

Glen Canyon Dam Adaptive Management Work Group
Agenda Item Information
August 8-9, 2013

Agenda Item

Planning for a Fall 2013 High Flow Experiment

Action Requested

Information item only

Presenter

Dr. Jack Schmidt, Chief, Grand Canyon Monitoring and Research Center (GCMRC)
Glen Knowles, Chief, Adaptive Management Group, Environmental Resources Division, Upper
Colorado Region, Bureau of Reclamation (Reclamation)

Previous Action Taken

N/A

Relevant Science

The Environmental Assessment and Finding of No Significant Impact for Development and Implementation of a Protocol for High-Flow Experimental Releases from Glen Canyon Dam, Arizona, 2011 through 2020 can be found here: <http://www.usbr.gov/uc/envdocs/index.html>

Background Information

The Finding of No Significant Impact for the Development and Implementation of a Protocol for High-Flow Experimental Releases from Glen Canyon Dam, Arizona, 2011 through 2020 (HFE Protocol) was completed in May of 2012 along with a directive from the Secretary of the Interior on the implementation of the HFE Protocol and Non-native Fish Control in Grand Canyon. The first HFE conducted under the HFE Protocol was completed in November 2012. The planning for this event under the Secretarial Directive was comprehensive, and resulted in a thorough review of all Glen Canyon Dam Adaptive Management Program resources. Reclamation will review the HFE planning and implementation process in preparation for a possible 2013 HFE. GCMRC will provide an overview of considerations in developing a hydrograph recommendation for a 2013 Fall HFE.

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Managing Water in the West

Planning for a Fall 2013 HFE

Glen Knowles
Katrina Grantz
Bureau of Reclamation

Glen Canyon Dam
Adaptive Management Program
Adaptive Management Work Group
August 8, 2013



U.S. Department of the Interior
Bureau of Reclamation

HFE Decision Making Process

1. Planning and Budgeting Component

- Annual resource status assessment
 - Annual Agency Reporting
 - GCDAMP Budget and Work Plan Process

