

Dams that brought us closer to 'nature'

by Margaret Sexton

The Colorado River Through Grand Canyon; Natural History and Human Change

by Steven W. Carothers and Bryan T. Brown
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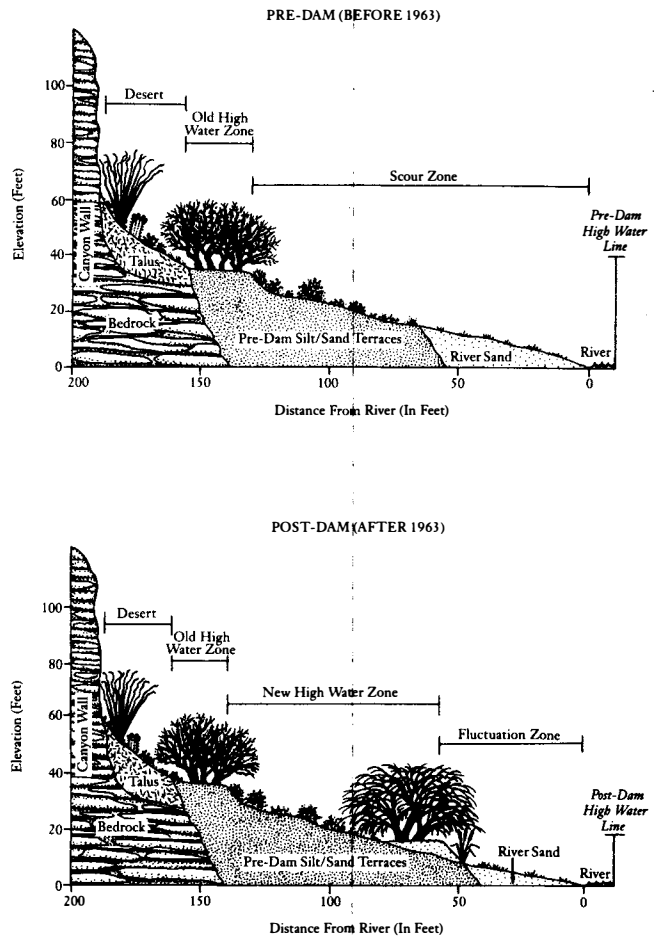
Since the construction of the Glen Canyon Dam in 1963, there have been many environmental changes to the Colorado River ecosystem, say biologists Steven Carothers and Bryan Brown, in this well-researched and beautifully illustrated book. Mr. Carothers has been studying the river since the 1960s, and Mr. Brown since 1976.

Their book, which also draws upon the work of many other scientists studying the effects of the dams on the river's ecosystem, reaches the conclusion that the environmental and other changes have not all been detrimental, and that wise management of the river's resources can ensure that both man and wildlife can benefit from the river as it now exists.

Carothers and Brown have thus written a powerful and cogent rebuttal to the arguments of environmentalists from David Brower (a founder of the Sierra Club) to the crazies of Earth First! for taking out the dams. Carothers and Brown show why the Grand Canyon and Colorado River should not be returned to a pristine, pre-dam state.

What they recommend instead, is regulating river flows to the mutual benefit of wildlife and man. Their ideas seem to be reflected in legislation sponsored by Sen. John McCain (R-Ariz.), and amended by Colorado Sen. Tim Wirth (D) and Wyoming Sen. Malcolm Wallop (R), that would closely regulate water flows, slightly decreasing the amount of electricity generated by Glen Canyon Dam, and increasing the cost of the now incredibly cheap electricity, in order to, as Senator Wirth put it, "protect the downstream resources of Grand Canyon National Park."

According to Brown and Carothers, the chief change to the river from the dams has been because silt that the river formerly carried now ends up in Lakes Powell and Mead. The clear, cold water has meant that "the energy available from the sun would no longer reflect off the surface of the



The Colorado River riparian zone, before and after the building of the Glen Canyon Dam. The authors write: "The riparian zone of the post-dam river is more complex and well developed. The old high-water zone remains unchanged, but the dam allowed the development of a dense new band of vegetation dominated by tamarisk in the new high-water zone where the scour zone had formerly existed."

water, but penetrate deeply. The effect has been to increase the river's biological productivity significantly." Introduced species such as rainbow trout have flourished over native fish, such as squawfish. The end of annual flooding has increased vegetation, and "because of the added vegetation, populations of native insects, lizards, toads, small mammals, and birds also flourished." Controlling dam flows to prevent scouring, the authors say, can help maintain the streamside abundance of life.

Water flow has been a major factor of change in the Colorado River's ecosystem. The authors point out that both dams release water in response to the needs to produce hydroelectric power or for irrigation. In addition, flows are governed by recreational requirements, such as river rafting or boating on the reservoirs. Since Glen Canyon Dam has been operational, there has been only one instance of uncontrolled

flooding, in 1983, when an unusually heavy snowpack melted. The dam's operators could not control the river flow, and the flow produced shock waves that caused cavitation in the spillways. The permanent solution came with installation of air slots in the spillways. The incident points to the fact that scouring and debris flows are problems to be reckoned with. The canyon's rock is erodible, and creates silt. The steep gradient, fault rock, and fast flows help cause turbulence. The river drops 1,900 feet over 260 miles, of which 50% takes place in rapids that make up only 10% of the total distance.

Aquatic ecosystems

The other major change has been in the plants and animals. With silt trapped in Lake Powell, the river below Glen Canyon Dam is clear and cold. Increased algae and microscopic organisms have enhanced the proliferation of introduced fish such as trout. But other native fish, such as the razorback sucker, thought to be extinct, have also been found alive and well. In addition, furbearing animals, such as beaver, muskrat, and river otter, hunted almost to extinction in the 1800s, have made a comeback due to the changed aquatic ecosystem. Bald eagles, whose favorite food is trout, have grown in number from a recorded 4 in 1985 to 18 in 1988. The peregrine falcon has also flourished.

However, as Carothers and Brown note, the future sur-

vival of many species depends on enlightened resource management, with less manipulation of the flora and fauna than used to be the norm. They offer that "although the dam, man, and the changing climate of prehistoric times have greatly modified many features of animal life in the river corridor, other aspects of the distribution of wildlife remain as they have for centuries."

To ensure that man's need for the Glen Canyon Dam can coexist with the natural environment of the Grand Canyon, Carothers and Brown rightly call for "common management goals" to govern the use of the Colorado River's resources. They note that Glen Canyon Dam has "paid for itself several times over," but must continue to produce huge amounts of electricity "because of the repayment schedule it is tied to, which in 1988 amounted to almost a billion dollars' worth of other CRSP [Colorado River Storage Project] responsibilities." Thus, the authors call for a "Colorado River Environmental Conservation Act" to articulate goals and priorities for managing the Colorado River and its dams and reservoirs. "If we assume that the dams and reservoirs are here to stay, their influence should be universally beneficial. We now possess the capability to maintain, restore, and even enhance the river of the future via the enlightened release of water from Glen Canyon Dam. Such a goal," Carothers and Brown state, "is not unreasonable for one of the world's greatest natural treasures."

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