

Glen Canyon Dam Adaptive Management Work Group
Agenda Item Form
August 24-25, 2016

Agenda Item

Long-Term Experimental Management Plan (LTEMP) Environmental Impact Statement (EIS)
Update and Science Plan

Purpose of Agenda Item

To provide an update on, and an opportunity to ask questions about, the LTEMP EIS and its associated science plan.

Action Requested

Information item only. We will answer questions; no action is requested.

Presenters

Rob Billerbeck, Colorado River Coordinator, National Park Service
Katrina Grantz, Chief, Adaptive Management Group, Upper Colorado River Region, Bureau of Reclamation
Scott VanderKooi, Chief, Grand Canyon Monitoring and Research Center

Previous Action Taken

June 29, 2015: The Cooperating Agency Draft EIS, Volume 1 was released.
July 31, 2015: The Cooperating Agency Draft EIS Appendices, Volume 2, was released.
January 8, 2016: The Public Draft EIS (DEIS) was released for comment, with a deadline of April 7, 2016. This was later extended to May 9.
February 16-March 1, 2016: Two public meetings and two webinars were held to take comments and answer questions on the DEIS.
May 9, 2016: Public comment period on the DEIS was closed.

Relevant Science

The full text of the LTEMP DEIS is available here: <http://ltempeis.anl.gov/documents/draft-eis/>.

Summary of Presentation and Background Information

LTEMP EIS Update

Rob Billerbeck and Katrina Grantz will present an overview of the LTEMP EIS with a description of the preferred alternative. The presentation will highlight all changes made to the preferred alternative and the text of the EIS since the release of the public draft. The presentation will also briefly describe the general types of comments received on the draft EIS and describe how these comments were addressed. The next steps for the Endangered Species Act consultation (Biological Assessment and Biological Opinion), National Historic Preservation Act Section 106 compliance

(Programmatic Agreement), and anticipated timeline for Final EIS and Record of Decision will also be discussed.

LTEMP Science Plan

Scott VanderKooi will provide an overview of the LTEMP Science Plan. The science plan provides the strategy by which monitoring and research data in the natural and social sciences will be collected, analyzed, and provided to the Department of the Interior (DOI), its bureaus, and to the Glen Canyon Dam Adaptive Management Program (GCDAMP) during the LTEMP period. The LTEMP Science Plan describes the overall data collection, analysis, modeling, and interpretation activities to be conducted by the U.S. Geological Survey Grand Canyon Monitoring and Research Center (GCMRC), partner agencies and its cooperators that will inform decisions about operations of Glen Canyon Dam and management of downstream resources. The specific activities will be described in GCMRC's Triennial Work Plans that will be developed during the LTEMP implementation period and will be reviewed and recommended by the GCDAMP and approved by the Secretary of the Interior.

Glen Canyon Dam LTEMP EIS

AMWG Presentation
August, 2016

Katrina Grantz, Reclamation
Rob Billerbeck, NPS

<http://ltempeis.anl.gov>





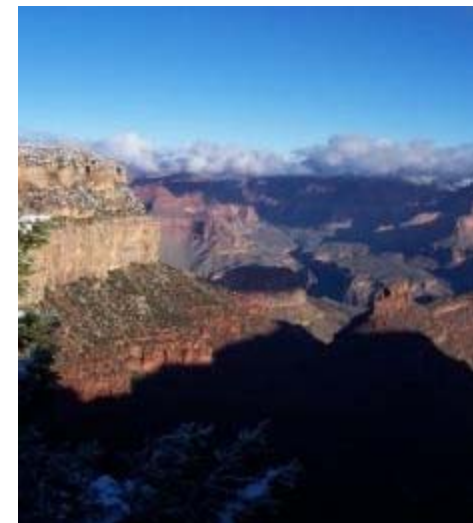
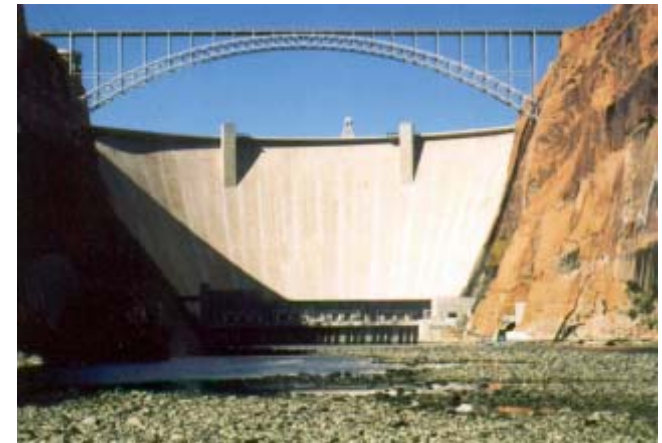
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Long-Term Experimental and Management Plan EIS



