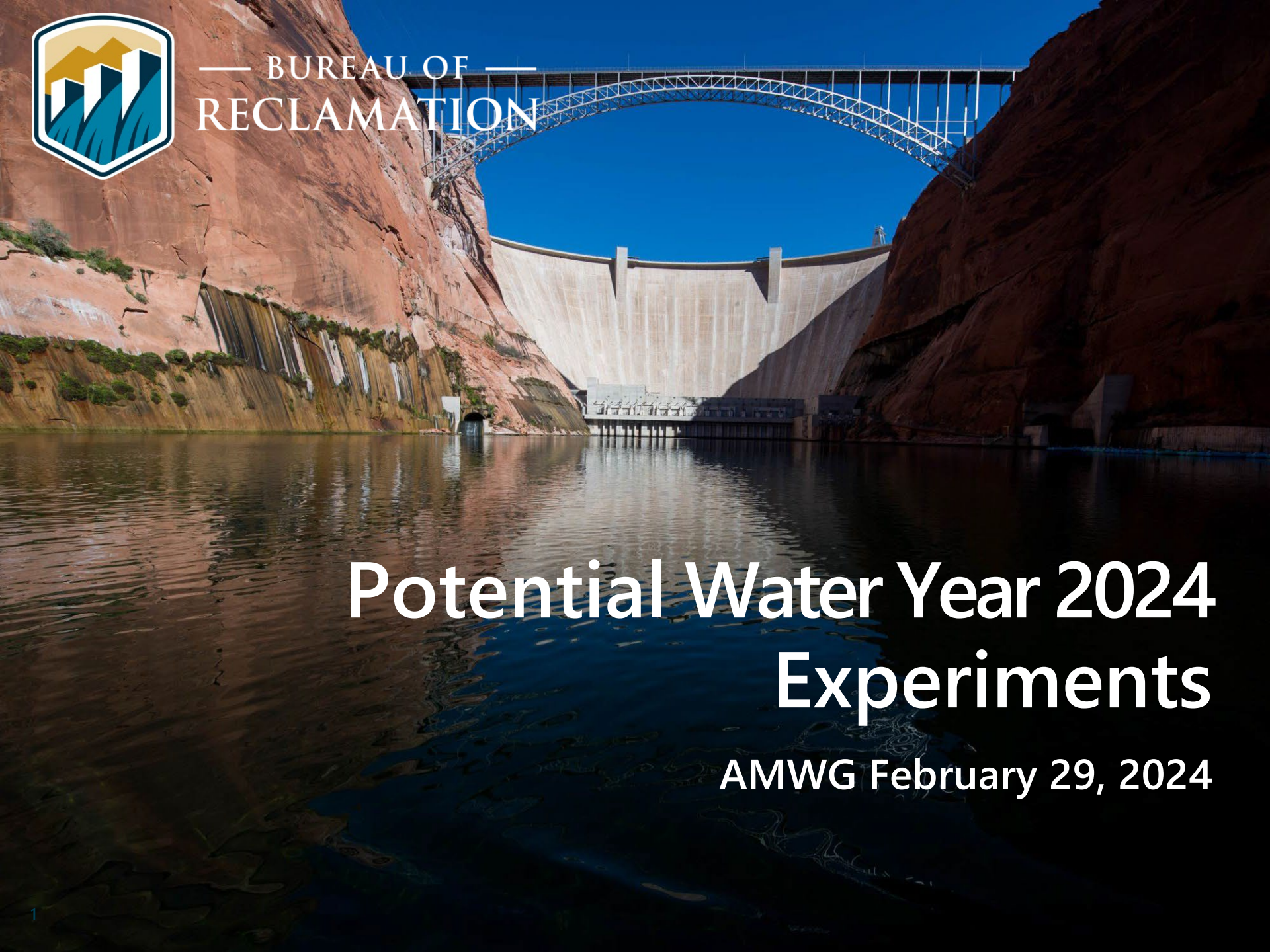


Potential Water Year 2024 Experiments

AMWG February 29, 2024

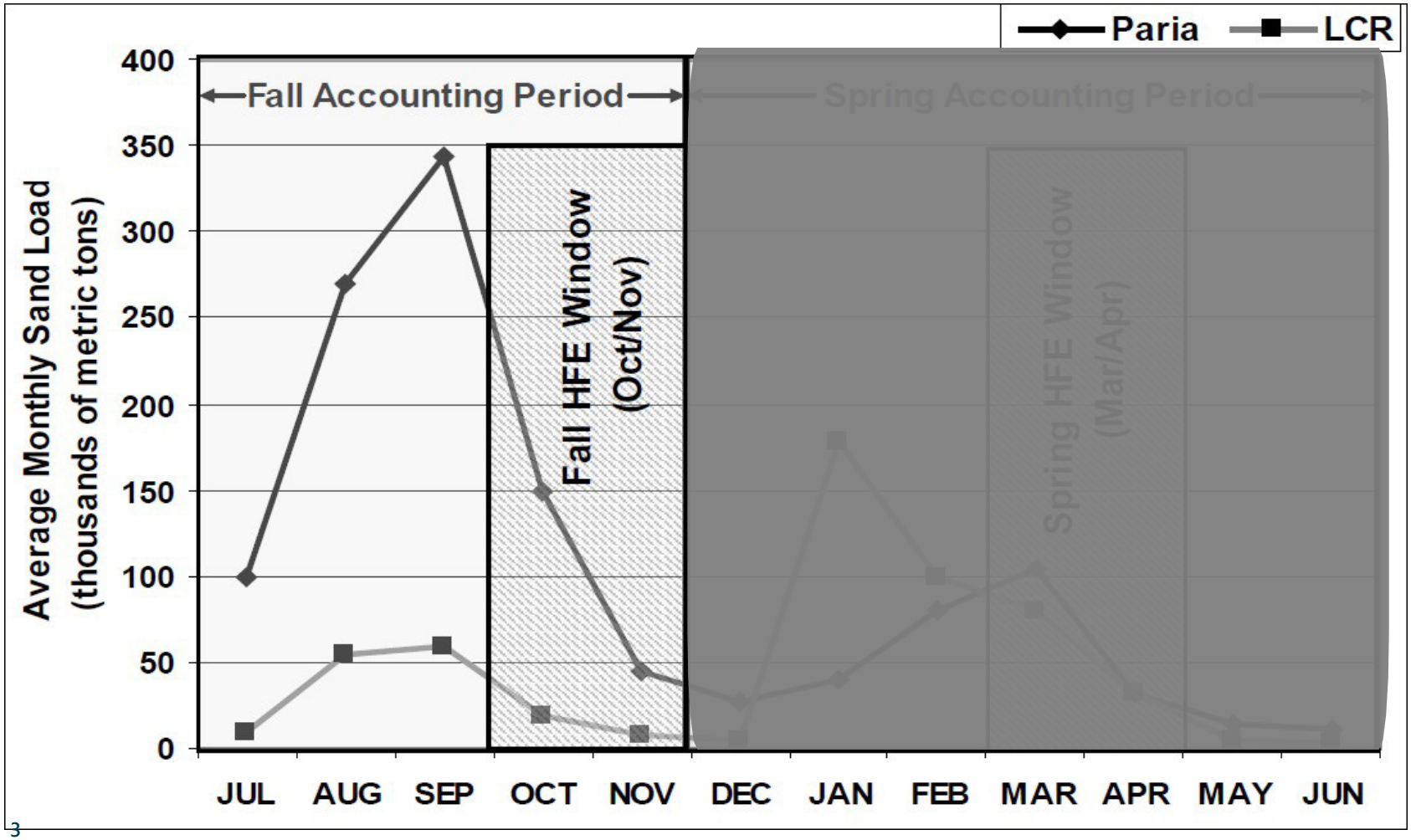
Planning and Implementation

- Planning / Implementation team coordination
- Strives for consensus recommendation to DOI
- Secretary of the Interior makes decision

