RECLAMATION
Managing Water in the West

2014 Salmon Flow Augmentation Program and Other Activities Associated with the NOAA Fisheries Service 2008 Biological Opinion and Incidental Take Statement for Operations and Maintenance of Bureau of Reclamation Projects in the Snake River Basin above Brownlee Reservoir

Annual Progress Report

U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region

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INTRODUCTION

On May 5, 2008, National Oceanic Atmospheric Administration (NOAA) Fisheries released a new 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. The incidental take statement included reasonable and prudent measures (RPMs) and associated terms and conditions to minimize incidental take to 13 listed salmon and steelhead Evolutionary Significant Units (ESUs).

This document reports the status of activities related to the incidental take statement, including Reclamation's flow augmentation program, status of new contracts, coordination activities, and conservation activities. This report meets Reclamation's responsibility to submit an annual progress report by December 31 of each year.

RECLAMATION'S 2014 SALMON FLOW AUGMENTATION PROGRAM

Overview of Salmon Flow Augmentation Program

Reclamation was able to provide 487,000 acre-feet of water for flow augmentation in 2014 (See Table 1). Water supply conditions in 2014 were well below average in much of the Snake River basin above Brownlee Reservoir throughout the first half of winter. Fortunately, a dramatic shift to wetter conditions occurred starting in February, leading to significant recovery in snowpacks and much improved runoff forecasts. For example, snowpacks saw a boost of 20% to 40% of average in February alone, with further gains of 10% or more in March. The prospects for providing the full target of 487,000 acre-feet for flow augmentation went from very unlikely in mid-winter to virtually assured by April 1. However, basins south and east of the Boise basin missed out on the wetter pattern and suffered severe to historic drought conditions due to the lack of reservoir carryover storage from the previous year (which also saw severe drought). Reservoirs were essentially empty by late July in the Owyhee and Malheur basins.

Reservoir carryover storage coming out of the prior 2013 water year (a drought year) was very low at all Snake River projects. November 2013 carryover storage was 90% of average in the Payette River basin and was 82% of average in the Boise River basin, but was only 39% in the upper Snake River basin above Milner. Snowpack on January 1, 2014 in the Payette, Boise, and upper Snake River basins was 59, 57, and 103 percent, respectively. But by April 1, snowpack in these three basins had improved to 100, 101, and 148 percent, respectively. Observed unregulated runoff for the April through July period turned out to be somewhat lower than April 1 snowpack percentages, with 92 percent of average for the Payette River at Horseshoe Bend, 85 percent for the Boise River near Boise, and 119 percent for the Snake River at Heise. There were minor flood control releases required in the Boise and Payette River basins in 2014. In the upper Snake River basin, no excess flows passed Milner Dam once irrigation began in late March, until flow augmentation began in early June.

Due to the very low carryover storage from the previous year, the upper Snake River System above Milner Dam reached a maximum combined physical storage content of approximately 867,000 acre-feet below the full capacity of 4,045,695 acre-feet. The Boise system nearly filled, coming up to about 31,500 acre-feet below its full capacity of 949,700 acre-feet. The Payette system was able to refill completely.

The 487,000 acre-feet volume includes 60,000 acre-feet of natural flow rights, a small portion (10,500 acre-feet) of which occurs outside of the April 3 to August 31 migration period.

In-Season Management Considerations for Meeting Augmentation Targets

Reclamation manages its in-season storage releases for flow augmentation, relying on the best data available 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 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.

Table 1 summarizes the source, amount, and timing for Reclamation's 2014 salmon flow augmentation program.

Table 1. Summary of Reclamation's 2014 Salmon Flow Augmentation Program.

