

boatman's quarterly review



Jon Hamilton

Prez Blurb • GTS • Olla Gardening • Flying Fish Continued • GCY • Books
A Groover Tale • New Era • Rubber Boats • 1960 Jet Boat Expedition

boatman's quarterly review

...is published more or less quarterly
by and for GRAND CANYON RIVER GUIDES.

GRAND CANYON RIVER GUIDES
is a nonprofit organization dedicated to

Protecting Grand Canyon
Setting the highest standards for the river profession
Celebrating the unique spirit of the river community
Providing the best possible river experience

General Meetings are held each Spring and Fall. Our Board of Directors Meetings are generally held the first Wednesday of each month. All innocent bystanders are urged to attend. Call for details.

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Our editorial policy, such as it is: provide an open forum. We need articles, poetry, stories, drawings, photos, opinions, suggestions, gripes, comics, etc. Opinions expressed are not necessarily those of Grand Canyon River Guides, Inc.

Written submissions should be less than 1500 words and, if possible, be sent on a CD or emailed to GCRG. Microsoft Word files are best but we can translate most programs. Include postpaid return envelope if you want your disk or submission returned.

Deadlines for submissions are the 1st of February, May, August and November. Thanks!
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Correction

IN REFERENCE TO “*Uranium Mining in the Grand Canyon*,” BQR VOLUME 22, NUMBER 4

THERE WAS ONE TYPO in the the last BQR article “Uranium Mining in the Grand Canyon”. In that article the EPA (U.S. Environmental Protection Agency) Maximum Contaminant Level (MCL) for Uranium is incorrectly listed as 0 PPB (parts per billion) in water. In 1991 the U.S. EPA set the MCL at twenty PPB, but after a cost-benefit analysis changed it in 2000 to 30 PPB which is the current standard. The BQR article correctly noted that the EPA concentration goals are 0 PPB. EPA notes: “Uranium has been shown to be nephrotoxic in humans and animals. It interferes with reabsorption of proteins in the proximal renal tubules of the kidney, resulting in proteinuria.”

Dave Kreamer

Dear Eddy

FROM A COMMENT OFF THE BACK OF A MEMBERSHIP CARD

I'D LIKE TO SEE MORE on what's happening in the canyon—more current events like: trip episodes, evacs/causes, funny stories, cool passengers, “no shit there I was” sort of stuff.

Kristin Downing

EDITOR'S NOTE: We'd like to see more of that in the BQR too. Please send your submissions to GCRG at gcrg@infomagic.net and we'll use them if we can! Please refer to the submission guidelines at www.gcrg.org.

Cover Photo: Kiwi Jon Hamilton Upruns *Wee Yellow* through Vulcan Rapid. NAU.PH.96.4.95.282,
Bill Belknap Photo Courtesy *National Geographic*
April 1962 #1076087

Prez Blurp

HELLO! I AM WRITING THIS just after 54 inches of snow fell in Flagstaff. What an amazing storm. I can't help but look at all the snow on the ground and think of the spring runoff. How will all this snow affect lake levels in the Southwest?

Lake levels and the management of the dams that control them have been an important issue for Grand Canyon River Guides. Our role in the Glen Canyon Dam Adaptive Management Program provides a uniquely knowledgeable view.

Recently, GCRG has had some change in our representatives. We say goodbye to John O'Brien and Andre Potochnik. I would like to offer them heartfelt thanks for the years of hard work and dedication that they have given to the program. To date we have seen three beach habitat building flows! It is encouraging to see changes in the way Glen Canyon Dam is operated; even though these changes may seem minor, we are making progress. Andre and John O's efforts helped to make these changes happen.

We are excited to welcome Sam Jansen as our new Adaptive Management Work Group (AMWG) representative nominee and Jerry Cox as our Technical Work Group (TWG) representative nominee. It was a tough decision out of the many fabulous applicants who were interested in the positions. We were really excited to see so much interest from the guiding community. Thanks to all of you who applied. We wish that we could have hired each and every one of you!

We are also starting an advisory committee for the AMP. We feel that it will be a great way to get more people involved in the process. The group will serve as an advisory board to our representatives to give them a better sense of the direction that our members would like to see us go with this program.

In other important news, the 9TH circuit court has upheld their earlier ruling in favor of the NPS in the River Runners for Wilderness versus Steve Martin/NPS lawsuit. The court has concluded that the plaintiffs have failed to establish that the Park Service acted arbitrarily and capriciously when it adopted the 2006 Management Plan. As you may recall, GCRG, along with the Grand Canyon River Runners Association and the Chicago Whitewater Association, submitted an Amicus Brief in support of the NPS and the continuation of the Colorado River Management Plan. It has been a long haul for the NPS and intervenors such as the Grand Canyon River Outfitters Association and the Grand Canyon Private Boaters Association. However, the end result is gratifying—all the more so because

the post-CRMP world has resulted in improved communication and positive relationships between our user groups.

Looking forward, GCRG will plunge into the EIS on overflights when it is finally available, and it is certain that uranium mining near Grand Canyon will continue to be an issue of concern. With a very engaged board of directors, GCRG will work hard protect Grand Canyon and the river experience we all cherish. We encourage our members to get involved with these issues as well. It takes all of us to make a difference.

The Guides Training Seminar land session is coming up quickly. Mark your calendars and come join us up at Hatchland March 27TH and 28TH. We have some great stuff lined up as always. What a great gathering of people! Come and be a part of it. Can't wait to see you there!

Emily Perry

Whirlpools Waltz (Mile 157, October, 1992)
in 3/4 time

by Zeke Lavick

As I sat by the river, I heard it was singing
With a voice that was harmony crossed
And it sang to the whirlpools as they covered the dance floor
And I saw they were dancing a waltz
They twirled around sweetly in 3/4 time
To the music we all could now hear
And the raindrops came sparkling from a sun ripened sky
Just like crystals from a ball chandelier

Then I lay down to sleep with the river still singing
And I dreamed that you asked me to dance
And I held you so lightly as we spun 'round together
In a waltz that was filled with romance
Well the melody chosen was for us alone
Like the love in our hearts it would stay
And the voices were joined by an orchestra now
Come listen, hear the violins play

So kiss me once gently, let me look in your eyes
Like we did when you became a bride
Hear your laughter which echoes from the walls of the shoreline
As we lay by this river we ride
Sometimes love's a current, so deep and so strong
In this tempest let's join the foray
And the river will rise up to sweep us along
Let's go floating and waltzing away

Yes please come a waltzing, like the whirlpools are waltzing
On this river come waltzing away

Guide Profiles

Laura Fallon, Age 37

WHERE WERE YOU BORN & WHERE DID YOU GROW UP? I was born in Massachusetts and was in Newcastle England until I was 7. From age 7–17 I was in Andover, MA. I moved out west in 2004. I love it here.

WHO DO YOU WORK FOR CURRENTLY (AND IN THE PAST)? I work for Arizona Raft Adventures (AZRA).

HOW LONG HAVE YOU BEEN GUIDING? In the Grand Canyon since 2001.

WHAT KIND OF BOAT(S) DO YOU RUN? S-Rigs/ Modified J-Rigs/ 18-foot oar rafts.

WHAT OTHER RIVERS HAVE YOU WORKED ON? I have boated privately on rivers out east: Penobscot, Dead, and Kennebec as well as Westwater, Cataract Canyon, and the Green River out here.

WHAT ARE YOUR HOBBIES/PASSIONS/DREAMS? I love being outside and challenging myself continually, physically and mentally. I love boating. I love yoga. I hope one day to combine the two and do yoga trips in the Grand Canyon.

MARRIED/FAMILY/PETS? Not married, amazing family... including my sister who now lives in Flagstaff. And Lucky...the best dog I could possibly ask for!

WHAT MADE YOU START GUIDING? The realization that I had to come back to the Grand Canyon...over and over and I needed a way to do that.

WHO HAVE BEEN YOUR MENTORS AND/OR ROLE MODELS? Every person I have gone on a river trip with has taught me something. I don't imagine that will ever

stop. There have been lots of boatmen—men and women—who were patient with me; taught me by showing me clean, clear runs; and allowed me to run their boats through big stuff when I was just starting out...Shay, Bev, Jed, Mike (Coach), Dave, Randy, Harlan, Brad, Ed, Lala, Jerry...just to name a few!



WHAT DO YOU DO IN THE WINTER? I teach yoga!

WHAT'S THE MOST MEMORABLE MOMENT IN YOUR GUIDING CAREER? There are so many. Running my first motor boat through the Canyon...being on a motor boat as it hit the wall at Crystal at high speed...flipping my oar boat in Crystal during a winter private...swimming Fishtail for the first time...talking my

close friend through rowing Pearce Ferry Rapid for her first time. The list will hopefully go on and on.

WHAT DO YOU THINK YOUR FUTURE HOLDS? Doing things I love and being with close friends and family through amazing adventures.

WHAT KEEPS YOU HERE? The looks on people's faces when they see something that amazes them or do something that surprises them. This is an incredible place to learn and to push the limits of what is possible. I love being part of that process for others and for myself.

Charly Heavenrich, Age 67

WHERE WERE YOU BORN & WHERE DID YOU GROW UP? Born in Michigan, haven't grown up yet.

WHO DO YOU WORK FOR CURRENTLY (AND IN THE PAST)? Started with Wilderness World (WiWo) which became Canyon Explorations and Expeditions.

HOW LONG HAVE YOU BEEN GUIDING? First trip in 1978.

WHAT KIND OF BOAT(S) DO YOU RUN? I'm an oar guide. I love the dance between the oars and the river.

WHAT OTHER RIVERS HAVE YOU WORKED ON? I'm a Grand Canyon chauvinist. Don't care to work on any other river.

WHAT ARE YOUR HOBBIES/PASSIONS/DREAMS? My passion is helping people explore and discover where they want to be and how to get there. My dream and mission is to share the Grand Canyon Experience with the world.

MARRIED/FAMILY/PETS? Single. No pets.

SCHOOL/AREA OF STUDY/DEGREES? Masters in International Finance, University of Michigan.

WHAT MADE YOU START GUIDING? Serendipity. My best friend and housemate, Gary Casey, had borrowed some money to buy a truck. He offered to trade the interest for a trip in the Canyon. As soon as we hit the current at Lees Ferry I got goose bumps, tears in my eyes, and I had a very clear sensation of non-physical arms wrapping around me as if to say, "Welcome home, brother."

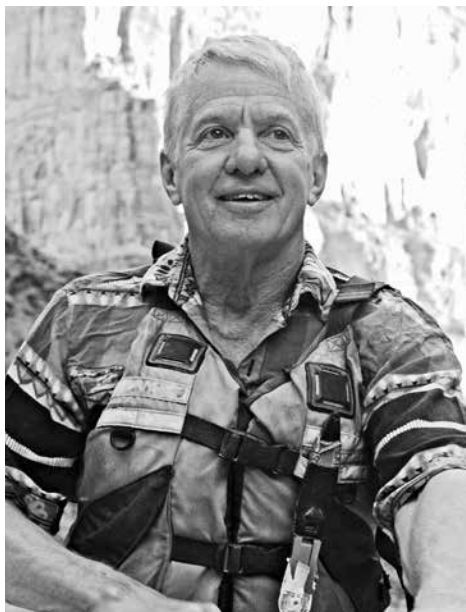
WHAT BROUGHT YOU HERE? The opportunity to work with amazing men and women and share the Grand Canyon with people of all walks of life.

WHO HAVE BEEN YOUR MENTORS AND/OR ROLE MODELS? The WiWo crew, Sue Bassett, Gary Casey, Floyd Stevens, Larry Stevens, Alan Fisk-Williams, who demonstrated their passion for sharing the Grand Canyon

by being willing to do whatever it takes to make sure our passengers had the best possible experience of the Canyon.

WHAT DO YOU DO IN THE WINTER? I'm an adventure speaker/story teller sharing the stories of ordinary people who go where they never thought possible, a life coach, author, and Inner Grand Canyon photographer (Gallery of Rock and Water).

IS THIS YOUR PRIMARY WAY OF EARNING A LIVING OR DO YOU COMBINE IT WITH SOMETHING ELSE? Combination.



WHAT'S THE MOST MEMORABLE MOMENT IN YOUR GUIDING CAREER? I've had so many, it's ridiculous to have to pick just one. One would certainly be when I flipped in the old Crystal and came up under my raft. Another would be getting hit by a water spout across from the Whitmore petroglyphs. Being cold-cocked by a cutting board in a wind sheer. Chopping off part of my finger from a cooler lid at the warehouse. None of that compares to the stories of the depth of courage and ability demonstrated by our passengers. Or all the laughter on the crews.

WHAT'S THE CRAZIEST QUESTION YOU'VE EVER BEEN ASKED ABOUT THE CANYON/RIVER? What time of year

does the Grand Canyon fill up with water? Where did they bring all these rock from?

WHAT DO YOU THINK YOUR FUTURE HOLDS? As long as I maintain my passion, my body remains willing, and the company is willing to schedule me, I hope my future continues to be guiding, and then sharing the experience with others during the off season.

WHAT KEEPS YOU HERE? People—the amazing men and women whom I love and get to work with, and the chance to meet and share the Canyon with awesome people from all over the world. What a privilege we have as guides.

Almost GTS Time!

HONESTLY WHERE DOES THE TIME GO—the 2010 Guides Training Seminar is almost upon us! Mark your calendars for Saturday and Sunday, March 27–28TH at Hatch River Expeditions in Marble Canyon, AZ. This event is open to the public and is as fascinating and illuminating as it is a heckuva lot of fun. And this is definitely a GTS you won't want to miss. We'll give you a sneak peak of some of the outstanding felarryatures of the land session:

River Heritage Celebration—Help us to celebrate the 50TH anniversary of the jet boat up-run with Buzz Belknap and Phil Smith, get an update on the conservation of Grand Canyon's Historic Boats, and more. Plus, we are practically bursting with excitement to tell you all about a proposal for the development of a River Heritage Museum at the South Rim of Grand Canyon National Park—finally some significant movement is afoot to preserve and highlight river running history in Grand Canyon! Come and find out all about it!

Native Foods Celebration—Sponsored by the Native Voices on the Colorado River Program, it occurred to us that a unique way to learn about the native perspectives of the Grand Canyon is through food. Activities will include a traditional Hualapai agave roast, interactive native food preparation, a native foods lunch fest on Saturday and fascinating presentations.

Other cool stuff: Learn about diverse topics from river management to water law, from uranium mining to tamarisk beetles—you name it. Plus we'll get you out of your seats for a stretching/yoga clinic for guides, you can boogie down on Saturday night with Kirk Burnett and the Johnny Lingo Trio, win good swag in the raffle, and who knows what else. You'll have to come and find out!

And of course the GTS river trip will be fantastic. Led this year by Jeri Ledbetter and Dr. Larry Stevens, we'll have a plethora of great speakers who will stuff your brain with useful information that will help you be a star in your profession. From interpretive learning “in situ” to stewardship projects and great hikes, this fun and exciting training opportunity is open to both trainees and more experienced guides who have trips for the 2010 river season. There is always something new to learn, and this is a fabulous way to do just that.

Details for both sessions along with costs (and the ability to pay) can be found on the handy dandy GCRG website at: www.gcr.org/guide_resources_gts.php. We'll also post the draft of the GTS land session agenda until a final draft becomes available. So keep checking back.

See you there!

Lynn Hamilton

Adopt-a-Boatman Update

AS YOU MAY KNOW, the Adopt-a-Boatman Program is the public funding mechanism for Grand Canyon River Guides' Oral History Program. Of late the program has morphed into a “we pick 'em and you fund 'em” mode.

Current open adoptions are: Brian Hansen, Pete Gibbs, and Amil Quayle. Please note that the Stu Reeder adoption is fully funded at this time. Check out the GCRG website for current status of adoptions on the Adopt-a-Boatman spreadsheet, and add one of these fine boatmen to your “cart” in Google Checkout!

Lynn Hamilton

Olla Gardening at Soap Creek

WHAT'S HAPPENING AT SOAP CREEK?

SOAP CREEK CAMP is a very popular stop in Grand Canyon National Park. It is used daily as a lunch spot or an overnight camp by river users, backpackers, fishermen, and day hikers. Consequently, Soap Creek has a heavy level of human impacts ranging from social trailing to excess tent site development that negatively affect both cultural and natural resources. Grand Canyon National Park staff have been working to address these concerns since the 1990's. However, in the last two years, staff have taken new, creative, and aggressive approaches to address this long standing problem.

In November 2008, crews created eight new campsites in the more durable, sandy, post-dam riparian zone, downriver from the kitchen area, to attract river users to less sensitive areas. They also obliterated pre-dam (or old) high water zone social trails and tent sites. In February 2009, park staff and boatmen from Wilderness River Adventures obliterated another large section of social trails. Last November, park staff and boatmen from Tour West began an aggressive approach to restoration at Soap Creek by initiating the first phase of a major replanting effort on the upper pre-dam high water zone terrace. This planting will occur in phases over several years in order to determine the best methods for ensuring restoration success along the river corridor.

WHAT WILL YOU SEE AT THE SITE?

