

THE GRAND CANYON River Runner

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preserving public access to the Colorado River

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LOST RAPIDS OF THE GRAND CANYON

by Roy Webb



SEPARATION RAPID 1909 - PHOTO COURTESY J. WILLARD MARRIOTT LIBRARY SPECIAL COLLECTIONS, UNIVERSITY OF UTAH

"The rapid at the end of this canyon was one of the worst of the entire series, and had been the scene of more than one fatality, we had been told. It had a very difficult approach and swung against the right wall, then the water was turned abruptly to the left by a great pile of fallen boulders. The cresting waves looked more like breakers of the ocean than anything we had seen on the river."

This breathless description cannot fail to catch the attention of anyone who loves wild rivers and whitewater, but unfortunately, as the saying goes, you can't get there from here. The rapid described by Ellsworth Kolb in

1911 was Dark Canyon Rapid, at the lower end of Cataract Canyon. Since the 1960s, Dark Canyon Rapid has been under a hundred feet of water, at the upper end of Lake Powell. Many of the most famous rapids on the Colorado River system have been underwater for decades, in some cases since the 1930s. Ashley Falls on the Green; Dark Canyon Rapid and Gypsum Canyon in Cataract Canyon on the Colorado; Paiute, 13-Foot, and Syncline Rapid on the San Juan River, all of these have long been covered by water and silt behind Flaming Gorge and Glen Canyon Dams.

Nor were a number of rapids in the Grand Canyon spared by the rising waters of Lake Mead. The lower end of the Grand Canyon, from about Mile 237 on to the end at Mile 277, contained many rapids that have been covered since the late 1930s. Rapids with evocative names like Surprise, Lost Creek, Reference Point, Last Chance, Devil's

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LTEMP: The two year process that will determine how Glen Canyon Dam is managed in the future was kicked off with a series of public scoping meetings in November. Unless the deadline is extended, initial comments on the Long Term Experimental and Management Plan Environmental Impact Statement will be due at the end of January. GCRRA urges all members and other interested parties to inform themselves and submit comments. Updated information, documents, FAQs and the schedule of important deadlines and dates can all be found on the LTEMP website at <http://ltempeis.anl.gov/index.cfm>. Please sign up for email updates and stay informed as this important management event progresses.

Remembering a Grand Friendship

Through the years I have made friendships that persist long past the last morning talk. There is no denying that the shared experience of a Grand Canyon river trip surpasses virtually all other shared experiences, thus memories of our trip mates are interwoven liberally throughout our collective river memory. My most cherished river friendship was also my longest, forged in 1996 when Bob Matthews and I launched on a 13 day oar trip with Arizona Raft Adventures.



Bob was an oddity at the trip orientation, his 70 plus years setting him apart from the 40-somethings that dominated the passenger list. We all eyed him somewhat askance, wondering if the rigors of the journey would prove too much for this river elder. It transpired that this was not Bob's first time down, and since it was my first trip I was immediately drawn to him when I learned that he had rafted the Canyon many times before. We chatted during dinner that first night and his story became even more compelling.

It turns out that no one in Bob's family knew that he was in the Grand Canyon. He had told them he was going fishing which, apparently, was not an unusual thing for Bob to do. Why the secrecy? Bob's two grandsons were going to join our trip at Pipe Creek to raft the lower Canyon and Bob had decided to surprise them. It was a delightful bit of intrigue, and I enjoyed the anticipation as we approached Phantom Ranch on the morning of day six.

Only four of us were doing the entire Canyon, so we wrote postcards and drank iced tea at Phantom Ranch while our fellow passengers went on downriver to Pipe Creek and started the long trek up to the rim. Bob bought me a Snickers, the movie theater size, proving that he was a true gentleman and securing his place in my heart. Eventually we four walked back to our boat and floated down to Pipe Creek with our guide. The other four boats were already

there, still waiting for our new group of passengers to make their way down the trail.

Bob and I sat well away from the boats, feet in the water to counteract a hot June day, watching for the two people that Bob most wanted to see. Don and Jim, young and athletic, were among the first to stride into our midday gathering. Bob remained still as the boys dropped their backpacks and met the guides. They were given cold juices and told to put their belongings into drybags. Eventually they began to take in their surroundings, and one of them saw us sitting down the shore a ways. "Hey, that looks like Grandpa," said one of Bob's grandsons. Then two faces split into big grins as the realization hit them. These young men clearly adored their grandfather, and nothing made them happier than knowing that they would share this journey with him.

I joined Bob and the two boys in Jelly Roll Baker's boat as we left Pipe Creek and idly wondered what lay ahead. Bob knew, but he wasn't talking. I was reserving all my angst for Crystal later that day, it being the only rapid I had heard of on the day's itinerary. We ran Horn Creek, then filled the boat with Colorado River water in Granite. Jelly Roll advised that we needn't bail the boat dry because Hermit was next.

Next came the pinnacle moment of that trip, the most unexpected of happenings, the focal point of conversations for our remaining days on the river. Bob, Jim, Don, Jelly

Roll and I all found ourselves in the classic out-of-boat experience, a flip on the fifth wave in Hermit.

There are few events on the river that can garner greater interest than a flip, among the other passengers as well as among the actual participants. As a result of our boat's having failed to negotiate a 25 foot standing wave, Bob and I found new footing for a steadily growing friendship. His reaction to the flip helped shape my own reaction, which could easily have turned to stress and anxiety. Bob displayed neither in camp that night, instead showing off his glasses, now minus one lens, as he joyfully recounted the story of how he flipped and lived to talk about it. He displayed remarkable resilience, and showed me an attitude that I chose to adopt as my own. More than that, before we left the river at Diamond Creek Bob had shared enough of his wealth of river experiences that I left determined to raft the Canyon again and again, as he had.