SOURCE	AMOUNT (acre-feet)	DATES OF DELIVERY
Upper Snake River above Milner Dam		
Reclamation Uncontracted Space	12,487	June 10 – July 7
Reclamation Powerhead Space	0	
Rentals – Water District 01	180,756	
Rentals – Tribes	0	
Subtotal	***193,243***	
Payette River		
Reclamation Uncontracted Space	95,608	June 12 – August 26
Rentals – Water District 65	74,268	
Subtotal	***169,876***	
Boise River		
Reclamation Uncontracted Space	40,932	June 10 – July 21
Reclamation Powerhead Space	0	
Rentals – Water District 63	5,300	
Subtotal	***46,232***	
Natural Flows		
IWRB[1] Lease (Idaho)	60,000[1]	

[1] Idaho Water Resources Board

Skyline Farms (Oregon)	17,649	April 3 – August 31
Subtotal	***77,649***	
TOTAL	**487,000**	

[1] See section titled "Lease of Natural Flow Water Rights Below Milner Dam."

Uncontracted Space and Space Reacquired for Flow Augmentation

Reclamation's 95,608[2] acre-feet of uncontracted space assigned to flow augmentation in the Payette system fully refilled, as did the full 40,932 acre-feet in the Boise system. The entire accrual to these accounts was provided to the 2014 flow augmentation program. In the upper Snake River above Milner Dam, 12,487 acre-feet of accrued uncontracted space (out of a total possible of 22,896) was provided for the flow augmentation program.

The 17,649 acre-feet of natural flow rights Reclamation has acquired in Oregon (Skyline Farms) were fully available again in 2014.

Rentals from Shoshone–Bannock Tribes

The Shoshone-Bannock Tribes (Tribe) 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. Reclamation did not negotiate rental of Tribal storage water in 2014. However, Idaho Power Company executed a lease with the Tribe for storage water and released this volume, along with other Idaho Power-owned storage water, between July 7 and August 8 at various rates (typically about 1,000 to 1,500 cubic feet per second (cfs). It should be noted this water is not included in Reclamation's 487,000 acre-foot volume calculations.

Annual Rentals

Reclamation relies heavily each year on annual rentals from water users to acquire water for its flow augmentation program. Water availability from the Water District 01 Rental Pool (upper Snake River 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 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.

[2] Reclamation was able to reacquire 608 acre-feet of formerly contracted space in 2012, increasing the total uncontracted storage assigned for flow augmentation in the Payette system to 95,608 acre-feet.

In 2014, the chart specified that Water District 1 would provide 185,000 acre-feet of rental water. Carryover from 2013 on November 1 was 731,680 acre-feet, and the April 1 runoff forecast was 5,110,000 acre-feet (135 percent of average) for the April through September period. Actual observed runoff turned out to be lower at 119%.
In the Payette basin, 74,268 acre-feet was made available and rented by Reclamation in 2014, and 5,300 acre-feet of rental water was made available from the Boise basin in 2014.

Powerhead Space

As part of the Nez Perce Water Rights Settlement, Reclamation may utilize powerhead space in Palisades Reservoir and Anderson Ranch Reservoir for flow augmentation. In order for Palisades Reservoir powerhead space to be used, the sum from all other sources must be less than 427,000 acre-feet, and this powerhead space cannot be used to exceed a flow augmentation total of 427,000 acre-feet. It is anticipated that this powerhead space will be used relatively infrequently, and it was not necessary to use any in 2014. However, the majority of the available powerhead space in Palisades Reservoir was used in previous years, and this will impact the availability of this source in subsequent years until sufficient runoff occurs to refill this account. No refill of this space occurred in 2014.

Use of powerhead space from Anderson Ranch Reservoir is less restrictive, and can be used to provide flow augmentation volumes in excess of 427,000 acre-feet, if available. Reclamation considers use of this powerhead space to be undesirable due to the difficulty in refilling the water right the following year and the potential for shutting down the powerplant during a continuing drought. It was not necessary to use any of this space in 2014, and water provided from this source in 2013 was able to refill.

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 natural flow rights downstream of Milner Dam for the purpose of flow augmentation. In better water years, this can increase the volume of water available for 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 was water that served roughly 25,000 acres via high-lift pumps. Reclamation then entered into a 30-year lease with the State for 60,000 acre-feet of this water for salmon 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 Apri1 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, they provide an instream benefit and continued flow augmentation.

