.0	e40.1	68.3	326	854	120	68.8	55.0
2	116	65.2	61.7	e44.4	e42.4	e41.0	73.1	281	732	202	72.1	55.4
3	103	64.8	59.0	e44.0	e42.1	e41.3	62.0	253	754	209	67.5	53.5
4	107	63.3	e45.3	e43.6	e42.2	e41.5	62.0	241	762	206	62.3	52.6
5	99.9	68.1	e53.6	e43.3	e42.0	e40.4	63.8	280	775	202	62.2	51.4
6	96.5	68.7	e53.9	e43.2	e41.5	e40.2	71.1	391	736	199	58.8	52.8
7	94.4	56.3	e54.1	e43.1	e41.2	e41.5	86.0	621	627	194	57.1	51.7
8	102	57.3	e54.3	e43.0	e41.6	e42.9	109	783	586	193	55.6	52.0
9	99.3	77.0	e54.4	e43.0	e42.3	e43.6	90.8	923	566	125	54.3	50.4
10	95.4	70.7	e54.5	e42.9	e42.2	e43.7	90.2	990	532	138	53.4	48.4
11	96.5	62.7	e54.6	e42.9	e40.1	e43.6	110	1,000	448	143	53.0	47.0
12	92.1	56.3	e54.6	e42.9	e38.5	e43.4	128	852	377	146	53.0	45.4
13	85.4	65.5	e54.1	e42.9	e38.3	e42.7	96.0	642	351	131	53.1	44.5
14	87.3	63.2	e53.7	e42.9	e37.8	e41.9	94.5	555	339	127	57.4	44.8
15	84.0	55.5	e53.6	e42.9	e37.0	e41.2	96.2	546	321	123	57.5	43.6
16	88.2	63.8	e53.4	e42.9	e35.9	e45.2	102	651	303	115	59.0	43.1
17	84.9	70.1	e52.9	e42.9	e36.3	46.2	110	801	291	120	64.0	43.5
18	83.6	54.5	e52.2	e42.6	e36.6	43.7	91.3	793	299	105	66.5	43.7
19	82.1	79.3	e51.5	e42.4	e36.0	46.6	93.0	664	246	95.8	61.0	43.2
20	83.4	74.1	e50.9	e42.2	e35.0	45.4	92.2	685	221	93.6	57.8	44.3
21	79.2	76.1	e50.3	e42.1	e35.0	46.8	105	701	202	92.4	59.3	39.7
22	81.4	75.9	e49.8	e42.2	e35.0	57.4	160	776	189	94.4	72.2	37.6
23	80.9	75.1	e49.3	e42.3	e35.0	74.1	207	786	175	98.1	124	37.0
24	75.0	74.3	e48.6	e42.3	e35.0	60.4	223	777	163	86.9	78.9	38.4
25	74.4	68.6	e47.8	e41.9	e35.2	56.4	250	956	166	83.6	69.9	36.9
26	75.1	67.5	e47.3	e41.7	e36.4	52.6	314	1,060	167	81.2	64.4	37.0
27	70.1	69.3	e46.9	e41.5	e37.9	49.8	401	972	159	77.4	62.5	37.1
28	71.9	62.6	e46.5	e41.6	e39.0	51.6	547	900	153	74.8	61.1	37.0
29	70.5	60.2	e46.0	e42.3		49.1	578	786	148	72.7	59.4	37.2
30	71.8	56.7	e45.6	e43.1		51.7	458	762	143	70.8	57.2	36.2
31	68.4		e45.2	e43.0		58.2		867		68.9	55.0	
<b>Total</b>	2,737	1,988	1,611	1,327	1,081	1,464	5,033	21,620	11,780	3,889	1,958	1,340
<b>Mean</b>	88.3	66.3	52.0	42.8	38.6	47.2	168	697	393	125	63.2	44.7
<b>Max</b>	137	79.3	65.0	44.8	43.0	74.1	578	1060	854	209	124	55.4
<b>Min</b>	68.4	54.5	45.2	41.5	35.0	40.1	62.0	241	143	68.9	53.0	36.2
<b>Ac-ft</b>	5,427	3,943	3,195	2,632	2,143	2,904	9,982	42,890	23,380	7,713	3,884	2,659

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943-2018, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	66.6	55.2	45.7	41.6	39.8	44.7	115	603	829	293	92.9	75.5
<b>Max</b>	208	106	94.9	72.4	64.3	99.5	316	1,044	1,990	1,371	244	229
<b>(WY)</b>	(1983)	(1984)	(1984)	(1984)	(1984)	(2017)	(1946)	(1984)	(1986)	(2011)	(1965)	(1983)
<b>Min</b>	30.8	32.5	27.7	28.9	21.1	26.0	37.2	162	204	67.4	31.0	23.9
<b>(WY)</b>	(1959)	(1955)	(1960)	(2007)	(2003)	(1964)	(1944)	(1977)	(1992)	(1961)	(2002)	(1956)

Figure 2018.18 (cont.)

## 10020100 BEAR RIVER ABOVE RESERVOIR, NEAR WOODRUFF, UT

LOCATION.--Lat 41°26'04", long 111°01'01" referenced to North American Datum of 1927, in NE ¼ NW ¼ sec.29, T.17 N., R.120 W., Uinta County, WY, Hydrologic Unit 16010101, on right bank 4.8 mi upstream from Woodruff Narrows Dam and 9.6 mi southeast of Woodruff.

DRAINAGE AREA.--755 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1961 to current year.

REVISED RECORDS.--WDR UT-74-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 6,455 ft above NGVD of 1929, from river-profile map.

REMARKS.-- Diversion for irrigation of about 43,500 acres above station. Records are good except for discharges below 15 cfs which are fair and estimated daily discharges which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,150 ft<sup>3</sup>/s, Jun 2, 1983, gage height, 6.17 ft; minimum, no flow several days during Aug, Sep 1988, and Sep 2002.

