



— BUREAU OF —
RECLAMATION

Annual Progress Report

2023 Salmon Flow Augmentation Program and Other Activities Associated with NOAA Fisheries 2008 Biological Opinion and Incidental Take Statement for Operations and Maintenance of Bureau of Reclamation Projects in the Snake River Basin above Brownlee Reservoir

Columbia-Pacific Northwest Region

Mission Statements

The U.S. Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, Native Hawaiians, and affiliated Island Communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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Introduction

On May 5, 2008, National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) released a biological opinion (2008 Upper Snake BiOp) for the continued operation and maintenance of Bureau of Reclamation (Reclamation) projects in the Snake River Basin above Brownlee Reservoir, replacing the previous 2005 Upper Snake BiOp. In the 2008 Upper Snake BiOp, Reclamation committed to shifting flow augmentation releases to earlier in the migration season, when Snake River flows are more beneficial to anadromous fish listed as threatened or endangered under the Endangered Species Act (ESA). The incidental take statement included Reasonable and Prudent Measures (RPMs) and associated terms and conditions to minimize incidental take to 13 stocks of listed salmon and steelhead, referred to as Evolutionarily Significant Units.

This document reports the status of activities related to the 2008 Incidental Take Statement, including Reclamation's salmon flow augmentation program (flow augmentation), status of new contracts, and coordination activities. This report meets Reclamation's responsibility to submit an annual progress report by December 31 of each year.

Flow augmentation releases in Water Year (WY) 2023 mark the 15th year of operations under the 2008 Upper Snake BiOp.

Reclamation's 2023 Salmon Flow Augmentation Program

Reclamation was able to provide 452,138 acre-feet of water for flow augmentation in water year 2023 (Table 1). The water supply and operational conditions in 2023 are summarized below. The percent of average values used in this report have been calculated based on the 30-year average of the 1991-to-2020 period.

Basin Conditions

At the beginning of the 2023 season, reservoir carryover storage varied considerably depending on the watershed in the Snake River Basin above Brownlee Reservoir. Carryover storage on November 1, 2022 was 93 percent of average in the Payette River basin, 117 percent of average in the Boise River basin, and 41 percent of average in the Upper Snake River Basin.

During the early-winter months of November through December above-normal precipitation fell in most basins. This transitioned to near normal precipitation for the months of January and February and by March 1st, snowpack was 96 percent of normal in the Payette River basin, 106 percent of normal in the Boise River basin, and 107 percent of normal in the Upper Snake River Basin. Precipitation during the month of March was much above normal, averaging 187 percent for the Payette and Boise Basins, and 140 percent in the Upper Snake. By April 15, the snowpack had increased and was 135 percent of normal in the Payette River basin, 143 percent of normal in the

Boise River basin, and 121 percent of normal in the Upper Snake River Basin. The most unique aspect of WY2023 was the extended cooler than normal temperatures during March and April and resulted in much of the low elevation snow remaining much longer than typical. During May, temperatures finally warmed to above average. These warmer than average temperatures resulted in rapidly increasing flows with the Payette and Boise experiencing near normal precipitation and the Upper Snake experiencing below average precipitation. All basins experienced above average precipitation during the month of June which helped sustain streamflow through this period.

Observed unregulated runoff was reflective of the near average precipitation conditions experienced during the spring runoff period. The April-through-July unregulated runoff was 104 percent of normal in the Payette River basin, 131 percent of normal in the Boise River basin, and 102 percent of normal in the Upper Snake River Basin (as measured at Heise). As a result of the average to above average snowpack and runoff conditions, flood risk management (FRM) operations were required in all three basins. Although FRM were needed in the Upper Snake River Basin, no water was spilled past Milner.

The runoff was sufficient to completely fill the Boise and Payette basin reservoirs, while the Upper Snake basin reservoirs did not completely fill. The Payette River reservoir system reached a maximum storage content of 778,438 acre-feet, approximately 22,014 acre-feet below full capacity of 800,452 acre-feet and would have filled completely but for early flow augmentation releases. The Boise River reservoir system reached a maximum storage content of 927,357 acre-feet, approximately 22,343 acre-feet below its full capacity of 949,700 acre-feet and would have filled completely but for early flow augmentation releases. The Upper Snake River reservoir system reached a maximum combined physical storage content of 3,841,412 acre-feet, approximately 344,283 acre-feet below full capacity of 4,185,695 acre-feet.

Above average snowpack and precipitation in Central and Eastern Oregon, resulted in high runoff conditions. All the eastern Oregon reservoirs filled except for Owyhee Reservoir and Phillips Lake.

