

I. Project Title: General Hydrology Support for Recovery Program Activities.

II. Principal Investigator:
George Smith
P.O. Box 25486, Denver, CO 80225-0486
E-mail: george_smith@fws.gov
Phone: (303) 236-4485
Fax: (303) 236-4224

III. Project Summary:

The Service's Division of Water Resources provides support for activities undertaken by the Recovery Program Director's Office in the areas of water acquisition and water scheduling and temperature monitoring. WAC support includes chairing the WAC, preparing agendas, preparing meeting summaries, developing Scopes of Work, preparing Annual Reports, and working on WAC-related projects. Other major tasks include participation in special projects such as Grand Valley Water Management, Coordinated Reservoir Operations, Monitoring support in basic river temperature and supervision river suspended sediment data collection. Accomplishments during FY 2006 include: 1) collecting temperature data at 10 sites on the Green River and four sites on the Gunnison River, and assembling a temperature database for use by Recovery Program researchers; 2) coordinating development of a sediment monitoring program; 3) providing technical hydrology support for a wide range of Recovery Program activities on a year-to-year basis; and 4) coordinating other Recovery Program efforts relating to scheduling reservoir releases for flow support in the 15-Mile Reach and Yampa River.

IV. Study Schedule: Ongoing

V. Relationship to RIPRAP:

Colorado River Action Plan, Mainstem: I.A.5
Yampa River Action Plan: I.A.1, I.B.2
General Recovery Program Support Action Plan
I.A.4.b. Conduct needed Geomorphology research and monitoring.

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

Colorado River Action Plan: Mainstem
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.

VI. Accomplishments of 2005 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

TASK 1: A. Temperature Data Collection

Temperature data collection went well during FY-20065. No thermographs were stolen and very few data were lost due to thermographs being out of the water. Older thermographs were replaced as part of an annual maintenance cycle where 25% of the existing thermographs are replaced each year.

Routine temperature data collection continued in 2005; in addition, we prepared 2005 data for archiving and publishing on the web. The yearly process involves downloading data from the thermographs in the field in March, July, and October, graphically plotting the data, visually checking the data, and preparing presentation quality graphs using Excel spreadsheets. The spreadsheets are then web enabled and linked to the Riverdata web page. The temperature data can be accessed and downloaded from the River data web page at <http://www.r6.fws.gov/riverdata/> or by email request from FWS Division of Water Resources (address above). An interactive map, included on the web page, displays the general location of each thermograph and links to temperature data for each of three rivers (Green, Yampa, and Gunnison). GPS coordinates for each thermograph are available by request; however, for security reasons the exact locations are not provided on the web page.

We provided data to the biologist and consultants working on other Scopes of Work and related projects. A notable project in 2005 was the coordination of flows and temperature from Flaming Gorge Dam with the flow and temperatures in the Yampa River. One of the recommendations of the report "Recommendations for Endangered Fish in the Green River Downstream of Flaming Gorge Dam" is that temperatures in the Green River be maintained within levels which are advantageous to avoid thermal shock to drifting Colorado Pikeminnow. The report targets water temperatures of 18° C or greater for two to five weeks in upper Lodore Canyon beginning at the onset of base flows. The report recommends that the temperature of the Green River be no more than 5° C older than the Yampa River at the confluence during the summer base-flow period to prevent cold shock to drifting Colorado Pikeminnow larvae. During the past summer thermograph data from the Green and Yampa Rivers were used by a coordinating committee to request temperature increases from Flaming Gorge Dam to mitigate temperature below the Yampa and Green confluence.

Grand Junction CRFP continued data collection in 2007 and converted the raw 2-hour interval data into daily means. Beginning in 2003 the Grand Junction CRFP office has converted all their data to USGS standard page format and posted the pages to the Recovery Program Riverdata web site. Temperature information was used during our food-web studies (Project 48) to help explain, along with food distribution, the distribution of pikeminnow in the mainstem Colorado River.

Task 2. Hydrology Support for Colorado River Biological Opinions:

The Water Resources Division will help coordinate of releases from Flaming Gorge and the Aspinall Unit for endangered fish. Releases will be monitored and researchers and administrators will be notified of important changes in planned release patterns. The Water Resources Division monitors river flows and schedules releases from Ruedi, Williams Fork and Wolford Mountain Reservoir to support flow augmentation in the 15-Mile Reach.