Bob and I corresponded for many years, and he always knew when I was going to be on the river. He took great pains to make sure I had mail waiting for me at Phantom Ranch. I was told that I got more mail than some of the guides! Once I asked a friend to check the Guides Mail box for me because I wanted to skip Phantom and walk the river trail down to the boats at Pipe Creek. Later I was handed a thick envelope from Bob full of photos, poetry, and river remembrances. He frequently talked about his Canyon trip with the Miro Quartet, one of this land's finest string ensembles. It was one of his favorites.

A few years ago I received an email from Barb, Bob's daughter and the mother of Don and Jim. She wanted me to know that Bob had had surgery and would not be able to email for a few weeks. My email box noticed his absence, the humor, airplane and military banter, and the staunchly patriotic messages. When he was better I was brought up to date on the family, always with the latest information on Don and Jim. It's hard to believe that the last time I saw Bob was when we hugged and said good-bye at our trip dinner that night in 1996. Bob made his way home to Washington

State, then eventually moved to Texas to be closer to Barb and the boys. We never lost touch.

I received my last email from Bob on May 27, 2011. Two weeks later Don wrote to tell me that at age 92 my old friend had run his last river. It was almost 15 years to the day from the date our trip launched at Lees Ferry. There followed revelations about Bob's life, his World War II career as a naval aviator, his time as an air traffic controller, as well as many more wonderful things that I had never known about him. His connection to the outdoors was a great part of his life, and he returned to the Grand Canyon at age 81 to take his last motor trip with his daughter. Bob was a devoted family man, patriot, aviator, outdoorsman, reader and teacher. He didn't teach in a classroom, but he was a teacher nonetheless.

Bob Matthews taught me an unforgettable lesson early in that first Grand Canyon journey. He had watched me lugging my camera gear on the hikes, changing lenses, changing film and fussing unrelentingly as I successfully put a big dent in the forty rolls of film I had brought. One evening he was sitting comfortably in camp after dinner when he called me over and invited me to sit with him. I caught a remark about what a busy gal I was. Naturally I wanted to keep taking pictures, not wanting to miss the last drop of available light in that fading day. But he insisted and so I sat. In his quiet way he remarked on the scene before us as we pondered the river and the cliffs facing us. Something he said made me look, really look, at the place we were in. I was 'seeing' it for the first time with my eyes, not with the camera's lens. And it was achingly beautiful. We watched the bats emerge with the first stars, listened to the softly hissing river and breathed in the desert scents as they embraced us in the deepening darkness. He said it was why he kept coming back, and I understood.

Mari Carlos

JOIN
GCRRA

Have you experienced a fantastic commercially outfitted trip down the Colorado River? Are you planning to have one in the future? Do you think that the opportunity to see Grand Canyon from river level should be available to everyone, even if they do not have the skill or strength to row their own boat? Did you know that the Park Service can change its management plan, including adjusting the number of visitors and kinds of trips permitted, from time to time? If you care about these issues, GCRRA speaks for you, with the Park Service and in the courts, helping preserve your opportunities to participate in a commercially outfitted river trip. Have your voice heard! Join us today! Use the membership reply envelope included with this issue, or log on to our website : www.gcriverrunners.org to learn more. We have an online interactive membership form and can accept PAYPAL for your convenience.

Membership includes half-yearly issues of the beautiful Grand Canyon River Runner newsletter. GCRRA is a 501(c)3 organization that has donated a portion of membership dues to Grand Canyon related causes, over \$12,500 through December, 2011.

The Grand Canyon Cougar Project



Adult female, P05 ensnared at capture site. Photo courtesy of B. Holton, Grand Canyon.

By Brandon Holton

The Grand Canyon cougar study focuses on movements and other behaviors of cougars (*Puma concolor*), with the goal of providing information that can be used to increase human safety at Grand Canyon, and, overall, provide insight into the ecology of cougars in the Grand Canyon Eco-Region. We have focused on collecting data that can provide spatially-explicit predictions of cougar activity, and provide insight into home range size, habitat selection, and prey selection of cougars around Grand Canyon National Park. Information reported in this document reflects cougar data collected from 2003-2010 at Grand Canyon.

The Grand Canyon Cougar Project is part of a USGS-NPS collaborative study investigating cougar ecology on the southern Colorado Plateau. This study is designed to address a broad range of questions focused on cougar behavior at GRCA and the surrounding non-park lands. Our focal questions pertain to cougar movements, habitat selection, and predatory behaviors, as follow:

- (1) What are cougar range sizes and patterns of movement, and the locations of ranges relative to human infrastructure? Home range, movement patterns and dispersal behavior
- (2) What are indicative features of habitats heavily used by mountain cougars, and where are these heavily-used seasonal habitats located relative to Grand Canyon Village? Habitat use
- (3) How often and what do cougars kill, by season, by species, and by gender and of cougar? Prey composition and predation rates

- (4) How long do cougars stay with kills and what behaviors do they exhibit while there, by species, and by gender and of cougar? Behavior at kills

During 2003-2010, we captured 16 adult (7 female and 9 male), 6 sub-adult (2 female and 4 male), and 5 cubs (4 female and 1 male) cougars along the south rim of Grand Canyon National Park, and 3 (2 female and 1 male) cougars along the north rim of Grand Canyon, fitting cougars with collars that collect between 6 to 24 high-precision GPS fixes per day. We typically programmed the collars to automatically release from the animal 1-2 years after deployment (depending on battery type and projected growth of the animal). All data collected in collars are stored in non-volatile memory that does not require battery power. Through December 2010 we had obtained 41,340 GPS locations across 5,590 monitored cougar days and visited 466 sites, at which we documented 366 kills, 135 of which were by 9 females and 241 by 13 males.

