

COLORADO RIVER RECOVERY PROGRAM  
FY 2015 ANNUAL PROJECT REPORT

RECOVERY PROGRAM  
PROJECT NUMBER: 19

I. Project Title: General Hydrology Support

II. Bureau of Reclamation Agreement Number(s): R13PG40019 expires September 30, 2017.

Project/Grant Period: Start date 1990  
End date: ongoing  
Reporting period end date: ongoing  
Is this the final report? Yes \_\_\_\_\_ No  x

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IV. Abstract:  
The Service's hydrologist provides basic hydrology support to Recovery Program researchers. Accomplishments during FY 2015 include: 1) coordinating and posting temperature data at sites on the Colorado, Green and Gunnison River, 2) providing technical hydrology support for a wide range of Recovery Program activities; and 3) supporting the Recovery Program in basic data collection and monitoring projects' efforts relating to hydrology.

V. Study Schedule: Initial Year - 1990 Final Year – Ongoing

VI. Relationship to RIPRAP:  
General Recovery Program Support Action Plan  
I.A.4.b. Conduct needed Geomorphology research and monitoring.

Green River Action Plan: Mainstream  
I.A.3. Deliver identified flows.

Colorado River Action Plan: Mainstream  
I.E. Evaluate and revise as needed flow regimes to benefit endangered fish populations.

Colorado River Action Plan: Gunnison River  
I.D. Evaluate and revise as needed flow regimes to benefit endangered fish populations.

VII. Accomplishment of FY 2015 Tasks and Deliverables,

Temperature data collection went well during FY-2015. Two locations on the Gunnison River, five locations on the Colorado River and seven locations on the Yampa and Green River were

checked semiannually and calibrated with on-site temperature readings. Temperature data collection on the Colorado River by CRFP was consolidated in this Scope of Work beginning in FY- 99 and a separate budget table is included for this work. The information for these temperature data can be found at: <http://www.r6.fws.gov/riverdata/>

19B Project Title: General Hydrology Support - (CRFP - Grand Junction contribution)

Principal Investigator:       Brendan Crowley, Biological Technician  
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Performance:

The Service's Division of Water Resources provides basic hydrology support to Recovery Program researchers and undertakes tasks to support the Recovery Program in basic data collection and monitoring projects. The work provided is, for the most part, in support of other research projects or activities such as flow delivery, flow quantification, and habitat restoration, all of which have a direct impact on the recovery of the Colorado River endangered fish. One task is the collection of water temperature data in various reaches of upper basin rivers. Temperature monitoring duties are divided between the Division of Water Resources Regional Office staff (Denver) and the Colorado River Fishery Project's Grand Junction field station (CRFP-GJ). CRFP-GJ currently collects water temperature data from five sites on the mainstem Colorado River, four sites on the Gunnison River and one site on the Uncompahgre River. These data, along with those collected by the Water Resources staff for the Green, Yampa and Gunnison rivers are assembled into a temperature database for use by Recovery Program researchers.

Temperature data for FY-14 was downloaded in the field during November-December, 2014 (i.e., during FY-15). Two-hour interval readings were converted to daily means and then sent to Division of Water Resources when the site-specific daily-mean tables were completed (during winter 2014-2015). Temperature data for FY-15 are currently in the process of being downloaded. This work should be completed by the end of December 2015 (i.e., during FY-16). Two-hour interval readings will be converted to daily means and then sent to Division of Water Resources once the site-specific daily-mean tables are completed (during winter 2015-2016).

Temperature data collection began in 1986 at two Colorado River stations, Palisade (rk 292.8) and Walker (rk 264.7). Over the years other sites have been added: Rulison in 1994 (rk 369.9), Dewey in 1994 (rk 154.5), Gold Bar in 1992 (rk 83.7) and The Slide upstream of the Green River confluence in 2000 (rk 2.9). A site on the Gunnison River at People's Orchard (rk 63.9) was added in 1999; one downstream of the North Fork confluence (rk 117.5) was added in 2007, one

at the NPS Never Sink recreation access area (just upstream of the Blue Mesa inflow) was added in 2007, and one just upstream of the confluence with the Uncompahgre River (rk 90.9) was added in fall 2008. These additional Gunnison River sites were added in an effort to provide better data for future temperature modeling efforts for management of Aspinall Unit releases. The Dewey site on the Colorado River was discontinued in 2007 when it was found that USGS had established their own temperature monitoring sensor at their streamflow gauging station.

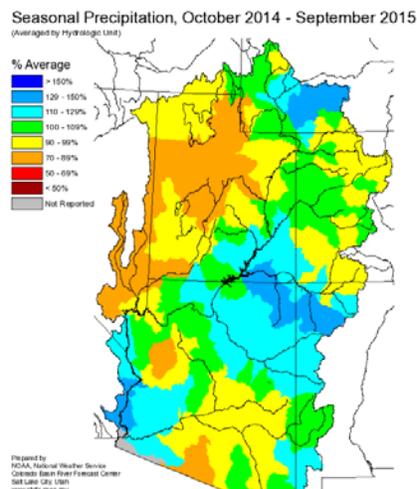
In previous years, data were recorded using TempMentor (Ryan Instruments, Redmond, Washington) thermographs. These units were later replaced with StowAway brand TidbiT v2 Temp UTBI-001 (Onset Computer Corporation, Bourne, Massachusetts) temperature loggers (accurate to 0.2°C). Loggers are placed in sites where depth and velocity will safeguard against dewatering and shoreline warming. Data are downloaded 1-2 times annually. Mean daily temperatures (MDT) are calculated from readings taken every two hours and reported to the nearest 0.1°C. In recent years, a second, backup logger has been deployed at many sites to try to help ensure data collection when loggers become impossible to retrieve due to being buried in sediment, lost, stolen, or willfully damaged by the public.