### DISCHARGE, CUBIC FEET PER SECOND WATER YEAR 2017-10-01 to 2018-09-30 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	124	24.6	100	e70.2	e77.7	e67.9	129	471	514	16.3	6.83	23.6
2	143	23.3	113	e67.4	e80.1	e71.7	145	350	456	15.4	5.88	23.5
3	120	21.5	108	e66.2	e82.1	e72.6	148	279	383	15.7	5.01	24.1
4	102	21.6	96.3	e65.8	e82.9	e73.8	122	238	363	17.4	5.64	25.0
5	106	22.6	e53.8	e67.0	e79.9	e70.1	118	196	326	16.8	5.31	23.3
6	94.4	25.2	e50.5	e68.2	e78.9	e69.3	116	224	318	13.5	4.59	21.6
7	92.1	33.7	e55.3	e69.8	e75.3	e69.9	136	338	265	13.1	4.43	20.1
8	86.1	34.2	e66.8	e71.3	e76.4	e81.4	163	491	214	14.7	5.86	20.9
9	92.0	26.1	e64.7	e72.2	e79.0	e91.1	189	589	190	14.3	18.8	21.5
10	93.5	78.2	e67.5	e72.7	e71.8	e104	119	686	170	14.3	20.7	20.6
11	88.8	90.3	e68.3	e72.1	e63.2	e114	108	720	151	15.2	19.4	18.7
12	92.3	77.3	e69.9	e71.3	e65.0	e136	126	819	122	16.2	20.5	19.2
13	82.4	71.1	e74.7	e70.6	e60.2	e178	161	697	85.5	17.8	19.7	19.4
14	76.3	77.0	e73.9	e69.8	e58.0	213	117	517	33.0	14.1	20.3	19.1
15	78.3	81.3	e71.6	e68.4	e59.8	245	113	471	26.3	11.3	18.7	18.8
16	70.2	69.1	e74.7	e67.3	e54.1	216	115	474	25.9	9.81	20.2	18.5
17	75.4	104	e73.0	e66.7	e60.3	193	108	544	36.6	8.79	24.5	22.2
18	60.0	118	e71.6	e66.9	e60.0	150	118	607	61.6	6.80	26.1	21.4
19	42.0	87.6	e71.9	e68.6	e52.7	115	93.2	587	63.5	e5.44	30.6	19.3
20	38.2	118	e71.9	e70.1	e51.6	116	98.6	507	50.6	e4.73	32.1	12.9
21	36.7	140	e70.8	e69.7	e48.7	126	101	510	41.5	e5.11	30.9	7.96
22	37.4	182	e68.8	e68.6	e50.7	166	109	529	34.0	e4.69	30.2	6.93
23	34.2	201	e71.7	e67.4	e53.0	276	166	601	29.3	e4.28	36.8	9.30
24	34.6	171	e69.8	e66.3	e53.2	295	212	606	28.1	e3.91	49.5	8.59
25	32.4	145	e70.2	e67.1	e56.0	236	220	627	26.2	e3.63	33.7	7.22
26	28.6	122	e72.2	e68.7	e61.5	187	240	771	22.8	e3.41	22.8	6.95
27	26.8	116	e72.2	e70.8	e68.5	135	302	778	17.5	3.26	16.0	7.03
28	27.0	91.6	e72.6	e73.1	e70.7	119	407	679	20.6	2.54	19.8	6.74
29	25.4	77.9	e73.1	e75.4		112	539	581	16.2	3.03	17.4	5.76
30	24.9	94.2	e72.8	e77.4		96.7	550	513	14.8	2.88	15.5	4.99
31	23.5		e72.3	e78.1		116		489		3.74	20.3	
<b>Total</b>	2,089	2,545	2,284	2,165	1,831	4,313	5,389	16,490	4,106	302	608	485
<b>Mean</b>	67.4	84.8	73.7	69.8	65.4	139	180	532	137	9.75	19.6	16.2
<b>Max</b>	143	201	113	78.1	82.9	295	550	819	514	17.8	49.5	25.0
<b>Min</b>	23.5	21.5	50.5	65.8	48.7	67.9	93.2	196	14.8	2.54	4.43	4.99
<b>Ac-ft</b>	4,142	5,049	4,530	4,295	3,632	8,554	10,690	32,710	8,144	599	1,206	962

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 -2018, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	65.5	64.4	63.5	62.0	73.5	157	308	769	789	182	45.8	45.6
<b>Max</b>	437	198	181	147	312	627	671	1,957	2,564	1,355	340	288
<b>(WY)</b>	(1983)	(1974)	(1984)	(1984)	(1986)	(1986)	(1969)	(1984)	(1986)	(2011)	(1983)	(1983)
<b>Min</b>	3.03	6.06	7.21	6.76	10.4	26.8	77.7	104	47.3	4.41	.68	.49
<b>(WY)</b>	(1965)	(1989)	(1989)	(1989)	(2003)	(1977)	(1977)	(1977)	(2012)	(2000)	(2000)	(1988)

Figure 2018.18 (cont.)



## 10020300 BEAR RIVER BELOW RESERVOIR, NEAR WOODRUFF, UT

LOCATION.--Lat 41°30'20", long 111°00'50" referenced to North American Datum of 1927, in NE ¼ NE ¼ NW ¼ sec.32, T.18 N., R.120 W., Uinta County, WY, Hydrologic Unit 16010101, on right bank 1,100 ft downstream from Woodruff Narrows Dam, 1.6 mi upstream from Salt Creek, 5.4 mi upstream from Wyoming-Utah State line, and 7.7 mi east of Woodruff.

DRAINAGE AREA.--784 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1961 to current year.

REVISED RECORDS.--WDR UT-74-1: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 6,398.96 ft above NGVD of 1929. Prior to September 26, 1962, at site 175 ft upstream at same datum.

REMARKS.-- Flow regulated by Woodruff Narrows Reservoir (station 10020200) beginning January 1962. Diversions for irrigation of about 43,500 acres above station. Records are good, except estimated daily discharges which are poor, and other exceptions as noted. Aug 4 to Sep 30, 2014 records are fair (due to variable control conditions from rain storm event).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,820 ft<sup>3</sup>/s, Jun 2, 1983, gage height, 8.26 ft; no flow Jul 4, 5, 1962, Aug 30, 31, Sep 1, 2, 6, 7, 1979, Oct 30, 1980.

### DISCHARGE, CUBIC FEET PER SECOND WATER YEAR 2017-10-01 to 2018-09-30 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	14.3	14.1	64.2	65.2	19.5	20.7	107	510	762	51.0	10.9	39.4
2	14.3	14.2	64.2	65.2	19.5	20.7	116	459	735	51.0	10.3	39.1
3	14.6	14.2	64.5	65.2	19.6	20.7	120	390	726	50.7	10.3	38.9
4	14.5	14.2	65.2	65.2	19.9	21.3	122	331	723	50.1	9.49	39.3
5	14.2	14.2	65.2	65.2	19.9	21.3	121	278	719	49.8	9.64	39.6
6	14.2	14.2	65.2	65.2	19.5	21.3	121	252	716	49.2	9.92	39.6
7	14.1	14.2	65.2	65.2	19.6	21.3	126	259	715	48.7	9.69	38.9
8	14.2	14.2	65.2	65.2	20.0	21.3	133	334	714	48.3	11.0	39.5
9	14.2	14.2	65.0	38.4	20.0	21.4	146	440	710	48.3	12.0	39.6
10	14.2	14.2	65.2	20.1	20.0	21.3	146	543	705	48.3	32.8	39.7
11	14.2	14.2	65.2	19.9	19.9	21.1	135	647	701	47.7	38.4	39.8
12	14.2	14.2	65.2	19.5	19.5	21.3	130	740	699	47.4	38.1	40.0
13	14.2	14.2	65.2	19.5	19.7	21.4	133	753	696	47.4	38.8	39.9
14	14.2	14.5	65.2	19.3	19.9	21.5	133	673	691	47.4	38.4	39.9
15	13.9	14.7	65.2	19.5	19.8	20.1	128	573	685	47.2	38.7	39.8
16	13.8	14.7	65.2	19.5	20.1	20.1	137	526	679	47.4	38.9	39.8
17	13.8	14.7	65.2	19.1	20.1	20.1	115	521	674	47.3	38.3	39.9
18	13.8	14.7	65.3	19.5	20.2	20.1	114	559	668	47.3	38.9	36.1
19	13.6	14.7	66.0	19.5	20.4	20.1	112	594	659	47.4	38.7	23.1
20	13.6	14.7	65.5	19.5	20.6	20.1	110	570	653	47.4	38.7	18.0
21	13.6	14.7	65.2	19.5	20.6	20.1	107	551	644	47.8	38.9	17.7
22	13.7	14.7	65.2	19.5	20.1	20.2	108	548	638	48.3	39.3	17.5
23	13.8	14.7	65.2	19.5	20.0	20.7	119	837	631	47.7	39.3	17.1
24	14.1	14.7	65.1	19.5	20.4	20.7	141	1,160	623	47.3	39.3	16.7
25	14.0	14.7	65.2	19.5	20.6	21.4	168	1,020	614	47.5	39.0	16.5
26	14.2	14.7	65.0	19.3	20.5	40.9	194	948	606	47.7	39.1	16.7
27	14.2	14.7	65.2	19.4	20.7	69.4	230	947	208	23.2	39.8	16.7
28	14.2	49.7	65.2	19.5	20.7	83.7	294	948	53.1	14.2	39.8	16.8
29	14.2	73.7	65.2	19.5		92.9	375	943	51.4	14.0	39.3	16.8
30	14.2	64.6	65.2	19.5		96.0	487	938	50.9	13.4	39.7	16.8
31	14.2		65.2	19.5		97.8		825		12.9	39.5	
<b>Total</b>	437	578	2,019	989	561	1,001	4,728	19,620	18,150	1,333	945	919
<b>Mean</b>	14.1	19.3	65.1	31.9	20.0	32.3	158	633	605	43.0	30.5	30.6
<b>Max</b>	14.6	73.7	66.0	65.2	20.7	97.8	487	1160	762	51.0	39.8	40.0
<b>Min</b>	13.6	14.1	64.2	19.1	19.5	20.1	107	252	50.9	12.9	9.49	16.5
<b>Ac-ft</b>	866	1,147	4,005	1,962	1,113	1,985	9,378	38,910	36,000	2,645	1,874	1,823