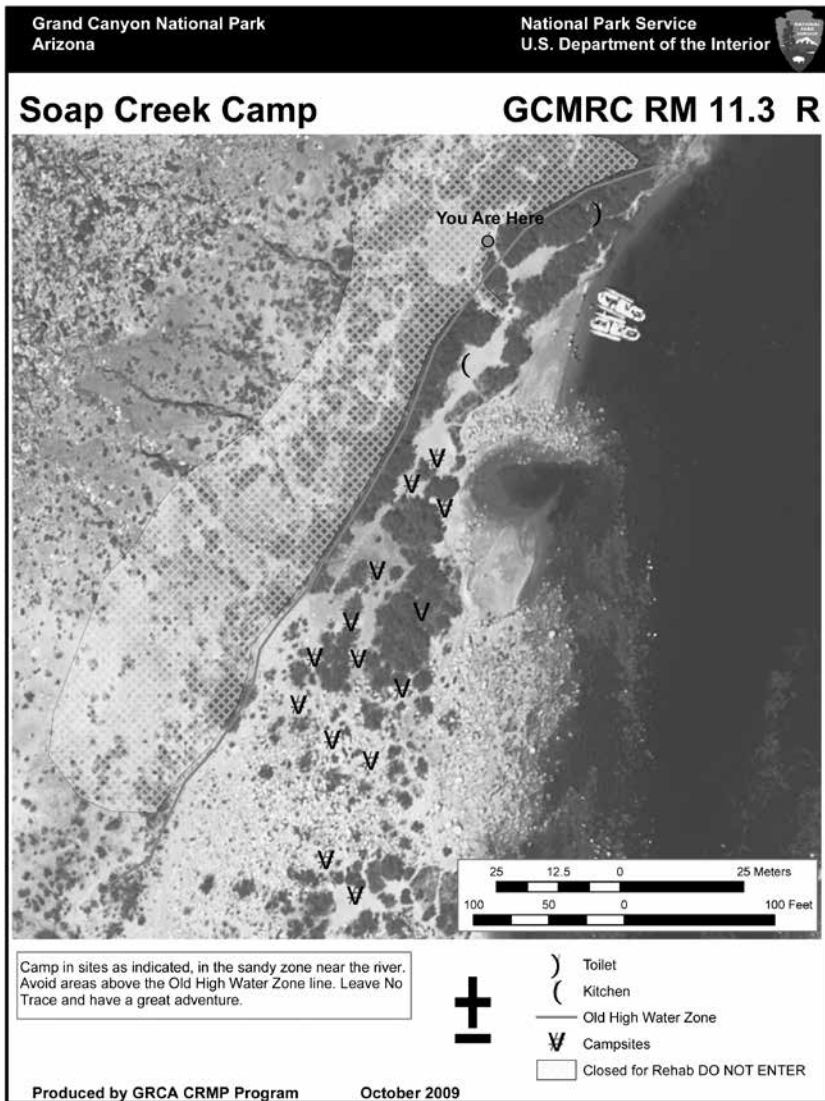
River users will see some interesting and exciting things at Soap Creek. Park crews are experimenting with a method of irrigation which has been used for many centuries, called "olla gardening." With this method, modern, unglazed, commercially produced clay pots are buried up to their narrow necks and filled with water. Crews then plant native vegetation immediately around the pots. Because the pots slowly release water into the soil through the porous clay wall, the plants benefit from the availability of water over an extended time period. Biologists and other park staff members have been continually monitoring the plants and pots since November, and will do so until the plants are fully established. As the plants become established, park staff will continue to plant the disturbed areas of the upper terrace until the site is completely restored. Ultimately, park staff hope to perfect the methods tested at Soap Creek to successfully carry out other restoration projects throughout the river corridor.

The olla gardening and restoration at Soap Creek is part of the park's continuing implementation of the Colorado River Management Plan (CRMP). Monitoring and mitigation of human impacts to the park's natural and cultural resources are essential components of the CRMP. These impacts include social trailing, vegetation damage, trail damage, illegal fires, trash accumulation, and others.



WHAT IS THE PRE-DAM HIGH WATER ZONE?

Most of the impacts found at river camps are located in the pre-dam high water zone. This zone is particularly fragile, as it no longer receives moisture from spring floods due to the regulated water flow of the Colorado River. It commonly hosts mesquite, catclaw



is typically used as the kitchen area of the camp. Eventually, the impacted and denuded area of the upper terrace will be completed restored with native vegetation. This large site in the pre-dam high water zone contributes to extensive social trailing and associated damage to native vegetation throughout the entire upper terrace at Soap Creek. Because new campsites were created in the durable, sandy riparian zone near the river, the number of high quality and available camping areas at Soap Creek has not changed.

WHAT CAN YOU DO?

River users are crucial to the success of the restoration at Soap Creek. Park staff ask that you contribute to the success of this project by being a good steward. Please take the time to look at the olla gardening site, but do not disturb the pots or the new plants, as the restoration area is being carefully monitored and information from this project will be used to plan future restoration projects. Instead of using the upper terrace to camp, encourage your group to locate tents low, close to the river, using one of the newly established camp sites. Learn to recognize both

acacia, and netleaf hackberry, among many other stunning desert species. You also will find healthy and diverse communities of biological soil crusts growing in unimpacted areas. This zone is attractive to people to explore because it is usually elevated above river level, offering expansive views. It is also flat and has sparse vegetation, which is attractive to people for hiking or setting up a tent. Unfortunately, this zone is very susceptible to human impacts and is also difficult to repair. Soil crusts can take decades to recover. New plantings can be extremely difficult to establish due to low water availability. Social trails are almost impossible to completely eliminate due to soil compaction and vegetation damage.

HOW WILL THIS PROJECT AFFECT RIVER USERS?

All river users will still be able to stop for lunch or camp overnight at Soap Creek. The olla gardening planting project is on the upper terrace above what

the pre- and post-dam zones, and use that knowledge as you travel down river. Keep your camp and tents in the post-dam riparian zone at all camps to minimize your impacts. Take note of other areas you see that have been impacted, and take care to avoid creating new impacts. Stay on trails, Leave No Trace, and have a good adventure.

Kassy Theobald

RESTORATION BIOLOGIST, GCNP

NOTE: For more information on the CRMP, email grca_crmp@nps.gov or visit the park's river management website at http://www.nps.gov/grca/parkmgt/riv_mgt.htm.

Flying Fish Continued—Additional Humpback Chub to be Translocated to Shinumo Creek

IN JUNE 2010, THE NATIONAL PARK SERVICE, in conjunction with the Bureau of Reclamation, U.S. Fish and Wildlife Service, the Arizona Game and Fish Department, and Grand Canyon Wildlands Council, will translocate 300 more juvenile humpback chub to Shinumo Creek in Grand Canyon National Park. This second translocation of humpback chub to Shinumo Creek is part of the multi-year experiment to increase the understanding of conservation efforts that must be undertaken in order to ensure that this native fish continues to survive in Grand Canyon. Data collected on the humpback chub that were translocated to Shinumo Creek in 2009 have indicated that the project has been successful to date.

Shinumo Creek has suitable habitat for humpback chub based on water quality, water temperature, and available foodbase. Near its confluence with the Colorado River, Shinumo Creek has a 15-foot high waterfall that prevents non-native predator fish in the mainstem Colorado River from entering the creek. Two species of native fish, speckled dace and bluehead suckers, and nonnative rainbow trout live in the stream. Native fish were more abundant than rainbow trout, indicating that some co-existence is possible between these native and nonnative species. These characteristics of Shinumo Creek led biologists to conclude that it is one of the most favorable Grand Canyon tributaries for establishment of a satellite humpback chub population.

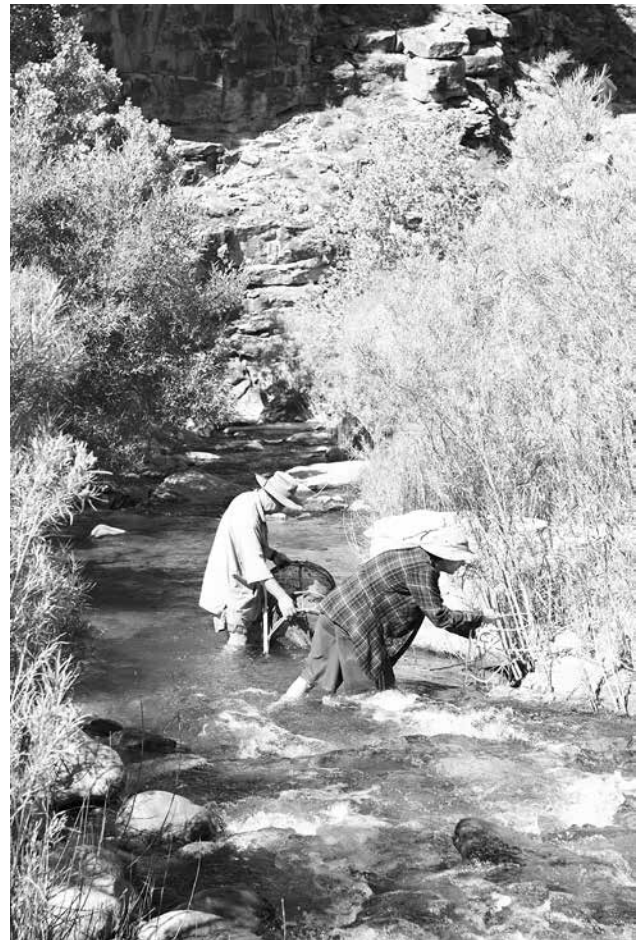
Last June, 302 juvenile humpback chub were translocated to Shinumo Creek in the first native fish translocation experiment conducted in Grand Canyon National Park. The young fish had been captured in July and October 2008 near the mouth of the Little Colorado River. They were treated to remove parasites then kept overwinter at the U.S. Fish and Wildlife Service Dexter National Fish Hatchery and Technology Center, in New Mexico. Approximately one month prior to translocation, identity tags, known as PIT tags, were implanted in each fish. The use of PIT tags is an essential part of the scientific research into the translocation as they allow unique identification of each fish for monitoring purposes.

Prior to releasing the humpback chub in Shinumo Creek last year, biologists surveyed the existing native fish community of bluehead suckers and speckled dace in the stream and installed a PIT tag antenna and stream gage above the barrier falls near the mouth of Shinumo Creek. They also removed approximately 800

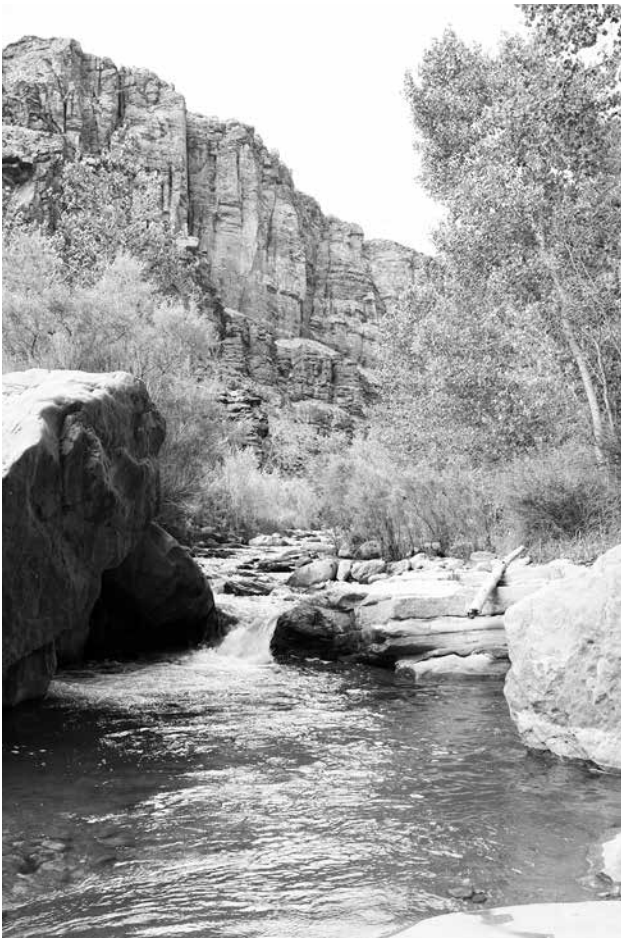
nonnative rainbow trout by using electrofishing gear, hoop nets, seines, and angling to give the endangered fish the best possible chance for survival in Shinumo Creek.

The juvenile humpback chub were flown by National Park Service helicopter to Shinumo Creek on June 15TH. After tempering the fish to the water temperature and chemistry of Shinumo Creek, they were released in four locations within a quarter-mile section of the stream. Snorkeling biologists observed the young humpback chub actively feeding and behaving normally a few minutes after they were released.

Crews returned to Shinumo Creek in July and September to monitor the translocated fish population. They observed a large group of humpback chub in the release areas, although many fish had dispersed downstream of the release areas in Shinumo Creek.



*Monitoring fish in Shinumo Creek, July 2009.
Credit: NPS photo by Brian Healy*



Shinumo Creek
Credit: NPS photo by Brian Healy

Two fish had moved upstream of the release site above falls that had previously been considered a barrier to upstream fish movement. Fifteen humpback chub from the translocation were found below Shinumo Creek falls near the mouth of the Colorado River as well as seven additional untagged juvenile humpback chub that were not part of the translocation.

Using hoop nets, minnow traps, and seines, 177 translocated humpback chub were re-captured during monitoring trips in 2009. The PIT tags allowed biologists to measure the growth of individual fish that were re-captured. The young humpback chub in Shinumo Creek appeared to grow exceptionally well between July and September indicating that the creek had suitable temperatures and that plenty of food was available.

Data from the PIT tag antenna indicated that only about thirty percent of the translocated fish had left the stream through December. About half the fish that left the creek did so in the days immediately following the translocation, after which the out-migration rate significantly slowed down. The initial dispersal of humpback chub following a translocation is not unexpected, as fish adjust to their new environment and search for cover and suitable habitat.

The Shinumo Creek translocations are part of a multi-agency effort to restore humpback chub in Grand Canyon river systems. In July and October 2009, biologists collected more than 700 additional juvenile humpback chub for additional recovery efforts.

Some of these fish were translocated above Chute Falls in 2009, approximately nine miles above the mouth of the Little Colorado River. Translocations of humpback chub above Chute Falls began in 2003 and have demonstrated that translocation is a viable restoration technique for this endangered species in Grand Canyon. Approximately one-third of the captured fish were added to the offsite humpback chub population at the Dexter National Fish Hatchery and Technology Center. This refuge population was initially established in 2008. The Dexter Center houses a



Juvenile humpback chub in Shinumo Creek after translocation in June 2009.
Credit: NPS photo by Melissa Trammel



*A juvenile humpback chub.
Credit NPS photo by Brian Healy*

variety of endangered and threatened fish species from southwestern rivers and plays a critical role in recovery efforts for these native fish.

The remainder of the juvenile humpback chub captured in the Little Colorado River in 2009 will be translocated to Shinumo Creek in June 2010. Biologists will monitor the Shinumo Creek population throughout 2010 and will record data to assess the population size, growth rate, dispersal, survival, and predation by non-native fish. Data collected by the PIT tag antenna and stream gage will give insight into what factors, such as snow melt runoff or monsoon flooding events, may cause humpback chub to migrate out of Shinumo Creek. Depending on the success of these initial translocations, additional translocations to Shinumo Creek may be conducted in the future.

While the long-term results of the Shinumo Creek translocation experiment will only be known after several years of monitoring, the preliminary data from the 2009 effort are encouraging. Martha Hahn, Chief of Science and Resource Management at Grand Canyon National Park said, "We're really pleased that the humpback chub in Shinumo Creek did so well in 2009. This type of scientific and restorative work of the river system's natural environment is very exciting. It is also an outstanding example of true collaboration between all the involved partners. What we learn from

this translocation experiment will help us as we move forward to recover the canyon's native fish populations."

Allyson Mathis and Brian Healy

NOTE: Allyson Mathis is the Outreach Coordinator and Brian Healy is the fisheries biologist for the Division of Science and Resource Management for Grand Canyon National Park. Brian can be reached at brian_healy@nps.gov.

NOTICE:

There are no closures at Shinumo Creek because of this translocation experiment. Anglers in Shinumo Creek should become familiar with the identifying characteristics of humpback chub to avoid any accidental capture of the translocated chub. Young humpback chub are silver, have small eyes and large fins, but have not yet developed the pronounced hump behind their head. If any humpback chub are incidentally caught, they must be immediately released unharmed.



What's New At Grand Canyon Youth

"GCY was a great experience that was not only educational, but a lot of fun. I would recommend this program to anyone who loves nature, camping, and having a great time. The volunteer projects were a fun experience. This trip created memories that will last a lifetime." — 2009 GCY PARTICIPANT



Youth cool off on the river during their GCY trip in June.
Photo by Angela Keith.



GCY participants volunteer with the Grand Canyon Trust at the North Rim as part of the Rim to River program.
Photo by Angela Keith.

2010 SUMMER PROGRAMS OPEN FOR ENROLLMENT!

AS GUIDES AND RIVER-LOVERS, you know first-hand the transformational power of the river. You are vital in helping Grand Canyon Youth (GCY) spread the word about our programs. The line-up of GCY 2010 summer programs is exciting! New this year is, "Grand Inspiration: Grand Canyon through the Eyes of Youth Artists". As part of this trip participants will create an art exhibit that will be shown to visitors at the South Rim.

There always seem to be questions about who our program aims to serve. GCY is open to any young person age twelve to nineteen who is excited about discovering the Southwest. Participants come from all walks of life, from different cultures, economic backgrounds, and physical abilities. We make a special effort to recruit participants from underserved populations but our trips are open to all youth. So, if you have kids, nephews, nieces, grandkids, or friends with kids, please tell them about GCY. It is a truly unique way to experience Grand Canyon.

A NEW HOME

We are thrilled to have settled in to our new more permanent home! Our new warehouse and office is working out swimmingly. We have more warehouse and office space than we have ever had. The new address

is: 2131 N. First Street, Suite B in Flagstaff. If you are in the neighborhood please stop by and we'll give you the tour! A huge thank-you goes out to all the guides, community members, and GCY alumni who helped us move (some for the second time). Your help was very much appreciated!

A NEW LOOK

After many years, we have taken the plunge and redesigned our website and logo. The new website is fantastic and is chock-full of great information about all things GCY. You can still find us at: www.gcyouth.org. Our new logo wordlessly captures some of the magic of GCY.

