

**Effects of the Beach-Habitat Building Flow and  
Subsequent Interim Flows from Glen Canyon Dam  
on Grand Canyon Camping Beaches, 1996: a Repeat  
Photography Study by Grand Canyon River Guides  
(Adopt-a-Beach Program)**

*by*

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## Abstract

The announcement of the 45,000 cfs test flood release through Grand Canyon sparked the interest of river guides in hands-on documentation of the changes in Colorado River sand bars ("beaches"). During a program of repeat photography called Adopt-a-Beach, commercial river guides took photos of 44 selected beaches and answered research questions about them, prior to and immediately following the test flood and throughout the commercial boating season (April to October, 1996).

The results of the study show 82% (36 of 44 sites) of the beaches photographed gained sand visibly, 11% (5 sites) stayed about the same, and 7% (3 sites) lost sand, because of the test flood. After observing the initial effects of the 45,000 cfs release, the guides documented four processes that eroded the beaches. The most significant of these were the interim fluctuating flows, followed by visitation, wind, and finally side canyon flash floods. From before the test flood until the end of the 1996 season, 80% of the beaches studied showed an overall net gain in sand, 11% showed a net loss, and 9% remained or returned to the same.

These results are supported by the conclusions of the sand bar survey project of Kaplinski and others (in press). They showed an average volume increase in sand of 176% for 93% of sand bars surveyed, due to the test flood. The results of Kearsley and Quartaroli (1997) differ, but their work focused on assessing change in campable area, rather than volume of sand. The guides comments refute the social conclusion in the Kearsley and Quartaroli report, that steep beach fronts left by the test flood made camps inaccessible. Guides generally considered the replenished condition of the beach well worth the scramble up the beach face and more consistent with natural conditions along undammed rivers.

The series of photographs of campsites showed that beaches with steep fronts slowly eroded to a gentle slope over the summer, as people tracked the sand downslope while loading and unloading boats. This suggests that human visitation is assisting in stabilizing the beach fronts. However, any reduced rate in erosion due to a gentler beach slope must be compared to the loss of sand into the eddy as pushed downslope by people.

The Adopt-a-Beach program can continue to address questions about beaches such as: 1) What will be the effects of high-flow releases in years of high lake levels? 2) How will the new maximum flows of 25,000 cfs affect beach shape and size? 3) Will the beach fronts remain at gentle slopes or begin to retreat as cutbanks reform? and 4) How will the new beaches fare in the long run?.

## Introduction

The operation of Glen Canyon Dam directly influences the Colorado River's ability to deposit, shape, and maintain sand bars in Grand Canyon. River guides have watched these sand bars decrease in size, height, and number as releases from the dam have diverged dramatically from predam flows. The guides' interest in "beaches" stems not only from intimate daily use, but from recognizing these sand deposits as indicators for overall health of the river ecosystem.

Guides depend on sand deposits for camping and lunch stops. Even with user limits, the number of river trips has made that resource vital, especially in critical areas where beaches are scarce and in high demand (Kearsley and Warren, 1993). The beaches also form the substrate for communities of plants, invertebrates, and vertebrates, including obligate species such as riparian birds (Carothers and Brown, 1991). Grand Canyon beaches nurture unique biologic diversity, preserve ancient cultural features, and foster our enjoyment of these resources.

Prompted by guides, their passengers, and many others, the Bureau of Reclamation began the Glen Canyon Environmental Studies (GCES) in 1982. The studies show that sand bars can be replenished at higher elevations above the river by releasing flows larger than the standard daily discharges (Hazel and others, 1993; Kaplinski and others, 1994; Schmidt and Graf, 1990; Hereford and others, 1993). Because sand bars are accumulations of sand settling out of water, the water level determines the elevation of the deposit. In the Glen Canyon Dam EIS that resulted from the studies, scientists and managers agreed to release an experimental "beach/habitat building" flow of 45,000 cfs for seven days, March 26 - April 1, 1996 (the "test flood"). This discharge level was designed to remobilize sand stored in the eddies and the main channel and deposit some of it as higher elevation sand bars.

The size and shape of many sand bars reflects the dynamics in recirculation zones (eddies) formed by debris fans constricting the river channel (Schmidt and Graf, 1990). During a flood release, sand may be eroded from an individual bar if the debris fan is overtopped and the sand bar is subjected to erosive downstream current. Otherwise, sand may be deposited in the enlarged eddy created just below the fan (Webb and others, 1989; Schmidt, 1990).

In 1983, a flood release of 97,000 cfs built many beaches (Brian and Thomas, 1984). However, most eroded back to their pre-1983 size during the erosive, high flows of 1984-86, and the high fluctuating flows that followed (Hereford and others, 1993; Kearsley and Warren, 1993). Hence, researchers are concerned with the longevity of sand bars formed by the test flood.

Many river guides observed changes during the mid-eighties and offered these observations to researchers as anecdotal evidence on GCES research trips. When the test flood release was scheduled for March-April 1996, river guides working with Grand Canyon River Guides, Inc. (a volunteer, non-profit organization) started a program of repeat photography called Adopt-a-Beach to document changes they would see. The guides would be on site much more often than any of the scheduled research science trips. Also, they could see first-hand, process-

es such as wind deflation, trampling, flash flooding, and calving of beach faces, which erode and reshape beaches. Thus, the goal of this project is to provide purely qualitative, anecdotal evidence about the effects of the test flood and the subsequent impacts on sandbars during the 1996 commercial boating season. Also, the study adds to the collection of photographs for campsite documentation by Kearsley and Quartaroli (1997) and complements sand bar and eddy studies by Parnell and others (in prep).

## Methods

### Data Collection

Grand Canyon River Guides selected 44 representative beaches (sand bars commonly used as campsites) in three "critical" reaches of the Colorado River. Critical reaches are narrow sections of river corridor with few, small, or high-demand beaches. The three reaches defined in our study are Marble Canyon (RM 8-42), Upper Granite Gorge (RM 75-116), and Muav Gorge (RM 131-167) (figure 1). These are the same critical reaches defined for the campsite

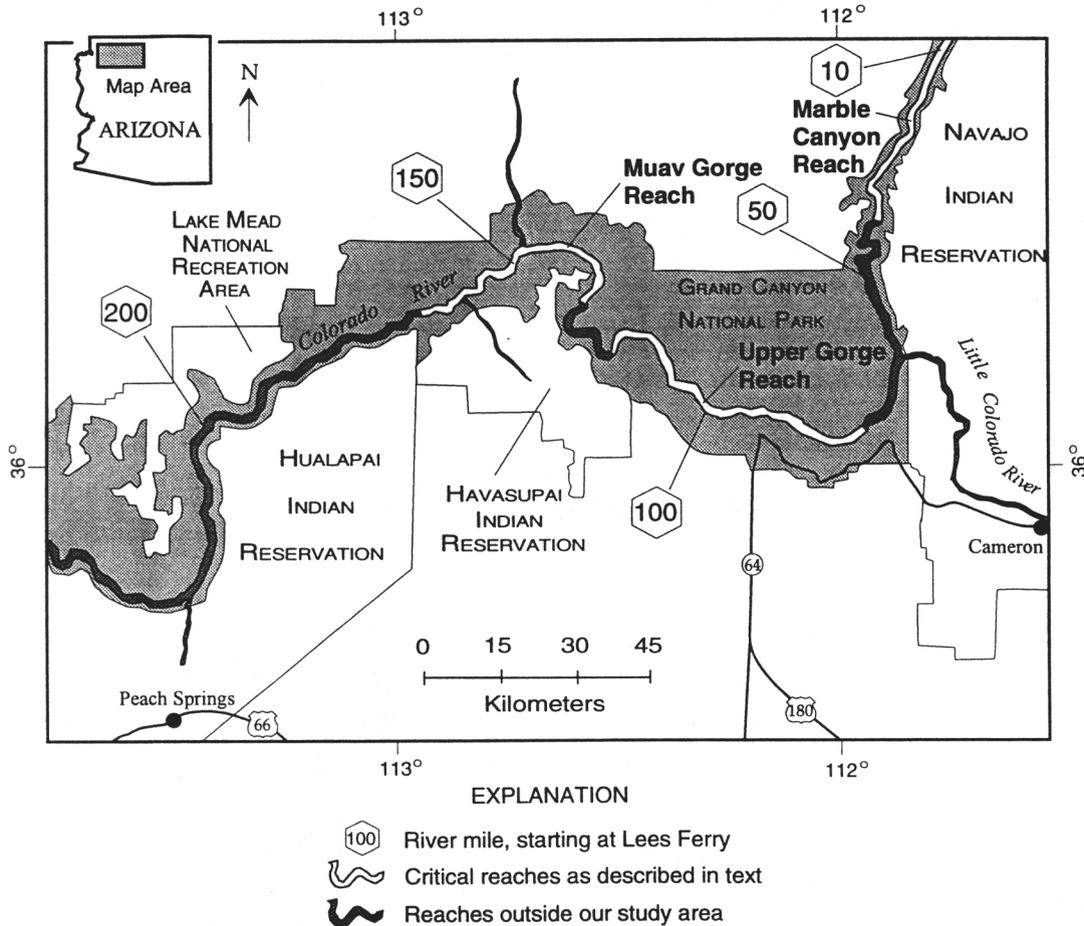


Figure 1. Location of the three critical reaches in Grand Canyon National Park.

study of Kearsley and Quartaroli (1997). Twenty-two beaches were observed by both studies, which employed slightly different methods. Kearsley and Quartaroli photographed and measured campable space of these beaches on three research trips: in March before the test flood, in April just after the test flood, and in September, 1996.

In our study, river guides participating in the program volunteered to take photos using disposable 35mm cameras and record specific observations of individual beaches every time they passed them. For consistency between the two studies, Kearsley and Quartaroli provided photo stations and pre-flood photos for 22 beaches they had previously photographed. Where possible, guides used those stations. For the remaining 22 beaches, we set up photo stations on trips in March 1996, prior to the test flood. Logistical difficulties resulted in three sites with no pre-flood photo. In these cases, several guides were interviewed in order to glean their knowledge of beach changes from pre- to post-flood conditions.

For each photo rematch, guides first took a photo of a sheet displaying date, time, and estimated flow level. On the reverse of the data sheet, they answered a series of descriptive questions about observed changes and processes (see Appendix A).

## Data Analysis

At the end of October 1996, the photos and data sheets were assembled in chronological order per site. We compared photos for each site, looking for changes in beach size and shape above the approximate 20,000 cfs level. Specifically, we identified rocks and vegetation as reference points in each photo to recognize apparent sand loss or gain. In this way we could evaluate relative amounts of cutbank retreat, slope changes, and surface scouring.

We compared the guide comments and compiled them into a spreadsheet along with our assessed changes that we observed from the photos. We used Kearsley and Quartaroli (1997) area measurements of campsites for comparison to what guides reported. No obvious discrepancies were found between the two studies for the 22 overlapping sites.

We grouped the data into three categories of change: beaches that increased in size, beaches that decreased in size, and beaches that remained the same size. We then analyzed and calculated the number of beaches that showed size change for three time periods: 1) from pre- to post-flood (March to April); 2) during the commercial boating season (April to October); and 3) from pre-flood to the end of the commercial boating season (March to October). These time divisions allow us to identify the processes that affect beach size over time, and finally to assess beach longevity at the end of the commercial boating season.

