COLORADO RIVER RECOVERY PROGRAM
FY 2014 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__

III. Principal Investigator:
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IV. Abstract:
The Service's hydrologist provides basic hydrology support to Recovery Program researchers Accomplishments during FY 2014 include: 1) collecting temperature data at sites on the Colorado, Green and Gunnison River, and assembling a temperature database for use by Recovery Program researchers; 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 2013 Tasks and Deliverables,

Temperature data collection went well during FY-2014. Thermographs at four locations were

determined to be duplicative of USGS sites on the Gunnison River and will not be continued into 2015. 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)

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Performance:

The CRFP-GJ 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 researchers.

Temperature data for FY 2013 was downloaded in the field during November-December, 2013. 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 2013-2014). Temperature data for FY 2014 are currently being downloaded. This work should be completed by the end of December 2014. 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 2014-2015).

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 Peeple'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 is being trained to take over 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

The Service's hydrologist provides hydrology support to Recovery Program researchers and supports the Recovery Program with data collection and monitoring projects. Snowpack in 2014 was above average, with the exception of the south western portion of the basin (ex. Duchesne and Price River basins). All fish flow targets were met with the exception of peak flow targets on the Gunnison River under the new ROD and on the Green River at Green River.

2014	Peak Target	**2014 Peak**	Base Flow Target	**Aug-Oct AVR**	**Annual Min**
Yampa R. at Maybell	N/A	**13,100**	200	**506**	**241**
Green R. at Jensen	Avr 18,600	**19,500**	Mod Wet 2,400 - 2,800	**3.018**	**2,550**
Green R. at Green River	Avr 22,000	**20,600**	Mod Wet 2,700 - 4,700	**3,487**	**2,560**
White R. at Watson	Dry 3,700	**Draft 3,290**	Mod Wet 500	**508**	**363**

Duchesne R. at Randlett	N/A	**124**	Dry 50	**147**	**33**
Price R. at Woodside	N/A	**45**	Dry 15	**144**	**14**
Colorado R. at Cameo/Palisade	23,500	**25,300**	Wet 1,630	**1,852**	**1,050**
Gunnison R. at Grand Junction	Mod Wet 14,350	**12,700**	Mod Wet 1,500	**1,806**	**1,370**
Colorado R. at State Line	Mod Wet 35,000	**38,000**	Mod Wet 3,900	**5,023**	**3,810**

Red= target not met

Near-average inflow to Lake Powell in the water year 2014 helped maintain storage at a similar level to last year in the key Colorado River reservoir. The Bureau of Reclamation reports that 12 months ending Sept. 30, the inflow was 96 percent of average and about double the inflow of the previous two waters.

Thanks to good snowpack, the U.S. Bureau of Reclamation (Reclamation) was able to operate the three dams on the Gunnison River known as the Aspinall Unit to provide high spring flows to benefit endangered fish. This was the first time reservoir inflow was sufficient for Reclamation to release 9000 cubic feet per second (cfs) water under the 2012 Record of Decision for Aspinall Unit operations.

Typically, Reclamation times their Aspinall releases to coincide with the peak flow of the North Fork of the Gunnison River to get the 'biggest bang for their buck' in the lower Gunnison River. However, spring runoff in 2014 presented a complicated set of conditions. Snowpack in the Gunnison and Colorado River basins was above average. Reclamation needed to delay releases from the Aspinall Unit (until slightly after the North Fork peak) to avoid flooding in the Grand Valley. Although a bit late, the Aspinall releases provided "scouring flows" to clean sediment from the Gunnison River cobbles and gravel to benefit endangered fishes. The Colorado River hit its high-water mark of 26,100 cfs above its confluence with the Gunnison River on June 2. The Gunnison River peaked at Whitewater on June 7 with flows of 12,850 cfs. If those peaks occurred simultaneously there could have been flooding problems particularly at an Interstate 70 bridge west of Fruita.

Reclamation used all three spillways in the dams of the Aspinall Unit to achieve high peak flows. More large releases from the Aspinall Unit can be expected in future years to regularly scour fine sediment from the Gunnison River and improve habitat for endangered fish and other

species.

VIII. Additional noteworthy observations:

2014 Hydrologist's Accomplishments:

Worked with the Yampa/White, Gunnison, and Upper Colorado River Roundtables regarding input for the Colorado State Water Plan. They all included nonconsumptive flows related to endangered fish needs.

Wrote a draft White River management plan scope of work for the State of Colorado

Coordinated efforts for collection of temperature data and USGS gages contract in Utah and Colorado. Took over temperature sites of the Gunnison and eliminated 4 redundant sites.

Updated 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.

Participated on the Environmental/Recreation work group for Reclamation's Colorado River Basin Study to develop potential solutions that protect or improve ecological and recreational resources while supporting integrated water management solutions that benefit multiple uses.

Chaired the WAC committee and worked on the GRUWAT and FGTWG and Geomorphology Committee. The draft Peak Flow Technical Supplement was written. Secured funding for the 2014 hydrophone research in the Gunnison River during the largest peak flow in approximately 20 years.

Coordinated reservoir releases on the Colorado River, and Yampa River from May through October. 2014 had a good snowpack in which some extreme high flows and good baseflows occurred.

Represented the Program regarding a controversial year on the Gunnison River. It was the first large peak under the ROD. The calls included disgruntled outfitters, power generators and the State of Colorado. Presented a PowerPoint at the Gunnison Water Conference to explain the value of these high flows.

Presented the Program's coordinated water program in Basalt, Carbondale, Rangely, Craig, Vernal, and the town of Gunnison. Discussed the status of the endangered fish and how the nonnative fish concerns are foremost in with the Program.

Coordinated one flow release on Yampa River for the last of the season's nonnative float trip. Did not use the entire pool in Elkhead, the flows were always above 200cfs. There will be no carryover water, just the annual 5000 acft in 2015.

During the Federal shutdown in the fall of 2013, held 3 briefings on a White River management plan.

Provided an analysis of Grand Valley fish screen operations for the Management Committee through 2013.

Manned the Program's trade booth for Utah, Gunnison and Colorado Water users group.

Analyzed Green River model output for the Tusher Wash Biologic Opinion for Kevin McAbee.

Wrote news releases for 3 White River Public meetings, 10825 completions and the CROS news release, provided updated materials and a new map for the briefing book, and wrote a newsletter article.

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.

Depending on 2015 runoff conditions (average to wet) consider another year of the hydrophone study and an embeddedness/invertebrate study on the Gunnison River and the 15-Mile Reach.

X. Project Status: Ongoing and on-track

XI. FY 2014 Budget Status

A. Funds provided: $146,401
B. Funds expended: $146,401
C. Difference: - 0-

XII. Status of Data Submission Data submitted as completed

XIII. Signed: Jana Mohrman November 18, 2014
Principal Investigator Date