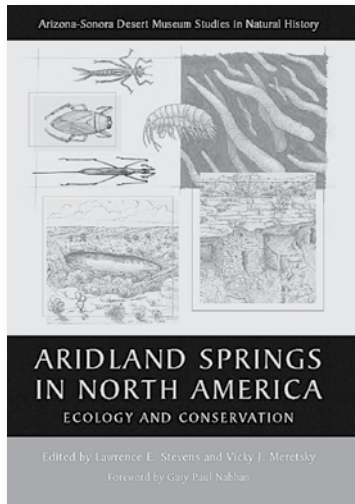


Emma Wharton
EXECUTIVE DIRECTOR

Books

Aridland Springs in North America: Ecology and Conservation, edited by LAWRENCE E. STEVENS AND VICKY J. MERETSKY.

Aridland Springs in North America: Ecology and Conservation, edited by Lawrence E. Stevens and Vicky J. Meretsky, has been selected for inclusion in *Choice Magazine's* Outstanding Academic Titles list. This annual list honors the most significant print and electronic works reviewed by *Choice* during the previous calendar year. Outstanding Academic



Titles are singled out for their overall excellence in presentation and scholarship, importance in building undergraduate library collections, and distinction as a first treatment of a given subject.

Editors Stevens and Meretsky have assembled chapters from numerous and diverse experts from the fields of geol-

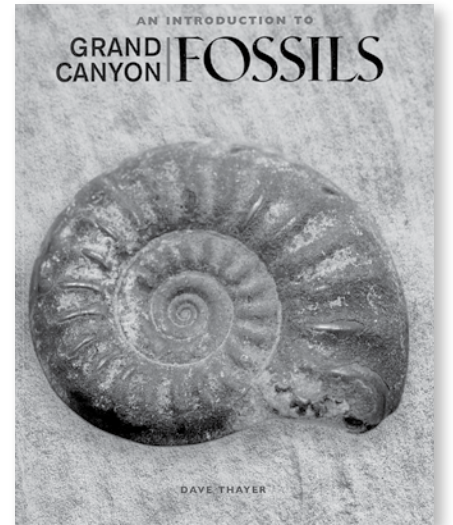
ogy, hydrology, geomorphology, water quality, ecosystem dynamics, water law, and conservation biology. Through analyses and case studies, these contributors provide an in-depth overview of these topics and address issues critical for improving the knowledge and conservation of springs.

This volume goes beyond examining the ecological importance of aridland springs to provide practical and productive ideas for their preservation. The authors facilitate future research by cultivating a language with which to collectively describe and study springs ecosystems, creating the beginnings of a comprehensive springs classification system. This book could not be more timely, as groundwater depletion throughout the continent is rapidly decimating these vital sources of life.

NOTE: This article was excerpted from the U of A Press website.

An Introduction to Grand Canyon Fossils, by DAVID THAYER; PUBLISHED BY GRAND CANYON ASSOCIATION; \$9.95 SOFT COVER; ISBN 978-1-938216-95-7 (JANUARY RELEASE)

THE GRAND CANYON IS FAMOUS for its rock layers, multihued bands of limestones, shales, sandstones, granites, and schists that have made the Canyon one of the Seven Natural Wonders of the World. But in many of those layers, the Grand Canyon contains a veritable sea of fossilized life, from ancient stromatolites in the Grand Canyon Supergroup layer to trilobites in the rim-rock Kaibab Formation to ancient reptile trackways preserved in the Coconino Sandstone. *An Introduction to Grand Canyon Fossils* introduces readers to the vast evidence of ancient life in the Canyon and to paleontology, the study of fossilized life.



Written in an easy-to-read style and heavily illustrated with diagrams and photographs, the book offers readers access to worlds of ocean shallows, windswept sand dunes, and swampy forests that once covered the Grand Canyon region and have left evidence of their presence in fossils. *An Introduction to Grand Canyon Fossils* is the only book of its kind focusing on the fossils of the national park, and it will be a delight to readers young and old fascinated by evidence of life hardened in stone.

NOTE: This article was excerpted from the GCA book release, written by Helen Ranney.

Grand Canyon: Bare Essentials of Geology, BY GARY LADD; PUBLISHED BY LADDSCAPES PRESS, PAGE, ARIZONA; \$8.95, SOFT COVER.

THE GRAND CANYON IS, not surprisingly, one of the Seven Natural Wonders of the World. But with respect to its origin and development, it may be *the* single greatest “geologic wonder” on the planet. Many different aspects of geology are on display here—long periods of deposition documenting the ancient landscapes that once existed here, numerous episodes of mountain building and erosion recorded by the absence of some rocks, its relatively recent but mysterious and still unresolved manner of formation, and the spectacular lava flows that snake into the Canyon downstream from Lava Falls. Taken together, this makes the Grand Canyon a geologic paradise that continues to attract its many pilgrims from all corners of the globe.

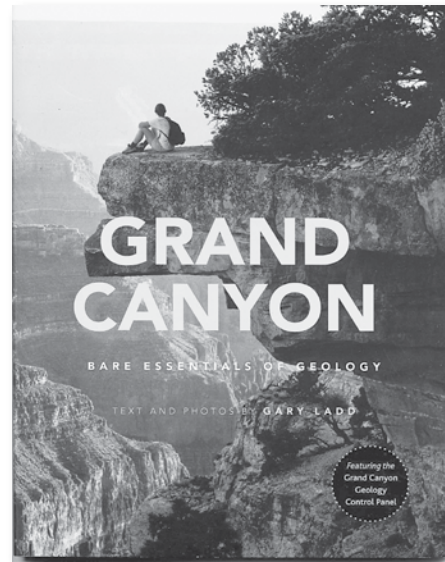
How fortunate it is that back in the 1970s Gary Ladd found his way into what is now one of his favorite haunts. His stunning photographs have been published in *Arizona Highways*, *Smithsonian Magazine*, on posters, and in other noteworthy publications. He is best known perhaps as the premier photographer of the Lake Powell area and his eye for the roughly 85 percent of glorious landscape that remains above the reservoir body is unequalled by anyone. Many people also consider him the pre-eminent photographer of the inner depths of Grand Canyon. His *Time Below the Rim*, published by Arizona Highways in 1999 is still by far (in my humble opinion) the greatest photographic work of Grand Canyon’s inner realm. Some boaters may remember how Gary captured the images for this book in the late 1990’s. He “hitch-hiked” down the river, legally I might add, and landed on some otherwise inaccessible spots to obtain rather unusual but ultimately satisfying views of the river corridor. I had the opportunity to share a night’s camp with Gary and his hiking buddy George Steck at South Canyon during one of these incredible adventures.

Ladd is definitely not one-dimensional and his interests only seem to grow as he becomes more intimate with the canyon landscapes he loves so well. It isn’t surprising then, that because he sees the Canyon so well photographically, that he is also beginning to see and sense it geologically. Ladd is increasingly becoming a talented and noteworthy interpreter of Grand Canyon’s earthly secrets, and one would do well to follow him in his photographic and growing literary path.

His latest work, *Grand Canyon: Bare Essentials of Geology*, bears this out. When one picks up the book,

the first thing they notice is that it is very small. But do not take its diminutive size for something unimportant, because great things do come in small packages. As a geologic interpreter myself, I know that when describing Grand Canyon’s complex geology to a general audience, less truly is more. Ladd’s book may be small in size but nonetheless an informative “tool” that river and trail guides can use to help them interpret the canyon’s geology for their guests. At just 40 pages, it can be easily stashed into your ammo can or backpack (it weighs just three ounces).

So you might be thinking, “Did Ladd take some serious shortcuts in telling the canyons immense story?” I thought this might be the case but I had a hard time



discerning if any such shortcuts were employed, at least with respect to telling the Canyon’s story at this “essential” level. The book contains straightforward, perhaps a bit blunt, prose that

ends up saying a whole lot about the Canyons’ geology. By using a minimum of words it brings the reader a maximum of understanding—interpretive perfection at its best! As might be expected, Ladd also included a few of his river photographs to enhance the geologic comprehension.

The book is organized in a very simple way being divided into ten short chapters that highlight the keys of canyon geology. The chapters deal with topics such as geologic time, canyon size, rock layers, canyon carving and age, the Colorado River and its rapids, connections to other events in time, and a sequence of events that could plausibly explain the formation of the canyon as well as some possible scenarios for its future. Each of these chapters begins by posing a few short questions that are followed by short and to the point answers. If you’ve ever found yourself at a loss for an answer to even the simplest geologic question, this may be the book that eventually gets you over that tired old hump. And just in time for the upcoming

river season.

An example: “How fast is the canyon deepening?” Answer: “On average the canyon deepens at the rate of $\frac{5}{8}$ inch per 100 years.” I mean who knew that? It’s short and sweet like a clean run along the bubble line. Or how about this one: “How wide (and deep) is the river?” In Ladd’s no-nonsense way, this time-honored joke of a question has an answer: “In Grand Canyon the Colorado River averages 300 feet wide and 30 to 35 feet deep.” No more fussing around with those silly answers that just make your guests wonder whether you are putting them on or not.

After a few questions are answered at the start of each chapter, Ladd then follows up with a page or two of what he calls “Looking Deeper.” But don’t worry, the size and space limitations in the book do not allow for any lengthy tomes. In the section that deals with how the Grand Canyon may have been carved, Ladd writes:

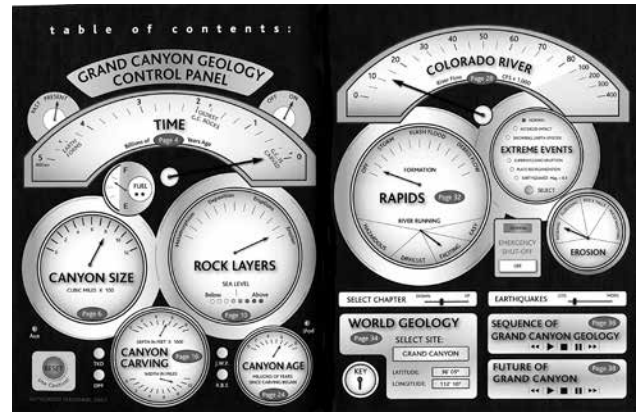
Earth’s surface is forever flexing. The unrest forces rivers to evolve by gaining or losing length, by annexing or surrendering territory to other rivers. Geologists believe the Colorado River became a canyon-cutting powerhouse only after a Rocky Mountain-draining ancestral river east of the Kaibab (upwarp) joined forces with a younger, steeper river headed towards the Gulf of California west of the Kaibab (upwarp).

That’s the whole story of the rivers’ history in a proverbial nutshell and Ladd is a master chef who serves up delectable entrées for us. Everyone could become a much better interpreter by whittling our long, more convoluted stories into these kind of digestible and tasty morsels.

There aren’t many complaints I have with the book. Ladd could have been a bit more careful with his editing, especially in fully articulating the names of certain geologic features (see the parenthetical inclusions in the quotation above for an example). In such instances, an additional word or two would not overburden the flow of the text, and would assure that even the most introductory of Grand Canyon students would not have to wonder what the word “Kaibab” actually refers to in this instance (it’s the upwarp here and not the formation, plateau, or trail). Folks who are just being introduced to the lay of the land need this kind of careful editing done for them.

I had a hard time making sense of the Table of Contents (designed by fellow river guide Bronze Black) upon first inspection. The unique way in which it is conceived and constructed took me awhile to grasp. My traditional senses kept looking for some

kind of order within the diagram and at first it confused me. But after studying it a few times I began to get it and now think of it as a very creative and alternative way to list topics and their page numbers. (And see if you can spot some of the hidden pieces of information that are peppered within this unusual table. I’m still finding them).



Of course, some readers will want to delve deeper into certain aspects of the canyons geology and this is not the book to do that. There are other books for this and you either already have them or know where to find them. Ladd’s book, by design and intent, deals only with the essentials of the story and for many of us, that’s all we really need.

In the end, this is a good book, told well and without excess baggage. You could easily waste \$9.00 on something much more ephemeral and I’ll bet some of you do. But I guarantee that if you take this little book along on your next trip, you’ll refer to it from time to time and actually start to “get it”. Its real strength however, is this: if you can incorporate a string of Ladd’s “bare essentials” into your geologic thinking, it will in some magical way prepare you for a more in-depth understanding and personal exploration of the canyon’s complex geology. This is what good interpreters do for us, they teach us not only how to teach others, but how to learn ourselves. And if this sounds a bit too much like “readin’ and ‘rithmetic” to you, just be aware that Ladd’s information here is so short that you could easily memorize some of his answers and call them your own! How cool is that.

This book is available from the author himself at www.garyladd.com, the Grand Canyon Association (www.grandcanyon.org), or other discerning book outlets in Northern Arizona.

Wayne Ranney

A Groover Tale

EVER WONDER WHERE THE NAME “the groover” came from? I think I know. I forgot to bring the toilet seat for the top of the rocket box and it definitely leaves grooves. We solved the problem by putting two rocket boxes with their lids on right next to the groover and it worked great except if you wriggled, then it would pinch the hell out of you. I heard my name along with some expletives every morning, for the next seventeen days.

It has always amazed me, at least on private river trips, how often the topic of groovers comes up. For some unknown reason people seem to be interested if not enthralled with the groover.

In keeping with tradition this story is about groovers. The story unfolded on a 1992 river trip. The way the groovers were set up in those days was to have a larger heavy duty compactor garbage bag that lined the clean rocket box. Each day when the groover was set up a fresh new garbage bag was used to line the inside of the groover which was already lined with the large heavy duty compactor bag. When the groover was being taken down after its final use in the morning the garbage bag holding the feces was squeezed by hand (called choking the chicken) to get all the extra air out and then tied shut. It was then placed back in the rocket box inside the compactor bag. Each evening a new garbage bag was placed on top of the old garbage bag which wasn't re-opened and the process repeated. Thus what you had when the groover was full was several “choked chickens” held in one large compactor bag which was also sealed and held in the rocket box. The idea was when you got to the dump you opened the lid and pulled out the large compactor bag and deposited it at the dump. Your rocket box was clean as all the fecal matter had been contained in the garbage bags inside the compactor bag.

This was my first down trip down the Grand Canyon and so we made some mistakes in our planning. We brought too much food, too many groovers, and too few garbage containers.

The permit holder was a great guy. He worked in a potato factory in Idaho and thus got all the free potatoes he wanted. He decided that we could each eat two very large potatoes with each meal so we had steak and potatoes, chicken and potatoes, pasta and potatoes, and cereal and potatoes. We had potatoes boiled, baked, fried, and made into soup. We still couldn't keep up with our daily allotment of potatoes.

We were having a super time running the river but we were going to have to adjust a few things as it was

becoming apparent that we were generating too much garbage.

We camped at Granite on our eighth day and had a discussion about what to do with all the potatoes and the shortage of garbage space. It was decided that we would throw any left over potatoes for that day in the groover since we had lots of extra groover room. After each meal we would take the potatoes that couldn't be eaten whether boiled, baked or fried to the groover.

Along about day ten, Dan asked me if my groovers were burping. I said that they smelled some but this was the longest river trip I had been on and that was probably the problem.

The trip went well and we went our separate ways at Pearce Ferry. Tom, Norm, and I went back to Albuquerque while Dan headed for Idaho. We decided to stop at the Williams dump on the way home and empty the groovers. It was late and nobody was around. Tom takes the first groover out to the center of the dump while Norm and I follow with the next two. Tom stops in the center of the dump and pulls the latches as Norm and I approach. There is a sudden loud noise and the rocket box lid goes flying. There is this monstrous white balloon coming out the groover. Tom is dancing around like a chicken with its head cut off convinced he is covered with you know what. It took us several minutes to convince him he wasn't covered and that he would live. The compactor bag had held. Compactor bag was still turgid but deflating slowly so we kept our distance. When it was soft we pulled it out of the rocket box which was still clean. We were more wary of the following boxes and so with two of us on the lid and one releasing the latches one at a time we were able to slowly defuse the rest of the bombs. Some of the groovers didn't have a lot of pressure while others did. We figured that the ones we first used had just built up more gas. Well, something to think about on the next long river trip.

About two weeks later Dan calls to settle up the final expenses for the trip. As we talked he asked if we had had any problem with our groovers and I relayed the story. His comment was “You lucky dog.” It seems that he had this great idea. From Pearce Ferry he and his wife would drive to Las Vegas get a hotel, clean up and do the town before heading back to work. On the way into Las Vegas he came across a carwash. Great he thought, I'll empty garbage boxes and groovers in the dumpster and spray the cans out with the high pressure hose and be on my way to the hotel. He opened the first groover and it exploded all over him, all over

the side of the car, all over the carwash walls. He said people were running out of the carwash as if a bomb went off, screeching their tires to get away.

Suddenly he and his wife, who thankfully was missed by the flying shit, were the only ones at the car wash. She sprayed him off with the high pressure hose. He was able to defuse the rest of the groovers without an explosion. Ten dollars worth of quarters later they leave, Dan riding wrapped in a tarp in the back of the suburban. She gets the hotel room and he slips in the back way and showers while she throws the clothes away.

As we were talking it sudden hit both of us like, well you know what? The reason the groovers were

so full of gas was because of the potatoes. They were a great media for bacteria to grow on and produce methane gas.

The plus to all this is we all lived through it and we'll never give any more food to all those little bacteria in the groover.

The park service changed the regulations a few years later stating safety and contamination issues—if they only knew.

Robert Southwick

A New Era in GCRG's Representation in the Glen Canyon Dam Adaptive Management Program

“Without continual growth and progress, such words as improvement, achievement, and success have no meaning.” — BENJAMIN FRANKLIN

GCRG HAS BEEN HONORED to represent the recreational river running community in the Glen Canyon Dam Adaptive Management Program (GCDAMP) for 14 years*. During that time, we have accomplished a great deal and are extremely proud of our participation in the process. We have also been frustrated by opposing interests that have thwarted our many attempts to change dam operations in order to accomplish GCRG's goal of protecting Grand Canyon and improve the values for which Grand Canyon National Park was created. Despite these setbacks, the voice of the river running community has been heard and our advocacy has been instrumental in the numerous experimental flow operations that were designed to improve the ecosystem along the river.