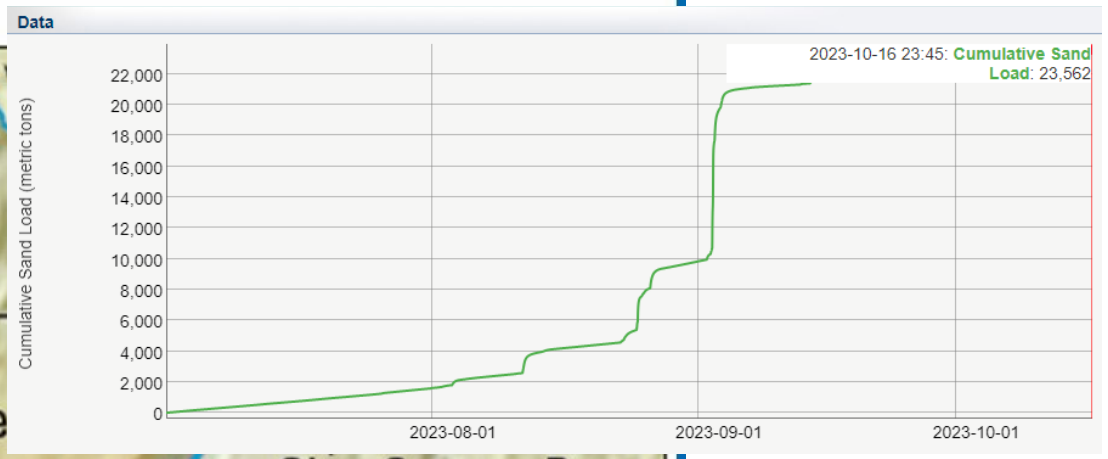
1.4 COMMUNICATION AND CONSULTATION PROCESS FOR ALTERNATIVE D

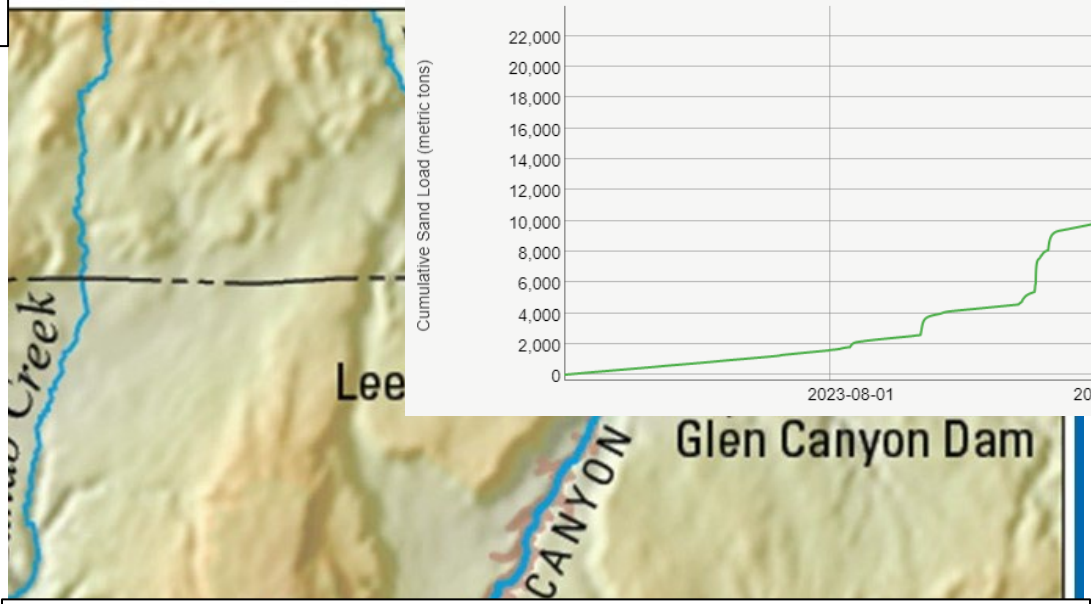
To determine whether conditions are suitable for implementing or discontinuing experimental treatments or management actions, the DOI will schedule implementation/planning meetings or calls with the DOI bureaus (USGS, NPS, FWS, BIA, and Reclamation), WAPA, AZGFD, and one liaison from each Basin State 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.

