



— BUREAU OF —
RECLAMATION



WY 2021 LTEMP Experiments & Other Flows

Lee Traynham
US Bureau of Reclamation

May AMWG Meeting
May 19, 2021

Michael Moran
US Geological Survey
Southwest Biological Science Center

LTEMP Process for Experiments

- Annual Reporting and TWG meetings
- Notification and Consultation to Tribes & PA Parties
- Implementation / Planning Team Recommendation
- DOI decision

1.4 COMMUNICATION AND CONSULTATION PROCESS FOR ALTERNATIVE D

To determine whether conditions are suitable for implementing or discontinuing experimental treatments or management actions, the DOI will schedule implementation/planning meetings or calls with the DOI bureaus (USGS, NPS, FWS, BIA, and Reclamation), WAPA, AZGFD, and one liaison from each Basin State and from the UCRC, as needed or requested by the participants. The implementation/planning group will strive to develop a consensus recommendation to bring forth to the DOI regarding resource issues as detailed at the beginning of this section, as well as including WAPA's assessment of the status of the Basin Fund. The Secretary of the Interior will consider the consensus recommendations of the implementation/planning group, but retains sole discretion to decide how best to accomplish operations and experiments in any given year pursuant to the ROD and other binding obligations.



Potential LTEMP Flow Experiments Water Year 2021

GCD Experimental Flow	Duration	Implementation Window
Fall HFE	up to 96 hours	October - November
Extended Duration Fall HFE	97- 192* or 97-250 hours***	October - November
Spring HFE ^Δ	up to 96 hours	March – April
Proactive Spring HFE ^{Δ◇}	24 hours**	April – June
Trout Management Flows	up to 3 cycles/month for 4 months	May – August
Macroinvertebrate Flows	target 2-3 replicates	May – August

* First test not to exceed 192 hours

Δ no Spring HFE in same WY as extended duration Fall HFE

** First test 24 hours

◇ no proactive Spring HFE in same WY as sediment-driven Spring HFE

*** After first test, up to 250 hours

Other WY2021 Research Flows :

- Apron Repair + Spring Disturbance Flow Test (March)
- Release reduction for Overflight (steady 8,000 cfs for 7 days in May)



WY2021 Bug Flows: PI Team Evaluation Summary

- 3 Consecutive Years Implementation (WY 18-20)
- GCMRC Recommended 4th year (WY 21)
 - ☐ See Q&A Document for summary
- Concerns Identified by the PI Team
 - ☐ Unresolved questions and uncertainties re: effectiveness
 - ☐ Analysis and learning from '18-'20 → what more is needed ?
 - ☐ Doubling of purchase power costs; Status of the Basin Fund
- 4 Alternative Hydrographs considered
 - ☐ Considered adjustments to timing, Weekend/weekday offset
 - ☐ None feasible to meet objectives
- Future Needs
 - ☐ Synthesis report, basin fund education, panel review, etc.



• Recommendation #1:

The LTEMP Planning/Implementation Team (PI Team) recommends that experimental Macroinvertebrate Production Flows (“Bug Flows”) not be implemented at Glen Canyon Dam in water year 2021.

• Recommendation #2:

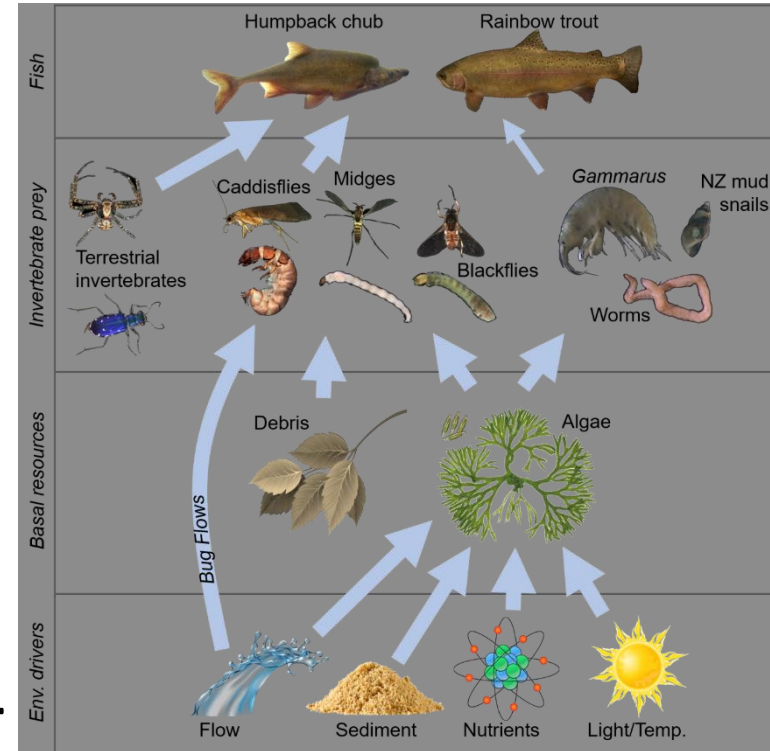
To inform discussion of potential future implementation of the Bug Flows experiment, the PI Team recommends, by consensus, the following next steps for DOI to consider:

- The PI Team commits to document its considerations in a memo to DOI and the LTEMP Leadership Team.
- Request that GCMRC state resource implications for non-implementation of Bug Flows in WY 2021.
- Request that GCMRC complete a report by January 2022 summarizing experimental findings and discuss how the observations of non-implementation compared to the predictions.
- Request that WAPA provide additional information regarding purchase power cost estimates, including assumptions and uncertainty, such that effects to hydropower are minimized if Bug Flows are implemented in the future.
- Request that the Science Advisors Program establish and convene an independent review panel to evaluate the Bug Flows experiment in achieving its objective and to develop opportunities for further experimentation.



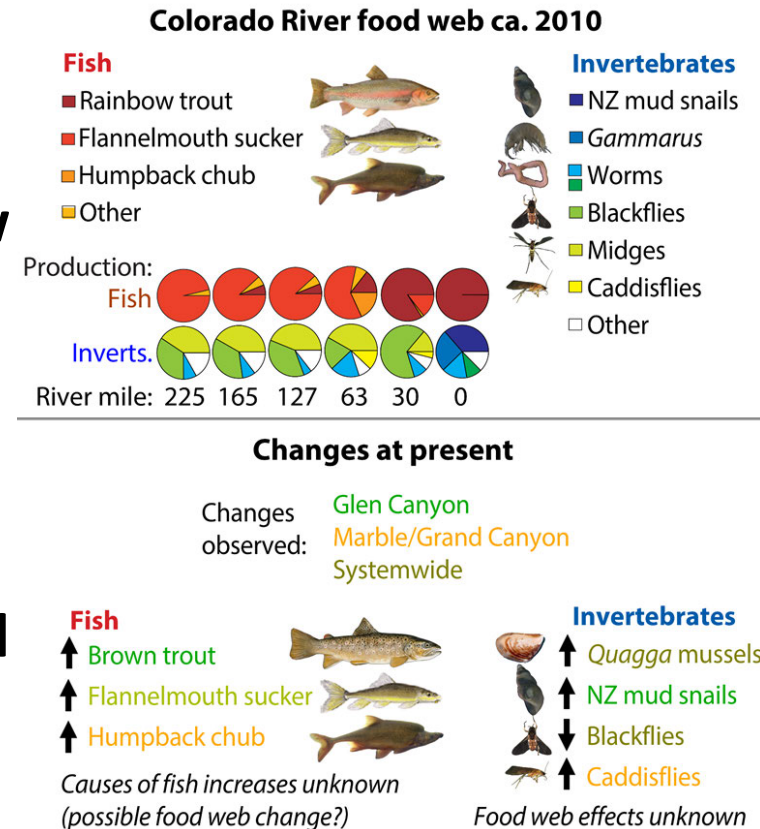
Bug Flows – Next Steps

- Bug Flows Synthesis first draft report fall 2021
- Report will summarize experimental findings from 3 years of Bug Flows, 2018, 2019, 2020, compared to pre-Bug Flow baseline (2012-2017)
- Discuss how the observations of non-implementation (2021) compared to the predictions



Bug Flows – Next Steps

- Review panel will convene to review report with results by late 2021 or early 2022
- Broader discussion of panel results and recommendations and potential Bug Flow implementation (2022) in early 2022



Aquatic Foodbase Monitoring

- GCMRC will continue to monitor the aquatic foodbase as outlined in FY2021-2023 TWP
- Accomplished through monitoring aquatic invertebrate abundance and distribution through various life stages
- Results from this work will inform the status of aquatic foodbase resources and effectiveness of Bug Flows



2021 Remote Sensing Overflight

What?