With the new administration in Washington, changes within the Department of the Interior, the Superintendent's award for his advocacy within the Glen Canyon Dam Adaptive Management Program, and the Secretary of the Interior's decision to develop High Flow Protocols, this is a particularly auspicious time that could present important opportunities to better achieve our goals. Accordingly, it behooves GCRG to look at our Glen Canyon Dam Adaptive Management participation with fresh eyes. How then, can we improve our advocacy? How can we do better?

In trying to answer this question, it became ap-

parent that there are only a few people within the community who are focused on GCDAMP activities. Everyone is interested, but when a meeting is just around the corner, how many folks are looking over the agenda? Who is reading the background material? What's our take on a tricky subject? What's our strategy? The answer is a pretty short list: Andre Pottochnick, GCRG's Adaptive Management Work Group (AMWG) representative, John O'Brien, GCRG's Technical Work Group, (TWG) representative, Lynn Hamilton, GCRG's Executive Director, plus or minus a few board members and others depending on the time of year. It appears that, as an organization and as a community, we need to do a much better job of supporting our GCDAMP representatives with constructive dialogue, clear goals and strategies.

So, we carefully reviewed how we go about representing the recreational river running community in the AMP process. We quickly realized that GCRG needed to revitalize our participation and, most importantly, get more folks involved. Towards those goals, we devised a plan to: 1) seek job applicants for both the AMWG and TWG positions in an open hiring process, 2) form an Adaptive Management advisory group, or council, or whatever we may want to call it, to discuss/debate and advise GCRG's representatives on how to best manage Glen Canyon Dam for the benefit of the recreational resource, and 3) establish a three-year GCDAMP representation review cycle. This will give us the opportunity to look back and continue to improve how we do business within the AMP process.

The hiring process is now complete and we are pleased to nominate Sam Jansen as our new Adaptive Management Work Group Representative and Jerry Cox as our Technical Work Group Representative. (Note: As a Federal Advisory Committee, AMWG nomination packets are sent to Washington D.C. for a full review). Out of a total of nine applicants, the hiring committee conducted interviews with the six strongest candidates. Arriving at a decision was difficult, as each candidate was extremely competent and brought many fine qualities to the table. In the end, we felt that Sam and Jerry will provide the fresh perspective and energy we need to revitalize our representation in the program. Sam and Jerry also have their work cut out for them, as they will need to maintain the high standards of energy, ability, and dedication that Andre and John have set in their many years with the program.

For the advisory group concept, we envision a group of dedicated volunteers who would be connected with our GCDAMP representatives primarily by email, and perhaps occasionally through meetings (such as GCRG board meetings, phone calls, or perhaps a visit to the local watering hole). This would allow the GCDAMP representatives to keep everyone up to date, and work collaboratively to strategize, offer insight and suggestions, and assist with decision-making and policy directions. Going forward, as we establish a three-year GCDAMP review cycle, advisory group participants will

be well-positioned to be considered as future GCDAMP representatives. So, we're looking for a pool of interested, knowledgeable individuals who are committed to maximizing our effectiveness within the GCDAMP as well as ensuring that the program meets the mandates of the Grand Canyon Protection Act. We will be sending out an email notice soon with details on our first meeting. If you're interested, please contact GCRG and make sure you're on the list.

The more minds involved, the better we will be able to represent our constituency, *you*, in defense of our beloved resource, the Colorado River and Grand Canyon. Together, we can capitalize on opportunities for progress and the creation of thoughtful policy within the Glen Canyon Dam Adaptive Management Program.

The Officers and Directors of Grand Canyon River Guides and the Adaptive Management Hiring Committee

* The continued support of the Grand Canyon Conservation Fund makes our participation within the GCDAMP possible. The Grand Canyon Conservation Fund is a non-profit grant making organization established and managed by the commercial outfitters in Grand Canyon. Our sincerest thanks for their support!

Thank You Andre!

GCRG AND THE RIVER COMMUNITY owe a big, sincere thank you to Andre Potochnick for his many years of service on our behalf. Andre is a past president of GCRG and has been advocating for environmental protection of Grand Canyon since before the EIS was ordered on the effects of Glen Canyon Dam on the downstream environment in 1989. Andre traveled to Washington D.C. with the late, great Tom Moody to testify before Congress during the debate over (and subsequent passage of) the Grand Canyon Protection Act of 1992. For the past 14 years, he has represented the Grand Canyon River Guides in the Glen Canyon Adaptive Management program and has selflessly dedicated himself to our shared cause of protecting Grand Canyon. Andre has worked tirelessly to attend meetings, absorb the vast amount

of scientific knowledge generated through the program, reviewed and commented on the endless supply of budget and planning documents, meeting notes, emails and letters to generate informed policy recommendations to the Secretary of Interior. Throughout his tenure, Andre has gone above and beyond the call of duty to make sure the voice of the river running community was heard. So, thank you Andre, for your commitment to Grand Canyon and our organization, and enjoy your well deserved break from the meeting circuit. Hopefully, you will continue to work with us in the Adaptive Management Advisory Group, where your experience and knowledge of the issues will help shape the future of the Grand Canyon River Guides' participation in the Glen Canyon Adaptive Management Program.

The History Of Rubber Boats And How They Saved Rivers

WITHOUT RUBBER it is unlikely that we would have our modern inflatable boats to use in running rivers and it is likely some of our rivers would have been silenced behind dams.

Ancient images of animal skins filled with air used as floats to cross rivers are the first records of inflatable boats. In 880 BC, Assyrian King Ashurnasrpal II ordered his troops to cross rivers on greased animal skins which they inflated.

The discovery and industrialization of rubber were important to the evolution of river craft. Rubber has been part of human history for ages. The Mayan people of South America made and used rubber latex to make rubber balls, figurines, bindings and in other applications. Latex is the sap of the Hevea or rubber tree, and when exposed to air it hardens into a springy mass. The Mayans learned to mix the rubber sap with morning glory vines to make it more durable and elastic.

By 1736, rubber had made its way to Europe, and in 1791, Englishman Samuel Peal discovered that by mixing rubber with turpentine he could produce a waterproof cloth. Soon after, inventor Joseph Priestly found that rubber could be used to erase pencil marks on paper. But rubber was subject to weather conditions. If the weather was hot and sticky, so was the rubber. In cold weather it became brittle and hard.

In 1837, rubber had its first practical application in the industrial world when American Charles Good-year accidentally dropped rubber, lead and sulfur on a hot stove top, causing it to char like leather yet remain plastic and elastic. The resulting substance wasn't affected by weather, and would snap back to its original shape if stretched. The process was refined and uses for rubber materials increased. This new rubber was resistant to water and chemical interactions and it did not conduct electricity, so it was suited for a variety of products. In 1939, vulcanization, a refined version of this process where the rubber is heated under pressure, transformed the white sap from the bark of the Hevea tree into an essential product of the industrial age.

Around 1837, John MacIntosh used Goodyear's technology to develop a small rubber boat with leg-gings in its bottom for amphibious-like use. In his patent application he claimed that, "this life-boat may be used for the saving of persons and property, for the conveyance of troops" across rivers. In 1840, Samuel White, an English inventor, created a rubber hat that doubled as a life preserver.

There is only one kind of natural rubber. The rubber plant only thrives in hot, damp regions near the equator in Southeast Asia and Africa. World War II cut the United States off from rubber supplies and the production of synthetic rubber from oil was increased for the war effort.

Today most of the rubber produced is a synthetic product made from crude oil. There are about twenty grades of synthetic rubber and the intended end use determines process and chemicals involved in production. In general, to make synthetic rubber, byproducts of petroleum refining called butadiene and styrene are combined in a reactor containing soap suds. The latex is coagulated from the liquid and results in rubber "crumbs" that are purchased by manufacturers and melted into products.

A combination of several events led to the development of rubber inflatables that river runner's use today.

In 1839, Arthur Wellesley, the first Duke of Wellington, Leader of the House of Lords, tested inflatable pontoons. An attempt was made to use some of these craft designed as pontoons in the Florida Seminole wars with little success. In 1840, John Foote Lane patented the bridge pontoons that were lashed together. A round shaped inflatable boat was used in 1840 Arctic expeditions by a Lieutenant Halkett.

John Charles Fremont purchased a rubber raft from Horace H. Day for \$150 and used it on the Platte River. In August of 1844, Fremont, along with trapper and guide Kit Carson, map maker Charles Preuss and seven others, planned to paddle an inflatable boat made of India gum rubber from the mouth of the Weber River to an island in the Great Salt Lake. On unpacking his boat Fremont discovered that instead of being strongly sewn like the one used a year earlier in exploring the canyons of the Upper Platte River, this boat's air cylinders had been poorly pasted together by a manufacturer rushed for time. At sunrise the rubber raft was inflated. When two of the lengthy cylinders leaked and threatened to sink the boat, one man constantly worked the bellows while the others rowed. Midway to their destination as the wind grew stronger, the air cylinders started to collapse and the bellows were pumped in haste. At last, the boat made it to the island beach. For the men boarding the "miserable rubber boat" returning to the Weber River was a challenge. Carson's recollection was understated: "We had not gone more than a league, when a storm came up,"

he said: "The boat was leaking wind."¹

By 1851, Charles Goodyear had won numerous awards for his designs of inflatable boats, self-inflating boats, pontoons with multiple chambers and other designs. In 1853, artist H.B. Molhausen sketched an inflatable raft used by Lieutenant Amiel Whipple of the U.S. Army Corps of Topographical Engineers crossing the Colorado River near Fort Mojave.

During the European Wars and American Civil War of the 1860's, destruction of bridges was a primary defensive tactic in a country veined with numerous streams and rivers. Temporary bridges were built from wooden boat-like pontoons decked with timber. It took some 34 pontoon wagons, 22 chess wagons hauling planks and timbers, four tool wagons, two traveling forges and a supply train of over twenty wagons to complete the working part of the cumbersome train that stretched for miles. As the war went on, collapsible, canvas covered pontoons were developed, increasing the capacity of bridging trains but the lengthy pontoon column still caused havoc. The delay of pontoon trains for crossing the Rappahannock River at Fredericksburg, Virginia, lost Union General Burnside the initiative and thousands of lives.

Around 1900, the advances of rubber manufacturing made it possible to build rubber inflatable boats. These crude craft had inherent defects as they tended to split at the seams and folds due to less than optimal manufacturing processing of the rubber.

In 1919, British Zodiac claimed patents for the first modern inflatable boat, the ancestor of the one-man life raft. By 1920, the German Army was using "pneumatic" boats designed and produced by Albert Meyer.

The loss of lives on the Titanic and the World War I loss of ships to torpedoes created a demand for additional lifeboat capacity on ocean-going ships. Passenger ships had a difficult task to accommodate the additional lifeboats and they had to stack lifeboats one on top of the other to save the limited deck space. Goodyear had discovered a better way to manufacture the inflatable boats between the two World Wars but their use was not implemented immediately. His inflatable life rafts (actually developed by employee Ward Van Orman) were square-shaped inflated rubber cylinders with a rigid floor.

In 1937, Pierre Debrouelle designed an inflatable boat with the now traditional U-Shaped inflatable tube. It was the first boat of its kind to gain certification from the French Navy. Later in 1943, a wooden transom was patented to accommodate a motor on the Debrouelle style boats.

The first known use of an inflatable raft on the Colorado River System was by Amos Burg. In 1938, Buzz Holmstrom and Amos Burg duplicated Buzz's

1937 solo trip down the Green and Colorado Rivers to make movies of his previous famed adventure. Burg used a custom built rubber raft, named *Charlie*, the first of such craft to be used on the Colorado and Green Rivers.

In 1934, an airman named Patten died when his plane crashed into the ocean during maneuvers. The pilot had no life raft and died because he was unable to survive the sea until a rescue arrived. In 1939, his brother, Fred F. Patten, joined the navy and pioneered the development of one-man life rafts to save pilots. Soon after Pearl Harbor, the Navy and Army Air Force adopted Patten's prototype life raft that was produced by the U.S. Rubber Company in Rhode Island. In 1942, Patten, who worked for U.S. Rubber was approached by the Army to produce life size inflatable decoys of B-26 bombers. Before the Normandy invasion, thousands of inflatable decoy tanks, trucks, artillery, planes and 110-foot long landing crafts were deployed near Dover, England to lure the Germans to expect the Allied invasion of Europe at Calais, France.

By World War II, new synthetic materials were invented and used that revolutionized inflatable boats. The refinement of neoprene, a synthetic with excellent air holding capabilities, combined with a manufacturing process that impregnated a cotton inner fabric with neoprene allowed boat tubes to have more rigid and various shapes.

On entry into World War II, the United States recognized the importance of pontoons to cross Europe's rivers and small infantry craft to infiltrate and assault the enemy's coast. United States warships began to use rubber life rafts and they were especially valuable on submarines where space was limited. Army engineers, faced with transporting large wooden pontoons and boats across the Atlantic and Pacific, began to look at inflatable rubber as a solution.

The rubber and manufacturing processes had improved and were significantly better than the prior 35 years. Designs were made for pontoons and small seven-man boat-shaped assault rafts capable of using a motor or being paddled. These pontoons and inflatable rafts eventually became the J-Rigs, G-Rigs and other inflatable craft we use on the rivers today.

There was another advantage of using inflatable boats in the war. The craft were inflated to a low pressure of two to four pounds per square inch. They would deflate slowly if struck by an enemy bullet and multiple chambers allowed the boat or pontoon to continue to float while repairs were made. In the 1930's and 1940's, much of America was still rural. Many town and farm boys had become familiar with patching leaking tire tubes and the simple repair of rubber was relatively easy to teach. A GI or Engineer didn't

have to be a master wood craftsman to repair a rubber boat.

Between the World Wars, a joint venture by Polish immigrant Stanley Switlik and George Putman (Emelia Earhart's husband) started the Switlik Parachute Company. The company continued development of new products including the "Mark II" life vest for the Navy in 1947. In 1949, inflatable one-man life rafts were developed and sold to the Navy. In 1951, a large quantity of twenty-man life rafts were manufactured for the Air Force. Eventually the company's search for new products led to inflatable life vests.

The Korean Conflict further highlighted the use of inflatable boats. Raids by British Commandos and U.S. Special Operations Group in the 1950's became common. A towrope attaching the black rubber raft to a landing craft (LCPR) was used to haul the rafts and men toward a landing site. A British writer who accompanied one mission wrote:

Cut loose they paddled towards land. The silence grows half-perceptibly into sound, the rhythmical swish of surf...For a second or two we are caught violently in a chaos of foam. We hit something solid: "Out, quick, get out Come on, for Christ's sake!" It is an urgent but not quick task to drag the boat up to [the beach]; no tug-o-war team ever heaved so desperately... This patch of sand becomes Commando H.Q. A new, temporary bridgehead is established in North Korea...²

After World War II and the Korean Conflict, thousands of rubber boats and pontoons became available to the public through military surplus sales. In 1948, Don Hatch convinced his dad, Bus, to look into the military surplus sales in Salt Lake City. Among the many surplus items were inflatable bridge pontoons, seven-man and ten-man inflatable rafts.

Bus and Don realized that here was a replacement for the wooden river boat. The inflatable rafts were cheap—only \$25 each for the ten-man, less for a seven-man—and they were virtually maintenance free. With an inflatable raft, you could carry twice as many passengers, and do it in comfort. If you hit a rock, it usually bounced off. They required no varnishing or repairs beyond a patch or two now and then, and when the river season was over you could just roll them up and store them away. And they were so cheap that a man could afford to have a fleet of them.³

Albert Quist of famed Moki Mac River Expeditions in Green River, Utah, was another early fan of the inflatable boats. He, John Cross and Malcom Ellington began taking Boy Scouts through Glen Canyon shortly after World War II. About that time, Roy DeSpain also began using the inflatables on the Upper Green and Yampa Rivers. In an article about the inflatables Don Hatch wrote:

They handle extremely fast. They pivot, slide slip, and perform many other antics not usually possible with other boats. An empty ten-man raft with a good set of oars can be made to almost leap out of the water with one good hard stroke. They turn and dodge like little water bugs. This is possible because they draw less than three inches of water—loaded! They bounce off rocks like a billiard ball striking a cushion. When they pound through big waves and holes, their low center of gravity helps tremendously to keep them upright.⁴

Enterprising river men like Bus and Don Hatch began experimenting with the new inflatables and advertising commercial river trips at a time when river running was considered a mere stunt. As the controversy to build a dam at Echo Park, within Dinosaur National Monument, spilled into the national press headlines, the National Geographic Society and Sierra Club began sponsoring trips down the Yampa and Green Rivers. The magazine and newspaper articles that the trips generated showed that river running was a legitimate sport—and, at least with a seasoned guide, could be enjoyed by anyone. The articles showed Americans the magnificent vistas, sublime beauty and challenging rapids of the canyons.