HFE Accounting & Implementation Windows

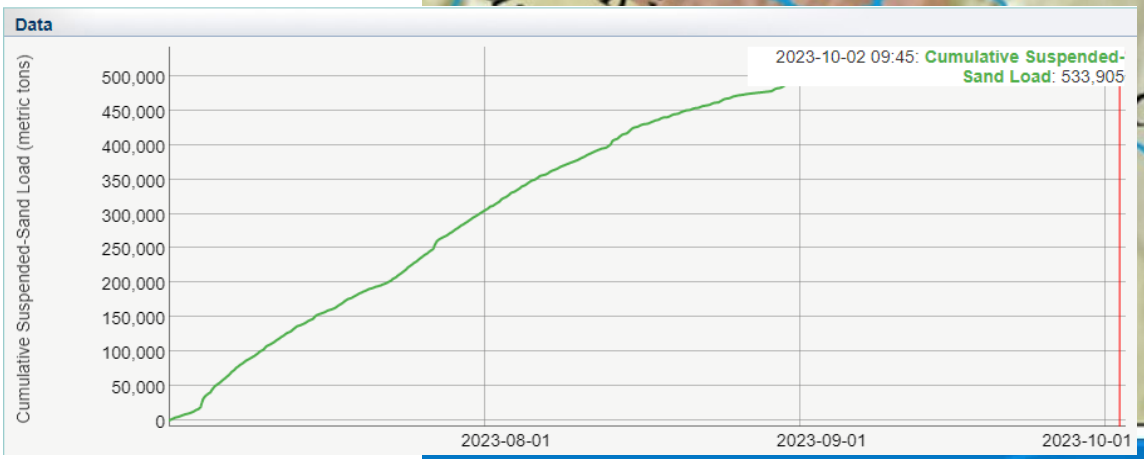


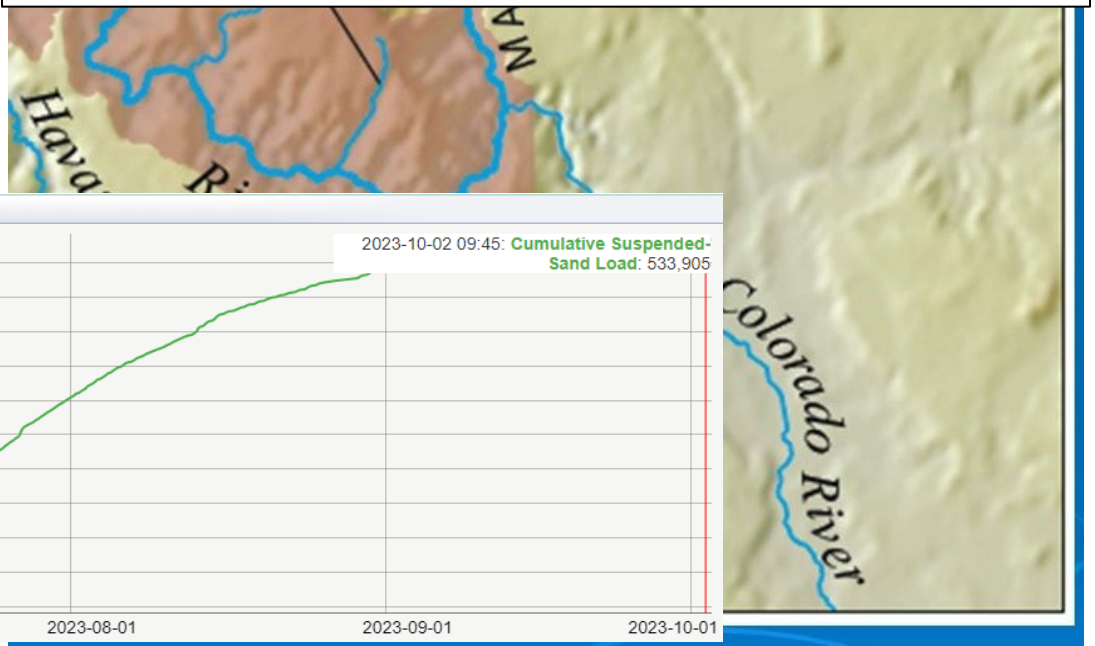
Fall WY 2024





- 530,000 ± 30,000





LTEMP Flow Experiments w/ Spring WY 2024 Potential

GCD Experimental Flow	Duration	Implementation Window
Spring HFE$^{\Delta}$	up to 96 hours	March – April
Proactive Spring HFE$^{\Delta\Diamond}$	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
Extended Duration Fall HFE	97- 192* or 97-250 hours***	October - November