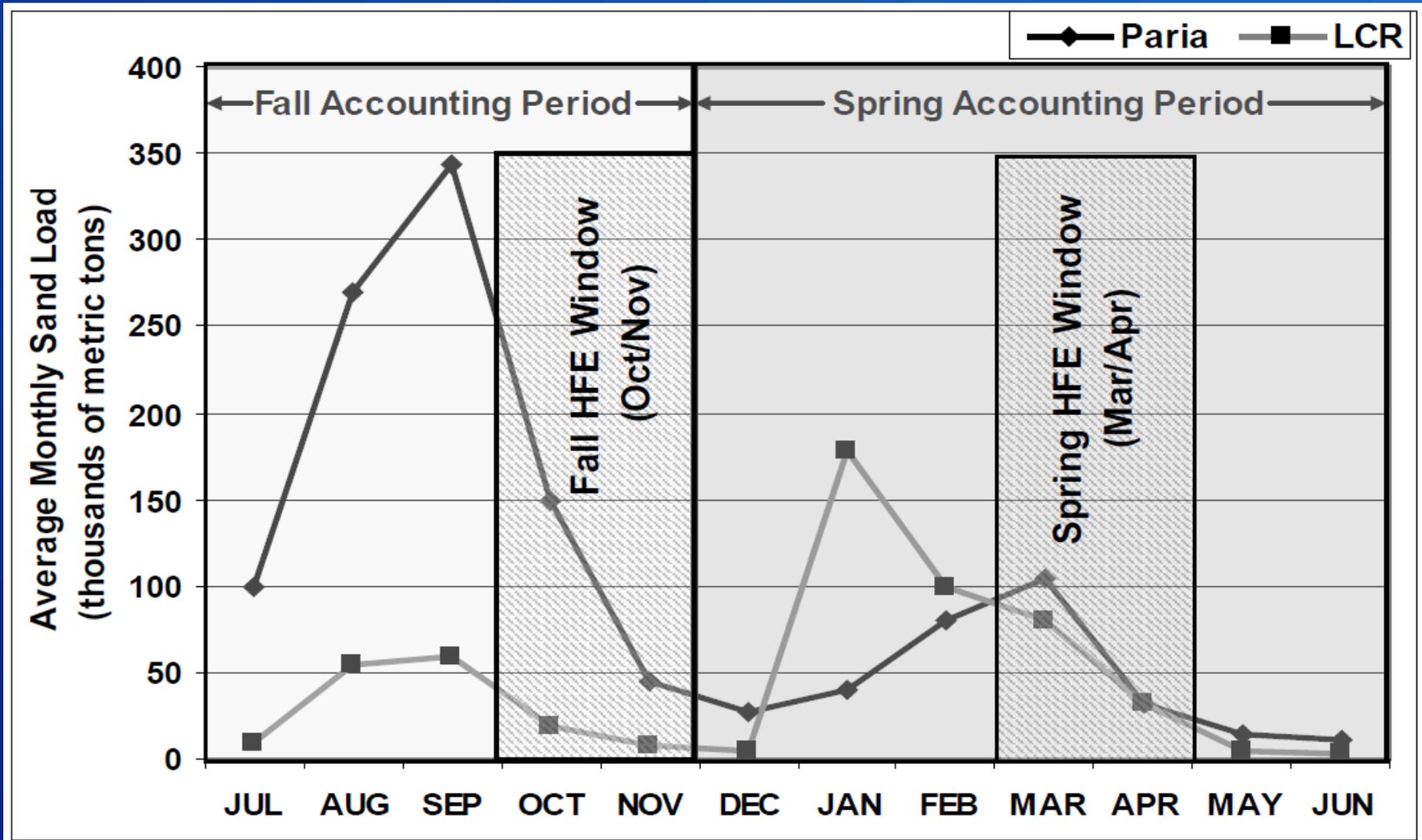
2. Modeling Component

3. Decision and Implementation Component

- Review Modeling Component
- Review Status of Resources
- Consultation with agencies and tribes, AMWG input
- Staff Recommendation/DOI GCD Leadership Team Recommendation

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Modeling Component



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HFE Protocol Parameters

Possible Timing

- March-April and October-November through 2020
- Spring HFEs will not be considered until 2015

Duration range

- 1 hr – 96 hrs (at full magnitude)
- 1 ½ days – 6 ½ days (including ramping)

Magnitude range

- 31,500 cfs – 45,000 cfs (depends on maintenance)

Ramping rates

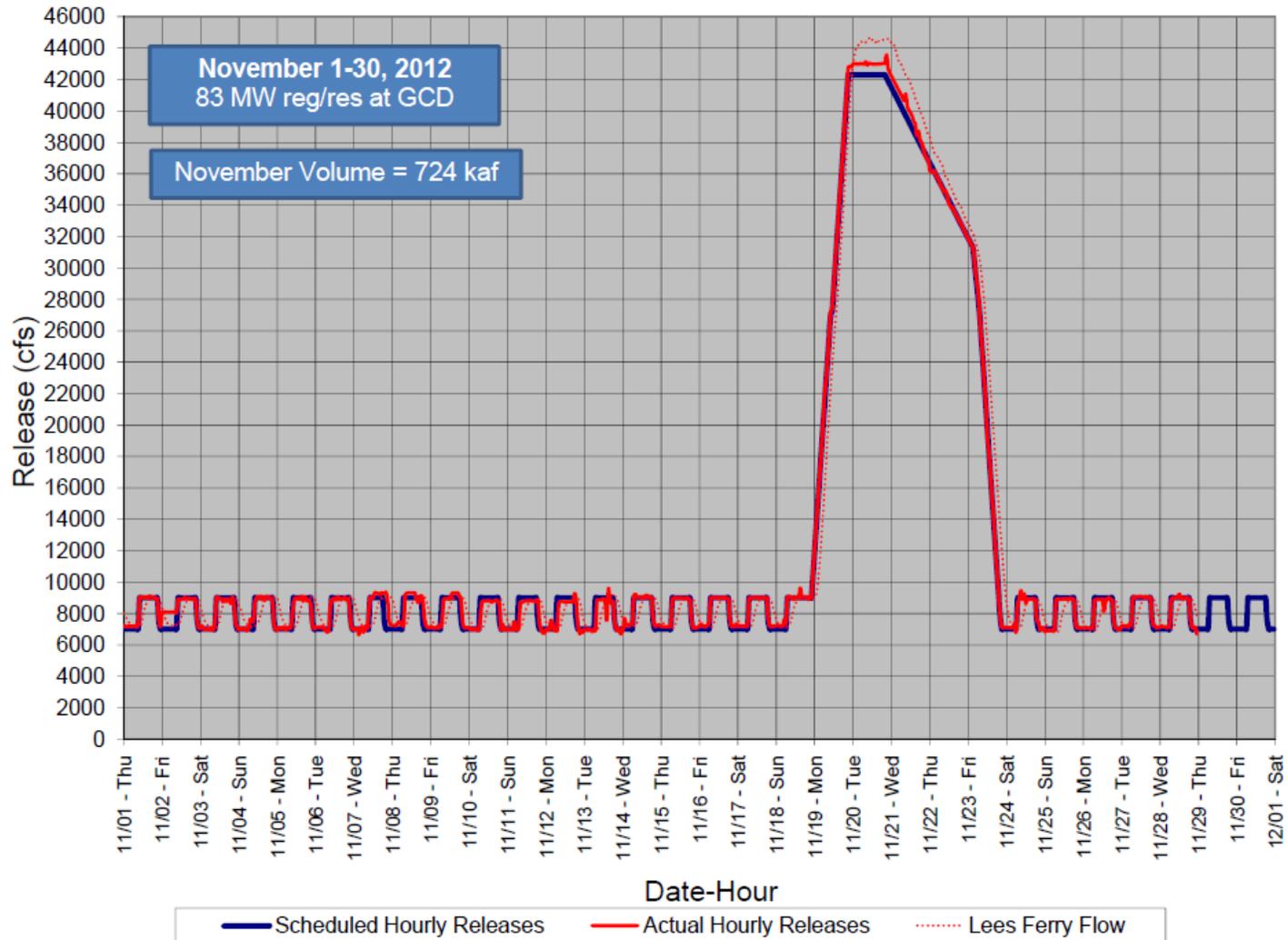
- Ramping rates are defined by 1996 ROD and 1997 Glen Canyon Dam Operating Criteria (62 FR 9447, 4,000 cfs up and 1,500 cfs down)