Timing Considerations for Flow Augmentation Releases

The timing of flow augmentation releases depends on the individual basin and source of water. Flow augmentation releases in 2014 mark the sixth year of operations under the 2008 BiOp, in which Reclamation committed to shifting releases to earlier in the migration season when Snake River flows are more beneficial to listed anadromous fish. The primary goal of the earlier 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 the releases varies depending on the water year type, total augmentation volume available, and the basin from which the augmentation originates. Consistent with the 2008 BiOp, not all water can be shifted from August releases, particularly in the Payette basin. The changes in release patterns for 2014 will be highlighted in the following discussion for each basin.

As discussed in the previous section, the 60,000 acre-feet of natural flow rights from the IWRB was provided for augmentation during the irrigation season.

To the extent possible, Reclamation strives to benefit local resources when implementing its proposed actions while also meeting its obligations under the BiOp and incidental take statement.

Upper Snake River Basin

The primary strategy for shifting augmentation releases in the upper Snake River Basin above Milner involves higher release rates and a relaxation of down-ramping criteria at the conclusion of augmentation. Formerly, the down-ramping rate of 100 cfs per day was very restrictive and forced lower release rates to avoid a protracted down-ramping period. With the restrictive rate, it was necessary to extend augmentation releases past Milner Dam into mid to late August in most years. The BiOp anticipated that 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 2014 past Milner Dam commenced on June 10, ramping up to about 3,600 cfs by June 12 and lasting until July 7. At the conclusion of flow augmentation, releases were reduced to about 1,500 cfs to deliver water owned or leased by Idaho Power Company. The Idaho Power releases continued at various rates through August 8. These releases were not counted toward Reclamation's flow augmentation volumes.

Boise River Basin

Augmentation flows began on the Boise system on June 10 and ended on July 21. The shift to earlier delivery of flow augmentation in the Boise River basin relies on a combination of two strategies. First, in flood control years when the system is assured to fill, some portion of the augmentation volume may be delivered by reserving an equivalent amount of system space that is not allowed to refill. In other words, as flood control operations near their end, releases are not cut 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 augmentation timing in 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 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 launch facilities. Once floating season begins, flows are limited to about 500 cfs above irrigation demand for public safety concerns. Reclamation looks for opportunities to make higher releases; in flood control years this can easily be accomplished by maintaining higher releases rather than immediately ramping down at the end of flood control. In non-flood control years, it can likely be accomplished by releasing in May (or early June) before the floating season begins.

There may be years when the above options are not available; such was the case in 2014. There were only minor flood control releases required in 2014, and these releases were primarily due to the distribution of space between the three reservoirs. Much of the space to refill in the system resided in the furthest upstream reservoir, Anderson Ranch, yet releases were required from Lucky Peak and Arrowrock Reservoirs to maintain adequate flood protection. By the time any flood threat had passed, there was insufficient inflow available to top off the system. Therefore the miss in refill was due to a flood control operation and not a deliberate release for flow augmentation. By the time flow augmentation releases could be started, safety considerations limited the release to about 600 cfs above irrigation demands. However, the full volume of augmentation water was still able to be released by July 21.

Payette River Basin

Augmentation releases from the Payette system began on June 12 as the reservoir system neared full; releases ended on August 26. Due to water quality concerns in Lake Cascade, some amount of flow augmentation water continues 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 strategy), and by increasing the initial rate of release in order to "front load" a portion of the augmentation volume, primarily by holding higher releases following flood control.

Both strategies were employed in 2014. There were limited flood control operations required in 2014, with releases from Lake Cascade briefly hitting 3,000 cfs in late May. Once any flood threat had passed, inflows were sufficient to fill the remaining space in the reservoir system. However, a minor amount of space in Lake Cascade (about 9,200 acre-feet) was deliberately not refilled by allowing inflows to pass downstream for flow augmentation. Releases from both Lake Cascade and Deadwood Reservoir were increased to invoke drafting. The release from Lake Cascade was set at the maximum powerhouse capacity of approximately 2,200 cfs in order to "front load" augmentation releases. These releases were reduced on several occasions during summer, dropping to about 1,850 cfs on July 11, to about 1,550 cfs on August 9, and finally to 1,400 cfs on August 23 until delivery of all flow augmentation water was completed on August 26.