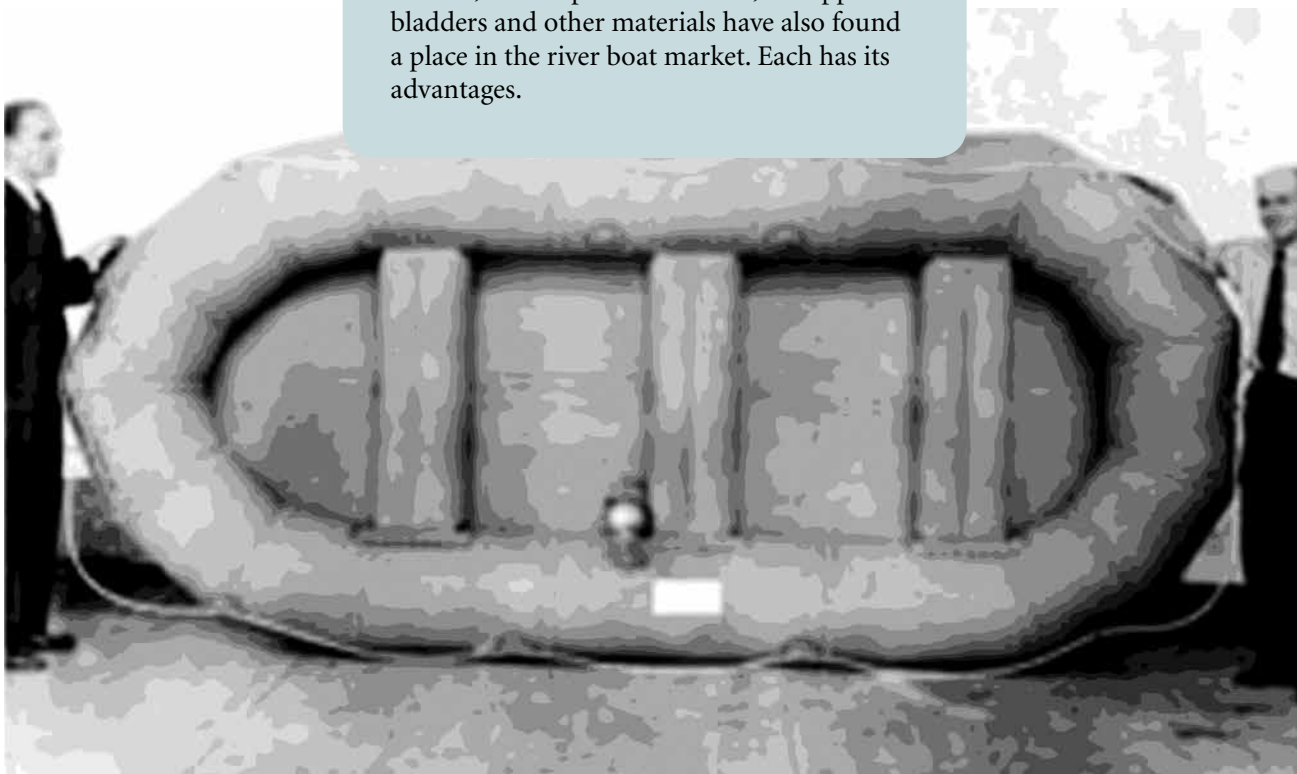
Within a few years, the inflatable boats used in commercial river running brought thousands of people to the rivers and canyons. The river tourists and the organizations to which they belonged wrote letters of protest and uniting against the desecration of magnificent rivers and inspiring scenery through which they passed.

In a sense it was the inflatable raft that saved places like Echo Park, the Yampa River and Grand Canyon for our enjoyment today.

Herm Hoops

The process of building inflatable boats was refined to adhere the air holding neoprene on the inside of the cotton inner fabric and the more durable hypalon to the outside. Unfortunately when the cotton inner fabric was exposed to water from cuts or tears, it began to deteriorate—causing a defect known as dry rot and the craft became unserviceable. As long as the fabric remained intact, or was repaired quickly the material remained durable.

Today fabrics have a nylon or polyester as a base that overcomes the problems created by cotton. Neoprene and hypalon still command a significant portion of the river boats produced because of their durability. Other fabrics like PVC, thermoplastic urethane, unsupported bladders and other materials have also found a place in the river boat market. Each has its advantages.



Fred Patten's first 7-man raft.

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Jon Hamilton

“INCHES FROM FOAMING DISASTER, Jon Hamilton steers a plunging jet boat up Vulcan Rapids, Grand Canyon’s wickedest water. Here the current’s maelstrom runs 20 miles an hour... Mr. Hamilton, the most experienced of the rivermen, drove every boat over this rapid... Veteran voyager Otis (Dock) Marston, who led us, says we never would have made it but for the river-driving genius of New Zealander Jon Hamilton...”

—FROM “SHOOTING RAPIDS IN REVERSE! Jet Boats Climb the Colorado’s Torrent through the Grand Canyon” BY BILL BELKNAP, NATIONAL GEOGRAPHIC, APRIL 1962

Jon Hamilton, engineer, glider pilot, explorer, and jet boat driver extraordinaire, paid a visit to the states in September, 2004 with his charming bride Joyce. Brad Dimock had the privilege of interviewing them at Cline Library—barely scraping the surface of a most amazing life. A few days later they made a Diamond Creek run, where Lew Steiger did a second taping session. This interview combines parts of both stories. Space limits us—if you want to read—or hear—more, visit Cline Library. We’d planned all along to run this oral history for Jon on the 50TH anniversary of his 1960 jet-boat uprun—unfortunately Jon died a few months ago (see tribute in last BQR).

Jon was a soft-spoken man, his voice often barely a whisper, and modest almost to a fault. Off tape we were asking about one of the American jet-boat drivers, Fireball Young, who sank the Wee Yellow in Grapevine. It seemed he hit an inordinate number of rocks and we were curious what Jon thought of his abilities. Jon hemmed and hawed a bit before saying, “Well, he raced boats for TurboCraft. He could drive very fast on a lake.” But about his own boating skills, he insisted he was really no better than anyone else. Pure coincidence that he was the only one who could get a jet boat up Lava Falls.

* * *

JON HAMILTON: I myself was born in Timaru in April 1925. My father lived on a backcountry sheep station in what was then remote Mackenzie country in New Zealand. I was brought up on the farm. My father ran the sheep station and owned it, leasehold property, 24,000 acres. He himself had been brought up, also, on a sheep station. But really, he was not a farmer by nature—he was an inventor, and a very practical man, would build useful machines for carrying out what-



*Irishman Creek Station.
Hamilton family photo.*



*Hamilton family circa 1929. John on right.
Hamilton family photo.*

ever jobs had to be done. He invented many different machines during the war, World War II, out in a little workshop. He expanded and we had, oh, a dozen or maybe fifteen people, and we were then doing war work manufacture. After the war, he started manufacture in Christchurch of bulldozers, loaders, different sorts of earth-moving equipment, which he himself had designed up in Irishman Creek, and we were manufacturing, by then, quite a substantial factory. We got into heavy engineering, big contract work. And then when the company was going well and were em-

ploying, oh, I suppose 400 or more people, my father decided to take time off to build himself a boat to run up rivers. He'd always liked boating in dinghies and so forth as a boy. As a holiday, he'd always go out into the backcountry with his father. So, being an inventor by nature, he didn't ask other people's advice, he just built what he thought might be interesting. His principle was, when you used something, you would soon learn the ins and outs, what was bad surfaced. Had a tunnel boat built for him, and then he put in a propeller in the tunnel, in the boat. However, it was an unfortunate choice of hull—it was a reverse “V”.

I, by this time, had been through an engineering course, so I theoretically knew something about it. I was thinking of other things, and I was just amazed what my dad did because he didn't know too much about technology—he was interested in other things. I still remember my wife Joyce and I going out to the riverbank and watching him, for the first time trying out this tunnel boat, he and the builder of the boat. We pushed them off into the river; he started the engine, the propeller being half above water and half below water cavitated straight away. For almost the first time in his life, he had not taken a paddle with him. Here was the boat, drifting down the river, turning 'round and 'round, and they were busy pulling out floorboards and paddling themselves.

STEIGER: Why did he want to run up rivers?

JON HAMILTON: I think merely because he liked the outdoors. As a boy he had floated down rivers in homemade little boats. He and my mother used to enjoy taking holidays, camping beside rivers. And he just thought it'd be fun to do.

Well, he tried many different schemes. He got interested in air screws. I think I was learning to fly a Tiger Moth at the time. He made a wonderful boat with an air screw and a tripod on the back of the boat, an ordinary propeller way out the back, which you could pull a lever to raise it or lower it—and keep your scarf tucked in! (laughter) He had enormous fun with it. We, of course, liked it. Then he said to me, “Look, I really think we're not doing the thing properly. I would like to get back to the propeller scheme, put in a propeller and a proper pump. And we'll make sure we get the intake under the water, it should be all right.”

Well, just then, we were shown a picture in the [*Popular Science*, February 1950]. A little article—it didn't even give the name, but it showed a cutaway drawing of what we now know as the Hanley Hydrojet. Hanley was the designer, working with a firefighting company prospect. They were building firefighting machinery and had built a few boats with a fire pump on it, and they, for a start, just used some of the water

from the fire pump to help propel the boat. And my father said, “We'll build this for a start. I will use it and see if it's of any use.” And so I actually did a bit of work, because I was a designer anyway, and I actually drew up something. We still have the pump, it was hand-built, up at Irishman Creek Station. He put it in a little second-hand boat, again, it may have been twelve-, fourteen-feet long, and it didn't work very well, but it worked. Then he thought about it, and thought, “Well, one of its problems was that it had a centrifugal pump with a “V” drive. And intake straight underneath, no sort of streamlined intake. Oddly enough, the outlet was not through a nozzle behind the boat, behind the intake, but in *front* of the intake. It went forward, down, and pointed backward. When you steered, the nozzle could turn.

The boat didn't go very well, so my father decided that he'd turn the thing 'round, put the nozzle straight out through the transom. The boat suddenly went much better. It jumped up onto the plane, and went from fourteen miles an hour up to about seventeen miles an hour, planing. My father then took it out in rapid rivers and he finally could go up amazing rapids. He'd go through shallows with nothing under the bottom, could skip over shingle bars and it was great fun.

Now, he did all of this work solely for fun. He built



Bill and Jon tinkering with reverse gear jet.
Hamilton family photo.

many machines because he liked [to tinker]. It was not a commercial idea. He already had a factory that was building his own things, making a reasonable income. But he did a quite surprising thing inadvertently. He developed a market for jet propulsion. Before that, for many years, in the United States, the Hanley people had made jet units, but they never found a real market. But my father inadvertently brought it to market. Friends came to him and said, “Bill, build *me* one,” and within a short period, a number of enthusiasts came, got themselves—it was worth coming into production to produce a few of these things. And then the young engineer my father hired [George Davison who eventually became the chief engineer of Hamilton Co.] put it into production as the Rainbow Jet. That was a cheap unit, much cheaper to produce. We built up to a hundred of those, and had people running up rivers. The newspapers, the press, the publicity people, jumped on it, and photographs appeared in the magazines and so forth in New Zealand, and we got a lot of publicity. Back in Christchurch, we were building huge hydro things, intakes for dams and huge penstocks for heavy machinery. Nobody wanted to mention *that*. But the upshot was public interest.

DIMOCK: What year would that have been?

JON HAMILTON: Well, it was 1953 that he first got it running; 1954 that he got the final form of the jet unit. But it’s interesting: my father was a quiet man, he didn’t order people about, people loved to follow him, and they sort of had the feeling he was very competent. Everything he did, he seemed to succeed.

And then it would have been later, I imagine [October 1956] that the Antarctic venture started [for International Geophysical Year], the Americans came down, picked Christchurch as the base for their Antarctic enterprise. One of their men, Bill Austin, [became] a good friend of my father’s. The other American was Phil Smith, a good friend of Bill Austin. My father eventually asked Austin if he would go around the United States and find a licensee who might be interested in building a jet unit itself—not the boat. Bill Austin came to the United States, bringing a New Zealand boat with him, and looked around, found the owner of the Indiana Gear Works in Indianapolis, John Buehler became interested and together they launched it. John Buehler agreed to finance a trip up through the Grand Canyon, more or less publicity picture, I think.

DIMOCK: Who thought of that?

JON HAMILTON: From *my* point of view, Bill Austin was the man I knew, and, but it could have well been Phil Smith, because Phil and Bill were very close together. But Bill Austin became employed by the Indi-

ana Gear Works to oversee the production of these jet units. I know Phil Smith was in right at the beginning, too. My father was the man who was supposed to go on the trip, and he came through in 1959, with a New Zealand-built boat, and Bill Austin. And they explored the bottom end of the Grand Canyon. And just Lake Mead—they went up a little way with another boat, and it may have been a Buehler-built boat. But for some reason or another, that two-boat team didn’t get very far. I think one of the boats had an overheating problem—something like that—it wasn’t a jet problem. And my father said yes, as far as he was concerned the trip was on. So he was due to come over and be the New Zealand driver.

However back in New Zealand we were doing some jet boating. Some of us at the factory, including myself, had taken my father’s boat, and we decided to put in a bigger engine, and to work on changes in the impeller. We had just cut a very fine leading edges with better than the rather coarse leading edge. We also put on a v-8 engine which increased in speed and performance enormously. When my father came back and was handed this upgraded boat, he was very impressed. But in one of the narrow rivers which had never been boated before, we went up the Matukituki River which runs into Lake Wanaka. On the way downstream he went from a bit of a pool, down through a rapid, and by a rock face turning to come along the next pool, boat skidded a bit—he was probably going a little bit fast with the new engine. He hit the rock face, broke his elbow and arm, put him in the hospital. And this was just before the trip. So, my father said, all right, he will send his son Jon and Guy Mannering, the man who had introduced us to Bill Austin and Phil Smith in the early days, they too could go. So, Guy and I and Joyce and Margie Mannering came over here.

DIMOCK: How much jet boat driving had you done?

JON HAMILTON: Well, I *had* done quite a bit.... I must say that this was already quite a number of years after the jet boat developed. I’d explored some of the rivers in New Zealand, some of which had been explored before. But I was not the first—there was a big team of people got involved in it, really, before I did, because I was busy flying [gliding]. I think Guy Mannering was one of the first. I’d driven quite a bit—I was perfectly happy with some very rough rapids there. But it tended to be much shallower, much smaller water, and much clearer water—none of this brown stuff.

The first jet boat running would be in the Mackenzie country. In the Ohura River and Waitaki Rivers. And then later, in the Waimakariri, which is a river near Christchurch. The Ohura was the roughest, but there are quite a number of little rivers that there we



Clarence River, Australia —1955.
Hamilton family photo.

ran, practicing. The Hurunui River was a *very* wild one.

DIMOCK: Was anyone—before the invention of the jet—was going up rapid rivers even thought of?

JON HAMILTON: Well, you can't—too shallow. I mean, you make up a few hundred yards, knock your propellor off, and that's that.

DIMOCK: So your father really kind of invented this sport of going up rapids.

JON HAMILTON: That's right. That's where, in retrospect, he really did not invent the jet, but he did perfect it.

* * *

You know, we'd heard of Grand, though we didn't know much about it. You know, one of these American things. (chuckling) Well, I mean the trip was a high education right from the beginning. We landed in San Francisco, invited to Dock Marston's residence, Dock being the man who had been picked as being the main organizer of the expedition, the man who knew the Canyon. I still remember sitting there, Dock Marston showing us a private movie of a float trip down the Canyon, showing us these great rafts running through some *colossal* water. Saying to us, "Can your boats really run these rapids?" We said yes, but we didn't really know. We had no idea. We'd never seen such water. We had great confidence in our boats, and we'd run some rough water. But we'd never seen anything like the Colorado. So it really was a remarkable experience to us.

Bill Austin was the leader from the jet boat point of view. Dock Marston was the overall leader because he knew location, the people, the rapids. Then we had a number of Indiana Gear Works people: Jim Bechtal—who I imagine they hired to take pictures. Later, [George] Morrison, who was a publicity man. Other people on the team, some of them were tops—all river running friends. Ed I'Anson. Ed I'Anson was valuable because he had a very good movie camera. Guy Mannering, being a photographer in Christchurch, but a still photographer, so he had a small camera with which he filmed most of the Grand Canyon uprun. But we also used some of Ed I'Anson's filming, too. "Fireball" Young, Dick Young, was the Works-supplied driver. Bill Austin was the official lead driver, being both the American, having had some experience [in a] jet boat. Guy Mannering and I were the two other drivers.

When we came, we met the team. We didn't really have any in depth knowledge of who, in fact, invited who or what elderly people who had been invited because of the likes of Dock Marston. We all arrived at the Ferry. There were two big boats, 24-foot boats they had cathedral hulls, which was like the inverted "V" of my father's first boat, but even worse: it was a "W." It had two "V's." A twin engine, twin jet, each jet being mounted in the upper part of the "W." In other words, a place to suck air, which they did. They were very fast boats. But you'd get them, you'd aim down-river, you'd [hit the] throttle, they would start to come up from the plane. Air was coming through the two inverted "V's," get into the intake. The jets would race like anything, you'd throttle back, throttle up again, you'd wiggle the thing. And then at last it [caught]. And then the boats were *off*. They were very fast boats. Not exactly what you wanted in the Canyon. And they



*Downrun group meeting.
NAU. Pt. 96.4.94.28 Bill Belknap photo.*

had a steering lock. You know, you wanted to turn around—as good as a railroad train—200-yard radius would be a good turn. So we had to go down with those. Well, I was put in charge of one of the boats, Bill Austin the other, the big boats. Of the two small boats, eighteen-footers, they looked good, they were typical “V’s.” Much higher sides than we had in New Zealand. Because over here they built them much higher—that turned out to be a very good thing.

So we started down the river, but only a short distance down, one of the big boats, driven by Bill Austin, hit a rock and damaged the hull. Took quite a while to get the thing out of the water, roll it over onto the side, patch the bottom. The river had not yet—no flood water had come down. It was in low level. So it was decided the whole expedition would be deferred.

So we deferred for about seven weeks. And when we came back, it was right on high flood. Totally different. And then we didn’t have too much trouble. We ran down over Soap Creek. Tried to run the big boats up, and then we saw that it was absolutely impossible. But the two little boats, they were [unclear]. And we went on down. We’d stop here and there. Dock Marston would tell us what to expect further down. And we were laying off fuel, these five-gallon fuel tanks, five-gallon tins. We discovered that the way to

carry them was to lay them all on the floor of the big 24-footers, then cover those with mattresses, and we could stand on top of them. So at least we were high enough to see, to drive. Which was good.