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 2018, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	50.7	46.2	40.6	38.2	40.0	90.8	248	742	948	257	69.6	55.2
<b>Max</b>	425	421	184	153	171	648	891	1,828	2,437	1,339	331	278
<b>(WY)</b>	(1983)	(1983)	(1983)	(1985)	(1971)	(2017)	(1985)	(1984)	(1983)	(2011)	(1983)	(1983)
<b>Min</b>	3.89	.12	4.28	4.37	4.71	4.70	.34	27.8	357	10.4	3.91	3.65
<b>(WY)</b>	(1990)	(1981)	(1978)	(1978)	(1978)	(1978)	(1977)	(1977)	(2002)	(2002)	(1979)	(1979)

## 10028500 BEAR RIVER BELOW PIXLEY DAM, NEAR COKEVILLE, WY

LOCATION.--Lat 41°56'20", long 110°59'05" referenced to North American Datum of 1927, in SW ¼ SE ¼ SE ¼ sec.25, T.23 N., R.120 W., Lincoln County, WY, Hydrologic Unit 16010102, 800 ft downstream from Pixley Dam, 11 mi south of Cokeville, and 17.5 mi downstream from Twin Creek.

DRAINAGE AREA.--2,032 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1941 to November 1943 (published as Bear River near Cokeville), October 1952 to September 1956, May 1958 to current year (seasonal only). Monthly discharge only for some periods, published in WSP 1314.

REVISED RECORDS.--WDR UT-74-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 6,185 ft above NGVD of 1929, from river-profile map. October 31, 1941 to November 30, 1943, at site 200 ft downstream at different datum. September 24, 1952 to August 31, 1994 at site 50 ft downstream at same datum. May 7, 2015 to August 14, 2015 at site 850 ft upstream at same datum.

REMARKS.-- Natural flow of stream affected by diversions for irrigation, return flow from irrigated areas, and regulation by upstream reservoirs.

Records are fair except for estimated daily discharges which are poor and other periods as noted. 6/20/14 - 7/12/14; records are poor due to variable control conditions from backwater. 5/6/15 - 9/30/16, 3/18/16 - 5/16/16, 6/8/16 - 10/4/16, 3/21/17 - 10/2/17, 3/14/18 - 4/24/18; records are good.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 2,300 ft<sup>3</sup>/s, Mar 25, 1956; minimum daily discharge, 0.09 ft<sup>3</sup>/s, Sep 8, 2002.

### DISCHARGE, CUBIC FEET PER SECOND WATER YEAR 2017-10-01 to 2018-09-30 DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	122	---	---	---	---	---	193	93.4	125	124	49.5	11.2
2	---	---	---	---	---	---	198	112	135	87.2	46.0	10.1
3	---	---	---	---	---	---	201	127	138	61.5	46.4	9.77
4	---	---	---	---	---	---	201	139	186	63.6	43.2	9.76
5	---	---	---	---	---	---	198	133	219	190	39.7	9.53
6	---	---	---	---	---	---	190	138	204	152	39.2	9.32
7	---	---	---	---	---	---	203	125	194	125	38.8	8.73
8	---	---	---	---	---	---	211	112	189	118	37.3	8.55
9	---	---	---	---	---	---	212	99.2	169	119	33.6	8.35
10	---	---	---	---	---	---	210	90.2	157	109	32.6	8.42
11	---	---	---	---	---	---	205	90.0	113	105	35.8	8.61
12	---	---	---	---	---	---	202	99.6	79.6	100	36.0	8.72
13	---	---	---	---	---	---	140	113	77.2	93.3	35.1	10.5
14	---	---	---	---	---	---	120	123	76.6	91.0	33.3	11.0
15	---	---	---	---	---	271	120	121	78.0	89.0	33.6	10.6
16	---	---	---	---	---	299	119	104	82.0	89.3	34.0	9.89
17	---	---	---	---	---	258	116	91.7	82.4	85.0	32.9	9.44
18	---	---	---	---	---	214	113	84.2	85.8	79.8	30.5	10.8
19	---	---	---	---	---	190	107	80.7	90.2	75.1	29.4	12.6
20	---	---	---	---	---	180	103	84.7	94.2	69.2	26.9	11.7
21	---	---	---	---	---	175	101	87.8	126	63.2	26.1	13.8
22	---	---	---	---	---	176	99.6	89.4	152	57.3	24.5	16.0
23	---	---	---	---	---	202	95.8	94.9	149	53.5	21.8	19.0
24	---	---	---	---	---	255	96.1	96.4	150	53.7	19.7	21.0
25	---	---	---	---	---	240	76.9	96.8	180	52.8	17.9	24.5
26	---	---	---	---	---	214	19.3	102	195	51.8	15.7	24.6
27	---	---	---	---	---	198	30.6	98.2	184	48.4	12.9	25.1
28	---	---	---	---	---	185	47.9	103	152	46.4	12.8	22.6
29	---	---	---	---	---	180	63.6	107	134	49.3	12.0	12.8
30	---	---	---	---	---	183	76.6	111	131	51.3	15.4	19.3
31	---	---	---	---	---	188		119		54.1	13.0	
Total							4,069	3,266	4,128	2,607	926	396
Mean							136	105	138	84.1	29.9	13.2
Max							212	139	219	190	49.5	25.1
Min							19.3	80.7	76.6	46.4	12.0	8.35
Ac-ft							8,072	6,478	8,188	5,172	1,836	786

Figure 2018.18 (cont.)

## 10032000 SMITHS FORK NEAR BORDER, WY

LOCATION.--Lat 42°17'36", long 110°52'18" referenced to North American Datum of 1927, in NE ¼ SW ¼ SW ¼ sec.28, T.27 N., R.118 W., Lincoln County, WY, Hydrologic Unit 16010102, on left bank 4.9 mi upstream from Howland Creek, 5.6 mi downstream from Hobble Creek, and 12.4 mi northeast of Border.

DRAINAGE AREA.--165 mi<sup>2</sup>.

PERIOD OF RECORD.--May 1942 to current year.

REVISED RECORDS.--WSP 1734: 1952(M).

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 6,720 ft above NGVD of 1929, from topographic map. Prior to October 16, 1945, at site 1.2 mi downstream at different datum. October 16, 1945 to November 1986 at site 0.4 mi downstream at different datum.

REMARKS.-- Records good except for estimated daily discharges which are poor. One diversion for irrigation of about 200 acres above station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,100 ft<sup>3</sup>/s, Jun 4, 1986, gage height, 5.66 ft; minimum, 19 ft<sup>3</sup>/s, Feb 28, 2007.