Support was provided for activities associated with the enlargement Elkhead Reservoir which will be compiled prior to runoff 2007. Planning also began on how water for endangered fish flow augmentation will be managed begin in the summer of 2007.

Advising Tri-State Generation when to begin using storage water (up to 1,000 AF) pursuant to the terms of the Craig III Biological Opinion. This commitment and task will end when a permanent replacement supply is made available from Elkhead Reservoir. This permanent supply is expected to be avail by summer/fall 2007 if the construction of Elkhead enlargement remains on schedule.

Support was provided to the Program Director's office in attending meetings and preparing position statements related to the Gunnison River EIS and Sufficient Progress issues. I also represented the Recovery Program and Service on the Gunnison EIS Hydrology Work Group.

Colorado River PBO work consisted of meetings with the Colorado Water Conservation Board and Reclamation on updating STATEMOD and data files to rerun the C1 scenario and 2005 depletion scenarios. The updated STATEMOD will be used by CWCB to do the 2006 PBO depletion accounting.

Supported the Program Director's office in scheduling and attending meetings with Grand Valley water users to follow up on activities the Recovery Program has on going on in the Grand Valley.

Task 3. Hydrology Support for Other Scopes of Work:

The Division of Water Resources will continue to work with USGS in support of support SOW's FR and FR-DUC sediment monitoring. The work will include providing technical and installation support for the deployment of suspended sediment sampling sensors on the Green and Gunnison River.

The Division of Water Resources will continue to work with USGS and Argonne labs in the development of a habitat-monitoring program for the Recovery Program. Work will entail periodic meetings of the suspended sediment sampling work group and development of a Scope of Work's for future habitat monitoring by the Recovery Program.

Task 4. Gage Installation and Maintenance

The Division of Water Resources will continue to work with the U.S. Geological Survey, Bureau of Reclamation, and Colorado Division of Wildlife to maintain the current gage at the head of the 15-Mile Reach of the Colorado River and two gages at Deerlodge Park on the Yampa River. Work will continue on the development and coordination of agreements with the Central Utah Water Conservancy District and USGS for the operation and maintenance of two gages located on the Duchesne River and a temperature probe to be installed on the Jensen gage. Work with the Bureau of Reclamation, the Central Utah Water Conservancy District to maintain a USGS gage at Woodside on the Price River. Water Rights Acquisition Committee Administrative Work: Scopes of Work and contracts were developed for the operation of the Palisade gage, two gages on the Yampa River, and two gages on the Duchesne River.

Task 5 Hydrology Support for Water Acquisition Activities

The Division of Water Resources will continue to support the Water Acquisition Committee in water right investigations as originally envisioned by the Recovery Program. The task requires working with willing sellers and potential leasers to gather information and acquire water rights. This task has become less important recently as water right acquisition has been given less priority and optimization of existing facilities has become the focus of the Water Acquisition Committee. The tasks listed below support the expanded mission of the Water Acquisition Committee.

1. Developing scopes of work for water rights evaluations by the water right consultant, and overseeing contract administration, consultant supervision, and review of the consultant's work.
2. Providing annual reports on the delivery and benefits of flows from Ruedi and Wolford Mountain reservoirs.
3. Preparing scopes of work and annual reports for projects in support of Water Acquisition Committee activities. Annual reports will be submitted to the Recovery Program Directors Office in November of each year.
4. During the late summer of 2006 , flows in the 15-Mile Reach were monitored on a daily basis and weekly conference calls were held to coordinate releases from Ruedi, and Williams Fork Reservoirs. Because the flows remained about average through July, an average year flows target of 1,240 cfs was established was established in consultation with Service Biologists. The flow target was met for much of the late summer and only was missed as the runoff played out in mid August when reservoir release could not be ramped up in time to offset the decline. The final accounting has been completed for 2006 and 18,248 acre-feet of water was released from Ruedi, and 4,871 acre-feet from Williams Fork Reservoirs 9,580 acre-feet from Wolford Mountain Reservoir and 22,822 acre-feet form Green Mountain Reservoir under the municipal lease. The total amount of water released from all sources in 2006 was 55,477 acre-feet as compared to 53,177 acre-feet in 2005.

