

RECLAMATION

Managing Water in the West

Non-native Fish Control Environmental Assessment

Bureau of Reclamation
Glen Canyon Dam
Adaptive Management Program
Technical Work Group
June 29, 2011



U.S. Department of the Interior
Bureau of Reclamation

History

- **2002:** Some tribes first expressed concern during the 2003-2006 removal experiment, resulting in mitigation using fish emulsion as fertilizer in the Hualapai tribal gardens.
- **2007-2008:** Non-native fish control was added as an important conservation measure of several U.S. Fish and Wildlife biological opinions on operations of Glen Canyon Dam.
- **2010-2011:** Annual Work Plan of the Glen Canyon Dam Adaptive Management Program for FY 2010-2011 one- two river trips to remove non-native fish at LCR.
- **The Pueblo of Zuni sent Reclamation a letter on June 30, 2009 in which Zuni Governor Norman Cooney expressed the Zuni Tribe's concerns with the "taking of life" associated with mechanical removal, and the lack of consultation with the Zuni Tribe.**
- **In response DOI representatives attended a meeting with Zuni tribal leaders to hear their concerns on September 15, 2009. In response, DOI cancelled the two planned removal trips in March 2010, reinitiated consultation with the U.S. Fish and Wildlife Service on cancelling removal, and later in 2010 began work on the EA.**



Purpose and Need

PURPOSE

Reduce the negative impacts of competition and predation by rainbow trout and brown trout on the endangered humpback chub (*Gila cypha*) and its critical habitat in the Grand Canyon.

NEED

Fulfill the conservation measures and terms and conditions of several **U.S. Fish and Wildlife Service (USFWS) biological opinions**, to contribute to the recovery of humpback chub by helping to maintain high juvenile survival and recruitment rates resulting in a stable adult population, and to **address concerns expressed by American Indian Tribes** over the killing of fish in the Grand Canyon, a location of cultural, religious, and historical importance to a number of tribes.

RECLAMATION

Structured Decision Making Project

<http://pubs.usgs.gov/of/2011/1012/>

<http://www.usbr.gov/uc/envdocs/ea/gc/nnfc/Appdx-A-SDMreport.pdf>



Non-Native Fish Control below Glen Canyon Dam— Report from a Structured Decision-Making Project