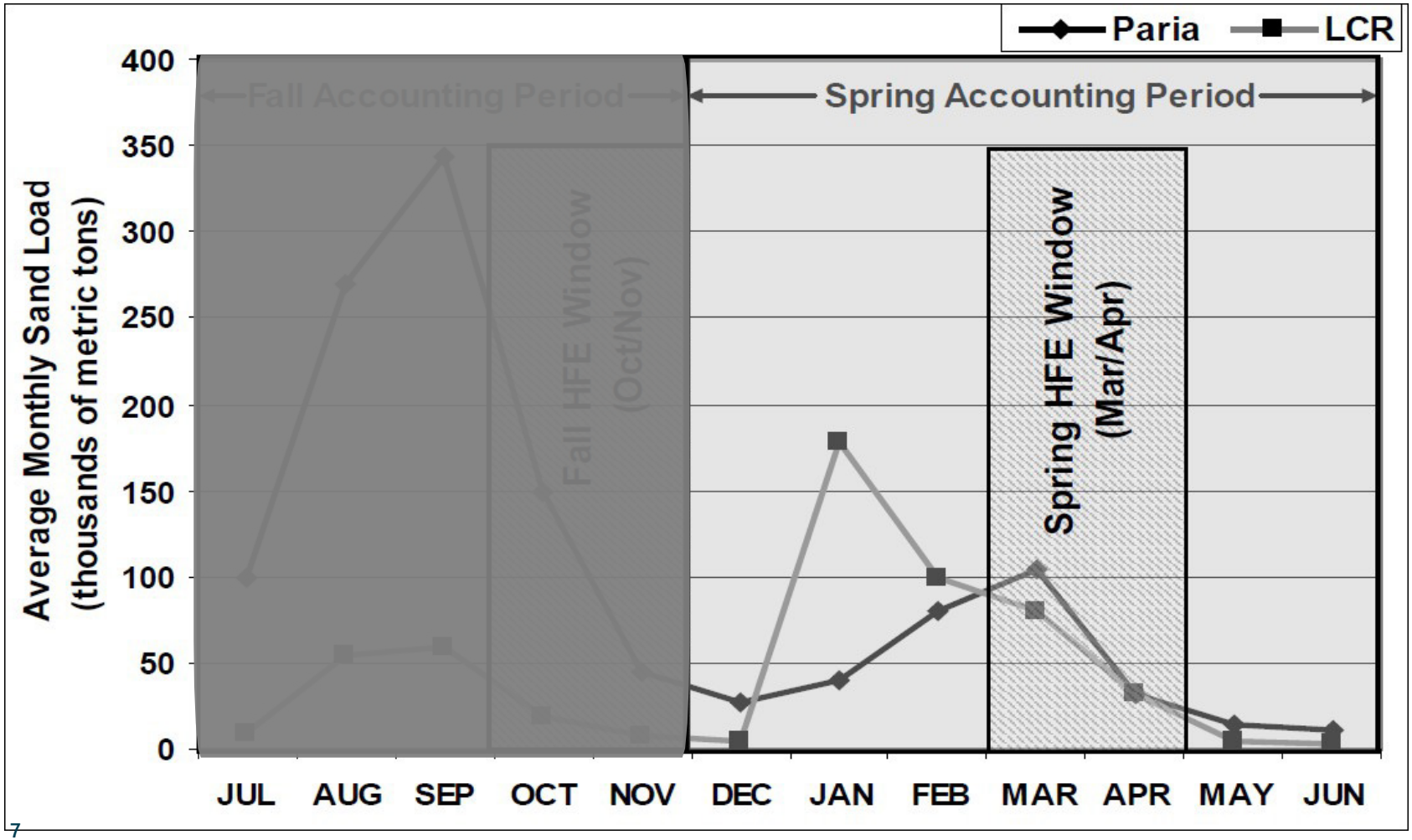
* First test not to exceed 192 hours
** First test 24 hours
*** After first test, up to 250 hours