## Results

We analyzed a total of 284 photographs, out of over 350 photos received from guides and scientists for the 1996 commercial boating season. The photo chronologies ranged from 3 to 14 photos per beach, spanning from shortly before the test flood to the end of the commercial boating season in mid October. Photographs with accompanying data and comments aver-

aged 1 per month per beach. This collection provides the basis for the following results which are summarized for three separate periods: 1) results from the test flood, 2) results from subsequent processes during the summer months, and 3) net results at the end of the season. Because the mission of Adopt-a-Beach is to evaluate beach "health" over time, we based much of our analysis on apparent beach volume change, with a lesser emphasis on campable area.

### Test-Flood Results (March to April)

Photo observations and adopters' comments show that of 44 sites, 82% (36 beaches) visibly gained a large volume of sand immediately following the flood release. Only 11% (5 beaches) stayed about the same, and 7% (3 beaches) lost sand. All adopted sites aggraded vertically, including the three that lost some beach frontage: 110 Mile, Ross Wheeler, and Upper National.

In comparison, the study of Parnell and others (in prep.), which contrasts preflood topographic surveys with post-flood surveys, shows that 93% of their 33 studied sand bars increased in volume above the 15,000 cfs level, which is the April-to-October average daily maximum flow. Volumes increased an average of 176% for all their sand bars, on which new sand was deposited as 1-2 meters of vertical gain. Sixty-two percent of the sand bars expanded in area by an average of only 7% for each bar. Although none of their study sites overlap with ours, this result substantiates our observations that beaches generally increased in height much more than in area.

Studies by Kearsley and Quartaroli (1997), which focused on campable area above the approximately 20,000 cfs level, infer that campsites generally increased in area following the test flood. Using their data from "established campsites" within the three critical reaches, we calculated that 62% of all their study beaches significantly increased in campable area due to the test flood. However, only 50% of the 22 beaches that coincide with our study increased; 27% decreased and 23% stayed the same. Although their study is directed at measuring campable area as a valuable resource, their data do not necessarily reflect gain in sand volume. "Campable area" excludes vegetation or slopes too steep to camp on. This may explain why their results show a smaller percentage of beaches that increased compared to our study or the study of Parnell and others (in prep.).

Most guides reported that camping was generally easier on the beaches that gained sand because the quality of beaches improved, in spite of the difficult hike up many steep slopes. Only 11% of guides complained of harder camping on these beaches because of steepness or height of the cutbank. For the three beaches that were eroded by the test flood, guides reported that camping was harder because of reduced area.

### Summer Results (April to October)

Beach change through the summer months was often witnessed first-hand and noted by most participating guides, as well as documented by photographs. By the end of the season

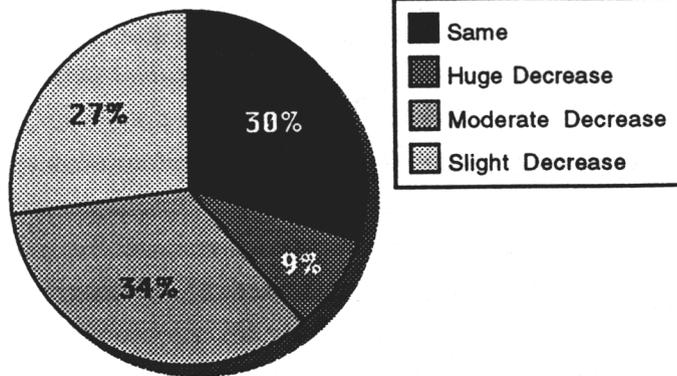


Figure 2. Percent change in beach size from mid-April to mid-October.

(mid-October), 30% of the beaches remained intact with minimal changes, whereas 70% showed some kind of decrease (figure 2).

Results of Parnell and others (in prep.) indicate a more pronounced, system-wide effect through the summer. From mid-April to September, they show that the volume of sand decreased by an average of 44% per beach above the 15,000 cfs level at 91% of their sites. Many of the guides reported that camping was

harder on beaches that lost sand because less space was available than just after the test flood, and more rocks were being exposed.

River guides were concerned about the sustainability of the beaches through the summer. Therefore, most of them systematically documented processes which helped shape or change beaches. In many cases, sites were affected by more than one process. The main forces that reportedly impacted beach size were identified as summer fluctuating flows, wind, people, flash floods or gullying from rainfall, and unknown processes. For three sites, North Canyon, Hance, and Kanab Creek, some of the sand loss was unexplained and could not be determined from photo observations. We summarized and ranked these processes by the percentage of beaches within each of the critical reaches that were altered by each process (figure 3).

Figure 3 shows that fluctuating flows reportedly had the most erosive effect on beach size. Daily fluctuating flows of 15,000 to 20,000 cfs characterized the flow regime throughout most of the summer months, with the exception of lower weekend flows. The percentage of beaches noticeably cut back by the summer flows ranged from 55% to 80%, depending on the reach. From May to July, guides commented that the erosive action

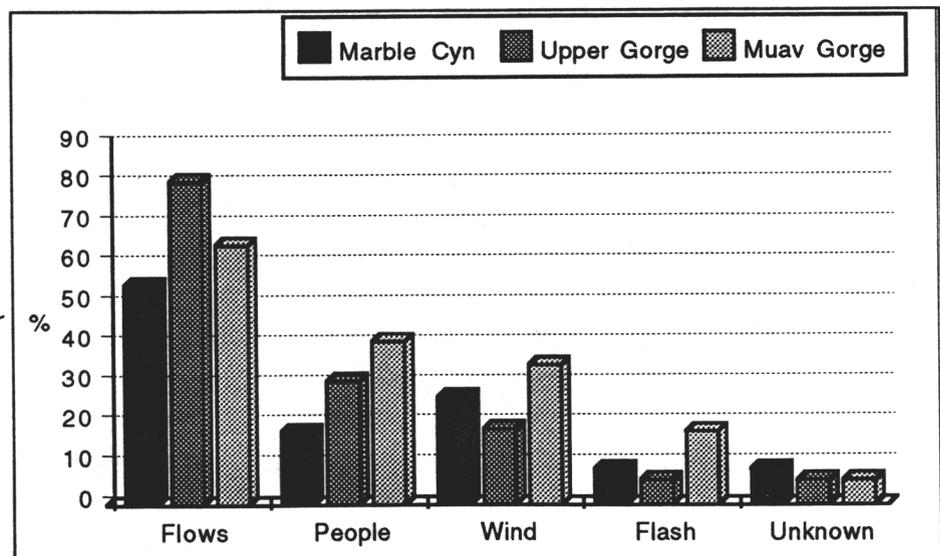


Figure 3. Processes that contribute to decreased beach size for each of the three critical reaches.

of fluctuating flows incised steep cutbanks into these beaches. These cutbanks generally retreated up beaches and became taller through much of the summer. By September, however, most cutbanks had become subdued, and steep beach fronts had evolved to more gentle slopes.

The next most commonly reported impact to beach shape was trampling by people. When separated per reach, reports of this process contributed to an average of 18% to 41% of beaches decreasing in size through the summer (figure 3). Sand was progressively pushed down steep slopes, accounting for minor beach front retreat. This helped lessen overall steepness of beach fronts, which many guides found to be beneficial as it afforded easier access to camping.

Guides reported that wind was active in reshaping most beaches by mounding sand on the surface and deflating cutbanks. This process contributed to a size decrease on 19 to 35% of beaches, when reports were averaged per reach (figure 3). The only repeatedly recorded, detrimental effect was surface scour, which visibly exposed rocks on the surface.

Flash floods and gullyng from rainfall, which are tangible events easily recognized in camps, accounted for sand loss on five beaches (figure 3). Three of these lie within a five-mile section of Muav Gorge. Flash floods scoured large quantities of sand from Nautiloid and Olo Camps, whereas Schist, Kanab, and Matkatamiba Camps showed minor gullyng.

We used either September or October photographs, and corresponding data collected by guides to evaluate end-of-summer beach-front stability. An estimated 84% of beach fronts achieved quasi-stability, indicated by a gentle slope and low-water bench extending into the eddy. A few guides suggested that calving of beach faces in early summer may have initiated beach stability. By late summer, many guides had reported on the processes that formed gentle beach-front slopes, and suggested that people were pushing sand downhill simply through visitation and camping. Several photo series where people are actively trampling beach fronts when loading and unloading boats can be seen in the photo series in the Boatman's Quarterly Review (Thompson and others, 1997, p. 19-21). Each of the beach-front slopes in the photos appears to become successively more gentle until the fall season, when they finally appear to stabilize as maximum flows were reduced to below 20,000 cfs.

### End-of-Season Net Results (March to October)

The results show a net gain in sand, from before the test flood in March/April to the end of the 1996 commercial boating season in October, for over 80% of the study beaches. Eleven percent of beaches suffered a net loss, mainly from the combination of the test flood and summer flows. Nine percent of beaches remained or returned to the same beach as before the test flood.

Our observations generally support the results of Parnell and others (in prep.) regarding volume change. Despite the system-wide decreases recorded in September as compared to April volumes, sand bars in their study still showed a net gain from preflood time (February) to September. During this time, 93% of sand bars increased, with an average volume gain of 97%.

However, our compiled observations are notably different from the results of Kearsley and Quartaroli (1997). Based upon their measurements in March and September, only 45% of

the 22 camps that coincide with our study showed a net increase in area. These sites averaged a net gain of 22% in area (Kearsley and Quartaroli, 1997). Comparatively, 82% of the same 22 camps were reported by guides to have increased in size by the end of the commercial boating season.

We divided out end-of-season change for each of the three reaches (figure 4) in order to see any concentrated net results. Marble Canyon was originally expected to be impacted the most by regulated flows following the test flood, yet 100% of the beaches show a net end-of-season increase.

Conversely, most of the net decreases occurred in the Upper Gorge reach where four beaches (25%) were visibly cut back, two of which were eroded by the test flood.

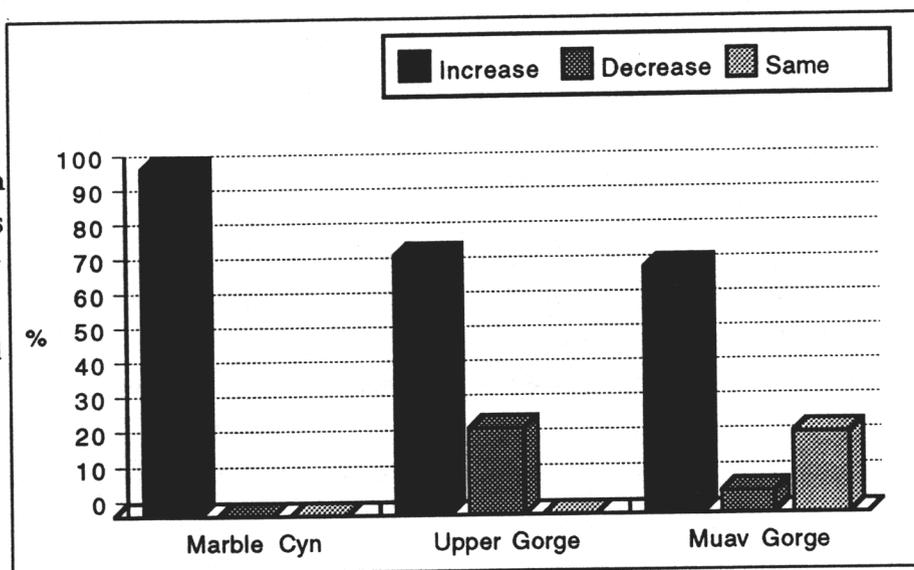


Figure 4. Net end-of-season change in beach size per reach (March to mid-October).

