

# Paiute Falls of the San Juan River

by Gene Stevenson and Donald Baars

## The San Juan River

The headwaters of the San Juan River lie in the high San Juan Mountains of southwestern Colorado, near Wolf Creek Pass. Water from the upper basin and several tributaries are temporarily stored in Navajo Dam, located on the Colorado--New Mexico border. From Navajo Dam, the San Juan River flows unimpeded across northwestern New Mexico and into southeastern Utah where it finally converges with the Colorado River in what is now Lake Powell.

On its course below Navajo Dam, the San Juan carries enormous amounts of suspended-and-bottom-load sediments. This high stream of soils is weathered from the overgrazed plateau lands of the Four Corners Region. Spring run-off and late summer rains can rapidly change the San Juan from a docile stream to a seething river of mud. Throughout its course, the San Juan River drops an average of more than 5 feet per mile, and as much as 14 feet per mile in the lower canyons. Historically, flows vary dramatically, from a recorded high of 91,000 cubic feet per second (cfs) in 1911, to several occasions when it basically dried-up. Since the construction of Navajo Dam in the 1960's, the highest flow has been 25,000 cfs in 1971; the last decade has seen flows ranging between 15,000 cfs and 150 cfs.

Today, the San Juan River is popular for commercial and private recreational boating enthusiasts. The most frequently-run stretch of the river is from Bluff to Clay Hills Crossing in southeastern Utah, a distance of nearly 84 miles. At Bluff, the river leaves its lazy meandering course and flows through deep limestone canyons incised into the Monument Upwarp. It is there, on the west flank of the Monument Upwarp, that the high gradient, silt-laden river enters the placid waters of Lake Powell. And not surprisingly, it is there where nature is at odds with the "achievements " of man.

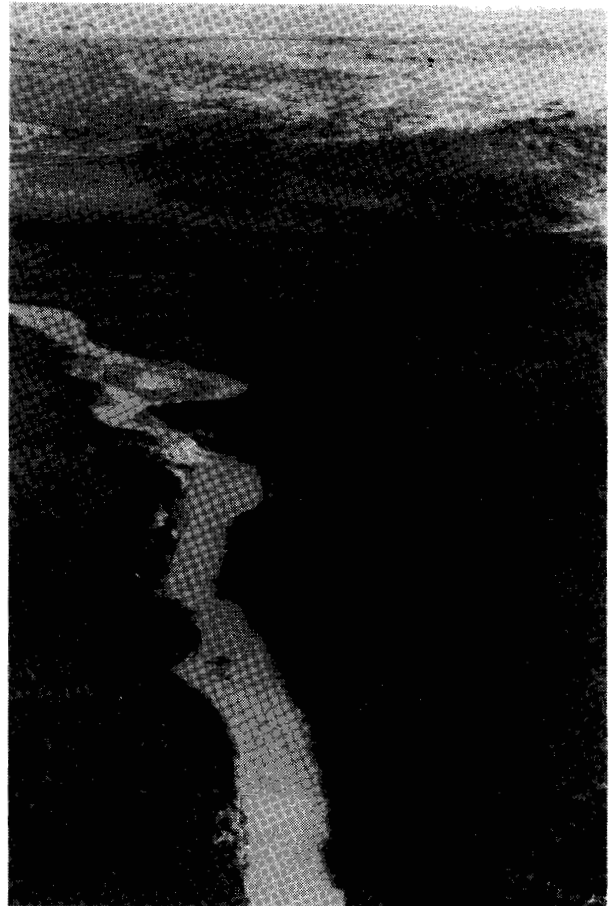
## Lower San Juan River Siltation

The decision to build another dam above Lake Mead, on the Nevada-Arizona border, was partly due to the tremendous rate at which this reservoir was silting-in. After exhaustive political efforts had failed to permit construction of dams in Grand and Marble canyons, the U.S. Bureau of Reclamation constructed Glen Canyon Dam near the Utah-Arizona border. Lake Powell began to fill in 1963 and power generation began in 1964. By 1980, 27 years later,

Lake Powell was finally filled and the spillways were tested for the first time. Because of a wet cycle in climate, the lake maintained a high reservoir pool until about 1988. In those nine years, the upper reaches of the San Juan River Arm of Lake Powell completely filled with sediment.