LTEMP is a Joint Lead Process

- Bureau of Reclamation operates Glen Canyon Dam
- National Park Service manages Grand Canyon National Park and Glen Canyon and Lake Mead National Recreation Areas
- Argonne National Laboratory, Reclamation, and NPS staff prepared the draft EIS





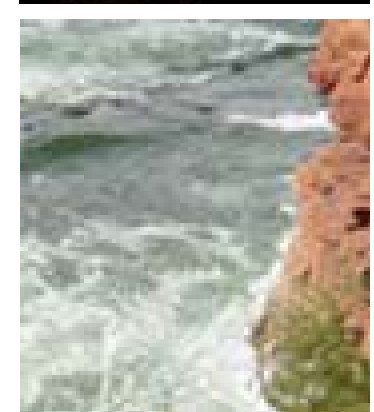
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Reminder – Why did we do this plan?

- To utilize new scientific information gathered since the last EIS on Glen Canyon Dam operations in 1995
- To comply with ongoing requirements and to protect natural and cultural resources in compliance with the 1992 Grand Canyon Protection Act
- We believe based on the research since 1996 that we can make changes to better achieve the resource goals of GCPA





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Long-Term Experimental and Management Plan EIS



Characteristics of the Preferred Alternative D

Component	Preferred Alternative
Monthly volumes	Lower volume Sep-Oct, relatively even rest of year. In an 8.23 year, August volume of 800 kaf.
Daily fluctuations	10 x kaf in June-Aug, 9 x kaf in other months Maximum daily range of 8,000 cfs
Proactive spring HFEs	Not in first 2 years, but then possible in the rest of the 20 years when triggered by release volume levels (>10maf). Not in the same water year as extended-duration fall HFEs.
Sediment-triggered spring HFEs	Not in first 2 years, but then possible in the rest of the 20 years when triggered. Not in the same water year as extended-duration fall HFEs.
Sediment-triggered fall HFEs	Possible in all 20 years when triggered.
Extended-duration fall HFE	Up to 250 hr but implemented in phases and limited to 4 per 20 years. First implementation 192 hr.
Trout management flows	Test early in the LTEMP period and implement when triggered based on predicted trout recruitment levels if successful.
Low summer flows	Test possible in years 11-20. Additional science panel review.
Conservation Measures	Tier 1 – expanded translocation of HBC in LCR, and head start program for larval HBC
Mechanical removal of trout	Now a tier 2 action after tier 1 actions are tried, language included referring to consultation and beneficial use



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Preferred Alternative—Alternative D (Hybrid)

What has not changed

- Monthly volume pattern still similar to Alternative E (the Basin States RTCD alternative) but with a higher August monthly volume (800 kaf rather than 750 kaf in 8.23 year adjusted for hydropower capacity). Has not changed from the DEIS.
- Fluctuations are set proportionally rather than in a step-wise manner as was the case for MLFF. The level of daily fluctuations are comparable to MLFF to slightly more on average. 8,000 cfs cap level still same as MLFF. Downramp rate is still greater than No action/MLFF by 1,000 cfs. Has not changed from the DEIS.
- Still includes fish management tools including: macroinvertebrate production flows (“bug flows”), trout management flows, mechanical removal, and low summer flows. These would be implemented with careful communication and consultation to take into account resource conditions and tribal concerns.
- Still includes spring and fall High Flow Experiments similar to those under the existing protocol as well as Proactive Spring HFEs in equalization years and Extended-Duration Fall HFEs in years when a very high sediment trigger is met.