Cougar Movements

All cougars during all seasons exhibited a strong selection for forest or woodland cover, and rarely dropped below 500 vertical feet from the rim into the inner canyon of the Colorado River. We found little use of the inner canyon by cougars, except the ledgy formations that provide ample resting sites (day beds), for cougars just below the rim. Several cougars at Grand Canyon, male and female, were documented and visually observed using steep rocky terrain between 20 -100 meters below the rim during the day. In fact, the bulk of cougar locations documented below the rim occurred during daylight, and thus was associated with day bedding activity

and not hunting behavior. Considering dietary strategies of cougars on the south rim of Grand Canyon and cougar movement data, the inner canyon was sparsely used for hunting in general. Inner canyon use by all collared cougars accounted for only 3-4% of all locations.

Both males and females year-round avoided Grand Canyon Village, and a zone outward to about 1-2 km. Collared cougars crossed paved highways 939 times, and, by necessity to access preferred daybed sites along the canyon edges, crossed the paved road paralleling the eastern canyon rim 499 times.

Cougar locations in close proximity to the village were generally sparse and brief in nature, and exhibited behavior associated with nocturnal movements between suitable habitats surrounding the village. Less than ten known locations of marked cougars were documented in the village, and only by two different individuals. Although Grand Canyon has seen a sharp increase in the number of elk residing in and around the developed areas, cougars still tended to avoid hunting near the village. Of the 384 documented kills, none occurred within the village proper.

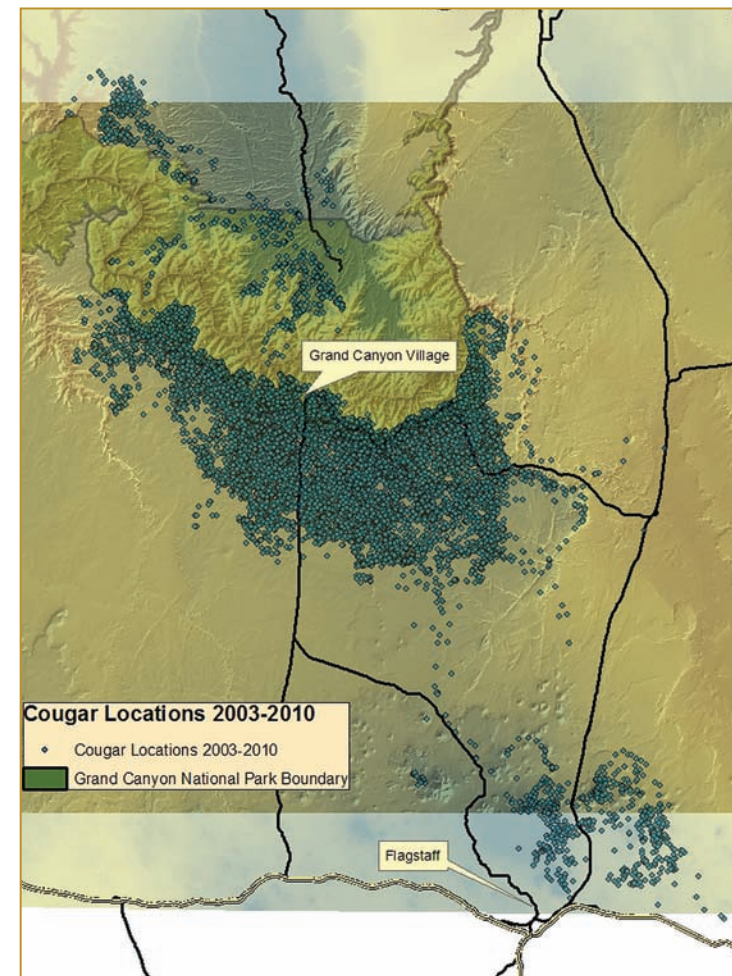


Figure 1. Locations of all collared Grand Canyon cougars from 2003-2010. Note: One two year old male (P1) captured in Grand Canyon dispersed 70 km south and established a home range NE of Flagstaff.

Only 8 kills occurred within 1 km of the village and 19 within 2 km. Spatially, cougars collectively tended to avoid Grand Canyon village, using adjacent habitat as a means to access more suitable habitat for hunting. See Figure 1.

Movements of cougars whose home ranges included or were in close proximity (< 10 km) to 2-lane paved roads indicated that cougars around the south rim of Grand Canyon avoided paved roads less than expected. We inferred a single crossing for any movement segment that crossed a paved road. 15 Cougars crossed paved roads 940 times. Male cougars accounted for 84% of all paved road crossings. Consistent with other studies, cougars at Grand Canyon were generally indifferent to secondary non-paved roads within the Grand Canyon boundary, and densely spread throughout adjacent public and private lands.

Almost all study cougars ranged outside the park and at least two sub-adult males traveled south nearly approximately 110 km and 60 km, respectively. We used data from every cougar that was GPS collared for at least one year, and monitored across all seasons to analyze home range. Home ranges for male cougars at Grand Canyon averaged 518 km². Mean annual home range of adult female cougars at Grand Canyon was 237 km². Adult males move more extensively on a daily basis, compared to adult females and subadults, patrolling large territories to locate females and defend against other males.

Dispersal behavior has been documented in two subadult male and one subadult female cougars at Grand Canyon. Subadult males were between 1.5-2 years old and the subadult female was 1.5 years at the approximate time of dependence and subsequent dispersal movements. Subadult male P1 (2 years old) is the only cougar in the study that expressed a typical obligate long distance dispersal resulting in core range establishment approximately 90 km south of Grand Canyon.

One adult female cougar was documented moving from the south to the north rim. One of the youngest adult females monitored in the study, 3.6 year old P05, moved along the periphery of two established female cougar's territories before descending the south rim, crossing the Colorado River near Hermit Rapid, and ascending to the north rim. Although nothing is known regarding her range and movements prior to her capture, she never established a movement pattern emulating a home range until she crossed over to the north rim. At the time of her collar's premature release in June 2005, she remained on the north rim (Walhalla Plateau).