### Summary and Conclusions

In short, river guides feel that the test flood was tremendously successful at depositing large amounts of sand on highly used beaches, such as the beaches adopted for this study. The test flood had deposited enough sand that erosive processes during the summer months did not strip away most of the sand that beaches had gained. Beach deposits system wide seem to be in moderately good condition after one commercial boating season, despite the erosion of sand bars during the summer. This conclusion agrees with Parnell and others (in prep.), who conclude that the new beaches are mostly "still there" (Matt Kaplinski pers. comm.).

Campable area markedly decreased over the summer, as Kearsley and Quartaroli's (1997) work shows; yet, river guides generally feel that campsites still are in better condition and contribute to a more pristine river experience than before the flood. However, it is imperative to evaluate the longevity of these beaches through continued photo monitoring and observations of beach change for several years.

Almost all guides commented about the steep slopes and cutbanks initially following the flood, yet they generally concluded that camping was easier because of the new sand and larger camp size. As the season progressed many steep slopes graded to gentler and apparently

more stable ones, affording easier access for camping. Therefore, we feel beach steepness is not a negative result of the test flood. Rather, it is a typical beach shape that forms when flood waters subside, and in fact is a common geomorphic characteristic in many natural, undammed, dryland rivers (Graf, 1988).

A hypothesis that needs to be further explored is that beach fronts become more stable if their slopes are reduced to lower angles. Trampling by people may cause some erosion of the beach front, but more importantly human visitation may be contributing to beach-front stability by lessening beach slope. If this is true, then quasi-stability of beach fronts may be achieved at a faster rate, with visitation during the commercial boating season. However, we would need to estimate the amount of sand that accumulates in eddies as a result of sand migrating downslope. Then we could weigh the benefits of slope stability enhanced by people against erosion caused by them. Unfortunately, any new regime of fluctuating flows can still undercut or remove sand. Alternatively, stability may be enhanced by lower discharge releases in the fall.

Most beaches ended up with a net gain in sand by the close of the commercial boating season, despite erosion during the summer season. Beaches that decreased were mostly concentrated in the Upper Gorge. It may be premature to speculate about why beaches decreased mostly in this reach. However, two camps, Hance and Crystal which are both upper pool deposits, decreased as a result of the summer fluctuating flows. This suggests that deposits such as these may be more susceptible to erosive qualities of higher flows, and should be closely monitored in the future—especially in light of the newly elevated maximum flow constraint of 25,000 cfs set in the Final GCDEIS Record of Decision. A flow increase such as this could cause beaches to lose their apparent stability as they re-equilibrate to the higher flow through further erosion. In addition any emergency flow releases above 20,000 cfs and below the 45,000 cfs test flood may entirely remove many of the newly created beaches.

## Acknowledgements

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## Appendix A

(example of the data sheet used by river guides to identify a beach photograph and document observed changes.)

Adopt a Beach  
DATA SHEET

(check appropriate spaces, make comments as needed)

beach name: \_\_\_\_\_

river mile / side: \_\_\_\_\_

date: \_\_\_\_\_

time: \_\_\_\_\_

photo frame #'s: \_\_\_\_\_

water level: low: \_\_\_\_\_ med.: \_\_\_\_\_ high: \_\_\_\_\_

guide's name/outfitter \_\_\_\_\_

How has the beach changed from your previous visit? How much?

smaller \_\_\_\_\_

same \_\_\_\_\_

larger \_\_\_\_\_

can't say \_\_\_\_\_

describe: \_\_\_\_\_

What seems to have caused the changes?

spike flow \_\_\_\_\_

daily fluctuations \_\_\_\_\_

monthly change in flow regime \_\_\_\_\_

tributary flood or debris flow \_\_\_\_\_

wind \_\_\_\_\_

people \_\_\_\_\_

hard tellin', not knowin' \_\_\_\_\_

other? \_\_\_\_\_

How has the shape of the beach changed?

gentle beach slope? \_\_\_\_\_

cutbank? just started \_\_\_\_\_

already present \_\_\_\_\_

taller \_\_\_\_\_

less tall \_\_\_\_\_

longer \_\_\_\_\_

shorter \_\_\_\_\_

retreated up beach \_\_\_\_\_

advanced toward river \_\_\_\_\_

bench out in eddy? \_\_\_\_\_

other? \_\_\_\_\_

Is it a better or worse camp compared to your last visit?

easier to camp \_\_\_\_\_

harder to camp \_\_\_\_\_

how ?(mooring, steepness, veg. cover, shade, etc.)

\_\_\_\_\_

\_\_\_\_\_

river

mile/side: \_\_\_\_\_

date: \_\_\_\_\_

m d y

time: \_\_\_\_\_

## Appendix B

(spreadsheets of results analyzed in this study, compiled from river guide's data sheets and photographs.)

Camp Name	Camp Mile	Date	Change	Cause	Slope	Cutbank	Bench
Badger	8.0	14-Jun-96	I	spike		present	
Badger	8.0	05-Jul-96	D	fluct		retreat	
Badger	8.0	11-Aug-96	S		gentle	none	
Salt Wash	12.2	17-Apr-96	I	spike		present	
Salt Wash	12.2	11-May-96	S	people		less tall	present
Salt Wash	12.2	05-Jun-96	S			less tall	present
Salt Wash	12.2	18-Jun-96	D	fluct		retreat	present
Salt Wash	12.2	02-Jul-96	D	fluct, wind		retreat, shorter	new
Salt Wash	12.2	15-Jul-96	D	fluct		retreat	
Salt Wash	12.2	28-Jul-96	S			none	
Salt Wash	12.2	11-Aug-96	D	month, wind		none	new
Salt Wash	12.2	25-Aug-96	D	fluct, month	gentle	retreat	present
19 mile	19.1	16-Apr-96	I	spike		present	
19 mile	19.1	06-May-96	S			less tall	
19 mile	19.1	19-May-96	S			less tall	
19 mile	19.1	30-Jun-96	S			none ?	
19 mile	19.1	14-Jul-96	S			none ?	
19 mile	19.1	27-Jul-96	S			none ?	
19 mile	19.1	20-Aug-96	S			none ?	
19 mile	19.1	03-Sep-96	S			none ?	
20 mile	19.9	17-Apr-96	I	spike		present	
20 mile	19.9	21-May-96	S			less tall	
20 mile	19.9	11-Jun-96	S			less tall	
20 mile	19.9	06-Jul-96	D	people	gentle	none	
20 mile	19.9	25-Jul-96	D	fluct, people		none	
20 mile	19.9	13-Aug-96	S	fluct		none	
20 mile	19.9	02-Sep-96	S			none	
North Canyon	20.4	17-Apr-96	I	spike		none	
North Canyon	20.4	09-Aug-96	D	hard tellin	gentle	none	new
North Canyon	20.4	23-Aug-96	S			none	present
North Canyon	20.4	14-Sep-96	S			none	present
23 mile	23.0	17-Apr-96	I	spike		none	
23 mile	23.0	03-May-96	D	fluct		present	
23 mile	23.0	20-May-96	S			present	
23 mile	23.0	03-Jun-96	S			present	
23 mile	23.0	17-Jun-96	D	fluct, month		retreat	
23 mile	23.0	29-Jul-96	D	fluct, wind	gentle	none	new
23 mile	23.0	19-Aug-96	S			none	
23 mile	23.0	02-Sep-96	D	wind		none	
Silver Grotto	29.3	28-May-96	I	spike		present	present
Silver Grotto	29.3	01-Jun-96	S			taller	present
Silver Grotto	29.3	02-Jul-96	S			retreat	present
Silver Grotto	29.3	30-Jul-96	S		gentle	none	present
Silver Grotto	29.3	13-Aug-96	S			none	present
Nautiloid	34.7	03-May-96	I	spike		started	
Nautiloid	34.7	22-May-96	S	fluct		present	
Nautiloid	34.7	16-Jun-96	D	fluct		present	
Nautiloid	34.7	31-Aug-96	D	fluct, flash, month		taller	
Tatahatso	37.7	19-Apr-96	I	spike		present	present
Tatahatso	37.7	22-May-96	S		gentle	less tall, longer	present
Tatahatso	37.7	12-Jun-96	S			less tall, longer	present
Tatahatso	37.7	24-Jun-96	D	fluct, wind		started	
Tatahatso	37.7	10-Jul-96	D	fluct, wind, people		taller, retreat	
Tatahatso	37.7	23-Jul-96	S			present	
Tatahatso	37.7	04-Aug-96	D	fluct, wind		taller	new
Tatahatso	37.7	11-Sep-96	D	fluct, wind, people	gentle	longer	
Tatahatso	37.7	22-Sep-96	S			none	
Bishop	38.3	27-Apr-96	I	spike		started	
Bishop	38.3	22-May-96	S			less tall	
Bishop	38.3	05-Jun-96	S	fluct, people	gentle	none	
Bishop	38.3	19-Jun-96	S	fluct, wind		none	
Bishop	38.3	16-Jul-96	S			advance	
Bishop	38.3	30-Jul-96	S	month		advance	
Bishop	38.3	27-Aug-96	S		gentle	longer	

