

RECOVERY PROGRAM
FY 2018-2022 SCOPE OF WORK for:
Hydrology and Temperature

Recovery Program Project Number: 19

Note: Recovery Program FY18-19 scopes of work are drafted in May 2017. They often are revised before final Program approval and may subsequently be revised again in response to changing Program needs. Program participants also recognize the need and allow for some flexibility in scopes of work to accommodate new information (especially in nonnative fish management projects) and changing hydrological conditions.

Lead agency: U.S Fish and Wildlife Service

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<u>Category:</u>	<u>Expected Funding Source:</u>
<input type="checkbox"/> Ongoing Project	<input checked="" type="checkbox"/> Annual funds
<input checked="" type="checkbox"/> Ongoing-revised project	<input type="checkbox"/> Capital funds
<input type="checkbox"/> Requested new project	<input type="checkbox"/> Other (explain)
<input type="checkbox"/> Unsolicited proposal	

I. Title of Proposal: Recovery Program Hydrology Support

II. Relationship to RIPRAP:

General Recovery Program Support Action Plan:

IIA. Evaluate methods for defining habitat-flow needs and select methods most appropriate to specific stream reaches.

Green River Action Plan: Mainstem

I.A.3.d. Operate Flaming Gorge Dam to provide winter and spring flows and revised summer/fall flows, pursuant to the 1992 Biological Opinion and 2006 Record of Decision.

I.A.4., I.B.3. Legally protect identified flows.

I.D. Evaluate and revise as needed, flow regimes to benefit endangered fish populations.

ID1d, Determine relationship of backwater development to sediment availability and peak flows in Reach 2.

Green River Action Plan: Yampa and Little Snake Rivers

I.A.1.f Install, operate, and/or maintain stream flow monitoring gages.

I.B.2.a.2.b. Deliver Elkhead Reservoir Releases

Green River Action Plan: Duchesne River

I.D.1 Determine feasibility and benefits of coordinated reservoir operations.

I.F. Determine need and feasibility of additional gaging.

I.G. Evaluate and revise as needed, flow regimes to benefit endangered fish populations.

Green River Action Plan: White River

I.A. Assess need for tributary management plan for the White River.

I.F. Evaluate and revise as needed, flow regimes to benefit endangered fish populations.

Colorado River Action Plan

I.A.3.a. Collect data for 15-MR PBO depletion accounting.

I.A.3.b. Develop Consumptive Use and Loss report for CRDSS model

I.A.5. Provide and legally protect instream flows pursuant to Colorado River PBO

I.A.5.a. Deliver Ruedi flows to 15-Mile Reach

I.A.5.h. Deliver Wolford Mountain flows.

I.A.5.i.2. Coordinated Reservoir operations (CROPS)

I.A.5.m.2. Coordinated Facilities operations (CFOPS)

I.A.6. Review implementation of RIPRAP items to determine timely compliance with applicable schedules (every 2 yrs. beginning in 2003).

I.B.4.c.2.

Gunnison River Action Plan

I.E. Evaluate and revise, as needed, Gunnison River flow regimes to benefit endangered fish populations.

The Record of Decision (ROD) for Aspinall Unit Operations was released April 2012 <http://www.usbr.gov/uc/envdocs/eis/AspinallEIS/ROD.pdf>. The ROD describes Aspinall Unit operations which will avoid jeopardy to downstream endangered fish species while continuing to meet the congressionally authorized unit purposes.

III. Study Background/Rationale and Hypotheses:

This proposal represents the US Fish and Wildlife Service (Service) Hydrologist activities that support the Program Directors office, river temperature monitoring and ongoing research and monitoring activities. Activities are, for the most part, broken down by specific task with task descriptions, budgets, and deliverables.

IV. Study Goals, Objectives, End Product:

Study Goal: To support, identify, evaluate and protection of instream flows to benefit Colorado River endangered fish.

Study Objectives:

1. To negotiate contracts and leases of water for endangered fish.
2. To collect temperature and hydrological data in support of Recovery program research priorities.
3. To provide water management services to the Recovery Program to manage water for endangered fish augmentation.
4. To provide staff support to the Recovery Program Directors Office on an as-needed basis in the area of instream flow identification, delivery and protection.