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Preferred Alternative—Alternative D (Hybrid) What has changed

- Removed load following curtailment experiment after the HFEs.
- Clarified language about no spring HFEs (sediment triggered or proactive) in the same water year as an extended-duration fall HFE.
- Provided for additional science reviews before Low Summer Flows (LSF) at the 10 year mark prior to implementation of an LSF test.
- Included more language regarding tribal concerns about fish management tools and based on consultation with tribes and with USFWS, included a two tier system to make mechanical removal an action ‘of last resort’, and provided more commitments of consultations and finding of beneficial uses for fish.
- Included additional conservation measures for HBC



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Collaboration on Alternative D

- Proportional change to fluctuations for operational efficiency
- Down ramp rate increase for hydropower flexibility
- Monthly volumes – tracking hydropower contract rate of delivery most of the year and for sediment conservation
- Oct-Dec total volume same as no action to avoid affecting Lake Powell operating tier
- Increased August release volume from 750 kaf to 800 kaf (8.23 maf years)
- Removal of the post-HFE load curtailment experiment
- Removal of sediment triggered spring HFEs in the same water year as extended duration fall HFEs
- Inclusion of additional process checks and analysis prior to implementing low summer flows and still only in second 10 years.
- Additional fish tiers to respond to tribal fish concerns



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Text - Adjustments to Chp 1 Introduction

- Text – geographic scope – incorporation of the “Colorado River Ecosystem” term
- Text – minor clarifications of goals and objectives
 - Clarifying LTEMP will not affect water delivery
 - Clarification of humpback chub recovery goals and range
 - Clarification that LTEMP is not addressing recovery implementation plans
- Text – water management related language adjustments throughout



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Text - Adjustments to Chp 2 - Alternatives

- Text – references to new Appendix P for HFE protocol
- Text – adjusted language for vegetation treatment and extent
- Text – revised language regarding recovery implementation plans
- Text – water related language adjustments throughout
- Text – Alternative D clarifications and adjustments
 - Removal of post HFE curtailment experiment
 - Clarification of no spring HFEs in same year as extended HFEs
 - Clarifications of annual communication and consultation process for experiments and resource checks
 - Incorporation of tiered conservation measures prior to mechanical removal of non-natives
 - Low summer flow language updates and scientific panel
 - Reference to Appendix P for HFE protocol
- Text – summary table updates and standardization



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Text - Adjustments to Chp 3 – Affected Environment

- Text – updated/added tribal perspectives throughout
- Text – water mgmt language adjustments, mostly in water resources
- Text – updated information in Lake Mead water quality section
- Text – updated aeolian studies in sediment and cultural
- Text – updated to include newer data from recent HFEs
- Text – updated foodbase studies and non-natives in aquatic resources
- Text – updated wildlife section for turtles, flycatchers and rails
- Text – cultural adjusted APE language
- Text – socioeconomics – clarifications and passive use study updates and Loomis study reference



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Text - Adjustments to Chp 4 – Environmental Consequences

- Text – water management related language adjustments throughout
- Text – recent HFE info and low summer flow effects throughout
- Text – updated tribal perspectives throughout
- Text – aquatics – updated foodbase and low summer flow info
- Text – vegetation – updated HFE effects and treatment extent
- Text – wildlife – updated flycatcher and rail information
- Text – cultural – updated aeolian references
- Text – tribal resources – updated concerns related to fish management and Hualapai recreation effects
- Text – recreation – updated effects to fishing and Hualapai recreation
- Text – wilderness – updated language