Don’t think there’s any particular trouble I remember. No trouble getting down. But then we wouldn’t. The boats were big enough, we could steer clear of the big waves. There weren’t enough rocks to cause trouble. But just speaking to you now, I don’t remember any trouble until after we hit Phantom Ranch. When we got to Phantom Ranch we stopped overnight for refueling. We’d had all the fuel sent down by mule. And the two small boats ran up to check up on Grapevine and Sockdolager. They were able to run up there and down again. When we came to Horn Creek Rapid, Dock stopped somewhere and got out and said, “I think that’s Horn Creek.” It was so flooded out he hadn’t recognized it. Hance was an interesting run. But when we came to Monument Creek, we got a hole in the hull, trying to uprun that. I was not in the boat. I didn’t do much of the uprunning then, because I was in charge of one of the bigger boats. So most of the uprunning experience was done by the two people who were in the small boats.

DIMOCK: And to patch them you were using polyester resin and fiberglass?



Jetboats at Phantom.
NAU. Pht. 96.4.94.255 Bill Belknap photo.

JON HAMILTON: We had taken lots of fiberglass and resin—we were prepared to do that. But there was not too much trouble, really, on the way down. The big rapid, officially called Lava Falls, but Dock called it Vulcan. That was quite a wild one, and that caused our first real difficulty or problem. We all looked at the rapids from the shore and we saw one huge, huge wave in the middle. It worked out we should really stay to the left of that. On the other hand, on the left crest there's a sharp drop. The main tongue of the rapid ended up going into the big wave, and that was a real big one. So the thing was to aim for the big wave, but turn across so that we could be on the left of it when we got down to the big wave. The right-hand side looked to be just generally clear to the bank and very rough. Now, Bill Austin was driving a bigger boat, he *really* had a year's experience. But he had far less river experience than Guy Mannering or myself. When you're up in the pool, you don't really get a good view of what the water is like over the crest. Dock was thinking, I understand, that Bill Austin should keep further to the right than he was aiming. And afterwards Bill said no, he was aiming that way, but whatever it was, they went over, more to the right

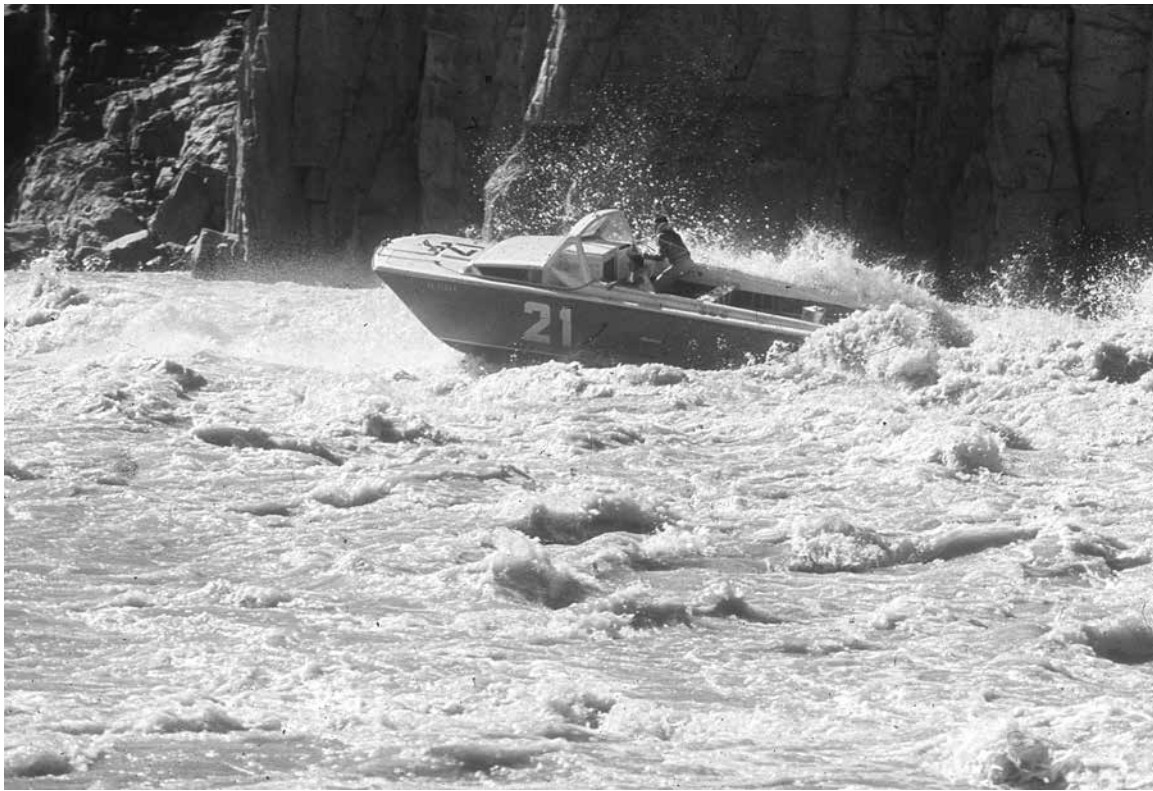
than Bill intended, and *my* criticism is that he was going too fast. There's no need to go so fast. And those boats didn't turn well. So when he turned over the crest, and there was the huge wave, he didn't go over to the left, but he really clipped the left-hand edge and the boat, at his speed, really jumped into the air and fell with a mighty thump. Bill was standing at the time, and the shock of it broke his leg. So we then had on our hands a man with a broken leg, bones sticking out, compound fracture. So we went across the beach, and all the other boats got through all right. Went to the beach, made Bill as comfortable as we could. Rigged up [a tarp lean-to], tried to make him comfortable. [We'd arranged] that fuel be available at the Rim at Whitmore Trail below Toroweap. So two little boats went down to meet the people who were on course to meet us. One of them was Chuck Richey, who I believe was superintendent of [Lake Mead NRA]. This man was interested in our expedition—had come there anyway—so he and [Chet Bundy]—went down at the beach. They'd run a hose a long way down the Canyon so they could siphon fuel down—they were picked up. One of them went up to warn people up on top that there was an accident. [They got word to] Luke



Downrun trip — repair of Wee Red.
NAU. PH. 96.4.94.279 Bill Belknap photo.



Fireball Young doing the glassing.
NAU. PH. 96.4.94.281 Bill Belknap photo.



*Jon and Joyce running down Granite in one of the big boats.
NAU. Pff. 96.4.94.64 Bill Belknap photo.*



*Bill Austin makes a successful uprun of Granite.
NAU. Pff. 96.4.94.161 Bill Belknap photo.*



Downrun trip — Lava Chuar rapid.
NAU. PH. 96.4.9437 Bill Belknap photo.



Running Granite rapid, Garth Marston driving.
NAU. PH. 96.4.94.150 Bill Belknap photo.



A stop at the Little Colorado River.
NAU, PHT 96.4.94.221 Bill Belknap photo.

Air Force Base. The Air Force, at the time apparently operated risk missions. They thought that was good practice for their pilots. Chuck Ritchey came back and stayed the night with us. Early in the morning, down came this wonderful helicopter—twin rotor, each rotor with two blades, intersecting, turning reverse directions, intersecting—and picked up Bill Austin, put him in. Phil Smith, being his good friend, decided to go with him, too, to supervise where he would go after he got back to Luke Air Force Base. So Phil, unfortunately, would miss the rest of the expedition.

DIMOCK: Who took Bill's boat out?

JON HAMILTON: Oh, well, I'll backtrack just a little bit now to Phantom Ranch. When we came down to Phantom Ranch, Joyce had come with me, had been the only woman on the expedition. We understand Dock Marston didn't *really* think rough trips were the right thing for girls. We didn't press it at the time, but however it was, Joyce came anyway. But Margie Mannering, Guy's wife, stayed on the Rim. And Buzzy Belknap, Bill Belknap's son, only sixteen, was on the Rim. And so was Fran Belknap, Bill Belknap's wife. They went 'round to Grand Canyon to keep an eye on what we were doing from the Rim. We rang them from

Phantom Ranch and said we decided there was room for them—would they like to come down and they said yes. Got up early in the morning, both ran all the way down Bright Angel Trail and got to us at Phantom Ranch at breakfast.

So after that we had Buzzy Belknap and we had both Joyce and Margie. Now, when Bill Austin broke his leg, I think *he* had to think who was going to take his place. And he decided that Buzzy Belknap might be the chap. So Buzzy took over as one of the four drivers.

We went down to Boulder City, got back in contact with the Indiana Gear Works, told them the big boats were no good, please send two more small ones. We realized the water was pretty rough, the boats should be strengthened.

I myself had seen some of the impellers which Indiana Gear Works put, and they had very blunt leading edges. They were much thicker than the ones we had made in New Zealand, and I realized this could be a very large improvement for getting better impellers. So we had got three spare impellers. I went 'round to the mechanic shop there, somewhere near there, and [found] a grinder. I spent the whole of many days [precision grinding]. The jet units—in New Zealand

we called them the Chinook—they were three-stage axial impellers. And then in the tail pipe, that converged the water, assimilated it to exit velocity at the nozzle. Behind the nozzle there's two steering deflectors. But the impellers, the subject of this thing, they were the key ones, which should be sharp leading edge. So I got the three spare impellers, I sharpened them, I dismantled one of the jets, changed its impellers for the sharpened ones. Each impeller had four blades, so you had twelve blades to service. The next boat as well, three of them. The fourth boat I got the impellers out and you see, each time I had impellers from the previous boat. I got *them* sharpened, and then Dock Marston said, "Time to go. The river is now dropping, we must go." So I said is it possible to have one more day? Nope. But that one boat had the blunt impellers.



Joyce Hamilton
NAU. PH. 96.4.94.119 Bill Belknap photo.

So when the time—then what others were doing was strengthening the bottom of the hulls. The production hulls were not very strong between the bottom and the sides, so they put additional fiberglass there. And they strengthened them and removed any excess weight. In due course we started off from Temple Bar, and I believe that was on the fourth of July 1960. Went up to Vulcan. At this stage, we really thought the girls would be better on the Rim, so both Joyce and Margie were left behind, and a number of the people previously being with us left, and we were left with only nine people. We had one new man, which was George Morrison. We got up to the Vulcan Rapids just in time to camp on the beach.

Well, after quite a few tries, and from my point of view, a learning experience, which is excellently filmed in the little film *Grand Canyon Uprun*. Shows a few of these experimental runs, and having failed in one or

two places, I thought, "Let's try running up here." And I aimed at a turbulent piece of water with a little bit of wave upstream of it. And to my surprise, to my great surprise, when I got into this turbulent whitewater, it was aerated, and the bow dropped quite significantly. At the same time, as I got close, I could see that the clearer water ahead was obviously just the down side of probably a big boulder deep underwater. So the bow went straight into this wave, the water was straight on top of it. And so much water came over onto the boat, it took on an *enormous* amount of water. I think I should explain that one thing we had done back at



Jon Hamilton
NAU. PH. 96.4.94.344 Bill Belknap photo.

Boulder City, was put water deflectors across the bows: that is, boards about, oh, eight to ten inches high, in a "V" formation, from the front to the side, so that if a bit of water comes over the front, ten inches or something like that, most

of it would go off the side, off of the boats, which had windscreens. We removed them, removed them the first day, actually. Same with the two new boats. So we had no windscreens, but we did have water deflectors. We also had covers, that would cover the whole of the back of the boat, behind the drivers' seats, and cover the passengers' seats. So it wasn't quite hermetically sealed, but we had most of the boat sealed.

Well, at any rate, a huge amount of water came over, you wouldn't think that any water deflectors that came straight over the top of that—six feet of water, no windscreen—it would have smashed it anyway. And it went "whoosh" right over me and the cover and everything in the boat, now wallowing. Went back to the beach and we just kept the two bilge pumps running until it dried out.

Now, one thing my father used to say, and I've tried to take it on, he said he never minded making a mis-

take, as long as you don't make it a second time. And so I've really tried to do that, in driving, to watch out. I've seen three boats sink, and every one sunk through putting the bow under a big wave. However, with a bit of experimenting, we took one boat up. I think we might have had a bit of damage to some of the other boats. We certainly didn't spend the full daylight hours getting one boat up. And I think we had a lot of repairs or something to do to the other boats, because we only got the first boat up that day.

At this stage of the game, a little bit of something from an historic view. When I got up to the top, I gave—what we used to do, we used to turn to our right, right angle, steeply. Now, doing that would throw a great scrim of water up, a victory run. In so doing, the reverse deflector, which I have not mentioned, which was a rather inadequate device, which drops below the exit nozzle, has a little cup in it which deflects the nozzle back forward. It cuts out all forward thrust, and gives you reverse thrust. It also cuts off all steering. That dropped, and jammed, halfway down, and there I was—just moved forward, just moved forward and just up the beach. Otherwise, there would have been a wonderful picture going backwards down Vulcan in reverse.

STEIGER: Was there a time in the midst of it that you thought you might not get up it?

JON HAMILTON: Well, not too critical, but I sort of thought that Dock was a bit optimistic when we were trying on the downrun, and we really didn't get far a'tall. We tried an uprun during the downrun, after Bill Austin had been taken away by helicopter. We pushed into it in different places. We didn't get very far. And Dock said, "Well, the other rapids, we went up them all right. The water level will be different and the boats seem to be going well." So he was not certain, but he was quite optimistic. I thought that he was being *particularly* optimistic. (laughs)

The following day we took the next two boats up.

I don't think it's important, but.... It is true that I was the one who took all boats. But really, I don't want to make a great thing out of it, because Guy Mannering and I were the two people who got all the experience really, and so it tended to be one or the other of us. Buzzy Belknap was only sixteen—in retrospect I think he was the best driver—he was only sixteen, never been in a jet boat apart from a short downstream trip. Fireball Young, likewise, had almost no experience. And so what tended to happen would be that the team would say, "This is a 'Kiwi' rapid." Well, since Guy was also the photographer, or he had a movie camera, he put most of the driving onto me. So I don't want to say that I'm the only one who could do it. Buzzy was

the only man who never damaged a boat—never hit anything. And Guy was as good as I was.

But at any rate, we took some wonderful footage of filming things going wrong taking the next two boats up, in particular Guy made one mistake—again, a learning curve—where he allowed a wave to hold the stern of the boat when he sort of inadvertently slightly moved back. And that turned him sidearm and threw him straight up onto a rock, nearly tipped over—very good for the filming—it's a wonderful film. I was on the bank, watching, and afterwards Guy and I had a *very* serious discussion. Guy said, "What went wrong? My steering suddenly stopped working." And I said, "I don't know what went wrong." And then he went and he did the same thing again, a second time. But the second time I saw it—I saw exactly at the same place, there was smooth water coming over the lip, running down, coming up into another little curler. He got below the lip and he's running across the wave, a slight angle toward the shore, inadvertently moved slightly back, this back wave, caught the transom, and would not allow it to turn, so the boat turned square onto the rock—the same rock—bang—he's up on top of it. So again, nice filming of everybody with ropes helping lever the boat off. And myself jumping onto the boat without even a life jacket on, and driving it up the last bit.

However, that's only three boats. I then tried the fourth boat. And we went again and again and again, and we could not quite get up. And so everybody said, "Right, well, we're going to camp on the top beach anyway." And so they were ferried across onto the true left bank. They walked up and made themselves camp. While they were doing that they left me to sort of tie up the remaining boat.

* * *

Here we get a window into the genius and the madness of Jon Hamilton. It was his inspiration to sharpen the impellers back in New Zealand that caused his father to crash his newly overpowered boat, break his arm, and choose Jon to take his place in Grand Canyon. On the downrun Jon had realized the American jetboats had dull impellers that would need sharpening if they were to stand a chance on the uprun—a job he'd worked on day and night in Boulder City but not quite completed. Alone at the foot of Lava in the late evening, Hamilton went to secure the Dock.

* * *

However, I looked at it and said, "Well blow me down!

This is the boat, I remember, which didn't have the sharpened impeller!" It's quite a job to change three impellers, but it's not much trouble to pull the tailpipe which sticks out behind the transom. Remove the tailpipe, and you have direct access to the last impeller. Unscrew the nut from the end of the shaft, take the last impeller off, put on a new sharpened one, screw it all up, and when everybody had gone I just moved up the shore with a sharpened impeller...

* * *

Jon classically understates this maneuver. No one on the trip suspected he would make another attempt. They were all in camp. And, oh yeah: by the time he finished replacing the impeller, it was dark.

Peering down from Toroweap Overlook, Joyce Hamilton was startled to see two lights that "looked like two cigarettes, glowing in the dark, cat's eyes moving stealthily up towards the rapid, sneaking quietly up the side under cover of darkness to deliver a surprise attack.... I was sure that no one but my lunatic husband would attempt to run Vulcan in the dark.... For a short time the lights wavered and winked uncertainly, bobbing and blinking among the bottom waves. Then they broached the first barrier... streaked forward, shot up over the top and swooped into the beach above."

* * *

Well, after that—[Vulcan] was the main problem. We had a good trip up, we hit quite a number of rocks, but we didn't have any serious holdup over any of the other rapids. We got to Phantom Ranch, we were in touch with the girls on the North Rim, by telephone. We left Phantom Ranch under great confidence. Got to Grapevine, and I was in the lead boat, in *Wee Red*. Fireball Young, Dick Young was driving *Wee Yellow*. I went first, Fireball went up second. When we got to the top and paused to look back, *Wee Yellow* was coming up, about halfway up hesitates, and there was a big plume of water, and we saw her no more, after that. She'd sunk.