- Orthorectified imagery with 20 cm resolution
- Digital elevation model with a 1-meter resolution

Where?

- Glen Canyon Dam to Pearce Ferry Rapid

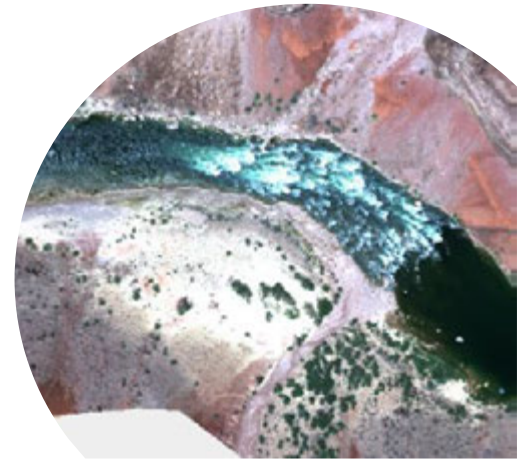
Why?

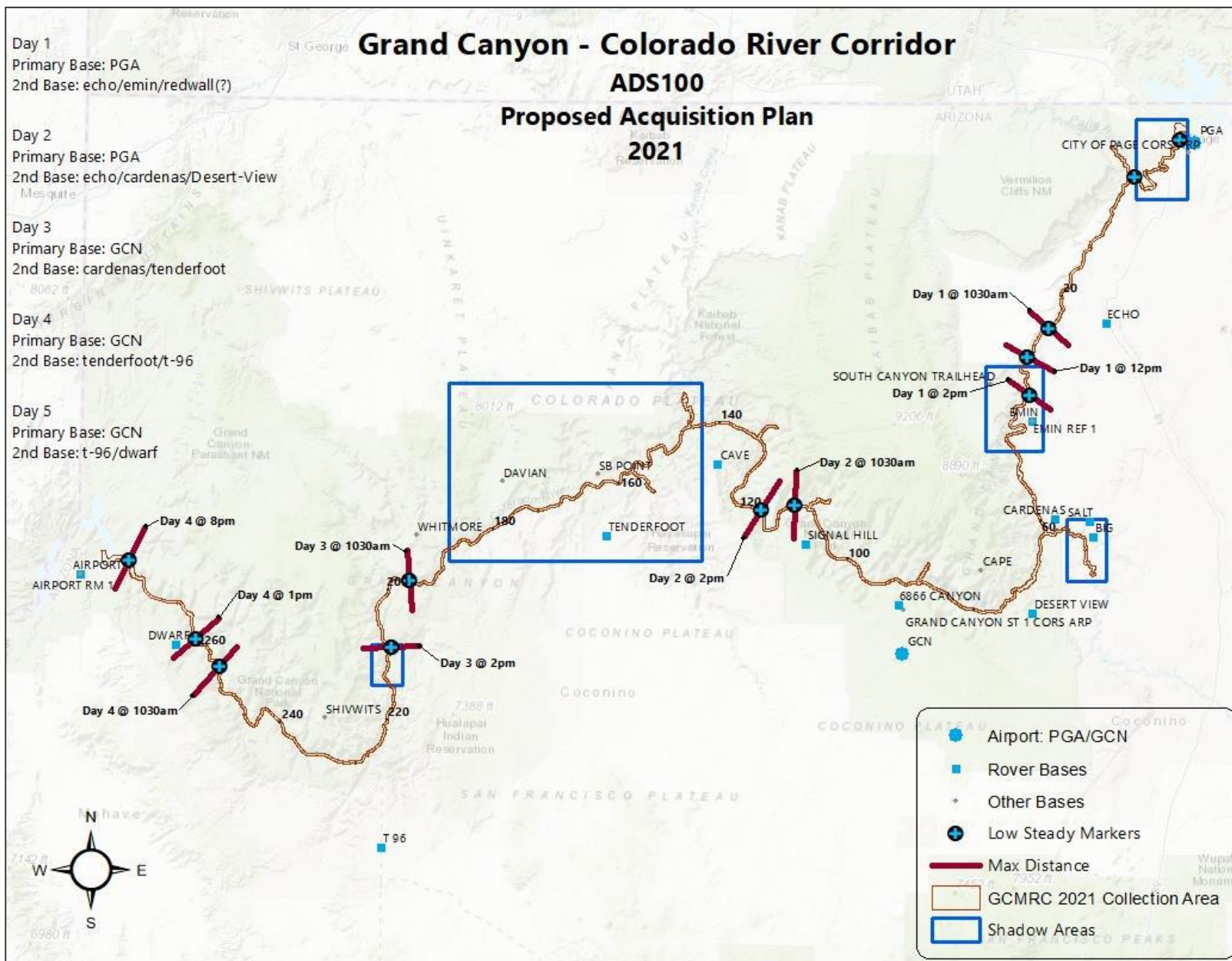
- Critical for GCMRC's ability to implement LTEMP requirements of tracking decadal-scale changes to ecosystem resources