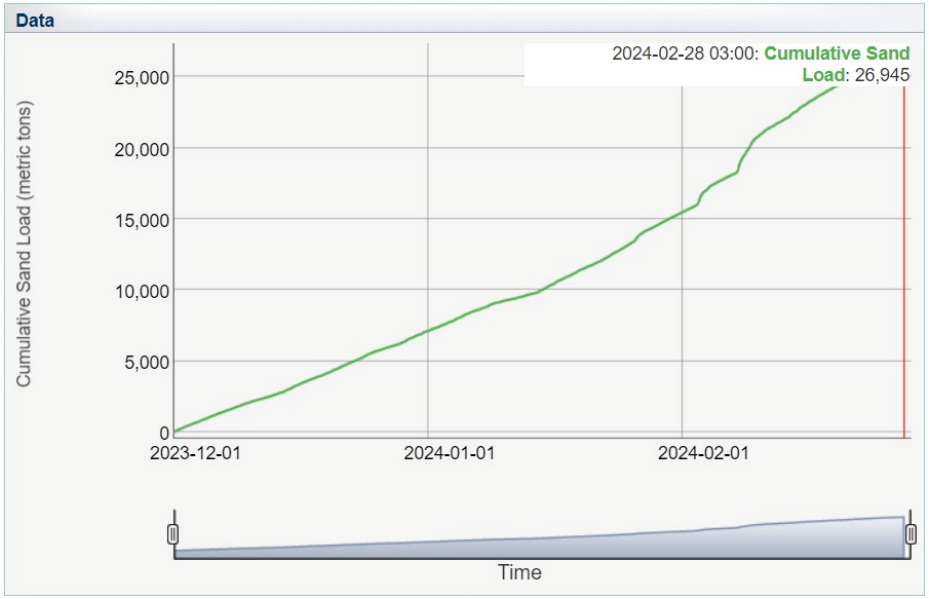
Δ no Spring HFE in same WY as extended duration Fall HFE
◊ no proactive Spring HFE in same WY as sediment-driven Spring HFE

HFE Protocol – LTEMP ROD

1. Planning and Budgeting
   - Annual resource status assessment
   - Annual Agency Reporting
   - GCDAMP Budget and Work Plan Process
2. Modeling
3. Decision and Implementation Component
   - Review modeling <- we are here
   - Review status of resources
   - Consultation with agencies and tribes
   - TWG / AMWG input - webinar
   - GCD Leadership Team recommendation
   - DOI Decision – Secretary's Designee

