



# BEAR RIVER COMMISSION

# EIGHTEENTH BIENNIAL REPORT

# 2013-2014

**Lower Division – Idaho  
Bench B Canal  
(Last Chance Canal Company)**

Ramp flume equipped with potentiometer sensor and datalogger. Data transferred by a cellular modem. Site also receives and transmits radio data from three other measurement sites.

**Central Division – Idaho  
Pegram Cellular and Radio  
Repeater**

This repeater, located on a hillside in the Pegram area, receives data from four diversions and transmits to the website.

**Lower Division – Idaho  
Skabelund #1 Pump**

Pumps directly from Bear River, equipped with magmeter and datalogger. Data is transmitted via radio to another site and then via cellular link to the web.

**Central Division – Idaho  
Dingle Canal**

Measurement is made in a rated section equipped with a shaft encoder float and pulley sensor and a datalogger which transmits data via radio to another site and then by a cellular link to the web.

**Central Division – Wyoming  
Covey Canal Headgate**

The Covey Canal is located on the Smith's Fork and is equipped with automated headgates, manual controls, a datalogger and radio telemetry. Diversion at this site can be adjusted remotely.

**Upper Division – Utah  
Francis Lee Canal**

Flows in this diversion are measured through a 76-inch ramp flume. Data is collected via datalogger and transmitted via radio to the repeater and subsequently sent to the base station where it is uploaded to the web.

**Upper Division – Wyoming  
Myers Repeater**

This repeater station is located in the upper Evanston area and receives data from six diversions and conveys them to Evanston.

**Upper Division – Wyoming  
B.Q. Dam**

This site receives diversion data from B.Q. East Canal and McFarland Canal and three pumps which are equipped with datalogger current sensors and potentiometers and then conveys data via radio to the Cokeville repeater.

**Lower Division – Utah  
Bullen Farms Pump**

This 116 horsepower diesel pump is equipped with an ultrasonic flow sensor. Data is transmitted to a repeater via radio and then sent to the base station and uploaded to the web.

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**COVER**

The Commission has recognized that there have been significant efforts in recent years to improve water distribution through construction of real-time measuring devices. These efforts are featured with a sampling of photos of real-time gages in the Basin on the front cover, along with a write-up in the Overview section herein. The Commission appreciates water officials in Idaho, Utah and Wyoming for providing the cover photos.

**EIGHTEENTH BIENNIAL REPORT**

**BEAR RIVER  
COMMISSION**

**2013-2014**

**For the Biennium October 1, 2012**

**to**

**September 30, 2014**

**BOUNTIFUL, UTAH**

**November 2015**





**BEAR RIVER  
COMMISSION**

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Suite 101  
Bountiful, Utah 84010-6232  
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CHAIR  
Jody Williams

IDAHO  
COMMISSIONERS  
Gary Spackman  
Kerry Romrell  
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UTAH  
COMMISSIONERS  
Eric Millis  
Blair Francis  
Charles W. Holmgren

WYOMING  
COMMISSIONERS  
Sue Lowry  
Sam Lowham  
Gordon Thornock

ENGINEER-MANAGER  
Don A. Barnett

November 30, 2015

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

Dear President Obama:

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

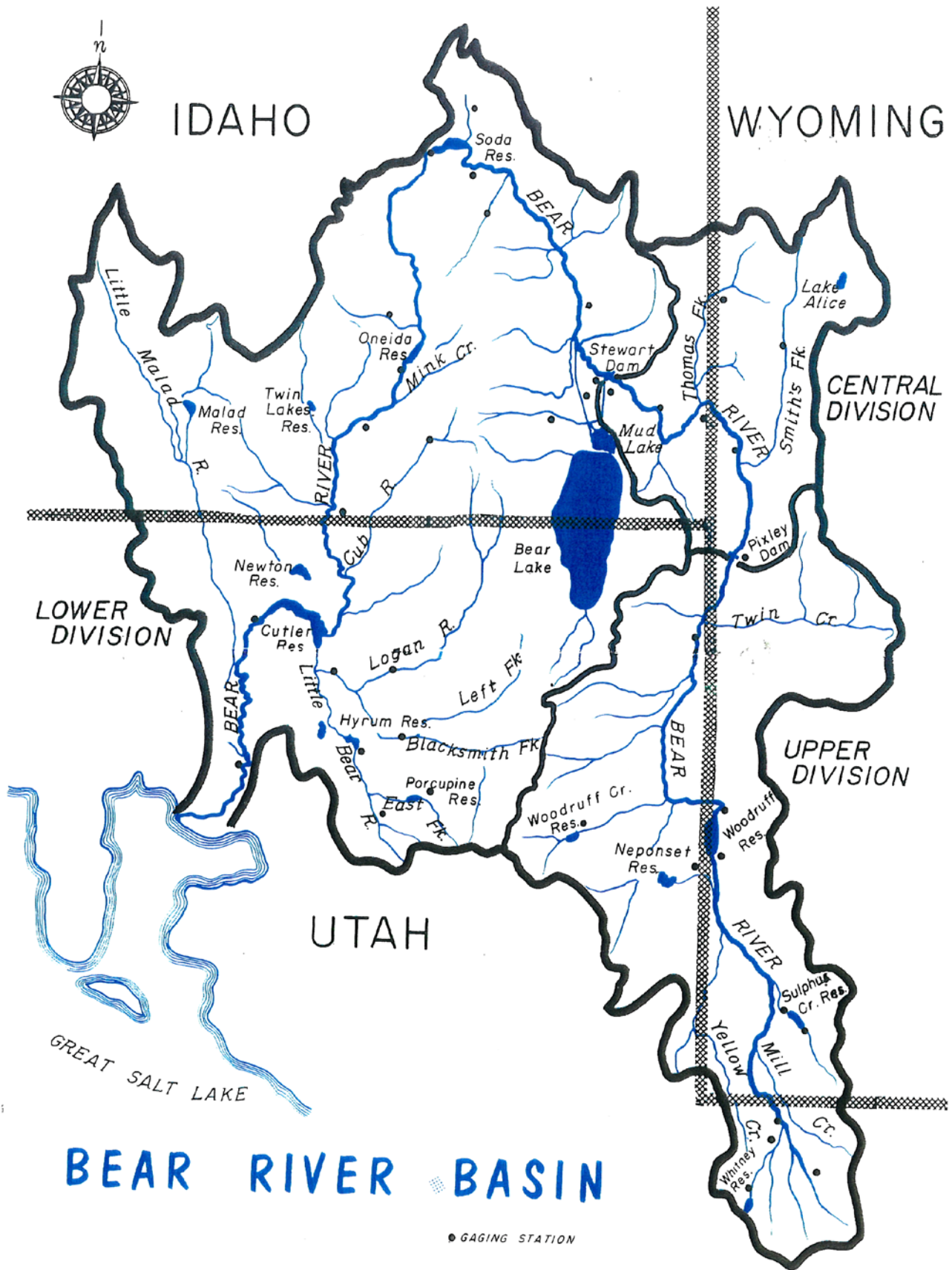
A copy of the report is being transmitted to the governor of each signatory state to the Bear River Compact.

Sincerely,

Don A. Barnett  
Engineer-Manager

Enclosure





# BEAR RIVER BASIN

● GAGING STATION

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# **EIGHTEENTH BIENNIAL REPORT BEAR RIVER COMMISSION**

## **Overview**

### **SYNOPSIS**

The biennial period began with a continuation from the prior year of well below normal streamflow and water supply. Streamflow in 2011 was at or near record high levels, whereas 2012 was extremely dry, and well below normal stream flows continued through 2013. Streamflow in 2014 was much closer to normal, and late summer rains made a dramatic beneficial impact to late summer irrigation water supplies. Distribution in 2013 in the Central Division was administered under a water emergency pursuant to the Compact. No water emergencies were declared in 2014 in any division. Distribution in all 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 2013 and 2014 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

Eighteenth Biennial Report covering the 2013 and 2014 water years (October 1, 2012, to September 30, 2014).

River operation under the Bear River Compact and activities of the Bear River Commission during the 2013 and 2014 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, 2012.

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, 2012)

**Officers**

Chair <sup>1</sup> .....	Dee C. Hansen, Centerville, UT
Vice Chairman <sup>2</sup> .....	Charles Holmgren, Bear River City, UT
Secretary <sup>3</sup> .....	Dennis J. Strong, Centerville, 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
Marcus J. Gibbs <sup>4</sup> .....	Grace, ID

**Utah**

Dennis J. Strong <sup>5</sup> .....	Centerville, UT
Blair Francis .....	Woodruff, UT
Charles W. Holmgren .....	Bear River City, UT

**Wyoming**

Sue Lowry .....	Cheyenne, WY
Sam Lowham .....	Evanston, WY
Gordon Thornock .....	Cokeville, WY

**United States**

Dee C. Hansen .....	Centerville, UT
---------------------	-----------------

**Management Committee**

Gary Spackman .....	Boise, ID
Dennis J. Strong .....	Centerville, UT
Sue Lowry .....	Cheyenne, WY

**Operations Committee**

Sam Lowham .....	Evanston, WY
Blair Francis .....	Woodruff, UT
Marc Gibbs <sup>6</sup> .....	Grace, ID

**Records Committee**

Charles Holmgren .....	Bear River City, UT
Kerry Romrell <sup>7</sup> .....	Montpelier, ID
Gordon Thornock .....	Cokeville, WY

---

<sup>1</sup> Dee Hansen resigned as Federal Chair on November 25, 2013.  
<sup>2</sup> On April 10, 2013, Kerry Romrell was elected Vice Chairman.  
<sup>3</sup> On November 19, 2013, Eric Millis was elected Secretary.  
<sup>4</sup> Marc Gibbs was replaced by Curtis Stoddard on February 26, 2013.  
<sup>5</sup> Dennis Strong was replaced by Eric Millis on October 15, 2013.  
<sup>6</sup> Kerry Romrell took the place of Marc Gibbs on the Operations Committee in April 2013.  
<sup>7</sup> Curtis Stoddard took the place of Kerry Romrell on the Records Committee in April 2013.

**Figure O.1**

## MEETINGS

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

November 13, 2012	Regular Meeting	Salt Lake City, Utah
April 10, 2013	Annual Meeting	Salt Lake City, Utah
November 19, 2013	Regular Meeting	Salt Lake City, Utah
April 15, 2014	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 on November 13, 2012, which was held in Salt Lake City, Utah. The Commission received a year-end financial report, as it does at each fall meeting. There was a detailed discussion on efforts to update the water depletion estimates. It was recognized that the effort was nearing completion and specific instructions were provided to the TAC to finalize the effort. Further, in order to accommodate some of the methodologies being employed in the update, changes were made to the Depletion Procedures. The Commission discussed the FWS's CCP for the Bear Lake Refuge and took action to request that it be more involved in future similar efforts. The Commission heard a presentation from Paris Hills regarding their proposed phosphate mining project and then received reports from the Operations Committee, the Records and Public Involvement Committee and the Water Quality Committee. The Commission then heard reports from each of the states. A more detailed report on this meeting can be found in the Commission's minutes.

The second meeting of the Commission during this biennial period was the Commission's annual meeting which was held on April 10, 2013, in Salt Lake City, Utah. Curtis Stoddard attended as a new Commissioner from Idaho. The Commission received an updated financial report and adopted a new budget for the upcoming year. It then discussed the TAC's draft technical memorandum relative to the depletion update effort, but then instructed the TAC to do additional work relative to depletions associated with supplemental water rights before considering adoption of the report. The Commission received a very dire



report relative to the streamflow forecast and a report from PacifiCorp on how it sets the storage allocation each year. The Commission then heard regular reports from its standing committees and the states. A more detailed report of this meeting can be found in the Commission's minutes.

The third meeting of the biennial period was the Commission's regular fall meeting on November 19, 2013. It was held in Salt Lake City, Utah. The Commission welcomed a new Utah Commissioner, Eric Millis, to take the place of Dennis Strong, and Millis was elected as the Commission's Secretary. The Commission received a year-end financial report, as it does at each fall meeting. The Commission then turned its attention to a detailed review of the water depletion update effort provided by each state. It concluded to accept the report, but directed that the TAC make a few refinements before finalizing it. The Commission also made amendments to the procedures in order to accommodate the methodologies used in the depletion update efforts. The Commission heard a report by Paris Hills on its groundwater study, followed by reports from the Commission's standing committees and the three states. A more detailed report of this meeting can be found in the Commission's minutes.

The fourth and final meeting of the Commission during this biennial period was the Commission's annual meeting which was held on April 15, 2014, in Salt Lake City, Utah. The meeting was chaired by Vice Chairman Romrell as the Federal Chair, Dee Hansen, had resigned and had not yet been replaced. The Commission heard a financial report and approved a budget for the upcoming year. It also accepted the final depletion update report and amended its depletion procedures. It heard an encouraging above-average water supply forecast and a report on national streamflow trends. It also received an update on efforts to prevent quagga muscle infestations. The Commission then heard reports from the Operations Committee, the Records and Public Involvement Committee and the Water Quality Committee, followed by reports from each of the three states. It also discussed the upcoming Mud Lake Symposium. A full report on discussions at the Commission meeting can be found in the Commission's minutes.

## 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, 2014, 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, 2014

	ACTUAL FY 13	ACTUAL FY 14	PROPOSED FY 15	PROPOSED FY 16
<b><u>ACTUAL/ANTICIPATED INCOME</u></b>				
Idaho Assessment	40,000.00	40,000.00	40,000.00	40,000.00
Utah Assessment	40,000.00	40,000.00	40,000.00	40,000.00
Wyoming Assessment	40,000.00	40,000.00	40,000.00	40,000.00
State Water Quality Agencies	12,778.00	12,944.00	8,151.00	8,314.00
USFWS Contract	7,809.97	2860.00	0.00	0.00
Interest on Savings	902.00	688.71	800.00	800.00
<b>TOTAL</b>	<b>\$141,489.97</b>	<b>\$136,492.71</b>	<b>\$128,951.00</b>	<b>\$129,114.00</b>
<b><u>ACTUAL/ANTICIPATED EXPENSES</u></b>				
Stream Gaging	\$55,660.00	\$57,120.00	48,540.00	40,755.00
Personal Services, Engineer-Manager	60,500.04	65,227.76	61,700.00	62,320.00
Travel Expenses	1,086.07	1,709.85	1,200.00	1,200.00
Office Expenses	561.58	1,013.75	1,600.00	1,600.00
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	770.34	3,013.90	1,600.00	1,600.00
Real-time Web Hosting	7,215.99	7,215.99	8,400.00	8,400.00
Clerical	5,000.00	6,000.00	8,000.00	8,080.00
Contingency	0.00	0.00	2,000.00	2,000.00
<b>TOTAL</b>	<b>\$130,894.02</b>	<b>\$141,401.25</b>	<b>135,440.00</b>	<b>128,355.00</b>

**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 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.

### **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 2013 and 2014 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.

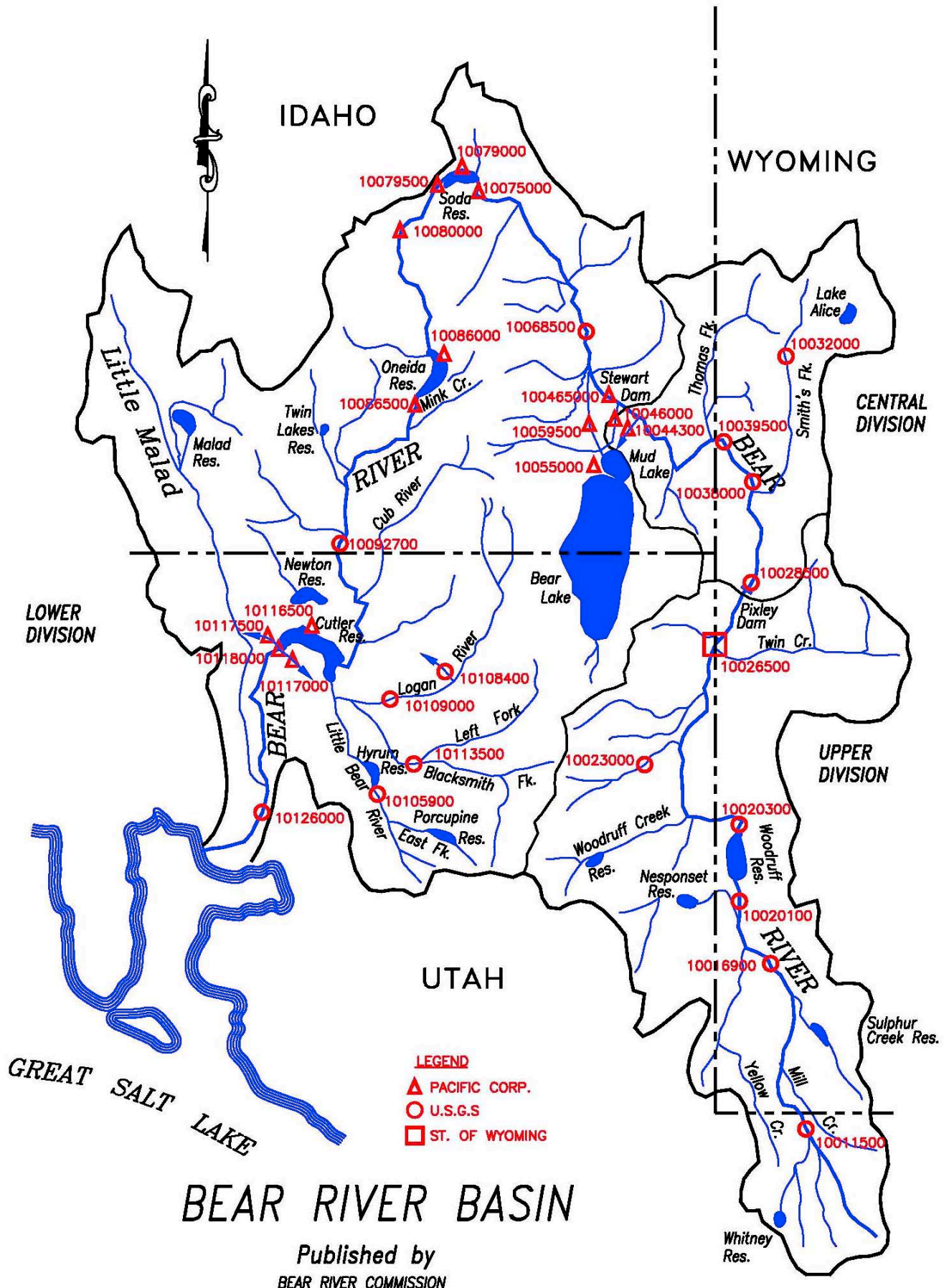


Figure O.5

## **WATER QUALITY EFFORTS**

When the Commission created the Water Quality Committee, the three states' environmental agencies supported this action and it was determined that the three lead water quality administrators would serve as the Committee membership. The Water Quality Committee has been meeting twice a year since the formation of this Committee. The Commission's Engineer-Manager serves as staff for this Committee. The Committee's activities are reported to the Commission at each Commission meeting. Water quality administration is not a charge of the Commission, but at times water quality issues become entwined with water quantity issues, and the reverse is also true. 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.

The Commission financially supports a stream gaging program maintained by the USGS that collects basic hydrologic information in the Bear River drainage. The Committee has agreed that a portion of the stream gaging cost should be financially supported by the three water quality agencies, and they are now paying a part of these costs.

During this biennial period the three states, acting under the umbrella of the Committee, have continued to monitor the water quality of the river at 21 selected sites. There is now enough historic data collected by this effort to start to look for trends in various water quality indicators. The Committee has concluded that this is a worthwhile effort and the three states plan to fund the effort until 10 years of record have been collected and the associated data has been reviewed.

As reported in the previous biennial report, with the assistance of an EPA grant, a Bear River Water Information System (WIS) was created. This valuable tool is housed at Utah State University. The Committee continues to coordinate the three-state funding needed to keep the WIS functional, and improvements were also made during this biennial period.

At each meeting the three states discuss their efforts with respect to water quality administration in the river. This is most valuable as the Bear River winds its way from its 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. Ongoing discussions concerning each state's water quality standards and their TMDL efforts have been most productive.



## **REAL-TIME GAGE EFFORTS**

With advances in technology in recent years, water users, the public and water resource officials continually want better, more accurate and timely reporting of streamflow and water diversion records so that they are able to make educated water use decisions. As the drought started in the early part of the 2000s, flumes and other improved measuring devices began to be placed in both the Upper and Central Divisions of the Bear River in Utah and Wyoming. In 2004, Utah was able to work with the Bureau of Reclamation to cost share on putting in approximately 11 real-time gaging stations in the Randolph area of the Upper Division.

In 2005, Wyoming followed suit in the Upper and Central Divisions around Cokeville by installing 10 real-time gaging stations along with 1 fully automated site. In 2006, Wyoming continued to install stations in both the Upper and Central Divisions in Wyoming around Cokeville and Evanston, adding several more telemetry sites. Between 2007 and 2013, the installation of telemetry equipment continued in all three states, adding in total over 104 gaging stations along with 1 weather station and several repeater sites which are able to transmit data from remote locations.

In total, there were 52 sites installed in the Upper Division which also includes the major reservoirs of Whitney, Sulphur Creek, and Woodruff Narrows. Also, one site in the Upper Division was automated (Chapman Headgate). In the Central Division of Idaho, 11 sites were equipped with real-time data gages, and in Wyoming, 24 sites were installed, of which 2 sites were fully automated. Several repeaters were also installed.

In the Lower Division of Idaho and Utah, 28 sites were installed along with different types of measuring devices and real-time sites and also several repeater sites. In the Utah Section of the Lower Division, the need for real-time data was somewhat different. Along the river in the Cache Valley there are about 90 pumps that divert water directly from the river to irrigate adjacent fields. The water rights associated with these pumps are generally very junior, and in 2004 Bear Lake storage allocations had been significantly reduced. The State Engineer found that all these pumps should be required to shut off for the remainder of the irrigation season on August 1<sup>st</sup>. Some irrigators resisted and regulation was difficult. To avoid similar issues in the future, in 2005 the State Engineer ordered that all 90 pumps be equipped with measuring devices and telemetry systems, and this has been accomplished.

Access to real-time internet-accessible information has proven to be an effective tool now used by water users and water resource officials. The Commission hosts a website where this real-time data plus real-time data from the USGS stream gages can be obtained by the public. Real-time data allows hydrographers and field personnel the ability to better coordinate the releases of storage water, thus wasting much less water.

Prior to this new technology, many of the measuring devices were antiquated, some potentially dating back the better part of a century. Measurements of the water diverted in some cases may have been less than accurate. Neighbors, and the public in general, had

little knowledge of the measured and recorded flows until much later in the year. Now these issues have been solved.

This above effort must be viewed as historic and to some degree a very successful experiment concerning the sociology of the irrigated agricultural communities. It was feared that there would be resistance to the instantaneous release of preliminary information to government officials and the public. It turned out this was not a major obstacle. As real-time technology became available, there were questions raised as to whether water users would be supportive of and, in part, finance proposed updated diversion and measuring equipment. It turned out that many water users embraced this opportunity to move ahead into the 21<sup>st</sup> Century. Some have felt the results are nothing less than miraculous. It has been noted that there is far less controversy concerning water diversion and use. Most users are thought to believe that water regulation is more accurate and fair and they are better able to plan their use of their water.

Clearly the installation and use of this real-time data technology has supported the main purpose of the Bear River Compact. That purpose is set forth in paragraph A of Article I of the Compact and reads as follows:

*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.*

As the discovery of the value of this new technology continues and monies become available, it is anticipated that more real-time data sites will be requested and installed by water users.

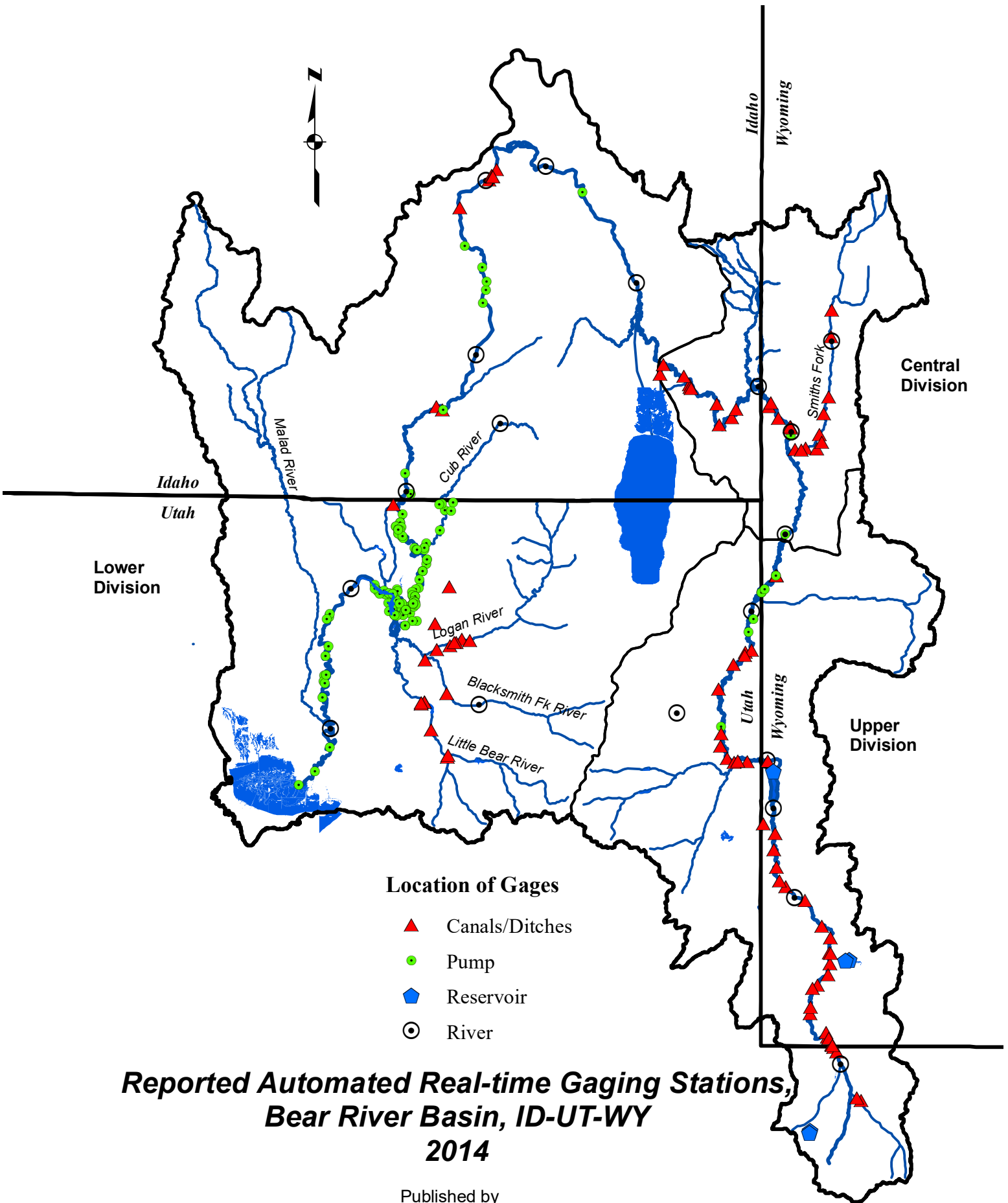


Figure 0.6



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**2013 WATER SUPPLY AND DISTRIBUTION REPORT**



# 2013 Water Supply and Distribution Report

## OVERVIEW

The 2013 water year followed quite closely to the previous dry water year. Stream flow went from near record highs in 2011 to much below normal in both 2012 and 2013. The significant carry-over in storage coming from 2011 was, with the exception of Bear Lake, almost completely depleted by the end of the 2013 irrigation season. Despite the low stream flows, due to coordination and cooperation amongst users, there was not a request for interstate regulation in the Upper Division. Flows in the Central Division were also extremely low and water was distributed pursuant to the Compact during most of the irrigation season. There was no request for the declaration of a water emergency in the Lower Division.

## 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 2013, compared with the long-term averages, are summarized in Figure 2013.1 and are graphically illustrated in Figures 2013.2 through 2013.4 on the subsequent pages.

Figure 2013.1 illustrates 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 illustrated in Figure 2013.1.

Figures 2013.2 through 2013.4 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 2013. The area between the 2013 hydrographs and the mean hydrographs represents the difference in volume of water discharged during 2013 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 2013.1, the annual discharge for the Upper Division (Utah-Wyoming State Line gage) was 73 percent of the long-term average, and streamflow on

## 2013 Water Supply Summary by Division

### 2013 WATER YEAR

(Discharge in Acre-feet)

GAGE	AVERAGE (1943-13)	2013	PERCENT
Upper Division (UT-WY State Line)	139,200	101,100	73%
Central Division (Smith's Fork)	136,400	87,200	64%
Lower Division (Logan River)	181,900	106,800	59%

### 2013 IRRIGATION SEASON

#### MAY - SEPTEMBER

(Discharge in Acre-feet)

GAGE	AVERAGE (1943-13)	2013	PERCENT
Upper Division (UT-WY State Line)	115,100	83,400	72%
Central Division (Smith's Fork)	101,600	58,600	58%
Lower Division (Logan River)	121,900	67,400	55%

**Figure 2013.1**

Smith's Fork and the Logan River were 64 and 59 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 less at 72 percent (Upper Division), 58 percent (Central Division), and 55 percent (Lower Division). This 55 percent of average stream flow in the Lower Division represents the fifth lowest over the past 71 years of record. These indicator gages show that the water supply in the Central and Lower Divisions started below normal and remained below normal during the entire irrigation season with very little increases during the spring runoff. Even in the Upper Division where flows were a little better, the flow was notably below normal during the irrigation season.

A closer look at the three hydrographs (Figures 2013.2, 2013.3 and 2013.4) is also insightful when one is trying to understand the natural water supply in the spring and summer of 2013. The Upper Division gage (Figure 2013.2) indicates runoff began well below normal and peaked about month earlier than normal. It had two resurgences in flow in late May and early June, but then quickly dropped to well below normal during the heart of the irrigation season. The Central Division gage (Figure 2013.3) indicates runoff was well below normal the entire irrigation season and similarly only had a very trivial peak runoff. The Lower Division indicator gage (Figure 2013.4) shows a very similar pattern as the Central Division, with runoff well below normal flows from the start to the end of the irrigation season, with a very small peak runoff period which was almost a month before normal. In summary, the 2013 irrigation season streamflow was extremely low.