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Text - Adjustments to Chp 4 – Environmental Consequences

- Text - hydropower
 - Clarification of economic vs. financial analysis
 - Updates to Hoover analysis
 - Updates to modeling costs and experimental cost summary
 - References to sensitivity analyses
 - Clarifications regarding wholesale/retail assumptions
- Text – socioeconomic – passive use studies
- Text – additions to cumulative impacts (1996 ROD, Aspinall, Flaming Gorge, Navajo Generating Station, updated language on climate change, water management details and minor revisions on irreversible commitments)



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Text - Adjustments to Appendices

- Appendix K – hydropower
 - Many language and technical clarifications
 - Addition of a new sensitivity analysis for cost of hydropower capacity powerplant replacement type (combined cycle vs gas turbine)
 - Updated cost/method for ‘bug’ flows
 - Clarification on Hoover dam analysis



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Conservation Measures

Humpback Chub

Ongoing actions

Translocations to tributaries, monitoring these translocations

Spring and Fall population estimates (LCR)

Removal of Nonnative fish in tributaries

Humpback Chub Refuge maintenance (SNAARC)

Monitor Mainstem Aggregation

Disease and Parasite Monitoring (increased)

New action: **Explore and evaluate other tribs for potential translocations**

Razorback Sucker

Ongoing action: **Monitor larval and small bodied fish (including response to TMFs)**

New action: **Determine the extent of hybridization**



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Conservation Measures

Non-Native Species Control

Ongoing action: Continue removal from Bright Angel and Shinumo, and Havasu, evaluate other tools (e.g., piscicides)

New actions:

Explore efficacy of a temperature control (warm and cool) device, including current and evolving technology

Explore means of preventing fish passage through dam

Planning and compliance to alter the warmwater slough in Glen Canyon

Support development of nonnative fish rapid response plan

Explore TMFs to inhibit Brown Trout recruitment in Glen Canyon

Southwest Willow Flycatcher and Yuma Ridgway's Rail

Monitoring at 3 year intervals



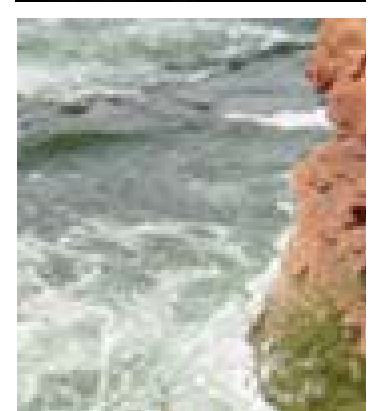
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LTEMP Timeline

- Publication of LTEMP FEIS – mid-late September
- Programmatic Agreement and Fish MOA _ meetings with tribes planned through Oct/Nov
- USFWS Section 7 consultation – BO expected to be finalized in October
- LTEMP Record of Decision – expected to be drafted by November.
- LTEMP Implementation – discussion of phased implementation





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Questions?

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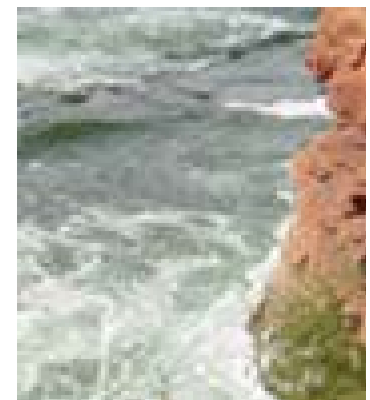
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Additional Reference Slides