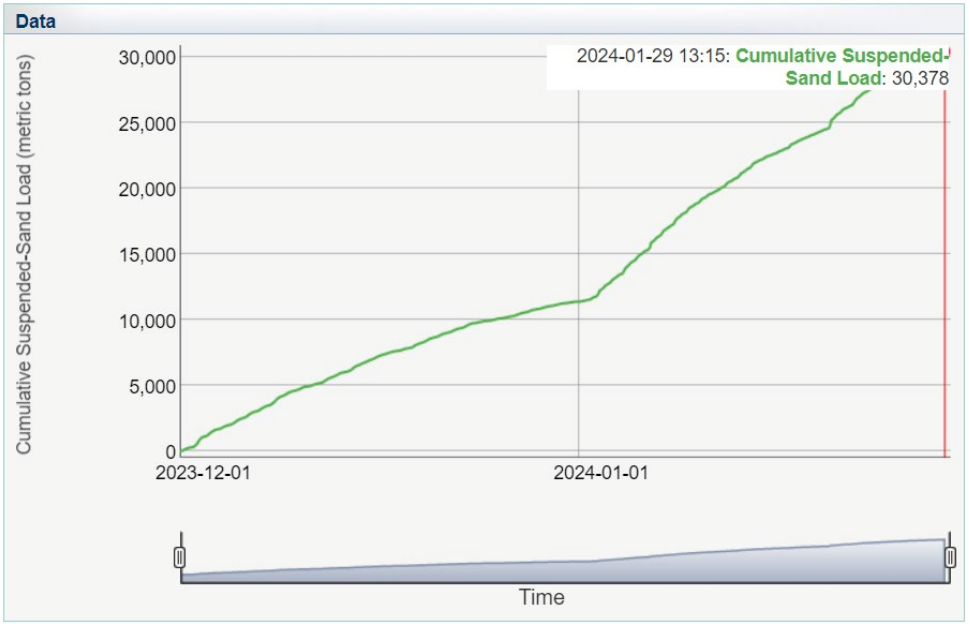
HFE Accounting & Implementation Windows





Paria River at Lees Ferry

Colorado River above Little Colorado River near Desert View, AZ



Experimental Flow Timelines

- PA notification
- Monitor conditions
  - Holds on calendars, cancel if no updates in sediment conditions.
  - Discuss alternative experimental flows in Early March
- Virtual AMWG/TWG webinar: Mid/Late March – If Needed
- Final Technical Team call and recommendation
- Leadership team recommendation
- DOI decision: ~ Late March/Early April
- Notification of decision: ~ Late March/Early April
- Potential Implementation: ~ April 15-22, 2024

LTEMP Flow Experiments w/ WY 2024 Potential

GCD Experimental Flow	Duration	Implementation Window
Spring HFE$^{\Delta}$	up to 96 hours	March – April
Proactive Spring HFE$^{\Delta\lozenge}$	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
** First test 24 hours
*** After first test, up to 250 hours

Δ no Spring HFE in same WY as extended duration Fall HFE
◊ no proactive Spring HFE in same WY as sediment-driven Spring HFE

Questions?

BUREAU OF
RECLAMATION

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TABLE 4 Implementation Criteria for Experimental Treatments of Alternative D

Experimental Treatment	Trigger[a] and Primary Objective	Replicates	Duration	Annual Implementation Considerations[b]	Long-Term Off-Ramp Conditions[c]	Action if Successful
Sediment-Related Experiments[d]						
Spring HFE up to 45,000 cfs in Mar. or Apr.	Trigger: Sufficient Paria River sediment input in spring accounting period (Dec.–Jun.) to achieve a positive sand mass balance in Marble Canyon with implementation of an HFE Objective: Rebuild sandbars	Not conducted during first 2 years of LTEMP, otherwise implement in each year triggered, dependent on resource condition and response	≤96 hr	Potential short-term unacceptable impacts on resources listed in Section 1.3; unacceptable cumulative effects of sequential HFEs; sediment-triggered spring HFEs will not occur in the same water year as an extended-duration (>96 hr) fall HFE	Sediment-triggered spring HFEs are not effective in building sandbars; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment when triggered and existing resource conditions allow
Proactive spring HFE up to 45,000 cfs (Apr., May, or Jun.)	Trigger: High-volume year with planned equalization releases (≥10 maf) Objective: Protect sand supply from equalization releases	Not conducted during first 2 years of LTEMP, otherwise implement in each year triggered, dependent on resource condition and response	First test 24 hr; subsequent tests could be shorter, but not longer, depending on results of first tests	Potential short-term unacceptable impacts on resources listed in Section 1.3; unacceptable cumulative effects of sequential HFEs; will not be implemented in the same water year as a sediment-triggered spring HFE or extended-duration fall HFE	Proactive spring HFEs are not effective in building sandbars; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment when triggered and existing resource conditions allow

TABLE 4 (Cont.)

Experimental Treatment	Trigger[a] and Primary Objective	Replicates	Duration	Annual Implementation Considerations[b]	Long-Term Off-Ramp Conditions[c]	Action if Successful
Sediment-Related Experiments (Cont.)						
Fall HFE ≤96 hr up to 45,000 cfs in Oct. or Nov.	Trigger: Sufficient Paria River sediment input in fall accounting period (Jul.–Nov.) to achieve a positive sand mass balance in Marble Canyon with implementation of an HFE Objective: Rebuild sandbars	Implement in each year triggered, dependent on resource condition and response	≤96 hr	Potential short-term unacceptable impacts on resources listed in Section 1.3; unacceptable cumulative effects of sequential HFEs	This type of fall HFE is not effective in building sandbars; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment when triggered and existing resource conditions allow
Fall HFEs longer than 96-hr duration up to 45,000 cfs in Oct. or Nov.	Trigger: Sufficient Paria River sediment input in fall accounting period (Jul.–Nov.) to achieve a positive sand mass balance in Marble Canyon with implementation of an HFE longer than a 96-hr, up to 45,000-cfs flow Objective: Rebuild sandbars	Implement in each year triggered; limited to total of four tests in LTEMP period	Up to 250 hr depending on availability of sand duration of first test not to exceed 192 hr	Potential short-term unacceptable impacts on resources listed in Section 1.3; unacceptable cumulative effects of sequential HFEs	Extended-duration fall HFEs are not effective in building sandbars; resulting sandbars are no bigger than those created by shorter-duration HFEs; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment when triggered and existing resource conditions allow

TABLE 4 (Cont.)