## 2013 - Upper Division Water Supply Flow at Utah-Wyoming State Line Gage

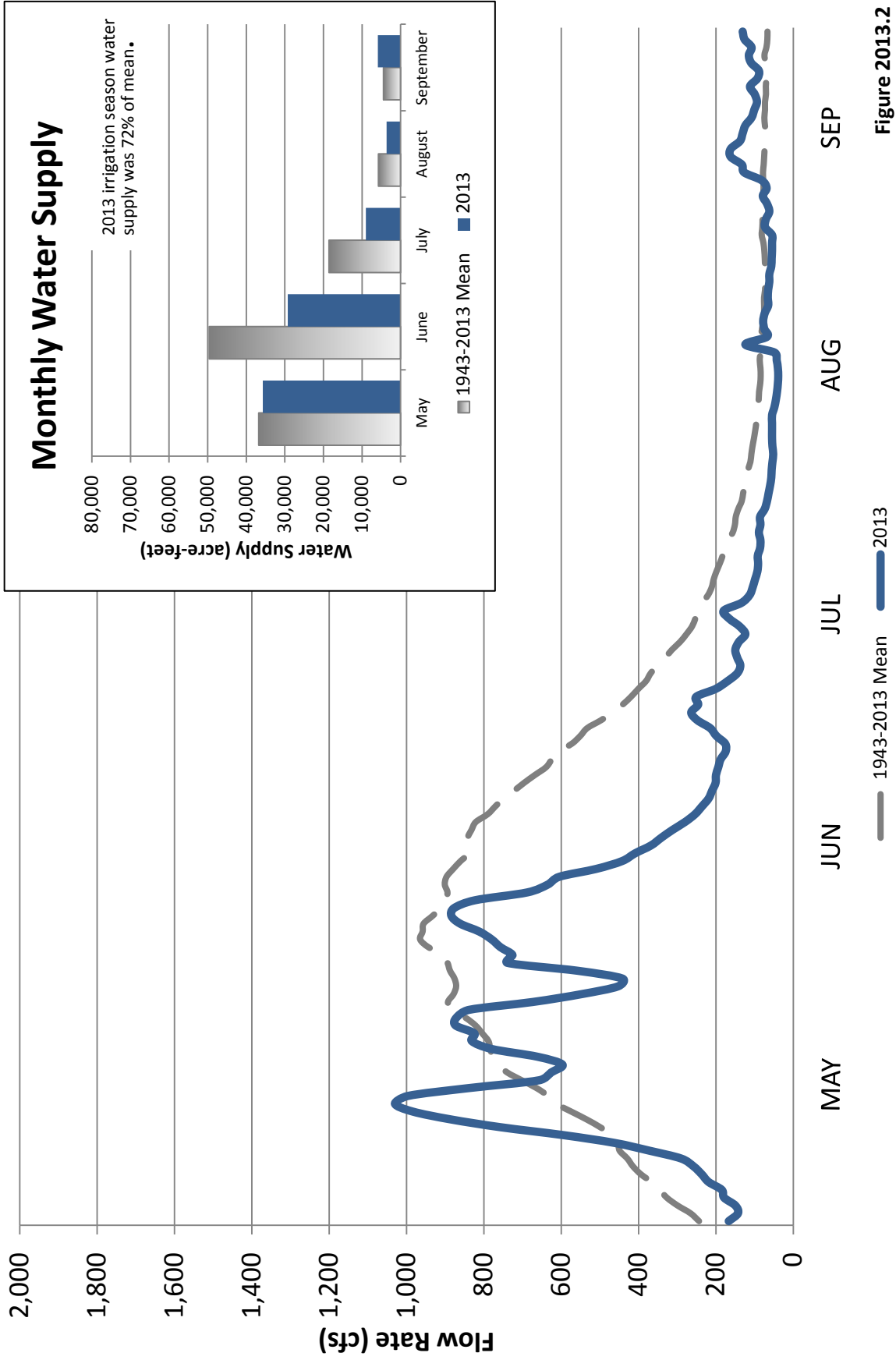


Figure 2013.2

# 2013 - Central Division Water Supply

Flow at Smiths Fork near Border, Wyoming Gage

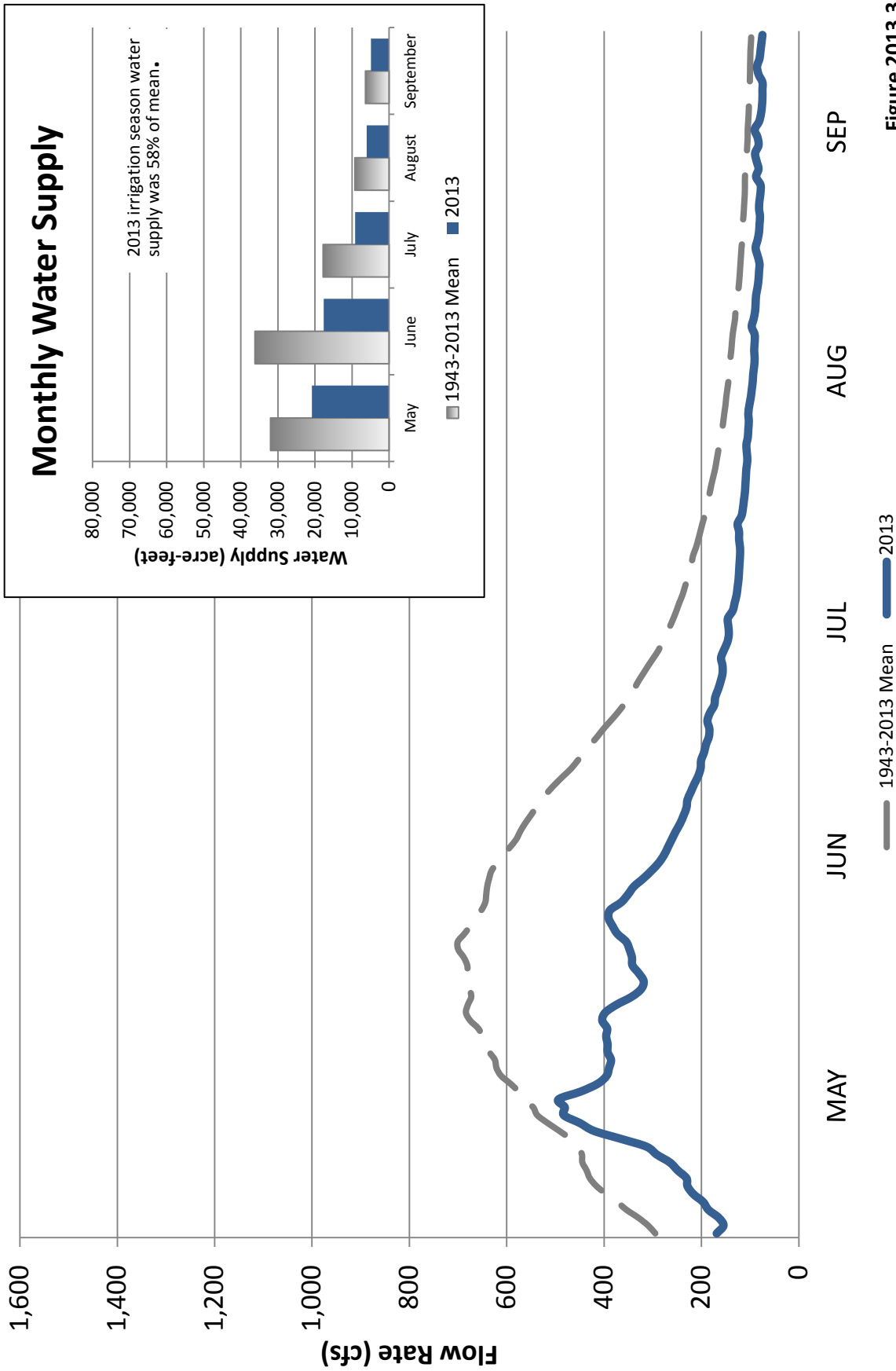


Figure 2013.3

## 2013 - Lower Division Water Supply Flow at Logan River Combined Gage

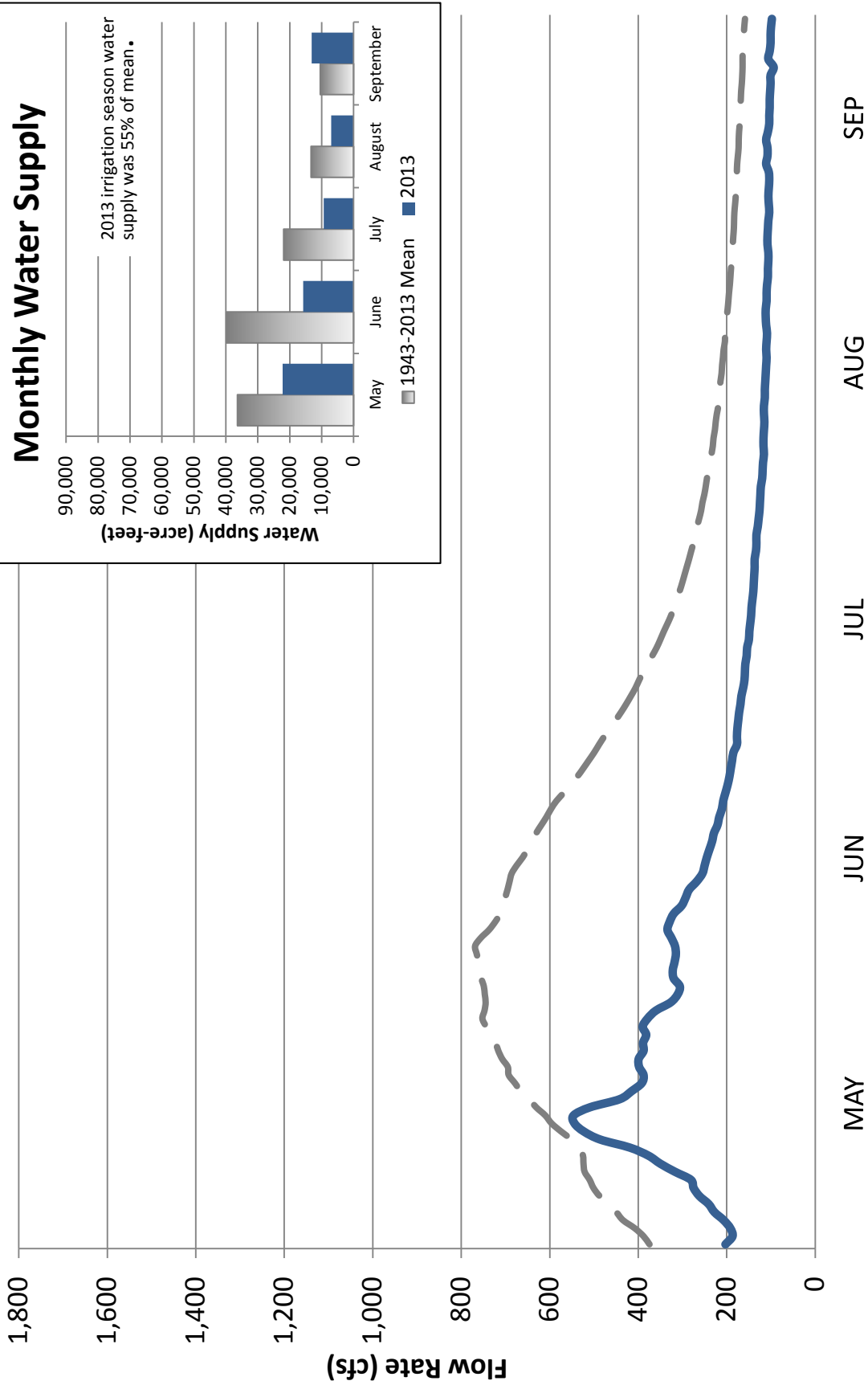


Figure 2013.4

## STORAGE

Storage supplies along the Bear River have a notable impact on the water resources available for irrigation each year. Because the prior water year was very dry, storage supplies in 2013 started with below average carryover storage even though during 2011 the system had nearly filled. 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. Because of the significant increases in Bear Lake levels in 2011, this storage restriction did not apply during the storage season.

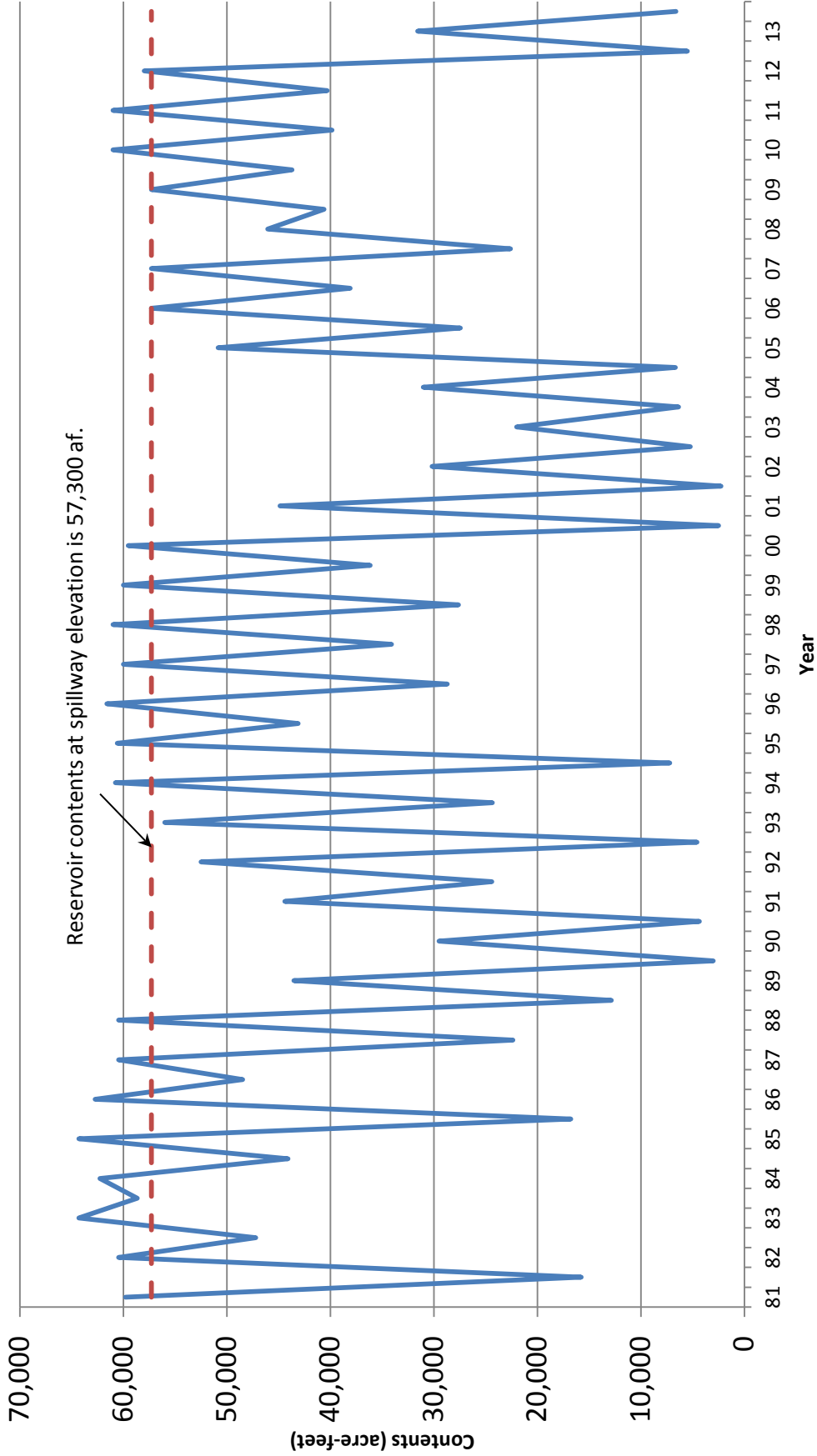
Prior to 1997, a gage was maintained, with Commission funding, by the USGS on Woodruff Narrows Reservoir. The gage included a recorder which allowed for preservation of daily values. Since this time, periodic measurements have been kept by the Woodruff Narrows Reservoir Company in coordination with the Wyoming State Engineer's Office. In 2013 a real-time water level gage was installed at Woodruff Narrows Reservoir. Figure 2013.5 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 very dry 2012 water year, Woodruff Narrows carried over only approximately 5,500 acre-feet into 2013. This, coupled with well below normal inflows in 2013, made it so that the reservoir only filled to approximately 31,600 acre-feet before its limited supply was needed for irrigation uses. It ended the season with only about 6,600 acre-feet of carryover storage.

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 2013.6 summarizes the 2013 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. Since this time, values are based on spot observations and estimates by the Woodruff Narrows Reservoir Company and the Wyoming State Engineer's Office. Contents above 57,300 af represent uncontrolled storage.

**Figure 2013.5**

**Summary of Significant  
2013 Bear Lake  
Hydrologic Information and Operational Events**

<u>Date</u>	<u>Hydrologic Information/Event</u>	<u>Contents (% of Full) Discharge (% of Normal)</u>
10-01-12	Bear Lake Beginning Elevation — 5915.90 ft	881,841 af (62%)
11-09-12	Bear Lake Low Elevation <sup>1</sup> — 5915.50 ft	854,751 af (60%)
	Rainbow Inlet Canal Discharge	69,800 af (27%)
	Bear River Discharge Below Stewart Dam	2,000 af
	Bear Lake Net Runoff (Computed Total Inflow less lake Evaporation)	37,100 af (11%)
06-01-13	Bear Lake High Elevation — 5917.20 ft	970,690 af (68%)
	Outlet Canal Releases: 10/1/12 – 10/11/12; 10/31/12 – 11/5/12; 5/12/13 – 5/19/13; 5/24/13 – 10/5/13; 10/23/13 – 10/26/13	250,000 af
06-28-12	Outlet Canal Maximum Release – 1,570 cfs	
	Bear Lake Storage Release <sup>2</sup>	228,000 af
09-30-12	Bear Lake Ending Elevation — 5912.69 ft	667,093 af (47%)
	Bear Lake Settlement Agreement “System Loss” Volume <sup>3</sup>	20,800 af

<sup>1</sup> Low contents prior to start of storage.

<sup>2</sup> Net irrigation storage release from Bear Lake, subtracting Rainbow inflow and the decreed adjustment for the natural yield of the Bear Lake and Mud Lake area. Includes system loss volume and releases made in October 2013 which were credited against Water Year 2013 irrigation allocation.

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

**Figure 2013.6**

Figure 2013.6 provides much information as to the water stored in Bear Lake in 2013. Some of this information will be discussed in the Lower Division section of this report. Because of the extremely high flows into the lake in 2011, Bear Lake began the storage season with fairly significant carry-over storage even though it was heavily drafted in 2012. PacifiCorp operated Bear Lake in storage mode throughout 2013.

Figure 2013.7 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) actually occurred on November 9, 2012, after the beginning of the storage season. One can see from Figure 2013.7 that storage in the lake only increased by 1.7 feet during the storage season and then dropped by more than five feet during the release period (note that the Bear Lake low elevation occurred after September 30, 2013). Figure 2013.8 is an area plot showing the daily contents in Bear Lake over the past ten years. This hydrograph and Figure 2013.7 show the very significant drop in Bear Lake water levels in the early 2000s, followed by a relatively stable, but low water period, which was followed by historic gains in lake elevation in 2011 and then a significant drop in both 2012 and 2013.

Bear Lake has such a large storage capacity compared to average annual use that it greatly buffers the potential shortages in the Lower Division over a period of below-normal years, but for the same reason, recovery from a depleted reservoir can be slow.

# BEAR LAKE ELEVATION

Annual Maximum & Minimum Elevations

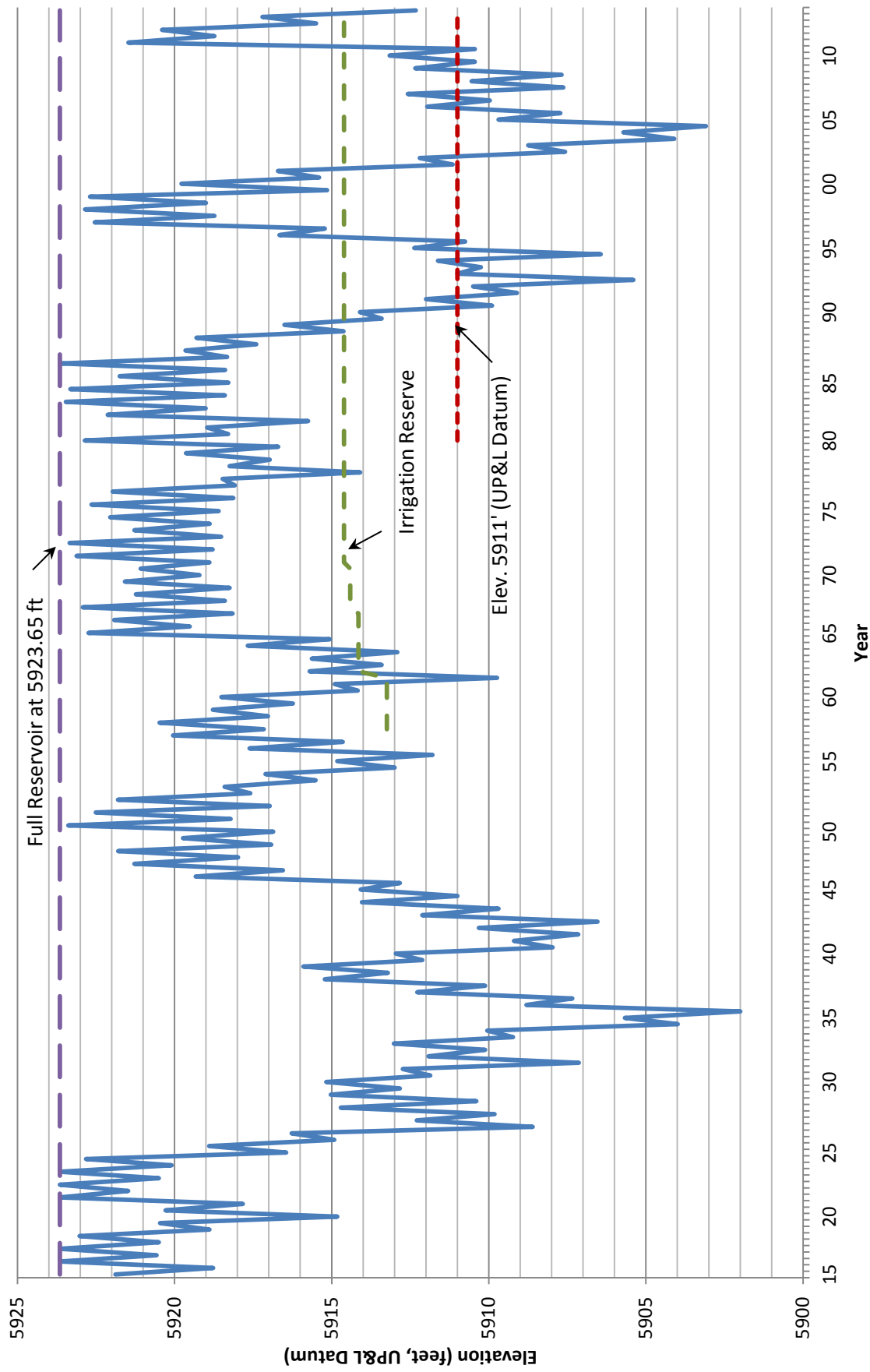


Figure 2013.7



# BEAR LAKE CONTENTS Water Years 2004 - 2013

Bear Lake's maximum active storage contents is 1,421,000 at an elevation of 5923.65'.

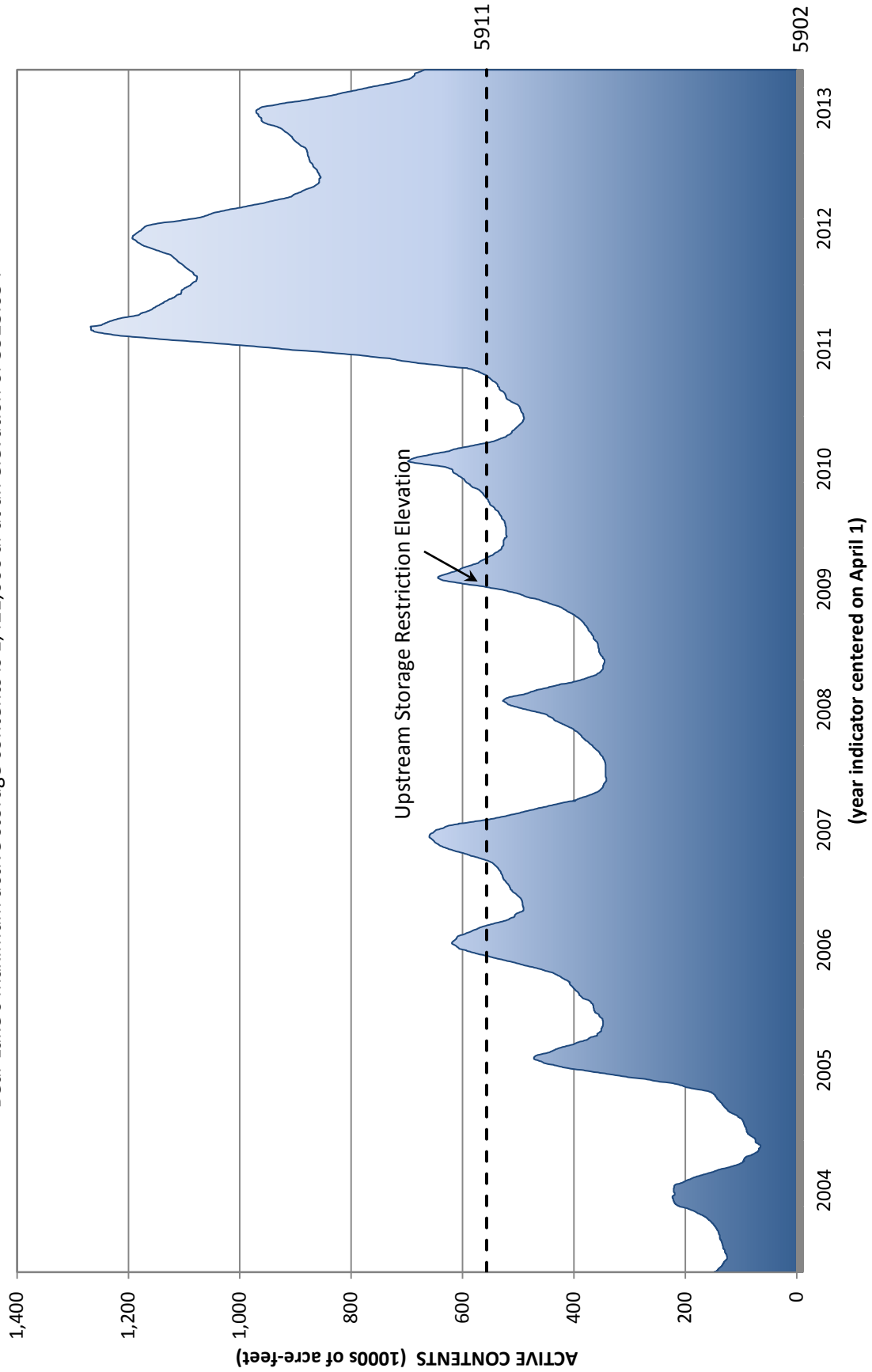


Figure 2013.8

## STREAMFLOW DISTRIBUTION

### General

The water administration in 2013 in the three divisions remained similar to prior years. In 2013, Josh Hanks began to serve as the Idaho Watermaster in the Central and Lower Divisions. There were no other changes to the River Commissioners/Watermasters in each of the sections from the previous year. Don A. Barnett continued to serve as Engineer-Manager of the Bear River Commission. Each River Commissioner/Watermaster works under the direction of the respective State Engineers' offices, 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 2013 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	Don Shoemaker
	Upper Wyoming	Don Shoemaker
	Lower Utah	Ron Hoffman
	Lower Wyoming	Mike Johnson
Central	Wyoming	Mike Johnson
	Idaho	Josh Hanks
Lower	Idaho	Josh Hanks
	Utah	Jim Watterson

As was discussed above, snow survey information early in 2013 pointed to a dry water year. This turned out to be the case. The 2013 water year was much below normal, especially during the irrigation season, and insufficient water supplies were experienced in all divisions. A water emergency was declared in the Central Division pursuant to the Compact.

### 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. Though the stream flow in the Upper Division during the irrigation season was very low it was a little improved from the prior year. A combination of limited natural flow water

supply in the upper sections coupled with return flows from storage releases in the lower sections made it so that there was no need to pass water from the upper sections to the lower sections to meet Compact provisions. Further, 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. With these factors, there was not a request for Compact administration in the Upper Division in 2013.

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 2013.9 and 2013.10 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. During May the diversions shown in the Lower Utah Section are well below the allocation. However, this is due to the fact that the users were diverting the limited supply to storage. Once return flows from Woodruff Narrows Reservoir releases began to affect the system in late May, the physical water supply to the Upper Wyoming Section was less than the natural flow allocation to the users. Figure 2013.11 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.

# 2013 - Upper Division

## Upper Wyoming Section Diversions vs Allocation

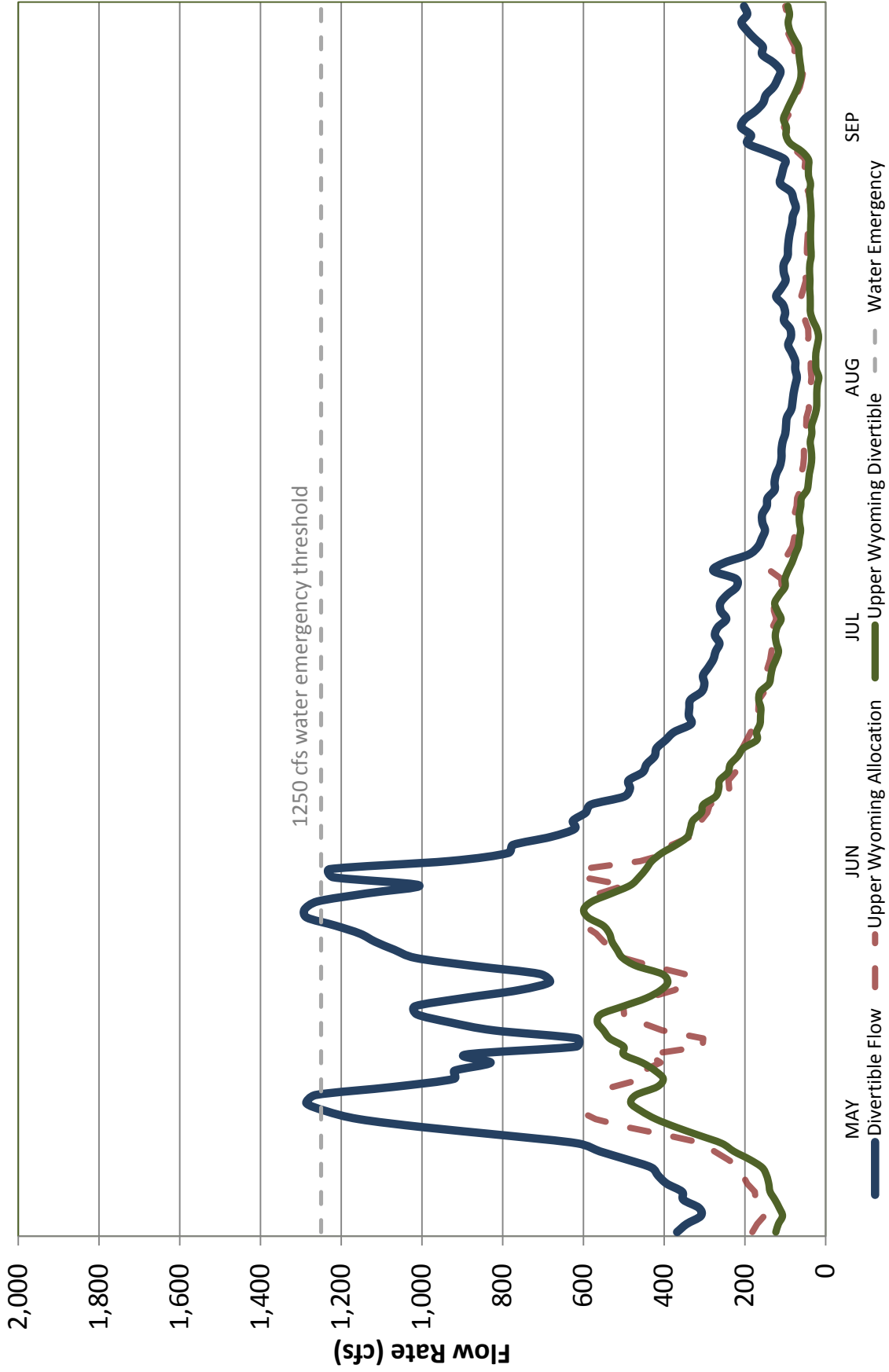


Figure 2013.9

# 2013 - Upper Division

## Lower Utah Section Diversions vs Allocation

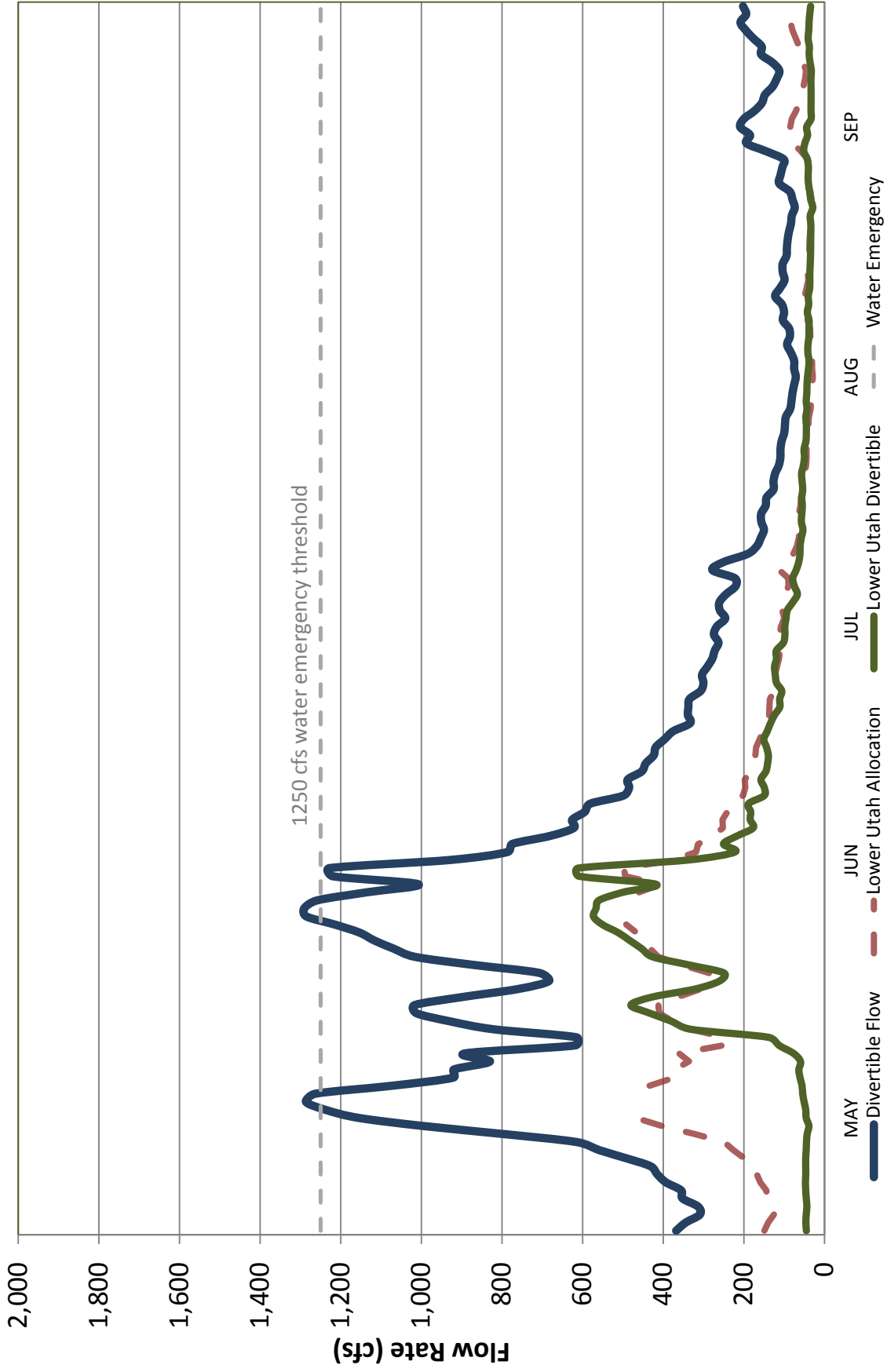


Figure 2013.10

	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		
UPPER UTAH SECTION																																	
Hovarka (E Fk)	0	0	0	0	0	0	0	0	0	4	8	8	8	8	8	8	8	7	7	7	7	7	8	8	8	8	9	8	8	7	7		
Hatch (W Fk)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5	5	5	5	3	3	3	3	3	3	3	3		
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	6	29	29	27	21	24	26	28	27	26	25			
Lannon & Lone Mtn	3	2	2	2	1	1	1	2	4	4	6	13	14	14	15	15	14	14	14	14	14	14	15	15	15	15	17	17	18	17			
Hilliard West Side	0	0	0	0	0	0	0	0	0	0	0	2	9	9	12	14	14	12	11	11	13	16	18	20	21	37	35	27	24	17			
Bear (Bear R)	7	7	7	7	6	6	6	6	15	24	23	30	29	34	34	33	46	41	40	38	37	35	40	61	71	71	68	59	54	50			
Tropic	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	3	3	3	2	3	4	4	4	3	3	4	4	4	4			
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	1	1	1	1	1	1	1	1	2	4	4	5	4	5	5	5	4	3	3	3	3	3	4	5	4	5	5	4	4	3	2		
Crown & Pine Grove	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	6	12	11	12	12	12	12	13	24	24	21	18	14	14	13			
McGraw	0	0	0	1	1	1	1	1	1	5	9	9	10	9	12	15	13	11	11	12	16	18	18	18	17	15	14	13	12	11			
Lewis (D4)	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	2	2	1	1	3	5	5	5	5			
Homer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2			
Lewis and Blanchard	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2			
Myers No. 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	4	4	4	4	4	3	2	2		
Hare	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	3	3	2	2	2	1	1	0	0	1		
Coffman	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	2	3	3	3	3	3	3	3	3	3	3		
Knoder	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	2	3	3	3	3	3		
Myers No. 1	0	0	0	0	0	0	0	0	0	0	0	0	1	7	5	5	4	4	3	3	3	3	4	4	4	4	4	4	4	3	4		
Myers Irr	0	0	0	0	0	0	0	0	0	0	0	0	3	5	5	5	5	5	5	4	5	6	6	6	6	6	6	5	5	4	4		
Evanston Pipeline	3	4	4	5	4	4	4	4	4	4	4	5	5	6	7	8	8	8	7	7	7	7	7	7	7	7	7	7	7	6			
Booth	0	0	0	0	0	0	0	0	0	3	6	8	8	8	10	12	14	13	13	12	12	11	12	12	13	14	15	16	12	11	11		
Anel Irr	1	1	1	1	1	1	1	1	1	1	1	1	1	4	12	13	14	14	13	11	11	10	11	11	11	11	11	11	10	9	8		
Cornelson	0	0	0	0	0	0	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	2	
Ev Water Supply (and Anderson)	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	2	3	3	3		
Knight No. 2 (and No. 1)	1	1	0	0	0	0	0	0	0	1	3	4	3	2	4	4	3	3	3	3	3	4	3	3	3	3	3	3	3	3	2	2	
*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	0	
Evanston Water	0	0	0	0	0	0	0	0	0	0	0	2	8	12	14	16	16	15	14	14	14	15	16	16	18	19	18	18	17	17	17		
Wilson Irr	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	1		
Faulkner	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	0	
Rocky Mtn & Blyth (and Crompton)	3	3	2	2	2	3	3	3	4	5	5	7	6	11	15	15	15	14	13	13	11	5	9	11	9	7	8	8	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	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	0	
Johnston & Narramore	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	1	0	0	0	0	0	1	2	2	2	2	2	2	2	2	2	
Fritz	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	3	3	2	0	1	1	1		
Bruce-Barton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	3	3	3	3	3	3	4	4	4	3		
A.W. Sims	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	4	4	3	3	3	3	1	0	0	0		
Junction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	
Morganson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fearne Irr (and Saxton-Thomas)	0	0	0	0	0	0	0	0	0	0	3	4	4	4	5	6	7	8	7	4	3	2	2	1	1	0	2	3	5	3	2	2	
John Sims	3	4	5	5	8	11	6	7	7	7	10	13	14	14	19	22	22	21	18	15	10	15	20	21	21	21	21	21	13	7	7		
Michael Sims	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
S. P.	1	1	1	5	4	4	4	6	7	7	9	10	9	8	8	12	15	12	12	12	12	12	13	13	13	14	14	14	11	8	8		
Almy	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	3	2	2	2	2	2		
Sims, Blight & Turner	0	0	0	0	0	0	0	0	0	0	1	2	2	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3		
Bowns	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	3	3	3	3	3	3	4	4	4	5	5	4	4	4	3		
Nixon West Side	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	1	0	0	0	0	0	1	1	0	1	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	0	0	
Chapman (Headgate)	78	72	63	65	71	80	86	88	90	97	103	108	136	157	173	180	187	169	142	128	131	129	143	153	148	147	150	147	140	123	107		
Chapman (Stalentine, incl'd above)	58	55	44	46	55	63	71	74	73	80	84	82	105	127	138	146	162	150	124	110	112	107	115	119	116	104	108	107	105	93	83		
Morris Bros Irr (Lower)	3	3	2	2	2	2	2	2	2	2	3	4	3	4	4	3	2	3	4	4	4	4	5	5	5	5	5	7	7	5	4		
Bowns & Bruce	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
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	0	
Tunnel	8	6	4	7	10	10	10	11	15	17	19	21	24	27	29	30	31	31	27	24	22	20	22	23	24	24	25	25	20	14	14		
Francis-Lee	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	3	13	13	14	14	14	14	18	22	22	21	21	21	21	21	21		
Bear River Canal	1	2	1	2	2	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3		
TOTAL UPPER WY DIV.	123	117	107	115	126	138	141	146	157	188	227	257	314	370	420	457	483	470	41														

