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SAVING GRAND CANYON RIVER RUNNING HISTORY

BRYNN BENDER

ABSTRACT

Modern adventurers have been traveling through the Grand Canyon on the Colorado River since 1869. The Grand Canyon National Park Museum collection contains 18 boats that have made historic journeys on this amazing river from 1909 to 1965. The history of running such an important river is captured in this collection. This article will include an overview of the National Park Service's project to preserve and exhibit these boats. The project has been a highlight for the park and the river running community. It has involved numerous volunteers, river runners, architects, historians, and park staff over the past five years. Overall, the boats are in good structural condition but their surfaces were damaged from outdoor storage conditions. Getting the boats into appropriate storage posed interesting challenges due to their size and public interest. Treatments of the four oldest wooden boats have been undertaken over the past four years. Condition problems thus far have involved dirt, staining, excessive linseed oil, unstable paint, torn and distorted canvas, and corrosion. Stabilization of these large boats required multi-disciplinary techniques. Future treatments include cleaning and stabilizing a rubberized canvas on a kayak, a painted polyethylene raft, a homemade fiberglass kayak, oxidized gel-coated fiberglass jet boats, and two jet propulsion systems and three motors. An inflation support for a large WWII rubber raft must also be located.

1. INTRODUCTION

A collection of historic boats is finally getting the attention they deserve to tell the story of running an incredible river. The Colorado River runs 277 miles through one of the greatest natural wonders in the world, the Grand Canyon. Nowhere along the river are the waters more violent and majestic than through this park where the river drops 2,000 feet within the park's boundaries. It has proved a real canyon-carving machine. The Grand Canyon was formed 5-6 million years ago by a handful of major geologic events, such as tectonic plate movement, water, and wind erosion. It has close to 2 billion year-old rock at the lowest visible level along the river.

There is a Native American story of a Hopi man who traveled down the river in a dug out cottonwood tree, to the sea where he learned about the Snake god and the ceremonies and songs that were necessary for bringing rain to his people. In the 1800s, the canyon was one of the last unexplored territories in the US. In 1869, John Wesley Powell, war veteran and geologist, mail ordered wooden boats from Chicago to attempt a trip through this area. He was successful and proved that the river went through here from Colorado to the Gulf of California. A western white man had never done it. Powell named formations along the way and named this place the Grand Canyon. By the 1880s sightseeing groups arrived and in 1919 it was declared a National Park. Before the introduction of the 1950s rubber raft, which allowed for safer travel down the river, fewer than 100 people faced the rapids and lived to tell the tale.



Fig. 1. Colorado River at horseshoe bend (Photograph by Brynn Bender)

2. HISTORY

The Grand Canyon National Park Museum collection contains 20 boats that have made historic journeys on the Colorado River from 1909-1963. There are wooden boats, plastic boats, a motorboat, metal boats, fiberglass jet boats, kayaks, and canoes. These boats span the various design styles that tried to get it right, some successful and some not.

Table 1. Grand Canyon National Park historic boat collection

Boat name	User	Significant date	Primary material
<i>Stone</i>	Julius Stone	1909	Wood
<i>Defiance</i>	Ellsworth Kolb	1911	Wood
<i>Edith</i>	Emery Kolb	1911	Wood
<i>Ross Wheeler</i>	Charlie Russell/Bert Loper	1915	Metal
<i>Glen</i>	U.S. Geological Survey	1921-1923	Wood
<i>Canoe, canvas-3</i>	David D. Rust	1920's	Canvas
<i>WEN</i>	Norm Nevills	1938	Wood
<i>Mexican Hat</i>	Norm Nevills, Don Harris	1938	Wood
<i>Escalante kayak</i>	Alexander "Zee" Grant	1941	Canvas and wood
<i>Esmeralda II</i>	Ed Hudson, JP Riggs, Doc Marston	1949	Wood
<i>Woman of the River</i>	Georgie White	1954	Neoprene
<i>Gem</i>	Stephen "Moulty" Fulmer	1950's	Wood
<i>Jet Boat - Wee Red</i>	Bill Hamilton, Jon Hamilton, Guy Mannering, Phil Smith	1960	Fiberglass
<i>Jet Boat - Dock</i>	Bill Hamilton, Jon Hamilton, Guy Mannering, Phil Smith	1960	Fiberglass
<i>Fiberglass Kayak</i>	Walter Kirshbaum	1960	Fiberglass
<i>Music Temple</i>	P.T. Reilly and Martin Litton	1962	Wood
<i>Sport Yak II</i>	Dock Marston	1963	Plastic

The *Stone* boat of 1909 was the first time a vacationer had hired a guide to go down the river just for fun. Nathaniel Galloway designed this boat; he had traveled down the river before on hunting trips. He came up with the design ideas for a wooden boat that have stood the test of time on this river. Previous boats were large, long and difficult to control in the intense rapids of the Colorado. He designed a narrow, shallow one-man boat. It was flat bottomed, with watertight compartments. It was light so it could be maneuvered in rapids that were filled with boulders. Galloway also started rowing the boat backwards, with stern first, to slow down and for better control.