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AS2, a 2 year old female, with Telonics Argos GPS collar, captured on the north rim of Grand Canyon in October 2010. Photo courtesy of B. Holton, Grand Canyon.

Cougar Prey Composition (South Rim)

We comprehensively documented clusters for individual cougars using GPS locational data. All clusters of ≥ 2 location points within 100 m apart for an 8 hour or greater period were distinguished to determine the locations of possible kill sites. We identified prey to species and, for ungulates, aged and sexed prey animals.

Of the 384 kills documented through 2010, the majority (67%) were elk. Elk <1-yr old comprised the largest single category of fully identified kills, accounting for 42.3% of all elk kills, and 28% of total kills. Mule deer comprised 29% and smaller prey 6% of all kills. Documented kills of small prey were uncommon; 70% were mesocarnivores, including coyotes (3), bobcats (2), and skunks (2), 20% (2) were javelina, and 10% (1) were porcupine. At Grand Canyon, only one bighorn sheep kill by a marked cougar has been documented, despite ample availability of sheep within the inner canyon. After closely tracking the predatory behavior of 25 different cougars at Grand Canyon, no individual cougars were observed having an affinity to prey on bighorn sheep. Why cougars on the south rim underuse bighorn sheep as a major prey item at Grand Canyon is likely rooted in high relative prey availability on the rim, arduous inner canyon topography, and associated risk factors.

Survival and Mortality Factors

A total of 21 cougars were radio-collared for survival analyses (n= 12 males; 9 females). Males were tracked an average of

656 days (range=8-2325 days) and females an average of 354 days (range 13-1147 days). Annual survival rates of all marked cougars at Grand Canyon averaged 71.3%. Mean annual male survival was surprisingly higher than female survival, 0.79 and 0.56 respectively.

Cause-specific mortality is one of the most important components of a cougar population. At Grand Canyon, ten (5 female and 5 male) subadult or adult cougars have been killed during the study while marked (collared). This represents 44% of individually marked cougars (50% if only including south rim cougars) and 30% of all captured cougars (including cougars marked multiple times, $n = 36 / 11 = 0.31$). Sport hunting outside the park was the primary source of mortality for cougars at Grand Canyon. Vehicular caused mortalities of two marked cougars occurred 2005-2006.

North Rim Cougars and Desert Bighorn Sheep

In the early summer 2010, the Grand Canyon – USGS cougar project began a collaborative effort to investigate the impacts of cougar predation on bighorn sheep populations along the north rim of Grand Canyon. In addition to gathering information on a potentially vulnerable bighorn population, this is the first attempt to investigate cougar behavior and population dynamics on the north rim of the Grand Canyon. In September and October 2010, we captured 3 cougars along the north boundary of the park. A 3-year old male (AS1) was captured in late September. Two females, a 1.5 year old (AS2) and a 4 year old (AS3) were subsequently captured in early October. In July 2011 we additionally captured a 6 year old female (AS4) and recaptured male AS1. Future cougar research will be focused on the north rim, with additional cougar captures planned in 2012. Additionally, we currently have 8 bighorn sheep (3 males and 5 females) collared along the Colorado River corridor to integrate with the cougar study and build a robust picture of cougar-bighorn sheep interactions.

Brandon Holton earned an M.S. in Environmental Science and Policy from Northern Arizona University, focusing in large vertebrate community dynamics at water sources. He has been studying cougars since 2003, and has also worked with lynx, pronghorn, salmon, humpback chub, and raptors. Brandon has been a Wildlife Biologist in Science and Resource Management at Grand Canyon National Park since 2008.

RIVER RECOLLECTION

By Jan Taylor

The sights I have seen today were breathtaking. The sheer walls of the cliffs, their colors, and their designs were spectacular. Color and light contrasts draw my eyes and breath. The history before us, the stories in the rocks, and the beauty of it all is beyond comprehension. I'm so happy to be back in the Canyon again and I don't look forward to leaving. The Canyon gives us a symphony of sights and sounds that has no comparison. Although artists have painted it and composers have made music about it, nothing can compare to the real majesty and the immensity of the Canyon. This is a place of romance for me, a magical, mystical province where I can experience life authentically and live life from moment to moment rather than from deadline to deadline. This is truly my magic magnetic place.

The feel of the Canyon is very different in different levels of light. During the spring when the sun is lower on the horizon, Marble Canyon, a north-south narrow canyon, has relatively brief periods of sunlight with deeper shadows, the light is more diffuse because of the angle of the sun, and it can be quite chilly. In the summer, when the sun is more directly overhead, shadows are few until later in the afternoon, and the heat can be intense and draining. Each season has its own charm and its own special magic. The type of boat also makes for a huge difference in the experience. On the large motor rigs, the drone of the motor in the back of the boat can be hypnotic, but is ever-present. We are several feet above the water, but feel and hear it lapping against the tubes. On these large boats, we are passive travelers with time to absorb every sight. Being able to make more miles from day to day, we have ample time to hike and explore the side canyons. On

the paddle and oar boats in the summer and fall, there is silence punctuated by the slap-slap-slap of the oars in the water, the song of the canyon wrens, and the roar of upcoming rapids. This silence is also hypnotic and lulls me into a semi-conscious state of complete comfort. In the oar boats, we are right at river level, so can trail our hands and feet in the water, but move much more slowly than the motor driven boats. Being on an oar boat in the summer (an 18 foot inflatable raft with the guide in the middle wielding a pair of large wooden oars), I have time to quietly observe the sights and sounds. The tint of my sunglasses turns the glinting sunlight on the water into tiny crimson flames lapping the boat. The reflection of dancing water on the Coconino sandstone cliffs of upper Marble Canyon tints the rock a pale green with light running through it. This is a memorable and magical moment.

