



— BUREAU OF —
RECLAMATION

Annual Progress Report

2021 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 Department of the Interior conserves and manages the Nation's natural resources and cultural heritage for the benefit and enjoyment of the American people, provides scientific and other information about natural resources and natural hazards to address societal challenges and create opportunities for the American people, and honors the Nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities to help them prosper.

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.

INTRODUCTION

On May 5, 2008, National Oceanic Atmospheric Administration (NOAA) Fisheries released a biological opinion (2008 Upper Snake BiOp) for the continued operation and maintenance of Bureau of 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 Evolutionary 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 2021 mark the thirteenth year of operations under the 2008 Upper Snake BiOp, in which Reclamation committed to shifting flow augmentation releases to earlier in the migration season when Snake River flows are more beneficial to Federally listed salmon and steelhead.

RECLAMATION'S 2021 SALMON FLOW AUGMENTATION PROGRAM

Reclamation was able to provide 427,000 acre-feet of water for flow augmentation in water year 2021 (Table 1). The water supply and operational conditions in 2021 are summarized below.

Basin Conditions

At the beginning of the 2021 season, reservoir carryover storage was near average to above average in the Snake River basin above Brownlee Reservoir. Carryover storage on November 1 from 2020 was 96 percent of average in the Payette basin, 106 percent of average in the Boise basin, and 111 percent of average in the Upper Snake basin.

During the winter months, near normal precipitation fell in all three of the basins. Snowpack at the beginning of March 2021 was 108 percent of normal in the Payette, 104 percent of normal in the Boise, and 99 percent of normal in the Upper Snake. However, from March through June, the basins experienced one of the driest spring periods on record. By April 15, the snowpack had declined to 81 percent of normal in the Payette, 75 percent of normal in the Boise, and 78 percent of normal in the Upper Snake.

Observed unregulated runoff was reflective of the dry conditions experienced during the spring runoff period. The April through July unregulated runoff was only 58 percent of normal in the Payette, 53 percent of normal in the Boise basin, and 66 percent of normal in the Upper Snake basin. As a result of the dry conditions and much below normal runoff,

flood risk management (FRM) operations were not required in the Payette, Boise or Upper Snake basins leading up to or during the spring runoff of 2021.

With the dry conditions the runoff was insufficient to fill the Payette, Boise, and Upper Snake basin reservoirs. The Payette reservoir system reached a maximum storage content of 746,196 acre-feet, approximately 54,256 acre-feet below full capacity of 800,452 acre-feet, which was the first time the Payette system did not refill since the early 2000s. The Boise reservoir system reached a maximum storage content of 719,432 acre-feet, approximately 230,268 acre-feet below its full capacity of 949,700 acre-feet. The Upper Snake reservoir system reached a maximum combined physical storage content of 3,703,349 acre-feet, approximately 482,346 acre-feet below full capacity of 4,185,695 acre-feet.

In Eastern Oregon, the snowpack conditions were well below normal, dry soil conditions persisted, and no major spring rain events occurred. This resulted in below normal runoff conditions in those basins as well.

Despite dry conditions and reservoirs that did not fill, a flow augmentation volume of 427,000 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 in order to set release rates. Reclamation utilizes 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 at a later date 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 one percent.

Reclamation was able to provide 427,000 acre-feet of water for flow augmentation in 2021. Table 1 summarizes the source, amount, and timing for Reclamation’s 2021 salmon flow augmentation program.

Table 1. Summary of Reclamation’s 2021 Salmon Flow Augmentation Releases

SOURCE	AMOUNT (acre-feet)	DATES OF DELIVERY
Upper Snake above Milner Dam		
Reclamation Uncontracted Space	393	May 3 – June 1 and June 28 – July 12
Reclamation Powerhead Space	94,401	
Rentals – Attachment 1 Chart	100,000 ^A	
Rentals – Shoshone-Bannock Tribes	100	
<i>Subtotal</i>	<i>194,894</i>	
Payette		
Reclamation Uncontracted Space	81,734	June 16 – August 31
Rentals	36,530	
<i>Subtotal</i>	<i>118,264</i>	

Boise		
Reclamation Uncontracted Space	0	May 17 – June 7
Reclamation Powerhead Space	36,193	
Rentals	0	
Subtotal	36,193	
Natural Flows		
IWRB Lease (Idaho)	60,000 ^B	April 3 – August 31 ^C
Skyline Farms (Oregon)	17,649	
Subtotal	77,649	
TOTAL	427,000	

^A The “Stipulated Augmentation Rental – Water District 01” Chart (see Attachment 1) specified Water District 01 would provide 100,000 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 is comprised of 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 system did not fully refill, and only 81,734 acre-feet was available. In the Boise system, Reclamation’s 40,932 acre-feet of uncontracted space assigned to flow augmentation received no new fill, and 0 acre-feet was available for 2021. In the Upper Snake above Milner, 393 acre-feet of uncontracted storage assigned to flow augmentation was allocated out of a total 22,896 acre-feet of space. The entire accrual to Reclamation’s uncontracted space assigned to flow augmentation in the Payette, Boise, and Upper Snake basins 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 2021.