Fig. 2. The Kolb brothers with the *Edith* and the *Defiance* boats in 1911
(Photograph courtesy of Grand Canyon NP collections)

Ellsworth and Emery Kolb used boats named the *Edith* and the *Defiance* to create the first motion picture of running the rapids in 1911. The Kolbs then ran this film four times a day for 65 years in their photo studio on the south rim. It is said to be the longest run of any motion picture. The *Ross Wheeler* of 1915 is a metal boat that sits just off the river. It is only accessible via the river or the end of the seven-mile long South Bass trail. It was stolen by two men who wanted to make a movie on the river. However, the trip proved extremely difficult as they had to hike out a few times for supplies, two other boats sank, and they were so battered and bruised that they gave up on the trip and abandoned the boat on the very spot it sits today. It is a wonderful exhibit for the river running community, but of course comes with conservation issues. The *WEN* boat of 1938 marked the beginning of commercial companies running trips for the public and started a three-generation family business that is going strong today. The first kayak traveled down the river in 1941. It is a foldboat with a rubberized canvas stretched over a collapsible wooden frame.

By 1948, river runners wanted to try to run a motorboat down and then up the river. They made it down in the *Esmeralda II* in four and a half days for the first ever downstream motoring. They then started upstream but the boat became so badly beat up they abandoned it. A year later it was found, repaired and taken downstream. Rubber rafts were introduced onto the river in the 1950s and enabled large groups to be toured down the river, but often times not safely. The *Georgie Woman of the River* raft is one of these early craft. In 1963, a group of four

bathtub-shaped sport yak boats were taken down the river to photograph the extreme low river conditions after the gates were closed at newly constructed Glen Canyon Dam. They used smaller crafts to maneuver through rapids at the low water levels.



Fig. 3. The *Wee Red* jet boat in Lava Falls rapid (Photograph courtesy of Grand Canyon NP collections)

In 1960, some enterprising New Zealanders brought their jet thrust propulsion system to the Colorado River. It was developed in New Zealand for motoring up whitewater rivers. They wanted to run down and then up the river. During the trip, one boat sank but the *Wee Red* made it up and back, the only boat ever to do so. It took all day and three different drivers to get through the largest rapid on the river, Lava Falls.

In 1962, some people wanted to get back to the dignity and grace of the wooden boat so they adapted a boat called a dory commonly used in Oregon. They made it taller, more water tight, and stronger. The *Music Temple* is the first dory to have run the river. Dorries are still used on the river but the most popular today is the inflatable raft.



Fig. 4. Two boats in the courtyard with snow (Photograph courtesy of Grand Canyon NP collections)

The collection of boats grew at the park over many years through donations. Nine were placed in an open courtyard for display in the 1960s and there they sat for over 40 years, neglected due to budgetary constraints. With interest from concerned boat lovers and a newly appointed cultural resources manager, preservation efforts began in 2003. The boat lovers came from the existing river running community including boat enthusiasts, admirers, expedition companies and families of the historic people that were involved with these boats. As conservators dedicated to the parks in the Rocky Mountain region, the lab was called to perform a condition survey. This survey eventually enabled the park to acquire funds from the National Park Service and the river running community to stabilize all 20 boats. The lab started the ball rolling right away using this fan club to get the boats out of the courtyard and inside for storage, thorough examinations, and stabilization so they can be displayed again in the future. During the move the lab replaced their custom-made cradle mounts. The project gathered good press in the area with regional newspaper articles. The community really grabbed hold of the project. Construction drawings were made by an architect to document the design. This was a priority for the boating community. The drawings helped incredibly with boat terminology for conservation treatment documentation.

3. CONDITIONS AND TREATMENTS

While in the courtyard, the boats suffered a lot of surface damage but luckily they were in great structural condition. The park museum staff began first with dry cleaning the three oldest wooden boats using a brush and vacuum. The boats were extremely dirty with loose dust, dirt, lint, and plant debris.