No drafting of reservoir storage for irrigation would have been necessary prior to July 10[3], so all reservoir draft (including Deadwood Reservoir) up to that point (69,147 acre-feet) was for release of flow augmentation water. The flow rate credited towards augmentation water was variable depending on unregulated tributary runoff and irrigation demands, but averaged about 1,300 to 1,500 cfs in June and July, and about 900 cfs in August.

Mean Monthly Inflows to Brownlee Reservoir[4]

April	14,806 cfs
May	16,361 cfs
June	15,108 cfs
July	10,571 cfs
August	8,799 cfs

[3] Unregulated runoff in the basin was sufficient to meet irrigation demands through July 9 according to preliminary State water accounting.
[4] Source: http://www.nwrfc.noaa.gov/runoff/runoff_summary.php?date=10/01/2014

November 1 Carryover

At the end of the 2014 irrigation season (November 1, 2014), the carryover storage into the 2015 water year was as follows:

Upper Snake above Milner Dam	1,947,461 acre-feet
Boise River system	368,701 acre-feet
Payette River system	464,084 acre-feet

OTHER REASONABLE AND PRUDENT MEASURES

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 Service, referred to as the National Marine Fisheries Service; NMFS, Upper Snake BiOp at page 13-4.)

NMFS's 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 NMFS 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.

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 2014 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.

CONSERVATION RECOMMENDATIONS

NMFS included voluntary conservation recommendations in its Upper Snake BiOp (page 12-3), recommending Reclamation's participation in Total Maximum Daily Load (TMDL) planning efforts in the Upper Snake River Basin. In its March 2009 Decision Document, Reclamation noted that it was generally amenable to implementing the conservation recommendations to the extent funding and staffing can be made available within its existing authorities. The following summarizes relevant activities that Reclamation has been involved in over the past year.

As part of the Idaho and Oregon's on-going TMDL development and implementation activities, Snake River Area Office and/or Pacific Northwest Region Reclamation staff continued to participate in all appropriate watershed advisory group and watershed council meetings in the Upper Snake River Basin. These included activities in the Lower Boise River, North Fork Payette River, Lower Payette River, Mid Snake River, Lake Walcott, Henrys Fork Watershed Council, and American Falls Reservoir Watershed Advisory Groups, as well as the Owyhee/Malheur Watershed Council.

Reclamation continued to provide technical assistance to irrigation system operators and other appropriate entities throughout its project areas in the Upper Snake River Basin. Reclamation's Pacific Northwest Region Laboratory also provided analytical laboratory services to several entities in the basin in 2014. Most of the financial assistance for these projects comes from the Upper Snake Field Office, with the remained coming from Water Conservation Field Services Funds. These entities included:

- Idaho Department of Environmental Quality – Twin Falls Region
- Idaho Department of Environmental Quality – Pocatello Region
- Oregon Department of Environmental Quality
- U.S. Geological Survey – Idaho
- Aberdeen Springfield Canal Company
- Owyhee Watershed Council

- A & B Irrigation District
- Minidoka Irrigation District
- Lake Walcott Watershed Advisory Group
- Malheur Soil & Water Conservation District
- Burley Irrigation District

Upper Snake Temperature Monitoring - Project Summary

In coordination with the U.S. Geological Survey, Reclamation continued to operate a comprehensive basin-wide temperature monitoring study for the Upper Snake River Basin. Data collection at 52 sites in the Upper Snake River and major tributaries was initiated in 2004 and will continue through 2015. An interim summary of the data collected thus far was prepared in 2007 and further updated in 2008. Reclamation prepared a summary report that compiles temperature trends at Snake River main-stem sites from 2004-2011. Annual reports have been compiled starting in 2012. The project will culminate with a completion report describing temperature conditions in the Upper Snake River and relationships to storage, irrigation, and hydropower facilities in the basin.

Attachment 1

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