The sun setting beyond the Canyon rim gives us an incredible show of color on the eastern walls, with contrasts of dark and light that are startling and mesmerizing. The shows of sunrise and sunset are sure winners for best picture of the year on a daily basis. I am completely taken by the beauty in a clear case of "piracy and capture" of my spirit. There is something about this Canyon that draws me to it, a bewitchment that is almost palpable. As it becomes dark with a bright and waxing moon, we peel off, one by one, to crawl into our warm sleeping bags and wait for the morning howl that coffee's ready.

Ed. Note: The above is an excerpt from an unfinished manuscript. Jan Taylor is a member of the GCRRRA board of directors.

Postcards

I was on a Western Rig early in May with Lucky and Jonathan as crew. This was my fourth trip in as many years. Lucky was determined to show me parts of the Canyon that I had not seen on any of the other trips and I got into a lighthearted assignment of points for anything he could come up with. One night we settled in for one of those beautiful moonless canyon nights with the stars so numerous that the night sky looked like it was covered in clouds. Well, the quiet night was disrupted by a loud crash and obvious tumble of rocks off of the talus slope on the opposite side of our Research campsite. There was the splash into the river then just as quickly the night returned to perfect stillness.

The next morning at breakfast I had to tell Lucky that I really don't know how he had arranged it but surely I had to award him two points for the rock fall.

Lucky actually did show me many new adventures and later he would be lead crew on my ninth trip and while we had no night rock falls he had no difficulty showing me other corners of this incredible Canyon. Every trip I've taken has brought new adventures and every guide's respect, knowledge and love of the Canyon is remarkable. I hope to continue over the next few years to make more trips with my grandchildren so they can have the same experiences and the memories that I've had.



Cliff Bombard

Its easy to remember back to trips in the canyon:
Magnificent night sky with little or no light pollution.
Bats flying overhead to keep the insects at bay.
The mixing of colors at the joining of Colorado and Little Colorado.
The great hikes, both morning and afternoon.
The great food.
The whitewater, and the reverse currents in deep areas.
The water fights with bailing buckets and fellow rafters on hot afternoons.
The rock formations, the caves, and variety of geology.
The ruins of ancient canyon dwellers and explorers.
The faces and other shapes in clouds and rocks.
The fun people in the groups, the guides and their interesting histories, and the spirit they set for the group.
The balance of exercise, rest, reflection, food, learning, a walk with God, all make time in the canyon so special.
I hear that lots of water has been let loose to refill Lake Mead, it would be a fun year to do the trip. I hope those who do get to run the canyon have wonderful times.

From one who has had many memorable times in the canyon, both on the river and off.



Baron Battles

I knew I would love the spectacular scenery. What surprised me was how I came to cherish our nightly camping routine and the delight of sleeping out in the open. In the past, I've always been too nervous to camp without a tent. But I felt safe and peaceful as I lay down on my cot beside the river I was getting to know. I came to look forward to the new routine of turning in early as the bats emerged, falling asleep to the rush of the waters, gazing up at the Milky Way in the middle of the night, waking to watch the sun creep slowly down the cliffs, and padding barefoot through the warm sand to breakfast. There was great camaraderie not only in sharing the excitement of the rapids and the beauty of the canyon but in living this simple routine together with a group of strangers. It left me grateful for the simple things in life and for the privilege of spending a week in this place.



Susan Auerbach
Pasadena, California

My best memory is a story that one guide, named Tyler, told me. It goes something like this:

In millions of years, intelligent beings will roam the earth. They will be somewhat like us, and visit the planet for pleasure. In the Grand Canyon, a pup asks his guide: "Hey, what is that black line in the rock?" And the guide answers, full of panic: "DON'T TOUCH THAT, IT'S RADIOACTIVE AND DANGEROUS! THAT LINE MARKS THE TIME OF HUMANITY!"

The story ends there, as it was told to me, but I have to add more.

The guide says: "We do not know whether they truly were intelligent beings, because they destroyed their ecosystems and their living habitats without any reason. Some say it was a big accident, others say they were too greedy and let it happen. There is evidence of multiple accidents, but they seem to have never learned anything from it."



Vincent Laberge

Restoring Humpback Chub in Grand Canyon National Park

by Emily Omana, Sarah Ernewein, Brian Healy, and Allyson Mathis : Humpback Chub in Grand Canyon

Historic fish communities in Grand Canyon National Park consisted of eight species, six of which are endemic to the Colorado River Basin. Today, only four native species can be found in Grand Canyon, including the humpback chub (*Gila cypha*), which is federally protected under the Endangered Species Act. Humpback chub are an unusual-looking member of the minnow family. These fish, which can live as long as 30 years and reach lengths of almost 20 inches, are characterized by large fins and pronounced humps behind the heads of the adults. Like other fish endemic to the Colorado River, humpback chub are adapted to natural conditions of the pre-dam Colorado River—rich, silty water, and seasonally variable flows and temperatures.



CHUB RELEASED INTO HAVASU CREEK - PHOTO BY MELISSA TRAMMELL, NPS

The humpback chub was listed as endangered in 1967. Its decline is thought to be due to a variety of significant human-caused changes to aquatic habitat in the Colorado River basin. In Grand Canyon, humpback chub face a dam-altered ecosystem as well as competition with and predation by non-native fish such as the rainbow and brown trout—species that thrive in the clear cold waters of the post-dam Colorado River. Nonnative parasites like the Asian tapeworm and the possibility of a catastrophic event such as a hazardous materials spill into the Little Colorado



FLYING FISH-NPS HELICOPTER FLYING HUMPBACK CHUB INTO HAVASU CREEK FOR TRANSLOCATION - PHOTO BY MELISSA TRAMMELL, NPS

River are also significant threats faced by Grand Canyon humpback chub. Today there are only six humpback chub populations remaining in the world, and the most stable of these populations, and the only one increasing in size, is found in Grand Canyon.

