

**COLORADO RIVER RECOVERY PROGRAM
FY 2017 ANNUAL REPORT**

Project No.: C-14 & PIP 12C

I. Project Title: Coordinated Reservoir Operations (CROS) and I&E

II. Bureau of Reclamation Agreement Number(s): Not applicable.

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IV. Abstract:

This project involves voluntary operational coordination of selected reservoirs and trans-mountain diversion projects in the Colorado River Basin upstream from the confluence of the Colorado and Gunnison rivers. The goal is to enhance spring peak flows to improve endangered fish species habitat in the 15-Mile Reach of the Colorado River without diminishing reservoir or diversion yields or affecting the timing of reservoir filling. Over time reservoirs and trans-mountain diversion projects that have participated in the operation have included the Colorado-Big Thompson Project, Granby Reservoir, Green Mountain Reservoir, the Fryingpan-Arkansas Project, the Homestake Project, the Moffat Tunnel Project, Ruedi Reservoir, Williams Fork Reservoir, Willow Creek Reservoir, Windy Gap Project and Wolford Mountain Reservoir. Participating water management agencies include Bureau of Reclamation, City of Aurora, Colorado River Water Conservation District, Colorado Springs Utilities, Denver Water Board, Northern Colorado Water Conservancy District and Northern Colorado Water Municipal Subdistrict. CROS occurs in years when runoff conditions allow participating reservoirs to contribute without affecting their yield. The intent of CROS is to enhance the natural peak flows on the Colorado River for 10 days to two weeks. This typically occurs around the last week of May and the first week of June. Since the first coordinated releases were made in 1997, CROS operations to augment peak flows have been implemented in ten years. In 2017, coordinated reservoir releases were made from June 2 through June 13.

V. Study Schedule: 1995 - present

VI. Relationship to RIPRAP: Colorado Mainstem Action Plan 1.A.5.I.

VII. Accomplishment of FY 2017 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

On June 5, 2017, USFWS, CWCB, and the Bureau of Reclamation jointly issued a press release announcing the implementation of CROS releases to augment flows in the 15-Mile Reach.

Coordinated Reservoir Operations were conducted in 2017. This was the third year in a row of augmented 15-Mile Reach flows via CROS. Prior to 2015, CROS was most recently implemented in 2010. In 2011 and 2014, wet conditions caused streamflows in certain areas of the basin to approach or exceed levels associated with minor flooding, so peak augmentation was not performed. In 2012 and 2013, reservoirs did not have surplus inflow to contribute because of unusually dry conditions.

Runoff conditions in 2017, together with these CROS releases, resulted in a peak daily mean flow in the Colorado River at the Cameo stream gage of 16,600 cfs, or 119% of average (14,000 cfs). The peak daily mean flow at the Palisade, Colorado gage in the 15-Mile Reach was 14,900 cfs. The Cameo and Palisade stream gage peak flows occurred on June 9, 2017 and included voluntary CROS releases. Combined CROS releases in 2017 totaled approximately 35,735 acre-feet (AF). We continued to maintain effective communications among participants and effective public outreach regarding CROS operations, as well as perform the necessary coordination and maintenance activities to facilitate CROS implementation as conditions allowed.

FWS provided an overview of 2017 CROS operations at Reclamation’s annual Ruedi Reservoir operations meeting in Basalt, Colorado in August, and to the Recovery Program Implementation Committee in October. We prepared an article on the 2017 CROS that was published Recovery Program’s annual field report.

Reservoirs participating in CROS have voluntarily bypassed additional inflow above their normal operating plans as follows (2017 is highlighted in yellow):

Coordinated Reservoir Operations (CROS) Augmentation of Peak Flows (AF released)

Reservoir	Homestake	Lake Granby	Green Mtn	Ruedi	Williams Fork	Willow Creek	Windy Gap	Wolford Mtn	Moffat Tunnel	Total AF
1997			3,568	693	946			10,635		15,842
1998			12,482	5,106	1,672			4,431		23,691
1999		8,515	11,010	3,602	1,543	6,631		8,555		39,856
2006			6,788	6,297	6,625			9,007		28,717
2008			2,101	4,848						6,949
2009			14,113	5,858	5,044	2,638	2,061	13,069		42,783
2010			34,666	10,050	19,982			9,273		73,971
2015		18,002	11,292	4,599	2,733	8,000	906	4,587		32,117

2016	1,430		8,632	4,007	4,893			8,452	1,960	29,374
2017			14,410	4,502	3,293	7,206		4,245	2,079	35,735
Sum	2,860	26,517	119,062	49,562	46,731	24,475	2,967	72,254	4,039	348,467

VIII. Additional noteworthy observations:

Fryingpan River interest groups have noted that the high spring flows associated with elevated CROS releases from Ruedi Reservoir (which peaked this year at more than 600 cfs on June 7) provide valuable flushing flows that improve local coldwater fisheries habitat, and have been instrumental in knocking back the problematic mat-forming algae *Didymosphenia geminata* (“didymo”).

IX. Recommendations: The Recovery Program should continue to support the efforts of and encourage participation in Coordinated Reservoir Operations. The participating entities should continue to work with the NWS Colorado River Basin Forecast Center to improve peak runoff forecasts. The ongoing effort should maintain and improve the coordination process, address any remaining issues associated with inundation concerns downstream of participating reservoirs, maintain effective communication & coordination, and maintain effective accounting and monitoring. Additionally, the Recovery Program’s I&E Committee is encouraged to work with participants and the U.S. Fish and Wildlife Service to improve the public’s understanding of the role, function, and benefits of CROS operations in the Upper Colorado River Basin.

X. Project Status: Coordinated Reservoir Operations are an ongoing activity and efforts will continue to refine and improve the process and address issues that arise to allow for greater effectiveness of the effort. The Recovery Program is nearing completion of the ‘Phase 3 Coordinated Facilities Operation Study’, which assesses the feasibility of additional activities to augment peak flows in the 15-Mile Reach including ‘enhanced coordinated reservoir operations’ (enhanced CROS) and ‘coordinated facilities operations’ (CFOPS). The former would add additional bypass flows to CROS flows when feasible, while the latter would provide up to 20,000 AF of additional water to further enhance peak flows, if that can be done without significant cost to water users or Reclamation.

XI. FY 2017 Budget Status

	<u>Federal</u>	<u>State (In Kind)</u>
A. Funds Provided:	\$ 5,000	\$12,000
B. Funds Expended:	\$ 0	\$ 5,000
C. Difference:	\$ 5,000	\$ 5,000
D. Percent of the FY 2017 work completed, and projected costs to complete:	100%	

E. Recovery Program funds spent for publication charges: \$0

XII. Status of Data Submission (Where applicable): N/A

XIII. This writeup prepared by Don Anderson, finalized 1/22/2018 with signatory input.

Signed: Michelle Garrison Principal
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Signed: Victor Lee (approved)
Principal Investigator