Open-File Report 2011–1012

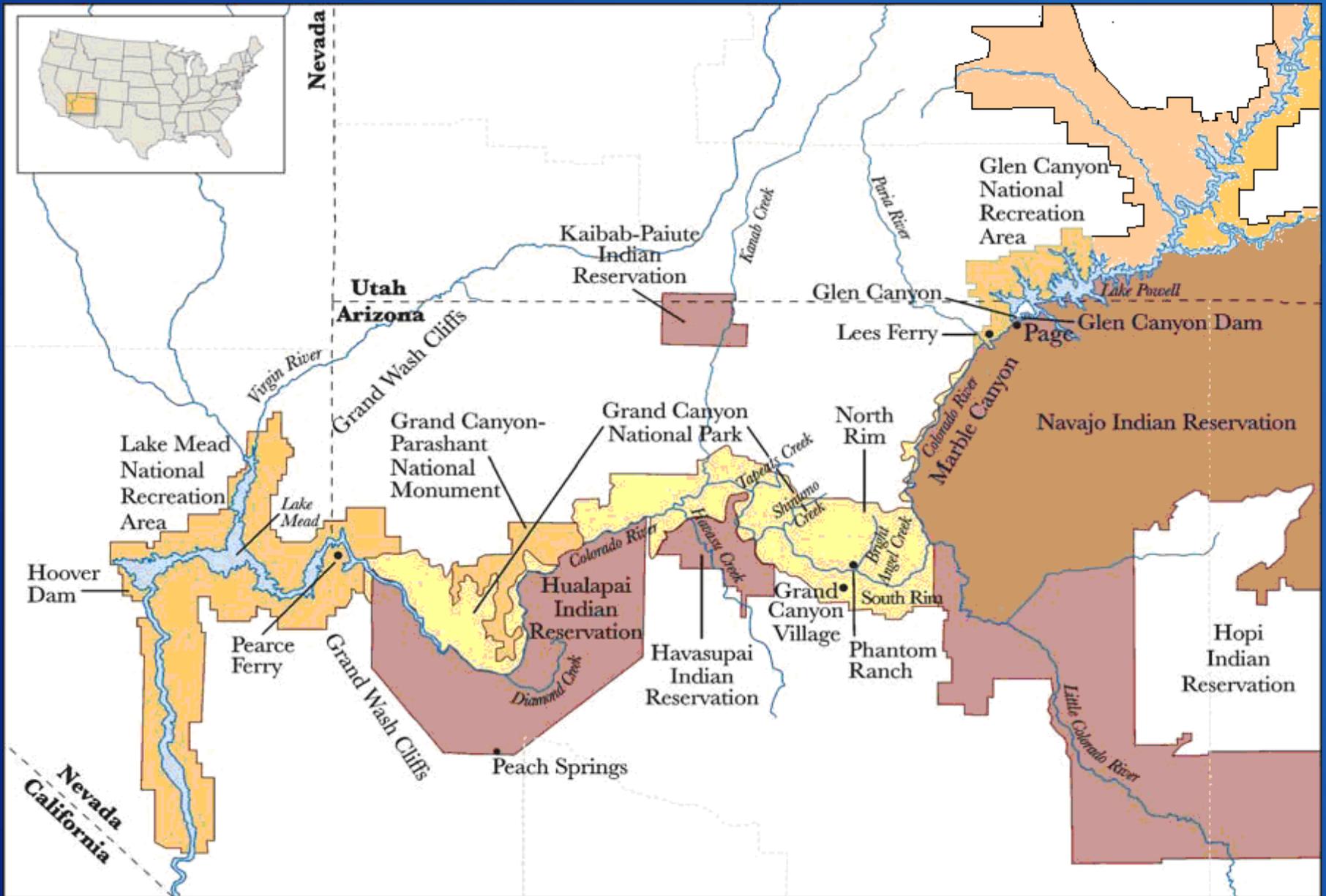
U.S. Department of the Interior
U.S. Geological Survey

RECLAMATION

SDM Results

Hybrid portfolio	AZGF	BoR	FWS	Hopi	Navajo	NPS	WAPA	Zuni	Average
A	0.598	0.527	0.497	0.563	0.498	0.647	0.432	0.462	0.501
C ₂	0.505	0.418	0.418	0.450	0.428	0.474	0.308	0.314	0.402
C ₃	0.427	0.380	0.373	0.419	0.397	0.443	0.280	0.267	0.361
C ₄	0.478	0.440	0.428	0.545	0.458	0.512	0.353	0.370	0.437
C ₅	0.444	0.404	0.397	0.527	0.433	0.483	0.326	0.366	0.411
D ₁	0.672	0.589	0.649	0.571	0.648	0.629	0.557	0.504	0.606
D ₂	0.584	0.538	0.596	0.525	0.610	0.598	0.519	0.457	0.554
D ₃	0.610	0.578	0.623	0.618	0.645	0.651	0.565	0.558	0.603
J ₁	0.522	0.496	0.567	0.586	0.553	0.503	0.501	0.519	0.539
J ₁ '	0.610	0.525	0.583	0.528	0.537	0.508	0.523	0.481	0.545
J ₂	0.439	0.452	0.519	0.559	0.522	0.474	0.472	0.471	0.497
J ₂ '	0.524	0.479	0.532	0.497	0.503	0.473	0.491	0.433	0.500
K	0.365	0.387	0.426	0.459	0.436	0.472	0.293	0.346	0.390
Rank									
1	D ₁	D ₁	D ₁	D ₃	D ₁	D ₃	D ₃	D ₃	D ₁
2	J ₁ '	D ₃	D ₃	J ₁	D ₃	A	D ₁	J ₁	D ₃
3	D ₃	D ₂	D ₂	D ₁	D ₂	D ₁	J ₁ '	D ₁	D ₂
4	A	A	J ₁ '	A	J ₁	D ₂	D ₂	J ₁ '	J ₁ '
5	D ₂	J ₁ '	J ₁	J ₂	J ₁ '	C ₄	J ₁	J ₂	J ₁

D1 – Removal curtain – includes PBR Removal to test limiting emigration of trout from Lees Ferry to reduce trout numbers at LCR, and LCR removal as a means to directly address the threat of predation and competition if needed. Mitigation of freezing fish removed for beneficial use to address tribal concerns.