I think she did not pitchpole, though the account given was that she stuck the nose under a bow, a lot of water came over. I don't know, it may not have had the cover over properly, and too much water got in. Grapevine was pretty rough at the time, and you'd be shipping more water, and it just sunk. But I don't think it turned upside down, or anything like that. But I think nothing was saved except Jim Bechtal, the still photographer, had the presence of mind to take out the ignition key to make sure that the eels wouldn't



Jet unit.
NAU. PH. 96.4.94.14 Bill Belknap photo.

drive it away. (chuckles)

It's unfortunate it happened to Fireball but it could happen to any of us. If we'd gotten something wrong, as I was saying, it nearly happened to me in Vulcan. Again, the mistake which Guy Mannering made in Vulcan landed him on the rocks. If it had been in a slightly different circumstance, he could have made the same mistake, which threw him into a place which rolled the boat over. Who knows?

I think I had Dock Marston with me at the time. We went 'round, down and found the other two boats, picked up the crew. So, had to retire to Phantom Ranch. We didn't have a great logistic problem, but sunk almost all the film which had been taken by the official photographer for the Indiana Gear Works. Guy Mannering, still had his.

And we lost an awful lot of our spare fiberglass—resin and fiberglass and tools, so had to be organized that they'd come down. They came down the next day from—they'd been obtained from Flagstaff—next day by mule, but it was an awful rush to get all that done. Two of the people were sent out, Fireball Young and

Morrison decided to leave.

We didn't really have any more problems. We spent quite a bit of time fibreglassing previously—we'd hit a rock—fiberglass. And then, as I say, Buzzy Belknap, I think was the man who hit no rocks, sunk no boats, had no problems. He was only sixteen of course. Experienced people get into trouble.

But we were frightened that the water was dropping so fast that it might be so low when we got up to Soap, or something like that, it could be just a line of boulders. We didn't really know.

But it took us ten days in all from leaving Temple Bar to arriving, ten days, four days with driving, or regrouping, thinking about, until we finally landed at Lees Ferry.

DIMOCK: Was it pretty exciting coming into Lees Ferry?

JON HAMILTON: Oh, yes. It's always great to say "we're here." Jolly good. See the welcoming team. But to be quite honest, also, after ten days, I think I was quite pleased that it wasn't going on for *another* 200 miles. You know, the first, second, third day—fun. The fourth, fifth is interesting. The sixth, seventh...

DIMOCK: Did you learn anything on that trip about the boats or the jet units that changed the way you thought about them?

JON HAMILTON: We realized how good jet propulsion is for really big water. And in later expeditions, that was really reinforced. Really, the clean-bottom boat is what you need, what you've got to have. And the extreme maneuverability. But it's very, very often that you see huge water, which is impressive in the pictures, a downstream raft, waters *have* to go through it. What else could you do? You can drag down, you've got to start in the middle of the river, or that happens frequently even a kayak. They tend to go through the big water quite often. We would get what would be called the "Kiwi" course. Sometimes, not always, but sometimes, a huge wave, which we can't do much about, but there's a patch about six-, seven-, or eight-foot wide between a rocky shore and a huge wave. And you can just run swiftly up it. You just don't give a thought towards it. There's often a shallow water course, and it may even mean crossing between two big waves. You can do that easily. As long as it's smooth, you can run across between one turn and another. In the typical New Zealand smaller rivers, shingle rivers, river may be ponded a little bit ahead of a rapid, then goes over a broad, not very deep, shingle lip, then typically narrows into sort of a single stream with the downstream waves maybe three or four or eight or ten; and on one side or the other, sort of calm. When you're upruning, you've got the calm water. You whistle past the

rough water, and you sort of climb stiffly but shortly into, likely just above the first big wave, climb up the smooth tongue and sail on. Maybe you've got a lot of boulders in the river, you've got to be standing up, keeping an eye out and make sure you see it. Or maybe you look at the surface of the water and try to say, "Is that a leeway, the downstream wave, from higher ripples, or is it a boulder underneath? If it's a boulder underneath, just be careful you don't hit it. If it's merely a leader wave that may be perfectly all right to plow straight over it. But, you know, these are things which become second nature after you've been on the river for a while.

It was a good fun expedition, goodness me, from our point of view, the scenery, and, you know, having a job to do makes it all worthwhile. Well, of course we were having fun, but we also had the challenge—it was really wonderful. As the years go by, it stays with you.

* * *

DIMOCK: So did you go on to run other rivers, other expeditions?

JON HAMILTON: From our point of view, Joyce and my point of view, really my father's invention of the jet has led to many experiences—very few organized by us. After the Colorado in 1960, in 1966 we were invited over to New Guinea. What a place to go! That was being run by Australian geologists, the Bureau of Mineral Resources, had an area they wanted to look at which was almost impossible to look at with helicopters—the jungle was too big, beaches nonexistent, and they thought it might be quite good to get Hamilton Jets to run up through the rivers, make camps, and walk through the jungle, tapping rocks, etc. [We were] seeing natives who had never seen Europeans before. Back there, 600 or 700 different languages. They didn't speak pidgin English even. You know, using stone axes, bones through their noses, no cloth or anything.

DIMOCK: What river was that?

JON HAMILTON: That was the Yuat tributary of the Sepik river. The Upper Yuat, and also the Baramuni, which is a tributary of the Sepik. Were there for quite a while, and then went further up, exploring in places where there were rough rivers, but where the natives *had* been contacted.

Another experience was [the Congo River] in Zaire, Africa: a big rapid from Kinshasa down to the sea. Kinshasa's 1,000 feet above the sea. The Ho [now called the Kwa], which is the second-biggest river in the world, and the Ho River joins, just before Kinshasa, no inflow after that. That is 1,000 feet above the sea, and about 250 miles, maybe 300 miles, you're down

to sea level. I think there's well over one million cubic feet a second when we ran. *Really* colossal. Some great whirlpools. If you fell out into a whirlpool a life jacket isn't going to help.

Well, again, we had boats which were not very big: they're not much bigger than the Colorado boats. They were built in Britain by our licensees, we had three of them. At this stage, that was 1974. We had better jet units, bigger engines. We didn't run the full distance. We ran down to the Inga town and we explored a little bit below Inga. But the water is just so big that it's—the Colorado's a trickle.

But there were many, many other rivers we've been. In Nepal there was a wonderful river, the Sun Kosi—now, that's a *tiny* little stream, much more New Zealand-type of stream running not far from Katmandu, coming out in India. We were with Ed Hillary there. And again, there's a story about Ed Hillary, which I've told before. Ed Hillary said, "How many boats shall we take?" I said, "I think we should take three boats, and they must be small ones, not as big as these Colorado boats. Small river," I said. "We'll take three boats." And he said, "Why three?" And I said, "Because I think we're going to sink one. And if we sink one we have two boats to get the expedition out, or we have two weeks' walking to get out." So he said, "Yes, yes. Well, *could* we get through with two boats?" And I said, "Oh, you know if we really push it, we can do it with two." So he said, "All right, we'll take two boats." So we took two boats.

It's the same with things like fuel. [You've got to] estimate how much rerunning—it's pretty difficult to estimate. So I put on a small margin for safety, but Ed cut that out.

STEIGER: How had you met Mr. Hillary to begin with?

JON HAMILTON: I think we had a good friend, Jim Wilson, who had climbed with him in Nepal, and who lives in Christchurch, and I thought it would be quite a good idea to get to know Ed Hillary, so we invited him on a few trips in New Zealand. Some of them were pretty uncomfortable. I remember once when I landed heavily on a rock in a very, very narrow gorge, Ed had to get out and push. After the boat just got going, and they threw themselves on board the boat over the back, just sank, another rock, and it just about punctured his ribs. Well, that's the sort of thing which Ed appreciates and remembers. (chuckles)

It was an upstream-only run, so we took two boats. It was a short day's run to where we made our headquarters, from the road to our headquarters. Then we made a long run up the Sun Kosi and established a fuel dump. We left most of the expedition behind and just



Sepik River, New Guinea.
Hamilton family photo.

took the fuel up, and left it at the side with a sherpa to look after it. Came back. The next day we said, "All right, we'll run up the Tamur, which came in—another river which comes in there, that will be fine." Then we said, "Let's have a look into the Arun River, which comes down from Tibet." Well, that was a wild river! My God! Through a terrible ten-mile gorge. We managed to get through it. Jim Wilson, who was driving second boat and had very little experience, he kept on disappearing and then appearing again. We got out of this narrow gorge into much more open water. Whilst driving on out, we came to a great big "V"-shaped wave. It was nothing very much, but instead of coming close to the shore, huge boulders on the shore. So instead of close to the thing I stayed further out. We dove into this wave—to my surprise, when I got to the



Sun Kosi River, Nepal.
Hamilton family photo.

top of the wave, there were actually a pair of waves fairly close together. I put my foot hard down, and “bang! bang!” through the two of them, and went on up and watched Jim come up. Jim, this time, went too slowly, where in Vulcan I think I had gone too fast. He went up the first wave, and instead of putting his foot down, went slowly over the wave and the nose dropped down, straight into the next wave—sunk. It ducked the nose of the boat under and sank the boat. So we got the people out from that, and I think we got one liter tin of oil and a seat cushion. That’s all that was saved.

He had a sherpa on board who couldn’t swim, he came from the area of the country where they couldn’t swim. The other two swam for shore.

Jim was able to rescue the other man, and got him to the shore *just* before this mighty gorge. So we had to go back, from then on we had to make do with only one boat. So we had to make three journeys: up, back; up, back; up, back. And then as the fuel supply got a bit low, it was only two journeys. But it was a very interesting trip, and one of the rapids right in the middle, we really had time to unload everything, get the people to carry the loads ’round. I had to take it with as light a boat as possible. I know that Ed said, “Don’t sink the boat here, because we’ll have sixteen days to walk out if you sink it.” When we got to Dolalghat in the last run up, I dipped the fuel tank at the end and it was less than half full, all we had. We had about one hour’s run left. After days and days and days of tripping. But Ed’s expeditions are excellent. He doesn’t have huge margins of safety or anything like that—he just doesn’t.

* * *

DIMOCK: And back in New Zealand, were you running the factory?

JON HAMILTON: A dowdy engineer.

DIMOCK: A dowdy engineer?

JON HAMILTON: Well. (laughs) Those are where my actual interests are. We always liked tramping—tramping over passes or something like that. Joyce and I share that interest. But we also remember these expeditions, of which the Colorado was the first. I would say that certainly the likes of Vulcan and of Lava Falls was the first of the big, difficult challenges. And because of that, it naturally stands out—bigger water



Jon Hamilton chats with Brad Dimock, September 2004.
NAU. PH. 2004.31.41.43 Dave Edwards photo.



Joyce Hamilton, 2004
NAU. PH. 2004.31.41.41 Dave Edwards photo.

and different circumstances. I very carefully don’t talk about the best, because everyone is so different, and the best in a different way. The Colorado run was really magnificent because it was the first, as well as bigger—I’ve never seen such stupendous country. It was excellent.

The 1960 Grand Canyon Jet Boat Expedition— Part 1: Planning And The Downstream Run

HOW THE EXPEDITION CAME TOGETHER

The Kolb brothers, Norman Nevills and others, in their expeditions and boats designs, greatly advanced river running in the Grand Canyon during the 1920's and 1930's. Their successes fueled the dream of going upriver through the Canyon from Lake Mead to Lees Ferry. Before and after World War II, Harry Aleson and inboard and outboard powerboat pioneers Ed Hudson, Dock Marston, Rod Sanderson, and Jim Jordan made a number of attempts. In the late 1950's however an upriver run through the Grand Canyon remained elusive. Mile-217 Rapid and Lava Falls were formidable barriers to upriver access.

The story of our successful 1960 downriver-upriver run fifty years ago begins in New Zealand with C.W.F. (Bill) Hamilton, rancher, inventor, and company executive. In the 1920's Bill developed a 24,000-acre sheep station, Irishman Creek, in the shadow of Mt. Cook, South Island's highest peak. The station also had a shop where Bill invented a variety of tools and equipment. In World War II the factory at Irishman Creek expanded, making heavy equipment for the war effort. After the war Bill moved manufacturing to Christchurch but continued his inventor's work at Irishman. Throughout all the years of managing the station, manufacturing of ever more complex heavy equipment, such as earth moving machinery, and contracting for hydropower station construction, Bill was frustrated by the problem of river travel over large areas of the South Island; the swift but shallow, braided glacial streams chewed up conventional inboard and outboard propellers. These rivers, however, gave access to great reaches of the South Island that were without roads. Hamilton started to experiment with boats and propulsion systems to navigate in shallow water. After several unsuccessful efforts Bill developed what became the Hamilton jet and perfected it step-by-step in the early 1950's. Bill's son Jon, by then a university graduate in engineering, participated in the jet unit's development. Bill, his wife Peg, Jon, daughter-in-law Joyce Hamilton, grandchildren, photographer Guy Mannering and his wife Margie, George Davison (the chief engineer at Hamilton) and other friends started spending many jet boating weekends exploring South Island's rivers. Bill and Jon added manufacturing of jet units and boats to the production lines at the Hamilton Works as there was an enthusiastic and growing market for jetboats among New Zealand sportsmen.

Between 1955 and 1972 I was an explorer, scientist, and manager of U.S. research programs in the Arctic and Antarctica. Bill Austin was also a part of the Antarctic research program. In 1957, on a long layover in Christchurch because of bad flying weather south to Antarctica, we met the Hamiltons and the Manneringers who took us into their homes and their lives.



Phil Smith
NAU. PH. 96.4.94.122 Bill Belknap photo.

We had many great outings with jet boats on the Waimakariri and Waitaki rivers, wonderful visits at Irishman Creek, and became close friends. Sometime during the 1957–58 austral summer while the two of us were part of a five man team doing glaciological research on Antarctica's Ross Ice Shelf during the International Geophysical Year, I said to Bill that a Hamilton jet boat might be able to go up the Colorado through the Grand Canyon. My audacious idea was inspired by youthful exuberance and by my reading (in Antarctica) of Wallace Stegner's Powell biography—*Beyond The Hundredth Meridian*—published three years earlier. I had no special knowledge about the Grand Canyon other than my geology training and the knowledge that uprun attempts had failed. Doing something that had not been done before seemed exciting to me who at the age of 25 had explored then unknown areas of Antarctica. I was impressed with the Hamilton jetboat's handling ability and power going against surging currents. The boat stayed at the surface and had no protruding propeller to be sheared off

by rocks. Austin agreed. More jet boat trips with the Hamiltons and Mannerings followed in February 1958 on our way back to the United States.

I knew that an uprun attempt should take advantage of the Colorado's undammed upper basin spring runoffs and that beyond 1963 when Glen Canyon Dam closed, it would be far less likely that an uprun through the Grand Canyon would be successful. The dam's impending closure became the first point of urgency for planning an uprun sooner rather than later. We kept talking about a Colorado uprun.

Bill Austin became the central planner. I remained



Bill Austin
NAU. PH. 96.4.94.352 Bill Belknap photo.

a sounding board and adviser for Bill but I was busy with the U.S. Antarctic Program. Austin quickly began to assemble the pieces needed to mount a campaign. By the autumn of 1958 he had purchased a Hamilton jet boat that was shipped to the United States. Bill made contact with Dock Marston and Bill Belknap early in 1959. Dock was tentatively recruited. Wary at first, Dock saw the scheme as encroachment into his "territory," that is, power boat-river running in the Canyon. Besides what did we know about the Canyon and what was this new-fangled Kiwi jetboat? Once committed, he threw himself into planning, and the expedition would not have succeeded without his expert advice. In 1959, Austin, Bill and Peg Hamilton, George Davison and Jim Jordan explored the lower Grand Canyon testing the jet boat in rapids to a point above Separation Canyon but not as far upriver as Mile-217; they turned back as they were having engine trouble. Except for Davison, they then successfully went to the Main Salmon. The Hamiltons and Austin worked up a licensing agreement with

Indianapolis-based Indiana Gear Works to have jet boats manufactured and marketed in the States as the Buehler Turbocraft. Indiana Gear Works was a successful supplier of helicopter rotor gears largely for the military but wanted to diversify; the manufacture of precision machined jet units fitted with their core business. John Buehler, Indiana Gear Work's president, became intrigued with the Grand Canyon uprun as an advertising strategy and was willing to underwrite the expedition's cost. I marvel to this day how anyone could have thought a film and still photos of a treacherous expedition in the big water of the Canyon could be a marketing tool for boats sold to water skiers and sport fishermen!

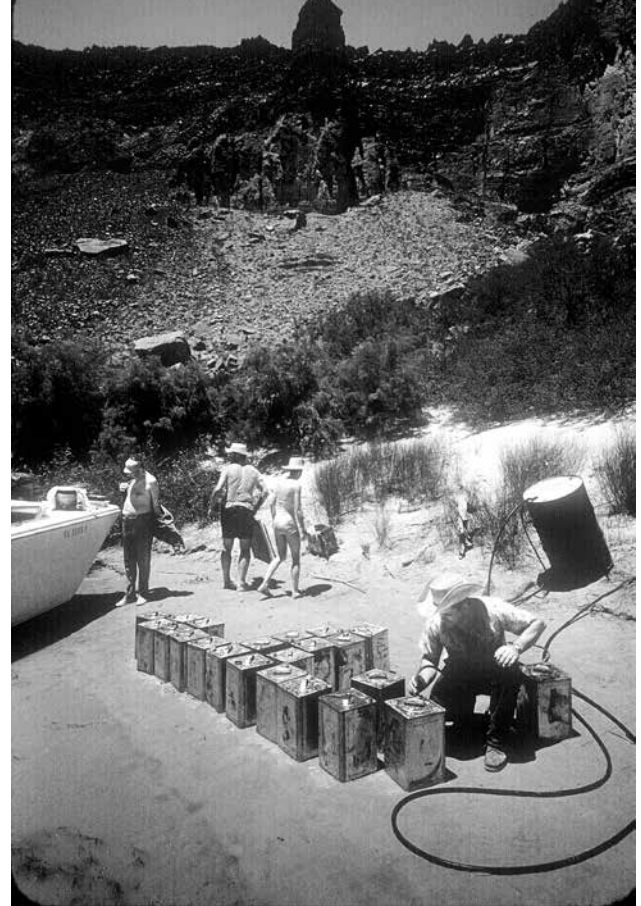
The pieces of the expedition were coming together. Meanwhile, competition was growing: in 1959 there had been a highly publicized upstream attempt by Bill Cooper and five others; a *Life Magazine* story recounted how the team had destroyed seventeen propellers getting to Lava Falls where they met defeat. Other manufacturers, e.g., Berkeley Marine and Anchor, were starting to make and sell jet boats with a similar but not as efficient propulsion system as the Hamilton jet. We learned that a team from Anchor was contemplating an uprun attempt in 1960. That galvanized us! While we were convinced the Hamilton unit was a superior design, and we were forming the most experienced team, we decided that the uprun attempt should be no later than the spring and summer of 1960. At the center of the planning in Indianapolis, Bill Austin was working round the clock. Cables were going back and forth to Jon Hamilton in New Zealand; almost daily phone calls and letters between Austin and Marston and from the two of them to those who needed to be recruited for the expedition went out at a furious pace. All planning was focused on an early May launch. Jon and Joyce Hamilton and Guy and Margie Mannering flew to the States for the expedition. But as late as mid-April, the team's composition was still not settled on! For example, Bill Belknap was not yet on board as *National Geographic* had not committed to a magazine article.