Rentals from Shoshone-Bannock Tribes

The Shoshone-Bannock Tribes have contract space in American Falls Reservoir. They are able to rent water from this space for downstream uses in accordance with the terms of the Fort Hall Water Rights Settlement of 1990. Tribal policy requires that on reservation water needs are served first. The Tribes’ space in Palisades Reservoir is usually adequate to meet their irrigation requirements, freeing up the space in American Falls Reservoir for potential rental. The Shoshone-Bannock Tribes rented 100 acre-feet for flow augmentation during the 2021 season.

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 basins are made

available by willing sellers. Despite dry conditions and the reservoirs not filling completely, 36,530 acre-feet of rental was made available from the Payette Basin. In the Boise basin, no rental water was made available.

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 2021, the chart specified that Water District 01 would provide 100,000 acre-feet of rental water. Carryover from the 2020 water year on November 1, 2020 for purposes of the chart was 2,004,638 acre-feet, and the April 1 runoff forecast was 3,041,000 acre-feet (80 percent of average) for the April through September period. The 2021 April through September observed runoff was 2,622,751 acre-feet (69 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 is comprised of 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 utilize 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.

With all other flow augmentation sources exhausted (Reclamation uncontracted space, rentals, and natural flows), water available for flow augmentation totaled 296,406 acre-feet. The full amount of Anderson Ranch Powerhead allocation of 36,193 acre-feet (out of a total 36,956 acre-feet of space) was utilized to increase the flow augmentation amount to 332,599 acre-feet. To reach the 427,000 acre-feet total, 94,401 acre-feet of the 149,892 acre-feet allocated to Palisades Powerhead was used. Going into the 2022 season, the Anderson Ranch powerhead account is empty, and 55,491 acre-feet of Palisades Powerhead will be carried over.

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 is 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 by which basin the flow augmentation originates from. Consistent with the 2008 Upper Snake BiOp, not all flow augmentation can be shifted from August, particularly in the Payette basin. The changes in flow augmentation release patterns for 2021 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 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 BiOp and corresponding incidental take statement.

Boise Basin:

Flow augmentation releases began in the Boise system on May 17 and lasted until June 7. 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 basin is to increase the rate of releases. This relies on the opportunity to make higher releases before the recreational floating (floating) season begins on the river. Floating season typically begins once streamflows through the city of Boise drop below 1,500 cfs, the weather warms up, the river is inspected and hazards removed, and the 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 2021, FRM operations were not necessary and the Boise reservoir system did not fill. Even so, a strategy similar to years with FRM operations was utilized by releasing water prior to the reservoirs reaching their maximum content for the season, thereby shifting releases earlier. The second strategy of releasing flow augmentation at a higher rate before the floating season began was also utilized. Releases from the Boise system were increased starting on May 17 to a release rate of approximately 1,200 cfs higher than was necessary for irrigation requirements. This higher flow continued through May 28. Releases were then incrementally decreased over the following 10-day period to reach the intended volume target and flow augmentation releases from the Boise system were completed on June 7.

Payette Basin:

Flow augmentation releases from the Payette system began on June 16 with releases ending on August 31. 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 basin include a combination of deliberately foregoing an amount of refill during years when the reservoirs would otherwise fill (similar to the Boise 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.

Similar to the Boise system, FRM operations were not necessary in the Payette basin. The Payette system did not fill and flow augmentation began to be released prior to the reservoirs reaching their maximum content for the season. Releases were held higher initially to “front load” the flow augmentation volume. The flow rate credited towards flow augmentation water was variable depending upon unregulated tributary runoff and irrigation demands, but averaged approximately 1,100 cfs in June, 850 cfs in July, and approximately 550 cfs in August. Discharge from Lake Cascade averaged around 1,700 cfs during the flow augmentation period in the Payette basin, less than the maximum powerhouse capacity of approximately 2,200 cfs.