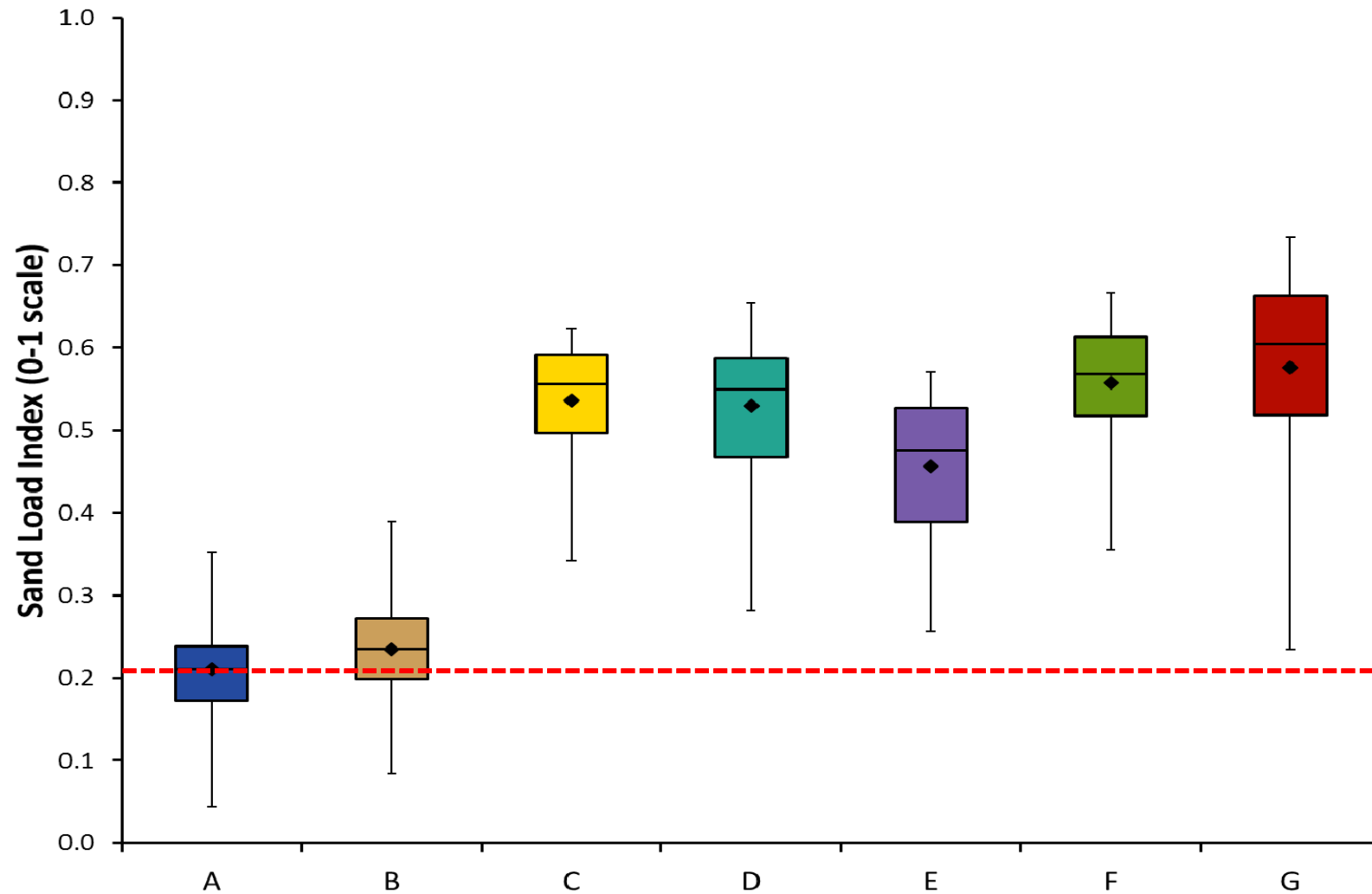


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Sediment – Sand Load Index