RECLAMATION

NATURAL RESOURCES

Water Resources

Water

Quality

Air Quality

Sediment

Vegetation

Terrestrial Invertebrates
and Herptofauna

Aquatic Food Base

Fish

- **Humpback chub**
- **Razorback sucker**
- **Other native fishes**
- **Trout**
- **Other non-native fishes**
- **Fish habitat**

Birds

Mammals

CULTURAL RESOURCES

Historic Properties

Traditional Cultural Properties

Sacred Sites

SOCIOECONOMIC RESOURCES

Hydropower

Recreation (including Public Safety and Sport Fishing)

RECLAMATION

EA Reviews

- **Conducted Cooperating Agency review from December 21, 2010 to January 7, 2011, comments from all 8 CAs**
- **In February 2011, Science Advisors have reviewed the GCRMC Science Plan for the EA as well as the Runge et al. 2011 SDM Report.**
- **Conducted public Review January 28 – March 18 2011**
 - **35 comments total**
 - **11 AMWG member comments, including 3 tribes**
 - **13 public (non-affiliated) comments**
- **AMWG and TWG Meetings (Jan 28, Feb 10, Mar 8, May 18)**
- **Now in second CA Review June 15 – June 29**
- **Second three-week public review in July**
- **Numerous tribal consultation meetings**
 - **NHPA 106 letters on eligibility and effect went out on June 27 and June 28**
 - **Meetings to resolve effects under 106 this summer**

Comments received during Public Comment Period January 28 – March 18 2011

- 35 comments total
- 11 AMWG member comments, including 3 tribes
- 13 public (non-affiliated) comments

Major themes of comments:

- Opposed to killing trout in general
- Actions hurt Marble Canyon business owners
- Support of Tribal concerns and need to find resolution to this issue
- Need for better integration between the two EAs
- Concern on HFE risk to HBC due to trout response and predation
- Should be more focus on the science and answering questions of trout movement, emigration, ultimate effect of trout predation on HBC, and role of mainstem versus the LCR for HBC recovery
- Flow actions not adequately considered
- Need trout and HBC triggers to determine if LCR removal should take place
- Postpone LCR removal to better test the effects of trout predation on HBC

Refined Proposed Action

1. 10-year period of proposed action, 2011-2020.
2. Little Colorado River (LCR) reach removal, up to 6 removal trips per year
3. Paria River to Badger Creek (PBR) reach removal, up to 10 trips per year.
4. All fish removed are moved alive to other waters for use as sport fish or euthanized for other beneficial use
5. Research:
 - a. Is Lees Ferry the source? Lees Ferry rainbow trout marking with PIT tags (fall) and increased Marble Canyon trout monitoring (summer)
 - b. Can PBR removal work? Two PBR removal Trips initially (winter)
 - c. Is predation limiting HBC recruitment? Is mainstem important habitat?
 - LCR removal ONLY IF adult humpback chub abundance drops below 7,000 adult fish
 - Increased marking and monitoring of young HBC
 - e. Are other NNFC methods better? Begin 1-2 year process with stakeholder involvement to develop and test feasibility of GCD flow releases and other non-flow options to reduce rainbow trout
 - f. Safety Valve: In 2014 Reclamation will undertake science review workshop with scientists to assess first two years of non-native fish control



Next Steps

The EA is available on the Reclamation website at:

<http://www.usbr.gov/uc/envdocs/ea/gc/nafc/index.html>

Reclamation intends to provide the public with another draft of the EA for a two-week review in July.

Conclude process by Summer 2011 with a decision notice.

