

## Remaining Questions regarding BHBFs

- 1 - What is the impact of BHBFs (timing, magnitude, and duration) on germination and scouring of woody riparian (both NHWZ and OHWZ communities)? (Important to camping beaches and viability of plant communities, 1996 BHBF buried not scoured?)
- 2 - What is the longevity of sediment deposits from BHBFs under various pre- and post-BHBF conditions? (Important to recreational users and riparian ecosystem, affected by magnitude of BHBFs and subsequent flows)
- 3 - What are the experimental flows required to validate the conceptual model and improve the predictability of BHBF impacts?
- 4 - What attributes of BHBFs (including cumulative effects from sequential BHBFs) are necessary to control small bodied non-native fish? (Did the 1996 BHBF have an effect? Do multiple events have a greater effect?)
- 5 - Can arroyo filling from BHBFs protect cultural sites from erosion? Are BHBFs effective at protecting cultural sites? (Include interactions with check dams)
- 6 - Can BHBFs help preserve the mesquite/acacia community (OHWZ species), and will it become established downslope in response to BHBFs?
- 7 - What magnitude BHBF is required to scour and rejuvenate backwaters and near shore habitats?
- 8 - What are the effects of different types of recession limbs of the BHBF hydrograph?
- 9 - What is the ponding effect of BHBFs of tributary mouths on native fish?
- 10 - What is effect of BHBFs on reworking debris flows? What magnitude is required to maintain navigability of rapids, what are the ecological effects of reworking debris deposits?
- 11 - What flows are required to maintain the sand beach community? (What species comprise this community?)
- 12 - What is the effect on downstream resources of using the powerplant, bypass tubes, and spillways in releasing BHBFs? (entrainment of non-native fish from Lake Powell, water quality and temperature)
- 13 - How would the timing of BHBFs with respect to tributary inputs affect the grain size of deposits, retention of silts and clays, and resource impacts?
- 14 - When are the best conditions for conducting HMFs and BHBFs? (From the scientific perspective, high vs. low years, time of year)
- 15 - What are the effects of BHBFs on nutrient budgets of the CRE?
- 16 - What BHBFs would be most beneficial in helping the NPS manage the riparian areas?

## Assumptions

1. Shorter duration of BHBF than in 1996 would be adequate for beach building (<1 week)
2. Subsequent releases in high flow year may be high and erode BHBF deposits.
3. Sediment is deposited near elevation of peak flow
4. Erosion will occur rapidly after high flow
5. > 45,000 cfs needed to scour backwaters
6. Scouring of benthic flora occurs during BHBF (primarily Lees Ferry reach)?
7. Low steady flows for aerial photography before and after (~ 8,000 cfs) not necessarily good for resource
8. Fines won't be deposited unless BHBF is conducted soon after or in conjunction with tributary inputs.
9. Main channel coarsens with time during BHBF
10. Sediment is not accumulating in main channel over the time frame of years
11. To retain sediment, low flows or BHBF timing are options
12. BHBF's can at least temporarily suppress non-natives (?) Questioned assumption (LSSF vs. BHBF results)  
[question is how long the effect lasts]
13. Antecedent and succeeding flows greatly affect outcome of BHBF
14. In 1996, there was greater system export than deposition (? - Ted to check)
15. Sediment conditions post-BHBF/pre-BHBF is important  
-> large determinant of outcome
16. BHBF's are part of overall hydrograph. We need to plan more than just the BHBF
17. 16% of Vasey's habitat taken by 1996 BHBF; not fully recovered within 1 year (what is the status in 2001?)

18. Cultural resources effects not known

19. Insignificant effect on riparian? How high was the percentage of marsh loss?