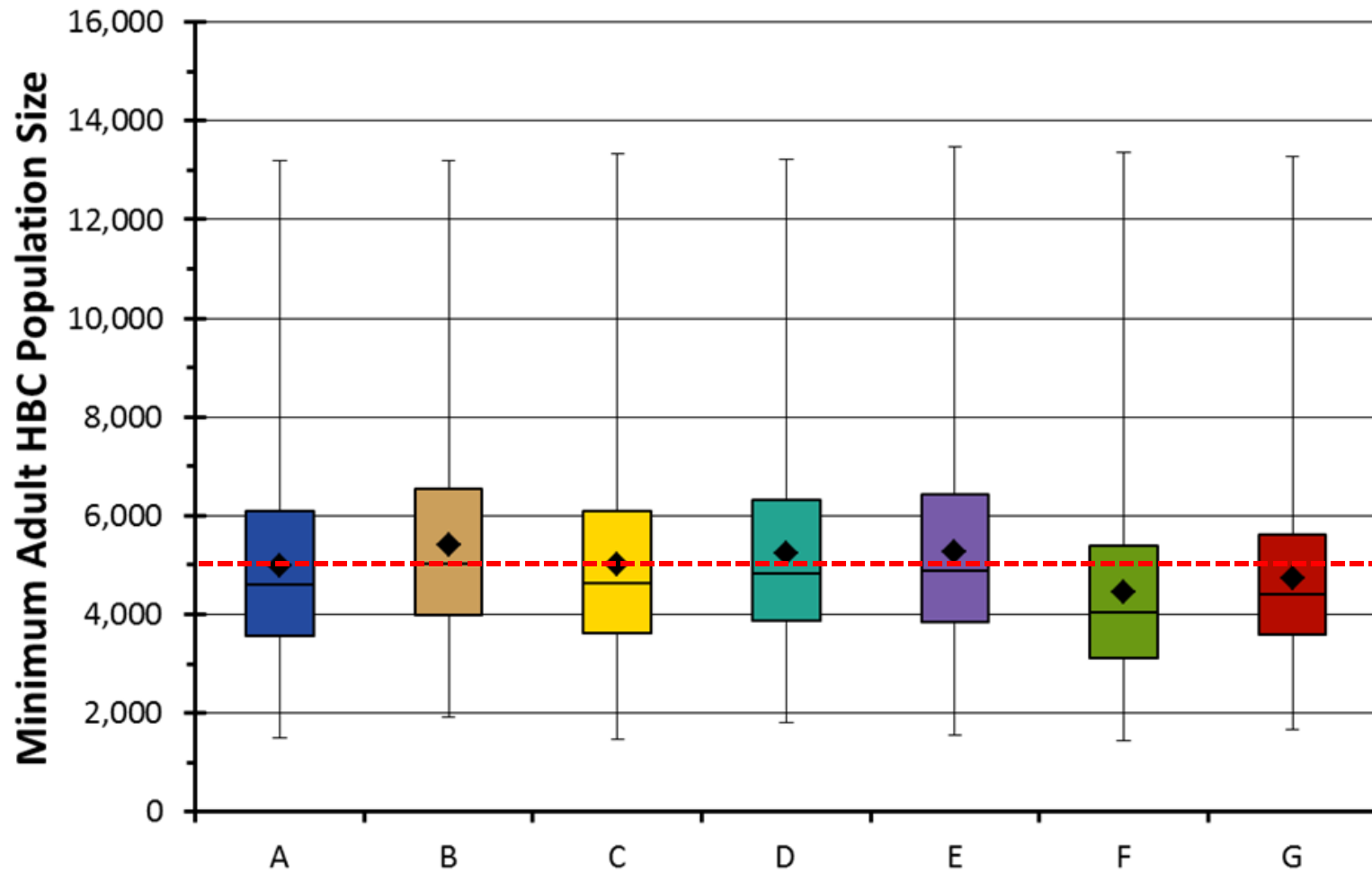


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Minimum Adult Humpback Chub Population Size