## Enter Waterfall

A waterfall now blocks navigation 2.2 miles below Clay Hills Crossing; the top is 9 feet below high lake level; the waterfall drops another 26 feet. The original course of the river flowed around a ledge of Organ Rock Shale (Permian Age) along the right-hand valley wall, and headed almost



**Aerial View of Paiute Falls**  
photo by Gene Stevenson

directly southward toward Paiute Farms. At high lake levels, silt was deposited evenly across the area, burying the Organ Rock ridge and the remainder of the valley floor uniformly nearly to the location of Paiute Farms, which at the time served as a Navajo-operated marina for upper Lake Powell and a take-out point for many San Juan River trips. The meandering current of the river lost its original course and

spread into several distributary channels that formed deltaic silt deposits where the current entered the quiet waters of the lake. As the lake lowered in the late 1980's, San Juan River currents shifted to the right (north) to circumnavigate the delta, flowing across the buried Organ Rock ledge. The currents became incised into the lake sediments as the lake level continued to drop and, upon cutting down to bedrock, encountered the Organ Rock ledge and a formidable obstacle, such that no one but the foolhardy attempted running it. With continued lowering of Lake Powell, the rapid matured into a sheer waterfall that has become a curiosity. Fishermen have enjoyed fishing the large eddies below the falls, where hundreds of fish mill around, confused that they are unable to travel upstream as before.

Trapped in the new channel, astride the exhumed rock ledge, the waterfall now forms a temporary nick point, or perched base level of erosion. Lake sediments trapped in the 19 miles of canyon above the waterfall have been temporarily suspended in the system at a level more than 26 feet, perhaps as much as 80 feet, above the new base level of Lake Powell. An artificially low gradient now moves finer sediments through the nearly 15 miles of canyon between the falls and clear water of the lake at Milepost 100.2 (1922 survey), where the second delta is necessarily forming.

As late as June 1992, the river flowed in a nearly straight path toward the waterfall; by October a huge eddy had developed above the falls. Apparently the river is trying to find its way around the rocky obstacle, and slide toward its old river course that circumvented the ledge to the south. When the waterfall is breached by erosion, or the river finds a new course around the obstacle, one thing is certain - the river will immediately re-establish its gradient and quickly erode through the unconsolidated lake sediments that have been perched upstream. This will be evident to any observer as a loud "unzipping" sound.

Once the obstacle is breached, the lake sediments will be deeply scoured, leaving the only existing boat ramp at Clay Hills Crossing high and dry, suspended 25 feet or more above the newly established river level. Take-out of the river-running equipment will be virtually impossible for several years until the lake sediments have thoroughly dried and settled. As the lake has subsided, high concentric desiccation cracks have formed along either side of the river bed. Slumping on a large scale of these unstable features will rapidly accelerate, and dangerous thixotropic conditions (quicksand) will prevail for some years following breachment. River travel, amounting to about 11,000 people each year, will be necessarily put to an end for lack of a viable take-out ramp.

## An Update

In 1993, there was a considerable increase in the pool elevation of Lake Powell due to a high spring run-off from the Rocky Mountains. The Lake Powell pool elevation for the winter of 1992-1993 was 3610 above sea level (asl), or 90 feet low. The pool elevation peaked in June, 1993, at 3667 asl, raising the lake level 57 feet. The raising pool level did not inundate Paiute Waterfall but it did manage to shorten its overall fall.

## Conclusion

When Glen Canyon Dam was built there was no study pertaining to the huge volume of silt that would be deposited at the lake-river interface on the Colorado and San Juan rivers. No apparent consideration was given to the starved beaches that would develop downstream in the Grand Canyon. Least studied were the upper marinas, necessary for the recreational objective of the project, that would be progressively silted such that continuous abandonment would be the only solution. Obviously, no consideration was given to drastically altered stream courses, the safety hazards that would result, nor of major ecologic damage that must necessarily follow.

A Navajo friend once explained why the Bureau of Indian Affairs was so reluctant to recognize Native American problems and approve changes. "It all started when Yellow Hair (Custer) said: 'Don't do anything until I get back!'" Perhaps John Wesley Powell had a similar effect on his Bureau of Reclamation.

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## Quote

*"So much depends on so little, and there is no sure way to prophesy human behavior. I spent the night with almost unbearable thoughts and was glad, when at last there was a glow of light in the eastern sky."*

Clyde Eddy/Spanish Bottom, 1927