Cooperating Agency Comments are due by **June 29, 2011**:

Bureau of Reclamation,
Environmental Resources Division
125 South State Street, room 7218
Salt Lake City, Utah 84138

e-mail to: fishcontrol@usbr.gov

For more info call **Glen Knowles** at **(801) 524-3781**

RECLAMATION

High-Flow Experiment Protocol Environmental Assessment Update

Glen Knowles
Bureau of Reclamation
Glen Canyon Dam
Adaptive Management Program
Technical Work Group Meeting
June 29, 2011



RECLAMATION

HFE Protocol EA Chronology

- **Announcement by Secretary: Dec 9, 2009**
- **Federal Register Notice: Dec 22, 2009**
- **Initiate Public Scoping, AMWG: Feb 3-4, 2010**
- **HFE Workshop: June 17-18, 2010**
- **Conference Calls w/10 Coop Agencies: Jul-Dec 2010**
- **Coop Agency Review Draft: Nov 23-Dec 6, 2010**
- **Public Review Draft: Jan 14-Mar 18, 2011**
- **Cooperating Agency Review: June 15-29, 2011**

The Protocol

- A formal set of rules and procedures to be followed during a particular research experiment.
- Experimental in nature and to facilitate better learning of how to incorporate high dam releases into future operations in a manner that effectively conserves more sediment by depositing on beaches and sandbars above the stage of MLFF dam operations.
- Sandbar building potential is greatest by generating the greatest possible sand concentrations and largest possible areas of inundation, both of which are maximized by increasing flow magnitude.
- Sandbar building occurs as long as elevated sand concentrations are maintained and there is still space available to deposit sand; thus high flows should be of as long a duration as can be maintained with available sand.