2021 Remote Sensing Overflight

- **Steady 8,000 ft³/s GCD Release**
 - Starts 6 pm Friday May 28, 2021
 - Stops 4 am morning Friday June 4, 2021
- **Gives contractor 8 days of flying to acquire data**
 - Flights commence on Saturday May 29th
 - ~10 am to 2 pm each day
 - minimizes shadows
 - Start at GCD, move downstream with 8k flow
- **Inclement weather may require extending daily flight window and/or duration of mission**





Spring Disturbance Flow

What?

- Low flow for dam maintenance (4k cfs) and then high flow (20k cfs) at power-plant capacity

When?

- March 15-25, 2021

Why?

- Study ecosystem disturbance effects of spring low flow followed by high flow



Spring Disturbance Flow



Vegetation monitoring



Aeolian sand measurements



Fish stranding study



Benthic invertebrate sampling

Spring Disturbance Flow



Foodbase monitoring



Nutrients



Photo matching



Sediment sampling

Spring Disturbance Flow – Foodbase Results

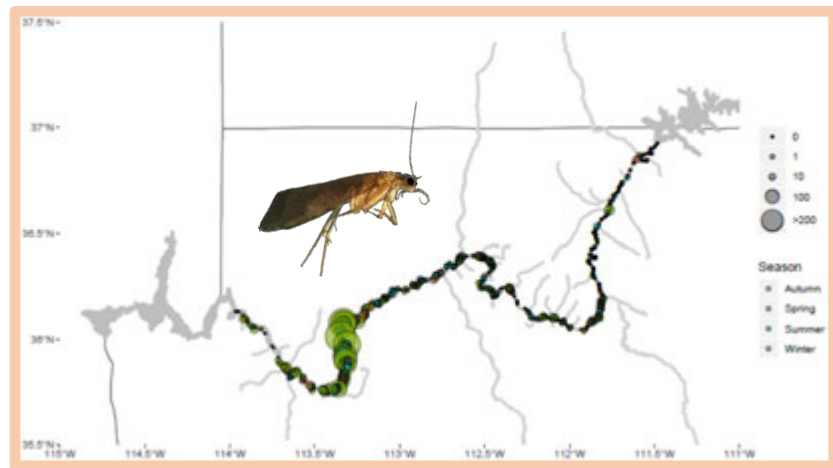
- Starting in 2018, citizen science light traps showed *Hydropsychid oslari* (net-spinning caddisflies) were common below Parashant (River Mile 199)
- This spatial pattern was confirmed by river bottom sampling of insects during Spring Disturbance Flow
- Thus, citizen science light traps are reliable method of monitoring aquatic insects



Citizen science
light trapping



Benthic sampling



Spring Disturbance Flow – Fish Results

- Small numbers of fish caught in isolated pools
- More non-natives than natives
- No humpback chub found in pools
- No evidence of widespread stranding



Questions?



— BUREAU OF —
RECLAMATION