Beginning in 2005, annual data were summarized as mean daily temperatures in Excel spreadsheets following the format used by USGS in their Water Resources Data yearbooks. The spreadsheets are currently forwarded to Carrie Cordova of FWS Water Resources who web enables them and links them to the Riverdata Web Page, but Jana Mohrman has been trained to take Carrie's duties. The temperature data can be accessed and downloaded from the Riverdata web page at <http://www.r6.fws.gov/riverdata/>. GPS locations for each thermograph are available by request; for security purposes the exact locations are not provided on the web page. We recommend continuation of the current data collection efforts at the established sites.

We recommend continuation of the current data collection efforts at the established sites. We believe that a couple of additional temperature monitoring sites added to the White River would be instructive.

## B. Hydrology Support for Biological Opinion Development and Monitoring

Snowpack in 2015 varied throughout the basin and would have been severely low, had it not been for "Miracle May's" contribution.



	2015	Peak % of Avg	2015 Peak	Base Flow Target	% and Aug-Oct Avg	Aug-Oct Min
Green River	Yampa R. at Maybell	72%	7,540	200	66% 215	115
	Green R. at Jensen	77%			1.14%	
	Target	8.3 - 14K	14,900	1900	2384	1,930
	Green R. at Green	57%			90%	
	Target	8,300	15,900	2.2-3.8K	2,802	2,050
	White R. at Watson	66%	2,550	375	86% 384	213
	Duchesne R. at Randlett	52%	2,040	50	45% 108	41
Colorado River	Price R. at Woodside	20%	805		48% 49	1
	Colorado R. at Palisade	110%			94%	
	Target	16,700	18,900	1,240	1,210	854
	Gunnison R. at Grand Junction	82%			137%	
	Target	5,000	10,000	1,050	2,005	1,660
	Colorado R. at State Line	114%			1.12%	
	Target	18-26.6K	30,400	3- 4.8K	4,400	3,790

All targets were met

Gray = targets are established

above % of average

Targets were exceeded

The unregulated inflow to Lake Powell in September was 276 kaf (68% of average). The release volume from Glen Canyon Dam in August was 714 kaf. The end of September elevation and storage of Lake Powell were 3,606.1 feet (94 feet from full pool) and 12.3 maf (51% of full capacity), respectively. The water year 2015 unregulated inflow to Lake Powell was 10.17 million acre-feet (maf) (94% of average). The water year 2015 release from Lake Powell was 9.0 maf. The reservoir elevation peaked at 3,614 feet on July 14, 2015 and is now in its seasonal decline through the fall and winter months. <http://www.usbr.gov/uc/water/crsp/cs/gcd.html>

VIII. Additional noteworthy observations: 2015 Hydrologist's Accomplishments:

Created a spreadsheet summarizing all existing flow protection and possible future needs

Reviewed and provided 2 sets of comments on the draft State Water Plan focusing on

the Yampa/White, Gunnison, and Upper Colorado River inputs. Clarified the draft White River management plan scope of work for the State of Colorado

Coordinated the collection of temperature data and USGS gages contracts in Utah and Colorado. Accompanied Jim Renne on the Yampa and Green River temperature run. Jim retired this summer; he has collected temperature data for the Recovery Program for 25 years and will continue to do so in retirement.

Updated the status of the instream flow elements for the RIPRAP to determine whether the Program is making sufficient progress. Provided hydrologic graphs and tables describing the water conditions and how the program met the flow targets.

Chaired the WAC committee and worked on the GRUWAT, GREAT, FGTWG, LTSP, and Geomorphology Committee.

Coordinated reservoir releases (CROS) on the Colorado River, and Yampa River from May through October. There hadn't been a CROS since 2010 because 2014 & 2011 had flood concerns and 2012 and 2013 were drought years. 2015 did not have a good snowpack until "Miracle May" in which some good peak and baseflows occurred.

Presented the Program's plan for Ruedi releases in Basalt, CO. Worked with CWCB to review the contract and administer leased UTE water from Ruedi.

Jana started working on; a summary of the PBO success in the 15-mile reach, real-time telemetered pipe flow on Stewart lake inflow, flow evaluations on the Gunnison River using embeddedness or hydrophones studies, sluicing sediment from Taylor Draw dam, coordination of Lidar on the Green River.

Coordinated releases on Yampa River using entire pool in Elkhead. There will be no carryover water, just the annual 5000 acft for 2016.

Manned the Program's trade booth for Colorado Water Congress. Wrote news releases for a successful CROS release, and wrote a newsletter article on the Ute water lease.

IX. Recommendations: The work provided supports other research projects or activities such as flow delivery, flow quantification, and habitat restoration, all of which have a direct impact on the recovery of the Colorado River endangered fish. We recommend the continuation of current efforts.

X. Project Status: Ongoing and on-track

XI. FY 2015 Budget Status

A. Funds provided: \$150,603

B. Funds expended: \$150,603

C. Difference: - 0-

XII. Status of Data Submission Data submitted as completed

XIII. Signed: Jana Mohrman November 2, 2015  
Principal Investigator Date