V. Study Area:

The Colorado and Green River Basin above Lake Powell.

VI. Study Methods/Approach:

The Service Hydrologist provides hydrological and temperature information to Recovery Program researchers. In addition to this work a number of specific tasks (described below) are undertaken to support instream flow protection of the Recovery Program.

VII. Schedule: Tasks will be completed November 1st of each year

VIII. FY 2018 and 2019 Tasks:

Task 1. Temperature Data Collection and Analysis:

In coordination with the Colorado River Fishery Project (CRFP) offices in Grand Junction and Vernal, water temperature data will be gathered systematically to support the water temperature model and other research projects. Thermographs were installed at five locations on the Gunnison River, five locations on the Colorado River, and five locations on the Green River. The thermographs will be checked periodically 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 gages can be found at:

<http://www.r6.fws.gov/riverdata/>

The temperature data, together with climatic, hydrologic, and stream geometry data, will be used to support ongoing research and future river temperature modeling and backwater studies. The temperature data from each of the thermographs will be made available on the Internet shortly after the data are collected. The temperature data along with the channel monitoring and sediment monitoring data will add to the Recovery Program Physical Data Repository.

Task 2. Hydrology Support for Colorado River Biological Opinions:

The Service Hydrologist helps coordinate releases from Flaming Gorge and the Aspinall Unit for endangered fish. Releases are monitored and researchers and administrators will be notified of important changes in planned releases. The Service Hydrologist will also schedule and monitor releases from Ruedi, Williams Fork and Wolford Mountain Reservoir for flow augmentation in the 15-Mile Reach.

Support activities of the Yampa River Management Plan and Programmatic Biological Opinion in managing the water from Elkhead Reservoir in 2018 through 2022.

The Service Hydrologist coordinates efforts to: Develop a White River management plan that: 1) identifies historic and future depletion scenarios; 2) uses (and refines) the Recovery Program's draft endangered fish flow recommendations and current hydrology to identify the effects of past and future water development on endangered fish habitat; 3) develops flow recommendations for the White River and 4) identifies recovery actions needed to offset depletion effects. A federal-state cooperative or other agreement to implement the resultant management plan will constitute the federal action (likely via USFWS participation) that serves as the basis for a Section 7 consultation and development of a White River PBO

Task 3. Hydrology Support for Other Scopes of Work:

Coordinates Reservoir Operations- Assistance will be provided to Bureau of Reclamation in implementing the annual coordinated reservoir program. A monitoring program will be developed to identify the habitat benefits of coordinated reservoir activities. Work will be 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 reservoirs 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.

The Service Hydrologist works with the Water Acquisition Committee to investigate plans for testing and protecting flow recommendations which protect the environment and protect endangered fish. The Hydrologist will also coordinate efforts to evaluate and implement strategies to help ensure the protection and enhancement of instream flows for the endangered fishes over the long-term, i.e., beyond the life of the Colorado River Recovery Program and/or beyond the de-listing of one or more species.

Task 4. USGS Gage Installation and Maintenance (See SOW #8)

The Service Hydrologist will continue to work with the U.S. Geological Survey, Bureau of Reclamation, and Colorado Division of Wildlife to contract payments for Program gages.

Task 5. Hydrology Support for the Water Acquisition Committee and Water Right Acquisition

- The Service Hydrologist chairs the Water Acquisition Committee (WAC) which oversees water concerns, water investigations, and possible water leasing opportunities. Water right acquisition has become less important recently and optimization of existing facilities has become the focus of the WAC. The tasks listed below support the expanded mission of the WAC.
- Develops scopes of work for water studies and oversees contracts and review of the consultant's work.
- Coordinates flow releases from Elkhead Reservoir with the River District, the City of Craig and the District Engineer's office and holds a weekly call during summer months with interested parties.