Tributary Translocations

To address some of the threats to the humpback chub, the National Park Service and cooperators including the Bureau of Reclamation, U.S. Fish and Wildlife Service, Arizona Game

and Fish Department, U.S. Geological Survey, University of Utah, University of Missouri, and Grand Canyon Wildlands Council, have conducted a series of humpback chub translocations into Grand Canyon tributaries. Historically, humpback chub would have used other tributaries besides the Little Colorado River but currently may now be excluded from these areas due to competition with and predation by non-native fish species. These translocations are a key part of a multi-faceted native fish recovery program for the Colorado River through Grand Canyon, the ultimate goal of which is the restoration of native fish populations in the park.



NEWLY RELEASED HUMPBACK CHUB SWIMMING IN SHINUMO CREEK - PHOTO BY MELISSA TRAMMELL, NPS

Prior to the translocations, researchers identified the Grand Canyon tributaries most likely to support humpback chub. They were looking for tributaries with low non-native fish presence, suitable water quality, temperature, flow, fish barriers, and close proximity to the reaches of the Colorado River where wild humpback chub are found. Havasu Creek and Shinumo Creek were determined to be the most suitable tributaries for humpback chub. To date, there have been four translocations of humpback chub outside of the Little Colorado River -- 3 in Shinumo Creek and 1 in Havasu Creek. These translocations may contribute towards the establishment of a second spawning population of humpback chub in Grand Canyon, thereby providing the “population redundancy” of another spawning population outside of the Little Colorado River. If humpback chub instead leave the tributaries, creeks may act as rearing, or grow-out, habitat for juveniles, allowing them to grow larger in the warmer food-rich tributaries before they reach the river, increasing their chances for survival. These fish that leave tributaries may in turn increase the numbers of humpback chub that live in the mainstem below the Little Colorado River.

Shinumo Creek, the site of three humpback chub translocations to date (2009, 2010, and 2011) was ranked as the second most favorable tributary. It is a small, clear tributary that joins the Colorado River at approximately River Mile 109. It is fed by springs in the Redwall Limestone and by surface flow from the North Rim, especially during spring snowmelt. Shinumo Creek has dense native vegetation along the shoreline and a good abundance of aquatic and riparian invertebrates. Near its connection with the Colorado River, Shinumo Creek has a 15 foot-high waterfall that prevents non-native predatory fish in the mainstem from

entering the creek. Two other species of native fish, speckled dace and bluehead suckers, as well as non-native rainbow trout live in the creek. Native fish are more abundant than rainbow trout, indicating that some co-existence is possible between these native and nonnative species.

Havasu Creek is the second translocation site; the first translocated chub arrived there in 2011. This was the first of three planned releases to take place from 2011-2013. Havasu Creek is very similar to the Little Colorado River, where the majority of humpback chub in Grand Canyon are found. Its water quality, stream characteristics, and available food base closely matches that of the Little Colorado River, making it an ideal location to expand on the translocation effort that began in Shinumo Creek. Logistics of the fisheries work in Havasu Creek are designed to minimize interference with boaters at the mouth of Havasu Creek and with the wilderness characteristics of the area.

The humpback chub that were released in Shinumo and Havasu Creeks were collected over several years from the Little Colorado River, flown out via helicopter, and driven to Arizona Game and Fish Department’s Bubbling Ponds Native Fish Facility or the U.S. Fish and Wildlife Service’s



TRANSLOCATED HUMPBACK CHUB IN SHIMANO CREEK - PHOTO BY MELISSA TRAMMELL, NPS

(cont. pg. 12)



TRANSLOCATED HUMPBAC CHUB UNDERWATER IN SHINUMO CREEK -
PHOTO BY MELISSA TRAMMELL, NPS

Dexter National Fish Hatchery and Technology Center. At the hatcheries the fish were treated to remove parasites and kept over winter. Prior to translocation they were given flow training to reacquaint them to river life, weighed and measured, and implanted with unique PIT (Passive Integrated Transponder) tags to individually identify them and track their growth and movement. PIT tags are similar to the identification chips that you might put in your dog or cat, and are harmless to the fish. On translocation day humpback chub were driven from the hatchery and flown via helicopter to the release sites in Shinumo and Havasu Creeks. There they were carefully acclimated to creek water using a slow process designed to minimize stress to the fish, and then released.

Biologists evaluate the success of the humpback chub translocations and remove non-native fish using established fisheries techniques such as snorkeling, hoop-netting, seining, and electrofishing. Electrofishing involves sending a light pulse of electricity through a ten to fifteen foot radius to briefly stun the fish and draw them to the surface, making them easier to catch. All captured non-native rainbow trout are removed and euthanized and consumed by researchers and passing river trips.

Early Results

Data from the Shinumo and Havasu Creek translocation projects are currently being analyzed, providing early

insights into the success of the translocations so far. Based upon data from the PIT tag antenna, approximately half of the released chub have left the creek since translocation. Most leave within the first 10 days, and most leave at night. Humpback chub that were translocated at smaller sizes seem more likely to remain in the creek than larger ones. While the barrier waterfall keeps non-native predatory fish from the Colorado River out of Shinumo Creek, it also prevents humpback chub that go over the falls from returning. Emigration and losses due to predation by non-native rainbow trout in Shinumo Creek remain a concern for long-term success of the project. However, growth rates of translocated humpback chub are higher in Shinumo Creek than in either the Little Colorado River or the Colorado River.

Data collected in 2010 also suggest that fish translocated to Shinumo Creek have added to the number of humpback chub found in the Colorado River. In September 2010, the U.S. Geological Survey and U.S. Fish and Wildlife Service found that 28% of all tagged humpback chub captured in the Colorado River were from the Shinumo Creek translocations. This means that some translocated humpback chub that leave the tributary are surviving, and potentially adding to the number of humpback chub in the mainstem below the Little Colorado River. Translocated humpback chub also seem to maintain the higher growth rate of Shinumo Creek, even after they have entered the mainstem.

What Can You Do?