Fig. 5. Dry cleaning the wooden boats (Photograph by M. Quinn)

The wooden boats were poorly coated with linseed oil in the 1960s as a preservation attempt. To start the reduction of oil, one of the volunteers picked off lint and hairs that had stuck to the semi-hard oil. This was just on the sides closest to the walls. The oil that

accumulated as drips was removed by shaving with a scalpel. Drips formed everywhere they could.

Two of the oldest boats had extensive tears to their canvas covered decks. One section had a severely torn and distorted tear. Humidification and flattening to realign allowed the area to be set in place with heat set BEVA film and muslin.



Fig. 6. Before (left) and after (right) treatment of the canvas deck on the *Stone* boat
(Photographs by Brynn Bender)

Paint stability was an issue due to the outside storage with sun, wind, air conditioner exhaust, and runoff of water. There was staining from close proximity to an air conditioner. Painted wood surfaces were cleaned using warm water where possible. A 15% (w/v) solution of Golden MSA varnish (an iso-butyl and n-butyl methacrylate mixture) in pure gum turpentine was then used to consolidate the paint layer using an airbrush. This consolidant was chosen for its flexibility with changes in temperature and humidity, adhesive strength and ease of application.

Wet cleaning was performed on the canvas decks and painted wood to remove years of loose dirt. In some cases only warm water was used. In other cases warm water was used, followed by a 3% (w/v) triammonium citrate mixture of citric acid in deionized water set to a pH of 6-8 using ammonium hydroxide, followed by a water rinse. The chelating action of the cleaning mixture picked up the dirt well on the painted canvas decks. Contrast became visible in the paint layers showing paint loss due to wear and tear on the river.

Severe flaking paint existed on a wooden hatch lid. The paint was set down with a hot spatula, cleaned with warm water, and adhered in place using 15% (w/v) Paraloid B-72 in acetone applied with a syringe and a brush.

Metals on all the boats have minor corrosion and an irregular coating of oil. They were cleaned mechanically using bamboo skewers and with cotton swabs of acetone. This was followed with the application of a coating of microcrystalline wax in Stoddard solvent.

On one boat, the 1938 *WEN*, the linseed oil had gathered dirt and yellowed. We removed the dirt layer using the same 3% triammonium citrate solution followed by a water rinse. The cockpit was particularly thick with a well-adhered layer of dirt. The oil layer was then removed by swelling with warm water compresses followed by removing with acetone or ethanol depending on the sensitivity of the underlying paint. The results were great, exposing original white and green colors.



Fig. 7. During treatment cleaning of *WEN* boat (Photograph by Brynn Bender)

4. CONCLUSION

We are still deciding on treatment for some boats, like the 1915 *Ross Wheeler* that is still on the river. It is such a cultural landmark for boat tours that the park is reluctant to remove it. However, more recently, items from the boat have gone missing and graffiti has occurred. When visiting it in 2004, we discovered an inflatable raft stashed inside, boulders pushing in the bottom, and corrosion on the floor. So this is an ongoing process to balance our wishes to helicopter it out of the river with the community's wishes. Future plans involve getting the *WEN* boat on exhibit at the visitor's center, more treatments, including two boats at a river history museum in Utah, and filling the WWII inflatable neoprene raft with polystyrene beads. It has been wonderful to witness the attachment the community has to this collection and their strong desire to promote the history of their river running culture.

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FURTHER READING

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Phenix, A., and A. Burnstock. 1992. The removal of surface dirt on paintings with chelating agents. *The Conservator* 16(1): 28-38.

Price, L. G. 1999. *An introduction to Grand Canyon geology*. Grand Canyon, Arizona: Grand Canyon Association.



Fig. 8. Ross Wheeler boat on Colorado River, 2004 (Photograph by Brynn Bender)

SOURCES OF MATERIALS

Citric acid, monohydrate, reagent grade (C7129-1KG)

Sigma-Aldrich
3300 S. Second Street
St. Louis, MO 63118
(800) 325-8070.

Golden MSA varnish (iso-butyl and n-butyl methacrylate mixture) gloss in turpentine (No. 7730), pure gum turpentine

Dick Blick Art Materials
PO Box 1267
Galesburg, IL 61402
(800) 447-8192

Paraloid B-72, Microcrystalline wax

Talas
20 West 20th Street
New York, NY 10011
(212) 219-0770

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