### DISCHARGE, CUBIC FEET PER SECOND WATER YEAR 2017-10-01 to 2018-09-30 DAILY MEAN VALUES

[e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	131	94.5	96.3	e76.0	67.0	60.7	89.9	389	680	270	150	107
2	125	94.1	91.2	e76.3	67.0	64.5	93.1	351	613	263	151	105
3	122	104	92.8	e76.6	68.0	61.2	83.5	326	576	260	147	104
4	120	119	e87.7	e77.0	67.5	61.9	85.2	340	568	254	143	103
5	118	107	e90.0	e77.5	70.8	e60.2	84.1	387	579	247	140	103
6	116	101	e84.7	e77.4	68.0	e59.2	105	433	579	241	138	106
7	115	93.7	e79.8	e76.2	67.1	57.1	122	529	572	235	134	105
8	114	e88.9	e80.4	e75.7	66.4	e62.1	141	584	555	231	131	105
9	112	101	e86.5	75.8	65.9	62.4	129	631	535	228	128	103
10	111	97.1	e88.2	76.9	64.6	61.0	128	679	520	223	126	102
11	110	94.9	e89.3	76.0	62.6	58.5	140	726	487	219	124	100
12	109	90.5	e87.4	74.8	65.5	63.3	154	689	456	216	124	99.1
13	108	93.9	e86.7	73.0	64.6	64.3	136	639	435	210	125	98.5
14	110	93.9	e84.6	e73.0	64.8	74.5	125	583	424	207	123	97.9
15	107	90.7	e87.8	e73.0	65.9	88.4	126	567	416	202	121	96.3
16	108	96.4	83.2	e72.7	66.4	78.1	139	565	404	200	119	94.8
17	106	111	81.6	e75.8	65.6	75.6	162	581	400	197	119	94.8
18	105	e95.5	80.9	e75.5	e66.6	e66.7	142	581	424	190	118	93.9
19	104	e87.9	e81.0	73.8	e64.4	71.7	148	558	389	185	118	93.9
20	104	94.1	79.8	72.1	e57.3	68.6	174	549	367	181	119	93.7
21	104	99.5	e78.2	71.3	e52.7	68.0	234	565	350	178	120	94.2
22	103	99.2	e79.0	e59.8	e53.5	74.9	289	606	339	185	125	93.5
23	101	101	e79.1	e64.8	e58.0	103	328	633	330	182	128	92.6
24	100	105	e69.2	e68.8	e62.5	92.3	300	629	319	173	119	92.2
25	99.9	104	e74.4	e71.3	e64.7	84.2	307	664	309	169	115	92.6
26	98.9	99.8	e78.3	e74.5	e65.7	79.1	344	701	301	164	114	90.8
27	96.9	99.0	e79.9	71.2	63.7	75.4	393	730	294	162	119	88.8
28	95.6	97.0	79.8	69.0	e61.8	78.3	449	701	286	159	117	88.1
29	94.8	92.2	81.1	68.5		76.0	471	664	281	155	112	87.8
30	95.2	86.4	79.0	68.0		77.2	453	641	277	153	109	86.6
31	94.3		e75.7	67.1		82.1		662		151	108	
<b>Total</b>	3,338	2,932	2,574	2,259	1,799	2,210	6,075	17,880	13,060	6,290	3,884	2,913
<b>Mean</b>	108	97.7	83.0	72.9	64.2	71.3	202	577	436	203	125	97.1
<b>Max</b>	131	119	96.3	77.5	70.8	103	471	730	680	270	151	107
<b>Min</b>	94.3	86.4	69.2	59.8	52.7	57.1	83.5	326	277	151	108	86.6
<b>Ac-ft</b>	6,622	5,816	5,104	4,481	3,567	4,384	12,050	35,470	25,910	12,480	7,704	5,778

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 2018, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	90.7	78.4	68.3	63.0	60.5	63.9	163	528	610	288	150	108
<b>Max</b>	156	114	88.4	85.0	87.5	159	446	1,072	1,377	779	280	169
<b>(WY)</b>	(1987)	(1986)	(1983)	(1983)	(2017)	(2017)	(2017)	(1997)	(1986)	(2011)	(2011)	(2011)
<b>Min</b>	51.0	50.7	41.5	39.7	34.7	39.5	58.6	99.1	96.2	61.4	55.1	52.1
<b>(WY)</b>	(1978)	(1978)	(2002)	(2008)	(2003)	(1988)	(1975)	(1977)	(1977)	(1977)	(1977)	(1977)

Figure 2018.18 (cont.)

## 10039500 BEAR RIVER AT BORDER, WY

LOCATION.--Lat 42°12'40", long 111°03'11" referenced to North American Datum of 1927, in NE ¼ NE ¼ NE ¼ sec.15, T.14 S., R.46 E., Bear Lake County, ID, Hydrologic Unit 16010102, on left bank 0.2 mi west of Wyoming-Idaho State line, 0.5 mi west of Border, and 2.1 mi upstream from Thomas Fork.

DRAINAGE AREA.--2,480 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1937 to September 1996, October 1996 to September 2000 (seasonal), October 2000 to current year.

REVISED RECORDS.--WDR UT-74-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 6,051.63 ft above NGVD of 1929, unadjusted.

REMARKS.-- Natural flow of stream affected by regulation of upstream reservoirs, diversions for irrigation, and return flow from irrigated areas.

Records are good except estimated discharges which are poor and the following exceptions: March 13 to August 15, 2017 which is rated fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,880 ft<sup>3</sup>/s, Jun 7, 1983, gage height, 9.69 ft; minimum discharge, 24 ft<sup>3</sup>/s, Apr 29, 30, 1977.

### DISCHARGE, CUBIC FEET PER SECOND WATER YEAR 2017-10-01 to 2018-09-30 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	273	234	265	e244	e216	e235	396	574	742	388	145	109
2	266	244	275	e240	e218	e239	417	542	764	378	144	92.3
3	258	244	282	e234	e225	e239	404	535	721	332	141	90.8
4	247	257	e283	e236	e239	e240	394	555	701	341	129	93.0
5	246	283	e267	e238	e262	e240	389	564	745	402	124	89.0
6	256	277	e267	e243	e291	e234	397	580	734	487	133	78.4
7	279	273	e273	e239	e305	e232	423	630	699	400	141	81.6
8	277	263	e277	e246	e296	e235	464	684	663	362	140	80.6
9	273	266	e282	e251	e284	e234	465	680	644	348	134	79.6
10	269	271	e283	e252	e278	e247	449	674	593	350	126	78.0
11	264	268	e283	e254	e265	e274	443	721	582	326	107	84.3
12	261	265	e285	e256	e258	e323	457	769	522	307	106	89.2
13	258	262	e287	e248	e263	e402	449	811	485	290	121	91.1
14	263	265	e287	e239	e260	450	361	768	467	270	122	92.0
15	262	264	e287	e232	e256	635	332	720	463	257	118	93.1
16	259	264	e295	e226	e252	636	333	684	459	248	116	90.9
17	258	300	e293	e224	e246	552	340	667	454	253	107	90.8
18	258	e273	e282	e223	e243	483	344	678	492	243	102	98.4
19	254	e250	e277	e223	e231	417	325	680	493	232	100	98.7
20	253	e259	e274	e222	e221	387	319	611	467	220	100	99.5
21	250	e285	e267	e219	e223	371	336	598	449	212	107	100
22	247	e283	e264	e213	e224	370	360	615	480	210	117	88.6
23	247	294	e248	e211	e225	426	432	691	491	228	122	86.2
24	244	298	e238	e208	e225	506	434	703	476	224	127	87.5
25	242	298	e239	e210	e224	499	416	693	462	204	117	84.6
26	222	286	e234	e208	e223	451	408	705	485	203	113	89.3
27	221	290	e236	e208	e223	415	395	716	470	195	111	90.4
28	222	288	e258	e210	e227	400	434	725	445	188	111	89.0
29	222	283	e261	e213		387	496	727	401	176	110	90.1
30	222	270	e254	e213		375	556	699	389	153	105	90.7
31	228		e247	e214		382		714		147	107	
<b>Total</b>	7,801	8,157	8,350	7,097	6,903	11,520	12,170	20,710	16,440	8,574	3,703	2,697
<b>Mean</b>	252	272	269	229	247	371	406	668	548	277	119	89.9
<b>Max</b>	279	300	295	256	305	636	556	811	764	487	145	109
<b>Min</b>	221	234	234	208	216	232	319	535	389	147	100	78.0
<b>Ac-ft</b>	15,470	16,180	16,560	14,080	13,690	22,840	24,140	41,080	32,600	17,010	7,345	5,349