Model Constraints

- “the Leadership Team's view is that it would be inappropriate to adjust the model output in a way that would increase the amount of water to be released or increase power costs associated with an HFE release.” November 7, 2012 memo from ASWS Anne Castle

2012 High Flow Experiment

Glen Canyon Dam Hourly Release Pattern NOV 2012



Resource Status Assessment

Sediment Resources

In-channel sediment storage

Sandbar campable area

High-elevation sand deposits

Cultural Resources

Archaeological site condition and stability

Access to archaeological sites by tribes

Biological Resources

Aquatic food base

Lees Ferry trout population

Lees Ferry fishery recreation experience quality

Endangered humpback chub and other fish abundance

Riparian vegetation

Hydropower and water delivery

Water quality

Water delivery

Dam maintenance

Hydropower production and marketable capacity

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Sediment Resources



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Cultural Resources

- Archaeological sites in Grand Canyon are subject to erosion.
- HFE-caused erosion is a consideration, most sites already mitigated.
- A summer work shop is planned to evaluate with Tribes and agencies.
- HFEs create larger sand bars, can be a sources of aeolian (wind-blown) sand to preserve sites, especially those in proximity to large sand bars.
- HFEs likely effect few sites in this way because of limited extent of large sand bars near sites in Grand Canyon.



The MOA for the HFE Protocol requires notification to all the consulting parties at least 30 days in advance of a HFE and will consult with tribes to resolve any issues.

Biological Resources

- 2013 HFE appears to have had little effect on food base or trout and native fishery.
- Trout populations in Lees Ferry and downstream may have decreased, but not significantly so.
- None of the triggers for nonnative fish control have been met, although rainbow trout numbers at the LCR are near the trigger.
- Humpback chub status appears to be stable or increasing.
- No indication that whirling disease is increasing or causing increased trout mortality.



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Hydropower/Socioeconomic Impacts

- HFEs effect hydropower production negatively:
 - Water released during an HFE counts against the annual release and is not available to be programmed in peaking releases during high demand months (HFE windows of Mar/Apr and Oct/Nov are low-demand shoulder months).
 - 30-40% of HFE releases bypass the power plant.
 - Lake Powell is lowered, reducing hydrologic head.
- Other impacts – Hualapai Enterprise, regional.



Western Area Power Administration estimated annual hydropower impacts of \$1.4M from Fall 2013 HFE.