	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)	7	7	7	7	8	8	8	8	9	9	9	8	8	7	7	7	6	5	4	5	5	6	6	6	5	5	5	5	5	5
Hatch (W Fk)	3	3	3	3	3	3	3	3	3	3	3	4	3	3	3	3	3	3	1	1	1	2	3	3	3	3	3	3	3	
UPPER WYOMING SECTION																														
Hilliard East Fork (E Fk)	25	27	31	33	33	33	33	32	31	32	32	33	35	35	34	35	31	28	26	28	37	37	36	36	36	35	33	31	33	
Lannon & Lone Mtn	16	16	16	16	16	16	17	17	17	17	17	17	16	16	16	16	14	13	13	13	13	13	10	7	7	7	7	7		
Hilliard West Side	15	20	25	28	31	38	35	36	36	35	33	32	31	31	31	33	30	30	30	29	28	26	24	23	21	10	3	3		
Bear (Bear B)	48	49	58	64	64	63	62	63	59	58	54	52	51	54	61	59	56	55	52	50	36	29	15	4	4	4	4	4		
Tropic	4	4	4	4	4	4	4	3	4	6	4	4	4	4	4	3	3	4	4	4	4	4	4	3	3	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		
Danielson	2	2	3	3	3	3	3	3	8	11	8	8	8	6	5	5	5	4	4	3	3	3	3	3	3	3	3	3		
Crown & Pine Grove	13	12	13	17	21	21	21	21	22	26	25	23	21	21	22	17	16	14	18	20	22	24	23	23	24	25	25	15		
McGraw	11	12	15	16	16	16	17	17	22	29	24	22	20	20	17	15	15	13	9	9	8	8	8	6	5	5	5	5		
Lewis (D4)	5	5	6	6	6	6	6	6	6	6	6	4	4	5	5	3	2	2	1	1	1	1	1	2	6	6	4	4		
Hornet	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Lewis and Blanchard	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	4	4	3	3		
Myers No. 2	2	2	3	4	4	4	4	4	4	4	4	4	3	2	2	2	2	1	1	1	2	2	1	2	2	2	2	2		
Hare	1	1	2	2	3	3	3	3	4	5	5	4	4	3	2	2	2	1	1	1	1	1	2	2	2	2	2	2		
Coffman	3	3	3	3	4	4	4	3	3	3	3	3	3	2	2	2	1	1	1	0	0	0	0	0	1	1	1	1		
Knoder	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	3	3		
Myers No. 1	8	5	4	5	4	4	4	4	4	4	5	7	4	4	3	3	3	4	4	4	4	4	4	4	3	1	0	0		
Myers Irr	4	4	5	5	5	5	5	5	5	5	5	5	5	5	4	4	3	4	4	4	4	3	3	3	4	4	4	5		
Evanston Pipeline	6	6	8	9	9	9	9	9	9	9	10	10	10	10	10	10	10	10	11	9	10	10	10	11	11	11	14	13		
Booth	11	11	12	15	16	16	16	15	18	17	16	14	12	10	9	8	8	8	10	10	10	9	9	10	11	11	10	10		
Anel Irr	7	8	9	9	9	9	10	10	10	10	10	9	9	8	7	7	6	6	6	5	6	7	6	7	7	7	7	6		
Cornelson	2	2	2	2	2	3	4	4	5	5	6	6	6	6	7	4	2	2	2	2	2	2	2	2	2	2	2	2		
Ev Water Supply (and Anderson)	3	3	3	2	2	2	3	3	4	3	2	2	2	2	2	1	1	1	1	1	1	1	0	0	0	0	0	0		
Knight No. 2 (and No. 1)	2	4	9	8	6	7	7	7	7	6	5	5	6	6	6	5	5	6	5	5	6	5	5	5	5	5	5	6		
*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		
Evanston Water	18	19	22	16	17	19	19	19	20	21	20	18	16	16	15	17	15	18	16	17	17	18	18	20	19	18	17	18		
Wilson Irr	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		
Faulkner	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Rocky Mtn & Blyth (and Crompton)	5	5	7	10	8	6	5	8	8	9	8	8	9	9	8	6	4	4	5	5	5	4	3	3	3	2	2	3		
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		
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		
Johnston & Narramore	2	2	2	2	2	2	2	2	2	2	2	1	0	0	1	1	1	2	1	1	1	1	0	0	0	1	2	2		
Fritz	1	1	2	2	2	2	2	2	1	0	0	0	0	1	2	2	2	2	2	2	1	0	0	0	0	0	1	2		
Bruce-Barton	3	3	3	3	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	2	2	2	2		
A.W. Sims	0	0	0	0	0	2	4	4	4	4	4	4	4	4	1	0	0	0	0	0	0	0	2	3	3	1	0	0		
Junction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Morganson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Featne Irr (and Saxton-Thomas)	0	0	0	1	2	2	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	0	0	0	1	2	3	3		
John Sims	6	8	12	13	13	14	14	22	24	24	21	14	10	10	9	7	6	6	5	5	5	6	6	7	8	11	7	8		
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		
S. P.	8	8	8	9	10	10	11	11	18	21	22	21	15	10	10	10	7	5	5	5	4	4	3	5	7	7	7	7		
Almy	1	3	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2		
Sims, Blight & Turner	3	3	4	4	6	6	6	6	6	6	6	5	5	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3		
Bowns	3	3	3	4	4	3	3	3	4	4	5	5	4	4	3	3	2	1	1	1	1	1	1	1	1	1	1	1		
Nixon West Side	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Turner	3	3	4	5	5	5	5	5	5	5	5	4	4	3	3	2	2	2	2	2	2	2	2	1	1	0	0	0		
Chapman (Headgate)	95	97	112	119	122	122	127	133	137	131	129	111	98	95	88	82	79	77	74	73	71	68	68	69	70	71	70	71		
Chapman (Stateline, incl'd above)	71	65	73	82	86	82	82	84	89	88	87	76	67	64	58	49	47	43	38	37	35	31	29	27	23	28	26	23		
Morris Bros Irr (Lower)	3	3	4	5	5	7	8	8	8	8	7	7	6	6	4	3	3	2	2	2	1	3	2	1	1	1	1	2		
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		
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		
Tunnel	13	12	16	20	20	20	23	28	28	23	17	12	8	7	7	7	8	8	8	8	8	10	12	12	13	10	7	7		
Francis-Lee	21	21	21	21	21	21	21	21	21	21	21	20	20	20	10	10	10	10	10	10	10	9	8	10	10	11	10	9		
Bear River Canal	35	35	36	35	35	35	37	36	36	36	36	35	30	24	24	23	22	23	23	22	22	20	20	24	26	24	26	24		
TOTAL UPPER WY DIV.	415	429	493	527	540	553	561	576	613	624	603	554	507	480	447	433	407	386	373	370	366	353	347	330	326	335	314	306	294	283
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		
Sulphur Creek Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	30	34	36	45	44	58	60	60	67	70	73	78	
LOWER UTAH																														
Neville	4	4	4	4	4	5	5	5	5	4	4	4	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Booth	10	10	10	10	10	11	12	12	12	13	13	13	12	10	7	9	9	8	6	6	5	4	2	2	2	2	2	1		
Rees Land & Livestock	21	22	21	21	20	19	1																							







		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)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	471
Hatch (W 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	0	0	243
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	0	1,750	
Lannon & Lons 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	0	1,053	
Hilliard West Side	4	4	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	3	3	3	1,566	
Bear (Bear R)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	3,212		
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	0	246	
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	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	0	259	
Crown & Pine Grove	3	3	3	2	2	2	2	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1,398	
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	869	
Lewis (D4)	1	1	1	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	0	0	317	
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	0	99	
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	0	101	
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	0	166	
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	0	88	
Coffman	0	0	0	0	0	1	0	0	0	0	0	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	147
Knoder	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	3	3	3	3	3	424	
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	0	198	
Myers Irr	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	564	
Evanston Pipeline	8	8	8	8	8	7	7	6	6	6	6	6	6	6	4	3	4	4	4	4	4	4	4	4	4	4	4	4	3	3	2	1,271	
Booth	4	4	4	4	4	4	4	4	5	5	6	7	9	12	12	12	12	11	5	6	3	3	3	3	3	3	3	3	3	3	3	1,078	
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	0	595	
Cornelison	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	172	
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	0	87	
Knight No. 2 (and No. 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	1	381	
*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	0	
Evanston Water	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	0	1,427	
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	0	
Faulkner	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
Rocky Mtn & Blyth (and Crompton)	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	662
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	0	26
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	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	0	0	87
Fritz	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	105
Bruce-Barton	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	0	0	0	0	0	1	186
A.W. Sims	3	3	3	3	3	3	3	3	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	143
Junction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Morganson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Fearne Irr (and Saxton-Thomas)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	127
John Sims	4	4	4	4	4	5	4	4	4	4	4	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	5	5	5	5	1,188	
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	0	7
S. P.	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	1	777
Almy	2	2	2	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	160
Sims, Blight & 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	0	0	211
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	1	180
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	0	13
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	0	0	200
Chapman (Headgate)	4	4	4	4	4	4	5	5	5	7	7	12	36	43	45	53	47	40	36	35	35	35	36	37	37	41	51	56	55	55	55	8,646	
Chapman (Stalaine, incl'd above)	0	0	0	0	1	1	2	2	2	3	3	4	16	28	28	31	30	25	22	21	22	22	22	22	23	25	29	33	33	33	5,559		
Morris Bros Irr (Lower)	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3	2	2	2	2	2	1	0	0	1	1	1	1	1	1	363	
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	0	0	7
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	0	8
Tunnel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,129
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	0	0	0	0	0	0	0	1,058
Bear River Canal	15	15	16	16	15	17	15																										

## 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 2013.12 and 2013.13 graphically illustrate the Central Division's divertible flow and the respective allocations and diversions to and 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. However, in 2013 flows at the Border gage were below the 350 cfs water emergency trigger for the entire irrigation season. It is important to note that on Figure 2013.13, 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 in the Central Division its full entitlement, a portion of its allocation can pass into the Lower Division via the Rainbow Inlet Canal or Stewart Dam. Data for this hydrograph are based on the River Commissioners'/ Watermasters' annual reports to their respective state water agencies.

Figure 2013.14 (pages 13-24 through 13-28) 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 can be seen on the graphs and from the data, the water supply in the Central Division in 2013 was significantly below normal from the beginning to the end of the irrigation season. Based on flows, the Central Division was administered pursuant to the Compact beginning on May 10, 2013, through the remainder of the season. Weekly call-ins of canal diversions in Wyoming and Idaho commenced thereafter and allocations to each state were formally made pursuant to the Compact. In order to better administer the system and reduce the calculated "loss" which sometime plagues administration in this division, measurement of diversions in Idaho was made several days after adjustments and measurements in Wyoming. There was very good cooperation between the Wyoming and Idaho Watermasters throughout this difficult irrigation season in appropriately distributing the very limited water supply.

# 2013 - Central Division Distribution

Wyoming Section Diversions vs Allocation

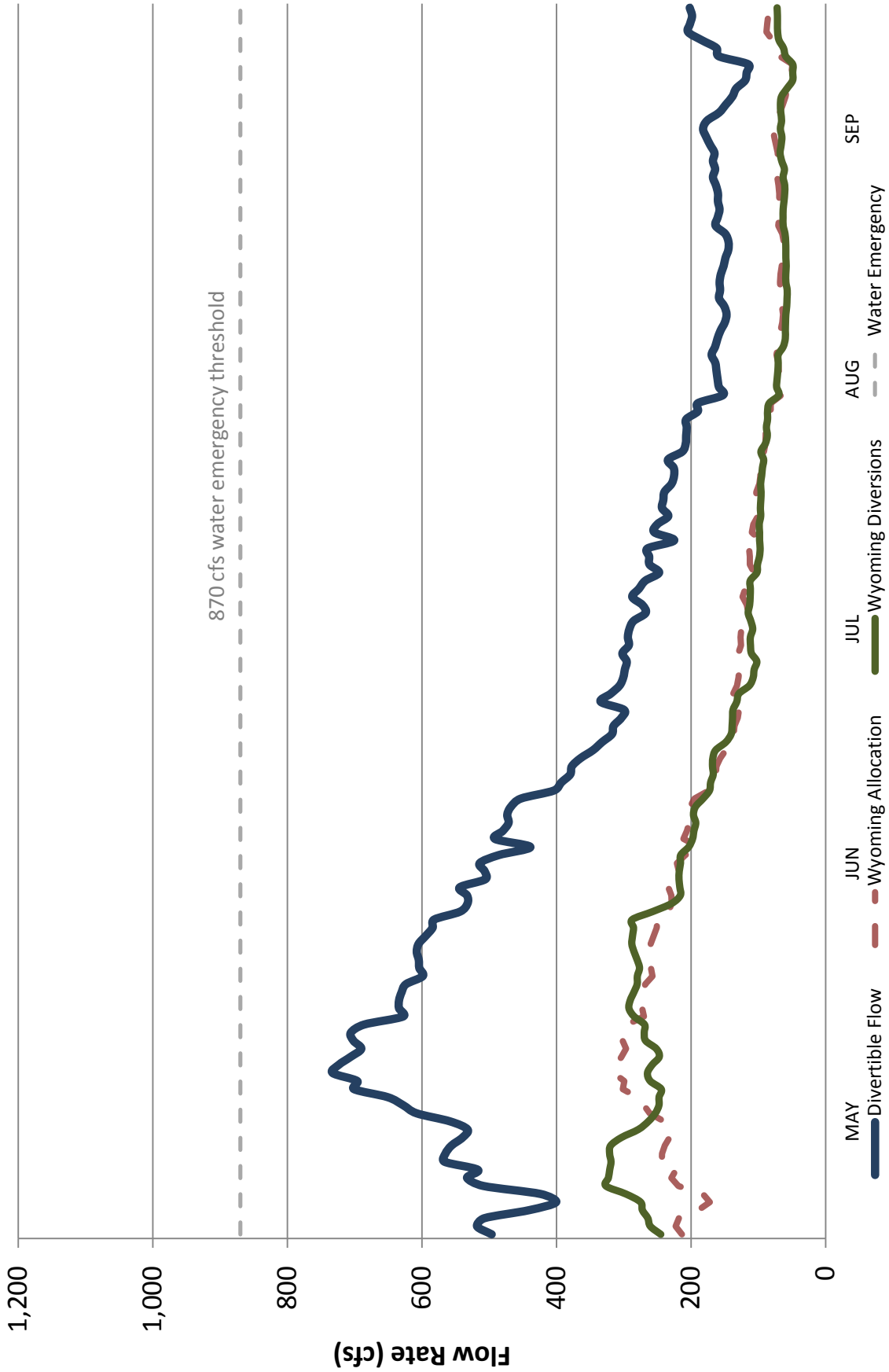


Figure 2013.12

## 2013 - Central Division Distribution

### Idaho Section Diversions vs Allocation

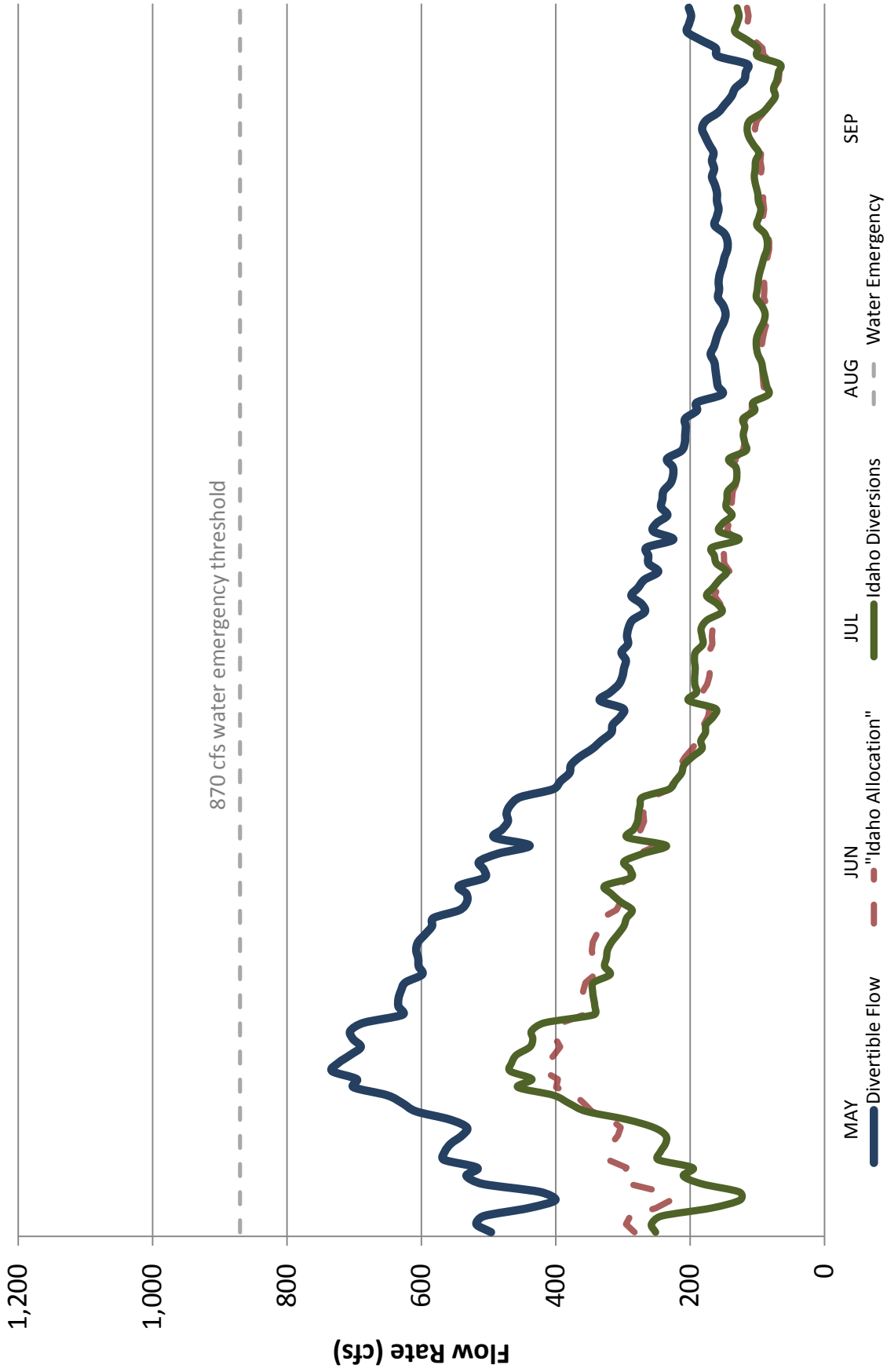


Figure 2013.13













## 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 2006 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 2013 with weekly conference calls with the state agencies, large water users and PacifiCorp. Figure 2013.15 shows the delivery of water in the Lower Division as reported by the two state agencies.

### 2013 Lower Division Irrigation Water Deliveries

Canal/Group	Natural Flow (af)	Storage Use (af)	Total Diversion (af)
<b>Idaho</b>			
Gentile Valley	7,920 af	1,883 af	9,803 af
West Cache	19,567 af	24,755 af	44,322 af
Cub River Pumps	1,302 af	17,820 af	19,122 af
Last Chance and Bench B	29,360 af	36,012 af	65,372 af
Idaho Small Irrigators	12,506 af	4,802 af	17,308 af
<b>Utah</b>			
Bear River Canal Company	139,809 af	105,878 af	245,686 af
Utah Small Irrigators	1,358 af	7,887 af	9,245 af

Figure 2013.15

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 2013.16 shows such deliveries in 2013.

**2013 Bear Lake Storage Deliveries**

Irrigation Storage Allocation	245,000 af
Bear Lake Storage Release	228,000 af
Lake Recovery Volume	17,000 af
Decreed Transit Losses	8,208 af
System Losses <sup>1</sup>	20,800 af
Delivered Bear Lake Storage	198,992 af

<sup>1</sup>Water that passes below Cutler Dam that is accounted for as storage water release

**Figure 2013.16**

Due to the much lower than normal stream flow, irrigation storage use was, though less than the allocation, higher than in most years.

## 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 2013 water year.

### Idaho

#### Water Activities

A drought emergency was declared in Bannock, Bear Lake, Caribou, Oneida and Power Counties, authorizing the Director to allow temporary changes in water rights to provide a replacement water supply to lands which normally have a full supply except for the drought conditions.

Josh Hanks was elected and appointed as the new Watermaster for Water District No. 11 in May, 2013.

#### 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>	<u>Total Acres</u>	<u>Volume (ac-ft)</u>
11-7774	5/10/2013	0.010	SPRING	STOCKWATER		
13-7784	3/15/2011	5.000	COTTONWOOD ET AL CKS	AESTH & RECREATION STORAGE		800.0
13-7866	8/30/2012		UNNAMED STREAM	STOCKWATER STORAGE		1.0
13-7883	4/19/2013	0.040	SPRING	DOMESTIC		
15-7259	5/21/2013	0.230	GROUND WATER	COMMERCIAL		
15-7276	5/21/2013	2.000	GROUND WATER	IRRIGATION	198.0	
15-7335	8/26/2010	1.230	GROUND WATER	IRRIGATION	61.4	
15-7366	2/12/2013	4.000	GROUND WATER	IRRIGATION	240.0	

Several transfer applications were approved with point of diversion and/or place of use changes; two approvals were in Basin 11 and four approvals were in Basin 13.

## Utah

### Water Activities

The Utah Division of Water Resources (UDWR) is completing a Bear River Pipeline Concept Study as an initial evaluation of the engineering, environmental, and real estate issues associated with the Bear River Project. One product of this Concept Study is the delineation of a recommended alignment for the Bear River Pipeline. This recommended alignment will provide guidance to the UDWR as they work with local, state, and federal decision-makers and with local land-owners to develop water delivery points needed for these growing communities.

The Concept Study also includes preliminary investigations for additional potential reservoir sites. Over 40 sites were reviewed as possible feasible sites. A short-list of six sites was produced from the preliminary investigation and a fatal flaw analysis will be performed. The recommendation of the Concept Study is to further study these potential six reservoir sites to include geotechnical and environmental work as well as conceptual dam designs. A final site(s) has not been selected.

The Cache Water Restoration Project is complete but still has a few minor items to finish such as backfilling and some cleanup. Because of a 2009 canal failure of the Logan Northern (LN) Canal, this project moved the LN Canal diversion upstream approximately 1.5 miles (on the Logan River) to that of the Logan, Hyde Park & Smithfield (LHS) Canal. This project was operated during the 2013 irrigation season.

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 \$82,000. 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 2013 water year.

### Water Rights

There were 27 applications to appropriate that were approved in Utah during 2013 for ground water for “ordinary domestic and stockwatering” purposes and associated irrigation use for 23 homes. There were also 7 applications to appropriate approved for stockwatering 1354 livestock.

In the Upper Division, in Rich County, there was an application to appropriate from the Bear River approved for supplemental irrigation of 33.33 acres. In the Lower Division, in Box Elder County below Cutler Dam, an application to appropriate was approved for Procter & Gamble Paper Products Company for industrial use of 6.2 cfs or 4481 acre-feet from the Bear River.

Change applications were also approved to change the points of diversion, nature and/or place of use of historic water rights.

## Wyoming

### Water Activities

The U.S. Fish & Wildlife Service's Cokeville Meadows Refuge administrators and the "Partners for Fish and Wildlife" program tested Wyoming's resolve to require permits for the enlargement of ditches. Proposed widening and deepening of ditches suggested impoundments of water with different outlet controls and consumption beyond the irrigation growing-season. Flow verification and adjudication of instream flow proofs in the Smith's Fork and Thomas Fork drainages were finished. Involved water rights are to be used to keep the Bonneville Cutthroat Trout from being listed as threatened or endangered. Cost-sharing with Trout Unlimited for fish screening on some ditches and canals continued. Sublette Creek Reservoir studies have suffered a setback because of the Wyoming Game & Fish Department's position on the needed exchange involving Smith's Fork.

Limited storage upstream was significant to the water supply this year. This was in spite of Bear Lake staying above the 5911' elevation, which allowed Amended Compact storage without restriction. A second year of low runoff compounded by minimal carryover kept Woodruff Narrows and Whitney reservoirs from filling. Low natural flow triggered early drafts from these reservoirs that threatened reduced carryover storage for the following year.

Staff worked with the Whitney Reservoir Company to design a measuring device for their outflow. This would allow for the telemetering of releases and eliminate the need for many long trips into the Uinta Mountains by the Water Commissioner. Concluding almost 42 years as Water Commissioner at the upper end of the Bear River Basin, Don Shoemaker announced his retirement after the end of the water year.

### Water Rights

New water right permits issued from Wyoming's allocation are as follows:

<u>Permit No.</u>	<u>Appropriator</u>	<u>Priority Date</u>
34833	Daniel B. Richins	November 18, 2011
34861	Teichert Brothers LLC and Mary Katherine Thompson Revocable Trust	April 1, 2011
7739 Enl.	Teichert Brothers	February 1, 2013
7740 Enl.	Jon and Vickie Child, Trustees and Office of State Lands and Investments	December 5, 2012
U.W. 200402	Cindy and Chris Schwitzer	May 20, 2013

## **STREAM GAGING**

As was indicated in the Overview chapter of this report, under the subsection concerning the Stream Gaging Program (see page O-13), 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 about half 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 help the Commission fulfill the responsibilities assigned to it by the Compact. There were no changes to the Commission's stream gaging program in 2013.

During 2013, a total of 32 gages were maintained on the Bear River system. Of these 32 gages, seven were part of a cooperative effort between the Bear River Commission and the USGS, and the USGS funded six gages under NSIP. PacifiCorp maintained 15 gages on the Bear River system during 2013. 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 one gage on the Bear River. Figure 2013.17 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 13-36 through 13-48.



## BEAR RIVER SYSTEM STREAM GAGING STATIONS

### STREAM GAGES MAINTAINED DURING THE 2013 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	BRC/USGS	BRC/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	WY	State of WY	WSE/WY-USGS
<u>10028500</u> *▲	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>1</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>2</sup> ¥	Logan River above State Dam near Logan UT	USGS	USGS	USGS
10113500▲¥	Blacksmith Fork above 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	BRC/USGS	BRC/USGS

- ▲ Stations which are equipped with DCPs.
- \* Seasonal stations
- ¥ NSIP site

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

<sup>1</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>2</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 NSIP program.

**Figure 2013.17**

## 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. 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.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,190 ft<sup>3</sup>/s, May 16, gage height, 6.35 ft; minimum daily discharge, 22 ft<sup>3</sup>/s, Jan 14.

### DISCHARGE, CUBIC FEET PER SECOND WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	45	46	e37	e29	e41	e38	51	167	442	176	68	56
2	44	45	e35	e27	e37	e40	47	143	559	199	64	55
3	43	39	e30	e28	e36	e39	48	150	739	215	60	55
4	42	42	e34	e29	e36	e37	57	179	726	248	57	55
5	41	42	e44	e33	e38	e35	64	185	757	264	56	73
6	41	42	e45	e34	e37	e37	53	219	780	246	54	71
7	40	40	e36	e45	e35	e40	53	237	812	251	52	62
8	41	42	e28	e44	e35	e38	56	258	861	201	54	68
9	43	45	e26	e45	e37	e37	50	290	884	170	55	79
10	42	e35	e26	e41	e36	e37	49	372	877	145	55	69
11	42	e30	e27	e30	e33	e38	51	463	823	137	55	82
12	42	e28	e34	e25	e33	e39	49	596	688	145	55	127
13	52	e39	e44	e23	e37	e38	57	757	635	150	49	133
14	54	e42	e44	e22	e37	e40	49	886	605	141	45	162
15	49	43	e42	e31	e35	42	51	984	510	124	42	162
16	48	47	e41	e30	e34	43	48	1,030	443	139	40	138
17	62	47	e42	e30	e36	39	45	996	409	166	39	131
18	50	50	e40	e30	e34	36	46	839	368	180	40	124
19	48	48	e42	e31	e33	36	43	657	341	134	43	108
20	46	47	e28	e31	e34	34	47	626	312	113	49	101
21	44	47	e34	e31	e36	36	44	597	280	105	124	94
22	46	46	e35	e30	e36	e34	48	661	254	99	68	100
23	58	41	e39	e30	e37	e33	45	780	236	93	75	112
24	53	43	e39	e40	e33	e32	48	831	219	91	78	93
25	39	40	e36	e47	e32	e32	53	825	210	92	74	89
26	47	e34	e36	e45	e33	e35	68	873	201	86	65	109
27	53	e32	e37	e43	e32	e36	90	871	200	85	66	115
28	51	e35	e32	e41	e33	35	125	838	194	89	65	108
29	52	e40	e32	e40	---	37	163	674	188	85	62	126
30	49	e38	e30	e40	---	40	191	548	175	86	62	131
31	47	---	e32	e41	---	44	---	453	---	74	57	---
<b>Total</b>	1,454	1,235	1,107	1,066	986	1,157	1,889	17,985	14,728	4,529	1,828	2,988
<b>Mean</b>	46.9	41.2	35.7	34.4	35.2	37.3	63.0	580	491	146	59.0	99.6
<b>Max</b>	62	50	45	47	41	44	191	1,030	884	264	124	162
<b>Min</b>	39	28	26	22	32	32	43	143	175	74	39	55
<b>Ac-ft</b>	2,880	2,450	2,200	2,110	1,960	2,290	3,750	35,670	29,210	8,980	3,630	5,930

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 2013, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	64.6	54.7	45.7	41.6	39.7	43.7	112	598	833	302	93.3	74.6
<b>Max</b>	208	106	94.9	72.4	64.3	69.0	316	1,044	1,990	1,371	244	229
<b>(WY)</b>	(1983)	(1984)	(1984)	(1984)	(1984)	(1986)	(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)

# 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 9.3 mi upstream from Woodruff Narrows Dam and 10 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.--Records good except for estimated daily discharges, which are poor. Diversion for irrigation of about 43,500 acres above station.

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.