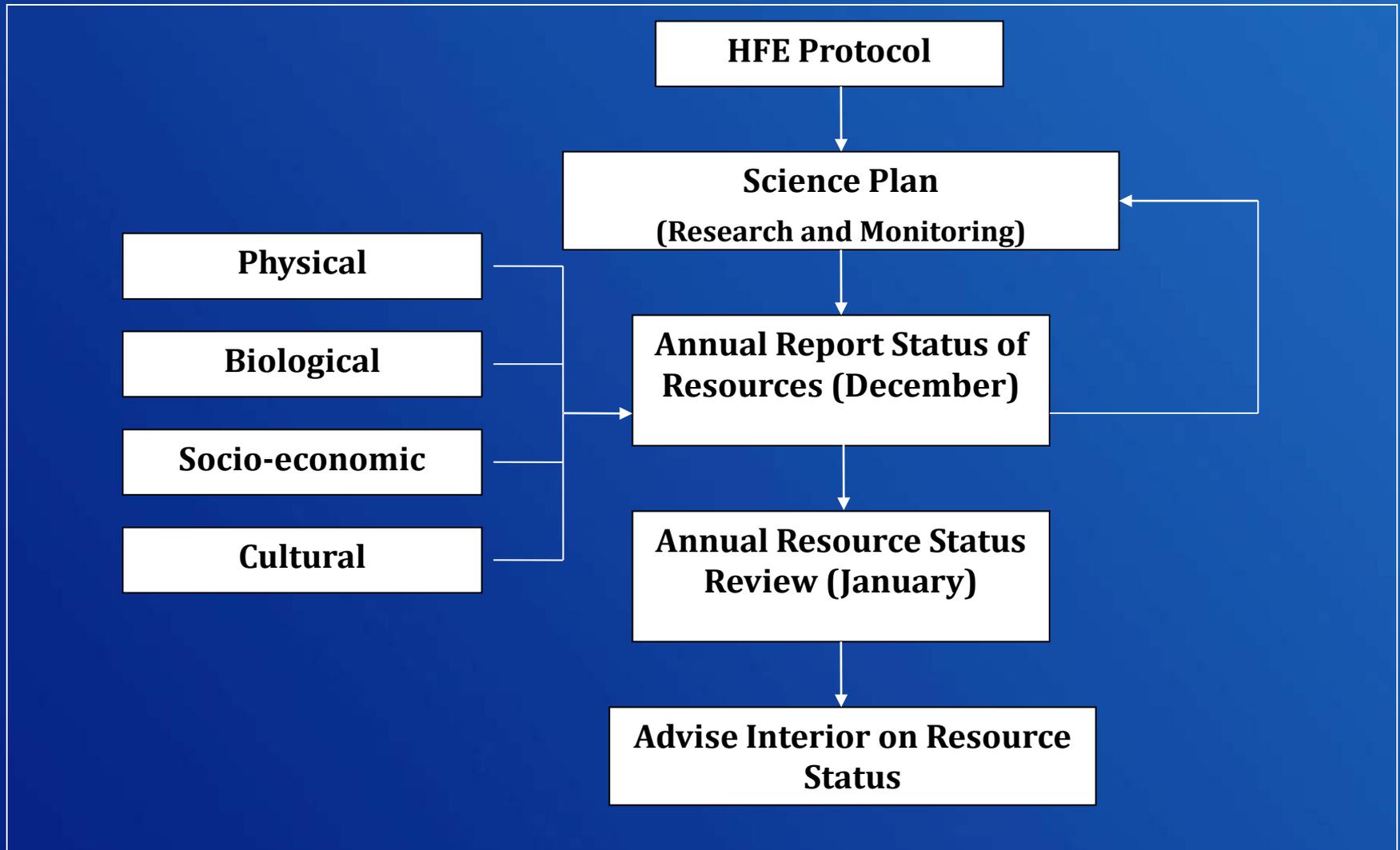
Purpose and Need

- **Purpose:** (1) to develop and implement a protocol that determines when and under what conditions to conduct experimental high volume releases, and (2) to evaluate the parameters of high-flow releases in conserving sediment to benefit downstream resources in Glen, Marble, and Grand Canyons.
- **Need:** This action is needed to take advantage of future sediment-enriched conditions in the Colorado River with experimental high flow tests that will improve the understanding of the relationships between high dam releases of up to 45,000 cfs and sediment conservation.