There are no closures at Shinumo or Havasu Creeks because of the translocations. Visitors to the park can help in these conservation actions by taking a few extra precautions, especially when visiting Shinumo or Havasu Creeks. Familiarize yourself with the anatomy of humpback chub, especially young chub which don't develop their trademark hump until they are several years old. Young humpback chub are silver, have small eyes and large fins. When fishing in these creeks, avoid barbed hooks and immediately release any captured humpback chub. The translocated fish are primarily in the pools below Beaver Falls in Havasu Creek, and from Shinumo Creek's old Bass Camp down to the waterfall. If you have the time, stop by one of these creeks and snorkel around—if you're quiet, you may just see one of these special fish!

Poetry

by Jeffrey Morgan

The next run

2003

It started on the final day
Only Lake Mead stood in the way

With a building touch of despair
I return to conditioned air
Padded seats, store bought eats
Gritless pants, lack of ants
Shoes with socks, tiny rocks
Starless nights, no falcon flights
Rooms without a view
No sand dunes made for 2

But while I frown & shed a tear
A grin sneaks from ear to ear
For now the countdown has begun
Til the start of the next run.

I am a Boatman

2007

I am a boatman but don't be afraid
I would do this without getting paid
I will take you on down the river
Tease your stomach and punish your liver

If you choose to take the chance
I will nearly drown you in Hance
Granite, Hermit, Sockdolager and Crystal
Then Dubie, Lava and even a water pistol

We camp in the sand and party under the moon
Another little hike tomorrow before noon
Up to a falls, up to the Source
Back to the river to get wet of course

I'll get you wet, I'll tell you stories
I sing you songs, I'll tease the Dories
I'll push, prod and even shove
To share with you the river I love

For I am a boatman and that's the only way
I can open my eyes for another day

Postcards

2003

Postcards five for a dollar
the placard silently hollered
See the canyon from all ends
Send a photo to your friends
Look quickly and choose your five
Make the canyon come alive

Easily I walk right by
never casting a curious eye
For the canyon that I know
doesn't live in 5 photos
Instead it resides
deep within my insides
You can't sell and tax the canyon I know
Stored deep...my private picture show

Fear

2009

I awoke on Day 8 with fear
The end of this trip so near
What will these travelers do
With this experience so new

Will they file the pictures away
And talk about the trip some day
Or will the trip leave a mark
Upon the life's journey they now embark

Will the older generation use their voice
To protect the memory if given a choice
And what of the younger ones
What opportunities when their future comes

When their kids want to know
Will it be the pictures they show
Or will it be instead
A trip down the river of dread

Who will show the next generation
This land of thrill and exhilaration
What a tragic loss it would be
For them to miss what's so dear to me

So now that the Canyon is in the mirror
Perhaps you understand my fear

(a special thanks to the 21 & over lounge for filling in the blanks on this one!)



MIKE BUCHHEIT © 2011



MIKE BUCHHEIT © 2011



MIKE BUCHHEIT © 2011

Grand Canyon Youth : River Connections

Community. It's difficult to define. Is it constructed of people in close proximity, by similar experience or something else? However you choose to characterize it, the community of young people that Grand Canyon Youth (GCY) serves continues to broaden, deepen, and be continually inspired by the experience of a river trip. Though our programs vary throughout the season, the feedback we get from kids, coordinators, parents and guides remains constant: there is something about the river that awakens people's spirit.

For a second season, GCY launched its Grand Inspiration program through Grand Canyon. In partnership with the National Park, this trip was designed to explore the historical idea of art as a medium to underscore and preserve the value of a protected place. Launching on an 8-day motor trip at the end of June, fifteen youth examined the forms of written word, photography and fine arts and their capacity to convey, in some small way, the intrinsic worth of Grand Canyon. There to cultivate the young artists' efforts were photographer Michael Buchheit, artist Sara Hooker, and park ranger Juliet Oakes. The work accomplished on the trip culminated in an exhibit displayed at park headquarters.

I was fortunate enough to observe firsthand the formation of a beautiful community on that trip. From Lee's Ferry down, it was heartening to observe young people navigating new relationships, sharing

ideas, supporting and including each other in novel experiences. Some participants had rarely been camping; others were reticent to the exposure that comes with creating. But with the space for growth that wilderness provides and the personal renovation it often demands, it was easy to observe subtle shifts in the participants, as a group and as individuals. A few idle kids found purpose, the disinterested discovered a curious side, the cliquish became inclusive, and for the majority who showed up eager, their energy was channeled into their art. And quite subtly, they each learned a little bit more about living together as a community.

It was telling, as the guides loaded the boats on trailers at Diamond Creek, the group of young people stood in a close circle on the beach as if they were huddled around a fire for the first time together. They had days in front of them on the rim to assemble their exhibit, and their task was to convey to the outside world how the canyon inspired them. At that moment, I trusted they would also carry their renewed spirits with them from the canyon to enrich their communities back home.

Grand Canyon Youth is a 501(c)3 non-profit organization based in Flagstaff, Arizona. For more information about our innovative programs or to make a donation, please visit our website: www.gcyouth.org.

--John Napier, Operations Director Grand Canyon Youth



PHOTO COURTESY OF GCY



PHOTO COURTESY OF GCY

Quiet Time

Deer pluck at prickly pears ten feet from a well worn path
Bright Angel laps endless waters on timeless basement stones
The Canyon slows its pace with the desert's transition to dusk

Alone in the stark beauty
Thoughts and memories pester the peace
The canyon offers answers by keeping them hidden
Forever acknowledging man's relative futility

Meanwhile, the deer feed on

The notes of the insects sing the sun to sleep
Bats dance on air
The moon returns for another soirée
Night approaches

The mind becomes clear as the day is put in perspective
Remembering faults, victories, mortality
Much is learned in the canyon
The past is laid out

A ringtail dances on the rocks
And still, the deer feed on.

