

**Glen Canyon Dam Adaptive Management Work Group**  
**Agenda Item Information**  
**May 27, 2014**

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Agenda Item

Long-Term Experimental and Management Plan (LTEMP) EIS Update

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Action Requested

✓ Information item only.

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Presenter

Kirk LaGory, Argonne National Lab  
Rob Billerbeck, National Park Service (NPS)  
Glen Knowles, Bureau of Reclamation (Reclamation)

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Previous Action Taken

✓ Other

**December 2009:** Secretary of the Interior Ken Salazar announced that the development of a Long-Term Experimental and Management Plan (LTEMP) for Glen Canyon Dam was needed. The Secretary emphasized the inclusion of stakeholders, particularly those in the Glen Canyon Dam Adaptive Management Program (GDAMP), in the development of the LTEMP.

**November 2011:** Public scoping meetings were held in Phoenix, Flagstaff, Page, Salt Lake City, Las Vegas, and Denver. A webcast was also held to capture participation from those that could not attend in person.

**April 4-5, 2012:** A public workshop was held in Flagstaff, AZ to receive feedback on the preliminary alternative concepts.

**April 30, 2012:** The Secretary of the Interior responded to a recommendation from the AMWG by stating, "With respect to the report of the Socioeconomic Ad Hoc Group, I appreciate the comprehensive nature of the program and plan proposed, and the support of the AMWG for the implementation of these socioeconomic impact assessment studies. I am directing the interagency team for the Department of the Interior to communicate to the AMWG the specific studies and activities that should be prioritized for utilization as part of the ongoing National Environmental Policy Act process to develop a Long Term Experimental and Management Plan (LTEMP) for Glen Canyon Dam. The Technical Work Group can then identify information needs and research priorities not addressed through the LTEMP process so that the [Grand] Canyon Monitoring and Research Center can refine and develop a work plan."

**August 30, 2012:** Motion (moved by Larry Stevens and seconded by Ted Rampton): AMWG requests that the February 2013 AMWG meeting agenda include a detailed description of the LTEMP alternatives; time for discussion and identification of issues, questions, and concerns; and possible development of a recommendation from non-DOI AMWG members.

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Relevant Science

LTEMP EIS, continued

Science and research completed since the GCDAMP was established will be used in the development of the EIS and assessment of impacts.

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Background Information

The Department of the Interior (Department), through Reclamation and NPS, is preparing a draft EIS for adoption of the LTEMP for the operation of Glen Canyon Dam. The purpose of the proposed LTEMP is to utilize current, and develop additional, scientific information to better inform Departmental decisions and to operate the dam in such a manner as to improve and protect important downstream resources while maintaining compliance with the GCPA, the Law of the River, and the Endangered Species Act, among others, and to fully evaluate dam operations and identify management actions and experimental options that will provide a framework for adaptively managing Glen Canyon Dam over the next 15 to 20 years, consistent with the GCPA and other provisions of applicable Federal law.

The LTEMP EIS Team will review progress made since the last AMWG meeting in February 2013 including a review of the current set of draft alternatives and the schedule for completion of the LTEMP Draft EIS.



# Glen Canyon Dam LTEMP EIS Update

Presentation to AMWG  
May 27, 2014





# Glen Canyon Dam

Long-Term Experimental and Management Plan EIS



## Presentation Topics

- Recent activities
- Alternatives to be evaluated in the LTEMP EIS
- Structured decision analysis, expected value of information, and experimental design
- Next steps



# Glen Canyon Dam

Long-Term Experimental and Management Plan EIS



## Recent Activities

- Stakeholder workshop to present modeling results (March 31-April 1)
- Joint-lead workshop to review modeling and swing-weighting results and begin discussions of a preferred alternative and experimental design (April 29-May 1)
- Distribute swing-weighting results to participating agencies (May 14)
- Webinar with all stakeholders to discuss swing weighting results (May 20)



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Long-Term Experimental and Management Plan EIS



## Alternatives Being Analyzed in EIS

1. No-Action Alternative
  2. Balanced Resource Alternative
  3. Condition-Dependent Adaptive Strategy
  4. Resource Targeted Condition-Dependent Alternative
  5. Seasonally Adjusted Steady Flows
  6. Year-Round Steady Flows
- *Note that alternatives are subject to change as the NEPA process unfolds*



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## Elements Potentially Common to All Alternatives

- High flow releases for sediment conservation using the HFE protocol (modified in some alternatives)
- Non-native fish control actions using the existing non-native fish control protocol (modified in some alternatives, not included in Seasonally Adjusted Steady Flow alternative)
- Compliance with 2007 record of decision on Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lakes Powell and Mead (until 2026)
- NPS management activities (durations as specified in management documents)



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## Structured Decision Analysis

- 12 stakeholder agencies participated in swing-weighting exercise
- Ranking of alternatives sensitive to weights placed by stakeholder agency
- Most stakeholders ranked Balanced Resources, CDAS, and RTCD as better than No-Action

## Expected Value of Information

- Value of resolving uncertainties was low:
  - Effect of fall HFEs on trout
  - Effect of trout management flows on trout recruitment
  - Effect of temperature and trout on humpback chub
- Had little effect on ranking of alternatives
- Does not support development of a complex experimental design to resolve these specific uncertainties



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Long-Term Experimental and Management Plan EIS



## Elements of an Experimental Design

- Experimentally identify best practice management tools related to sediment conservation, humpback chub, and vegetation control
- Sediment conservation experiments
  - Triggered spring and fall high flow experiments
    - Effects of magnitude, duration, and timing on sand bar size and longevity
    - Effects on food base, trout, humpback chub
  - Proactive spring HFEs
    - Effects of magnitude, duration, and timing on sand bar longevity
    - Effects on food base and trout
  - Load curtailment after HFEs
    - Effects of duration on sand bar longevity



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Long-Term Experimental and Management Plan EIS



## Elements of an Experimental Design (Cont.)

- Humpback chub-related experiments
  - Trout management flows
    - Effects of trigger levels, frequency, timing, magnitude on trout recruitment
    - Effects on food base, trout outmigration, humpback chub numbers
  - Mechanical removal of trout
    - Effects of trigger levels, frequency, timing on trout numbers in LCR reach
    - Effects on humpback chub
  - Low summer flows
    - Effects of different temperature targets and flow levels
    - Effects on humpback chub growth, warmwater nonnative fish



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Long-Term Experimental and Management Plan EIS



## Elements of an Experimental Design (Cont.)

- Vegetation control experiments
  - On-ground, pilot adaptive vegetation restoration project in Glen and Grand Canyons and on Hualapai lands related to:
    - Clearing encroaching vegetation
    - Invasive species (target around campgrounds)
    - Targeted removal in wind-driven sand source areas
    - Gooding's willow restoration



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## Elements of an Experimental Design (Cont.)

- For all experiments, identify:
  - Hypotheses being tested
  - Design of monitoring component
  - Adaptive response to information generated by experiment
  - Implementation of multiple tests and avoidance of confounding effects



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Long-Term Experimental and Management Plan EIS



## Next Steps

- Complete adaptive strategy and experimental design of a preferred alternative (June)
- Prepare structured decision analysis report for inclusion in EIS (July)
- Prepare preliminary administrative draft EIS for internal review (July)
- Distribute preliminary draft EIS to cooperating agencies for review (August)
- Release DEIS to public (October)