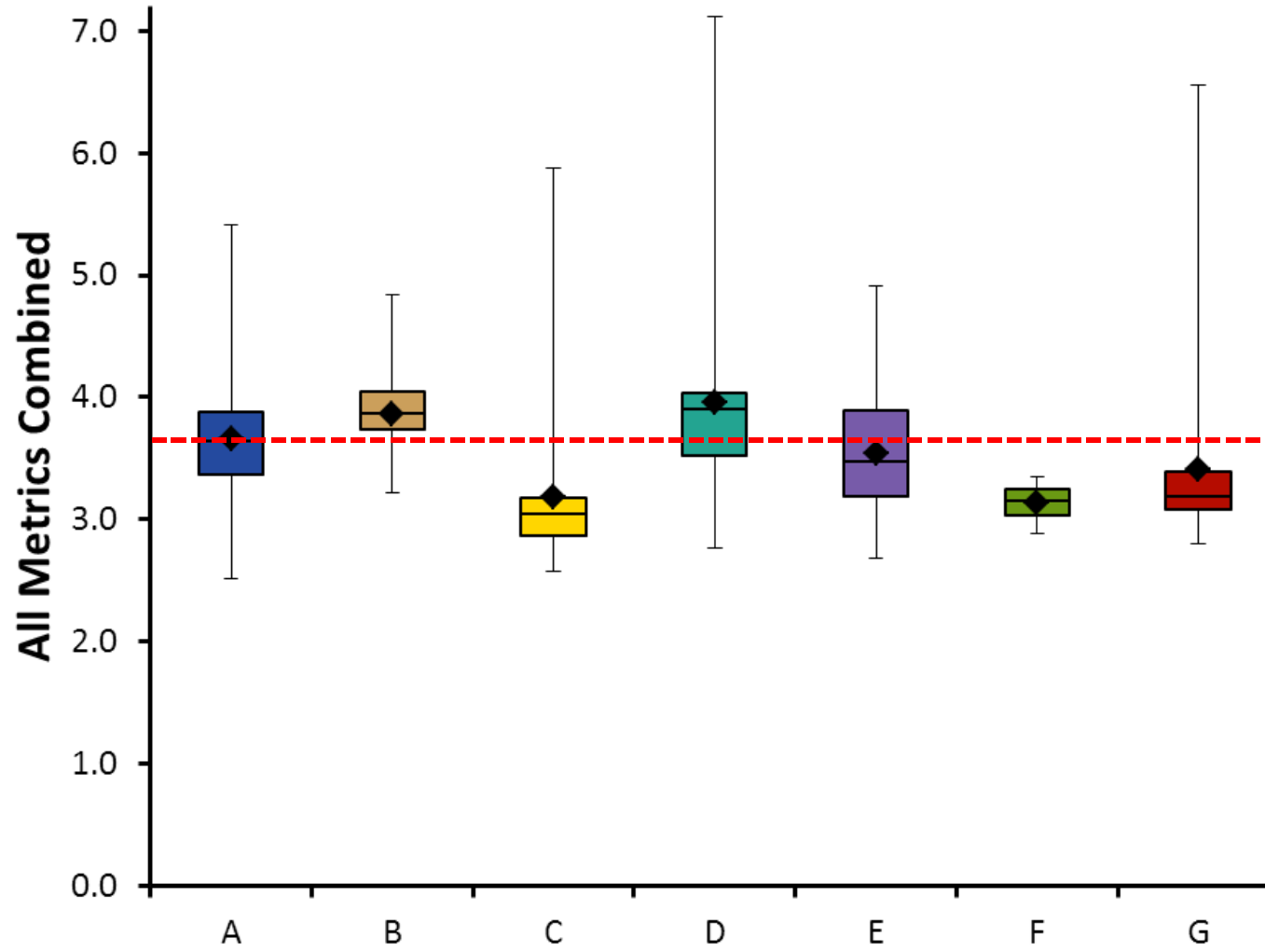


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Riparian Vegetation Metric



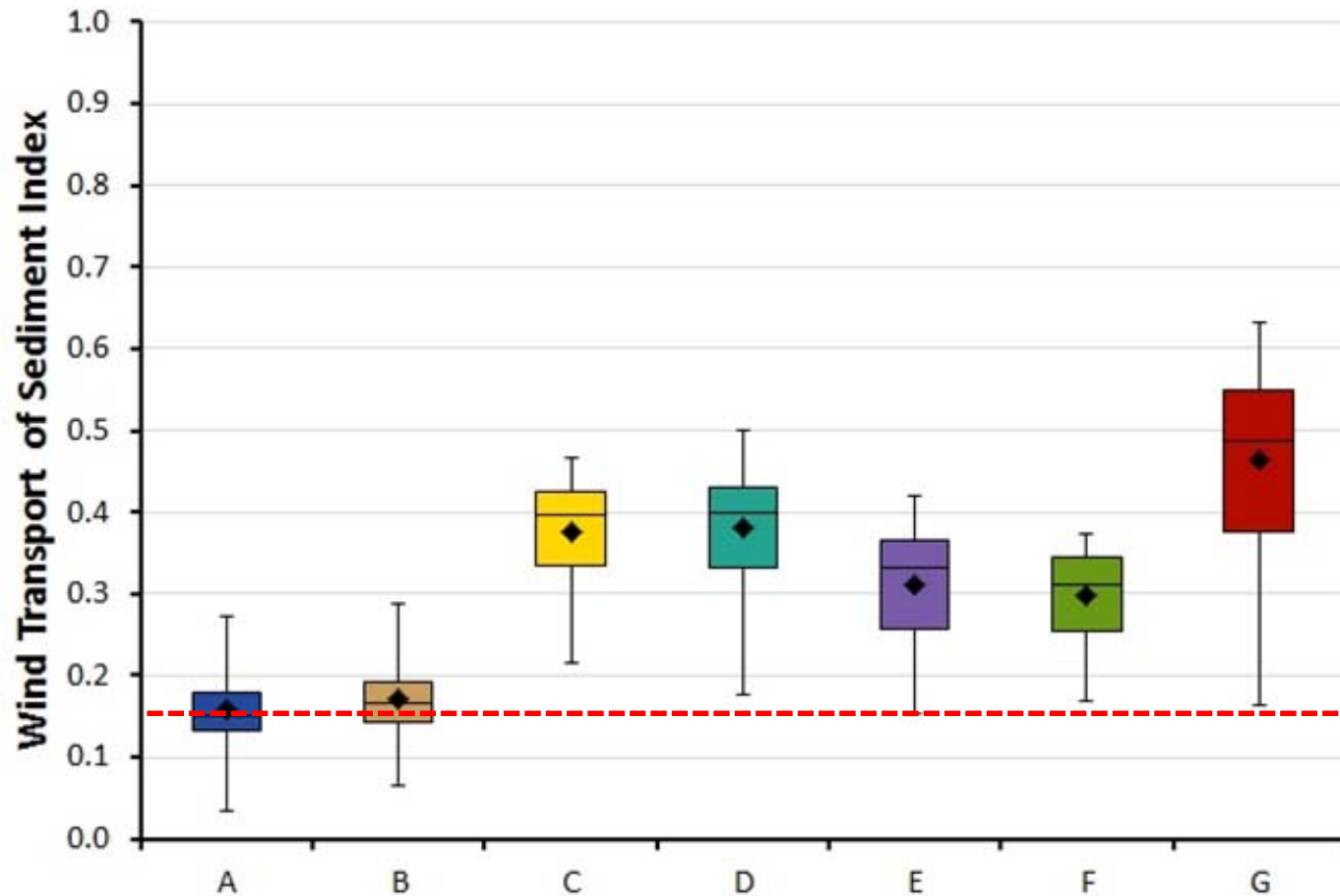


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Cultural Resources—Wind Transport of Sand





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Hydropower—Difference from No Action in NPV of Capacity and Energy with NGCC Replacement