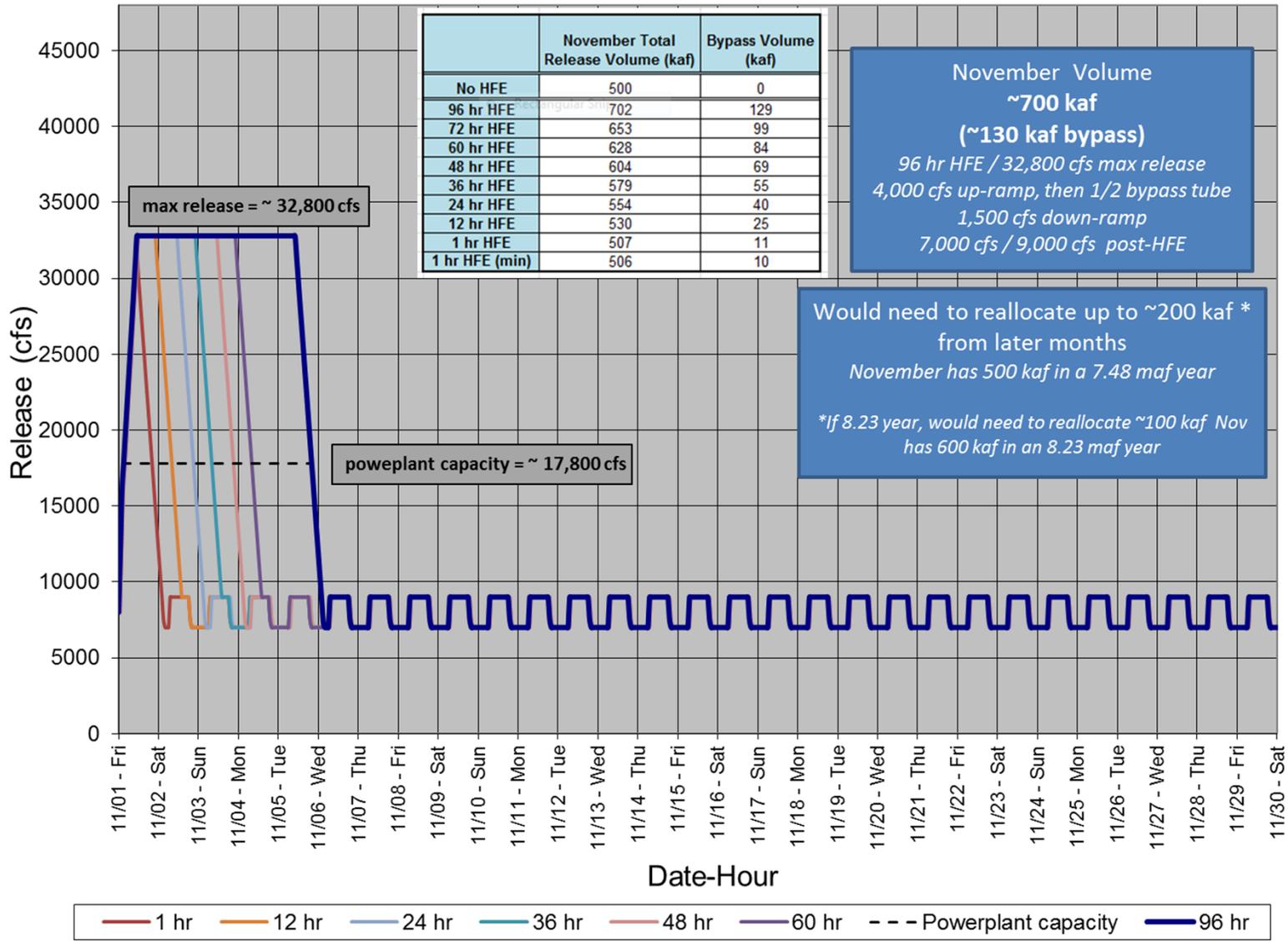
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HFE Protocol Reporting

1. GCDAMP Annual Reporting meeting every January.
2. Updates at TWG and AMWG meetings of the GCDAMP.
3. Meet with the HFE MOA consulting parties and consult with tribes as needed.
4. The HFE Technical Team report to the Secretary's Glen Canyon Leadership Team for their consideration in HFE decisions.
5. US Fish and Wildlife Service report each January on the effects of prior HFEs and conservation measures of the 2011 FWS biological opinion.

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Glen Canyon Dam Possible HFE Release Patterns



Nonnative Fish Control

The Non-Native Fish Control EA proposed to implement mechanical removal below Paria River and on an as-needed basis at the Little Colorado River, defined by the 2011 FWS Biological Opinion:

- Rainbow trout abundance from RM 63.0-64.5 exceeds 760 fish and brown trout abundance exceeds 50 fish **AND**
- ASMR estimate of humpback chub falls below 7,000 **OR**
- 3 of 5 years subadult humpback chub drop below 910
- In two consecutive years water temp at LCR does not exceed 12 deg. C
- Annual survival of juvenile HBC drops 25% in any one year.

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