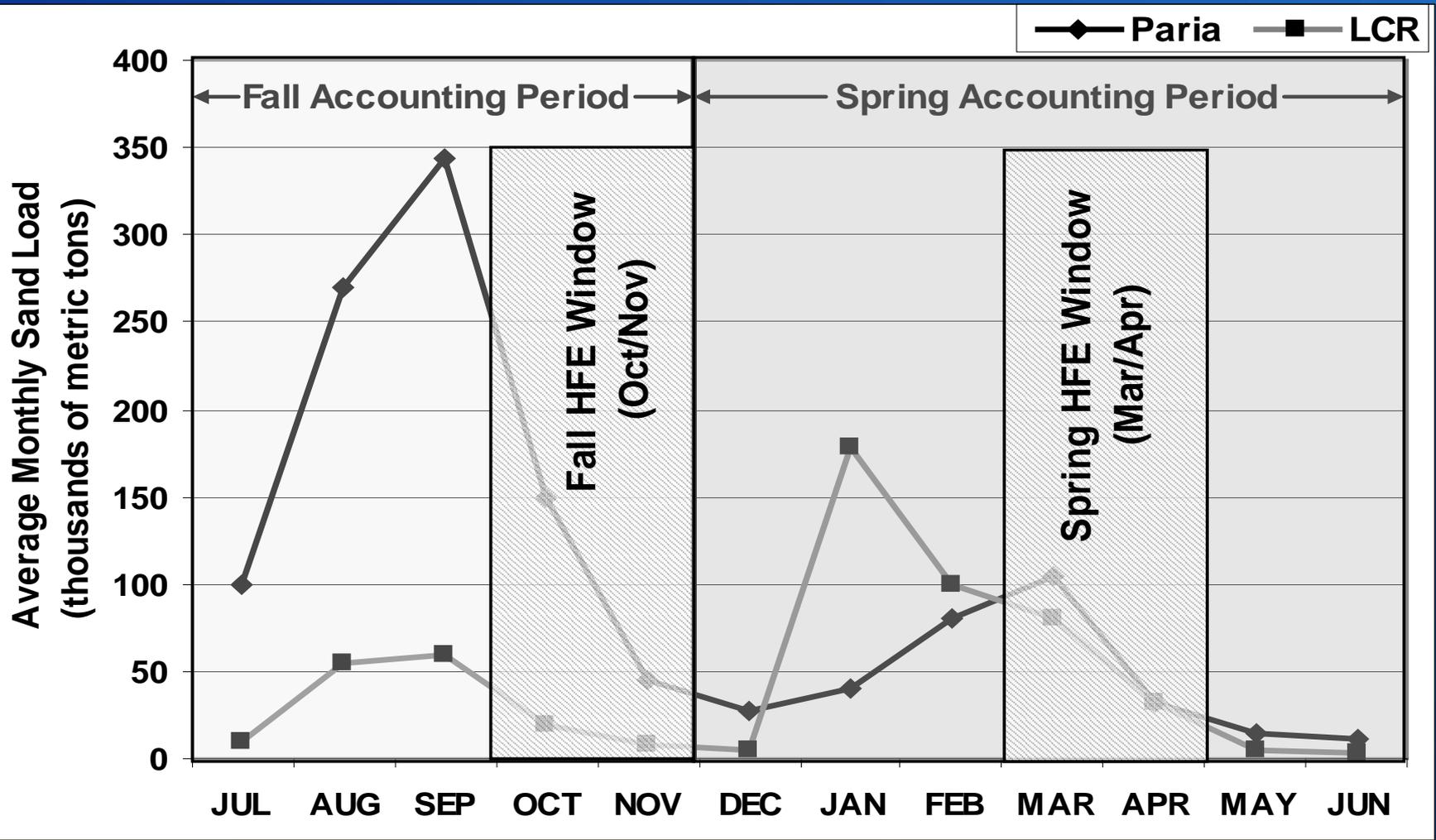
HFE Protocol Paradigms

- **Store and Release**
 - developed by USGS and was first introduced as the basis for the HFE protocol in a June 2010 modeling workshop
 - relies on accumulation of sand during periods of above-average sediment input from tributaries to achieve sediment enriched conditions called for in the development of the HFE protocol (74 FR 69361); decisions occur over months
- **Rapid Response**
 - proposed in September 2010 by Western Area Power Administration
 - requires real-time coupling of tributary sediment inputs and dam releases; decisions must occur in hours