EXTREMES FOR CURRENT YEAR.-- Maximum discharge, 837 ft<sup>3</sup>/s, May 16, gage height, 3.50 ft; minimum daily discharge, 5.7 ft<sup>3</sup>/s, Dec 11, 12

## DISCHARGE, CUBIC FEET PER SECOND WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	21	23	14	e8.0	e30	e32	130	149	260	78	28	33
2	20	21	15	e7.0	e26	e33	141	133	231	80	27	31
3	17	21	17	e7.0	e25	e32	165	113	297	72	25	30
4	13	21	17	e8.0	e25	e32	127	113	373	77	21	35
5	15	19	9.2	e10	e28	e30	112	144	378	86	19	33
6	17	18	24	e12	e28	e33	123	133	402	91	19	35
7	20	16	27	e23	e27	e33	88	167	423	81	16	38
8	19	16	17	e22	e27	e34	72	185	460	83	16	62
9	18	16	11	e23	e29	e33	71	189	480	88	17	53
10	17	23	6.5	e19	e28	e32	43	215	461	74	17	48
11	15	19	5.7	e18	e25	e37	49	249	444	59	18	45
12	14	11	5.7	e16	e25	e39	86	e273	396	52	19	63
13	19	15	6.0	e16	e28	e46	78	e401	306	54	17	73
14	18	30	11	e15	e29	e54	81	e555	265	65	17	58
15	18	28	15	e19	e28	e63	67	669	237	60	19	79
16	20	17	15	e19	e27	e61	67	730	186	50	18	74
17	23	18	16	e19	e29	e55	58	748	147	53	17	54
18	23	23	e14	e19	e28	e56	43	e737	136	60	23	47
19	24	22	e10	e20	e27	e60	42	e597	113	64	30	55
20	20	26	e7.0	e20	e28	e59	50	e454	96	45	30	46
21	19	22	e9.0	e20	e27	e55	55	e439	83	42	32	40
22	17	24	e10	e22	e27	e51	58	e422	69	33	53	35
23	25	25	e12	e25	e29	e48	42	e493	53	33	40	32
24	30	19	e12	e29	e27	e34	38	566	49	29	45	45
25	25	14	e10	e35	e28	e28	34	560	53	28	60	37
26	21	17	e10	e33	e28	e26	32	524	62	29	48	39
27	18	15	e11	e31	e27	31	40	e545	62	28	37	49
28	22	13	e8.0	e30	e33	41	80	e543	63	32	39	59
29	29	12	e8.0	e29	---	71	115	e549	63	35	40	49
30	24	18	e7.0	e29	---	121	143	e456	68	34	36	56
31	25	---	e8.0	e30	---	154	---	342	---	33	35	---
<b>Total</b>	626	582	368.1	633.0	773	1,514	2,330	12,393	6,716	1,728	878	1,433
<b>Mean</b>	20.2	19.4	11.9	20.4	27.6	48.8	77.7	400	224	55.7	28.3	47.8
<b>Max</b>	30	30	27	35	33	154	165	748	480	91	60	79
<b>Min</b>	13	11	5.7	7.0	25	26	32	113	49	28	16	30
<b>Ac-ft</b>	1,240	1,150	730	1,260	1,530	3,000	4,620	24,580	13,320	3,430	1,740	2,840

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 -2013, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	65.5	66.1	64.7	62.7	75.1	153	313	772	812	196	47.5	45.7
<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)	(2011)	(1984)	(1986)	(2011)	(1983)	(1983)
<b>Min</b>	3.03	6.06	7.21	6.76	10.4	26.8	77.7	104	47.4	4.41	0.68	0.49
<b>(WY)</b>	(1965)	(1989)	(1989)	(1989)	(2003)	(1977)	(2013)	(1977)	(2012)	(2000)	(2000)	(1988)

Figure 2013.17 (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.--Records good. Flow regulated by Woodruff Narrows Reservoir (station 10020200) beginning January 1962. Diversions for irrigation of about 43,500 acres above station.

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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1,130 ft<sup>3</sup>/s, May 25; minimum daily discharge, 1.2 ft<sup>3</sup>/s, Mar 22-27.

## DISCHARGE, CUBIC FEET PER SECOND WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013 DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	21	19	19	19	18	20	1.5	21	1,040	84	28	31
2	21	19	19	19	18	20	1.6	21	1,020	84	24	31
3	21	19	18	19	18	20	6.0	22	1,000	78	25	32
4	22	19	18	19	18	20	14	22	983	59	24	34
5	22	19	18	19	18	20	14	22	968	58	23	34
6	21	19	18	19	18	20	14	20	950	69	21	34
7	21	19	19	19	19	20	14	20	933	80	21	34
8	22	19	18	18	19	20	13	20	917	80	21	34
9	22	19	18	18	19	13	13	20	902	80	21	34
10	22	19	19	18	19	4.0	13	20	886	80	21	34
11	22	19	19	18	19	2.6	13	20	869	65	21	34
12	22	19	19	18	19	2.0	12	21	850	52	20	34
13	22	19	19	18	19	1.8	12	21	822	52	20	33
14	21	19	19	18	19	1.7	12	21	481	52	20	33
15	21	19	19	18	19	1.7	12	35	246	52	21	33
16	21	19	19	18	19	1.5	12	56	245	47	20	33
17	21	19	19	18	19	1.4	12	57	243	42	20	33
18	21	19	19	18	19	1.3	12	58	195	42	20	33
19	20	19	19	18	19	1.3	12	59	167	42	20	33
20	20	19	19	18	19	1.3	12	59	157	42	20	33
21	20	19	19	18	19	1.3	12	59	145	42	20	33
22	20	19	18	18	19	1.2	12	153	119	41	31	34
23	20	19	18	18	19	1.2	12	221	100	41	32	22
24	20	19	18	18	19	1.2	13	764	99	36	31	14
25	20	19	19	18	20	1.2	13	1,130	98	32	31	13
26	19	19	19	18	20	1.2	13	1,120	97	31	31	13
27	19	19	19	18	20	1.2	18	1,110	97	31	31	13
28	19	19	19	18	20	1.3	21	1,100	97	31	31	13
29	19	19	19	18	---	1.3	22	1,080	96	31	31	12
30	19	19	19	18	---	1.3	21	1,070	89	31	31	12
31	19	---	19	18	---	1.4	---	1,060	---	32	31	---
<b>Total</b>	640	570	580	565	530	207.4	382.1	9,482	14,911	1,619	762	843
<b>Mean</b>	20.6	19.0	18.7	18.2	18.9	6.69	12.7	306	497	52.2	24.6	28.1
<b>Max</b>	22	19	19	19	20	20	22	1,130	1,040	84	32	34
<b>Min</b>	19	19	18	18	18	1.2	1.5	20	89	31	20	12
<b>Ac-ft</b>	1,270	1,130	1,150	1,120	1,050	411	758	18,810	29,580	3,210	1,510	1,670

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 2013, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	54.1	49.1	42.1	40.1	41.2	85.7	256	748	957	274	72.6	58.0
<b>Max</b>	425	421	184	153	171	473	891	1,828	2,437	1,339	331	278
<b>(WY)</b>	(1983)	(1983)	(1983)	(1985)	(1971)	(1972)	(1985)	(1984)	(1983)	(2011)	(1983)	(1983)
<b>Min</b>	3.89	0.12	4.28	4.37	4.71	4.70	0.34	27.8	356	10.5	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.

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

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.

EXTREMES FOR CURRENT YEAR. -- Maximum discharge, 235 ft<sup>3</sup>/s, Jul 22, gage height, 3.46 ft; minimum daily discharge, 0.35 ft<sup>3</sup>/s, Jun 4.

## DISCHARGE, CUBIC FEET PER SECOND WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013 DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	23	---	---	---	---	---	62	12	0.87	0.67	9.5	9.8
2	13	---	---	---	---	---	43	12	0.67	0.76	9.3	9.3
3	4.5	---	---	---	---	---	27	12	0.41	0.83	8.1	5.3
4	---	---	---	---	---	---	25	14	0.35	0.87	7.3	1.9
5	---	---	---	---	---	---	24	11	0.39	1.0	7.0	1.9
6	---	---	---	---	---	---	22	10	0.86	1.0	5.5	1.7
7	---	---	---	---	---	---	22	11	0.91	1.3	5.1	1.6
8	---	---	---	---	---	---	25	11	0.73	1.4	5.0	1.8
9	---	---	---	---	---	---	28	11	0.63	1.5	5.0	1.9
10	---	---	---	---	---	---	26	11	0.80	1.6	4.7	2.2
11	---	---	---	---	---	---	30	6.5	0.81	1.5	4.0	2.3
12	---	---	---	---	---	---	32	1.4	0.63	1.4	2.9	2.5
13	---	---	---	---	---	---	33	1.0	0.62	1.5	2.9	14
14	---	---	---	---	---	---	34	1.0	0.77	1.4	4.3	17
15	---	---	---	---	---	---	36	0.95	1.1	1.2	4.8	19
16	---	---	---	---	---	---	39	0.97	1.3	1.3	4.8	19
17	---	---	---	---	---	---	36	0.87	1.6	2.5	4.9	19
18	---	---	---	---	---	---	36	0.86	1.9	3.0	6.7	17
19	---	---	---	---	---	---	81	0.77	1.4	3.2	13	12
20	---	---	---	---	---	---	112	0.82	1.4	3.4	11	12
21	---	---	---	---	---	---	67	0.75	1.1	3.4	7.7	14
22	---	---	---	---	---	---	44	1.9	0.84	79	7.0	16
23	---	---	---	---	---	---	11	3.8	1.0	84	7.5	18
24	---	---	---	---	---	---	12	2.5	0.74	36	8.2	19
25	---	---	---	---	---	---	13	2.3	0.56	22	9.5	22
26	---	---	---	---	---	---	14	2.0	0.58	18	10	24
27	---	---	---	---	---	50	15	1.6	0.66	16	11	24
28	---	---	---	---	---	53	14	0.55	0.72	14	11	24
29	---	---	---	---	---	73	13	0.46	0.86	12	11	24
30	---	---	---	---	---	44	12	0.58	0.80	11	10	23
31	---	---	---	---	---	51	---	0.71	---	9.8	9.9	---
<b>Total</b>	---	---	---	---	---	---	988	147.29	26.01	336.53	228.6	379.2
<b>Mean</b>	---	---	---	---	---	---	32.9	4.75	0.87	10.9	7.37	12.6
<b>Max</b>	---	---	---	---	---	---	112	14	1.9	84	13	24
<b>Min</b>	---	---	---	---	---	---	11	0.46	0.35	0.67	2.9	1.6
<b>Ac-ft</b>	---	---	---	---	---	---	1,960	292	52	668	453	752

Figure 2013.17 (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.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 516 ft<sup>3</sup>/s, May 18, gage height, 2.33 ft; minimum daily discharge, 39 ft<sup>3</sup>/s, Jan 3, 14.

### DISCHARGE, CUBIC FEET PER SECOND WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	86	80	72	e44	e59	e51	79	169	324	195	115	81
2	86	79	70	e41	e55	53	85	155	319	191	113	85
3	85	77	72	e39	e54	52	99	165	329	185	111	89
4	85	77	e66	e40	e54	e50	111	186	342	184	110	85
5	85	76	79	e41	e56	e48	124	197	343	188	109	82
6	84	76	74	e45	e55	e50	118	217	348	183	108	81
7	83	75	69	e46	e53	e53	113	229	355	174	106	80
8	84	75	e63	e59	e53	51	106	231	373	172	107	82
9	83	77	e58	e58	e55	50	97	249	383	166	108	81
10	83	74	e63	e60	e54	e50	90	265	391	161	105	79
11	82	e73	e62	e56	e51	51	93	292	388	157	104	79
12	82	e72	e65	e45	e51	53	96	313	365	157	103	88
13	83	74	e66	e40	e55	52	103	366	351	160	104	83
14	82	74	e61	e39	e55	54	96	421	339	154	102	87
15	81	69	e66	e47	e53	59	92	450	320	147	99	90
16	87	72	e65	e45	e51	61	91	483	303	144	97	83
17	88	73	e63	e44	e51	62	86	481	288	145	95	85
18	82	81	e61	e44	e51	e57	83	494	277	146	94	91
19	81	78	e44	e45	e50	e56	83	448	269	136	92	82
20	80	74	e40	e45	e51	58	83	413	261	132	91	78
21	79	73	e41	e45	e53	61	83	395	253	128	92	76
22	86	70	e45	e46	e53	e55	87	390	244	126	91	75
23	100	e66	e58	e48	e54	e56	83	386	237	124	91	75
24	87	70	e58	e60	e49	e55	82	393	231	123	97	75
25	83	72	e52	e67	e47	e54	88	393	229	122	93	83
26	80	e64	e53	e65	e48	e57	97	396	222	121	90	86
27	81	e63	e54	e63	e46	55	120	394	215	121	89	81
28	82	e66	e50	e59	e46	56	162	404	207	123	88	79
29	83	69	e44	e58	---	63	187	398	202	123	85	77
30	83	69	e44	e58	---	68	178	375	201	126	83	75
31	81	---	e42	e59	---	74	---	344	---	118	82	---
<b>Total</b>	<b>2,597</b>	<b>2,188</b>	<b>1,820</b>	<b>1,551</b>	<b>1,463</b>	<b>1,725</b>	<b>3,095</b>	<b>10,492</b>	<b>8,909</b>	<b>4,632</b>	<b>3,054</b>	<b>2,453</b>
<b>Mean</b>	<b>83.8</b>	<b>72.9</b>	<b>58.7</b>	<b>50.0</b>	<b>52.2</b>	<b>55.6</b>	<b>103</b>	<b>338</b>	<b>297</b>	<b>149</b>	<b>98.5</b>	<b>81.8</b>
<b>Max</b>	<b>100</b>	<b>81</b>	<b>79</b>	<b>67</b>	<b>59</b>	<b>74</b>	<b>187</b>	<b>494</b>	<b>391</b>	<b>195</b>	<b>115</b>	<b>91</b>
<b>Min</b>	<b>79</b>	<b>63</b>	<b>40</b>	<b>39</b>	<b>46</b>	<b>48</b>	<b>79</b>	<b>155</b>	<b>201</b>	<b>118</b>	<b>82</b>	<b>75</b>
<b>Ac-ft</b>	<b>5,150</b>	<b>4,340</b>	<b>3,610</b>	<b>3,080</b>	<b>2,900</b>	<b>3,420</b>	<b>6,140</b>	<b>20,810</b>	<b>17,670</b>	<b>9,190</b>	<b>6,060</b>	<b>4,870</b>

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 2013, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	90.2	77.9	68.5	63.1	60.2	62.2	157	520	608	290	150	107
<b>Max</b>	156	113	88.4	85.0	82.8	99.4	385	1,072	1,377	779	280	169
<b>(WY)</b>	(1987)	(1986)	(1983)	(1983)	(1984)	(1986)	(1946)	(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 2013.17 (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.--Records good except for estimated daily discharges, which are poor. Natural flow of stream affected by regulation of upstream reservoirs, diversions for irrigation, and return flow from irrigated areas.

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.

EXTREMES FOR CURRENT YEAR.--Maximum discharge recorded, 355 ft<sup>3</sup>/s, May 19, gage height 2.70 ft, minimum daily, 64 ft<sup>3</sup>/s, Sep 11.

## DISCHARGE, CUBIC FEET PER SECOND WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	77	132	147	e90	e130	e138	244	142	235	147	107	75
2	78	130	155	e80	e131	e142	251	142	221	157	102	74
3	78	129	171	e76	e129	e142	246	132	214	162	100	78
4	68	129	157	e78	e133	e138	226	124	213	157	96	76
5	65	129	157	e80	e138	e132	211	118	218	159	91	72
6	65	128	166	e90	e137	e140	211	131	217	153	90	70
7	65	126	165	e90	e135	e148	200	156	219	149	84	69
8	65	127	e140	e122	e127	e150	203	172	224	146	82	70
9	71	133	e125	e133	e124	e152	210	172	231	160	82	71
10	73	134	e130	e135	e130	e152	200	177	248	159	80	67
11	72	128	e130	e122	e115	e152	202	182	284	153	77	64
12	71	118	e135	e107	e118	e154	211	186	291	150	77	70
13	70	136	e137	e76	e125	e150	207	196	282	145	76	72
14	69	127	e130	e75	e124	e170	199	245	270	154	79	69
15	68	132	e140	e116	e122	e170	185	304	262	142	79	77
16	69	130	e135	e119	e120	e160	200	315	248	131	77	80
17	72	133	e140	e117	e120	e188	196	330	237	136	76	79
18	74	139	e125	e113	e120	188	185	337	231	130	75	83
19	71	149	e87	e113	e120	195	177	345	235	125	74	82
20	70	150	e83	e112	e120	193	215	321	221	115	78	76
21	71	147	e85	e115	e125	183	238	299	218	108	83	80
22	77	145	e88	e117	e125	171	211	287	210	104	83	74
23	119	140	e120	e123	e127	161	191	288	200	140	83	76
24	159	131	e120	e128	e125	168	148	279	194	185	93	77
25	150	137	e114	e133	e125	170	141	265	194	146	92	75
26	141	135	e115	e131	e125	179	130	252	192	131	89	78
27	135	e134	e118	e126	e125	182	128	257	180	126	86	84
28	134	e145	e110	e130	e127	194	136	259	176	126	86	84
29	133	148	e95	e128	---	222	154	271	173	126	83	84
30	131	143	e95	e124	---	272	158	272	152	121	81	83
31	130	---	e85	e125	---	246	---	253	---	115	78	---
<b>Total</b>	2,791	4,044	3,900	3,424	3,522	5,302	5,814	7,209	6,690	4,358	2,619	2,269
<b>Mean</b>	90.0	135	126	110	126	171	194	233	223	141	84.5	75.6
<b>Max</b>	159	150	171	135	138	272	251	345	291	185	107	84
<b>Min</b>	65	118	83	75	115	132	128	118	152	104	74	64
<b>Ac-ft</b>	5,540	8,020	7,740	6,790	6,990	10,520	11,530	14,300	13,270	8,640	5,190	4,500

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 2013, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	199	217	188	173	195	358	702	969	1,137	535	218	170
<b>Max</b>	751	693	563	381	479	1,294	1,979	3,158	3,829	2,837	752	671
<b>(WY)</b>	(1983)	(1983)	(1983)	(1985)	(1986)	(1986)	(1985)	(1952)	(1983)	(2011)	(1983)	(1983)
<b>Min</b>	43.5	74.6	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)

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

### STREAMFLOW RECORDS FOR WATER YEAR 2013

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 ft<sup>3</sup>/s, May 27, 1984; no flow Apr 28, 1977 and Oct 1, 1979.

DISCHARGE MEASUREMENT DATES.-- 9-2-12, 10-4-12, 10-28-12, 11-24-12, 2-14-13, 3-12-13, 4-14-13, 5-12-13, 5-26-13, 5-28-13, 7-6-13, 8-2-13, 9-14-13, 9-24-13, 10-12-13.

#### Rainbow Inlet Canal near Dingle, ID (10046000) Water Year 2013 (October 2012 to September 2013)

##### Daily Mean Values

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	8	166	159	140	150	92	270	160	5	2	8	3
2	4	166	159	140	150	92	270	160	2	2	6	3
3	57	166	159	140	150	92	300	140	2	2	6	3
4	41	166	165	140	150	92	300	60	2	2	6	3
5	41	166	165	140	150	92	300	10	2	2	6	3
6	41	160	165	140	150	92	300	5	2	27	5	3
7	41	160	165	140	150	92	275	7	2	27	4	3
8	41	160	165	140	150	92	275	7	2	27	3	3
9	41	160	165	140	150	120	285	7	2	27	2	3
10	50	160	165	140	150	120	285	7	2	27	2	3
11	52	160	165	140	150	150	285	5	2	27	2	3
12	52	160	165	140	150	165	285	3	3	27	2	3
13	52	160	165	140	150	165	295	3	4	27	2	10
14	52	160	165	140	92	170	315	3	4	27	2	18
15	52	160	165	140	92	170	296	3	4	27	2	18
16	52	160	175	140	92	180	276	7	3	27	2	18
17	52	150	175	140	95	180	257	8	3	27	2	18
18	52	150	160	140	92	170	235	20	3	35	2	20
19	65	160	140	140	92	170	280	100	3	27	2	20
20	65	160	140	140	92	200	280	100	2	27	2	20
21	65	160	140	140	92	225	250	125	2	27	2	20
22	60	160	140	140	92	200	300	115	2	27	2	20
23	65	160	140	140	92	180	280	100	2	27	2	20
24	75	159	150	140	92	180	250	80	2	27	3	51
25	90	159	150	140	92	180	200	75	2	27	5	51
26	100	159	150	140	92	180	200	81	2	35	5	51
27	110	159	150	150	92	180	190	75	2	30	5	51
28	166	159	150	150	92	185	185	3	2	27	5	48
29	166	159	140	150		195	185	3	2	8	12	48
30	166	159	140	150		210	160	2	2	8	10	51
31	166		140	150		260		5		8	10	

	Monthly Statistics											Yearly Stats	
<b>Total</b>	2,140	4,803	4,837	4,390	3,333	4,871	7,864	1,479	74	674	129	589	<b>35,183</b>
<b>Mean</b>	69	160	156	142	119	157	262	48	2	22	4	20	<b>97</b>
<b>Min</b>	4	150	140	140	92	92	160	2	2	2	2	3	<b>2</b>
<b>Max</b>	166	166	175	150	150	260	315	160	5	35	12	51	<b>315</b>
<b>Ins. Min</b>	4	140	140	118	92	92	23	2	2	2	2	3	<b>2</b>
<b>Ins. Max</b>	166	198	205	198	199	281	323	700	898	637	498	425	<b>898</b>
<b>Ac-ft</b>	4,240	9,530	9,590	8,710	6,610	9,660	15,600	2,930	147	1,340	256	1,170	<b>69,783</b>



**PacifiCorp Energy**  
**Reservoir Level Records**  
**Bear Lake 2012-2013**

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

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	15.90	15.54	15.61	15.80	15.88	16.21	16.50	17.06	17.17	15.85	14.47	13.16	1
2	15.88	15.54	15.62	15.81	15.89	16.21	16.51	17.06	17.15	15.80	14.43	13.12	2
3	15.86	15.54	15.63	15.81	15.89	16.22	16.52	17.06	17.13	15.75	14.39	13.11	3
4	15.84	15.53	15.64	15.81	15.90	16.23	16.53	17.06	17.12	15.70	14.35	13.09	4
5	15.81	15.51	15.65	15.81	15.91	16.24	16.55	17.06	17.11	15.65	14.31	13.07	5
6	15.78	15.50	15.66	15.81	15.92	16.24	16.57	17.06	17.10	15.60	14.27	13.05	6
7	15.76	15.50	15.67	15.82	15.94	16.25	16.59	17.07	17.08	15.55	14.23	13.05	7
8	15.73	15.50	15.68	15.82	15.96	16.25	16.62	17.09	17.06	15.50	14.19	13.04	8
9	15.71	15.50	15.69	15.82	15.98	16.25	16.63	17.10	17.04	15.45	14.14	13.02	9
10	15.69	15.51	15.70	15.83	16.00	16.26	16.65	17.11	17.01	15.40	14.10	13.02	10
11	15.67	15.52	15.70	15.83	16.02	16.26	16.67	17.12	16.97	15.35	14.05	13.00	11
12	15.66	15.52	15.70	15.84	16.03	16.28	16.70	17.13	16.90	15.30	14.00	12.99	12
13	15.65	15.53	15.70	15.84	16.04	16.29	16.73	17.14	16.83	15.25	13.96	12.98	13
14	15.64	15.53	15.71	15.84	16.05	16.30	16.76	17.14	16.77	15.21	13.92	12.98	14
15	15.62	15.54	15.71	15.84	16.06	16.31	16.80	17.14	16.71	15.16	13.87	12.98	15
16	15.61	15.54	15.71	15.85	16.07	16.32	16.84	17.14	16.67	15.12	13.82	12.98	16
17	15.60	15.54	15.72	15.85	16.08	16.33	16.88	17.14	16.63	15.08	13.77	12.98	17
18	15.58	15.54	15.72	15.85	16.09	16.34	16.90	17.14	16.59	15.05	13.72	12.98	18
19	15.57	15.55	15.73	15.85	16.10	16.35	16.92	17.16	16.55	15.02	13.67	12.96	19
20	15.56	15.56	15.74	15.85	16.11	16.36	16.94	17.17	16.51	14.99	13.62	12.94	20
21	15.55	15.57	15.75	15.85	16.13	16.37	16.96	17.18	16.45	14.96	13.58	12.92	21
22	15.54	15.57	15.76	15.85	16.14	16.38	16.98	17.19	16.40	14.91	13.55	12.89	22
23	15.54	15.58	15.77	15.85	16.15	16.39	17.00	17.19	16.34	14.87	13.51	12.86	23
24	15.54	15.58	15.78	15.86	16.16	16.41	17.02	17.20	16.26	14.83	13.46	12.84	24
25	15.54	15.59	15.79	15.86	16.17	16.43	17.03	17.20	16.18	14.78	13.42	12.81	25
26	15.54	15.59	15.79	15.86	16.18	16.44	17.04	17.20	16.10	14.73	13.38	12.79	26
27	15.54	15.59	15.79	15.86	16.19	16.45	17.05	17.20	16.05	14.68	13.35	12.77	27
28	15.54	15.60	15.79	15.87	16.20	16.46	17.06	17.20	16.00	14.64	13.32	12.75	28
29	15.54	15.60	15.79	15.87	16.20	16.47	17.06	17.20	15.95	14.59	13.29	12.72	29
30	15.54	15.60	15.80	15.87	16.20	16.48	17.06	17.19	15.90	14.55	13.24	12.69	30
31	15.54	15.54	15.80	15.88	16.14	16.49	17.18	17.18	15.90	14.51	13.20	12.69	31

**BEAR LAKE STATISTICS**

		Monthly												Yearly
Daily Mean	15.65	15.55	15.72	15.84	16.04	16.33	16.80	17.14	16.66	15.16	13.83	12.95	15.64	
Daily Min	15.54	15.50	15.61	15.80	15.88	16.21	16.50	17.06	15.90	14.51	13.20	12.69	12.69	
Daily Max	15.90	15.60	15.80	15.88	16.20	16.49	17.06	17.20	17.17	15.85	14.47	13.16	17.20	

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

**PacifiCorp Energy  
Reservoir Records  
Bear Lake 2012-2013  
Daily Contents (Acre Feet)**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	881838	857451	862185	875053	880480	902925	922711	961068	968625	878444	785429	698128	1
2	880480	857451	862862	875732	881159	902925	923394	961068	967251	875053	782747	695479	2
3	879123	857451	863538	875732	881159	903606	924078	961068	965976	871664	780067	694818	3
4	877766	856775	864215	875732	881838	904288	924761	961068	965189	869277	777386	693494	4
5	875732	855423	864892	875732	882517	904969	926128	961068	964502	864892	774707	692171	5
6	873697	854748	865568	875732	883196	904969	927494	961068	963815	861508	772029	690848	6
7	872341	854748	866245	876410	884555	905650	928862	961755	962442	858128	769353	690848	7
8	870309	854748	866922	876410	885913	905650	930914	963128	961068	854748	766676	690187	8
9	868954	854748	867600	876410	887272	905650	931598	963815	959695	851370	763332	688865	9
10	867600	855423	868277	877088	888632	906332	932967	964502	957636	847994	760659	688865	10
11	866245	856099	868277	877088	889992	906332	934335	965189	954892	844618	757318	687543	11
12	865568	856099	868277	877766	890673	907695	936388	965876	950090	841245	753979	686882	12
13	864892	856775	868277	877766	891353	908377	938442	966564	945292	837874	751310	686221	13
14	864215	856775	868954	877766	892033	909059	940496	966564	941181	835177	748642	686221	14
15	862862	857451	868954	877766	892713	909741	943237	966564	937072	831808	745306	686221	15
16	862185	857451	868954	878444	893393	910424	945977	966564	934335	829114	741973	686221	16
17	861508	857451	869632	878444	894073	911106	948719	966564	931598	826421	738642	686221	17
18	860156	857451	869632	878444	894754	911788	950090	966564	928862	824402	735311	686221	18
19	859480	858128	870309	878444	895434	912470	951461	967938	926128	822382	731983	684899	19
20	858804	858804	870986	878444	896115	913152	962833	968625	923394	820363	728657	683578	20
21	858128	859480	871664	878444	897476	913834	964206	969312	919295	818345	725996	682257	21
22	857451	859480	872341	878444	898157	914517	955578	970000	915882	814982	724001	680277	22
23	857451	860156	873019	878444	898838	915199	956950	970000	911788	812292	721343	678296	23
24	857451	860156	873697	879123	899519	916564	958323	970687	906332	809603	718022	676976	24
25	857451	860832	874375	879123	900200	917930	959009	970687	900882	806243	715365	674998	25
26	857451	860832	874375	879123	900882	918612	959695	970687	895434	802882	712710	673679	26
27	857451	860832	874375	879123	901563	919295	960382	970687	892033	799523	710720	672361	27
28	857451	861508	874375	879801	902244	919978	961068	970687	888632	796837	708731	671042	28
29	857451	861508	874375	879801		920661	961068	970687	885234	793480	706741	669066	29
30	857451	861508	875053	879801		921345	961068	970000	881838	790795	703426	667090	30
31	857451		875053	880480		922028		969312		788111	700777		31

Monthly Totals													Yearly Totals
Mean	864,722	857,925	869,589	877,810	891,648	911,196	943,408	966,431	933,543	831,567	742,366	684,332	864,545
Min	857,451	854,748	862,185	875,053	880,480	902,925	922,711	961,068	881,838	788,111	700,777	667,090	667,090
Max	881,838	861,508	875,053	880,480	902,244	922,028	961,068	970,687	968,625	878,444	785,429	698,128	970,687

Notes:

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

**STREAMFLOW RECORDS FOR WATER YEAR 2013**

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, 1.0 ft<sup>3</sup>/s, for many days in 1937, 1954, 1959,

DISCHARGE MEASUREMENT DATES.-- 9-30-12, 11-3-12, 5-14-13, 6-4-13, 6-8-13, 6-11-13, 6-19-13, 6-26-13, 7-15-13, 8-2-13, 8-10-13, 8-17-13, 8-31-13, 9-11-13,

**Bear Lake Outlet Canal near Paris, ID (10059500)  
Water Year 2013 (October 2012 to September 2013)**

**Daily Mean Values**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	175	613	5	5	5	5	5	5	275	1550	523	779
2	172	686	5	5	5	5	5	5	377	1550	523	757
3	173	719	5	5	5	5	5	5	475	1550	523	567
4	166	723	5	5	5	5	5	5	473	1550	522	561
5	189	388	5	5	5	5	5	5	477	1550	597	559
6	209	5	5	5	5	5	5	5	669	1550	677	525
7	208	5	5	5	5	5	5	5	940	1550	826	407
8	206	5	5	5	5	5	5	5	996	1550	1060	432
9	207	5	5	5	5	5	5	5	1010	1470	1020	410
10	207	5	5	5	5	5	5	5	1210	1330	811	173
11	112	5	5	5	5	5	5	5	1420	1320	1010	164
12	5	5	5	5	5	5	5	121	1410	1310	1220	163
13	5	5	5	5	5	5	5	242	1270	1320	1150	158
14	5	5	5	5	5	5	5	314	1160	1290	1050	156
15	5	5	5	5	5	5	5	410	1160	1130	1130	152
16	5	5	5	5	5	5	5	388	1160	1000	1260	149
17	5	5	5	5	5	5	5	364	1310	999	1260	151
18	5	5	5	5	5	5	5	266	1470	998	1250	149
19	5	5	5	5	5	5	5	53.1	1480	995	1240	194
20	5	5	5	5	5	5	5	5	1490	993	1230	298
21	5	5	5	5	5	5	5	5	1500	989	1230	293
22	5	5	5	5	5	5	5	5	1500	1110	1200	451
23	5	5	5	5	5	5	5	5	1520	1250	1120	636
24	5	5	5	5	5	5	5	102	1560	1250	1120	509
25	5	5	5	5	5	5	5	221	1570	1240	1110	514
26	5	5	5	5	5	5	5	224	1570	1250	1080	445
27	5	5	5	5	5	5	5	166	1570	1250	911	267
28	5	5	5	5	5	5	5	87.2	1570	1250	902	190
29	5	5	5	5	5	5	5	216	1560	1170	898	189
30	5	5	5	5	5	5	5	281	1560	1060	885	191
31	317		5	5		5		282		832	787	

	Monthly Statistics											Yearly Stats	
<b>Total</b>	2,436	3,254	155	155	140	155	150	3,812	35,712	39,206	30,125	10,589	<b>125,889</b>
<b>Mean</b>	79	108	5	5	5	5	5	123	1,190	1,260	972	353	<b>343</b>
<b>Min</b>	5	5	5	5	5	5	5	5	275	832	522	149	<b>5</b>
<b>Max</b>	317	723	5	5	5	5	5	410	1,570	1,550	1,260	779	<b>1,570</b>
<b>Ins. Min</b>	5	5	5	5	5	5	5	5	272	532	518	130	<b>5</b>
<b>Ins. Max</b>	577	727	5	5	5	5	5	432	1,590	1,610	1,260	784	<b>1,610</b>
<b>Ac-ft</b>	4,830	6,450	307	307	278	307	298	7,560	70,830	77,760	59,750	21,000	<b>249,677</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.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,330 ft<sup>3</sup>/s, Apr 15, gage height, 11.81 ft, minimum daily discharge, 164 ft<sup>3</sup>/s, May 14.