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 2018, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	197	215	187	172	196	370	701	971	1,127	526	217	169
<b>Max</b>	752	693	563	381	479	1,640	2,220	3,158	3,829	2,837	752	671
<b>(WY)</b>	(1983)	(1983)	(1983)	(1985)	(1986)	(2017)	(2017)	(1952)	(1983)	(2011)	(1983)	(1983)
<b>Min</b>	43.5	74.7	97.2	77.6	75.2	105	71.2	74.4	62.2	54.2	42.3	38.5
<b>(WY)</b>	(2002)	(2002)	(2002)	(1993)	(1993)	(1988)	(1977)	(1977)	(1977)	(1977)	(1940)	(1940)

# Daily Mean by Year

Rainbow Inlet Canal WY2018

**Identifier:** Discharge.Daily Average@10046000  
**Location:** Rainbow Inlet Canal near Dingle ID  
**Units:** ft<sup>3</sup>/s  
**Filter:** None

Year: WY2018

1843

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	318 UN	250 UN	319 UN	288 UN	267 UN	265 UN	417 UN	515 UN	426 UN	240 UN	78.0 UN	52.0 UN
2	320 UN	251 UN	314 UN	279 UN	269 UN	263 UN	412 UN	540 UN	435 UN	230 UN	40.0 UN	45.0 UN
3	322 UN	256 UN	315 UN	274 UN	276 UN	270 UN	413 UN	533 UN	446 UN	220 UN	40.0 UN	45.0 UN
4	325 UN	259 UN	314 UN	263 UN	284 UN	273 UN	416 UN	526 UN	438 UN	200 UN	40.0 UN	42.0 UN
5	322 UN	266 UN	297 UN	249 UN	298 UN	265 UN	414 UN	514 UN	453 UN	200 UN	45.0 UN	35.0 UN
6	317 UN	278 UN	299 UN	243 UN	312 UN	258 UN	412 UN	513 UN	490 UN	320 UN	40.0 UN	18.0 UN
7	316 UN	300 UN	296 UN	242 UN	321 UN	266 UN	413 UN	530 UN	491 UN	320 UN	40.0 UN	18.0 UN
8	319 UN	303 UN	319 UN	256 UN	332 UN	278 UN	426 UN	550 UN	468 UN	280 UN	45.0 UN	18.0 UN
9	321 UN	297 UN	326 UN	249 UN	332 UN	282 UN	448 UN	569 UN	412 UN	280 UN	54.0 UN	18.0 UN
10	320 UN	301 UN	303 UN	248 UN	333 UN	283 UN	460 UN	510 UN	374 UN	260 UN	54.0 UN	22.0 UN
11	317 UN	295 UN	297 UN	273 UN	354 UN	294 UN	459 UN	464 UN	356 UN	260 UN	54.0 UN	22.0 UN
12	311 UN	296 UN	300 UN	261 UN	334 UN	315 UN	458 UN	468 UN	325 UN	255 UN	52.0 UN	22.0 UN
13	307 UN	298 UN	296 UN	256 UN	316 UN	338 UN	458 UN	509 UN	294 UN	174 UN	50.0 UN	13.0 UN
14	303 UN	300 UN	303 UN	273 UN	313 UN	384 UN	465 UN	526 UN	262 UN	174 UN	45.0 UN	13.0 UN
15	300 UN	304 UN	308 UN	261 UN	310 UN	427 UN	456 UN	510 UN	231 UN	174 UN	45.0 UN	10.0 UN
16	318 UN	299 UN	292 UN	266 UN	307 UN	526 UN	438 UN	501 UN	200 UN	170 UN	23.0 UN	10.0 UN
17	323 UN	309 UN	306 UN	250 UN	302 UN	581 UN	424 UN	540 UN	210 UN	160 UN	20.0 UN	10.0 UN
18	295 UN	320 UN	294 UN	246 UN	292 UN	572 UN	416 UN	528 UN	230 UN	160 UN	23.0 UN	10.0 UN
19	294 UN	315 UN	300 UN	244 UN	322 UN	536 UN	409 UN	499 UN	226 UN	160 UN	23.0 UN	10.0 UN
20	290 UN	281 UN	291 UN	249 UN	313 UN	498 UN	372 UN	494 UN	300 UN	118 UN	23.0 UN	18.0 UN
21	285 UN	297 UN	317 UN	303 UN	289 UN	468 UN	372 UN	463 UN	300 UN	110 UN	30.0 UN	23.0 UN
22	283 UN	316 UN	306 UN	282 UN	286 UN	447 UN	367 UN	469 UN	247 UN	105 UN	30.0 UN	28.0 UN
23	278 UN	319 UN	286 UN	257 UN	278 UN	437 UN	376 UN	481 UN	250 UN	105 UN	30.0 UN	28.0 UN
24	276 UN	328 UN	298 UN	263 UN	274 UN	451 UN	396 UN	500 UN	245 UN	105 UN	32.0 UN	23.0 UN
25	272 UN	331 UN	283 UN	253 UN	271 UN	500 UN	410 UN	507 UN	245 UN	105 UN	34.0 UN	23.0 UN
26	270 UN	334 UN	267 UN	256 UN	272 UN	504 UN	399 UN	488 UN	245 UN	92.0 UN	37.0 UN	23.0 UN
27	263 UN	330 UN	283 UN	251 UN	267 UN	487 UN	391 UN	469 UN	245 UN	90.0 UN	37.0 UN	26.0 UN
28	258 UN	331 UN	274 UN	251 UN	269 UN	470 UN	388 UN	455 UN	260 UN	90.0 UN	37.0 UN	28.0 UN
29	258 UN	330 UN	271 UN	256 UN		455 UN	457 UN	446 UN	250 UN	90.0 UN	40.0 UN	32.0 UN
30	263 UN	324 UN	275 UN	261 UN		445 UN	481 UN	441 UN	240 UN	88.0 UN	40.0 UN	35.0 UN
31	257 UN		292 UN	264 UN		430 UN		433 UN		82.0 UN	52.0 UN	
<b>Aggr</b>	297	301	298	260	300	396	421	500	320	175	39.8	24.0
<b>Min</b>	257	250	267	242	267	258	367	433	200	82.0	20.0	10.0
<b>Max</b>	325	334	326	303	354	581	481	569	491	320	78.0	52.0
<b>Total</b>	18300	17900	18300	16000	16600	24300	25000	30700	19000	10700	2450	1430