Planning and Budgeting Component



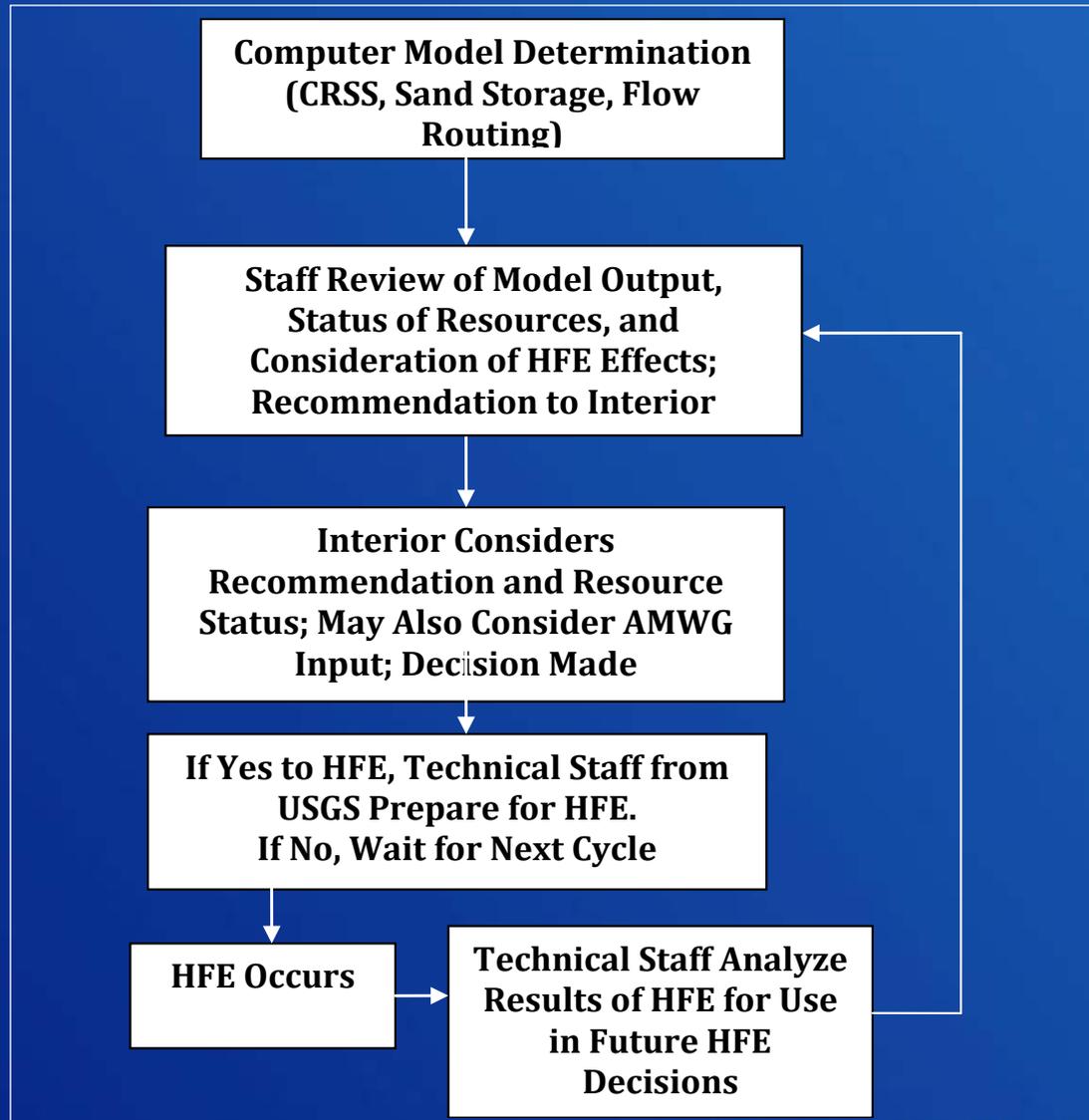
Modeling Component



HFE Protocol – Flow magnitude and duration for Model HFEs

HFE No.	Flow Magnitude (cfs)	Duration (hours)	HFE No.	Flow Magnitude (cfs)	Duration (hours)
1	45,000	96	8	45,000	1
2	45,000	72	9	41,500	1
3	45,000	60	10	39,000	1
4	45,000	48	11	36,500	1
5	45,000	36	12	34,000	1
6	45,000	24	13	31,500	1
7	45,000	12			

Decision and Implementation Component



RECLAMATION

Assessment of Effects

PHYSICAL RESOURCES	CULTURAL RESOURCES
Water Resources	Historic Properties
Water Quality	Sacred Sites
Air Quality	SOCIO-ECONOMIC RESOURCES
Sediment	Hydropower
BIOLOGICAL RESOURCES	Recreation (including Public Safety)
Vegetation	
Terrestrial Invertebrates and Herptofauna (Kanab ambersnail)	
Aquatic Foodbase	
Fish	
• Humpback Chub	
• Razorback Sucker	
• Non-Listed Native Fishes	
• Trout	
• Other Non-native Fishes	
• Fish Habitat	
Birds (Southwest willow flycatcher)	
Mammals	

RECLAMATION

Comments and Input on HFE EA

Numerous comments, meetings with agencies and stakeholders, resulted in changes to the EA ;

- Numerous Cooperating Agency Meetings
- Many Tribal Consultation meetings
- CA Review Nov 23-Dec 6 2010
- Public comment period January 14 – March 18, 2011
- January 20, 2011 TWG Meeting
- February 8-9, 2011 AMWG Meeting
- March 7-8, 2011 TWG Meeting
- May 18 AMWG Meeting
- Science Advisor Review of Science Plan
- Now in second CA review period, June 18-June 29

Some of the Comment Received

- **77 responses (19 GCDAMP members; 5 Tribes; 9 State; 4 Recreation; 7 Environmental; 3 Water and Power; 42 No identified affiliation)**
- **Main Recurring Issues**
 - **Scope, T&E impacts, and EA interactions require EIS**
 - **Must coordinate and integrate two EAs**
 - **Underestimate negative impacts of trout and overestimate positive effects on native fish**
 - **Protocol decision process is unclear; needs more detail**
 - **Insufficient for GCPA; missing targets for measures of success**
 - **Insufficient consideration of navigation risks; other safety, property and financial impacts from low and high flows**