- The PD's office and Service Hydrologist will continue to support the Utah ES Field Office in their involvement with the Flaming Gorge Technical Work Group to coordinate flows for critical habitat for the Green River.
- Prepares scopes of work and annual reports for projects in support of WAC activities. Annual reports will be submitted to the Recovery Program Directors Office in November of each year.

Task 6. General Support Activities:

The Service Hydrologist will participate 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, performing independent analyses, and reporting back to the Service and the Water Acquisition Committee. This effort supports the flow filings outlined in the RIPRAP.

The Service Hydrologist will represent the Service and the Recovery Program as a representative at meetings of the "HUP Managing Entities", a group which was set up to implement the Orchard Mesa Check settlement, including management of the 'Historic Users Account' at Green Mountain Reservoir. 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 must be 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 Service Hydrologist also will serve as Recovery Program liaison with the State of Utah and The Nature Conservancy regarding potential additional instream flow protection and enhancement activities on the Price and Duchesne Rivers in Utah. Similarly, the Hydrologist will remain engaged in discussions with the State of Utah, the U.S. Fish & Wildlife Service Ecological Services Office, and environmental interests for the evaluation and development of strategies to address potential impacts of future water resources development along the Green River in Utah.

The Service Hydrologist will participate in updating the RIPRAP, developing Program Guidance and other activities in support of the Program Directors office.

IX. FY 2018 - 2019 Deliverables:

Given the diverse nature of the work involved, some deliverables are hard to specify. Annual progress presentations will be prepared for the Recovery Program and submitted to the WAC for consideration.

Deliverables that are direct products of the tasks outlined above include:

- A database of temperature data is assembled each year for each thermograph that is maintained by the Recovery Program Database Manager. The data will be made available on the Recovery Program's River Data Web Page under 'General' and then 'Recovery Program Elements', then 'Instream Flow Identification & Protection' at: <http://www.r6.fws.gov/riverdata/>

- Each year a report is generated documenting releases from Green Mountain, Ruedi, Granby, Palisade Pipeline and Wolford Mountain reservoirs that describe release volumes to benefit the 15-Mile Reach for endangered fish habitat.
- A report will be prepared as necessary to document work on flow recommendations implementation. The Service Hydrologist will continue to coordinate the reviews by the Geomorphology Peer Review Panel, serve as Chair of the Water Acquisition Committee, develop annual updates to the RIPRAP, coordinate scopes of work, develop meeting agendas, distribute meeting material, and conduct meetings.
- Hydrologic updates will be presented at the Management Committee.
- Scopes of work will be prepared for projects under the purview of the WAC