Camp Name	Camp Mile	Date	Change	Cause	Slope	Cutbank	Bench
Buck Farm	41.0	13-May-96	I	spike		present	
Buck Farm	41.0	12-Jul-96	S	fluct, wind, people		retreat	
Nevils	75.6	25-Apr-96	I	spike		present	
Nevils	75.6	01-Jun-96	S	wind		present	
Nevils	75.6	22-Jun-96	S	wind		taller	
Nevils	75.6	06-Jul-96	D	fluct		taller, retreat	
Nevils	75.6	31-Jul-96	S	wind		shorter	
Hance	76.6	25-Apr-96	S	spike		present	
Hance	76.6	29-Apr-96	S			less tall	
Hance	76.6	10-May-96	D	hard tellin	gentle	less tall	new
Hance	76.6	23-May-96	S			present	
Hance	76.6	07-Jun-96	S			taller	present
Hance	76.6	15-Aug-96	D	fluct		taller	present
Clear Creek	84.0	25-Apr-96	I	spike		present	
Clear Creek	84.0	08-May-96	D	fluct		retreat	new
Clear Creek	84.0	25-May-96	S			present	present
Clear Creek	84.0	10-Jul-96	D	fluct		retreat, less tall	present
Clear Creek	84.0	31-Jul-96	S	hard tellin		advance	present
above Zoroaster	84.5	20-May-96	I	spike		present	
above Zoroaster	84.5	28-Jun-96	D	fluct		retreat	
above Zoroaster	84.5	10-Aug-96	D	fluct		retreat	
above Zoroaster	84.5	29-Aug-96	D	fluct		retreat	
above Zoroaster	84.5	17-Sep-96	S		gentle	none	
Trinity	91.6	30-Apr-96	I	spike		just started	
Trinity	91.6	19-May-96	S			present	
Trinity	91.6	17-Jun-96	D	fluct, people		just started	
Trinity	91.6	02-Jul-96	D	fluct, month		shorter	
Trinity	91.6	27-Jul-96	D	fluct		taller	
Trinity	91.6	24-Aug-96	S	wind, people	gentle	retreat	
Trinity	91.6	08-Sep-96	S	wind, people		retreat	
Salt Creek	92.2	15-May-96	I	spike		present	
Salt Creek	92.2	28-May-96	S			taller, advance	
Salt Creek	92.2	11-Jun-96	S	fluct, wind		retreat	
Salt Creek	92.2	25-Jun-96	S	fluct, wind		just started, re	
Salt Creek	92.2	09-Jul-96	D	fluct, wind		taller, retreat	
Schist Camp	96.1	26-Apr-96	I	spike		present	
Schist Camp	96.1	01-May-96	S			taller	
Schist Camp	96.1	25-May-96	D	fluct	gentle	none	
Schist Camp	96.1	08-Jun-96	D	fluct, people		just started	
Schist Camp	96.1	22-Jun-96	D	fluct, people		retreat	new
Schist Camp	96.1	20-Jul-96	D	fluct, flash, people	gentle	retreat	
Schist Camp	96.1	03-Aug-96	S			none	
Schist Camp	96.1	31-Aug-96	S	fluct, people		none	present
Schist Camp	96.1	14-Sep-96	S	flash, fluct	gentle	taller	
Boucher	96.7	09-Apr-96	I	spike		present	
Boucher	96.7	23-Apr-96	D	fluct		taller, retreat	
Boucher	96.7	16-May-96	S		gentle	none	
Boucher	96.7	04-Jun-96	S	hard tellin		none	
Boucher	96.7	04-Jul-96	S	wind		none	
Boucher	96.7	24-Jul-96	S			none	
Boucher	96.7	20-Aug-96	S	wind		none	
Boucher	96.7	12-Sep-96	S			none	
Crystal	98.0	26-May-96	S	spike		just started	
Crystal	98.0	07-Jun-96	D	wind, fluct		retreat	
Crystal	98.0	21-Jul-96	D	fluct		retreat, taller	
Crystal	98.0	21-Aug-96	S		gentle	none	new
Lower Tuna	99.7	19-May-96	I	spike		just started	new
Lower Tuna	99.7	03-Jun-96	D	fluct		taller, retreat	present
Lower Tuna	99.7	03-Jul-96	S			retreat	present
Lower Tuna	99.7	15-Jul-96	D	fluct		less tall, retrea	present
Lower Tuna	99.7	29-Jul-96	S	fluct, hard tellin	gentle	none	present
Shady Grove	102.7	24-May-96	I	spike		none	new
Shady Grove	102.7	08-Jun-96	S			none	present
Shady Grove	102.7	05-Jul-96	D	fluct, people		none	new

Camp Name	Camp Mile	Date	Change	Cause	Slope	Cutbank	Bench
Shady Grove	102.7	24-Aug-96	D	people, hard tellin		none	present
Shady Grove	102.7	21-Sep-96	D	people	gentle	none	present
Shady Grove	102.7	13-Oct-96	S	people		none	present
Ross Wheeler	107.8	27-Apr-96	D	spike		present	new
Ross Wheeler	107.8	24-May-96	S			taller	present
Ross Wheeler	107.8	13-Jun-96	S			advance	present
Ross Wheeler	107.8	29-Jun-96	S	wind		none	present
Ross Wheeler	107.8	25-Jul-96	S		gentle	none	present
Ross Wheeler	107.8	30-Aug-96	S			none	present
Ross Wheeler	107.8	05-Oct-96	S			none	present
Bass	108.3	30-Apr-96	I	spike		none	present
Bass	108.3	25-May-96	S			none	
Bass	108.3	08-Jun-96	S			none	
Bass	108.3	24-Aug-96	S			none	
Bass	108.3	06-Sep-96	S			none	new
Bass	108.3	18-Oct-96	S		gentle	none	present
110 mile	109.4	27-Apr-96	D	spike		present	
110 mile	109.4	12-May-96	S			present	
110 mile	109.4	07-Jul-96	S			none	new
110 mile	109.4	25-Jul-96	D	fluct		taller, retreat	present
110 mile	109.4	12-Aug-96	D	fluct	gentle	retreat	present
110 mile	109.4	26-Aug-96	S	fluct, month		retreat	present
110 mile	109.4	31-Aug-96	S			none	present
110 mile	109.4	06-Oct-96	S			none	present
Upper Garnet	114.3	27-Apr-96	I	spike		present	new
Upper Garnet	114.3	02-May-96	S			taller	present
Upper Garnet	114.3	27-May-96	S		gentle	less tall	present
Upper Garnet	114.3	13-Jun-96	S	people		none	present
Upper Garnet	114.3	12-Jul-96	S	people, wind		none	present
Upper Garnet	114.3	23-Aug-96	D	people, wind		none	present
Lower Garnet	114.5	24-May-96	I	spike		present	
Lower Garnet	114.5	13-Jun-96	S			none	
Lower Garnet	114.5	11-Jul-96	S			taller	
Lower Garnet	114.5	03-Aug-96	D	people	gentle	none	new
Lower Garnet	114.5	18-Aug-96	D	month, people		none	present
Below Bedrock	131.1	30-Apr-96	I	spike		present	
Below Bedrock	131.1	28-Jul-96	S	fluct, people, hard tellin		less tall	new
Above Galloway	131.8	28-Apr-96	S	spike		present	
Above Galloway	131.8	19-Jul-96	S	fluct		taller	
Above Galloway	131.8	24-Sep-96	S			present	
Stone Creek	132.0	28-Apr-96	I	spike		present	new
Stone Creek	132.0	05-May-96	S	fluct		taller	present
Stone Creek	132.0	18-May-96	I			taller, longer	present
Stone Creek	132.0	30-May-96	S	fluct		started	present
Stone Creek	132.0	15-Jun-96	D	fluct		taller	present
Stone Creek	132.0	24-Jun-96	S	fluct, hard tellin		none	present
Stone Creek	132.0	23-Aug-96	D	fluct, wind, people	gentle	none	present
Talking Heads	133.0	17-Apr-96	I	spike		present, tall	
Talking Heads	133.0	28-Apr-96	D	fluct		taller, retreat	
Talking Heads	133.0	08-May-96	D	fluct, wind		taller, retreat	
Talking Heads	133.0	15-May-96	D	fluct, wind		taller, longer, r	
Talking Heads	133.0	05-Jun-96	D	fluct, waves		retreat	
Talking Heads	133.0	19-Jun-96	D	fluct, wind		retreat	new
Talking Heads	133.0	03-Jul-96	D	fluct		retreat, longer,	
Talking Heads	133.0	17-Jul-96	D	month, fluct, wind		retreat	present
Talking Heads	133.0	31-Jul-96	D	month, fluct, wind		retreat	new
Talking Heads	133.0	08-Aug-96	S	people, hard tellin		less tall	present
Talking Heads	133.0	21-Aug-96	S	people hard tellin	gentle	none	present
Talking Heads	133.0	28-Aug-96	S	people		none	present
Talking Heads	133.0	11-Sep-96	S	people		none	
Racetrack	133.5	15-May-96	I	spike		none	
Racetrack	133.5	01-Jun-96	D	fluct, people		just started	
Racetrack	133.5	05-Jul-96	S	fluct, people		taller	
Racetrack	133.5	28-Jul-96	D	fluct, people		retreat	

Camp Name	Camp Mile	Date	Change	Cause	Slope	Cutbank	Bench
Racetrack	133.5	20-Sep-96	S	fluct, people	gentle	advance	new
Tapeats (mouth)	133.6	01-Jun-96	S	spike		none	
Tapeats (mouth)	133.6	09-Jul-96	D	fluct		retreat	
Lower Tapeats	133.7	01-Jul-96	I	spike		just started	new
Lower Tapeats	133.7	15-Aug-96	D	fluct, people	gentle	shorter, retreat	present
Lower Tapeats	133.7	03-Sep-96	S	fluct, month, people		present	present
Lower Tapeats	133.7	21-Sep-96	D	fluct, wind, people		retreat, less tal	present
Owl Eyes	134.6	28-Apr-96	I	spike		present	
Owl Eyes	134.6	14-May-96	D	fluct		retreat	
Owl Eyes	134.6	01-Jun-96	S	wind		less tall	
Owl Eyes	134.6	17-Jun-96	D	fluct, wind		retreat	
Owl Eyes	134.6	01-Jul-96	D	fluct		less tall, shorte	
Owl Eyes	134.6	16-Jul-96	S	wind, people		none	new
Owl Eyes	134.6	30-Sep-96	S	wind, people	gentle	advance	present
Backeddy	137.0	29-Apr-96	I	spike		present	new
Backeddy	137.0	30-May-96	D	fluct		taller, retreat	
Backeddy	137.0	12-Jun-96	S	wind, people		shorter	
Backeddy	137.0	27-Jun-96	S			none	
Backeddy	137.0	06-Aug-96	S		gentle	none	
Backeddy	137.0	28-Aug-96	D	month, wind, people		retreat	
Kanab	143.2	05-May-96	I	spike	gentle	none	
Kanab	143.2	01-Jul-96	S			none	
Kanab	143.2	29-Jul-96	S	flash		none	
Kanab	143.2	17-Aug-96	S			none	
Kanab	143.2	15-Sep-96	D	flash		none	
Kanab	143.2	21-Oct-96	D	hard tellin		none	
Olo	145.6	16-Apr-96	I	spike	gentle	none	new
Olo	145.6	29-Apr-96	S			none	present
Olo	145.6	05-May-96	S	fluct		just started	
Olo	145.6	22-May-96	S			none	
Olo	145.6	04-Jun-96	S		gentle	none	new
Olo	145.6	16-Jun-96	D	fluct		none	present
Olo	145.6	14-Jul-96	D	flash		none	present
Olo	145.6	30-Jul-96	S			none	present
Olo	145.6	04-Sep-96	S			none	present
Olo	145.6	02-Oct-96	S			none	present
Matkat	148.5	29-Apr-96	I	spike		present	
Matkat	148.5	14-May-96	S			none	
Matkat	148.5	29-May-96	S	people		none	
Matkat	148.5	06-Aug-96	D	fluct, people		taller	new
Matkat	148.5	22-Sep-96	D	fluct, people, flash		taller	present
Last Chance	155.7	04-Apr-96	I	spike		none	
Last Chance	155.7	02-May-96	D	wind		none	
Last Chance	155.7	21-May-96	S	fluct, wind, people		none	
Last Chance	155.7	21-Jun-96	D	people, fluct		retreat	
Last Chance	155.7	03-Jul-96	S	people		shorter	
Last Chance	155.7	29-Jul-96	D	people	gentle	none	
Last Chance	155.7	26-Aug-96	D	fluct, people, hard tellin		none	
Last Chance	155.7	09-Sep-96	D	wind, people, hard tellin		none	
First Chance	157.7	29-Apr-96	I	spike		none	
First Chance	157.7	15-Jun-96	S			shorter	new
First Chance	157.7	30-Jun-96	S			none	present
First Chance	157.7	14-Jul-96	S			none	present
First Chance	157.7	28-Jul-96	S			none	present
First Chance	157.7	14-Sep-96	S			none	present
Tuckup	164.5	17-May-96	I	spike		none	
Tuckup	164.5	05-Jun-96	D	fluct, people		retreat	new
Tuckup	164.5	07-Aug-96	D	fluct, month, hard tellin		retreat	present
National (upper)	166.4	11-Apr-96	D	spike	gentle	none	
National (upper)	166.4	01-May-96	S			none	
National (upper)	166.4	21-May-96	S			none	
National (upper)	166.4	09-Jun-96	S			none	
National (upper)	166.4	08-Jul-96	S			none	new
National (upper)	166.4	28-Jul-96	S			none	present