### DISCHARGE, CUBIC FEET PER SECOND WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	419	432	489	e370	e385	405	695	433	210	973	1,040	698
2	441	410	469	e375	e375	417	765	419	191	961	921	741
3	514	425	433	e370	e370	428	960	413	232	955	911	745
4	585	447	450	e350	e375	429	981	423	261	977	887	709
5	565	439	463	e335	e375	438	980	428	250	990	870	627
6	535	443	469	e365	e370	422	1,010	422	360	1,050	831	504
7	519	441	466	e400	e375	425	986	420	391	1,070	838	512
8	517	441	437	e400	e365	435	919	355	410	1,070	897	559
9	519	448	415	e405	e400	442	908	350	486	1,060	906	556
10	543	451	425	e415	e410	448	943	326	518	976	923	489
11	540	446	429	e425	406	448	925	286	524	970	937	426
12	541	420	430	e420	390	456	816	246	606	969	1,010	416
13	547	421	437	e410	310	480	661	204	630	913	897	228
14	528	468	435	e390	414	507	815	164	684	921	887	219
15	379	418	437	e365	448	560	962	272	670	912	887	213
16	395	440	438	e380	444	645	635	266	737	905	887	220
17	409	419	442	e390	428	630	676	281	781	901	893	218
18	413	428	452	e395	420	589	695	288	918	821	895	220
19	451	430	436	e385	414	597	617	233	975	700	892	211
20	401	433	e350	e375	410	583	634	475	967	679	883	216
21	400	424	e390	e365	422	619	669	351	957	680	884	214
22	418	426	e425	e360	413	642	634	225	959	683	879	213
23	400	421	e450	e360	414	639	608	219	1,020	688	883	209
24	389	422	e465	e365	410	640	547	199	1,040	695	898	282
25	460	411	449	e370	426	643	514	178	1,050	781	912	316
26	496	421	437	e395	405	623	581	184	1,050	874	898	365
27	477	414	433	e430	401	633	463	184	1,050	945	897	361
28	456	427	423	e465	394	624	557	170	1,040	971	891	363
29	432	537	e395	e440	---	626	668	251	1,040	1,010	873	372
30	409	496	e380	e400	---	632	537	240	1,000	1,080	754	348
31	413	---	e375	e390	---	657	---	234	---	1,070	700	---
<b>Total</b>	14,511	13,099	13,424	12,060	11,169	16,762	22,361	9,139	21,007	28,250	27,561	11,770
<b>Mean</b>	468	437	433	389	399	541	745	295	700	911	889	392
<b>Max</b>	585	537	489	465	448	657	1,010	475	1,050	1,080	1,040	745
<b>Min</b>	379	410	350	335	310	405	463	164	191	679	700	209
<b>Ac-ft</b>	28,780	25,980	26,630	23,920	22,150	33,250	44,350	18,130	41,670	56,030	54,670	23,350

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1971 - 2013, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	826	881	891	867	868	1,073	1,301	1,351	1,250	960	887	821
<b>Max</b>	2,850	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>	223	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**

REVISED RECORDS.--WDR UT-04-1: Discharge.

**DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013  
DAILY MEAN VALUES**

<b>Day</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>
<b>1</b>	124	114	109	91	97	91	139	203	311	185	125	106
<b>2</b>	119	114	110	84	95	89	139	187	306	177	124	108
<b>3</b>	118	113	119	82	96	93	144	192	320	177	123	108
<b>4</b>	118	114	105	85	94	93	150	207	322	176	120	107
<b>5</b>	118	112	124	88	95	90	162	228	318	174	119	106
<b>6</b>	118	110	117	101	95	92	167	241	315	172	118	104
<b>7</b>	117	110	112	102	95	90	167	262	317	169	116	105
<b>8</b>	117	110	110	106	96	93	166	275	325	167	117	106
<b>9</b>	116	117	108	105	96	94	165	281	334	163	117	105
<b>10</b>	116	113	106	105	95	94	150	317	329	160	116	104
<b>11</b>	116	112	106	102	93	94	152	350	320	159	115	105
<b>12</b>	116	109	106	98	89	97	148	377	302	158	116	111
<b>13</b>	116	109	106	82	93	101	152	419	293	155	116	108
<b>14</b>	116	108	105	78	91	112	149	486	285	154	114	108
<b>15</b>	115	108	106	97	90	112	144	523	268	150	114	111
<b>16</b>	113	108	106	100	90	119	141	544	255	149	113	107
<b>17</b>	115	108	109	97	91	123	135	546	250	147	112	104
<b>18</b>	112	116	105	97	90	115	130	509	245	145	111	104
<b>19</b>	112	117	97	97	90	110	134	442	239	144	110	103
<b>20</b>	112	112	88	97	90	106	141	415	233	142	111	103
<b>21</b>	112	109	92	98	90	110	136	392	229	140	110	102
<b>22</b>	115	110	101	97	90	104	132	388	221	139	109	101
<b>23</b>	134	108	107	98	92	99	131	398	217	138	111	101
<b>24</b>	129	108	104	100	89	99	129	399	211	137	112	94
<b>25</b>	123	108	101	100	86	99	130	388	208	137	112	106
<b>26</b>	119	106	99	100	91	101	131	389	203	134	110	103
<b>27</b>	118	105	99	100	86	98	136	382	198	133	110	101
<b>28</b>	118	105	98	99	87	101	152	390	194	133	109	101
<b>29</b>	118	104	92	99	---	107	172	379	191	130	107	100
<b>30</b>	116	105	96	99	---	118	194	360	188	128	107	98
<b>31</b>	115	---	91	97	---	132	---	327	---	126	106	---
<b>Total</b>	3,641	3,302	3,234	2,981	2,572	3,176	4,418	11,196	7,947	4,698	3,530	3,130
<b>Mean</b>	117	110	104	96.2	91.9	102	147	361	265	152	114	104
<b>Max</b>	134	117	124	106	97	132	194	546	334	185	125	111
<b>Min</b>	112	104	88	78	86	89	129	187	188	126	106	94
<b>Ac-ft</b>	7,220	6,550	6,410	5,910	5,100	6,300	8,760	22,210	15,760	9,320	7,000	6,210

Figure 2013.17 (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.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,180 ft<sup>3</sup>/s, Mar 19, gage height, 7.78 ft; minimum daily discharge, 109 ft<sup>3</sup>/s, Jun 21.

## DISCHARGE, CUBIC FEET PER SECOND WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	339	604	682	e864	e951	e843	1,230	1,080	320	258	154	141
2	343	746	797	e635	e951	e705	1,400	1,250	257	187	150	164
3	389	705	1,010	e522	e950	980	1,610	988	208	161	146	189
4	443	692	931	e833	e966	1,150	1,640	606	182	150	145	190
5	498	691	951	e947	e972	1,450	1,760	426	162	159	152	187
6	617	687	916	e803	e974	1,380	1,830	594	164	164	142	183
7	743	680	887	e681	e973	1,130	1,890	471	166	171	133	181
8	778	681	921	e726	e947	1,010	2,000	205	151	176	132	186
9	745	692	1,050	e795	e928	981	1,980	145	138	173	137	192
10	670	797	1,160	e854	e930	1,220	2,000	180	137	172	144	186
11	671	1,050	984	e1,030	e931	1,420	2,010	147	135	174	147	183
12	681	1,060	824	e1,220	e982	1,490	1,910	127	135	180	153	186
13	693	888	810	e1,050	e1,040	1,560	1,920	125	137	178	145	198
14	699	647	894	e1,050	e1,030	1,500	1,600	129	129	170	143	176
15	709	603	961	e902	e753	1,600	1,600	136	122	176	137	187
16	683	763	970	e725	e740	1,850	1,840	140	120	174	135	302
17	621	832	985	e726	e913	2,020	1,700	141	122	176	139	364
18	594	845	955	e855	e988	1,980	1,550	313	120	181	142	437
19	575	755	861	e953	e1,040	2,150	1,540	1,080	122	170	140	448
20	575	841	e876	e938	e1,090	2,030	1,520	804	111	173	141	424
21	577	687	e947	e896	e1,030	1,770	1,080	850	109	176	140	402
22	636	642	e746	e848	e806	1,400	1,120	864	111	184	139	362
23	747	655	e626	e629	e854	1,570	1,450	855	111	181	146	282
24	987	739	e925	e767	e989	1,570	1,650	734	120	179	144	220
25	1,020	765	e1,370	e1,100	e1,040	1,550	1,320	519	122	146	150	188
26	930	775	e1,280	e995	e1,030	1,560	1,090	351	119	140	155	169
27	870	771	e1,070	e952	e956	1,560	1,090	432	114	142	150	175
28	798	766	e1,070	e951	e919	1,550	1,250	298	113	149	149	196
29	765	761	e1,070	e1,060	---	1,470	1,260	213	115	162	147	214
30	784	702	e1,060	e1,030	---	1,310	1,090	216	296	159	146	244
31	787	---	e969	e1,100	---	1,240	---	286	---	150	145	---
<b>Total</b>	<b>20,967</b>	<b>22,522</b>	<b>29,558</b>	<b>27,437</b>	<b>26,673</b>	<b>44,999</b>	<b>46,930</b>	<b>14,705</b>	<b>4,468</b>	<b>5,291</b>	<b>4,468</b>	<b>7,156</b>
<b>Mean</b>	<b>676</b>	<b>751</b>	<b>953</b>	<b>885</b>	<b>953</b>	<b>1,452</b>	<b>1,564</b>	<b>474</b>	<b>149</b>	<b>171</b>	<b>144</b>	<b>239</b>
<b>Max</b>	<b>1,020</b>	<b>1,060</b>	<b>1,370</b>	<b>1,220</b>	<b>1,090</b>	<b>2,150</b>	<b>2,010</b>	<b>1,250</b>	<b>320</b>	<b>258</b>	<b>155</b>	<b>448</b>
<b>Min</b>	<b>339</b>	<b>603</b>	<b>626</b>	<b>522</b>	<b>740</b>	<b>705</b>	<b>1,080</b>	<b>125</b>	<b>109</b>	<b>140</b>	<b>132</b>	<b>141</b>
<b>Ac-ft</b>	<b>41,590</b>	<b>44,670</b>	<b>58,630</b>	<b>54,420</b>	<b>52,910</b>	<b>89,260</b>	<b>93,090</b>	<b>29,170</b>	<b>8,860</b>	<b>10,490</b>	<b>8,860</b>	<b>14,190</b>

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 2013, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	1,267	1,522	1,597	1,717	1,740	2,239	2,749	2,777	2,113	667	564	831
<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	913	638	71.8	77.6	40.4	46.7	62.2
<b>(WY)</b>	(1993)	(2001)	(1995)	(1993)	(1993)	(1991)	(1992)	(1992)	(1992)	(2003)	(2004)	(1992)

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**2014 WATER SUPPLY AND DISTRIBUTION REPORT**





# 2014 Water Supply and Distribution Report

## OVERVIEW

The 2014 water year was notably improved over the two previous very dry water years. Stream flow went from near record highs in 2011 to much below normal in both 2012 and 2013 and then near normal in 2014. The significant carry-over in storage coming from 2011 was, with the exception of Bear Lake, almost completely depleted coming in to the 2014 water year. The real story in 2014 was the significantly above normal summer precipitation which dramatically reduced the irrigation demand. Though flows were tracked beginning in mid-summer through the irrigation season in the Central Division, due to coordination and cooperation amongst users, 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 2014, compared with the long-term averages, are summarized in Figure 2014.1 and are graphically illustrated in Figures 2014.2 through 2014.4 on the subsequent pages.

Figure 2014.1 illustrates 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 illustrated in Figure 2014.1.

Figures 2014.2 through 2014.4 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 2014. The area between the 2014 hydrographs and the mean hydrographs represents the difference in volume of water discharged during 2014 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 2014.1, the annual discharge for the Upper Division (Utah-Wyoming State Line gage) was 96 percent of the long-term average, and streamflow on

## 2014 Water Supply Summary by Division

### 2014 WATER YEAR

(Discharge in Acre-feet)

GAGE	AVERAGE (1943-14)	2014	PERCENT
Upper Division (UT-WY State Line)	139,200	134,200	96%
Central Division (Smith's Fork)	136,400	142,100	104%
Lower Division (Logan River)	181,300	139,400	77%

### 2014 IRRIGATION SEASON

#### MAY - SEPTEMBER

(Discharge in Acre-feet)

GAGE	AVERAGE (1943-14)	2014	PERCENT
Upper Division (UT-WY State Line)	115,00	107,000	93%
Central Division (Smith's Fork)	101,800	113,500	112%
Lower Division (Logan River)	121,500	96,000	79%

**Figure 2014.1**

Smith's Fork and the Logan River were 104 and 77 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 93 percent (Upper Division), 112 percent (Central Division), and 79 percent (Lower Division). One item of interest to note is that the actual streamflows realized during the irrigation season shown above were very close to the NRCS April 1 forecasted amounts in the Upper and Central Divisions, but 20% less on the Logan River.

A closer look at the three hydrographs (Figures 2014.2, 2014.3 and 2014.4) is also insightful when one is trying to understand the natural water supply in the spring and summer of 2014. The Upper Division gage (Figure 2014.2) indicates runoff varied up and down in the early spring and then peaked well above normal in late May, but then fell off to well below normal until early July when summer rains brought it back to near normal flows during the remainder of the irrigation season. The Central Division gage (Figure 2014.3) shows runoff had a much higher spring peak than normal and then remained near to a little above normal during the remainder of the irrigation season. The Lower Division indicator gage (Figure 2014.4) shows about normal flows until late May with runoff then being notably below normal flow to the end of the irrigation season. In summary, the 2014 irrigation season streamflow was notably improved from the prior year with near normal water supply in the Upper and Central Divisions.

# 2014 - Upper Division Water Supply

## Flow at Utah-Wyoming State Line Gage

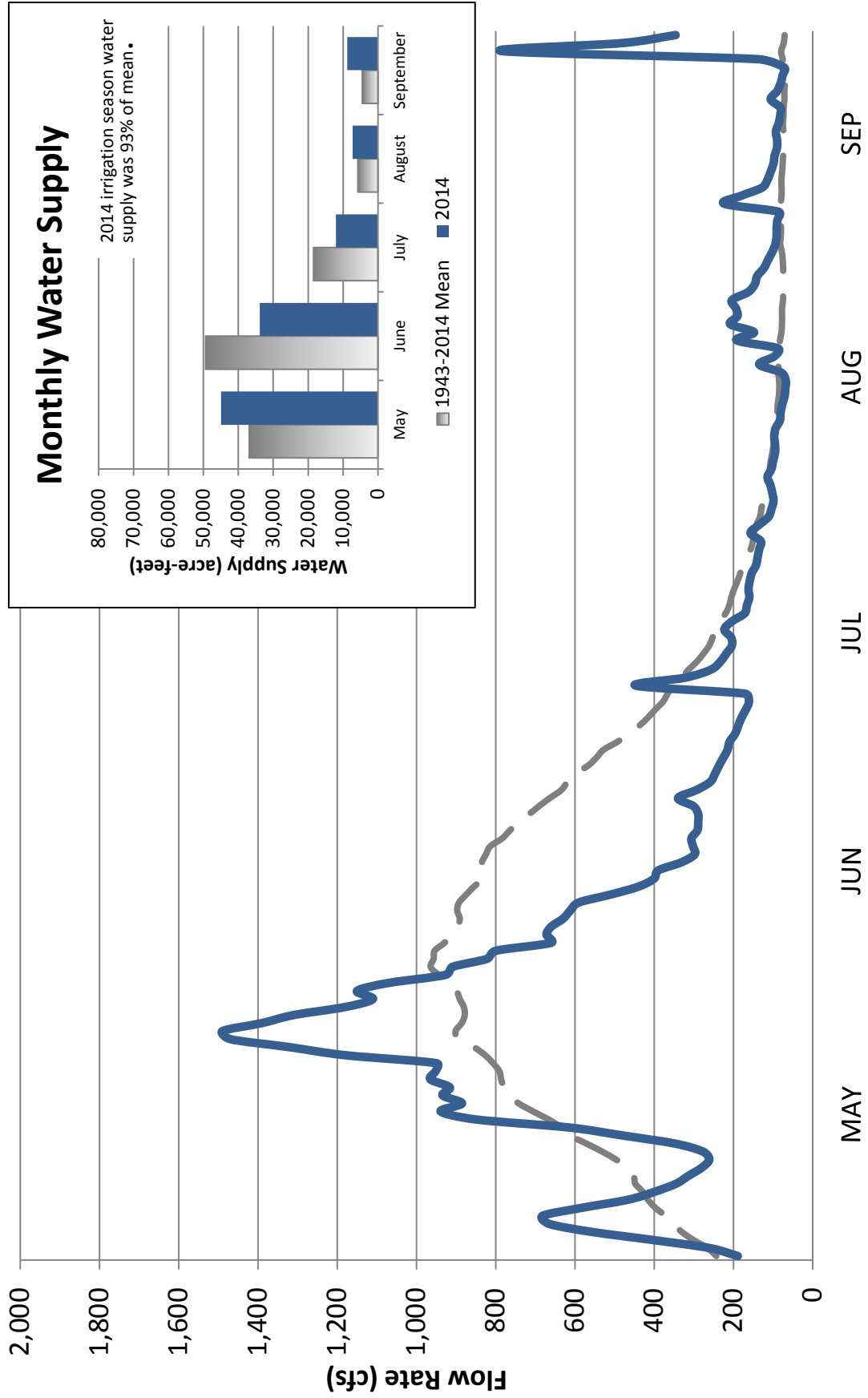


Figure 2014.2

# 2014 - Central Division Water Supply

Flow at Smiths Fork near Border, Wyoming Gage

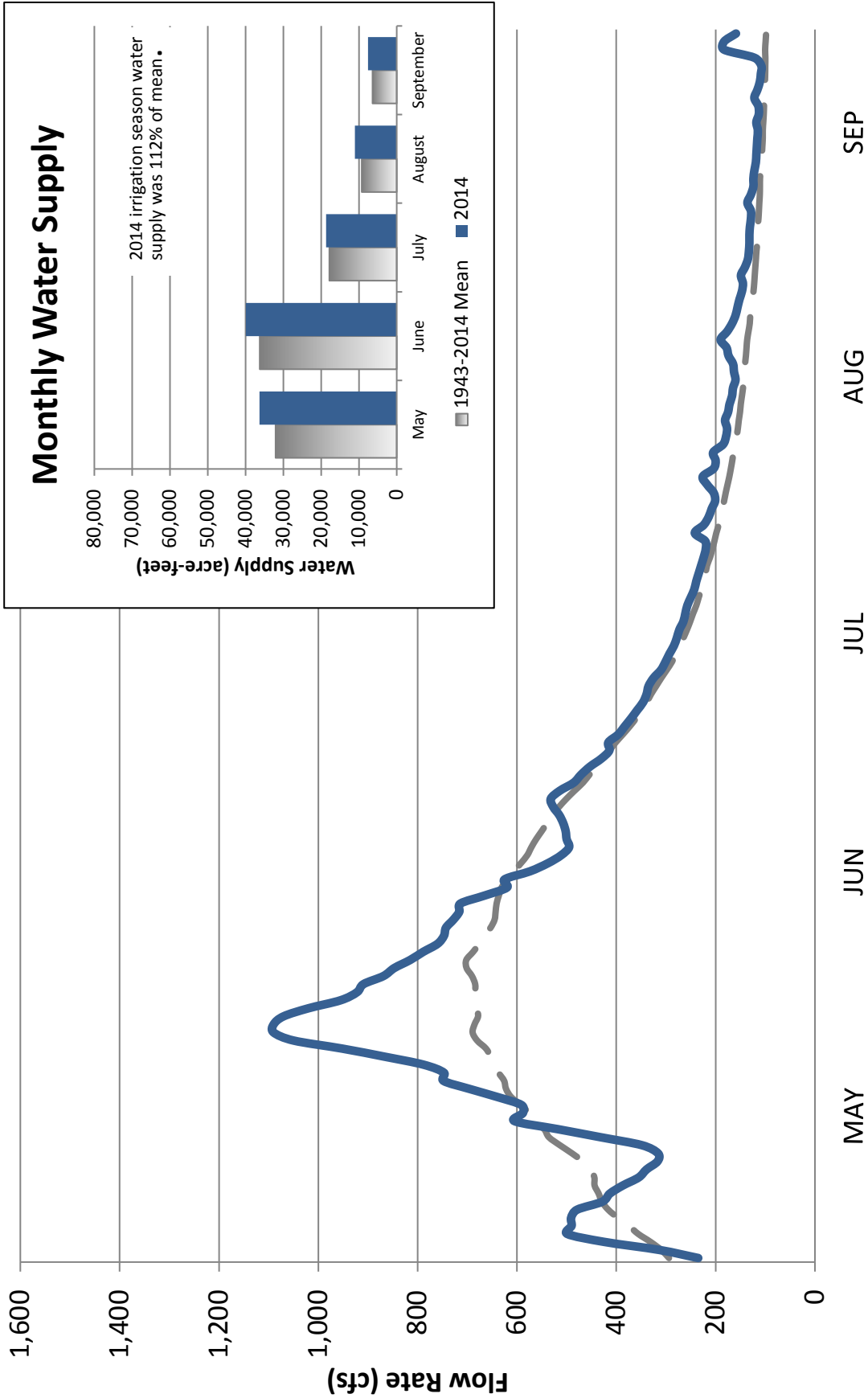


Figure 2014.3

## 2014 - Lower Division Water Supply Flow at Logan River Combined Gage

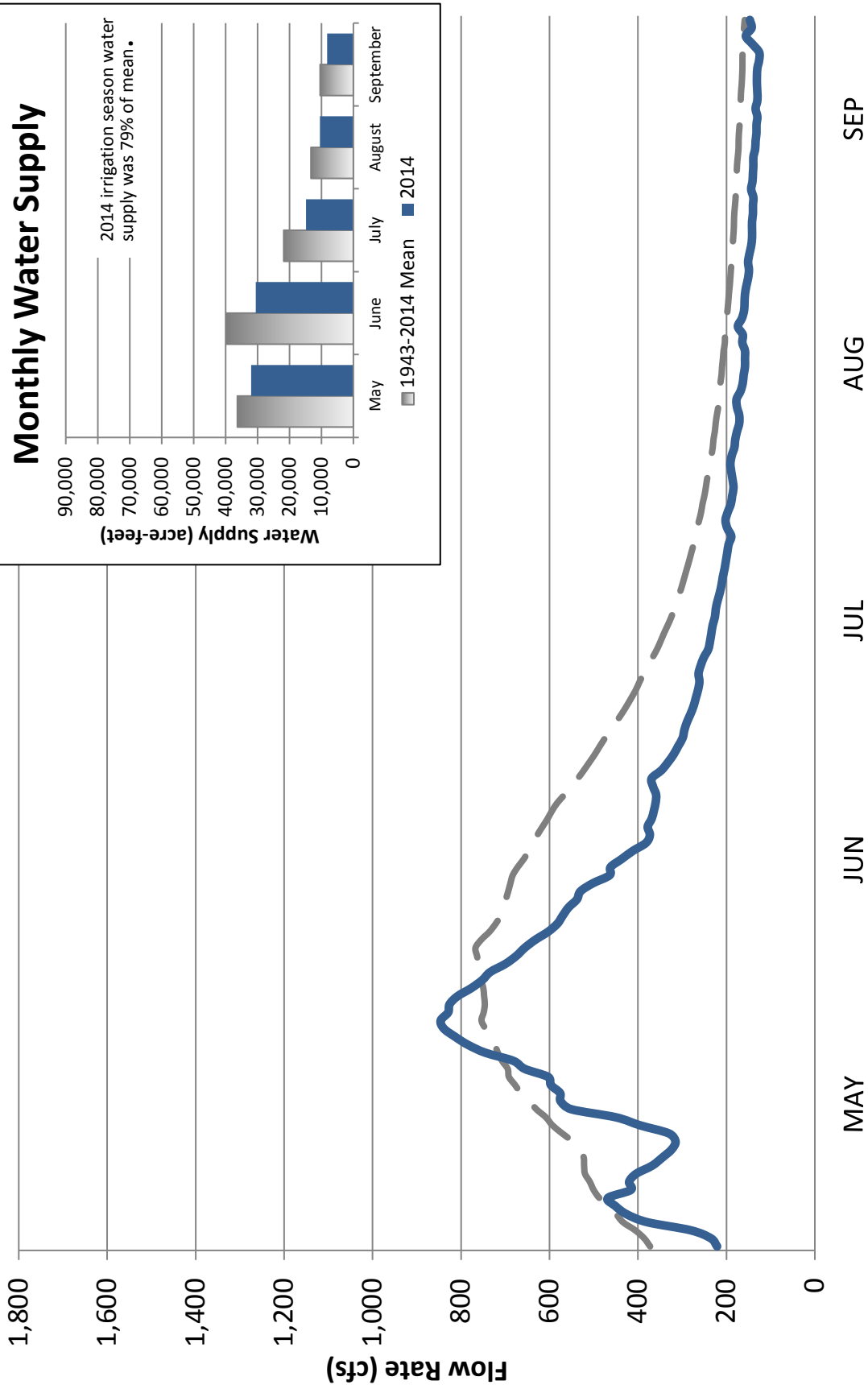


Figure 2014.4

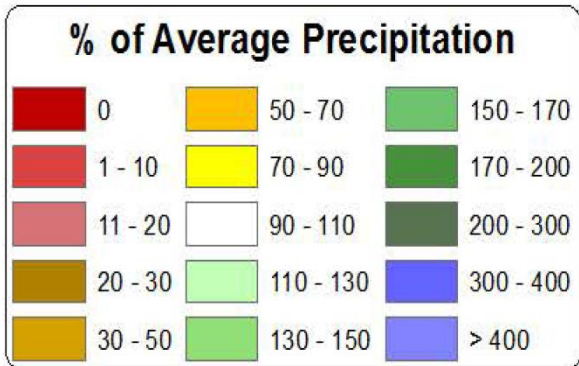
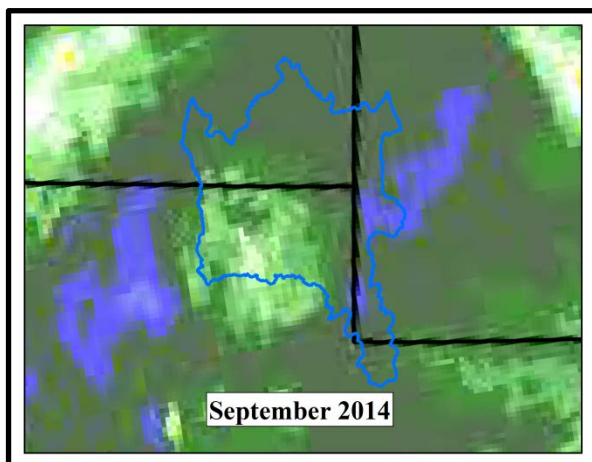
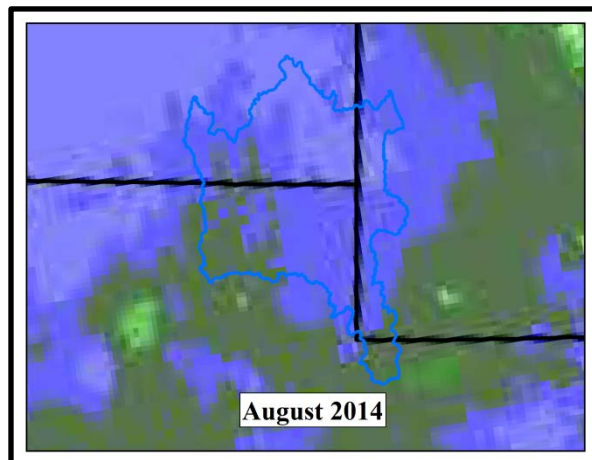
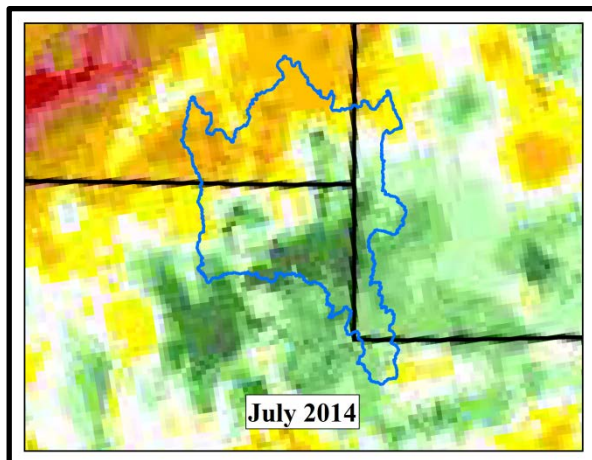
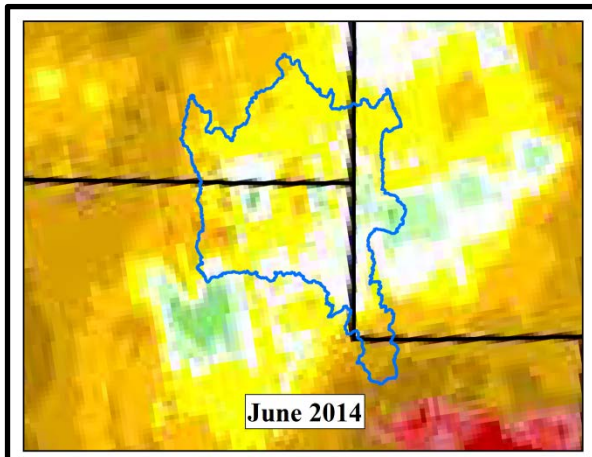
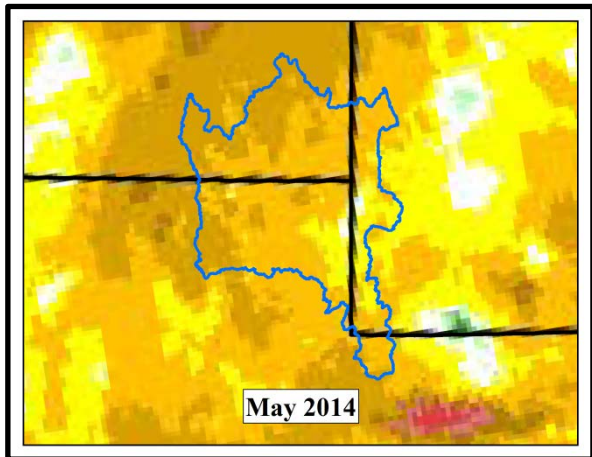
Typically, only streamflow and storage values are reported in the Commission's biennial reports as water supply indicators. However, in 2014, summer rainfall had a huge impact on the water supply. In order to more fully tell the story of the irrigation water supply, Figure 2014.1.b has been added herein.

The PRISM Climate Group at Oregon State University compiles and arrays climate data in a variety of formats. One format shows precipitation data in terms of deviation (in percentage) from the long-term average in a graphical map format. Figure 2014.1.b shows the PRISM precipitation deviation data for the months of May, June, July, August and September, 2014 in the Bear River Basin.

One can see that in May 2014 precipitation in the Basin was very low – in the 30 to 50 percent or less of normal range in most of the Basin. In June the situation had improved somewhat with some of the Basin near normal, but most was still below normal in precipitation. By July things had changed, with most of the Basin more than 100% of normal and some as high as nearly 200% of normal. In August the sky opened up and the Basin had precipitation amounts almost universally greater than 200% of normal with much of the Basin in the 300% to 400% of normal range and some even greater than 400%. September saw a reduction from the August amounts, but still, most of the Bear River Basin had precipitation amounts greater than 200% of normal.

A study of the above graphs shows that, though rainfall events were very significant, by and large streamflows were about as forecasted based on snowpack. The increased precipitation does not appear to have dramatically altered the streamflow at the indicator gages. However, the dramatic impact was the direct irrigation by precipitation of the fields. This led to a substantially reduced irrigation demand from the Bear River and a reduction of stored water needed to be released from the reservoirs.

### Comparison of 2014 Monthly Precipitation in the Bear River Basin



Copyright © 2015, PRISM Climate Group, Oregon State University, <http://prism.oregonstate.edu>, November 10, 2015

**Figure 2014.1.b**

## STORAGE

Storage supplies along the Bear River have a notable impact on the water resources available for irrigation each year. Because the prior two water years were very dry, storage supplies in 2014 started below average carryover storage, even though during 2011 the system had nearly filled. 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. Because of the significant gains in Bear Lake levels in 2011, this storage restriction did not apply during the 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 2014.5 shows the maximum and minimum contents for the Woodruff Narrows Reservoir since its enlargement in 1980.

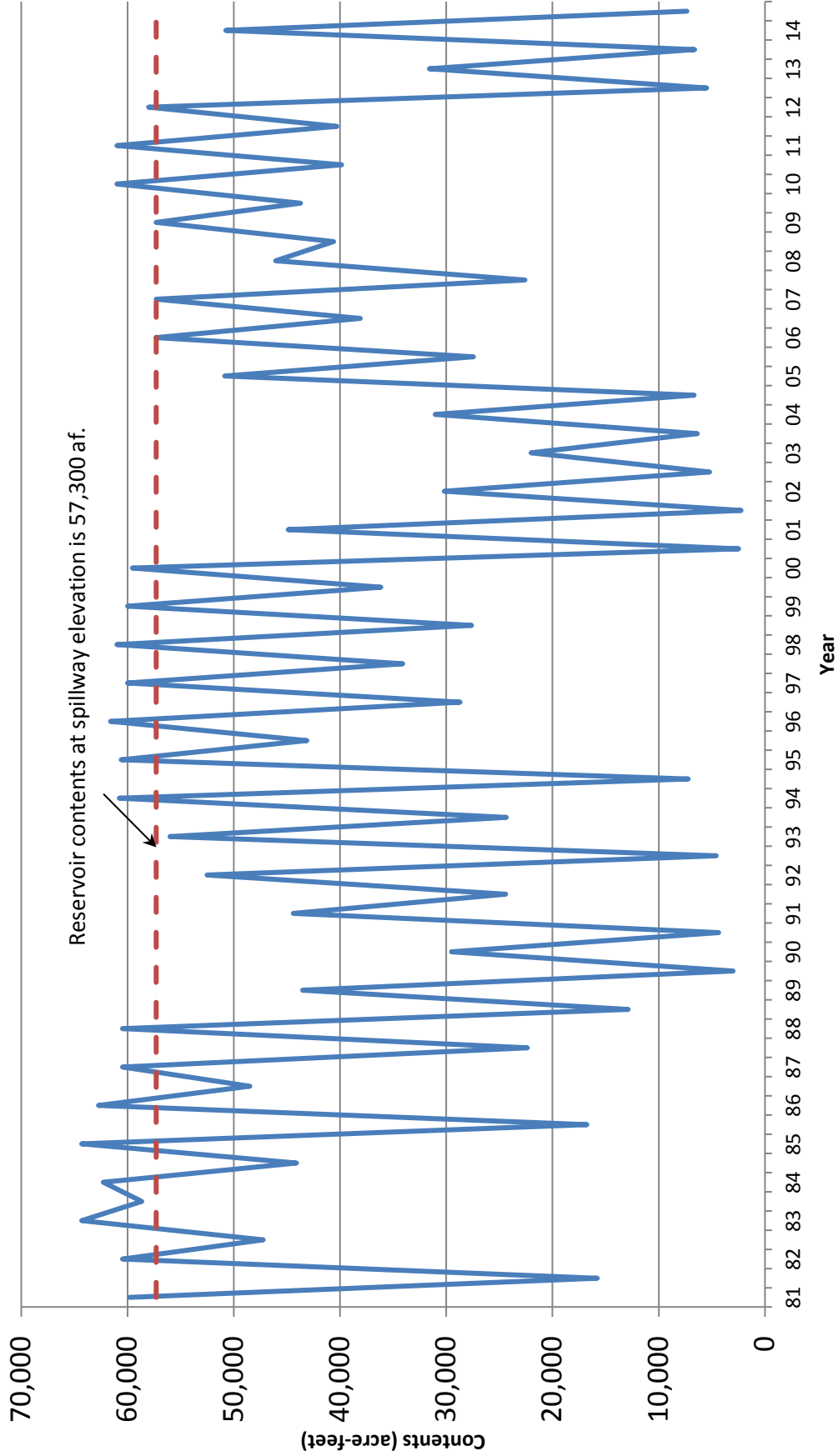
The spillway crest of Woodruff Narrows Dam is at an elevation of 6454.5 feet and when the water level is at this elevation, the content is 57,300 acre-feet. Hence, when the reservoir is spilling, the contents above this amount represent uncontrolled storage as this storage is only temporary and cannot 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 very dry 2012 and 2013 water years, Woodruff Narrows carried over only approximately 6,600 acre-feet into 2014. With near normal streamflow in 2014 the reservoir filled to approximately 51,000 acre-feet before being drafted for summer irrigation uses. It ended the season with only about 7,400 acre-feet of carryover storage.