Experimental Treatment	Trigger[a] and Primary Objective	Replicates	Duration	Annual Implementation Considerations[b]	Long-Term Off-Ramp Conditions[c]	Action if Successful
Aquatic Resource-Related Experiments[e]						
Trout management flows	Trigger: Predicted high trout recruitment in the Glen Canyon reach Objective: Test efficacy of flow regime on trout numbers and survival of humpback chub	Implement as needed when triggered after consultation with Tribes; test may be conducted early in the 20-year period even if not triggered by high trout recruitment[f]	Implemented in as many as 4 months (May–Aug.)	Potential short-term unacceptable impacts on resources listed in Section 1.3	TMFs have little or no effect on trout recruitment after at least three tests; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment triggered by predicted high trout recruitment in Glen Canyon, taking into consideration Tribal concerns
Tier 1: Expanded translocation of humpback chub in the Little Colorado River	Trigger: Number of adult or subadult humpback chub in the Little Colorado River reach below Tier 1 triggers Objective: Increase number of adult and subadult humpback chub	Implement in each year triggered unless determined ineffective	As needed	Potential short-term unacceptable impacts on resources listed in Section 1.3	Expanded translocation has little or no effect on increasing the number of adult or subadult humpback chub; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment when triggered and existing resource conditions allow
Tier 1: Implement head-start program for larval humpback chub	Trigger: Number of adult or subadult humpback chub in the Little Colorado River reach below Tier 1 triggers Objective: Increase number of adult and subadult humpback chub	Implement in each year triggered unless determined ineffective	As needed	Potential short-term unacceptable impacts on resources listed in Section 1.3	Head-start program has little or no effect on increasing the number of adult or subadult humpback chub; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment when triggered and existing resource conditions allow

TABLE 4 (Cont.)

Experimental Treatment	Trigger[a] and Primary Objective	Replicates	Duration	Annual Implementation Considerations[b]	Long-Term Off-Ramp Conditions[c]	Action if Successful
Aquatic Resource-Related Experiments (Cont.)						
Macroinvertebrate production flows	Trigger: None Objective: Improve food base productivity and abundance or diversity of mayflies, stoneflies, and caddisflies	Target two to three replicates	Up to 4 months (May–Aug.)[g]	Potential short-term unacceptable impacts on resources listed in Section 1.3; coordinate planning with other experiments to avoid confounding conditions or results	Steady weekend flows have little or no benefit on food base, trout fishery, or native fish; increase in warmwater nonnative species or trout at the Little Colorado River; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment in target months when conditions allow
Riparian Vegetation Experiments						
Non-flow vegetation treatments	Trigger: None Objective: Improve vegetation conditions at key sites	Not applicable	20 years if successful pilot phase	Potential short-term unacceptable impacts on resources listed in Section 1.3	Control and replanting techniques are not effective or practical; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment if invasive species can be reduced and native species increased

[a] Triggers will be modified as needed during the 20-year LTEMP period in an adaptive manner through processes including ESA consultation and based on the best available science utilizing the experimental framework for each alternative.i

[b] Annual determination by the DOI. Any implementation will consider resource condition assessments and resource concerns using the annual processes described in Sections 1.3 and 1.4.

[c] Suspension of experiment if the DOI determines effects cannot be mitigated.

[d] Details of implementation of sediment experiments are presented in Section 2.1.i

[e] Details of implementation of aquatic resource experiments are presented in Section 2.2.i

[f] The decision to conduct TMFs in a given year will consider the resource conditions, as specified in Section 1.3, and will also involve considerations regarding the efficacyi of the test based on those resource conditions.

[g] The duration and other characteristics of experimental macroinvertebrate production flows could be adjusted based on the results of initial experiments.