Camp Name	Camp Mile	Date	Change	Cause	Slope	Cutbank	Bench
National (upper)	166.4	24-Aug-96	S			none	present
National (upper)	166.4	17-Sep-96	S			none	present
Lower National	166.6	30-Apr-96	I	spike		present	new
Lower National	166.6	18-Jun-96	S	fluct, people, hard tellin		less tall	present
Lower National	166.6	09-Aug-96	S			less tall	new
Lower National	166.6	25-Sep-96	S		gentle	less tall	present

Camp Name	Camp Mile	Date	Campability	Campability Comments
Badger	8.0	14-Jun-96	easier	
Badger	8.0	05-Jul-96	same	About the same
Badger	8.0	11-Aug-96	same	About the same
Salt Wash	12.2	17-Apr-96	easier	More room, but steep slope
Salt Wash	12.2	11-May-96	easier	Less of a cutbank
Salt Wash	12.2	05-Jun-96	same	
Salt Wash	12.2	18-Jun-96	same	Just as good
Salt Wash	12.2	02-Jul-96	easier	Less steep cutbank
Salt Wash	12.2	15-Jul-96	same	
Salt Wash	12.2	28-Jul-96	same	
Salt Wash	12.2	11-Aug-96	same	
Salt Wash	12.2	25-Aug-96	easier	Gentle slope
19 mile	19.1	16-Apr-96	easier	More room
19 mile	19.1	06-May-96	same	
19 mile	19.1	19-May-96	same	
19 mile	19.1	30-Jun-96	same	
19 mile	19.1	14-Jul-96	same	
19 mile	19.1	27-Jul-96	same	
19 mile	19.1	20-Aug-96	same	
19 mile	19.1	03-Sep-96	same	
20 mile	19.9	17-Apr-96	same	
20 mile	19.9	21-May-96	same	
20 mile	19.9	11-Jun-96	same	
20 mile	19.9	06-Jul-96	easier	
20 mile	19.9	25-Jul-96	same	
20 mile	19.9	13-Aug-96	same	
20 mile	19.9	02-Sep-96	same	
North Canyon	20.4	17-Apr-96	easier	Nice new sand, less rocks, more space
North Canyon	20.4	09-Aug-96	easier	Gentler slope.
North Canyon	20.4	23-Aug-96	same	
North Canyon	20.4	14-Sep-96	same	
23 mile	23.0	17-Apr-96	easier	Alot more space
23 mile	23.0	03-May-96	same	
23 mile	23.0	20-May-96	same	
23 mile	23.0	03-Jun-96	same	
23 mile	23.0	17-Jun-96	same	
23 mile	23.0	29-Jul-96	harder	
23 mile	23.0	19-Aug-96	same	
23 mile	23.0	02-Sep-96	harder	
Silver Grotto	29.3	28-May-96	same	
Silver Grotto	29.3	01-Jun-96	same	
Silver Grotto	29.3	02-Jul-96	same	
Silver Grotto	29.3	30-Jul-96	same	
Silver Grotto	29.3	13-Aug-96	same	
Nautiloid	34.7	03-May-96	easier	Larger area, not as steep
Nautiloid	34.7	22-May-96	same	
Nautiloid	34.7	16-Jun-96	same	
Nautiloid	34.7	31-Aug-96	harder	Mostly rocks, even in upper camp area
Tatahatso	37.7	19-Apr-96	easier	Good pull-in for S rigs; steeper bank, but more room
Tatahatso	37.7	22-May-96	easier	Less steep
Tatahatso	37.7	12-Jun-96	same	
Tatahatso	37.7	24-Jun-96	same	
Tatahatso	37.7	10-Jul-96	same	
Tatahatso	37.7	23-Jul-96	easier	Low water
Tatahatso	37.7	04-Aug-96	same	
Tatahatso	37.7	11-Sep-96	easier	
Tatahatso	37.7	22-Sep-96	same	
Bishop	38.3	27-Apr-96	easier	Less steep; rock covered by sand in boat parking area
Bishop	38.3	22-May-96	easier	Not as steep
Bishop	38.3	05-Jun-96	same	Not as steep
Bishop	38.3	19-Jun-96	same	
Bishop	38.3	16-Jul-96	same	
Bishop	38.3	30-Jul-96	easier	Water is lower
Bishop	38.3	27-Aug-96	same	

Camp Name	Camp Mile	Date	Campability	Campability Comments
Buck Farm	41.0	13-May-96	easier	More sand but steep
Buck Farm	41.0	12-Jul-96	same	
Nevils	75.6	25-Apr-96	harder	Steep incline but excellent camp
Nevils	75.6	01-Jun-96	same	Steep slope, but great camp space
Nevils	75.6	22-Jun-96	harder	Very steep, but good camp
Nevils	75.6	06-Jul-96	harder	Steep
Nevils	75.6	31-Jul-96	easier	Not as steep slope
Hance	76.6	25-Apr-96	same	
Hance	76.6	29-Apr-96	same	
Hance	76.6	10-May-96	same	
Hance	76.6	23-May-96	same	
Hance	76.6	07-Jun-96	same	
Hance	76.6	15-Aug-96	same	
Clear Creek	84.0	25-Apr-96	harder	Smaller area with steep bank
Clear Creek	84.0	08-May-96	harder	Smaller camp
Clear Creek	84.0	25-May-96	same	Too small to camp on
Clear Creek	84.0	10-Jul-96	same	Too small to camp with 27 people
Clear Creek	84.0	31-Jul-96	same	
above Zoroaste	84.5	20-May-96	easier	More sand but steep bank
above Zoroaste	84.5	28-Jun-96	same	Still steep bank
above Zoroaste	84.5	10-Aug-96	harder	Steeper bank, less space
above Zoroaste	84.5	29-Aug-96	same	
above Zoroaste	84.5	17-Sep-96	same	
Trinity	91.6	30-Apr-96	easier	Good camp
Trinity	91.6	19-May-96	same	
Trinity	91.6	17-Jun-96	easier	Steep bank is being pushed down by parties camping here
Trinity	91.6	02-Jul-96	easier	Less steep
Trinity	91.6	27-Jul-96	same	
Trinity	91.6	24-Aug-96	easier	Less steep
Trinity	91.6	08-Sep-96	same	
Salt Creek	92.2	15-May-96	harder	Steep
Salt Creek	92.2	28-May-96	easier	
Salt Creek	92.2	11-Jun-96	same	
Salt Creek	92.2	25-Jun-96	harder	
Salt Creek	92.2	09-Jul-96	harder	Steepness- new cutbank and dune forming on downstream sid
Schist Camp	96.1	26-Apr-96	easier	More room, but steep
Schist Camp	96.1	01-May-96	same	
Schist Camp	96.1	25-May-96	same	
Schist Camp	96.1	08-Jun-96	same	
Schist Camp	96.1	22-Jun-96	same	Sand has shifted downhill
Schist Camp	96.1	20-Jul-96	easier	same
Schist Camp	96.1	03-Aug-96	same	
Schist Camp	96.1	31-Aug-96	same	Low bench in eddy
Schist Camp	96.1	14-Sep-96	same	
Boucher	96.7	09-Apr-96	easier	Steeper bank, but nicer beach
Boucher	96.7	23-Apr-96	harder	Swme hard pull-in; rolling eddy, high cutbank
Boucher	96.7	16-May-96	same	
Boucher	96.7	04-Jun-96	same	
Boucher	96.7	04-Jul-96	same	
Boucher	96.7	24-Jul-96	same	
Boucher	96.7	20-Aug-96	same	
Boucher	96.7	12-Sep-96	same	
Crystal	98.0	26-May-96	same	Same camp, just a little smaller
Crystal	98.0	07-Jun-96	harder	The path to the upstream pooper spot is no longer there at hig
Crystal	98.0	21-Jul-96	harder	
Crystal	98.0	21-Aug-96	easier	Less of an embankment
Lower Tuna	99.7	19-May-96	harder	Steep cutbbank, hard loading/unloading; but huge level camp o
Lower Tuna	99.7	03-Jun-96	same	Still too steep for easy access
Lower Tuna	99.7	03-Jul-96	same	Still hard camp and little shade
Lower Tuna	99.7	15-Jul-96	same	Still too steep for convenience
Lower Tuna	99.7	29-Jul-96	easier	Less steep
Shady Grove	102.7	24-May-96	easier	Lots of sand
Shady Grove	102.7	08-Jun-96	same	
Shady Grove	102.7	05-Jul-96	same	

Camp Name	Camp Mile	Date	Campability	Campability Comments
Shady Grove	102.7	24-Aug-96	same	
Shady Grove	102.7	21-Sep-96	easier	Flatter beach under shade tree
Shady Grove	102.7	13-Oct-96	easier	Lower water makes better parking and unloading
Ross Wheeler	107.8	27-Apr-96	harder	Now two separate beaches
Ross Wheeler	107.8	24-May-96	same	
Ross Wheeler	107.8	13-Jun-96	same	
Ross Wheeler	107.8	29-Jun-96	same	
Ross Wheeler	107.8	25-Jul-96	same	
Ross Wheeler	107.8	30-Aug-96	same	
Ross Wheeler	107.8	05-Oct-96	same	
Bass	108.3	30-Apr-96	same	
Bass	108.3	25-May-96	same	
Bass	108.3	08-Jun-96	same	
Bass	108.3	24-Aug-96	same	
Bass	108.3	06-Sep-96	same	
Bass	108.3	18-Oct-96	same	
110 mile	109.4	27-Apr-96	harder	Less space, steep bank, still easy parking, no shade
110 mile	109.4	12-May-96	same	Smaller since spike
110 mile	109.4	07-Jul-96	same	
110 mile	109.4	25-Jul-96	same	
110 mile	109.4	12-Aug-96	same	Camp pretty small, but generally the same
110 mile	109.4	26-Aug-96	easier	Less steep
110 mile	109.4	31-Aug-96	same	
110 mile	109.4	06-Oct-96	same	
Upper Garnet	114.3	27-Apr-96	easier	More room and lots of new sand that covers boulders.
Upper Garnet	114.3	02-May-96	same	Great camp
Upper Garnet	114.3	27-May-96	same	
Upper Garnet	114.3	13-Jun-96	easier	Gentle beach slope
Upper Garnet	114.3	12-Jul-96	easier	Gentle beach slope
Upper Garnet	114.3	23-Aug-96	easier	Gentle beach slope
Lower Garnet	114.5	24-May-96	easier	More sand and better camp
Lower Garnet	114.5	13-Jun-96	same	
Lower Garnet	114.5	11-Jul-96	same	
Lower Garnet	114.5	03-Aug-96	easier	Gentler beach slope
Lower Garnet	114.5	18-Aug-96	easier	gentler beach slope and bench at low water
Below Bedrock	131.1	30-Apr-96	easier	More room with lots of sand covering boulders in main camp.
Below Bedrock	131.1	28-Jul-96	easier	Less steep with bench for parking.
Above Gallowa	131.8	28-Apr-96	same	
Above Gallowa	131.8	19-Jul-96	same	
Above Gallowa	131.8	24-Sep-96	same	Camp seems just the same
Stone Creek	132.0	28-Apr-96	easier	Lots of new sand, more rocks covered making more room; stee
Stone Creek	132.0	05-May-96	same	
Stone Creek	132.0	18-May-96	easier	Tall ledge of sand at 20K mark. There is more flat sand to cam
Stone Creek	132.0	30-May-96	easier	The cut ledge has created an easier walking platform in the we
Stone Creek	132.0	15-Jun-96	same	Same area, but steeper ledge
Stone Creek	132.0	24-Jun-96	same	Not much change except that cutbank is slightly cut away
Stone Creek	132.0	23-Aug-96	easier	More gentle slope
Talking Heads	133.0	17-Apr-96	easier	Larger, but steep
Talking Heads	133.0	28-Apr-96	harder	Taller, steeper bank.
Talking Heads	133.0	08-May-96	harder	Much smaller
Talking Heads	133.0	15-May-96	harder	Smaller
Talking Heads	133.0	05-Jun-96	harder	
Talking Heads	133.0	19-Jun-96	harder	Smaller
Talking Heads	133.0	03-Jul-96	harder	Too steep of a cutbank
Talking Heads	133.0	17-Jul-96	harder	Much smaller
Talking Heads	133.0	31-Jul-96	harder	Bigger new sandbar exposed in low water, but steep cutbank
Talking Heads	133.0	08-Aug-96	same	
Talking Heads	133.0	21-Aug-96	easier	Not so steep
Talking Heads	133.0	28-Aug-96	same	
Talking Heads	133.0	11-Sep-96	harder	Smaller
Racetrack	133.5	15-May-96	easier	Nicer camp
Racetrack	133.5	01-Jun-96	same	The quality of the camp has not changed that much
Racetrack	133.5	05-Jul-96	harder	Much of beach is underwater; have to park under tamarisk
Racetrack	133.5	28-Jul-96	easier	low flows make for easier parking