STRATEGY AND LOGISTICS

The strategy was to take advantage of the annual spring runoff of up to 50,000 CFS or more for the downstream trip and have substantial flow for the upstream attempt. We would lay out gasoline caches periodically going down river and uprun jet boats at many rapids to test them against the rapids. Then after re-supply in Boulder City a smaller party would attempt the uprun. On the down stream trip we used two 18-foot jet boats, christened *Wee Red* and *Wee Yel-*



Gas supply at Lees Ferry
NAU. Pht. 96.4.94.15 Bill Belknap photo.



Gasging up at Whitmore
NAU. Pht. 96.4.94.330 Bill Belknap photo.

low, powered by 185 horsepower Dearborn Interceptor v-8 engines and two 24-foot cathedral hulls each with twin jet units powered by two Grey Marine 188 horsepower engines. They were christened *Big Red* and *Big Yellow* and served as fuel transports for our ambitious fuel plan. Although it had not been finally decided, Bill Austin and Jon Hamilton suspected that two additional 18-foot jet boats would be needed to replace the 24-footers for the uprun attempt. Revealing this to John Buehler, however, might have caused him to pull the plug on the funding of the expedition as the costs were mounting. George Morrison, his on-the-scene publicity agent, was reporting the steadily rising cost of the expedition.

Fuel requirements—high-octane gasoline—were based on an estimate of 3.25 miles per gallon per boat down stream taking into account upstream testing at rapids and the same mileage was planned on the uprun. In addition to having fuel for the uprun attempt, the caches would also have enough fuel to get the uprun party *all the way from Soap Creek back to Lake Mead* if need be. Thus the logistic plan for fuel was very conservative befitting a prudent expedition, not a spur-of-the-moment scheme.¹

We would start at Lees Ferry with 1,500 gallons, to be put in the four boats' fuel tanks and five-gallon gas cans to be cached periodically downstream. Two hun-

dred gallons on two successive mornings would come down Bright Angel by mule train. The Bundy family would organize the last downriver cache: 550 gallons sent over the rim from a small tanker truck backed to the rim's edge at Whitmore Wash through a rubber hose into 55 gallon drums they brought down the trail empty. In turn gasoline, would be transferred to the boats' tanks and on-board then-empty five gallon gas cans would be re-filled for the next downstream leg, with 100 gallons left in the drums at Whitmore for the uprun. Caches laid out on the downriver part of the expedition were the fuel for the uprun attempt. Fuel not cached was used on the downstream expedition, e.g. 400 gallons was taken on downstream from Whitmore. (*See Table One*). In the end a good deal of the fuel was not used as a final downriver run due to defeat well upstream did not take place. For years several of these caches of five gallon filled gasoline cans remained in the Canyon visited on occasion by commercial and private boatmen. Today we would never think of such an environmental abuse, but thinking was different when high spring flows flushed out the Canyon and rebuilt beaches with the sediment swept down from the then-undammed Green and Colorado Rivers.

Crude river-to-rim communication signals were devised, as good as you could have in 1960 as there

were no really good radios and of course no satellite phones. North and south rim parties would follow the expedition down and upriver. The rim parties would know the general schedule and make their ways to vantage points where they could see the river. Beyond safety this became a way of keeping newspapers informed, as by the time we were ready to go the word was out—partly because of Indiana Gear Works promotion and partly as a result of the avid interest of newspapers in Utah and Arizona. Newspapers wondered whether we would meet the fate of others who dreamed of an uprun through the Grand Canyon and as today, news of disaster made a better headline than news of success.

ABORTED FIRST START

On May 3, 1960, when there had still been fewer than 400 persons through the Canyon, our downstream party assembled at Lees Ferry. What followed was partly a comedy and partly a serious set-back. The first problem was that we were not an expedition. The team literally began to get acquainted at Lees Ferry! Two Indiana Gear Works members were clearly uncomfortable with the Canyon and River environment, as was Hy Peskin, a *Sports Illustrated* photographer. Some of Dock's team was skeptical about the jetboat and let their thoughts be known as the evening cocktail ensued, a well-known feature of Dock's expeditions. The crew kept evolving to the last minute. Bill Belknap did become a member but Jim Jordan cancelled in late May due to health. The National Park Service was remarkably cooperative about the last minutes personnel substitutions in an expedition Dock sold as "experimentation with river craft."ⁱⁱ

Second, the USGS was predicting a May 1960 flow of 45,000 CFS but it turned out to be a cold spring and the flow was only 22,800 CFS on May 3, and two weeks later the River had actually dropped, not risen! The low water flow—now we would never think of 22,000 CFS as low—proved too low for the heavily laden cathedral hull jets. Five miles out, in sight of the Navajo Bridge, *Big Red* hit a rock and was holed badly. So it

TABLE ONE: 1960 JetBoat Expedition Gasoline and Gas Cache Plan
Based on Dock Marston expedition log

Total Fuel Planned for Expedition			
Locations	Gallons		
Lees Ferry (4 tanks topped + 5 gal cans)	1,500		
Phantom Ranch (2 mule trains with 5 gal cans)	400		
Whitmore (1,800 foot garden hose rim to river)	550		
Total	2,450		

Gas Cached - DOWNRUN			
Date	Cache Locations	Gals Cached	Gas Retrieved - UPRUN
6/18/60	Soap (remove 50 gals each fm two 18' boats)	100	
6/19/60	Harding beach (36 five gallon cans)	180	(did not use)
6/19/60	Chuar Tunnel (16 five gallon cans)	80	-> 50
6/20/60	Head of Unkar RB	80	-> 15
6/20/60	Hance	80	"did not stop"
6/22/60	Hermit - head	30	-> 15
6/22/60	Elves - just above	50	-> 30 net
6/22/60	Dubendorff - above	50	-> 30 net
6/23/60	Tuckup (mile 164)	100	(no mention)
6/23/60	Top of Vulcan	30	-> 30
6/24/60	Whitmore Beach (on rim - 50 gal)	85	-> 84
6/24/60	217 Rapid - top	150	-> 100
		30	<-> "exchange high test for regular"
			<- Bridge Cyn City "left 30 gals"
			7/4/60
			7/4/60

was pulled ashore and unloaded (see photo on page 44). We discovered we did not have enough gear—timbers and chain hoists—to manhandle the heavily loaded 24-footers. Three of us were dispatched to Flagstaff to get the needed gear, arriving in a blinding snowstorm with several inches on the ground. During the three days we were repairing *Big Red*, Bill Austin, Dock Marston, and Jon Hamilton decided we should postpone the campaign until the water was higher. We took everything to Lees Ferry and stored it. The Kiwis toured the southwest; the rest of us went home.

DOWNRIVER IN JUNE

On June 18, we started again as a more coalesced team: Dock Marston and Ed I'Anson, Pug Atherton, Jack Reynolds and Garth Marston, all of whom had crewed with Dock; Jon and Joyce Hamilton, Guy and Margie Mannering from New Zealand; Bill Austin, Dick (Fireball) Young, George Morrison and Jim Bechtel from Indiana Gear Works; Bill Belknap; Buzz Belknap; and, Phil Smith. Margie Mannering and Buzz Belknap did not start at Lees Ferry. They came in at Phantom after a phone call from Bill Austin suggesting they hike down the Bright Angel Trail early the next morning. In retrospect a pre-expedition tension was a differing view among Dock, his cronies, and Austin and Smith about women on the river. While women had been on some of Dock's previous twelve trips, he and his crew were decidedly chauvinistic. From the start Bill Austin and I assumed the Kiwi spouses would be on



"Big Red" (aka "Little Squirt") undergoing repairs, May 1960.
 NAU. PH. 96.4.94.2 Bill Belknap photo.

the downstream run. After all we had spent many days with them jet boating in New Zealand.

The Colorado was running about 38,000 cfs but was dropping steadily. Downstream we had successful test up-runs at Soap, Hance, Sock and Grapevine and several more below Phantom. We had continual fiberglass repair work downriver. There was a vexsome thrust bearing repair with *Big Red* at Elves Chasm. Fiberglassing and the bearing repair added a couple days to the planned downriver run but we had a fabulous 71-mile day on June 22, buoying spirits.

On June 23 disaster struck. Piloting *Big Red* with Dock as crew Bill Austin started into Lava on a course to the left of a large hole in Lava at that water level but well above the large black rock familiar to those who do a right run at Lava. Bill started at too high a speed and that was an error on his part. Dock, based on his propeller experience, urged Bill to take a course further right than Bill planned. So in the end they took neither the left hand run nor the right hand run around the hole.ⁱⁱⁱ *Big Red* dropped nearly ten feet and Austin ended up with a compound fracture of his left femur. When we gathered up on the beach below Lava, Jim Bechtel, Bill Belknap and I became the first aid team. We knew Austin required an air evacuation and quick medical attention if he was to have full use of

his leg in the future. Once we got the first stages of a hospital set up on the beach, Dock and Garth Marston and Fireball Young went to Whitmore in *Wee Yellow* and *Wee Red*. We hoped but weren't sure that NPS Lake Mead Superintendent Chuck Richey might be at the beach as he knew our schedule and was extremely interested in our progress. He and Don Squires, a lower canyon-Lake Mead guide, were at Whitmore and Don set off towards the rim in gathering darkness to an elevation where he could radio the Bundys who relayed an s.o.s to park headquarters on the South Rim which in turn contacted Luke Air Force Base. Chuck came upriver to our camp with the Marstons in the dark but Fireball waited at Whitmore with the other 18-footer overnight waiting for news of an air evacuation which did not come; he returned demoralized to our campsite below Lava at first light. Happily, the Air Force had a new Kaman turbine twin rotor helicopter in its fleet and was eager to test its capability. At 7:10 A.M. on June 24 the helicopter landed at lower Lava Beach to take Austin to the Grand Canyon Airport where the Indiana Gear Works DC-3 was waiting to take him to Las Vegas.^{iv}

A test uprun at Lava on the morning of June 24 failed. But there was a much-needed confidence building uprun at Mile-217 Rapid, the rapid that had

Bill Austin and Dock Marston entering Lava.
NAU. Pt. 96.4.94.91 Bill Belknap photo.



Bill Austin in the medical tent
below Lava.
NAU. Pt. 96.4.94.97 Bill Belknap
photo.



Luke Air Force Base helicopter arrives at lower Lava.
NAU. Pt. 96.4.94.101 Bill Belknap photo.

defeated most uprun attempts except Cooper's. The downstream expedition camped at Temple Bar on the night of the 24TH and arrived at Boulder City on the morning of June 25. The Colorado was at 37,400 cfs at Lees Ferry but the forecast was that the river would start dropping rapidly over the next week.

Philip M. Smith

NOTE: Part II of the Jet Boat Expedition will be published the Fall issue of the next BQR.

FOOTNOTES:

- 1) Based on his prior trips, Marston felt Soap Creek Rapid might be impassable at July water levels, thus the plan to get from there all the way back to Lake Mead.
- 2) The quote is from correspondence between Marston

and the Superintendent, Grand Canyon National Park. Marston papers, Huntington Library. The two Indiana Gear Works employees and Hy Peskin did not return for the June 1960 attempt. Among their other discomforts, these three were convinced that boulders high up on the Canyon Rim would tumble off and kill them during the night.

- 3) For more than a year after the 1960 expedition there was a heated correspondence between Austin and Marston as to which had been the cause of the accident. In the end, Bill Austin wrote to Dock Matson "Okay you win." See Marston papers Huntington Library.
- 4) I knew before the second downriver effort started that I would not be on the uprun because I had already spent seven weeks on the expedition. I had to return to Antarctic planning in Washington, DC so it was an easy decision to leave on the helicopter with Austin. I would have done the same with any member of our team needing serious medical attention.

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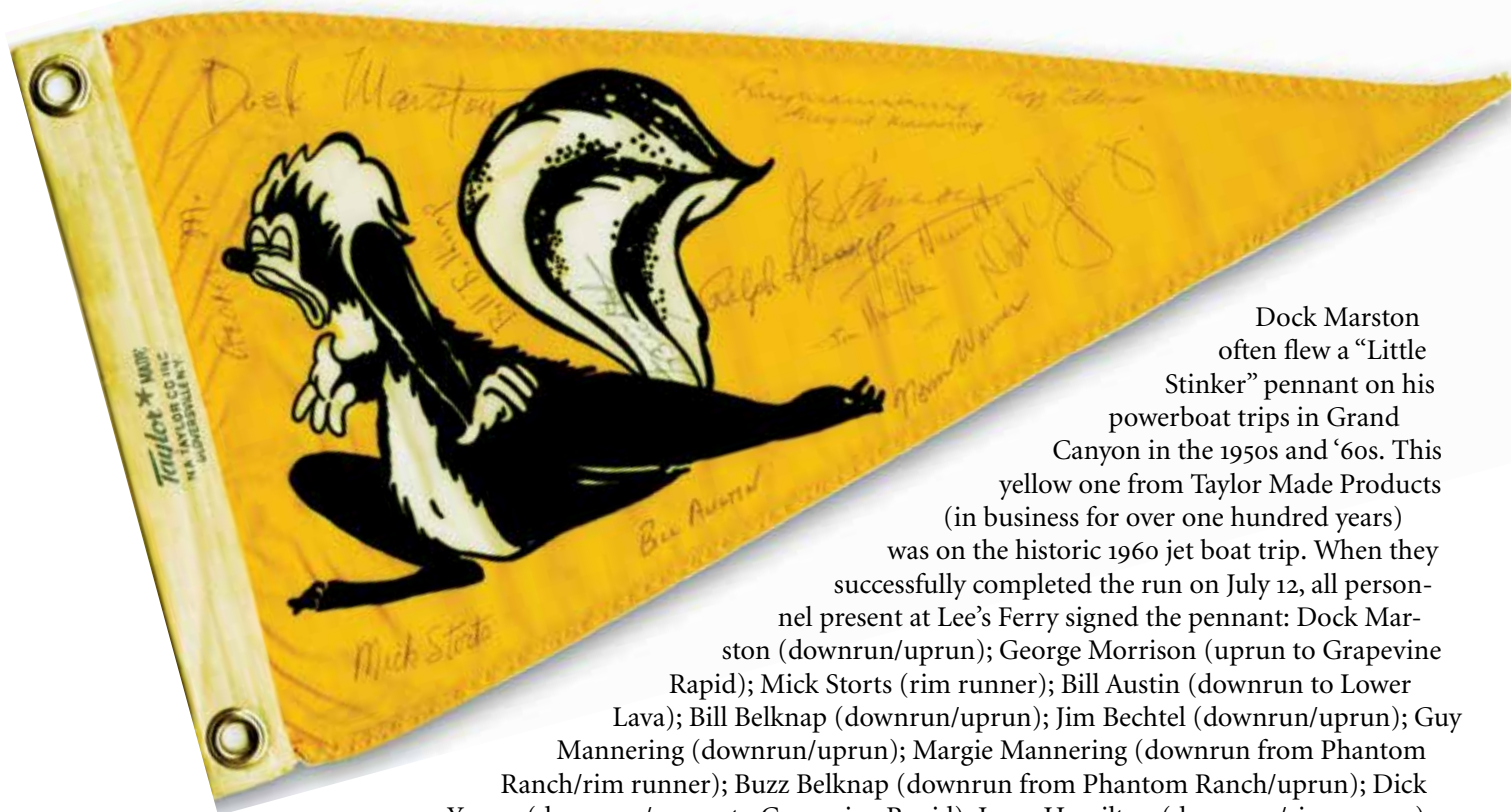
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Dock Marston often flew a "Little Stinker" pennant on his powerboat trips in Grand Canyon in the 1950s and '60s. This yellow one from Taylor Made Products (in business for over one hundred years) was on the historic 1960 jet boat trip. When they successfully completed the run on July 12, all personnel present at Lee's Ferry signed the pennant: Dock Marston (downrun/uprun); George Morrison (uprun to Grapevine Rapid); Mick Storts (rim runner); Bill Austin (downrun to Lower Lava); Bill Belknap (downrun/uprun); Jim Bechtel (downrun/uprun); Guy Mannering (downrun/uprun); Margie Mannering (downrun from Phantom Ranch/rim runner); Buzz Belknap (downrun from Phantom Ranch/uprun); Dick Young (downrun/uprun to Grapevine Rapid); Joyce Hamilton (downrun/rim runner); Jon Hamilton (downrun/uprun); Ed I'Anson (downrun/uprun); and Norm Warner and Ralph L. Jessup (probably Turbocraft airplane pilots). Not present: Phil Smith (downrun to Lower Lava); Pug Atherton (downrun); Jack Reynolds (downrun); and Garth Marston (downrun). Thanks to Loie Belknap Evans for loan of the pennant.