Date Processed: February 7, 2019 13:07

**PacifiCorp  
Reservoir Level Records  
Bear Lake 2017-2018**

**Daily Stage (Ft) Add 5900 for Elevation**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	20.98	20.63	20.18	19.81	19.50	19.21	19.28	19.75	20.38	19.90	18.74	17.38	1
2	20.98	20.63	20.18	19.80	19.47	19.20	19.28	19.77	20.38	19.87	18.69	17.32	2
3	20.98	20.61	20.17	19.78	19.44	19.20	19.29	19.77	20.40	19.83	18.64	17.28	3
4	20.98	20.59	20.16	19.78	19.42	19.19	19.29	19.81	20.41	19.80	18.60	17.25	4
5	20.98	20.57	20.14	19.75	19.41	19.18	19.30	19.83	20.41	19.75	18.55	17.22	5
6	20.97	20.55	20.12	19.74	19.40	19.17	19.31	19.85	20.42	19.71	18.50	17.19	6
7	20.96	20.55	20.10	19.73	19.39	19.17	19.32	19.87	20.43	19.71	18.44	17.15	7
8	20.95	20.54	20.08	19.72	19.39	19.17	19.33	19.89	20.44	19.62	18.38	17.12	8
9	20.95	20.53	20.06	19.71	19.38	19.16	19.34	19.91	20.44	19.58	18.33	17.09	9
10	20.91	20.52	20.04	19.71	19.37	19.15	19.35	19.92	20.44	19.54	18.28	17.06	10
11	20.90	20.51	20.02	19.70	19.36	19.14	19.36	19.94	20.44	19.50	18.23	17.03	11
12	20.89	20.50	20.01	19.70	19.35	19.13	19.38	19.96	20.43	19.46	18.19	17.00	12
13	20.88	20.49	20.00	19.69	19.34	19.12	19.39	19.96	20.42	19.42	18.15	16.97	13
14	20.87	20.46	19.99	19.69	19.33	19.12	19.42	20.00	20.40	19.38	18.09	16.94	14
15	20.87	20.42	19.98	19.68	19.32	19.12	19.45	20.02	20.37	19.33	18.03	16.90	15
16	20.86	20.40	19.97	19.67	19.30	19.12	19.48	20.04	20.33	19.29	17.99	16.86	16
17	20.85	20.38	19.96	19.66	19.28	19.13	19.50	20.06	20.33	19.25	17.94	16.82	17
18	20.84	20.37	19.94	19.64	19.27	19.13	19.52	20.08	20.30	19.21	17.89	16.79	18
19	20.83	20.36	19.92	19.63	19.26	19.14	19.54	20.10	20.27	19.18	17.84	16.76	19
20	20.81	20.34	19.91	19.62	19.26	19.15	19.55	20.12	20.27	19.15	17.86	16.74	20
21	20.79	20.32	19.89	19.61	19.26	19.16	19.56	20.14	20.20	19.12	17.74	16.70	21
22	20.77	20.30	19.87	19.60	19.26	19.17	19.58	20.15	20.17	19.10	17.69	16.65	22
23	20.75	20.28	19.87	19.60	19.26	19.18	19.60	20.17	20.14	19.07	17.64	16.63	23
24	20.74	20.26	19.86	19.59	19.25	19.19	19.62	20.19	20.10	19.04	17.60	16.60	24
25	20.72	20.22	19.86	19.58	19.25	19.20	19.64	20.21	20.06	18.99	17.56	16.56	25
26	20.70	20.20	19.86	19.57	19.24	19.21	19.66	20.24	20.03	18.96	17.52	16.54	26
27	20.69	20.18	19.85	19.59	19.23	19.22	19.68	20.27	20.00	18.93	17.50	16.52	27
28	20.67	20.18	19.84	19.55	19.22	19.23	19.69	20.30	19.97	18.90	17.48	16.50	28
29	20.66	20.18	19.83	19.53		19.24	19.71	20.33	19.95	18.87	17.44	16.49	29
30	20.65	20.18	19.83	19.52		19.25	19.73	20.35	19.92	18.84	17.41	16.48	30
31	20.64		19.82	19.51		19.26		20.37		18.79	17.38		31

18.44

**BEAR LAKE STATISTICS**

**Monthly**

**Yearly**

Daily Mean	20.84	20.41	19.98	19.66	19.33	19.17	19.47	20.04	20.28	19.33	18.01	16.88	19.45
Daily Min	20.64	20.18	19.82	19.51	19.22	19.12	19.28	19.75	19.92	18.79	17.38	16.48	16.48
Daily Max	20.98	20.63	20.18	19.81	19.50	19.26	19.73	20.37	20.44	19.90	18.74	17.38	20.98

Notes: Based on lake elevations taken at Utah State Park Marina.

# Daily Mean by Year

Bear Lake Outlet Canal - Final Reviewed Data

**Identifier:** Discharge.Working Daily Average@10059500  
**Location:** Bear Lake Outlet Canal near Paris ID  
**Units:** ft<sup>3</sup>/s  
**Filter:** None

Water Year: 2018

**Aggr:** 676      **Min:** 0      **Max:** 1520

18.45

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0 G	745 G	1110 G	735 G	742 G	599 G	0 G	0 G	293 G	1150 G	1270 G	815 G
2	0 G	749 G	1070 G	734 G	745 G	607 G	0 G	0 G	287 G	1240 G	1280 G	890 G
3	0 G	752 G	1070 G	733 G	745 G	608 G	0 G	0 G	286 G	1370 G	1280 G	868 G
4	224 G	762 G	1070 G	733 G	743 G	618 G	0 G	0 G	286 G	1380 G	1290 G	914 G
5	444 G	767 G	1070 G	723 G	751 G	609 G	0 G	0 G	291 G	1310 G	1290 G	976 G
6	445 G	770 G	955 G	718 G	749 G	608 G	0 G	0 G	394 G	1220 G	1250 G	1000 G
7	441 G	767 G	796 G	716 G	751 G	607 G	0 G	0 G	545 G	1220 G	1210 G	1010 G
8	448 G	765 G	797 G	715 G	753 G	458 G	0 G	0 G	547 G	1210 G	1120 G	930 G
9	443 G	763 G	764 G	714 G	755 G	274 G	0 G	0 G	586 G	1210 G	1000 G	851 G
10	446 G	763 G	763 G	717 G	767 G	274 G	0 G	0 G	698 G	1210 G	998 G	845 G
11	446 G	829 G	751 G	714 G	751 G	275 G	0 G	0 G	702 G	1200 G	1060 G	840 G
12	450 G	918 G	737 G	713 G	750 G	279 G	0 G	0 G	883 G	1280 G	1140 G	835 G
13	446 G	944 G	733 G	713 G	748 G	281 G	0 G	0 G	1090 G	1410 G	1140 G	716 G
14	714 G	944 G	723 G	711 G	744 G	326 G	0 G	0 G	1120 G	1430 G	1140 G	562 G
15	975 G	922 G	721 G	710 G	744 G	398 G	0 G	0 G	1220 G	1430 G	1130 G	564 G
16	953 G	999 G	728 G	708 G	739 G	453 G	0 G	0 G	1440 G	1430 G	1080 G	565 G
17	858 G	1190 G	724 G	707 G	736 G	575 G	0 G	0 G	1470 G	1390 G	1020 G	569 G
18	780 G	1300 G	723 G	706 G	740 G	648 G	0 G	0 G	1500 G	1290 G	1060 G	465 G
19	765 G	1160 G	722 G	721 G	746 G	637 G	0 G	0 G	1520 G	1150 G	1130 G	373 G
20	758 G	1350 G	724 G	736 G	751 G	405 G	0 G	0 G	1410 G	1080 G	1130 G	371 G
21	754 G	1410 G	726 G	747 G	740 G	0 G	0 G	0 G	1220 G	1070 G	1130 G	370 G
22	749 G	1300 G	728 G	769 G	728 G	0 G	0 G	0 G	1210 G	1060 G	1130 G	300 G
23	747 G	1120 G	730 G	744 G	727 G	225 G	0 G	0 G	1210 G	1050 G	1070 G	200 G
24	747 G	1120 G	732 G	721 G	725 G	564 G	0 G	0 G	1200 G	1040 G	969 G	192 G
25	746 G	1120 G	734 G	715 G	717 G	646 G	0 G	0 G	1190 G	1120 G	960 G	188 G
26	745 G	1120 G	736 G	708 G	716 G	646 G	0 G	98.8 G	1180 G	1240 G	843 G	98.1 G
27	744 G	1070 G	738 G	707 G	662 G	641 G	0 G	264 G	1180 G	1240 G	727 G	0 G
28	741 G	62.0 G	740 G	707 G	600 G	640 G	0 G	267 G	1170 G	1240 G	723 G	0 G
29	739 G	370 G	740 G	717 G		632 G	0 G	275 G	1160 G	1250 G	716 G	0 G
30	741 G	1110 G	738 G	726 G		608 G	0 G	289 G	1160 G	1260 G	708 G	0 G
31	747 G		733 G	739 G		335 G		288 G		1270 G	703 G	
<b>Aggr</b>	588	932	801	722	734	467	0	47.8	949	1240	1050	544
<b>Min</b>	0	62.0	721	706	600	0	0	0	286	1040	703	0
<b>Max</b>	975	1410	1110	769	767	648	0	289	1520	1430	1290	1010
<b>Tot. (af)</b>	36200	55500	49200	44400	40800	28700	0	2940	56500	76300	64900	32400

Date Processed: November 2, 2018 17:03

## 10092700 BEAR RIVER AT IDAHO-UTAH STATE LINE

LOCATION.--Lat 42°00'47", long 111°55'14" referenced to North American Datum of 1927, in NE ¼ NW ¼ NE ¼ sec.29, T.16 S., R.39 E., Franklin County, ID, Hydrologic Unit 16010202, on left bank 1,050 ft downstream from inlet canal to Cub River pumps, 1.1 mi downstream from Weston Creek, 1.8 mi upstream from Idaho-Utah State line, and 3.5 mi southeast of Weston.