Due to average to above average runoff conditions experienced this season, coupled with good carryover storage in the Boise and Payette, a flow augmentation volume of 452,138 acre-feet was secured.

In-Season Management Considerations for Meeting Flow Augmentation Targets

Reclamation manages in-season storage releases for flow augmentation, relying on the best data available at the time to set release rates. Reclamation uses preliminary water rights accounting provided by the State of Idaho to estimate volumes available in storage accounts and amounts delivered. This preliminary accounting is provisional and subject to change later, when data are finalized, and after-the-fact accounting is completed. Therefore, while it is difficult to deliver the precise targeted volume on a real-time basis, Reclamation strives to come as close as possible, with a typical margin of error of less than 1 percent.

Reclamation was able to provide 452,138 acre-feet of water for flow augmentation in 2023. Table 1 summarizes the source, amount, and timing for Reclamation's 2023 salmon flow augmentation program.

Table 1. Summary of Reclamation’s 2023 Salmon Flow Augmentation Releases

Source	Amount (acre-feet)	Dates of Delivery
Upper Snake above Milner Dam		
Reclamation Uncontracted Space	0	June 15-July 11
Reclamation Powerhead Space	0	
Rentals – Attachment 1 Chart	150,000 ^A	
Subtotal	150,000	
Payette		
Reclamation Uncontracted Space	95,608	June 10-August 29
Rentals	85,625	
Subtotal	181,233	
Boise		
Reclamation Uncontracted Space	40,932	June 15-July 16
Reclamation Powerhead Space	0	
Rentals	2,324	
Subtotal	43,256	
Natural Flows		
IWRB Lease (Idaho)	60,000 ^B	April 3-August 31 ^C
Skyline Farms (Oregon)	17,649	
Subtotal	77,649	
Total	452,138	

^A The “Stipulated Augmentation Rental – Water District 01” Chart (see Attachment 1) specified Water District 01 would provide 150,000 acre-feet of flow augmentation rental.

^B See section titled “Lease of Natural Flow Water Rights Below Milner Dam.”

^C The IWRB Lease of 60,000 acre-feet comprises 49,500 acre-feet estimated to occur within the April 3 to August 31 period, and 10,500 acre-feet estimated to occur before and after the migration period. See section titled “Lease of Natural Flow Water Rights Below Milner Dam” for further explanation.

Uncontracted Space and Space Reacquired for Flow Augmentation

Reclamation’s 95,608 acre-feet of uncontracted space used for flow augmentation in the Payette River system fully refilled. In the Boise River system, Reclamation’s 40,932 acre-feet of uncontracted space assigned to flow augmentation fully refilled. In the Upper Snake River above Milner Dam, only 6 acre-feet (due to carryover) of uncontracted storage assigned to flow augmentation was allocated out of a total 22,895 acre-feet of space. The 6 acre-feet of uncontracted storage was not released this year due to the very small volume and inherent uncertainty (due to evaporation) in the actual amount that would be allocated. Last-to-fill space in the Upper Snake did not receive any allocation in 2023. The entire accrual to Reclamation’s uncontracted space assigned to flow augmentation in the Payette and Boise was used for flow augmentation.

The 17,649 acre-feet of natural flow rights Reclamation has acquired in Oregon (Skyline Farms) were fully available again in 2023.

Annual Rentals

Reclamation relies heavily each year on annual rentals from water users to acquire water for its flow augmentation program. Storage rentals in the Payette and Boise River basins are made available by willing sellers. With full reservoirs in the Payette River basin, the largest volume of 85,625 acre-feet of rental water in the history of the program for the basin was made available. The Boise River basin provided 2,324 acre-feet of rental water.

Water availability from the Water District 01 Rental Pool (Upper Snake above Milner Dam) is determined by a chart (Attachment 1) that considers carryover storage on November 1 and the April 1 runoff forecast for the Snake River at Heise (for the April-through-September period) to determine contributions to the rental pool for the flow augmentation program. Use of this chart was enacted after negotiation of the 2004 Nez Perce Water Rights Settlement and is fully consistent with Reclamation's description of its flow augmentation program in its 2004 and 2007 Upper Snake Biological Assessments.

In 2023, the Stipulated Augmentation Chart (Attachment 1) specified that Water District 01 would provide 150,000 acre-feet of rental water. Carryover from the 2022 water year on November 1, 2022, for purposes of the chart was low at only 728,438 acre-feet (42 percent of average), and the April 1 runoff forecast was 4,309,034 acre-feet (112 percent of average) for the April-through-September period. The 2023 April-through-September observed runoff was 3,942,869 acre-feet (102 percent of average).

