

Adopt – A – Beach: Long-Term Monitoring of Camping Beaches in Grand Canyon

Summary of Results for Years 2006 – 2007

Introduction and Methods

The Adopt-A-Beach (AAB) program has now completed its twelfth year as a study that monitors camping beaches along the Colorado River in Grand Canyon. This program, sponsored by Grand Canyon River Guides, Inc., is implemented by a 100% volunteer group of river guides, scientists and NPS personnel. Results are submitted to various agencies such as the Cultural Resources Program of the Grand Canyon Monitoring and Research Center (GCMRC) and Grand Canyon National Park. Results are also presented to the Adaptive Management Program for Glen Canyon Dam, so that private and commercial recreational interests are represented as stakeholders in Colorado River management as reported to the Secretary of the Interior.

Methods implement repeat photography and observational comments that document a selected set of camping beaches in Grand Canyon. Data collection is usually conducted from April through October of the year, though data has been gathered through December and as early as February in some years. The selected beaches are categorized as belonging within one of five different critical reaches within the river corridor (Glen Canyon, Marble Canyon, Upper Granite Gorge, Muav Gorge and the Lower Granite Gorge). A critical reach is defined as an extended area in which camping beaches are sparse, small, and/or in high demand.

The program assesses visible photographs and first-hand, objective comments pertaining to changes to beaches, as influenced by regulated flow regimes, rainfall, wind, vegetation and human impacts. Volunteers for this program are unique in that many run the Colorado River more than once in one season, and are able to provide sets of repeat photographs and on-the-spot comments for each study beach. To date, river runners have produced almost 2000 repeat photographs and associated field sheets recording the sequential condition of beaches. Research results include changes to beaches after being impacted by certain flow regimes, longevity of the 1996 Beach Habitat/Building Flow (BHBF) and 2004 High Experimental Flow (HEF) deposits and primary and secondary processes that cause change in camping beach area and quality.

Results and General Conclusions

Results of this study show that beaches have continued to decrease in size and quality, system-wide, since 1996. As of the end of 2007, 33% of the beaches reviewed (12 of 36) were classified as being degraded compared to the same beaches examined in 1996. The factor considered to be the primary contributor of long-term erosion is fluctuating flows that contain low sediment concentrations. This is especially evident for a period immediately following a BHBF or HEF event. This is followed by a decreased magnitude of change that reflects two geomorphic processes: 1) the increased stability of beach fronts as they attain an angle of repose, and 2) decreased amounts of sediment that can be eroded from beaches (Thompson, 2004). The angle of repose is achieved as the beach recedes to a point static with the erosive force of the water. This recession is

directly related to the amount of river flow and the geography of the surrounding canyon near an individual beach.

Independent of low sediment concentration flows is the loss of camp area at a beach through the action of rain-created gullies. Rainfall funneled onto a beach by tributaries or the surrounding rock walls is recorded in at least 15 instances during 2006 and 2007, and has been the second most often cited cause of erosion in the two previous years of study (Thompson and Pollock, 2006, Lauck, 2007). Unlike the decrease in magnitude of erosion from fluctuating flows, flash events are less predictable in their frequency and vary considerably in their effects. Any single event can prove devastating to a beach, as happened at Olo, RM 145.6L in recent years, and the erosion effects appear to be accumulative, as experienced at Matkat Hotel, RM 148.5L in 2006 and 2007.

Vegetation encroachment is a less dramatic and less frequent factor in beach change, though reduced camp area and camp desirability due to vegetation, particularly arrowweed and camelthorn, were commented on by adopters.

Changes in beaches due to eolian action is another of the lesser emphasized contributors to beach adjustment. Though not cited as a cause for change in beach classification during this study, sand removal and repositioning on beaches by wind was discernable. The same can be said for human impacts.

The data accumulated for 2006 and 2007 emphasize the need for continued BHBF events whenever the sediment load available in the system allows, followed by low fluctuating flows. The flows that exceed power plant capacity are vital in replacing beach areas above the 30000 cfs line where sand has been removed by flash floods, restoring beach fronts eroded by river and wave action and to help mitigate the effects of vegetation encroachment and eolian erosion.

We thank the Grand Canyon Conservation Fund for their ongoing support of the Adopt-a-Beach program, including the 2006/2007 analysis. The Grand Canyon Conservation Fund is a non-profit, grant-making organization, managed by the Grand Canyon River outfitters and fueled by donations made primarily by the outfitted public who visit the Grand Canyon via professionally outfitted river trips. We also thank individual GCRG members who contributed to this program. And of course, this program would not have been possible without the considerable work of the volunteer adopters who fuel this program through their stewardship efforts.

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