



— BUREAU OF —
RECLAMATION

Trout Management Flows White Paper

Technical Work Group Meeting
June 16, 2022

Kerri Pedersen
Bureau of Reclamation
Upper Colorado Basin

What is a trout management flow?

- **One of the flow experiments in LTEMP**
- **Reduce recruitment of rainbow trout to minimize number of rainbow trout moving out of Glen Canyon and downstream to LCR reach.**
- **Peak discharge of water from the dam pushes YOY trout into low angle nearshore habitats, and then the water level is dropped rapidly with the objective of stranding the YOY trout in the shallows.**



LTEMP Biological Opinion

- TMF implemented and tested for efficacy early in LTEMP (preferably first 5 years)
- Trigger is high trout recruitment
- Could be implemented early in LTEMP period even if not triggered by high trout recruitment



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In reply refer to:
AES/OSE
02EAAZ00-2012-F-0059
02EAAZ00-2014-CPA-0029

November 28, 2016

Memorandum

To: Regional Director, Bureau of Reclamation, Upper Colorado Regional Office,
Salt Lake City, Utah

From: Field Supervisor, Arizona Ecological Services Office, U.S. Fish and Wildlife
Service

Subject: Biological Opinion for the Glen Canyon Dam Long-Term Experimental and
Management Plan, Coconino County, Arizona

Thank you for your request for formal consultation/conference with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. § 1531-1544), as amended (Act). Your request was dated August 16, 2016, and received by us via electronic mail the same day. At issue are impacts that may result from the proposed Glen Canyon Dam Long-Term Experimental and Management Plan (LTEMP) located in Coconino County, Arizona. The proposed action may affect the endangered humpback chub (*Gila cypha*) and its critical habitat, the endangered razorback sucker (*Xyrauchen texanus*) and its critical habitat, and the endangered Kanab ambersnail (*Oxytoma kanabensis*).

In your memorandum, you requested our concurrence that the proposed action is not likely to adversely affect the endangered southwestern willow flycatcher (*Empidonax traillii eximius*) and the endangered Yuma Ridgway's rail (*Rallus obsoletus yumanensis*). We concur with your determinations. The basis for our concurrences is found in Appendix A.

This biological opinion (BO) replaces the 2008 Final Biological Opinion on the Operation of Glen Canyon Dam (USFWS 2008, 2009, consultation number 22410-1993-F-167 and the court ordered supplements to that opinion, 22410-1993-F-167-R1). This BO also replaces the 2011 Final Biological Opinion on the Operation of Glen Canyon Dam including High Flow Experiments and Non-Native Fish Control (USFWS 2011a, consultation numbers 22410-2011-F-0100 and 22410-2011-F-0112). Since we issued these BOs, the status of the humpback chub, razorback sucker, and their critical habitat have improved, and the proposed LTEMP action includes conservation actions for these species and their habitats beyond what was included in past operations and BOs.



Past Progress on TMF

- **Series of meetings in 2019**
- **Identify sources of uncertainty**
 - Questions that could be answered with research
 - Questions that could only be answered with full implementation
 - Related to trigger, effectiveness, flow conditions
- **Design of hydrograph**



Purpose of White Paper

- Not a decision document
- Compilation of information to reference when making a decision
- Review current state of science
 - Design
 - Implementation
 - Effectiveness
- Focus on rainbow trout
 - Brown trout included but not the focus
- *Not a substitute for tribal consultation



Outline of Paper

Problem

Purpose

Background

- Recreational Rainbow Trout Fishery
- Trout Management Tools & Experimental Actions

TMF Experimental Design

- Experimental Theory
- Triggering Mechanism

Hydrograph Elements for TMF implementation

Monitoring & Effectiveness

Summary

Other Considerations

Recommendations/Next Steps



Next steps

- Draft paper will be posted on TWG website with June meeting materials
 - Comments focused on topics missing in conversation related to TMFs
- Provide any thoughts/comments to kpetersen@usbr.gov by September 15th, 2022



Questions?



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