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 2014.6 summarizes the 2014 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. Since this time, values are based on spot observations and estimates by the Woodruff Narrows Reservoir Company and the Wyoming State Engineer's Office. Contents above 57,300 af represent uncontrolled storage.

**Figure 2014.5**

**Summary of Significant  
2014 Bear Lake  
Hydrologic Information and Operational Events**

<u>Date</u>	<u>Hydrologic Information/Event</u>	<u>Contents (% of Full) Discharge (% of Normal)</u>
10-01-13	Bear Lake Beginning Elevation — 5912.65 ft	664,460 af (47%)
11-16-13	Bear Lake Low Elevation <sup>1</sup> — 5912.32 ft	642,778 af (45%)
	Rainbow Inlet Canal Discharge	163,000 af (62%)
	Bear River Discharge Below Stewart Dam	2,160 af
	Bear Lake Net Runoff (Computed Total Inflow less lake Evaporation)	180,000 af (56%)
06-11-14	Bear Lake High Elevation — 5914.14 ft	763,335 af (54%)
	Outlet Canal Releases: 10/1/13 – 10/4/13; 10/24/13 – 10/26/13; 5/24/14 – 9/26/14	202,000 af
07-14-14	Outlet Canal Maximum Release – 1,543 cfs	
	Bear Lake Storage Release <sup>2</sup>	108,000 af
09-30-14	Bear Lake Ending Elevation — 5912.28 ft	640,155 af (45%)
	Bear Lake Settlement Agreement “System Loss” Volume <sup>3</sup>	15,500 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 the 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 Dam during the irrigation season, any storage water in the system at Cutler is the first water out. Natural flow goes to irrigators.

**Figure 2014.6**

Figure 2014.6 provides much information as to the water stored in Bear Lake in 2014. Some of this information will be discussed in the Lower Division section of this report. Because of the extremely high flows into the lake in 2011, Bear Lake began the storage season with a carry-over storage of just under 50% even though it was heavily drafted in 2012 and 2013 irrigation seasons. PacifiCorp operated Bear Lake in storage mode throughout 2014.

Figure 2014.7 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) actually occurred on November 16, 2013, after the beginning of the storage season. One can see from Figure 2014.7 that though storage in the lake only increased by 1.8 feet during the storage season, due to the significant summer rains which dramatically reduced the irrigation demands, it also dropped by only about 1.8 feet during the release period, ending the year within a few hundredths of a foot from where it began. Figure 2014.8 is an area plot showing the daily contents in Bear Lake over the past ten years. This hydrograph and Figure 2014.7 show the very significant drop in Bear Lake water levels in the early 2000s, followed by a relatively stable, but low water period, which was followed by historic gains in lake elevation in 2011 and then a significant drop in 2012 and 2013 and almost no change in 2014.

Bear Lake has such a large storage capacity compared to average annual use that it greatly buffers the potential shortages in the Lower Division over a period of below-normal years, but for the same reason, recovery from a depleted reservoir can be slow.

# BEAR LAKE ELEVATION

Annual Maximum & Minimum Elevations

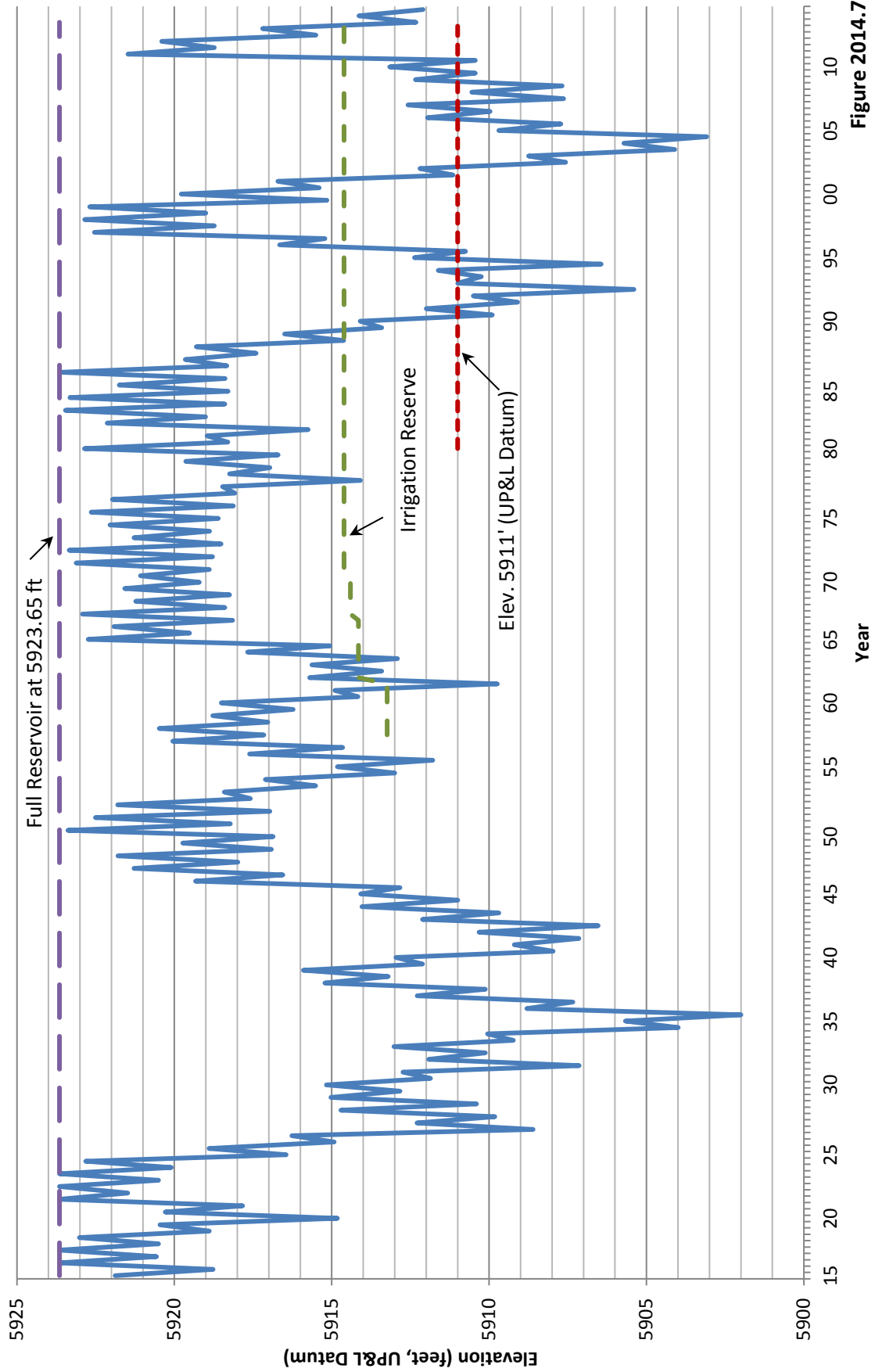


Figure 2014.7

# BEAR LAKE CONTENTS Water Years 2005 - 2014

Bear Lake's maximum active storage contents is 1,421,000 at an elevation of 5923.65'.

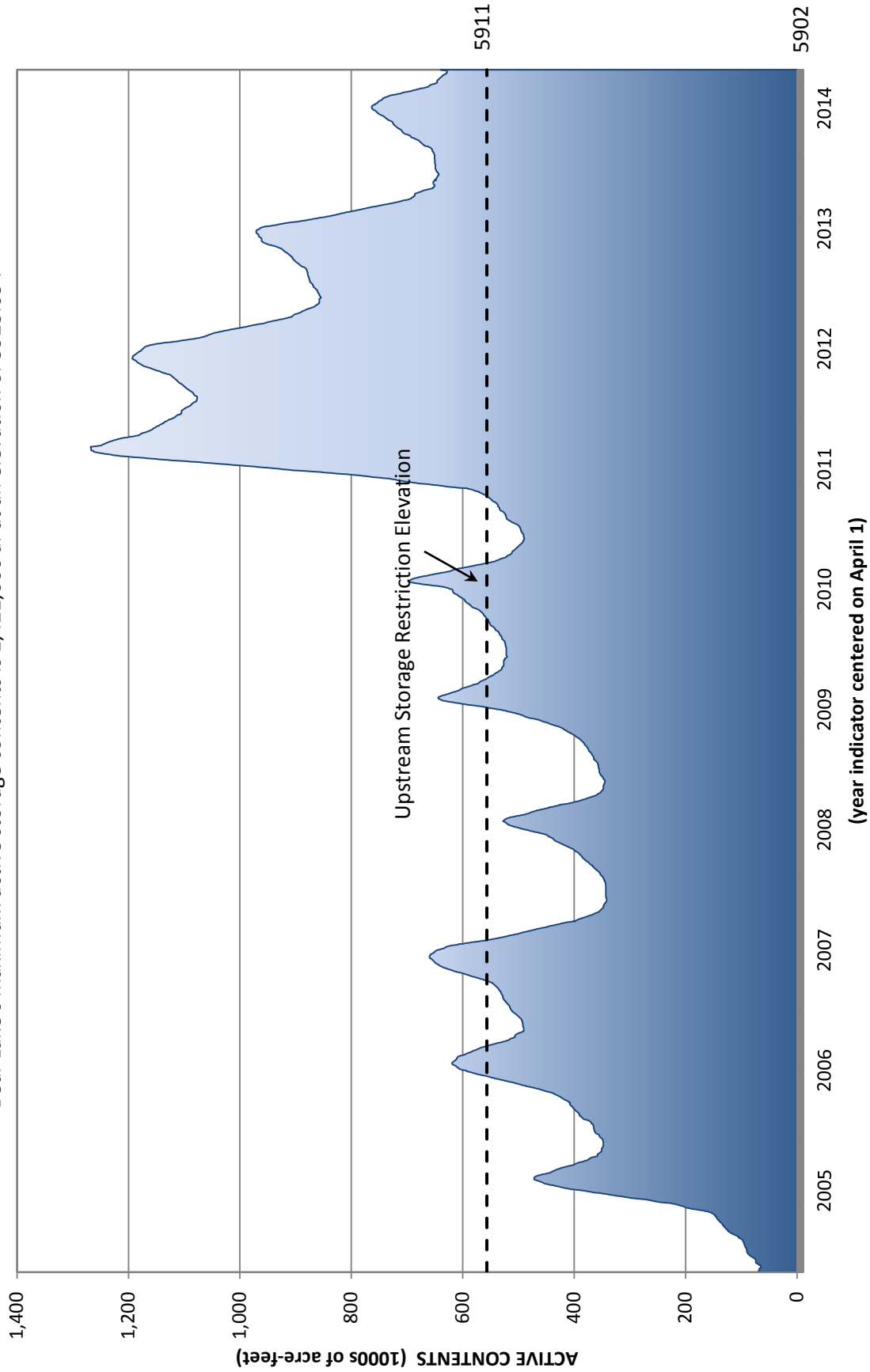


Figure 2014.8

## STREAMFLOW DISTRIBUTION

### General

The water administration in 2014 in the three divisions remained similar to prior years. Assistant Water Superintendent Kevin Payne administered deliveries in the upper two sections of the Upper Division until midway through the season when Travis McNinnis took over as Commissioner. There were no other changes to the River Commissioners/Watermasters in each of the sections from the previous year. Don A. Barnett continued to serve as Engineer-Manager of the Bear River Commission. Each River Commissioner/Watermaster works under the direction of the respective State Engineers' offices, 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 2014 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	Kevin Payne/Travis McNinnis
	Upper Wyoming	Kevin Payne/Travis McNinnis
	Lower Utah	Ron Hoffman
	Lower Wyoming	Mike Johnson
Central	Wyoming	Mike Johnson
	Idaho	Josh Hanks
Lower	Idaho	Josh Hanks
	Utah	Jim Watterson

As was discussed above, snow survey information early in 2014 pointed to a close-to-normal water year. This turned out to be the case from a streamflow standpoint, but it was a really good water year when the summer rains are factored in. No water emergencies were declared under the Compact in any of the three divisions in 2014.

### 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. Though the stream flow in the Upper Division during the irrigation season was below this threshold, beginning about the first of July streamflow coupled with rains yielded a much

improved supply from the prior two years. The reduced irrigation demands created by the summer rains made it so that there was no need to call water from the upper sections to the lower sections to meet Compact provisions. Further, 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. With these factors, there was not a request for Compact administration in the Upper Division in 2014.

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 2014.9 and 2014.10 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. During May the diversions shown in the Lower Utah Section are well below the allocation. However, this is due to the fact that the users were diverting the limited supply to storage. Figure 2014.11 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.

# 2014 - Upper Division

## Upper Wyoming Section Diversions vs Allocation

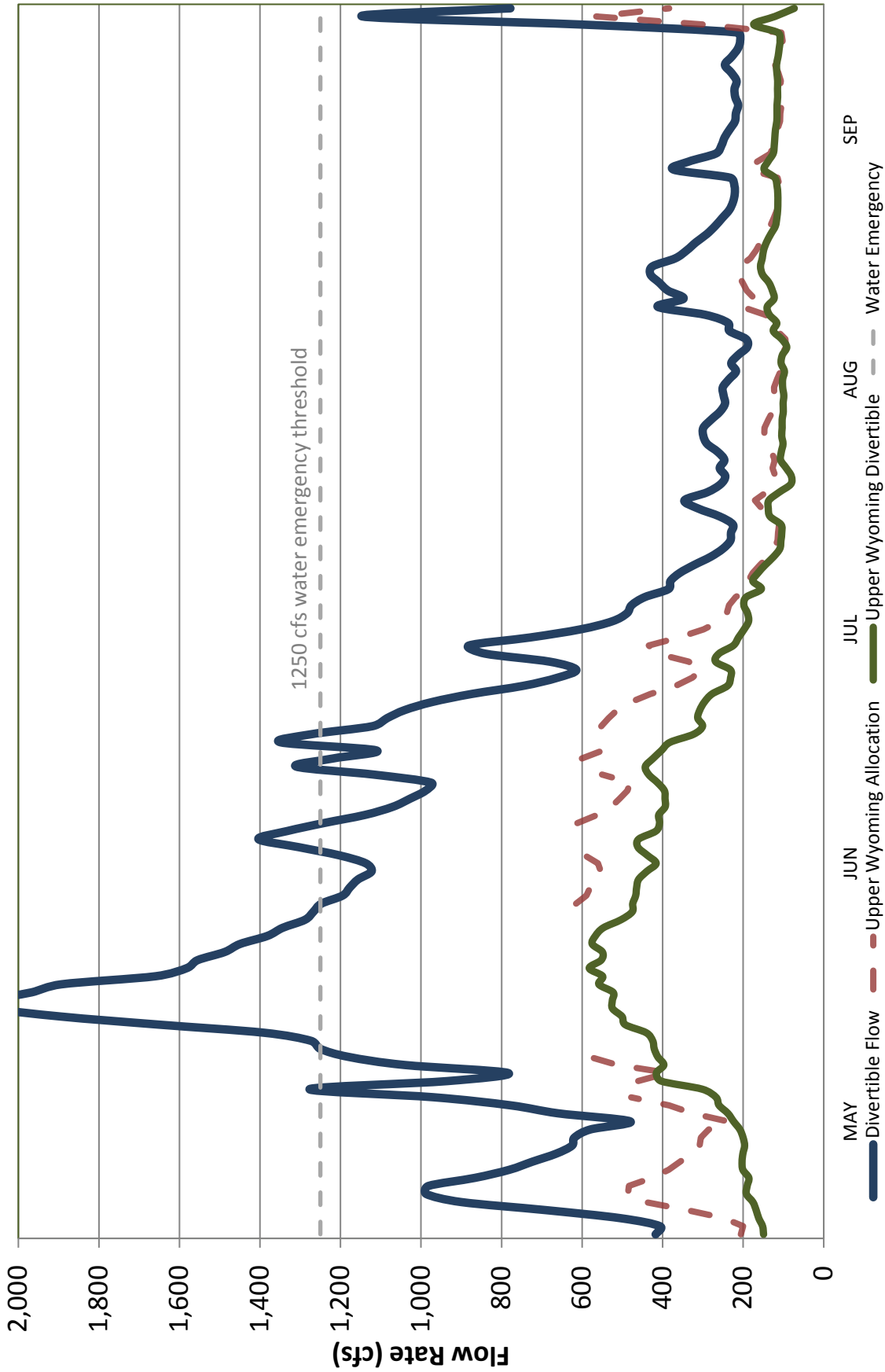


Figure 2014.9



# 2014 - Upper Division

Lower Utah Section Diversions vs Allocation

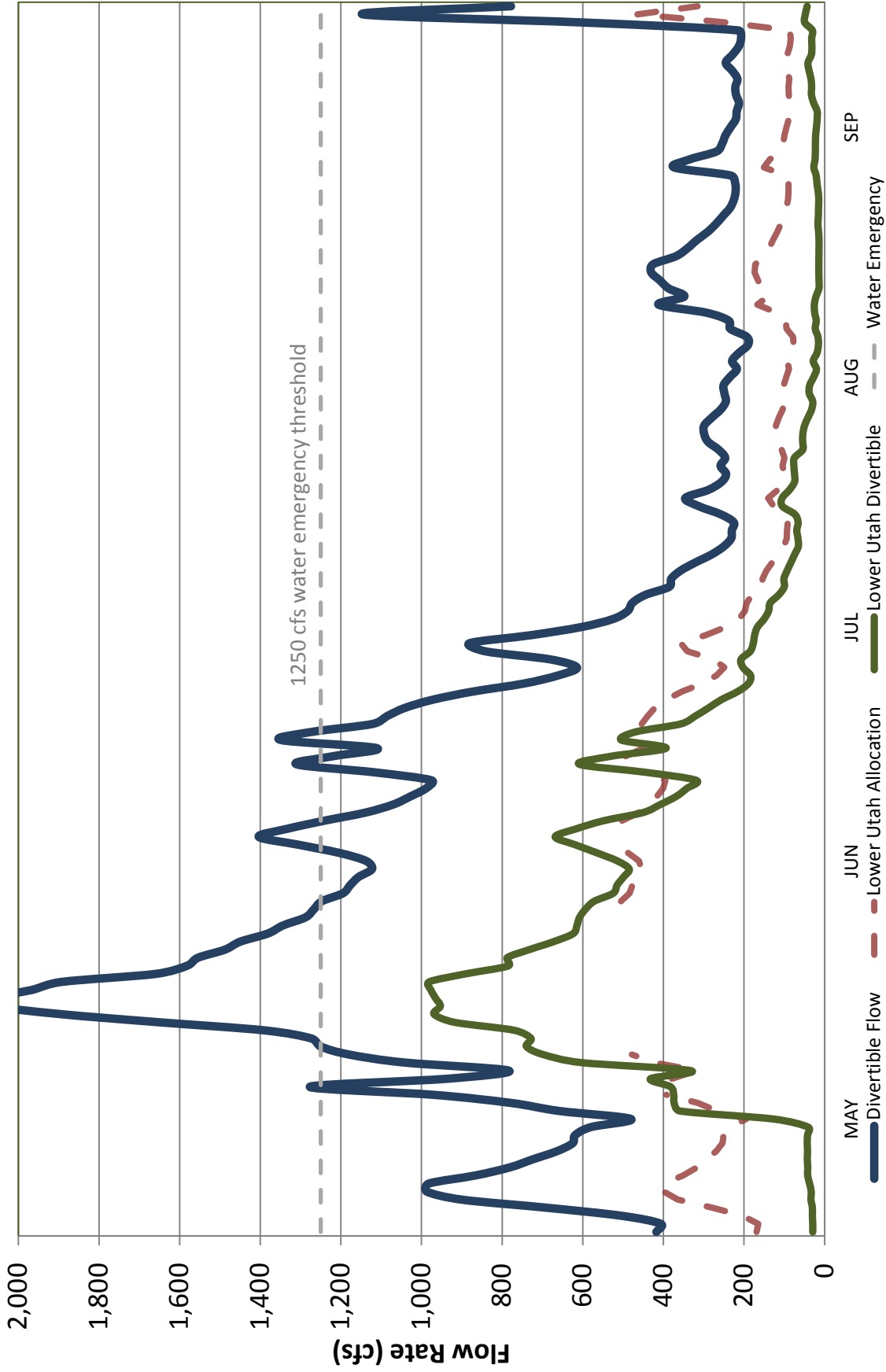


Figure 2014.10

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	
UPPER UTAH SECTION																																
Hovarka (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	0	0
Hatch (W Fk)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	12	12	12	12	12	12	12	12	12	
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	0	
Lammon & Lone Mtn	3	6	10	10	11	13	12	12	12	12	11	11	11	11	11	11	11	12	12	12	12	14	16	15	15	15	17	18	17	16		
Hilliard West Side	0	0	2	5	6	8	7	4	4	4	3	3	3	4	4	3	3	4	11	9	9	8	7	7	6	9	13	17	21			
Bear (Bear R)	5	5	4	4	6	12	12	12	12	13	13	13	16	16	17	16	13	11	21	30	29	30	30	30	26	24	38	26	18			
Tropic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	4	4	4	4			
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	4	5	6	5	2	2	2	3	3	4	4	5	4	3	3	2	2	1	1	2	2	3	5	6	7	9	10	11	10	9		
Crown & Pine Grove	3	3	3	3	2	4	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	5	7	12	23	21	23		
McGraw	4	5	6	7	9	13	13	12	12	13	13	14	14	14	16	21	25	28	21	19	19	19	21	21	20	20	23	22	19	17	17	
Lewis (D4)	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	10	
Homer	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	0	0	0	0	0	0	
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	5	5	5	5		
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	0	
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	6	6	6	6	6	
Coffman	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	3	3	3	
Knoper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	3	3	3	3	3	3	3	
Myers No. 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	9	8	5	5	5	5	5	5	5	5	5	
Myers Irr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	8	15	14	13	15	15	16	15	16	12	6	5	4	4	
Evanston Pipeline	3	3	3	3	3	4	4	4	4	3	3	3	3	3	3	4	5	5	5	5	5	5	6	6	6	6	5	7	7	7	7	
Booth	0	0	0	0	0	1	2	2	1	1	1	1	1	1	1	1	1	1	10	18	18	19	20	20	21	20	16	15	16	16		
Anel Irr	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	4	5	6	7	7	7	7	7	7	7	5	
Cornelison	1	1	1	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	6	6	6	6	6	
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	3	3	3	3	3	
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	0	
"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	0	0	0	0	0	0	0	0	0	0	0	0	3	6	7	7	6	6	6	9	12	13	17	18	20	21	22	22	21	21	21	
Wilson Irr	4	4	4	4	4	4	4	4	4	4	4	4	2	2	2	2	2	3	3	3	3	3	3	3	3	3	4	4	4	4	4	
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)	4	3	3	3	4	4	5	4	3	3	3	3	5	5	9	8	8	8	8	7	5	7	5	5	5	5	5	5	7	9		
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	
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	1	1	1	1	1	1	1	1	1	3	3	3	3	3	3	3	2	2	2	2	
Sim's Creek Slough Diversion	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	17	17	17	17	16	16	16	16	16	16		
John Sims	3	3	3	4	4	3	3	4	8	6	4	4	4	4	4	5	6	8	9	14	18	20	21	22	24	31	28	26	27	26	25	
Michael Sims	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	3	3	3	3	3	
S. P.	4	4	4	4	4	4	3	3	3	3	3	2	2	1	1	4	8	14	26	29	29	30	32	34	35	36	37	37	37	37		
Almy	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	4	4	4	4	4	
Sims, Blight & Turner	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	4	4	4	4	4	4	4	4	4	4	
Bowns	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	
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	0	
Chapman (Headgate)	66	66	65	65	65	65	64	63	78	82	79	78	80	83	86	93	106	109	127	149	147	115	115	114	114	112	109	110	109	108	108	
Chapman (Stataline, incl'd above)	52	52	51	50	47	46	45	46	60	73	73	74	76	76	74	76	85	88	95	116	121	95	78	80	84	79	76	75	73	74	72	
Morris Bros Irr (Lower)	4	3	3	3	3	2	2	2	2	2	2	2	2	1	1	3	4	5	5	5	3	2	2	2	2	3	3	3	2	2	2	
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	0	
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	
Tunnel	11	11	13	16	20	21	20	18	16	15	15	14	14	14	14	14	14	15	18	18	18	18	18	19	20	20	24	25	25	25	25	
Francis-Lee	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	12	12	12	12	12	19	22	22	22	22	22	22	22	22	22	22	
Bear River Canal	20	20	20	20	20	20	20	20	20	20	20	20	20	20	23	23	23	23	23	35	48	47	46	46	46	46	46	46	46	46	46	
TOTAL UPPER WY DIV.	152	155	164	171	179	196	194	190	204	206	204	200	204	212	227	245	265	272	306	408	459	438	454	463	466	482	498	508	532	532	530	
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	3	3	3	3	3	4	4	4	3	3	3	3	3	3	3	4	5	5	5	5	5	5	5	5	5	5	5	7	7	7	7	
LOWER UTAH																																
Neville	1	1	1	2	2	2	3	2	2	2	2	2	2	0	1	7	5	5	5	6	6	6	6	6	6	6	6	6	5	5	5	
Booth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	13	16	19	19	11	11	11	10	9	9	9	9	9	9	9		
Rees Land & Livestock	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	9	9	8	10	14	19	22	26	21	18</						

2014

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)	0	0	0	0	0	0	5	11	11	11	12	11	11	11	11	11	11	11	11	11	11	11	11	11	11	7	5	5	5	5	
Hatch (W Fk)	12	12	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	3	3	3	3	3	3	
UPPER WYOMING SECTION																															
Hilliard East Fork (E Fk)	0	0	9	24	24	24	23	23	22	22	22	23	33	33	31	30	29	31	37	36	36	37	35	33	30	27	27	27	27	27	
Lannon & Lone Mtn	16	16	16	15	15	17	18	17	17	17	17	17	16	16	16	15	14	9	9	9	15	19	19	19	19	18	18	18	18	18	
Hilliard West Side	25	21	30	24	20	18	20	12	6	9	14	13	11	14	12	15	27	33	32	32	32	32	32	29	31	26	31	31	30		
Bear (Bear R)	57	95	110	84	81	80	80	80	75	76	76	74	72	70	62	57	70	77	74	69	68	68	66	66	66	68	73	73	72		
Tropic	4	4	4	4	5	5	5	5	4	4	4	6	6	6	5	4	4	4	4	4	4	5	4	4	4	4	4	4	4		
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	9	10	10	10	10	9	9	8	8	8	7	7	6	5	4	4	3	3	3	3	3	3	3	3	4	4	4	3	3		
Crown & Pine Grove	21	17	18	21	18	21	19	19	17	18	18	16	15	14	10	11	13	4	3	6	11	17	19	17	18	19	19	18	18		
McGraw	16	15	15	13	13	12	12	11	13	13	12	12	11	10	9	8	8	7	7	9	15	14	13	13	13	13	15	13	11		
Lewis (D4)	10	10	9	9	8	9	9	8	7	6	6	5	5	5	5	4	4	4	4	3	3	3	3	3	3	3	3	2	2		
Homner	0	3	3	3	3	3	3	4	4	4	4	4	4	4	4	2	2	2	2	2	2	2	2	5	5	5	5	5	1		
Lewis and Blanchard	5	5	5	5	5	5	5	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	2	2	2	2	2	3		
Myers No. 2	3	3	3	3	3	2	3	2	2	2	2	2	2	2	2	1	3	4	4	2	2	2	2	3	3	3	6	5	4		
Hare	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3		
Coffman	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	2	2	2	2		
Knoeder	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3		
Myers No. 1	5	7	8	5	4	4	4	4	4	3	3	3	3	4	9	5	5	5	3	3	3	3	3	2	5	6	4	4	3		
Myers Irr	4	4	6	6	6	6	5	5	5	5	5	4	4	4	4	4	4	4	4	3	3	3	2	2	2	2	2	2	2		
Evanson Pipeline	8	8	8	9	10	10	9	9	10	10	11	11	11	11	10	10	9	8	8	9	10	10	10	10	10	15	15	15	12		
Booth	14	13	12	11	12	16	18	17	13	8	6	6	7	11	10	9	7	9	7	3	1	0	0	0	8	19	14	14	12		
Anel Irr	6	14	18	16	15	13	12	10	9	9	8	8	8	7	7	9	11	10	8	7	7	6	8	7	6	5	6	5	6		
Cornelson	6	2	2	2	2	2	2	2	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	0	0	0	0	0	0		
Ev Water Supply (and Anderson)	3	3	7	7	7	7	7	7	7	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	4	4	4	4	4		
Knight No. 2 (and No. 1)	5	5	5	5	5	4	4	4	4	4	3	4	7	6	6	6	7	7	6	5	5	5	4	4	5	6	6	6	6		
*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		
Evanson Water	21	20	22	22	21	21	21	22	20	20	21	22	21	20	19	17	16	18	19	15	13	12	16	14	14	20	22	22	20	20	
Lewis Irr	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	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		
Rocky Mtn & Blyth (and Crompton)	10	10	10	10	11	11	11	10	10	10	10	10	10	9	9	10	7	9	11	10	10	9	9	9	9	9	9	9	8		
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		
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		
Johnston & Narramore	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Sim's Creek Slough Diversion	16	16	16	15	15	15	15	15	9	9	9	9	9	9	11	11	11	11	11	11	11	7	7	7	4	4	4	4	4		
John Sims	25	20	15	13	8	9	16	13	6	5	9	11	10	10	9	10	10	9	8	7	6	6	5	4	6	6	5	4	4		
Michael Sims	3	3	3	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		
S. P.	36	35	34	33	27	26	25	25	24	22	21	21	20	20	21	20	20	21	21	19	18	17	14	11	8	7	6	6	5		
Almy	4	4	4	3	3	3	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Sims, Blight & Turner	4	4	4	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		
Bowns	3	3	3	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		
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		
Turner	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		
Chapman (Headgate)	107	107	108	110	132	153	143	138	131	121	117	112	105	100	96	90	89	96	97	85	78	73	70	67	63	62	69	76	72	68	
Chapman (Stateline, incl'd above)	64	55	52	54	65	88	87	84	81	69	67	63	59	57	54	48	50	68	67	62	57	46	38	30	24	27	32	30	26		
Morris Bros Irr (Lower)	2	2	1	1	4	3	2	2	2	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	3	6	3	2		
Bowns & Bruce	6	6	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		
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		
Tunnel	24	22	19	19	17	16	15	14	14	14	14	13	12	11	11	12	18	21	20	16	12	11	10	11	11	10	12	18	17	13	
Francis-Lee	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22		
Bear River Canal	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46		
TOTAL UPPER WY DIV.	566	592	627	598	595	620	612	593	549	521	520	513	510	505	486	462	483	484	491	454	448	451	435	435	421	428	450	458	439	418	
Whitney Storage																															
Sulphur Creek Storage	7	7	8	9	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
LOWER UTAH																															
Neville	5	5	5	5	5	5	6	5	5	5	6	7	7	6	6	6	6	6	6	6	6	5	5	5	6	7	6	6	6		
Booth	9	10	10	10	10	10	11	11	11	11	12	13	13	13	13	13	13	13	13	12	11	12	12	12	12	12	12	11	11		
Rees Land & Livestock	20	21	20	20	20	19	19	20	22	26	26	27	25	21	19	17	14	14	16	14	10	8	8	10	17	8	10	17	8		
Crawford-Thompson	139	139	139	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	137	142	141	142	140	137	137	140	138	134	133		
Randolph-Woodruff	255	256	256	257	251	245	260	267	265	264	272	264	264	264	259	269	282	287	271	263	275	278	274	271	262	259	2				