Camp Name	Camp Mile	Date	Campability	Campability Comments
Racetrack	133.5	20-Sep-96	easier	Calm eddy means easier parking
Tapeats (mouth)	133.6	01-Jun-96	same	
Tapeats (mouth)	133.6	09-Jul-96	harder	Too small
Lower Tapeats	133.7	01-Jul-96	easier	Less rocks, now a great camp
Lower Tapeats	133.7	15-Aug-96	same	No difference only smaller; no boat camping but great low wat
Lower Tapeats	133.7	03-Sep-96	same	Still smooth sand on new eddy bench, no rocks, good for dorys
Lower Tapeats	133.7	21-Sep-96	same	better low water camp
Owl Eyes	134.6	28-Apr-96	easier	Bigger and wider camp, but very steep bank.
Owl Eyes	134.6	14-May-96	easier	Less steep bank
Owl Eyes	134.6	01-Jun-96	easier	Less steep
Owl Eyes	134.6	17-Jun-96	same	
Owl Eyes	134.6	01-Jul-96	same	Still steep bank, but beautiful sand
Owl Eyes	134.6	16-Jul-96	easier	More gradual slope. Great camp with lots of people traffic and
Owl Eyes	134.6	30-Sep-96	easier	Easier access. People have flattened out beach making campin
Backeddy	137.0	29-Apr-96	easier	More room with lots new sand covering rocks, but steep bank.
Backeddy	137.0	30-May-96	harder	Taller cutbank
Backeddy	137.0	12-Jun-96	same	
Backeddy	137.0	27-Jun-96	same	
Backeddy	137.0	06-Aug-96	same	
Backeddy	137.0	28-Aug-96	harder	New cutbank
Kanab	143.2	05-May-96	easier	No real change in campability, but new sand makes nicer camp
Kanab	143.2	01-Jul-96	same	Beach up mouth still looks good. Can pull boats up to it
Kanab	143.2	29-Jul-96	same	Not changing; very stable
Kanab	143.2	17-Aug-96	same	beach up mouth still stable with no real change
Kanab	143.2	15-Sep-96		
Kanab	143.2	21-Oct-96	same	Still good sand left
Olo	145.6	16-Apr-96	easier	More room
Olo	145.6	29-Apr-96	same	
Olo	145.6	05-May-96	same	
Olo	145.6	22-May-96	same	
Olo	145.6	04-Jun-96	easier	More gentle slope
Olo	145.6	16-Jun-96	same	
Olo	145.6	14-Jul-96	harder	No more new sand. Beach wiped out by flash flood
Olo	145.6	30-Jul-96	harder	Very rocky beach now. Still some camping in dunes that weren
Olo	145.6	04-Sep-96	same	
Olo	145.6	02-Oct-96	same	Low water camp, with good cottonwoods - still going strong.
Matkat	148.5	29-Apr-96	easier	More room and nice sand.
Matkat	148.5	14-May-96	same	
Matkat	148.5	29-May-96	same	
Matkat	148.5	06-Aug-96	harder	A little harder to camp
Matkat	148.5	22-Sep-96	harder	Steeper
Last Chance	155.7	04-Apr-96	easier	Steep beach slope with ledges covered with sand.
Last Chance	155.7	02-May-96	same	Steep slope of about 10' to flat platform.
Last Chance	155.7	21-May-96	same	Still steep beach slope, but sand is starting to migrate downhill
Last Chance	155.7	21-Jun-96	easier	Less steep.
Last Chance	155.7	03-Jul-96	easier	Less steep.
Last Chance	155.7	29-Jul-96	easier	Less steep
Last Chance	155.7	26-Aug-96	same	
Last Chance	155.7	09-Sep-96	same	
First Chance	157.7	29-Apr-96	easier	New camp made by spike
First Chance	157.7	15-Jun-96	same	
First Chance	157.7	30-Jun-96	same	
First Chance	157.7	14-Jul-96	same	
First Chance	157.7	28-Jul-96	same	
First Chance	157.7	14-Sep-96	same	
Tuckup	164.5	17-May-96	easier	Lots of room for camping.
Tuckup	164.5	05-Jun-96	easier	Gentler slope, but less beach front.
Tuckup	164.5	07-Aug-96	harder	More rocks exposed in eddy and on beach edge, although slope
National (upper)	166.4	11-Apr-96	harder	Harder boat parking because more rocks; smaller camp
National (upper)	166.4	01-May-96	same	
National (upper)	166.4	21-May-96	same	
National (upper)	166.4	09-Jun-96	same	
National (upper)	166.4	08-Jul-96	same	
National (upper)	166.4	28-Jul-96	same	

Camp Name	Camp Mile	Date	Campability	Campability Comments
National (upper)	166.4	24-Aug-96	same	
National (upper)	166.4	17-Sep-96	same	
Lower National	166.6	30-Apr-96	easier	More room with lots of nice sand, but steep bank
Lower National	166.6	18-Jun-96	easier	Less steep bank
Lower National	166.6	09-Aug-96	easier	smaller cutbank
Lower National	166.6	25-Sep-96	easier	A little less steep.

Camp Name	Camp Mile	Date	Change	Comments
Badger	8.0	14-Jun-96 I		Photo - Vertical increase and lateral increase; Guide - The lower alcove has about 8-12' of new sand
Badger	8.0	05-Jul-96 D		Photo - Very slight decrease; Guide - Basically same w/change in cutbank.
Badger	8.0	11-Aug-96 S		Guide - About the same w/the cutbank getting softened; upper alcove starting to catch debris.
Salt Wash	12.2	17-Apr-96 I		K. Photo - Large vertical increase; Guide - Obviously alot of new sand deposited; beach seemed to grow vertically.
Salt Wash	12.2	11-May-96 S		Photo, no data - Generally the same
Salt Wash	12.2	05-Jun-96 S		Photo - Looks the same
Salt Wash	12.2	18-Jun-96 D		Guide - Cut away a little at bottom; steep slope
Salt Wash	12.2	02-Jul-96 D		Guide - Eroded along north side. Cutbank smoothed by wind erosion.
Salt Wash	12.2	15-Jul-96 D		Guide - North side eroded
Salt Wash	12.2	28-Jul-96 S		Guide - Not much change
Salt Wash	12.2	11-Aug-96 D		Guide - Small decrease from surface erosion, but bigger shelf
Salt Wash	12.2	25-Aug-96 D		Guide - Spreading slowly into the eddy and making a wonderful frisbee beach.
19 mile	19.1	16-Apr-96 I		Photo - Vertical increase
19 mile	19.1	06-May-96 S		(photo, no data)
19 mile	19.1	19-May-96 S		(photo, no data)
19 mile	19.1	30-Jun-96 S		(photo, no data)
19 mile	19.1	14-Jul-96 S		(photo, no data)
19 mile	19.1	27-Jul-96 S		(photo, no data)
19 mile	19.1	20-Aug-96 S		(photo, no data)
19 mile	19.1	03-Sep-96 S		(photo, no data)
20 mile	19.9	17-Apr-96 I		K. Photo - Vertical increase; nice level beach on top
20 mile	19.9	21-May-96 S		Photo - Appears the same; Guide - Fresh sand deposit.
20 mile	19.9	11-Jun-96 S		Photo - Appears the same
20 mile	19.9	06-Jul-96 D		Photo - Appears the same
20 mile	19.9	25-Jul-96 D		Photo - Only very slight decrease
20 mile	19.9	13-Aug-96 S		Photo - Appears the same
20 mile	19.9	02-Sep-96 S		Photo - Appears the same; Guide - Larger because of low water
North Canyon	20.4	17-Apr-96 I		K. Photo - big vertical increase, but eddy scoured
North Canyon	20.4	09-Aug-96 D		(photo, no data - Surface lowered a bit; bench forming in eddy
North Canyon	20.4	23-Aug-96 S		(photo, no data)
North Canyon	20.4	14-Sep-96 S		(photo, no data)
23 mile	23.0	17-Apr-96 I		K. Photo - Lots more sand; large boulder (6' across) in foreground gone; vertical increase
23 mile	23.0	03-May-96 D		(photo, no data - beach has retreated a little)
23 mile	23.0	20-May-96 S		(photo, no data - appears the same)
23 mile	23.0	03-Jun-96 S		(photo, no data - appears the same)
23 mile	23.0	17-Jun-96 D		(photo, no data - Beach front cut back some)
23 mile	23.0	29-Jul-96 D		(photo, no data - Rockier at base of beach)
23 mile	23.0	19-Aug-96 S		(photo, no data - appears the same)
23 mile	23.0	02-Sep-96 D		(photo, no data - windblown; more rocks exposed)
Silver Grotto	29.3	28-May-96 I		Photo - (no pre-flood photo for comparison); Guide - Big rockpile now a sand dune from flood.
Silver Grotto	29.3	01-Jun-96 S		(photo, no data - appears the same)
Silver Grotto	29.3	02-Jul-96 S		(photo, no data - appears the same)
Silver Grotto	29.3	30-Jul-96 S		(photo, no data - appears the same)
Silver Grotto	29.3	13-Aug-96 S		(photo, no data - appears the same)
Nautlioid	34.7	03-May-96 I		Guide - All rocks covered at ends of beach; middle beach is now campable as boulders are covered; beach more continuo
Nautlioid	34.7	22-May-96 S		Photo - appears the same
Nautlioid	34.7	16-Jun-96 D		Guide - More rocks exposed at both ends of beach