Some of the Revisions Made

- Clarify that the HFE Protocol will be conducted during the period 2011-2020 as an experimental action
- Clarify that the HFE Protocol is a component of Interior's compliance with the Grand Canyon Protection Act, in its entirety
- Clarify that the HFE Protocol would be carried out under the 1996 ROD, the 1997 operating criteria, and the 2007 interim guidelines wherein annual release volumes are amounts of water released in a water year, Oct 1 – Sep 30
- Updated the literature cited to include recently released publications and corrected previous errors identified by cooperating agencies and the public
- Provided additional information on the relationships and interactions between the HFE Protocol EA and the Non-native Fish Control EA
- Added text to better identify how uncertainty will be addressed using CEQ guidelines for the inclusion of adaptive management into the NEPA process
- Monitoring of resources – If monitoring shows that there are unacceptable impacts, such as a significant decline in humpback chub numbers, reclamation would suspend implementation of the protocol.

RECLAMATION



Next Steps

Reclamation intends to provide the public with another draft of the EA for a two-week review in July.

Reclamation needs to complete consultation with FWS, complete tribal consultation and NHPA compliance, and complete NEPA compliance to implement the HFE Protocol.

Conclude process by early Summer 2011 with a decision notice.

The EA is available on the Reclamation website at:

<http://www.usbr.gov/uc/envdocs/ea/gc/HFEProtocol/index.html>

Comments are due by **June 29, 2011**:

Bureau of Reclamation,
Environmental Resources Division
125 South State Street, room 7218
Salt Lake City, Utah 84138

e-mail to: protocol@usbr.gov

For more info contact Dennis Kubly at (801) 524-3715

RECLAMATION

Glen Canyon Dam Long-Term Experimental and Management Plan Environmental Impact Statement



Bureau of Reclamation
Glen Canyon Dam
Adaptive Management Program
Upper Colorado Leadership Team
June 29, 2011





RECLAMATION

Managing Water in the West

National Park Service

National Park Service
U.S. Department of the Interior



Long-Term Experimental and Management Plan EIS

- First announced by Asst. Secretary Anne Castle at the August AMWG Meeting that Secretary of the Interior Ken Salazar had directed development of a of the Long Term Experimental and Management Plan.
- Will be led by the Bureau of Reclamation and the National Park Service as co-lead agencies.
- Will include multiple cooperating agencies, including Federal, Tribal, State or Local agencies or governments.
- 2011 will be primarily determining and designating cooperating agencies and scoping.
- Effort will be on an expedited schedule to draft EIS.

RECLAMATION



RECLAMATION

Managing Water in the West

National Park Service

National Park Service
U.S. Department of the Interior



Purpose and Need, Proposed Action

- ❑ Purpose and Need will be focused on continuing adaptive management through the GCDAMP to meet requirements of Grand Canyon Protection Act, the Law of the River, and other laws, to continue the adaptive management experiments that have been successfully completed under the GCDAMP.
- ❑ Will build on prior experiments, such as the 1996, 2004, and 2008 HFEs, and learning gained through implementation of the High Flow Experimental Protocol, non-native fish control experimentation, and other experiments. Reclamation will utilize information developed during prior NEPA process, the ongoing EAs and LTEP EIS Process.
- ❑ Alternatives to be considered include dam operations and other actions under the authority of the Secretary of the Interior in keeping with the GCPA, Law of the River, other laws.

RECLAMATION



RECLAMATION

Managing Water in the West

National Park Service

National Park Service
U.S. Department of the Interior



Goals for 2011

- Identify and formalize Cooperating Agencies.
- Define roles and responsibilities.
- Complete scoping and scoping comment analysis in 2011.
- Begin to develop alternatives with cooperating agencies by the end of 2011.

RECLAMATION



RECLAMATION

Managing Water in the West

National Park Service

National Park Service
U.S. Department of the Interior



Next Steps

- Kickoff meeting with potential cooperating agencies was held on February 11, 2011. We have received initial input from potential cooperating agencies.
- Now working with NPS on NOI for publication in the Federal Register, **NOI is now signed in the cue for publication in the Federal Register.**
- Scoping meetings in Phoenix, Salt Lake City, possibly additional cities.
- More to come...

RECLAMATION