DAILY DISCHARGE IN CFS OF BEAR RIVER CANALS WITH COMPACT ALLOCATIONS IN THE UPPER 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	
UPPER UTAH SECTION																																
Hovarka (E Fk)	5	5	6	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
Hatch (W Fk)	3	3	3	3	3	3	3	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
UPPER WYOMING SECTION																																
Hilliard East Fork (E Fk)	27	27	28	28	28	28	28	28	28	28	30	29	28	28	28	28	27	27	28	28	27	26	25	27	28	26	13	2	2	2	2	
Lannon & Lone Mtn	18	18	15	13	13	13	14	15	17	17	17	17	16	16	17	17	17	17	17	17	17	16	12	11	12	11	7	7	8	8	8	
Hilliard West Side	27	25	26	36	37	32	28	22	17	16	32	33	33	33	33	32	32	30	25	25	21	20	18	15	12	10	9	9	9	9		
Bear (Bear R)	67	63	36	26	26	14	8	7	7	48	62	59	60	59	60	62	63	60	31	17	16	16	16	14	16	15	10	8	8	8		
Tropic	3	2	4	4	4	3	3	4	4	4	5	3	3	3	3	3	3	3	4	4	3	3	3	2	2	2	1	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	0	
Danielson	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	1	0	0	0	0	0	0	0	0	
Crown & Pine Grove	21	19	22	19	19	19	20	22	23	23	21	18	17	17	20	21	23	20	19	20	16	16	14	12	12	12	12	12	9	7	7	
McGraw	11	10	8	8	7	8	8	8	5	6	5	4	4	4	4	4	5	4	4	5	4	4	4	4	4	4	4	4	5	5		
Lewis (D4)	2	1	2	4	4	4	4	4	4	5	6	6	4	3	2	1	0	0	0	1	1	2	1	1	1	1	1	0	2	4	2	
Homer	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1		
Lewis and Blanchard	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	0	0	4	4	4	3	3	0	0	0	0	0	0	0	0	0	
Myers No. 2	3	2	3	4	3	3	2	2	1	2	10	5	3	2	2	2	5	4	3	2	4	4	4	4	3	3	3	3	3	2	2	
Hare	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	0	0	0	0	0	
Coffman	1	2	2	2	2	2	2	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Knober	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	3	3	3	3	3	
Myers No. 1	3	3	4	5	4	4	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	
Myers Irr	2	2	3	4	3	3	3	4	4	3	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	
Evanston Pipeline	12	12	12	12	12	12	12	12	12	12	12	12	9	9	9	9	9	9	9	9	9	10	10	10	10	10	10	7	7	7	7	
Booth	11	11	11	14	13	12	11	12	12	18	12	6	5	6	3	5	13	11	9	13	12	12	13	13	12	14	12	14	15	15	15	
Anel Irr	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	4	4	4	4	4	4	4	4	3	1	1	1	1	1	1	1	
Cornelison	0	3	4	4	4	4	4	4	4	4	4	4	4	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Ev Water Supply (and Anderson)	4	3	3	3	3	3	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	
Knight No. 2 (and No. 1)	6	6	6	6	6	6	6	6	6	6	6	8	8	7	7	6	6	5	5	5	5	6	5	5	5	4	3	3	3	3	3	
"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	19	19	20	20	19	18	20	20	21	26	22	18	17	15	11	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	5	
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)	8	8	10	10	10	9	7	6	5	5	7	7	8	8	7	6	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	
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	
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	1	1	1	1	3	3	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	
Sim's Creek Slough Diversion	4	6	6	6	6	6	6	6	6	6	6	6	6	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	
John Sims	3	3	3	3	3	3	3	3	3	4	5	5	5	5	4	4	4	4	5	5	4	4	3	2	2	2	2	2	2	3	2	
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.	4	4	4	6	6	6	6	6	6	4	4	4	4	4	4	4	4	3	3	4	4	4	3	2	2	2	2	2	2	2	2	
Almy	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Sims, Blight & Turner	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	2	
Bowns	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	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	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	0	
Chapman (Headgate)	64	66	67	69	69	68	65	63	61	64	83	88	79	73	68	65	64	60	59	58	62	61	58	55	53	51	51	51	52	55	57	
Chapman (Stataline, incl'd above)	23	26	25	27	30	28	26	22	25	27	36	51	47	43	42	42	41	39	37	39	41	41	41	39	37	38	39	39	40	45	45	
Morris Bros Irr (Lower)	0	0	1	2	1	2	4	3	3	0	0	0	0	0	0	0	0	0	0	1	2	2	1	0	2	5	6	9	13	6	1	
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	0	
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	
Tunnel	9	5	2	2	1	1	1	1	0	0	0	0	1	1	1	1	1	2	4	5	10	16	12	8	8	8	8	9	11	12		
Francis-Lee	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	0	0	0	0	0	0	
Bear River Canal	33	23	23	23	23	23	23	23	23	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL UPPER WY DIV.	384	367	346	358	354	342	323	307	299	300	393	381	346	330	313	302	296	304	299	261	263	257	243	222	206	204	202	183	173	174	169	
Whitney Storage																																
Sulphur Creek Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	63	71	71	71	71	71	71	71	71	71	
	0	44	45	45	46	46	46	68	68	68	125	121	121	119	114	105	105	105	105	105	24	23	28	27	27	27	27	35	31	29	26	
LOWER UTAH																																
Neville	4	1	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	
Booth	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	
Rees Land & Livestock	6	4	3	2	3	2	3	3	3	4	3	3	3	3	3																	

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

	August																														
	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
UPPER UTAH SECTION																															
Hovarka (E Fk)	2	2	2	2	2	2	4	5	5	5	5	5	5	4	4	4	4	2	1	1	1	1	1	1	1	1	1	2	3	3	3
Hatch (W Fk)	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	0	0	0	
UPPER WYOMING SECTION																															
Hilliard East Fork (E Fk)	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	
Larnon & Lone Mtn	8	8	8	8	8	9	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hilliard West Side	9	9	8	8	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	2	2	4	5	5	
Bear (Bear R)	7	7	7	7	7	8	7	7	8	8	8	8	7	8	8	7	8	8	7	8	8	9	9	8	8	8	8	8	8	8	
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Crown & Pine Grove	6	6	6	6	6	6	7	7	7	7	6	6	6	6	6	6	6	6	4	2	2	2	2	2	2	2	2	2	2	2	
McGraw	4	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	7	5	5	6	5	5	4	5	6	5	4	
Lewis (D4)	1	0	0	1	1	1	1	1	1	1	4	4	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Homer	1	1	1	1	1	4	4	4	4	4	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
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	
Myers No. 2	3	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	
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	
Coffman	1	1	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	0	0	
Knoder	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	1	1	0	0	0	
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	
Myers Irr	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	3	3	4	5	5	6	6	5	4	4	4	3	3	3	
Evanston Pipeline	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
Booth	12	11	12	11	11	10	10	10	9	8	10	11	10	9	8	6	4	4	4	5	1	4	4	5	4	4	4	4	4	4	
Anel Irr	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	
Cornelison	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	
Ev Water Supply (and Anderson)	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	
Knight No. 2 (and No. 1)	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	3	3	2	2	2	3	4	6	
"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	5	5	5	5	5	5	5	5	4	4	4	5	5	5	6	6	6	7	10	11	11	11	12	6	5	5	4	4	4	4	
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	
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	
Rocky Mtn & Blyth (and Crompton)	4	4	4	4	5	4	3	3	3	3	5	4	4	4	4	4	4	3	3	3	3	3	1	1	1	0	0	0	0	0	
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	
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	
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	
Sim's Creek Slough Diversion	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
John Sims	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	4	4	4	5	5	5	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.	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	3	3	3	3	2	2	2	1	
Almy	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	0	0	0	0	
Sims, Blight & Turner	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	
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	
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Chapman (Headgate)	39	13	13	26	45	46	48	48	47	46	44	45	48	52	53	53	50	41	48	65	59	66	72	66	72	75	83	79	72	70	
Chapman (Stataline, incl'd above)	38	9	9	12	30	32	37	38	37	36	35	34	35	36	42	41	34	26	33	56	62	66	64	67	68	70	72	67	64		
Morris Bros Irr (Lower)	1	1	1	1	0	1	1	2	1	0	1	0	0	0	0	0	0	0	0	5	2	8	13	5	3	1	1	1	0		
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	
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	12	12	12	12	10	10	10	10	10	10	10	10	9	7	6	6	5	5	4	5	6	7	11	11	13	14	14	18	21	21	
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	0	0	0	0	0	
Bear River Canal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL UPPER WY DIV.	144	114	112	124	137	138	138	132	131	131	128	126	126	128	126	122	120	118	110	121	140	135	152	158	140	144	145	154	159	155	151
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	
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	
Rees Land & Livestock	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	0	1	1	0	0	
Crawford-Thompson	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	
Randolph-Woodruff	30	32	32	34	39	34	34	34	34	33	33	33	36	37	33	32	32	18	16	10	10	7	7	5	0	0	0	0	0	0	
Dykens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Lazy P Ranch Pump	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	
Randolph-Sage Creek	24	7	7	7	7																										



## 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 2014.12 and 2014.13 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. However, in 2014 flows at the Border gage were not below the 350 cfs water emergency trigger until mid-July. It is important to note that on Figure 2014.13 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 this hydrograph are based on the River Commissioners'/ Watermasters' annual reports to their respective state water agencies.

Figure 2014.14 (pages 14-26 through 14-30) 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 can be seen on the graphs and from the data, the water supply in the Central Division in 2014 was above normal for most of the irrigation season. When the total divertible flow dropped below the 870 cfs trigger in mid-July, weekly call-ins of diversion data were commenced and continued through the remainder of the irrigation season. However, as discussed above, due to summer rains, there was no request for regulation pursuant to the Compact. As can be seen by Figure 2014.13, except for a short period in late July, Idaho received more than the Compact required 57% during the remainder of the irrigation season. In order to better administer the system and reduce the calculated "loss" which sometimes plagues administration in this division, measurement of diversions in Idaho was made several days after adjustments and measurements in Wyoming. There was very good cooperation between the Wyoming and Idaho Watermasters, throughout this irrigation season.

# 2014 - Central Division Distribution

Wyoming Section Diversions vs Allocation

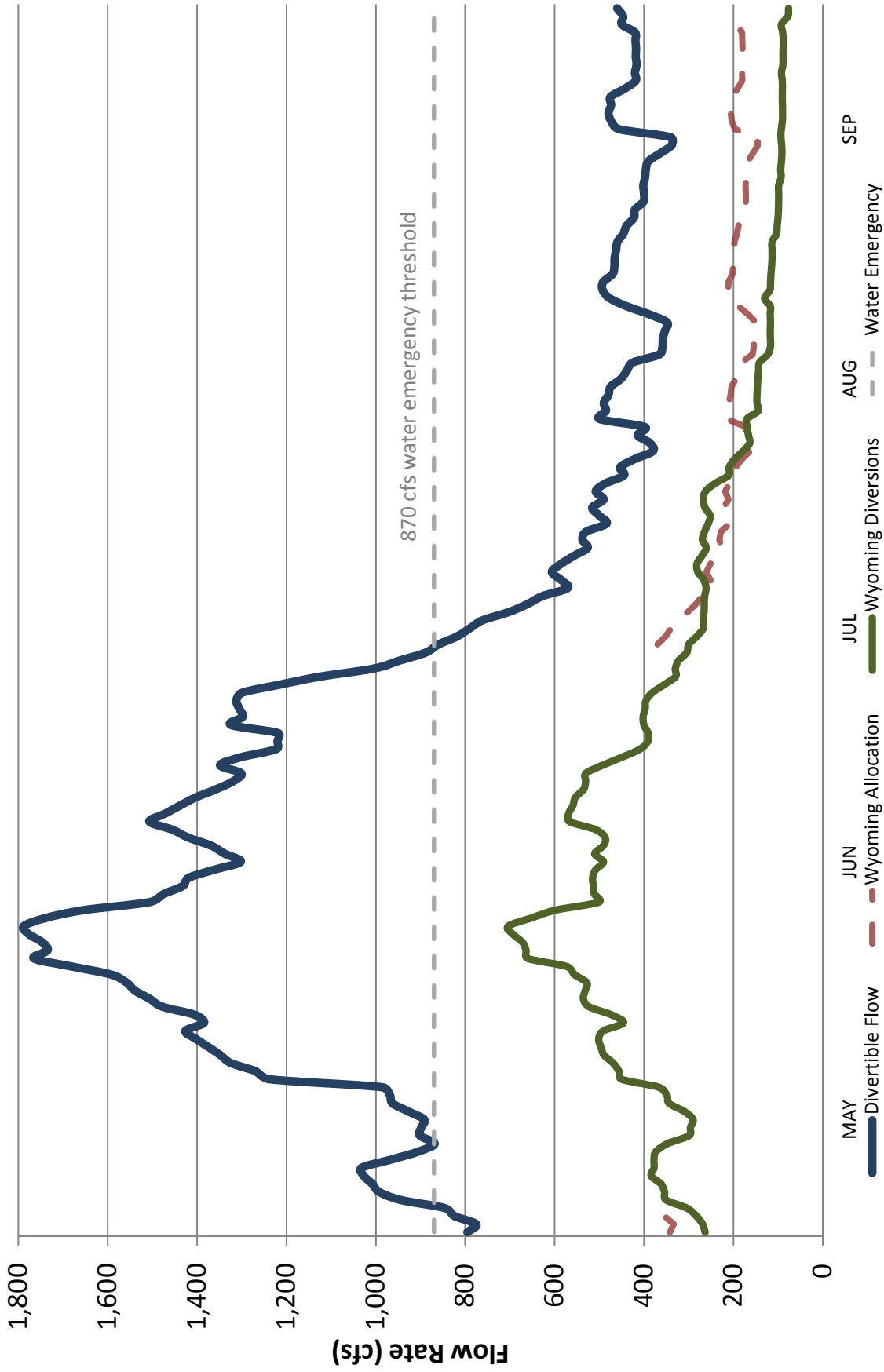


Figure 2014.12



# 2014 - Central Division Distribution

Idaho Section Diversions vs Allocation

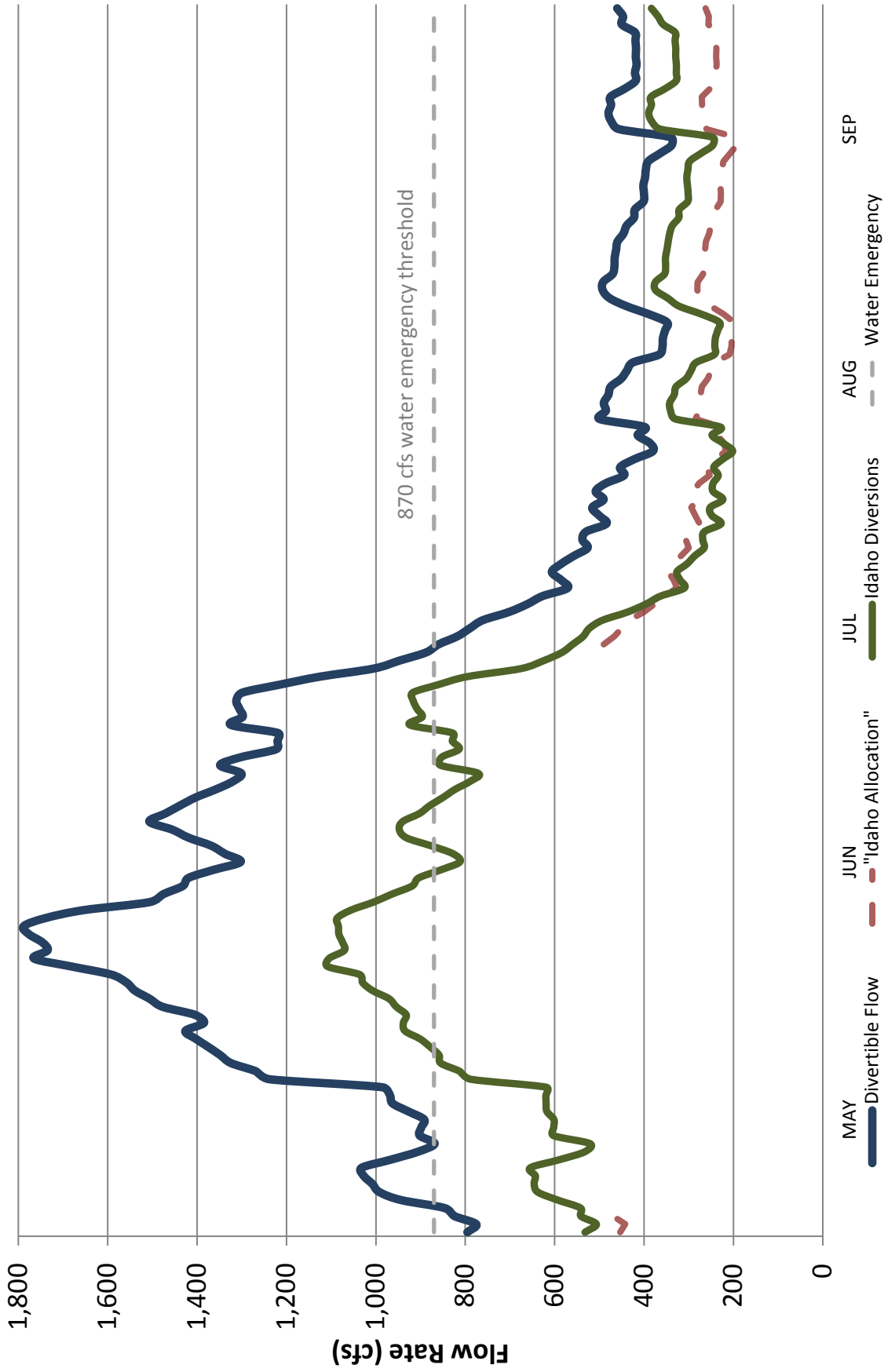


Figure 2014.13











## 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 2006 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 2014 with weekly conference calls with the state agencies, large water users and PacifiCorp. Figure 2014.15 shows the delivery of water in the Lower Division as reported by the two state agencies.

### 2014 Lower Division Irrigation Water Deliveries

Canal/Group	Natural Flow (af)	Storage Use (af)	Total Diversion (af)
<b>Idaho</b>			
Gentile Valley	9,808	48	9,856
West Cache	32,101	3,652	35,753
Cub River Pumps	7,438	9,326	16,764
Last Chance and Bench B	85,597	10,817	96,414
Idaho Small Irrigators	5,196	553	5,749
<b>Utah</b>			
Bear River Canal Company	204,206 af	58,560 af	262,766 af
Utah Small Irrigators	5,382 af	4,542 af	9,924 af

Figure 2014.15

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 2014.16 shows such deliveries in 2014.

**2014 Bear Lake Storage Deliveries**

Irrigation Storage Allocation	245,000 af
Bear Lake Storage Release	108,000 af
Lake Recovery Volume	137,000 af
Decreed Transit Losses <sup>1</sup>	
System Losses <sup>2</sup>	15,500 af
Delivered Bear Lake Storage	92,500 af

<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 2014.16**

Due to the summer rains which reduced the irrigation demands, the irrigation storage use was dramatically less than in most years.



## 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 2014 water year.

### Idaho

#### Water Activities

The Cub River Irrigation Co. submitted an application to appropriate water from the Cub River for power purposes in the amount of 38.36 cfs. The application (no. 13-7906) proposes to construct a pipeline from their existing Middle Ditch irrigation diversion works to a power plant to be constructed a few miles down the Middle Ditch. The application was protested by several parties who are working with the applicant to resolve issues.

#### 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>	<u>Total Acres</u>	<u>Volume (ac-ft)</u>
11-7786	4/7/2014	0.02	Springs	Stockwater		
11-7787	4/7/2014	0.01	Springs	Stockwater		
11-7789	4/28/2014	0.02	Springs	Stockwater		
11-7790	5/14/2014	0.04	Springs	Domestic		
13-7907	12/27/2013	0.06	Groundwater	Domestic		
13-7912	3/12/2014	0.04	Unnamed Spring	Fish, Recreation & Wildlife Storage		1.9
13-7914	4/29/2014	0.04	Unnamed Spring	Stockwater		
15-7365	1/24/2014	1.80	Groundwater	Irrigation, Stockwater	90.0	123.0
15-7367	5/24/2013	5.00	Groundwater	Irrigation	264.0	160.0
15-7372	11/21/2013	3.93	Groundwater	Irrigation	196.5	
15-7373	11/26/2013	2.51	Groundwater	Irrigation	185.0	
15-7374	2/5/2014	0.20	Groundwater	Domestic, Irrigation	10.0	
15-7380	7/7/2014	0.30	Groundwater	Domestic, Irrigation, Stockwater	14.0	

Several transfer applications were approved with point of diversion and/or place of use changes; five approvals in Basin 11, nine approvals in Basin 13, and one approval in Basin 15.

## Utah

### Water Activities

The Division of Water Resources is continuing their studies on the Bear River Development Project (Project). Current projections indicate that water from the Project will be needed sometime between 2035 and 2040.

In 2014, the Division of Water Resources completed the Bear River Pipeline Concept Study as an initial evaluation of the engineering, environmental, and real estate issues associated with this part of the overall Project. The Concept Report also included preliminary investigations for additional possible reservoir sites. A short-list of seven sites was produced from the preliminary investigation. One of these sites, Washakie Reservoir, was studied more extensively in 2006. The engineering feasibility of the other six sites is now being studied further. A final site(s) has not been selected. This phase of the study effort will provide additional information to DWRe to determine which of the seven reservoir sites to study further.

A team was hired in August 2014 that includes Bowen Collins & Associates, HDR Engineering, and Gerhart Cole Inc. to complete the study. The study includes geotechnical, geologic and environmental work and dam conceptual design. The Scope of Work also includes ongoing refinement of the pipeline alignment, project management, public relations and inter-agency coordination assistance, as well as Real Estate acquisition assistance. The current study is expected to be completed in late 2015.

The Cache Water Restoration Project is complete and was operated normally this entire irrigation season. The Cache Highline Water Association has obtained a \$1 million WaterSMART Grant and has approached the Board of Water Resources for funding to extend the pipeline enclosing the Logan Northern Canal from 1500 North in Logan to approximately 4800 North, just south of Smithfield.

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 \$102,000. 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 2014 water year.

### Water Rights

There were 25 applications to appropriate that were approved in Utah during 2014 for groundwater for “ordinary domestic and stockwatering” purposes and associated irrigation use for 20 homes and 6.0 associated acres and for stockwatering 314 livestock.

Change applications were also approved to change the points of diversion, nature and/or place of use of historic water rights.

## Wyoming

### Water Activities

Don Shoemaker retired after almost 42 years of water administration in the Upper Division. Wyoming hired a new replacement for this area, but he also resigned after a couple months. Kevin Payne then regulated the area until mid-July when Travis McInnis was hired and finished out the season. Although there was no official compact regulation, Wyoming did a voluntary regulation between Utah and Wyoming using compact allocations.

Wyoming continued to expand its telemetry sites by the addition of two new diversions: Whites Water and Johnson No. 3 pump. Trout Unlimited and NRCS installed a new diversion and a paddle wheel fish screen on the Whites Water ditch.

Expanded storage is still being explored by the Cokeville Development Company. Sublette Creek Reservoir is in the final stages of studies and is facing opposition from the Wyoming Game & Fish as to the impact of the water temperature in the Smith's Fork River and a minimum flow requirement of 125 cfs before any storage can take place. This requirement would also apply during times exchanges would be needed to the Smith's Fork.

Wyoming continues to see an increase in irrigators converting from flood irrigation to sprinklers and pivots.

### Water Rights

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

<u>Permit No.</u>	<u>Appropriator</u>	<u>Depletion Allocation</u>	<u>Priority Date</u>
202606W	Clark and Arden Lawlar	3.43 acre-feet	July 1, 2013
201783W	Jason Thornock and State Board of Land Commissioners	6.39 acre-feet	March 13, 2014
201723W	Ernest Thornock	0.92 acre-feet	February 24, 2014
201724W	Jason Thornock	5.53 acre-feet	February 24, 2014

## **STREAM GAGING**

As was indicated in the Overview chapter of this report, under the subsection concerning the Stream Gaging Program (see page O-13), 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 about half 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 help the Commission fulfill the responsibilities assigned to it by the Compact. In 2014 the U.S. Fish & Wildlife Service began directly funding the Bear River below Corinne, Utah gage. There were no other changes to the Commission's stream gaging program in 2014.

During 2014, a total of 32 gages were maintained on the Bear River system. Of these 32 gages, 6 were part of a cooperative effort between the Bear River Commission and the USGS, and the USGS funded 6 gages under NSIP. PacifiCorp maintained 15 gages on the Bear River system during 2014. 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. Figure 2014.17 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 14-38 through 14-50.

## BEAR RIVER SYSTEM STREAM GAGING STATIONS

### STREAM GAGES MAINTAINED DURING THE 2014 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	BRC/USGS	BRC/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	WY	State of WY	WSE/WY-USGS
<u>10028500</u> *▲	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>1</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>2</sup> ¥	Logan River above State Dam near Logan UT	USGS	USGS	USGS
10113500▲¥	Blacksmith Fork above 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

- ▲ Stations which are equipped with DCPs.
- \* Seasonal stations
- ¥ NSIP site

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

<sup>1</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>2</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 NSIP program.

**Figure 2014.17**

## 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 2013-10-01 to 2014-09-30

#### DAILY MEAN VALUES

[e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	130	82	e47	e39	e39	34	41	189	1,180	237	112	123
2	116	73	e51	e39	e38	35	38	261	1,110	226	104	113
3	129	78	e48	e42	e37	36	42	404	1,150	215	99	102
4	121	61	e32	e39	e36	35	39	557	1,070	210	102	94
5	113	70	e31	e37	e36	e34	39	665	927	196	107	91
6	113	78	e32	e37	e35	e35	37	682	909	188	114	91
7	115	80	e34	e40	e38	36	38	583	822	180	104	89
8	108	75	e33	e41	e40	e35	46	467	800	169	100	86
9	103	69	e30	e42	e39	e35	64	399	660	161	95	223
10	102	67	e36	e41	e37	e36	78	345	672	170	95	180
11	114	64	e37	e42	e37	e35	96	313	660	446	97	128
12	104	62	e38	e43	e38	e34	118	280	630	322	94	114
13	106	64	e40	e43	e40	e34	116	261	612	257	83	106
14	116	60	e39	e40	e42	e35	93	277	591	233	81	99
15	104	60	e40	e39	e43	e36	90	348	510	218	77	96
16	94	41	e42	e38	e43	e35	94	479	439	204	71	90
17	99	64	e42	e37	e41	33	101	615	400	206	69	90
18	98	69	e45	e36	e40	33	137	850	390	223	68	93
19	87	68	e41	e37	e38	e33	163	939	332	204	80	86
20	92	64	e39	e37	e36	e34	204	885	298	172	135	82
21	87	60	e40	e36	e35	e33	254	934	302	166	97	82
22	85	e37	e41	e38	e34	e31	344	916	306	160	88	106
23	84	e39	e45	e36	33	e32	360	965	291	162	192	90
24	84	e45	e38	e36	34	e33	282	952	289	159	148	81
25	83	e42	e35	e37	34	e37	301	949	289	154	208	76
26	79	e43	e36	e37	34	42	303	1,180	301	143	190	73
27	78	e45	e40	e38	34	40	240	1,320	340	139	194	139
28	83	e44	e40	e37	35	40	206	1,470	294	135	204	783
29	87	e44	e38	e37		39	181	1,490	259	131	163	481
30	81	e42	e40	e38		42	177	1,390	247	157	146	346
31	83		e42	e39		40		1,310		136	140	
<b>Total</b>	3,078	1,790	1,212	1,198	1,046	1,102	4,322	22,680	17,080	6,079	3,657	4,433
<b>Mean</b>	99.3	59.7	39.1	38.6	37.4	35.5	144	731	569	196	118	148
<b>Max</b>	130	82	51	43	43	42	360	1490	1180	446	208	783
<b>Min</b>	78	37	30	36	33	31	37	189	247	131	68	73
<b>Ac-ft</b>	6,105	3,550	2,404	2,376	2,075	2,186	8,573	44,970	33,880	12,060	7,254	8,793

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943-2014, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	65.0	54.7	45.6	41.6	39.6	43.5	113	600	830	300	93.7	75.6
<b>Max</b>	208	106	94.9	72.4	64.3	69.0	316	1,044	1,990	1,371	244	229
<b>(WY)</b>	(1983)	(1984)	(1984)	(1984)	(1984)	(1986)	(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 2014.17 (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 9.3 mi upstream from Woodruff Narrows Dam and 10 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.-- For water year 2014, records good except estimated daily discharges which are poor. Diversion for irrigation of about 43,500 acres above station.

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 OCTOBER 2013 TO SEPTEMBER 2014 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	56	51	27	e37	e35	e95	129	211	1,350	53	58	70
2	63	50	25	e36	e34	e102	152	199	1,100	47	72	55
3	60	45	e40	e36	e34	e101	137	288	955	47	65	43
4	62	47	e30	e36	e32	e105	124	469	957	55	68	33
5	64	33	e27	e35	e26	e111	115	671	795	53	42	24
6	51	37	e25	e35	e27	e103	128	753	658	46	39	21
7	52	50	e26	e38	e33	e103	131	742	563	33	52	23
8	52	60	e27	e39	e32	e111	151	624	506	23	51	22
9	46	56	e26	e38	e32	111	258	521	473	27	43	28
10	43	42	e30	e37	e30	111	332	459	402	41	34	135
11	45	39	e33	e38	e30	123	320	401	376	107	27	114
12	51	34	e34	e39	e31	102	311	366	364	259	24	63
13	47	38	e37	e40	e32	92	313	348	322	191	32	49
14	54	37	e36	e37	e32	88	292	304	290	136	28	42
15	57	38	e38	e38	e35	96	234	293	270	104	21	34
16	52	36	e39	e38	e35	89	215	368	238	75	14	28
17	42	28	e40	e37	e32	93	207	463	234	57	11	24
18	48	20	e39	e36	e26	89	205	638	316	50	7.6	21
19	46	47	e38	e35	e23	77	251	906	316	30	6.9	20
20	38	60	e38	e35	e24	80	288	888	233	20	8.7	22
21	35	40	e37	e34	e28	82	334	842	168	20	25	20
22	35	e25	e35	e34	e31	71	375	872	129	21	40	24
23	38	18	e38	e34	e34	70	e492	905	100	17	56	35
24	38	14	e38	e33	e38	64	e452	963	80	14	155	29
25	38	17	e35	e32	e41	76	e378	999	61	13	118	19
26	37	39	e35	e32	e47	111	e393	1,030	44	14	158	14
27	35	37	e37	e33	e58	123	e398	1,240	60	17	161	15
28	33	39	e36	e31	e73	98	e341	1,430	108	16	154	307
29	45	35	e35	e32		84	290	1,580	99	20	150	859
30	59	32	e37	e34		96	247	1,590	75	58	102	497
31	53		e38	e35		123		1,460		70	81	
<b>Total</b>	1,475	1,144	1,056	1,104	965	2,980	7,993	22,820	11,640	1,734	1,904	2,690
<b>Mean</b>	47.6	38.1	34.1	35.6	34.5	96.1	266	736	388	55.9	61.4	89.7
<b>Max</b>	64	60	40	40	73	123	492	1590	1350	259	161	859
<b>Min</b>	33	14	25	31	23	64	115	199	44	13	6.9	14
<b>Ac-ft</b>	2,926	2,269	2,095	2,190	1,913	5,911	15,850	45,270	23,090	3,439	3,777	5,336

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 -2014, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	66.7	65.9	64.2	62.4	74.5	151	308	772	804	193	47.7	46.5
<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	47.4	4.41	.68	.49
<b>(WY)</b>	(1965)	(1989)	(1989)	(1989)	(2003)	(1977)	(1977)	(1977)	(2012)	(2000)	(2000)	(1988)

Figure 2014.17 (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.-- Records for water year 2014 are good, except Aug 4 to Sep 30 which are fair (due to variable control conditions from rain storm event) and estimated daily discharges which are poor. Flow regulated by Woodruff Narrows Reservoir (station 10020200) beginning January 1962. Diversions for irrigation of about 43,500 acres above station.

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 OCTOBER 2013 TO SEPTEMBER 2014 DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	11	14	14	15	15	13	11	39	1,240	297	46	24
2	11	14	14	15	16	13	11	39	1,240	74	46	22
3	11	14	14	15	16	13	11	40	1,230	74	46	17
4	12	14	14	14	16	13	11	40	1,230	73	46	17
5	12	14	14	14	16	13	11	40	1,140	73	46	17
6	12	14	14	15	16	13	11	41	1,070	72	45	16
7	12	14	14	15	16	13	11	41	1,060	72	46	16
8	12	14	14	15	16	14	11	42	1,060	72	46	16
9	12	13	14	15	16	14	11	42	1,050	72	46	19
10	12	14	15	15	15	14	12	42	979	72	46	16
11	12	14	15	15	15	15	12	43	945	57	46	16
12	12	14	15	15	15	14	12	43	942	47	46	16
13	13	14	15	15	15	12	15	43	934	46	47	16
14	13	14	15	15	15	9.6	17	43	925	46	46	16
15	13	14	15	15	15	e9.4	17	230	918	46	46	16
16	13	14	15	15	15	e8.1	29	383	870	46	46	16
17	13	14	15	15	15	e6.4	29	383	835	46	33	15
18	13	14	15	15	15	e5.6	29	383	826	46	24	15
19	13	14	15	15	14	e5.1	27	386	787	46	24	16
20	13	14	15	15	14	e4.9	26	863	734	46	24	15
21	13	14	16	15	14	e4.4	28	1,100	728	45	24	16
22	13	14	16	15	14	e3.8	31	1,100	723	45	23	15
23	13	14	16	15	14	e3.0	35	1,160	711	45	23	15
24	13	14	15	15	14	e2.2	38	1,240	706	45	23	15
25	13	14	15	15	13	e6.5	38	1,230	697	46	23	16
26	13	14	15	16	13	10	38	1,230	689	46	26	16
27	13	14	16	16	13	10	38	1,230	680	45	23	18
28	13	14	15	16	13	10	39	1,230	668	46	23	17
29	13	14	15	15		10	39	1,230	659	46	23	16
30	13	14	16	15		10	39	1,240	650	46	24	16
31	14		15	15		10		1,230		46	24	
<b>Total</b>	389	419	461	466	414	303	687	16,430	26,930	1,923	1,100	497
<b>Mean</b>	12.5	14.0	14.9	15.0	14.8	9.77	22.9	530	898	62.1	35.5	16.6
<b>Max</b>	14	14	16	16	16	15	39	1240	1240	297	47	24
<b>Min</b>	11	13	14	14	13	2.2	11	39	650	45	23	15
<b>Ac-ft</b>	772	831	914	924	821	601	1,363	32,579	53,410	3,816	2,182	986

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 2014, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	52.7	47.8	41.1	39.6	40.8	84.3	252	744	956	270	71.9	57.2
<b>Max</b>	425	421	184	153	171	473	891	1,828	2,437	1,339	331	278
<b>(WY)</b>	(1983)	(1983)	(1983)	(1985)	(1971)	(1972)	(1985)	(1984)	(1983)	(2011)	(1983)	(1983)
<b>Min</b>	3.89	.12	4.28	4.37	4.71	4.70	.34	27.8	357	10.5	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.

REMARKS.-- Records fair except for estimated daily discharges which are poor and other periods as noted. Records poor 6/20/14 through 7/12/14 due to variable control conditions from backwater. Natural flow of stream affected by diversions for irrigation, return flow from irrigated areas, and regulation by upstream reservoirs.