Camp Name	Camp Mile	Date	Change	Comments
Naurfield	34.7	31-Aug-96	D	Guide - Flash flood has washed away lots of sand; beach filled and gullied; front boulders now exposed
Tatahasso	37.7	19-Apr-96	I	Guide - Beach has steeper bank, comes out further
Tatahasso	37.7	22-May-96	S	Guide - More slope on downriver side
Tatahasso	37.7	12-Jun-96	S	Photo - Beach appears the same but cutbank has changed.
Tatahasso	37.7	24-Jun-96	D	Guide - New cutbank at river level (1' high); slight decrease; huge upstream wind
Tatahasso	37.7	10-Jul-96	D	Guide - Bank cut by eddy; severe rain storm here
Tatahasso	37.7	23-Jul-96	S	Guide - No change, only water lower
Tatahasso	37.7	04-Aug-96	D	Guide - Wind erosion evident; bank cut; eddy encroaching
Tatahasso	37.7	11-Sep-96	D	Guide - Cutbank lowered and less steep; Photo - A little smaller
Tatahasso	37.7	22-Sep-96	S	Photo - Appears the same
Bishop	38.3	27-Apr-96	I	Photo - Clear increase; Guide - Can't tell
Bishop	38.3	22-May-96	S	Photo - Appears the same; Guide - Larger because lower water.
Bishop	38.3	05-Jun-96	S	Guide - Less steep; cut back slightly
Bishop	38.3	19-Jun-96	S	Guide - Slightly less steep
Bishop	38.3	16-Jul-96	S	Photo - Appears the same
Bishop	38.3	30-Jul-96	S	Photo - Appears the same; Guide - Larger because lower water
Bishop	38.3	27-Aug-96	S	Photo - Mostly built up vertically covering lots of rocks; Guide - Big mound and cut back upstream
Buck Farm	41.0	13-May-96	I	Guide - Only a little more cut back at water level
Buck Farm	41.0	12-Jul-96	S	Photo - Only a little more cut back at water level
Nevils	75.6	25-Apr-96	I	K. Photo - All vegetation gone, lots new sand, huge cutbank, vertical increase, all rocks covered; Guide - All rocks and br
Nevils	75.6	01-Jun-96	S	Photo - Looks about same; can't see beach edge; Guide - Steep incline
Nevils	75.6	22-Jun-96	S	Guide - Steep incline at end of beach; Photo - Hard to see change from photo
Nevils	75.6	06-Jul-96	D	Guide - Narrower beach; Photo - Hard to see change from photo
Nevils	75.6	31-Jul-96	S	Guide - Same but not as steep; Photo - Hard to see change from photo
Hance	76.6	25-Apr-96	S	K. Photo - Only a bit narrower from pre-flood; upper beach has appears to have increased vertically; Guide - Just a little s
Hance	76.6	29-Apr-96	S	Photo - Appears the same
Hance	76.6	10-May-96	D	Guide - Just a little smaller
Hance	76.6	23-May-96	S	Photo - Appears the same
Hance	76.6	07-Jun-96	S	Photo - Appears the same
Hance	76.6	15-Aug-96	D	Photo - Slight cutbank retreat
Clear Creek	84.0	25-Apr-96	I	K. Photo - Beach front scoured, vertical increase behind; Guide - A great deal of the beach seems to have gone into the e
Clear Creek	84.0	08-May-96	D	Photo - Beach front cut back more
Clear Creek	84.0	25-May-96	S	Photo - Appears the same
Clear Creek	84.0	10-Jul-96	D	Photo - Beach front cut back slightly
Clear Creek	84.0	31-Jul-96	S	Photo - Beach front advanced slightly
above Zoroaster	84.5	20-May-96	I	(photo only, no data - Large vertical increase and wider beach; lots of talus covered making more space)
above Zoroaster	84.5	28-Jun-96	D	(photo only, no data - Beach face cut back)
above Zoroaster	84.5	10-Aug-96	D	(photo only, no data - Beach front cut back more)
above Zoroaster	84.5	29-Aug-96	D	(photo only, no data - Appears a little smaller)
above Zoroaster	84.5	17-Sep-96	S	(photo only, no data - Appears the same)
Trinity	91.6	30-Apr-96	I	Guide - More sand deposited in camping area; beach is steeper; Photo - vertical increase
Trinity	91.6	19-May-96	S	Photo - Appears the same
Trinity	91.6	17-Jun-96	D	Guide - The 20K flow is eroding beach and causing cutbank
Trinity	91.6	02-Jul-96	D	Guide - Less sand under tumbles on upstrm end
Trinity	91.6	27-Jul-96	D	Photo - Cutbank retreated up beach
Trinity	91.6	24-Aug-96	S	Photo - Cutbank has stabilized with less steep slope
Trinity	91.6	08-Sep-96	S	Photo - Appears the same

Camp Name	Camp Mile	Date	Change	Comments
Salt Creek	92.2	15-May-96	I	Photo - Lots of new sand; vertical increase, lots of rocks covered, steep bank
Salt Creek	92.2	28-May-96	S	Photo - Cutbank less steep
Salt Creek	92.2	11-Jun-96	S	Photo - Wind action appears to be mounding sand
Salt Creek	92.2	25-Jun-96	S	Photo - Can't tell from photo
Salt Creek	92.2	09-Jul-96	D	Guide - Smaller and steeper, dune forming and beach is undercut; Photo - Beach front cut back, lateral dune forming from
Schist Camp	96.1	26-Apr-96	I	K. Photo - Lots new sand; vertical increase; scoured a bit on upstream end; Guide comment - increase at upriver end of l
Schist Camp	96.1	01-May-96	S	Guide - About the same
Schist Camp	96.1	25-May-96	D	Guide - Steeper, cut back a little; Photo - Small rock now showing
Schist Camp	96.1	08-Jun-96	D	Guide - Small cutbank, less steep
Schist Camp	96.1	22-Jun-96	D	Guide - A little smaller; Photo - Some beach retreat
Schist Camp	96.1	20-Jul-96	D	Guide - Slight beach retreat. Small flash flood came down and cut a swath through lower end.
Schist Camp	96.1	03-Aug-96	S	Photo - Appears the same
Schist Camp	96.1	31-Aug-96	S	Guide - Lower water exposes bench in eddy
Schist Camp	96.1	14-Sep-96	S	Guide - Same size, but slightly steeper; small flash flood took part of beach
Schist Camp	96.7	09-Apr-96	I	(photo only, no data - Huge increase both vertically and areally; most rocks covered)
Boucher	96.7	23-Apr-96	D	Guide - Decrease just a bit; high cutbank
Boucher	96.7	16-May-96	S	(photo only, no data - Appears the same)
Boucher	96.7	04-Jun-96	S	(photo only, no data - Can't tell from photo)
Boucher	96.7	04-Jul-96	S	(photo only, no data - Wind is duning sand up on beach top)
Boucher	96.7	24-Jul-96	S	(photo only, no data - Can't see any real change, but photo does not show beach edge)
Boucher	96.7	20-Aug-96	S	(photo only, no data - Wind during up parts of beach)
Boucher	96.7	12-Sep-96	S	(photo only, no data)
Crystal	98.0	26-May-96	S	Guide - Beach downstream of center rock blown out after flood; Photo - Beach cut back, steep bank, vertical increase
Crystal	98.0	07-Jun-96	D	Photo - Some beach retreat and surface erosion
Crystal	98.0	21-Jul-96	D	(no data, photo only - Only a little cutbank retreat)
Crystal	98.0	21-Aug-96	S	(no data, photo only - Cutbank now a slope)
Lower Tuna	99.7	19-May-96	I	Photo - Steep bank, vertical increase, much of the gravel bar covered; Guide - Steep, but huge level camp once on top
Lower Tuna	99.7	03-Jun-96	D	Photo - Beach front cut back some
Lower Tuna	99.7	03-Jul-96	S	Photo - Mostly same with some cutbank retreat
Lower Tuna	99.7	15-Jul-96	D	Photo - A little more beach retreat from last visit
Lower Tuna	99.7	29-Jul-96	S	Photo - More gentle slope
Shady Grove	102.7	24-May-96	I	Photo - The camp is back; vertical and areal increase
Shady Grove	102.7	08-Jun-96	S	Photo - Appears the same
Shady Grove	102.7	05-Jul-96	D	Guide - Downstream cove is more carved out, beach is steeper. There appears to be erosion at water level around upstrm
Shady Grove	102.7	24-Aug-96	D	Guide - Sand under downstream tree is going into river
Shady Grove	102.7	21-Sep-96	D	Guide - Volume of sand under tree has decreased
Shady Grove	102.7	13-Oct-96	S	Guide - Lower bench exposed and being impacted by people
Ross Wheeler	107.8	27-Apr-96	D	K. Photo - Main beach too far away to see, but huge vertical increase; Guide - Middle eroded, but seems to now extend!
Ross Wheeler	107.8	24-May-96	S	Photo - Main beach far away to see
Ross Wheeler	107.8	13-Jun-96	S	Photo - Main beach far away to see
Ross Wheeler	107.8	29-Jun-96	S	Photo - Main beach far away to see
Ross Wheeler	107.8	25-Jul-96	S	Photo - Main beach far away to see
Ross Wheeler	107.8	30-Aug-96	S	Photo - Main beach far away to see
Ross Wheeler	107.8	05-Oct-96	S	Photo - Main beach far away to see
Ross Wheeler	108.3	30-Apr-96	I	Photo - Vertical increase only
Bass	108.3	25-May-96	S	Photo - Looks the same and very stable
Bass	108.3	08-Jun-96	S	Photo - Looks the same and very stable