5. The geomorphology peer review panel was not requested to review any reports in 2006 and no funds were expended.

D. Coordinated Reservoir Operations and CROS:

Coordinated Reservoir Operation assistance was provided to Bureau of Reclamation in implementing the annual coordinated reservoir program. The spring snowpack in 2006 was the first year since 1999 where conditions were sufficient for Coordinated Reservoir Operation implemented. Water Year 2006 was a year where snowpack was near normal most of the winter and all major reservoirs with the exception of Flaming Gorge filled. Because it had been so long since CROS criteria were met, all participants worked comparatively and CROS was implemented in June of 2006. Approximately 1,800 cfs was added to the 18,000 cfs peak at Cameo. A total of 28,460 acre-feet of water was provided: 6,337 acre-feet from Ruedi Reservoir, 6,788 acre-feet from Green Mountain Reservoir, 8,989 acre-feet from Wolford Mountain Reservoir, and 6,346 acre-feet from Williams Fork Reservoir. Support work for the project included coordinated with the Loveland and Grand Junction offices of Bureau of Reclamation, Denver Water, CWCB, and the State Engineer. Activities will include: representing the Service at coordinated reservoir's work group meetings, assisting in scheduling public meetings, reviewing press releases, representing the Recovery Program at public meetings, monitoring runoff, and participating in scheduling reservoir releases to enhance peaks.

E. General Support Activities:

I served as Chairman of the Water Acquisition Committee where the following tasks were performed: 1. Prepared meeting summaries for all WAC meetings and reports to the Management Committee, 2. Prepared annual reports to the Colorado Water Conservation Board on Ruedi flows and associated benefits to the 15-Mile Reach, and 3. Prepared Scopes of Work and annual reports for the following projects:

1. Water Right Consultant Services
2. General gage operation and maintenance
3. Green and Gunnison River Sediment Sampling
4. Water acquisition Hydrology Support
5. Geomorphology Peer review

Task 6 General Support Activities:

The Division of Water Resources participated in technical discussions with the CWCB staff in an effort to clarify and quantify the Service's instream flows for endangered fish. The work will include attending meetings, reviewing reports, providing comments, and reporting back to the Service and the Water Acquisition Committee. This effort supports the flow filings outlined in the RIPRAP.

The Division of Water Resources will represent the Service and the Recovery Program as

one of the "HUP managing Entities" which was set up to implementation the Orchard Mesa Check settlement. Work includes attending annual kickoff and wrap-up meeting in Grand Junction and participation in weekly conference calls beginning early in July and ending when irrigation ends in November. Each week river flows are tracked, flow targets coordinated with Service biologists and recommendations made on how best to release reservoir water secured by to Recovery Program to meet targets and provide benefits to endangered fish.

The Division of Water Resources will participate in updating the RIPRAP, developing Program Guidance and other activities in support of the Program Directors' office.

1. As chairman of the Water Acquisition Committee, I serve as coordinator for Grand Valley Water Management, Redlands Gage, Coordinated Reservoirs, and the two CWCB projects. Many of the tasks included attending meetings, reviewing reports, providing comments, and reporting to the Service and WAC.
 3. Provided support to the Program Directors' office in updating the RIPRAP, developing Program Guidance, developing Program Directors updates and reviewing water related press releases and media products.
 4. The 15-Mile Reach PBO 5 year accounting process started in 2006. Time was spent in gathering depletion data and condonation with CWCB staff. A spreadsheet of depletions consulted upon by the Service was developed and forwarded to the CWCB Staff.
- VII. Recommendations: Continue general hydrology support for Water Acquisition activities.
- VIII. Project Status: The project is ongoing and changes each year to meet the changing objectives of the Recovery Program in securing, protecting, and delivering water for endangered-fish habitats.
- IX. FY 2006 Budget Status:
- | | |
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| A. Funds provided: | \$157,560 |
| B. Funds expended: | <u>157,560</u> |
| C. Difference: | \$ 0 |
- X. Status of Data Submission: Not applicable.
- XI. Signed: George R Smith March 13, 2007
Principal Investigator Date