Upper Snake Basin:

The strategy for flow augmentation releases in the Upper Snake Basin is to increase flows past Milner 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 2021 at Milner commenced on May 3, ramping up to approximately 3,000 cubic feet per second (cfs) through May 15, and then up to 5,000 cfs through May 23. Releases were then reduced to approximately 1,500 cfs to reach the initial intended flow augmentation volume of 177,602 acre-feet by June 1.

The initial intended volume from the Upper Snake was based on the assessment that the Payette reservoir system would refill and Reclamation's uncontracted space in that system would be fully available and additional rental would be secured. With the Payette system missing refill in June, an additional 17,292 acre-feet of flow augmentation volume had to be released from the Upper Snake system from June 28 to July 12 at an average rate of approximately 600 cfs.

At the conclusion of flow augmentation, releases continued past Milner at an average rate of approximately 1,500 cfs to deliver water owned or leased by Idaho Power Company. The Idaho Power Company releases continued through July 27; they were not counted toward Reclamation's flow augmentation volumes.

Mean Monthly Inflows to Brownlee Reservoir¹

April	12,542 cfs
May	15,961 cfs
June	9,344 cfs
July	8,133 cfs
August	8,361 cfs

November 1 Carryover

At the end of the 2021 irrigation season (November 1, 2021), the carryover storage into the 2022 season was as follows:

Upper Snake above Milner Dam	827,241 acre-feet ² (46% of Average)
Boise River system	259,176 acre-feet (71% of Average)
Payette River system	393,424 acre-feet (83% of Average)

Although too early to determine water supply and storage available for flow augmentation, the lower carryover amounts may impact Reclamation's delivery of flow augmentation in 2022.

¹ Source: https://www.nwrhc.noaa.gov/runoff/runoff_summary.php?date=10/01/2021

² This number reflects the actual November 1 carryover in the Upper Snake above Milner. For purposes of determining the quantity of storage available for flow augmentation rental in 2022 from the Water District 01 Rental Pool (Upper Snake above Milner Dam), 20,000 acre-feet will be added to actual carryover (totaling 847,241 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.

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.

New Contracts for Water Stored in Reclamation Projects

RPM 13.3.1 states:

“Because 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 Idaho Water Resource Board, 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)

Reclamation continued to coordinate with the TMT and Regional Forum when planning and implementing its 2021 annual salmon flow augmentation program. Reclamation staff regularly attended these meetings and provided estimates and updates of the salmon flow augmentation program acquisitions and delivery.

Attachment 1

Stipulated Augmentation Rental -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	0	150000	185000	185000
100	0	0	0	0	0	150000	185000	185000
200	0	0	0	0	0	150000	185000	185000
300	0	0	0	0	0	150000	185000	185000
400	0	0	0	0	0	150000	185000	185000
500	0	0	0	0	0	150000	185000	185000
600	0	0	0	0	60000	150000	185000	185000
700	0	0	0	0	60000	150000	185000	185000
800	0	0	0	0	60000	150000	185000	185000
900	0	0	0	60000	60000	150000	185000	185000
1,000	0	0	0	60000	60000	150000	185000	185000
1,100	0	0	0	60000	60000	150000	185000	185000
1,200	0	0	0	60000	60000	150000	185000	185000
1,300	0	0	0	60000	60000	150000	185000	185000
1,400	0	0	0	60000	60000	150000	185000	185000
1,500	0	0	0	100000	150000	185000	185000	185000
1,600	0	0	0	100000	150000	185000	185000	185000
1,700	0	0	0	100000	150000	185000	185000	185000
1,800	0	0	0	100000	150000	185000	185000	185000
1,900	0	0	0	100000	150000	185000	185000	185000
2,000	0	0	0	100000	150000	185000	185000	185000
2,100	0	0	0	100000	150000	205000	205000	205000
2,200	0	0	0	100000	150000	205000	205000	205000
2,300	0	0	0	100000	150000	205000	205000	205000
2,400	0	0	0	100000	150000	205000	205000	205000
2,500	0	0	0	100000	150000	205000	205000	205000
2,600	0	0	0	185000	185000	205000	205000	205000
2,700	0	0	0	185000	185000	205000	205000	205000
2,800	0	0	0	185000	185000	205000	205000	205000
2,900	0	0	0	185000	185000	205000	205000	205000
3,000	60000	60000	0	185000	185000	205000	205000	205000
3,100	60000	60000	0	185000	185000	205000	205000	205000
3,200	100000	100000	0	185000	185000	205000	205000	205000
3,300	100000	100000	0	185000	185000	205000	205000	205000
3,400	100000	100000	0	185000	185000	205000	205000	205000
3,500	100000	100000	0	185000	185000	205000	205000	205000
3,600	100000	100000	0	185000	185000	205000	205000	205000