Camp Name	Camp Mile	Date	Change	Comments
Bass	108.3	24-Aug-96	S	Photo - Looks the same and very stable
Bass	108.3	06-Sep-96	S	Photo - Looks the same and very stable
Bass	108.3	18-Oct-96	S	Photo - Low water shows bench in eddy, beach slope stable
110 mile	109.4	27-Apr-96	D	K. Photo - Beach cut way back, but new sand up high (.5 m) at back of beach; Guide - the beach got reamed. Nice, huge
110 mile	109.4	12-May-96	S	Guide - Beach still looks like shit
110 mile	109.4	07-Jul-96	S	Photo - Different angle, can't tell
110 mile	109.4	25-Jul-96	D	Photo - Slight decrease; Guide - Cutbank steeper and closer to tammies
110 mile	109.4	12-Aug-96	D	Photo - Lots of surface erosion near waters edge; beach now gently sloping; Guide - Cutbank retreated
110 mile	109.4	26-Aug-96	S	No photo, only data - Cutbank may have receded
110 mile	109.4	31-Aug-96	S	Photo - Appears the same
110 mile	109.4	06-Oct-96	S	Photo - Appears the same
Upper Garnet	114.3	27-Apr-96	I	K. Photo - Lots new sand with mostly vertical increase; covers many boulders, making more campable space.
Upper Garnet	114.3	02-May-96	S	Photo - Some downslope movement of sand, but mostly the same
Upper Garnet	114.3	27-May-96	S	Photo - Appears the same with less tall cutbank
Upper Garnet	114.3	13-Jun-96	S	Photo - Cutbank taller with a little retreat
Upper Garnet	114.3	12-Jul-96	S	Photo - Surface erosion beginning
Upper Garnet	114.5	23-Aug-96	D	Photo - More rocks exposed on surface and a little beach retreat
Lower Garnet	114.5	24-May-96	I	Photo - Huge vertical increase
Lower Garnet	114.5	13-Jun-96	S	Photo - Appears the same
Lower Garnet	114.5	11-Jul-96	S	Photo - Appears the same
Lower Garnet	114.5	03-Aug-96	D	Photo - Very little decrease; Guide - It seems the slope is more gradual from people traffic
Lower Garnet	114.5	18-Aug-96	D	Guide - Beach more leveled out and pushed toward the river
Below Bedrock	131.1	30-Apr-96	I	K. Photo - Nice new sand that has built beach vertically; scoured some parts just upstream
Below Bedrock	131.1	28-Jul-96	S	(photo, no data - Appears mostly the same with a less steep slope)
Above Gallowa	131.8	28-Apr-96	S	K. Photo - Appears just the same with a little new sand up high.
Above Gallowa	131.8	19-Jul-96	S	(photo, no data - Appears the same)
Above Gallowa	131.8	24-Sep-96	S	(photo, no data - Appears the same)
Stone Creek	132.0	28-Apr-96	I	K. Photo - Lots new sand especially up high; mostly vertical increase that covers lots of talus; Guide - Much larger than I
Stone Creek	132.0	05-May-96	S	Photo -
Stone Creek	132.0	18-May-96	I	Guide - Steep edge toward river; flat on upper end w/peak of sand in mid-section slumping to point on down river end
Stone Creek	132.0	30-May-96	S	Guide - Cutbank beginning to appear with 20K flow
Stone Creek	132.0	15-Jun-96	D	Guide - Cutbank much more defined and steep
Stone Creek	132.0	24-Jun-96	S	Guide - Beach is still being cut away but not as much as last visit
Stone Creek	132.0	23-Aug-96	D	Photo - Beach has been cut back dramatically; Guide - More sloped .
Talking Heads	133.0	17-Apr-96	I	Guide - Flood built huge, steep dune
Talking Heads	133.0	28-Apr-96	D	K. Photo - Huge steep dune has been cut back.
Talking Heads	133.0	08-May-96	D	Guide - Major, huge cutbank appeared; Photo - Beach cut back
Talking Heads	133.0	15-May-96	D	Photo - Beach cut back
Talking Heads	133.0	05-Jun-96	D	Photo - Beach cut back; Guide - Cutbank receding.; beach reforming below cutbank; big decrease.
Talking Heads	133.0	19-Jun-96	D	Photo - Beach cut back; Guide - A bit smaller; cutbank receding
Talking Heads	133.0	03-Jul-96	D	Photo - Beach cut back; Guide - Cutbank receding; beach disappearing before our eyes; goodbye Talking Heads!
Talking Heads	133.0	17-Jul-96	D	Photo - Beach cut back; Guide - Way smaller
Talking Heads	133.0	31-Jul-96	D	Photo - Beach cut back; Guide - Cutbank still receding.; low water has exposed a sandbar which is in eddy
Talking Heads	133.0	08-Aug-96	S	Guide - Cutbank has a slope now and may be stabilizing
Talking Heads	133.0	21-Aug-96	S	Guide - Cutbank has gentler, kinder slope
Talking Heads	133.0	28-Aug-96	S	Guide - Cutbank has gentle slope from people walking up and down
Talking Heads	133.0	11-Sep-96	S	Guide - More people eroding cutbank

Camp Name	Camp Mile	Date	Change	Comments
Racetrack	133.5	15-May-96	I	Photo - Big beach built vertically
Racetrack	133.5	01-Jun-96	D	Guide - Center part of the beach is calving off.
Racetrack	133.5	05-Jul-96	S	Guide - Beach looks like it did in May ; slightly more eroded from people
Racetrack	133.5	28-Jul-96	D	Guide - Beach is steeper and cut back from fluctuations
Racetrack	133.5	20-Sep-96	S	Guide - Seems to be more terraced
Tapeats (mouth)	133.6	01-Jun-96	S	Photo - More sand behind the tammies, but no real change
Tapeats (mouth)	133.6	09-Jul-96	D	Photo - Cutbank retreated up beach
Lower Tapeats	133.7	01-Jul-96	I	Guide - 4-5 ft vertical increase; now about 30-40' wide and 150-200' long.
Lower Tapeats	133.7	15-Aug-96	D	Guide - Cutbank receding and decreasing size of beach
Lower Tapeats	133.7	03-Sep-96	S	Guide - Small cutbank cutting into beach and nice bench out in eddy
Lower Tapeats	133.7	21-Sep-96	D	Guide - Daily fluctuations are eroding into beach; bench out into eddy is growing larger
Owl Eyes	134.6	28-Apr-96	I	K. Photo - Huge vertical increase with steep bank; much talus covered with sand; Guide - At least 7-10' new sand; gong
Owl Eyes	134.6	14-May-96	D	Photo - Beach front cut back since late April
Owl Eyes	134.6	01-Jun-96	S	Guide - Not much change; Photo - Appears about the same
Owl Eyes	134.6	17-Jun-96	D	Photo - Slightly smaller
Owl Eyes	134.6	01-Jul-96	D	Guide - Starting to get smaller from water erosion
Owl Eyes	134.6	16-Jul-96	S	Guide - More or less the same; people not trashing the cutbank
Owl Eyes	134.6	30-Sep-96	S	Guide - People have flattened out the camp; absolutely great camp
Owl Eyes	137.0	29-Apr-96	I	K. photo - Big vertical increase with lots of new sand; debris fan rocks covered
Backeddy	137.0	30-May-96	D	Photo - Beach front cut back a little
Backeddy	137.0	12-Jun-96	S	Photo - Sand migrating downslope
Backeddy	137.0	27-Jun-96	S	Photo - Appears the same
Backeddy	137.0	06-Aug-96	S	Photo - Appears the same
Backeddy	137.0	28-Aug-96	D	Guide - Cutbank has really retreated up beach
Kanab	143.2	05-May-96	I	Guide - Only a little - perhaps 2-3 feet vertical increase back toward the vegetation line; shoreline remains the same; nice
Kanab	143.2	01-Jul-96	S	Guide - No visible change; Photo - Appears the same
Kanab	143.2	29-Jul-96	S	Guide - Kanab flashed; putting more gravel into rapid
Kanab	143.2	17-Aug-96	S	Guide - Shape has not changed at all. Seem stable
Kanab	143.2	15-Sep-96	D	Other guide - apparently Kanab flashed and changed the beach)
Kanab	143.2	21-Oct-96	D	Photo - Beach deflated a little because a new rock is exposed; gravel from Kanab flash deposited gravel below the 20K
Olo	145.6	16-Apr-96	I	Photo - Lots new sand deposited in mouth; vertical increase; Guide - Huge dunes that have filled in way up to the falls.
Olo	145.6	29-Apr-96	S	K. Photo - Appears the same
Olo	145.6	05-May-96	S	Photo - Looks the same at water edge; can't see upper beach
Olo	145.6	22-May-96	S	Photo - Appears the same
Olo	145.6	04-Jun-96	S	Guide - Lower water than previous visits; can see bench in eddy
Olo	145.6	16-Jun-96	D	Photo - The beach is retreating a little
Olo	145.6	14-Jul-96	D	Guide - Flash flood a few days prior wiped out the new beach; 10' cut through the sand up to the water fall.
Olo	145.6	30-Jul-96	S	Guide - Low water exposes lower beach which has gravel strewn through it.
Olo	145.6	04-Sep-96	S	Photo - Looks the same
Olo	145.6	02-Oct-96	S	Guide - Low water camp now; Photo - Looks the same.
Matkat	148.5	29-Apr-96	I	K. Photo - Lots of new sand up high and covering talus; vertical increase
Matkat	148.5	14-May-96	S	Photo - No change
Matkat	148.5	29-May-96	S	Photo - No change
Matkat	148.5	06-Aug-96	D	Guide - Gully cutting through beach
Matkat	148.5	22-Sep-96	D	Guide - Gully narrowing
Last Chance	155.7	04-Apr-96	I	Guide - Lots of new sand; ledges covered with sand.; Photo - Big vertical increase with lots of talus blocks covered
Last Chance	155.7	02-May-96	D	Guide - Wind is moving sand around; muv ledge at river level beginning to be exposed.

Camp Name	Camp Mile	Date	Change	Comments
Last Chance	155.7	21-May-96	S	Guide - More use by people; Photo - Looks the same
Last Chance	155.7	21-Jun-96	D	Guide - Only a little smaller; beach not as steep; Photo - Small cutbank forming which has retreated up beach a little)
Last Chance	155.7	03-Jul-96	S	Guide - More use from campers; Photo - Sand getting pushed downslope
Last Chance	155.7	29-Jul-96	D	Guide - Sand migrating downslope; Photo - More sand getting pushed downslope
Last Chance	155.7	26-Aug-96	D	Guide - Muv ledges more exposed; Photo - Can see more ledges exposed.
Last Chance	155.7	09-Sep-96	D	Guide - More ledges exposed; Photo - More rocks showing in camp
First Chance	157.7	29-Apr-96	I	K. Photo - New sand deposited up high in and among boulders; vertical increase; flash flood gravel now buried under san
First Chance	157.7	15-Jun-96	S	Photo - Appears the same
First Chance	157.7	30-Jun-96	S	Photo - Appears the same
First Chance	157.7	14-Jul-96	S	Photo - Appears the same
First Chance	157.7	28-Jul-96	S	Photo - Appears the same
First Chance	157.7	14-Sep-96	S	Photo - Appears the same
Tuckup	164.5	17-May-96	I	(photo only, no data - Lots of new sand, most rocks covered, beach built up vertically and arealy).
Tuckup	164.5	05-Jun-96	D	(photo only, no data - Receding beach front with gentler slope)
Tuckup	164.5	07-Aug-96	D	(photo only, no data - Huge beach front retreat with now lots of rocks exposed in eddy; gentler slope)
National (upper)	166.4	11-Apr-96	D	(photo only, no data - Huge amount of scour from original camp; lots of boulders exposed now; new sand deposited on t
National (upper)	166.4	01-May-96	S	(photo only, no data - Appears the same)
National (upper)	166.4	21-May-96	S	(photo only, no data - Appears the same)
National (upper)	166.4	09-Jun-96	S	(photo only, no data) - Appears the same)
National (upper)	166.4	08-Jul-96	S	(photo only, no data - Appears the same)
National (upper)	166.4	28-Jul-96	S	(photo only, no data - Appears the same)
National (upper)	166.4	24-Aug-96	S	(photo only, no data - Appears the same)
National (upper)	166.4	17-Sep-96	S	(photo only, no data) - Appears the same)
National (upper)	166.4	17-Sep-96	S	(photo only, no data - Appears the same)
Lower National	166.6	30-Apr-96	I	K. photo - Big vertical increase with large dune atop a cutbank
Lower National	166.6	18-Jun-96	S	Photo - Appears mostly the same with less steep bank
Lower National	166.6	09-Aug-96	S	Photo - Less steep bank
Lower National	166.6	25-Sep-96	S	Photo - Cutbank gone

Appendix C  
(not included)

(beach photograph collection is archived at the office of Grand Canyon  
River Guides, Inc., 91/2 E. Aspen Ave., Flagstaff, AZ., mailing address:  
GCRG  
PO Box 1934  
Flagstaff, AZ 86002)

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*End of Rpt*