Lease of Natural Flow Water Rights below Milner Dam

The Nez Perce Water Rights Settlement authorized the use of up to 60,000 acre-feet of Idaho natural flow rights downstream of Milner Dam for the purpose of flow augmentation. In better water years, this will increase the volume of water available for flow augmentation. In 2005, the Idaho Water Resources Board (IWRB) purchased approximately 98,000 acre-feet of water rights from the Bell Rapids Mutual Irrigation Company; this is water that served roughly 25,000 acres via high-lift pumps. Reclamation then entered into a 30-year lease with the State of Idaho for 60,000 acre-feet of this water for flow augmentation (IWRB Lease in Table 1).

Flow augmentation from natural flow rights downstream of Milner Dam occurs during the entire irrigation season, roughly April 1 to October 31. The IWRB Lease of 60,000 acre-feet comprises 49,500 acre-feet estimated to occur within the April 3 to August 31 period, and 10,500 acre-feet estimated to occur before and after the migration period. Even though these 10,500 acre-feet are delivered outside the April 3 to August 31 period, it provides an instream benefit and continued flow augmentation.

Powerhead Space

As part of the 2004 Nez Perce Water Rights Settlement, Reclamation may use powerhead space in Anderson Ranch and Palisades Reservoirs for flow augmentation. In order for powerhead space to be used, the sum from all other flow augmentation sources must be less than 427,000 acre-feet, and powerhead space cannot be used to exceed a flow augmentation total of 427,000 acre-feet. In addition, Palisades Reservoir powerhead space may only be used after all other flow augmentation sources have been exhausted, including Anderson Ranch Reservoir powerhead space. For water year 2023, Anderson Powerhead was allocated 36,456 acre-feet and Palisades Powerhead was allocated 9,728 acre-feet. Due to the flow augmentation volume from all other sources being greater than 427,000 acre-feet, powerhead space was not used in 2023.

Timing Considerations for Flow Augmentation Releases

The timing of flow augmentation releases depends on the individual basin and source of water. In the 2008 Upper Snake BiOp, Reclamation committed to shifting flow augmentation releases to earlier in the migration season when Snake River flows are more beneficial to Federally listed fish. The primary goals of the earlier flow augmentation releases are to minimize the amount of warmer water provided in August and to shift it into July or earlier. The opportunity and ability to shift flow augmentation will vary depending on the water year type, total flow augmentation volume available, and from which basin the flow augmentation originates. Consistent with the 2008 Upper Snake BiOp, not all flow augmentation can be shifted from August, particularly in the Payette River basin due to water quality concerns in Cascade Reservoir. The changes in flow augmentation release patterns for 2023 will be highlighted in the following discussion for each basin.

Reclamation made a concerted effort to provide early timing flow augmentation, including foregoing peak reservoir fill in the Payette and Boise River systems and releasing flow augmentation at high rates. In addition, extensive coordination was conducted with the Technical Management Team (TMT) members (NOAA Fisheries, State of Idaho, and Nez Perce Tribe representatives) during the flow augmentation period.

As discussed in the previous sections, the 60,000 acre-feet of Idaho natural flow rights from the IWRB was provided for flow augmentation during the irrigation season, which ends on October 31.

To the extent possible, Reclamation will strive to benefit local resources when implementing its proposed actions while also meeting its obligations under the 2008 Upper Snake and 2005 USFWS Biological Opinions and corresponding incidental take statements.

Boise River Basin

Delivering water during this period in the Boise basin for flow augmentation relies on a combination of two strategies. First, in years with FRM operations when the system is assured to fill, some portion of the flow augmentation volume will be delivered by reserving an equivalent amount of system space that is not allowed to refill. In other words, as FRM operations near their end, releases are not reduced in order to fill the last remaining space; that vacant space is considered to have been delivered as flow augmentation instead.

The second strategy for shifting flow augmentation timing from the Boise River basin is to increase the rate of releases. This relies on the opportunity to make higher releases before the recreational floating season begins on the river. Floating season typically begins once stream flows through the City of Boise drop below 1,500 cubic feet per second (cfs), the weather warms up, the river is inspected and hazards removed, and Ada County officially opens the boat launch facilities. Once floating season begins, flows are limited to approximately 500 cfs above irrigation demand due to public safety concerns. Reclamation will look for opportunities to make higher releases; in years with FRM operations, this can be accomplished by maintaining higher releases rather than immediately ramping down at the end of FRM. In non-FRM years, it can likely be accomplished by releasing flow augmentation in May (or early June) before the floating season begins.