Work	FY 2018			FY 2019			FY 2020			FY 2021			FY 2020		
	Labor Rates			Labor Rates			Labor Rates			Labor Rates			Labor Rates		
Task 1. Temperature Data	Rate/Week	Weeks	Total	Rate/Week	Weeks	Total	Rate/Week	Weeks	Total	Rate/Week	Weeks	Total	Rate/Week	Weeks	Total
Principal Investigator	\$3,164	3	\$9,492	\$3,227	3	\$9,682	\$3,292	3	\$9,875	\$3,358	3	\$10,074	\$3,425	3	\$10,275
Jim Renne Volunteer		2			2			2			2			2	
Equipment & 1 time software	Thermographs 10 @ \$134		\$1,340	Thermographs 10 @ \$137		\$1,370	Thermographs 10 @ \$139		\$1,390	Thermographs 10 @ \$142		\$1,420	Thermographs 10 @ \$145		\$1,450
Per diem + Hotel (days)	\$144	11	\$1,584	\$148	11	\$1,628	\$151	11	\$1,661	\$154	11	\$1,694	\$157	11	\$1,727
Supplies (Cable, Clamps, Weights)		days	\$609		days	\$621		days	\$634		days	\$646		days	\$659
Grand Junction CRFP										Grand Junction CRFP			Grand Junction CRFP		
Project leader	\$3,238	0.7	\$2,267	\$3,303	0.7	\$2,312	\$3,369	0.7	\$2,358	\$3,436	0.7	\$2,405	\$3,505	0.7	\$2,453
Administrative Officer	\$1,686	0.5	\$843	\$1,720	0.5	\$860	\$1,754	0.5	\$877	\$1,789	0.5	\$895	\$1,825	0.5	\$912
Fishery Biologist	\$2,112	0.4	\$845	\$2,154	0.4	\$862	\$2,197	0.4	\$879	\$2,241	0.4	\$896	\$2,286	0.4	\$914
Biological technician	\$922	4	\$3,688	\$940	4	\$3,762	\$959	4	\$3,835	\$978	4	\$3,913	\$998	4	\$3,990
Vehicle Mileage			\$364			\$374			\$384			\$394			\$404
Supplies			\$109			\$111			\$113			\$116			\$118
Replacement Thermographs	\$134	2	\$268	\$137	2	\$274	\$139	2	\$278	\$142	2	\$284	\$145	2	\$290
Task subtotal			\$8,383			\$8,555			\$8,729			\$8,907			\$9,087
Task 2. BO Hydrology Support															
Principal Investigator	\$3,164	10	\$31,640	\$3,227	10	\$32,273	\$3,292	10	\$32,915	\$3,358	10	\$33,578	\$3,425	10	\$34,252
Bio conferences to update		Days			Days			Days			Days			Days	
Per diem + Hotel	\$144	2	\$288	\$148	2	\$296	\$151	2	\$302	\$154	2	\$308	\$157	2	\$314
Task 3. Other Hydrology Support															
Principal Investigator	\$3,164	9	\$28,476	\$3,227	9	\$29,046	\$3,292	9	\$29,624	\$3,358	9	\$30,221	\$3,425	9	\$30,826
Travel		Days			Days			Days			Days			Days	
Per diem + Hotel	\$144	2	\$288	\$148	2	\$296	\$151	2	\$302	\$154	2	\$308	\$157	2	\$314
TASK 4. Gages															
Principal Investigator	\$3,164	8	\$25,312	\$3,227	8	\$25,818	\$3,292	8	\$26,332	\$3,358	8	\$26,863	\$3,425	8	\$27,401
Travel		Days			Days			Days			Days			Days	
Per diem + Hotel	\$144	2	\$288	\$148	2	\$296	\$151	2	\$302	\$154	2	\$308	\$157	2	\$314
TASK 5. Water Acquisition Committee															
Principal Investigator	\$3,164	9.65	\$30,533	\$3,227	9.65	\$31,143	\$3,292	9.65	\$31,763	\$3,358	9.65	\$32,403	\$3,425	9.65	\$33,053
Utah Water Users, St George	1 trip		\$1,275	1 trip		\$1,301	1 trip		\$1,327	1 trip		\$1,353	1 trip		\$1,380
TASK 6. General Support															
Principal Investigator	\$3,164	12	\$37,968	\$3,227	12	\$38,727	\$3,292	12	\$39,498	\$3,358	12	\$40,294	\$3,425	12	\$41,102
Travel		Days			Days			Days			Days			Days	
Per diem + Hotel	\$144	2	\$288	\$148	2	\$296	\$151	2	\$302	\$154	2	\$308	\$157	2	\$314
Grand Total			\$177,765			\$181,348			\$184,951			\$188,681			\$192,462
Principal Investigator Hydrologist			\$169,381			\$172,793			\$176,227			\$179,778			\$183,381

X. Budget Summary:

FY-2018	The Service Hydrologist	\$ 169,3818
	CRFP Grand Junction	\$8,383
	TOTAL	\$ 177,765
FY-2019	The Service Hydrologist	\$ 172,793
	CRFP Grand Junction	\$8,555
	TOTAL	\$ 181,348
FY-2020	The Service Hydrologist	\$ 176,227
	CRFP Grand Junction	\$8,724
	TOTAL	\$ 184,951
FY-2021	The Service Hydrologist	\$ 179,778
	CRFP Grand Junction	\$8,903
	TOTAL	\$ 188,681
FY-2022	The Service Hydrologist	\$ 183,381
	CRFP Grand Junction	\$9,081
	TOTAL	\$ 192,462

XI. Reviewers: Tom Chart, Angela Kantola, Recovery Program Water Acquisition Committee