David Jensen
June 9th, 2011
Phantom Ranch - Grand Canyon, AZ



"FISHEYEING ON THE SANDRA : PHOTO©BOB WYATT



"GREG REIFF SUPERVISING A PASSENGER IN THE SANDRA" : PHOTO©BOB WYATT

Slide, and Waterfall, along with many others in the Lower Granite Gorge were inundated as the reservoir filled. But there were two rapids in the lower Grand Canyon that were feared even more than Lava Falls: Separation and Lava Cliff. Separation, at Mile 240, was formed by two streams that entered the main canyon opposite each other, the result of a major cross-canyon fault. It's best known for the dramatic climax of the first Powell expedition in 1869. Three of the men took one look and decided there was no way they could live through the rapid, so they decided to abandon the river and climb out of the canyon. They were never seen again. Robert Brewster Stanton, on a railroad survey in 1890, wrote "As I looked down into that pit of fury, I wondered if it were possible for our boats to go through it and come out whole, and right side up." Stanton and his party lined their heavy wooden boats around the rapid. In 1923, the U.S.G.S. party surveying the Grand Canyon for damsites decided to run it. The first two boats made it through, albeit both were completely swamped with water from the rough ride. The third boat, the Grand, carrying the expedition leader, E.C. La Rue, and the geologist, Raymond Moore, and rowed by Lewis Freeman (a better writer than a boatman), didn't do so well:

painter and climbed on top of the overturned boat.

Freeman later wrote "My only mental picture of the incident is of La Rue's legs spidering against the sky as he spilled off the stern hatch, all but falling into the cockpit. Then darkness and much rolling and tumbling of water." Some early boatmen felt that the rapid was actually easier than it looked; while it looked dangerous, there was actually a natural run that the river took you through. But it was still considered dangerous enough to be regularly portaged, right up until it was covered by Lake Mead in 1938.

Even worse was Lava Cliff Rapid, at Mile 246, considered to be the worst rapid on the entire Colorado river system. There was a huge jagged cliff of lava along the right side, and gigantic boulders along the left, rendering a portage or lining job incredibly difficult. Even so, virtually all early parties chose the days of labor required to let their boats down with lines, rather than face the maelstrom of rocks and water. The first to do so was John Wesley Powell's starving, grumbling crew in August 1869. With their worn-out boats and weakened constitutions, Powell's men felt there was no way they could run what seemed to be unrunnable, so they tried to line their boats by climbing onto the Lava Cliff with ropes attached to one of the boats. George Bradley stayed with the boat to fend it off the rocks, but their plans had a flaw: the current swung the boat out into the middle of the rapid and then smashed it back up against the cliff. After about three repetitions of this, Bradley was reaching with his knife to cut the rope when the ring in the stern post pulled free. The men on the cliff watched in horror as Bradley scrambled for the oars, and then he went out of sight behind the cliff. Sure that their

companion was drowned, they rushed back to the other boat, crowding into it, and launched into the rapid. They quickly capsized but were picked up by Bradley, who had survived the bedlam of waves and spray and was waiting below.

George Flavell, who floated from Wyoming to Mexico in 1896-97, was probably the first to run Lava Cliff, and noted that it was "as dangerous as any on the whole river." In 1912, Ellsworth Kolb described what they saw when they reached Lava Cliff:

"It was more than a nasty rapid, it was a cataract! What a din the water sent up! The air vibrated with the impact of water against rock. The rapid was nearly half a mile long. There were two sections near its head staggered with great rocks, just above or slightly submerged under the surface of the water."

After their experiences in Separation Rapid, the 1923 U.S.G.S. survey party decided to line their heavy wood boats past the rapid, much to the disgust of two of the boatmen, H. Elwyn Blake and Leigh Lint, who were sure they could run a channel next to the cliff. But Emery Kolb, the head boatman, was less sure and convinced Claude Birdseye, the expedition leader, to order them to portage and line their heavy wooden boats. Buzz Holmstrom, one of the best boatmen ever to float the Colorado, was one of the very few to actually run it, as late as 1937. His run was described by historian David Lavender as "...a heart stopper. He dodged submerged rocks, grazed one huge boulder, and in avoiding a yawning trough was shot toward a lethal cliff, escaping a collision only when water billowing back from the granite spun him away." The very next year, Holmstrom motored back up Lake Mead, then almost full,

only to find that Lava Cliff was already flooded, and Separation was almost gone.

Recently I camped at Mile 246, the mouth of Spencer Canyon but also the site of Lava Cliff Rapid. Across from the camp, the toothed profile of the eponymous Lava Cliff glowed in the moonlight, evoking images of Powell and the Kolbs and Buzz Holmstrom. Now that Lake Mead has dropped, there is still current in the lower Grand Canyon, and a small projection of lava caused a chattering riffle at the edge of the cliff. It was like Lava Cliff Rapid was speaking for all the lost rapids of the Colorado, in a muted voice, saying, "I may be gone for now, but someday, I'll be back."

Ashley Falls and the other rapids in Red Canyon; Dark Canyon Rapid and the rapids on the lower San Juan, all were inundated soon after the completion of Flaming Gorge and Glen Canyon dams in 1963. Today, river runners can only dream about these rapids and many others--the many rapids in Red Canyon; Gypsum Canyon in Cataract; Reference Point and Last Chance in the Grand Canyon. Maybe someday free-running water will once again lash the rocks of these rapids, but until then they must remain the lost rapids of the Colorado.

Roy Webb is the author of several books on Grand Canyon and Colorado Plateau river running history, including Call of the Colorado. He is the editor of High, Wide and Handsome, The River Journals of Norman D. Nevills. Roy is multimedia archivist at the University of Utah's J. Willard Marriott Library.



"DRAGON FLY AT SHIMUNO CREEK" : PHOTO © SUE TANGES



"LIKING LICHEN - NEAR BASS CAMPG" : PHOTO © SUE TANGES



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