In 2023, flood releases on the Boise River system began in mid-March. After the risk of flooding had ended, releases for flow augmentation began on June 15 and lasted until July 16. Releases of flow augmentation averaged approximately 1,600 cfs above irrigation demand for the first 7 days and then ramped down to approximately 500 cfs above demand by the Day of Allocation on June 28th. After this, flow augmentations releases remained near this level for public safety as people began to float the river in inner tubes and rafts due to warmer weather. Close coordination between Reclamation, Ada County, and the Boise Fire Department in June helped to deliver as much of the flow augmentation as early as possible before the public began recreating on the river. The early release of flow augmentation in the Boise is consistent with Reclamation's 2007 biological assessment. Flow augmentation was completed on July 16 after a total of 43,256 acre-feet was delivered.

Payette River Basin

Due to water quality concerns in Lake Cascade, some amount of flow augmentation water will continue to be released in August. Strategies for shifting the timing of flow augmentation from the Payette River basin include a combination of deliberately foregoing an amount of refill during years when the reservoirs would otherwise fill (similar to the Boise River basin strategy), and by increasing the initial rate of release in order to front-load a portion of the flow augmentation volume, primarily by holding higher releases following FRM operations.

Both strategies were employed in 2023. Flood releases at Cascade Reservoir began in early April and in early May at Deadwood Reservoir. After the risk of flooding had ended, releases for flow augmentation began on June 10 and lasted until August 29. Inflows were sufficient to fill the reservoir system, but refill was deliberately missed to shift the timing of flow augmentation earlier into the spring. Releases at Cascade Reservoir were held higher initially to front-load the flow augmentation volume. The flow rate credited toward flow augmentation water was variable depending upon unregulated tributary runoff and irrigation demands but averaged approximately 1,200 cfs in July and 1,270 cfs in August. Discharge from Lake Cascade averaged around 1,600 cfs during the flow augmentation period in the Payette River basin, less than the maximum powerhouse capacity of approximately 2,200 cfs.

Upper Snake River Basin

The strategy for flow augmentation releases in the Upper Snake River Basin is to increase flows past Milner Dam advantageous to downstream salmon and steelhead. The 2008 Upper Snake BiOp anticipated that flow augmentation releases can be provided in May or June in most average or lower water years, and by the end of July in most wet years. Flow augmentation releases in 2023 at Milner Dam commenced on June 15, ramping up to approximately 3,000 cfs and holding this through July

9, and then finishing on July 11 at which point releases transitioned into Idaho Power Company storage releases. A total flow augmentation volume of 150,000 acre-feet was released past Milner during 2023.

Water leased or owned by Idaho Power Company started past Milner Dam on July 11 and ended on July 26, with an average flow rate of 1,416 cfs. The total volume of this water was approximately 42,778 acre-feet and was not counted toward Reclamation's flow augmentation volumes.

Mean Monthly Inflows to Brownlee Reservoir

The mean monthly inflows to Brownlee Reservoir from April to August are:¹

- April: 22,225 cfs (88 percent of average)
- May: 31,364 cfs (120 percent of average)
- June: 19,476 cfs (89 percent of average)
- July: 10,259 cfs (90 percent of average)
- August: 9,755 cfs (98 percent of average)

November 1 Carryover

At the end of the 2023 irrigation season (November 1, 2023), the carryover storage into the 2024 season was as follows:

- Upper Snake above Milner Dam: 1,971,321 acre-feet² (114 percent of average)
- Boise River System: 484,508 acre-feet (135 percent of average)
- Payette River System: 477,768 acre-feet (101 percent of average)

Other Reasonable and Prudent Measures

In addition to submitting an annual report documenting salmon flow augmentation releases, NOAA Fisheries Service's incidental take statement contains two other RPMs and associated terms and conditions to ensure that Reclamation implements its salmon flow augmentation program, as described in its Upper Snake Biological Assessment (BA) and supporting documents.

¹Information about these data can be found at the website

https://www.nwrfc.noaa.gov/runoff/runoff_summary.php?date=10/01/2023

² This number reflects the actual November 1 carryover in the Upper Snake above Milner Dam. For purposes of determining the quantity of storage available for flow augmentation rental in 2024 from the Water District 01 Rental Pool (Upper Snake above Milner Dam), 20,000 acre-feet will be added to actual carryover (totaling 1,991,321 acre-feet of calculated carryover) to mitigate against any impacts to flow augmentation reliability resulting from rentals for hydropower purposes that occurred in 2020 and have not yet refilled.

New Contracts for Water Stored in Reclamation Projects

RPM 13.3.1 states:

“... Reclamation’s salmon flow augmentation program is heavily dependent on annual water rentals from Idaho’s water rental pools, which are variable and insecure sources. Due to this variability Reclamation must consult with NOAA Fisheries prior to issuing a new contract that would reduce streamflows or reduce Reclamation’s ability to meet salmon flow augmentation commitments, as described in its proposed actions, or whenever Reclamation otherwise determines that listed salmon or steelhead species or critical habitat may be affected.”

