Experimental Options Review FY 07- FY11

SPG/TWG Meetings

May 23-35, 2006

GCMRC

Background and Purpose

- Background: MLFF has been the "Preferred Alternative" flow regime for 10 years, but all conditions have not been evaluated yet (variable range in hydrology, sediment inputs, release temperatures)
- Purpose: Identify a suite of flow and non flow actions that will be implemented or tested in FY 07-11
  - Provides foundation for 5 Year Monitoring and Research Plan and FY 07-08 AWP
- General Goals of Options:
  - Evaluate policies that will likely improve resource conditions
  - Enhance understanding (learning) of relationship between proposed action and target resource
- Developed cooperatively w/ SPG

Experimental Options Considered

1. **Continue MLFF** in spring/summer/ fall, w/ winter ramping experiments + BHBF in winter/spring + limited suite of mgt actions
2. **Continue MLFF** in spring and summer, w/ winter ramping experiments + BHBF in winter/spring + stable flows in Sept & October + limited suite of mgt actions
3. **Increased fluctuating flows** in summer and winter + BHBF in fall + expanded suite of management actions
4. **Seasonally adjusted steady flows** throughout the year + spring BHBF + limited suite of mgt actions
5. **Seasonally adjusted steady flows** implemented incrementally + spring BHBF + limited suite of mgt actions

No Action Alternative

Continue evaluating MLFF, the 1995 Final EIS "Preferred Alternative" (possibly with future BHBF testing in winter/spring under sand enriched conditions)

- **Scientifically the least confounded approach**
  - Builds on previous learning tied to baseline operations
  - Provides continuity with Phase IV (2003-2006) activities
  - Understand the effect of natural warming and trout removal
- **Could include actions to benefit resources**
  - HBC (translocation, refuge, TCD, exotic fish management)
  - Sediment conservation (winter/spring BHBF)
- **Follows Secretary's mandate to evaluate ROD**

SPG Option A

Enhanced Fluctuating Flows (9 months), in combination with ecologically stable flows (3 months), w/ Enriched BHBF (winter/spring)

- **Provides resource improvements using a suite of flow and non-flow actions**
  - late summer-fall steady flows
  - exotic fish control
  - augmentation planning
  - translocation,
  - TCD
  - Sediment conservation (BHBF)
- **Increased fluctuating flows in winter and summer targeted at:**
  - Hydropower generation during periods of high demand
  - Aquatic food base production and delivery (RBT an HBC)
  - Rainbow trout fishery below GCD
- **Short-term experiments (ponding, etc)**

Option A: SPG Agreements

- **Continued BHBF Testing w/ New Trigger and Guidelines**
- **Steady Flow Tests in Sep, Oct and possibly Nov**
  - Define ecologically steady
  - Short duration spike flow test
  - Maintain 7,000 cfs minimum
- **HBC Augmentation Planning**
  - Addresses refuge development; genetic mgt plan, stocking plan, and facilities
  - Future augmentation determined by FWS

Option A: SPG Agreements (cont)

- Mechanical removal as needed
  - Target: all problematic species; includes tributaries
  - GCMRC will develop plan (coordinated w/ NPS)
  - Include public outreach
- Experimental Design
  - Forward titration
  - Long term design determined in 2011 or when TCD comes online

Option A: Other Elements

- MLFF modifications
  - 2X increase in downramp rate (Nov-Aug)
  - Increase diurnal fluctuating ranges from maximum allowed of 8,000 cfs, to ranges up to 12,000 cfs
  - Ecologically steady flows in late summer – fall
- Possible Mini Experiments:
  - Summer Stranding Flows
  - Ponding flows (high water years)
  - Operational parameters

SPG Option B

Seasonally adjusted steady flows implemented incrementally for the entire year + spring BHBF + limited suite of mgt actions

- Implements seasonally adjusted stable flows over 6 years in conjunction with TCD and non-native fish control
- Incorporates BHBFs (if they will not impact YOY HBC)
- Expected resource benefits:
  - Restore rearing habitat for YOY HBC
  - Maintains positive mass balance of sand
- Aimed at providing resource benefits and addressing research questions related to Goals 1 (**food base**), 2 (**humpback chub**), 7 (**water temperature, quality and flow dynamics**), 8 (**sediment**), 9 (**recreation**), and 11 (**cultural resources**)
- Increased impact to power generation

Probable Resource Responses

- Sediment – moderately increased rates of sand export under Option A versus significant reduction in sand export under Option B associated with daily releases. Option B has greater probability of promoting multi-year accumulation of new tributary sand supply in channel prior to BHBF testing, with enhanced potential for more robust sand bar restoration.

Probable Resource Responses

- Water Temperature – Option B has greater probability of promoting increased near-shore and main channel warming after water is released from GCD in summer/fall owing to slower flow velocities and greater potential for shoreline stability in the vicinity of backwaters and other areas where flow stagnates.

Probable Resource Responses

- Productivity and Drift – Option B has greater probability of promoting increased productivity owing to more stable flows, but Option A might result in increased levels of drifting organic matter under wider fluctuating flow that are more varied than Option B.

Probable Resource Responses

- Recreational Boating & Camping – Option B has greater probability of promoting increased retention and access to camping areas associated with sand bars that are inundated to a lesser degree on a daily basis. Navigation and access to campsites will probably be less predictable under more widely ranging daily fluctuating flows associated with Option A.

Probable Resource Responses

- Arch Site Preservation – Option B has greater probability of promoting increased transport of sand by wind near preservation sites where in-situ preservation is of interest. This owes to the greater areal extent of sand deposits that remain consistently dryer in spring/summer (when windy conditions persist). Option A, with more widely varied river stages throughout windy season, results in larger, wetted sand bar areas. This condition is thought to limit wind transport to higher elevations containing archeological sites and this might be particularly important following beach deposition (after BHBF test).

Probable Resource Responses

- Humpback Chub – Option B will promote greater shoreline stability and higher mainstem and backwater temperatures which should benefit HBC spawning and recruitment. Option A includes a broader set of non-flow actions which are aimed at expanding the range of HBC (translocation), providing a safeguard against catastrophic population decline. Option A may limit RBT reproduction (trout suppression flows) which may benefit HBC.

Probable Resource Responses

- Lees Ferry Trout Fishery – Option B should increase aquatic productivity and overall RBT biomass. Option A should increase drifting food and may result in fewer, but larger RBT.

Probable Resource Responses

- Hydropower Capacity – Option B is a more costly experimental flow regime relative to the hydropower resource. It has been estimated to have a potential impact to the Colorado River Basin fund that may be 3 to 6 times larger (negative impact on the CR Basin Fund derived from increased replacement power costs) than the benefit (reduced impact on the CR Basin Fund) associated with operations under Option A.