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 OCTOBER 2013 TO SEPTEMBER 2014 DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	---	---	---	---	---	---	46	16	e0.98	227	66	112
2	18	---	---	---	---	---	47	15	e1.1	208	60	108
3	9.0	---	---	---	---	---	45	15	e1.0	196	54	103
4	17	---	---	---	---	---	42	14	e1.0	185	51	100
5	21	---	---	---	---	---	38	12	e1.1	178	57	96
6	24	---	---	---	---	---	35	1.5	e1.3	164	99	90
7	24	---	---	---	---	---	33	1.1	e1.4	172	119	82
8	49	---	---	---	---	---	32	1.1	e1.5	146	125	79
9	48	---	---	---	---	---	29	1.1	e1.7	112	135	79
10	29	---	---	---	---	---	25	1.5	e1.8	81	126	77
11	29	---	---	---	---	---	33	1.8	e1.9	64	116	73
12	30	---	---	---	---	---	35	1.4	e2.1	92	109	70
13	32	---	---	---	---	---	35	1.3	e2.0	264	106	73
14	31	---	---	---	---	---	31	1.9	e2.0	184	107	74
15	32	---	---	---	---	109	26	2.1	e2.0	153	103	73
16	32	---	---	---	---	89	24	1.8	e2.5	135	98	71
17	32	---	---	---	---	82	23	1.0	e3.9	125	92	72
18	32	---	---	---	---	88	22	0.77	e6.0	119	88	61
19	31	---	---	---	---	85	21	0.84	e40	120	81	66
20	35	---	---	---	---	71	20	0.95	69	112	68	65
21	37	---	---	---	---	66	19	1.2	67	85	77	62
22	---	---	---	---	---	62	19	0.72	72	82	78	63
23	---	---	---	---	---	56	17	0.82	67	79	95	65
24	---	---	---	---	---	46	17	0.80	66	68	111	66
25	---	---	---	---	---	21	17	0.92	64	60	106	66
26	---	---	---	---	---	24	17	1.1	66	46	110	65
27	---	---	---	---	---	32	16	e1.1	71	43	117	68
28	---	---	---	---	---	42	16	e1.2	75	41	128	89
29	---	---	---	---	---	41	17	e1.3	79	39	123	126
30	---	---	---	---	---	40	16	e1.3	135	45	120	166
31	---	---	---	---	---	42	---	e0.97	---	66	116	---
<b>Total</b>							813	104	906	3,691	3,041	2,460
<b>Mean</b>							27.1	3.34	30.2	119	98.1	82.0
<b>Max</b>							47	16	135	264	135	166
<b>Min</b>							16	0.72	0.98	39	51	61
<b>Ac-ft</b>							1,613	205	1,797	7,321	6,032	4,879

Figure 2014.17 (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.-- For water year 2014, records good except 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 OCTOBER 2013 TO SEPTEMBER 2014 DAILY MEAN VALUES

[e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	75	73	e58	e40	e43	55	58	235	1,020	453	214	141
2	75	71	e62	e39	e41	52	56	313	955	430	208	135
3	81	73	e53	e39	e40	51	56	424	922	414	201	133
4	79	e65	e50	e40	e39	51	57	499	909	416	204	132
5	76	e68	e45	e37	e38	50	60	490	869	396	217	132
6	77	70	e42	e36	e41	50	61	491	847	383	226	131
7	76	71	e42	e36	e43	50	62	479	815	370	204	129
8	76	70	e37	e38	e42	49	70	428	789	358	200	129
9	74	69	e34	e43	41	e49	83	413	760	346	205	136
10	75	69	e42	e45	42	50	101	387	747	339	185	129
11	81	68	e38	e47	e44	52	127	355	743	335	179	124
12	76	67	e39	e47	50	e49	148	339	728	325	177	124
13	77	69	e42	e48	53	e49	146	317	716	310	181	122
14	78	68	e47	e42	e48	e49	131	316	714	301	175	119
15	77	68	e46	e38	57	51	128	348	665	293	172	118
16	76	67	e44	e37	e59	e50	125	432	620	284	167	117
17	76	63	e45	e38	e55	52	137	518	625	278	165	116
18	75	e65	e46	e39	e55	e52	164	605	574	273	160	115
19	74	68	e43	e37	e56	e49	172	588	538	265	163	118
20	74	69	e41	e38	e53	e51	213	591	511	261	165	113
21	73	68	e42	e35	e52	e51	251	640	495	257	174	114
22	73	e56	e44	e37	e53	e52	281	696	500	250	178	122
23	72	e44	e48	e40	e54	e50	308	748	502	243	190	116
24	71	e46	e40	e36	56	e52	256	747	507	239	177	111
25	71	e48	e35	e40	56	54	236	788	515	234	167	109
26	71	e50	e36	e39	e54	59	260	867	527	229	160	108
27	71	e51	e38	e42	53	61	243	952	532	224	156	122
28	74	e52	e39	e38	53	58	221	1,050	514	220	152	183
29	81	e52	e36	e42		55	203	1,090	486	221	147	183
30	75	e50	e39	e43		57	206	1,090	471	242	145	159
31	73		e45	e41		57		1,070		224	149	
<b>Total</b>	<b>2,333</b>	<b>1,888</b>	<b>1,338</b>	<b>1,237</b>	<b>1,371</b>	<b>1,617</b>	<b>4,620</b>	<b>18,310</b>	<b>20,120</b>	<b>9,413</b>	<b>5,563</b>	<b>3,840</b>
<b>Mean</b>	<b>75.3</b>	<b>62.9</b>	<b>43.2</b>	<b>39.9</b>	<b>49.0</b>	<b>52.2</b>	<b>154</b>	<b>591</b>	<b>671</b>	<b>304</b>	<b>179</b>	<b>128</b>
<b>Max</b>	<b>81</b>	<b>73</b>	<b>62</b>	<b>48</b>	<b>59</b>	<b>61</b>	<b>308</b>	<b>1090</b>	<b>1020</b>	<b>453</b>	<b>226</b>	<b>183</b>
<b>Min</b>	<b>71</b>	<b>44</b>	<b>34</b>	<b>35</b>	<b>38</b>	<b>49</b>	<b>56</b>	<b>235</b>	<b>471</b>	<b>220</b>	<b>145</b>	<b>108</b>
<b>Ac-ft</b>	<b>4,627</b>	<b>3,745</b>	<b>2,654</b>	<b>2,454</b>	<b>2,718</b>	<b>3,207</b>	<b>9,164</b>	<b>36,310</b>	<b>39,900</b>	<b>18,670</b>	<b>11,030</b>	<b>7,617</b>

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 2014, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	90.3	77.9	68.2	62.9	60.0	62.0	157	521	609	290	151	108
<b>Max</b>	156	114	88.4	85.0	82.8	99.4	385	1,072	1,377	779	280	169
<b>(WY)</b>	(1987)	(1986)	(1983)	(1983)	(1984)	(1986)	(1946)	(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 2014.17 (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.--Records good except for estimated daily discharges, which are poor. Natural flow of stream affected by regulation of upstream reservoirs, diversions for irrigation, and return flow from irrigated areas.

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.

EXTREMES FOR CURRENT YEAR.--Maximum discharge recorded, 355 ft<sup>3</sup>/s, May 19, gage height 2.70 ft, minimum daily, 64 ft<sup>3</sup>/s, Sep 11.

### DISCHARGE, CUBIC FEET PER SECOND WATER YEAR OCTOBER 2013 TO SEPTEMBER 2014 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	82	101	e141	e112	e100	e227	210	216	911	779	204	306
2	81	102	e129	e108	e100	e233	215	248	880	778	211	293
3	82	104	e115	e107	e98	e240	209	321	819	712	229	282
4	80	105	e108	e107	e96	e255	203	405	778	669	219	273
5	76	99	e103	e104	e95	e264	203	448	797	627	247	265
6	76	87	e105	e101	e97	e264	207	442	799	584	340	261
7	77	93	e98	e98	e101	e263	205	427	817	556	358	254
8	78	100	e96	e98	e103	e285	208	425	808	549	363	242
9	80	101	e94	e101	e102	e305	216	392	805	484	386	239
10	101	101	e100	e102	e99	e310	229	400	785	435	374	235
11	100	100	e97	e103	e96	e325	222	384	797	409	344	227
12	94	100	e107	e103	e95	346	257	357	773	419	326	217
13	90	100	e112	e108	e97	332	250	350	773	503	326	217
14	96	102	e116	e106	e99	312	230	328	742	484	314	213
15	95	104	e120	e102	e99	303	216	318	731	424	303	209
16	92	107	e117	e97	e110	293	205	339	696	367	288	205
17	91	105	e118	e97	e122	257	200	403	713	339	275	203
18	91	97	e118	e96	e128	244	215	482	819	323	263	201
19	90	108	e118	e96	e128	234	239	542	819	309	253	197
20	89	108	e114	e96	e127	231	241	506	819	301	252	199
21	90	115	e121	e93	e135	228	272	509	745	279	253	196
22	92	e101	e123	e92	e140	223	304	552	723	236	267	205
23	89	e90	e125	e96	e140	222	337	609	704	225	296	210
24	89	e100	e120	e94	e140	217	340	669	691	216	315	201
25	89	e105	e101	e94	e140	218	303	689	675	211	325	196
26	88	e105	e102	e95	e140	208	297	708	700	196	332	195
27	88	e104	e106	e98	e162	210	313	744	750	177	329	201
28	88	e104	e110	e94	e215	202	286	795	799	172	335	288
29	98	e103	e103	e102		206	246	859	782	173	328	374
30	108	e108	e108	e103		211	226	918	744	185	314	384
31	100		e113	e101		210		942		204	315	
<b>Total</b>	2,760	3,059	3,458	3,104	3,304	7,877	7,304	15,730	23,190	12,320	9,284	7,188
<b>Mean</b>	89.0	102	112	100	118	254	243	507	773	398	299	240
<b>Max</b>	108	115	141	112	215	346	340	942	911	779	386	384
<b>Min</b>	76	87	94	92	95	202	200	216	675	172	204	195
<b>Ac-ft</b>	5,474	6,067	6,858	6,157	6,553	15,630	14,490	31,190	46,010	24,450	18,420	14,260

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 2015, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	198	215	187	173	195	355	690	963	1,132	533	219	171
<b>Max</b>	752	693	563	381	479	1,293	1,979	3,158	3,829	2,837	752	671
<b>(WY)</b>	(1983)	(1983)	(1983)	(1985)	(1986)	(1986)	(1985)	(1952)	(1983)	(2011)	(1983)	(1983)
<b>Min</b>	43.5	74.6	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)

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

**STREAMFLOW RECORDS FOR WATER YEAR 2014**

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 ft<sup>3</sup>/s, May 27, 1984; no flow Apr 28, 1977 and Oct 1, 1979.

DISCHARGE MEASUREMENT DATES.-- 10-12-13, 12-13-13, 2-16-14, 3-4-14, 3-29-14, 4-24-14, 5-13-14, 5-23-14, 5-29-14, 6-12-14, 6-18-14, 6-25-14, 7-3-14, 8-26-14, 9-15-14.

**Rainbow Inlet Canal near Dingle, ID (10046000)  
Water Year 2014 (October 2013 to September 2014)**

**Daily Mean Values**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	76.3	95.4	72.1	71.8	88.8	180	248	225	609	654	125	296
2	79.4	94.7	71.3	72.4	89.3	225	248	200	613	671	125	295
3	82.6	93.9	70.6	72.9	89.9	250	248	200	686	733	115	292
4	85.7	93.1	69.8	73.5	90.4	358	248	200	685	729	125	278
5	88.9	92.3	69	74	91	366	248	250	647	724	115	267
6	92.1	91.6	68.2	74.6	91.5	375	248	295	654	719	125	250
7	95.2	90.8	67.4	75.1	92.1	384	248	303	662	700	125	250
8	98.4	90	66.7	75.7	92.6	395	248	301	663	642	150	250
9	102	89.2	65.9	76.2	93.2	415	248	313	664	578	150	250
10	105	88.4	65.1	76.8	93.7	423	255	250	634	522	250	250
11	108	87.7	64.3	77.3	94.3	444	265	195	584	471	250	250
12	111	86.9	63.6	77.9	94.8	460	265	180	543	430	245	225
13	110	86.1	62.8	78.4	95.4	460	285	264	524	394	235	200
14	109	85.3	62	79	95.9	438	285	264	501	370	225	200
15	109	84.6	62.5	79.5	96.5	424	285	264	484	359	210	303
16	108	83.8	63.1	80	97	404	240	264	478	335	200	306
17	107	83	63.6	80.6	97	393	240	264	480	290	190	306
18	106	82.2	64.2	81.1	97	373	225	264	505	250	150	305
19	106	81.4	64.7	81.7	97	355	225	264	551	220	150	306
20	105	80.7	65.3	82.2	97	336	240	433	566	200	150	275
21	104	79.9	65.8	82.8	97	314	240	460	564	200	150	250
22	103	79.1	66.4	83.3	97	250	240	452	551	200	150	250
23	102	78.3	66.9	83.9	97	282	275	456	530	200	200	250
24	102	77.6	67.5	84.4	97	273	268	469	508	150	250	250
25	101	76.8	68	85	105	250	290	492	484	126	275	250
26	100	76	68.6	85.5	153	250	290	524	474	126	300	250
27	99.3	75.2	69.1	86.1	165	250	290	527	484	120	300	250
28	98.6	74.4	69.7	86.6	165	250	290	521	575	100	305	275
29	97.8	73.7	70.2	87.2		248	280	532	632	90	303	285
30	97	72.9	70.8	87.7		248	280	550	642	90	304	300
31	96.2		71.3	88.3		248		586		100	300	

	Monthly Statistics											Yearly Stats	
<b>Total</b>	3,086	2,525	2,077	2,482	2,850	10,321	7,785	10,762	17,177	11,493	6,247	7,964	<b>84,768</b>
<b>Mean</b>	100	84	67	80	102	333	260	347	573	371	202	265	<b>232</b>
<b>Min</b>	76	73	62	72	89	180	225	180	474	90	115	200	<b>62</b>
<b>Max</b>	111	95	72	88	165	460	290	586	686	733	305	306	<b>733</b>
<b>Ins. Min</b>	53	73	62	72	89	180	111	176	464	61	71	200	<b>53</b>
<b>Ins. Max</b>	186	261	422	295	232	474	368	617	705	738	312	772	<b>772</b>
<b>Ac-ft</b>	6,120	5,010	4,120	4,920	5,650	20,470	15,440	21,350	34,070	22,800	12,390	15,800	<b>168,140</b>

**PacifiCorp Energy  
Reservoir Records  
Bear Lake 2013-2014  
Daily Contents (Acre Feet)**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	664457	648024	648681	650650	655250	680937	711384	733980	760659	745306	682917	643431	1
2	661824	648024	648681	650650	655907	682257	712047	734645	761327	744639	680937	642775	2
3	659193	648024	648681	650650	656564	683578	713374	735311	761996	743972	678296	642119	3
4	656564	646712	649337	650650	657221	684899	713374	735977	762664	743972	676976	641464	4
5	655250	646712	649337	650650	657878	686221	715365	737309	762664	742639	672361	640808	5
6	653278	646712	649337	650650	658536	687543	716693	737976	763332	742639	669724	640152	6
7	653278	646056	649337	650650	659851	689526	717358	738642	763332	740640	667090	639497	7
8	652621	646056	649337	650650	661166	690848	718022	739308	763332	739308	665115	638841	8
9	651964	646056	649337	650650	662482	692171	718686	739974	763332	737976	663140	638186	9
10	651307	645400	649337	650650	665773	692833	719350	740640	763332	736643	661824	637531	10
11	650650	644744	649337	650650	667748	693494	720014	741306	763332	734645	661166	636876	11
12	650650	644744	649337	650650	669066	694156	720679	741973	762664	733314	660508	636221	12
13	650650	644744	649337	650650	669066	694156	721343	743306	761996	731983	659851	635566	13
14	650650	643431	649337	650650	670383	694818	722008	744639	761327	730652	659193	635566	14
15	650650	642775	649337	650650	671042	696141	722672	745973	759991	727326	657878	633600	15
16	651307	642775	649337	651307	671701	697466	723336	747307	757986	724001	656564	632290	16
17	651964	643431	649337	651307	672361	698790	724001	748642	757318	720679	655250	630980	17
18	652621	643431	649337	651307	673020	701439	724666	749309	757318	717358	650650	629671	18
19	652621	644087	649994	651307	673679	702764	724666	750643	755982	714038	650650	629671	19
20	652621	644087	649994	651964	674339	704089	724666	751310	754647	712047	648681	629017	20
21	652621	644744	649994	651964	674998	705415	725331	751977	753979	710057	647368	628362	21
22	652621	644744	649994	652621	675657	706078	725331	752644	753312	708731	646056	628362	22
23	652621	645400	649994	652621	676317	706741	725996	753312	752644	707404	646056	628362	23
24	652621	646056	649994	653278	676976	707404	726661	753979	751977	704089	646056	628362	24
25	652621	646712	649994	653935	677636	708068	726661	754647	751310	700777	646056	628362	25
26	652621	647368	649994	654593	678296	708731	727326	755315	750643	697466	646056	628362	26
27	651307	647368	649994	654593	678956	708731	728657	755982	749976	694156	646056	628362	27
28	649994	648024	649994	654593	679616	709394	729987	756650	748642	690848	646056	631635	28
29	649337	648024	649994	654593		709394	731318	757318	747307	689526	645400	636876	29
30	648024	648024	649994	654593		710057	732648	758654	745973	688204	644744	640152	30
31	650650		649994	655250		710720		759991	684899	684899	644087		31

<b>Monthly Totals</b>													
<b>Mean</b>	652,876	645,750	649,549	651,922	668,624	698,028	722,121	746,730	757,476	720,643	657,508	634,715	<b>683,829</b>
<b>Min</b>	648,024	642,775	648,681	650,650	655,250	680,937	711,384	733,980	745,973	684,899	644,087	628,362	<b>628,362</b>
<b>Max</b>	664,457	648,024	649,994	655,250	679,616	710,720	732,648	759,991	763,332	745,306	682,917	643,431	<b>763,332</b>

Notes:

**PacifiCorp Energy  
Reservoir Level Records  
Bear Lake 2013-2014**

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

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	12.65	12.40	12.41	12.44	12.51	12.90	13.36	13.70	14.10	13.87	12.93	12.33	1
2	12.61	12.40	12.41	12.44	12.52	12.92	13.37	13.71	14.11	13.86	12.90	12.32	2
3	12.57	12.40	12.41	12.44	12.53	12.94	13.39	13.72	14.12	13.85	12.86	12.31	3
4	12.53	12.38	12.42	12.44	12.54	12.96	13.39	13.73	14.13	13.85	12.84	12.30	4
5	12.51	12.38	12.42	12.44	12.55	12.98	13.42	13.75	14.13	13.83	12.77	12.29	5
6	12.48	12.38	12.42	12.44	12.56	13.00	13.44	13.76	14.14	13.83	12.73	12.28	6
7	12.48	12.37	12.42	12.44	12.58	13.03	13.45	13.77	14.14	13.80	12.69	12.27	7
8	12.47	12.37	12.42	12.44	12.60	13.05	13.46	13.78	14.14	13.78	12.66	12.26	8
9	12.46	12.37	12.42	12.44	12.62	13.07	13.47	13.79	14.14	13.76	12.63	12.25	9
10	12.45	12.36	12.42	12.44	12.67	13.08	13.48	13.80	14.14	13.74	12.61	12.24	10
11	12.44	12.35	12.42	12.44	12.70	13.09	13.49	13.81	14.14	13.71	12.60	12.23	11
12	12.44	12.35	12.42	12.44	12.72	13.10	13.50	13.82	14.13	13.69	12.59	12.22	12
13	12.44	12.35	12.42	12.44	12.72	13.10	13.51	13.84	14.12	13.67	12.58	12.21	13
14	12.44	12.33	12.42	12.44	12.74	13.11	13.52	13.86	14.11	13.65	12.57	12.21	14
15	12.44	12.32	12.42	12.44	12.75	13.13	13.53	13.88	14.09	13.60	12.55	12.18	15
16	12.45	12.32	12.42	12.45	12.76	13.15	13.54	13.90	14.06	13.55	12.53	12.16	16
17	12.46	12.33	12.42	12.45	12.77	13.17	13.55	13.92	14.05	13.50	12.51	12.14	17
18	12.47	12.33	12.42	12.45	12.78	13.21	13.56	13.93	14.05	13.45	12.44	12.12	18
19	12.47	12.34	12.43	12.45	12.79	13.23	13.56	13.95	14.03	13.40	12.44	12.12	19
20	12.47	12.34	12.43	12.46	12.80	13.25	13.56	13.96	14.01	13.37	12.41	12.11	20
21	12.47	12.35	12.43	12.46	12.81	13.27	13.57	13.97	14.00	13.34	12.39	12.10	21
22	12.47	12.35	12.43	12.47	12.82	13.28	13.57	13.98	13.99	13.32	12.37	12.10	22
23	12.47	12.36	12.43	12.47	12.83	13.29	13.58	13.99	13.98	13.30	12.37	12.10	23
24	12.47	12.37	12.43	12.48	12.84	13.30	13.59	14.00	13.97	13.25	12.37	12.10	24
25	12.47	12.38	12.43	12.49	12.85	13.31	13.59	14.01	13.96	13.20	12.37	12.10	25
26	12.47	12.39	12.43	12.50	12.86	13.32	13.60	14.02	13.95	13.15	12.37	12.10	26
27	12.45	12.39	12.43	12.50	12.87	13.32	13.62	14.03	13.94	13.10	12.37	12.10	27
28	12.43	12.40	12.43	12.50	12.88	13.33	13.64	14.04	13.92	13.05	12.37	12.15	28
29	12.42	12.40	12.43	12.50		13.33	13.66	14.05	13.90	13.03	12.36	12.23	29
30	12.40	12.40	12.43	12.50		13.34	13.68	14.07	13.88	13.01	12.35	12.28	30
31	12.44		12.43	12.51		13.35		14.09		12.96	12.34		31

**BEAR LAKE STATISTICS**

		Monthly												Yearly
Daily Mean	12.47	12.37	12.42	12.46	12.71	13.16	13.52	13.89	14.05	13.50	12.54	12.20	12.94	
Daily Min	12.40	12.32	12.41	12.44	12.51	12.90	13.36	13.70	13.88	12.96	12.34	12.10	12.10	
Daily Max	12.65	12.40	12.43	12.51	12.88	13.35	13.68	14.09	14.14	13.87	12.93	12.33	14.14	

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

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

**STREAMFLOW RECORDS FOR WATER YEAR 2014**

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, 1.0 ft<sup>3</sup>/s, for many days in 1937, 1954, 1959,

DISCHARGE MEASUREMENT DATES.-- 5-29-14, 6-18-14, 6-24-14, 7-3-14, 7-7-14, 7-13-14, 7-19-14, 8-1-14, 8-5-14, 8-9-14, 8-16-14, 8-26-14,

**Bear Lake Outlet Canal near Paris, ID (10059500)  
Water Year 2014 (October 2013 to September 2014)**

**Daily Mean Values**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	296	5	5	5	5	5	5	5	442	872	1170	366
2	299	5	5	5	5	5	5	5	480	934	1180	364
3	300	5	5	5	5	5	5	5	478	1020	1270	365
4	301	5	5	5	5	5	5	5	472	1020	1280	284
5	206	5	5	5	5	5	5	5	467	1000	1130	316
6	5	5	5	5	5	5	5	5	462	988	930	502
7	5	5	5	5	5	5	5	5	503	1050	758	502
8	5	5	5	5	5	5	5	5	563	1190	726	500
9	5	5	5	5	5	5	5	5	579	1340	717	497
10	5	5	5	5	5	5	5	5	614	1390	719	494
11	5	5	5	5	5	5	5	5	788	1540	718	500
12	5	5	5	5	5	5	5	5	1030	1570	720	448
13	5	5	5	5	5	5	5	5	1040	1570	723	399
14	5	5	5	5	5	5	5	5	1040	1570	784	399
15	5	5	5	5	5	5	5	5	1030	1500	899	395
16	5	5	5	5	5	5	5	5	1030	1390	968	390
17	5	5	5	5	5	5	5	5	1000	1370	963	326
18	5	5	5	5	5	5	5	5	958	1250	957	266
19	5	5	5	5	5	5	5	5	968	1120	947	263
20	5	5	5	5	5	5	5	5	924	1120	948	258
21	5	5	5	5	5	5	5	5	855	1190	911	256
22	5	5	5	5	5	5	5	5	824	1270	781	202
23	97.5	5	5	5	5	5	5	160	830	1250	658	95.6
24	218	5	5	5	5	5	5	334	837	1260	576	56.5
25	223	5	5	5	5	5	5	286	835	1340	505	53.6
26	151	5	5	5	5	5	5	237	935	1390	546	30
27	5	5	5	5	5	5	5	240	1020	1420	472	5
28	5	5	5	5	5	5	5	238	943	1460	369	5
29	5	5	5	5	5	5	5	256	871	1480	366	5
30	5	5	5	5	5	5	5	322	878	1490	365	5
31	5	5	5	5	5	5	5	405	405	1330	367	

	Monthly Statistics											Yearly Stats	
<b>Total</b>	2,202	150	155	155	140	155	150	2,588	23,696	39,684	24,423	8,548	<b>102,045</b>
<b>Mean</b>	71	5	5	5	5	5	5	84	790	1,280	788	285	<b>277</b>
<b>Min</b>	5	5	5	5	5	5	5	5	442	872	365	5	<b>5</b>
<b>Max</b>	301	5	5	5	5	5	5	405	1,040	1,570	1,280	502	<b>1,570</b>
<b>Ins. Min</b>	5	5	5	5	5	5	5	5	401	868	342	5	<b>5</b>
<b>Ins. Max</b>	317	5	5	5	5	5	5	438	1,060	1,600	1,370	533	<b>1,600</b>
<b>Ac-ft</b>	4,370	298	307	307	278	307	298	5,130	47,000	78,710	48,440	16,950	<b>202,395</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 OCTOBER 2013 TO SEPTEMBER 2014 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	334	334	370	e360	403	653	639	475	341	636	1,110	560
2	341	357	364	e370	400	736	630	460	330	568	1,070	517
3	333	361	364	e350	399	762	604	559	351	516	907	497
4	324	357	e330	e340	398	510	594	658	275	467	869	404
5	316	328	e320	e332	393	495	591	652	263	485	844	389
6	313	319	e350	e327	384	569	603	631	242	572	957	424
7	310	323	e380	e325	390	701	856	601	273	623	956	426
8	312	327	e350	e320	394	678	615	676	184	656	737	427
9	313	325	e340	e360	468	606	530	827	157	651	808	486
10	319	328	e330	e380	510	632	521	751	154	755	789	554
11	320	338	e320	e400	506	650	551	578	179	825	724	500
12	310	338	e320	405	483	655	578	611	280	937	644	528
13	313	340	e340	399	592	656	791	563	307	1,010	625	523
14	325	341	e360	388	1,000	655	777	441	287	1,070	562	539
15	320	357	e365	379	733	642	678	410	288	1,040	540	499
16	297	363	e365	373	848	646	514	401	346	1,020	546	495
17	351	359	e370	e360	660	615	515	423	653	839	558	478
18	349	368	e360	e347	481	609	519	391	696	891	639	412
19	350	370	e350	e345	441	652	521	415	657	866	677	464
20	353	372	e350	e344	426	605	479	443	702	724	726	465
21	320	385	e355	e340	426	644	477	385	816	735	796	336
22	312	387	e360	e338	423	627	488	288	866	739	884	414
23	306	373	e357	e345	434	632	516	256	811	818	950	401
24	304	372	e380	e330	439	609	548	333	636	832	985	405
25	304	372	e360	e360	461	612	575	362	600	824	753	398
26	302	364	e360	e370	474	602	577	383	508	877	745	329
27	302	360	e350	e380	468	681	723	390	501	933	731	382
28	304	363	e340	e420	485	610	836	398	613	948	620	442
29	326	372	e350	e400		601	524	363	723	992	609	486
30	327	374	e360	418		592	481	361	755	1,030	519	467
31	335		e350	410		615		357		1,100	531	
<b>Total</b>	9,945	10,630	10,920	11,320	13,919	19,550	17,850	14,840	13,790	24,980	23,410	13,650
<b>Mean</b>	321	354	352	365	497	631	595	479	460	806	755	455
<b>Max</b>	353	387	380	420	1000	762	856	827	866	1100	1110	560
<b>Min</b>	297	319	320	320	384	495	477	256	154	467	519	329
<b>Ac-ft</b>	19,730	21,080	21,660	22,440	27,610	38,780	35,410	29,440	27,360	49,550	46,430	27,070

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1971 - 2014, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	806	869	879	856	859	1,063	1,285	1,332	1,232	957	884	813
<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 2014.17 (cont.)



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

REVISED RECORDS.--WDR UT-04-1: Discharge.

**DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2013 TO SEPTEMBER 2014  
DAILY MEAN VALUES**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	99	92	78	75	71	95	111	221	808	319	190	148
2	100	92	78	74	72	92	106	235	777	309	187	144
3	104	93	81	75	71	87	102	281	752	299	184	142
4	101	91	70	75	71	93	101	379	734	295	186	142
5	99	83	66	74	70	91	101	426	700	289	189	142
6	98	84	67	70	72	91	103	451	675	281	191	140
7	99	93	65	75	73	93	104	468	656	274	188	140
8	97	91	70	77	76	88	115	416	632	269	182	139
9	98	90	65	75	79	88	143	420	603	264	180	144
10	101	89	71	77	76	89	196	404	582	261	176	141
11	102	88	71	77	73	92	225	368	570	263	171	140
12	98	83	73	79	75	86	265	345	557	258	171	139
13	96	84	75	77	84	86	241	324	538	251	176	139
14	97	84	77	75	83	87	217	315	530	241	177	135
15	96	87	76	74	91	91	219	330	502	237	168	134
16	95	88	76	73	85	90	214	395	464	234	163	132
17	101	87	75	71	80	93	221	450	462	231	161	132
18	99	85	77	76	78	91	245	551	437	226	158	130
19	93	86	79	74	77	86	279	575	412	224	158	134
20	94	87	78	73	75	87	301	576	382	220	158	130
21	94	87	78	71	75	92	329	597	373	215	164	130
22	93	82	77	73	74	96	349	603	378	211	163	131
23	93	82	78	74	74	102	359	656	369	208	174	131
24	95	82	78	67	74	107	311	682	364	204	165	130
25	94	83	74	72	75	120	288	745	360	201	160	126
26	91	79	74	73	75	134	314	785	359	198	159	126
27	91	77	78	73	80	127	285	814	366	195	158	141
28	92	77	76	69	83	113	260	839	369	189	155	156
29	94	78	73	75		109	239	846	347	198	151	143
30	92	79	74	76		108	223	829	332	202	149	147
31	92		76	72		110		826		197	151	
<b>Total</b>	2,988	2,562	2,304	2,291	2,142	3,014	6,566	16,150	15,390	7,463	5,263	4,128
<b>Mean</b>	96.4	85.4	74.3	73.9	76.5	97.2	219	521	513	241	170	138
<b>Max</b>	104	93	81	79	91	134	359	846	808	319	191	156
<b>Min</b>	91	77	65	67	70	86	101	221	332	189	149	126
<b>Ac-ft</b>	5,927	5,084	4,570	4,544	4,249	5,978	13,020	32,040	30,530	14,800	10,440	8,188

**STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1922 - 2014, BY WATER YEAR (WY)**

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	147	130	116	109	106	122	250	591	641	338	210	168
<b>Max</b>	262	221	187	165	205	369	629	1,186	1,465	1,118	477	312
<b>(WY)</b>	(2012)	(2012)	(1984)	(2012)	(1986)	(1986)	(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 2014.17 (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 OCTOBER 2013 TO SEPTEMBER 2014 DAILY MEAN VALUES [e, Value has been estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	208	643	649	e780	e550	1,450	1,280	1,550	1,030	128	219	373
2	190	641	670	e810	e520	1,970	1,340	1,280	991	122	208	197
3	190	652	688	e820	e540	2,210	1,380	1,230	948	119	207	187
4	187	663	666	e830	e540	2,390	1,450	1,180	704	122	211	328
5	187	683	552	e800	e540	2,260	1,440	796	596	123	226	254
6	189	675	e550	e790	e550	1,750	1,280	621	504	118	245	183
7	190	660	e490	e740	e530	1,570	1,090	720	329	127	246	157
8	187	626	e600	e660	e560	1,520	1,010	1,020	151	126	246	146
9	186	610	e650	e730	e590	1,500	1,090	1,360	95	129	334	157
10	256	617	e640	e790	e570	1,500	1,200	1,520	86	130	595	157
11	583	619	e700	e810	e740	1,500	1,170	1,620	85	145	354	148
12	844	617	e670	e850	e1,250	1,480	1,180	1,580	86	156	228	149
13	895	625	e700	e840	e1,720	1,490	1,330	1,430	89	156	219	151
14	886	630	e695	e870	e1,730	1,470	1,400	1,090	86	154	203	174
15	878	637	e730	e850	e1,730	1,410	1,420	899	87	154	190	200
16	880	674	e770	e870	e1,770	1,340	1,520	843	94	147	183	216
17	883	709	e800	e850	e2,100	1,340	1,640	814	108	110	177	218
18	869	709	e810	e800	2,100	1,070	1,660	793	130	77	175	218
19	854	689	e790	e730	1,970	881	1,560	725	133	60	187	211
20	869	672	e800	e700	1,580	956	1,300	696	128	55	183	193
21	747	676	e810	e710	1,100	1,290	1,160	702	126	61	191	124
22	675	665	e820	e750	974	1,370	1,180	746	124	56	196	104
23	637	666	e800	e710	1,010	1,360	1,450	852	122	57	209	162
24	596	695	e800	e690	1,100	1,330	1,630	941	119	68	215	244
25	572	684	e830	e680	1,150	1,290	1,760	938	115	80	409	342
26	558	666	e850	e690	1,150	1,260	1,760	851	112	95	1,050	383
27	557	652	e820	e660	1,160	1,280	1,630	900	117	112	790	349
28	573	643	e700	e650	1,250	1,280	1,720	1,060	130	127	641	535
29	590	636	e750	e740		1,290	1,810	1,100	139	133	612	691
30	606	639	e760	e800		1,300	1,840	1,110	136	189	583	796
31	632		e770	e690		1,250		1,080		212	491	
<b>Total</b>	17,150	19,670	22,330	23,690	31,069	45,360	42,680	32,050	7,700	3,648	10,220	7,747
<b>Mean</b>	553	656	720	764	1,110	1,463	1,423	1,034	257	118	330	258
<b>Max</b>	895	709	850	870	2100	2390	1840	1620	1030	212	1050	796
<b>Min</b>	186	610	490	650	520	881	1010	621	85	55	175	104
<b>Ac-ft</b>	34,020	39,020	44,290	46,990	61,629	89,960	84,660	63,560	15,270	7,236	20,280	15,370

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 2014, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	1,247	1,496	1,569	1,685	1,729	2,226	2,727	2,747	2,081	657	560	821
<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	913	638	71.8	77.6	40.4	46.7	62.2
<b>(WY)</b>	(1993)	(1995)	(1995)	(1993)	(1993)	(1991)	(1992)	(1992)	(1992)	(2003)	(2004)	(1992)