NOAA Fisheries’ intent is to ensure that any contract actions taken by Reclamation result in “an improvement or ‘zero net impact’ on Snake River flows and on Reclamation’s ability to provide up to 487,000 acre-feet for salmon flow augmentation.”

Reclamation committed in its March 2009 Decision Document to consult with NOAA Fisheries before entering into new, renewed, or supplemental contracts for storage water, if Reclamation determined that it would affect its ability to provide salmon flow augmentation water as described in the Upper Snake BA, or if it determined that listed species or critical habitat may be adversely affected.

In the past year, Reclamation has not entered into any new contracts for uncontracted space in any of the reservoirs covered in the Upper Snake BiOp. Further, Reclamation has not entered into any renewed or supplemental contracts for storage water that would result in reduced streamflows or affect Reclamation’s ability to meet its salmon flow augmentation commitments.

Reclamation, in partnership with the IWRB, proposes to raise Anderson Ranch Dam 6 feet. This raise would capture and store additional water when it is available. The proposal would create up to an additional 29,145 acre-feet of storage; an analysis of the additional storage and operations to fill this space indicate that Reclamation’s flow augmentation deliveries would not be impacted. Formal ESA Section 7 consultation with NOAA Fisheries on the proposed action began November 9, 2020, was stopped to update project designs in March 2021, and will be restarted when updates have been completed.

Annual Coordination of the Salmon Flow Augmentation Program

RPM 13.3.2 states:

“Reclamation must continue to coordinate annually with the Technical Management Team (TMT) and Regional Forum when planning and implementing its annual salmon flow augmentation program.” (NOAA Fisheries Service Upper Snake BiOp page 13-4)

As a member of TMT, Reclamation continued to coordinate with the TMT and Regional Forum when planning and implementing its 2023 annual salmon flow augmentation program. Reclamation staff regularly attended scheduled meetings and provided estimates and updates of the salmon flow augmentation program acquisitions and delivery.

Attachment 1: Stipulated Augmentation Rental for Water District 01

November 1	Stipulated Augmentation Rental Water Dist 01						
Carryover	April 1 - Sept 30 Heise Forecast 1000s af						
1000s af	< 2,450	< 2,920	< 3,450	< 4,208	< 5,042	< 5,670	> 5,670
0	0	0	0	0	150000	185000	185000
100	0	0	0	0	150000	185000	185000
200	0	0	0	0	150000	185000	185000
300	0	0	0	0	150000	185000	185000
400	0	0	0	0	150000	185000	185000
500	0	0	0	0	150000	185000	185000
600	0	0	0	60000	150000	185000	185000
700	0	0	0	60000	150000	185000	185000
800	0	0	0	60000	150000	185000	185000
900	0	0	60000	60000	150000	185000	185000
1,000	0	0	60000	60000	150000	185000	185000
1,100	0	0	60000	60000	150000	185000	185000
1,200	0	0	60000	60000	150000	185000	185000
1,300	0	0	60000	60000	150000	185000	185000
1,400	0	0	60000	60000	150000	185000	185000
1,500	0	0	100000	150000	185000	185000	185000
1,600	0	0	100000	150000	185000	185000	185000
1,700	0	0	100000	150000	185000	185000	185000
1,800	0	0	100000	150000	185000	185000	185000
1,900	0	0	100000	150000	185000	185000	185000
2,000	0	0	100000	150000	185000	185000	185000
2,100	0	0	100000	150000	205000	205000	205000
2,200	0	0	100000	150000	205000	205000	205000
2,300	0	0	100000	150000	205000	205000	205000
2,400	0	0	100000	150000	205000	205000	205000
2,500	0	0	100000	150000	205000	205000	205000
2,600	0	0	185000	185000	205000	205000	205000
2,700	0	0	185000	185000	205000	205000	205000
2,800	0	0	185000	185000	205000	205000	205000
2,900	0	0	185000	185000	205000	205000	205000
3,000	60000	60000	185000	185000	205000	205000	205000
3,100	60000	60000	185000	185000	205000	205000	205000
3,200	100000	100000	185000	185000	205000	205000	205000
3,300	100000	100000	185000	185000	205000	205000	205000
3,400	100000	100000	185000	185000	205000	205000	205000
3,500	100000	100000	185000	185000	205000	205000	205000
3,600	100000	100000	185000	185000	205000	205000	205000

Figure 1. Stipulated Augmentation Rental – Water District 01