PERIOD OF RECORD.--October 1970 to current year.

REVISED RECORDS.--WDR UT-74-1: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 4,420 ft above NGVD of 1929, from topographic map. Prior to September 10, 1982 at datum 12.00 ft higher. September 10, 1982 to September 30, 1985 at datum 10.0 ft higher.

REMARKS.-- Records good except for estimated daily discharges, which are poor. Natural flow of stream affected by storage reservoirs, power developments, diversions for irrigation, and return flow from irrigated areas.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,870 ft<sup>3</sup>/s, Jun 14, 1984, gage height, 19.20 ft, present datum; maximum gage height, 20.25 ft, Jun 21, 1971, present datum; minimum daily discharge, 24 ft<sup>3</sup>/s, May 16, 2004.

### DISCHARGE, CUBIC FEET PER SECOND WATER YEAR 2017-10-01 to 2018-09-30 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	478	1,470	960	1,540	1,460	1,340	1,520	1,030	577	742	987	713
2	464	1,430	1,410	1,560	1,440	1,360	1,400	1,010	544	794	1,000	708
3	461	1,520	1,670	1,420	1,460	1,380	1,150	943	578	733	996	706
4	453	1,560	1,820	1,300	1,540	1,380	976	915	529	869	987	728
5	463	1,710	1,820	1,300	1,560	1,340	934	982	412	958	991	820
6	633	1,740	1,820	1,320	1,640	1,320	935	1,030	374	920	974	816
7	948	1,560	1,700	1,450	1,640	1,320	1,090	1,080	340	898	978	759
8	1,060	1,600	1,580	1,550	1,630	1,260	1,280	921	385	852	985	728
9	1,060	1,580	1,280	1,550	1,630	1,130	1,320	786	418	830	938	737
10	1,060	1,530	1,240	1,570	1,620	1,000	1,180	765	411	819	942	668
11	1,050	1,630	1,230	1,580	1,610	875	1,130	733	406	817	915	701
12	1,040	1,710	1,230	1,530	1,560	843	1,180	787	396	816	773	693
13	1,510	1,520	1,230	1,640	1,500	833	1,200	749	413	891	768	715
14	1,730	1,600	1,280	1,560	1,470	918	1,180	737	439	914	777	716
15	1,640	1,800	1,280	1,480	1,480	1,210	1,150	882	525	940	881	681
16	1,540	1,660	1,310	1,450	1,470	1,220	1,140	836	674	965	890	613
17	1,540	1,720	1,450	1,410	1,470	1,310	1,080	765	746	987	841	559
18	1,630	1,750	1,410	1,350	1,440	1,380	1,050	666	778	1,030	778	534
19	1,740	1,680	1,430	1,400	1,450	1,480	1,010	631	866	966	803	478
20	1,530	1,710	1,440	1,470	1,390	1,460	1,010	581	1,020	840	801	474
21	1,500	1,710	1,460	1,460	1,360	1,620	1,030	591	980	790	854	471
22	1,490	1,740	1,480	1,440	1,320	1,790	1,040	625	912	731	916	481
23	1,510	1,740	1,360	1,340	1,240	1,940	1,040	586	892	699	967	481
24	1,440	1,740	1,420	1,260	1,250	2,040	1,040	501	884	730	1,000	475
25	1,440	1,730	1,250	1,350	1,210	1,580	908	477	922	756	985	432
26	1,450	1,720	1,350	1,410	1,230	1,560	936	453	914	792	943	403
27	1,520	1,730	1,340	1,410	1,370	1,510	959	440	880	877	839	397
28	1,430	1,740	1,300	1,420	1,290	1,460	982	427	832	821	814	396
29	1,490	1,620	1,390	1,420		1,500	984	455	727	916	753	400
30	1,490	1,220	1,520	1,440		1,520	1,040	538	733	987	689	402
31	1,490		1,520	1,470		1,520		582		873	670	
<b>Total</b>	38,280	49,170	43,980	44,850	40,730	42,400	32,870	22,500	19,510	26,550	27,430	17,890
<b>Mean</b>	1,235	1,639	1,419	1,447	1,455	1,368	1,096	726	650	857	885	596
<b>Max</b>	1740	1800	1820	1640	1640	2040	1520	1080	1020	1030	1000	820
<b>Min</b>	453	1220	960	1260	1210	833	908	427	340	699	670	396
<b>Ac-ft</b>	75,930	97,530	87,230	88,960	80,790	84,100	65,210	44,640	38,690	52,669	54,420	35,470

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1971 - 2018, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	800	857	864	845	878	1,077	1,281	1,316	1,190	947	882	814
<b>Max</b>	2,849	2,983	2,552	1,904	2,556	3,264	3,594	3,968	4,263	3,442	2,416	2,545
<b>(WY)</b>	(1984)	(1984)	(1985)	(1984)	(1986)	(1986)	(1986)	(1986)	(1986)	(1983)	(1984)	(1986)
<b>Min</b>	224	298	310	269	296	351	351	158	301	368	461	192
<b>(WY)</b>	(2004)	(1993)	(1982)	(2004)	(2002)	(1991)	(2003)	(2003)	(2004)	(2006)	(1993)	(1992)



**10109001 COMBINED DISCHARGE, IN CUBIC FEET PER SECOND, OF LOGAN RIVER ABOVE STATE DAM AND  
CACHE HIGHLINE CANAL LOGAN, HYDE PARK AND SMITHFIELD CANAL NEAR LOGAN, UTAH**

Water-Data Report 2018 REVISED RECORDS.--WDR UT-04-1: Discharge.

**DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR 2017-10-01 to 2018-09-30  
DAILY MEAN VALUES**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	226	189	167	140	129	122	169	421	630	261	177	149
2	224	188	169	138	129	121	184	379	583	254	177	149
3	221	194	168	135	133	122	173	355	537	254	177	145
4	218	207	171	134	135	123	165	365	523	253	176	145
5	218	203	162	140	140	120	162	408	514	244	175	143
6	214	193	160	141	136	120	186	460	506	238	172	141
7	212	186	157	141	132	122	211	528	493	238	170	148
8	211	181	153	139	132	130	254	562	476	236	167	146
9	209	180	149	141	134	128	236	597	460	230	167	146
10	207	180	148	149	132	122	221	641	448	230	166	143
11	206	181	149	145	132	122	224	667	422	226	167	141
12	206	177	151	144	130	123	246	616	404	223	166	138
13	206	175	151	141	128	126	235	554	386	218	163	139
14	206	175	153	139	128	132	221	521	381	220	164	138
15	204	175	150	138	130	142	219	508	372	216	161	138
16	202	174	155	137	124	137	214	531	362	211	161	138
17	202	224	154	136	126	139	222	570	356	210	161	134
18	202	187	153	136	134	133	209	599	364	205	160	134
19	201	180	152	139	131	131	210	598	342	198	161	132
20	202	176	154	137	128	128	214	601	326	203	159	131
21	202	180	151	136	121	129	222	620	315	199	158	130
22	200	180	144	129	124	135	246	619	310	199	160	130
23	197	182	152	134	127	169	292	616	306	197	162	131
24	195	185	141	131	122	169	309	620	302	194	157	130
25	195	184	151	132	126	163	308	655	291	191	156	131
26	194	180	149	132	123	155	336	670	286	190	155	131
27	193	178	146	131	124	149	381	666	284	187	155	131
28	192	178	145	132	123	149	438	652	273	185	155	128
29	192	174	148	131		149	507	635	271	185	153	129
30	191	170	146	131		153	484	618	267	181	151	128
31	189		144	130		160		629		179	150	
<b>Total</b>	6,337	5,516	4,743	4,239	3,613	4,223	7,698	17,480	11,790	6,655	5,059	4,117
<b>Mean</b>	204	184	153	137	129	136	257	564	393	215	163	137
<b>Max</b>	226	224	171	149	140	169	507	670	630	261	177	149
<b>Min</b>	189	170	141	129	121	120	162	355	267	179	150	128
<b>Ac-ft</b>	12,570	10,940	9,408	8,408	7,166	8,376	15,270	34,670	23,390	13,200	10,030	8,166

**STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1922 - 2018, BY WATER YEAR (WY)**

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	147	130	116	109	108	125	253	592	640	336	209	168
<b>Max</b>	262	221	187	165	230	405	629	1,186	1,465	1,118	477	312
<b>(WY)</b>	(2012)	(2012)	(1984)	(2012)	(2017)	(2017)	(1986)	(1936)	(1986)	(2011)	(2011)	(2011)
<b>Min</b>	74.2	71.9	69.0	63.1	61.6	80.3	111	163	141	103	86.4	79.9
<b>(WY)</b>	(1935)	(1993)	(1993)	(1993)	(1993)	(1942)	(1991)	(1977)	(1934)	(1934)	(1992)	(1934)

Figure 2018.18 (cont.)

### 10126000 BEAR RIVER NEAR CORINNE, UT

LOCATION.--Lat 41°34'35", long 112°06'00" referenced to North American Datum of 1927, in NE ¼ SE ¼ NE ¼ sec.30, T.10 N., R.2 W., Box Elder County, UT, Hydrologic Unit 16010204, on right bank 1.2 mi downstream from Salt Creek, 2.0 mi northeast of Corinne, and 2.8 mi downstream from Malad River.

DRAINAGE AREA.--7,029 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1949 to September 1957, October 1963 to current year.

REVISED RECORDS.--WRD UT-74-1: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 4,204.6 ft above NGVD of 1929, unadjusted. Auxiliary nonrecording gage 7,800 ft downstream July 27, 1950 to November 21, 1955.

REMARKS.-- Records good except for estimated daily discharges, which are poor. Natural flow of stream affected by Cutler Dam many miles upstream of gage, power development, diversions for irrigation, and return flow from irrigated areas and backwater from Bear River Bird Refuge about 5 miles downstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,770 ft<sup>3</sup>/s, May 19, 1984, gage height, 17.50 ft; minimum daily discharge, 23 ft<sup>3</sup>/s, Jul 30, 2004.

#### DISCHARGE, CUBIC FEET PER SECOND WATER YEAR 2017-10-01 to 2018-09-30 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	1,070	1,850	2,450	2,190	2,310	1,970	2,530	2,570	978	134	161	156
2	1,190	1,910	2,180	2,180	2,360	1,990	2,480	2,410	962	138	157	171
3	925	2,190	1,900	2,110	2,340	1,980	2,180	2,360	1,090	141	158	175
4	743	2,120	2,000	2,130	2,320	1,970	2,460	1,960	986	144	154	184
5	815	2,320	2,260	2,100	2,330	2,040	2,320	1,590	823	149	156	199
6	996	2,480	2,420	2,080	2,360	2,100	2,040	1,400	640	163	162	210
7	1,060	2,360	2,460	2,200	2,460	2,060	1,990	1,420	343	158	163	197
8	1,000	2,450	2,470	2,150	2,430	1,960	2,090	1,390	259	155	162	184
9	1,050	2,440	2,460	2,150	2,410	1,890	2,250	1,550	265	160	162	180
10	1,380	2,310	2,300	2,190	2,480	1,850	2,600	1,600	142	163	157	189
11	1,600	2,240	2,070	2,250	2,490	1,820	2,650	1,530	112	154	158	206
12	1,620	2,310	1,940	2,340	2,400	1,760	2,610	1,620	111	149	157	228
13	1,580	2,270	1,950	2,340	2,290	1,710	2,490	1,850	133	138	159	217
14	1,540	2,280	1,950	2,380	2,190	1,870	2,570	1,990	158	129	154	200
15	1,510	2,280	2,030	2,410	2,110	1,860	2,910	1,930	174	127	149	201
16	1,700	2,260	2,030	2,370	2,020	2,060	2,740	1,730	184	128	147	217
17	1,980	2,430	2,070	2,280	2,130	2,420	2,430	1,580	206	129	150	238
18	1,930	2,780	2,090	2,290	2,060	2,530	2,250	1,410	204	135	150	238
19	1,890	3,100	2,060	2,270	2,090	2,410	2,420	1,480	167	148	152	234
20	1,900	2,810	2,120	2,230	2,070	2,360	2,320	1,460	154	157	151	228
21	1,910	2,500	2,070	2,310	2,090	2,430	2,130	1,400	142	156	154	212
22	1,970	2,510	2,160	2,330	2,020	2,720	2,110	1,280	137	159	159	186
23	1,980	2,490	2,230	2,280	1,930	2,670	2,120	1,150	138	165	171	180
24	1,870	2,530	2,110	2,190	1,810	2,840	2,180	1,130	131	168	177	188
25	1,890	2,530	2,250	2,210	2,010	3,070	2,240	1,170	135	166	180	210
26	1,830	2,580	2,180	2,110	1,920	3,210	2,320	1,040	138	167	175	e217
27	1,820	2,570	2,000	2,060	1,830	3,360	2,210	852	140	166	525	e211
28	1,840	2,490	2,070	2,160	1,880	3,220	2,100	786	139	161	682	211
29	1,860	2,470	2,160	2,170		2,890	2,180	935	134	163	194	203
30	1,810	2,530	2,110	2,170		2,730	2,400	975	133	165	127	211
31	1,940		2,130	2,170		2,600		870		165	136	
Total	48,200	72,390	66,680	68,800	61,140	72,350	70,320	46,420	9,458	4,700	5,799	6,081
Mean	1,555	2,413	2,151	2,219	2,184	2,334	2,344	1,497	315	152	187	203
Max	1980	3100	2470	2410	2490	3360	2910	2570	1090	168	682	238
Min	743	1850	1900	2060	1810	1710	1990	786	111	127	127	156
Ac-ft	95,600	143,600	132,300	136,500	121,300	143,500	139,500	92,070	18,760	9,322	11,500	12,060

#### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 2018, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	1,231	1,489	1,558	1,678	1,776	2,243	2,738	2,723	2,018	634	541	804
<b>Max</b>	4,240	4,471	4,414	3,639	5,966	6,041	7,258	9,598	9,201	4,186	3,045	3,423
<b>(WY)</b>	(1984)	(1985)	(1984)	(1984)	(1986)	(1986)	(1985)	(1984)	(1984)	(1983)	(1983)	(1984)
<b>Min</b>	95.6	621	535	620	723	897	638	71.8	77.6	40.4	46.8	62.2
<b>(WY)</b>	(1993)	(1995)	(1995)	(1993)	(1993)	(2015)	(1992)	(1992)	(1992)	(2003)	(2004)	(1992)